

ADDENDUM NO. 01

Project No.:	160021	Date:	January 30, 2019
Project:	Northern Natatorium Portage Public Schools Portage, Michigan	A/E Firm:	C2AE/Stantec
Owner:	Portage Public Schools Portage, Michigan	Project Manager:	Tom McKercher, C2AE Mike Baker, Stantec
		Project Architect:	Gregg Jones, C2AE
		Const. Manager:	Owen-Ames-Kimball

The following changes, revisions, modifications, etc. shall be incorporated into the contract documents, specifications, and plans.

BID FORM

A1.1 Refer to the Bid Form, Acknowledgement of Addendum.

The Bidder shall acknowledge receipt of Addenda #01 by indicating so in the spaces provided on the bid form.

SPECIFICATIONS

A1.2 Refer to Section 07 53 23 - EPDM Roofing (reissued)

Revise footer to correct section title and number. Previously identified as 07 51 13 Built-Up Asphalt Roofing.

A1.3 Refer to Section 10 14 00 - Signage (reissued)

Revise section to add vinyl die-cut lettering for exterior door identification.

A1.4 Refer to Section 14 21 23.16 - Machine Room-Less Electric Traction Passenger Elevator (not reissued):

Revise Basis-of-Design Product (2.3.A) to Kone Ecospace in lieu of Endura MRL.

A1.5 Refer to Section 22 11 24 - Domestic Water Packaged Booster Pumps (new issue):

Add the attached section in its entirety.

A1.6 Refer to Section 23 34 29 - Destratification Fans (reissued)

Revise section to add manufacturer and controls requirements as shown.

A1.7 Refer to Section 23 36 00 - Diffusers, Registers, and Grilles (reissued)

Revise section to add manufacturer to each product type as shown.

A1.8 Refer to Section 23 37 13- Air Terminal Units (reissued)

Revise section to add manufacturer as shown.

DRAWINGS

A1.9 Refer to Sheet EC-112 – Electrical Site Plan (not reissued):

Revise Keynote 3 to read: “ALTERNATE **NO. 1** – REPLACE EXISTING SITE LIGHTING POLES AND FIXTURES WITH NEW FIXTURES AND POLES INDICATED. EXISTING BASE MAY BE REUSED IF COMPATIBLE WITH NEW POLE. EXISTING POLES ARE SPAULDING SSS-30-40-7-A1-DB.”

A1.10 Refer to Sheet EC-700.3 - Natatorium Primary One-Line Diagrams (not reissued):

Revise Keynote 3 to read: “Demolish existing North Middle School electric services as indicated. Middle School building will be demolished by others.”

A1.11 Refer to Sheet A-212 - Second Floor Reflected Ceiling Plan (reissued):

Refer to attached drawing for highlighted Tectum ceiling panel locations.

A1.12 Refer to Sheet A-501 - Door Schedule, Info, And Frame Types (not reissued):

Borrowed lite frame type F8 is FRP. Borrowed lite frame type F9 is aluminum, painted to match FRP.

A1.13 Refer to Sheet A-720 – Signage Schedule And Details (not reissued):

Revise Signage General Note 1 to read: “EXTERIOR DOORS WILL HAVE VINYL-CUT NUMBERS. NUMBERS SHALL BE 1 1/2" H AND DARK IN COLOR APPLIED TO THE TOP CENTER OF EXTERIOR DOOR FRAMES. REFER TO ~~DOOR AND FRAME SCHEDULE, AS WELL AS~~ SPEC. SECTION 101400 FOR MORE INFORMATION.”

A1.14 Refer to Sheet P-401 – Plumbing Riser Diagram (reissued):

Revise note to gas meter to remove Consumers contact.

A1.15 Refer to Sheet E-111 - First Level Lighting Plan (reissued):

Revise General Lighting Note #9 to read, “NOT USED”.

A1.16 Refer to Sheet E-211 - First Level Power & Auxiliary Plan (reissued):

Revise motor controls as indicated to coordinate with mech equipment.

A1.17 Refer to Sheet 301 - Enlarged Electrical Plan (reissued):

Revise motor controls as indicated to coordinate with mech equipment.

Refer to attached Prebid Meeting Minutes, Revised Bid Form and RFI/Substitution Request Responses

ATTACHMENTS

Section 07 53 23 - EPDM Roofing
Section 10 14 00 - Signage
Section 22 11 24 - Domestic Water Packaged Booster Pumps
Section 23 34 29 - Destratification Fans
Section 23 36 00 - Diffusers, Registers, and Grilles
Section 23 37 13 - Air Terminal Units
Sheet A-212 - Second Floor Reflected Ceiling Plan
Sheet P-401 - Plumbing Riser Diagram
Sheet E-111 - First Level Lighting Plan
Sheet E-211 - First Level Power & Auxiliary Plan
Sheet E-301 - Enlarged Electrical Plan

Prebid Meeting Minutes

Revised Bid Form

RFI/Substitution Request Responses

SECTION 07 53 23 - ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered EPDM membrane roofing system.
2. Substrate and cover board.
3. Roof insulation.
4. Vapor retarder.

B. Related Sections

1. Section 06 10 00 "Rough Carpentry" for wood nailers, cants, curbs, and blocking.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof copings, penetration flashings, flashings, and counter flashings.

1.2 DEFINITIONS

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms used in this Section:

1. ASTM D 1079 and NRCA's "Roofing and Waterproofing Manual."

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.
- D. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals' markings.
1. Fire/Windstorm Classification: Class 1A-90.
 2. Hail Resistance: MH.
- E. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.
- F. Energy Performance: Provide roofing system that is listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

- G. Energy Performance: Provide roofing system with initial solar reflectance not less than 0.70 and emissivity not less than 0.75 when tested according to CRRC-1.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening patterns.
- C. Samples for Verification: Provide for each product specified.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Manufacturer Certificate: Signed by roofing manufacturer certifying that membrane roofing system complies with requirements specified in "Performance Requirements" Article. Submit evidence of complying with performance requirements.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
- G. Research/Evaluation Reports: For components of membrane roofing system, from ICC-ES.
- H. Field quality-control reports.
- I. Warranties: Sample of special warranties.
- J. Maintenance Data: For membrane roofing system to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and is eligible to receive the specified manufacturer's warranty.
- B. Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.
- C. Source Limitations:
 - 1. Obtain components including roof insulation and fasteners for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.
 - 2. Obtain all components from the single source roofing system manufacturer guaranteeing the roofing system. All products used in the system must be labeled by the single source roofing system manufacturer issuing the guarantee.
- D. Testing Agency Qualifications: Independent testing agency with the experience and capability to conduct the testing indicated, as documented in accordance with ASTM E329.

E. Test Reports:

1. Roof drain and leader test or submit plumber's verification.
2. Core cut (if requested).
3. Steel Deck: Roof deck fastener pullout test.

F. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

1.8 WARRANTY

- A. Provide manufacturer's standard system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 - 1. Single-Source special guarantee includes base flashings, roofing membrane accessories, roof insulation, fasteners, base sheet, and other single-source components of roofing system marketed by the manufacturer.
 - 2. Guarantee Period: 20 years from date of Substantial Completion.
- B. Installer's Guarantee: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, and cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two Years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOFING

- A. EPDM: Uniform, flexible sheet made from Ethylene Propylene Diene Monomer, ASTM D 4637, Type I, non-reinforced.
- B. Basis of Design Product: Subject to compliance with requirements, provide Johns Manville EPDM NR, or comparable product by one of the following:
 - 1. Carlisle SynTec Incorporated.
 - 2. Firestone Building Products.
 - 3. GAF Materials Corporation.
- C. Composite Thickness: 60 mils.
- D. Exposed Face Color: Black.
- E. Factory Inseam Tape: 4-inch wide minimum, butyl splice tape with release film.

2.2 AUXILIARY MEMBRANE ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.
 - 1. Basis of Design Product: JM EPDM Peel & Stick Flashing.
- C. Primer Material: Manufacturer's standard synthetic-rubber polymer primer.
 - 1. Basis of Design Product: JM EPDM Tape Primer.

- D. Seaming Material: Manufacturer's standard 3-inch-wide minimum, butyl splice tape with release film.
 - 1. Basis of Design Product: JM EPDM Seam Tape Plus.
- E. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
 - 1. Basis of Design Product: JM EPDM Membrane Adhesive (Solvent Based).
- F. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
 - 1. Basis of Design Product: JM Termination Systems.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
 - 1. Basis of Design Product: High Load Fasteners and Plates.
- H. Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, sealants and other accessories.
 - 1. Basis of Design Products:
 - a. JM EPDM Peel & Stick Flashing.
 - b. JM EPDM Peel & Stick Inside/Outside Corners.
 - c. JM EPDM Peel & Stick Pipe Boots.
 - d. JM EPDM Peel & Stick Sealing Strip.
 - e. JM EPDM Peel & Stick T-Joint Patch.
 - f. JM EPDM Protective Stone Mat.
 - g. JM EPDM Reinforced Termination Strip with Tape (RTS).
 - h. JM Single Ply Caulk.

2.3 AUXILIARY ROOFING SYSTEM COMPONENTS

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee.
 - 1. Basis of Design Product: Expand-O-Flash.
- B. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

2.4 VAPOR RETARDER

- A. Self-Adhering-Sheet Vapor Retarder: ASTM D 1970/D 1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil- (1.0-mm-) total thickness; maximum permeance rating of 0.1 perm (6 ng/Pa x s x sq. m); cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor retarder manufacturer.

- B. Self-Adhering-Sheet Vapor Retarder: Polyethylene film laminated to layer of butyl rubber adhesive, minimum 30-mil- (0.76-mm-) total thickness; maximum permeance rating of 0.1 perm (6 ng/Pa x s x sq. m); cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor retarder manufacturer.

2.5 SUBSTRATE AND COVER BOARD

- A. General: Contractor's choice of the following:
- B. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 3, High-density Polyisocyanurate technology bonded in-line to mineral-surfaced, fiber glass reinforced facers with greater than 140 lbs of compressive strength.
 - 1. Basis of Design Product: Invinsa Roof Board.
 - 2. Thickness: 1/4 inch.
- C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, or ASTM C 1278/C 1278M, fiber-reinforced gypsum board.
 - 1. Thickness: 1/4 inch.

2.6 ROOF INSULATION

- A. General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi).
 - 1. Basis of Design Product: JM ENRGY 3.
 - 2. Provide insulation package with minimum R Value: R-12.
 - 3. Provide insulation package in two layers.
 - 4. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.
 - a. Determined in accordance with CAN/ULC S770 at 75°F (24°C)

2.7 TAPERED INSULATION

- A. Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/8 inch per 12 inches (1:96), unless otherwise indicated.
 - 1. Basis of Design Product: JM Tapered ENRGY 3.

2.8 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
 - 1. Basis of Design Products: DiamondBack Pre-Cut Crickets, DiamondBack Pre-Cut Miters, and Tapered Fesco Edge Strip

- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer.
 - 1. Basis of Design Product: UltraFast Fasteners and Plates.
- D. Two Part Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate.
 - 1. Basis of Design Product: Roofing Systems Urethane Adhesive (RSUA).
- E. Wood Nailer Strips: Comply with requirements in Division 06 Section "Rough Carpentry."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. At Steel Decks: Verify that surface plane is flat and steel roof deck is fastened.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 VAPOR RETARDER INSTALLATION

- A. Self-Adhering-Sheet Vapor Retarder: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 and 6 inches, respectively.
 - 1. Extend vertically up parapet walls and projections to a minimum height equal to height of insulation and cover board.
 - 2. Seal laps by rolling.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
 - 1. At steel roof decks, install substrate board at right angle to flutes of deck.
 - a. Locate end joints over crests of steel roof deck.
 - 2. Tightly butt substrate boards together.
 - 3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 4. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturers' written instructions.

3.5 INSULATION INSTALLATION

- A. Coordinate installation of roof system components so insulation and cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation boards with long joints in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with like material.
- E. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- H. Steel Deck Areas: Mechanically Fastened with Subsequent Layers Adhered Insulation: Secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type to deck type.
 - 1. Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof.
 - 2. Install subsequent layers in a two-part urethane adhesive according to roofing system manufacturer's instruction.
 - 3. Install each layer to resist uplift pressure at corners, perimeter, and field of roof.

3.6 COVER BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

- C. Install cover board with long joints of cover board in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with cover board.
 - 1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 - 1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck.
 - 1. Fasten cover boards according to requirements in FM Approvals' "RoofNav" for specified Windstorm Resistance Classification.
 - 2. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
- F. Adhered Cover Board: Adhere cover board to substrate as follows:
 - 1. Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.
 - 2. Install each layer in a one-part urethane adhesive according to roofing system manufacturer's instruction.
 - 3. Install to resist uplift pressure at corners, perimeter, and field of roof.

3.7 ADHERED MEMBRANE ROOFING INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Where roof slope exceeds 1/2 inch per 12 inches (1:24), contact the membrane manufacturer for installation instructions regarding installation direction and backnailing.
- D. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- E. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.8 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Install roofing membrane over area to receive roofing in accordance with membrane roofing system manufacturer's written instructions.
 - 1. Unroll roofing membrane and allow to relax before installing.
 - 2. Install sheet in accordance with roofing system manufacturer's written instructions.
- B. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply solvent-based bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.
- D. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- E. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- F. Field Fabricated Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.
- G. Tape to Tape Installation: Align membrane for appropriate overlap, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.
- H. Tape to Standard Sheet Installation: Align membrane for appropriate overlap, clean and prime non-taped face of splice area, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.
- I. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.
- J. Install roofing membrane and auxiliary materials to tie in to existing roofing.

3.9 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.10 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 53 23

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following types of signs:
 - 1. Panel signs.
 - 2. Dimensional letters and numbers.
 - 3. Cast metal plaques.
 - 4. *Vinyl-cut letters*.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 14 Section "Hydraulic Elevators" for elevator door jamb markings.

1.2 SUBMITTALS

- A. Product data for each type of sign specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Shop drawings showing fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, layout, reinforcement, accessories, and installation details.
- C. Provide message list for each sign required, including large-scale details of wording and lettering layout.
- D. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.
- E. Templates: Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
- F. Furnish full-size rubbings for metal plaques.
- G. Samples: Provide the following samples of each sign component for initial selection of color, pattern and surface texture as required and for verification of compliance with requirements indicated.
 - 1. Samples for initial selection of color, pattern, and texture:
 - a. Cast Acrylic Sheet and Plastic Laminate: Manufacturer's color charts consisting of actual sections of material including the full range of colors available for each material required.

2. Samples for verification of color, pattern, and texture selected and compliance with requirements indicated:
 - a. Cast Acrylic Sheet and Plastic Laminate: Provide a sample panel not less than 8-1/2 inches by 11 inches for each material, color, texture, and pattern required. On each panel include a representative sample of the graphic image process required, showing graphic style, and colors and finishes of letters, numbers, and other graphic devices.
- H. Dimensional Letters: Provide full-size representative samples of each dimensional letter type required, showing letter style, color, and material finish and method of attachment.

1.3 QUALITY ASSURANCE

- A. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and sufficient production capacity to produce sign units required without causing delay in the Work.
- B. Single-Source Responsibility: For each separate sign type required, obtain signs from one source of a single manufacturer.
- C. Design Concept: The Drawings indicate sizes, profiles, and dimensional requirements of signs and are based on the specific types and models indicated. Sign units by other manufacturers may be considered provided deviations in dimensions and profiles do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.
- D. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:
 1. Manufacturers of Panel Signs:
 - a. ABC Architectural Signing System.
 - b. Allenite Signs 800-825-0150 www.allenitesigns.com
 - c. Andco Industries Corporation 800-476-8900 www.andco.com
 - d. APCO Graphics 877-988-2726 www.apcosigns.com
 - e. Architectural Graphic Products, Inc. 713-683-8942 www.agpsignsonline.com
 - f. ASI Sign Systems, Inc. 800-274-7732 www.asisignage.com
 - g. Bayuk Graphic Systems, Inc. 800-670-2316 www.bayukgraphics.com
 - h. Building Image Group, Inc. 512-494-1466 www.buildingimagegroup.com
 - i. Charleston Industries, Inc. 800-722-0209 www.cisigns.com
 - j. DanSign 877-257-2062 www.dansign.com
 - k. DGS Corp. 773-283-4411

- l. Diskey Sign Company 800-669-4472 www.diskeysign.com
- m. DiverseID (877) 446-2374 diverseid.com/
- n. Lettering Specialists, Inc., 847-674-3414 www.asigncompany.com
- o. Modulex 214-352-9140 www.modulex.com
- p. Mohawk Sign Systems 800-223-7705 www.mohawksign.com
- q. MooreCo. Inc. 800-749-2258 www.moorecoinc.com
- r. Poblocki Sign Company LLC 888-678-9995 www.poblocki.com
- s. South Texas Graphic Specialties, Inc. 713-467-4499
- t. Spanjer Brothers, Inc.
- u. Texas Star Engraving 877-989-7827 www.txstarengraving.com
- v. The Supersine Company 800-328-1988 www.supersine.com
- w. Vomar Products, Inc. 818-610-5115 www.vomarproducts.com

2. Manufacturers of Dimensional Letters:

- a. Andco Industries Corporation 800-476-8900 www.andco.com
- b. A.R.K. Ramos Signage Systems 800-725-7266 www.arkramos.com
- c. ASI Sign Systems, Inc. 800-274-7732 www.asisignage.com
- d. Building Image Group, Inc. 512-494-1466 www.buildingimagegroup.com
- e. DiverseID (877) 446-2374 diverseid.com/
- f. Gemini Inc. 800-421-1256 www.signletters.com
- g. Matthews International Corp. 214-631-8240 www.matthewsgsd.com
- h. Metal Arts 800-237-8069 www.metalartslettersandplaques.com
- i. Metallic Arts Inc. 800-541-3200 www.metallicarts.com
- j. The Southwell Company 800-950-8068 www.southwellco.com
- k. Spanjer Brothers, Inc.
- l. Texas Star Engraving 877-989-7827 www.txstarengraving.com
- m. Vomar Products, Inc. 818-610-5115 www.vomarproducts.com

3. Manufacturers of Cast Plaques:

- a. Andco Industries Corporation 800-476-8900 www.andco.com
- b. A.R.K. Ramos Signage Systems 800-725-7266 www.arkramos.com
- c. Building Image Group, Inc. 512-494-1466 www.buildingimagegroup.com
- d. DiverseID (877) 446-2374 diverseid.com/
- e. Gemini, Inc. 800-421-1256 www.signletters.com
- f. Metal Arts 800-237-8069 www.metalartslettersandplaques.com
- g. Show and Tell Products 979-690-8900 www.showandtellproducts.biz
- h. The Southwell Company 800-950-8068 www.southwellco.com
- i. Texas Star Engraving 877-989-7827 www.txstarengraving.com
- j. Vomar Products, Inc. 818-610-5115 www.vomarproducts.com

2.2 MATERIALS

- A. Cast Acrylic Sheet: Provide cast (not extruded or continuous cast) methyl methacrylate monomer plastic sheet, in sizes and thicknesses indicated, with a minimum flexural strength of 16,000 psi when tested according to ASTM D 790, with a minimum allowable continuous service temperature of 176 deg F (80 deg C), and of the following general types:
 1. Transparent Sheet: Where sheet material is indicated as "clear," provide colorless sheet in matte finish, with light transmittance of 92 percent, when tested according to the requirements of ASTM D 1003.
 2. Opaque Sheet: Where sheet material is indicated as "opaque," provide colored opaque acrylic sheet in colors and finishes as selected from the manufacturer's standards.

- B. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by the sign manufacturer for the casting process used and for the use and finish indicated.
- C. Fasteners: Use concealed fasteners fabricated from metals that are not corrosive to the sign material and mounting surface.
- D. Anchors and Inserts: Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- E. Colored Coatings for Acrylic Plastic Sheet: Use colored coatings, including inks and paints for copy and background colors, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are nonfading for the application intended.

2.3 PANEL SIGNS

- A. Panel Signs: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
 - 1. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.
- B. Unframed Panel Signs: Fabricate signs with edges mechanically and smoothly finished to conform with the following requirements:
 - 1. Edge Condition: Square, unless otherwise indicated.
 - 2. Corner Condition: Round corners, unless otherwise indicated.
- C. Laminated Sign Panels: Permanently laminate face panels to backing sheets of material and thickness indicated using the manufacturer's standard process.
- D. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.
- E. Subsurface Copy: Apply copy to the back face of clear acrylic sheet forming the panel face by process indicated to produce precisely formed opaque images free from rough edges.
 - 1. Use reverse silk-screen process to print copy; overspray the copy with an opaque background color coating.
 - 2. Use Dupont Chromalin heat- and pressure-laminated photopolymer film system to form copy and background color.
 - a. The manufacturer has the option of selecting either process indicated above, or using subsurface engraving process, as appropriate to the copy form and the economics of production.
- F. Raised Copy: Machine-cut copy characters from matte-finished opaque acrylic sheet and chemically weld onto the acrylic sheet forming sign panel face. Produce precisely formed characters with square cut edges free from burrs and cut marks.
 - 1. Panel Material: Matte-finished clear acrylic with opaque color coating subsurface applied.
 - 2. Raised Copy Thickness: Not less than 1/32 inch.

2.4 DIMENSIONAL LETTERS AND NUMBERS

- A. Cast Letters and Numbers: Form individual letters and numbers by casting. Produce characters with smooth, flat faces, sharp corners, and precisely formed lines and profiles, free from pits, scale, sand holes, or other defects. Cast lugs into the back of characters and tap to receive threaded mounting studs. Comply with requirements indicated for finish, style, and size.

1. Metal: Aluminum.
2. Letter Height: As indicated.
3. Letter Style: As indicated.
4. Letter Thickness: 1/2 inch.

- B. Schedule of Dimensional Signage:

1. Location: Canopy
 - a. Text : "PORTAGE NORTH NATATORIUM"
 - b. Material: Aluminum
 - c. Character Height: 1'-0"
 - d. Character Style: Helvetica
 - e. Mounting Type: Clip angles
2. Location: Concession Window
 - a. Text : "CONCESSIONS"
 - b. Material: Aluminum
 - c. Character Height: 9"
 - d. Character Style: Helvetica
 - e. Mounting Type: Pin

2.5 CAST METAL PLAQUES

- A. Plaques: Castings shall be free from pits, scale, sand holes, or other defects. Comply with requirements specified for metal, border style, background texture, and finish and with requirements shown for thickness, size, shape, and copy. Hand-tool and buff borders and raised copy to produce the manufacturer's standard satin polished finish. Refer to the "Finishes" Article for other finish requirements.

1. Metal: Aluminum.
2. Border Style: Plain bevel.
3. Background Texture: Manufacturer's standard leatherette finish.
4. Background Finish: Provide the manufacturer's standard baked-enamel finish.

2.6 DIE-CUT VINYL LETTERING

- A. *Material: 2-mil vinyl, UV protected.*
- B. *Installation: Pre-masked transfer tape.*
- C. *Font: Helvetica Bold.*

2.7 FINISHES

- A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.
- B. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
- C. Aluminum Finishes: Natural satin finish with clear polyurethane protective coat.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
 - 1. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.
- B. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using the methods indicated below:
 - 1. Vinyl-Tape Mounting: Use double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
 - 2. Mount directly on glass with double face foam tape, reinforce with clear silicone adhesive. Install back shield on opposite side of glass.
- C. Dimensional Letters and Numbers: Mount letters and numbers using standard fastening methods recommended by the manufacturer for letter form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish letter spacing and to locate holes for fasteners.
 - 1. Flush Mounting: Mount letters with backs in contact with the wall surface.
- D. Cast Metal Plaques: Mount plaques using the standard method recommended by the manufacturer for the type of wall surface indicated.
 - 1. Concealed Mounting: Mount the plaques by inserting threaded studs into tapped lugs on the back of the plaque. Set in predrilled holes filled with quick-setting cement.

3.2 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION 10 14 00

SECTION 22 11 24 - DOMESTIC-WATER PACKAGED BOOSTER PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Division 20, Common Work Results for Mechanical, requirements apply to this section.
- C. Division 01 Project Management and Coordination, apply to this section and will require the contractors' participation in the Above Ceiling Coordination Program.
- D. Division 01 General Commissioning Requirements, apply to this section and will require the contractors' participation in the commissioning process.

1.2 SUMMARY

- A. Section Includes:
 - 1. Multiplex, variable-speed booster pumps.
- B. Related Sections:
 - 1. Division 22 "Domestic Water Pumps" for domestic-water circulation pumps.
 - 2. Division 22 "Facility Indoor Potable-Water Storage Tanks" for separate hydropneumatic domestic-water tanks for multiplex booster pumps.

1.3 DEFINITIONS

- A. VFC: Variable-frequency controller(s).

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, and dimensions of individual components and profiles. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For booster pumps. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For booster pumps to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASME Compliance: Comply with ASME B31.9 for piping.
- C. UL Compliance for Packaged Pumping Systems:
 - 1. UL 508, "Industrial Control Equipment."
 - 2. UL 508A, "Industrial Control Panels."
 - 3. UL 778, "Motor-Operated Water Pumps."
 - 4. UL 1995, "Heating and Cooling Equipment."
- D. Booster pumps shall be listed and labeled as packaged pumping systems by testing agency acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Retain protective coatings and flange's protective covers during storage.

1.8 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Statically and dynamically balance rotating parts
- B. Pumps to operate at 3450 rpm maximum unless specified otherwise.
- C. Pump package shall be factory tested and pre-set to site conditions as well as hydrostatically tested. The testing laboratory shall be an NSF 61 Certified closed loop testing system capable of pressurized suction and supply pressure condition simulation. The test laboratory shall feature procedures detailing an unbroken chain of calibrations as required by NIST. Open atmospheric testing equipment or devices are not compliant. The specified flow conditions shall be tested and verified as well as specified supply pressure per plans and specifications. The factory to provide a certified performance test indicating pressure and flow from zero to 100% capacity. Certified "NSF/ANSI 61" documentation shall be submitted to the specifying engineer.
- D. The manufacturer shall provide certificate indicating that they have passed compliance with NSF61 Drinking Water Systems based on Federal Legislation S.3874. This certification must be conducted by an approved 3rd Party Laboratory certified to NSF 61 Compliance Testing.

2.2 MULTIPLEX, VARIABLE-SPEED BOOSTER PUMPS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong Pumps Inc.
 - 2. Bell & Gossett Domestic Pump; ITT Corporation.
 - 3. Canariis Corporation.
 - 4. Goulds Pumps; ITT Corporation.
 - 5. Grundfos Pumps Corporation U.S.A.
 - 6. Patterson Pump Company; a subsidiary of the Gorman-Rupp Company.

7. QuantumFlo.
- B. Description: Factory-assembled and -tested, fluid-handling system for domestic water, with pumps, piping, valves, specialties, and controls, and mounted on base.
- C. Pumps:
1. Type: End suction as defined in HI 1.1-1.2 and HI 1.3 for end-suction, close-coupled, single-stage, overhung-impeller, centrifugal pump.
 2. Casing: Radially split; stainless steel.
 3. Impeller: Closed, stainless steel; statically and dynamically balanced and keyed to shaft.
 4. Shaft and Shaft Sleeve: Steel shaft, with copper-alloy shaft sleeve and deflector.
 5. Seal: Mechanical.
 6. Orientation: Mounted horizontally .
- D. Motors: Single speed, with grease-lubricated, ball-type bearings. Select motors that will not overload through full range of pump performance curve.
- E. Piping: Stainless-steel pipe and fittings.
- F. Valves:
1. Shutoff Valves NPS 2 and Smaller: Gate valve or two-piece, full-port ball valve, in each pump's suction and discharge piping.
 2. Shutoff Valves NPS 2-1/2 and Larger: Gate valve or lug-type butterfly valve, in each pump's suction and discharge piping and in inlet and outlet headers.
 3. Check Valves NPS 2 and Smaller: Silent or swing type in each pump's discharge piping.
 4. Check Valves NPS 2-1/2 and Larger: Silent type in each pump's discharge piping.
 5. Thermal-Relief Valve: Temperature-and-pressure relief type in pump's discharge header piping.
- G. Dielectric Fittings: With insulating material isolating joined dissimilar metals.
- H. Control Panel: Factory installed and connected as an integral part of booster pump; automatic for multiple-pump, variable-speed operation, with load control and protection functions.
1. Control Logic: Solid-state system with transducers, programmable microprocessor, VFC, and other devices in controller. Install VFC for pump motors larger than 25 hp in separate panel; same type as motor control panel enclosure.
 2. Motor Controller: NEMA ICS 2, variable-frequency, solid-state type.
 - a. Control Voltage: 120-V ac, with integral control-power transformer.
 3. Enclosure: NEMA 250, Type 4].
 4. Motor Overload Protection: Overload relay in each phase.
 5. Starting Devices: Hand-off-automatic selector switch for each pump in cover of control panel, plus pilot device for automatic control.
 - a. Triplex, Sequence (Lead-Lag-Lag) Starter: Switches lead pump to one lag main pump and to three-pump operation.
 6. Pump Operation and Sequencing: Pressure-sensing method for lead pump and flow-sensing method for lag pumps.
 - a. Time Delay: Controls pump on-off operation; adjustable from 1 to 300 seconds.
 7. VFC: Voltage-source, pulse-width, modulating-frequency converter for each pump.
 8. Manual Bypass: Magnetic contactor arranged to transfer to constant-speed operation upon VFC failure.
 9. Instrumentation: Suction and discharge pressure gages.
 10. Lights: Running light for each pump.
 11. Alarm Signal Device: Sounds alarm when backup pumps are operating.

- a. Time Delay: Controls alarm operation; adjustable from 1 to 300 seconds, with automatic reset.
- 12. Thermal-bleed cutoff.
- 13. Low-suction-pressure cutout.
- 14. High-suction-pressure cutout.
- 15. Low-discharge-pressure cutout.
- 16. High-discharge-pressure cutout.
- 17. Building Automation System Interface: Provide auxiliary contacts for interface to BACnet building automation system. Building automation systems are specified in Section 230900 "Instrumentation and Control for HVAC." Include the following:
 - a. On-off status of each pump.
 - b. Alarm status.
- I. Base: Structural steel.
- J. Capacities and Characteristics: Refer to drawing schedule.

2.3 MOTORS

- A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors.
 - 1. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.
 - 2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in NFPA 70.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for booster pumps to verify actual locations of piping connections before booster-pump installation.

3.2 INSTALLATION

- A. Equipment Mounting:
 - 1. Install booster pumps on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Division 03 "Cast-in-Place Concrete."
- B. Support connected domestic-water piping so weight of piping is not supported by booster pumps.

3.3 CONNECTIONS

- A. Comply with requirements for piping specified in Division 22 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect domestic-water piping to booster pumps. Install suction and discharge pipe equal to or greater than size of system suction and discharge headers.

1. Install shutoff valves on piping connections to booster-pump suction and discharge headers. Install ball, butterfly, or gate valves same size as suction and discharge headers. Comply with requirements for general-duty valves specified in Division 22 "General-Duty Valves for Plumbing Piping."
2. Install union, flanged, or grooved-joint connections on suction and discharge headers at connection to domestic-water piping. Comply with requirements for unions and flanges specified in Division 22 "Domestic Water Piping."
3. Install valved bypass, same size as and between piping, at connections to booster-pump suction and discharge headers. Comply with requirements for domestic-water piping specified in Division 22 "Domestic Water Piping."
4. Install flexible connectors, same size as piping, on piping connections to booster-pump suction and discharge headers. Comply with requirements for flexible connectors specified in Division 22 "Domestic Water Piping."
5. Install piping adjacent to booster pumps to allow service and maintenance.

3.4 CONTROL CONNECTIONS

- A. Install control and electrical power wiring to field-mounted control devices.
- B. Connect control wiring between pressure switches and devices.
- C. Connect pressure switches to pumps that they control.

3.5 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Division 20 "Mechanical Identification."

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 1. Perform visual and mechanical inspection.
 2. Leak Test: After installation, charge booster pump and test for leaks. Repair leaks and retest until no leaks exist.
 3. Operational Test: After electrical circuitry has been energized, start booster pumps to confirm proper motor rotation and booster-pump operation.
 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Pumps and controls will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.7 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 1. Complete installation and startup checks according to manufacturer's written instructions.

3.8 ADJUSTING

- A. Adjust booster pumps to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust pressure set points.
- C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting booster pump to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.9 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain booster pumps.

END OF SECTION 22 11 24

SECTION 23 34 29 – DESTRATIFICATION FANS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Division 20, Common Work Results for Mechanical, requirements apply to this section.
- C. Division 01 Project Management and Coordination, apply to this section and will require the contractors' participation in the Above Ceiling Coordination Program.
- D. Division 01 General Commissioning Requirements, apply to this section and will require the contractors' participation in the commissioning process.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Ceiling mounted circulating fans

1.3 PERFORMANCE REQUIREMENTS

- A. Project Altitude: Base fan-performance ratings on sea level.
- B. Operating Limits: Classify according to AMCA 99.

1.4 SUBMITTALS

- A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:
 - 1. Certified fan performance curves with system operating conditions indicated.
 - 2. Certified fan sound-power ratings.
 - 3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
 - 4. Material thickness and finishes, including color charts.
 - 5. Fan speed controllers.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Wiring Diagrams: Power, signal, and control wiring.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

- B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.
- C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.
- D. UL Standard: Power ventilators shall comply with UL 705.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fans as factory-assembled unit, to the extent allowable by shipping limitations, with protective crating and covering.
- B. Disassemble and reassemble units, as required for moving to final location, according to manufacturer's written instructions.
- C. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 COORDINATION

- A. Coordinate size and location of structural-steel support members.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace components of fail that fail in materials or workmanship within specified warranty period.
 - 1. Airfoils & Hub: Lifetime Parts
 - 2. Motor, Gearbox, VFD: 7 years Parts
 - 3. Wall controller: 1 year parts
 - 4. Labor: 1 year.

PART 2 - PRODUCTS

2.1 HIGH VOLUME, LOW SPEED FANS CEILING MOUNTED CIRCULATING FANS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Delta T Corporation Big Ass Fan
 - 2. **Go Fan Yourself**
- B. Complete Unit:
 - 1. The fan shall be ETL certified for use in wet locations and built pursuant to construction guidelines set forth by UL standards 507 and CSA standard 22.2 No.113-08. The fan shall be designed to move an effective amount of air for cooling and destratification in small, low ceiling, commercial applications. The fan, in operation, shall not disturb other hanging objects 2' outside of its circumference to a distance of 3' below its airfoils. The fan shall incorporate a direct drive system designed specifically for high volume, low speed fans to ensure silent operation. The sound levels from the fan operating at maximum speed shall not exceed 40 dBA (measured 20' below the blades and 20' horizontally from the center of the fan).
 - 2. Provide without product name / signage affixed to unit.
- B. Airfoils:

1. The fan shall be equipped with eight (8) Powerfoil airfoils of precision extruded aluminum alloy. The airfoils shall be connected by means of two (2) high strength locking bolts per airfoil. The airfoils shall be connected to the hub and interlocked with zinc plated steel retainers.
2. The fan shall be equipped with eight (8) Powerfoil winglets on the ends of the airfoils and eight (8) AirFences™ positioned on the airfoils at the optimum location for performance. Both the winglet and AirFence shall be molded of polypropylene. The standard color of the winglet and AirFence shall be "Safety Yellow."

D. Motor:

1. The fan motor shall be an AC induction type inverter rated at one of the following:
 - a. 1725 RPM, 200–240/400–480 VAC, 50/60 Hz, three-phase
2. The motor shall be totally enclosed, fan cooled (TEFC) with an IP44 NEMA classification. A NEMA 56C standard frame shall be provided for ease of service. The motor shall be manufactured with a double baked Class F insulation and be capable of continuous operation in -30°F to 122°F (-34°C to 50°C) ambient conditions.
3. The motor shall have a C-face attachment that shall enable technicians to detach the motor for easy field service. The C-face motor adapter shall be designed to work with the NitroSeal™ gearbox.
4. Provide "harsh environment package," and motor with an IP55 NEMA classification. With onboard VFD enclosure sealed for weather-resistant operation.

E. Gearbox

1. The fan gearbox shall be a NitroSeal™ Drive designed specifically for the Powerfoil X series. The gearbox shall include a high-efficiency, hermetically sealed, nitrogen-filled, offset helical gear reducer with two-stage gearing, a hollow output shaft, cast iron housing, double lip seals, high quality SKF Explorer Series bearings with crowned cages for optimal lubrication flow, and precision machined gearing to maintain backlash less than 11 arc-minutes over the life of the unit. Lubrication shall be high-grade, low-foaming synthetic oil with extreme pressure additives and a wide temperature range.
2. The gearbox shall be equipped with a hollow shaft threaded to accept a ¾" NPT fitting in which wiring, piping, etc., can be routed to below the fan. A standard junction box can be affixed to this hollow shaft to allow for installing optional features such as lights or cameras. The inclusion of the hollow shaft shall be specified at the time of order.

F. Hub

1. The fan hub shall be made of precision cut aluminum for high strength and light weight. The hub shall consist of two (2) aluminum plates, eight (8) aluminum spars and one (1) aluminum spacer fastened with a pin and collar rivet system.
2. The hub shall be secured to the output shaft of the gearbox by means of (10) high strength bolts. The hub shall incorporate five (5) safety retaining clips made of 1/4" (0.6 cm) thick steel that shall restrain the hub/airfoil assembly.

F. Mounting System:

1. The fan mounting system shall be designed for quick and secure installation on a variety of structural supports. The mounting yoke shall be of ASTM A-36 steel, welded construction, at least 3/16" thick, and powder coated for appearance and corrosion resistance. No mounting hardware or parts substitutions, including cast aluminum, are acceptable.
2. All mounting bolts shall be SAE Grade 8 or equivalent.
3. The fan shall be equipped with a mounting post that provides a structural connection between the fan assembly and extension tube. The mounting post shall be formed from A36 steel, contain no critical welds, and be powder coated for corrosion resistance and appearance.

G. Safety Cable:

1. The fan shall be equipped with a safety cable that provides an additional means of securing the fan assembly to the building structure. The safety cable shall be Ø3/8" (1 cm) diameter and fabricated out of 7 x 19 galvanized steel cable. The end loops shall be secured with swaged Nicopress® sleeves, pre-loaded and tested to 3,200 lbf (13,345 N).
2. Field construction of safety cables is not permitted.

H. Controls:

1. The fan shall be equipped with an auxiliary controller capable of providing 100% control of all fan functions. The auxiliary controller shall be a digital keypad device mounted within a cast zinc cover. The cover shall be capable of mounting to a standard switch box.
2. The fan shall be equipped with touchpad controls and an LED display for controlling the fan's direction, operation, speed, and programming. Communication between the fan VFD and auxiliary controller is by a standard CAT5 (or higher) Ethernet cable. The auxiliary control comes standard with 150 ft of factory-assembled CAT5 Ethernet cable.
3. The fan shall be equipped with a simple diagnostic program to identify faults in the system. Provisions shall be made for retrieving fan operation and diagnostic data (fault messages) through the auxiliary controller.
4. **Provide relay for fire control panel integration.**
5. **Provide for BACnet integration to BMS to perform functions indicated on Temperature Controls plans. Coordinate protocol platform with TCC contractor (some of the district elements are LON).**

I. Wall Control:

1. Regulatory Requirements: The fan speed control system shall be compliant with NFPA 70-2011—National Electric Code (NEC).
2. Sustainability Characteristics: The system shall be designed to automatically control the speed of Big Ass Fans from the locations of the wall controller and upper temperature sensor to maximize energy savings and user comfort. The system shall be designed specifically for high volume, low speed Big Ass Fans, and receives information from user-determined settings and temperature sensors.
3. Good workmanship shall be evident in all aspects of installation.
4. The wall control shall be a digital keypad device with an internal temperature sensor. It shall be recessed/flush wall-mounted centrally within the fan zone at head height using two (2) provided 6-32 x 7/8" pan head screws and four (4) provided 6-32 countersink.
5. The wall controller shall be enclosed in a cast zinc cover measuring 3.86" (9.8 cm) x 7.25" (18.4 mm) x 1" (2.5 cm) and be made of heavy-duty steel.
6. The wall controller includes a Class II AC Adapter power cord.
7. The wall controller only provides a speed reference for the fan. Start and stop functions are controlled by the auxiliary controller.
8. The mounting location shall meet the requirements of OSHA standard 29 CFR 1910.303(g) for accessibility minimum clearances.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mechanical contractor to provide for installation to be completed by a factory-trained certified installer.

3.2 CONNECTIONS

- A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 1. Verify that shipping, blocking, and bracing are removed.
 2. Verify that unit is secure on mountings and supporting devices. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

3. Verify that cleaning and adjusting are complete.
4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
5. Verify lubrication for bearings and other moving parts.
6. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
7. Shut unit down and reconnect automatic temperature-control operators.
8. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

- A. Refer to Division 20 Section "Testing, Adjusting, and Balancing" for testing, adjusting, and balancing procedures.
- B. Replace fan and motor pulleys as required to achieve design airflow.
- C. Lubricate bearings.

END OF SECTION 23 34 29

SECTION 23 36 00 - AIR TERMINAL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Division 20, Common Work Results for Mechanical, requirements apply to this section.
- C. Division 01 Section 01 31 00 Project Management and Coordination, apply to this section and will require the contractors' participation in the Above Ceiling Coordination Program.
- D. Division 01 Section 01 91 13 General Commissioning Requirements, apply to this section and will require the contractors' participation in the commissioning process.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Single-duct air terminal units.
 - 2. Casing liner.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of air terminal unit.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for air terminal units.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For air terminal units.
 - 1. Include plans, elevations, sections, and mounting details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.
 - 4. Hangers and supports, including methods for duct and building attachment and vibration isolation.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Size and location of initial access modules for acoustic tile.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For air terminal units to include in emergency, operation, and maintenance manuals.

In addition to items specified in Division 01 "Operation and Maintenance Data," include the following:

- a. Instructions for resetting minimum and maximum air volumes.
- b. Instructions for adjusting software set points.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."
- C. ASHRAE Compliance: Applicable requirements in ASHRAE/IES 90.1, "Section 6 - Heating, Ventilating, and Air Conditioning."

2.2 SINGLE-DUCT AIR TERMINAL UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
1. Anemostat.
 3. Nailor Industries.
 4. Price Industries.
 5. Titus.
 6. Trane.
 7. Tuttle & Bailey.
 8. **Krueger**
- B. Configuration: Volume-damper assembly inside unit casing with control components inside a protective metal shroud.
- C. Casing: 0.034-inch thick galvanized steel, single wall.
1. Casing Liner: Comply with requirements in "Casing Liner" Article for fibrous-glass duct liner.
 2. Air Inlet: Round stub connection or S-slip and drive connections for duct attachment.
 3. Air Outlet: S-slip and drive connections.
 4. Access: Removable panels for access to parts requiring service, adjustment, or maintenance; with airtight gasket.
 5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- D. Volume Damper: Galvanized steel with peripheral gasket and self-lubricating bearings.
1. Maximum Damper Leakage: AHRI 880 rated, 2 percent of nominal airflow at 3-inch wg inlet static pressure.
 2. Damper Position: Normally open.
- E. Hydronic Heating Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, and rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.

- F. DDC Controls: Single-package unitary controller and actuator specified in Division 23 "Instrumentation and Control for HVAC."
- G. Control devices shall be compatible with temperature controls system specified in Division 23 "Instrument and Control for HVAC."

2.3 CASING LINER

- A. Casing Liner: Fibrous-glass duct liner, complying with ASTM C 1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."
 - 1. Minimum Thickness: 3/4 inch.
 - a. Maximum Thermal Conductivity:
 - 1) Type I, Flexible: 0.27 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
 - 2) Type II, Rigid: 0.23 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
 - 2. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
 - 3. Solvent-Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C 916.
 - a. Adhesive VOC Content: 80 g/L or less.
 - b. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.4 SOURCE QUALITY CONTROL

- A. Factory Tests: Test assembled air terminal units according to AHRI 880.
 - 1. Label each air terminal unit with plan number, nominal airflow, maximum and minimum factory-set airflows, coil type, and AHRI certification seal.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 5, "Hangers and Supports" and with Division 20 "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 - 1. Where practical, install concrete inserts before placing concrete.
 - 2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
 - 3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes and for slabs more than 4 inches thick.
 - 4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes and for slabs less than 4 inches thick.
 - 5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hangers Exposed to View: Threaded rod and angle or channel supports.

- D. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.2 TERMINAL UNIT INSTALLATION

- A. Install air terminal units according to NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."
- B. Install air terminal units level and plumb. Maintain sufficient clearance for normal service and maintenance.

3.3 CONNECTIONS

- A. Where installing piping adjacent to air terminal unit, allow space for service and maintenance.
- B. Hot-Water Piping: Comply with requirements in Division 23 "Hydronic Piping" and Division "Hydronic Piping Specialties," and connect heating coils to supply with shutoff valve, strainer, control valve, and union or flange; and to return with balancing valve and union or flange.
- C. Comply with requirements in Division 23 "Metal Ducts" for connecting ducts to air terminal units.
- D. Make connections to air terminal units with flexible connectors complying with requirements in Division 23 "Air Duct Accessories."

3.4 IDENTIFICATION

- A. Label each air terminal unit with plan number, nominal airflow, and maximum and minimum factory-set airflows. Comply with requirements in Division 20 "Mechanical Identification" for equipment labels and warning signs and labels.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform the following tests and inspections:
 - 1. After installing air terminal units and after electrical circuitry has been energized, test for compliance with requirements.
 - 2. Leak Test: After installation, fill water coils and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Air terminal unit will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.6 STARTUP SERVICE

- A. Perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify that inlet duct connections are as recommended by air terminal unit manufacturer to achieve proper performance.

3. Verify that controls and control enclosure are accessible.
4. Verify that control connections are complete.
5. Verify that nameplate and identification tag are visible.
6. Verify that controls respond to inputs as specified.

3.7 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain air terminal units.

END OF SECTION 23 36 00

SECTION 23 37 13 - DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Division 20, Common Work Results for Mechanical, requirements apply to this section.
- C. Section 01 31 00 Project Management and Coordination, apply to this section and will require the contractors' participation in the Above Ceiling Coordination Program.
- D. Section 01 91 13 General Commissioning Requirements, apply to this section and will require the contractors' participation in the commissioning process.
- E. Division 08 "Louvers and Vents" for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.
- F. Section 23 33 00 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.2 SUMMARY

- A. Section Includes:
 - 1. Rectangular and square ceiling diffusers.
 - 2. Perforated diffusers.
 - 3. Louver face diffusers.
 - 4. Linear slot diffusers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, include the following:
 - 1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
 - 2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:
 - 1. Ceiling suspension assembly members.
 - 2. Method of attaching hangers to building structure.
 - 3. Size and location of initial access modules for acoustical tile.
 - 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, fire alarm devices, access panels, and special moldings.
 - 5. Duct access panels.
- B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 CEILING DIFFUSERS

A. Square Ceiling Diffusers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anemostat Products.
 - b. Nailor Industries.
 - c. Price Industries.
 - d. Titus.
 - e. Tuttle & Bailey.
 - f. **Krueger**
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: See schedule
4. Finish: Baked enamel, white.
5. Face Size: See schedule.
6. Face Style: Plaque.
7. Mounting: See schedule and architectural ceiling plans
8. Pattern: Fixed.

B. Perforated Grille:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anemostat Products.
 - b. Nailor Industries.
 - c. Price Industries.
 - d. Titus.
 - e. Tuttle & Bailey.
 - f. **Krueger**
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: Steel backpan and pattern controllers, with steel or aluminum face per schedule.
4. Finish: Baked enamel, white
5. Face Size: See schedule.
6. Duct Inlet: Round or square.
7. Face Style: Flush.
8. Mounting: See schedule and architectural ceiling plans.

C. Louver Face Diffuser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anemostat Products.
 - b. Nailor Industries.
 - c. Price Industries.
 - d. Titus.
 - e. Tuttle & Bailey.
 - f. **Krueger**
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material: See schedule
4. Finish: Baked enamel, white
5. Face Size: See plans.
6. Blade Arrangement: Horizontal spaced $\frac{3}{4}$ " apart w/ rear vertical $\frac{3}{4}$ " apart
7. Mounting: See schedule and plans.
8. Pattern: 22,5 degree double deflection.
9. Dampers: Opposed blade.

2.2 CEILING LINEAR SLOT OUTLETS

A. Linear Bar Diffuser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anemostat Products.
 - b. Nailor Industries.
 - c. Price Industries.
 - d. Titus.
 - e. Tuttle & Bailey.
 - f. **Krueger**
2. Material: See plans.
3. Finish: Baked enamel, standard color selected by architect.
4. Frame: 3/4 inch wide.
5. Mounting: Countersunk screw.

B. Linear Slot Diffuser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anemostat Products.
 - b. Nailor Industries.
 - c. Price Industries.
 - d. Titus.
 - e. Tuttle & Bailey.
 - f. **Krueger**
2. Devices shall be specifically designed for variable-air-volume flows.
3. Material - Shell: Steel, insulated
4. Material - Pattern Controller and Tees: Aluminum.
5. Finish - Face and Shell: Baked enamel, standard color selected by architect.
6. Finish - Pattern Controller: Baked enamel, black.
7. Slot Width: See schedule.
8. Number of Slots: See schedule.
9. Length: See plans.

REGISTERS AND GRILLES

A. Louver face Grille :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anemostat Products.
 - b. Nailor Industries.
 - c. Price Industries.
 - d. Titus.
 - e. Tuttle & Bailey.
 - f. **Krueger**
2. Material: See plans.
3. Finish: Baked enamel, white
4. Face Blade Arrangement: Horizontal spaced 1/2" apart.
5. Core Construction: Integral
6. Frame: 1 inch wide.
7. Mounting: Countersunk screw, or plaster frame as applicable.
8. Accessory: Opposed blade damper.

2.4 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.
- D. Support flexible duct connectors at connection to air diffusion devices with "FLEXFLOW ELBOW" elastomeric duct elbow support as manufactured by Thermaflex or approved equal.

3.3 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13

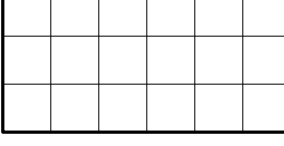
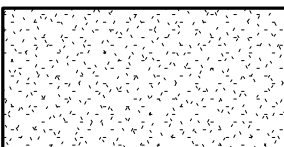
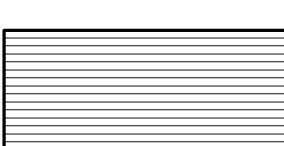

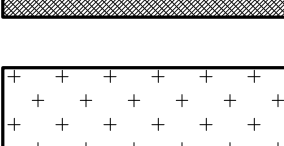





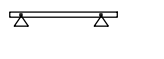







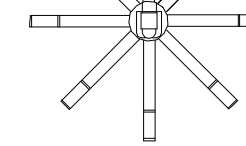
CEILING PLAN GENERAL NOTES

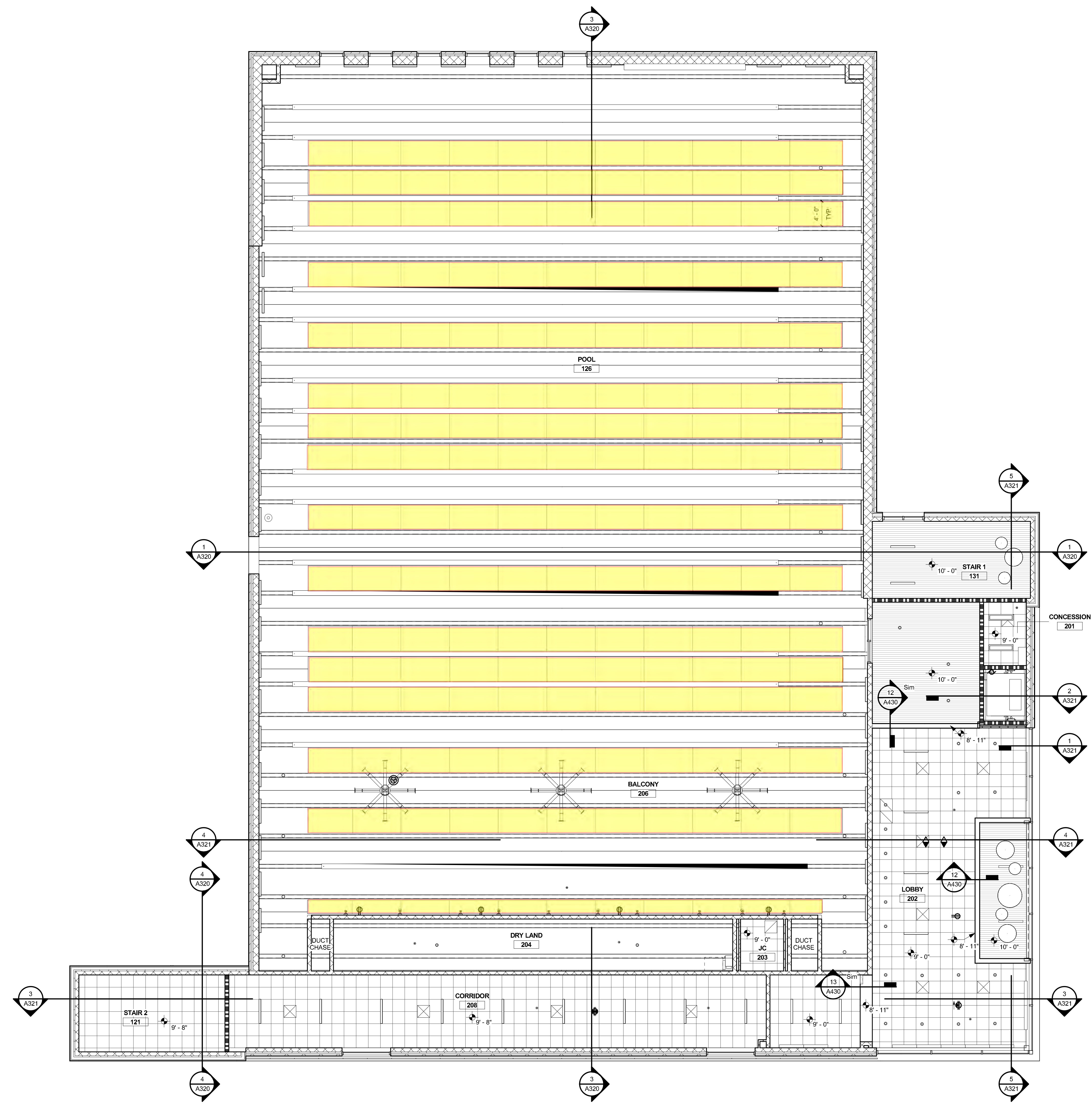
- 1 REFER TO FLOOR PLANS & INTERIOR ELEVATIONS FOR WALL MOUNTED FIXTURES & DEVICES, ETC.
- 2 CENTER ALL LIGHTS, DIFFUSERS, ETC. IN CEILING TILES UNLESS NOTED OTHERWISE
- 3 TYPICAL CEILING HEIGHT SHALL BE 9'-0" AFF UNLESS NOTED OTHERWISE - REFER TO FINISH SCHEDULE FOR HEIGHTS
- 4 ALL SHADES ARE MANUAL UNLESS NOTED OTHERWISE
- 5 GYPSUM BOARD SOFFIT ELEVATIONS ARE GENERAL IN NATURE. THOSE ABUTTING CURTAIN WALL ARE TO ALIGN WITH TOP AND BOTTOM OF MULLION AS INDICATED IN SECTION DETAIL.
- 6 PROJECTORS SHOWN AS REFERENCE. COORDINATE LOCATION OF PROJECTOR MOUNTS WITH OWNER BEFORE INSTALLATION.

CEILING CONSTRUCTION NOTES

- #
1 TEXT

CEILING LEGEND

	2 x 2 ACP
	GYPSUM BD
	WOOD-LOOK METAL SLAT SYSTEM
	TECTUM CEILING PANELS
	ROOF STRUCTURE
	NO CEILING, EXPOSED STRUCTURE/DECK
	INDUSTRIAL PENDANT LIGHT FIXTURE RE: ELECTRICAL DOCUMENTS
	SURFACE MOUNTED INDUSTRIAL LIGHT FIXTURE RE: ELECTRICAL DOCUMENTS
	LINEAR PENDANT LIGHT FIXTURE RE: ELECTRICAL DOCUMENTS
	RECESSED LIGHT FIXTURE RE: ELECTRICAL DOCUMENTS
	TRACK LIGHTING FIXTURE RE: ELECTRICAL DOCUMENTS
	EXIT SIGN RE: ELECTRICAL DOCUMENTS
	RECESSED CAN LIGHT FIXTURE RE: ELECTRICAL DOCUMENTS
	SUPPLY DIFFUSER RE: MECHANICAL DOCUMENTS
	LINEAR SUPPLY DIFFUSER RE: MECHANICAL DOCUMENTS
	EXHAUST DIFFUSER RE: MECHANICAL DOCUMENTS
	RETURN GRILLE RE: MECHANICAL DOCUMENTS
	EXHAUST GRILLE RE: MECHANICAL DOCUMENTS
	CEILING FAN RE: MECHANICAL DOCUMENTS



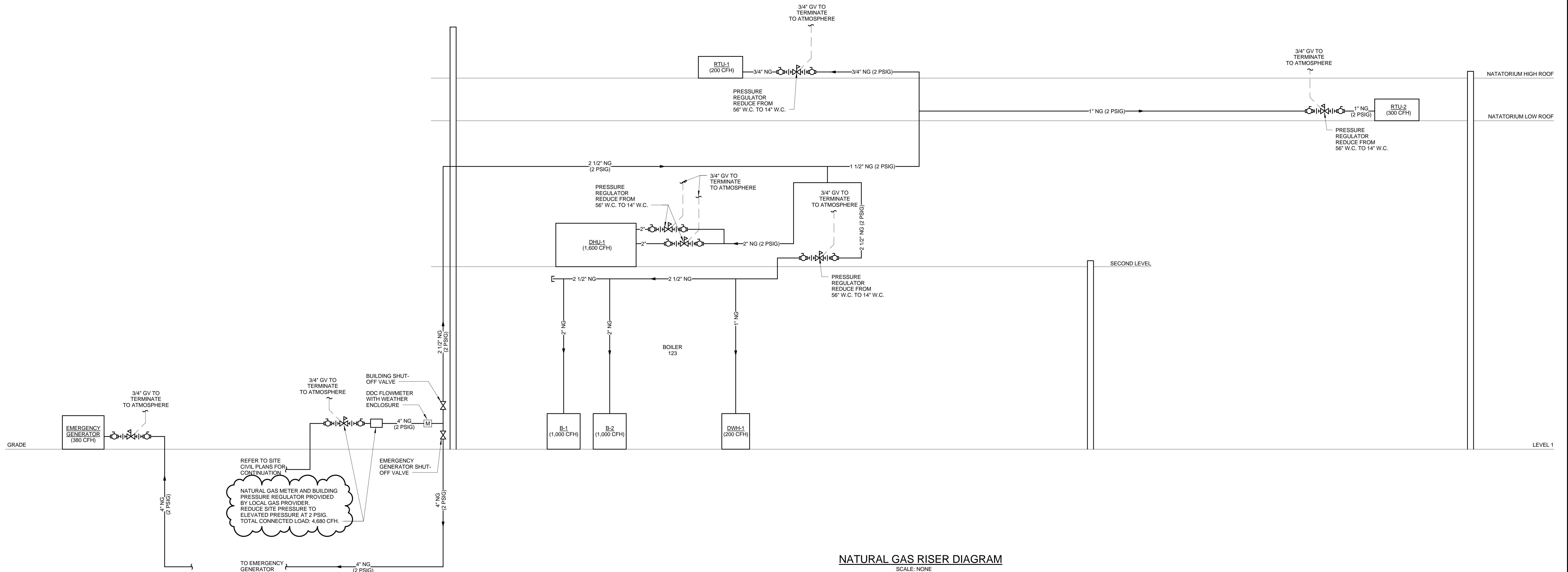
SECOND LEVEL REFLECTED CEILING PLAN
1/8" = 1'-0"

REVISIONS		
REV.	DESCRIPTION	DATE

SCALE: 1/8" = 1'-0"
PROJECT: 180021
DATE: 01/03/2016
SHEET

NATURAL GAS LOAD SCHEDULE

EQUIPMENT	PRESSURE (IN W.C.)	LOAD (CFH)
DHU-1	7-14	1,600
RTU-1	7-14	200
RTU-2	7-14	300
BOILER (B-1)	4-14	1,000
BOILER (B-2)	4-14	1,000
DOMESTIC WATER HEATER (DWH-1)	4-14	200
EMERGENCY GENERATOR	5-14	380
TOTAL @ 56" W.C.		4,680 CFH



NATURAL GAS RISER DIAGRAM
 SCALE: NONE

PLUMBING RISER DIAGRAM

REVISIONS

REV.	DESCRIPTION	DATE
1.1	ISSUED FOR BIDS	01/03/2021

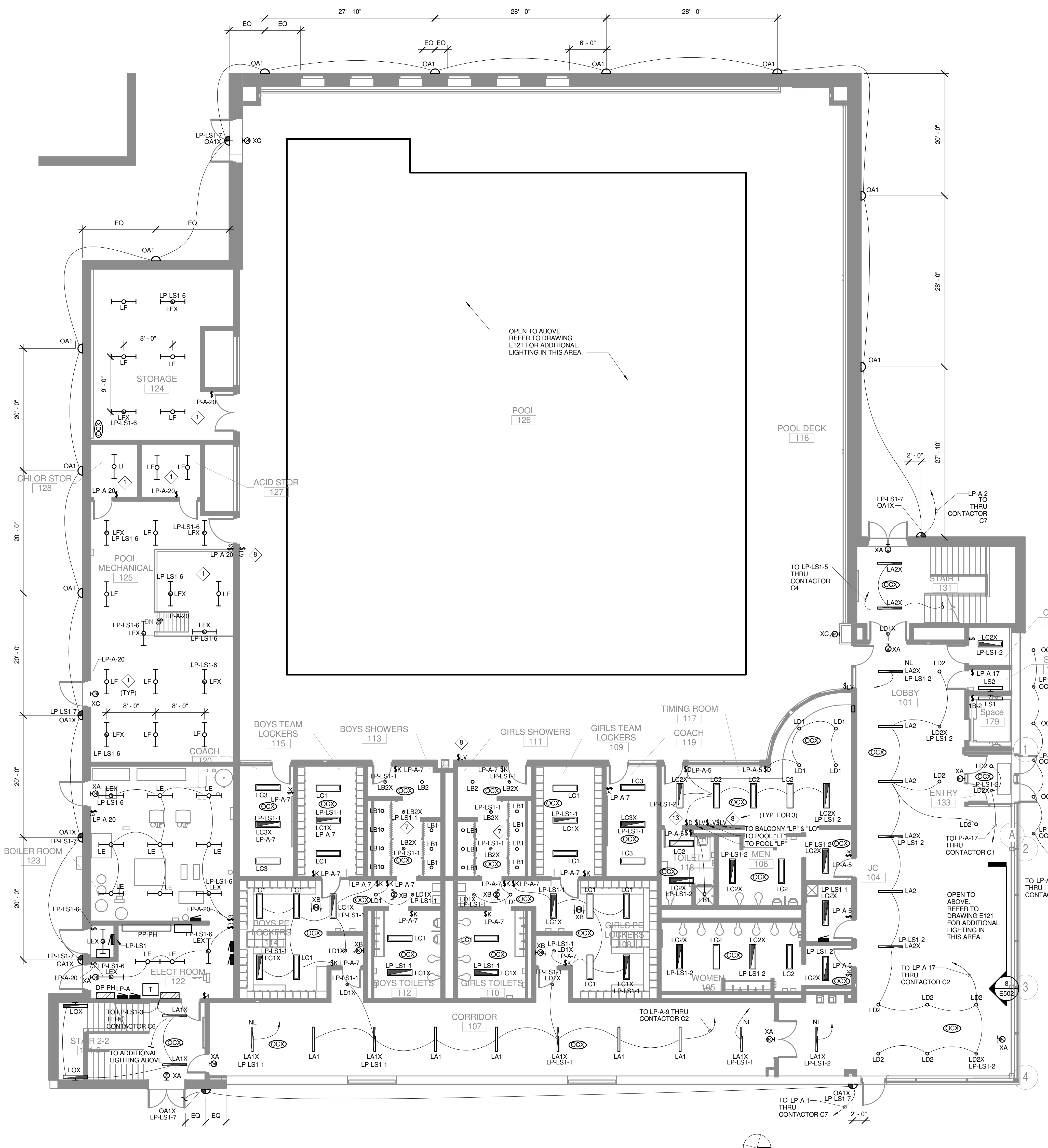
NOT TO BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN CONSENT FROM C2CAE. ALL RIGHTS RESERVED.

SCALE: NOT TO SCALE

PROJ. #: 160021

DATE: 01/03/2021

SHEET



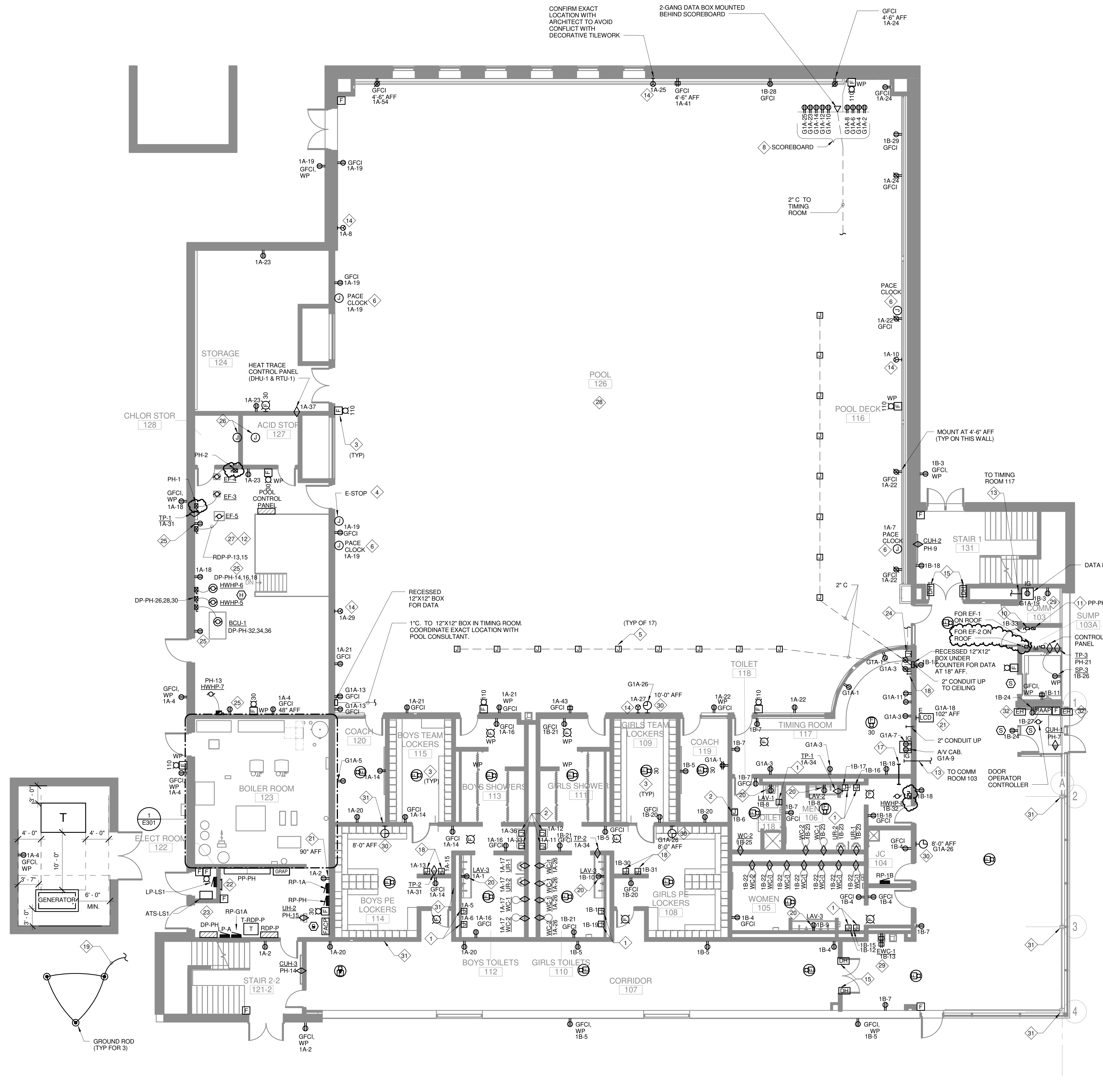
- ### LIGHTING KEY NOTES
- CONTRACTOR TO PROVIDE ALL MATERIALS FOR THE INSTALLATION OF FIXTURES, DEVICES AND ACCESSORIES, IN CORROSION PROOF MATERIAL.
 - NOT USED
 - LIGHT FIXTURES SHALL BE MOUNTED TO UNDERSIDE OF LP, AND AIMED, ALL THE SAME, SO THAT THEY GRAZE BUILDING. REFER TO ARCHITECTURAL DETAILS FOR MORE INFORMATION ON MOUNTING.
 - REFER TO DRAWING E502 FOR MOUNTING HEIGHTS FOR LIGHT FIXTURES.
 - LIGHT TUBE LIGHT FIXTURES SHALL BE SUSPENDED FROM CONCRETE ROOF PLANKS, AT A HEIGHT OF APPROXIMATELY 27'-0" ABOVE FINISHED DECK. LIGHT FIXTURE LOCATIONS SHALL BE COORDINATED SO THAT THEY ARE BELOW THAT MECHANICAL EQUIPMENT, BUT ALIGNED. LIGHT TUBE FIXTURES ABOVE DECK SEATING SHALL BE AT SAME HEIGHT AS POOL TUBE FIXTURES.
 - EXIT SIGNS SHALL BE MOUNTED SO THEY ARE NOT OBSTRUCTED BY PENDANT LIGHTS. COORDINATE MOUNTING LOCATIONS, FOR VISIBILITY, IN THE FIELD AND WITH ARCHITECT SO THAT EXIT SIGNS ARE VISIBLE FROM BLEACHERS.
 - ALL LIGHTS AND LIGHTING CONTROL DEVICES IN THIS SPACE SHALL BE LISTED FOR WET LOCATIONS.
 - LOW-VOLTAGE SWITCH SHALL BE WIRED TO BMS.
 - CONTRACTOR SHALL PROVIDE UNISTRUT FOR MOUNTING OF LIGHT FIXTURES. COORDINATE MOUNTING AROUND MECHANICAL DUCTS IN LOCATIONS AS SHOWN ON PLANS.
 - SWITCH SHALL BE ON LOAD SIDE OF CONTACTOR.
 - COORDINATE EXACT LOCATION IN FIELD WITH ARCHITECT.
 - NOT USED.
 - TYPE 1" T LIGHTS SHALL BE CONTROLLED BY A 0-10V DIMMER LOCATED IN THE TIMING ROOM. REFER TO CONTACTOR DETAIL.
 - TYPE "LPX" LIGHT TUBE FIXTURES HAVE LIGHT SOURCES ON EACH END OF FIXTURES. CONTRACTOR SHALL MAKE ELECTRICAL CONNECTIONS AT BOTH ENDS OF EACH FIXTURE.

- ### GENERAL LIGHTING NOTES
- REFER TO DRAWING E001 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
 - REFER TO DRAWING E601 FOR LIGHTING FIXTURE SCHEDULE.
 - THE CONTRACTOR SHALL PROVIDE A "HOT WIRE" TIED AHEAD OF LOCAL SWITCHING AND THE LIGHTING CONTROL PANEL RELAYS FOR THE LEADS TO ALL NIGHT LIGHTS, EMERGENCY BATTERY PACKS AND EMERGENCY UL924 RELAYS AND EXIT LIGHTS.
 - THE CONTRACTOR SHALL SUBMIT A FULL SET OF OCCUPANCY CONTROL LOCATION DRAWING SUBMITTALS TO THE A/E PRIOR TO PURCHASE OR INSTALLATION. OCCUPANCY CONTROL LOCATIONS AND QUANTITIES SHALL BE BASED ON THE MANUFACTURER'S RECOMMENDATIONS. THE LIGHTING PLANS SHOW DESIGN INTENT ONLY AND DO NOT REFLECT EVERY MANUFACTURER PERMUTATIONS.
 - OCCUPANCY CONTROLS SHALL BE WIRED SUCH THAT ALL GENERAL ROOM LIGHTING IS CONTROLLED.
 - PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT.
 - IN GENERAL, DEVICES AT LOWER HEIGHTS SHALL BE STACKED DIRECTLY BELOW DEVICES AT HIGHER ELEVATIONS. PROVIDE CONDUIT OFFSET AS NECESSARY.
 - REFER TO ARCHITECTURAL REFLECTED CEILING PLAN AND/OR ROOM FINISH SCHEDULE AND VERIFY LIGHT FIXTURE TYPE FOR THE CEILING CONSTRUCTION PRIOR TO ORDERING THE FIXTURES. PROVIDE FIXTURES THAT ARE COMPATIBLE WITH THE CEILING SYSTEM.
 - NOT USED

1 FIRST LEVEL LIGHTING PLAN
1/8" = 1'-0"

REVISIONS			
REV	DESCRIPTION	DATE	BY

SCALE:	1/8" = 1'-0"
PROJ. #	160021
DATE	01/03/2019
SHEET	



1 FIRST LEVEL POWER AND AUXILIARY PLAN
1/8" = 1'-0"

POWER AND AUXILIARY KEY NOTES

- HAND DRYERS: INSTALL RECESSED SINGLE GANG ELECTRICAL BOX WITH DEDICATED 120V CIRCUIT AS INDICATED FOR EACH DEVICE. COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN. DRYERS FURNISHED BY ARCH TRADES.
- SUIT SPINNER: INSTALL RECESSED ELECTRICAL BOX PER MANUFACTURER'S REQUIREMENTS AT 42" AFF FROM THE TOP OF THE UNIT. COORDINATE WITH ARCHITECTURAL DRAWINGS/ARCHITECT PRIOR TO ROUGH-IN.
- WIREGUARDS: INSTALL WIREGUARDS ON ALL FIRE ALARM ANNUNCIATING DEVICES LOCATED IN POOL AND LOCKER ROOMS.
- INSTALL A 4" SQUARE ELECTRICAL BOX FOR POOL EQUIPMENT EMERGENCY SHUT OFF MUSHROOM HEAD SUPPLIED BY POOL CONTRACTOR. E.C. TO MAKE ALL CONNECTIONS TO POOL CONTROL PANEL. REFER TO PL DRAWINGS FOR MORE REQUIREMENTS.
- INSTALL 4"x4"x6" CARLON (OR EQUAL) RECESSED NON-METALLIC FLOOR BOX FOR SWIMMERS STARTER PLATFORMS. COORDINATE EXACT LOCATIONS WITH POOL CONTRACTOR PRIOR TO ROUGH-IN.
- PACE CLOCKS: INSTALL (2) RECESSED SINGLE GANG JUNCTION BOXES FOR PACE CLOCKS CONTROLS. COORDINATE MOUNTING HEIGHTS WITH POOL CONTRACTOR PRIOR TO INSTALLATION. PROVIDE 1" CONDUIT FROM BOXES TO TIMING EQUIPMENT ROOM. INSTALL PULL STRINGS. INSTALL 120V CIRCUIT AS INDICATED NEXT TO CONTROL BOX AT SAME HEIGHT.
- COVERPLATE SHALL HAVE PERMANENT PROVISIONS FOR PAD-LOCKING TOGGLE IN THE OFF POSITION.
- POOL SCOREBOARD: INSTALL DEDICATED RECESSED RECEPTACLES FOR SCOREBOARD WITH 120V CIRCUITS AS INDICATED. COORDINATE EXACT LOCATION OF RECEPTACLES WITH ARCHITECTURAL AND POOL CONTRACTOR PRIOR TO INSTALLATION.
- E.C. SHALL COORDINATE EXACT LOCATIONS WITH MECHANICAL AND PLUMBING SHOP DRAWINGS PRIOR TO INSTALLATION TO MEET PROPER CLEARANCES OF ELECTRICAL EQUIPMENT PER REC. PROVIDE UNISTRUT MOUNTING AS REQUIRED TO MEET THE REQUIREMENTS.
- ELEVATOR CAB LIGHTS AND INTERCOMMUNICATION SYSTEM: PROVIDE CONNECTION TO ELEVATOR CONTROLLER INTEGRAL TO ELEVATOR JAMB. COORDINATE ALL REQUIREMENTS WITH ELEVATOR MANUFACTURER AND APPROVED SHOP DRAWINGS.
- ELEVATOR FEED: PROVIDE CONNECTION TO CONTROLLER INTEGRAL TO ELEVATOR JAMB. COORDINATE ALL REQUIREMENTS WITH ELEVATOR MANUFACTURER AND APPROVED SHOP DRAWINGS.
- REFER TO PL SERIES DRAWINGS FOR EQUIPMENT IN THIS AREA.
- INSTALL 3" CONDUIT UP TO ACCESSIBLE CEILING SPACE OF INDICATED ROOM. PROVIDE REMOVABLE RESEALABLE PUTTY IN CONDUIT AND FIRESTOP AS REQUIRED.
- PROVIDE TWIST-LOCK RECEPTACLE FOR POOL VAC PUMP. CONFIRM TYPE WITH PUMP TO MATCH. SERVE FROM GFCI-TYPE BREAKER.
- FIRE ALARM POWER AND TERMINATION REQUIRED AT THIS LOCATION. REQUIRES 24V @ 20mA PER MAGNET (WIRE MAGENTS IN PARALLEL, NOT IN SERIES).
- CONFIRM RECEPTACLE NEMA CONFIGURATION TO MATCH PLUG. SERVE FROM GFCI-TYPE BREAKER.
- PROVIDE RECEPTACLE AT TOP OF HOISTWAY. COORDINATE EXACT LOCATION WITH ELEVATOR MANUFACTURER.
- HAIR DRYERS: INSTALL RECESSED SINGLE GANG ELECTRICAL BOX WITH DEDICATED 120V CIRCUIT AS INDICATED FOR EACH DEVICE. COORDINATE MOUNTING HEIGHTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN. DRYERS FURNISHED BY ARCH TRADES.
- TO GROUND BAR IN MAIN ELECTRICAL ROOM. REFER DETAILS ON SHEET E501 FOR ADDITIONAL INFORMATION.

POWER AND AUXILIARY KEY NOTES

- GFCI RECEPTACLE FOR LAV FAUCET MOUNTED AT 24" AFF. E.C. SHALL LOCATE RECEPTACLE DIRECTLY BELOW SINK CONCEALED BY SHROUD. COORDINATE RECEPTACLE LOCATION WITH PLUMBING WORK AND ARCHITECT TO ENSURE PROPER INSTALLATION AND ACCESS FOR FAUCET PLUG-IN CONNECTION.
- PROVIDE SMOKE DETECTOR FOR FIRE RATED SHUTTER DOOR. SMOKE DETECTORS SHALL BE CONNECTED TO FIRE ALARM SYSTEM.
- POOL GROUND BAR, MOUNTED BELOW WALL DEVICES AT 18" AFF. REFER TO GROUNDING SYSTEM DETAIL ON SHEET E501, FOR ADDITIONAL INFORMATION.
- PROVIDE 2"x4" FLUSH BOX MOUNTED ABOVE COUNTER AT 48" AFF. REFER TO TECHNOLOGY AND PL SERIES DRAWINGS, FOR ADDITIONAL INFORMATION. COORDINATE EXACT LOCATION WITH POOL CONSULTANT PRIOR TO ROUGH-IN.
- CIRCUITS FED FROM POOL CONTROL PANEL. REFER TO PL SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
- SURFACE MOUNTED JUNCTION FOR CHEMICAL FEED PUMPS. FED FROM POOL CONTROL PANEL. COORDINATE EXACT LOCATION WITH POOL CONSULTANT PRIOR TO ROUGH-IN. REFER TO PL SERIES DRAWINGS FOR ADDITIONAL INFORMATION.
- IN POOL MECHANICAL ROOM, ALL CONDUITS SHALL BE PVC AND COVERPLATES & JUNCTION BOXES SHALL BE SUITABLE PLASTIC.
- IN POOL AREA, ALL CONDUITS SHALL BE PAINTED RIGID GALVANIZED STEEL. PROVIDE SILICONE BLOCK AT TERMINATIONS.
- CONFIRM EXACT CONNECTION REQUIREMENTS AND DEVICE LOCATION(S) WITH SUBMITTED AND REVIEWED EQUIPMENT PRODUCT DATA AND/OR SHOP DRAWINGS.
- E.C. SHALL PROVIDE FLUSH MOUNT SINGLE-GANG BOX WITH 1" CONDUIT STUBBED ABOVE CEILING. COORDINATE EXACT REQUIREMENTS AND LOCATION WITH TECHNOLOGY CONSULTANT PRIOR TO ROUGH-IN.
- APPROXIMATE LOCATION OF BUILDING COLUMN. E.C. SHALL PROVIDE GROUNDING PER COLUMN LOCATIONS WITH STRUCTURAL DRAWINGS. COORDINATE EXACT COLUMN LOCATIONS WITH STRUCTURAL DRAWINGS.
- FIRE ALARM PANEL, POWER AND TERMINATION REQUIRED AT THIS LOCATION FOR EL HOS.

GENERAL POWER NOTES

- REFER TO DRAWING E601 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
- REFER TO DRAWING E401 FOR ELECTRICAL ONE LINE DIAGRAM.
- EACH CIRCUIT SHALL HAVE A DEDICATED NEUTRAL CONNECTED BACK TO THE PANEL.
- PROVIDE FIRE ALARM EXTENDER PANELS (NAC'S) AS REQUIRED BY MANUFACTURER.
- COORDINATE ALL DEVICE MOUNTING LOCATIONS, HEIGHTS, AND SPACINGS WITH ARCHITECTURAL FLOOR PLANS AND ELEVATIONS. BIDDERS SHALL EXAMINE ARCHITECTURAL DRAWINGS TO INCLUDE ANY NECESSARY COSTS WITH HIS BID.
- IN GENERAL, DEVICES AT LOWER HEIGHTS SHALL BE STACKED DIRECTLY BELOW DEVICES AT HIGHER ELEVATIONS. PROVIDE CONDUIT OFFSET AS NECESSARY.
- COORDINATE MOUNTING HEIGHT OF DEVICES ABOVE MILLWORK WITH ARCHITECTURAL PLANS.
- PROVIDE 4" HOUSEKEEPING PAD FOR ALL FLOOR MOUNTED EQUIPMENT.
- FURNISH AND INSTALL DUCT SMOKE DETECTORS ASSOCIATED WITH AIR HANDLING EQUIPMENT AND LIFE SAFETY DAMPERS. FIRE ALARM COMMUNICATION MODULES, POWER, AND ALL NECESSARY WIRING. REFER TO MECHANICAL FLOOR PLANS AND TEMPERATURE CONTROL DRAWINGS FOR LIFE SAFETY DAMPER LOCATIONS AND DUCT DETECTORS ASSOCIATED WITH AIR HANDLING UNITS.

REV.	DESCRIPTION	DATE

SCALE:	1/8" = 1'-0"
PROJ. #:	160021
DATE:	01/03/2010
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POWER AND AUXILIARY KEY NOTES

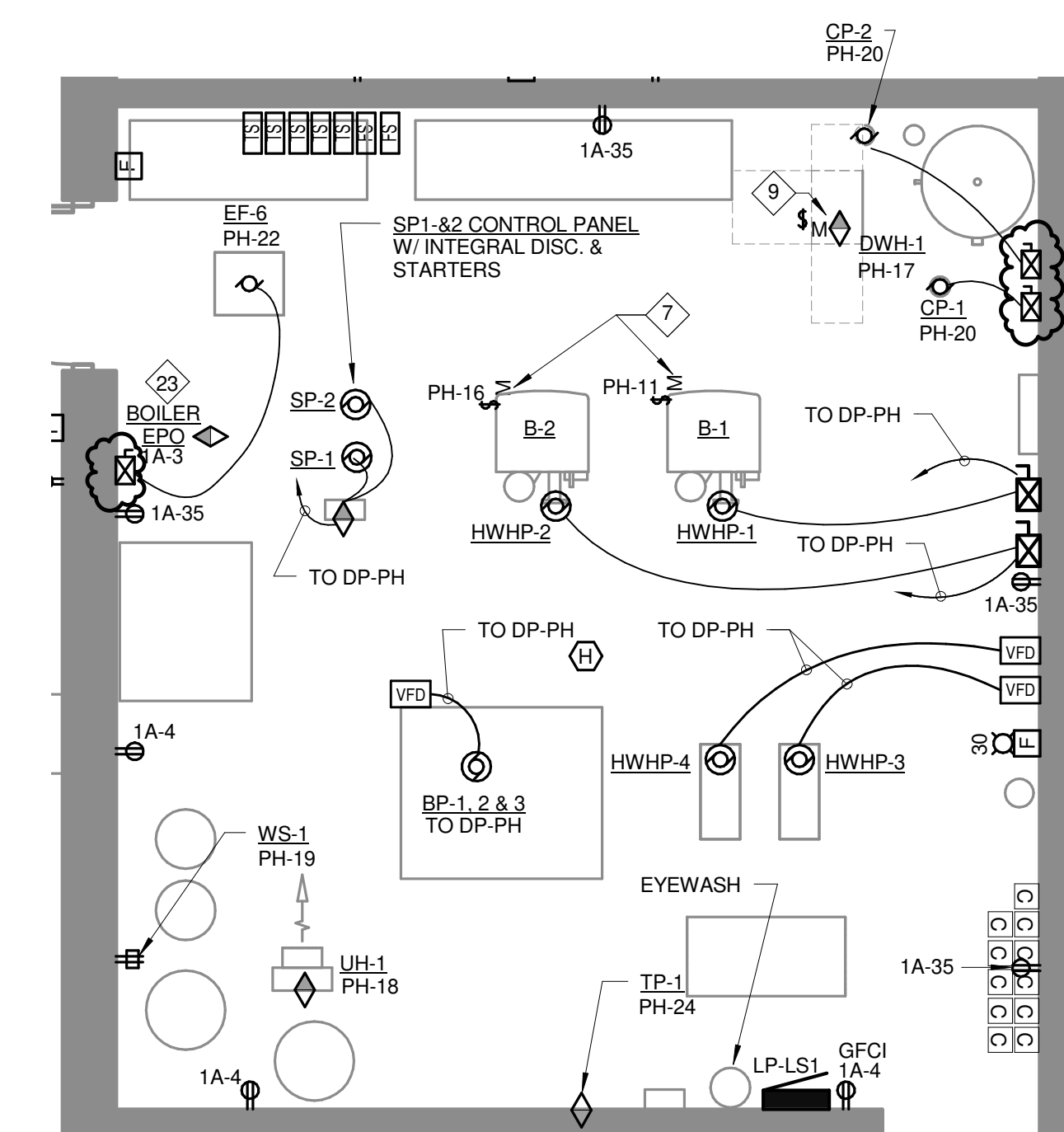
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- PAGE CLOCKS: INSTALL (2) RECESSED SINGLE GANG JUNCTION BOXES FOR PAGE CLOCKS CONTROLS. COORDINATE MOUNTING HEIGHTS WITH POOL CONTRACTOR PRIOR TO INSTALLATION. PROVIDE 1" CONDUIT FROM BOXES TO TIMING EQUIPMENT ROOM. INSTALL PULL STRINGS. INSTALL 120V CIRCUIT AS INDICATED NEXT TO CONTROL BOX AT SAME HEIGHT.
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- POOL GROUND BAR MOUNTED BELOW WALL DEVICES AT 18" AFF. REFER TO GROUNDING SYSTEM DETAIL ON SHEET E501 FOR ADDITIONAL INFORMATION.
- REFER TO BOILER CONTROL DRAWINGS FOR EPO LOCATIONS AND REQUIREMENTS.
- PROVIDE 2"x4" FLUSH BOX MOUNTED ABOVE COUNTER AT 48" AFF. REFER TO TECHNOLOGY AND PL SERIES DRAWINGS. FOR ADDITIONAL INFORMATION. COORDINATE EXACT LOCATION WITH POOL CONSULTANT PRIOR TO ROUGH-IN.
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- FURNISH AND INSTALL DUCT SMOKE DETECTORS ASSOCIATED WITH AIR HANDLING EQUIPMENT AND LIFE SAFETY DAMPERS, FIRE ALARM COMMUNICATION MODULES, POWER, AND ALL NECESSARY WIRING. REFER TO MECHANICAL FLOOR PLANS AND TEMPERATURE CONTROL DRAWINGS FOR LIFE SAFETY DAMPER LOCATIONS AND DUCT DETECTORS ASSOCIATED WITH AIR HANDLING UNITS.



1 ENLARGED ELECTRICAL PLAN - BOILER ROOM
 1/4" = 1'-0"

REVISIONS		
REV	DESCRIPTION	DATE
1	ISSUED FOR BIDS	10/20/11

SCALE:	1/4" = 1'-0"
PROJ. #	160021
DATE	01/03/2010
SHEET	



**PORTAGE PUBLIC SCHOOLS
NORTHERN NATATORIUM
PRE-BID MEETING MINUTES
January 23rd, 2019 – 4:00pm**

1. Introductions:

- a. Portage Public Schools – Owner - Ron Herron - Assistant Superintendent of Operations
- b. Walbridge – Owner’s Representative - David Skinner
- c. C2AE/Stantec – Design Team - Gregg Jones & Thomas McKercher
- d. Owen-Ames-Kimball Co. – Construction Manager: Cade Dammen, Tim Robinson, Jeff Weber & Dan Rathburn

2. Project Descriptions:

- a. Northern Natatorium is a two story, 30,130sf facility budgeted at \$11,900,000.

3. Schedule / Key Topics:

- a. PPS Northern Natatorium
 - i. Mobilization and Demo start September 9, 2019
 - ii. Pool Roof Precast January 2020
 - iii. Scaffold Install July 2020
 - iv. Substantial completion January 29, 2021

4. Safety:

- a. The safety of Portage Public School students and staff is our first priority.
- b. Clean-up. A clean site is a safe site. Subcontractors are responsible for cleaning up their work areas on a daily basis. Participation in weekly jobsite cleanups are mandatory for each subcontractor.
- c. Contractors must follow proper safety procedures, and keep their safety manuals on site.
- d. Start-up Meetings will be held with each contractor prior to beginning work. Safety is a large portion of these meetings.
- e. Contractors must provide their own first aid, and fire protection equipment.
- f. Contractors are responsible for providing the necessary barricades for their work.
- g. Contractors must comply with the “Right to Know” law.
- h. Contractors are responsible for their own security.
- i. Contractors must comply with O-A-K’s substance abuse policy.
- j. MiOSHA’s CET division will be invited to walk the site multiple times throughout the project.

5. Site Constraints:

- a. Maintaining a clean site is mandatory. All roads & lots must be kept clean.
- b. All roads & entrances must remain open.
- c. School day is 7:45AM-3:00PM. Deliveries and construction traffic will be coordinated to avoid bus and parent drop off and pickup times.
- d. Construction trailers, staging, & contractor parking will be coordinated with our Superintendent.
- e. No radios or iPods allowed on site.
- f. **NO SMOKING ON SCHOOL PROPERTY**



6. Testing, Permits, Inspections:

- a. Testing will be paid for by the Owner.
- b. All necessary permits and inspections are the responsibility of the affected trade.
- c. Copies of all test reports and permits must be e-mailed to danr@oakmi.com.

7. Temporary Services:

- a. Temporary toilet facilities will be provided. Use of the buildings toilets is prohibited!
- b. Electrician to provide temporary power and lighting on site. Contractors to provide their own GFI protection.

8. Layout:

- a. OAK will provide control points & benchmark.
- b. Contractors are responsible for their own layout and surveying costs.

9. Bidding:

- a. Bid Documents
 - i. Can be downloaded from these websites:
 - 1. www.Owen-Ames-Kimball.com – click on SUBCONTRACTORS (located on the lower right of the page) and select the project from the list of projects bidding.
 - 2. <https://ppsnnat.blogspot.com/>
 - ii. Hard copies are available from ARC and KalBlue with \$100 deposit.
 - iii. RFIs and Substitution Requests are to be sent to Fidel Salas, fidels@oakmi.com.
- b. Addendum 1 will include the Pre-Bid Meeting Minutes and RFI responses. It will be issued on Monday, January 28th.
- c. RFIs will **not** be accepted after Friday January 25th at 1:00pm.
- d. Bid Opening
 - i. The Little Theater, Portage North Middle School, 5808 Oregon Ave, Portage, MI 49024
 - ii. The **Bid Opening** will be Tuesday, February 5th at **4:00pm**. Bids may be hand delivered to an Owen-Ames-Kimball Co. representative starting about 15 minutes before the opening.
 - iii. Bids may be dropped off at **Owen-Ames-Kimball Co. – Kalamazoo**, 161 E Michigan Ave., Kalamazoo, MI 49007 on Tuesday, February 5th until **2:30pm** local time.
 - iv. We will also take bids at **Owen-Ames-Kimball Co.**, 300 Ionia NW, Grand Rapids, MI 40503 on Tuesday, February 5th until **1:30pm** local time.
- e. Bid Form and Other Required Documents
 - i. Your bid must be in a sealed envelope clearly marked as to your respective bid category and must include the following (in triplicate):
 - 1. Bid Form
 - 2. Bid security/Bid Bond.
 - 3. Affidavit of Compliance – Iran Economics Sanctions Act
 - 4. Familial Disclosure Statement must be signed and notarized.
 - 5. Debarment Certificate
 - ii. Remember to fill in all required items on the bid forms.
 - iii. Voluntary Alternates are encouraged - list accordingly on the bid form.
- f. Prevailing Wages – Do **NOT** apply to this project.

10. Post Bid Reviews:

- a. Post Bid Interviews will take place February 13th and 14th.



11. Policies and Procedures:

- a. Monthly invoices must be submitted to O-A-K by the 20th of each month. Contractors must invoice on AIA forms G702 & G703.
- b. There will be a 10% retainage on invoices.
- c. If contractors invoice for stored material not on site, the invoice must be accompanied with pictures & an insurance certificate for that material.
- d. Any additional work requires an O-A-K CCD issued by the O-A-K Field Superintendent. Extras will not be paid for without a CDD.

12. Insurance:

- a. Contractors must provide insurance certificates as per specifications.
- b. Bonds & Insurance certificates are required before payment is approved and contracts are issued. Each contractor must have the insurance form approved prior to mobilization.

13. Shop Drawings & Submittals:

- a. Submittals are required electronically.
- b. Submittals can be viewed directly through Owen-Ames-Kimball Co.'s Project Management Website.

14. Site Visits

- a. None should be necessary. If you do want to walk the site please coordinate through Tim Robinson, 269-910-2684, timr@oakmi.com.

15. General Notes:

- a. Each bidder must submit their bid per the plans, and specifications.
- b. If your bid varies from these documents, you must submit the variance as a voluntary alternate with your base bid matching the bid document.
- c. Each contractor must supply sufficient manpower.
- d. Storage will be allowed on site for each phase of construction only while in construction.

16. Time Line Bidding:

- a. RFIs will not be accepted after January 25th at 1:00pm.
- b. Addendum 1 will be issued on January 28th.
- c. Bid Opening – February 5th at 4:00pm.
- d. Post Bid Interviews will take place February 13th and 14th.
- e. Board Approval February 25th.

Thank you and good luck with your bid!

Portage Public Schools
Northern Natatorium
Bid Schedule



ID	Task Name	Duration	Start	Finish	2019												2020											
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Preconstruction	178 days	Fri 1/11/19	Tue 9/17/19	[Gantt bar from Jan 11 to Sep 17, 2019]																							
2	Bidding	17 days	Fri 1/11/19	Mon 2/4/19	[Gantt bar from Jan 11 to Jan 28, 2019]																							
3	Bid Date	1 day	Tue 2/5/19	Tue 2/5/19	[Gantt bar at Feb 5, 2019]																							
4	Submittals	75 days	Wed 4/3/19	Tue 7/16/19	[Gantt bar from Apr 3 to Jul 16, 2019]																							
5	Material Procurement	45 days	Wed 7/17/19	Tue 9/17/19	[Gantt bar from Jul 17 to Sep 17, 2019]																							
6	Construction	365 days	Mon 9/9/19	Fri 1/29/21	[Gantt bar from Sep 9, 2019 to Jan 29, 2021]																							
7	Building Shell	365 days	Mon 9/9/19	Fri 1/29/21	[Gantt bar from Sep 9, 2019 to Jan 29, 2021]																							
8	Mobilization & site demo	5 days	Mon 9/9/19	Fri 9/13/19	[Gantt bar from Sep 9 to Sep 13, 2019]																							
9	Site utilities, Storm, Water, Sanitary	10 days	Mon 9/16/19	Fri 9/27/19	[Gantt bar from Sep 16 to Sep 27, 2019]																							
10	Foundations	18 days	Mon 9/30/19	Wed 10/23/19	[Gantt bar from Sep 30 to Oct 18, 2019]																							
11	Misc Structural Steel Bleachers	2 days	Thu 10/24/19	Fri 10/25/19	[Gantt bar at Oct 24-25, 2019]																							
12	Bleacher precast bearing CMU and Cure time	11 days	Mon 10/28/19	Mon 11/11/19	[Gantt bar from Oct 28 to Nov 8, 2019]																							
13	Misc Steel Angles for Precast	2 days	Tue 11/12/19	Wed 11/13/19	[Gantt bar from Nov 12 to Nov 13, 2019]																							
14	Bleacher precast - lower level	3 days	Thu 11/14/19	Mon 11/18/19	[Gantt bar from Nov 14 to Nov 18, 2019]																							
15	Bleacher precast bearing CMU - upper level	7 days	Tue 11/19/19	Wed 11/27/19	[Gantt bar from Nov 19 to Nov 27, 2019]																							
16	Steel Angles and corridor Steel	2 days	Thu 11/28/19	Fri 11/29/19	[Gantt bar from Nov 28 to Nov 29, 2019]																							
17	Bleacher precast - upper level	2 days	Mon 12/2/19	Tue 12/3/19	[Gantt bar from Dec 2 to Dec 3, 2019]																							
18	Pool precast bearing CMU	40 days	Thu 11/28/19	Wed 1/22/20	[Gantt bar from Nov 28 to Jan 22, 2020]																							
19	Pool Roof Precast	5 days	Thu 1/23/20	Wed 1/29/20	[Gantt bar from Jan 23 to Jan 29, 2020]																							
20	Pool Parapet Walls	12 days	Thu 1/23/20	Fri 2/7/20	[Gantt bar from Jan 23 to Feb 7, 2020]																							
21	Pool Roofing	15 days	Mon 2/10/20	Fri 2/28/20	[Gantt bar from Feb 10 to Feb 28, 2020]																							
22	East, South, West Exterior CMU Walls 1st Floor	14 days	Mon 3/2/20	Wed 3/25/20	[Gantt bar from Mar 2 to Mar 25, 2020]																							
23	Steel Deck and Framing 1st Floor Exterior	10 days	Wed 3/25/20	Wed 4/8/20	[Gantt bar from Mar 25 to Apr 8, 2020]																							
24	East, West, and South Exterior CMU Walls 2nd Floor	14 days	Wed 4/8/20	Tue 4/28/20	[Gantt bar from Apr 8 to Apr 28, 2020]																							
25	East, West, and South Exterior Steel and Decking Roof	10 days	Tue 4/28/20	Tue 5/12/20	[Gantt bar from Apr 28 to May 12, 2020]																							
26	Canopy and Exterior Wall Framing	14 days	Tue 5/12/20	Mon 6/1/20	[Gantt bar from May 12 to Jun 1, 2020]																							
27	Metal Wall Panels	20 days	Mon 6/1/20	Mon 6/29/20	[Gantt bar from Jun 1 to Jun 29, 2020]																							
28	Roofing South, West, East	12 days	Mon 6/29/20	Wed 7/15/20	[Gantt bar from Jun 29 to Jul 15, 2020]																							
29	Exterior Brick & CMU	40 days	Tue 4/28/20	Tue 6/23/20	[Gantt bar from Apr 28 to Jun 23, 2020]																							
30	Pool	239 days	Mon 3/2/20	Thu 1/28/21	[Gantt bar from Mar 2, 2020 to Jan 28, 2021]																							
31	Excavation/Underdrain/Stone Base	15 days	Mon 3/2/20	Fri 3/20/20	[Gantt bar from Mar 2 to Mar 20, 2020]																							
32	Concrete slab & walls	40 days	Mon 3/23/20	Fri 5/15/20	[Gantt bar from Mar 23 to May 15, 2020]																							
33	Water Test and Clean	10 days	Mon 6/29/20	Fri 7/10/20	[Gantt bar from Jun 29 to Jul 10, 2020]																							
34	Outer Pool Plumbing and Backfill	20 days	Mon 5/18/20	Fri 6/12/20	[Gantt bar from May 18 to Jun 12, 2020]																							
35	Temp Wall Infill	10 days	Mon 6/15/20	Fri 6/26/20	[Gantt bar from Jun 15 to Jun 26, 2020]																							

PORTAGE PUBLIC SCHOOLS
NORTHERN NATATORIUM
PRE-BID MEETING
January 23, 2019 at 4:00pm

Name	Company	Phone	E-mail	Bid Category
DRU FONTAINE	CRIPPS FONTAINE EXCAVATING	269-342-1088	dfontaine@crippsfontaine.com	Site work
Dan Baruzzini	Baruzzini's	810-217-1824	danny@baruzzinis.com	Pool
Lenny Smith	Mack Industries	269-370-3112	lsmith@mackconcrete.com	PRECAST
Norm Overhiser	Ritsera Assoc.	269-217-9668	overhiser@ritsera.com	Drywall/Ceilings
Isaac McEllland	Brist Electric	269-343-9191	imcellland@bristelectric.com	Electrical
Jim Aho	DHE Plumbing & Mech	616 350 8085	Jim@dheplumbing.com	HVAC/Plumb
Mike Floyd	Elevator Service INC	(616) 430-0504	m.floyd@esigs.com	Elevator

PORTAGE PUBLIC SCHOOLS
NORTHERN NATATORIUM
PRE-BID MEETING
January 23, 2019 ato 4:00pm

Name	Company	Phone	E-mail	Bid Category
PETE STALZOR	SONSEKER POOL MASONRY	616 531 9999	PETE@SONSEKER.COM SONSEKER.ATT.NET	POOL
Rob Kraus	Allied Elect.	616-791-1164	rkraus@alliedelectricinc.com	Elect.
Matt Snyder	McDonald Roofing	269-419-9249	matt@mcdonaldroofing.biz	Roof
Jacob Hendrick	Bonna Corp.	616-538-3600	jhendrick@bonnacorp.com	LPDA
Chris Coyer	Circuit Electric	616-889-1020	chris.coyer@circuitelectric.com	Elec.
Jennifer Cooley	SA Norman & Co	269-383-0500	jcooley@sarnorman.com	Frames/Doors/Trnd
Eric Beale	Third Coast Restored Balance	616-834-1354	ebeale@thirdcoasttb.com	36 TAB
Dandel Crauen	Choice Concrete	616 723 5012	office@choiceconcretecorp.com	Concrete

SUBMIT IN TRIPLICATE

BID FORM (Revised Addendum 1)

BID TO: Portage Public Schools
8107 Mustang Dr.
Portage, MI 49002

BID FROM: _____

PROJECT: Portage Public Schools, Northern Natatorium

Ladies and Gentlemen:

The undersigned, having familiarized themselves with the local conditions affecting the cost of the Work and having examined the site, and Bidding Documents prepared by C2AE/Stantec, 211 E. Water Street Suite 213L, Kalamazoo, MI 49007, hereby propose to furnish all labor, material, equipment, taxes and services required for the proper completion of each of the following categories for this Project, including all addenda issued thereto, for the sum of:

Bid Category No. ___ Title _____

_____ Dollars (\$ _____),
Said amount constituting the Base Bid.

Cost Breakout for Northeast Parking Lot (called out as a add alternate on Sheet C-101 – Please Note This is NOT an Add Alternate):

_____ Dollars (\$ _____),

TAXES: Bid sum includes all applicable taxes, including Michigan Sales Tax. Confirm that your company can pay Michigan Sales and Use Tax: Yes No

ALLOWANCES: Base bid includes applicable allowance cost(s) as set forth in Section 01020 of the General Requirements and as identified in the Instruction to Bidders Bid Category Descriptions.

COST OF BONDS: Bid sum includes cost of furnishing a Performance Bond and Labor and a Material Payment Bond, each in the amount of 100% of Base Bid.

ACKNOWLEDGEMENT OF ADDENDA

The following addenda have been received, are hereby acknowledged, and their execution is included in the above Base Bid:

Addendum No. ___ Dated _____ Addendum No. ___ Dated _____ Addendum No. ___ Dated _____

Addendum No. ___ Dated _____ Addendum No. ___ Dated _____ Addendum No. ___ Dated _____

ALTERNATES

Base bid amount may be increased or decreased in accordance with each of the following alternate bids as may be selected, following the procedures stated in the Instruction to Bidders. **Any applicable bonding cost should be included with the Alternate pricing.** Refer to Section 01030.

Alternate No. 1: Replace existing site lighting poles and fixtures with new fixtures and poles indicated. Existing base may be reused if compatible with new pole. Existing Poles are Spaulding SSS-30-40-7-A1-DB.

Add/Delete _____ Dollars (\$ _____)

Alternate No. 2: Section 13 15 00 – Competition Swimming Pool and Equipment - 2.26C Chemical Feeders - Add for CO2 System

Add/Delete _____ Dollars (\$ _____)

Alternate No. 3: Section 13 15 00 – Competition Swimming Pool and Equipment - 2.29 Handrails, Grab Rails, and Water Polo Goals - Add for powder coated grab rails and handrails

Add _____ Dollars (\$ _____)

Alternate No. 4: Section 13 15 00 – Competition Swimming Pool and Equipment - 2.35 Backstroke and Recall Posts and lines - Add for powder coated backstroke and recall posts

Add _____ Dollars (\$ _____)

Alternate No. 5: Section 13 15 00 – Competition Swimming Pool and Equipment - 2.42 Dive Stand and Diving Board with Diving Sprays - Add for powder coated dive stand rails

Add _____ Dollars (\$ _____)

Alternate No. 6: Section 13 15 00 – Competition Swimming Pool and Equipment - 3.11 Pool and Deck Finish: Add for epoxy grout for Pool Deck, Add for Lifetime Warranty for Pool & Add for Lifetime warranty for Deck

Add _____ Dollars (\$ _____)

Alternate No. 7: Section 13 15 60 Aquatic Timing System - 2.10 Pace Clocks - Add for four (4) portable pace clocks

Add _____ Dollars (\$ _____)

VOLUNTARY ALTERNATES (Identify in detail on appropriate attachment any Voluntary Alternates shown here)

A _____

B _____

C _____

BID SECURITY

Accompanying this Bid, as required by the Instructions to Bidders, is a bid security in the form of (Certified Check/Cashier's Check/Bidder's Bond) in the amount of:

_____, Dollars (\$ _____), payable to the Owner, which it is agreed, shall be retained as liquidated damages, not as a penalty, by the Owner, if the undersigned fails to execute the Contract in conformity with the form of Contract incorporated in the Contract Documents and fails to furnish specified bonds within ten (10) days after date of issuance of Letter of Intent to the undersigned.

If awarded the Contract, the undersigned agrees to commence Work within ten (10) days after date of issuance of Notice of Pending Award, which shall be considered as the notice to proceed, and agrees to complete the Work in accordance with the Construction Progress Schedule.

CONSTRUCTION PROGRESS SCHEDULE

If awarded this Contract, the undersigned:

Endorses the Construction Progress Schedule: _____

Amends the Construction Progress Schedule as follows:

UNIT LABOR RATES

The undersigned further proposes and agrees that should the amount of work required be increased or decreased where unit prices have not been established, the following labor rates will be the basis for any change order proposal. Labor rates are to include all direct costs without mark-up as defined in Article 7.3 of the General Conditions. Prior to contract award, if requested by the Construction Manager, the successful bidder shall provide documentation substantiating the proposed labor rates.

Job Classification	Hourly Rate	Benefits	Employer's Liability	Payroll Taxes	Total

FEES FOR ADDITIONAL WORK

1. There will be a fee of 10% applied to the total cost of materials purchased and work completed by a contractor's own forces. This percentage represents both overhead and profit.
2. There will be a fee of 5% applied to the total cost of work completed by a subcontractor. This percentage represents both overhead and profit.

CREDIT FOR WORK DELETED

Should any work be deleted from Contract by order of the Owner, full cost savings realized thereby will be credited to Owner.

FAMILIAL DISCLOSURE

See Page 4 of this Bid Form for required statement.

AGREEMENT

The undersigned agree(s) to provide the post-bid information required within (10) days after notification of the Notice of Award and to execute an agreement for work covered by this Proposal on AIA Document A132-2009, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment is a Stipulated Sum.

In submitting this bid, it is understood that the Owner reserves the right to reject any or all bids. It is further agreed that this bid is binding for a period of sixty (60) days from the opening thereof.

Respectfully submitted,

Date _____, 2017

Firm Name _____

By _____

Signed _____

Title _____

Official Address _____

(If a corporation, affix seal)

Telephone No. (____) _____

Fax Number (____) _____

E-Mail Address _____

Familial Disclosure Statement
(Must be completed for bid to be considered)

In accordance with Section 1267 of the Revised School Code this bid must be accompanied by a sworn and notarized statement disclosing any familial relationship between the Owner or any employee of the Bidder and any member of the District's Board of Education or Superintendent of the District.

___ No, there is not a familial relationship between the Owner or any employee of the Bidder and any member of the District's Board of Education or Superintendent of the District.

___ Yes, there is a familial relationship between the Owner or an employee of the Bidder and a member of the District's Board of Education or Superintendent of the District. The person(s) and relationship are as follows:

Bidder	Board of Education or Superintendent
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Subscribed and sworn this _____ day of _____, 2013.

In the County of _____ State of _____

By _____
Notary Public Signature

My commission expires on: _____ Seal or stamp:

Affidavit of Compliance – Iran Economics Sanctions Act

Michigan Public Act No. 517 of 2012

The undersigned, the owner or authorized office of the below-named contractor (the “Contractor”), pursuant to the compliance certification requirement provided in the Portage Public Schools (“the School District”) Request for Proposals For Central Natatorium (“the RFP”), hereby certifies, represents and warrants that the Contractor (including its officers, directors, employees) is not an “Iran linked business” within the meaning of the Iran Economics Sanctions Act, Michigan Public Act No.517 of 2012 (“the Act”), and that in the event Contractor will not become an “Iran linked business” at any time during the course of performing any services under this contract.

The Contractor further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the School District’s Investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date determined that the person had submitted the false certification.

Contractor: _____

(Name of Contractor)

By: _____

Title: _____

Date: _____

State of: _____

County of: _____

This instrument was acknowledged before me on the _____ day of _____, 2017,

by, _____, Notary Public

_____ County, _____

My Commission Expires: _____

Acting in the County of: _____

LEGAL STATUS OF BIDDER

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS.

The Vendor and/or Bidder certifies to the best of its knowledge and belief that it and its principals: Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency; Have not within a three-year period preceding this agreement been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offences enumerated above in this certification; and Have not within a three-year period preceding this agreement had one or more public transactions (Federal, State, or local) terminated for cause or default; is not now or has been, within a three-year period preceding this date, been listed on the Excluded Parties List System website (EPLS).

Vendor/contractor will notify the Portage Public Schools Business Office immediately upon becoming suspended or debarred if there is any current or ongoing contract or agreement in place between the district and the vendor/contractor.

Firm Name: _____

Address: _____

Phone &

E-mail: _____

Name, title and signature of individual duly authorized to execute contracts:

Name: _____

Title: _____

Signature: _____

A Corporation organized and existing under the laws of the

State of _____



Owen-Ames-Kimball Co. - Kalamazoo

Prebid RFI Responses

#	Question	Official Response
Pre-Bid RFI 001	On sheet A720- the notes section refers to vinyl on the exterior door frames with a referral to specs 101400. There is nothing related to vinyl in the specs. I also checked the door and framing schedule on sheet A501 and there is not a vinyl copy schedule. If this is part of the signage scope, please provide a copy schedule if possible. May Valley City Sign be an approved manufacturer for the interior ADA signs? Kristin Houthoofd - Valley City Sign - khouthoofd@valleycitysign.com	Vinyl-cut numbers at exterior doors shall be 1-1/2 high, 2-mil vinyl, solid color (to be selected from manufacturer's full range), UV protected, pre-masked transfer tape. Each door opening to have a single digit number in Helvetica Bold font. Valley City Signs is an acceptable manufacturer.
Pre-Bid RFI 002	Doors and Frames: Doors 108.1, 109.1, 114.1, and 115.1 show FRP doors going into Hollow metal frames is this correct and if so will you be picking up these doors or am I to furnish the doors only? Doors 124.1, 125.1, 127.1, and 128.1 show FRP doors in FRP frames as a fire rated frame. FRP frames and doors are not fire rated. Please provide direction. Jim Totten - Double O - JimT@doubleoinc.com	Doors 108.1, 109.1, 114.1, and 115.1 are FRP doors in HM frames. Bid Category 12 - Doors, Frames and Hardware is responsible to furnish FRP doors in hollow metal frames and Bid Category 8 - General Trades will install. Doors 124.1, 125.1, 127.1, and 128.1 are to be 45 min fire rated FRP doors and frames as scheduled. Refer to spec section 081516 FRP Doors, Paragraph 2.4. - use FR Series Doors and Frames. FRP in Aluminum or FRP frames will be by Bid Category 14 - Aluminum, Glass and Glazing.
Pre-Bid RFI 003	Please verify that tectum ceiling panels are to be installed above the pool. There is an outline of them on the reflected ceiling plan, but they are not shaded in properly. And detail 11/A430 is not referenced on another page. Will scaffolding with a decked platform be built above the pool for all trades to work off (similar to what was done at the Portage Central Natatorium job)? If so, what elevation will it be built to? Scaffolding will be provided by O-A-K, elevation will be similar to Central's. Who is responsible for the spray applied insulation? There are 3 different types of walls for it to be installed: Masonry only, CMU with metal panels, and cold-formed metal studs with metal panels. Curtis Sebright - Bouma-Betten Construction - csebright@boumabetten.com	1. Yes, there are Tectum ceiling panels over the pool. Hatching was omitted from the drawings. See attached drawing A212 for locations of ceiling panels. 2. OWEN-Ames-Kimball Co. will provide a scaffold platform for contractors to work off of. The platform will be located approximately 9' below the bottom of the Precast Ts. 3. Bid Category 6 - Masonry is responsible for the spray insulation located behind brick/masonry and Bid Category 9 - Metal Wall Panels is responsible for it behind metal panels.
Pre Bid RFI 006	Will Bid Category 23 have to include the ceramic flooring and base at room 116 pool deck? Will Bid Category 16 have to include all the wall tile at room 116 pool deck? Will Bid Category 16 have to provide any tile overages per section 09 30 00 Tiling? If so, how much? Room 131 Stair 1: Will the riser be finished with CT-12? Room 206 Balcony: Sheet A712 Detail 1, will RSN-1 be the same manufacturer nosing we used at Central Natatorium but with different colors? Also, which bid category will be painted the sides of the steps at the balcony tiers? Louis V. Mion - Central Tile & Terrazo Co., Inc - louie@centraltile.net	1. Bid Category 23 - Competition Swimming Pool will be responsible for pool deck tile and base in Room 116. 2. Bid Category 16 - Flooring is responsible for wall tile in Room 116. 3. Each bid category is responsible for attic stock/extra materials for their supplied products. 4. Yes. 5. Yes, same as Central Natatorium. Color as well - Roppe #15 DBL Flange, Dark Gray 150. 6. Bid Category 16 - Flooring will paint the sides of the balcony tiers.
Pre Bid RFI 007	Can you please clarify the cable to be used? The high voltage cable between MVSG-2 and T-PP-PH. The specified cable on the attached pic is not a valid part #. Jeffrey Nichols - Hi-Tech Electric - jnichols@hi-techelectric.net	3#2, 15KV, CN & 1#6, 600V-G
Pre Bid RFI 008	On the spec for the elevator, the basis of design is our Endura MRL, which is a hydraulic elevator, but the spec goes on to talk about a traction elevator. Can you please confirm which type of elevator they would like? Becca Foste - NI/MOD Sales, Grand Rapids - rebecca.foste@thyssenkrupp.com	Revise Basis-of-Design Product (2.3.A) to Kone Ecospace in lieu of Endura MRL. System is to be a Machine Room-Less Electric Traction Passenger Elevator.
Pre Bid RFI 011	Who is responsible for the Fero anchors that support the brick ledge at the roof line & lentiis? Also, the angle that sits on them? See detail 1 / S-502.	Bid Category 6 - Masonry will supply and install the Fero anchors. Bid Category 7 - Metals will supply and install the angle.
Pre Bid RFI 012	Who is responsible for the Pool Heat Exchanger?	Bid Category 23 - Competition Swimming Pool will provide and install the Pool Heat Exchanger. They are to follow the Pool specification for this over mechanical specification where there are conflicts.
Pre Bid RFI 013	The Civil drawings show the Northeast Parking Lot as a Add Alternate, is it?	The Northeast Parking Lot is to be included in the Base Bid. It is NOT a add alternate. We are asking for the price to be broken out on the Revised Bid Form, issued with Addendum 1.
Pre Bid RFI 015	There is a L3 x 3 x 1/4 perimeter angle around the edge on top of the precast planking. See details 10 on S502.. Whom provides and installs this angle? Dan Hushower - FCC Construction - dhushower@fccconstructioninc.com	This is covered under Bid Category 7. Supply and Install.
Substitution Request 001	Equipment Request per Swaney Sales Chip Emery - Swaney Sales - chip@swaneysales.com	MY CONVERSATION WITH CHIP EMERY CENTERED ON INCLUDING THE KRUEGER PRODUCT. THE PACKET THEY SENT ALSO INCLUDES DIFFERENT PRODUCTS AND INFORMATION THAT WILL NOT BE CONSIDERED DUE TO NO EXPERIENCE ON OUR PAST PROJECTS. WE WILL REVISE OUR SPECIFICATIONS IN ADDENDUM 1 TO INCLUDE KRUEGER FOR AIR TERMINAL UNITS AND GRILLES, REGISTERS, DIFFUSERS.
SubstitutionRequest002	A substitution form and submittals are attached for your review. Color and finish options are also included in the attachments. We do offer quantity discounts! I have also enclosed a little more information about Jamestown Advanced Products. Brittany Green - Jamestown Advanced Products - brittany@jamestownadvanced.com	Jamestown Advanced Products "Contour Bench" has been approved for this project.
SubstitutionRequest003	Request for approval from Corrim Company for the fiberglass door system. David Bersuder - Corrim Company - dbersuderabs@gmail.com	Corrim Company is approved as an acceptable manufacturer for FRP doors and frames.