

March 7, 2025

ADDENDUM #3

TO CONTRACT DOCUMENTS FOR: Project #CP242812 – Jesse Hall Auditorium –
Building Envelope Update

ADVERTISEMENT DATE: February 7, 2025

PREPARED FOR: The Curators of the University of Missouri

CONSULTANT: Planning, Design & Construction
University of Missouri
130 General Services Building
(573) 882-6800

Specifications and Drawings for the above noted project and the work covered thereby are herein modified as follows, and except as set forth herein, otherwise remain unchanged and in full force and effect:

SPEFICIATIONS:

- 1) Section 1.E – SPECIAL CONDITIONS
REMOVE: Entire Paragraph 2: SPECIAL SCHEDULING REQUIREMENTS
ADD: Paragraph 2: SPECIAL SCHEDULE REQUIREMENTS
a. Special scheduling requirements supplemental to the bid form

Contractor shall perform all work in the designated areas during regular work hours, which are 7:00 a.m. to 5:00 p.m., Monday through Friday. Access and work efforts outside of these normal working hours to be coordinated with the Owner’s representative.

Mobilization on site cannot begin until March 6, 2025. Contractor permitted to begin work and/or erect scaffolding along the east and south elevations of Jess Auditorium before Commencement Weekend, May 16, 2025.

Contractor shall not start work or erect scaffolding along the north elevation of Jesse Auditorium until after Commencement Weekend, May 19, 2025.

Masonry contractor shall be complete, including all punch list items, and have scaffolding removed by Homecoming September 27, 2025.

Tuesday, March 11, 2025, an event at the project site will require quiet time from 7:00 am to 11:00 am.

Thursday, March 13 through Wednesday, March 19, 2025, work can continue on site as long as the parking areas and loading dock door is safe with required protection and accessible after 4 pm each day.

Wednesday, March 26, 2025, there is an event all day long in which work cannot be done on site.

Tuesday, April 1, 2025, the project parking areas and loading dock will be needed for Owner's use all day for major touring show performances that evening.

Monday, April 7 through Thursday, April 10, 2025, the Owner will be having evening events after regular work hours. **No construction impact is anticipated.**

Saturday, April 12, 2025, the Owner will have an evening event after regular work hours. **No construction impact is anticipated.**

Friday, April 18, 2025, there is an Owner event for the entire day. No construction activities shall take place during this date.

Thursday, April 24, 2025, the Owner will have an evening event after regular work hours. **No construction impact is anticipated.**

Friday, April 25, 2025, there is an Owner event starting at 3:00 pm. All construction activities shall stop on site by 2:00 pm.

Saturday, April 26 through Sunday, April 27, 2025, there is an Owner event all weekend outside of regular work hours. **No construction impact is anticipated.**

Friday, May 2, 2025, the Owner will have an evening event after regular work hours. **No construction impact is anticipated.**

Friday, May 16 through Sunday, May 18, 2025 Spring Commence Ceremonies will be held. No construction activities shall take place during these dates.

Jesse Auditorium will not be in use by the Owner after Commencement, May 19, 2025.

Jesse Auditorium will be opened and used by the Owner starting by September 18, 2025.

Thursday, September 18 through Sunday, September 21, 2025, the Owner will be performing Homecoming skit rehearsals in the evening after regular working hours. **No construction impact is anticipated.**

Monday, September 22 through Friday, September 26, 2025, the Owner will be performing Homecoming skit rehearsals in the evening after regular working hours. **No construction impact is anticipated.**

Saturday, October 4, 2025, the Owner will have a morning event outside of regular working hours. **No construction impact is anticipated.**

Sunday, October 19, 2025, the Owner will have an event outside of regular working hours. **No construction impact is anticipated.**

Saturday, October 25, 2025, the Owner will be hosting India Nite event in the evening after regular working hours. **No construction impact is anticipated.**

Contractor shall submit to Architect all required product data, shop drawings, and other submittals for the automatic smoke vents within 30 days of Contractor receiving unsigned Contract, Performance Bond, Payment Bond, and “Instructions for Execution of Contract, Bonds, and Insurance Certificates.”

- 2) Section 262923 – VARIABLE FREQUENCY CONTROLLERS
ADD: Entire Specification Section 262923 attached to this Addendum.

DRAWINGS:

- 1) Drawing Sheet: M103 – ROOF DEMOLITION PLAN - HVAC
ADD: “by the General Contractor” between “the roof” and “and protected” in Sheet Note #4.

DELETE: “Min. outside air & economizer” in Keynote 7 and
REPLACE WITH: “Outside air”.
- 2) Drawing Sheet: ME202 – STAGE RADIATOR PLAN – HVAC & ELECTRICAL
ADD: “Typical Steam Radiator Assembly” detail B21/ME202 on attached sheet.
REVISE: VFD note on plan B6/ME202 on attached sheet.

- 3) Drawing Sheet: M203 – ROOF PLAN - HVAC
ADD: Tag CC-1 to Keynote 4 on Roof Plan – HVAC: B6.
DELETE: “(2 – 31.5x57)” and “Coil shall cool 12,000 CFM from 82.3°DB/66.7°WB EAT to 53.7°DB/52.7°WB LAT with 45°EWT and 55°LWT. Coils shall use 5/8" copper tubes with 0.025" min. thick walls and 0.008" thick aluminum fins with no more than 12 fins/inch.” from Keynote 4.
ADD: “and fan belts” to the end of Keynote 5.
DELETE: “Min.” and “Economizer” from Keynote 7.
ADD: “Install new filters.” to the end of Keynote 9.

REQUESTS FOR CLARIFICATIONS:

- 1) The special inspections listed on G001 post-installed anchors. Does this include the micro pins and threaded rods for the masonry repairs (details Y29 and Y21 on sheet A520)? Or does this only apply to the roof infills (detail X5 on sheet A531)

RESPONSE: Micro pins and threaded rods are for masonry restoration scope of work and are not required to have Special Inspections.

- 2) What is the manufacturer of the existing Fire Alarm Panel in Jesse Auditorium?

RESPONSE: The existing Fire Alarm Panel is located on the southwest corner of the stage. The existing panel is the E3 Series from Gamewell-FCI by Honeywell.

- 3) Does the University have submittal information on the existing RTU, mostly interested in its weight for crane sizing?

RESPONSE: The original shop drawings for the existing RTU is attached to the end of this Addendum for reference only. The estimated weight of the RTU is provided for reference only in the original attached shop drawing submittal.

- 4) Sheet ME202 note 4 – Indicates a new electrical feed to a vfd serving the RTU. Is this vfd existing? I don't see it scheduled anywhere, nor do I see a specification section for it. Although there is a vfd mounting detail on sheet M500.

RESPONSE: See attached specification section 262923 and revised sheet ME202 for requirements for the vfd unit.

- 5) Note #12 on the A200 series of exterior elevations calls out areas of brick parapets and penthouse walls that are to be 100% tuckpointed. General Note #1 on each A200 sheet states that the Base Bid is to include 100% tuckpointing for all brick and stone masonry joints. Please clarify the tuckpointing scope of work.

RESPONSE: 100% of all brick and stone joints shall be raked and tuckpointed per Note #1 on each A200 exterior elevation sheet. Note #12 intent is to highlight that all parapet walls on the inside face of the roof are to also be 100% raked and tuckpointed after the existing roof assembly has been removed and before the new roofing wall terminations have been installed.

- 6) Referencing Note #22 on the A200 series of exterior elevations. Can the cracked stones be pinned and repaired in place? Or do they have to be removed, pinned and reset?

RESPONSE: Note #22 states that the cracked stones are required to be removed and references detail J13/520 showing concealed threaded rods set in epoxy. The intent and project requirement is that no threaded rod patching mortar shall be exposed at the exposed faces of the stones called for repair note #22.

- 7) Can you provide any required loading information for the existing stage floor for potential lift access to the wall radiators?

RESPONSE: The original Jesse Auditorium 1st Floor Stage structural drawing sheet has been attached to the end of this addendum for reference only. It is the contractor's responsibility to provide means and methods and delegated design for all scaffolding and/or other means of access to perform the required scope of work of the Contract Documents.

ATTACHMENTS: Specification Section 262923, Sheet ME202, Existing RTU Shop Drawing Submittal (For Reference Only), Existing First Floor Stage Framing Plan (For Reference Only)

END OF ADDENDUM #3

SECTION 262923 – VARIABLE FREQUENCY CONTROLLERS (ADDENDUM #3)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Variable frequency controllers.

1.2 REFERENCES

- A. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems; National Electrical Manufacturers Association.
- B. NEMA ICS 7 - Industrial Control and Systems: Adjustable-Speed Drives; National Electrical Manufacturers Association.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association.
- D. NFPA 70 - National Electrical Code; National Fire Protection Association.
- E. IEEE 519 – Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems. Motors greater than 60 HP shall comply with IEEE 519 with the point of common coupling (PCC) located at the source feeder overcurrent protective device

1.3 SUBMITTALS

- A. See Section 01 3000 (01300) - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.
- C. Shop Drawings: Indicate front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends.
- D. Test Reports: Indicate field test and inspection procedures and test results.
- E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- F. Manufacturer's Field Reports: Indicate start-up inspection findings.
- G. Operation Data: NEMA ICS 7.1. Include instructions for starting and operating controllers, and describe operating limits that may result in hazardous or unsafe conditions.
- H. Maintenance Data: NEMA ICS 7.1. Include routine preventive maintenance schedule.

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- I. Coordination Drawings: Prepare floor plan coordination drawings drawn to scale that identify the arrangement of the new VFD's to be provided in relationship to existing equipment and elements within the existing electrical room.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience and with service facilities within 200 miles of Project.
- C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Toshiba; Model AS3: www.toshiba.com.
- B. ABB; Model ACH580: www.abb.com.
- C. Yaskawa; Model HV600 www.yaskawa.com.
- D. For UMSL & MS&T, include Danfoss; Model VLT FC 102: www.danfoss.com.
- E. For UMKC, include Eaton.

2.2 DESCRIPTION

- A. Variable Frequency Controllers: Enclosed controllers suitable for operating the indicated loads, in conformance with requirements of NEMA ICS 7. Select unspecified features and options in accordance with NEMA ICS 3.1
 - 1. Employ microprocessor-based inverter logic isolated from power circuits
 - 2. Employ pulse-width-modulated inverter system.
 - 3. Include a DC link reactor for reduction of harmonic distortion.
 - 4. The controller, and all associated components, shall be supplied by a single vendor.
 - 5. The controller will be operating a variable volume fan motor, or water pump motor for HVAC application.
 - 6. System voltage shall be indicated on front of ASD, using minimum of 1-inch high letters.

- B. Enclosures: NEMA 250, Type 1, suitable for equipment application in places regularly open to the public. No disconnects in VFD cabinet. Disconnect must be in separate enclosure.

2.3 OPERATING REQUIREMENTS

- A. Rated Input Voltage for motors rated below 40 HP: 200 volts, three phase, 60 Hertz, with a voltage tolerance of +/- 10% and a frequency tolerance of +/- 2 Hz.
- B. Rated Output: Output to be rated for design ambient temperature and maximum PWM carrier frequency. Output frequency shall vary between 0.1 Hz and 400 Hz. Frequency resolution shall be 0.01 Hz digital and 0.03 Hz analog with an accuracy of +/-0.2% of maximum frequency at 25 degrees Celsius. Maximum voltage frequency shall be adjustable from 25 Hz to 400 Hz. Voltage boost shall be adjustable from 0% to 30% with starting frequency adjustable from 0 Hz to 10 Hz. The output current shall be 100% continuous and 110% for 60 seconds, based on NEC table 430-150 (Full-Load Current, Three-Phase Alternating Current Motors) for 200 volts or 460 volts.
- C. The controller shall contain three critical frequency jump points with individual bandwidth. Upper and lower frequency limits shall be capable of being varied.
- D. The PWM carrier frequency shall be adjustable from 5000 Hz to 12000 Hz.
- E. The drive shall contain two separate acceleration/deceleration times (0.1 to 1800 seconds) with a choice of linear, S, or C curves. The drive shall have a standard dynamic electric braking for motors rated 30 HP or below. The drive shall restart into a rotating motor by sensing the coasting motor speed and matching that frequency. The drive shall have adjustable soft stall (10%-150%) and adjustable electronic overload protection (10%-100%).
- F. The drive shall have external fault input, be capable of re-setting faults remotely and locally.
- G. Input Signal:
 - 1. 0 to 10 v DC.
 - 2. 0 to 5 v DC
 - 3. 4 to 20 mA DC
- H. Manual bypass is not required on VFD unless indicated on bid documents.

2.4 COMPONENTS

- A. Display: Provide integral digital display to indicate output voltage, output frequency, and output current, output power (kw), and motor RPM.
- B. For MS&T, BACnet option included.

2.5 HARMONICS

- A. Reference IEEE 519-2014 Total Demand Distortion (TDD) limit at the PCC (point of common coupling). VFD supplier must provide harmonic calculations to show compliance with IEEE 519-2014.
- B. VFDs provided shall have 5% reactor (or DC choke) as integral to the VFD.

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- C. Additional harmonic mitigation equipment in order to achieve compliance with IEEE 519-2014 shall include, but not be limited to, the following:
 - 1. 5% THD passive harmonic filter with contactor. The passive harmonic filter shall be mounted in the same enclosure as the drive.
 - 2. A capacitor drop-out contactor shall be included to open at reduced loads.
 - D. Active front end "ULH" technology that incorporates DC bus capacitors, IGBTs, LCL filtering, and LCL contactor. Maintain unity power factor at full load while complying with IEEE 519-2014. VFDs that do not utilize this technology are not allowed.
 - E. VFDs that cannot produce an output voltage that is equal to the motor nameplate voltage while operating at full speed are not allowed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with NEMA ICS 7.1, manufacturer's instructions, and per drawings.
- B. Tighten accessible connections and mechanical fasteners after placing controller.
- C. Provide engraved plastic nameplates; refer to Section 26 0553 (16075) for product requirements and location.
- D. Neatly type label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place in clear plastic holder.
- E. The service disconnect switch must be installed on the line side of the VFD. The disconnect must be in a separate enclosure from the VFD. If conditions do not allow this disconnect to be located near the motor within NEC requirements, then a second remote disconnect may be required at the motor. Consult the project manager or University Engineer if this condition arises. All remote disconnects must be provided with auxiliary contacts hardwired to VFD safety circuit to shut down VFD when disconnect is opened. This may affect warranty on the drive so every attempt should be taken to install it per these design guidelines.
- F. If a single VFD is controlling multiple fans in an air handling unit then overload protection on each fan must be provided. No more than 4 fans shall be connected to a single VFD.
- G. The ground wire should be of the same size as the power conductors from the motor to the VFD and from the VFD to the source.
- H. Do not install VFD's on AHU's. See detail below.

3.2 FIELD QUALITY CONTROL

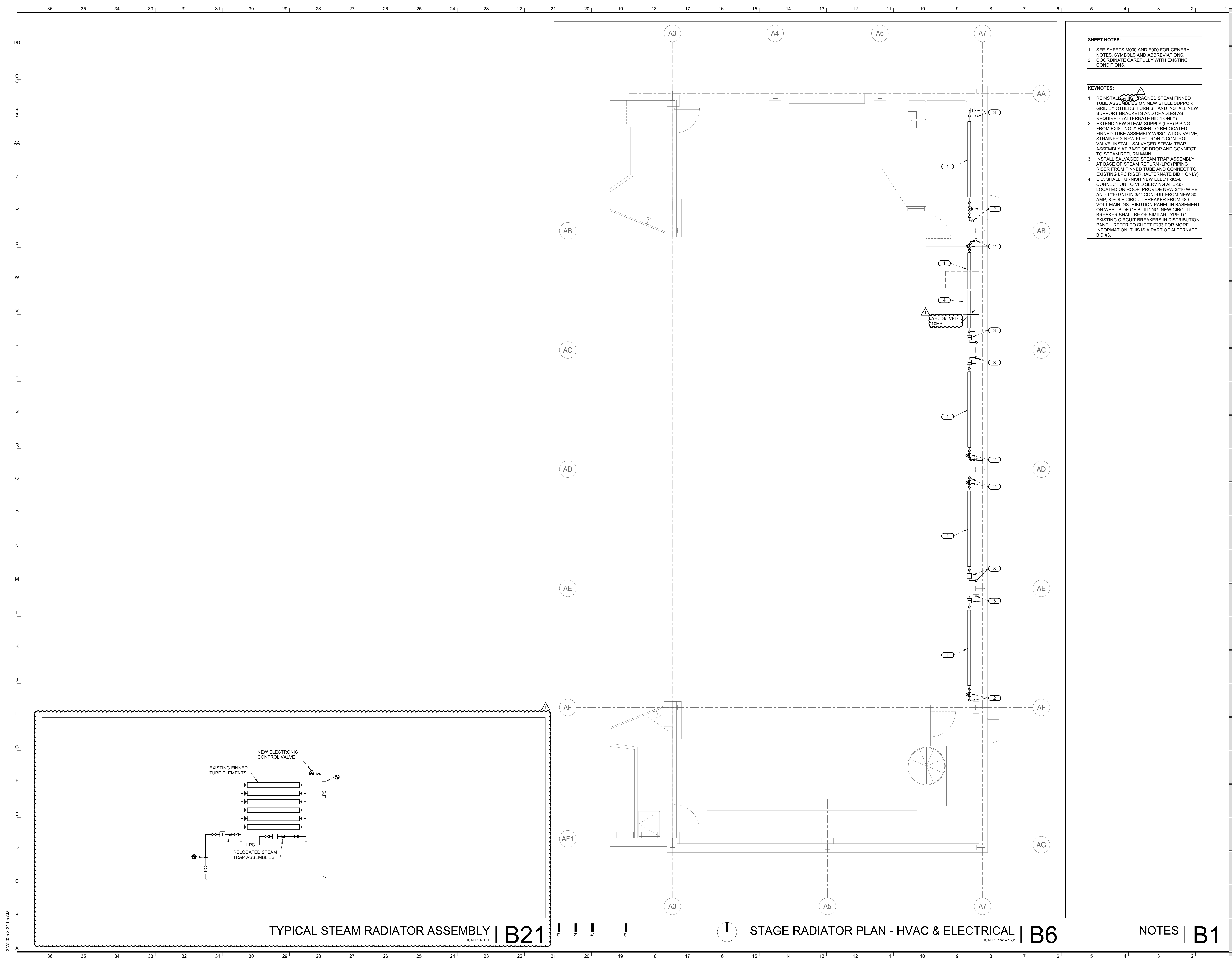
- A. Prior to initial energization, provide the service of the manufacturer's field representative to prepare and start controllers.

3.3 MAINTENANCE

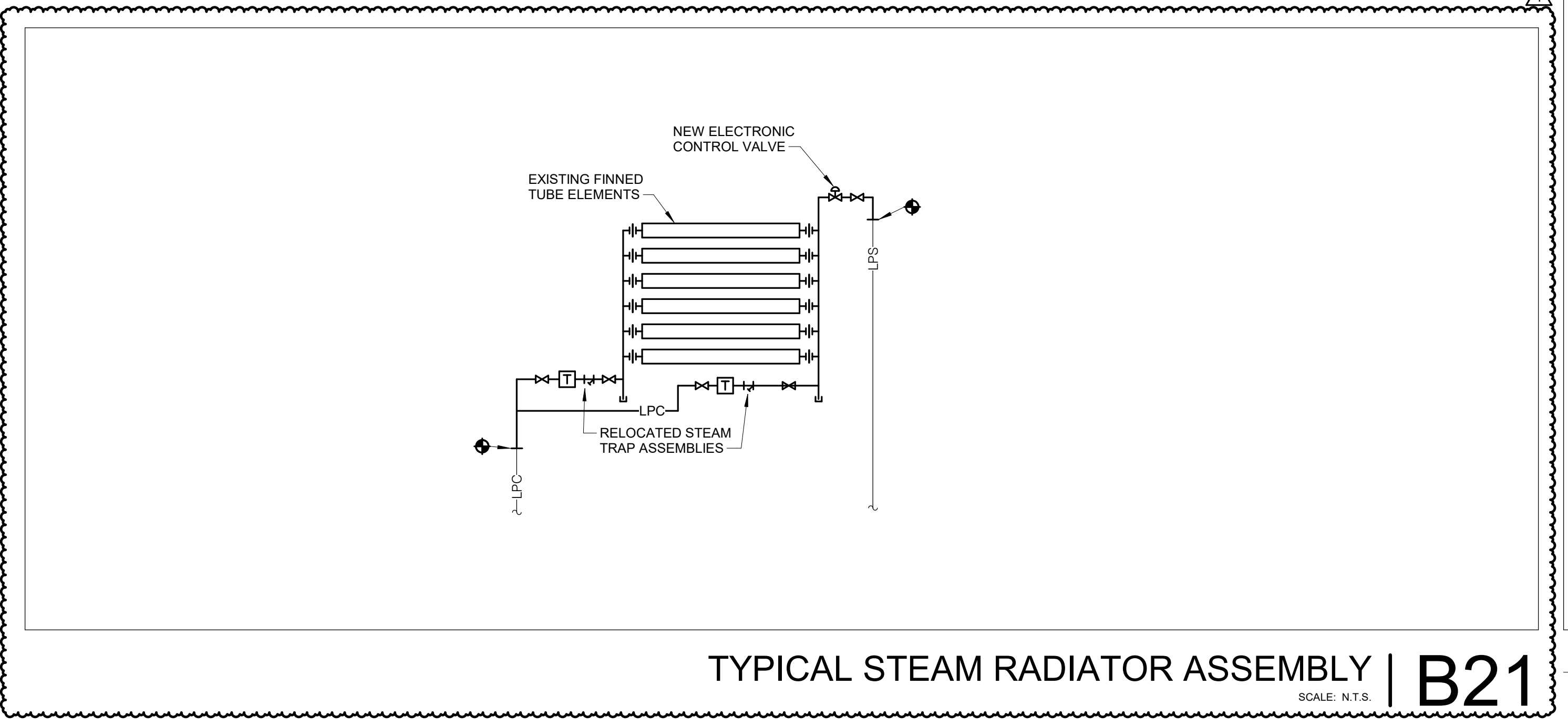
- A. Furnish two extra of each air filter.
- B. Provide service and maintenance of controllers for one year from Date of Substantial Completion.

END OF SECTION 262923

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- SHEET NOTES:**
- SEE SHEETS M000 AND E000 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS
 - COORDINATE CAREFULLY WITH EXISTING CONDITIONS.
- KEYNOTES:**
- REINSTALL PACKAGED STEAM FINNED TUBE ASSEMBLIES ON NEW STEEL SUPPORT GRID BY OTHERS. FURNISH AND INSTALL NEW SUPPORT BRACKETS AND CRADLES AS REQUIRED. (ALTERNATE BID 1 ONLY)
 - EXTEND NEW STEAM SUPPLY (LPS) PIPING FROM EXISTING 2" RISER TO RELOCATED FINNED TUBE ASSEMBLY WITH ISOLATION VALVE, STRAINER & NEW ELECTRONIC CONTROL VALVE. INSTALL SALVAGED STEAM TRAP ASSEMBLY AT BASE OF DROP AND CONNECT TO STEAM RETURN MAIN.
 - INSTALL SALVAGED STEAM TRAP ASSEMBLY AT BASE OF STEAM RETURN (LPC) PIPING RISER FROM FINNED TUBE AND CONNECT TO EXISTING LPC RISER. (ALTERNATE BID 1 ONLY)
 - E.C. SHALL FURNISH NEW ELECTRICAL CONNECTION TO VFD SERVING AHU-SS LOCATED ON ROOF. PROVIDE NEW #10 WIRE AND #10 GND IN 3/4" CONDUIT FROM NEW 30-AMP, 3-POLE CIRCUIT BREAKER FROM 480VOLT MAIN DISTRIBUTION PANEL IN BASEMENT ON WEST SIDE OF BUILDING. NEW CIRCUIT BREAKER SHALL BE OF SIMILAR TYPE TO EXISTING CIRCUIT BREAKERS IN DISTRIBUTION PANEL. REFER TO SHEET E203 FOR MORE INFORMATION. THIS IS A PART OF ALTERNATE BID #3.



TYPICAL STEAM RADIATOR ASSEMBLY | B21

STAGE RADIATOR PLAN - HVAC & ELECTRICAL | B6

NOTES | B1

INTERNATIONAL ARCHITECTS ATELIER
 912 BROADWAY BLVD, SUITE 300 | KANSAS CITY, MO 64105
 P: 816.471.6522 | F: 816.471.3755 | W: I-A-A.COM
 MISSOURI STATE CERTIFICATE OF AUTHORITY #000582

MECHANICAL, ELECTRICAL AND FIRE PROTECTION CONSULTANT

IMEG
 IMEG CORP.
 1600 BALTIMORE
 KANSAS CITY, MO 64108
 PH: 816.842.8337

STRUCTURAL CONSULTANT

BOB D. CAMPBELL & CO.
 4338 BELLEVUE AVE.
 KANSAS CITY, MO 64111
 PH: 8816.531.4144



JESSE HALL AUDITORIUM BUILDING ENVELOPE UPDATE

ISSUE FOR BID

801 Conley Avenue
 Columbia, MO 65211

DATE: FEBRUARY 7, 2025
 PROJ. NO.: CP242812
 DESIGNED BY: SGB
 DRAWN BY: SGB
 CHECKED BY: SGB
 APPROVED BY: SGB



FEBRUARY 7, 2025
 The Professional Engineer's seal affixed to this sheet applies only to the material and items shown on this sheet. All drawings, instruments or other documents not exhibiting this seal shall not be considered prepared by this engineer, and this engineer expressly disclaims any and all responsibility for such plans, drawings, or documents not exhibiting this seal.

NO.	REVISION SUBMISSION	DATE
0	ISSUE FOR BID	02/07/2025
1	ADDENDUM 3	03/07/2025

STAGE RADIATOR PLAN - HVAC & ELECTRICAL

ME202

UNIVERSITY OF MISSOURI - JESSE HALL

NOTES:

1. FAN REQUIREMENTS:

- A. P-30, AF, SWSI, Class I Construction.
- B. Lube lines to be extended to motor side of fan framing.

2. CASING REQUIREMENTS:

- A. AMCA "A" for pressure.
- B. Weatherproof #2 - Curb by others.

3. ELECTRICAL REQUIREMENTS:

- △ A. PACE to supply, install and wire a Cutler Hammer combination magnetic starter #A30DDAOE23B NEMA 12/3R Size 2, with one AUX N.O. contact (C320KA1) factory installed.
- B. PACE to MOUNT customers supplied actuators,
- C. PACE to mount and wire customer supplied OSA, Mixed Air and Air Flow Sensors.

4. DAMPER REQUIREMENTS:

- A. OSA and RA dampers to be aluminum low-leak parallel blade.
- B. EXH. CESCO BDA 101V with retarding counterbalance 31"W x 39"H.
- C. Associated Air Products to supply actuators for OSA & RA dampers. PACE to mount OSA - N.C. and RA - N.O.

5. INSULATION REQUIREMENTS:

- A. Coil Section / Piping Section Walls and Roof: 2"-3# Fiberglass
Balance of Walls and Roof: 3"-6# Rockwool covered with 1"-1 1/2# Fiberglass.
Under Floor Throughout: 1"-1 1/2# Fiberglass.

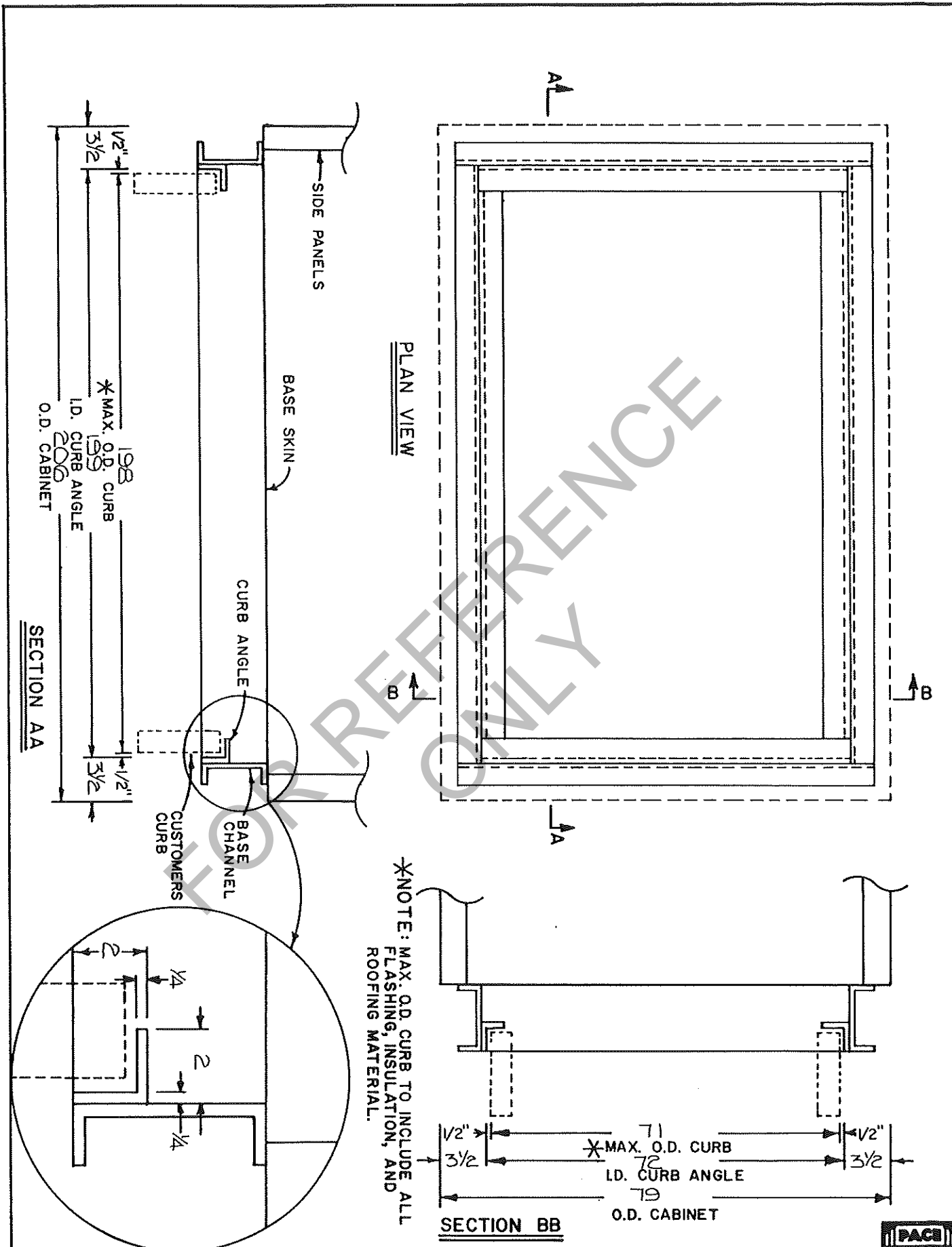
6. FILTER REQUIREMENTS:

- A. Two sets required. One set installed, one set shipped loose.

△ rev 3A DL 2/21/89

PAGE

UNIVERSITY OF MISSOURI JESSE HALL	Brod & McClung-Pace Co. 9800 S. E. McBROD AVE. PORTLAND, OREGON 97222	DRAWN BY D.L.	DRAWING # 89-58305-01 Sht. 2 of 3
		DATE 2-23-89	
		SCALE	



CORRELATING DATA SHEET

CONTRACTOR: _____ PROJECT: UNIVERSITY OF MISSOURI-JESSE HALL
 CITY: _____ JOB NO: 89-58305

ITEM NO. QTY. UNIT DESCRIPTION SER. NO. FAN BRG. MOTOR BRG. DRIVE COIL FILTER
 1 P-30AF SWSI 89-58305-01 BALL V-BELT CLG. FARR 30/30

PARTS LIST

PART	QUANTITY	MAKE-MODEL	SIZE
MOTOR	1	CENTURY SC 215T	10 HP, 1800 RPM, 3 PH, 200 V.
FAN WHEEL	1	PACE	30" SWSI, AF, CWR.
FAN BEARING	2	FAFNIR RAK	2-3/16"
SHAFT	1	PACE	2-3/16" x 22"
SHEAVE	1	BROWNING	2TB66 x 1-3/8"
SHEAVE	1	BROWNING	2TB110 x 2-3/16"
BELT	2	GATES	B-89
FILTER	12	FARR 30/30	(12) 16 x 20 x 2 (1) EXTRA SET
COIL	2	PACE COOLING LH:	126CW: 31-1/2" x 57"
STARTER	1	CUTLER-HAMMER #A30DDAOE23B	SIZE "2"
DAMPER	1	CESCO	31" W x 39"H

Brod & McClung-PACE Co.
 9800 S.E. McBrod Avenue
 Portland, Oregon 97222
 Phone: 503-659-5880



BROD & McCLUNG-PACE CO.

9800 S. E. McBrod Avenue
Portland, Oregon 97222
(503) 659-5880

In Reply Refer to:

May 1, 1987

PACE UNITARY OPERATING INSTRUCTIONS

INSTALLATION:

Equipment should be carefully checked on arrival to be sure it has not been damaged in transit. Storage must be in dry area and protection should be afforded against mechanical abuse.

Equipment should be installed level and on adequate supports. Where vibration isolation is installed, be sure that isolator base is properly fastened to the sub-base, and also attached as indicated to equipment. Leveling screws should be adjusted to keep equipment level.

STORAGE:

When fans are stored for long periods of time in the same position the bearing balls or rollers and races depress and a flat spot can develop. When put into operation later, this depression can cause a bearing to run rough and eventually cause failure of the bearing. Once a month the fan rotors should be rotated several times to make sure lubricant is returned to the lower part of the bearing and the position of the balls or rollers is changed.

LUBRICATION:

1. RULES for lubrication are difficult to make universal in application. In general, the following recommendations will ensure long bearing life.

May 1, 1987

3. SLEEVE BEARINGS: (Cont'd)

c. Pillow Block Sleeve Bearings with Oil Reservoir and/or Gauge Glass.

Keep oil reservoir full with SAE-10 motor oil-- preferably non-detergent.

4. BALL BEARINGS: Ball bearings are the most commonly used bearings at the present time. These are usually identified by a grease plug in the pillow block, a grease fitting, or no opening at all - in other words, a lifetime or sealed bearings. Ball bearings are normally supplied grease-packed and will purge excess grease upon startup.

a. Ball Bearings on Motors

If no hole or plug is in the bearing assembly, this is a life-time-lubricated bearing and need no further lubrication.

If a plug or grease fitting is in the bearing housing, lubricate with Alvania # 2 (Shell Oil Company) or Rykon # 2 (Standard Oil, Indiana), or equivalent. Grease lightly at the following intervals, using a relief-type fitting and low-pressure gun, or remove grease fitting and run for five minutes before re-installing plug or fitting.

Light Duty:	Eight (8) years.
Medium Duty:	Five (5) years.
Heavy Duty:	Two (2) year.
Severe Duty:	Usually requires a special grease for low ambients. (Lithium base recommended.)

b. Pillow Block Ball Bearings

These are often furnished for light duty with no grease opening or fitting, indicating that they are lubricated for life and require no further lubrication.

May 1, 1987

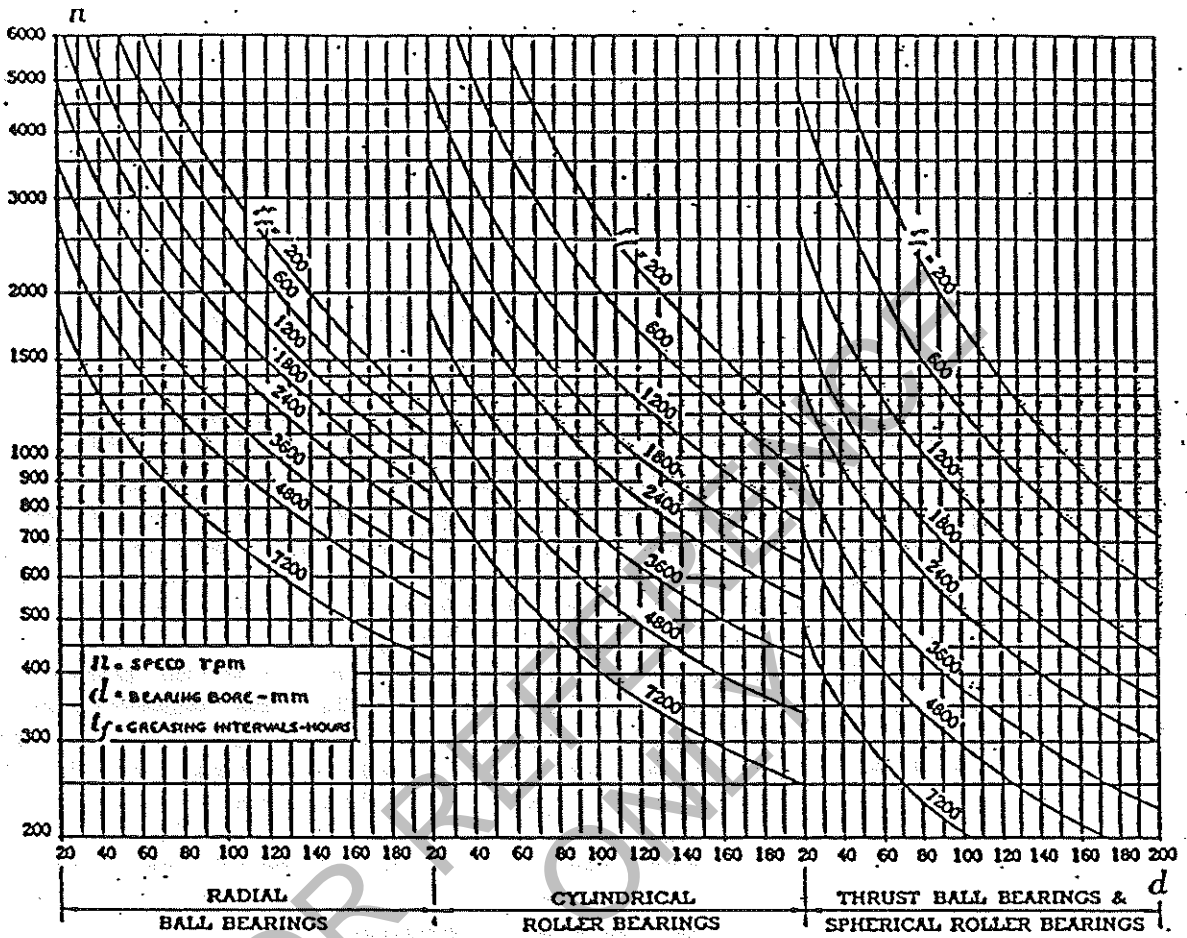


Fig. 11

5. **ROLLER BEARINGS:** These are usually used only on heavy-duty equipment, and manufacturer's specific lubrication recommendations should be followed for the particular installation service or duty. Roller bearings are normally supplied grease packed and will purge excess grease upon startup.

If recommendations are not with the bearings, PACE Company can obtain them for you on request.

May 1, 1987

PRIOR TO INITIAL OPERATION:

Be sure wiring is correct - both as to size, phase, voltage and connections. Overload protective device(s) should be inspected to make sure that correct thermal elements are installed.

Rotate equipment manually to ensure freedom of rotation.

Check condition, adjustment and alignment of V-drive.

START-UP:

Check unit immediately to be sure of smooth operation. It is excellent practice to check all motors with an ammeter and compare reading with motor rating. Do not run equipment in an overload condition.

Investigate unusual noises or vibrations. Maladjustment of V-drive as to alignment, and excessively tight or loose belts, are very common causes of trouble. Loose Varipitch Drives are a further common cause of trouble.

MOTORS:

Thermal overloading relays, either manual or magnetic, are installed for motor protection. If thermals kick out, the cause may be one of the following:

1. Low voltage
2. Bad bearing
3. Overload due to system characteristics because of fan speed. A continuous overload under unfavorable conditions in excess of manufacturer's guarantee will eventually cause failure of the motor.

FAN:

Care should be taken to see that the bearings have been properly inspected and lubricated. When first starting the fan, see that it turns over easily, and check the bearings after a short interval of operation to be sure that they are not over-heated.



BROD & McCLUNG - PACE CO.

9800 S. E. McBrod Avenue
Portland, Oregon 97222
(503) 659-5880

In Reply Refer to:

PL-17-3
1-15-89

WARRANTY

BROD & McCLUNG - PACE Company warrants products of its manufacture to be free of defects in material and workmanship if properly installed, cared for and operated under normal conditions with competent supervision. BROD & McCLUNG - PACE Company's obligation under this warranty is limited to make good at its factory any part or parts thereof which shall, within one year after startup or 18 months from shipment (whichever occurs first), of its products to the original purchaser, be returned to the factory with transportation charges prepaid and which, upon examination, shall appear to BROD & McCLUNG - PACE Company's satisfaction to have been thus defective. Correction of such defects by repair or replacement shall constitute fulfillment of any obligation to purchaser, and BROD & McCLUNG - PACE Company shall not be liable for loss, damage, or expenses directly or indirectly arising from the use of its products or from any other cause. BROD & McCLUNG - PACE Company assumes no liability for expenses or repairs made outside its factory except by written consent. No liability whatsoever shall attach to the seller until said products have been paid for.

The above warranty supersedes and is in lieu of all other warranties expressed or implied; and no person, agent, or dealer is authorized to give any warranties on behalf of BROD & McCLUNG - PACE Company nor to assume for BROD & McCLUNG - PACE Company any other liabilities in connection with any of BROD & McCLUNG - PACE Company's products.

BROD & McCLUNG - PACE Company makes no warranty whatsoever with respect to motors, switches, controls or accessories, inasmuch as they are warranted separately by their manufacturers.

AIR-CONDITIONING COIL MAINTENANCE

For proper functioning, heating and cooling coils should be clean; therefore periodically check for cleanliness on both sides.

After cleaning the obviously dirty side, check again by flashlight from one side to the other by observing the amount of light emission. Dirt can collect deep within on a multiple-tubed coil. Very low-pressure compressed air or hot detergent water can be blown from the clean side to the dirty side for ejection of the build-up.

For circulating hot or cold water systems, proper water treatment may be required to lessen the build-up of deposits inside the tubes. Contact companies specializing in water treatment if this is a possible problem.

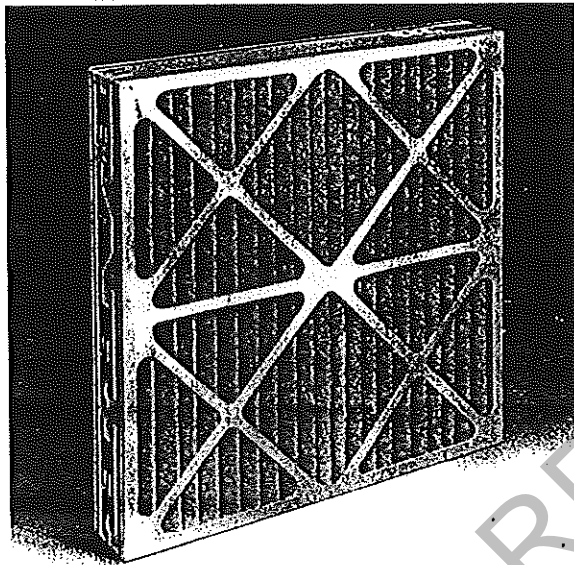


BROD & McCLUNG - PACE CO.
9800 S. E. McBrod Avenue
Portland, Oregon 97222
(503) 659-5880

COMMERCIAL PRODUCTS SPECIFICATIONS

UL CLASS 1 30/30 FILTERS

FARR 30/30 EXTENDED AREA FILTERS have established a new air filtration standard in a wide variety of commercial, industrial and residential applications. High efficiency ratings, extended service life and ease of handling have made them the accepted choice where both performance and economy are required.



NEW OR EXISTING SYSTEMS can be upgraded by incorporating the Farr 30/30 Class 1. Its greater dust holding capacity not only extends replacement intervals, but, considerably lengthens the service life of any other secondary filters in the system.

Farr 30/30 Class 1 filters may be installed in built-up banks, Farr Glide/Pack side access housings and OEM air handling units. A wide range of conversion fasteners and clips are available to adapt the Farr 30/30 to almost any existing built-up filter bank.

FILTER MEDIA shall be of high density glass micro fibers laminated to all glass closed mesh backing. The filter media shall have an average efficiency of 25-30% on ASHRAE Test Standard 52-76. It shall have an average arrestance of 94-96% in accordance with that test standard.

The Farr 30/30 Class 1 is categorized as a 30% efficiency filter. Average efficiencies may vary 5 points. These variances are typical of filters in the medium efficiency category when tested in accordance with the ASHRAE 52-76 standard. The filter shall be listed by Underwriters' Laboratory as Class 1.

MEDIA SUPPORT GRID shall be a welded wire grid with an effective open area of not less than 96%.

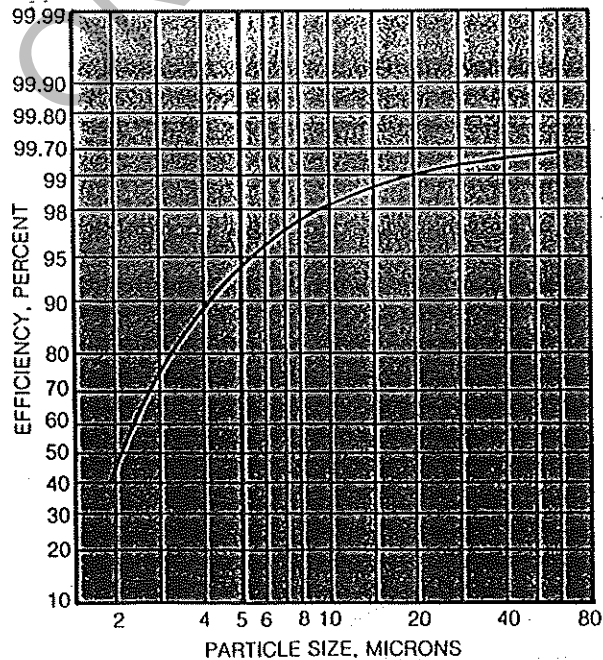
The welded wire grid shall be bonded to the filter media to eliminate the possibility of media oscillation and media pull away.

The media support grid shall be formed in such a manner that it affects a radial pleat design, allowing total use of filter media.

ENCLOSING FRAME is constructed of non-flammable board and meets requirements for Underwriters' Laboratory Class 1 rating. The enclosing frame has diagonal support members bonded to the air entering and air exit side of each pleat, to ensure pleat stability. The inside periphery of the enclosing frame shall be bonded to the filter pack, thus, eliminating the possibility of air bypass.

HOLDING FRAMES shall be Farr Type 8, factory fabricated of 16 gauge galvanized steel and shall be equipped with gaskets and four spring type positive sealing fasteners. Fasteners shall be capable of being attached or removed without the use of tools.

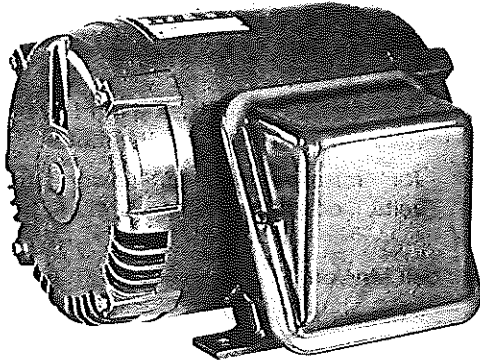
EFFECTIVE PARTICLE SIZE EFFICIENCY



A COMPLETE LIST OF AVAILABLE SIZES IS SHOWN ON REVERSE SIDE

FARR

Installation And Maintenance Instructions Three Phase Squirrel Cage Types SC, SCH, SCT, SCM



Polyphase Squirrel Cage Induction Motors - have the primary stator winding arranged for connection to the power source with a rotor having a squirrel cage type secondary winding.

Maintenance Program

To prolong the life of the motor and minimize service trouble, it is recommended that a program providing for regular, periodic inspection and maintenance of the motor be set up. Such a program should include:

1. Check bearings and lubrication. Relubricate as required in accordance with instructions furnished with the motor.
2. Clean motor thoroughly inside and out.
3. Clean and check connections.
4. Check mounting and alignment. Tighten any mounting bolts, pulley or couplings, etc. which may have worked loose.

Before Starting — Check

Before the motor is started for the first time, check the following items in accordance with the general procedure covered by General Instruction-Sheet 9-110 Page 1.

Mounting	Connections
Alignment	Voltage (if dual voltage)
Power Supply	Rotation
Voltage	Protective Devices
Phase	Lubrication
Frequency	

Service Problems

Gould Century motors are individually tested and inspected before shipment, reducing to a minimum troubles due to failure of the motor. Service problems often result from causes outside the motor, and therefore, the driven apparatus, control equipment, etc. should be carefully checked as the possible source of the trouble. The following descriptions of service problems and suggested remedies will assist in locating and correcting many of the operating difficulties that arise.

I. Motor Fails To Start Or Runs At Incorrect Speed

A. No Power — Check for voltage at motor terminals with test lamp or meter. (Refer to items 1-B and 1-C).

B. Protective Device — Check protective device for proper operation and rating. If protective device is operating correctly, check further to determine reason for functioning. (Overloads, overheat, too frequent startings, power supply, etc.)

C. Connections — Check for proper motor and control connections. Refer to respective manufacturers instructions.

D. Low Voltage — Measure voltage at motor terminals with motor loaded and unloaded. If voltage deviates more than 10% from nameplate rating, performance will be adversely affected. Check with power company; also check circuit capacity.

E. Excessive Load — Check driven equipment for proper operation. Motor overload may be approximately determined by comparing the ampere input to motor during operation with nameplate rating. Check operation of motor with load disconnected. Determine cause of overload before putting motor back in operation.

F. Open Circuited Field — Check by applying power to the winding to be tested through a circuit with a test lamp in it. Refer to connection diagram.

If any winding is open, remove motor from service for repair.

Caution: Do not leave winding connected any longer than required.

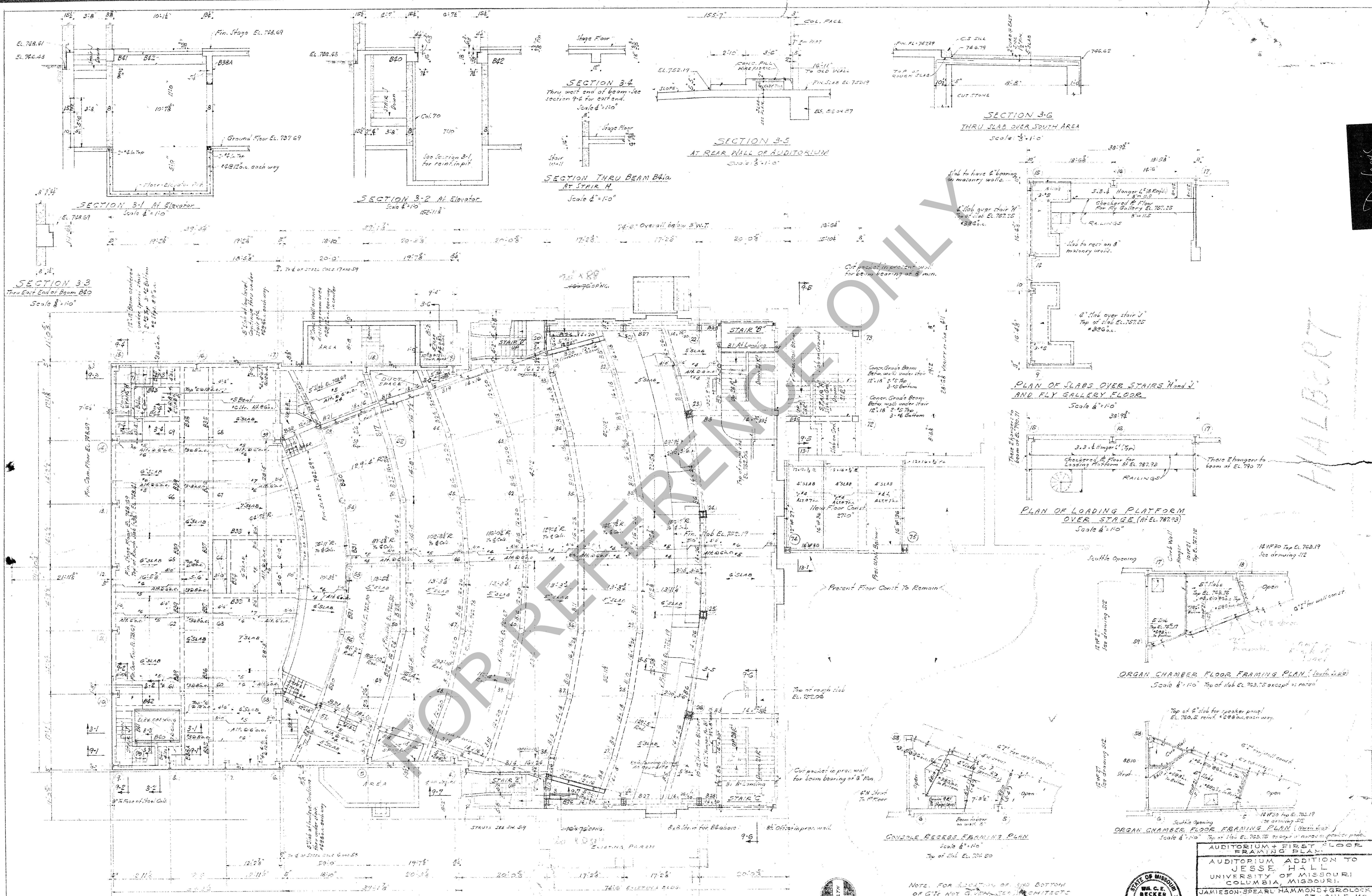
G. Shorted Field — Motor with a shorted field will draw excessive current, overheat and have a pronounced magnetic hum. Remove from service for repair.

Continued

Insist On Service By Gould Century Authorized Service Centers

9 ★ - New Format

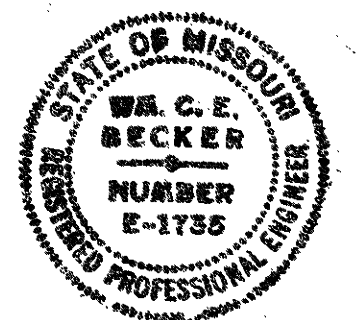
Prices and data Subject to Change Without Notice



FIRST FLOOR FRAMING PLAN
Scale 3/4"=1'-0"

NOTE: PROVIDE 98 NAILS IN FIRST FLOOR SLAB
AIR DEF. BOTTOMS - SEE CEILING LAYOUT DRAWING

NOTE: FOR LOCATION OF END BOTTOM OF G.I. NOT TO SCALE ARCHITECTS DRAWING NO. 53



AUDITORIUM + FIRST FLOOR FRAMING PLAN AUDITORIUM ADDITION TO JESSE HALL UNIVERSITY OF MISSOURI COLUMBIA, MISSOURI JAMESON, SPEAR, HAMMOND & GROLICK ARCHITECTS ST. LOUIS, MO. WM. C. E. BECKER CONSULTING ENGINEER 1018 AMBASSADOR BLDG. ST. LOUIS, MO.	
DATE	REVISIONS
1-25-53	9-7-53
REVISED 9-7-53 COMPLETED 1-25-53	
SHEET S3	

HALBERT

DUBOIS