2 Consultant Requirements: Scope of Work

2.1 Summary Statement

2.1.1 The Maryland Stadium Authority (MSA) is issuing this Request for Proposals ("RFP") to enter into a contract with a highly qualified engineering firm to provide HVAC controls, lighting controls, and sub-metering consulting services at M&T Bank Stadium in Baltimore, Maryland (the "Project"). Included in the project is the generator plant located in Lot C and the chiller plant located in Oriole Park.

2.1.2 MSA intends to make a single award as a result of this RFP, but reserves its right to make multiple contract awards if it deems it to be in its best interest to do so.

2.1.3 An Offeror, either directly or through its subconsultant(s), must be able to provide all services and meet all of the requirements requested in this solicitation. The successful Offeror (the Consultant) shall remain responsible for Contract performance regardless of subconsultant participation in the work.

2.1.4 The following schedule is anticipated for the Project:

Design – July – September 2020
Procurement of Installer – October – December 2020
Submittals/Mobilization – January 2021
Installation – February – July 2021 (chiller plant must be installed in February 2021)

2.2 Intentionally Omitted

2.3 Responsibilities of Consultant

<u>Phase I – Design Development</u> – Review all current systems to capture all current functionalities. Review existing IT infrastructure and recommend upgrades to support the new systems to be installed. In collaboration with MSA, create an owner project requirements that outline MSA's objectives and the project goals.

<u>Phase II – Construction Documents</u> – Provide construction documents for the use in bidding and installation of the project. The consultant shall produce a review set for MSA's approval at 50% and 95% completion. MSA's review comments shall be reviewed with the consultant and incorporated.

<u>Phase III – Construction Administration</u> – The construction administration services shall include but not be limited to: answering of RFIs, reviewing design issues, submittal review/approval, providing bi-weekly field inspections/reports, review of payment applications, review of change orders/requests, punch lists, as built documentation, closeout, etc. It is anticipated MSA will hire one Consultant to install a complete working system.

<u>Design Services – General Requirements</u>

- The consultant will be expected to work closely with MSA and the Baltimore Ravens during all phases of the project.
- The consultant will be expected to hold and conduct bi-weekly stakeholder meetings during the design process. It will be the consultant's responsibility to create agendas and record meeting minutes.
- The consultant will be expected to attend (in person or via phone/video conference) bi-weekly construction progress meetings during the installation.

- MSA reserves the right to add or delete scope in a manner necessary to serve the best interests of MSA.
- All plans created by the consultant shall comply with all Federal, State, and local codes.
- Upon completion of the project the consultant shall submit Maryland PE stamped electronic copy (.pdf and .CAD) of all drawings created for the project to MSA. The drawings shall be updated to reflect the as built conditions noted by the Consultant.
- MSA reserves the right to proceed with all or a partial portion of the scope of work at any point throughout the project.
- All work shall comply with MSA's LEED EBOM certification.
- It is intended MSA will hire a commissioning agent to be involved during design and construction to commission the systems. The consultant shall assist MSA in the development of the commissioning scope of work.
- The building contains various equipment manufactures for the systems. The consultant shall be responsible for ensuring the design of all new control systems work with all equipment manufactures.
- The consultant shall work with MSA's IT should any IT infrastructure updates be required.
- M&T Bank System is supported by a Siemens fire alarm system. The chiller plant is supported by a Simplex fire alarm system. The consultant shall coordinate system functions with the fire alarm system manufactures as required for a fully operation system.

HVAC Controls - Information/Assumptions

- The building contains a Johnson DDC control network with an Andover Continuum overlay.
- The replacement of the controls shall be to the sensor, actuator, and valve level for a completely new DDC control system. The intent is to remove and replace all existing pneumatic and DDC controls.
- All exhaust fans, unit heaters, cabinet heaters shall be added to the building automation system for disable/enable and status monitoring.
- All concession exhaust fans and walk in coolers shall be added to the building automation system for status monitoring.
- The basis of design shall be Schneider Electric Eco Struxure platform integrated with the Warehouse system currently to be installed.

Lighting Controls - Information/Assumptions

- The building contains an existing Microlite system.
- The existing lighting control system shall be replaced and integrated into the building automation system.

Sub-Metering - Information/Assumptions

- The building currently contains an Emon sub metering system.
- The sub metering system shall be replaced with meters that are compatible with MSA's existing Schneider Power logic Monitoring System.
- The existing system shall be expanded as determine by MSA and consultant during the design.
- The basis of design shall be Schneider Electric Struxure Ware platform integrated into MSA's existing Schneider Powerlogic Monitoring System.

Maryland Stadium Authority
The Warehouse at Camden Yards
333 W. Camden Street, Suite 500
Baltimore, MD 21201
410-333-1560
1-877-MDSTADIUM
Fax: 410-333-1888

www.mdstad.com

Voice: 800-201-7165
TTY: 800-735-2258

ADDENDUM No. 1
Engineering Consulting Services
M&T Bank Stadium
MSA Project No. 20-071

Date Issued: May 1, 20120

This Addendum is hereby made a part of the Contract Documents dated April 17, 2020, on the subject work as though originally included therein. The following amendments, additions, and/or corrections shall govern this work. **This form should be acknowledged below and submitted with the Proposals.**

This Addendum incorporates the following items:

1. Pre-Proposal Summary and Attendance Sheet.

2. To register on the Negometrix website, go to:

   https://www.negometrix.com/us/general-terms-conditions-privacy/

   Negometrix Help Desk: 724-888-5294

3. Separately attached drawings in pdf format:
   HVAC
   Electrical One Lines
   Lighting Controls Schedule

4. Questions and Answers.

Issued by:

Maryland Stadium Authority
333 W. Camden Street, Suite 500
Baltimore, MD 21201
Sandra Fox, Procurement Officer

____
Company

____________________________ ____________________________
Acknowledgment (Name and Title) Date

Pre-Proposal Summary

Solicitation:	Engineering Consulting Services M&T Bank Stadium MSA Project No. 20-071
Subject:	Pre-Proposal Meeting Summary on April 24, 2020 at 11:00 a.m.
Proposals due:	No later than 2:00 p.m. (local time) on May 22, 2020
Attendees:	Sandra E. Fox, John Samoryk, Phil Hutson, Kelly Smulovitz, and Theresa Masilek

Sandra Fox opened the meeting with introductions and by stating the instructions for submitting Proposals. All Proposals shall be delivered electronically through MSA's third party e-procurement system (Negometrix). All Offerors must be registered with Negometrix prior to submitting a proposal. Please refer to Attachment J–Negometrix Supplier Guide for instructions on how to register on this e-procurement system. This system will close bidding at the date and time stated in the solicitation. Late, faxed, or emailed proposals will not be accepted. It is the Offerors' responsibility to make sure they have received all appropriate documents prior to the due date.

There is a minimum MBE subcontract participation goal of twenty-nine percent (29%) of the total dollar value of the contract with no sub-goals. The MDOT Certified MBE Utilization and Fair Solicitation Affidavit (Part 2) and MBE Participation Schedule Part 3 (MBE Attachment D-1A) is required to be submitted with the Proposal and must identify the specific MBE(s) proposed for the contract, along with the services to be performed. A prime MBE contractor may receive credit for self-performing work up to 50% of the total goal (in other words 14.5 %). The selected description of work on your MBE Form must correspond with the vendor's certified NAICs code.

MSA is using a third party software (B2GNow) to monitor MBE compliance. An email will be sent to the prime with instructions when online reporting starts. Log onto https://mdstad.diversitycompliance.com and report payments made to the list of subcontractors. The subcontractor will receive an email to confirm payment reported by the prime and that it was received in a timely manner.

Responses to written questions will be provided in addenda and will be posted to MSA website, eMaryland Marketplace Advantage, and Negometrix.

All Offerors must be registered with eMaryland Marketplace Advantage and be in good standing with the State of Maryland before a contract can be awarded.

All questions must be submitted through Negometrix or to Sandra Fox by email at sfox@mdstad.com.

Kelly Smulovitz gave a summary of the scope of work. The project includes design of new HVAC controls, new lighting controls, and a new submetering system for M&T Bank Stadium, the Hamburg Street Generator Plant, and the complex Chiller Plant located at Oriole Park (Add Alternate). Details of the scope are contained in the RFP. Several questions were asked to which the answers are provided below. Existing drawings are being provided here with the intent being for a consultant to have the information needed to provide an accurate and fair proposal. Once a consultant is selected for the job, additional drawings and information will be provided to facilitate the design.

Directory of 20-071 Pre Proposal Conference
20-071 Engineering Consultant Services
M&T Bank Stadium
4/24/2020 at 11:00 a.m.
Via Google Hangout
Meeting ID
meet.google.com/hpv-vecj-iyk Phone Numbers (US)+1 678-813-2290
PIN: 765 600 789#

Catherine Diaz DeWitt, CPSM / Associate
Director of Marketing + Business Development
BKM | Collaboration is at our core.
6300 Blair Hill Lane, Suite 400 | Baltimore, MD 21209 | www.bkma.com
410.323.0600 | 443.921.8725 direct | 443.605.7968 cell | cdewitt@bkma.com

GLY Mendon, PE
BLV Engineering Associates Inc.
8 Spring Glen Ct.
Cockeysville, MD 21030
Contact: 516 417 4462
blvengg2010@gmail.com
We are MDOT certified MBE

Thomas C. Almore IV
Project Manager
CECA, LLC
Email: Talmore@cecallc.com
Phone: 301-967-1719 www.cecallc.com
CECA, LLC, a Prince George's County **based MDOT certified MBE Engineering Firm**
specialized in third party inspections and are one of the primary providers of said service in the State of Maryland

Theo Milford, PE, CEM, CMVP | Director of Operations
Project Interest: Team/Partner/Subcontract
Conquest Solutions LLC
6401 Golden Triangle Drive, Suite 205
Greenbelt, MD 20770
Office: (202) 888-6458 (Ext. 2013)
D-301-957-0160 Fax: (240) 595-6167
Email: tmilford@conquest-solutions.com
www.conquest-solutions.com
SBA 8(a) Certified SDB **MDOT MBE Yes 14-206 – African American Owned**
DUNS: 829600464
CAGE: 5C079 NAICS Codes: 541690, 561210, 541330, 541513, 236220, 541611, 541512

Tom Oliver
Marketing and Business Development Specialist
DM Enterprises
14405 Laurel Pl. Suite 318, Laurel, MD 20707
400 E. Pratt St. Suite 604, Baltimore, MD 21202
Cell: 240-381-9805
MBE engineering and consulting firm.

Leah Schultz, Marketing Director
Gipe Associates, Inc.
CONSULTING ENGINEERS
MECHANICAL / ELECTRICAL / PLUMBING
T-410-822-8688
lschultz@gipe.net

Donald A. Silwick, Marketing Coordinator
HENRY ADAMS, LLC
600 Baltimore Avenue
Suite 400
Baltimore, MD 21204
Baltimore, MD & Washington, DC
P (410) 296-6500, Ext. 442 | F (410) 296-6501
M (443) 955-9995 | www.HENRYADAMS.com
Small Business
marketing@henryadams.com
Silwick@henryadams.com

Taylor Simon, Marketing Coordinator
KCI TECHNOLOGIES INC.
11830 W Market Pl Suite F, Fulton, MD 20759
taylor.simon@kci.com
o: 410.792.8086 Ext.8407 www.kci.com
Adam Rickey, PE, CPD - adam.rickey@kci.com | 443.451.7642
Wayne Martin Jr., PE – wayne.martin@kci.com | 410.891.1809
Timothy Reynolds, PE, CEM, EMP, CxA, LEED AP - timothy.reynolds@kci.com | 443.353.0996
KCI is not a small business or registered MBE/WBE/DBE.

P. Edwin Abbott, Jr., P.E., CCP
President
Ed Abbott: pea@kibart.com
Julia Webster: jbw@kibart.com
901 Dulaney Valley Road, Suite 301
Towson, Md 21204
410.494.1111 410-371-1701 (C) www.Kibart.com

Robert Lutz, PE
Vice President
Lutz Engineering
3324 Hermitage Road
Wilmington, DE 19810
Cell: 302.898.2077
Office: 302.479.9017 x102 Fax #: (302) 479-9018
Email: rlutz@lutz-engr.com
SBR#: SB20-007847
Web: www.lutz-engr.com

Jason Dittrich, Director - Business Development & Marketing
Mueller Associates, Inc.
Consulting Engineers
1306 Concourse Drive, Suite 100
Linthicum, Maryland 21090
T-410.646.4500 (x125) F-410.646.4738
C-410.299.4236 cell
www.muellerassoc.com
Robert Marino, rmarino@muellerassoc.com, President, 410.646.4500
Steven Gillis, sgillis@muellerassoc.com, Vice President, 410.646.4500
Kenneth Rock, krock@muellerassoc.com, Vice President, 410.646.4500
Todd Garing, tgarding@muellerassoc.com, Vice President, 410.646.4500
Joyce McDade, jmccdade@muellerassoc.com, Marketing Coordinator, 410.646.4500
Mueller Associates is a designated **SBE** in the State of Maryland.

Duane R. Ellis, P.E.
Director, Washington D.C. Metro Region
O&S Associates, Inc.
Parking & Restoration Consultants
7406 Alban Station Court, Suite B211
Springfield, Virginia 22150
Main: (202) 400-3533
Direct: (202) 930-0344
www.OandSassociates.com

Dennis Young, Client Relations
RMF Engineering, Inc.
REQUESTED MAILING ADDRESS
410-576-0505
dennis.young@rmf.com
www.rmf.com
STEVE DEVON, PE
Principal
RMF Engineering, Inc.
REQUESTED MAILING ADDRESS
steve.devon@rmf.com
P: 443.341.5253 | M: 410.218.6451
www.rmf.com

Tony DiCola

Setty & Associates
REQUESTED MAILING ADDRESS
T-703-268-3761 F-703-691-8084
tonyd@setty.com
MBE Status= **Setty is MDOT certified MBE with Asian classification**

Soma Ramesh
Tek Solutions
REQUESTED MAILING ADDRESS
513-227-2375

soma.ramesh@teksolutionsgov.com
We would like to be included in the **potential supplier** list so that we can participate

Questions and Answer

1. Do you have the existing system as built drawings? Without the site visit if you provide us before the proposal it would be useful.

   Attached to this addendum are a combination of existing systems drawings. This is not meant to be a comprehensive set of drawings, but rather to give a sense of quantities and types of equipment in the building. Modifications have been made over time. Included drawings are:

   a. HVAC Drawings - This includes the drawings from the original 1998 construction as well as schedules from major construction projects over the last three years. Equipment has been added over the years for specialty projects that is not identified on these drawings. That added equipment is minimal in quantity compared to what is shown here. Please note that some of the equipment schedules from the original drawings indicate TYP equipment so all drawings in this set should be reviewed to obtain accurate quantities. Assume double the number or cabinet unit heaters as shown on the drawings to account for one added in each restroom that is not indicated on the drawings.

   b. Electrical One Lines – This includes the riser diagrams from the original 1998 construction. This will help to identify the quantity of panels and feeds in the building.

   c. Lighting Controls Schedule - This drawing shows the thirty-three (33) lighting control panels throughout the building. The panels are located in the electrical rooms in each quad (IT or Electrical Bart?). Each current panel can accommodate up to 48 circuits. Not all are full.

   Site visits can be accommodated if anyone needs them but will need to be coordinated through Sandra Fox in advance.

2. Do you have CAD drawings of these drawings or Architectural background?

   We do not have CAD files of these drawings. We do have base building architectural CAD backgrounds.

3. Good Standing: Since the tax filing tax or any tax owed to the government is to be paid by 6/15/2020, due to virus, will the good standing be affected by this since the due date for this is before that dead line.

   The Offeror should be in good standing with the State of Maryland at the time of award. If there are extenuating circumstances caused by the pandemic that prevent the Offeror from being in good standing, that will be addressed on a case by case basis.

4. If you are not providing existing system drawings, can you list the controls elements to be replaced or a current point list? Also the current sequence of operation of the existing system is available?

   Relevant drawings are attached to this addendum. If additional information is required to provide an accurate proposal, indicate what specific information is needed and we will do our best to provide.

   Additional information of current sequences of operations and points lists can be pulled from the existing BAS during the time of design.

   We might want to provide point lists if we can

5. Will there be any commissioning agent during the construction? Is it part of this RFP scope?

   There will be a commissioning agent who will be procured through a separate RFP. The selected design consultant will be requested to assist with this RFP if needed.

6. Is construction Management part of this RFP?

   Refer to Section 2.3 - Phase III – Construction Administration in the RFP for required services during construction.

7. Since you have many systems, do you have any preference to a manufacturer like Siemens or Johnsons etc?

   Refer to Section 2.3 of the RFP.

8. No HVAC equipment to be replaced, even if it is an old equipment beyond its life? Alternatively what is the average age of different equipment we are dealing with?

   No HVAC equipment is scheduled to be replaced at this time. The majority of the equipment is original to the building.

9. Are we required to meet the MBE goal or to use MBEs?

   There is a MBE subcontracting goal of 29% with no subgoals. Please carefully review the solicitation and this Addendum No. 1 for detailed instructions on MBE compliance requirements.

10. Is there a deadline for questions?

    There is no hard deadline for receipt of questions. However, be advised that questions received too close to the deadline will not be answered if there is not sufficient time to provide timely responses to all offerors. It is strongly recommended that questions be submitted as soon as possible, and not later than a week prior to the closing date, in order to provide sufficient time for a response.

11. Is there a budget listed?

    No.

12. If we have large Building experience but not stadium experience, will that qualify?

    <u>Please see Section 1 of the RFP, Minimum Qualifications. The proposals received from Offerors that meet the minimum qualifications will be evaluated in accordance with Section 6 of the RFP.</u>

13. If the existing conduit is useable is it to be discarded or reused?

    Existing conduit will be re-used to the extent possible.

14. Please elaborate on the coordination with the fire alarm system.

    M&T and the Generator Plant have a Siemens XLS fire alarm system. The chiller plant has a Simplex fire alarm system. Neither system is being replaced. The consultant shall coordinate system functions with the fire alarm system manufactures as required for a fully operation system.

15. Will base floor plans be available in .DWG and .PDF format that reasonably document current conditions for use under this project? For MSA to receive pricing from proposers, base floor plans will need to be made available, to allow for MSA to conduct an apples-to-apples comparison of proposers' pricing.

    a. Will plans show room numbering, structural grid, and other labeling conventions?

       Relevant drawings are attached to this addendum. If additional information is required to provide an accurate proposal, indicate what specific information is needed and we will do our best to provide. More detailed information is available and will be provided to the selected consultant during the design process.

    b. Will plans include equipment locations for all existing equipment currently served through the DDC system?

       Relevant drawings are attached to this addendum. If additional information is required to provide an accurate proposal, indicate what specific information is needed and we will do our best to provide.

    c. Will plans include equipment locations for all existing equipment to be added to the new DDC system?

       Plans as well as design sessions with MSA will give the consultant all the information needed as to what equipment needs to be included.

    d. Will plans include all existing DDC controller locations?

       No.

e. Will plans include all existing lighting control panel and control station locations?

Relevant drawings are attached to this addendum. If additional information is required to provide an accurate proposal, indicate what specific information is needed and we will do our best to provide.

f. Will plans include all existing submeter locations?

This information is only available as a list pulled from the existing system. The included one-line drawings give panel quantities. There are approximately 130 meters.

16. Will current network riser diagrams, controller layouts, system schematics, the sequence of operations, valve schedules, damper schedules, input/output list, and other DDC data be provided in PDF format or another electronic format for evaluating the scope of services and developing a fee proposal for this project?

    Relevant drawings are attached to this addendum. If additional information is required to provide an accurate proposal, indicate what specific information is needed and we will do our best to provide.

    During the design process, a points list and sequence of operation for each piece of equipment can be pulled from the BAS.

17. Are the floor-plan locations of existing sensors, dampers, valves, and other field devices required to be shown on the construction documents, or can their general location be shown in schematic form only?

    Plans should be as specific as possible.

18. Will the current sequence of operations for the systems controlled through the existing DDC system be generally retained as-is for integration into the new DDC system?

    Designer shall work with MSA to come up with the optional sequence of operation for all equipment.

19. Do any prior system optimization studies exist for work not yet integrated into the existing DDC system? If so, please share it for reference.

    No.

20. Will any new optimization strategies be integrated into the scope of work for this project?

    Consultant shall work with MSA to determine best approach to both be cost effective but work for our operations.

21. Will any life cycle cost analysis or energy modeling be required under this scope of work?

    No.

22. Will existing naming conventions for equipment, sensors, valves, dampers, and other field devices be retained as-is?

    For the majority of equipment – yes. There are some that will change to make it easier for maintenance staff.

23. Will any <u>additional</u> sensors, dampers, valves, airflow measuring stations, or other components be required for any existing equipment currently connected to the DDC system, either for optimization, compliance with current code requirements, or other requirements?

    That is not known at this time.

24. Will scope of work associated with dampers be limited to their actuators, or will any dampers need to be replaced, repaired, or upgraded with new seals or other?

    Scope of this contract is just to replace actuators.

25. Is it the intent to remove all pneumatic controls and replace them with new electric/electronic type devices. If so, will removal work also include the associated air compressors, dryers, storage tanks, and tubing?

    Yes. Demo will be included to the extent that makes sense. For example – we will not tear apart a whole ceiling to remove one run of tubing, but tanks sitting on the floor in a mechanical room will be removed.

26. Will schedules of existing lighting control panels be made available, indicating lighting fixture types and load per circuit?

    A schedule for each of the panels is available and will be provided during design. This information however does not include light fixture types and load per circuit. It indicates which zone of lights are on a given circuit.

27. Did the 2019 installation of 416 LED fixtures include new controls as well? If so, *is this system excluded from the scope of the lighting control replacement?*

    The sports lighting shall be included in the lighting control replacement if compatible.

28. Which utilities are being submetered?

    Domestic Water, Chilled Water, Heating Water, Steam, Electric, and Gas are all currently being metered. With the exception of electric – these meters are already on the Schneider system and the meters were replaced in 2017. The scope of this project is primarily to replace the older electrical meters with new meters and add them to the existing Schneider system. Electrical meters are down to the panel level. MSA might decide through assistance from the designer that additional meters need to be added on other utilities as well.

29. When is a decision expected to be made? (helps with our resource planning) RFP mentions July start dates.

    The decision is expected to be made the first week of July.

30. Can you elaborate on the mandatory licensing requirements of the engineer.

    All licensing requirements are outlined in the RFP.

31. Is the scope of work for till Supplier identification or is till the final installation & commissioning?

    Refer to Section 2.3 for consultant requirements during each phase of the project – including the construction phase.

32. How many number of engineering consultant are needed for this project or do you expect us to estimate?

    Each proposal submitted shall include a team needed to complete the full scope. MSA will select one submitted team.

33. Do we need a licensed lighting consultant as part of team (LC)?

    No.

34. Are we just replacing in-kind lighting controls or are modifications to be made that will include re-circuiting or bringing facility up to present code?

    Intent is to replace in kind with newer technology. If code issues come up we will evaluate when they come up.

35. Need additional electrical metering points to be monitored and will this require re-circuiting or modifications to the existing distribution system?

    Additional metering points might be added. They will not require re-circuiting or modifications to the existing distribution system.

36. Are we replacing in-kind the HVAC controls and associated sequences or will upgrades be required?

    Consultant will work with MSA to evaluate current sequences and improve if and where make sense.

37. Is there a contact name from Schneider Electric we can touch base with to understand what level of support we can expect from them?

    MSA does not have a contact at Schneider to provide.

38. Will the MSA be hiring a construction manager for the hvac controls, lighting controls, and submetering systems project separately?

It will be the intent of MSA to hire one controls contractor to replace the entire system.

39. Will the construction for the project be phased? If so, how many phases?

No.

40. Are subconsultants required to attend all design and construction meetings?

The lead project manager of the design should attend all meetings and be able to answer all questions. Key personnel shall accompany the lead project manager as deemed appropriate by the lead consultant.

41. Is the MSA requiring estimates at each design submissions?

No.

42. Can the MSA define the number of submissions and schedule for the project?

Refer to Section 2.0 of the RFP.

43. The RFP references expansion of the sub-metering system. Is this in reference to the expansion of the existing Schneider system to replace the existing E-Mon meters, or are there also new meters desired? Please provide a list of existing E-Mon meters to be replaced and any new meters to be added to the system.

All E-Mon meters will be replaced with meters that are compatible with the Schneider system. See question 35.

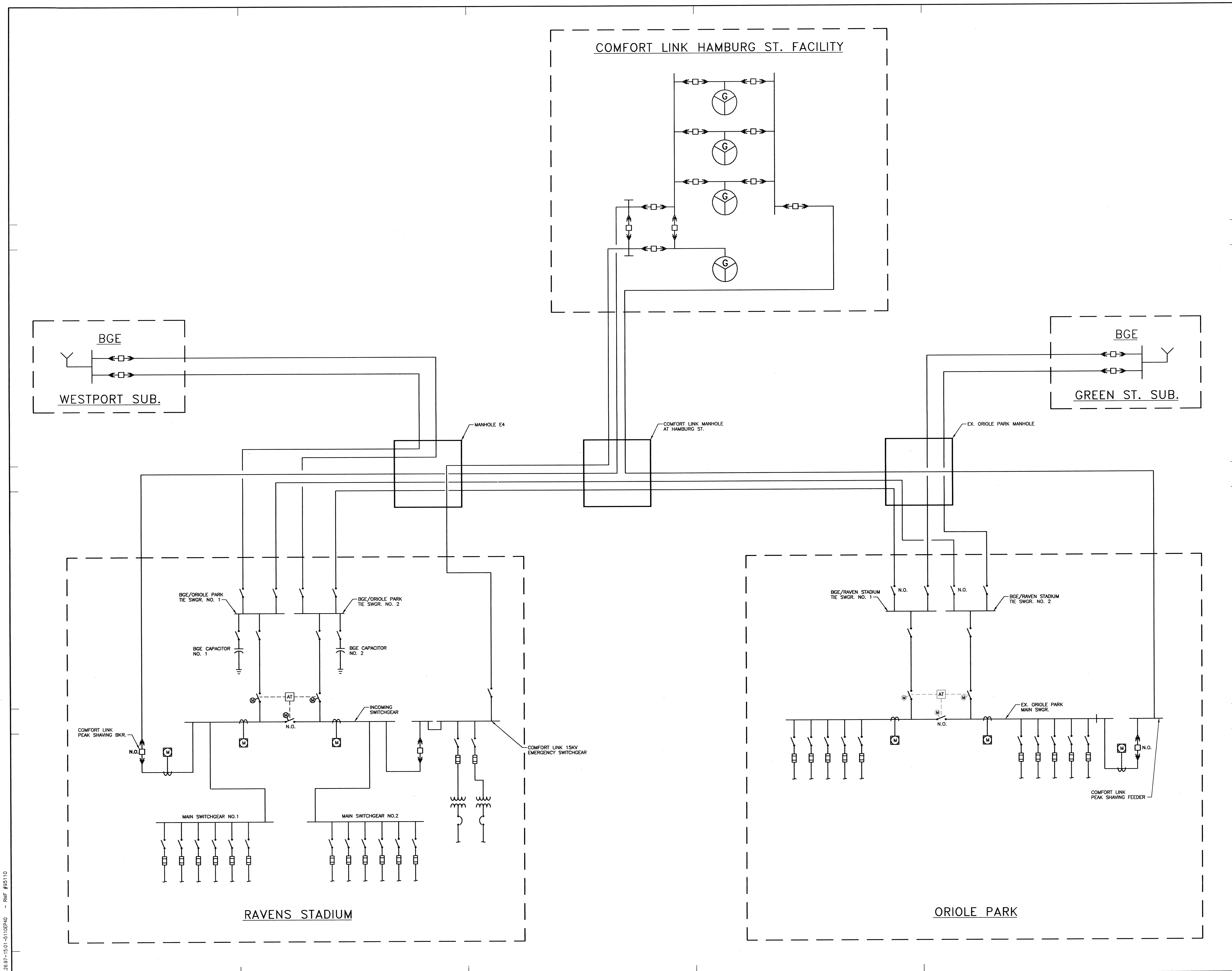
44. The RFP references replacement of the existing lighting control system. Are there areas of the facility not currently under centralized lighting control that are under consideration for addition to the new lighting control system?

If compatible with the new lighting control replacement system, the sports lighting, façade lighting, upper seating bowl up lighting, and club level diming system shall be included.

45. Can you please confirm the Financial Proposal Form? The instructions are provided on page 36 of the RFP and a form is reference but I don't see a form attached to the RFP document.

The Financial Proposal is listed as a separate attachment (Attachment B).

THE END



SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

CIVIL ENGINEER
RUMMEL, KLEPPER & KAHL
BALTIMORE, MARYLAND

AUDIO/VIDEO CONSULTANT
WRIGHTSON, JOHNSON, HADDON & WILLIAMS
DALLAS, TEXAS

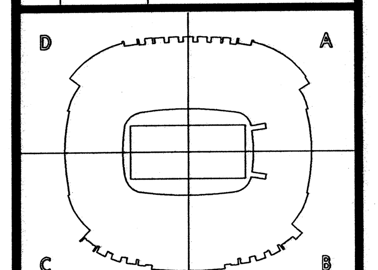
INTERIOR ARCHITECTURE CONSULTANT
CHO, WILKS & BENN
BALTIMORE, MARYLAND

BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: DSS
REVIEWED BY: PMP
ISSUED: 2-28-97

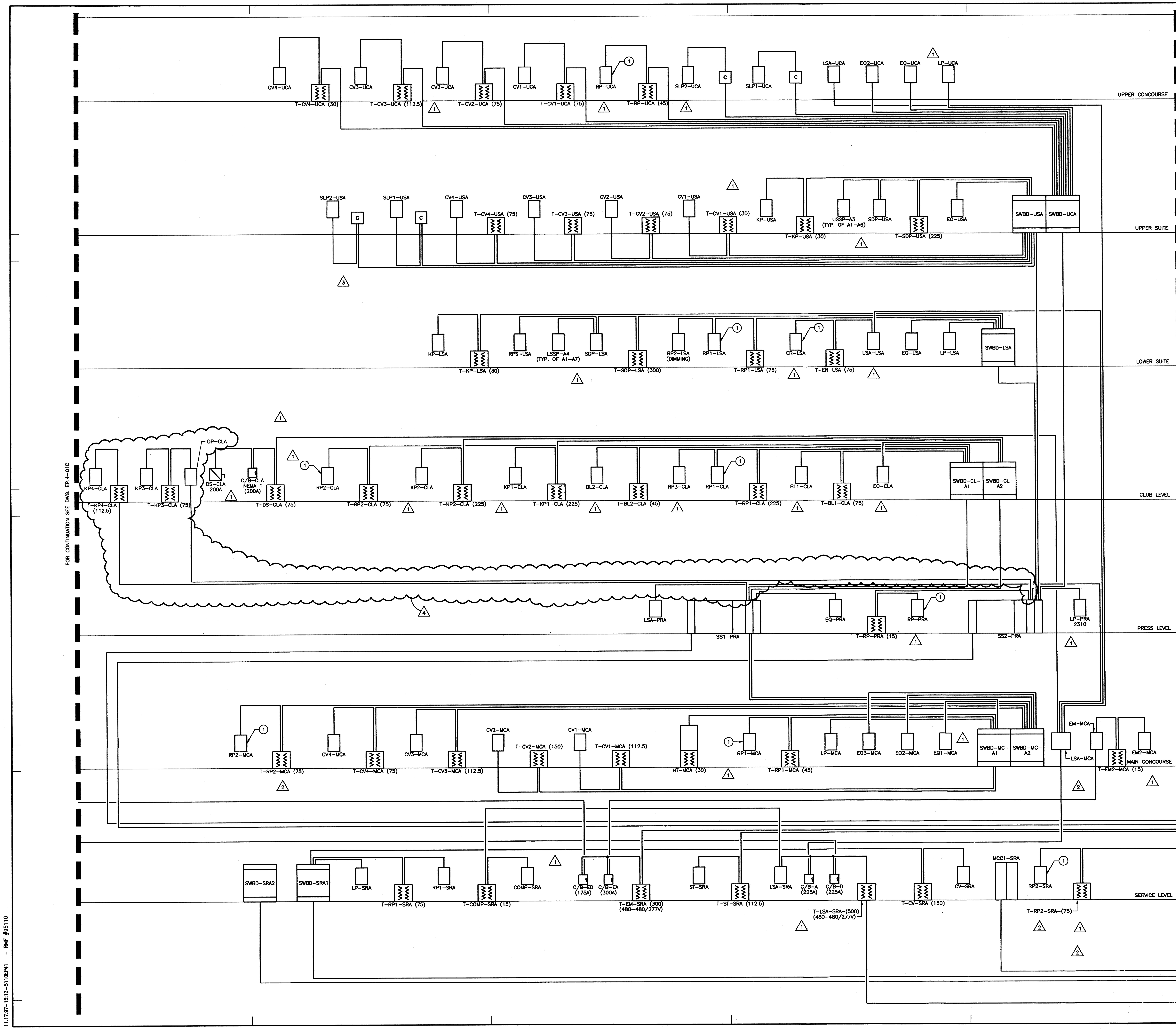
SHEET TITLE
SINGLE LINE DIAGRAM

CATEGORY - SUB-CATEGORY - SHEET
EP.4-00

04.26.97-15:01-5110EP40 - RMF #95110

DRAWING NOTES:

1 PROVIDE ISOLATED GROUND IN PANEL. REFER TO DWG EP.4-03 FOR DETAILS.



HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

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BLISS & NITRAY, INC.
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PACKAGE
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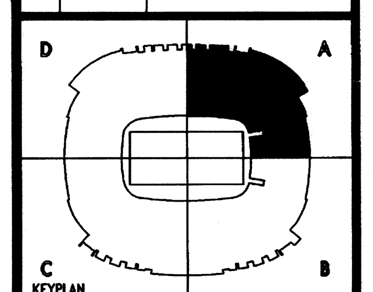
REVISIONS

NO.	DATE	DESCRIPTION
1	3-21-97	BULLETIN #37
2	4-28-97	BULLETIN #44
3	10-03-97	NFL #242
4	11-14-97	BULLETIN #83



KEYPLAN

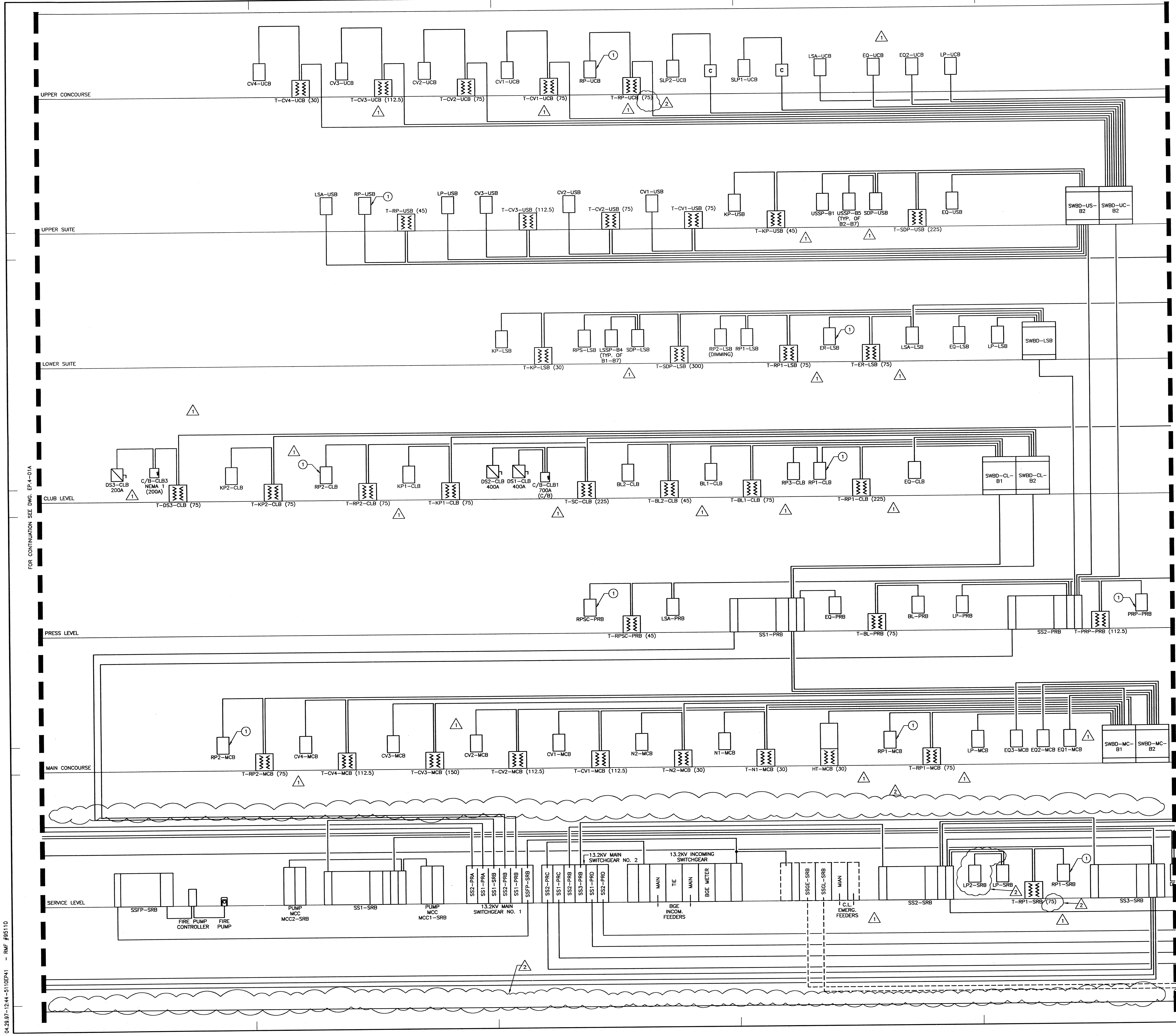
PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JJS
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
RISER DIAGRAM QUADRANT A

CATEGORY - SUB-CATEGORY - SHEET
EP.4-01A

DRAWING NOTES:

1. PROVIDE ISOLATED GROUND IN PANEL. REFER TO DWG EP.4-03 FOR DETAILS.



04.29.97-12:44-5110EP41 - RMF #95110

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

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NO.	DATE	DESCRIPTION
1	3-21-97	BULLETIN #37
2	4-28-97	BULLETIN #44

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: JJS	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE

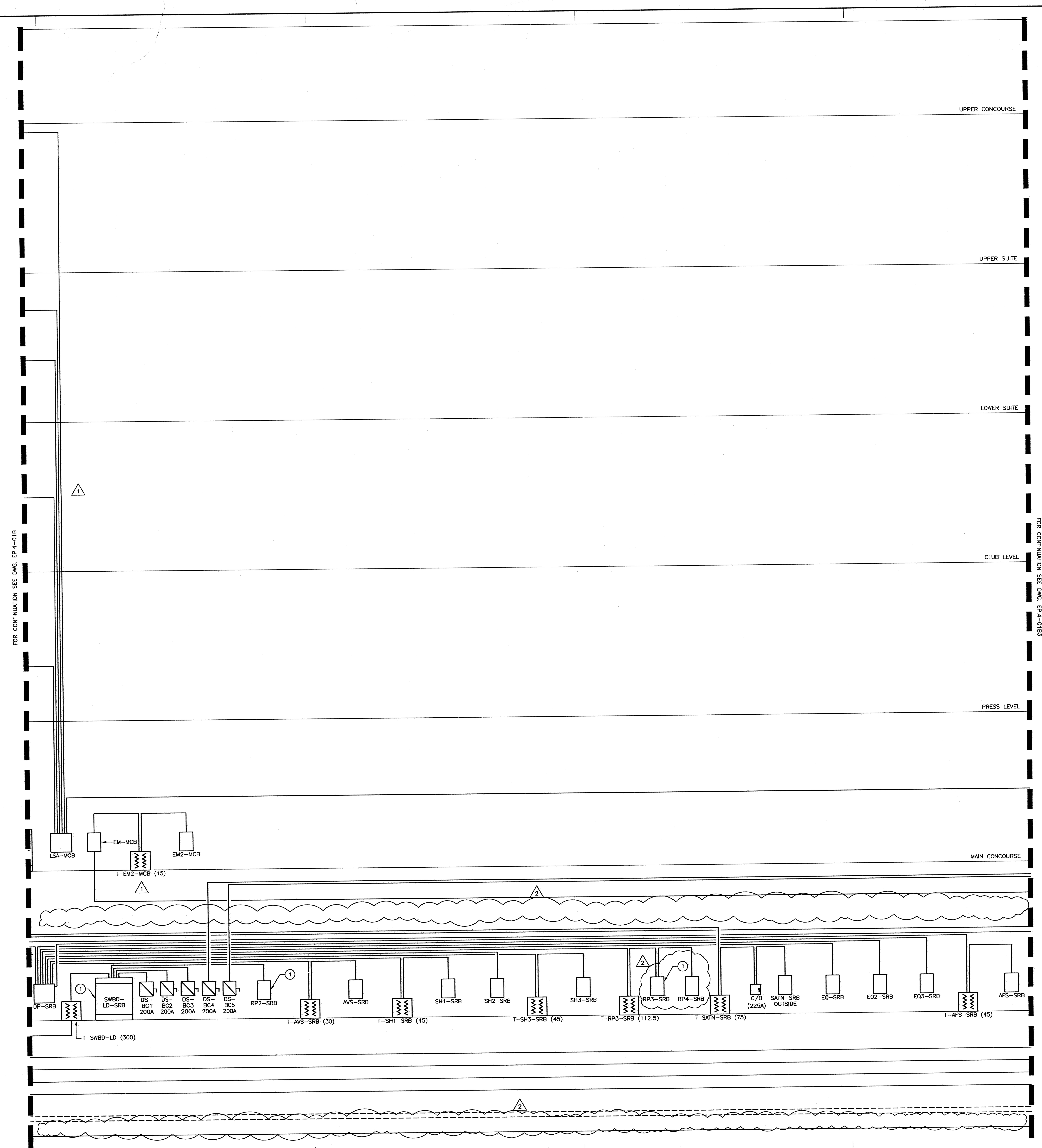
RISER DIAGRAM QUADRANT B

CATEGORY - SUB-CATEGORY - SHEET

EP.4-01B

DRAWING NOTES:

(1) PROVIDE ISOLATED GROUND IN PANEL. REFER TO DWG EP.4-03 FOR DETAILS.



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Kansas City, Missouri 64105

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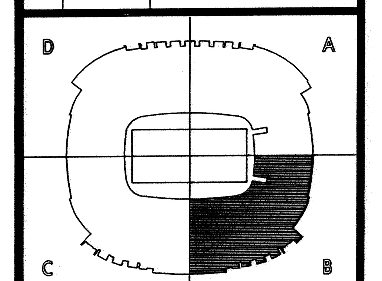
REVISIONS

NO.	DATE	DESCRIPTION
1	3-21-97	BULLETIN #37
2	4-28-97	BULLETIN #44



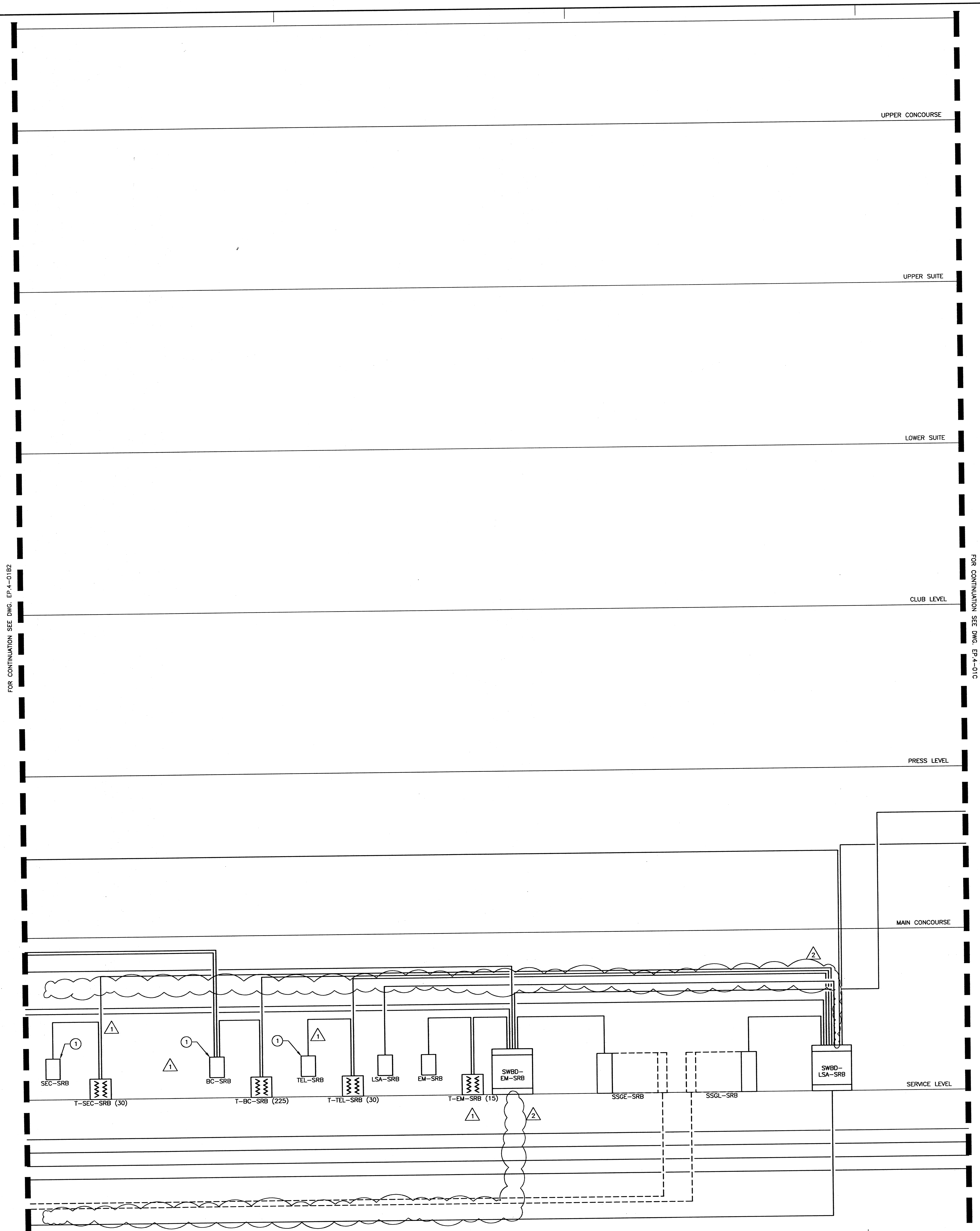
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JJS
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
RISER DIAGRAM QUADRANT B

CATEGORY - SUB-CATEGORY - SHEET
EP.4-01B2

04.25.97-11:07-5110EP41 - RMF #95110



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Kansas City, Missouri 64105

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MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
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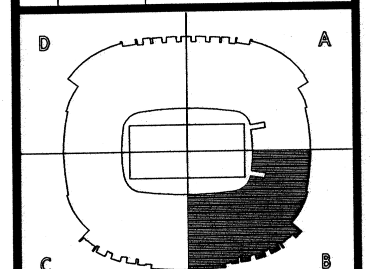
REVISIONS

NO.	DATE	DESCRIPTION
1	3-21-97	BULLETIN #37
2	4-28-97	BULLETIN #44

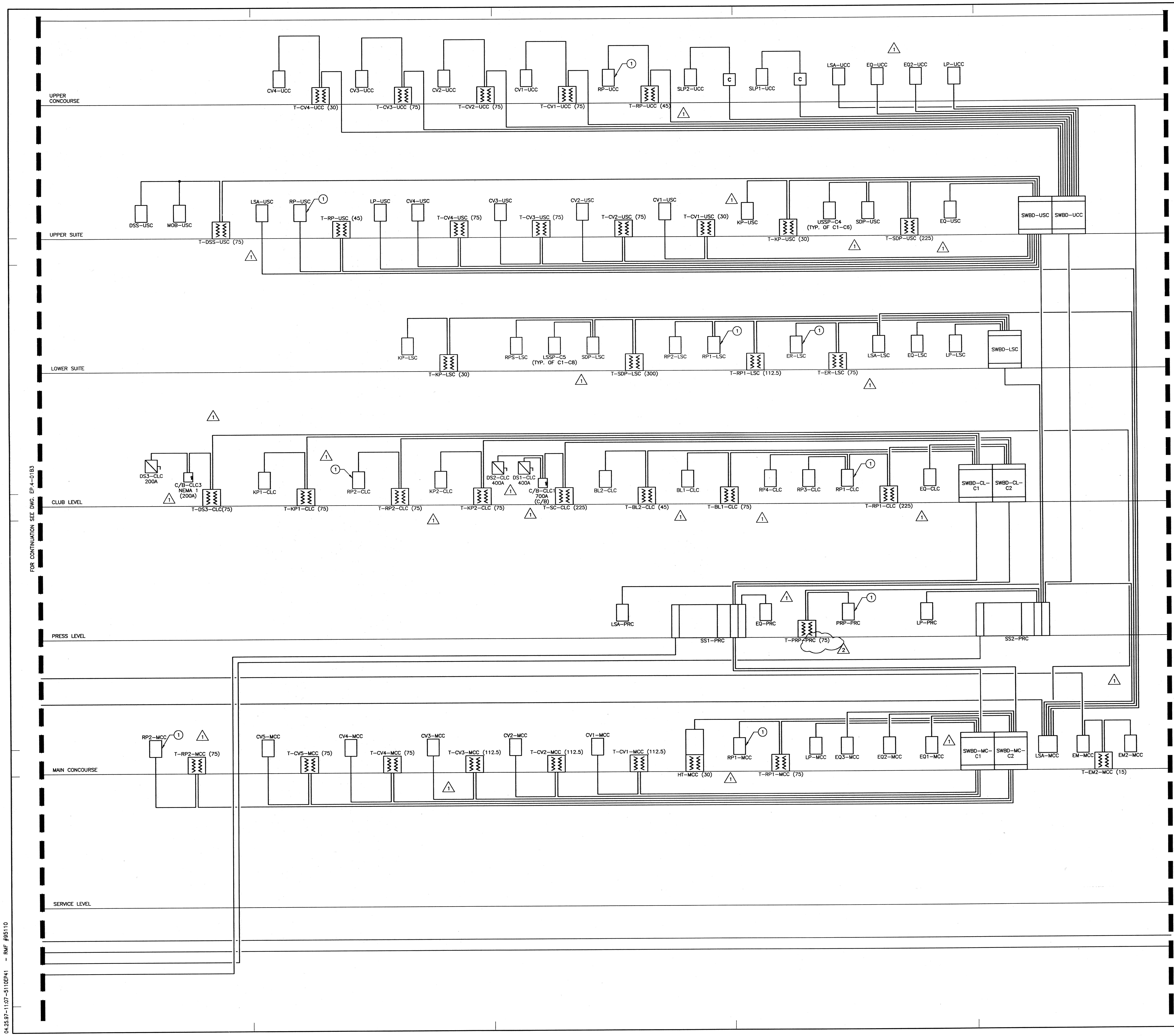


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JJS
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
RISER DIAGRAM
QUADRANT B

CATEGORY - SUB-CATEGORY - SHEET
EP.4-01B3



04.25.97-11:07-5110EP41 - RMF #95110

DRAWING NOTES:
1. PROVIDE ISOLATED GROUND IN PANEL. REFER TO DWG EP.4-03 FOR DETAILS.

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

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ROSS MURPHY FINKELSTIEN, INC.
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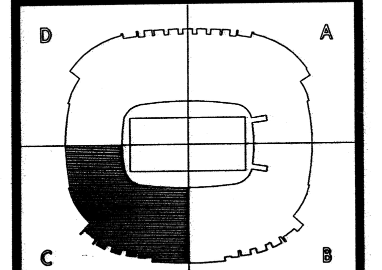
REVISIONS

NO.	DATE	DESCRIPTION
1	3-21-97	BULLETIN #37
2	4-28-97	BULLETIN #44

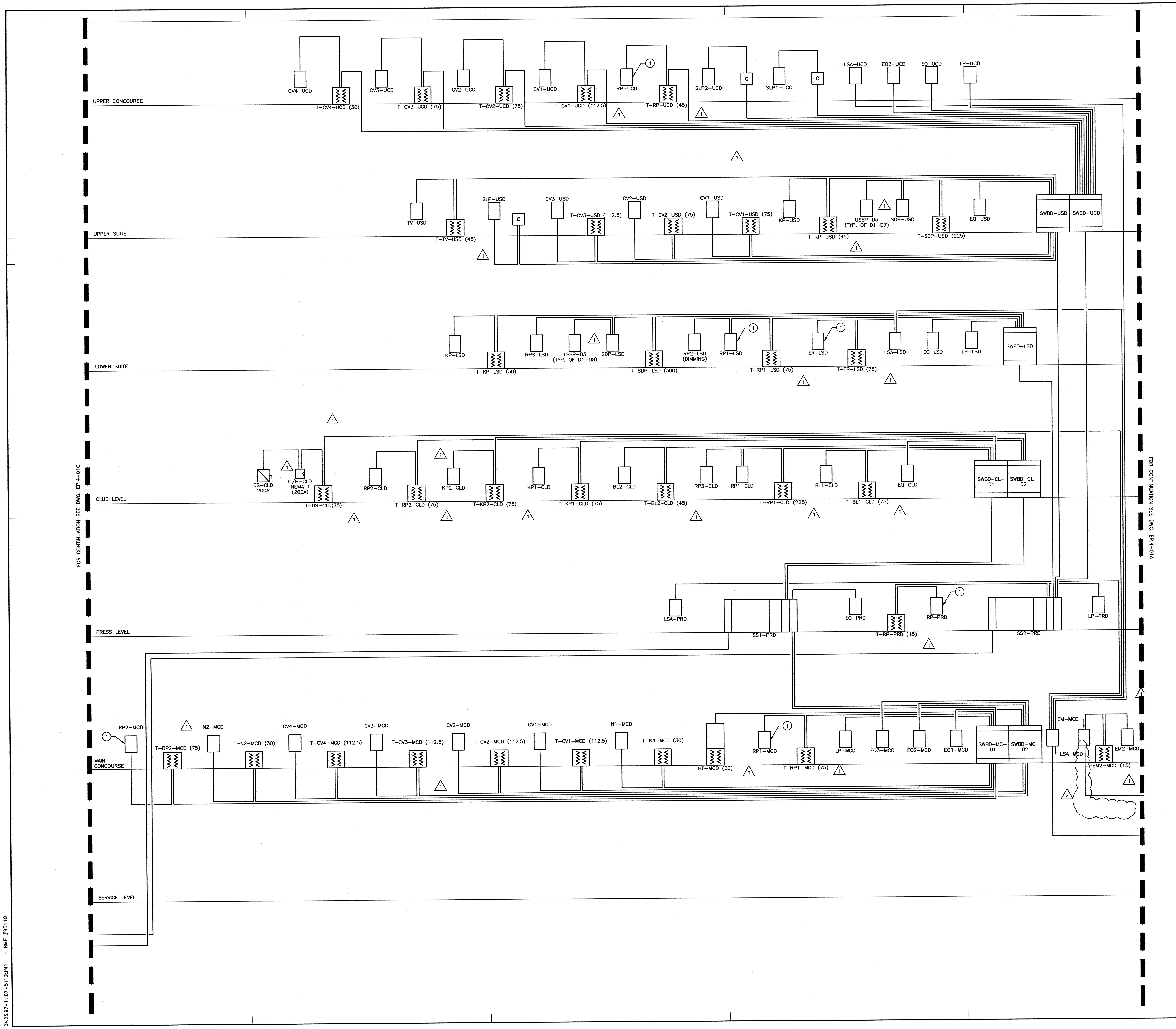


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JJS
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
RISER DIAGRAM QUADRANT C

CATEGORY - SUB-CATEGORY - SHEET
EP.4-01C



DRAWING NOTES:

1. PROVIDE ISOLATED GROUND IN PANEL. REFER TO DWG EP.4–03 FOR DETAILS.

04.25.97–11:07–5110EP41 – RMF #95110

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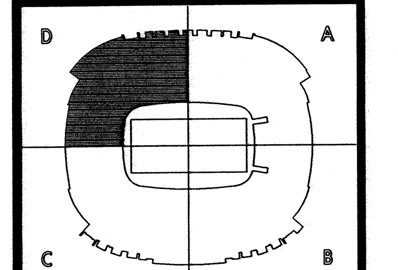
REVISIONS

NO.	DATE	DESCRIPTION
1	3-21-97	BULLETIN #37
2	4-28-97	BULLETIN #44



KEYPLAN

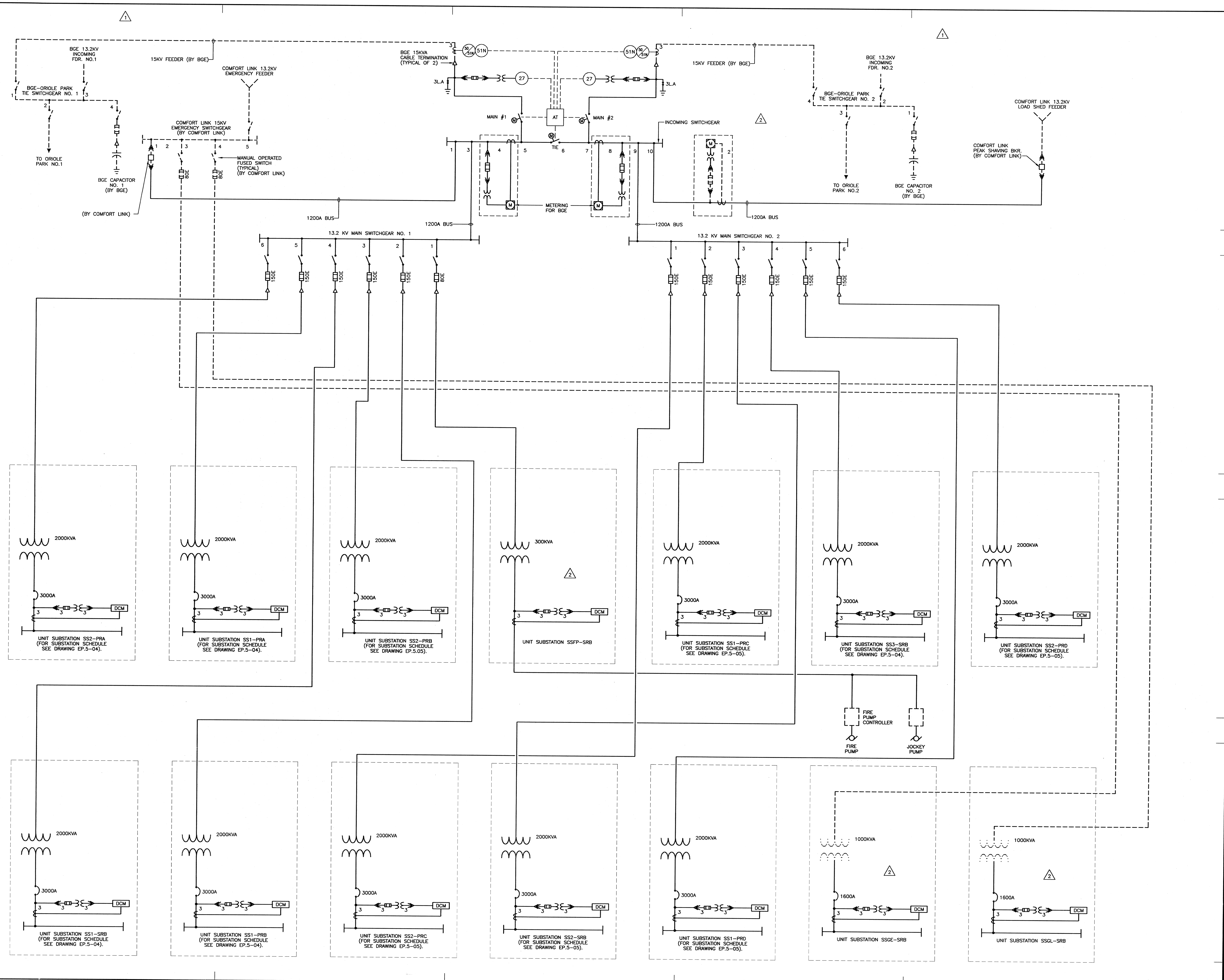
PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: JJS	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE

RISER DIAGRAM QUADRANT D

CATEGORY – SUB-CATEGORY – SHEET

EP.4–01D



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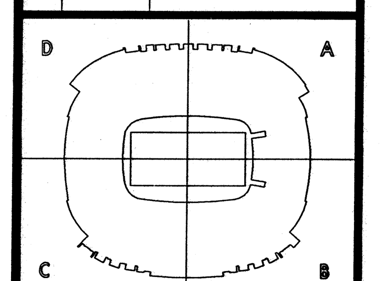
REVISIONS

NO.	DATE	DESCRIPTION
1	2-28-97	FINAL PACKAGE
2	3-21-97	BULLETIN #37
	4-28-97	BULLETIN #44



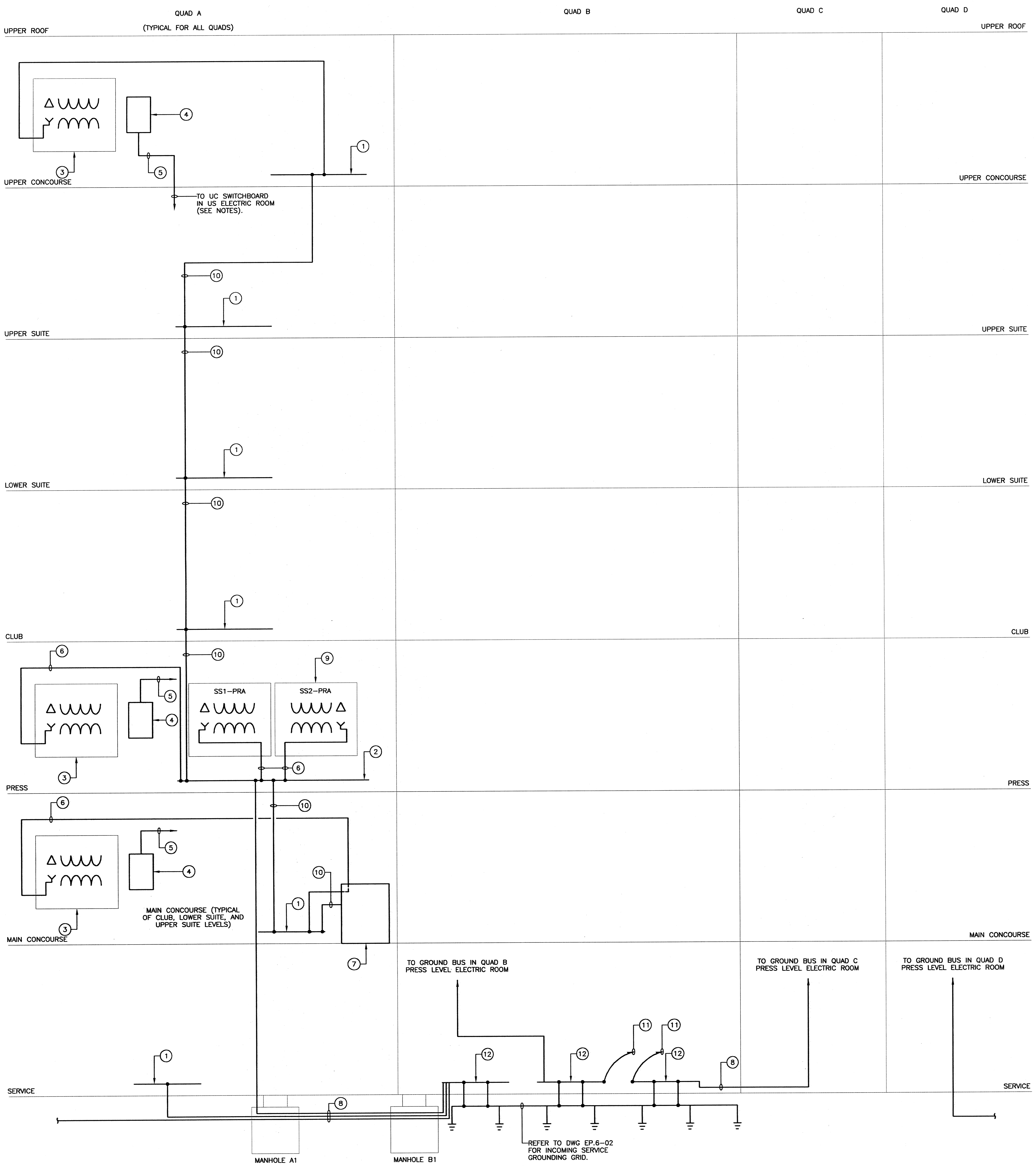
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: DSS
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
SINGLE LINE DIAGRAM

CATEGORY - SUB-CATEGORY - SHEET
EP.4-02

04.26.97-15:02-5110EP42 - RMF #95110

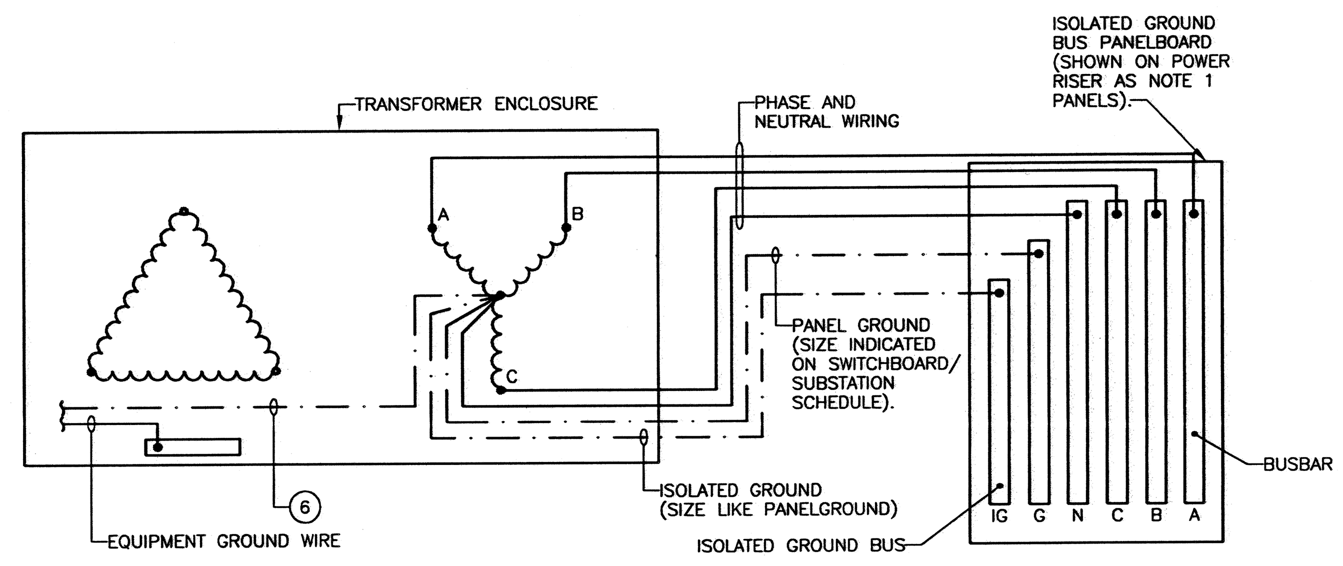


GENERAL NOTES:

1. THE FOLLOWING IS A REPRESENTATION IF THE BUILDING GROUND SUBSTITUTE FOR STEEL STRUCTURE.

DRAWING NOTES:

1. 4' COPPER GROUND BUS BAR (4" x 1/4" CROSS SECTION).
2. 2-4' COPPER GROUND BUS BARS (4" x 1/4" CROSS SECTION). CONNECT TO EACH OTHER WITH #500MCM BCSD GROUND WIRE.
3. TYPICAL 480V PRIMARY DRY TYPE TRANSFORMER.
4. TYPICAL 480V PANEL (OR 208V PANEL FED FROM 208V SWITCHBOARD).
5. GROUND TO SWITCHBOARD/SUBSTATION GROUND BUS. REFER TO SWITCHBOARD/SUBSTATION SCHEDULE FOR GROUND WIRE SIZE.
6. IN ADDITION TO EQUIPMENT GROUND WIRE SCHEDULED IN SWITCHBOARD/ SUBSTATION SCHEDULE, PROVIDE GROUND WIRE FROM SECONDARY OF TRANSFORMER TO GROUND BUS BAR. SIZE OF GROUNDING ELECTRODE CONDUCTOR SHALL BE IN ACCORDANCE WITH NEC TABLE 250-94. THE TRANSFORMER SECONDARY WORE SIZE SHALL BE USED AS THE "SIZE OF LARGEST SERVICE-ENTRANCE CONDUCTOR". REFER TO DWG EP.5-01 FOR TRANSFORMER SCHEDULE.
7. TYPICAL SWITCHBOARD IN QUAD ELECTRIC ROOM.
8. #500MCM BCSD COPPER GROUND WIRE (REFER TO DWG EP.6-01 FOR ROUTING).
9. TYPICAL SUBSTATION.
10. #4/0 BCSD COPPER GROUND WIRE.
11. #4/0 BCSD COPPER GROUND WIRE TO NEAREST COLD WATER PIPING.
12. 8' COPPER GROUND BUS BARS (4" x 1/4" CROSS SECTION).



ISOLATED GROUND BUS PANELBOARD DETAIL

SCALE: NONE

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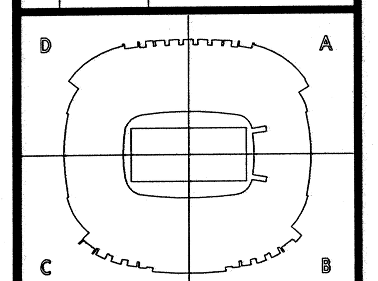
NO.	DATE	DESCRIPTION
	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: DSS	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
GROUNDING SYSTEM RISER DIAGRAM

CATEGORY - SUB-CATEGORY - SHEET
EP.4-03

04.26.97-15:03-5110EP43 - RMF #95110

FAN SCHEDULE

CODE	MANUFACTURER/ MODEL NO.	SERVICE	LOCATION	WEIGHT LBS	CFM	DRIVE	MOTOR TYPE	MOTOR RPM	ESP ("WC)	ELECTRICAL DATA HP	BHP	VOLT	PH	HZ	FLA	DISC.	FUSE	FEEDER	MTG	CONTROL	REMARKS
TX-2	GREENHECK / GB-071	TOILET EXHAUST	CORNER CLUB ROOF QUAD A	51	100	BELT	ODP	1725	0.5	1/6	0.05	115	1	60	4.4	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	2	II	-
TX-3	GREENHECK / GB-071	TOILET EXHAUST	CORNER CLUB ROOF QUAD B	51	100	BELT	ODP	1725	0.5	1/6	0.05	115	1	60	4.4	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	2	II	-
TX-4	GREENHECK / GB-071	TOILET EXHAUST	CORNER CLUB ROOF QUAD C	51	100	BELT	ODP	1725	0.5	1/6	0.05	115	1	60	4.4	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	2	II	-
TX-5	GREENHECK / GB-071	TOILET EXHAUST	CORNER CLUB ROOF QUAD D	51	100	BELT	ODP	1725	0.5	1/6	0.05	115	1	60	4.4	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	2	II	-
GX-1	GREENHECK / CSP-A110	GENERAL EXHAUST	ELEV REMOTE CONTROL QUAD B	16	100	DIRECT	ODP	950	0.25	0.03	0.03	115	1	60	0.62	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	1	III	-
GX-2	GREENHECK / CSP-A110	GENERAL EXHAUST	ELEV REMOTE CONTROL QUAD D	16	100	DIRECT	ODP	950	0.25	0.03	0.03	115	1	60	0.62	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	1	III	-
GX-3	GREENHECK / BSQ-080	GENERAL EXHAUST	TELE/DATA QUAD B	80	350	BELT	ODP	1140	0.25	1/4	0.09	115	1	60	5.8	THERMAL OVERLOAD		(2#12,#12G) 3/4"C	1	III	

1
2

GENERAL NOTES
1. DRIVE TYPE: D=DIRECT-PROVIDE RHEOSTAT SPEED CONTROLLER IN FAN HOUSING UNLESS OTHERWISE NOTED.
B=BELT-PROVIDE ADJUSTABLE SHEAVE UNLESS OTHERWISE NOTED.
VFD=VARIABLE FREQUENCY DRIVE.
2. ALL CURBS SHALL BE FACTORY MADE, 14 INCH HIGH INSULATED UNLESS OTHERWISE NOTED.
3. PROVIDE MAGNETIC STARTER WITH AUXILARY CONTACTS AND HOA SWITCH ON ALL THREE PHASE UNITS EXCEPT WHEN SERVED FROM MOTOR CONTROL CENTER.
4. PROVIDE PREMIUM EFFICIENCY MOTORS. PER NEMA STANDARD MG1-2003, TABLED 12-12, AND 12-13.
5. PROVIDE FLEXIBLE CONNECTIONS AT DUCT INLET AND OUTLET.
6. ALL EXTERIOR DISCONNECTS SWITCHES SHALL BE NEMA 4X TYPE.

MOUNTING (MTG)
1. INSTALL FAN WITH HANGING VIBRATION ISOLATORS.
2. PROVIDE WITH FACTORY MANUFACTURED ROOF CURB SUITABLE FOR ROOFING SYSTEM BEING USED. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONTROL (CTRL)
I. INTERLOCK WITH DISHWASHER OPERATION.
II. RUN CONTINUOUSLY, CONTROL VIA DDC SYSTEM.
III. CONTROL VIA WALL SENSOR - ENERGIZE AT 85F (ADJUSTABLE).

REMARK NOTES
A. PROVIDE SPEED CONTROL SWITCH.
B. STAINLESS STEEL DUCTWORK.

GRILLE REGISTER DIFFUSER SCHEDULE

CODE	MANUFACTURER/ MODEL NO.	SERVICE	TYPE	ACCESSORIES	FACE SIZE	NECK SIZE	FINISH	REMARKS
A	TITUS / OMNI	SUPPLY AIR	PLAQUE	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	24x24	6" DIA UP TO 115 CFM 8" DIA UP TO 200 CFM 10" DIA UP TO 325 CFM 12" DIA UP TO 470 CFM 14" DIA UP TO 600 CFM	TBD BY ARCHITECT	-
B	TITUS / ML-39	SUPPLY AIR	LINEAR	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	SEE PLANS FOR NO. OF SLOTS AND TOTAL LENGTH	SEE DRAWING	SEE PLANS	A, B
C	TITUS / OMNI	SUPPLY AIR	PLAQUE	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	12x12	6" DIA UP TO 115 CFM 8" DIA UP TO 200 CFM 10" DIA UP TO 325 CFM 12" DIA UP TO 470 CFM 14" DIA UP TO 600 CFM	TBD BY ARCHITECT	-
D	TITUS / 350	RETURN/EXHAUST AIR	GRILLE	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	SEE PLANS	SEE DRAWING	SEE PLANS	-
E	TITUS / MLR-39	RETURN AIR	LINEAR	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	SEE PLANS FOR NO. OF SLOTS AND TOTAL LENGTH	SEE DRAWING	SEE PLANS	A, B

GENERAL NOTES
1. SEE PLANS FOR CFM AND NECK SIZES.
2. MAXIMUM NOISE CRITERIA (NC) SHALL BE 30 UNLESS OTHERWISE NOTED.
3. COLOR TO BE COORDINATED WITH ARCHITECT PRIOR TO ORDERING.
4. MATERIAL IS STEEL UNLESS OTHERWISE NOTED.
5. PROVIDE BALANCING DEVICE FOR ALL GRILLES, REGISTERS, AND DIFFUSERS UNLESS OTHERWISE NOTED.
BALANCING DEVICES SHALL BE LOCATED AS FAR FROM THE GRILLES AS POSSIBLE.
6. CONTRACTOR TO CONFIRM GRILLES BORDER TYPE WITH ARCHITECTURAL REFLECTED CEILING PLANS PRIOR TO ORDERING.
7. CONTRACTOR SHALL PAINT THE INSIDE OF ALL DUCTWORK THAT IS VISIBLE THROUGH THE GRILL.

REMARKS
A. PROVIDE END CAPS, END BORDERS, OPEN BORDERS, AND ALIGNMENT CLIPS AS REQUIRED FOR CONTINUOUS DIFFUSER.
B. PROVIDE INSULATED PLENUMS BEHIND ALL DUCTED LINEAR DIFFUSERS AND RETURNS.

PUMP SCHEDULE

GENERAL: CODE	MANUFACTURER/ MODEL NO.	SERVICE	LOCATION	PUMP DATA: PUMP TYPE	GPM	DRIVE	RPM	HEAD (FT)	MIN. DESIGN PRESSURE	FLUID TEMP. RANGE (F)	NPSHR (FT)	IMPELLER SIZE (IN.)	HP	VOLT	PH	HZ	FLA	DISC	FUSE	COND	REMARKS
FFP-1	BELL & GOSSETT / e-90 STOCK-2AB	AHU-1	CLUB LEVEL MECH RM	IN-LINE	80	STARTER	1800	30	0	150-200	7.58	5.75	1.5	208	3	60	6.9	30A/3P	12A FRN-R	(3#12,#12G) 3/4"C	-

GENERAL NOTES
1. PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AND HOA SWITCH ON ALL THREE PHASE MOTORS WHERE VARIABLE FREQUENCY DRIVES ARE NOT SPECIFIED.
2. PROVIDE PREMIUM EFFICIENCY MOTORS FOR MOTORS 1 HP AND OVER PER NEMA STANDARD MG1-2003, TABLES 12-12 AND 12-13.
3. FOR PARALLEL PUMP APPLICATIONS MANUFACTURER SHALL REVIEW SINGLE PUMP OPERATON SUCH THAT PUMP CAN OPERATE AND NOT EXCEED THE END OPERATION POINT ON THE PUMP CURVE AND MOTOR HP IS PROPERLY SELECTED TO PREVENT OVERLOADING.
4. NPSHR AT SCHEDULED OPERATING POINT SHALL NOT EXCEED 0.8*NPSHA.
5. REFER TO DRAWINGS TO DETERMINE REQUIRED PUMP ROTATION. COORDINATE WITH MECHANICAL CONTRACTOR PRIOR TO ORDERING.
6. PUMP HOUSING SHALL BE COMPLETELY INSULATED.

REMARK NOTES
A. -

CABINET HEATER SCHEDULE (ELECTRIC)

CODE (CUH)	MANUFACTURER/ MODEL NO.	SERVING	LOCATION	ORIENTATION	CAPACITY (kW)	EAT (°F)	LAT (°F)	CFM	WEIGHT (LBS.)	VOLT	HZ	PH	FLA	DISC	FUSE	FEEDER	REMARKS
CUH-A	TRANE / FFC-030	CORNER CLUB VESTIBULE	VARIOUS SEE PLANS	HORIZONTAL CONCEALED	4.5	50	97	300	74	208	60	3	12.6	30A/3P	20A FRN-R	(4#12,#12G) 3/4"C	A
CUH-B	TRANE / FFE-060	ELEVATOR LOBBY	VARIOUS SEE PLANS	HORIZONTAL RECESSED	10.5	50	97	700	74	480	60	3	12.7	30A/3P	20A FRS-R	(4#12,#12G) 3/4"C	A

GENERAL NOTES
1. PROVIDE WALL MOUNTED THERMOSTAT WITH SPEED CONTROL SWITCH.
2. PROVIDE 24 VDC CONTROL TRANSFORMER. COORDINATE WITH CONTROL CONTRACTOR.

REMARK NOTES
A. PROVIDE DDC CONTROLS.

1

SPLIT SYSTEM HEAT PUMP SCHEDULE

AIR HANDLING UNIT

CODE (SSAC)	MANUFACTURER/ MODEL NO.	AREA SERVED	LOCATION	FAN CFM	FAN ESP ("W.C)	COOLING CAPACITY SENS MBH	TOTAL MBH	LINE SIZE (IN DIA.) LIQUID	SUCTION	ELECTRICAL DATA W	VOLT	PH	HZ	MCA	MAX FUSE	DISC	FEEDER SIZE	PANEL OCPD	WEIGHT LBS.	REMARKS
SSAC-A	MITSUBISHI / PEAD-A18	SEE PLANS	SEE PLANS	635	0.2	14.4	18	1/4	1/2	96	208	1	60	2	15	30A/3P	FED FROM OUTDOOR UNIT		62	

CONDENSING UNIT

CODE (ACCU)	MANUFACTURER/ MODEL NO.	SEER	ELECTRICAL VOLT	PH	HZ	FAN FLA	MCA	MAX FUSE	DISC	FEEDER SIZE	PANEL OCPD	WEIGHT LBS.	REMARKS
ACCU-A	MITSUBISHI/ PUZ-A18	14.3	208	1	60	0.35	13	15A	30A/3P	(3#12,#12G) 3/4"C	20	91	

GENERAL NOTES
1. EAT= 80/67 DB/WB.
2. PROVIDE PREMIUM EFFICIENCY MOTORS FOR MOTORS 1 HP AND OVER PER NEMA STANDARD MG1-2003, TABLES 12-12 AND 12-13.
3. CONTRACTOR TO MAINTAIN ALL MANUFACTURE SERVICE AND PERFORMANCE CLEARANCES. COORDINATE WITH ALL TRADES.
4. REFRIGERANT: R-410A
5. WARRANTY: TYPICALLY 2 YEAR PARTS, 5 YEAR COMPRESSOR
6. PROVIDE A REMOTE BMS CONNECTION. BMS SHALL MONITOR ALL POINTS.
7. CONTRACTOR IS RESPONSIBLE FOR ALL ADDITIONAL MECHANICAL, ELECTRICAL, RIGGING, OR PHYSICAL ALTERATION COST NECESSITATED BY THE PRODUCT, EVEN WITH ENGINEER APPROVAL. COST SAVINGS FOR THE SUBSITUTE PRODUCT SHALL BE PROVIDED TO THE ENGINEER.
8. CHECK, TEST AND STARTUP SUPERVISION WITH INSTALLING CONTRACTOR AND MANUFACTURE TECHNICIAN. SUBMIT STARTUP LOGS TO ENGINEER FOR RECORD.
9. PROVIDE ISOLATION VALVE AND FLEX CONNECTIONS ON EACH CONNECTION AT EACH EVAPORATOR & CONDENSER.
10. PROVIDE MINI CONDENSATE PUMP IN DRAIN PAN, SIMILAR TO LITTLE GIANT-VCC20, 10' HEAD, 45 GPH, 115V, 1/30HP, WITH OVERFLOW SWITCH. POWER FROM NEAREST 120V RECEPTACLE CIRCUIT.
11. AIR HANDLING UNIT TO BE POWERED FROM CONDENSING UNIT. PROVIDE WIRING PER MANUFACTURER'S INSTRUCTIONS.

VAV BOX SCHEDULE (ELECTRIC HEAT)

CODE (VAV)	AREA SERVED	MANUFACTURER/ MODEL NO.	CONTROL	DESIGN (CFM) MIN	MAX	ELECTRIC HEATING COIL kW	STAGES/SCR	VOLT	PH	HZ	FLA	MOCP	DISC	FUSE	FEEDER	MAX. NC @ BOX MAX.	INLET SIZE	OUTLET SIZE	REMARKS
VAV-06-01	QUAD A CORNER CLUB UPPER CONCOURSE	TITUS DESV 14	DIGITAL	500	2000	36	2	480	3	60	43.3		60A/3P	60A FRS-R	(3#4,8G)1-1/4"C	25	14	20 x 17	C,E
VAV-06-02	QUAD B CORNER CLUB UPPER CONCOURSE	TITUS DESV 14	DIGITAL	500	2000	36	2	480	3	60	43.3		60A/3P	60A FRS-R	(3#4,8G)1-1/4"C	25	14	20 x 17	C,E
VAV-06-03	QUAD C CORNER CLUB UPPER CONCOURSE	TITUS DESV 14	DIGITAL	500	2000	36	2	480	3	60	43.3		60A/3P	60A FRS-R	(3#4,8G)1-1/4"C	25	14	20 x 17	C,E
VAV-05-04	QUAD D CORNER CLUB UPPER SUITE	TITUS DESV 14	DIGITAL	500	2000	36	2	480	3	60	43.3		60A/3P	60A FRS-R	(3#4,8G)1-1/4"C	25	14	20 x 17	C,E
VAV-06-04	QUAD D CORNER CLUB UPPER CONCOURSE	TITUS DESV 14	DIGITAL	500	2000	36	2	480	3	60	43.3		60A/3P	60A FRS-R	(3#4,8G)1-1/4"C	25	14	20 x 17	C,E

GENERAL NOTES
1. CONTROLS SHALL BE BY MANUFACTURER OR BY CONTROL MANUFACTURER AND INSTALLED AT THE FACTORY (SEE SPECIFICATIONS).
2. MOUNT WITH 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF THE BOX.
3. MAXIMUM NC LEVELS ARE RADIATED SOUND DATA AND BASED ON AN INLET VELOCITY OF 2000 FPM AND AT A PRESSURE DROP ACROSS THE BOX OF 1.5".
4. PROVIDE FACTORY MOUNTED 120V FUSED DISCONNECT SWITCH, CONTROL, TRANSFORMER AND AIR FLOW SWITCH.
5. UPON POWER FAILURE, ACTUATOR SHALL MODULATE TO LAST USED POSITION
6. PROVIDE CONTROL TRANSFORMER FOR EACH VAV BOX. SUITABLE FOR 120V POWER SUPPLY.
7. HEATING SHALL BE DISABLED UNLESS VAV IS AT MINIMUM AIRFLOW.

SOUND ATTENUATOR SCHEDULE

CODE (SA)	MANUFACTURER./ MODEL NO.	SYSTEM	CFM	FACE VELOCITY (FPM)	OCTAVE BAND Hz / DYNAMIC INSERTION LOSS, dB / SELF-NOISE POWER LEVELS, dB: 63	125	250	500	1K	2K	4K	8K	SIZE WIDTH (IN)	HEIGHT (IN)	LENG. (IN)	MAX. PRESS. DROP (IN WC)	REMARKS
SA-06-01	PRICE / ERM48/WF	RTU-4 RETURN	2,000	541	8	14	16	26	27	19	17	18	38	14	48	0.13	A,B
SA-06-02	PRICE / ERM48/WF	RTU-4 RETURN	2,000	541	8	14	16	26	27	19	17	18	38	14	48	0.13	A,B
SA-06-03	PRICE / ERM48/WF	RTU-4 RETURN	2,000	541	8	14	16	26	27	19	17	18	38	14	48	0.13	A,B
SA-06-04	PRICE / ERM48/WF	RTU-4 RETURN	2,000	541	8	14	16	26	27	19	17	18	38	14	48	0.13	A,B

GENERAL NOTES
1. PROVIDE TWO STRAIGHT DUCT LENGTH UPSTREAM AND DOWNSTREAM OF SILENCER.
2. SILENCERS ARE SCHEDULED BASED ON SCHEDULED EQUIPMENT. CONTRACTOR SHALL PROVIDE NOISE INFORMATION FOR EACH ITEM REQUIRING AN ATTENUATOR AND SHALL BE RESPONSIBLE FOR MAKING REVISIONS TO SILENCERS IF ALTERNATE EQUIPMENT IS INSTALLED.
3. IF REQUIRED, PROVIDE MULTIPLE MODULES SO TOTAL SIZE MATCHES THE LISTED DIMENSIONS.

REMARK NOTES
A. ABSORPTIVE ELBOW ATTENUATOR.
B. ATTENUATOR SHALL HAVE MINIMUM 18 GA CASING.

UNIT HEATER SCHEDULE (ELECTRIC)

CODE (EUH)	MANUFACTURER/ MODEL NO.	SERVING	LOCATION	DISCHARGE DIRECTION	CAPACITY (kW)	EAT (°F)	LAT (°F)	CFM	WEIGHT (LBS)	ELECTRICAL kW	VOLT	PH	HZ	FLA	MOCP	DISC	FUSE	FEEDER	REMARKS
EUH-A	TRANE / UHEC-03	ELEV CONTROL RM	VARIOUS, SEE PLANS	HORIZONTAL	3.3	65	91	400	45	3.3	208	3	60	9.2	20A	30A/3P	20A FRN-R	(4#12,#12G) 3/4"C	

GENERAL NOTES
1. PROVIDE WALL MOUNTED THERMOSTAT.
2. PROVIDE 24V DC CONTROL TRANSFORMER. COORDINATE WITH CONTROL CONTRACTOR.

REMARK NOTES

1

POPULOUS®

Populous
Architecture, Planning, Interiors & Programming
4800 Main St., Suite 300
Kansas City, Missouri 64112 (816) 221-1500

Thornton Tomasetti
Structural Consultant
2323 Grand Boulevard, Suite 900
Kansas City, MO 64108 (816) 221-7771

ME Engineers
MEP / FA / FP Engineers
14143 Denver West Pkwy, Suite 300
Golden, CO 80401 (303) 421-6655

WJHW
Audio Visual Consultant
3424 Midcourt Road, Suite 124
Carrollton, TX 75006 (972) 934-3700

Howe Engineers
Code Consultant
101 Longwater Cir, Suite #203
Norwell, MA 02061 (781) 878-3500

RK&K
Civil Engineering
3501 Concord Rd, Suite #100
York, PA 17402 (717) 600-2220

S2O Consultants, Inc.
Food Service Consultant
13 Winding Branch Rd
Hawthorn Woods, IL 60047 (224) 717-1555

Lorax Partnerships, LLC
LEED Consultant
1200 Light Street,
Baltimore, MD 21230 (443) 449-6319

Lerch Bates
Vertical Transportation Consultant
9780 S. Meridian Blvd #450
Englewood, CO 80112 (303) 723-7978

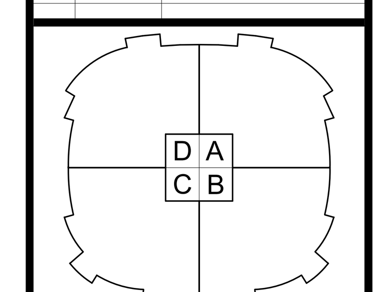
M&T BANK STADIUMEMENT IMPROVEMENTS
PHASE - 2

1101 RUSSEL ST,
BALTIMORE, MD 21230

ASI 002
01.18.2018

REVISIONS

NO.	DATE	DESCRIPTION
1	11/16/2017	PHASE-2 ASI 001
2	01/18/218	PHASE-2 ASI 002



PROJECT NO. 15.4130.50
ISSUED BY POPULOUS
ISSUED DATE 07.27.2017
SHEET TITLE
MECHANICAL SCHEDULES

DISCIPLINE - CATEGORY - SUB CATEGORY - SHEET
2M0-03

4/10/2019 10:11:55 AM

SPLIT SYSTEM SCHEDULE

AIR HANDLING UNIT

CODE (SSAC)	MANUFACTURER/ MODEL NO.	AREA SERVED	LOCATION	FAN CFM	FAN ESP ("W.C)	COOLING CAPACITY SENS MBH	COOLING CAPACITY TOTAL MBH	LINE SIZE (IN DIA.) LIQUID	LINE SIZE (IN DIA.) SUCTION	ELECTRICAL DATA KW	VOLT	PH	HZ	MCA	MAX FUSE	DISC	FEEDER SIZE	WEIGHT LBS.	REMARKS
AC-55IN	MITSUBISHI / PEFY-P72	PANTRY 5.04.09	PANTRY 5.04.09	2,154	0.2	57.6	72	1/4	1/2	1.6	208	1	60	7.7	15	30A/2P	(2#12,#12G) 3/4"C	214	
AC-56AIN	MITSUBISHI / PLFY-36	PANTRY 5.29.09	PANTRY 5.29.10	1,060	0.2	28.8	36	3/8	5/8	0.63	208	1	60	1.13	15	30A/2P	(2#12,#12G) 3/4"C	62	
AC-56BIN	MITSUBISHI / PLFY-36	PANTRY 5.29.09	PANTRY 5.29.09	1,060	0.2	28.8	36	3/8	5/8	0.63	208	1	60	1.13	15	30A/2P	(2#12,#12G) 3/4"C	62	
AC-57AIN	MITSUBISHI / PLFY-36	PANTRY 6.04.09	PANTRY 6.04.09	1,060	0.2	28.8	36	3/8	5/8	0.63	208	1	60	1.13	15	30A/2P	(2#12,#12G) 3/4"C	62	
AC-57BIN	MITSUBISHI / PLFY-36	PANTRY 6.04.09	PANTRY 6.04.09	1,060	0.2	28.8	36	3/8	5/8	0.63	208	1	60	1.13	15	30A/2P	(2#12,#12G) 3/4"C	62	
AC-58AIN	MITSUBISHI / PLFY-36	PANTRY 6.25.09	PANTRY 6.25.09	1,060	0.2	28.8	36	3/8	5/8	0.63	208	1	60	1.13	15	30A/2P	(2#12,#12G) 3/4"C	62	
AC-58BIN	MITSUBISHI / PLFY-36	PANTRY 6.25.09	PANTRY 6.25.09	1,060	0.2	28.8	36	3/8	5/8	0.63	208	1	60	1.13	15	30A/2P	(2#12,#12G) 3/4"C	62	
AC-54IN	MITSUBISHI / PEFY-P72	PANTRY 4.25.05	PANTRY 4.25.05	2,154	0.2	57.6	72	1/4	1/2	1.6	208	1	60	7.7	15	30A/2P	(2#12,#12G) 3/4"C	214	
AC-53IN	MITSUBISHI / PEFY-P72	PANTRY 4.29.06	PANTRY 4.25.05	2,154	0.2	57.6	72	1/4	1/2	1.6	208	1	60	7.7	15	30A/2P	(2#12,#12G) 3/4"C	214	

CONDENSING UNIT

CODE (ACCU)	MANUFACTURER/ MODEL NO.	SEER	ELECTRICAL VOLT	PH	HZ	FAN FLA	MCA	MAX FUSE	DISC	FEEDER SIZE	PANEL OCPD	WEIGHT LBS.	REMARKS
AC-55OT	MITSUBISHI/ PUMY-P60	17	208	1	60	0.35	36	40	60A/2P	(2#8,#10G) 1"C	40	306	
AC-56OT	MITSUBISHI/ PUMY-P60	17	208	1	60	0.35	36	40	60A/2P	(2#8,#10G) 1"C	40	306	
AC-57OT	MITSUBISHI/ PUMY-P60	17	208	1	60	0.35	36	40	60A/2P	(2#8,#10G) 1"C	40	306	
AC-58OT	MITSUBISHI/ PUMY-P60	17	208	1	60	0.35	36	40	60A/2P	(2#8,#10G) 1"C	40	306	
AC-54OT	MITSUBISHI/ PUMY-P60	17	208	1	60	0.35	36	40	60A/2P	(2#8,#10G) 1"C	40	306	
AC-53OT	MITSUBISHI/ PUMY-P60	17	208	1	60	0.35	36	40	60A/2P	(2#8,#10G) 1"C	40	306	

GENERAL NOTES
1. EAT= 80/67 DB/WB.
2. PROVIDE PREMIUM EFFICIENCY MOTORS FOR MOTORS 1 HP AND OVER PER NEMA STANDARD MG1-2003, TABLES 12-12 AND 12-13.
3. CONTRACTOR TO MAINTAIN ALL MANUFACTURE SERVICE AND PERFORMANCE CLEARANCES. COORDINATE WITH ALL TRADES.
4. REFRIGERANT: R-410A
5. WARRANTY: 2 YEAR PARTS, 5 YEAR COMPRESSOR
6. PROVIDE A REMOTE BMS CONNECTION. BMS SHALL MONITOR ALL POINTS.
7. CONTRACTOR IS RESPONSIBLE FOR ALL ADDITIONAL MECHANICAL, ELECTRICAL, RIGGING, OR PHYSICAL ALTERATION COST NECESSITATED BY THE PRODUCT, EVEN WITH ENGINEER APPROVAL. COST SAVINGS FOR THE SUBSITUTE PRODUCT SHALL BE PROVIDED TO THE ENGINEER.
8. CHECK, TEST AND STARTUP SUPERVISION WITH INSTALLING CONTRACTOR AND MANUFACTURE TECHNICIAN. SUBMIT STARTUP LOGS TO ENGINEER FOR RECORD.
9. PROVIDE ISOLATION VALVE AND FLEX CONNECTIONS ON EACH CONNECTION AT EACH EVAPORATOR & CONDENSER.
10. PIPE CONDENSATE TO NEAREST FLOOR SINK IN PANTRY. IF DRAINAGE PITCH IS NOT ACHIEVEABLE PROVIDE MANUFACTURER DRAIN PUMP OPTION.
11. PROVIDE MANUFACTURER'S MOUNTING KIT FOR CONDENSING UNITS.

GRILLE REGISTER DIFFUSER SCHEDULE

CODE	MANUFACTURER/ MODEL NO.	SERVICE	TYPE	ACCESSORIES	FACE SIZE	NECK SIZE	FINISH	REMARKS
A	TITUS / TMS	SUPPLY AIR	SQUARE CEILING	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	24"X24"	6" DIA UP TO 115 CFM 8" DIA UP TO 200 CFM 10" DIA UP TO 325 CFM 12" DIA UP TO 470 CFM 14" DIA UP TO 600 CFM	MATCH EXISTING FINISH	
B	TITUS / 300RS	SUPPLY AIR	GRILLE	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	24"x24"	22"x22"	MATCH EXISTING FINISH	E
C	TITUS / OMNI	SUPPLY AIR	PLAQUE	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	24"x24"	6" DIA UP TO 115 CFM 8" DIA UP TO 200 CFM 10" DIA UP TO 325 CFM 12" DIA UP TO 470 CFM 14" DIA UP TO 600 CFM	MATCH EXISTING FINISH	
D	TITUS / 350RS	EXHAUST/ RETURN AIR	GRILLE	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	SEE PLANS	SEE DRAWING	MATCH EXISTING FINISH	
E	TITUS / ML-39	SUPPLY AIR	LINEAR	PROVIDE OPPOSED BLADE DAMPER WHERE NOTED	SEE PLANS FOR NO. OF SLOTS AND TOTAL LENGTH	SEE DRAWING	MATCH EXISTING FINISH	C,D

GENERAL NOTES
1. SEE PLANS FOR CFM AND NECK SIZES.
2. MAXIMUM NOISE CRITERIA (NC) SHALL BE 30 UNLESS OTHERWISE NOTED.
3. COLOR TO MATCH EXISTING DIFFUSERS AND IS SUBJECT TO ARCHITECTS APPROVAL PRIOR TO ORDERING.
4. MATERIAL IS STEEL UNLESS OTHERWISE NOTED.
5. PROVIDE BALANCING DEVICE FOR ALL GRILLES, REGISTERS, AND DIFFUSERS UNLESS OTHERWISE NOTED.
BALANCING DEVICES SHALL BE LOCATED AS FAR FROM THE GRILLES AS POSSIBLE.
6. CONTRACTOR TO CONFIRM GRILLES BORDER TYPE WITH ARCHITECTURAL REFLECTED CEILING PLANS PRIOR TO ORDERING.
7. CONTRACTOR SHALL PAINT THE INSIDE OF ALL DUCTWORK THAT IS VISIBLE THROUGH THE GRILL MATTE BLACK.

REMARKS
A. ALUMINUM CONSTRUCTION.
B. PROVIDE CONTINUOUS DIFFUSER FACE ACROSS ACTIVE AND BLANK SECTIONS SHOWN ON PLANS. REFER TO ARCHITECTURAL DRAWING FOR TOTAL DIFFUSER LENGTH.
PROVIDE DIFFUSER PLENUMS AT ACTIVE SECTIONS PER PLANS.
C. PROVIDE END CAPS, END BORDERS, OPEN BORDERS, AND ALIGNMENT CLIPS AS REQUIRED FOR CONTINUOUS DIFFUSER.
D. PROVIDE INSULATED PLENUMS BEHIND ALL DUCTED LINEAR DIFFUSERS AND RETURNS.
E. PROVIDE ADJUSTABLE AIR SCOOP DAMPER FOR ALL SIDEWALL INSTALLATIONS.

FAN SCHEDULE

CODE	MANUFACTURER/ MODEL NO.	SERVICE	LOCATION	WEIGHT LBS	CFM	DRIVE	MOTOR TYPE	MOTOR RPM	ESP ("WC)	ELECTRICAL DATA HP	BHP	VOLT	PH	HZ	FLA	DISC.	FUSE	FEEDER	MTG	CONTROL	REMARKS
KEF-13B	GREENHECK / SQ-100-A	DISHWASHER EXHAUST	LOWER SUITE KITCHEN	61	1,100	DIRECT	ODP	1725	0.8	1/3	0.25	115	1	60	7.2	THERMAL OVERLOAD	-	(2#12,#12G) 3/4"C	1	I	A, B, C
CLA - TF1	GREENHECK / SQ-140-VG	CLUB LEVEL AV ROOM - QUAD A	CLUB LEVEL AV ROOM QUAD A	104	1,500	DIRECT	ECM	1000	0.38	3/4	0.3	277	1	60	5.4	THERMAL OVERLOAD	-	(2#12,#12G) 3/4"C	1	II	
CLB - TF1	GREENHECK / SQ-140-VG	CLUB LEVEL AV ROOM - QUAD B	CLUB LEVEL AV ROOM QUAD B	104	1,500	DIRECT	ECM	1000	0.38	3/4	0.3	277	1	60	5.4	THERMAL OVERLOAD	-	(2#12,#12G) 3/4"C	1	II	
CLC - TF1	GREENHECK / SQ-140-VG	CLUB LEVEL AV ROOM - QUAD C	CLUB LEVEL AV ROOM QUAD C	104	1,500	DIRECT	ECM	1000	0.38	3/4	0.3	277	1	60	5.4	THERMAL OVERLOAD	-	(2#12,#12G) 3/4"C	1	II	
CLD - TF1	GREENHECK / SQ-140-VG	CLUB LEVEL AV ROOM - QUAD D	CLUB LEVEL AV ROOM QUAD D	104	1,500	DIRECT	ECM	1000	0.38	3/4	0.3	277	1	60	5.4	THERMAL OVERLOAD	-	(2#12,#12G) 3/4"C	1	II	

GENERAL NOTES
1. DRIVE TYPE: D=DIRECT-PROVIDE RHEOSTAT SPEED CONTROLLER IN FAN HOUSING UNLESS OTHERWISE NOTED.
B=BELT-PROVIDE ADJUSTABLE SHEAVE UNLESS OTHERWISE NOTED.
VFD=VARIABLE FREQUENCY DRIVE.
2. ALL CURBS SHALL BE FACTORY MADE, 14 INCH HIGH INSULATED UNLESS OTHERWISE NOTED.
3. PROVIDE MAGNETIC STARTER WITH AUXILARY CONTACTS AND HOA SWITCH ON ALL THREE PHASE UNITS EXCEPT WHEN SERVED FROM MOTOR CONTROL CENTER.
4. PROVIDE PREMIUM EFFICIENCY MOTORS. PER NEMA STANDARD MG1-2003, TABLED 12-12, AND 12-13.
5. PROVIDE FLEXIBLE CONNECTIONS AT DUCT INLET AND OUTLET.
6. ALL EXTERIOR DISCONNECTS SWITCHES SHALL BE NEMA 4X TYPE.

MOUNTING (MTG)
1. INSTALL FAN WITH HANGING VIBRATION ISOLATORS.
2. PROVIDE WITH FACTORY MANUFACTURED ROOF CURB SUITABLE FOR ROOFING SYSTEM BEING USED. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

CONTROL (CTRL)
I. INTERLOCK WITH DISHWASHER OPERATION.
II. CONTROL VIA WALL SENSOR - ENERGIZE AT 76 DEG F (ADJUSTABLE). PROVIDE DDC SYSTEM MONITORING.

REMARK NOTES
A. PROVIDE SPEED CONTROL SWITCH.
B. STAINLESS STEEL DUCTWORK.
C. PROVIDE MOTORIZED BACKDRAFT DAMPER INTERLOCKED WITH FAN OPERATION.

FAN POWERED VAV BOX SCHEDULE (ELECTRIC)

CODE	AREA SERVED	MANUFACTURER/ MODEL NO.	INLET SIZE	PRIMARY AIR CFM	DESIGN AIR MIN. CFM	DESIGN AIR MAX. CFM	FAN SECTION CFM	FAN SECTION S.P. "W.C.	FAN SECTION HP	UNIT ELECTRICAL VOLT	PH	FLA	FEEDER	DISC	REMARKS
CLA-VB26	ELEC / 4.03.03	TRANE / VSCF-Q	8	740	105	900	900	.2	1/3	277	1	1.6	(2#12, 1#12G)3/4"C.	THERM OVLD SWITCH	
CLB-VB29	ELEC / 4.24.04	TRANE / VSCF-Q	8	550	105	900	710	.2	1/3	277	1	1.6	(2#12, 1#12G)3/4"C.	THERM OVLD SWITCH	
CLC-VB27	ELEC / 4.30.04	TRANE / VSCF-P	8	460	105	900	620	.2	1/3	277	1	1.6	(2#12, 1#12G)3/4"C.	THERM OVLD SWITCH	
CLD-VB24	ELEC / 4.51.04	TRANE / VSCF-P	8	460	105	900	620	.2	1/3	277	1	1.6	(2#12, 1#12G)3/4"C.	THERM OVLD SWITCH	

GENERAL NOTES:
1. PROVIDE 1" TA FILTERS ON FAN INLET.
2. FAN PERFORMANCE BASED ON MEDIUM SPEED UNLESS OTHERWISE NOTED.
3. PRIMARY AIR S.P. IS DOWNSTREAM BASED ON DESIGN AIR. VERIFY UNIT SELECTION BASED ON MAXIMUM ALLOWABLE S.P.
4. CONTROLS (DDC) SHALL BE BY MANUFACTURER OR BY TEMPERATURE CONTROL CONTRACTOR AND MOUNTED AT THE FACTORY. SEE SPECIFICATIONS.
5. PROVIDE FLEXIBLE CONNECTION ON INLET AND DISCHARGE.
6. PROVIDE SOLID STATE SPEED CONTROLLER, UNIT MOUNTED, FOR BALANCING.
7. SINGLE POINT ELECTRICAL CONNECTION.

REMARK NOTES:
A. SERIES CONFIGURATION.

POPULOUS

Populous
Architecture, Planning, Interiors & Programming
4800 Main St., Suite 300
Kansas City, Missouri 64112 (816) 221-1500

Thornton Tomasetti
Structural Consultant
2323 Grand Boulevard, Suite 900
Kansas City, MO 64108 (816) 221-7771

ME Engineers
MEP / FA / FP Engineers
14143 Denver West Pkwy, Suite 300
Golden, CO 80401 (303) 421-6655

WJHW
Audio Visual Consultant
3424 Midcourt Road, Suite 124
Carrollton, TX 75006 (972) 934-3700

Howe Engineers
Code Consultant
101 Longwater Cir, Suite #203
Norwell, MA 02061 (781) 878-3500

S2O Consultants, Inc.
Food Service Consultant
13 Winding Branch Rd
Hawthorn Woods, IL 60047 (224) 717-1555

Lorax Partnerships, LLC
LEED Consultant
1200 Light Street,
Baltimore, MD 21230 (443) 449-6319

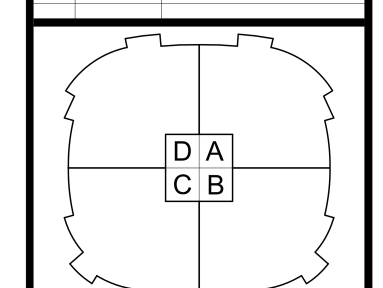
M&T BANK STADIUM IMPROVEMENTS
PHASE - 3

1101 RUSSEL ST,
BALTIMORE, MD 21230

CONSTRUCTION DOCUMENTS

REVISIONS

NO.	DATE	DESCRIPTION
1	09/21/2018	PHASE-3 ADDENDUM #1
2	11/01/2018	PHASE-3 ADDENDUM #2
3	04/10/2019	PHASE-3 ASI 003



PROJECT NO.
15.4130.50

ISSUED BY:
POPULOUS

ISSUED DATE:
05/24/2018

SHEET TITLE:
MECHANICAL SCHEDULES

DISCIPLINE - CATEGORY - SUB CATEGORY - SHEET
3M0-02

MECHANICAL LEGEND

SYMBOL	ABBREV	DESCRIPTION
— — — — —	RX	REMOVE EXISTING (SHOWN HEAVY AND DASHED ON DEMO.)
— CD —	CD	CONDENSATE DRAIN
— — V — —	V	VENT
- - RV - -	RV	RELIEF VENT
— D —	D	DRAIN WATER, MISCELLANEOUS DRAINAGE
— CHS —	CHS	CHILLED WATER SUPPLY
- - CHR - -	CHR	CHILLED WATER RETURN
— HS —	HS	HEATING WATER SUPPLY
- - HR - -	HR	HEATING WATER RETURN
— PHS —	PHS	PRIMARY HEATING WATER SUPPLY
- - PHR - -	PHR	PRIMARY HEATING WATER RETURN
— PCHS —	PCHS	PRIMARY CHILLED WATER SUPPLY
- - PCHR - -	PCHR	PRIMARY CHILLED WATER RETURN
H		HUMIDISTAT
T		THERMOSTAT
		PIPE CAP
		BRANCH TAKE OFF
		PIPE DROP TEE
		PIPE RISE TEE
	ACV	AUTOMATIC CONTROL VALVE
		SHUT-OFF VALVE
		BALL VALVE
		BALL VALVE
		UNION
		STRAINER W/BLOWDOWN VALVE
		PIPE GUIDE
		PIPE ANCHORS
		SOLENOID VALVE
	PRV	PRESSURE REDUCING VALVE
		ECCENTRIC REDUCER
		CONCENTRIC REDUCER
		PRESSURE RELIEF VALVE
		BALANCING VALVE (W/MEMORY STOP)
		CHECK VALVE
		BUTTERFLY VALVE
	HED	HOSE END DRAIN VALVE
UC	UC	UNDERCUT DOOR
		AIR FLOW
DL	DL	DOOR LOUVER
	AAV	AUTOMATIC AIR VENT
	MAV	MANUAL AIR VENT
		PRESSURE GAUGE w/GAUGE COCK
		THERMOMETER
		SMOKE DETECTOR
		SMOKE DETECTOR
	AMD	AIR MONITORING DEVICE
		SUPPLY AIR DIFFUSER
		RETURN AIR REGISTER
		EXHAUST AIR GRILLE
	FD	FIRE DAMPER
	VD	VOLUME DAMPER
		SQUARE TO ROUND DUCT TRANSITION
	FC	FLEXIBLE CONNECTION
	SL	DUCTWORK SOUND LINING, 1"THICK
	AD	ACCESS DOOR
	MOD	MOTOR OPERATED DAMPER
		ELBOW w/ DOUBLE THICKNESS TURNING VANES
		RECTANGULAR BRANCH TAKE-OFF
		BELL MOUTH BRANCH TAKE-OFF
		ROUND BRANCH TAKE-OFF
		DUCT TRANSITION
		CIRCULAR AIR DIFFUSER
		DUCT DROP OFF BOTTOM
		SQUARE TO ROUND TRANSITION
		SUPPLY/OUTSIDE AIR DUCT RISER
		RETURN AIR DUCT RISER
		EXHAUST/RELIEF AIR DUCT RISER
		ALL WELDED VEHICLE EXHAUST DUCT CONNECTION

SYMBOL	ABBREV	DESCRIPTION
		ROUND DUCT RISER
ø	DIA.	DIAMETER
		ARCHITECTURAL WALL LOUVER
XX	VAV	VARIABLE AIR VOLUME BOX
XX	FPTRU	FAN POWERED TERMINAL REHEAT UNIT
P–	P	PLUMBING FIXTURE DESIGNATION
AC–	AC	AIR COMPRESSOR DESIGNATION
WM–	WM	WATER METER DESIGNATION
AS–	AS	AIR SEPARATOR DESIGNATION
V–	V	VALVE DESIGNATION
CC–	CC	COOLING COIL DESIGNATION
PHC–	PHC	PRIMARY HEATING COIL
DWH–	DWH	DOMESTIC WATER HEATER DESIGNATION
AMD–	AMD	DUCT AIR MONITOR DEVICE DESIGNATION
SPSS–	SPSS	STATIC PRESSURE SENSOR DESIGNATION
UH–	UH	UNIT HEATER DESIGNATION
CUH–	CUH	CABINET UNIT HEATER DESIGNATION
F–	F	FILTER DESIGNATION
SF–	SF	SUPPLY FAN DESIGNATION
RF–	RF	RETURN FAN DESIGNATION
FCU–	FCU	FAN COIL UNIT DESIGINATION
HVU–	HVU	HEATING AND VENTILATING UNIT
AHU–	AHU	AIR HANDLING UNIT
HP–	HP	HEAT PUMP
KEF–	KEF	KITCHEN EXHAUST FAN
TEF–	TEF	TOILET EXHAUST FAN
GEF–	GEF	GENERAL EXHAUST FAN
SEF–	SEF	SMOKE EXHAUST FAN
VF–	VF	VENTILATION FAN
MAU	MAU	MAKEUP AIR UNIT
RAD–	RAD	RADIATION HEATING

X / XX% — AIR DEVICE:
— CFM

A / MX-X — SECTION REFERENCE:
(SEE DATA BELOW FOR DETAILS)

3 / MX-XX — PARTIAL FLOOR PLANS = LETTER OF PARTIAL SECTION = LETTER OR NUMBER DETAIL = NUMBER

— SHEET NUMBER WHERE PLAN, PARTIAL SECTION, ELEVATION OR DETAIL IS LOCATED

ABBREVIATIONS

ABV	ABOVE
AD	ACCESS DOOR
A	COMPRESSED AIR
AHU	AIR HANDLING UNIT
APPROX	APPROXIMATELY
A DR	AREA DRAIN
@	AT
ATTEN	ATTENUATOR
AAV	AUTOMATIC AIR VENT
ACV	AUTOMATIC CONTROL VALVE
ATC	AUTOMATIC TEMPERATURE CONTROL
AMD	AIR MONITORING DEVICE
BFP	BACKFLOW PREVENTOR
BWV	BACKWATER VALVE
BLW	BELOW
BHP	BRAKE HORSEPOWER
BTU/HR	BRITISH THERMAL UNITS PER HOUR
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CO	CLEANOUT
CW	COLD WATER
C	COMMON
CONC	CONCRETE
COND	CONDENSATE
CD	CONDENSATE DRAIN
CRU	CONDENSATE RETURN UNIT
CX	CONNECT TO EXISTING
CC	COOLING COIL
CFM	CUBIC FEET PER MINUTE
CCP	COOLING COIL PUMP
DPR	DAMPER
DB	DECIBEL
D	DEEP, DEPTH
DESIGN	DESIGNATION
DIA, ø	DIAMETER
DIFF	DIFFERENTIAL
DN	DOWN
DR	DRAIN WATER, MISCELLANEOUS DRAINAGE
DB	DRY BULB
DAM	DUCT AIR MONITOR
EFFIC	EFFICIENCY
EAT	ENTERING AIR TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
EDR	EQUIVALENT DIRECT RADIATION
EXH	EXHAUST
EA	EXHAUST AIR
EF	EXHAUST FAN
EX	EXISTING
ESP	EXTERNAL STATIC PRESSURE
°F	DEGREES FAHRENHEIT
FPM	FEET PER MINUTE
FD	FIRE DAMPER
FDV	FIRE DEPARTMENT VALVE
F	FIRE LINE
FSP	FIRE STANDPIPE
FT	FLASH TANK
FC	FLEXIBLE CONNECTION
FD	FLOOR DRAIN
FT, '	FOOT, FEET
FD	FOUNDATION DRAIN
GAL	GALLON, GALLONS
GPM	GALLONS PER MINUTE
G	NATURAL GAS
GEN	GENERATOR
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
H_2O	WATER
HP	HORSEPOWER
HB	HOSE BIBB
HED	HOSE END DRAIN VALVE
HR	HEATING WATER RETURN
HS	HEATING WATER SUPPLY
HZ	HERTZ
H	HIGH, HEIGHT
HPR	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM
HW	HOT WATER
HCP	HEATING COIL PUMP
HWR	HOT WATER RECIRCULATION
IL	PIPE MOUNTED INLINE PUMP
IN, "	INCH, INCHES
ISOL	ISOLATION
KW	KILOWATTS
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
L	LONG, LENGTH
LPR	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MPR	MEDIUM PRESSURE CONDENSATE RETURN
MPS	MEDIUM PRESSURE STEAM
MIN	MINIMUM
MOD	MOTOR OPERATED DAMPER
NC	NOISE CRITERIA, NORMALLY CLOSED
NOM	NOMINAL
NO	NORMALLY OPEN
No	NUMBER
OS&Y	OUTSIDE STEM & YOKE VALVE
OA	OUTDOOR AIR
%	PERCENT
PH	PHASE
POD	POINT OF DISCONNECTION
LBS	POUNDS
LBS/HR	POUNDS PER HOUR
PSI	POUNDS PER SQUARE INCH
PRESS	PRESSURE
PD	PRESSURE DROP, PUMP DISCHARGE
PRV	PRESSURE REDUCING VALVE
PHC	PRE-HEAT COIL
PCHS	PRIMARY CHILLED WATER SUPPLY
PCHR	PRIMARY CHILLED WATER RETURN
PHS	PRIMARY HEATING WATER SUPPLY
PHR	PRIMARY HEATING WATER RETURN
RH	RELATIVE HUMIDITY
RV	RELIEF VENT
RX	REMOVE EXISTING
RA	RETURN AIR, RELIEF AIR
RF	RETURN FAN
RPM	REVOLUTIONS PER MINUTE
RD	ROOF DRAIN
RM	ROOM
SAN	SANITARY, SOIL, WASTE
SAT	SATURATED
SENS	SENSIBLE
SEP	SEPARATOR
SD	SMOKE DETECTOR
SA	SOUND ATTENUATOR
SL	SOUND LINING
SPEC	SPECIFICATION
SPR	SPRINKLER LINE
SQ	SQUARE
SQ FT	SQUARE FOOT
SP	STATIC PRESSURE
SPSS	STATIC PRESSURE SENSING STATION
ST	STEAM TRAP
SW	STORM WATER
SF	SUPPLY FAN
TS	TAMPER SWITCH
TEMP	TEMPERATURE
ΔT	TEMPERATURE DROP
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UC	UNDERCUT DOOR
UH	UNIT HEATER
V	VACUUM
VEL	VELOCITY
V	VENT
VTR	VENT THROUGH ROOF
VENT	VENTILATION
VIB ISOL	VIBRATION ISOLATION
V	VOLTS
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VF	VENTILATION FAN
WB	WET BULB
W/	WITH

HOK SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

CIVIL ENGINEER
RUMMEL, KLEPPER & KAHL
BALTIMORE, MARYLAND

AUDIO/VIDEO CONSULTANT
WRIGHTSON, JOHNSON, HADDON & WILLIAMS
DALLAS, TEXAS

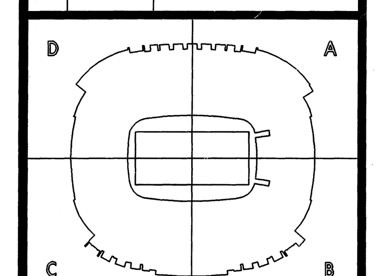
INTERIOR ARCHITECTURE CONSULTANT
CHO, WILKS & BENN
BALTIMORE, MARYLAND

BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: JTP	REVIEWED BY:
ISSUED: 2-28-97	

SHEET TITLE
HVAC LEGEND
AND ABBREVIATIONS

CATEGORY - SUB-CATEGORY - SHEET
M.0-01

AIR HANDLING UNIT SCHEDULE

DESIG	DUTY	FAN SECTION: CFM	MIN. OA CFM	TSP INCH H_2O	MOTOR BHP	MOTOR HP	RPM	WHEEL DIA INCH	COOLING SECTION: EAT °F DB	EAT °F WB	LAT °F DB	LAT °F WB	TOTAL MBH	SENS MBH	GPM @ 36°F EWT 54°F LWT	MAX H_2O PD FT H_2O	MIN TOTAL FACE AREA	MAXIMUM FACE VEL FPM	No OF COILS	MAX FIN SPACING FIN/IN	MAXIMUM AIR PD IN H_2O	MIN ROWS
AHU-1	CLUB/SUITES – A	18200	11650	6.39	24.3	30	1471	AF30	87.6	71.8	42.5	42.5	1565	898	197	40	40.0	455	2	14	1.80	12
AHU-2	CLUB/SUITES – A	18200	11650	6.39	24.3	30	1471	AF30	87.6	71.8	42.5	42.5	1565	898	197	40	40.0	455	2	14	1.80	12
AHU-3	CLUB/SUITES – B	27500	15400	7.0	37.6	50	1451	AF33	86.1	70.5	42.5	42.5	2222	1311	280	40	58.8	468	2	14	1.87	12
AHU-4	CLUB/SUITES – B	27500	15400	7.0	37.6	50	1451	AF33	86.1	70.5	42.5	42.5	2222	1311	280	40	58.8	468	2	14	1.87	12
AHU-5	CLUB/SUITES – C	27500	17050	7.0	37.6	50	1451	AF33	87.2	71.6	42.6	42.6	2336	1341	295	40	58.8	468	2	14	1.87	12
AHU-6	CLUB/SUITES – C	27500	17050	7.0	37.6	50	1451	AF33	87.2	71.6	42.6	42.6	2336	1341	295	40	58.8	468	2	14	1.87	12
AHU-7	CLUB/SUITES – D	18200	12010	6.30	24.3	30	1471	AF30	87.9	72.2	42.6	42.6	1590	902	201	39	40.0	455	2	14	1.80	12
AHU-8	CLUB/SUITES – D	18200	12010	6.30	24.3	30	1471	AF30	87.9	72.2	42.6	42.6	1590	902	201	39	40.0	455	2	14	1.80	12
AHU-9	PRESS LEVEL	13300	3720	5.91	16.6	20	1775	AF24	81.0	64.9	42.5	42.5	806	560	102	29	30.2	441	1	14	1.68	12
AHU-10	GAME DAY SERVICES – A	1800	1800	2.5	1.5	2	1625	FC10X7	94.0	78.0	52.3	52.1	162	82.1	20.7	28	5.5	327	1	10	0.45	6
AHU-11	STADIUM OPERATIONS – B	2900	1420	2.5	2.2	3	1562	FC10X10	84.8	69.0	52.1	51.7	155	104	18.9	24	7.6	383	1	14	0.57	5
AHU-12	BROADCAST MEDIA – B	3000	1350	2.0	2.0	3	1493	FC10X10	84.1	68.2	52.7	51.9	150	103	18.5	27	7.6	396	1	8	0.52	6
AHU-13	SECURITY – B	1600	320	2.25	1.6	2	1939	FC9X4	79.6	65.4	53.2	52.3	62.2	46.1	7.9	36	3.4	471	1	10	0.63	5
AHU-14	OFFICIALS – B	2500	2500	2.5	2.7	5	1817	FC10X7	94.0	78.0	51.9	51.8	226	115	27.9	25	5.5	455	1	10	0.98	8
AHU-15	VISITING LOCKER NO.1 – B	9300	9300	3.5	8.9	15	2014	AF20	94.0	78.0	51.8	51.7	843	429	104	19	21.3	437	1	10	0.92	8
AHU-16	VISITING LOCKER NO.2 – B	8100	8100	3.0	6.5	10	1807	AF20	94.0	78.0	51.8	51.6	736	374	90.5	21	21.3	380	1	8	0.66	8
AHU-17	HOME TEAM AREA – B	12900	12900	3.5	10.1	15	1494	AF24	94.0	78.0	51.6	51.5	1177	598	144	19	30.2	427	1	10	0.89	8
AHU-18	HOME TEAM STORAGE – B	2600	260	2.5	1.8	2	1531	FC10X10	77.8	64.4	52.9	52.0	94.2	70.8	11.7	34	5.5	473	1	10	0.64	5
AHU-19	MEDIA LOUNGE – A	640	640	0.40	–	380W	1100	3@6.3	94.0	78.0	52.7	52.3	56.0	27.5	7.3	9	3.2	200	1	16	–	4
AHU-20	ELEVATOR CORE – A	9700	970	3.75	10.0	15	2090	AF20	77.8	64.4	52.4	51.8	358	270	44.0	22.0	21.3	460	1	12	0.70	5
AHU-21	ELEVATOR CORE – B	11300	1130	3.75	10.4	15	1820	AF22	77.8	64.4	52.5	51.8	416	313	51.0	22.0	21.3	460	1	12	0.70	5
AHU-22	ELEVATOR CORE – C	11300	1130	3.75	10.4	15	1820	AF22	77.8	64.4	52.5	51.8	416	313	51.0	22.0	21.3	460	1	12	0.70	5
AHU-23	ELEVATOR CORE – D	9,700	970	3.75	10.0	15	2090	AF20	77.8	64.4	52.4	51.8	358	270	44.0	22.0	21.3	460	1	12	0.70	5
AHU-24	TICKET OFFICE – C	1260	130	2.0	0.95	1.5	1680	FC9x4	77.8	64.4	54.0	52.5	44.8	32.4	5.0	22.0	3.4	400	1	8	0.31	4
AHU-25	TICKET OFFICE – D	1200	120	2.0	0.95	1.5	1680	FC9x4	77.8	64.4	54.0	52.5	42.7	30.9	5.0	22.0	3.4	380	1	8	0.31	4
AHU-26	TICKET OFFICE – B	1200	120	2.0	0.95	1.5	1680	FC9x4	77.8	64.4	54.0	52.5	42.7	30.9	5.0	22.0	3.4	380	1	8	0.31	4

DESIG	HEATING SECTION: EAT °F	LAT °F	MBH @200°F EWT	GPM @30°F ΔT	MAXIMUM H_2O PD FT H_2O	MAXIMUM AIR PD IN H_2O	MIN TOTAL FACE AREA	MAXIMUM FACE VEL FPM	No OF COILS	MAX FIN SPACING FIN/IN	MIN ROWS	ELECTRICAL	REMARKS
AHU-1	33.8	53.8	393	28.0	27	0.09	40.0	495	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-2	33.8	53.8	393	28.0	27	0.09	40.0	495	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-3	39.0	59.0	594	42.4	22	0.09	58.8	468	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-4	39.0	59.0	594	42.4	22	0.09	58.8	468	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-5	35.1	55.1	594	42.4	22	0.09	58.8	468	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-6	35.1	55.1	594	42.4	22	0.09	58.8	468	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-7	32.4	52.4	393	28.0	26	0.09	40.0	455	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-8	32.4	52.4	393	28.0	26	0.09	40.0	455	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-9	57.5	77.5	287	20.5	22	0.08	30.2	441	2	8	1	480V/3ø/60HZ	LOW TEMP/FP VAV
AHU-10	10	85	146	10.7	21	0.05	5.5	325	1	8	2	480V/3ø/60HZ	CV/SZ
AHU-11	44	85	128	9.4	13	0.07	7.6	383	1	8	1	480V/3ø/60HZ	CV/SZ
AHU-12	46	85	126	9.3	12	0.07	7.6	396	1	8	1	480V/3ø/60HZ	CV/SZ
AHU-13	63	85	38.0	2.8	5	0.10	3.4	471	1	8	1	480V/3ø/60HZ	CV/SZ
AHU-14	10	85	203	14.9	25	0.08	5.5	451	1	10	2	480V/3ø/60HZ	CV/SZ
AHU-15	10	85	753	55.2	21	0.09	20.4	457	1	8	2	480V/3ø/60HZ	CV/RH
AHU-16	10	85	656	48.1	21	0.07	20.4	398	1	8	2	480V/3ø/60HZ	CV/RH
AHU-17	10	85	1045	76.6	22	0.08	29.7	434	1	8	2	480V/3ø/60HZ	CV/RH
AHU-18	69	89	56.2	4.0	14	0.10	5.5	473	1	8	1	480V/3ø/60HZ	CV/SZ
AHU-19	10	85	51.8	3.8	13	–	3.2	200	1	16	4	120V/1ø/60HZ	CV/SZ–FCU
AHU-20	69	89	210	15.0	20	0.10	21.3	460	1	8	1	480V/3ø/60HZ	BYPASS VAV
AHU-21	69	89	244	17.5	30	0.10	21.3	460	1	8	1	480V/3ø/60HZ	BYPASS VAV
AHU-22	69	89	244	17.5	30	0.10	21.3	460	1	8	1	480V/3ø/60HZ	BYPASS VAV
AHU-23	69	89	210	15.0	20	0.10	21.3	460	1	8	1	480V/3ø/60HZ	BYPASS VAV
AHU-24	69	118.5	72.4	4.5	13	0.10	3.2	400	1	8	2	480V/3ø/60HZ	CV/SZ
AHU-25	69	121.0	72.4	4.5	13	0.10	3.2	380	1	8	2	480V/3ø/60HZ	CV/SZ
AHU-26	69	121.0	72.4	4.5	13	0.10	3.2	380	1	8	2	480V/3ø/60HZ	CV/SZ

NOTE: CHILLED AND HEATED WATER ARE 40% ETHYLENE GLYCOL SOLUTION

HEATING AND VENTILATING UNIT SCHEDULE

DESIG	DUTY	FAN SECTION: CFM	MIN. OA CFM	TSP INCH H_2O	MOTOR BHP	MOTOR HP	RPM	WHEEL DIA INCH	HEATING SECTION: EAT °F	LAT °F	MBH @200°F EWT	GPM @30°F ΔT	MAXIMUM H_2O PD FT H_2O	MAXIMUM AIR PD IN H_2O	MIN TOTAL FACE AREA	MAXIMUM FACE VEL FPM	No OF COILS	MAX FIN SPACING FIN/IN	MIN ROWS	ELECTRICAL	REMARKS
HVU-1	CONCESSION STO/COMMISSARY	30,000	3000	2.0	16.0	20	947	AF36	50.5	85.0	1118	59.8	24	0.09	66.1	454	1	8	1	480V/3ø/60HZ	
HVU-2	CONC. LOCKERS	13000	3900	2.0	6.8	10	1327	AF24	32.5	85.0	737	39.4	27	0.09	30.2	431	1	12	1	480V/3ø/60HZ	
HVU-3	GAME DAY LOCKERS	6,000	3000	2.0	4.6	7.5	2703	AF15	32.5	85.0	340	18.2	19	0.14	12.0	500	1	14	1	480V/3ø/60HZ	
HVU-4	RECYCLE	2000	2000	1.75	0.9	1.5	1289	FC10X10	10.0	85.0	162	8.7	15	0.08	5.5	364	1	14	1	480V/3ø/60HZ	
HVU-5	FIELD MAINTENANCE	6600	1320	2.0	4.2	7.5	1047	FC15X15	47.4	85.0	268	14.3	22	0.09	14.7	448	1	8	1	480V/3ø/60HZ	
HVU-6	SHOP–EAST	2300	1150	2.0	1.3	2	1393	FC10X10	32.5	85.0	130	7.0	39	0.10	5.5	419	1	12	1	480V/3ø/60HZ	
HVU-7	SHOP–WEST	5700	2850	2.0	4.1	7.5	2613	AF15	32.5	85.0	323	17.3	13	0.12	12.0	476	1	12	1	480V/3ø/60HZ	
HVU-8	FREIGHT ELEVATOR LOBBY	2700	2700	2.0	1.7	2	1440	FC10X10	10	85.0	219	11.7	28	0.19	5.5	491	1	8	2	480V/3ø/60HZ	
HVU-9	SERVICE TUNNEL	3200	3200	2.0	2.3	3	1534	FC10X10	10	85.0	259	13.9	46	0.15	7.6	422	1	8	2	480V/3ø/60HZ	
HVU-10	SERVICE TUNNEL	8800	8800	2.0	5.6	7.5	1749	AF20	10	85.0	713	38.1	20	0.14	21.3	413	1	8	2	480V/3ø/60HZ	
HVU-11	SERVICE TUNNEL	5800	5800	2.0	4.3	7.5	2643	AF15	10	85.0	470	25.1	28	0.19	12.0	484	1	8	2	480V/3ø/60HZ	
HVU-12	SERVICE TUNNEL	5800	5800	2.0	4.3	7.5	2643	AF15	10	85.0	470	25.1	28	0.19	12.0	484	1	8	2	480V/3ø/60HZ	
HVU-13	FREIGHT ELEVATOR LOBBY	5800	2700	2.0	1.7	2	1440	FC10X10	10	85.0	219	11.7	28	0.19	5.5	491	1	8	2	480V/3ø/60HZ	

NOTE: 40% ETHYLENE GLYCOL HEATING WATER SOLUTION

AIR SEPARATOR DUTY

DESIGNATION :	AS-1
PIPE SIZE :	10"ø
WATER FLOW :	3,000 GPM
STRAINER FREE AREA :	409 SQ. INCHES
PRESSURE DROP :	10.0 FT H_2O
CV FACTOR W/STRAINER :	
APPROX SHIPPING WEIGHT :	1,000 LBS
SIZE :	30"øx60"H
REMARKS :	AMTROL 10-AS

FOUR-PIPE FAN COIL UNIT SCHEDULE

DESIG	SUPPLY FAN SECTION: MAX CFM	RPM	ESP INCH H_2O	MOTOR SIZE HP	WHEEL DIA INCH	COOLING SECTION: EAT (°F) DB	EAT (°F) WB	SENS LOAD MBH	TOTAL LOAD MBH	MIN ROWS	GPM @18°F ΔT	MAXIMUM H_2O PD FT H_2O	HEATING SECTION: EAT °F	MBH @ 200°F EWT	GPM @30°F ΔT	MAXIMUM H_2O PD FT H_2O	MIN ROWS	APPROXIMATE OPERATING WEIGHT (LBS)	ELECTRICAL (V/PH/HZ)	REMARKS
FC-1	900	1080	0.35	1/3	9"	76	62.5	16.0	24.0	3	3.5	1.0	65	32	2.5	2.0	2	130	120/1/60	HORIZONTAL CONCEALED – CEILING
FC-2	1200	1000	0.35	(2)1/4	(2)9"	76	62.5	22.0	32.0	3	4.0	1.0	65	37	3.0	2.0	2	180	120/1/60	HORIZONTAL CONCEALED – CEILING
FC-3	1500	1100	0.35	(2)1/3	(2)9"	76	62.5	28.0	40.0	3	5.0	1.0	65	41	3.8	2.0	2	200	120/1/60	HORIZONTAL CONCEALED – CEILING
FC-4	1300	1000	.25	(2)1/3	(2)9"	95	75.0	36.3	36.3	4	5.5	12	55	13.9	1.0	2.0	1	200	120/1/60	VERTICAL CABINET – WALL

NOTES:
1. UNITS SHALL BE PROVIDED WITH 2-WAY MODULATING VALVE, PIPING PACKAGE, REMOTE THERMOSTATS, REAR RETURN AND UNIT MOUNTED DISCONNECT SWITCH.
2. CHILLED AND HEATED WATER ARE 40% ETYHLENE GLYCOL SOLUTION.

EXPANSION TANK SCHEDULE

DESIG	DUTY	TANK VOLUME	TYPE	DIMENSIONS: DIA	DIMENSIONS: HEIGHT	DRY WEIGHT	REMARKS
ET-1	HEATING WATER	528	DIAPHRAGM	48"	85"	1810 LBS	AMTROL 2000-L
ET-2	HEATING WATER	528	DIAPHRAGM	48"	85"	1810 LBS	AMTROL 2000-L
~~ET-3~~	~~HEATING WATER~~	~~528~~	~~DIAPHRAGM~~	~~48"~~	~~85"~~	~~1810 LBS~~	~~AMTROL 2000-L~~
ET-4	DOMESTIC HOT WATER	422	DIAPHRAGM	48"	71"	1580 LBS	AMTROL 1600-L

RETURN FAN SCHEDULE

DESIG	SERVICE	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA. (IN)	DRIVE	AMCA CONSTRUCTION CLASS	ELECTRICAL (V/PH/HZ)	APPROX WEIGHT (LBS)	REMARKS
RF-1	AHU-1,2-CLUB/SUITE LEVEL-QUAD A	B	20,600	2.25	1170	11.0	15.0	42	BELT	I	480/3/60	1,240	INLINE-VANEAXIAL
RF-3	AHU-3,4-CLUB/SUITE LEVEL-QUAD B	B	44,000	2.25	1170	25.0	30.0	54	BELT	I	480/3/60	1,340	INLINE-VANEAXIAL
RF-5	AHU-5,6-CLUB/SUITE LEVEL-QUAD C	B	44,000	2.25	1170	25.0	30.0	54	BELT	I	480/3/60	1,340	INLINE-VANEAXIAL
RF-7	AHU-7,8-CLUB/SUITE LEVEL-QUAD D	B	27,400	2.25	1170	15.0	20.0	42	BELT	I	480/3/60	1,240	INLINE-VANEAXIAL
RF-9	AHU-9-PRESS LEVEL	C	11,200	1.5	950	4.2	5.0	30	BELT	I	480/3/60	490	INLINE-CENTRIFUGAL
RF-20	AHU-20-ELEVATOR LOBBIES-QUAD A	C	8,700	1.5	850	3.2	5.0	30	BELT	I	480/3/60	490	INLINE-CENTRIFUGAL
RF-21	AHU-21-ELEVATOR LOBBIES-QUAD B	C	10,200	1.5	950	4.2	5.0	30	BELT	I	480/3/60	490	INLINE-CENTRIFUGAL
RF-22	AHU-22-ELEVATOR LOBBIES-QUAD C	C	10,200	1.5	950	4.2	5.0	30	BELT	I	480/3/60	490	INLINE-CENTRIFUGAL
RF-23	AHU-23-ELEVATOR LOBBIES-QUAD D	C	8,700	1.5	850	3.2	5.0	30	BELT	I	480/3/60	490	INLINE-CENTRIFUGAL

VENTILATION FAN SCHEDULE

DESIG	SERVICE	LEVEL	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA	DRIVE	AMCA CONSTRUCTION CLASS	ELECTRICAL (V/PH/HZ)	APPROX WEIGHT (LBS)	REMARKS
VF-1	HVU-1	SERVICE – A	C	26,000	1.0	600	11.0	15.0	45	BELT	I	480/3/60	720	INLINE-CENTRIFUGAL
VF-2	HVU-2	SERVICE – A	C	11,000/5500	1.0	900	4.8	5.0	33	BELT	I	480/3/60	480	INLINE-CENT-2 SPEED
VF-3	HVU-3	SERVICE – A	C	2800	1.0	1100	1.13	2.0	18	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-4	HVU-4	SERVICE – A	C	2,000	1.0	1600	1.3	2.0	15	BELT	I	480/3/60	100	INLINE-CENTRIFUGAL
VF-5	HVU-5	SERVICE – A	C	6,300	1.0	1100	2.3	3.0	24	BELT	I	480/3/60	240	INLINE-CENTRIFUGAL
VF-6	HVU-6	SERVICE – B	C	2200/1100	1.0	1600	1.3	2.0	15	BELT	I	480/3/60	100	INLINE-CENT-2 SPEED
VF-7	HVU-7	SERVICE – B	C	5500	1.0	1100	2.3	3.0	24	BELT	I	480/3/60	240	INLINE-CENTRIFUGAL
VF-8	NORTH MECH RM A	SERVICE – A	C	10,000	1.25	800	3.9	5.0	33	BELT	I	480/3/60	480	INLINE-CENTRIFUGAL
VF-9	NORTH MECH RM A	SERVICE – A	C	30,000	1.25	600	12.0	15.0	40	BELT	I	480/3/60	600	INLINE-CENTRIFUGAL
VF-10	SOUTH MECH RM B	SERVICE – B	F	12,000	0.50	915	2.0	2.0	36	BELT	I	480/3/60	260	INLINE-CENTRIFUGAL
VF-11	SOUTH MECH RM B	SERVICE – B	C	24,000	1.25	800	11.0	15.0	40	BELT	I	480/3/60	600	INLINE-CENTRIFUGAL
VF-12	SOUTH ELEC RM B	SERVICE – B	C	25,000	1.25	800	11.0	15.0	40	BELT	I	480/3/60	600	INLINE-CENTRIFUGAL
VF-13	SOUTH ELEC RM B	SERVICE – B	C	25,000	1.25	800	11.0	15.0	40	BELT	I	480/3/60	600	INLINE-CENTRIFUGAL
VF-14	LOADING DOCK	SERVICE – A	C	4,300	1.0	1100	1.9	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-15	LOADING DOCK	SERVICE – A	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-16	LOADING DOCK	SERVICE – A	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-17	LOADING DOCK	SERVICE – A	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-18	LOADING DOCK	SERVICE – A	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-19	LOADING DOCK	SERVICE – A	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-20	LOADING DOCK	SERVICE – A	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-21	LOADING DOCK	SERVICE – B	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-22	LOADING DOCK	SERVICE – B	C	5,300	1.0	1300	2.4	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-23	LOADING DOCK	SERVICE – B	C	4,300	1.0	1100	1.9	3.0	20	BELT	I	480/3/60	120	INLINE-CENTRIFUGAL
VF-24	FIRE PUMP ROOM	SERVICE – B	F	4,500	0.25	1200	–	3/4	20	BELT	I	480/3/60	65	PROPELLER
VF-25	AHU-1 THRU 8 MECH RMS	PRESS LEVEL	F	3,600	0.25	1200	–	1/2	20	BELT	I	480/3/60	65	PROPELLER
VF-26	ELECTRIC ROOM	PRESS – A	H	32,000	0.75	640	12.0	15.0	44.5	BELT	I	480/3/60	840	PLENUM FAN
VF-27	ELECTRIC ROOM	PRESS – B	H	32,000	0.75	640	12.0	15.0	44.5	BELT	I	480/3/60	840	PLENUM FAN
VF-28	ELECTRIC ROOM	PRESS – C	H	32,000	0.75	640	12.0	15.0	44.5	BELT	I	480/3/60	840	PLENUM FAN
VF-29	ELECTRIC ROOM	PRESS – D	H	32,000	0.75	640	12.0	15.0	44.5	BELT	I	480/3/60	840	PLENUM FAN
VF-30	ELEV MACH ROOMS- A,B,C,D	LEVEL 8	D	3,700	0.25	1000	0.58	3/4	–	BELT	I	480/3/60	130	ROOF CENTRIFUGAL
VF-31	SERVICE ELEV MACH RM-A,B	LEVEL 7,8	D	1,200	0.25	1135	0.13	1/4	–	BELT	I	120/1/60	100	ROOF CENTRIFUGAL

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SPORT

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Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

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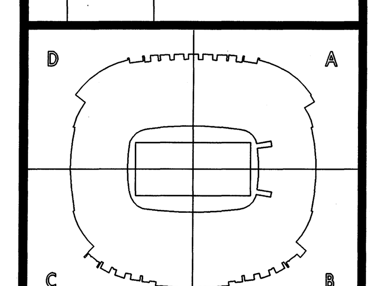
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL SCHEDULES

CATEGORY - SUB-CATEGORY - SHEET
M.0-02

GENERAL FAN SCHEDULE

DESIG	SERVICE	LEVEL	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA	DRIVE	AMCA CONSTRUCTION CLASS	ELECTRICAL	APPROX WEIGHT (LBS)	REMARKS
GEF-A1	ELEVATOR LOBBY	UPPER CONC	D	1650	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
GEF-A2	TRASH ROOM	MAIN CONC	J	970	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
GEF-A3	ELECTRIC ROOM	MAIN CONC	E	1420	0.375	1075	0.50	1/2	–	DIRECT	I	115V/1ø/60HZ	130	
GEF-A4	SUMP PIT	SERVICE	A	900	3.0	2600	0.70	1.0	10 1/2"	DIRECT	I	480V/3ø/60HZ	150	
GEF-A5	ELECTRICAL ROOM	UPPER SUITE	E	480	0.375	1725	0.149	1/6	12 15/16"	DIRECT	I	115V/1ø/60HZ	70	
GEF-A6	ELECTRICAL ROOM	UPPER CONC	D	480	0.375	1550	–	1/8	–	DIRECT	I	115V/1ø/60HZ	30	
GEF-A7	ELECTRICAL ROOM	SERVICE LEVEL	E	240	0.375	1725	0.149	1/6	12 15/16"	DIRECT	I	115V/1ø/60HZ	30	
GEF-B1	ELEVATOR LOBBY	UPPER CONC	D	4620	0.50	1370	1.33	1 1/2	–	BELT	I	480V/1ø/60HZ	130	
GEF-B2	TRASH ROOM	MAIN CONC	J	970	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
GEF-B3	ELECTRIC ROOM	MAIN CONC	E	1420	0.375	1075	0.50	1/2	–	DIRECT	I	115V/1ø/60HZ	130	
GEF-B4	SUMP PIT	SERVICE	A	900	3.0	2600	0.70	1.0	10 1/2"	DIRECT	I	480V/3ø/60HZ	150	
GEF-B5	VENDING	MAIN CONC	J	940	0.375	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/3ø/60HZ	100	
GEF-B6	ELECTRICAL ROOM	UPPER CONC	D	480	0.375	1550	–	1/8	–	DIRECT	I	115V/1ø/60HZ	30	
GEF-B7	MECHANICAL ROOM	PRESS LEVEL	E	710	0.375	1075	–	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
GEF-B8	ELEV. LOBBY	UPPER CONC	D	1660	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
GEF-C1	TRASH ROOM	MAIN CONC	J	880	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
GEF-C2	ELECTRIC ROOM	MAIN CONC	E	1420	0.375	1075	0.50	1/2	–	DIRECT	I	115V/1ø/60HZ	130	
GEF-C3	ELECTRIC ROOM	UPPER CONC	D	480	0.375	1550	–	1/8	–	DIRECT	I	115V/1ø/60HZ	30	
GEF-C4	ELECTRIC ROOM	UPPER SUITE	E	480	0.375	1725	0.149	1/6	12 15/16"	DIRECT	I	115V/1ø/60HZ	70	
GEF-D1	TRASH ROOM	MAIN CONC	J	970	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
GEF-D2	ELECTRIC ROOM	MAIN CONC	E	1420	0.375	1075	0.50	1/2	–	DIRECT	I	115V/1ø/60HZ	130	
GEF-D3	ELECTRIC ROOM	UPPER CONC	D	480	0.375	1550	–	1/8	–	DIRECT	I	115V/1ø/60HZ	30	

SMOKE EXHAUST FAN SCHEDULE

DESIG	SERVICE	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA	DRIVE	AMCA CONSTRUCTION CLASS	ELECTRICAL	APPROX WEIGHT (LBS)	REMARKS
SEF-1	SERVICE LEVEL-QUAD A	C	12,500	1.5	800	5.2	7.5	33	BELT	I	480/3/60	480	INLINE-CENTRIFUGAL
SEF-2	SERVICE LEVEL-QUAD A	C	12,500	1.5	800	5.2	7.5	33	BELT	I	480/3/60	480	INLINE-CENTRIFUGAL
SEF-3	SERVICE LEVEL-QUAD B	C	12,500	1.5	800	5.2	7.5	33	BELT	I	480/3/60	480	INLINE-CENTRIFUGAL
SEF-4	SERVICE LEVEL-QUAD B	C	12,500	1.5	800	5.2	7.5	33	BELT	I	480/3/60	480	INLINE-CENTRIFUGAL
SEF-5	ATRIUM-QUAD A	B	26,000	1.5	1170	13.5	15.0	40	DIRECT	I	480/3/60	930	INLINE-VANEAXIAL
SEF-6	ATRIUM-QUAD A	A	24,000	1.5	800	12.5	15.0	40	BELT	I	480/3/60	1,230	VENT SET
SEF-7a	ATRIUM-QUAD B	B	32,000	1.5	1170	15.0	20.0	48	DIRECT	I	480/3/60	1,490	INLINE-VANEAXIAL
SEF-7b	ATRIUM-QUAD B	B	32,000	1.5	1170	15.0	20.0	48	DIRECT	I	480/3/60	1,490	INLINE-VANEAXIAL
SEF-8	ATRIUM-QUAD B	A	12,000	1.5	800	5.3	7.5	33	BELT	I	480/3/60	930	VENT SET
SEF-9	ATRIUM-QUAD B	A	24,000	1.5	800	12.5	15.0	40	BELT	I	480/3/60	1,230	VENT SET
SEF-10a	CLUB LEVEL-QUAD C	B	37,500	2.0	1170	17.0	20.0	48	DIRECT	I	480/3/60	1,490	INLINE-VANEAXIAL
SEF-10b	CLUB LEVEL-QUAD C	B	37,500	2.0	1170	17.0	20.0	48	DIRECT	I	480/3/60	1,490	INLINE-VANEAXIAL
SEF-11	ATRIUM-QUAD D	B	26,000	1.5	1170	13.5	15.0	40	DIRECT	I	480/3/60	930	INLINE-VANEAXIAL
SEF-12	ATRIUM-QUAD D	A	24,000	1.5	800	12.5	15.0	40	BELT	I	480/3/60	1,230	VENT SET

HEAT EXCHANGER SCHEDULE

DESIG	TUBE SIDE								SHELL SIDE					APPROX SIZE	CAPACITY
	GPM	EWT °F	LWT °F	TUBE VELOCITY	MAXIMUM PRESS DROP	No PASS	HEATING SURFACE	FOULING FACTOR	GPM	EWT °F	LWT °F	SHELL VELOCITY	MAXIMUM PRESS DROP		
HX-1	200	40	130	1.6 FPS	1.1 FT	4	761 SQ FT	0.001	300	200	140	2.1 FPS	4.8 FT	24"øx96"L	9000 MBH

STEAM / HEATING WATER CONVERTOR SCHEDULE

DESIG	HEATING WATER SIDE								STEAM SIDE			APPROX SIZE	CAPACITY
	GPM	EWT °F	LWT °F	TUBE VELOCITY	MAXIMUM PRESS DROP	No PASS	HEATING SURFACE	FOULING FACTOR	STEAM PRESSURE	SAT STEAM TEMP	COND LOAD		
C-1	1500	176	200	7.3 FPS	5.8 FT	2	337 SQ FT	0.001	60 PSIG	307 °F	49,200 MBH	22"øx60"L	16,400 MBH
C-2	1500	176	200	7.3 FPS	5.8 FT	2	337 SQ FT	0.001	60 PSIG	307 °F	49,200 MBH	22"øx60"L	16,400 MBH
C-3	1500	176	200	7.3 FPS	5.8 FT	2	337 SQ FT	0.001	60 PSIG	307 °F	49,200 MBH	22"øx60"L	16,400 MBH

DUPLEX CONDENSATE RETURN UNIT SCHEDULE

DESIG	LOCATION	CAPACITY SQ FT EDR	GPM	DISCHARGE HEAD PSIG	RECEIVER SIZE	PUMP DISCHARGE SIZE	MOTOR HP	RPM	ELECTRICAL V/PH/HZ	REMARKS
CRU-1	MECH 1.26.03	100,000	150	20	120 GAL	2"	2.0	1750	480/3/60	
CRU-2	MECH 1.26.03	100,000	150	20	120 GAL	2"	2.0	1750	480/3/60	

TOILET EXHAUST FAN SCHEDULE

DESIG	SERVICE	LEVEL	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA	DRIVE	AMCA CONSTRUCTION CLASS	ELECTRICAL	APPROX WEIGHT (LBS)	REMARKS
TEF-A1	TOILET/LOCKER	SERVICE	J	2400	0.50	1775	0.859	1	18 1/4"	DIRECT	I	480V/3ø/60HZ	100	
TEF-A2	TOILET/LOCKER	SERVICE	J	1500	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-A3	TOILET/LOCKER	SERVICE	J	3720	0.50	1725	1.729	2	20 15/16"	DIRECT	I	480V/3ø/60HZ	120	
TEF-A4	TOILET	MAIN CONC	J	1460	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-A5	TOILET	MAIN CONC	J	1900	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-A6	TOILET	MAIN CONC	J	2480	0.75	1725	1.729	2	20 15/16"	DIRECT	I	480V/3ø/60HZ	120	
TEF-A7	TOILET	MAIN CONC	E	200	0.375	1550	–	155 WATTS	–	DIRECT	I	115V/1ø/60HZ	40	
TEF-A8	NOT USED													
TEF-A9	TOILET	MAIN CONC	J	1460	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-A10	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-A11	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-A12	TOILET	UPPER CONC	D	1800	0.50	1075	0.42	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-A13	NOT USED													
TEF-A14	TOILET	UPPER CONC	D	960	0.50	1075	0.16	1/6"	–	DIRECT	I	115V/1ø/60HZ	80	
TEF-A15	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-A16	TOILET	UPPER CONC	D	3760	0.75	1020	0.90	1	–	BELT	I	480V/3ø/60HZ	140	
TEF-A17	TOILET	UPPER SUITE	J	800	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-A18	TOILET	UPPER SUITE	J	1040	0.50	1725	0.357	1/8	15 9/16"	DIRECT	I	115V/1ø/60HZ	90	
TEF-A19	TOILET	UPPER SUITE	J	450	0.375	1725	0.149	1/6	12 15/16"	DIRECT	I	115V/1ø/60HZ	70	
TEF-A20	TOILET	UPPER CONC	D	1360	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-A21	TOILET	UPPER CONC	D	1100	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-A22	TOILET	UPPER CONC	D	1180	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-A23	TOILET/TRASH	CLUB	J	1410	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-B1	TOILET/LOCKER	SERVICE	J	810	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-B2	TOILET	SERVICE	J	1395	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-B3	TOILET	SERVICE	J	1980	0.75	1725	0.859	1	18 1/4"	DIRECT	I	480V/3ø/60HZ	100	
TEF-B4	TOILET/LOCKER	SERVICE	J	225	0.375	1140	0.101	1/8	15 9/16"	DIRECT	I	115V/1ø/60HZ	90	
TEF-B5	TOILET	SERVICE	J	2675	0.50	1725	0.859	1	18 1/4"	DIRECT	I	480V/3ø/60HZ	100	
TEF-B6	TOILET/LOCKER	SERVICE	J	13270	0.75	780	4.91	7 1/2	42 3/16"	BELT	I	480V/3ø/60HZ	500	
TEF-B7	TOILET/LOCKER	SERVICE	J	7920	0.50	1075	3.02	5	31 9/16"	BELT	I	480V/3ø/60HZ	280	
TEF-B8	TOILET/LOCKER	SERVICE	J	8770	0.75	1190	4.17	5	31 9/16"	BELT	I	480V/3ø/60HZ	280	
TEF-B9	TOILET	MAIN CONC	J	1460	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-B10	TOILET	MAIN CONC	J	2060	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-B11	TOILET	UPPER SUITE	J	300	0.375	1140	0.101	1/8	15 9/16"	DIRECT	I	115V/1ø/60HZ	90	
TEF-B12	TOILET	MAIN CONC	J	2140	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-B13	TOILET	MAIN CONC	J	1700	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-B14	TOILET	UPPER CONC	D	3580	0.75	1020	0.90	1	–	BELT	I	480V/3ø/60HZ	140	
TEF-B15	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-B16	TOILET	CLUB/SUITE	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-B17	TOILET	UPPER CONC	D	2620	0.50	1140	0.82	3/4	–	DIRECT	I	480V/3ø/60HZ	110	
TEF-B18	TOILET	UPPER CONC	D	960	0.50	1075	0.16	1/6	–	DIRECT	I	115V/1ø/60HZ	80	
TEF-B19	TOILET	UPPER CONC	D	960	0.50	1075	0.16	1/6	–	DIRECT	I	115V/1ø/60HZ	80	
TEF-B20	TOILET	UPPER SUITE	J	940	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-B21	TOILET	UPPER SUITE	J	880	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-B22	TOILET	UPPER CONC	D	1540	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-B23	TOILET	UPPER CONC	D	1180	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-B24	TOILET	UPPER CONC	D	1180	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-B25	TOILET/TRASH	CLUB	J	570	0.375	1140	0.101	1/8	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-B26	TOILET	UPPER SUITE	E	100	0.375	1170	–	115 WATTS	–	DIRECT	I	115V/1ø/60HZ	20	
TEF-B27	TOILET	MAIN CONC	J	750	0.375	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-C1	TOILET	MAIN CONC	J	1460	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-C2	TOILET	MAIN CONC	J	2220	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-C3	TOILET	MAIN CONC	J	3240	0.75	1140	0.923	1	23 9/16"	DIRECT	I	480V/3ø/60HZ	170	
TEF-C4	TOILET	MAIN CONC	E	200	0.375	1550	–	155 WATTS	–	DIRECT	I	115V/1ø/60HZ	40	
TEF-C5	TOILET	PRESS	J	940	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-C6	TOILET	UPPER CONC	D	2620	0.50	1140	0.82	3/4	–	DIRECT	I	480V/3ø/60HZ	110	
TEF-C7	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-C8	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-C9	TOILET	UPPER CONC	D	5060	0.50	1010	1.17	1 1/2	–	BELT	I	480V/3ø/60HZ	260	
TEF-C10	TOILET	UPPER CONC	D	1360	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-C11	TOILET	UPPER CONC	D	960	0.50	1075	0.16	1/6	–	DIRECT	I	115V/1ø/60HZ	80	
TEF-C12	TOILET	UPPER SUITE	J	800	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-C13	TOILET	UPPER SUITE	J	1020	0.50	1725	0.357	1/3	15 9/16"	DIRECT	I	115V/1ø/60HZ	90	
TEF-C14	TOILET/TRASH	CLUB	J	1230	0.50	1725	0.357	1/3	15 9/16"	DIRECT	I	115V/1ø/60HZ	90	
TEF-C15	TOILET	MAIN CONC	E	200	0.375	1550	–	155 WATTS	–	DIRECT	I	115V/1ø/60HZ	40	
TEF-C16	TOILET	UPPER CONC	D	1200	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-C17	TOILET	UPPER CONC	D	1180	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-C18	TOILET	UPPER CONC	D	1540	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-C19	NOT USED	–	–	–	–	–	–	–	–	–	–	–	–	
TEF-C20	TOILET	UPPER SUITE	J	400	0.375	1140	0.101	1/8	15 9/16"	DIRECT	I	115V/1ø/60HZ	90	
TEF-C21	TOILET	UPPER CONC	D	480	0.50	1550	–	1/8	–	DIRECT	I	115V/1ø/60HZ	30	
TEF-D1	TOILET	MAIN CONC	J	3440	0.75	1140	0.923	1	23 9/16"	DIRECT	I	480V/3ø/60HZ	170	
TEF-D2	TOILET	UPPER CONC	D	1180	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-D3	TOILET	UPPER CONC	D	1540	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-D4	TOILET	MAIN CONC	J	2140	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-D5	TOILET	MAIN CONC	J	1700	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-D6	TOILET	UPPER CONC	D	3720	0.75	870	0.81	3/4	–	BELT	I	480V/3ø/60HZ	240	
TEF-D7	TOILET	UPPER CONC	D	1900	0.50	1075	0.42	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-D8	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-D9	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-D10	TOILET	UPPER CONC	D	960	0.50	1075	0.16	1/6	–	DIRECT	I	115V/1ø/60HZ	80	
TEF-D11	TOILET	UPPER CONC	D	1740	0.50	1075	0.26	1/3	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-D12	TOILET	UPPER SUITE	J	450	0.375	1140	0.101	1/8	–	DIRECT	I	115V/1ø/60HZ	90	
TEF-D13	TOILET	UPPER SUITE	J	940	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-D14	TOILET	UPPER SUITE	J	800	0.50	1140	0.248	1/4	18 1/4"	DIRECT	I	115V/1ø/60HZ	100	
TEF-D15	TOILET/TRASH	CLUB	J	1440	0.50	1140	0.498	1/2	20 15/16"	DIRECT	I	115V/1ø/60HZ	120	
TEF-D16	TOILET	UPPER CONC	D	1560	0.50	1725	0.34	1/3	–	DIRECT	I	115V/1ø/60HZ	70	
TEF-D17	TOILET	UPPER SUITE	E	100	0.375	1170	–	115 WATTS	–	DIRECT	I	115V/1ø/60HZ	20	

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323 West 8th Street, Suite700
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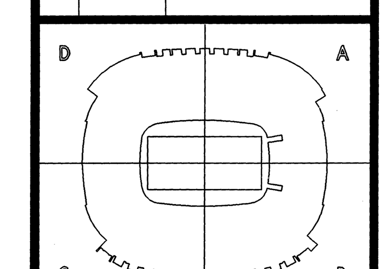
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY:	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL SCHEDULE

CATEGORY - SUB-CATEGORY - SHEET
M.0-03

3.97-11:27-5110M03 - RMF #95110

KITCHEN FAN SCHEDULE

DESIG	SERVICE ROOM No	LEVEL	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA	DRIVE	ELECTRICAL	REMARKS
KEF-1A	6.13.01	UPPER SUITE	G	2,500	1.75	2,830	1.60	2.0	12	BELT	480V/3ø/60HZ	NOTE 1
KEF-2A	7.02.01	UPPER CONCOURSE	G	5,000	1.75	2,150	3.33	5.0	16	BELT	480V/3ø/60HZ	NOTE 1
KEF-3A	1.08.01 & 4.08.05	CLUB LEVEL	G	2,875	2.25	2,510	2.05	3.0	13	BELT	480V/3ø/60HZ	NOTE 1
KEF-4A	4.08.01 & 4.08.05	CLUB LEVEL	G	5,400	3.00	1,960	4.40	5.0	18	BELT	480V/3ø/60HZ	NOTE 1
KEF-5A	4.08.01 & 4.08.06	CLUB LEVEL	G	3,600	2.75	2,350	2.92	5.0	15	BELT	480V/3ø/60HZ	NOTE 1
KEF-6A	4.08.01 & 4.08.07	CLUB LEVEL	G	1,600	2.75	2,780	1.25	2.0	10	BELT	480V/3ø/60HZ	NOTE 1
KEF-1B	2.19.01	MAIN CONCOURSE	G	7,500	3.5	1,665	6.36	7.5	22	BELT	480V/3ø/60HZ	NOTE 1
KEF-3B	6.15.01	UPPER SUITE	G	5,000	1.75	2,150	3.33	5.0	16	BELT	480V/3ø/60HZ	NOTE 1
KEF-4B	7.23.01	UPPER CONCOURSE	G	5,000	1.75	2,150	3.33	5.0	16	BELT	480V/3ø/60HZ	NOTE 1
KEF-2B	4.19.01	CLUB LEVEL	G	2,875	2.25	2,510	2.05	3.0	13	BELT	480V/3ø/60HZ	NOTE 1
KEF-2C	6.40.01	UPPER SUITE	G	2,500	1.75	2,830	1.60	2.0	12	BELT	480V/3ø/60HZ	NOTE 1
KEF-3C	7.32.01	UPPER CONCOURSE	G	2,500	1.75	2,830	1.60	2.0	12	BELT	480V/3ø/60HZ	NOTE 1
KEF-1D	2.46.01	MAIN CONCOURSE	G	2,500	1.75	2,830	1.82	3.0	16	BELT	480V/3ø/60HZ	NOTE 1
KEF-2D	6.42.01	UPPER SUITE	G	5,000	1.75	2,150	3.33	5.0	16	BELT	480V/3ø/60HZ	NOTE 1
KEF-3D	7.52.01	UPPER CONCOURSE	G	2,500	1.75	2,830	1.60	2.0	12	BELT	480V/3ø/60HZ	NOTE 1
KEF-8A	COMMISSARY	SERVICE LEVEL	C	1,400	2.75	2,780	1.25	2.0	10	BELT	480V/3ø/60HZ	
KEF-9A	2.01.02	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-10A	2.04.01	MAIN CONCOURSE	A	1,480	2.50	2,340	1.00	1.5	12 1/4	BELT	480V/3ø/60HZ	
KEF-11A	2.10.02	MAIN CONCOURSE	G	5,000	3.50	1,490	4.29	5.0	22	BELT	480V/3ø/60HZ	NOTE 1
KEF-12A	2.12.01	MAIN CONCOURSE	G	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	NOTE 1
KEF-13A	6.08.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-14A	6.09.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-15A	6.10.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-16A	7.05.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-17A	7.05.02	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-18A	7.06.02	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-5B	2.16.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-6B	2.24.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-7B	2.25.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-8B	6.18.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-9B	6.19.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-10B	7.21.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-11B	7.22.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-12B	7.25.02	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-4C	2.30.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-5C	2.31.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-6C	2.34.01	MAIN CONCOURSE	G	10,000	3.50	1,280	7.50	10	27	BELT	480V/3ø/60HZ	NOTE 1
KEF-7C	2.38.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-8C	4.35.05	CLUB LEVEL PANTRY	G	2,875	3.50	2,250	2.40	3	15	BELT	480V/3ø/60HZ	NOTE 1
KEF-9C	6.35.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-10C	6.36.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-11C	6.37.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-12C	7.28.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-13C	7.32.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-14C	7.33.02	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-4D	2.43.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-5D	2.50.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-6D	2.53.01	MAIN CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-7D	4.46.03	CLUB LEVEL PANTRY	G	2,875	3.50	2,250	2.40	3	15	BELT	480V/3ø/60HZ	NOTE 1
KEF-8D	6.45.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-9D	6.46.01	UPPER SUITE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-10D	7.48.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-11D	7.48.04	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	120V/1ø/60HZ	
KEF-12D	7.49.01	UPPER CONCOURSE	A	650	1.25	1,470	0.23	1/3	9 3/16	BELT	480V/3ø/60HZ	
KEF-13D	2.46.01	MAIN CONCOURSE	G	5,000	3.50	1,685	4.29	5	20	BELT	480V/3ø/60HZ	NOTE 1

NOTE:

1. FAN SHALL BE UL 762 APPROVED FOR MAXIMUM 375 DEGREES FARENHEIT, EQUIPPED WITH HINGED ACCESS DOOR AND DRAIN CONNECTION.

FILTER SCHEDULE

DESIG	SERVES	TYPE	NOM CFM	APPROX BANK DIMENSION LxHxD	No CARTRIDGES	CARTRIDGE SIZE LxHxD	FACE VEL FPM	MEDIA AREA PER CARTRIDGE	MAXIMUM INITIAL PD IN WG	EFFICIENCY	REMARKS
F-1-1	AHU-1	B	18200	100"x60"x12"	15	20"x20"x12"	436	39.0 SQ FT	0.29	60%	
F-1-1A	AHU-1	A	18200	100"x60"x2"	15	20"x20"x2"	436	4.6 SQ FT	0.28	30%	
F-2-1	AHU-2	B	18200	100"x60"x12"	15	20"x20"x12"	436	39.0 SQ FT	0.29	60%	
F-2-1A	AHU-2	A	18200	100"x60"x2"	15	20"x20"x2"	436	4.6 SQ FT	0.28	30%	
F-3-1	AHU-3	B	27500	100"x80"x12"	20	20"x20"x12"	494	39.0 SQ FT	0.29	60%	
F-3-1A	AHU-3	A	27500	100"x80"x2"	20	20"x20"x2"	494	4.6 SQ FT	0.28	30%	
F-4-1	AHU-4	B	27500	100"x80"x12"	20	20"x20"x12"	494	39.0 SQ FT	0.29	60%	
F-4-1A	AHU-4	A	27500	100"x80"x2"	20	20"x20"x2"	494	4.6 SQ FT	0.28	30%	
F-5-1	AHU-5	B	27500	100"x80"x12"	20	20"x20"x12"	494	39.0 SQ FT	0.29	60%	
F-5-1A	AHU-5	A	27500	100"x80"x2"	20	20"x20"x2"	494	4.6 SQ FT	0.28	30%	
F-6-1	AHU-6	B	27500	100"x80"x12"	20	20"x20"x12"	494	39.0 SQ FT	0.29	60%	
F-6-1A	AHU-6	A	27500	100"x80"x2"	20	20"x20"x2"	494	4.6 SQ FT	0.28	30%	
F-7-1	AHU-7	B	18200	100"x60"x12"	15	20"x20"x12"	436	39.0 SQ FT	0.29	60%	
F-7-1A	AHU-7	A	18200	100"x60"x2"	15	20"x20"x2"	436	4.6 SQ FT	0.28	30%	
F-8-1	AHU-8	B	18200	100"x60"x12"	15	20"x20"x12"	436	39.0 SQ FT	0.29	60%	
F-8-1A	AHU-8	A	18200	100"x60"x2"	15	20"x20"x2"	436	4.6 SQ FT	0.28	30%	
F-9-1	AHU-9	B	13300	96"x48"x12"	8	24"x24"x12"	416	39.0 SQ FT	0.30	60%	NOTE 1
F-9-1A	AHU-9	A	13300	96"x48"x2"	8	24"x24"x2"	416	4.6 SQ FT	0.20	30%	NOTE 1
F-10-1	AHU-10	A	1800	32"x40"x2"	4	20"x16"x2"	202	4.6 SQ FT	0.20	30%	NOTE 1,2
F-11-1	AHU-11	A	2900	40"x40"x2	4	20"x20"x2"	261	4.6 SQ FT	0.20	30%	NOTE 1,2
F-12-1	AHU-12	A	3000	40"x40"x2"	4	20"x20"x2"	270	4.6 SQ FT	0.20	30%	NOTE 1,2
F-13-1	AHU-13	A	1600	20"x32"x2"	2	20"x16"X2"	364	4.6 SQ FT	0.20	30%	NOTE 1,2
F-14-1	AHU-14	A	2500	32"x40"x2"	4	20"x16"x2"	280	4.6 SQ FT	0.20	30%	NOTE 1,2
F-15-1	AHU-15	B	9300	80"x40"x12"	8	20"x20"x12"	419	39.0 SQ FT	0.30	60%	NOTE 1
F-15-1A	AHU-15	A	9300	80"x40"x2"	8	20"x20"x2"	419	4.6 SQ FT	0.20	30%	NOTE 1
F-16-1	AHU-16	B	8100	80"x40"x12"	8	20"x20"x12"	365	39.0 SQ FT	0.30	60%	NOTE 1
F-16-1A	AHU-16	A	8100	80"x40"x2"	8	20"x20"x2"	365	4.6 SQ FT	0.20	30%	NOTE 1
F-17-1	AHU-17	B	12900	96"x48"x12"	8	20"x20"x12"	403	39.0 SQ FT	0.30	60%	NOTE 1
F-17-1A	AHU-17	A	12900	96"x48"x2"	8	20"x20"x2"	403	4.6 SQ FT	0.20	30%	NOTE 1,2
F-18-1	AHU-18	A	2600	32"x40"x2"	4	20"x16"x2"	292	4.6 SQ FT	0.20	30%	NOTE 1,2
F-20-1	AHU-20	A	9700	80"x40"x2"	8	20"x20"x2"	437	4.6 SQ FT	0.20	30%	NOTE 1,2
F-21-1	AHU-21	A	11300	72"x48"x2"	6	24"x24"x2"	471	4.6 SQ FT	0.20	30%	NOTE 1,2
F-22-1	AHU-22	A	11300	72"x48"x2"	6	24"x24"x2"	471	4.6 SQ FT	0.20	30%	NOTE 1,2
F-23-1	AHU-23	A	9700	80"x40"x2"	8	20"x20"x2"	437	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-1	HVU-1	A	16300	96"x60"x2"	12	24"x20"x2"	408	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-2	HVU-2	A 3	13000	95"x64"x2"	12 4	16"x25"x2" 16"x20"x2"	308	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-3	HVU-3	A	6000	60"x40"x2"	6	20"x20"x2"	360	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-4	HVU-4	A	2000	32"x40"x2"	4	16"x20"x2"	225	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-5	AHU-23	A	6600	76"x40"x2"	6 2	20"x20"x2" 16"x20"x2"	313	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-6	HVU-6	A	3300	32"x40"x2"	4	16"x20"x2"	259	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-7	HVU-7	A	5700	60"x40"x2"	6	20"x20"x2"	342	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-8	HVU-8	A	2700	32"x40"x2"	4	16"x20"x2"	304	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-9	HVU-9	A	3200	40"x40"x2	4	20"x20"x2"	288	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-10	HVU-10	A	8800	84"x50"x2"	8 2	16"x25"x2" 20"x25"x2"	302	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-11	HVU-11	A	5800	60"x40"x2"	6	20"x20"x2"	348	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-12	HVU-12	A	5800	60"x40"x2"	6	20"x20"x2"	348	4.6 SQ FT	0.20	30%	NOTE 1,2
F-V-13	HVU-13	A	2700	32"x40"x2"	4	16"x20"x2"	520	4.6 SQ FT	0.20	30%	NOTE 1,2
F-A-1	ELEC RM	A	32,000	72"x144"x2"	18	24"x24"x2"	444	4.6 SQ FT	0.20	30%	PRESS QUAD-A
F-B-1	ELEC RM	A	32,000	72"x144"x2"	18	24"x24"x2"	444	4.6 SQ FT	0.20	30%	PRESS QUAD-B
F-C-1	ELEC RM	A	32,000	72"x144"x2"	18	24"x24"x2"	444	4.6 SQ FT	0.20	30%	PRESS QUAD-C
F-D-1	ELEC RM	A	32,000	72"x144"x2"	18	24"x24"x2"	444	4.6 SQ FT	0.20	30%	PRESS QUAD-D
F-B-2	ELEC RM	A	50000	192"x72"x2"	24	24"x24"x2"	520	4.6 SQ FT	0.20	30%	MAIN CONCOURSE-B

NOTES:

1. PROVIDED BY AHU MANUFACTURER.
2. FILTER/MIXING BOX.

COIL PIPE SCHEDULE

DESIG	No COILS IN BANK	RUNOUT PIPE SIZE (A)	BANK HEADER PIPE SIZE (B)	MAIN PIPE SIZE (B)	REMARKS
CC-1	2	3	4	4	AHU-1
HC-1	2	1.5	2	2	AHU-1
CC-2	2	3	4	4	AHU-2
HC-2	2	1.5	2	2	AHU-2
CC-3	2	3	4	4	AHU-3
HC-3	2	1.5	2	2	AHU-3
CC-4	2	3	4	4	AHU-4
HC-4	2	1.5	2	2	AHU-4
CC-5	2	3	4	4	AHU-5
HC-5	2	1.5	2	2	AHU-5
CC-6	2	3	4	4	AHU-6
HC-6	2	1.5	2	2	AHU-6
CC-7	2	3	4	4	AHU-7
HC-7	2	1.5	2	2	AHU-7
CC-8	2	3	4	4	AHU-8
HC-6	2	1.5	2	2	AHU-8

DUCT HEATING COIL SCHEDULE

DESIG No	CFM	APPROX SIZE LxH	MAX AIR PD (IN H_2O)	EAT °F	LAT °F	BTUH @200°F EWT	MAX H_2O PD (FT H_2O)	ROWS	GPM * @30°F ΔT	REMARKS
RH-1	670	18"x9"	.20	55	90	25300	1.0	1	1.9	
RH-2	800	34"x8"	.10	55	90	30200	1.0	1	2.2	
RH-3	1825	38"x12"	.20	55	90	69000	1.0	1	5.0	
RH-4	525	14"x9"	.20	55	90	19800	1.0	1	1.4	
RH-5	495	14"x9"	.20	55	90	18700	1.0	1	1.3	
RH-6	500	14"x9"	.20	55	90	18900	1.0	1	1.4	
RH-7	260	12"x6"	.20	55	90	9800	1.0	1	0.8	
RH-8	315	14"x6"	.20	55	90	11900	1.0	1	0.9	
RH-9	180	6"x10"	.20	55	90	6800	1.0	1	0.6	
RH-10	160	6"x10"	.10	55	90	6000	1.0	1	0.5	
RH-11	160	6"x10"	.10	55	90	6000	1.0	1	0.5	
RH-12	935	26"x12"	.10	55	90	35300	2.0	1	2.6	
RH-13	110	8"x6"	.10	55	90	4200	1.0	1	0.5	
RH-14	760	24"x9"	.20	55	90	28700	1.0	1	2.1	
RH-15	1120	30"x9"	.20	55	90	42300	2.0	1	3.1	
RH-16	970	20"x12"	.20	55	90	36700	2.0	1	2.6	
RH-17	545	16"x9"	.20	55	90	20600	1.0	1	1.5	
RH-18	85	6"x6"	.10	55	90	3200	1.0	1	0.5	
RH-19	1310	30"x12"	.20	55	90	49500	4.0	1	3.6	
RH-20	1310	30"x12"	.20	55	90	49500	4.0	1	3.6	
RH-21	370	16"x6"	.20	55	90	14000	1.0	1	1.0	
RH-22	1000	28"x9"	.20	55	90	37800	2.0	1	2.7	
RH-23	560	24"x6"	.20	55	90	21200	1.0	1	1.5	
RH-24	1120	24"x12"	.20	55	90	42300	2.0	1	3.1	
RH-25	680	20"x9"	.20	55	90	25700	1.0	1	1.9	
RH-26	765	22"x9"	.20	55	90	28900	1.0	1	2.1	
RH-27	880	20"x12"	.20	55	90	33300	1.0	1	2.5	
RH-28	720	18"x12"	.20	55	90	27300	1.0	1	2.0	

* 40% EG SOLUTION

HOK SPORT

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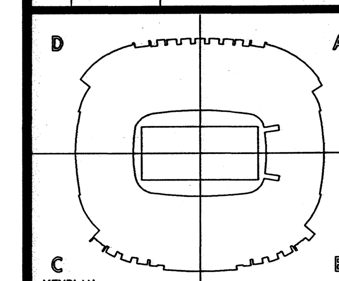
PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	7-9-97	BULLETIN #58
4	7-25-97	BULLETIN #71



KEYPLAN

PROJECT NO. 95-675-00 | ISSUED BY: ---
DRAWN BY: | REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
MECHANICAL SCHEDULE

CATEGORY - SUB-CATEGORY - SHEET
M.0-04

UNIT HEATER SCHEDULE (ELECTRIC)

DESIG	NOMINAL CFM	REQUIRED MBH	KW	TEMP RISE °F	MOTOR HP	RPM	ELECTRICAL	REMARKS
UH-1	715	34.1	10.0	44	1/15	1550	480V/3ø/60HZ	
UH-2	540	25.6	7.5	44	1/25	1550	480V/3ø/60HZ	
UH-3	1250	51.3	15.0	38	1/4	1550	480V/3ø/60HZ	
UH-4	315	17.1	5.0	50	1/50	1550	480V/3ø/60HZ	

CONVECTOR SCHEDULE

DESIG	REQUIRED MBH	KW	ELECTRICAL	REMARKS
1	6.8	2	277V/1ø/60HZ	
2	10.2	3	277V/1ø/60HZ	
3	13.7	4	277V/1ø/60HZ	
4	3.4	1	277V/1ø/60HZ	

HEAT PUMP UNIT SCHEDULE

DESIG	DUTY	CFM	FAN SECTION MIN. OA CFM	FAN SECTION TSP INCH H_2O	FAN SECTION MOTOR HP	RPM	WHEEL DIA INCH	COOLING SECTION EAT °F DB	EAT °F WB	LAT °F DB	LAT °F WB	TOTAL MBH	SENS MBH	MAXIMUM AIR PD IN H_2O	HEATING SECTION HEAT PUMP MBH ΔT 17°F	RESISTANCE HEAT MBH	RESISTANCE HEAT KW	RESISTANCE HEAT EAT °F DB	RESISTANCE HEAT LAT °F DB	CONDENSER SECTION No OF COMP	COND FAN HP	TOTAL UNIT AMP	ELECTRICAL	REMARKS
HPU-1	TICKETS C – MAIN CONC.	4030	400	2.20	5	980	15x15	77.8	52.2	54.0	52.2	143.3	103.6	–	–	184.3	54	69.0	111.3	2	1	65	480V/3ø/60HZ	
HPU-2	FIRST AID A – MAIN CONC.	920	90	1.50	1/3	960	10x8	77.8	52.2	54.0	53.0	26.9	21.9	0.4	18.0	52.5	15	70.0	121.5	1	1	62.4	480V/3ø/60HZ	
HPU-3	FIRST AID C – MAIN CONC.	920	90	1.50	1/3	960	10x8	77.8	52.2	54.0	53.0	26.9	21.9	0.4	18.0	52.5	15	70.0	121.5	1	1	62.4	480V/3ø/60HZ	
HPU-4	NOVELTY B – MAIN CONC.	1140	110	1.50	1/3	960	10x8	77.8	52.2	54.0	52.2	36.4	27.1	–	18.0	52.5	15	70.0	111.6	1	1	–	480V/3ø/60HZ	
HPU-5	NOVELTY B – MAIN CONC.	1140	110	1.50	1/3	960	10x8	77.8	52.2	54.0	53.0	36.4	27.1	–	18.0	52.5	15	70.0	111.6	1	1	–	480V/3ø/60HZ	
HPU-6	NOVELTY D – MAIN CONC.	1140	110	1.50	1/3	960	10x8	77.8	52.2	54.0	53.0	36.4	27.1	–	18.0	52.5	15	70.0	111.6	1	1	–	480V/3ø/60HZ	
HPU-7	NOVELTY D – MAIN CONC.	1140	110	1.50	1/3	960	10x8	77.8	52.2	54.0	53.0	36.4	27.1	–	18.0	52.5	15	70.0	111.6	1	1	–	480V/3ø/60HZ	
HPU-8	TV/AV-A	1070	0	1.00	1/2	980	9X4	76.0	53.0	54.0	53.0	31.8	25.4	–	22.6	–	–	74.0	93.6	REFER TO ACCU-8 SCH.			115V/1ø/60HZ	SPLIT SYSTEM
HPU-9	TV/AV-B	1070	0	1.00	1/2	980	9X4	76.0	53.0	54.0	52.2	31.8	25.4	–	22.6	–	–	74.0	93.6	REFER TO ACCU-9 SCH.			115V/1ø/60HZ	SPLIT SYSTEM
HPU-10	TV/AV-C	1070	0	1.00	1/2	960	9X4	76.0	53.0	54.0	53.0	31.8	25.4	–	22.6	–	–	74.0	93.6	REFER TO ACCU-10 SCH.			115V/1ø/60HZ	SPLIT SYSTEM
HPU-11	TV/AV-D	1070	0	1.00	1/2	960	9X4	76.0	53.0	54.0	53.0	31.8	25.4	–	22.6	–	–	74.0	93.6	REFER TO ACCU-11 SCH.			115V/1ø/60HZ	SPLIT SYSTEM
HPU-12	FIRST AID B	430	0	–	0.5 AMP	–	–	76.0	53.0	–	–	14.3	–	–	8.7	5.1	1.5	74.0	103.7	REFER TO ACCU-12 SCH.			115V/1ø/60HZ	SPLIT SYSTEM
HPU-13	FIRST AID D	430	0	–	0.5 AMP	–	–	76.0	53.0	–	–	14.3	–	–	8.7	5.1	1.5	74.0	103.7	REFER TO ACCU-13 SCH.			115V/1ø/60HZ	SPLIT SYSTEM
HPU-14	SCORE BOARD CONTROL A	7300	750	2.25	7.5	1000	15X15	77.8	52.2	54.0	53.0	249.7	187.6	–	–	126.2	38.0	69.0	85.0	REFER TO ACCU-14 SCH.			115V/1ø/60HZ	SPLIT SYSTEM

PUMP SCHEDULE

DESIG	DUTY	TYPE	GPM	HEAD FEET H_2O	SUCTION X DISCHARGE	MOTOR BHP	MOTOR HP	RPM	% EFFICIENCY	ELECTRICAL	REMARKS
P-1	SECONDARY CHW	B	1650	160	8"x8"	81	100	1780	81%	460V/3ø/60HZ	VSD
P-2	SECONDARY CHW	B	1650	160	8"x8"	81	100	1780	81%	460V/3ø/60HZ	VSD
P-3	SECONDARY CHW	B	1650	160	8"x8"	81	100	1780	81%	460V/3ø/60HZ	VSD
P-4	PRIMARY HTG WATER	B	1500	50	10"x8"	22.7	25	1175	83%	460V/3ø/60HZ	VSD
P-5	PRIMARY HTG WATER	B	1500	50	10"x8"	22.7	25	1175	83%	460V/3ø/60HZ	VSD
P-6	PRIMARY HTG WATER	B	1500	50	10"x8"	22.7	25	1175	83%	460V/3ø/60HZ	VSD
P-7	SECONDARY HTG WATER	B	1300	130	8"x6"	53.3	75	1780	79%	460V/3ø/60HZ	VSD
P-8	SECONDARY HTG WATER	B	1300	130	8"x6"	53.3	75	1780	79%	460V/3ø/60HZ	VSD
UDP-1	PRIMARY CHW	–	3300	–	–	–	–	–	–	–	BY OTHERS
UDP-2	PRIMARY CHW	–	3300	–	–	–	–	–	–	–	BY OTHERS

AIR COOLED HEAT PUMP CONDENSING UNIT SCHEDULE

DESIG.	OUTDOOR FAN CFM	No MOTOR	MOTOR SIZE	RPM	FLA EACH	LRA EACH	ELECTRIC	COMPRESSOR No	RLA	LRA	OUTDOOR COIL OUTDOOR TEMP °F DB	TOTAL FACE AREA	No ROWS	FINS/INCH	REMARKS
ACCU-8	2700	1	1/4	850	1.6	3.5	480V/3ø/60HZ	1	20.5	107.0	95	14.6	2	13	
ACCU-9	2700	1	1/4	850	1.6	3.5	480V/3ø/60HZ	1	20.5	107.0	95	14.6	2	13	
ACCU-10	2700	1	1/4	850	1.6	3.5	480V/3ø/60HZ	1	20.5	107.0	95	14.6	2	13	
ACCU-11	2700	1	1/4	850	1.6	3.5	480V/3ø/60HZ	1	20.5	107.0	95	14.6	2	13	
ACCU-12	–	1	–	–	0.5	–	115V/1ø/60HZ	1	10.0	35.0	95	–	–	–	
ACCU-13	–	1	–	–	0.5	–	115V/1ø/60HZ	1	10.0	35.0	95	–	–	–	
ACCU-14	17100	3	3/4	1075	3.5	–	480V/3ø/60HZ	1	10.0	214.0	95	38.8	3	12	

SOUND ATTENUATOR SCHEDULE

DESIG	DUTY	No ATTEN	SIZE LxWxH IN. (EACH)	CAPACITY CFM TOTAL	MAXIMUM PD INCH H_2O	FACE VELOCITY FPM	MIN. DB REDUCTION BY OCTAVE BAND 2	3	4	5	6	7	8	REMARKS
SA-1-1	AHU-1 SUPPLY	1	36"x36"x36"	18200	0.20	2022	5	9	14	23	24	14	10	IAC 3L
SA-2-1	AHU-2 SUPPLY	1	36"x36"x36"	18200	0.20	2022	5	9	14	23	24	14	10	IAC 3L
SA-3-1	AHU-3.4 SUPPLY	4	36"x24"x36"	55000	0.30	2290	7	12	15	15	10	9	8	IAC 3LFL
SA-5-1	AHU-5.6 SUPPLY	4	36"x24"x36"	55000	0.30	2290	7	12	15	15	10	9	8	IAC 3LFL
SA-7-1	AHU-7.8 SUPPLY	3	36"x24"x30"	36400	0.30	2000	7	12	15	15	10	9	8	IAC 3LFL
SA-1-2	RF-1 DUCT	2	36"x24"X30"	20600	0.20	1650	7	13	17	16	11	11	10	IAC 3LFL
		1	36"x12"x30"											
SA-3-2	RF-3 DUCT	3	36"x24"x42"	44000	0.30	2095	7	13	17	16	11	11	10	IAC 3LFL
SA-5-2	RF-5 DUCT	3	36"x24"x42"	44000	0.30	2095	7	13	17	16	11	11	10	IAC 3LFL
SA-7-2	RF-7 DUCT	3	36"x24"x30"	27400	0.20	1570	7	13	17	16	11	11	10	IAC 3LFL
		1	36"x12"x30"											
SA-1-3	RF-1 DISCHARGE	1	32"x48"x48"	20600	–	–	9	16	18	19	14	10	10	IAC D-DUCT
SA-3-3	RF-3 DISCHARGE	1	48"x72"x72"	44000	–	–	9	17	19	17	12	12	10	IAC D-DUCT
SA-5-3	RF-5 DISCHARGE	1	48"x72"x72"	44000	–	–	9	17	19	17	12	12	10	IAC D-DUCT
SA-7-3	RF-7 DISCHARGE	1	38"x58"x58"	27400	–	–	10	16	20	17	14	12	10	IAC D-DUCT

KITCHEN EXHAUST UNIT SCHEDULE

DESIG	SERVICE ROOM No	LEVEL	TYPE	CFM	SP INCH H_2O	APPROX RPM	BHP	HP MOTOR SIZE	DRIVE	ELECTRICAL V/PH/HZ	APPROX WEIGHT	REMARKS
KEU-1A	2.10.02	MAIN CONCOURSE	A	5000	2	1840	5.20	7.5	BELT	480V/3ø/60HZ	3360	
KEU-1B	2.19.01	MAIN CONCOURSE	A	5000	2	1840	5.20	7.5	BELT	480V/3ø/60HZ	3360	
KEU-1C	2.34.01	MAIN CONCOURSE	A	5000	2	1840	5.20	7.5	BELT	480V/3ø/60HZ	3360	
KEU-2C	22.34.01	MAIN CONCOURSE	A	5000	2	1840	5.20	7.5	BELT	480V/3ø/60HZ	3360	
KEU-3C	4.35.03	CLUB	A	2875	2	2960	3.10	5.0	BELT	480V/3ø/60HZ	2700	
KEU-1D	2.46.01	MAIN CONCOURSE	A	5000	2	1840	5.20	7.5	BELT	480V/3ø/60HZ	3360	
KEU-2D	4.46.03	CLUB	A	2875	2	2960	3.10	5.0	BELT	480V/3ø/60HZ	2700	

COIL PUMP SCHEDULE

DESIG	DUTY	TYPE	GPM	HEAD FEET H_2O	SUCTION X DISCHARGE	MOTOR BHP	MOTOR HP	RPM	% EFFICIENCY	ELECTRICAL	REMARKS
CCP-1	AHU-1 COOLING OIL	C	197	51	2.5"x2.5"	4.2	5.0	1760	60%	460V/3ø/HZ	
CCP-2	AHU-2 COOLING COIL	C	197	51	2.5"x2.5"	4.2	5.0	1760	60%	460V/3ø/HZ	
CCP-3	AHU-3 COOLING COIL	C	280	51	3"x3"	5.0	7.5	1760	73%	460V/3ø/HZ	
CCP-4	AHU-4 COOLING COIL	C	280	51	3"x3"	5.0	7.5	1760	73%	460V/3ø/HZ	
CCP-5	AHU-5 COOLING COIL	C	295	51	3"x3"	5.3	7.5	1760	72%	460V/3ø/HZ	
CCP-6	AHU-6 COOLING COIL	C	295	51	3"x3"	5.3	7.5	1760	72%	460V/3ø/HZ	
CCP-7	AHU-7 COOLING COIL	C	201	50	2.5"x2.5	4.3	5.0	1760	60%	460V/3ø/HZ	
CCP-8	AHU-8 COOLING COIL	C	201	50	2.5"x2.5"	4.3	5.0	1760	60%	460V/3ø/HZ	
CCP-9	AHU-9 COOLING COIL	C	102	40	2"x2"	1.6	3.0	1750	63%	460V/3ø/HZ	
CCP-10	AHU-10 COOLING COIL	C	21	38	1.5"x1.5"	0.5	1.0	1750	43%	460V/3ø/HZ	
CCP-11	AHU-11 COOLING COIL	C	19	34	1.5"x1.5"	0.4	1.0	1760	41%	460V/3ø/HZ	
CCP-12	AHU-12 COOLING COIL	C	19	37	1.5"x2.5"	0.4	1.0	1760	40%	460V/3ø/HZ	
CCP-13	AHU-13 COOLING COIL	C	8	46	1.5"x1.5"	0.7	1.5	1760	17%	460V/3ø/HZ	
CCP-14	AHU-14 COOLING COIL	C	28	35	1.5"x1.5"	0.5	1.0	1760	49%	460V/3ø/HZ	
CCP-15	AHU-15 COOLING COIL	C	104	30	2"x2"	1.3	2.0	1750	62%	460V/3ø/HZ	
CCP-16	AHU-16 COOLING COIL	C	91	31	2"x2"	1.0	1.5	1750	71%	460V/3ø/HZ	
CCP-17	AHU-17 COOLING COIL	C	144	30	2"x2"	1.7	3.0	1750	63%	460V/3ø/HZ	
CCP-18	AHU-18 COOLING COIL	C	12	44	1.5"x1.5"	0.7	1.5	1760	20%	460V/3ø/HZ	
CCP-19	AHU-19 COOLING COIL	C	8	40	1.5"x1.5"	0.4	1.5	1750	25%	460V/3ø/HZ	
CCP-20	AHU-20 COOLING COIL	C	44	31	1.5"x1.5"	0.6	1.5	1750	55%	460V/3ø/HZ	
CCP-21	AHU-21 COOLING COIL	C	51	31	2"x2"	0.7	1.5	1750	59%	460V/3ø/HZ	
CCP-22	AHU-22 COOLING COIL	C	51	31	2"x2"	0.7	1.5	1750	59%	460V/3ø/HZ	
CCP-23	AHU-23 COOLING COIL	C	44	31	1.5"x1.5"	0.6	1.5	1750	55%	460V/3ø/HZ	
CCP-24	AHU-24 COOLING COIL	C	7	32	2"x2"	0.4	1.0	1160	16%	460V/3ø/HZ	
CCP-25	AHU-25 COOLING COIL	C	7	32	2"x2"	0.4	1.0	1160	16%	460V/3ø/HZ	
CCP-26	AHU-26 COOLING COIL	C	7	32	2"x2"	0.4	1.0	1160	16%	460V/3ø/HZ	

UNIT HEATER SCHEDULE (HYDRONIC)

DESIG	NOMINAL CFM	CAP BTUH @ 200°F EWT	CAP BTUH @ 30°F ΔT H_2O	MAXIMUM H_2O PD FT H_2O	MOTOR HP	RPM	ELECTRICAL	REMARKS
UH-10	2220	83.2	5.5	2.0	1/6	1070	120V/1ø/60HZ	DOWN-BLAST DISCHARGE
UH-11	1540	50.0	3.5	1.0	1/8	1550	120V/1ø/60HZ	HORIZONTAL DISCHARGE
UH-12	1100	31.7	2.5	1.0	1/8	1550	120V/1ø/60HZ	HORIZONTAL DISCHARGE

CABINET HEATER SCHEDULE

DESIG	NOMINAL CFM	REQUIRED MBH	KW	TEMP RISE °F	MOTOR HP	RPM	ELECTRICAL	REMARKS
CUH-1	1000	81.9	24.0	75.8	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-2	1000	95.6	28.0	88.5	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-3	1000	68.3	20.0	63.2	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-4	1000	54.6	16.0	50.6	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-5	1000	109.2	32.0	101.1	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-6	750	40.9	12.0	50.5	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-7	320	17.1	5.0	50.0	1/50	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-8	400	20.5	6.0	47.4	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-9	600	27.3	8.0	42.1	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-10	310	10.2	3.0	31.1	1/20	1550	480V/3ø/60HZ	WALL MOUNTED – SURFACE
CUH-11	750	34.1	10.0	42.1	1/20	1550	480V/3ø/60HZ	CEILING MOUNTED – RECESSED
CUH-12	600	27.3	8.0	42.1	1/20	1550	480V/3ø/60HZ	CEILING MOUNTED – RECESSED
CUH-13	1000	54.6	16.0	50.6	1/20	1550	480V/3ø/60HZ	CEILING MOUNTED – RECESSED
CUH-14	320	17.1	5.0	50.0	1/50	1550	480V/3ø/60HZ	CEILING MOUNTED – RECESSED

SPORT

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323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
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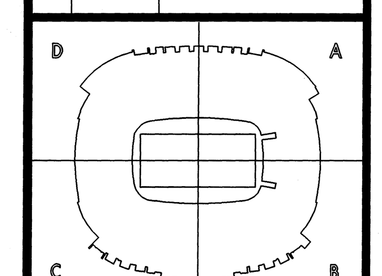
BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY:
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
MECHANICAL SCHEDULE

CATEGORY - SUB-CATEGORY - SHEET
M.0-05

04.23.97-10:42-5110M05 - RMF #95110
ALS

MAKE UP AIR UNIT SCHEDULE

DESIG	SERVICE ROOM No	LEVEL	TYPE (SEE SPEC)	FAN SECTION CFM	SP INCH H_2O	APPROX RPM	BHP	HP MOTOR SIZE	WHEEL DIA	DRIVE	HEATING SECTION EAT °F	LAT °F	OUTPUT MBH	ELECTRICAL V/PH/HZ	REMARKS
MAU-1A	2.10.02	MAIN CONCOURSE	A	5500	1.25	895	3.06	5.0	15	BELT	0	100	594.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-2A	4.08.01	CLUB LEVEL	A	8600	1.25	950	4.08	5.0	15	BELT	0	60	557.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-3A	6.13.01	UPPER SUITE	B	2750	1.25	1205	1.45	2.0	10	BELT	0	100	297.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-4A	7.02.01	UPPER CONCOURSE	B	5500	2 1.25	780	2.46	3.0	15	BELT	0	100	594.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-1B	2.19.01	MAIN CONCOURSE	A	8250	1.25	785	4.21	5.0	18	BELT	0	100	891.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-2B	4.19.03	CLUB LEVEL	C	2575	1.25	1180	1.25	2.0	10	BELT	0	60	167.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-3B	6.15.01	UPPER SUITE	B	5500	1.25	780	2.46	3.0	15	BELT	0	100	594.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-4B	7.23.01	UPPER CONCOURSE	B	5500	1.25	780	2.46	3.0	15	BELT	0	100	594.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-1C	2.34.01	MAIN CONCOURSE	A	11000	1.25	700	5.80	7.5	20	BELT	0	100	1,188.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-2C	4.35.05	CLUB LEVEL	C	2575	1.25	1180	1.25	2.0	10	BELT	0	60	167.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-3C	6.40.01	UPPER SUITE	B	2750	1.25	1205	1.45	2.0	10	BELT	0	100	297.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-4C	7.32.01	UPPER CONCOURSE	B	2750	1.25	1205	1.45	2.0	10	BELT	0	100	297.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-1D	2.46.01	MAIN CONCOURSE	A	8250	1.25	785	4.21	5.0	18	BELT	0	100	891.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-2D	4.46.03	CLUB LEVEL	C	2575	1.25	1180	1.25	2.0	10	BELT	0	60	167.0	480V/3ø/60HZ	CEILING MOUNTED UNIT
MAU-3D	6.42.01	UPPER SUITE	B	5500	1.25	780	2.46	3.0	15	BELT	0	100	594.0	480V/3ø/60HZ	ROOF MOUNTED UNIT
MAU-4D	7.52.01	UPPER CONCOURSE	B	2750	1.25	1205	1.45	2.0	10	BELT	0	100	297.0	480V/3ø/60HZ	ROOF MOUNTED UNIT

1

NOTE: MAKE-UP AIR UNITS TYPE C REFER TO COOLING COIL SCHEDULE ON M.0-06

2 2 3

VARIABLE AIR VOLUME TERMINAL REHEAT UNIT SCHEDULE

No	CFM MAX	CFM MIN	INLET SIZE	OUTLET SIZE	STATIC PRESSURE DROP INCHES WG	MAX NC VALUE @1.0 INCH H_2O INLET SP	HEATING COIL PERFORMANCE EAT °F	LAT °F	MAX AIR P.D. IN. H_2O	MBH @190°F EWT	MAX H_2O PD FT H_2O	ROWS	GPM @30°F ΔT	REMARKS
1	2130	600	14"ø	20"x17"	0.49	–	55°	89	0.41	78.3	3.9	2	5.5	
2	300	0	5"ø	12"x8"	0.25	21	55°	97	0.13	13.5	0.3	2	1.0	
3	450	120	7"ø	12"x10"	0.29	20	55°	137	0.20	39.8	2.3	2	3.0	
4	1510	600	12"ø	16"x15"	0.56	–	55°	103	0.41	78.3	5.6	2	5.5	
5	480	0	7"ø	12"x10"	0.33	20	55°	81	0.20	13.5	2.3	2	1.0	
6	1290	600	10"ø	14"x12"	0.84	22	55°	111	0.45	78.3	4.5	2	5.5	
7	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
8	1290	600	10"ø	14"x12"	0.84	22	55°	111	0.45	78.3	4.5	2	5.5	
9	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
10	280	240	5"ø	12"x8"	0.25	21	55°	103	0.13	15.0	0.3	2	1.0	
11	2730	600	14"ø	20"x17"	0.84	–	55°	82	0.63	78.3	3.9	2	5.5	
12	300	0	5"ø	12"x8"	0.25	21	55°	97	0.13	13.5	0.3	2	1.0	
13	330	120	6"ø	12"x8"	0.32	20	55°	167	0.18	39.8	1.7	2	3.0	
14	1990	600	14"ø	20"x17"	0.49	–	55°	92	0.65	78.3	5.6	2	5.5	
15	480	0	7"ø	12"x10"	0.33	20	55°	81	0.20	13.5	2.3	2	1.0	
16	1550	600	12"ø	16"x15"	0.61	–	55°	102	0.41	78.3	5.7	2	5.5	
17	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
18	1550	600	12"ø	16"x15"	0.61	–	55°	102	0.41	78.3	5.7	2	5.5	
19	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
20	290	240	5"ø	12"x8"	0.25	21	55°	103	0.13	15.0	0.3	2	1.0	
21	2490	600	14"ø	20"x17"	0.74	–	55°	84	0.51	78.3	3.9	2	5.5	
22	300	0	5"ø	12"x8"	0.25	21	55°	97	0.13	13.5	0.3	2	1.0	
23	330	120	6"ø	12"x8"	0.32	20	55°	167	0.18	39.8	1.7	2	3.0	
24	2010	600	14"ø	20"x17"	0.49	–	55°	91	0.35	78.3	5.6	2	5.5	
25	480	0	7"ø	12"x10"	0.33	20	55°	81	0.20	13.5	2.3	2	1.0	
26	1550	600	12"ø	16"x15"	0.61	–	55°	102	0.41	78.3	5.7	2	5.5	
27	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
28	1550	600	12"ø	16"x15"	0.61	–	55°	102	0.41	78.3	5.7	2	5.5	
29	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
30	280	240	5"ø	12"x8"	0.25	21	55°	103	0.13	15.0	0.3	2	1.0	
31	2170	600	14"ø	20"x17"	0.49	–	55°	88	0.41	78.3	3.9	2	5.5	
32	300	0	5"ø	12"x8"	0.25	21	55°	97	0.13	13.5	0.3	2	1.0	
33	470	120	7"ø	12"x10"	0.33	20	55°	133	0.20	39.8	2.4	2	3.0	
34	1510	600	12"ø	16"x15"	0.56	–	55°	103	0.41	78.3	5.6	2	5.5	
35	480	0	7"ø	12"x10"	0.33	20	55°	81	0.20	13.5	2.3	2	1.0	
36	1290	600	10"ø	14"x12"	0.84	22	55°	111	0.45	78.3	4.5	2	5.5	
37	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
38	1290	600	10"ø	14"x12"	0.84	22	55°	111	0.45	78.3	4.5	2	5.5	
39	820	0	8"ø	12"x10"	0.69	25	55°	80	0.46	22.2	1.0	2	1.5	
40	290	240	5"ø	12"x8"	0.25	21	55°	103	0.13	15.0	0.3	2	1.5	

AIR DEVICE SCHEDULE

TYPE	DUTY	CFM	SIZE	BLOW	PD IN H_2O	NC	REMARKS
A	CEILING SUPPLY	0–150	6"X6"	4–WAY	0.17	23	
A	CEILING SUPPLY	151–280	9"X9"	4–WAY	0.12	21	
A	CEILING SUPPLY	281–500	12"X12"	4–WAY	0.12	23	
A	CEILING SUPPLY	501–625	15"X15"	4–WAY	0.08	19	
A	CEILING SUPPLY	626–900	18"X18"	4–WAY	0.08	20	
A	CEILING SUPPLY	901–1225	21"X21"	4–WAY	0.08	21	
A	CEILING SUPPLY	1226–1600	24"X24"	4–WAY	0.08	22	
B	LINEAR BAR SUPPLY	100/FT	3 1/2"	0° DEFL	0.07	21	
B	LINEAR BAR SUPPLY	120/FT	4"	0° DEFL	0.07	22	
B	LINEAR BAR SUPPLY	160/FT	5"	0° DEFL	0.07	22	
B	LINEAR BAR SUPPLY	200/FT	6"	0° DEFL	0.07	24	
C	SUPPLY REGISTER	0–130	6"X6"	22.5° DEFL	0.10	20	
C	SUPPLY REGISTER	131–230	10"X6"	22.5° DEFL	0.10	23	
C	SUPPLY REGISTER	231–330	14"X6"	22.5° DEFL	0.10	24	
C	SUPPLY REGISTER	331–430	20"X6" *	22.5° DEFL	0.08	21	* OR EQUIVALENT
C	SUPPLY REGISTER	431–530	18"X8" *	22.5°DEFL	0.08	22	* OR EQUIVALENT
C	SUPPLY REGISTER	531–670	18"X10" *	22.5° DEFL	0.08	23	* OR EQUIVALENT
C	SUPPLY REGISTER	671–820	22"X10" *	22.5° DEFL	0.08	23	* OR EQUIVALENT
C	SUPPLY REGISTER	821–1000	24"X12" *	22.5° DEFL	0.08	21	* OR EQUIVALENT
C	SUPPLY REGISTER	1001–1200	30"X12" *	22.5° DEFL	0.06	22	* OR EQUIVALENT
D	LINEAR SLOT SUPPLY	70/FT	3@1"SLOT	1–WAY	0.05	22	
D	LINEAR SLOT SUPPLY	100/FT	4@1"SLOT	1–WAY	0.05	24	
D	LINEAR SLOT SUPPLY	110/FT	5@1"SLOT	1–WAY	0.05	23	
D	LINEAR SLOT SUPPLY	120/FT	6@1"SLOT	1–WAY	0.05	21	
E	RETURN REGISTER	0–170	6"X6"	0° DEFL	0.11	22	
E	RETURN REGISTER	171–230	8"X6"	0° DEFL	0.11	22	
E	RETURN REGISTER	231–310	10"X6"	0° DEFL	0.11	23	
E	RETURN REGISTER	311–370	12"X6"	0° DEFL	0.11	24	
E	RETURN REGISTER	371–460	12"X8" *	0° DEFL	0.11	22	* OR EQUIVALENT
E	RETURN REGISTER	461–580	12"X10" *	0° DEFL	0.11	23	* OR EQUIVALENT
E	RETURN REGISTER	581–700	24"X6" *	0° DEFL	0.11	24	* OR EQUIVALENT
E	RETURN REGISTER	701–800	18"X10" *	0° DEFL	0.11	21	* OR EQUIVALENT
E	RETURN REGISTER	801–950	18"X12" *	0° DEFL	0.11	22	* OR EQUIVALENT
E	RETURN REGISTER	951–1100	18"X14" *	0° DEFL	0.11	22	* OR EQUIVALENT
E	RETURN REGISTER	1101–1500	18"X18" *	0° DEFL	0.11	23	* OR EQUIVALENT
E	RETURN REGISTER	1501–1600	30"X12" *	0° DEFL	0.11	24	* OR EQUIVALENT
E	RETURN REGISTER	1601–2100	30"X18" *	0° DEFL	0.11	21	* OR EQUIVALENT
F	EXHAUST GRILLE	0–170	6"X6"	0° DEFL	0.11	22	
F	EXHAUST GRILLE	171–230	8"X6"	0° DEFL	0.11	22	
F	EXHAUST GRILLE	231–310	10"X6"	0° DEFL	0.11	23	
F	EXHAUST GRILLE	311–370	12"X6"	0° DEFL	0.11	24	
F	EXHAUST GRILLE	371–460	12"X8" *	0° DEFL	0.11	22	* OR EQUIVALENT
F	EXHAUST GRILLE	461–580	12"X10" *	0° DEFL	0.11	23	* OR EQUIVALENT
F	EXHAUST GRILLE	581–700	24"X6" *	0° DEFL	0.11	24	* OR EQUIVALENT
F	EXHAUST GRILLE	701–800	18"X10" *	0° DEFL	0.11	21	* OR EQUIVALENT
F	EXHAUST GRILLE	801–950	18"X12" *	0° DEFL	0.11	22	* OR EQUIVALENT
F	EXHAUST GRILLE	951–1100	18"X14" *	0° DEFL	0.11	22	* OR EQUIVALENT
F	EXHAUST GRILLE	1101–1500	18"X18" *	0° DEFL	0.11	23	* OR EQUIVALENT
F	EXHAUST GRILLE	1501–1600	30"X12" *	0° DEFL	0.11	24	* OR EQUIVALENT
F	EXHAUST GRILLE	1601–2100	30"X18" *	0° DEFL	0.11	21	* OR EQUIVALENT
G	TRANSFER GRILLE	0–170	6"X6"	0° DEFL	0.11	22	
G	TRANSFER GRILLE	171–230	8"X6"	0° DEFL	0.11	22	
G	TRANSFER GRILLE	231–310	10"X6"	0° DEFL	0.11	23	
G	TRANSFER GRILLE	311–370	12"X6"	0° DEFL	0.11	24	
G	TRANSFER GRILLE	371–460	12"X8" *	0° DEFL	0.11	22	* OR EQUIVALENT
G	TRANSFER GRILLE	461–580	12"X10" *	0° DEFL	0.11	23	* OR EQUIVALENT
G	TRANSFER GRILLE	581–700	24"X6" *	0° DEFL	0.11	24	* OR EQUIVALENT
G	TRANSFER GRILLE	701–800	18"X10" *	0° DEFL	0.11	21	* OR EQUIVALENT
G	TRANSFER GRILLE	801–950	18"X12" *	0° DEFL	0.11	22	* OR EQUIVALENT
G	TRANSFER GRILLE	951–110	18"X14" *	0° DEFL	0.11	22	* OR EQUIVALENT
G	TRANSFER GRILLE	1101–1500	18"X18" *	0° DEFL	0.11	23	* OR EQUIVALENT
G	TRANSFER GRILLE	1501–1600	30"X12" *	0° DEFL	0.11	24	* OR EQUIVALENT
G	TRANSFER GRILLE	1601–2100	30"X18" *	0° DEFL	0.11	21	* OR EQUIVALENT
J	SPOT DIFFUSER	320–500	12"ø	40° ROTATION	0.24	25	0° ROTATION @ SIDEWALL
J	SPOT DIFFUSER	501–950	16"ø	40° ROTATION	0.21	26	

2

COOLING COIL SCHEDULE

DESIG	DUTY	CFM	COOLING SECTION EAT °F DB	EAT °F WB	LAT °F DB	LAT °F WB	TOTAL MBH	SENS MBH	GPM @ 36°F EWT 54°F LWT	MAX H_2O PD FT H_2O	MIN TOTAL FACE AREA	MAXIMUM FACE VEL FPM	No OF COILS	MAX FIN SPACING FIN/IN	MAXIMUM AIR PD IN H_2O	MIN ROWS	REMARKS
CC-MAU-2B	RM 4.19.03	2575	94	78	58	57.8	187	100	23	20	5.2	500	1	11	0.39	4	40% GLYCOL
CC-MAU-2C	RM 4.35.05	2575	94	78	58	57.8	187	100	23	20	5.2	500	1	11	0.39	4	40% GLYCOL
CC-MAU-2D	RM 4.46.03	2575	94	78	58	57.8	187	100	23	20	5.2	500	1	11	0.39	4	40% GLYCOL

h+k SPORT

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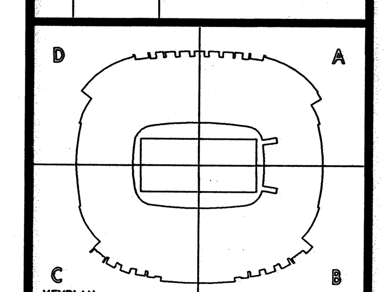
BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	7-25-97	BULLETIN #71



PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY:
REVIEWED BY: PMP
ISSUED: 2-28-97
SHEET TITLE
MECHANICAL SCHEDULE

CATEGORY – SUB-CATEGORY – SHEET
M.0-06

31.07.97-09.37-5110M06 - RMF #95110

FAN POWERED TERMINAL REHEAT UNIT SCHEDULE

NO	FAN CFM	PRIMARY AIR CFM MAX	PRIMARY AIR CFM MIN	INLET SIZE	OUTLET SIZE	PRIMARY AIR SP LOSS INCHES H_2O	FAN DATA HP	FAN DATA FLA	FAN DATA DISCH SP	FAN DATA ELECTRICAL	HEATING COIL PERFORMANCE EAT °F	LAT °F	BTUH @190°F EWT	MAX. H_2O PD FT H_2O	ROWS	GPM @30°F ΔT	FILTER SIZE	FILTER EFFICIENCY
1	160	110	80	6"ø	6 7/8x10 3/8	0.02	1/10	0.8	0.40	277V/1ø/60HZ	60	85	4320	1.0	1	0.5	16"x14"	20%
2	1670	1110	555	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	93	50447	1.0	2	3.4	17"x17"	20%
3	2020	1350	675	12"ø	13 1/4x11 1/2	0.22	3/4	5.4	0.40	277V/1ø/60HZ	65	85	43686	1.0	1	2.9	22"x19"	20%
4	1670	1110	555	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	93	50447	1.0	2	3.4	17"x17"	20%
5	1570	1050	525	12"ø	13 1/4x11 1/2	0.17	1/2	4.6	0.40	277V/1ø/60HZ	65	85	33966	1.0	1	2.3	17"x17"	20%
6	280	190	95	6"ø	6 7/8x10 3/8	0.05	1/10	0.8	0.40	277V/1ø/60HZ	65	85	6102	1.0	1	0.5	16"x14"	20%
7	1260	840	420	10"ø	10 1/2x10 3/8	0.19	1/3	3.1	0.40	277V/1ø/60HZ	65	85	27216	1.0	1	1.8	17"x17"	20%
8	1940	1290	645	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	85	41850	1.0	1	2.8	22"x19"	20%
9	1930	1290	645	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	85	41742	1.0	1	2.8	22"x19"	20%
1	1500	1000	500	12"ø	13 1/4x11 1/2	0.17	1/2	4.6	0.40	277V/1ø/60HZ	65	85	32400	1.0	1	2.2	17"x17"	20%
11	1110	740	370	10"ø	10 1/2x10 3/8	0.11	1/3	3.1	0.40	277V/1ø/60HZ	65	85	23976 2	1.0	1	1.6 2	17"x17"	20%
2 12	945	630	315	10"ø	10 1/2x10 3/8	2 0.06	1/3	3.1	0.40	277V/1ø/60HZ	65	85	20412	1.0	1	1.3	17"x17"	20%
13	1480	990	495	12"ø	13 1/4x11 1/2	0.15	1/2	4.6	0.40	277V/1ø/60HZ	65	85	32022	1.0	1	2.1	17"x17"	20%
14	740	490	245	8"ø	9 1/4x10 3/8	0.10	1/4	2.1	0.40	277V/1ø/60HZ	65	85	15930	1.0	1	1.1	16"x14"	20%
15	320	210	105	6"ø	6 7/8x10 3/8	0.07	1/10	0.8	0.40	277V/1ø/60HZ	65	85	6858	1.0	1	0.5	16"x14"	20%
16	1800	1200	600	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	115	97200	1.0	2	6.5	22"x19"	20%
17	1785	1190	595	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	115	96390	1.0	2	6.4	22"x19"	20%
18	2040	1360	680	12"ø	13 1/4x11 1/2	0.22	3/4	5.4	0.40	277V/1ø/60HZ	65	85	44064	1.0	1	2.9	22"x19"	20%
19	1000	670	335	10"ø	10 1/2x10 3/8	0.09	1/3	3.1	0.40	277V/1ø/60HZ	65	85	21654	1.0	1	1.4	17"x17"	20%
20	1780	1190	595	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	115	96174	1.0	2	6.4	22"x19"	20%
21	2270	1510	755	14"ø	13 5/8x11 7/8	0.20	3/4	5.7	0.40	277V/1ø/60HZ	65	85	48978	1.0	1	3.3	24"x20"	20%
22	760	510	255	8"ø	9 1/4x10 3/8	0.11	1/4	2.1	0.40	277V/1ø/60HZ	65	85	16470	1.0	1	1.1	16"x14"	20%
23	1520	1010	505	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	85	32778	1.0	1	2.2	17"x17"	20%
24	615	410	205	8"ø	9 1/4x10 3/8	0.06	1/4	2.1	0.40	277V/1ø/60HZ	65	85	13284	1.0	1	0.9	16"x14"	20%
25	1290	860	430	10"ø	10 1/2x10 3/8	0.15	1/3	3.1	0.40	277V/1ø/60HZ	65	85	27864	1.0	1	1.9	17"x17"	20%
26	1470	980	490	12"ø	13 1/4x11 1/2	0.15	1/2	4.6	0.40	277V/1ø/60HZ	65	85	31752	1.0	1	2.1	17"x17"	20%
27	1630	1090	545	12"ø	13 1/4x11 1/2	0.20	1/2	4.6	0.40	277V/1ø/60HZ	65	85	35262	1.0	1	2.4	17"x17"	20%
28	940	630	315	10"ø	10 1/2x10 3/8	0.06	1/3	3.1	0.40	277V/1ø/60HZ	65	85	20358	1.0	1	1.4	17"x17"	20%
29	1880	1250	625	12"ø	13 1/4x11 1/2	0.25	3/4	5.4	0.40	277V/1ø/60HZ	65	85	40554	1.0	1	2.7	22"x19"	20%
30	1705	1140	570	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	85	36882	1.0	1	2.5	22"x19"	20%
31	1700	1130	565	12"ø	13 1/4x11 1/2	0.18	3/4	5.4	0.40	277V/1ø/60HZ	65	85	36666	1.0	1	2.4	22"x19"	20%
32	1550	1030	515	12"ø	13 1/4x11 1/2	0.17	1/2	4.6	0.40	277V/1ø/60HZ	65	85	33426	1.0	1	2.2	17"x17"	20%
33	1080	720	360	10"ø	10 1/2x10 3/8	0.10	1/3	3.1	0.40	277V/1ø/60HZ	65	100	40824	1.0	2	2.7	17"x17"	20%
34	1330	890	445	10"ø	10 1/2x10 3/8	0.18	1/3	3.1	0.40	277V/1ø/60HZ	65	85	28782	1.0	1	1.9	17"x17"	20%
35	1090	730	365	10"ø	10 1/2x10 3/8	0.10	1/3	3.1	0.40	277V/1ø/60HZ	65	100	41256	1.0	2	2.8	17"x17"	20%
36	1540	1030	515	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	85	33318	1.0	1	2.2	17"x17"	20%
37	1710	1140	570	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	85	36936	1.0	1	2.5	22"x19"	20%
38	1180	790	395	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	85	25542	1.0	1	1.7	17"x17"	20%
39	2300	1530	765	14"ø	13 5/8x11 7/8	0.20	3/4	5.7	0.40	277V/1ø/60HZ	65	90	62046	1.0	2	4.1	24"x20"	20%
40	1090	730	365	10"ø	10 1/2x10 3/8	0.10	1/3	3.1	0.40	277V/1ø/60HZ	65	85	23598	1.0	1	1.6	17"x17"	20%
41	1600	1070	535	12"ø	13 1/4x11 1/2	0.20	1/2	4.6	0.40	277V/1ø/60HZ	65	85	34614	1.0	1	2.3	17"x17"	20%
42	2265	1510	755	14"ø	13 5/8x11 7/8	0.20	3/4	5.7	0.40	277V/1ø/60HZ	65	90	61155	1.0	2	4.1	24"x20"	20%
43	2240	1490	745	14"ø	13 1/4x11 1/2	0.20	3/4	5.7	0.40	277V/1ø/60HZ	65	100	84618	1.0	2	5.6	24"x20"	20%
44	1115	740	370	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	100	42093	1.0	2	2.8	17"x17"	20%
45	780	520	260	8"ø	9 1/4x10 3/8	0.11	1/4	2.1	0.40	277V/1ø/60HZ	65	90	21060	1.0	1	1.4	16"x14"	20%
46	1120	750	375	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	110	54486	1.0	2	3.6	17"x17"	20%
47	1030	690	345	10"ø	10 1/2x10 3/8	0.09	1/3	3.1	0.40	277V/1ø/60HZ	65	85	22302	1.0	1	1.5	17"x17"	20%
48	2075	1380	690	12"ø	13 1/4x11 1/2	0.25	3/4	5.4	0.40	277V/1ø/60HZ	65	85	44766	1.0	1	3.0	22"x19"	20%
49	780	520	260	8"ø	9 1/4x10 3/8	0.11	1/4	2.1	0.40	277V/1ø/60HZ	65	85	16848	1.0	1	1.1	16"x14"	20%
50	1040	690	345	10"ø	10 1/2x10 3/8	0.09	1/3	3.1	0.40	277V/1ø/60HZ	65	100	39258	1.0	2	2.6	17"x17"	20%
51	2080	1390	695	12"ø	13 1/4x11 1/2	0.22	3/4	5.4	0.40	277V/1ø/60HZ	65	100	78678	1.0	1	5.2	22"x19"	20%
52	1880	1250	625	12"ø	13 1/4x11 1/2	0.21	3/4	5.4	0.40	277V/1ø/60HZ	65	90	50706	1.0	2	3.4	22"x19"	20%
53	1700	1130	565	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	85	36666	1.0	1	2.4	22"x19"	20%
54	1185	1260	630	12"ø	13 1/4x11 1/2	0.21	3/4	5.4	0.40	277V/1ø/60HZ	65	90	50949	1.0	1	3.4	22"x19"	20%
55	1890	1260	630	12"ø	13 1/4x11 1/2	0.21	3/4	5.4	0.40	277V/1ø/60HZ	65	90	51030	1.0	1	3.4	22"x19"	20%
56	1720	1150	575	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	85	37206	1.0	1	2.5	22"x19"	20%
2 57	1490	990	495	12"ø	13 1/4x11 1/2	0.15	1/2	4.6	0.40	277V/1ø/60HZ	65	85	32130	1.0	1	2 2.1	17"x17"	20%
58	960	640	320	10"ø	10 1/2x10 3/8	0.06	1/3	3.1	0.40	277V/1ø/60HZ	65	90	25920	2 1.0	1	1.7	17"x17"	20%
59	1650	1100	550	12"ø	13 1/4x11 1/2	0.19	1/2	4.6	0.40	277V/1ø/60HZ	65	85	35640	1.0	1	2.4	17"x17"	20%
60	1870	1250	625	12"ø	13 1/4x11 1/2	0.21	3/4	5.4	0.40	277V/1ø/60HZ	65	90	50544	1.0	1	3.4	22"x19"	20%
61	~~1380~~	~~920~~	~~460~~	10"ø	10 1/2x10 3/8	0.18	1/3	3.1	0.40	277V/1ø/60HZ	65	85	29808	1.0	1	2.0	17"x17"	20%
62	1375	920	460	10"ø	10 1/2x10 3/8	0.18	1/3	3.1	0.40	277V/1ø/60HZ	65	85	29754	1.0	1	2.0	17"x17"	20%
63	1870	1250	625	12"ø	13 1/4x11 1/2	0.21	3/4	5.4	0.40	277V/1ø/60HZ	65	90	50544	1.0	1	3.4	22"x19"	20%
64	1640	1090	545	12"ø	13 1/4x11 1/2	0.20	1/2	4.6	0.40	277V/1ø/60HZ	65	85	35370	1.0	1	2.4	17"x17"	20%
65	1115	740	370	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	85	24030	1.0	1	1.6	17"x17"	20%
66	1650	1100	550	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	85	35640	1.0	1	2.4	17"x17"	20%
67	400	270	135	6"ø	6 7/8x10 3/8	0.14	1/10	0.8	0.40	277V/1ø/60HZ	65	85	8694	1.0	1	0.6	16"x14"	20%
68	1375	920	460	10"ø	10 1/2x10 3/8	0.18	1/3	3.1	0.40	277V/1ø/60HZ	65	85	29754	1.0	1	2.0	17"x17"	20%
69	1800	1200	600	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	97	62208	1.0	2	4.1	22"x19"	20%
70	540	360	180	8"ø	9 1/4x10 3/8	0.04	1/4	2.1	0.40	277V/1ø/60HZ	65	97	18662	1.0	2	1.2	16"x14"	20%
71	1120	750	375	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	97	38761	1.0	2	2.6	17"x17"	20%
72	960	640	320	10"ø	10 1/2x10 3/8	0.07	1/3	3.1	0.40	277V/1ø/60HZ	65	97	33178	1.0	2	2.2	17"x17"	20%
73	1570	1050	525	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	108	72965	1.0	2	4.9	17"x17"	20%
74	1800	1200	600	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	108	83592	1.0	2	5.6	22"x19"	20%
75	860	570	285	10"ø	10 1/2x10 3/8	0.05	1/3	3.1	0.40	277V/1ø/60HZ	65	108	39884	1.0	2	2.7	17"x17"	20%
76	1920	1280	640	12"ø	13 1/4x11 1/2	0.22	3/4	5.4	0.40	277V/1ø/60HZ	65	108	89165	1.0	2	5.9	22"x19"	20%
77	2200	1470	735	14"ø	13 5/8x11 7/8	0.15	3/4	5.7	0.40	277V/1ø/60HZ	65	85	47574	1.0	1	3.2	24"x20"	20%
78	860	570	285	10"ø	10 1/2x10 3/8	0.05	1/3	3.1	0.40	277V/1ø/60HZ	65	85	18522	1.0	1	1.2	17"x17"	20%
79	510	340	170	8"ø	9 1/4x10 3/8	0.04	1/4	2.1	0.40	277V/1ø/60HZ	65	85	11016	1.0	1	0.7	16"x14"	20%
80	840	560	280	10"ø	10 1/2x10 3/8	0.04	1/3	3.1	0.40	277V/1ø/60HZ	65	85	18144	1.0	1	1.2	17"x17"	20%
81	510	340	170	8"ø	9 1/4x10 3/8	0.04	1/4	2.1	0.40	277V/1ø/60HZ	65	85	11016	1.0	1	0.7	16"x14"	20%
82	1310	870	435	10"ø	10 1/2x10 3/8	0.17	1/3	3.1	0.40	277V/1ø/60HZ	65	85	28242	1.0	1	1.9	17"x17"	20%
83	2300	1530	765	14"ø	13 5/8x11 7/8	0.20	3/4	5.7	0.40	277V/1ø/60HZ	65	85	49626	1.0	1	2 3.3	24"x20"	20%
84	1500	1000	500	12"ø	13 1/4x11 1/2	2 0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	90	40500	1.0	2	3.3	22"x19"	20%
2 85	1820	1210	605	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	90	49140	2 1.0	2	2.7	17"x17"	20%
86	1585	1060	530	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	108	73661	1.0	2	4.9	17"x17"	20%
87	590	390	195	8"ø	9 1/4x10 3/8	0.05	1/4	4.6	0.40	277V/1ø/60HZ	65	108	27346	1.0	2	1.8	16"x14"	20%
88	1120	750	375	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	97	38761	1.0	2	2.6	17"x17"	20%
2 89	540	360	180	8"ø	9 1/4x10 3/8	0.04	1/4	2.1	0.40	277V/1ø/60HZ	65	97	18662	2 1.0	2	1.2	16"x14"	20%
90	1230	820	410	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	97	42509	2 1.0	2	2 2.8	17"x17"	20%
91	1375	920	460	10"ø	10 1/2x10 3/8	0.14	1/3	3.1	0.40	277V/1ø/60HZ	65	97	47574	1.0	2	3.2	17"x17"	20%
92	400	270	135	6"ø	6 7/8x10 3/8	0.14	1/10	0.8	0.40	277V/1ø/60HZ	65	85	8694	1.0	1	0.6	16"x14"	20%
93	1650	1100	550	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	85	35640	1.0	1	2.4	17"x17"	20%
94	1115	740	370	10"ø	10 1/2x10 3/8	0.12	1/3	3.1	0.40	277V/1ø/60HZ	65	85	24030	1.0	1	1.6	17"x17"	20%
95	1780	1190	595	12"ø	13 1/4x11 1/2	0.20	3/4	5.4	0.40	277V/1ø/60HZ	65	115	96174	1.0	2	6.4	22"x19"	20%
96	465	310	155	6"ø	6 7/8x10 3/8	0.18	1/10	0.8	0.40	277V/1ø/60HZ	65	99	17075	1.0	1	1.1	16"x14"	20%
97	930	620	310	10"ø	10 1/2x10 3/8	0.08	1/3	3.1	0.40	277V/1ø/60HZ	65	99	34150	1.0	2	2.3	17"x17"	20%
98	1800	1200	600	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	115	97200	1.0	2	6.5	22"x19"	20%
99	390	260	130	6"ø	6 7/8x10 3/8	0.14	1/10	0.8	0.40	277V/1ø/60HZ	65	99	14321	1.0	1	1.0	16"x14"	20%
100	2080	1390	695	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	90	56214	1.0	2	3.7	22"x19"	20%
101	2070	1380	690	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	90	55890	1.0	2	3.7	22"x19"	20%
102	690	460	230	8"ø	9 1/4x10 3/8	0.09	1/4	2.1	0.40	277V/1ø/60HZ	65	85	14904	1.0	1	1.0	16"x14"	20%
103	590	390	195	8"ø	9 1/4x10 3/8	0.06	1/4	2.1	0.40	277V/1ø/60HZ	65	85	12690	1.0	1	0.8	16"x14"	20%
104	1360	910	455	10"ø	10 1/2x10 3/8	0.19	1/3	3.1	0.40	277V/1ø/60HZ	65	85	29430	1.0	1	2.0	17"x17"	20%
105	1660	1110	555	12"ø	13 1/4x11 1/2	0.19	1/2	4.6	0.40	277V/1ø/60HZ	65	90	44874	1.0	2	3.0	17"x17"	20%
106	400	270	135	6"ø	6 7/8x10 3/8	0.14	1/10	0.8	0.40	277V/1ø/60HZ	65	85	8694	1.0	1	0.6	16"x14"	20%
107	1225	820	410	10"ø	10 1/2x10 3/8	0.15	1/3	3.1	0.40	277V/1ø/60HZ	65	85	26514	1.0	1	1.8	17"x17"	20%
2 108	1500	1000	500	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	90	40500	1.0	2	2.7	17"x17"	20%
109	500	330	165	8"ø	9 1/4x 10 3/8	0.03	1/4	2.1	0.40	277V/1ø/60HZ	65	90	13500	1.0	1	0.9	16"x14"	2 20%
110	465	310	155	6"ø	6 7/8x10 3/8	0.18	1/10	0.8	0.40	277V/1ø/60HZ	65	99	17075	1.0	1	1.1	16"x14"	20%
111	410	270	135	6"ø	6 7/8x10 3/8	0.14	1/10	0.8	0.40	277V/1ø/60HZ	65	99	15001	1.0	1	1.0	16"x14"	20%
112	1800	1200	600	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	115	97200	1.0	2	6.5	22"x19"	20%
113	930	620	310	10"ø	10 1/2x10 3/8	0.08	1/3	3.1	0.40	277V/1ø/60HZ	65	99	34150	1.0	2	2.3	17"x17"	20%
114	465	310	155	6"ø	6 7/8x10 3/8	0.18	1/10	0.8	0.40	277V/1ø/60HZ	65	99	17075	1.0	1	1.1	16"x14"	20%
115	1780	1190	595	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	115	96174	1.0	2	6.4	22"x19"	20%
116	1565	1040	520	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	96	52342	1.0	2	3.5	17"x17"	20%
117	1200	800	400	10"ø	10 1/2x10 3/8	0.15	1/3	3.1	0.40	277V/1ø/60HZ	65	96	40176	1.0	2	2.7	17"x17"	20%
118	610	410	205	8"ø	9 1/4x10 3/8	0.09	1/4	2.1	0.40	277V/1ø/60HZ	65	90	16524	1.0	1	1.1	16"x14"	20%
119	510	340	170	8"ø	9 1/4x10 3/8	0.06	1/4	2.1	0.40	277V/1ø/60HZ	65	85	11016	1.0	1	0.7	16"x14"	20%
120	360	240	120	6"ø	6 7/8x10 3/8	0.07	1/10	0.8	0.40	277V/1ø/60HZ	65	85	7776	1.0	1	0.5	16"x14"	20%
121	220	150	80	6"ø	6 7/8x10 3/8	0.03	1/10	0.8	0.40	277V/1ø/60HZ	65	85	4968	1.0	1	0.5	16"x14"	20%
122	430	290	145	8"ø	9 1/4x10 3/8	0.03	1/10	0.8	0.40	277V/1ø/60HZ	65	105	18630	1.0	2	1.2	16"x14"	20%
123	535	360	180	8"ø	9 1/4x10 3/8	0.04	1/4	2.1	0.40	277V/1ø/60HZ	65	105	23166	1.0	2	1.5	16"x14"	20%
124	390	260	130	6"ø	6 7/8x10 3/8	0.03	1/10	0.8	0.40	277V/1ø/60HZ	65	90	10530	1.0	1	0.7	16"x14"	20%
125	435	290	145	8"ø	9 1/4x10 3/8	0.03	1/10	0.8	0.40	277V/1ø/60HZ	65	105	18792	1.0	2	1.3	16"x14"	20%
126	1600	1070	535	12"ø	13 1/4x11 1/2	0.20	1/2	4.6	0.40	277V/1ø/60HZ	65	85	34614	1.0	1	2.3	17"x17"	20%
127	370	250	125	6"ø	6 7/8x10 3/8	0.08	1/10	0.8	0.40	277V/1ø/60HZ	65	105	16038	1.0	1	1.1	16"x14"	20%
128	530	350	175	8"ø	9 1/4x10 3/8	0.05	1/4	2.1	0.40	277V/1ø/60HZ	65	85	11394	1.0	1	0.8	16"x14"	20%
129	275	180	905	6"ø	6 7/8x10 3/8	0.06	1/10	0.8	0.40	277V/1ø/60HZ	65	105	11826	1.0	1	0.8	16"x14"	20%
130	1595	1060	530	12"ø	13 1/4x11 1/2	0.18	1/2	4.6	0.40	277V/1ø/60HZ	65	85	34398	1.0	1	2.3	17"x17"	20%
2 131	540	360	180	8"ø	9 1/4X 10 3/8	0.05	1/4	2.1	0.40	277V/1ø/60HZ	65	85	11664	1.0	1	0.8	16"x14"	20%
132	440	290	145	6"ø	6 7/8X10 3/8	0.14	1/10	0.8	0.40	277V/1ø/60HZ	65	97	15206	1.0	1	1.0	16"x14"	20%
133	1700	1130	565	12"ø	13 1/4x11 1/2	0.19	3/4	5.4	0.40	277V/1ø/60HZ	65	90	45900	1.0	1	3.1	22"x19"	20%
134	2300	1530	765	14"ø	13 5/8X11 7/8	0.20	3/4	5.7	0.40	277V/1ø/60HZ	65	90	62046	1.0	2	4.1	24"x20"	20%
135	600	400	200	8"ø	9 1/4X 10 3/8	0.06	1/4	2.1	0.40	277V/1ø/60HZ	65	90	16200	1.0	1	1.1	16"x14"	20%

03.02.97–18:09–5110M06 - RMF #95110

HOK SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

CIVIL ENGINEER
RUMMEL, KLEPPER & KAHL
BALTIMORE, MARYLAND

AUDIO/VIDEO CONSULTANT
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DALLAS, TEXAS

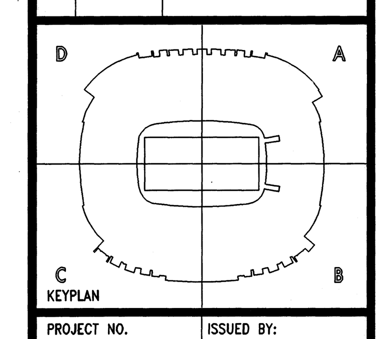
INTERIOR ARCHITECTURE CONSULTANT
CHO, WILKS & BENN
BALTIMORE, MARYLAND

BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

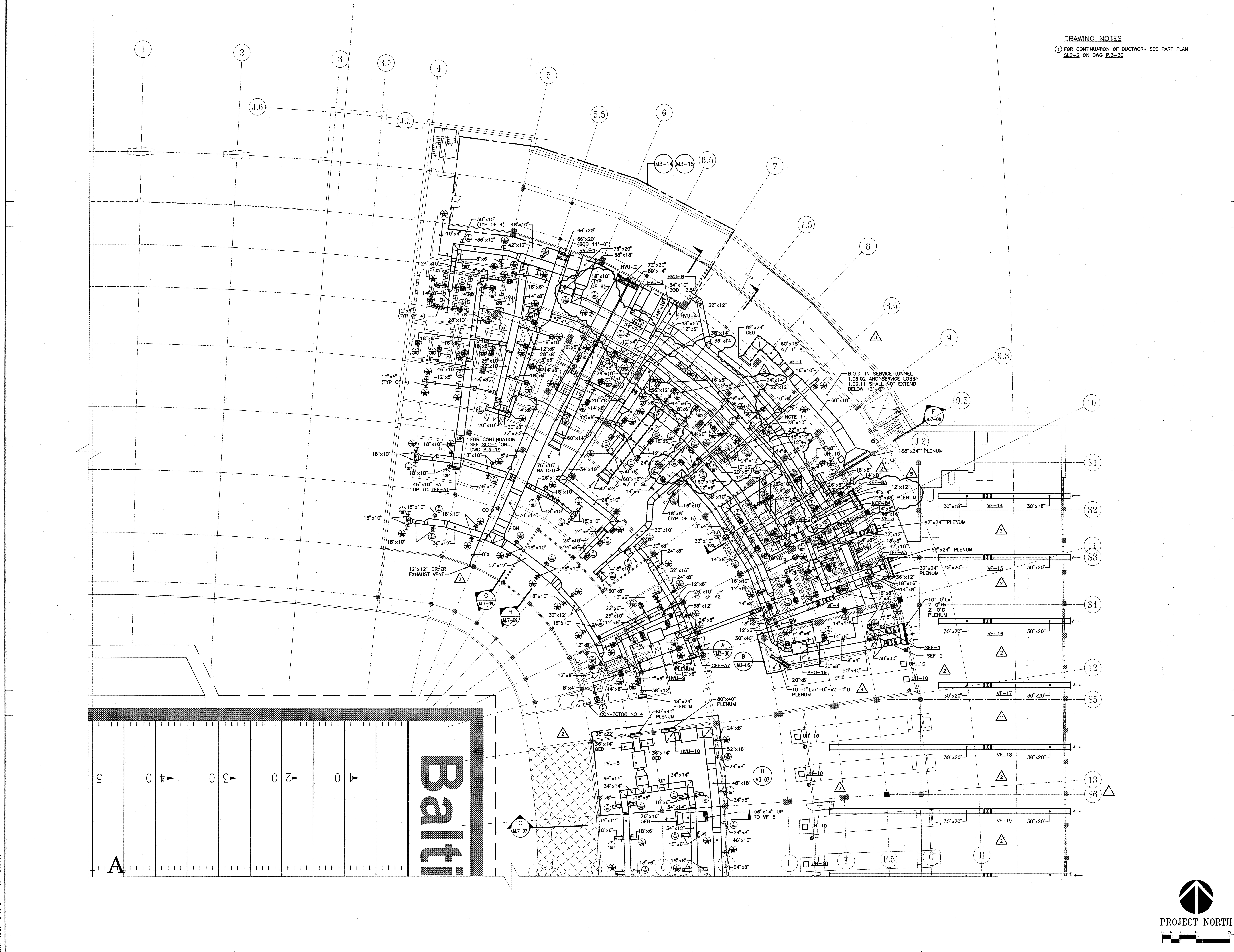


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY:
REVIEWED BY: PMP
ISSUED: 4-4-97

SHEET TITLE
MECHANICAL SCHEDULE

CATEGORY - SUB-CATEGORY - SHEET
M.0-07



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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

CIVIL ENGINEER
RUMMEL, KLEPPER & KAHL
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AUDIO/VIDEO CONSULTANT
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DALLAS, TEXAS

INTERIOR ARCHITECTURE CONSULTANT
CHO, WILKS & BENN
BALTIMORE, MARYLAND

BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	7-8-97	BULLETIN #58
4	9-10-97	SUPPLEMENTS NFL - 221
5	11-26-97	BULLETIN #94

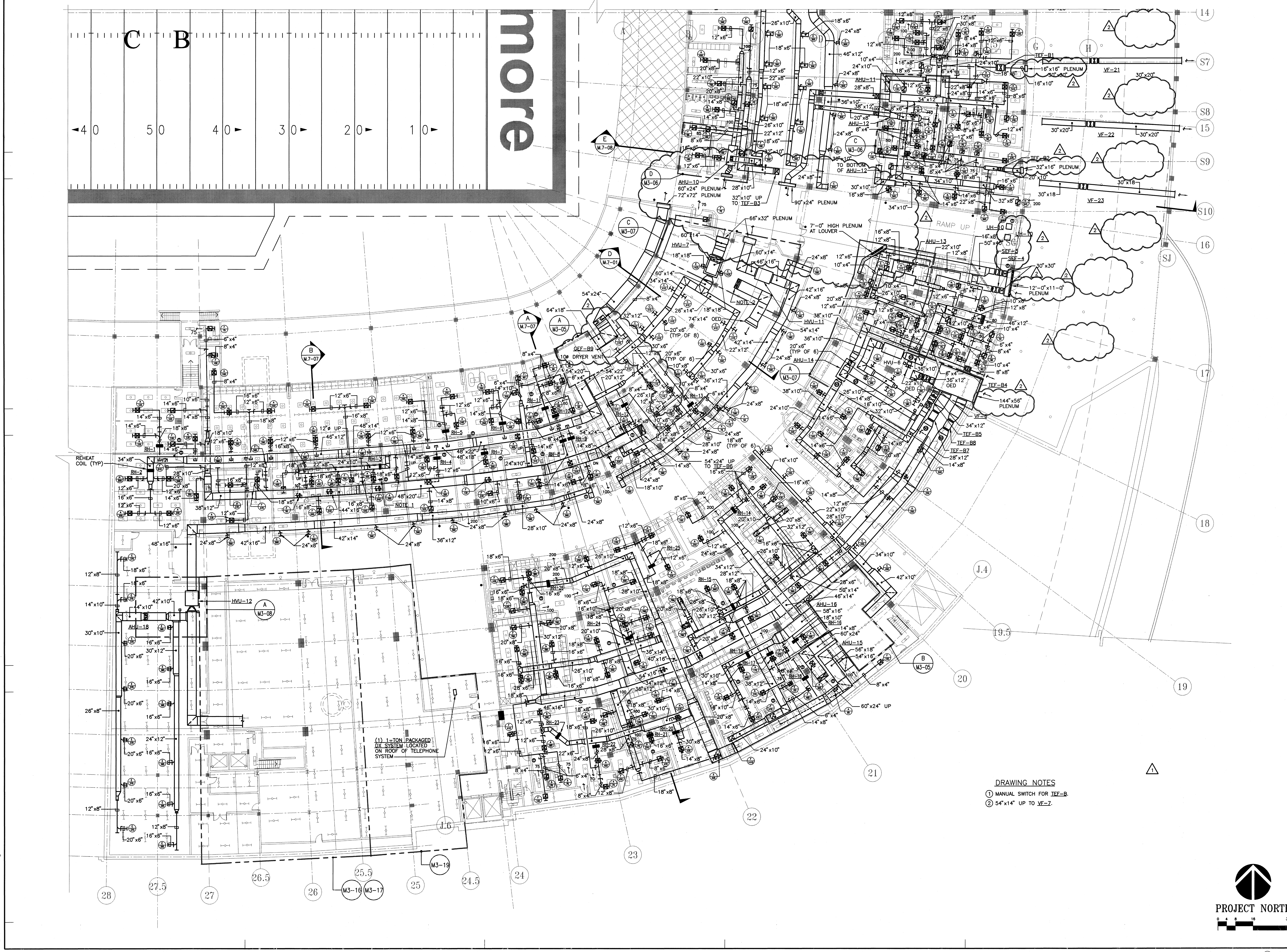
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: ---
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
SERVICE LEVEL
QUAD A

CATEGORY - SUB-CATEGORY - SHEET
M.2-01A

25.97-13:20- 5110M21 - RMF #95110



DRAWING NOTES

1. MANUAL SWITCH FOR TEF-B.
2. 54"x14" UP TO VF-7.

SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

CIVIL ENGINEER
RUMMEL, KLEPPER & KAHL
BALTIMORE, MARYLAND

AUDIO/VIDEO CONSULTANT
WRIGHTSON, JOHNSON, HADDON & WILLIAMS
DALLAS, TEXAS

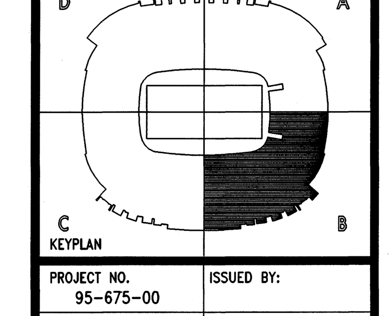
INTERIOR ARCHITECTURE CONSULTANT
CHO, WILKS & BENN
BALTIMORE, MARYLAND

BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: ---
REVIEWED BY:
ISSUED: 2-28-97

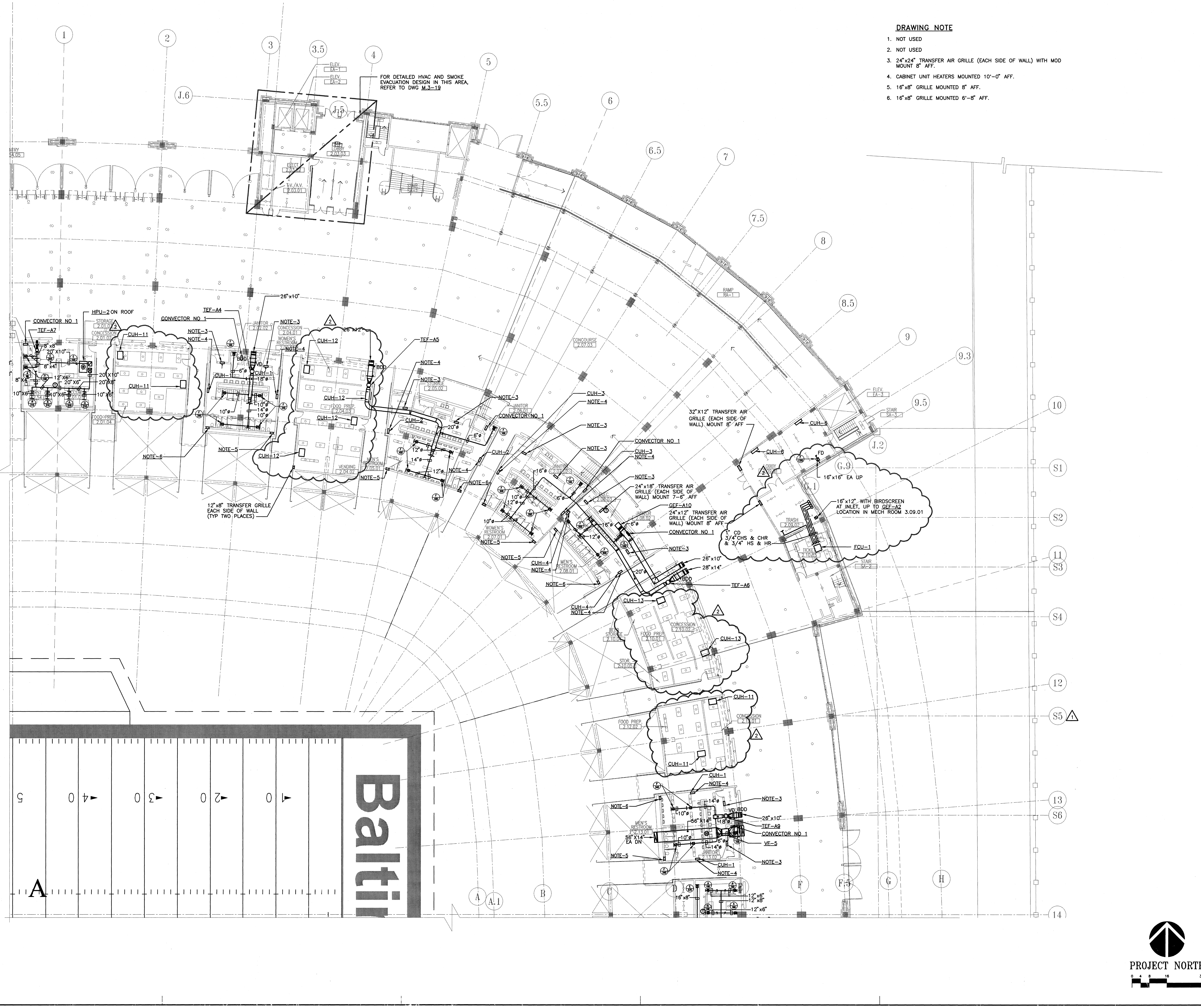
SHEET TITLE
HVAC PLAN
SERVICE LEVEL
QUAD B

CATEGORY - SUB-CATEGORY - SHEET
M.2-01B

04.27.97-15.48 - 5110M21 - RMF #95110

DRAWING NOTE

1. NOT USED
2. NOT USED
3. 24"x24" TRANSFER AIR GRILLE (EACH SIDE OF WALL) WITH MOD MOUNT 8" AFF.
4. CABINET UNIT HEATERS MOUNTED 10'-0" AFF.
5. 16"x8" GRILLE MOUNTED 8" AFF.
6. 16"x8" GRILLE MOUNTED 6'-8" AFF.



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REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY:
REVIEWED BY: DSP
ISSUED: 2-28-97

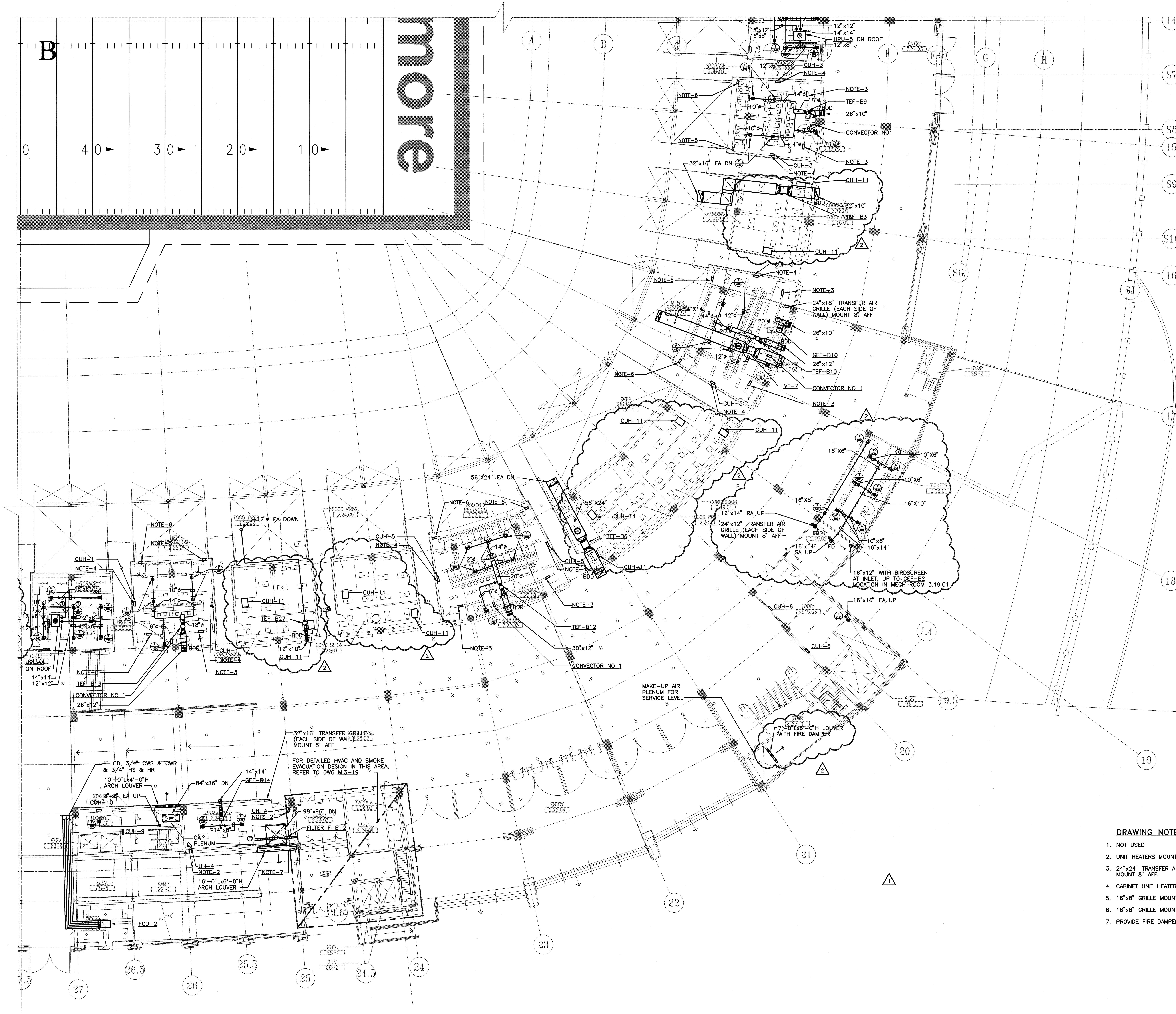
SHEET TITLE

HVAC PLAN MAIN CONCOURSE QUAD A

CATEGORY - SUB-CATEGORY - SHEET

M.2-02A

03.02.97-16:17-5110M22 - RMF #95110



DRAWING NOTES

1. NOT USED
2. UNIT HEATERS MOUNTED 8'-0" AFF.
3. 24"x24" TRANSFER AIR GRILLE (EACH SIDE OF WALL) WITH MOD MOUNT 8" AFF.
4. CABINET UNIT HEATERS MOUNTED 10'-0" AFF.
5. 16"x8" GRILLE MOUNTED 8" AFF.
6. 16"x8" GRILLE MOUNTED 6'-8" AFF.
7. PROVIDE FIRE DAMPER BEHIND LOUVER.

PROJECT NORTH

HOK SPORT

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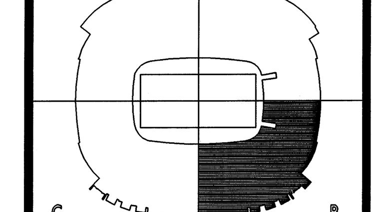


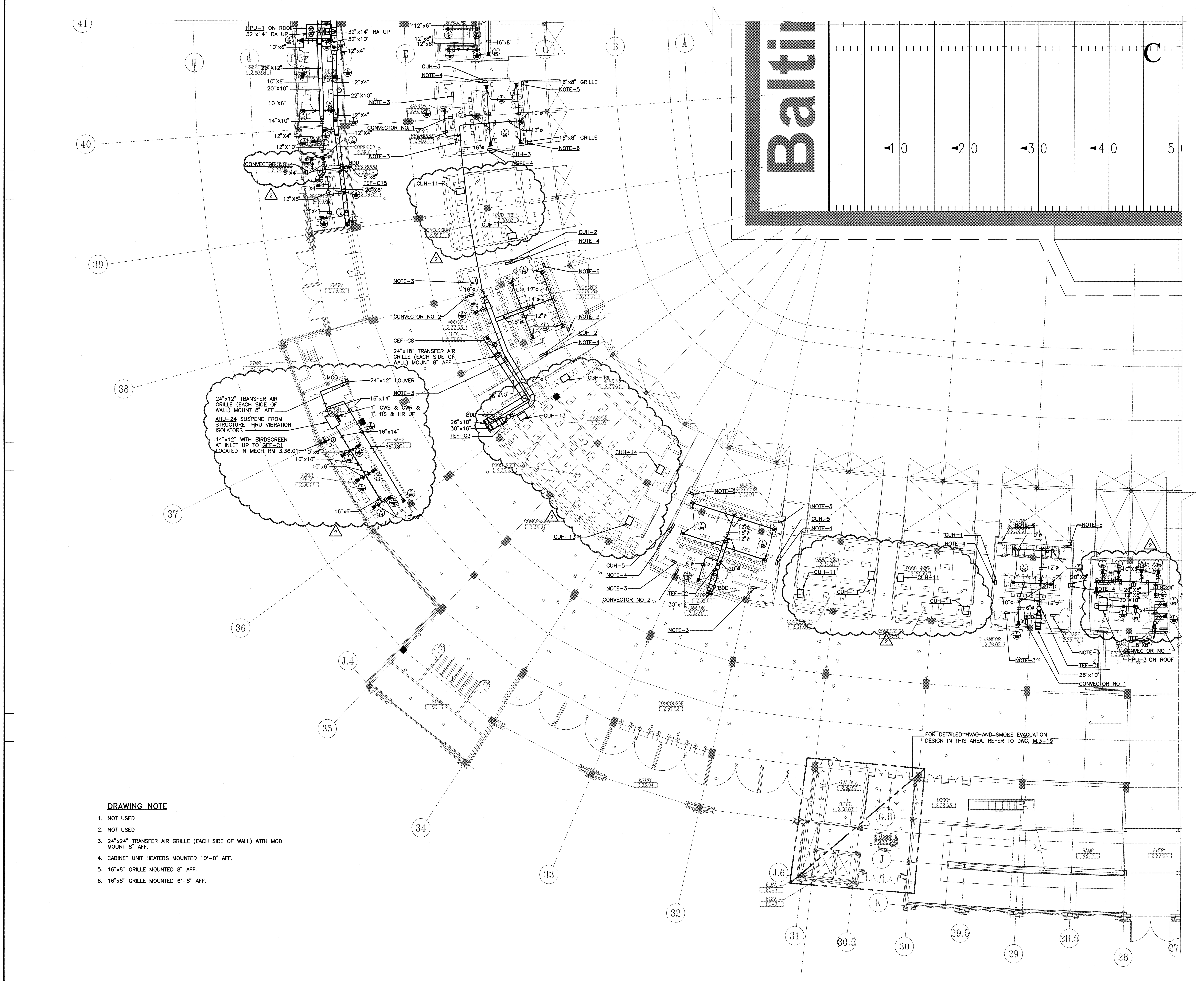
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
MAIN CONCOURSE
QUAD B

CATEGORY - SUB-CATEGORY - SHEET
M.2-02B

03.02.97-16:17-5110M22 - RMF #95110



DRAWING NOTE

1. NOT USED
2. NOT USED
3. 24"x24" TRANSFER AIR GRILLE (EACH SIDE OF WALL) WITH MOD MOUNT 8" AFF.
4. CABINET UNIT HEATERS MOUNTED 10'-0" AFF.
5. 16"x8" GRILLE MOUNTED 8" AFF.
6. 16"x8" GRILLE MOUNTED 6'-8" AFF.

PROJECT NORTH

0 4 8 16 32

03.02.97-16:17-5110M22 - RMF #95110

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323 West 8th Street, Suite700
Kansas City, Missouri 64105

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MIAMI, FLORIDA

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ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
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PHILADELPHIA, PENNSYLVANIA

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NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

D A C B
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY:	REVIEWED BY: DSP

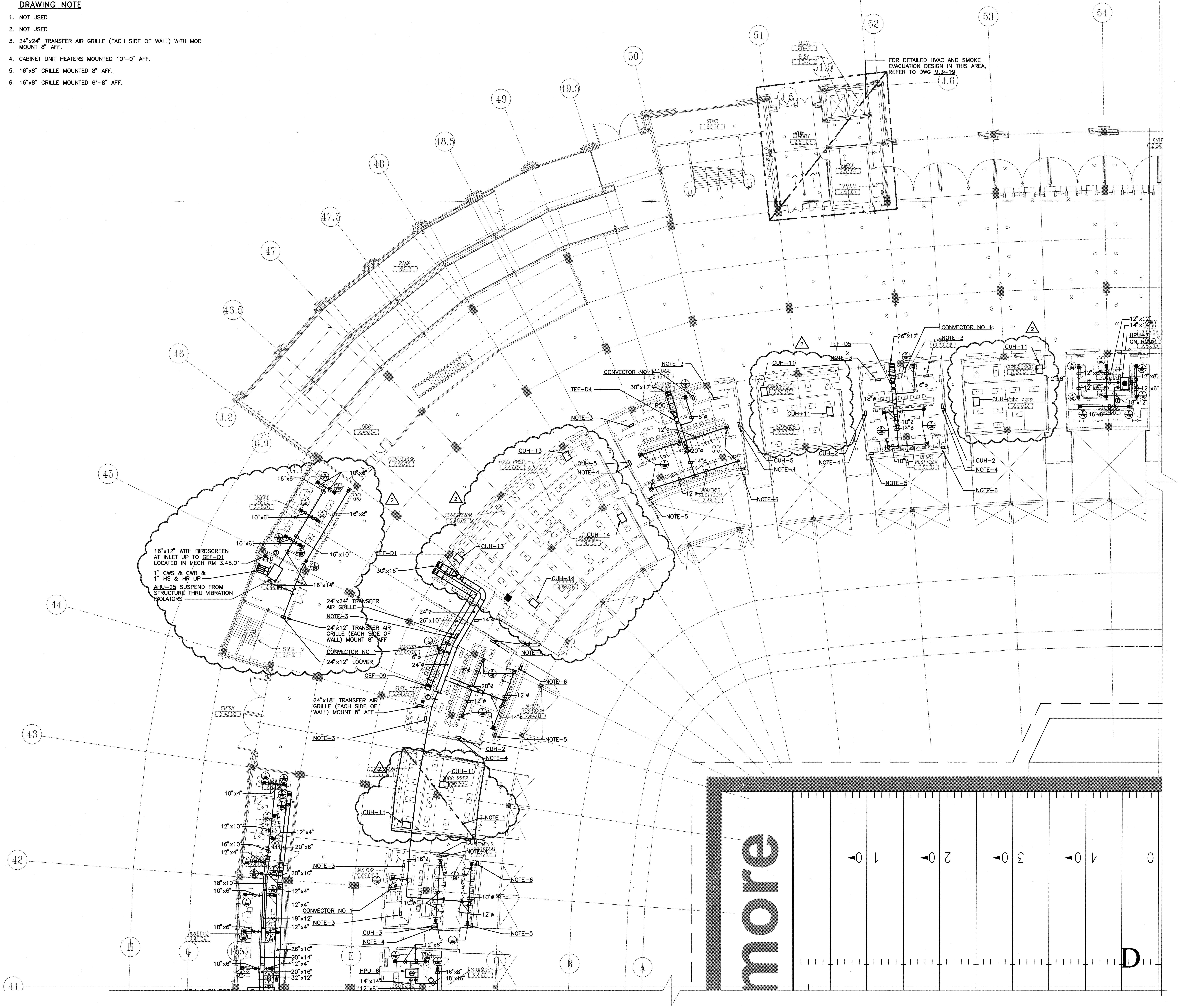
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
MAIN CONCOURSE
QUAD C

CATEGORY - SUB-CATEGORY - SHEET
M.2-02C

DRAWING NOTE

1. NOT USED
2. NOT USED
3. 24"x24" TRANSFER AIR GRILLE (EACH SIDE OF WALL) WITH MOD MOUNT 8" AFF.
4. CABINET UNIT HEATERS MOUNTED 10'-0" AFF.
5. 16"x8" GRILLE MOUNTED 8" AFF.
6. 16"x8" GRILLE MOUNTED 6'-8" AFF.



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Architecture, Engineering, Planning, Interiors, Facility Programming
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Kansas City, Missouri 64105

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MIAMI, FLORIDA

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ROSS MURPHY FINKELSTIEN, INC.
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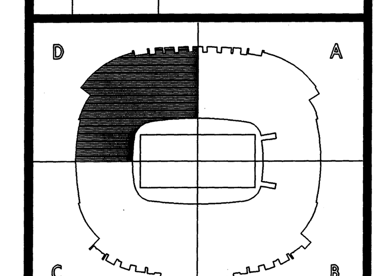
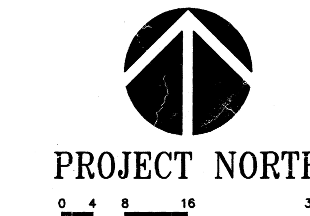


KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP

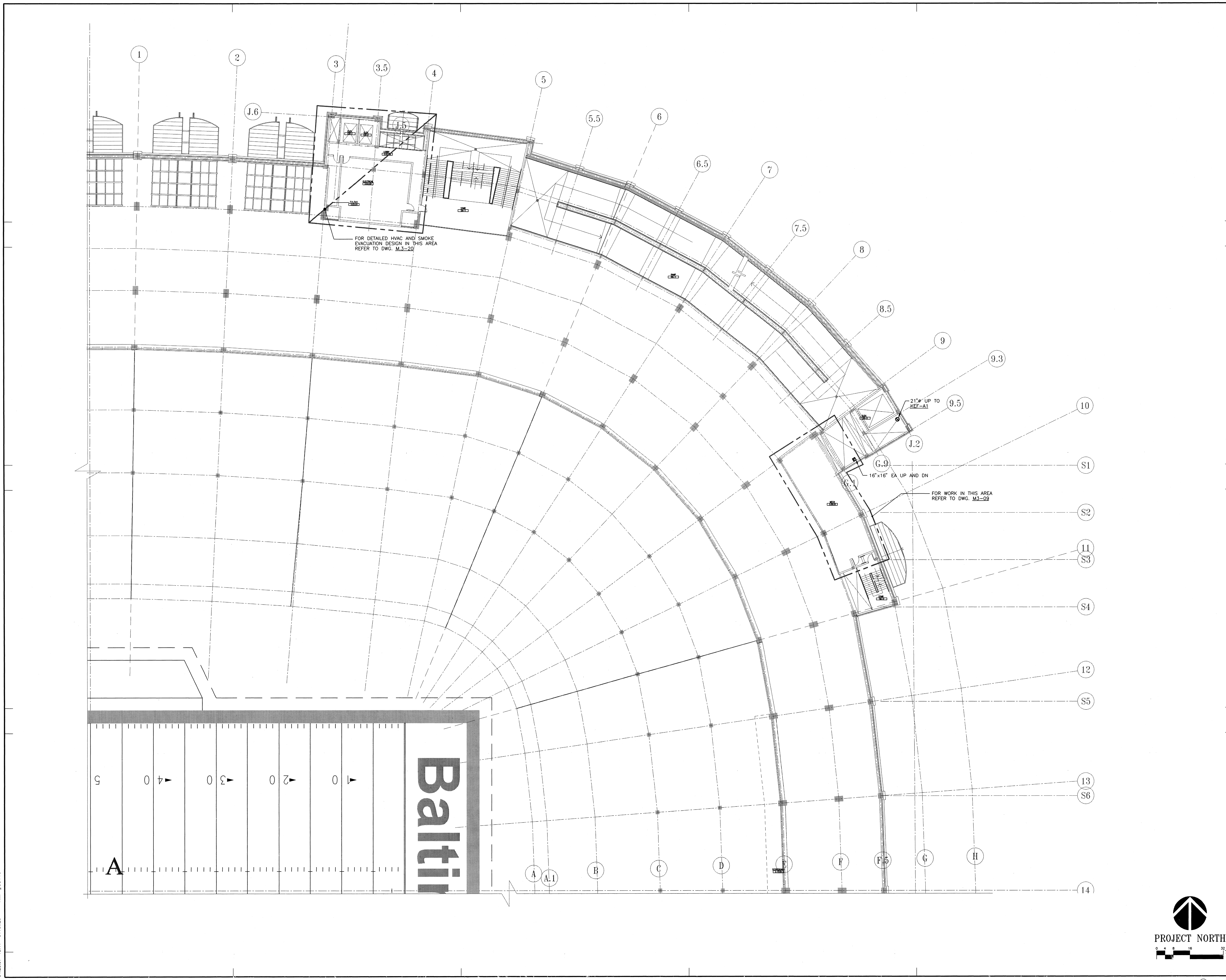
ISSUED: 2-28-97

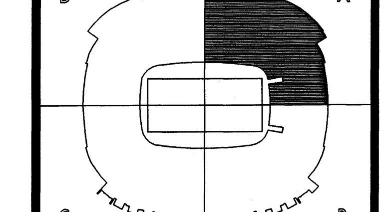
SHEET TITLE
HVAC PLAN
MAIN CONCOURSE
QUAD D


PROJECT NORTH

CATEGORY - SUB-CATEGORY - SHEET
M.2-02D

03.02.97-16:17-5110M22 - RMF #95110





KEYPLAN

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323 West 8th Street, Suite700
Kansas City, Missouri 64105

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BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
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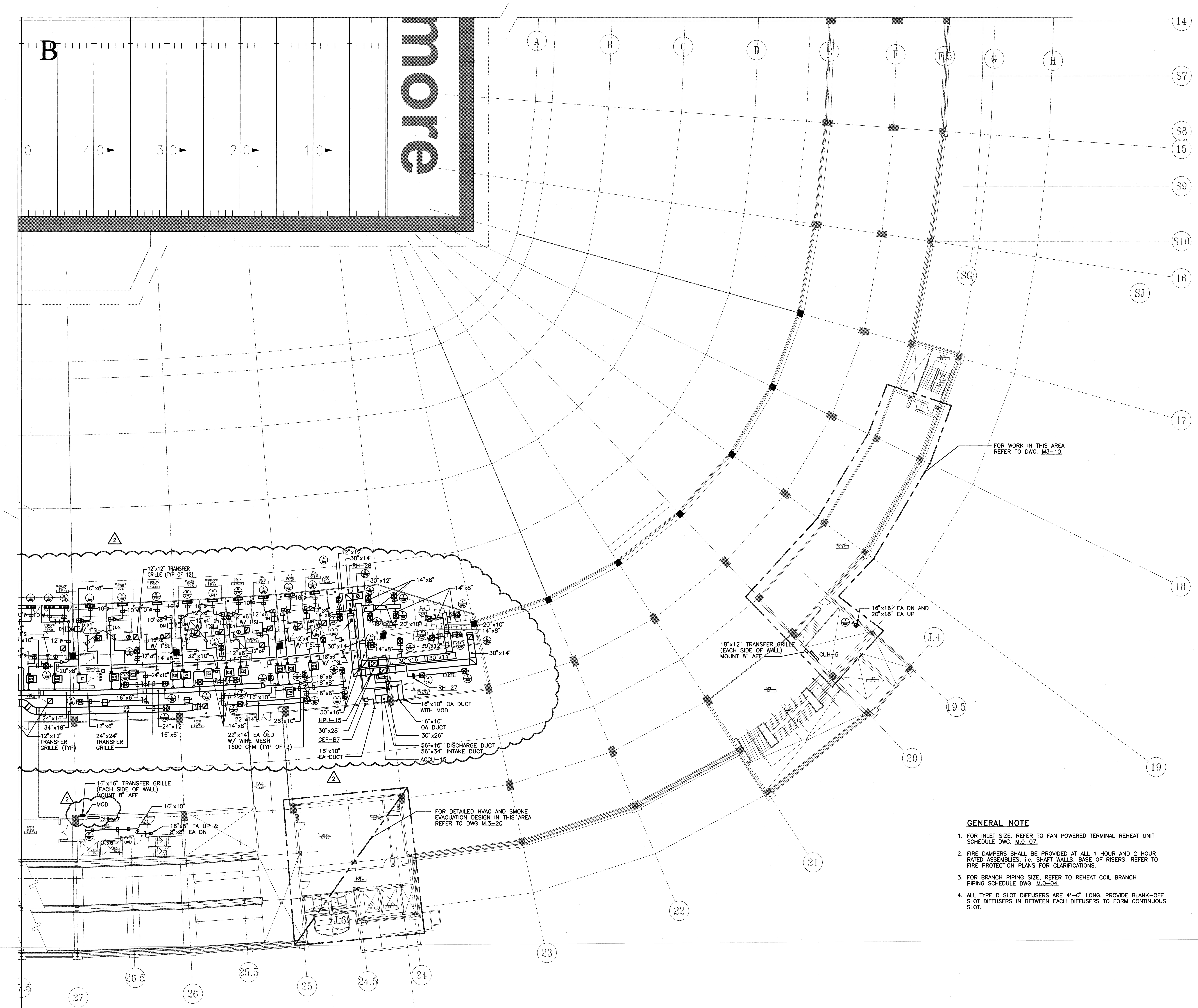
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN PRESS LEVEL QUAD A

CATEGORY - SUB-CATEGORY - SHEET
M.2-03A

04.25.97-13:41-5110M23 - RMF #95110



GENERAL NOTE

1. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG. M.0-07.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL 1 HOUR AND 2 HOUR RATED ASSEMBLIES, i.e. SHAFT WALLS, BASE OF RISERS. REFER TO FIRE PROTECTION PLANS FOR CLARIFICATIONS.
3. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG. M.0-04.
4. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG. PROVIDE BLANK-OFF SLOT DIFFUSERS IN BETWEEN EACH DIFFUSERS TO FORM CONTINUOUS SLOT.

PROJECT NORTH

0 4 8 16 32

04.29.97-16:19-5110M23 - RMF #95110

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Kansas City, Missouri 64105

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MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
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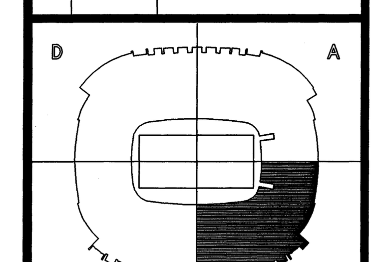
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

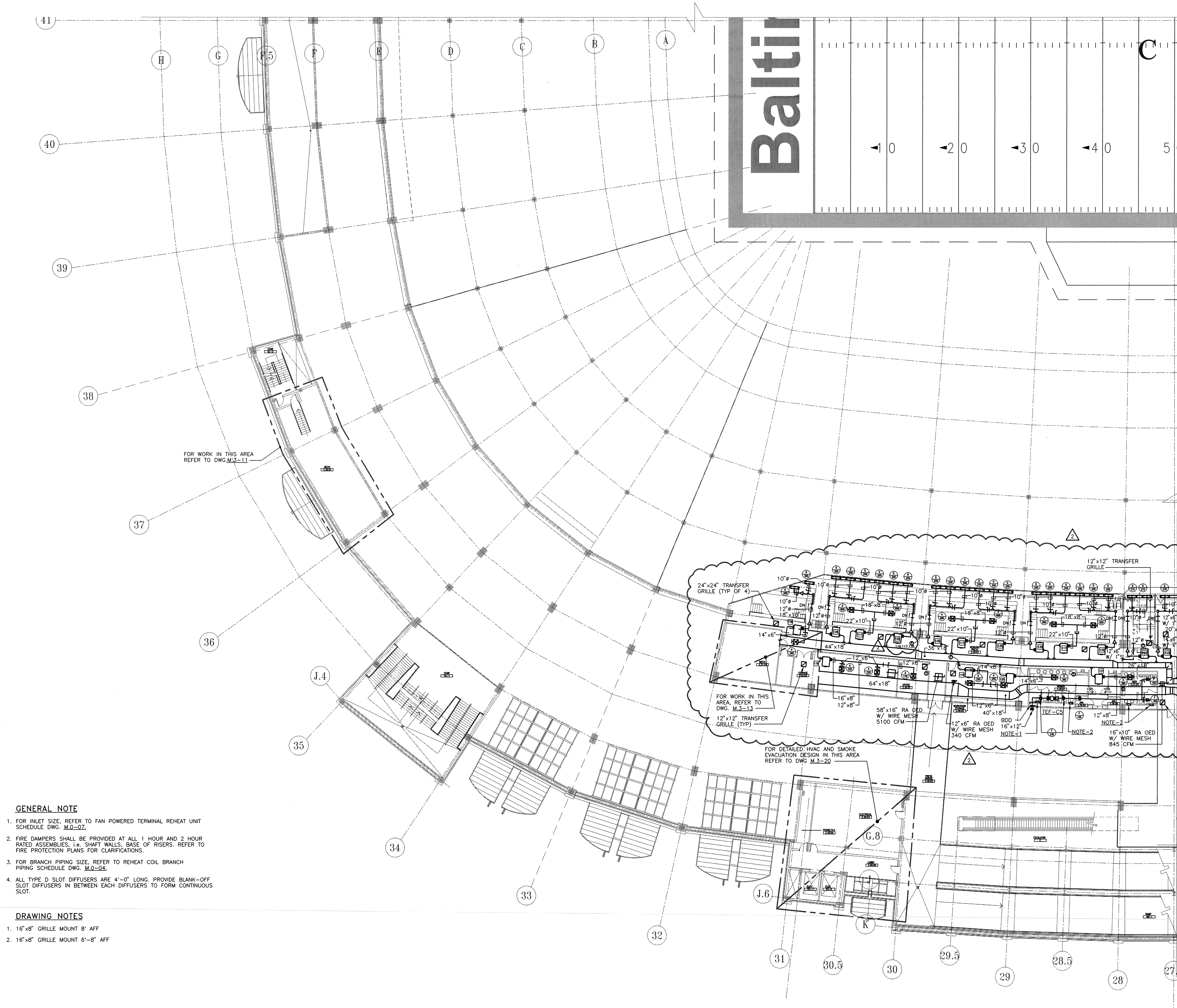
PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JFL
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE

HVAC PLAN
PRESS LEVEL
QUAD B

CATEGORY - SUB-CATEGORY - SHEET

M.2-03B



GENERAL NOTE

1. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG. M.0-07.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL 1 HOUR AND 2 HOUR RATED ASSEMBLIES, i.e. SHAFT WALLS, BASE OF RISERS. REFER TO FIRE PROTECTION PLANS FOR CLARIFICATIONS.
3. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG. M.0-04.
4. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG. PROVIDE BLANK-OFF SLOT DIFFUSERS IN BETWEEN EACH DIFFUSERS TO FORM CONTINUOUS SLOT.

DRAWING NOTES

1. 16"x8" GRILLE MOUNT 8' AFF
2. 16"x8" GRILLE MOUNT 6'-8" AFF

04.25.97-13:41-5110M23 - RMF #95110

SPORT

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NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

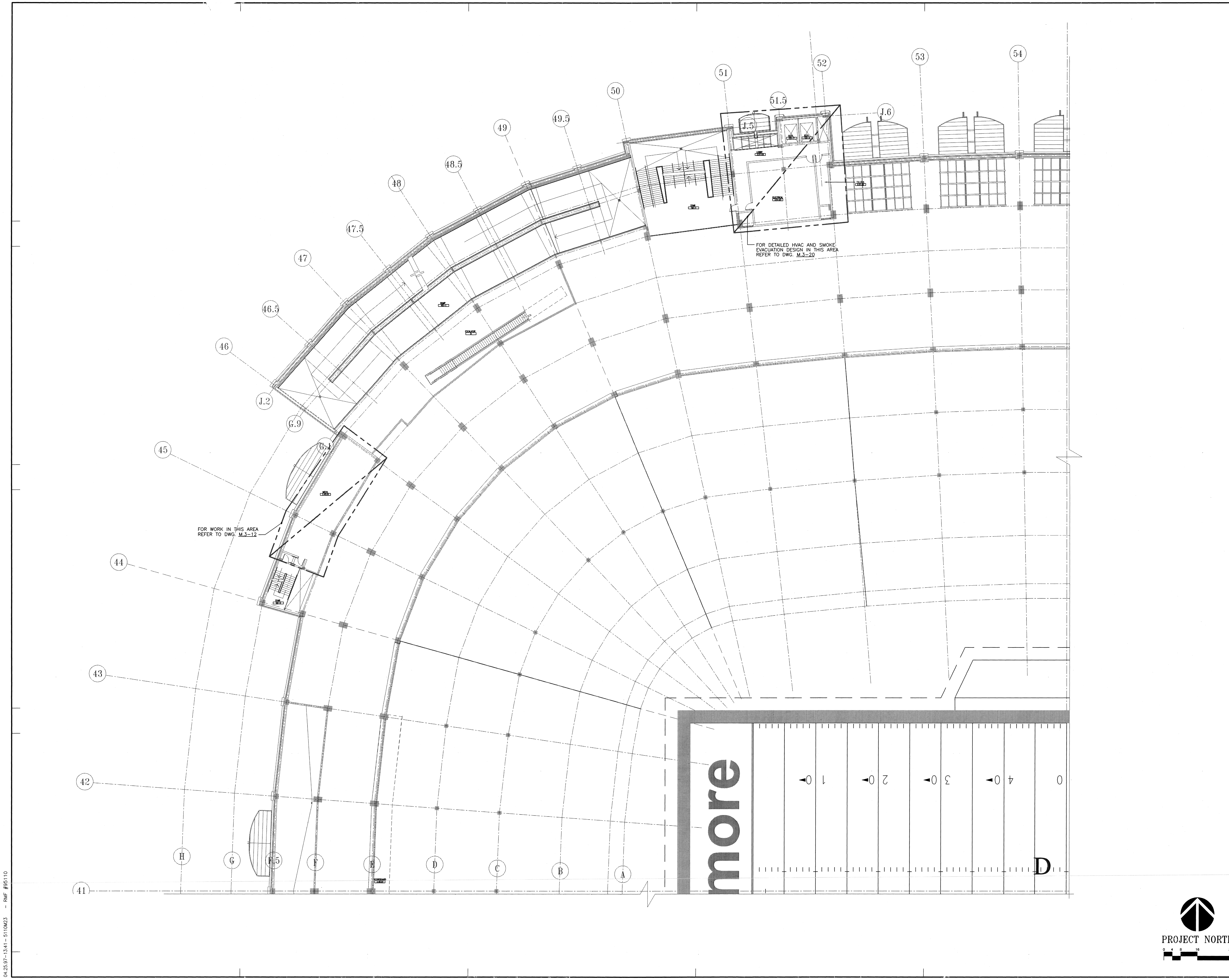
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP

ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN PRESS LEVEL QUAD C

CATEGORY - SUB-CATEGORY - SHEET
M.2-03C



SPORT

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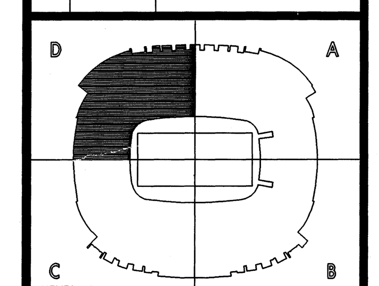
2	4-28-97	BULLETIN #44



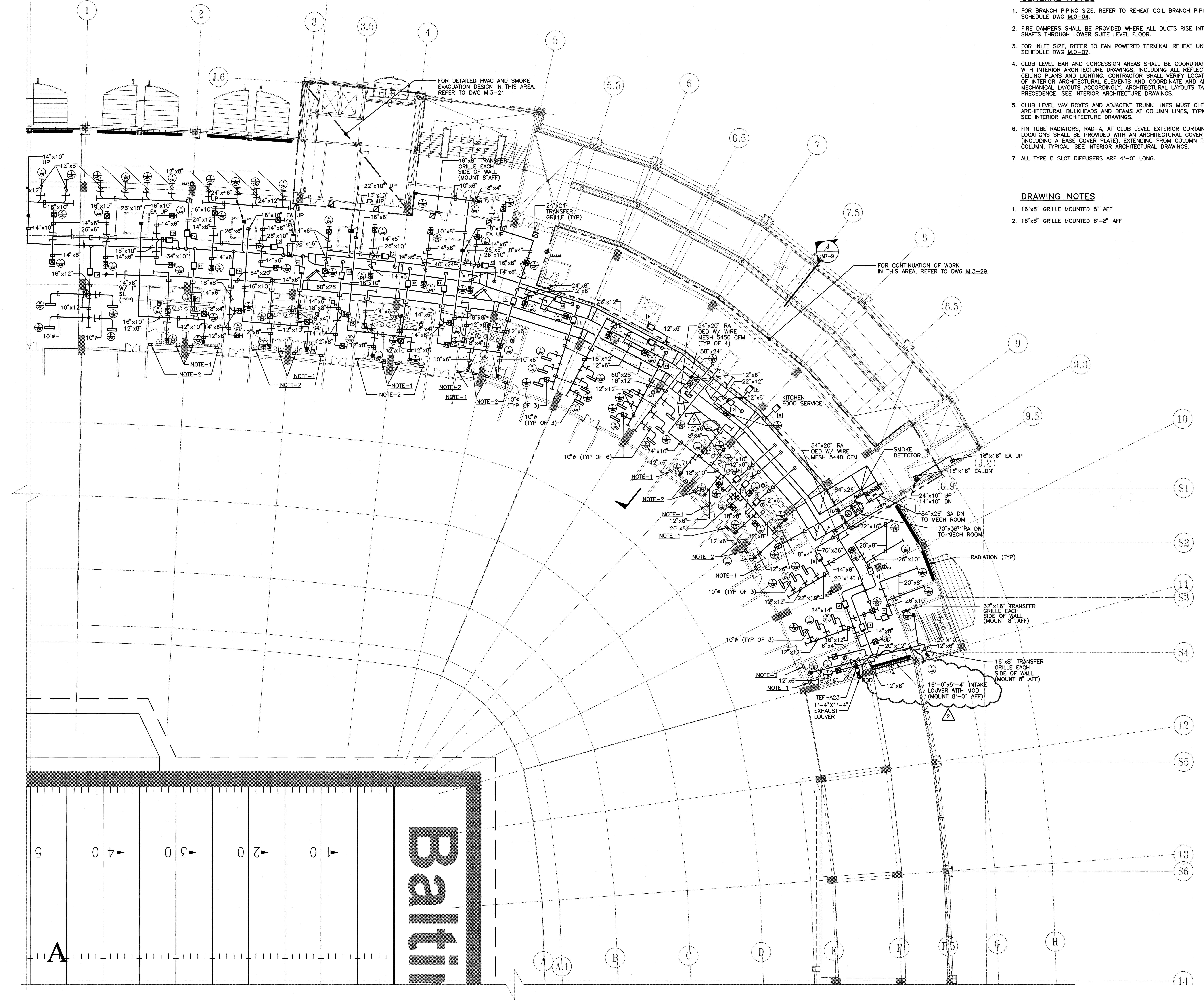
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY:
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
PRESS LEVEL
QUAD D

CATEGORY - SUB-CATEGORY - SHEET
M.2-03D

04.25.97-13:41-5110M23 - RMF #95110



GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED WHERE ALL DUCTS RISE INTO SHAFTS THROUGH LOWER SUITE LEVEL FLOOR.
3. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG M.0-07.
4. CLUB LEVEL BAR AND CONCESSION AREAS SHALL BE COORDINATED WITH INTERIOR ARCHITECTURE DRAWINGS, INCLUDING ALL REFLECTED CEILING PLANS AND LIGHTING. CONTRACTOR SHALL VERIFY LOCATIONS OF INTERIOR ARCHITECTURAL ELEMENTS AND COORDINATE AND ADJUST MECHANICAL LAYOUTS ACCORDINGLY. ARCHITECTURAL LAYOUTS TAKE PRECEDENCE. SEE INTERIOR ARCHITECTURE DRAWINGS.
5. CLUB LEVEL VAV BOXES AND ADJACENT TRUNK LINES MUST CLEAR ARCHITECTURAL BULKHEADS AND BEAMS AT COLUMN LINES, TYPICAL. SEE INTERIOR ARCHITECTURE DRAWINGS.
6. FIN TUBE RADIATORS, RAD-A, AT CLUB LEVEL EXTERIOR CURTAIN WALL LOCATIONS SHALL BE PROVIDED WITH AN ARCHITECTURAL COVER (INCLUDING A BASE COVER PLATE), EXTENDING FROM COLUMN TO COLUMN, TYPICAL. SEE INTERIOR ARCHITECTURAL DRAWINGS.
7. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.

DRAWING NOTES

1. 16"x8" GRILLE MOUNTED 8" AFF
2. 16"x8" GRILLE MOUNTED 6'-8" AFF

PROJECT NORTH

0 4 8 16 32

HOK SPORT

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Architecture, Engineering, Planning, Interiors, Facility Programming
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Kansas City, Missouri 64105

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BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
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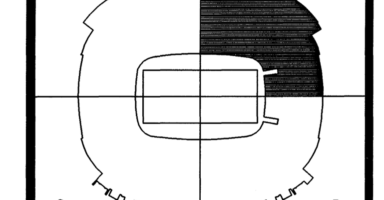


KEYPLAN

PROJECT NO.	ISSUED BY:
95-675-00	---
DRAWN BY: ---	REVIEWED BY: DSP

ISSUED:
2-28-97

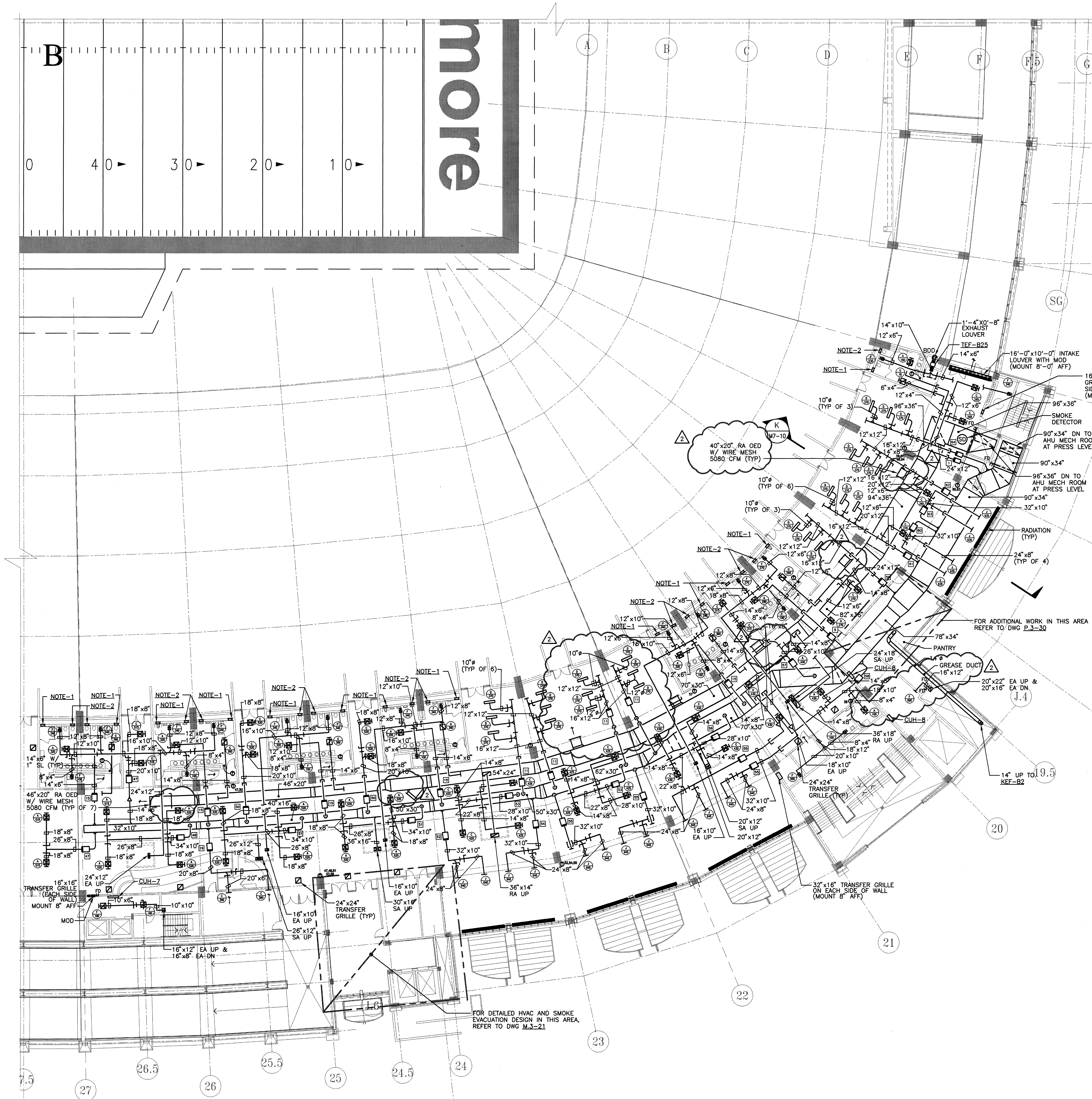
SHEET TITLE

HVAC PLAN CLUB LEVEL QUAD A

CATEGORY - SUB-CATEGORY - SHEET

M.2-04A

04.14.97-14:48-5110M24 - RMF #95110



GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED WHERE ALL DUCTS RISE INTO SHAFTS THROUGH LOWER SUITE LEVEL FLOOR.
3. FOR DETAILED HVAC DESIGN OF CONCESSION AREAS, REFER TO DWG M.3-20.
4. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG M.0-07.
5. CLUB LEVEL BAR AND CONCESSION AREAS SHALL BE COORDINATED WITH INTERIOR ARCHITECTURE DRAWINGS, INCLUDING ALL REFLECTED CEILING PLANS AND LIGHTING. CONTRACTOR SHALL VERIFY LOCATIONS OF INTERIOR ARCHITECTURAL ELEMENTS AND COORDINATE AND ADJUST MECHANICAL LAYOUTS ACCORDINGLY. ARCHITECTURAL LAYOUTS TAKE PRECEDENCE. SEE INTERIOR ARCHITECTURE DRAWINGS.
6. CLUB LEVEL VAV BOXES AND ADJACENT TRUNK LINES MUST CLEAR ARCHITECTURAL BULKHEADS AND BEAMS AT COLUMN LINES, TYPICAL. SEE INTERIOR ARCHITECTURE DRAWINGS.
7. FIN TUBE RADIATORS, RAD-A, AT CLUB LEVEL EXTERIOR CURTAIN WALL LOCATIONS SHALL BE PROVIDED WITH AN ARCHITECTURAL COVER (INCLUDING A BASE COVER PLATE), EXTENDING FROM COLUMN TO COLUMN, TYPICAL. SEE INTERIOR ARCHITECTURAL DRAWINGS.
8. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.

DRAWING NOTES

1. 16"x8" GRILLE MOUNTED 8" AFF
2. 16"x8" GRILLE MOUNTED 6'-8" AFF

PROJECT NORTH

HOK SPORT

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
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MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
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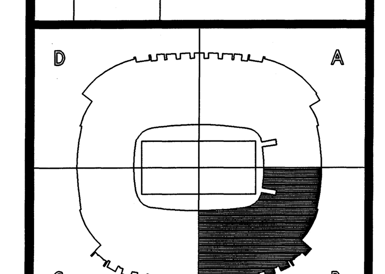
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

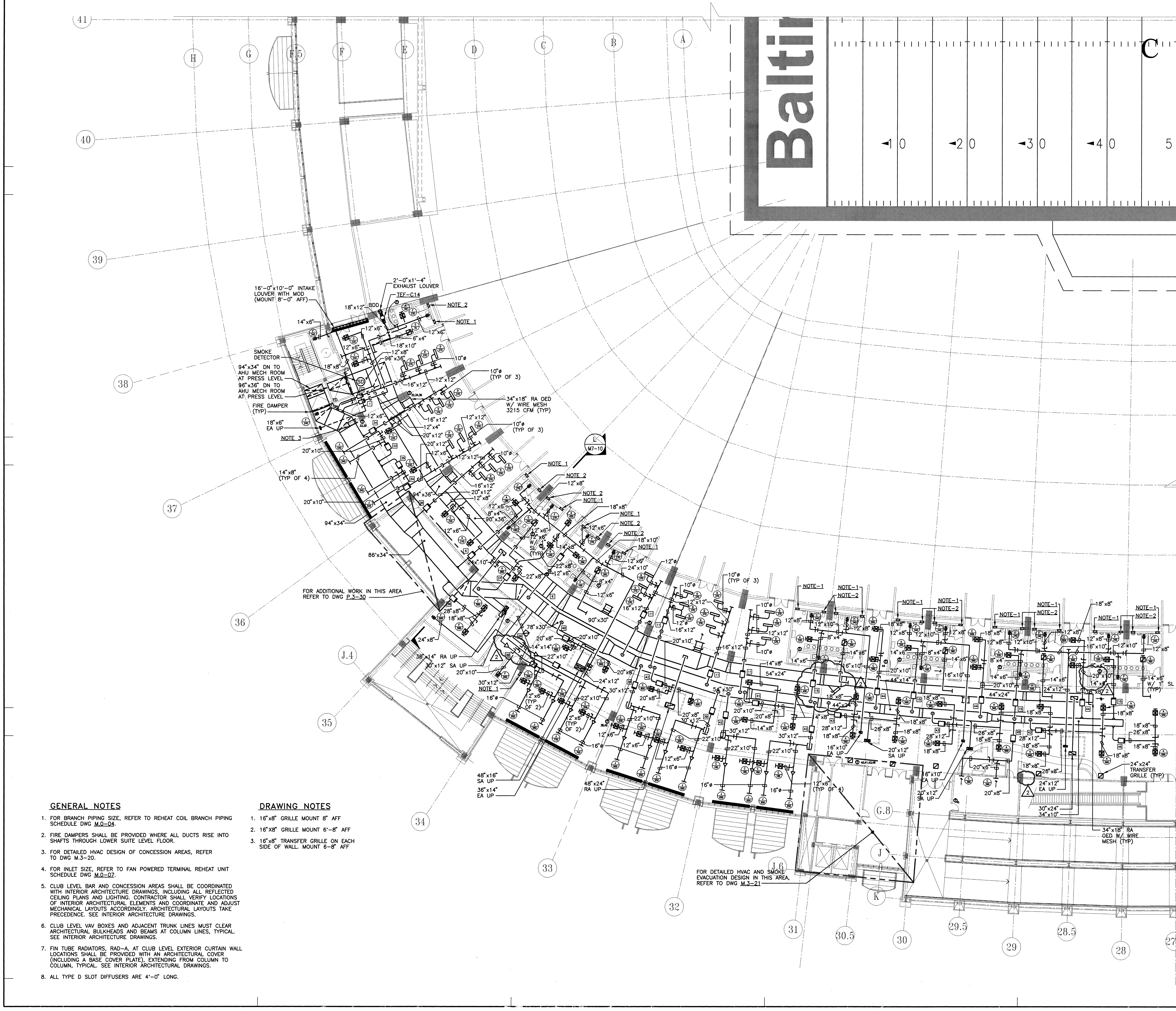
PROJECT NO.	ISSUED BY:
95-675-00	---
DRAWN BY: JFL	REVIEWED BY: DSP

ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
CLUB LEVEL
QUAD B

CATEGORY - SUB-CATEGORY - SHEET
M.2-04B

04.14.97-14:48-5110M24 - RMF #95110



GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED WHERE ALL DUCTS RISE INTO SHAFTS THROUGH LOWER SUITE LEVEL FLOOR.
3. FOR DETAILED HVAC DESIGN OF CONCESSION AREAS, REFER TO DWG M.3-20.
4. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG M.0-07.
5. CLUB LEVEL BAR AND CONCESSION AREAS SHALL BE COORDINATED WITH INTERIOR ARCHITECTURE DRAWINGS, INCLUDING ALL REFLECTED CEILING PLANS AND LIGHTING. CONTRACTOR SHALL VERIFY LOCATIONS OF INTERIOR ARCHITECTURAL ELEMENTS AND COORDINATE AND ADJUST MECHANICAL LAYOUTS ACCORDINGLY. ARCHITECTURAL LAYOUTS TAKE PRECEDENCE. SEE INTERIOR ARCHITECTURE DRAWINGS.
6. CLUB LEVEL VAV BOXES AND ADJACENT TRUNK LINES MUST CLEAR ARCHITECTURAL BULKHEADS AND BEAMS AT COLUMN LINES, TYPICAL. SEE INTERIOR ARCHITECTURE DRAWINGS.
7. FIN TUBE RADIATORS, RAD-A, AT CLUB LEVEL EXTERIOR CURTAIN WALL LOCATIONS SHALL BE PROVIDED WITH AN ARCHITECTURAL COVER (INCLUDING A BASE COVER PLATE), EXTENDING FROM COLUMN TO COLUMN, TYPICAL. SEE INTERIOR ARCHITECTURAL DRAWINGS.
8. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.

DRAWING NOTES

1. 16"x8" GRILLE MOUNT 8" AFF
2. 16"X8" GRILLE MOUNT 6'-8" AFF
3. 16"x8" TRANSFER GRILLE ON EACH SIDE OF WALL. MOUNT 6-8" AFF

04.14.97-14:48-5110M24 - RMF #95110

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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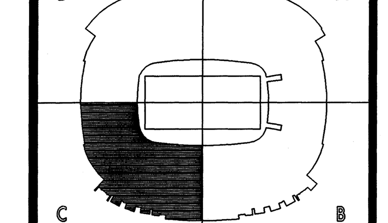
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
CLUB LEVEL
QUAD C

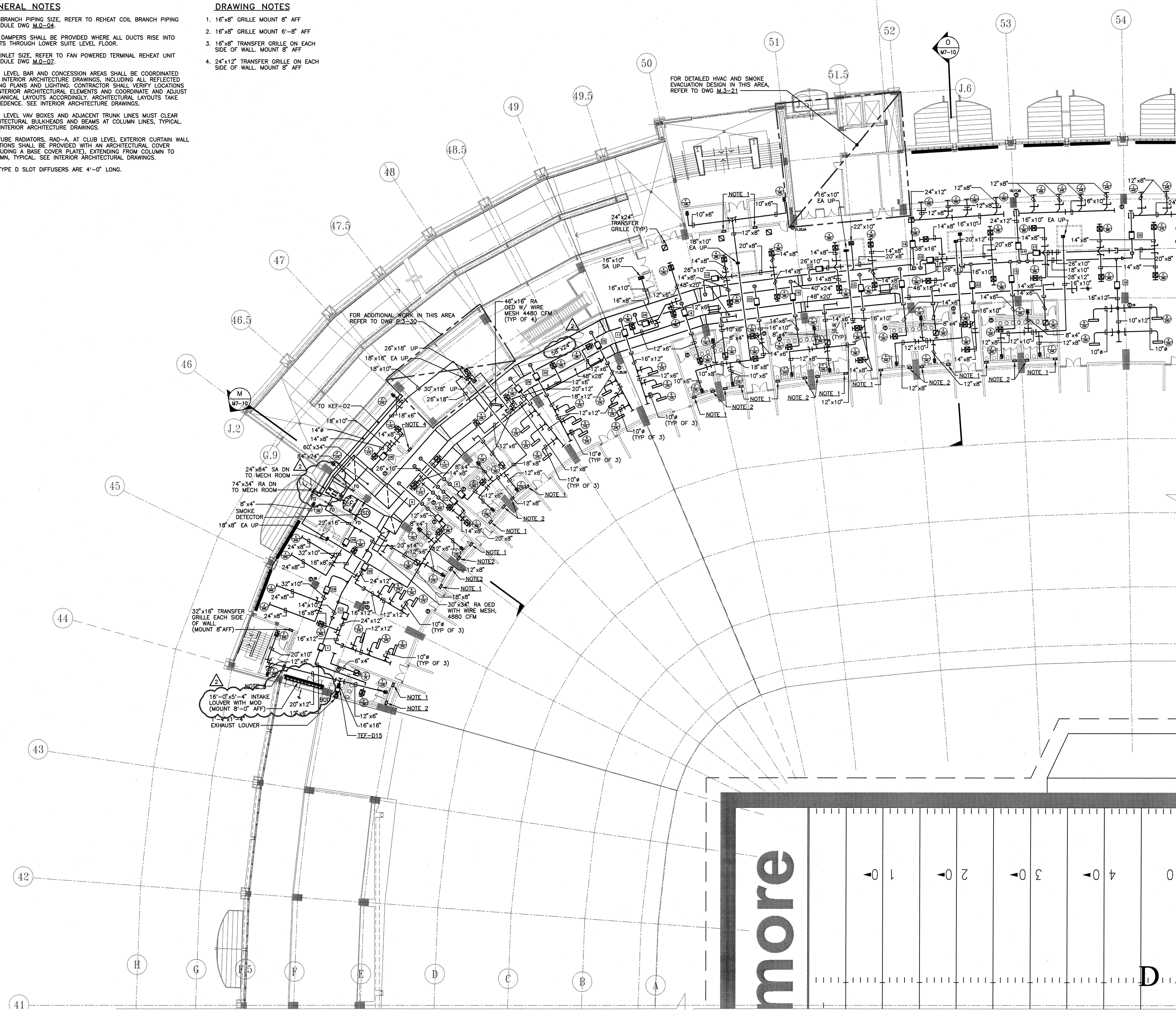
CATEGORY - SUB-CATEGORY - SHEET
M.2-04C

<u>GENERAL NOTES</u>

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED WHERE ALL DUCTS RISE INTO SHAFTS THROUGH LOWER SUITE LEVEL FLOOR.
3. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG M.0-07.
4. CLUB LEVEL BAR AND CONCESSION AREAS SHALL BE COORDINATED WITH INTERIOR ARCHITECTURE DRAWINGS, INCLUDING ALL REFLECTED CEILING PLANS AND LIGHTING. CONTRACTOR SHALL VERIFY LOCATIONS OF INTERIOR ARCHITECTURAL ELEMENTS AND COORDINATE AND ADJUST MECHANICAL LAYOUTS ACCORDINGLY. ARCHITECTURAL LAYOUTS TAKE PRECEDENCE. SEE INTERIOR ARCHITECTURE DRAWINGS.
5. CLUB LEVEL VAV BOXES AND ADJACENT TRUNK LINES MUST CLEAR ARCHITECTURAL BULKHEADS AND BEAMS AT COLUMN LINES, TYPICAL. SEE INTERIOR ARCHITECTURE DRAWINGS.
6. FIN TUBE RADIATORS, RAD-A, AT CLUB LEVEL EXTERIOR CURTAIN WALL LOCATIONS SHALL BE PROVIDED WITH AN ARCHITECTURAL COVER (INCLUDING A BASE COVER PLATE), EXTENDING FROM COLUMN TO COLUMN, TYPICAL. SEE INTERIOR ARCHITECTURAL DRAWINGS.
7. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.

<u>DRAWING NOTES</u>

1. 16"x8" GRILLE MOUNT 8" AFF
2. 16"x8" GRILLE MOUNT 6'-8" AFF
3. 16"x8" TRANSFER GRILLE ON EACH SIDE OF WALL. MOUNT 8" AFF
4. 24"x12" TRANSFER GRILLE ON EACH SIDE OF WALL. MOUNT 8" AFF



PROJECT NORTH

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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RUMMEL, KLEPPER & KAHL
BALTIMORE, MARYLAND

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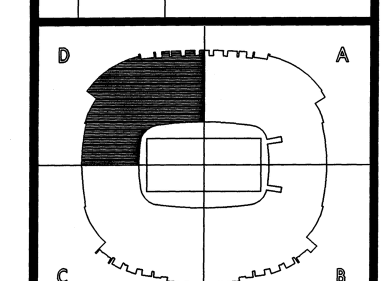
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO.: 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

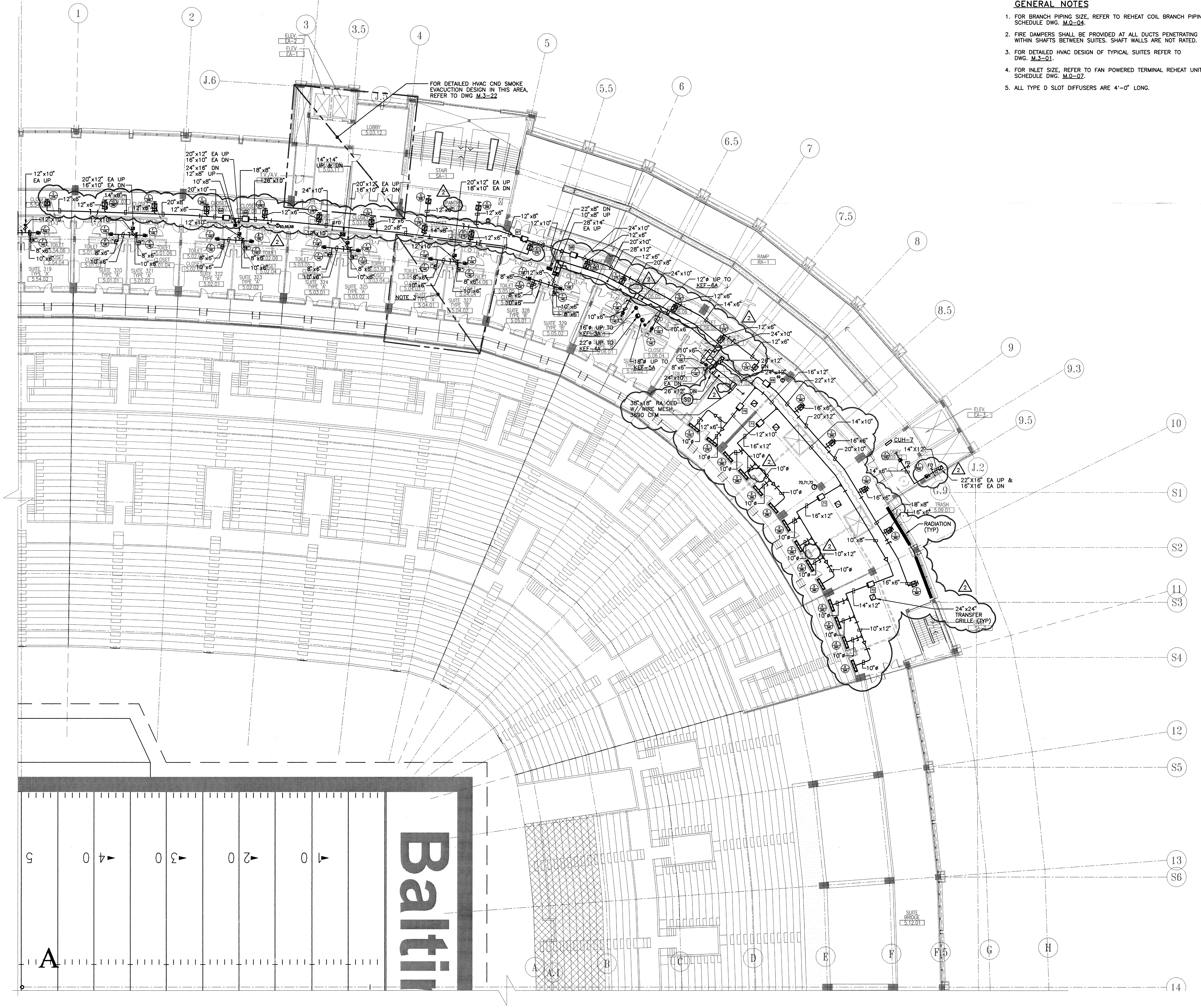
SHEET TITLE
HVAC PLAN
CLUB LEVEL
QUAD D

CATEGORY - SUB-CATEGORY - SHEET
M.2-04D

04.14.97-14:48-5110M24 - RMF #95110

GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG. M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
3. FOR DETAILED HVAC DESIGN OF TYPICAL SUITES REFER TO DWG. M.3-01.
4. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG. M.0-07.
5. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.



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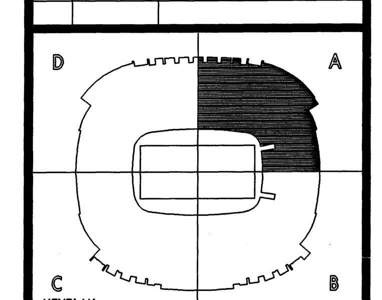


KEYPLAN

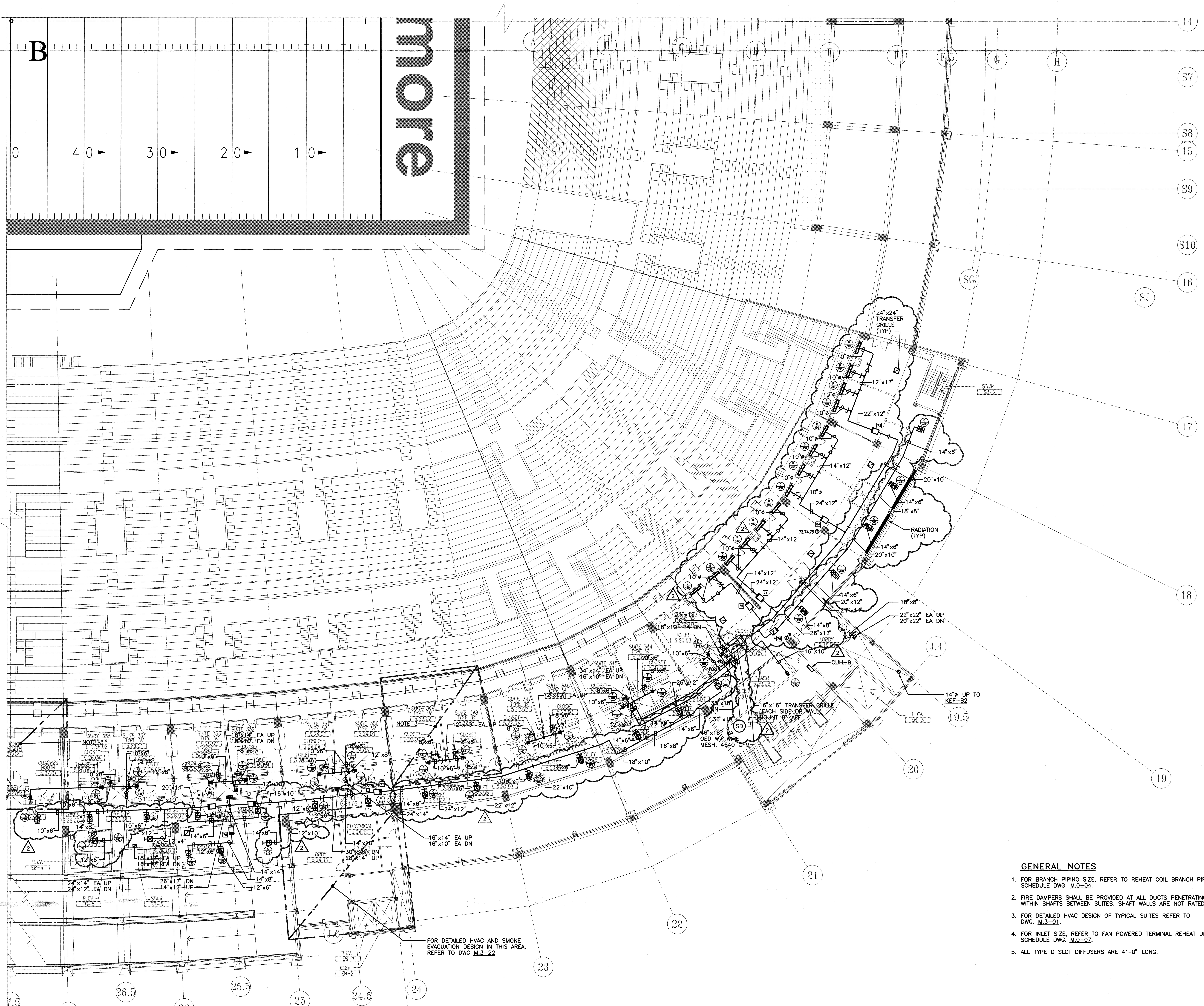
PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP

ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
LOWER SUITE LEVEL
QUAD A

CATEGORY - SUB-CATEGORY - SHEET
M.2-05A

04.15.97-07:50-5110M25 - RMF #95110



GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG. M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
3. FOR DETAILED HVAC DESIGN OF TYPICAL SUITES REFER TO DWG. M.3-01.
4. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG. M.0-07.
5. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.

PROJECT NORTH

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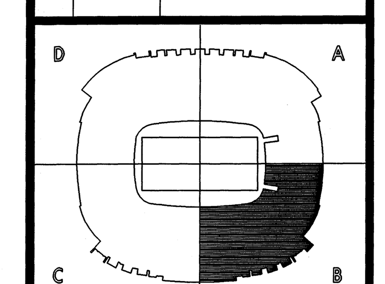
REVISIONS

NO.	DATE	DESCRIPTION

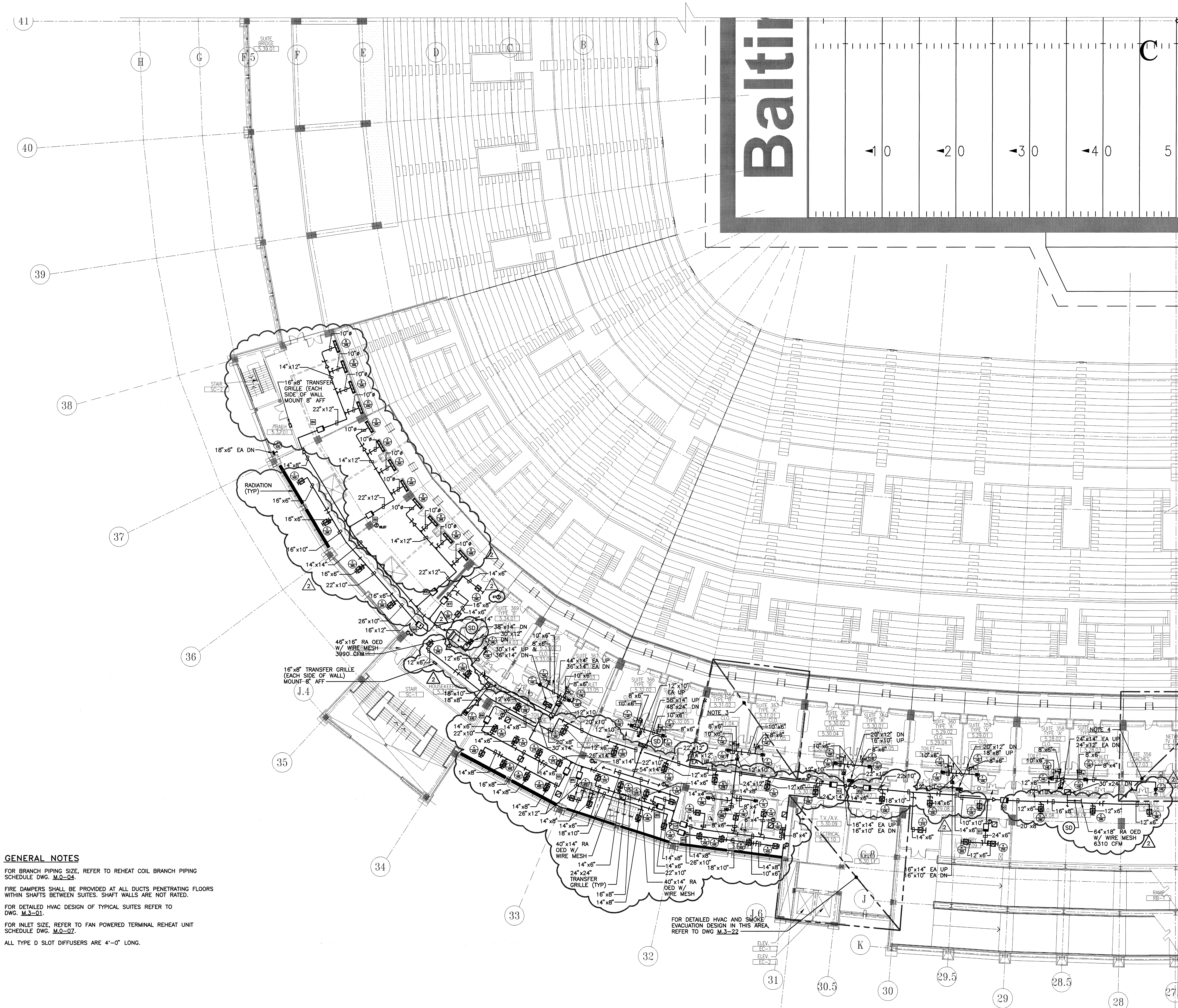


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JFL
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
LOWER SUITE LEVEL
QUAD B

CATEGORY - SUB-CATEGORY - SHEET
M.2-05B



GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG. M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
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4. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG. M.0-07.
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REVISIONS

NO.	DATE	DESCRIPTION

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: JFL	REVIEWED BY: DSP
ISSUED: 2-28-97	

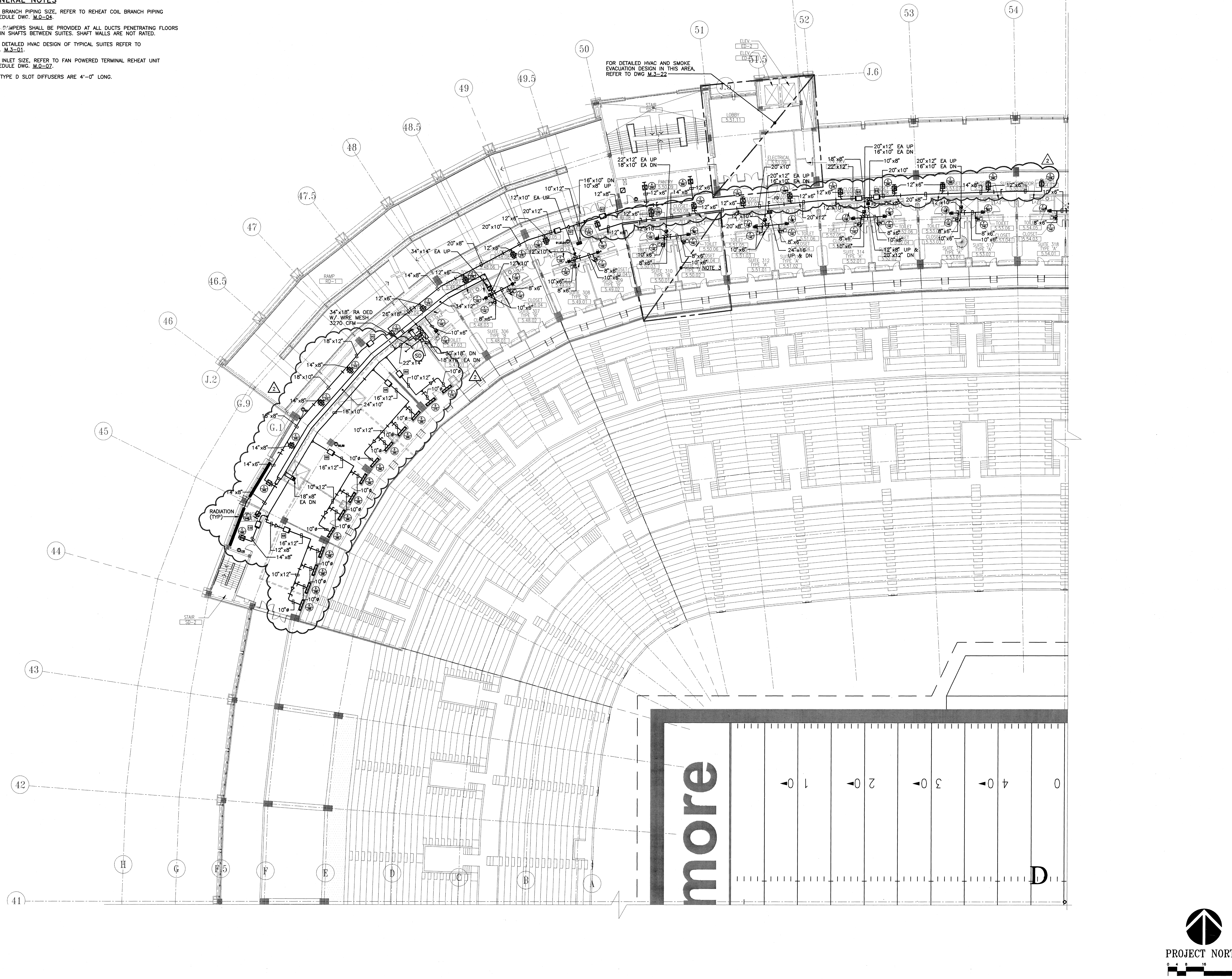
SHEET TITLE
HVAC PLAN
LOWER SUITE LEVEL
QUAD C

CATEGORY - SUB-CATEGORY - SHEET
M.2-05C

04.15.97-07.50-5110M25 - RMF #95110

GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG. M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
3. FOR DETAILED HVAC DESIGN OF TYPICAL SUITES REFER TO DWG. M.3-01.
4. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DWG. M.0-07.
5. ALL TYPE D SLOT DIFFUSERS ARE 4'-0" LONG.



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MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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RUMMEL, KLEPPER & KAHL
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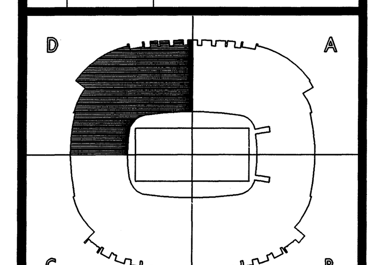
REVISIONS

NO.	DATE	DESCRIPTION



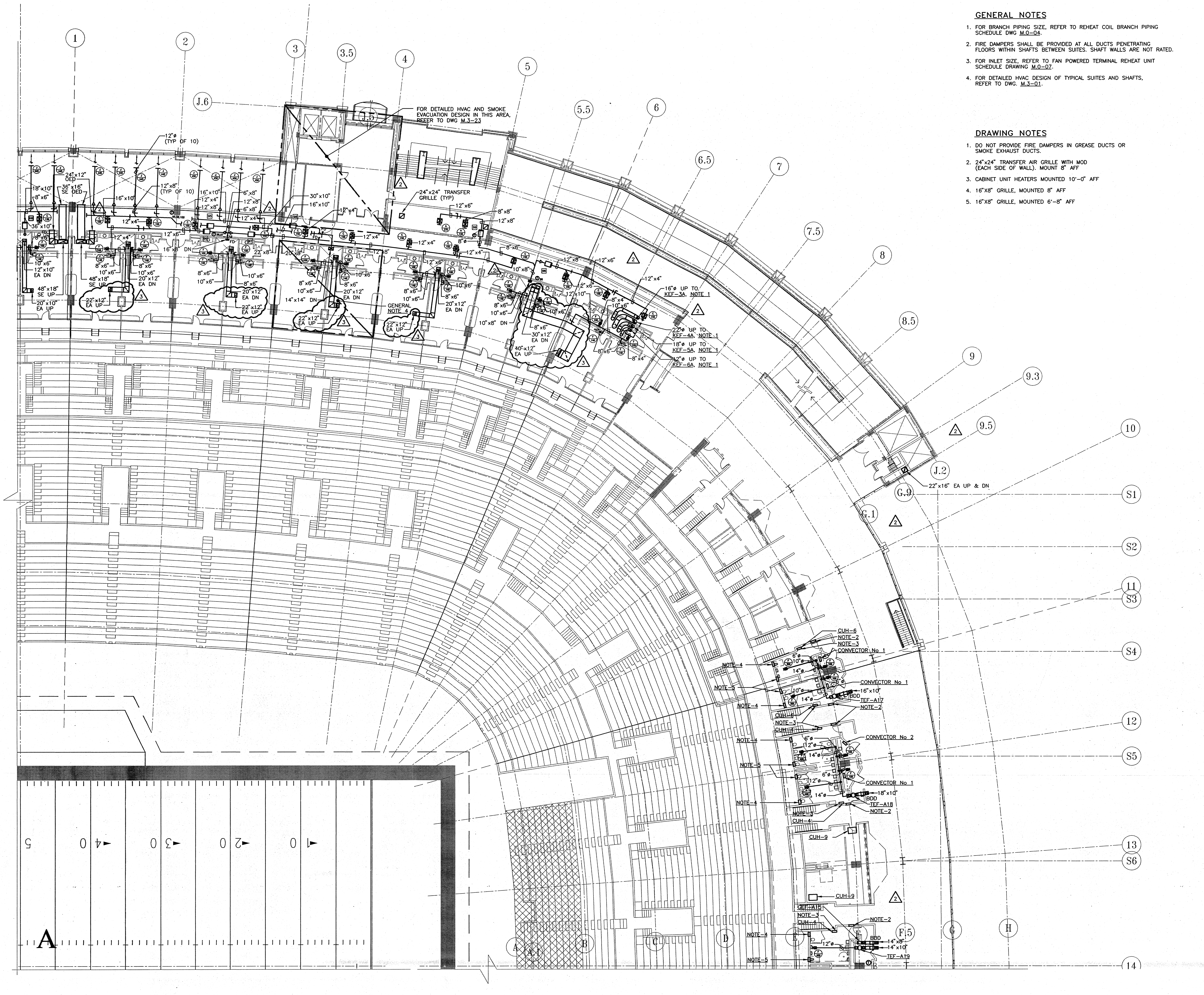
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
LOWER SUITE LEVEL
QUAD D

CATEGORY - SUB-CATEGORY - SHEET
M.2-05D

04.15.97-07:50-5110M25 - RMF #95110



GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
3. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DRAWING M.0-07.
4. FOR DETAILED HVAC DESIGN OF TYPICAL SUITES AND SHAFTS, REFER TO DWG. M.3-01.

DRAWING NOTES

1. DO NOT PROVIDE FIRE DAMPERS IN GREASE DUCTS OR SMOKE EXHAUST DUCTS.
2. 24"x24" TRANSFER AIR GRILLE WITH MOD (EACH SIDE OF WALL). MOUNT 8" AFF
3. CABINET UNIT HEATERS MOUNTED 10'-0" AFF
4. 16"X8" GRILLE, MOUNTED 8" AFF
5. 16"X8" GRILLE, MOUNTED 6'-8" AFF

SPORT

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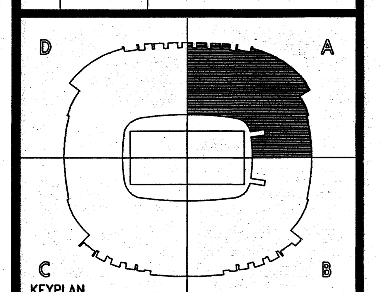
BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76



KEYPLAN

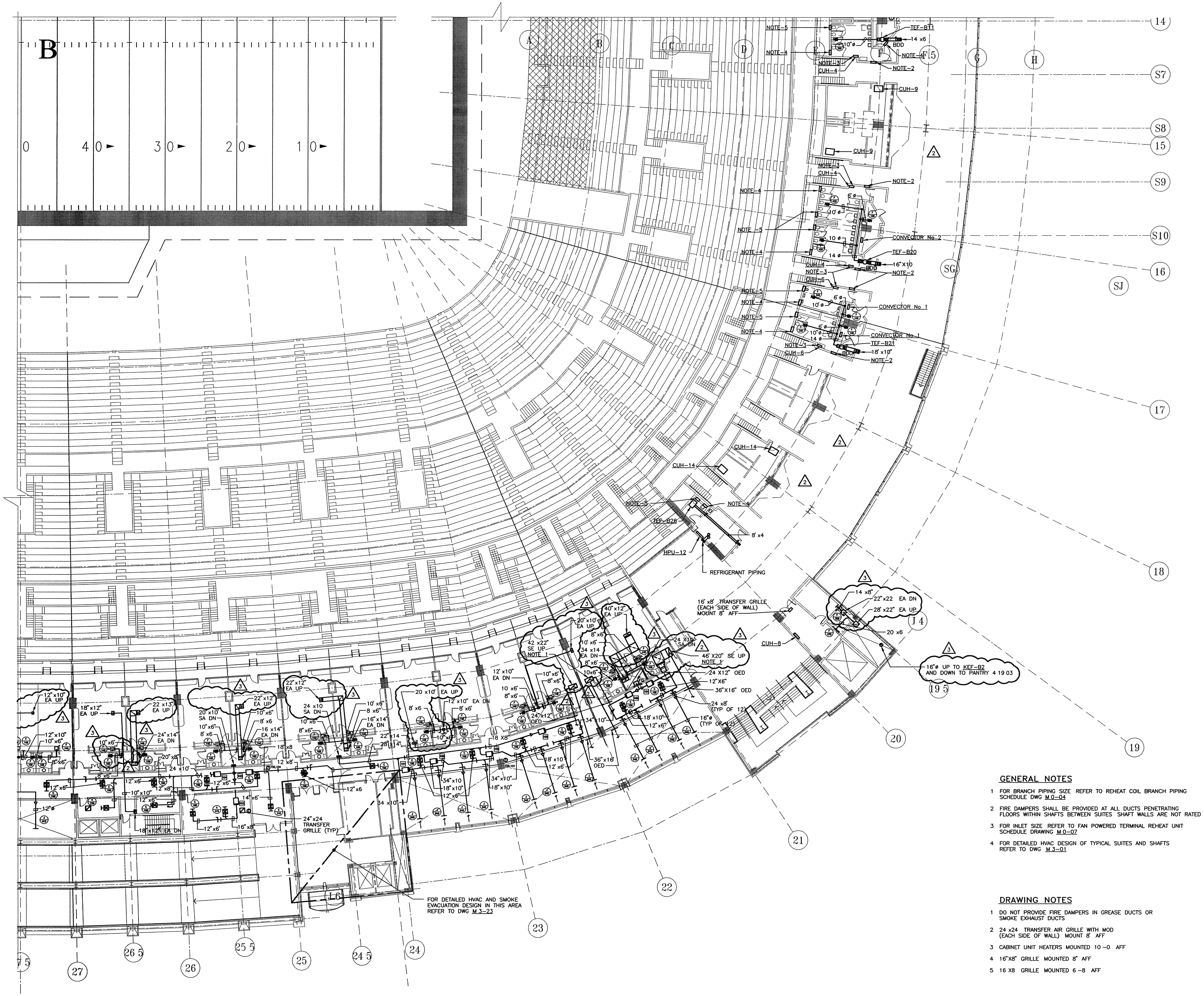
PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP

ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN UPPER SUITE LEVEL QUAD A

CATEGORY - SUB-CATEGORY - SHEET
M.2-06A

08.15.97-0748-5110M26 - RMF #95110



GENERAL NOTES

1 FOR BRANCH PIPING SIZE REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M 0-04

2 FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES SHAFT WALLS ARE NOT RATED

3 FOR INLET SIZE REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DRAWING M 0-07

4 FOR DETAILED HVAC DESIGN OF TYPICAL SUITES AND SHAFTS REFER TO DWG M 3-01

DRAWING NOTES

1 DO NOT PROVIDE FIRE DAMPERS IN GREASE DUCTS OR SMOKE EXHAUST DUCTS

2 24 x24 TRANSFER AIR GRILLE WITH MOD (EACH SIDE OF WALL) MOUNT 8' AFF

3 CABINET UNIT HEATERS MOUNTED 10 -0 AFF

4 16"X8" GRILLE MOUNTED 8" AFF

5 16 X8 GRILLE MOUNTED 6 -8 AFF

PROJECT NORTH

0 4 8 16 32

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Architecture Engineering Planning
Interiors Facility Programming
323 West 8th Street, Suite700
Kansas City Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY INC
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MECHANICAL/ELECTRICAL/PLUMBING
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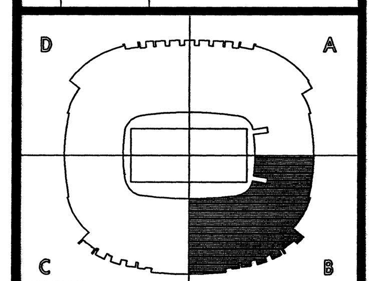
BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76



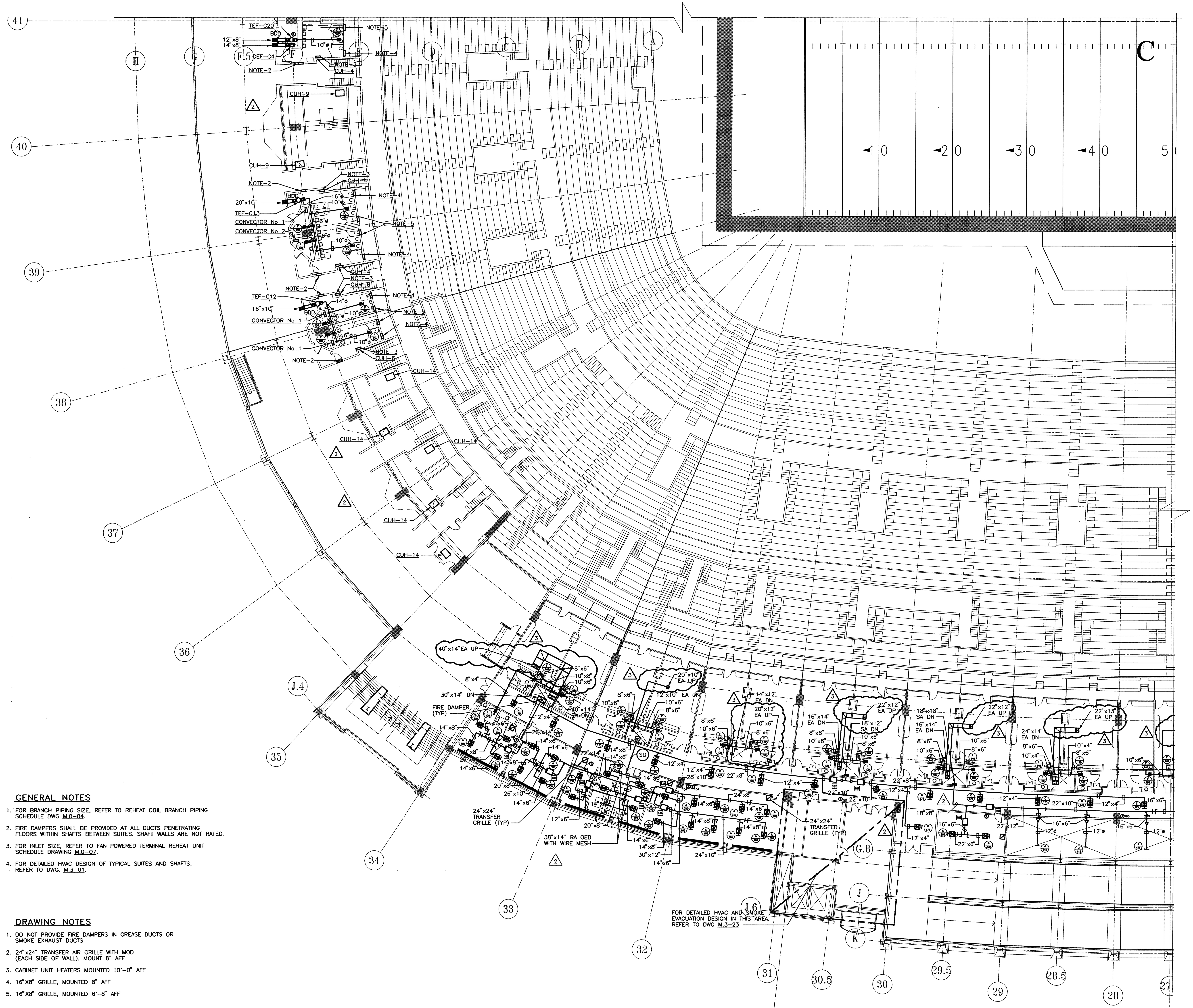
KEYPLAN

PROJECT NO 95-675-00	ISSUED BY ---
DRAWN BY JFL	REVIEWED BY DSP
ISSUED 2-28-97	

SHEET TITLE
HVAC PLAN
UPPER SUITE LEVEL
QUAD B

CATEGORY - SUB-CATEGORY - SHEET
M.2-06B

08 15 97-0748-5110M26 - RMF #95110

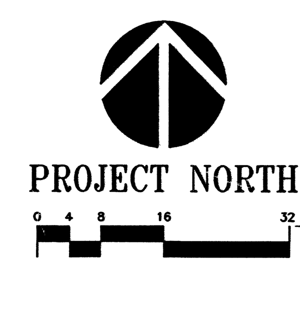


GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
3. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DRAWING M.0-07.
4. FOR DETAILED HVAC DESIGN OF TYPICAL SUITES AND SHAFTS, REFER TO DWG. M.3-01.

DRAWING NOTES

1. DO NOT PROVIDE FIRE DAMPERS IN GREASE DUCTS OR SMOKE EXHAUST DUCTS.
2. 24"x24" TRANSFER AIR GRILLE WITH MOD (EACH SIDE OF WALL). MOUNT 8" AFF
3. CABINET UNIT HEATERS MOUNTED 10'-0" AFF
4. 16"X8" GRILLE, MOUNTED 8" AFF
5. 16"X8" GRILLE, MOUNTED 6'-8" AFF



08.15.97-07:48 - 5110M26 - RMF #95110

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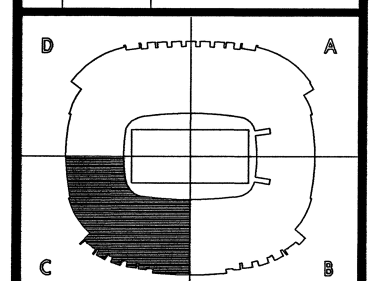
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP
ISSUED: 2-28-97	

SHEET TITLE
HVAC PLAN
UPPER SUITE
QUAD C

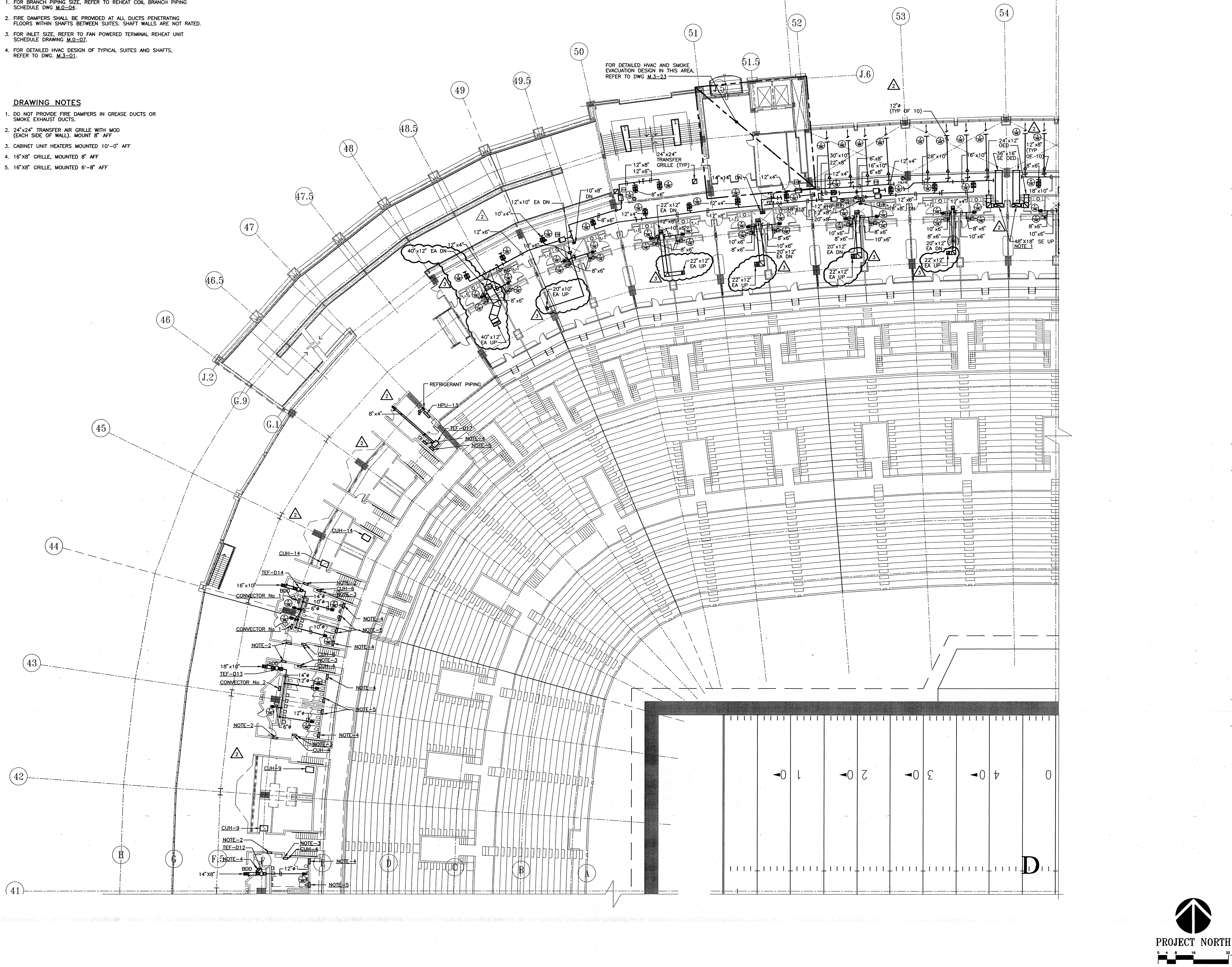
CATEGORY - SUB-CATEGORY - SHEET
M.2-06C

GENERAL NOTES

1. FOR BRANCH PIPING SIZE, REFER TO REHEAT COIL BRANCH PIPING SCHEDULE DWG M.0-04.
2. FIRE DAMPERS SHALL BE PROVIDED AT ALL DUCTS PENETRATING FLOORS WITHIN SHAFTS BETWEEN SUITES. SHAFT WALLS ARE NOT RATED.
3. FOR INLET SIZE, REFER TO FAN POWERED TERMINAL REHEAT UNIT SCHEDULE DRAWING M.0-07.
4. FOR DETAILED HVAC DESIGN OF TYPICAL SUITES AND SHAFTS, REFER TO DWG. M.3-01.

DRAWING NOTES

1. DO NOT PROVIDE FIRE DAMPERS IN GREASE DUCTS OR SMOKE EXHAUST DUCTS.
2. 24"x24" TRANSFER AIR GRILLE WITH MOD (EACH SIDE OF WALL). MOUNT 8" AFF
3. CABINET UNIT HEATERS MOUNTED 10'-0" AFF
4. 16"X8" GRILLE, MOUNTED 8" AFF
5. 16"X8" GRILLE, MOUNTED 6'-8" AFF



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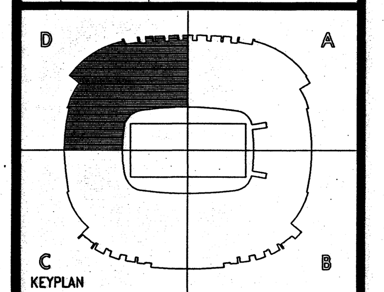
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76



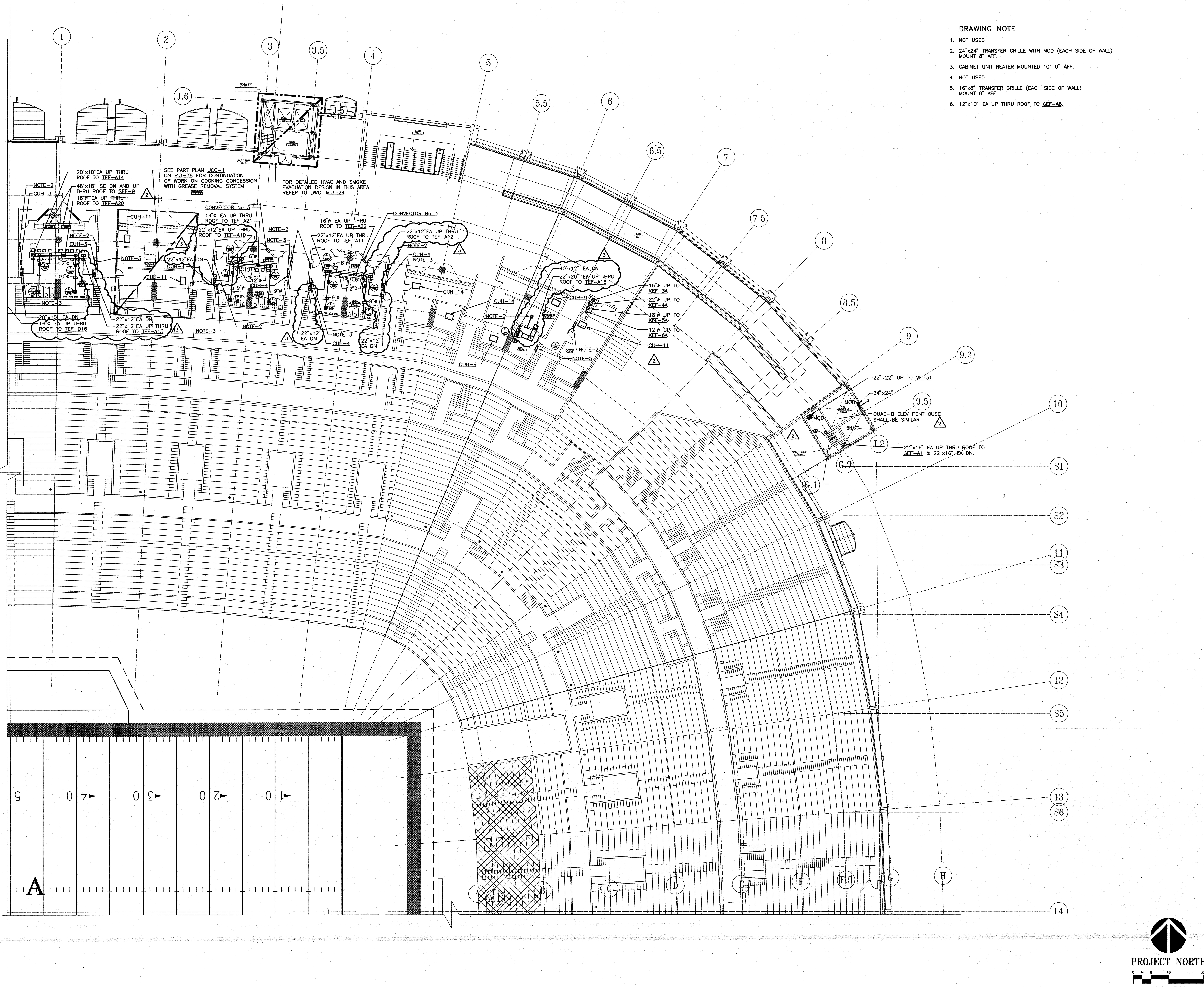
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN UPPER SUITE LEVEL QUAD D

CATEGORY - SUB-CATEGORY - SHEET
M.2-06D

08.15.97-07:48-5110M26 - RMF #95110



DRAWING NOTE

1. NOT USED
2. 24"x24" TRANSFER GRILLE WITH MOD (EACH SIDE OF WALL). MOUNT 8" AFF.
3. CABINET UNIT HEATER MOUNTED 10'-0" AFF.
4. NOT USED
5. 16"x8" TRANSFER GRILLE (EACH SIDE OF WALL) MOUNT 8" AFF.
6. 12"x10" EA UP THRU ROOF TO GEF-A6.

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REVISIONS

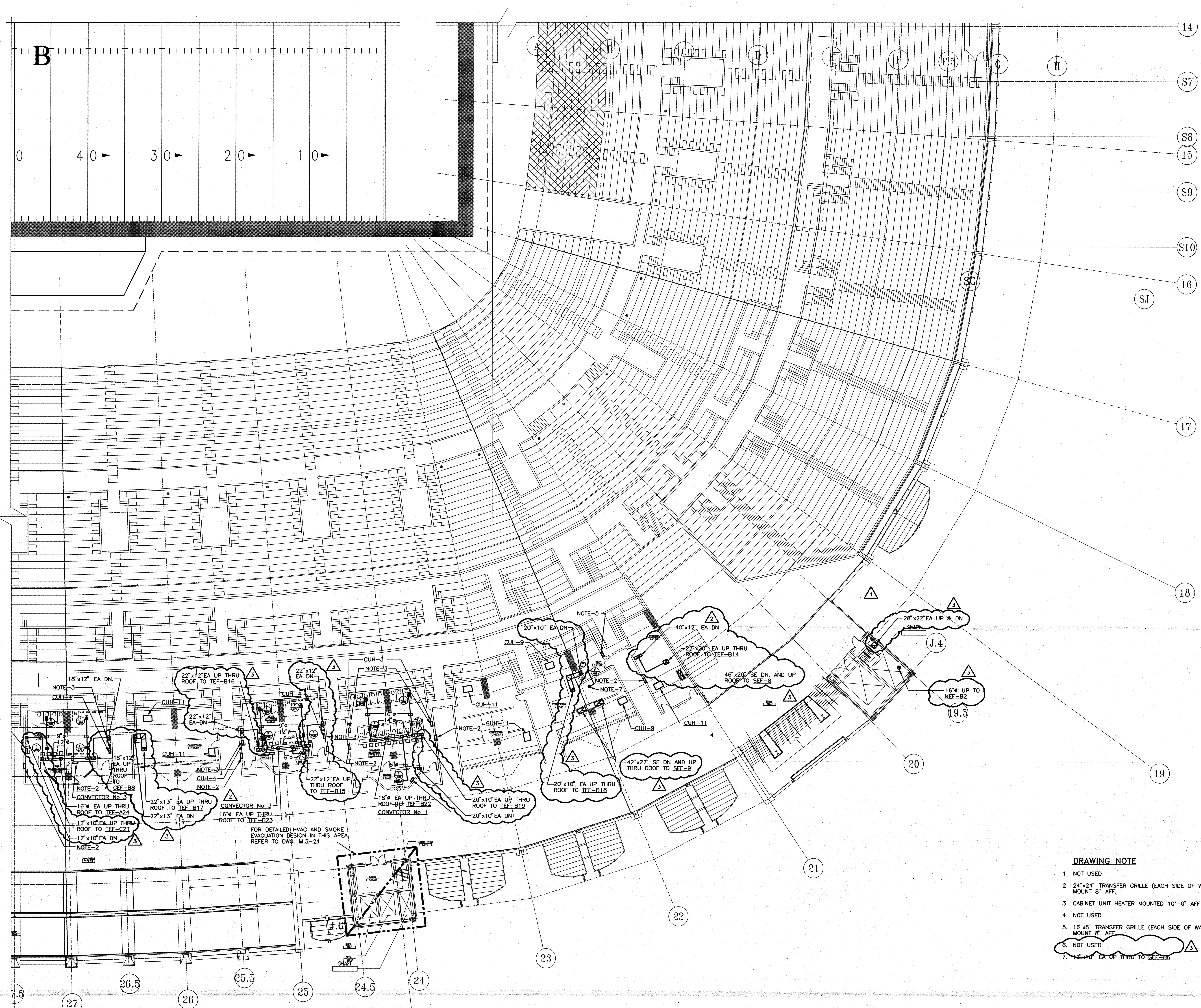
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76

KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN UPPER CONCOURSE QUAD A

CATEGORY - SUB-CATEGORY - SHEET
M.2-07A



DRAWING NOTE

1. NOT USED
2. 24"x24" TRANSFER GRILLE (EACH SIDE OF WALL) WITH MOD. MOUNT 8" AFF.
3. CABINET UNIT HEATER MOUNTED 10'–0" AFF.
4. NOT USED
5. 16"x8" TRANSFER GRILLE (EACH SIDE OF WALL). MOUNT 8" AFF.
6. NOT USED
7. ~~12"x10" EA UP THRU TO GEF-B6~~

PROJECT NORTH

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REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76

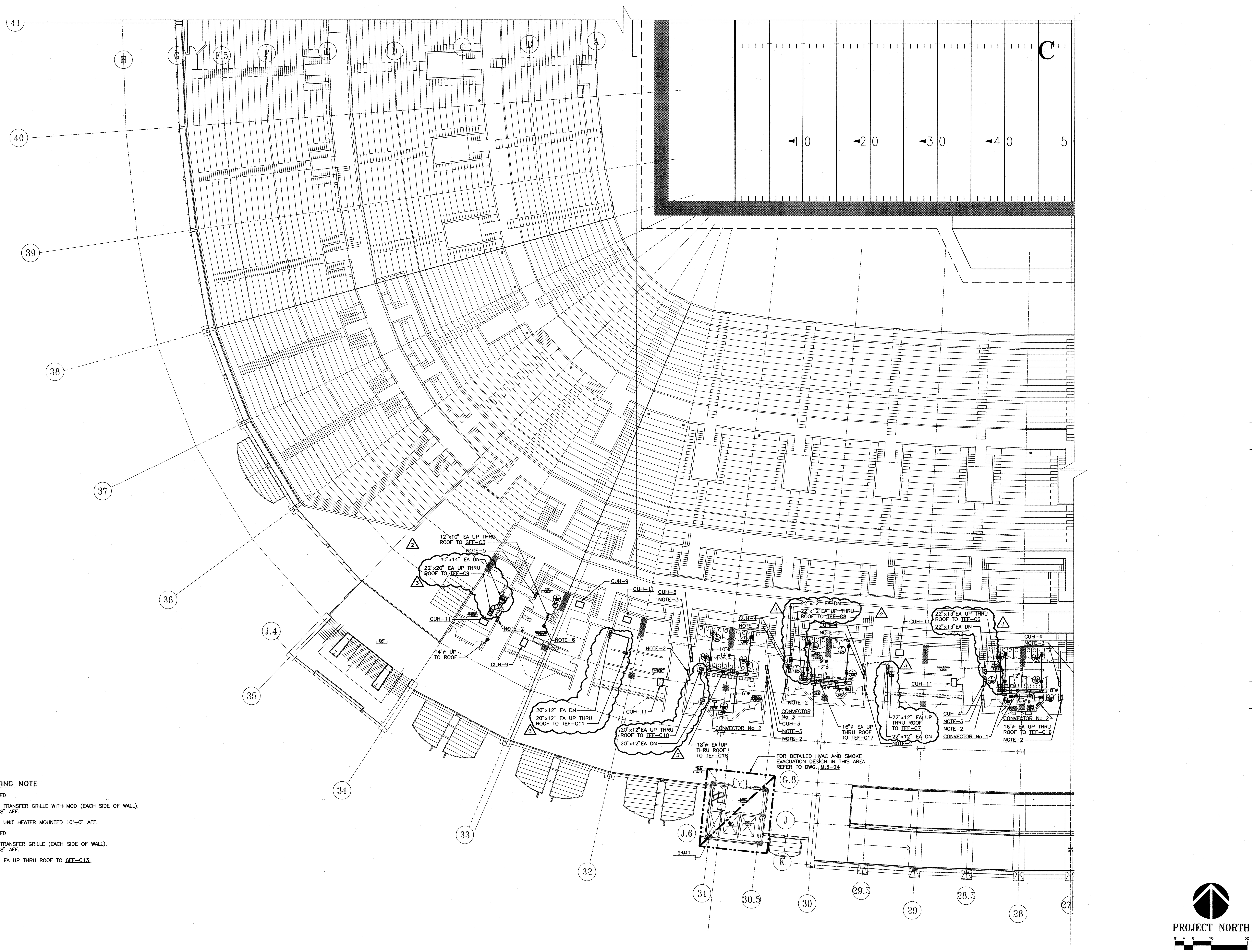
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP
ISSUED: 2-28-97	

SHEET TITLE
HVAC PLAN UPPER CONCOURSE QUAD B

CATEGORY – SUB-CATEGORY – SHEET
M.2-07B

08.15.97-07:39-5110M27 - RMF #95110



DRAWING NOTE

1. NOT USED
2. 24"x24" TRANSFER GRILLE WITH MOD (EACH SIDE OF WALL). MOUNT 8" AFF.
3. CABINET UNIT HEATER MOUNTED 10'-0" AFF.
4. NOT USED
5. 16"x8" TRANSFER GRILLE (EACH SIDE OF WALL). MOUNT 8" AFF.
6. 12"x10" EA UP THRU ROOF TO GEF-C13.

08.15.97-07:39-510M27 - RMF #95110

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REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76

KEYPLAN

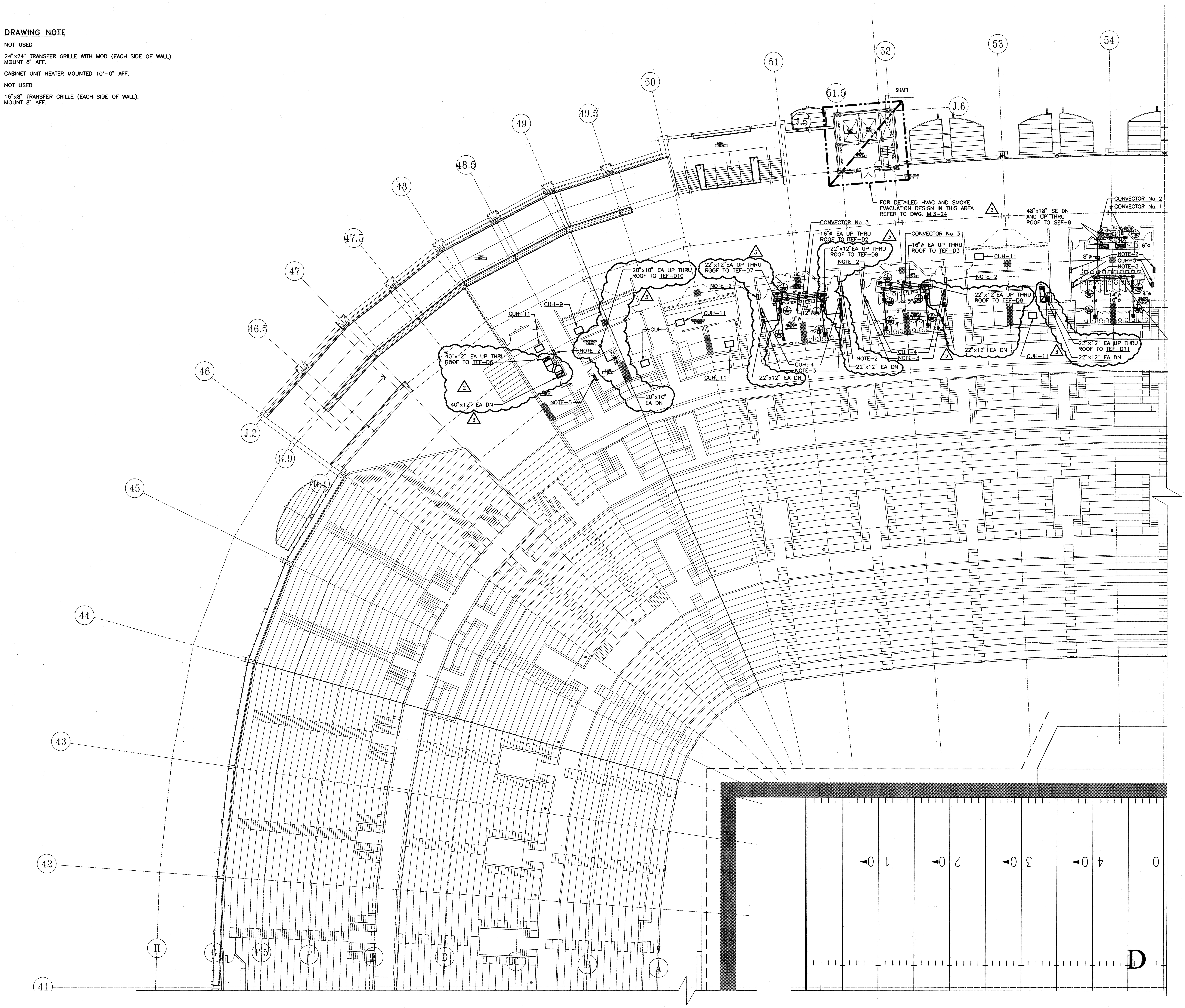
PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP
ISSUED: 2-28-97	

SHEET TITLE
HVAC PLAN UPPER CONCOURSE QUAD C

CATEGORY - SUB-CATEGORY - SHEET
M.2-07C

DRAWING NOTE

1. NOT USED
2. 24"x24" TRANSFER GRILLE WITH MOD (EACH SIDE OF WALL). MOUNT 8" AFF.
3. CABINET UNIT HEATER MOUNTED 10'-0" AFF.
4. NOT USED
5. 16"x8" TRANSFER GRILLE (EACH SIDE OF WALL). MOUNT 8" AFF.



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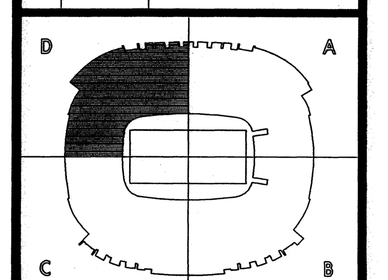
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76



KEYPLAN

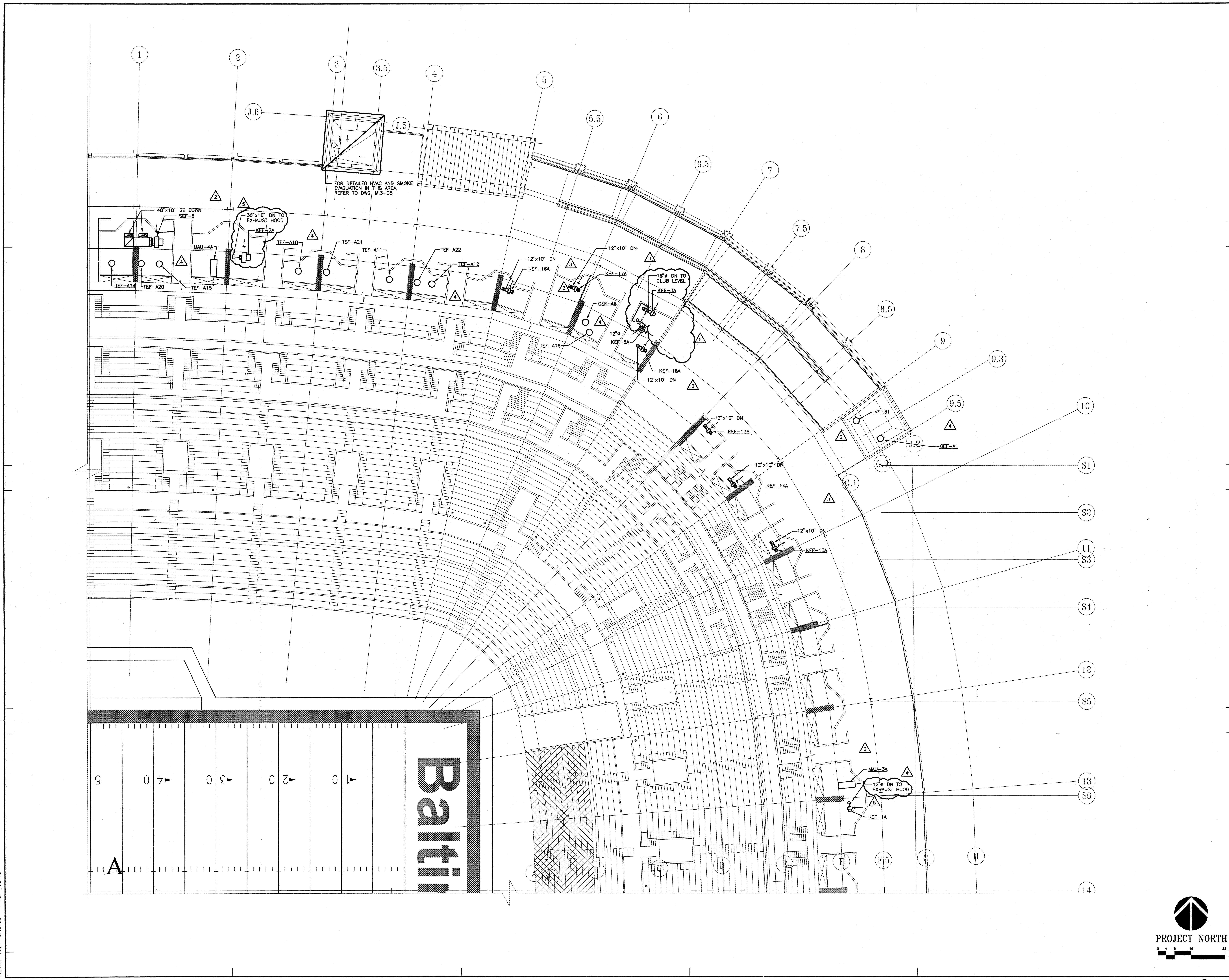
PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY:	REVIEWED BY: DSP
ISSUED: 2-28-97	

SHEET TITLE

HVAC PLAN
UPPER CONCOURSE
QUAD D

CATEGORY - SUB-CATEGORY - SHEET
M.2-07D

08.15.97-07:39-5110M27 - RMF #95110



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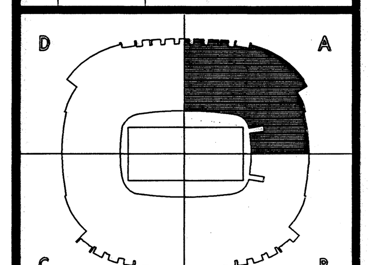
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	7-25-97	BULLETIN #71
4	8-12-97	BULLETIN #76
5	11-26-97	BULLETIN #94



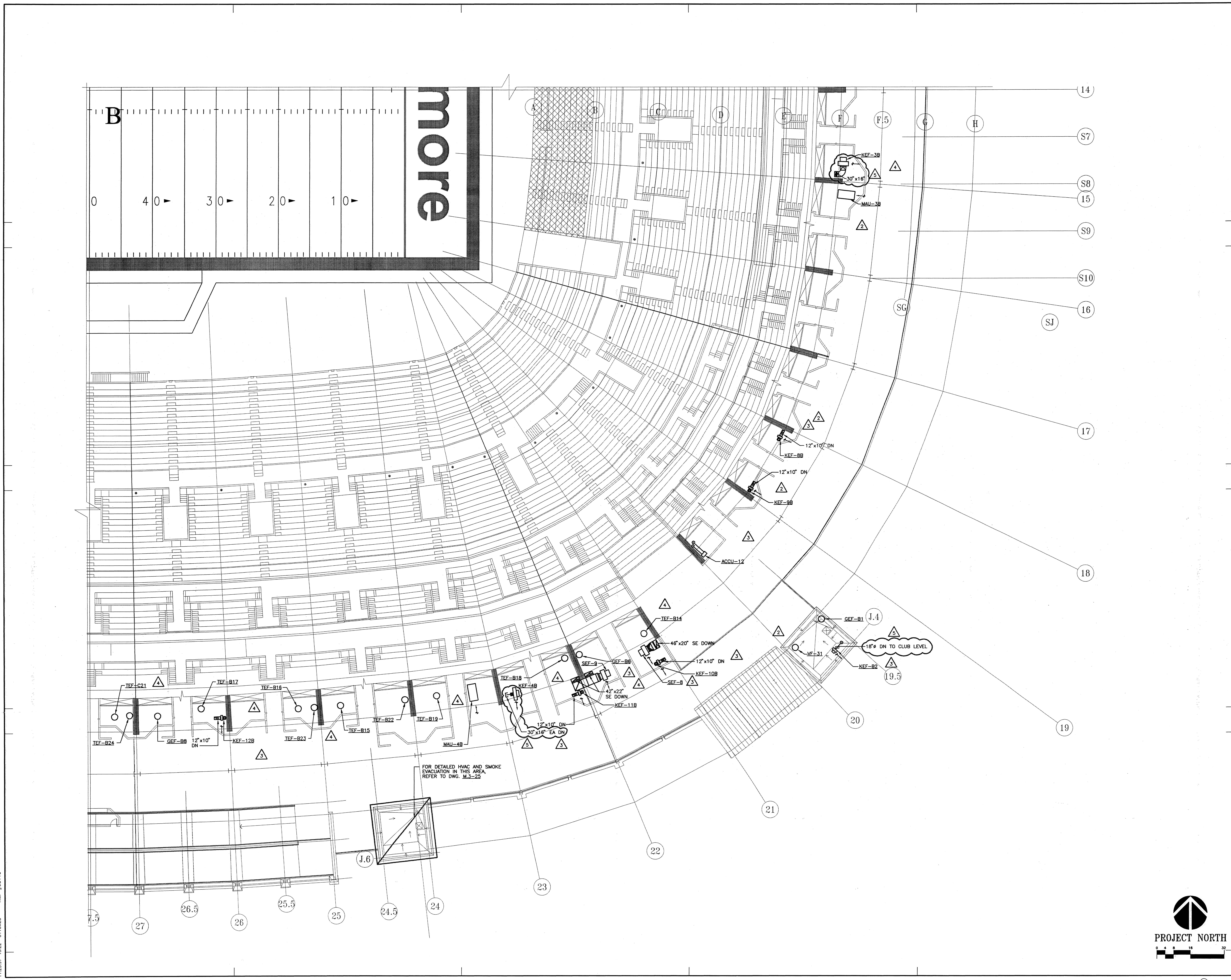
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP

ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN UPPER CONCOURSE ROOF QUAD A

CATEGORY - SUB-CATEGORY - SHEET
M.2-08A



11.25.97-13.22-511OM28 - RMF #95110

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3	7-25-97	BULLETIN #71
4	8-12-97	BULLETIN #76
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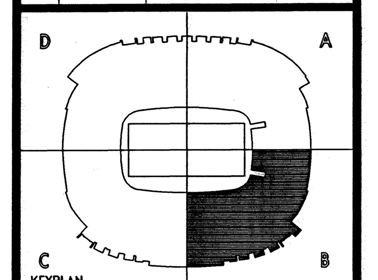
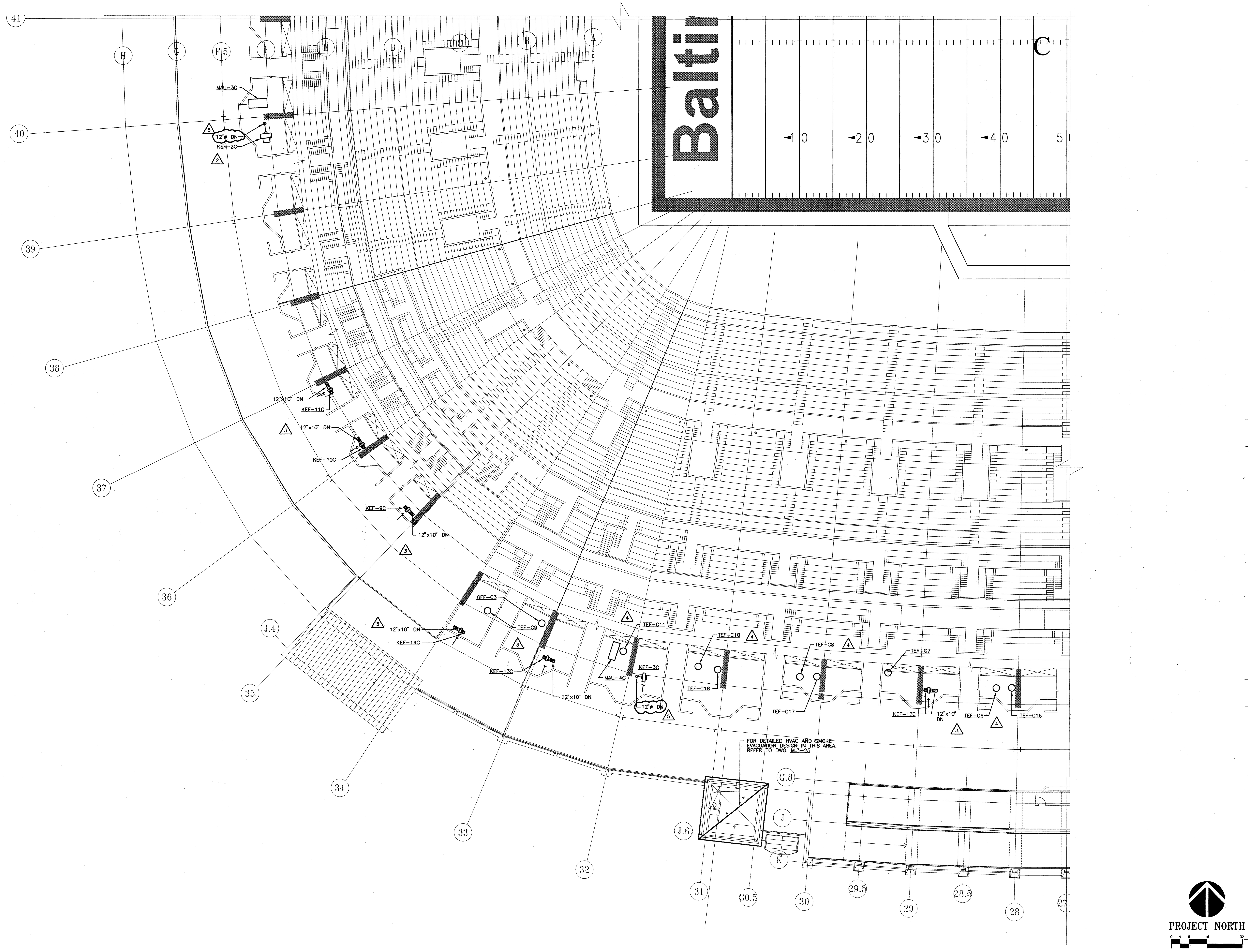


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN UPPER CONCOURSE ROOF QUAD B

CATEGORY - SUB-CATEGORY - SHEET
M.2-08B



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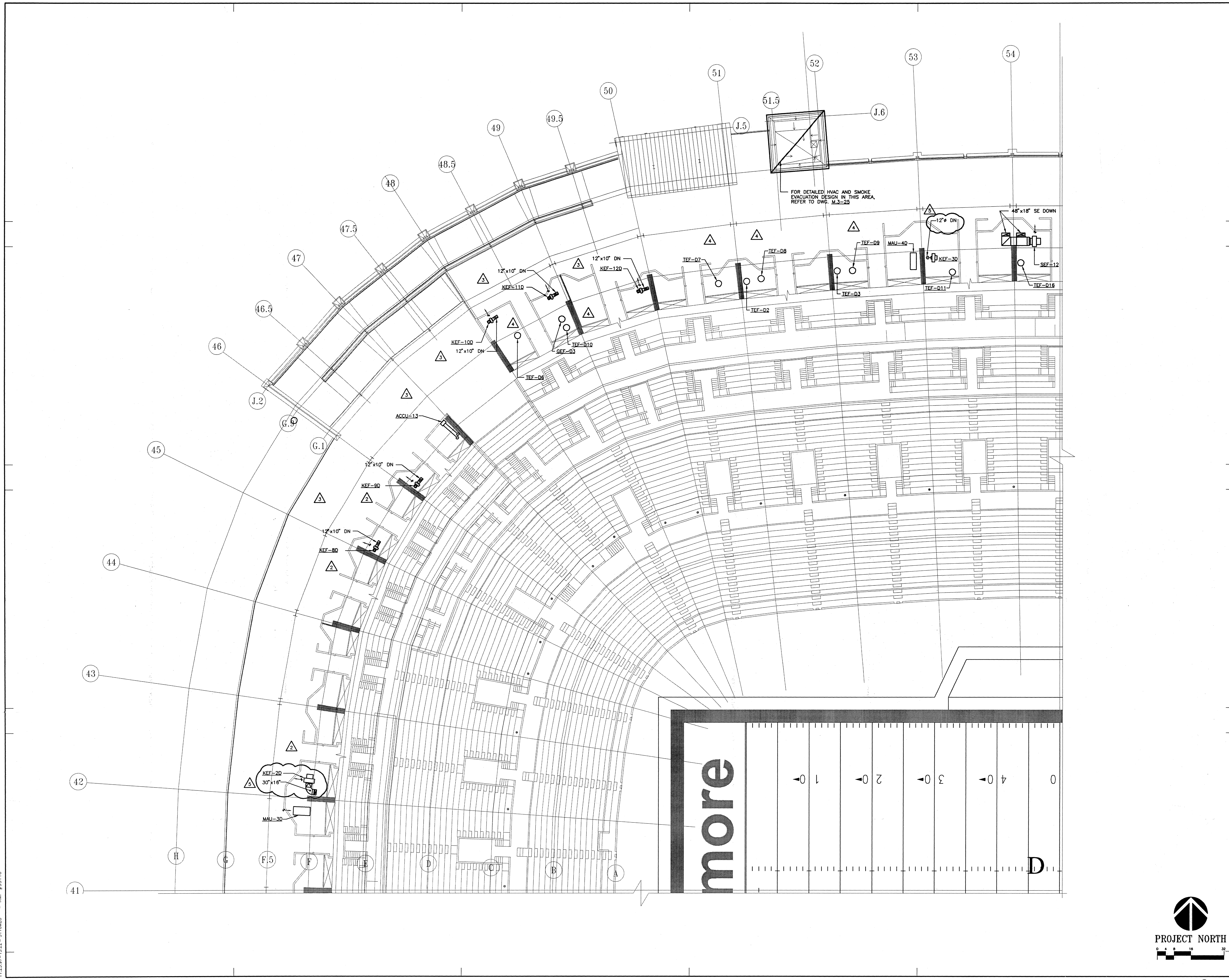
4	8-12-97	BULLETIN #76
5	11-26-97	BULLETIN #94

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: ---	REVIEWED BY: DSP
ISSUED: 2-28-97	

SHEET TITLE
HVAC PLAN UPPER CONCOURSE ROOF QUAD C

CATEGORY - SUB-CATEGORY - SHEET
M.2-08C



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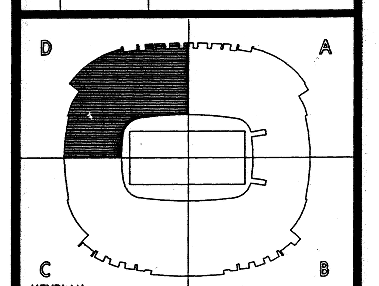


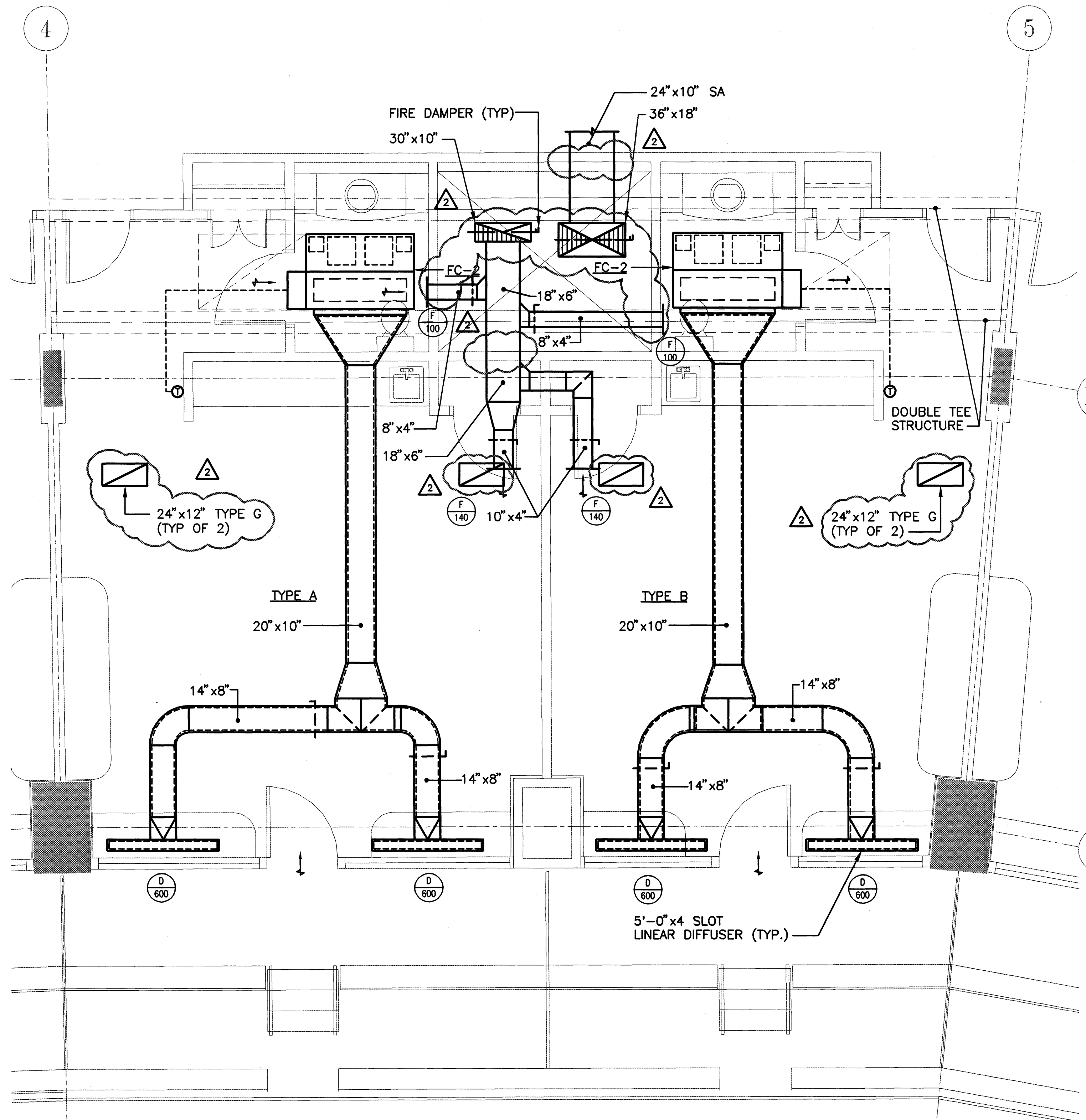
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: ---
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
HVAC PLAN
UPPER CONCOURSE
ROOF QUAD D

CATEGORY - SUB-CATEGORY - SHEET
M.2-08D

11.25.97-13:22-5110M28 - RMF #95110

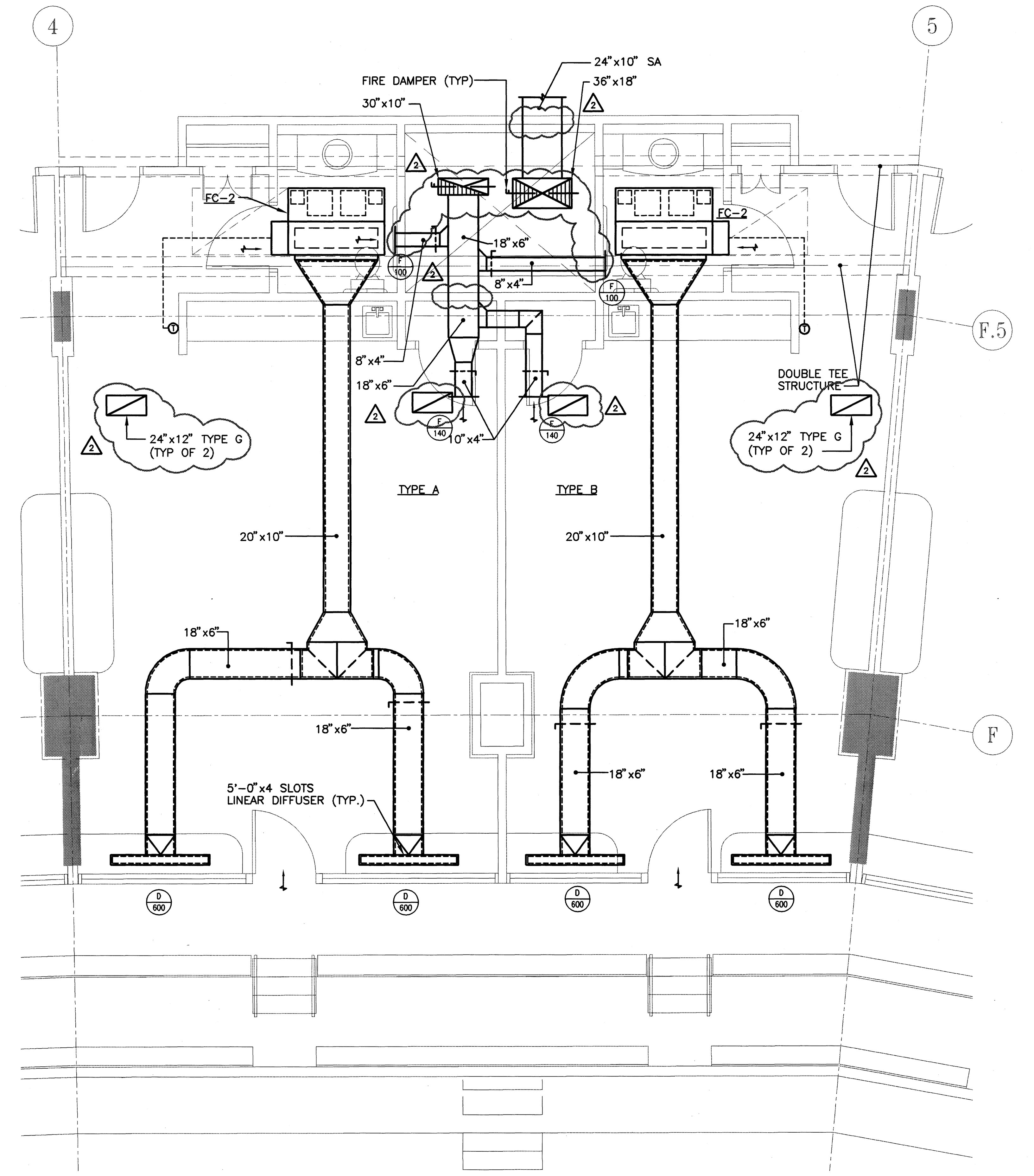


PART PLAN – LOWER SUITE LEVEL QUAD A & D

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

DRAWING NOTES:

1. FOR ACTUAL DUCT RISER SIZES LOCATED WITHIN SHAFTS REFER TO DRAWINGS M.2-04a – d, M.2-05a – d, AND M.2-06a – d.
2. DUCT RISER SIZES ON PLANS ARE SHOWN FOR CLARIFICATION PURPOSES ONLY.
3. FOR SHAFT COORDINATION AND DETAILED PIPING OF TYPICAL SUITES SEE PART PLAN 5 ON DWG M.3-03.
4. DIFFUSERS SHALL BE CENTERED ABOVE GLASS AREA.
5. PROVIDE 1" SOUND LINING ON ALL SUPPLY DUCTWORK.
6. HORIZONTAL DUCTWORK RUNS WITHIN SHAFTS SHALL BE RUN BELOW DOUBLE TEE STRUCTURE AND PIPING.



PART PLAN – UPPER SUITE LEVEL QUAD A & D

SCALE: 1/4"=1'-0" (2)

DRAWING NOTES:

1. FOR ACTUAL DUCT RISER SIZES LOCATED WITHIN SHAFTS REFER TO DRAWINGS M.2-04a – d, M.2-05a – d, AND M.2-06a – d.
2. DUCT RISER SIZES ON PLANS ARE SHOWN FOR CLARIFICATION PURPOSES ONLY.
3. FOR SHAFT COORDINATION AND DETAILED PIPING OF TYPICAL SUITES SEE PART PLAN 5 ON DWG M.3-03.
4. DIFFUSERS SHALL BE CENTERED ABOVE GLASS AREA.
5. PROVIDE 1" SOUND LINING ON ALL SUPPLY DUCTWORK.
6. HORIZONTAL DUCTWORK RUNS WITHIN SHAFTS SHALL BE RUN BELOW DOUBLE TEE STRUCTURE AND PIPING.

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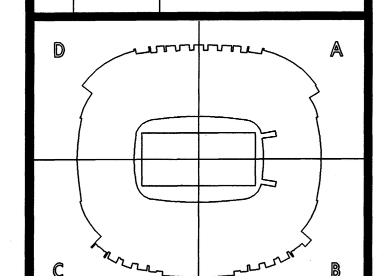
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



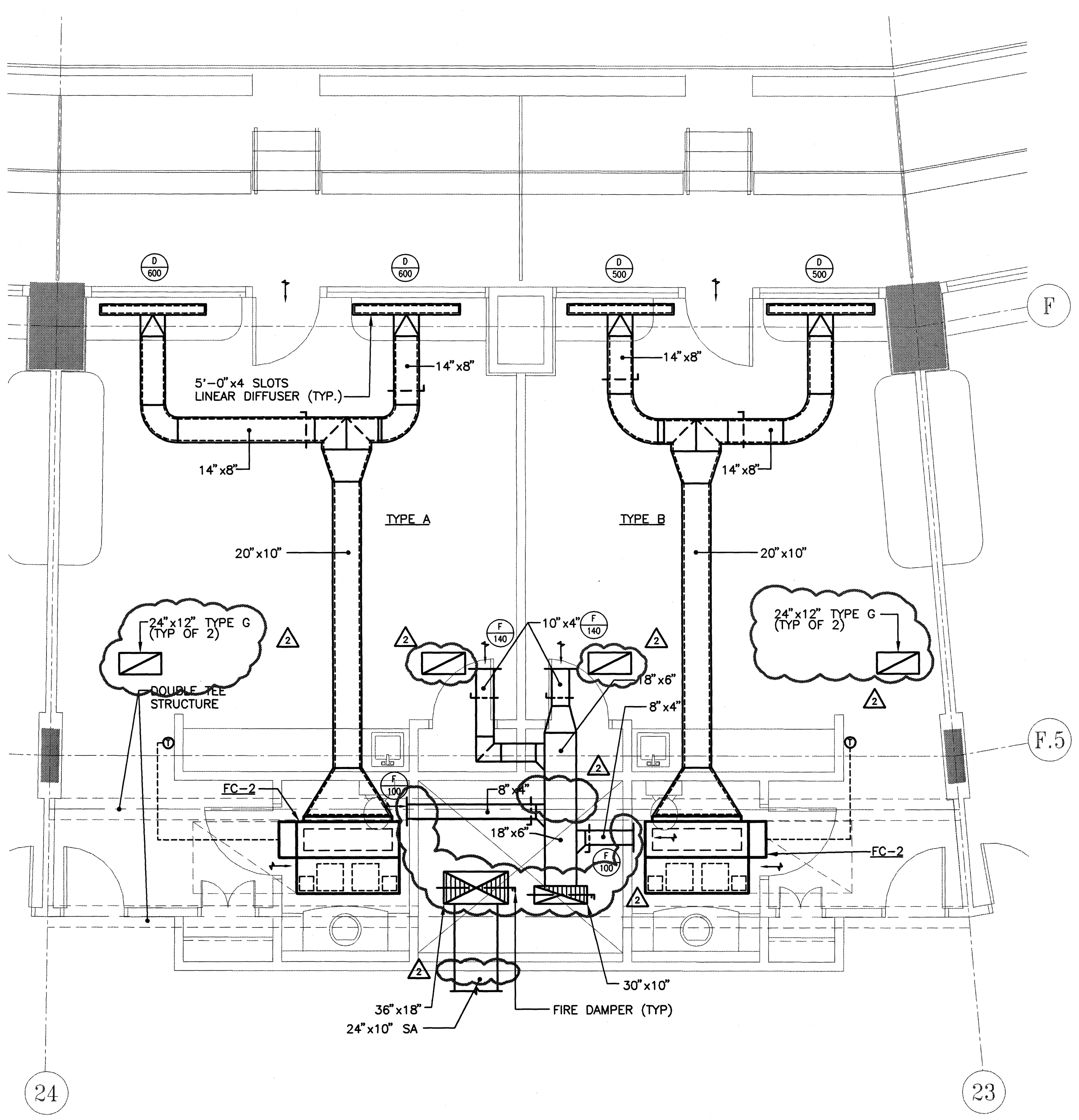
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY:
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
PART PLANS – TYPICAL SUITES HVAC

CATEGORY – SUB-CATEGORY – SHEET
M.3-01

04.24.97-18:25- 5110M31 - RMF #95110

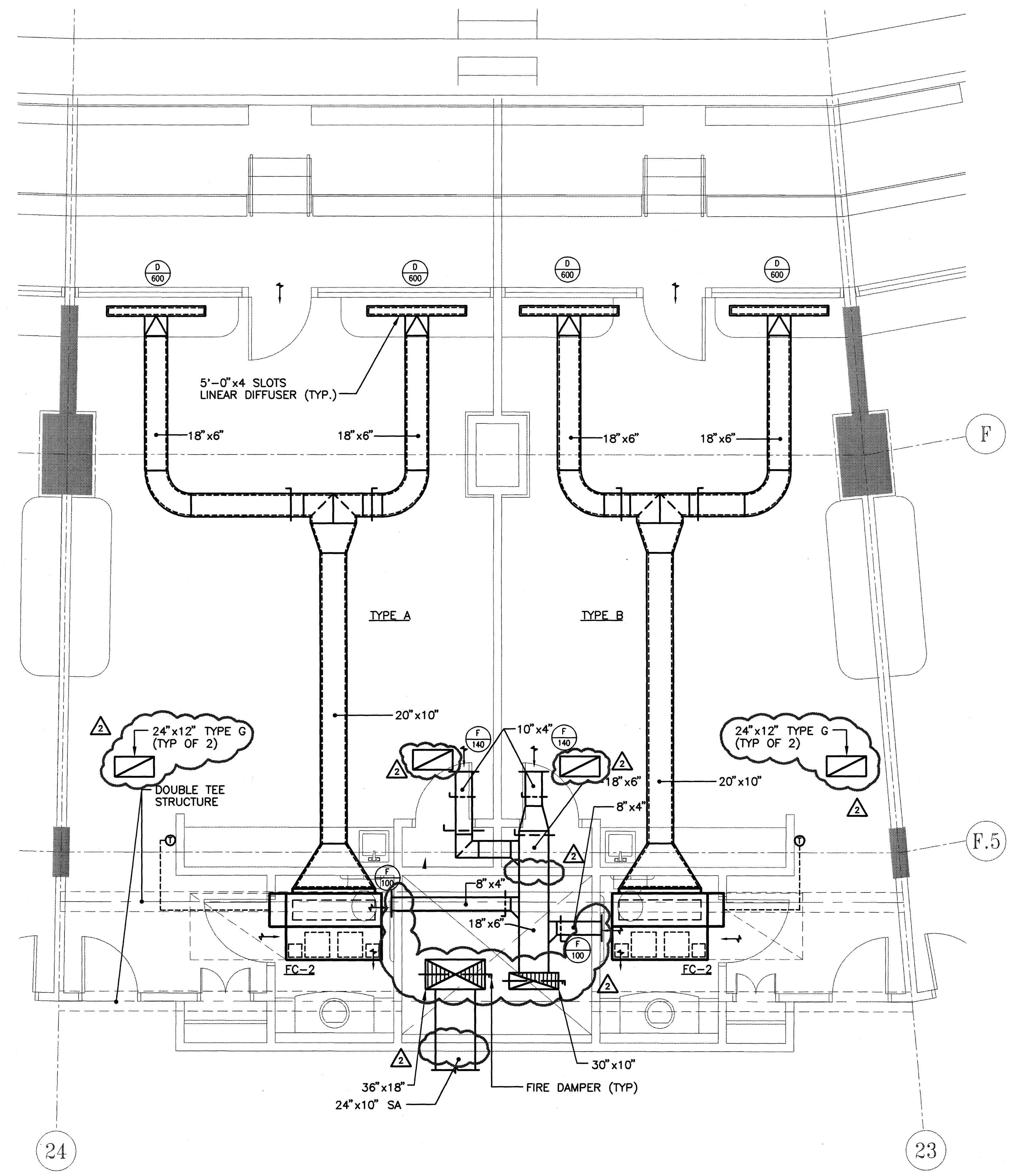


DRAWING NOTES:

1. FOR ACTUAL DUCT RISER SIZES LOCATED WITHIN SHAFTS REFER TO DRAWINGS M.2-04a – d, M.2-05a – d, AND M.2-06a – d.
2. DUCT RISER SIZES ON PLANS ARE SHOWN FOR CLARIFICATION PURPOSES ONLY.
3. FOR SHAFT COORDINATION AND DETAILED PIPING OF TYPICAL SUITES SEE PART PLAN 5 ON DWG M.3-03.
4. DIFFUSERS SHALL BE CENTERED ABOVE GLASS AREA.
5. PROVIDE 1" SOUND LINING ON ALL SUPPLY DUCTWORK.
6. HORIZONTAL DUCTWORK RUNS WITHIN SHAFTS SHALL BE RUN BELOW DOUBLE TEE STRUCTURE AND PIPING.

PART PLAN – LOWER SUITE LEVEL QUAD B & C

SCALE: 1/4"=1'-0" (3)



DRAWING NOTES:

1. FOR ACTUAL DUCT RISER SIZES LOCATED WITHIN SHAFTS REFER TO DRAWINGS M.2-04a – d, M.2-05a – d, AND M.2-06a – d.
2. DUCT RISER SIZES ON PLANS ARE SHOWN FOR CLARIFICATION PURPOSES ONLY.
3. FOR SHAFT COORDINATION AND DETAILED PIPING OF TYPICAL SUITES SEE PART PLAN ON DWG M.3-03.
4. DIFFUSERS SHALL BE CENTERED ABOVE GLASS AREA.
5. PROVIDE 1" SOUND LINING ON ALL SUPPLY DUCTWORK.
6. HORIZONTAL DUCTWORK RUNS WITHIN SHAFTS SHALL BE RUN BELOW DOUBLE TEE STRUCTURE AND PIPING.

PART PLAN – UPPER SUITE LEVEL QUAD B & C

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

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NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

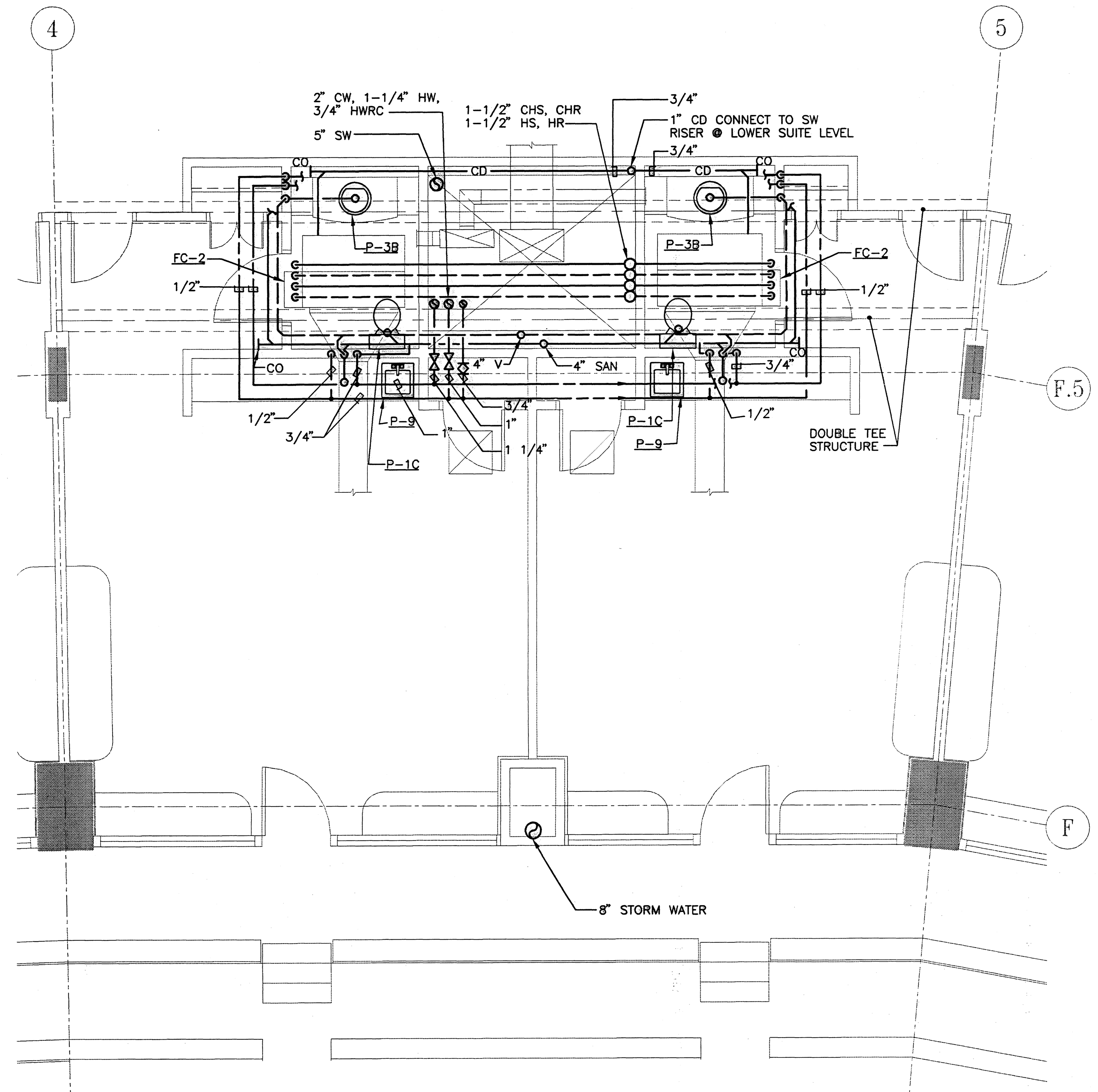
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: RMF
DRAWN BY: JRJ	REVIEWED BY: DSP

ISSUED: 2-28-97

SHEET TITLE
PART PLANS – TYPICAL SUITES HVAC

CATEGORY – SUB-CATEGORY – SHEET
M.3-02

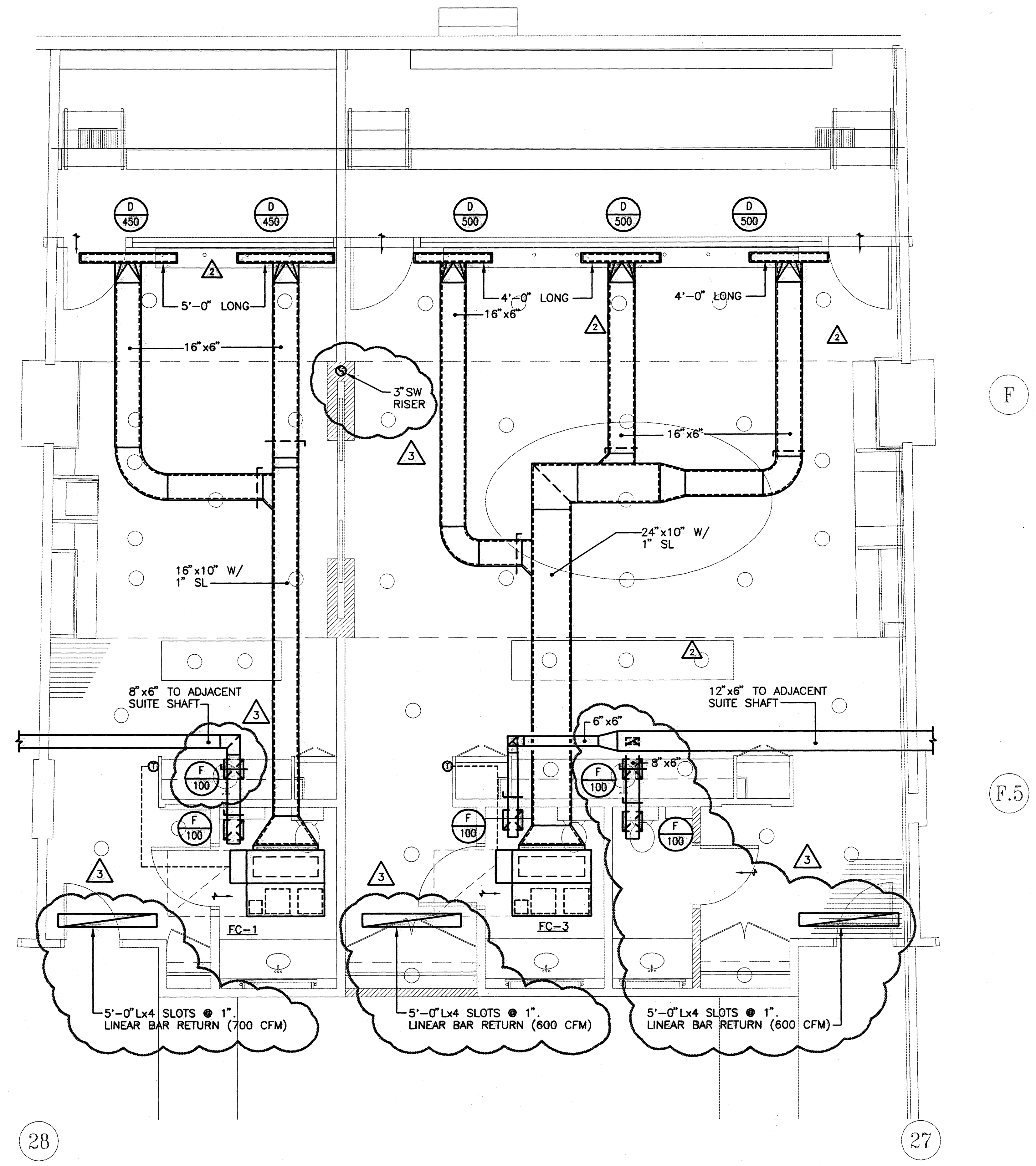


DRAWING NOTES:

1. FOR CLARIFICATION OF PIPE ROUTING AND SIZES REFER TO DRAWINGS P.2-04a-d, P.2-05a-d, P.2-06a-d.
2. BRANCH PIPING TO FAN COIL UNITS FROM SHAFT MAINS SHALL BE RUN ABOVE FAN COIL UNIT.
3. PROVIDE ACCESS PANELS FOR SHUT-OFF VALVES.

PART PLAN – TYPICAL SUITE – PIPING

SCALE: 1/4"=1'-0" 5



DRAWING NOTES:

1. COORDINATION AND DETAILED PIPING OF TYPICAL SUITES SEE PART PLAN ON DWG M.3-03.
2. DIFFUSERS SHALL BE CENTERED ABOVE GLASS AREA.
3. PROVIDE 1" SOUND LINING ON ALL SUPPLY DUCTWORK.

PART PLAN – OWNERS SUITE

SCALE: 1/4"=1'-0" 6

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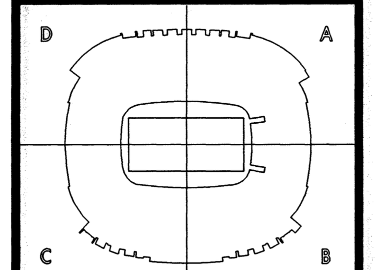
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	1-16-98	BULLETIN #104

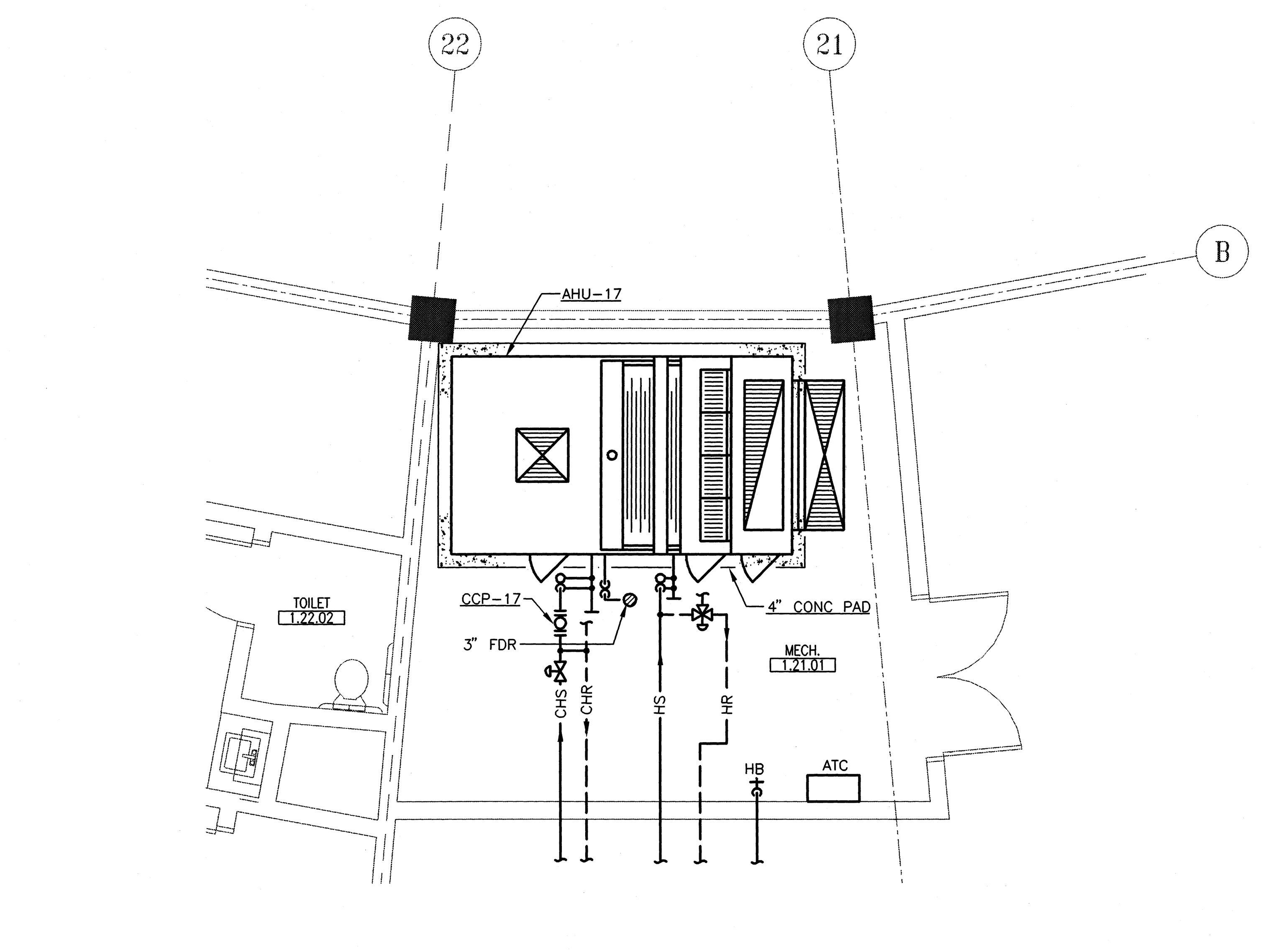


KEYPLAN

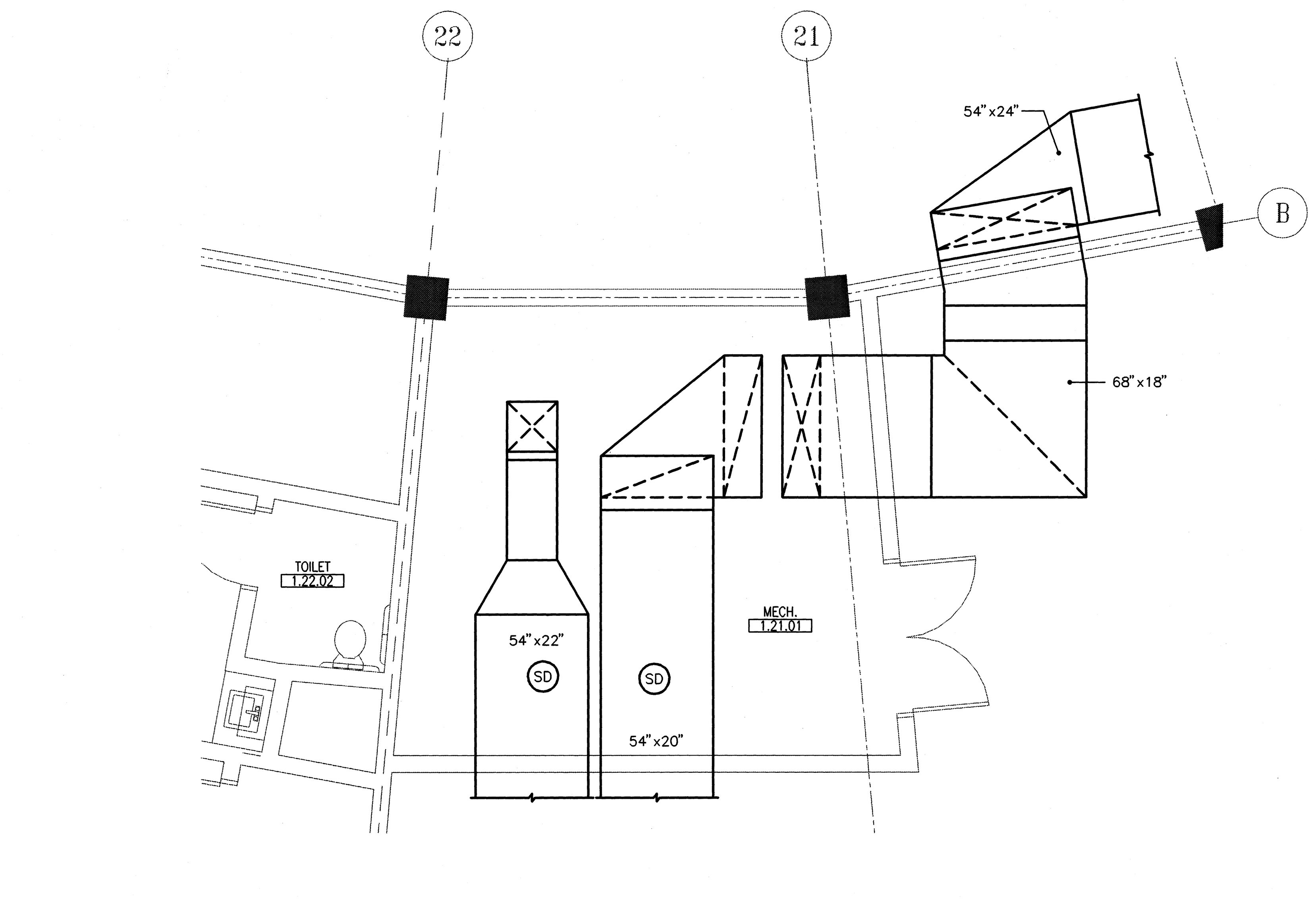
PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: JRJ
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
PART PLANS – TYPICAL SUITE PIPING AND OWNER'S SUITE

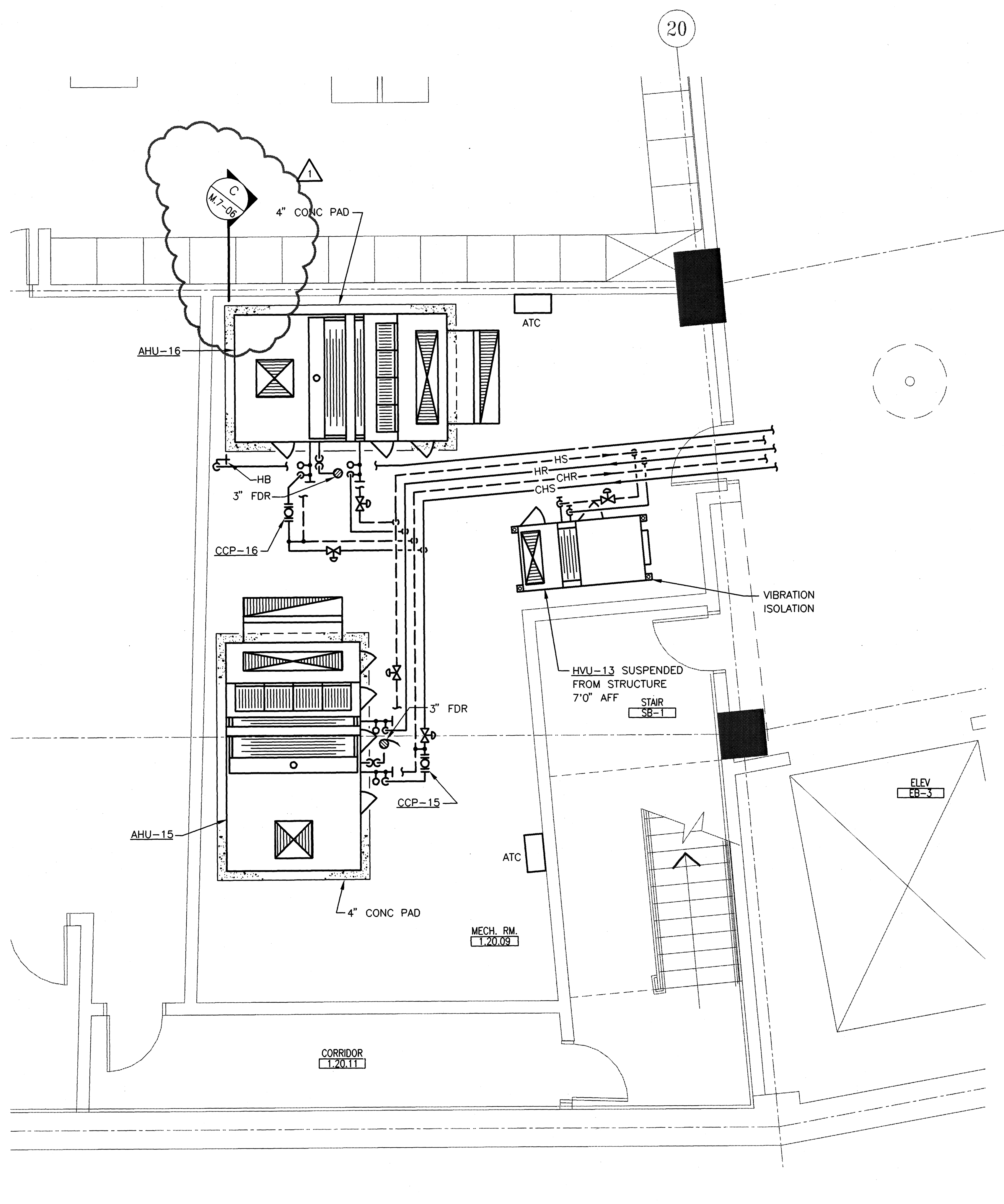
CATEGORY – SUB-CATEGORY – SHEET
M.3-03



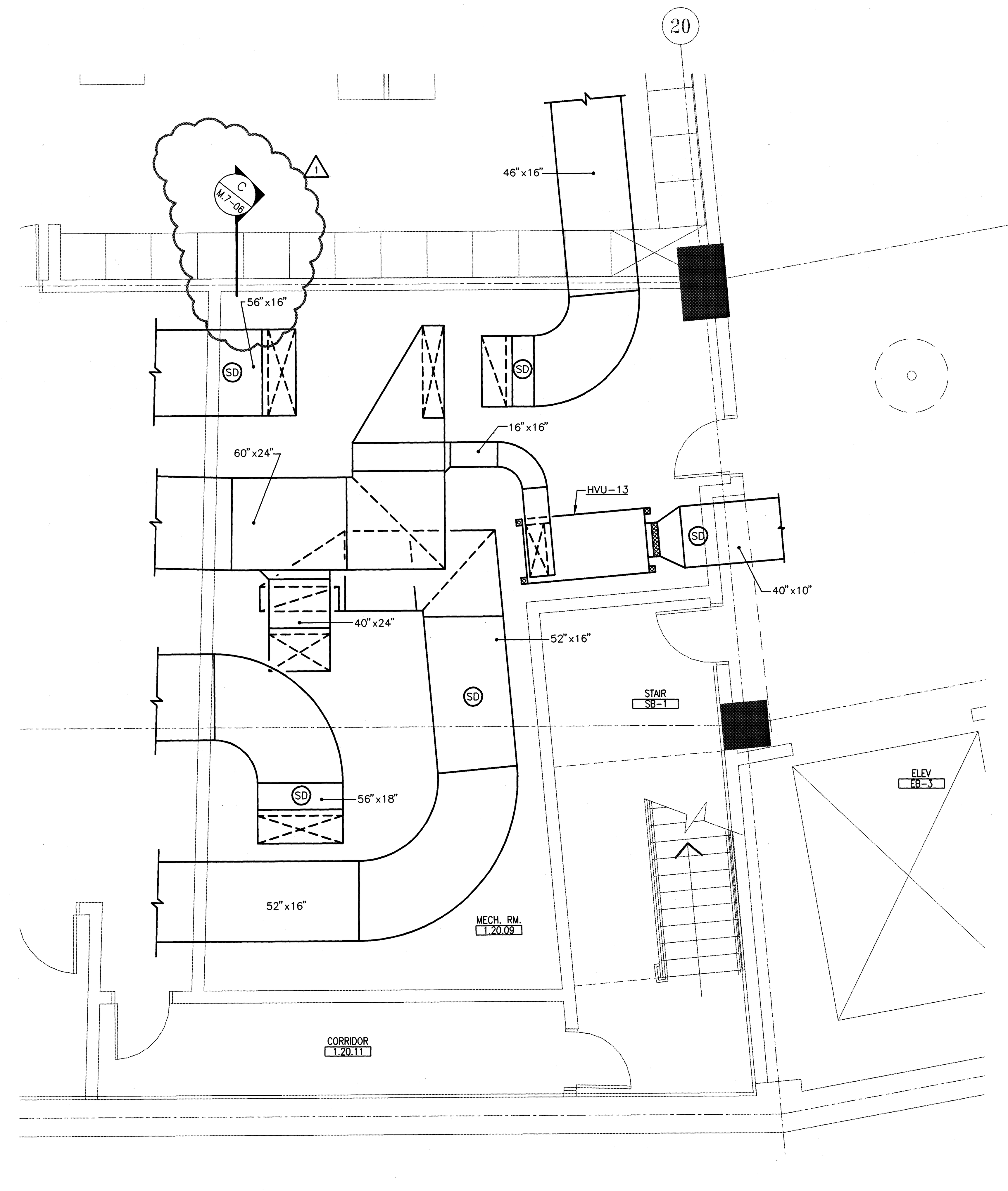
A M.3-05 MECHANICAL ROOM #1.21.01 – PIPING
SCALE: 1/4"=1'-0"



A M.3-05 MECHANICAL ROOM #1.21.01 – DUCTWORK
SCALE: 1/4"=1'-0"



B M.3-05 MECHANICAL ROOM #1.20.09 – PIPING
SCALE: 1/4"=1'-0"



B M.3-05 MECHANICAL ROOM #1.20.09 – DUCTWORK
SCALE: 1/4"=1'-0"

GENERAL NOTES:
1. FLOOR DRAINS SHALL HAVE DEEP SEAL TRAPS.

PROJECT NORTH
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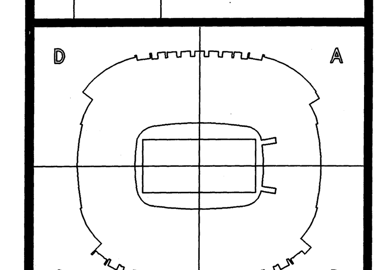
NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44



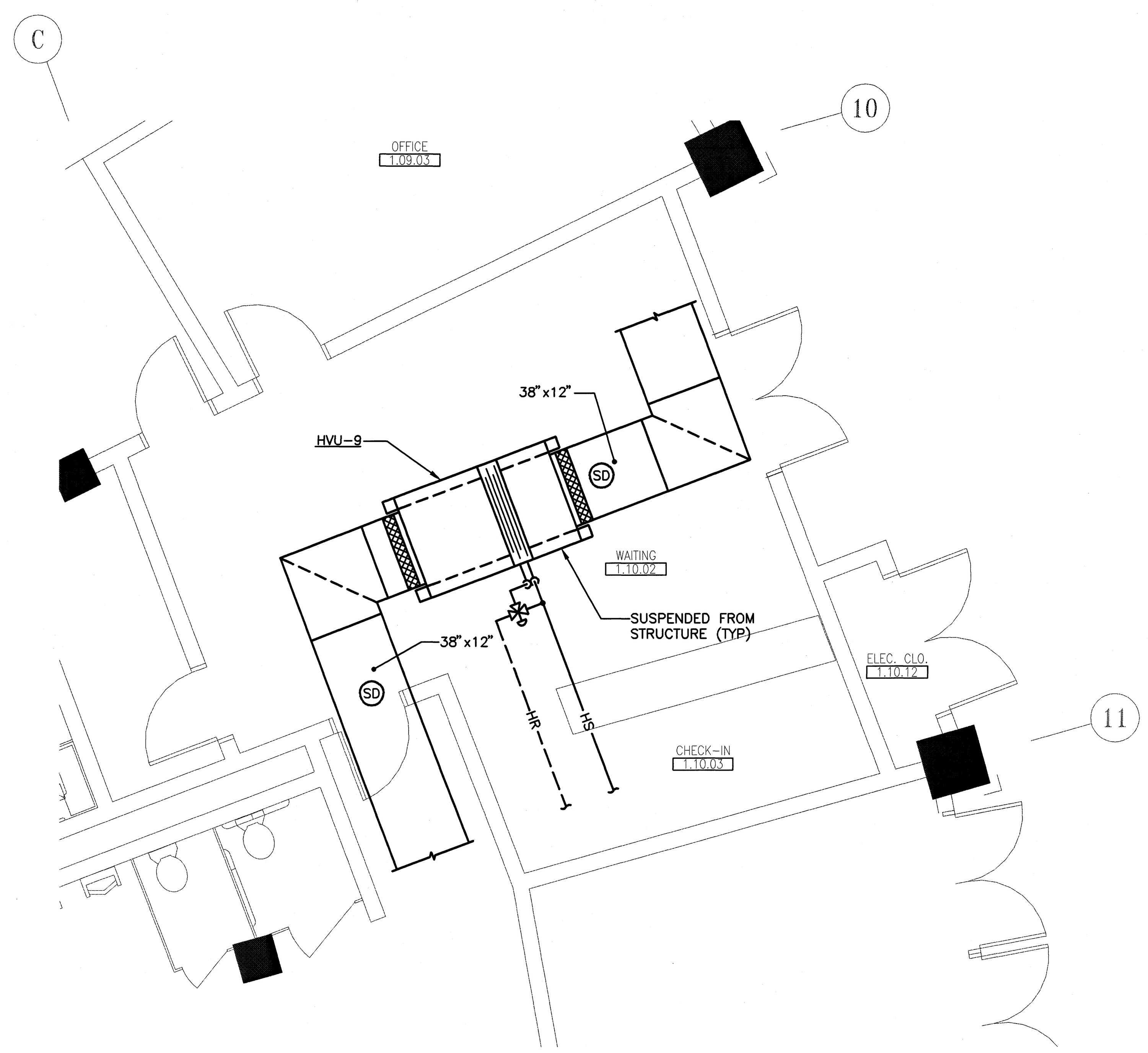
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: JRJ
REVIEWED BY:
ISSUED: 2-28-97

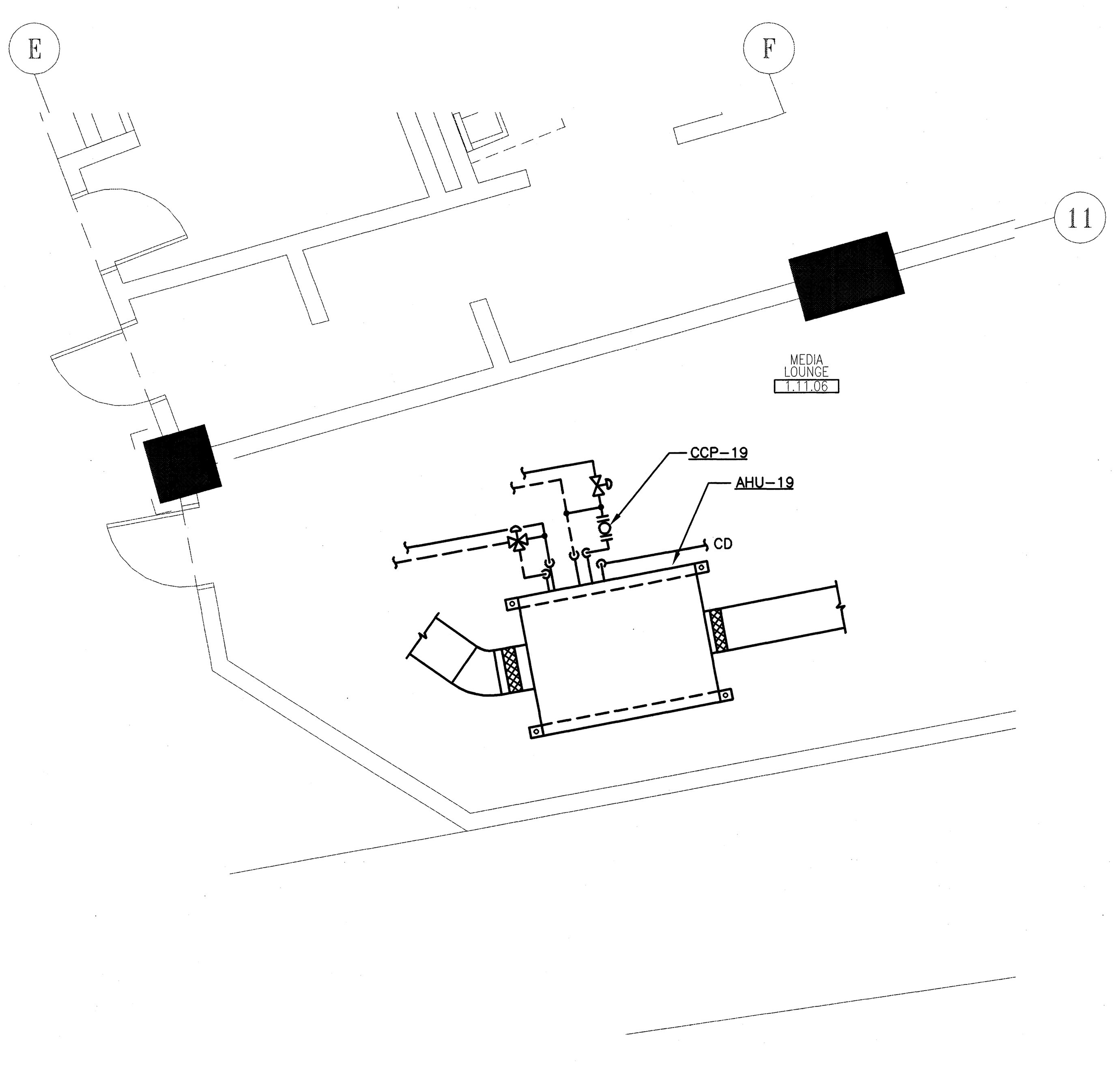
SHEET TITLE
MECHANICAL ROOMS
AIR SYSTEMS
SERVICE LEVEL – B

CATEGORY – SUB-CATEGORY – SHEET
M.3-05

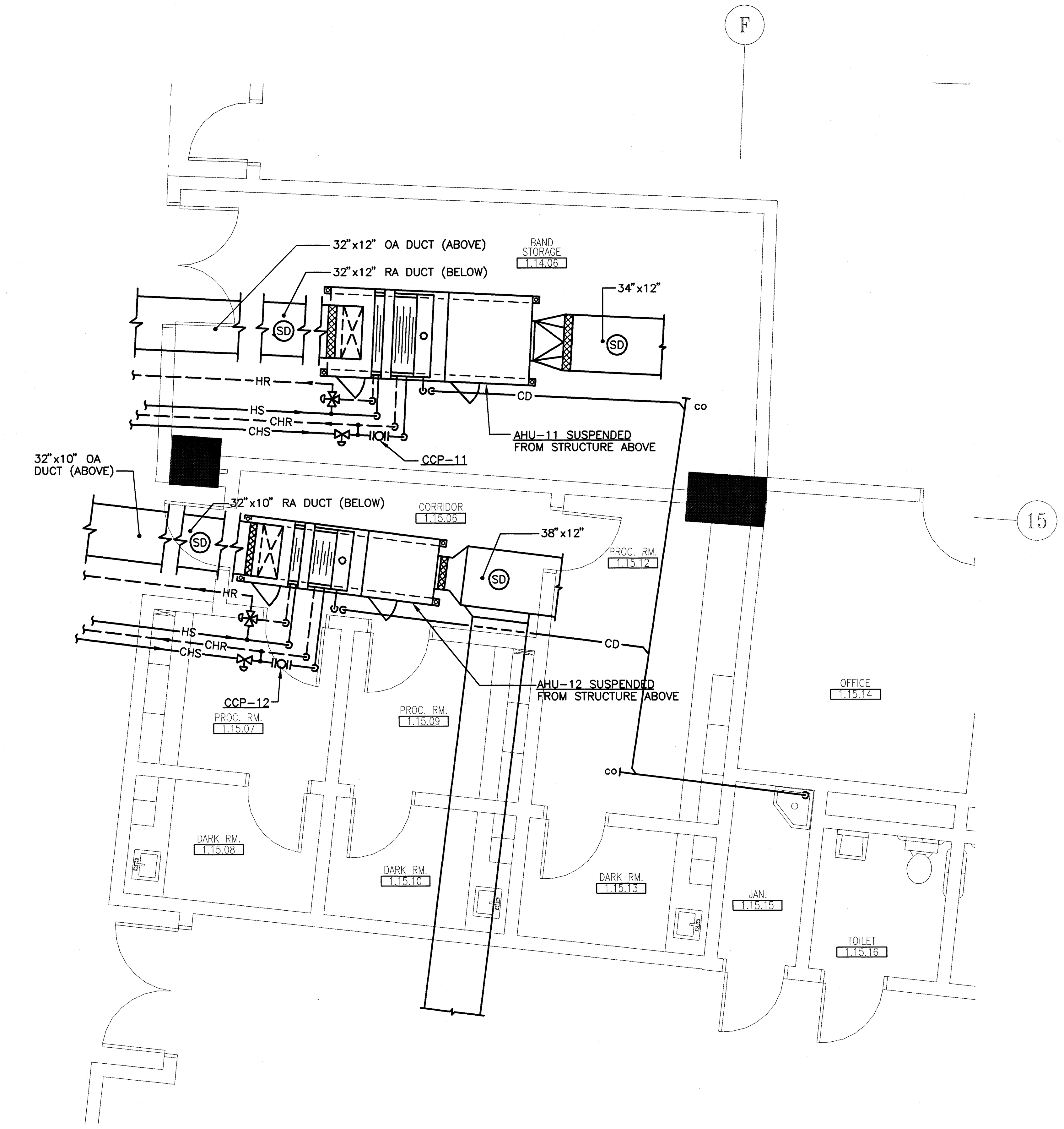
01.03.97-12:10-6110M305 – RMF #95110



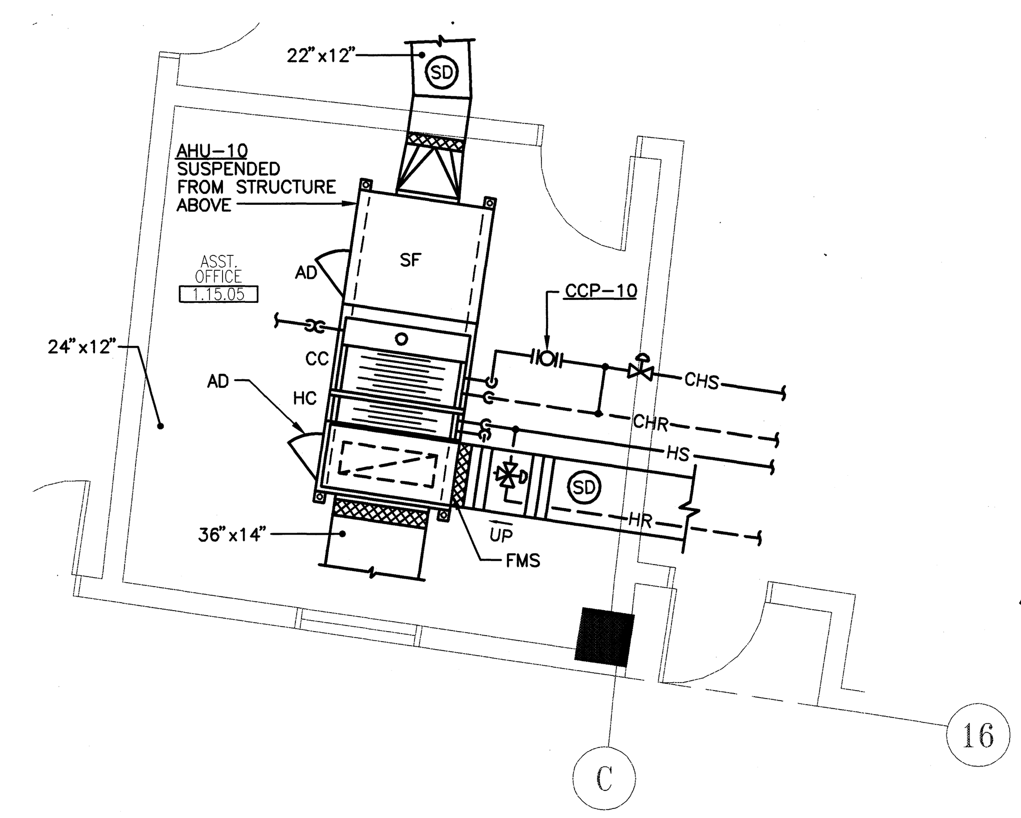
A M.3-06 PART PLAN – HVU-9
SCALE: 1/4"=1'-0"



B M.3-06 PART PLAN – AHU-19
SCALE: 1/4"=1'-0"



C M.3-06 PART PLAN – AHU-11 & 12
SCALE: 1/4"=1'-0"



D M.3-06 PART PLAN – AHU-10
SCALE: 1/4"=1'-0"

SHOW FLEX CONNECTIONS AND SUPPORT HANGERS/RAILS

PROJECT NORTH

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NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44

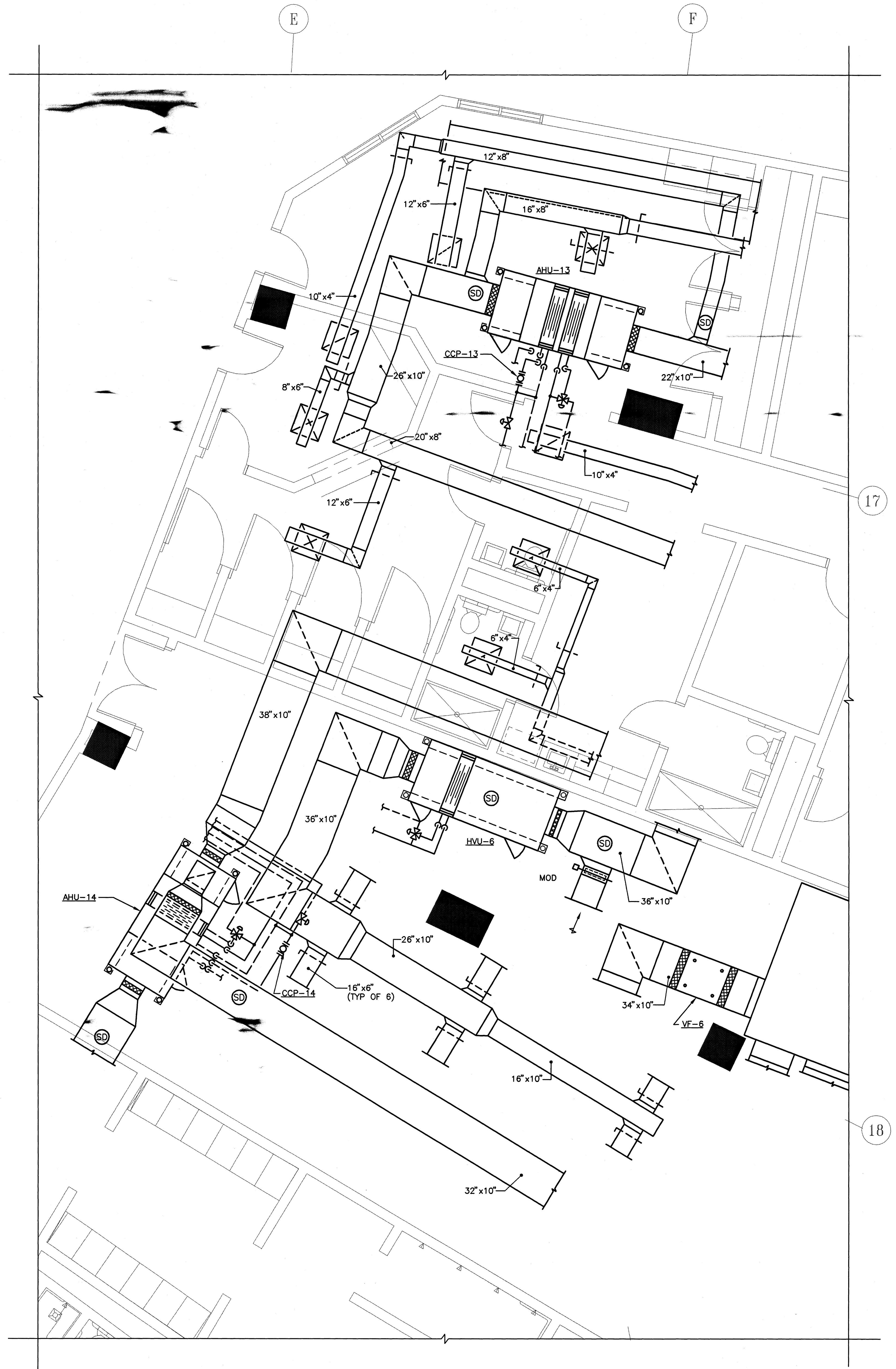
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: JRJ	REVIEWED BY:
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL PART PLANS – AIR SYSTEMS SERVICE LEVEL

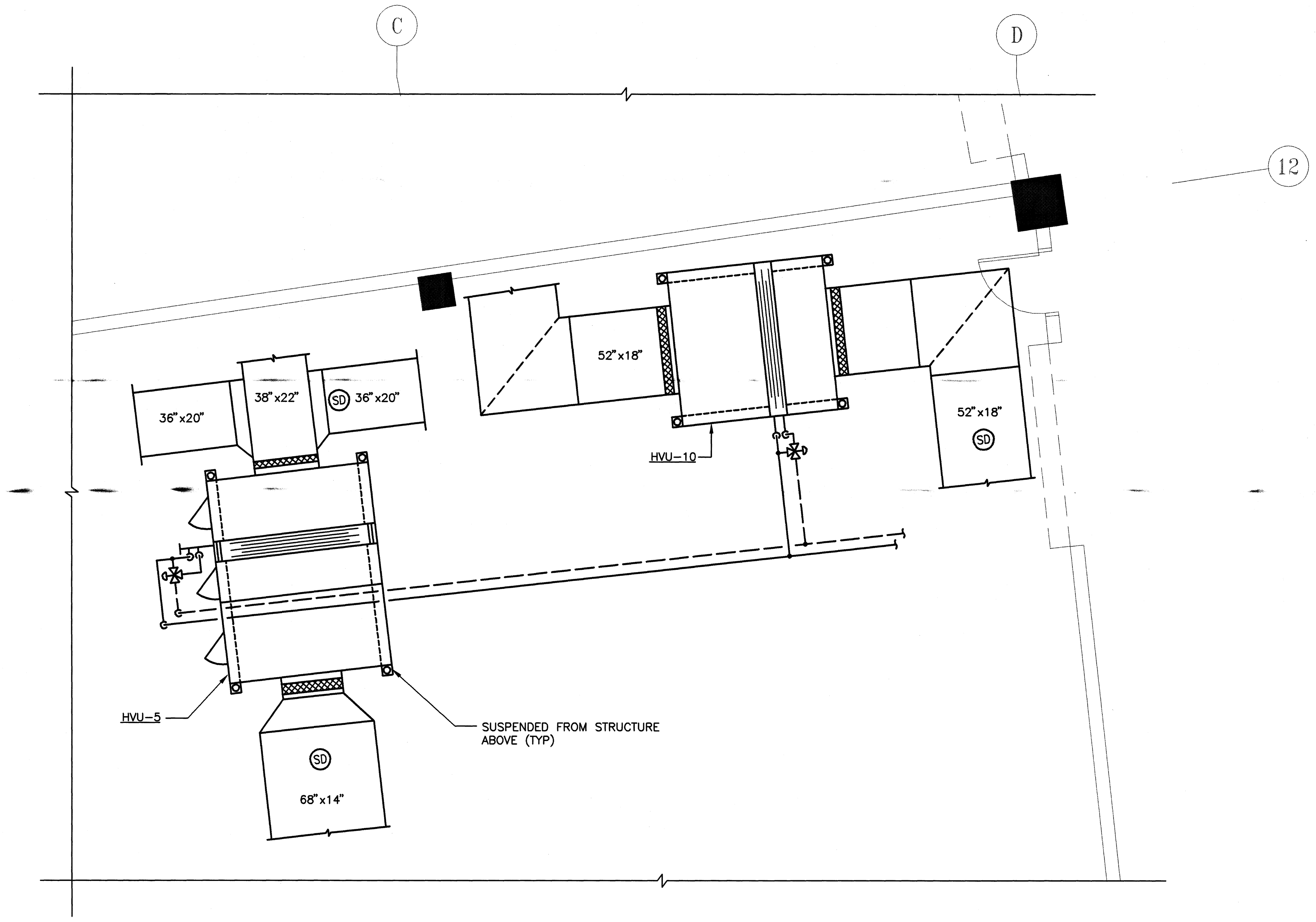
CATEGORY – SUB-CATEGORY – SHEET
M.3-06

04:27:97-11:21-6110M306 - RMF #95110



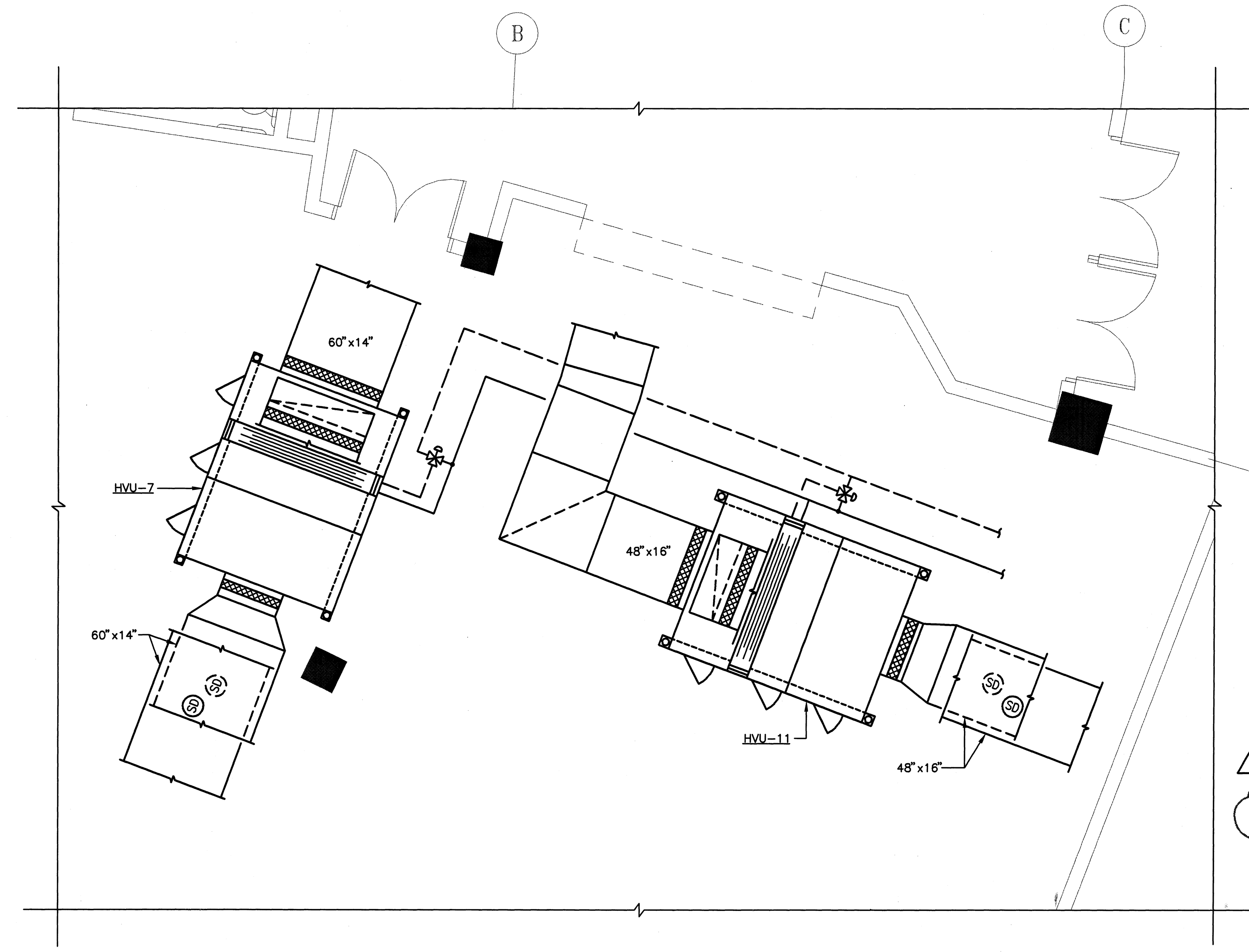
(A / M.3-07) PART PLAN – AHU – 13 & 14, HVU -6

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



(B / M.3-07) PART PLAN – HVU-5 & HVU-10

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



(C / M.3-07) PART PLAN – HVU-7 & HVU-11

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

(1) SHOW FLEX CONNECTIONS AND SUPPORT HANGERS/RAILS

PROJECT NORTH

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NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44

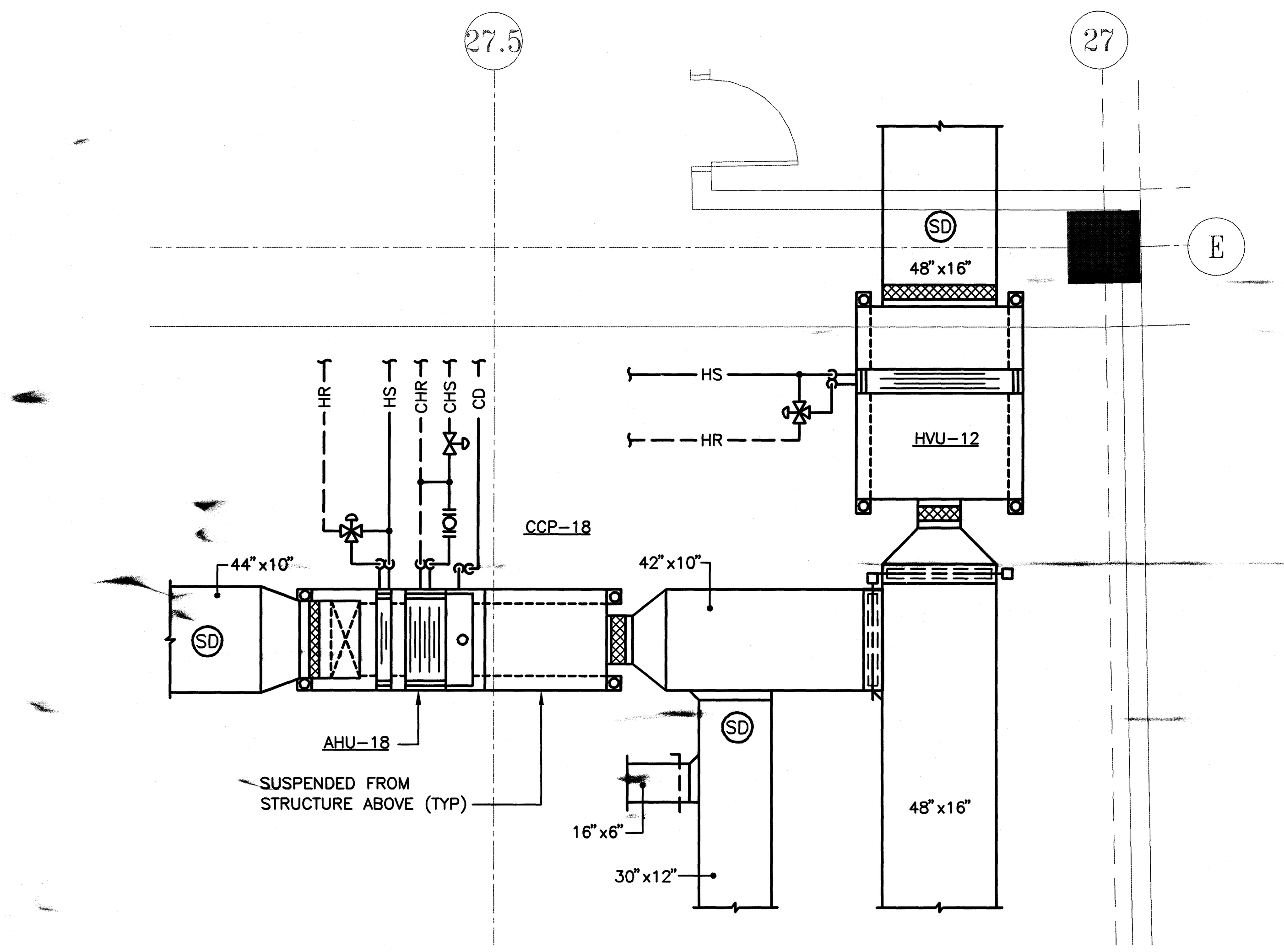
KEYPLAN (D A C B)

PROJECT NO.: 95-675-00
ISSUED BY:
DRAWN BY: JTP
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
MECHANICAL
PART PLANS –
AIR SYSTEMS
SERVICE LEVEL

CATEGORY – SUB-CATEGORY – SHEET
M.3-07

04.27.97-12:52-5110M307 - RMF #95110



A M.3-08 PART PLAN – AHU-18 AND HVU-12

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

SHOW FLEX CONNECTIONS AND SUPPORT HANGERS/RAILS

PROJECT NORTH

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04-27-97-15:07-5110M308 – RMF #95110

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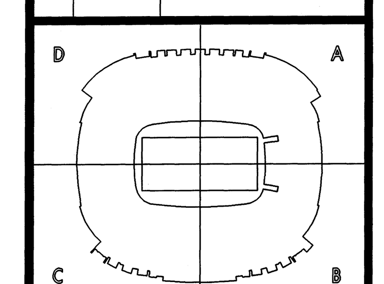


KEYPLAN

PROJECT NO. 95-675-00

ISSUED BY:

DRAWN BY: JFL

REVIEWED BY:

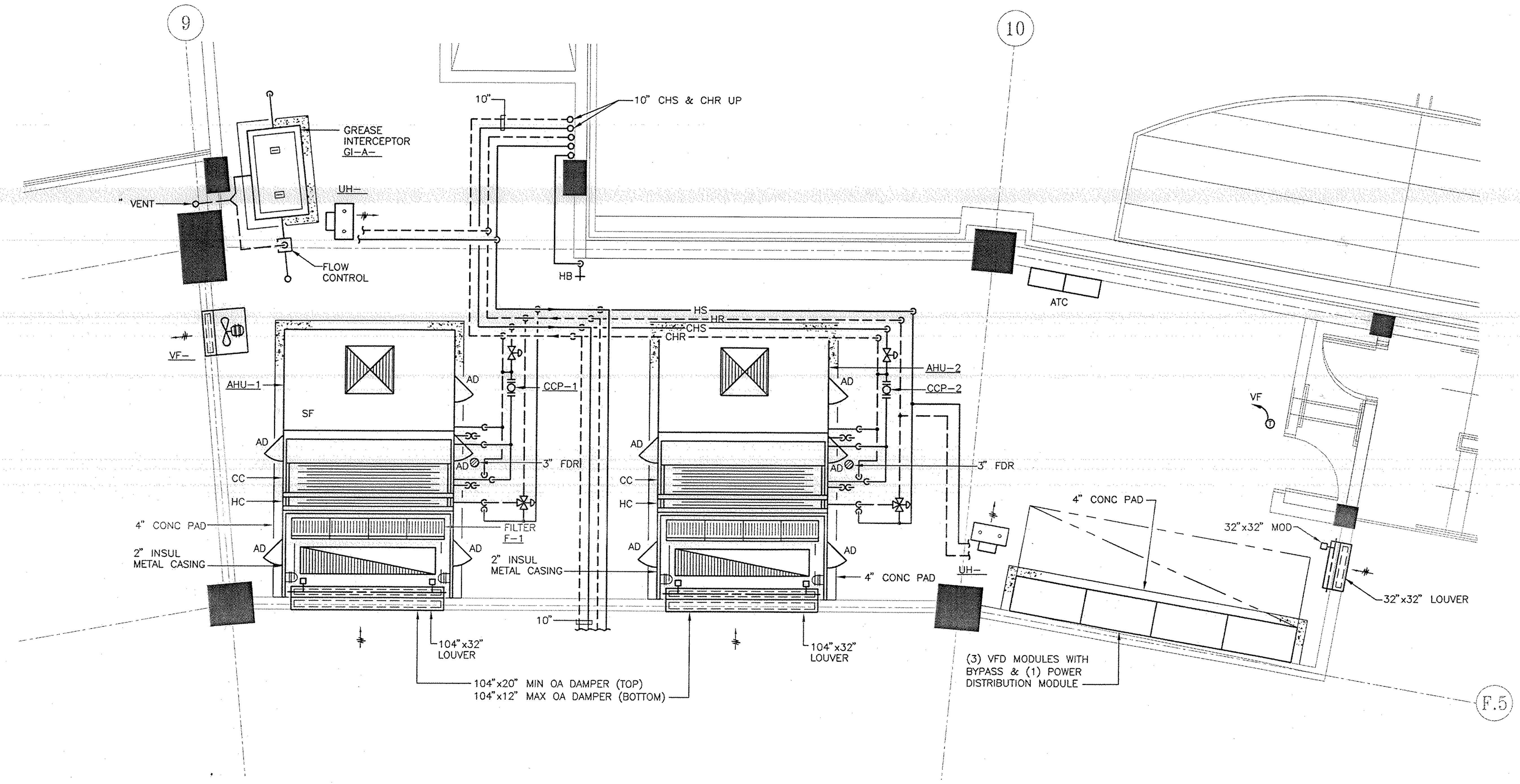
ISSUED: 2-28-97

SHEET TITLE

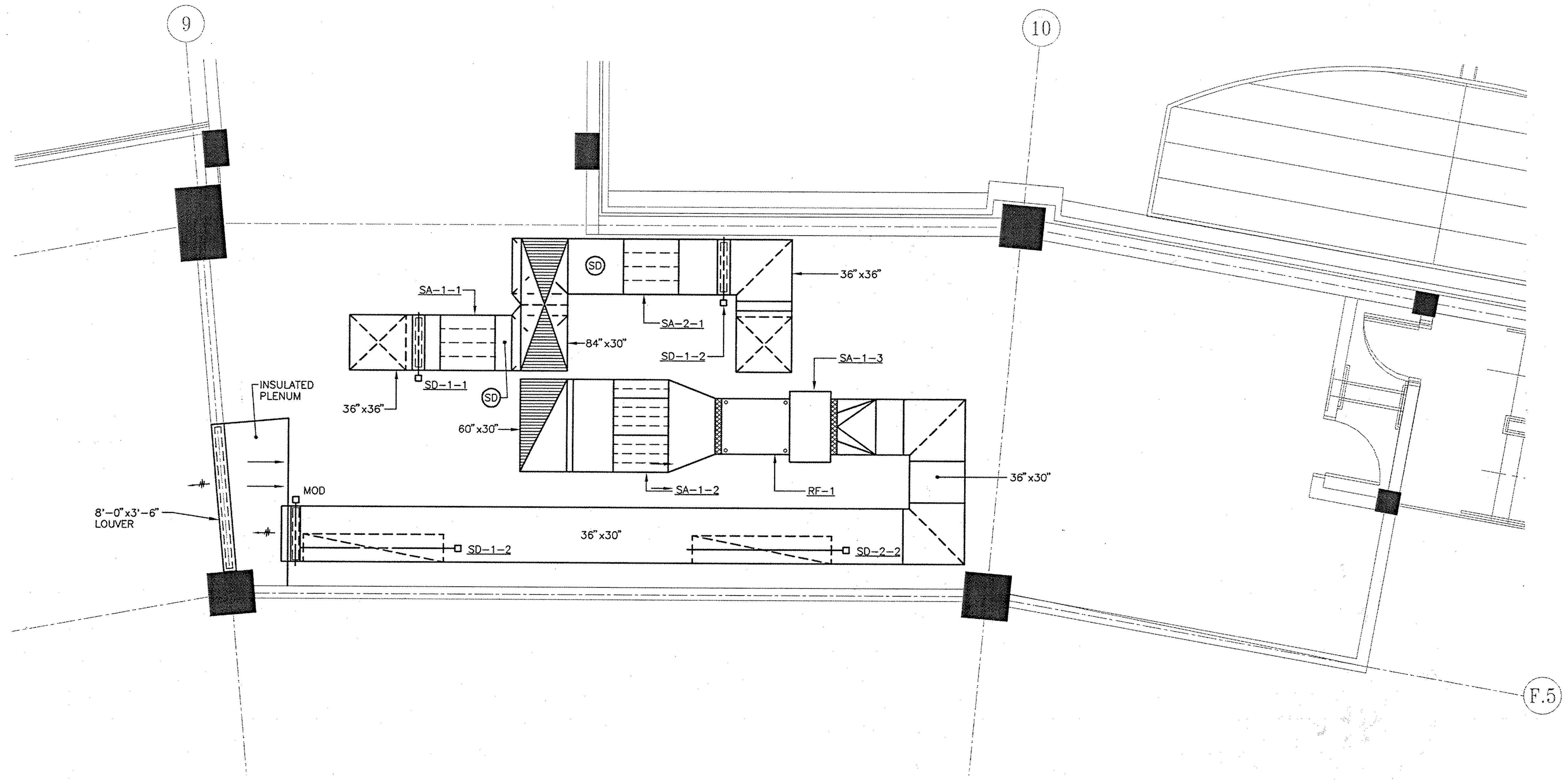
MECHANICAL PART PLANS – AIR SYSTEMS SERVICE LEVEL

CATEGORY -- SUB-CATEGORY – SHEET

M.3-08



MECHANICAL ROOM – PIPING PLAN
SCALE: 1/4"=1'-0"



MECHANICAL ROOM – DUCTWORK PLAN
SCALE: 1/4"=1'-0"

PROJECT NORTH

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Kansas City, Missouri 64105

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BLISS & NITRAY, INC.
MIAMI, FLORIDA
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REVISIONS

NO.	DATE	DESCRIPTION

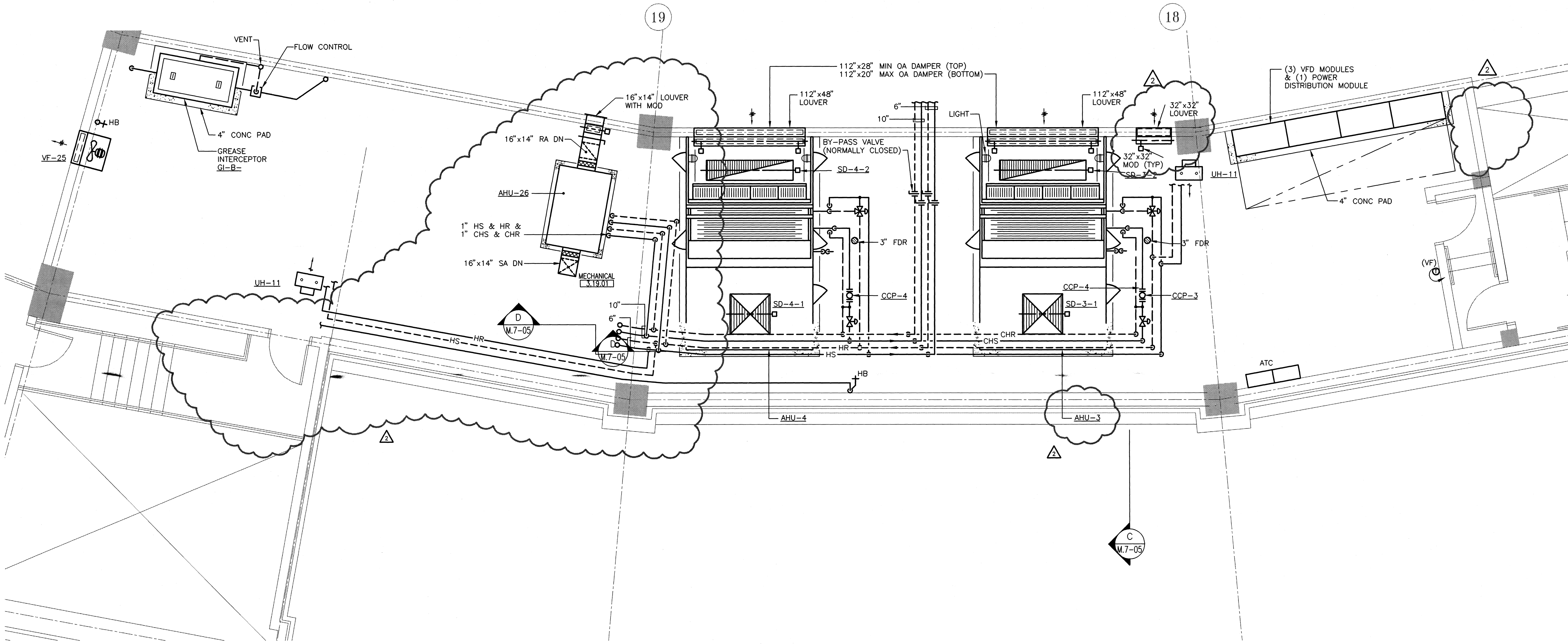
KEYPLAN
A B C D

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: JRJ	REVIEWED BY: PJH
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL ROOMS
AIR SYSTEMS
PRESS LEVEL – A

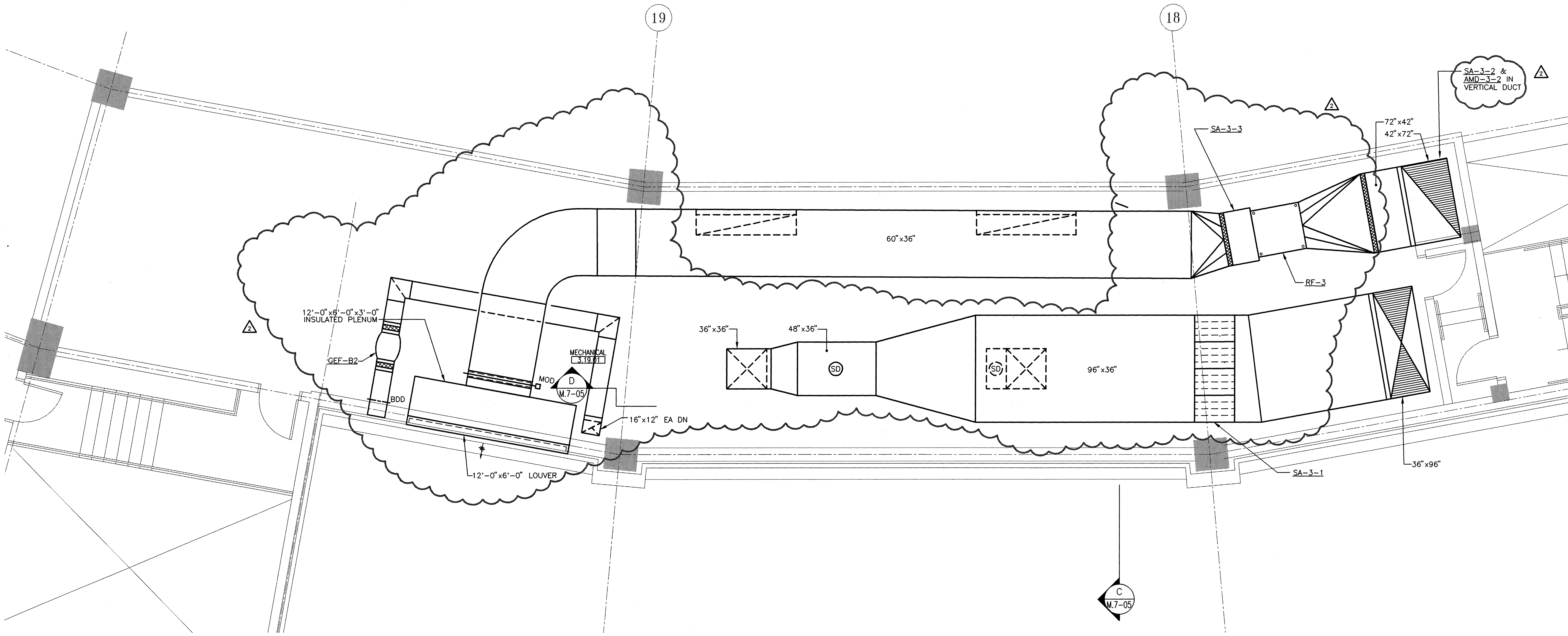
CATEGORY – SUB-CATEGORY – SHEET
M.3-09

03.02.97-23:14-5110M309 – RMF #95110



MECHANICAL ROOM – PIPING PLAN

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



MECHANICAL ROOM – DUCTWORK PLAN

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

PROJECT NORTH

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Kansas City, Missouri 64105

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MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
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BALTIMORE, MARYLAND

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BALTIMORE, MARYLAND

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PACKAGE

MEP PACKAGE

DRAWING PACKAGE
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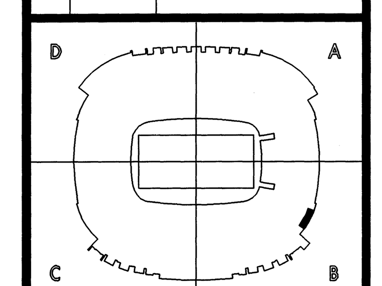
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00

ISSUED BY: ---

DRAWN BY: JRJ

REVIEWED BY: PJH

ISSUED: 2-28-97

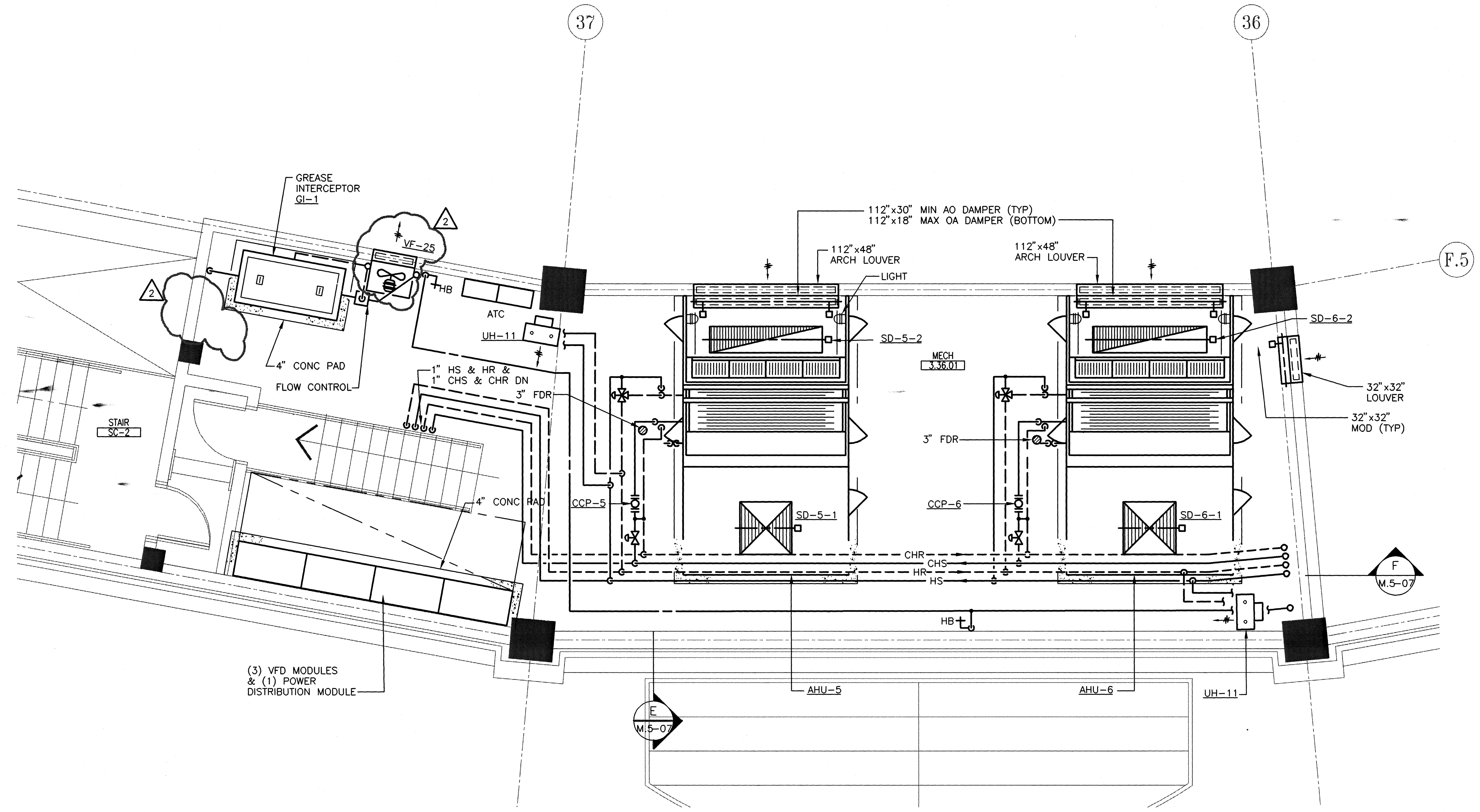
SHEET TITLE

MECHANICAL ROOMS
AIR SYSTEMS
PRESS LEVEL – B

CATEGORY – SUB-CATEGORY – SHEET

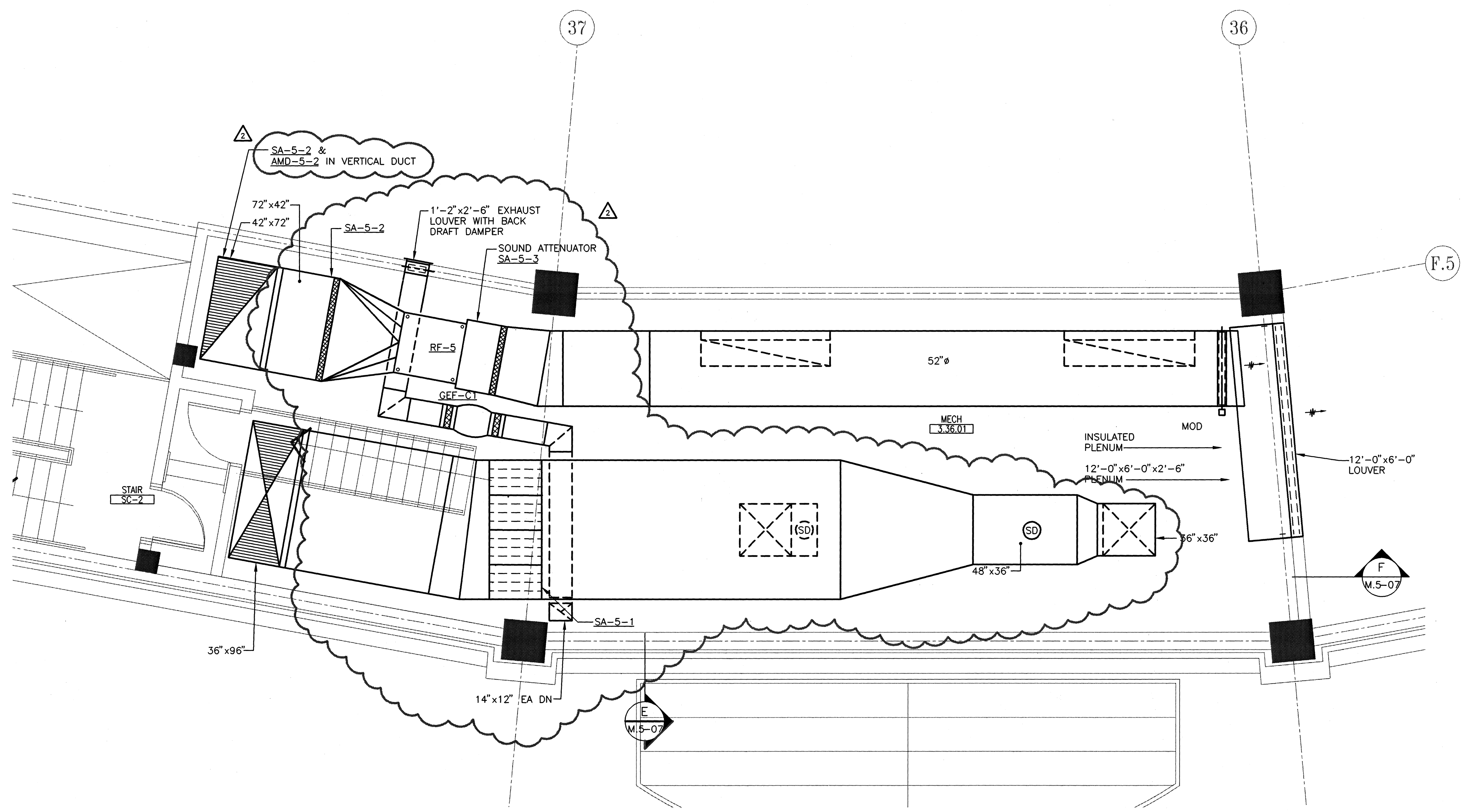
M.3-10

04.07.97-12:56-6110M310 – RMF #95110



MECHANICAL ROOM – PIPING PLAN

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



MECHANICAL ROOM – DUCTWORK PLAN

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

PROJECT NORTH

0 1 2 4 8

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NO.	DATE	DESCRIPTION
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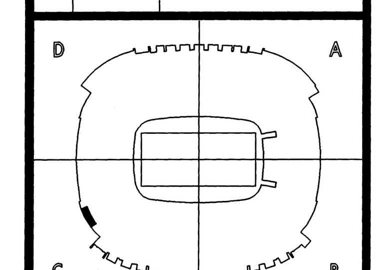
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JRJ
REVIEWED BY: PJH
ISSUED: 2-28-97

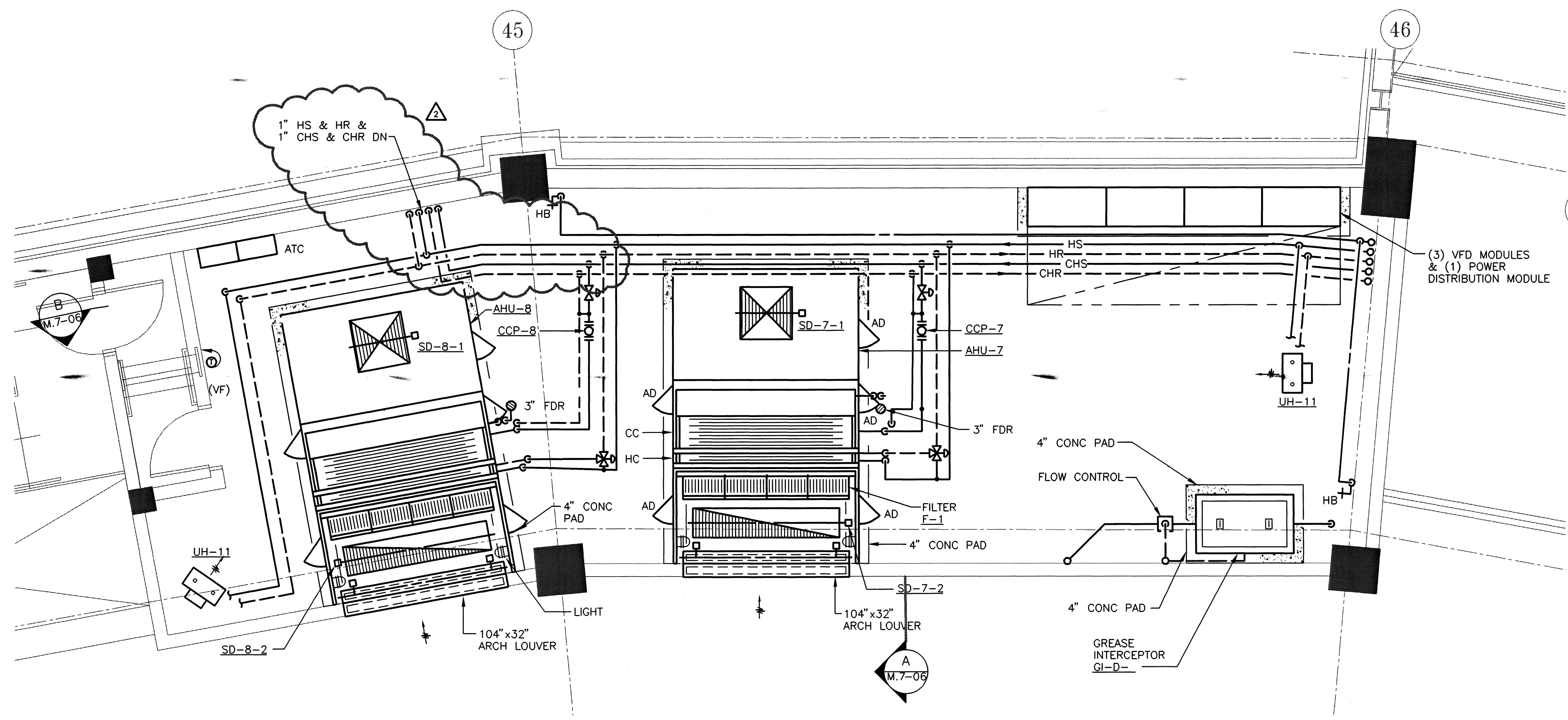
SHEET TITLE

MECHANICAL ROOMS
AIR SYSTEMS
PRESS LEVEL – C

CATEGORY – SUB-CATEGORY – SHEET

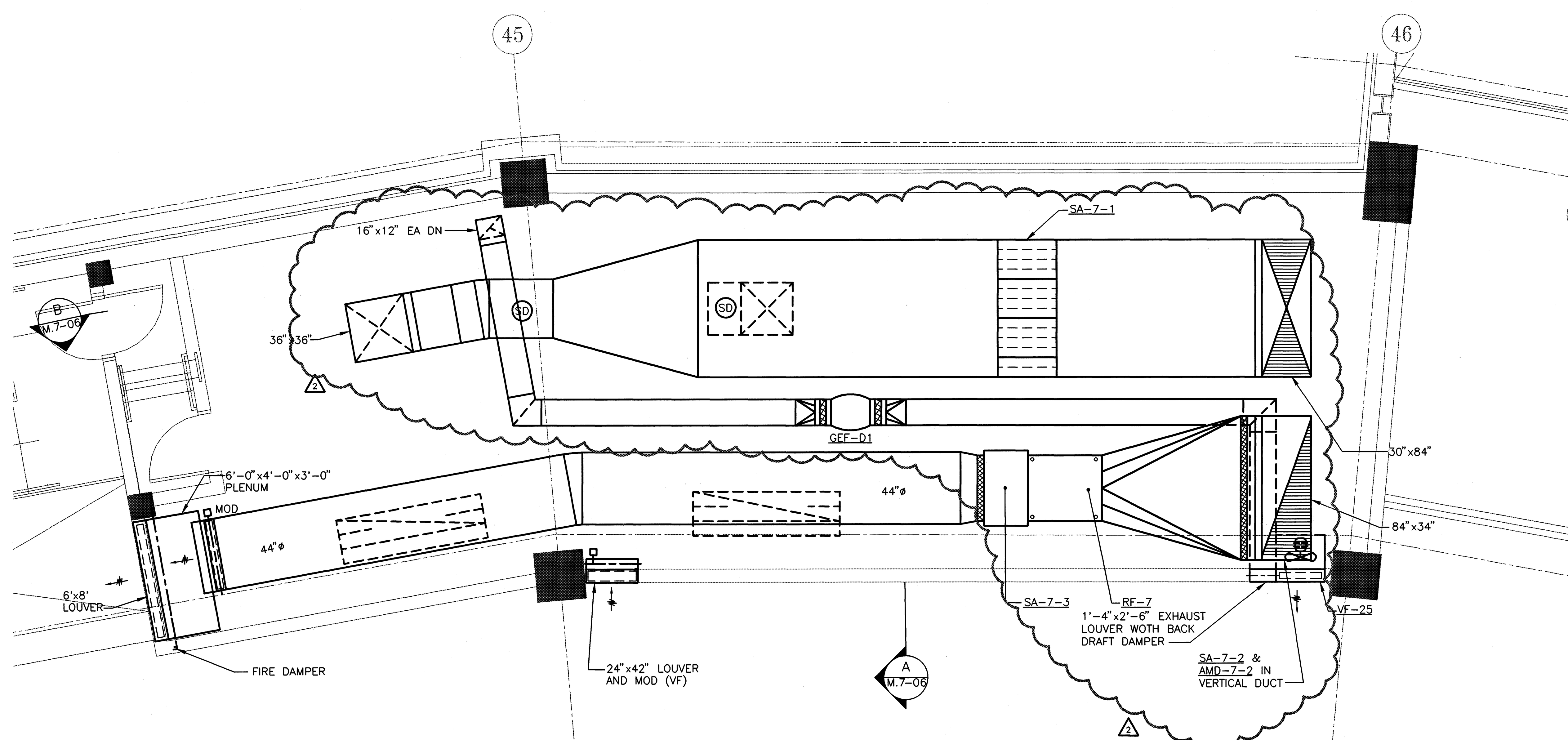
M.3-11

04.07.97-13:06-5110M311 - RMF #95110



MECHANICAL ROOM – PIPING PLAN

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



MECHANICAL ROOM – DUCTWORK PLAN

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

PROJECT NORTH

0 1 2 4 8

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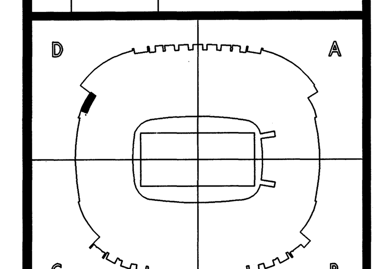
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00

ISSUED BY: ---

DRAWN BY: JRJ

REVIEWED BY: PJH

ISSUED: 2-28-97

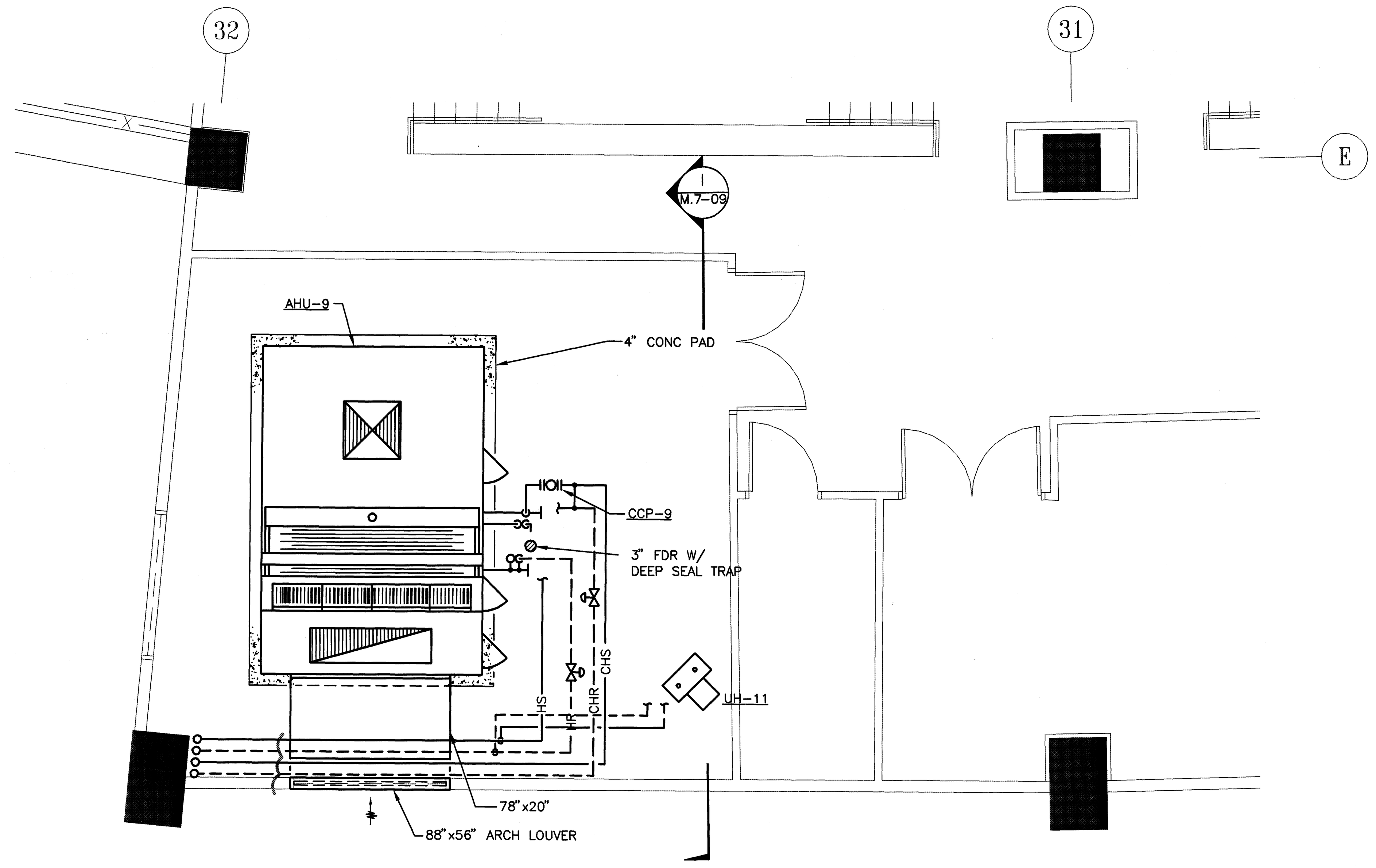
SHEET TITLE

MECHANICAL ROOMS
AIR SYSTEMS
PRESS LEVEL – D

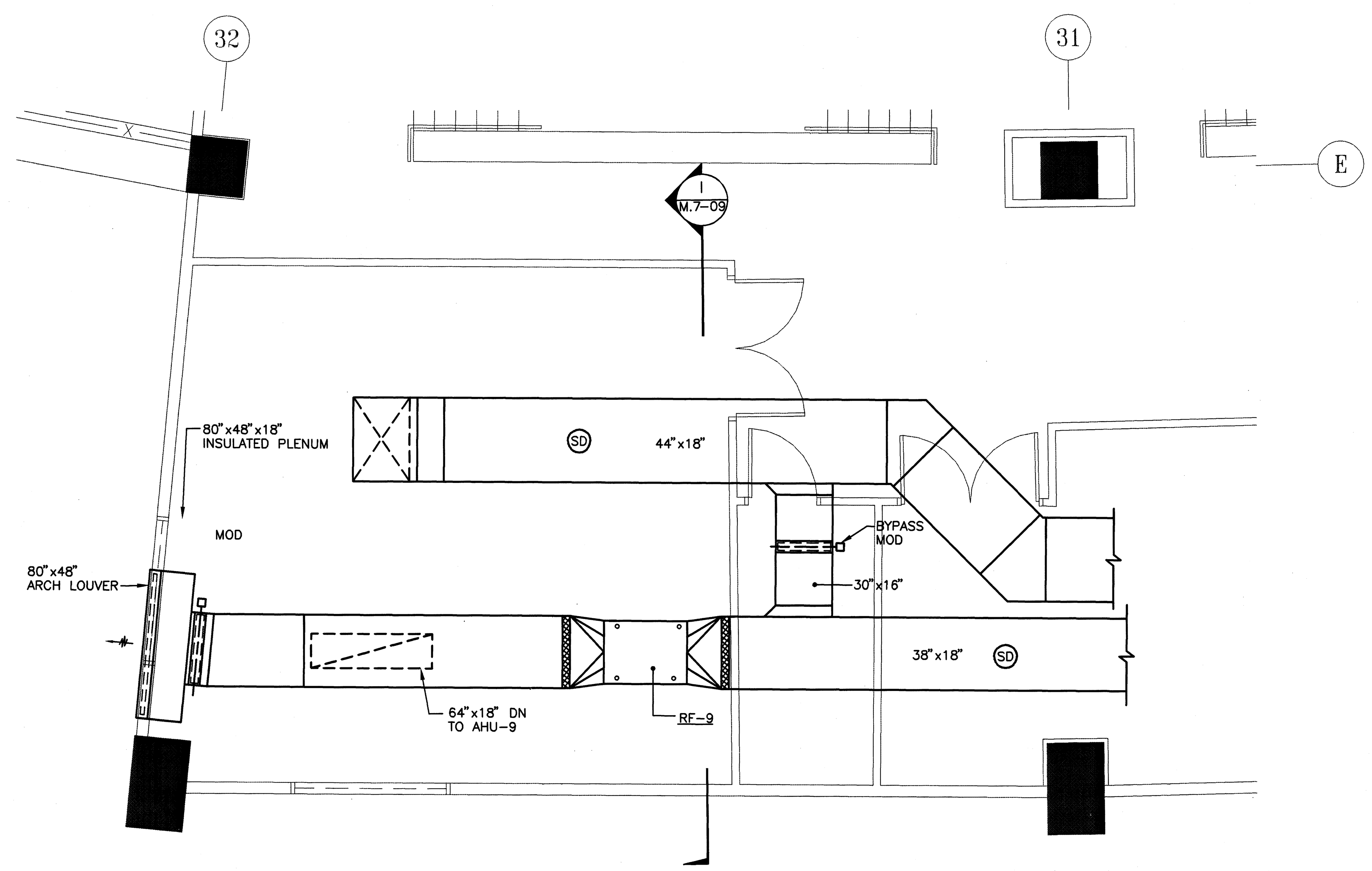
CATEGORY – SUB-CATEGORY – SHEET

M.3-12

04.07.97-11:41-5110M312 - RMF #95110



MECHANICAL ROOM – PIPING
SCALE: 1/4"=1'-0"



MECHANICAL ROOM – DUCTWORK
SCALE: 1/4"=1'-0"

04.07.97-11:12-5110M313 - RMF #95110

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BALTIMORE, MARYLAND
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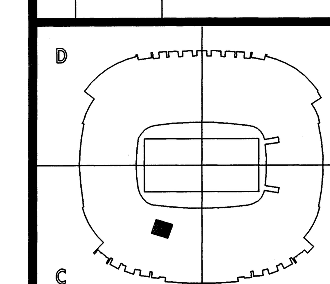
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

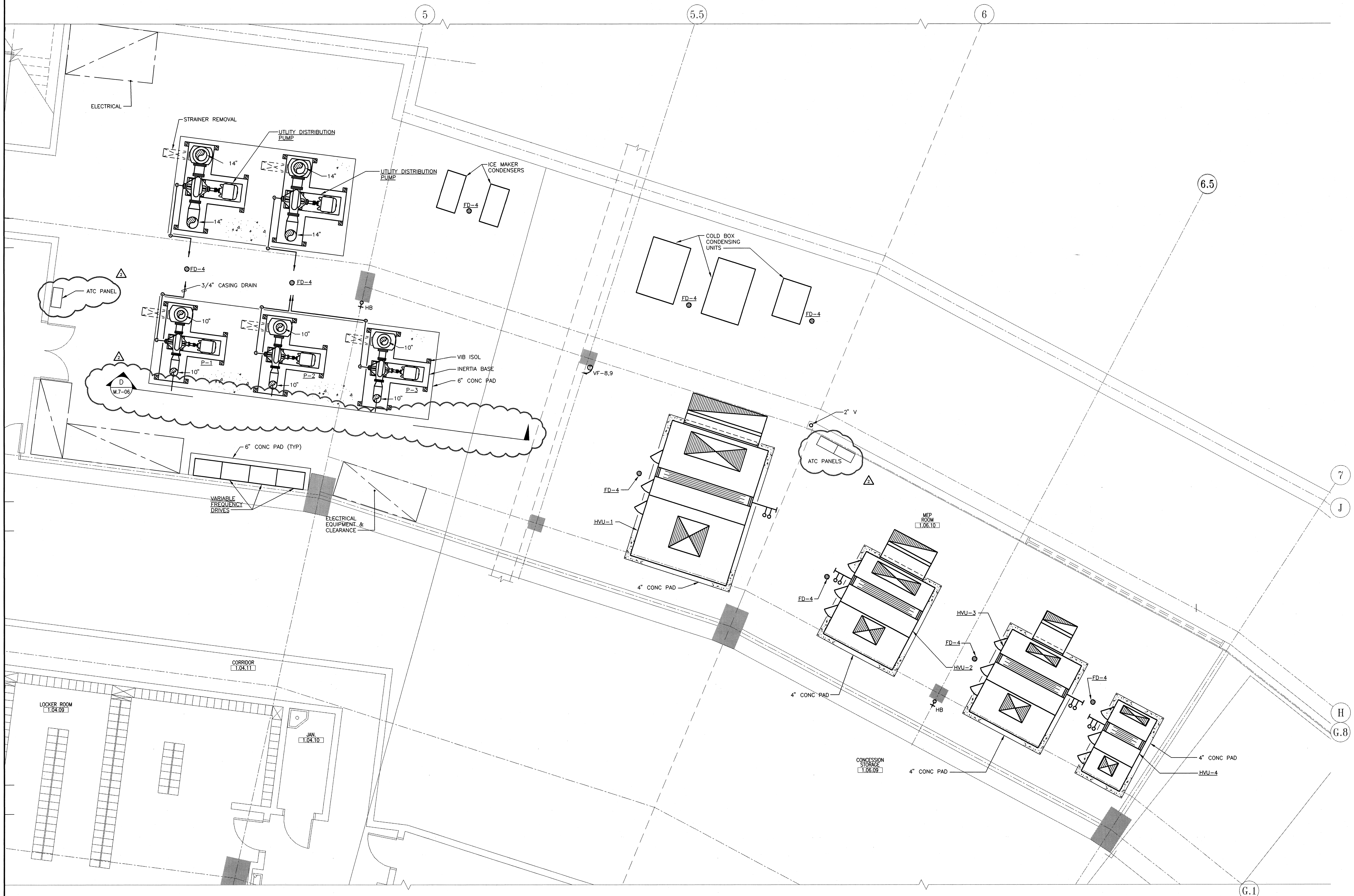


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: JRJ
REVIEWED BY:
ISSUED: 2-28-97
SHEET TITLE
MECHANICAL ROOMS
AIR SYSTEMS
PRESS LEVEL - C

PROJECT NORTH
0 1 2 4 8

CATEGORY - SUB-CATEGORY - SHEET
M.3-13



MECHANICAL ROOM – PLANT SYSTEMS – EQUIPMENT PLAN – A

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

GENERAL NOTES:

1. FLOOR DRAINS SHALL HAVE DEEP SEAL TRAPS.

PROJECT NORTH

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04-27-97-17:43-6110M314 – RMF #95110

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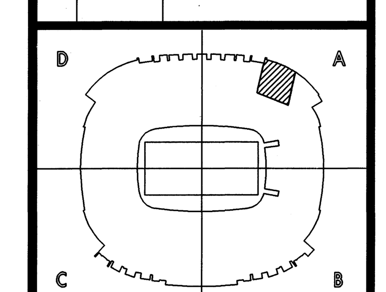
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

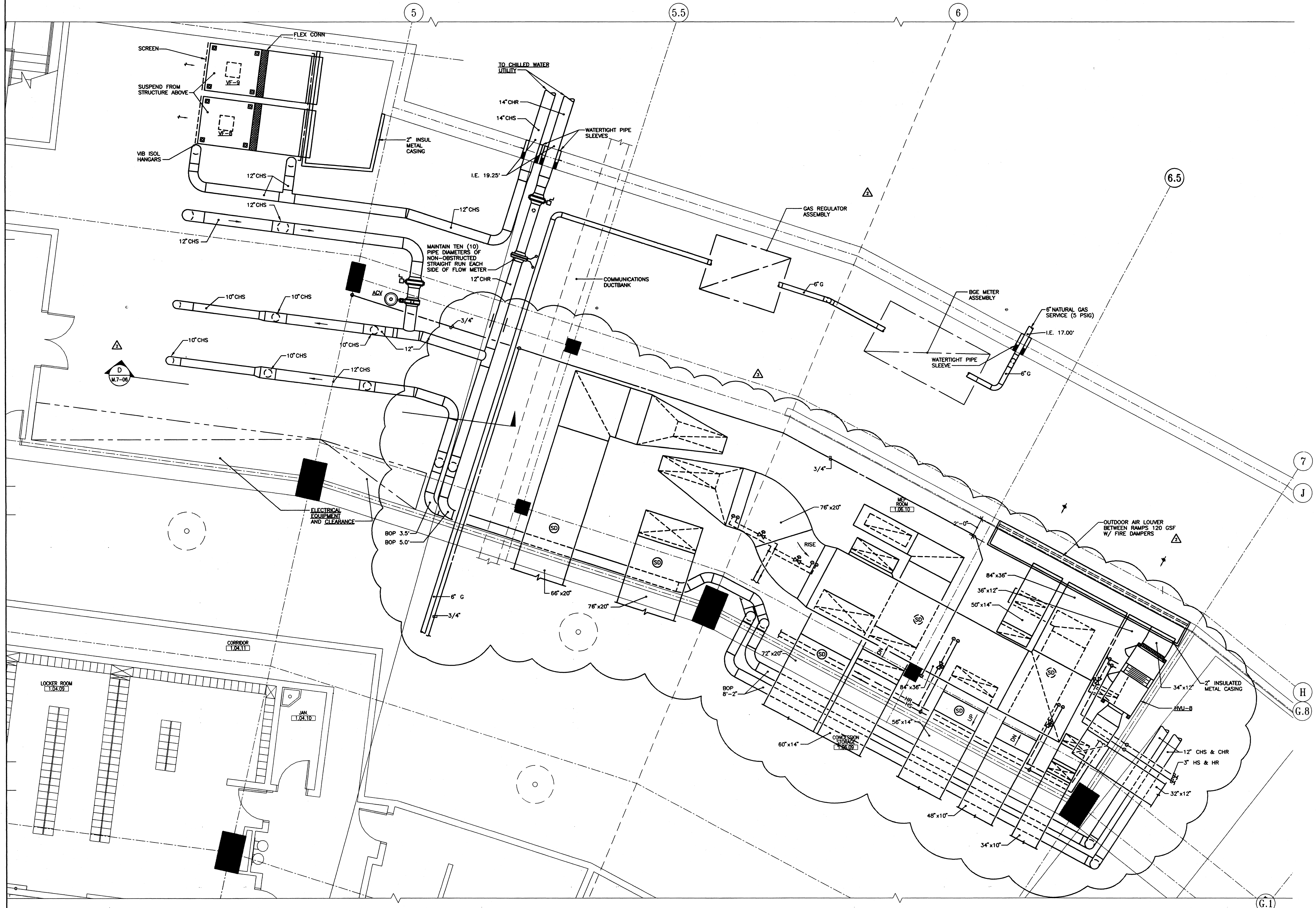


KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: JTP	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL ROOM PLANT SYSTEMS EQUIPMENT PLAN – A

CATEGORY – SUB-CATEGORY – SHEET
M.3-14



MECHANICAL ROOM – PLANT SYSTEMS DISTRIBUTION PLAN – A

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

GENERAL NOTES

1. FOR CONTINUATION OF PIPING REFER TO DRAWING P.2-01A.
   FOR CONTINUATION OF HVAC REFER TO DRAWING M.2-01A.

PROJECT NORTH

10.07.97-10:43-5110M314 - RMF #95110

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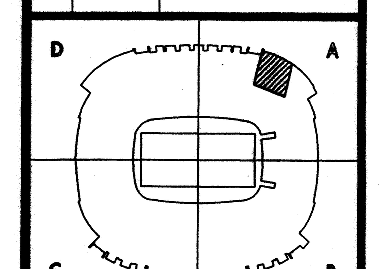
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	7-9-97	BULLETIN #58

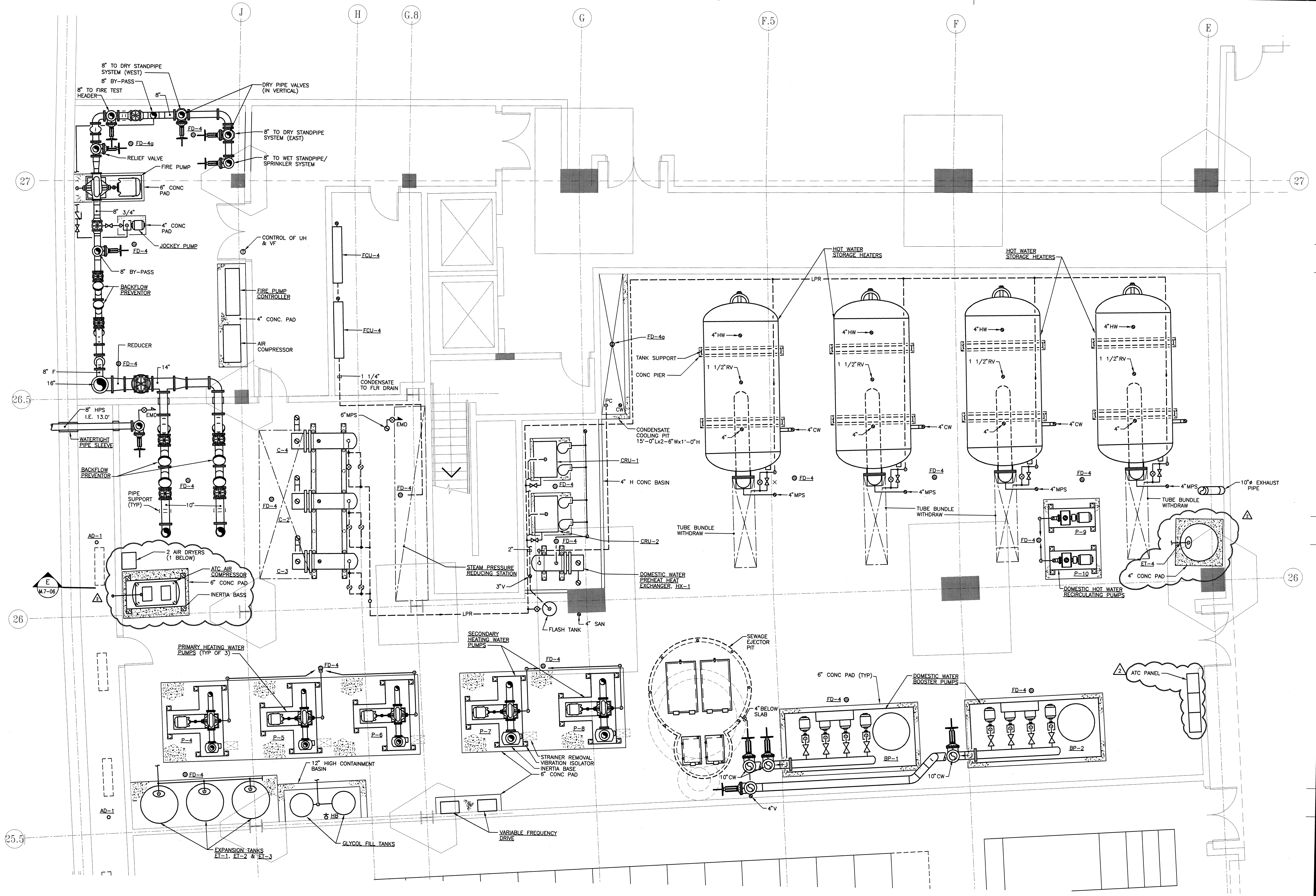


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JTP
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
MECHANICAL ROOM PLANT SYSTEMS DISTRIBUTION PLAN – A

CATEGORY – SUB-CATEGORY – SHEET
M.3-15



MECHANICAL ROOM – PLANT SYSTEMS – EQUIPMENT PLAN

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

04.27.97-17:12-6110M316 – RMF #95110

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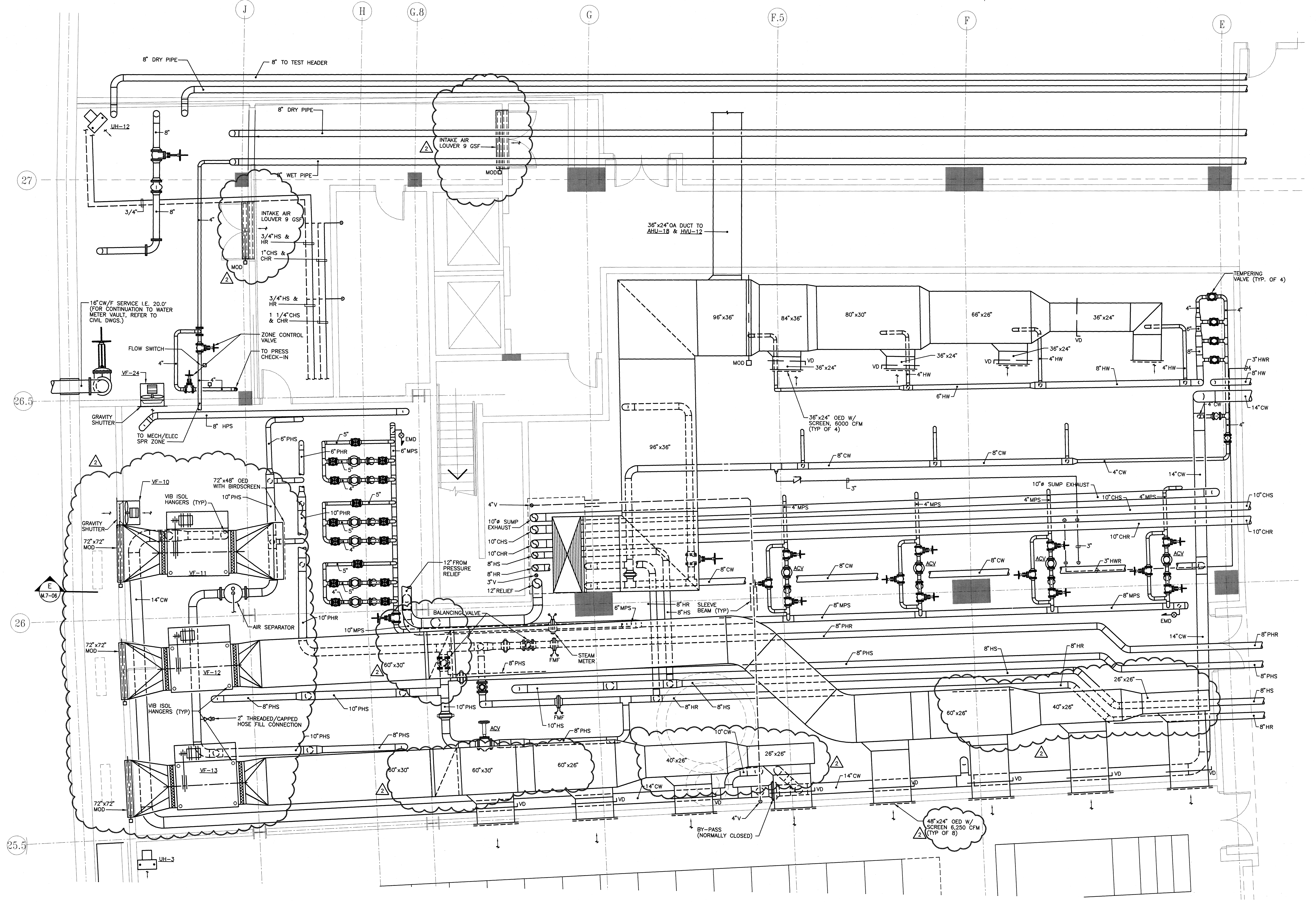
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: MWS
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
MECHANICAL ROOM PLANT SYSTEMS EQUIPMENT PLAN

CATEGORY – SUB-CATEGORY – SHEET
M.3-16



MECHANICAL ROOM - PLANT SYSTEMS - DISTRIBUTION PLAN - B

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

04.27.97-17:12-6110M316 - RMF #95110

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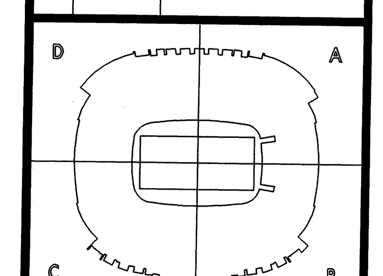
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

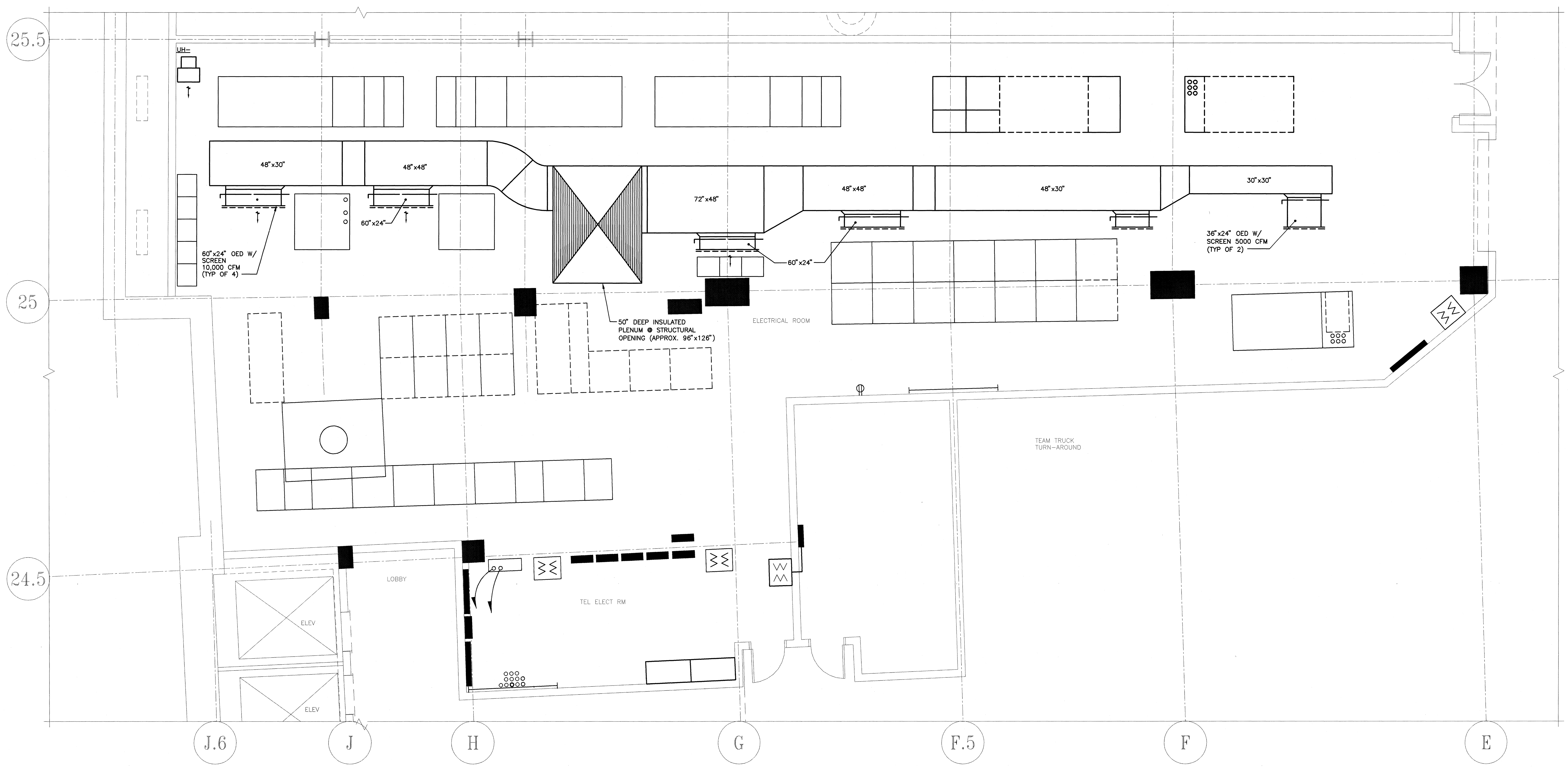


KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY:
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL ROOM PLANT SYSTEMS DISTRIBUTION PLAN B

CATEGORY - SUB-CATEGORY - SHEET
M.3-17



ELECTRICAL EQUIPMENT ROOM – SERVICE LEVEL – B

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

GENERAL NOTES:

1. FLOOR DRAINS SHALL HAVE DEEP SEAL TRAPS.

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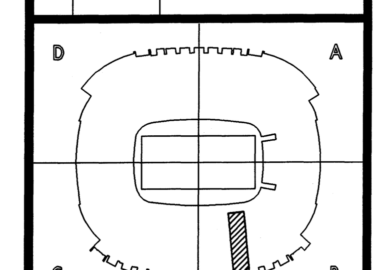
NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: JTP	REVIEWED BY:
ISSUED: 2-28-97	

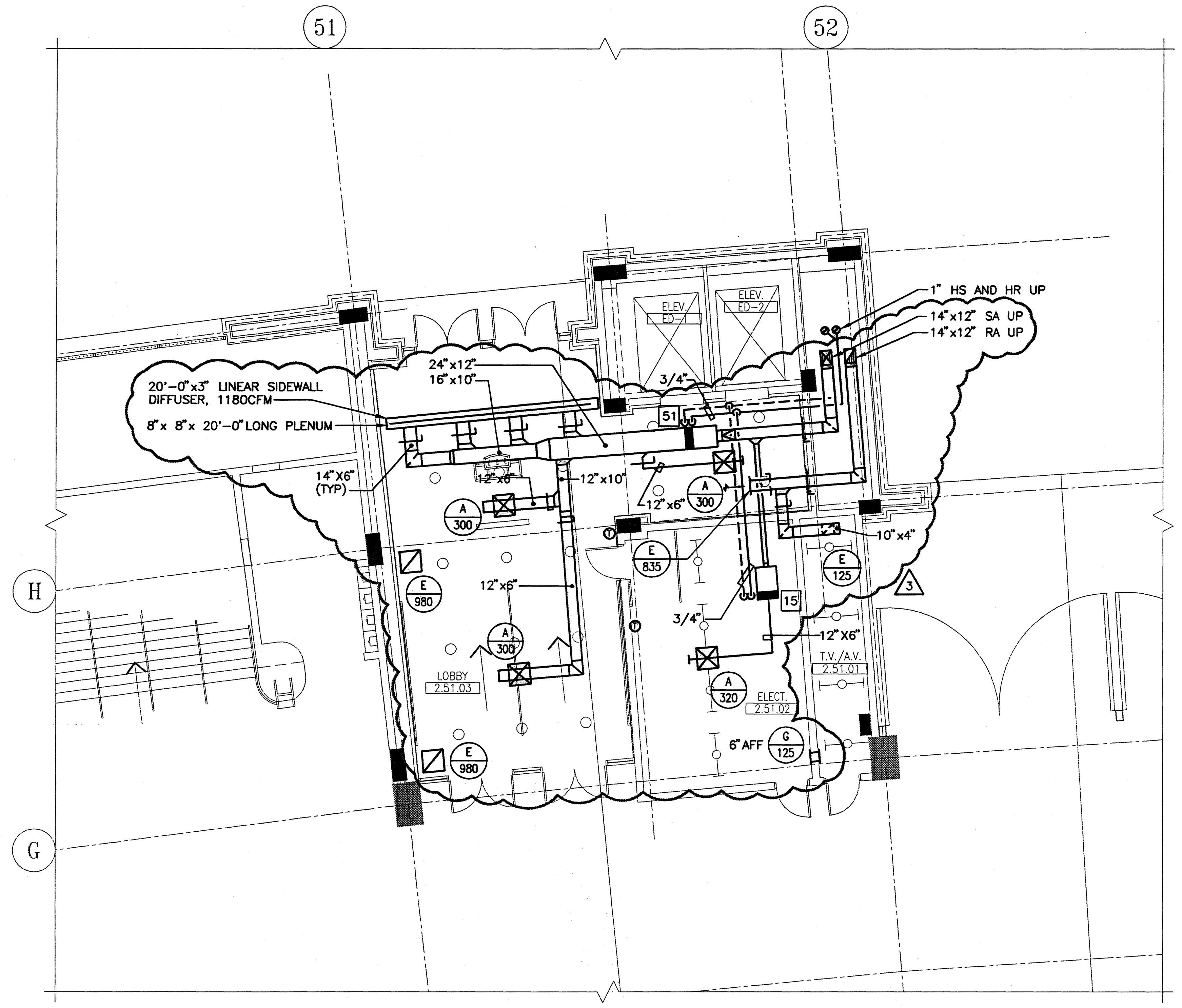
SHEET TITLE

PART PLANS
SERVICE LEVEL

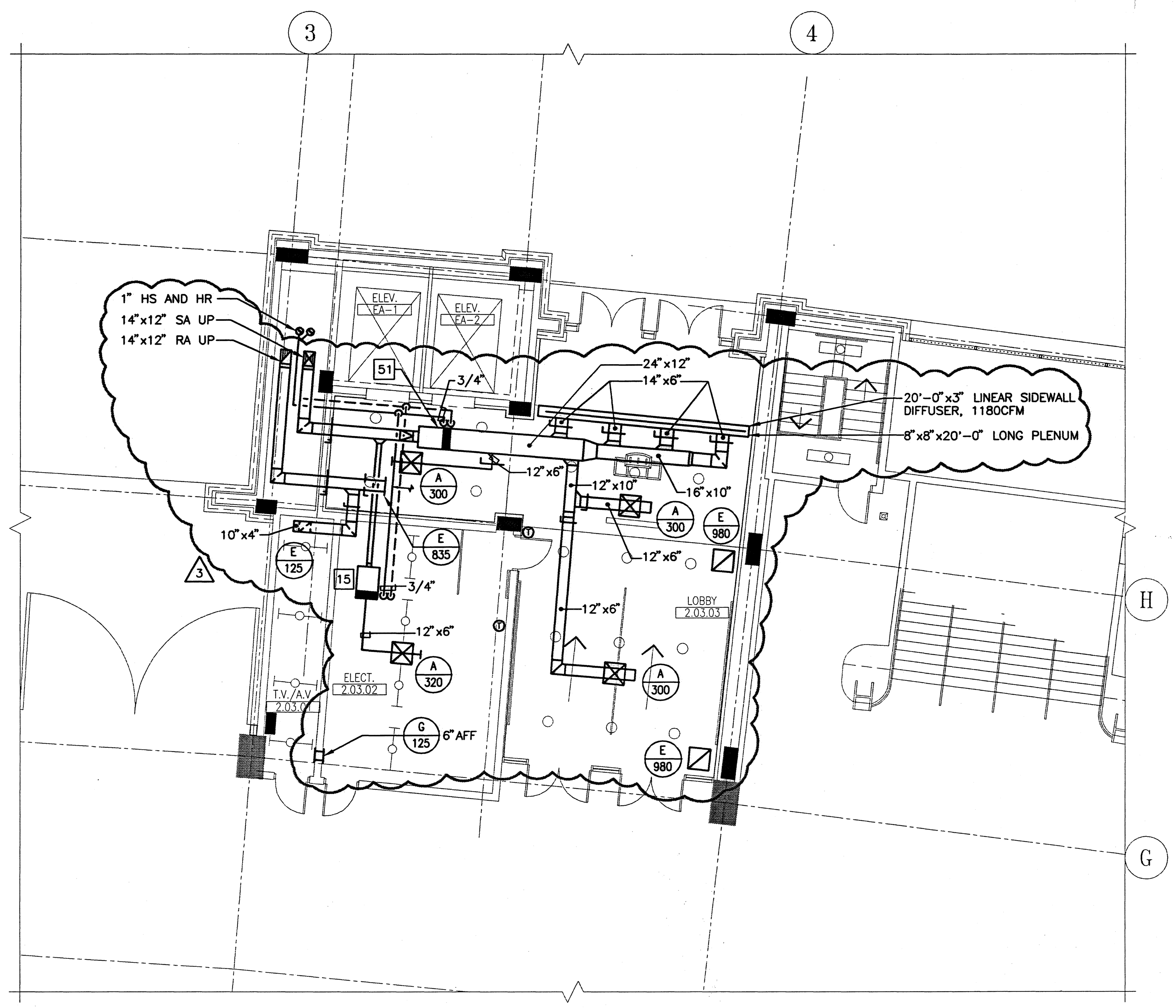
CATEGORY – SUB-CATEGORY – SHEET

M.3-18

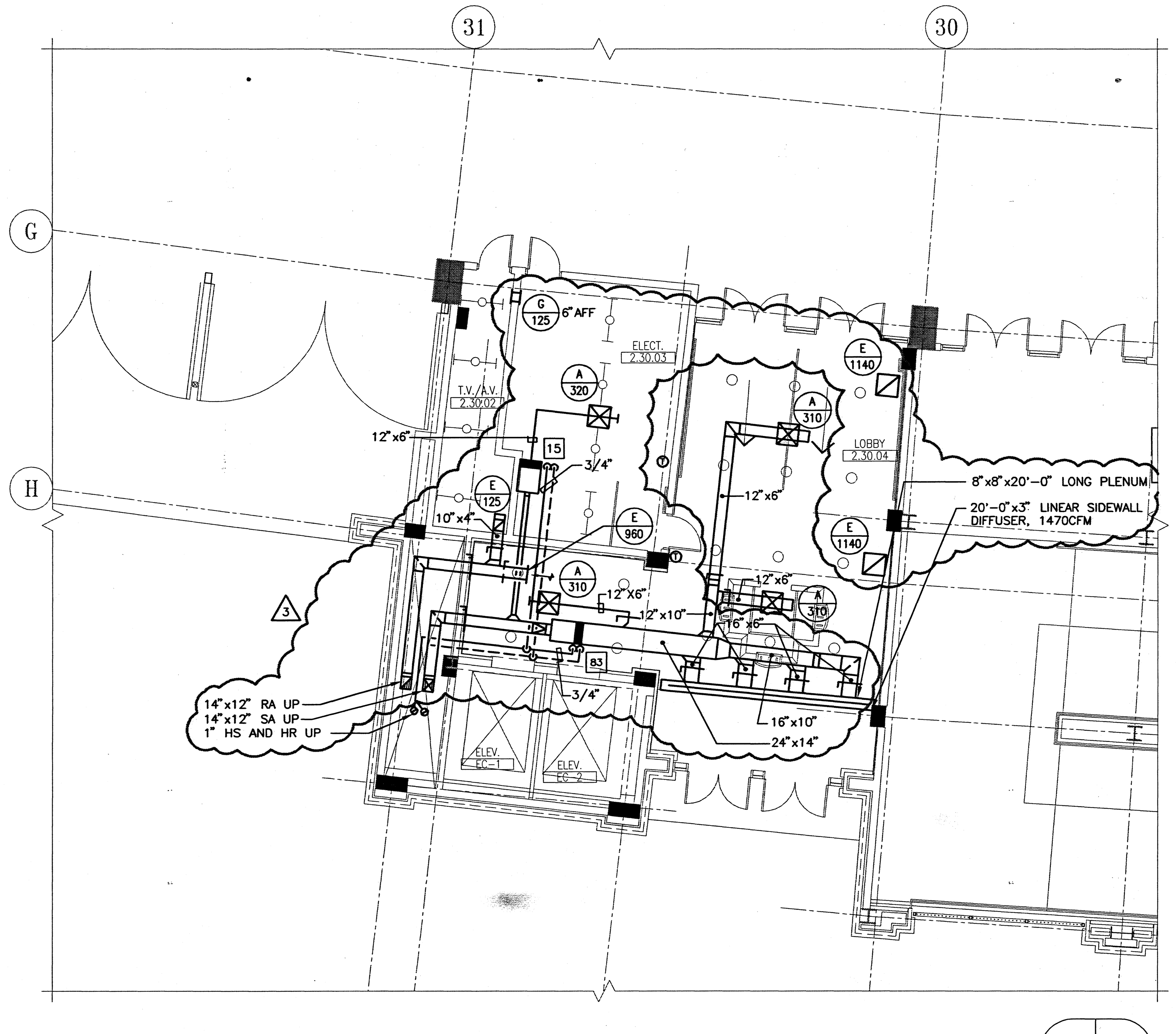
01.14.97-16:14-5110M318 - RMF #95110



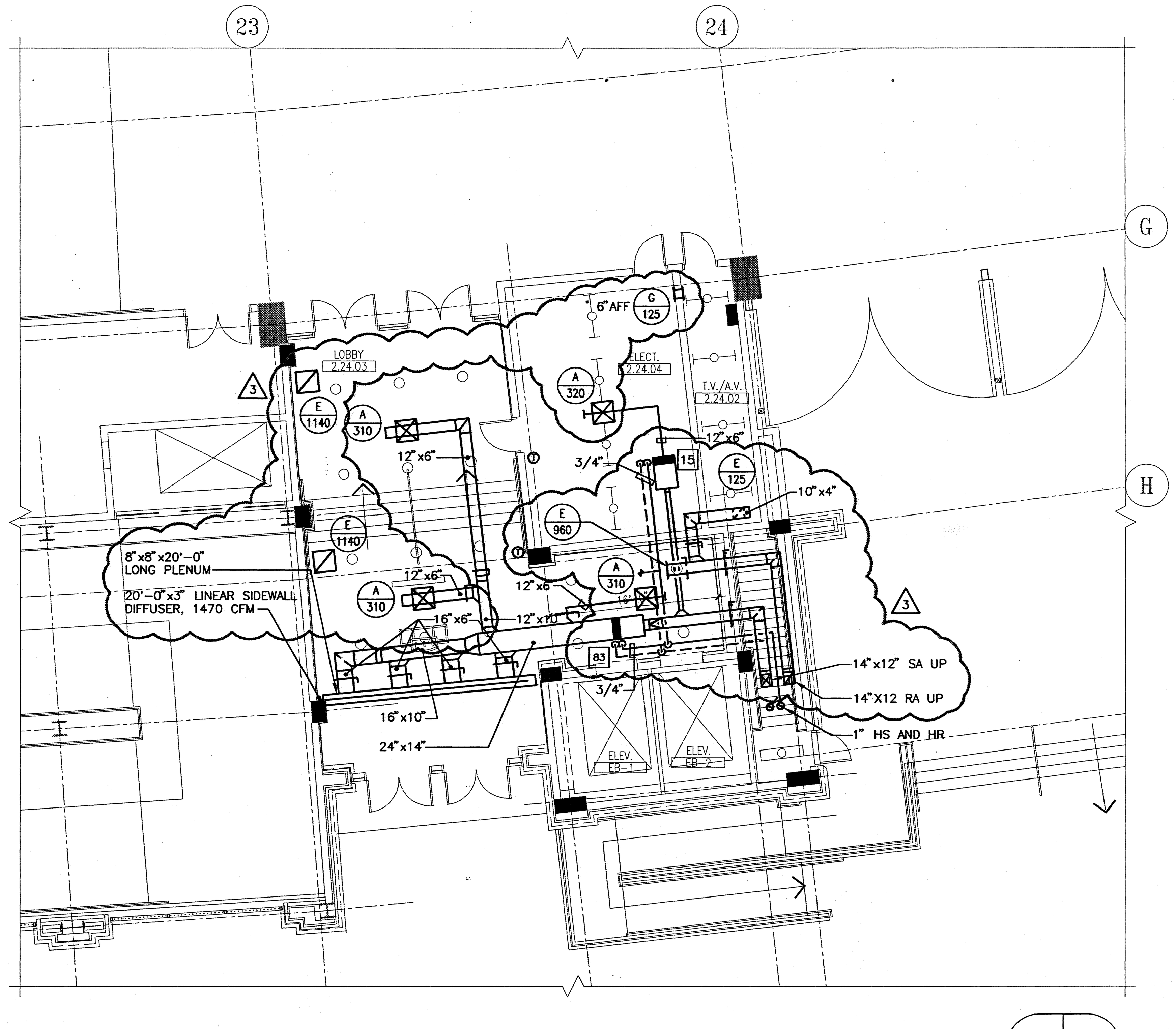
ELEVATOR CORE PLANS – MAIN CONCOURSE QUAD D
SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – MAIN CONCOURSE QUAD A
SCALE: 1/8"=1'-0"



ELEVATOR CORE PLAN – MAIN CONCOURSE QUAD C
SCALE: 1/8"=1'-0"



ELEVATOR CORE PLAN – MAIN CONCOURSE QUAD B
SCALE: 1/8"=1'-0"

PROJECT NORTH

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MIAMI, FLORIDA

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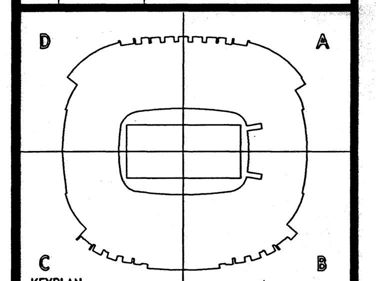
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	2-13-98	NFL #349



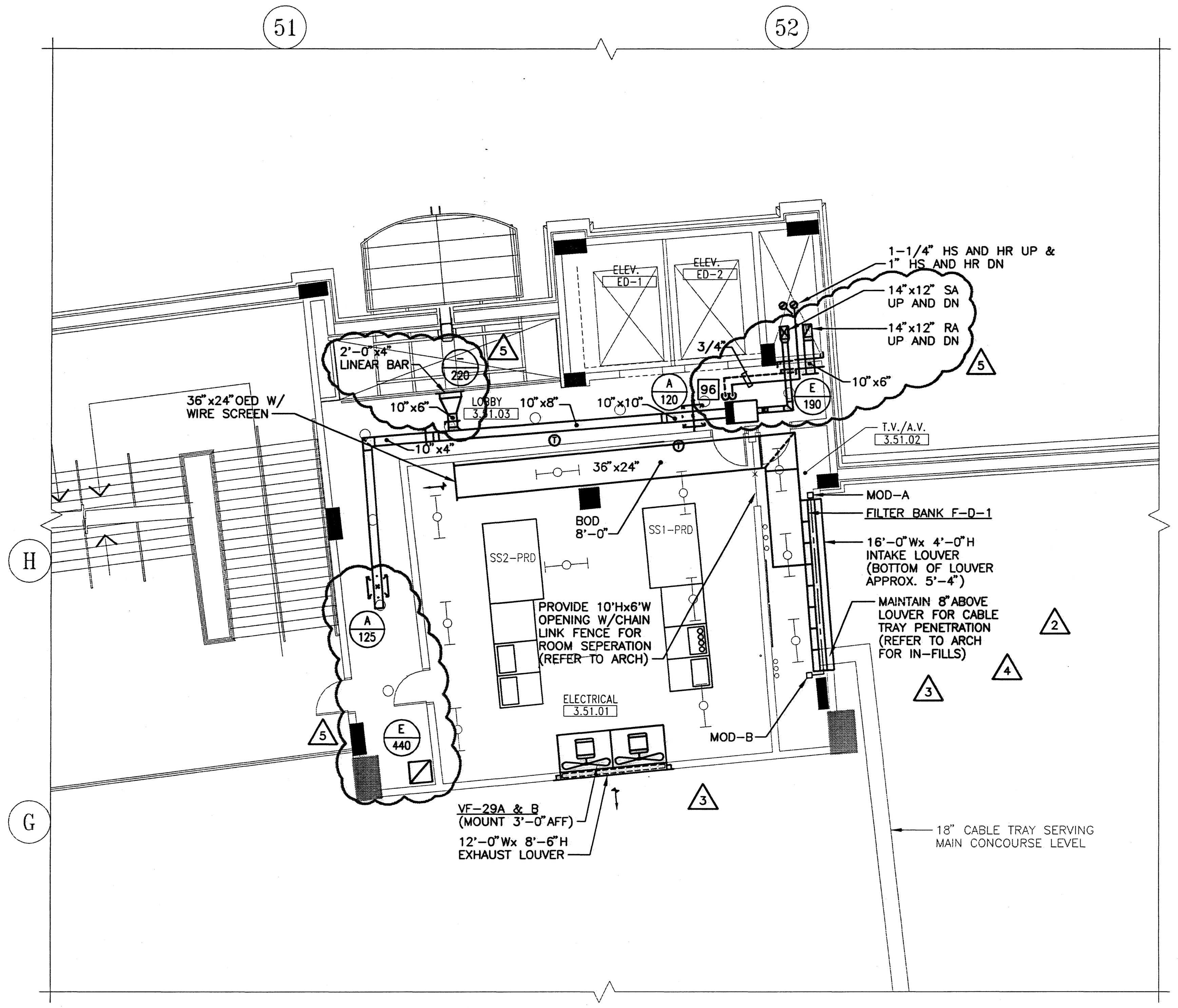
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
ELEVATOR CORE PLANS – MAIN CONCOURSE QUADS A,B,C & D

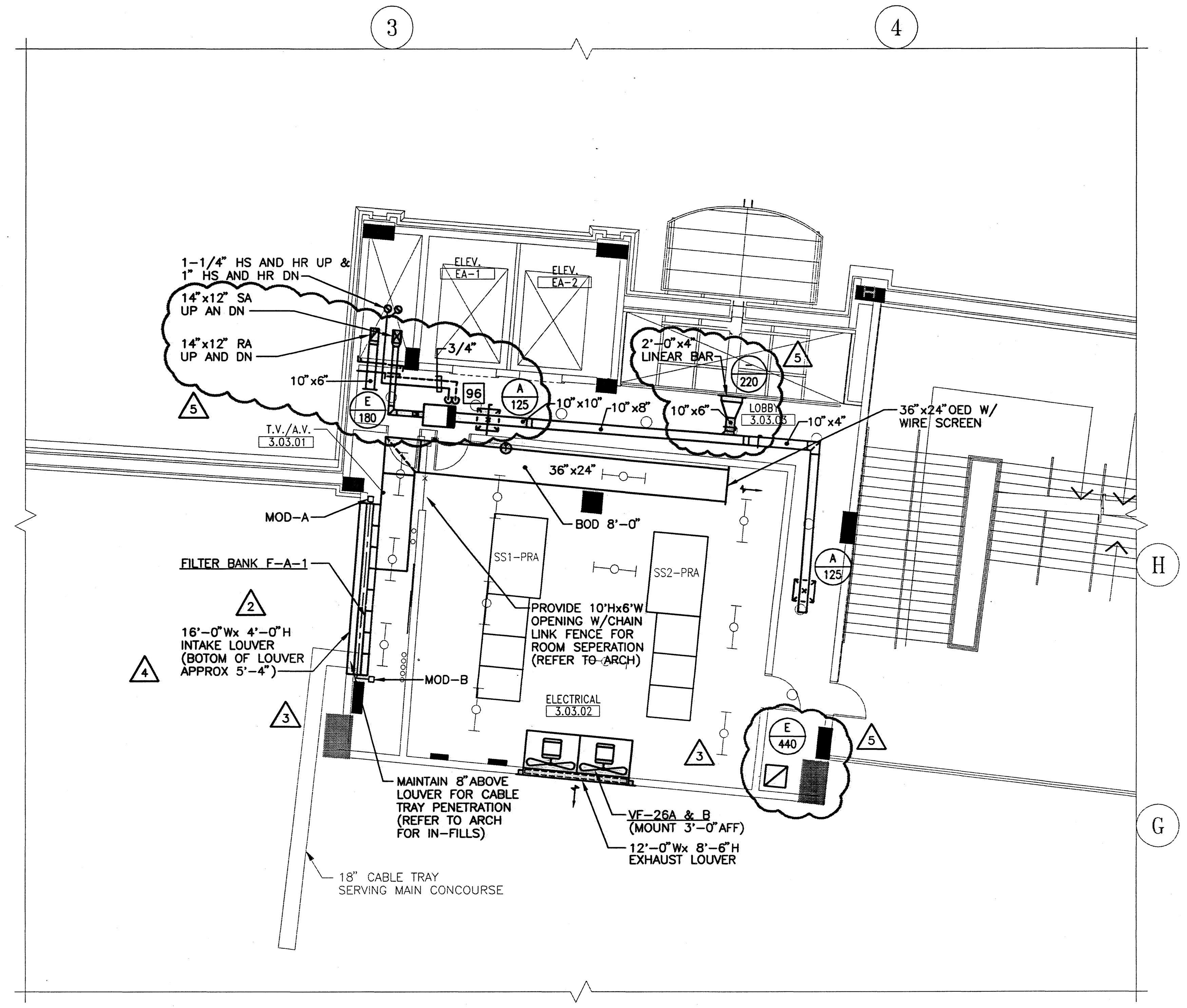
CATEGORY – SUB-CATEGORY – SHEET
M.3-19

02:12:98-14:08-6110M319 - RMF #95110



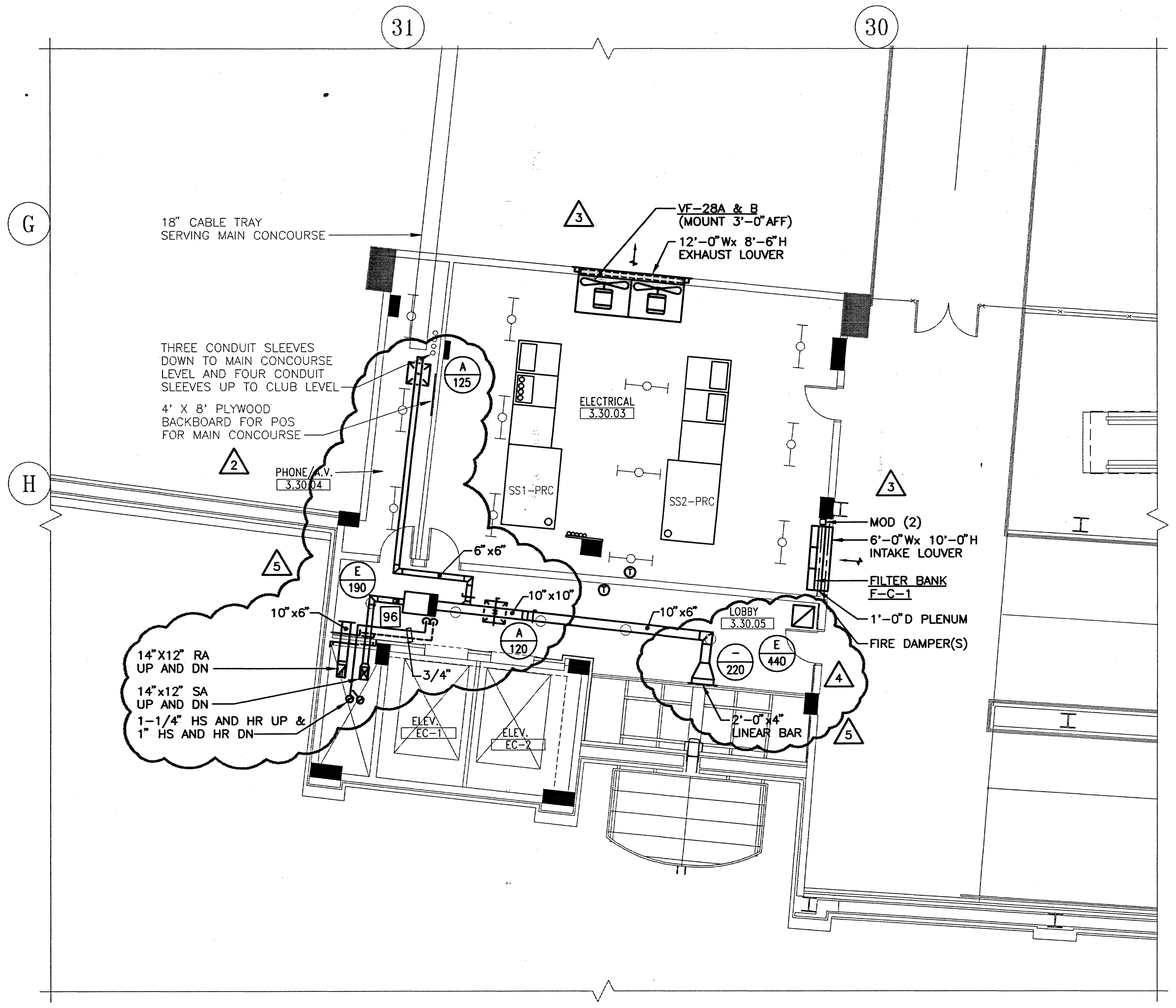
ELEVATOR CORE PLANS – PRESS LEVEL QUAD D

SCALE: 1/8"=1'-0"



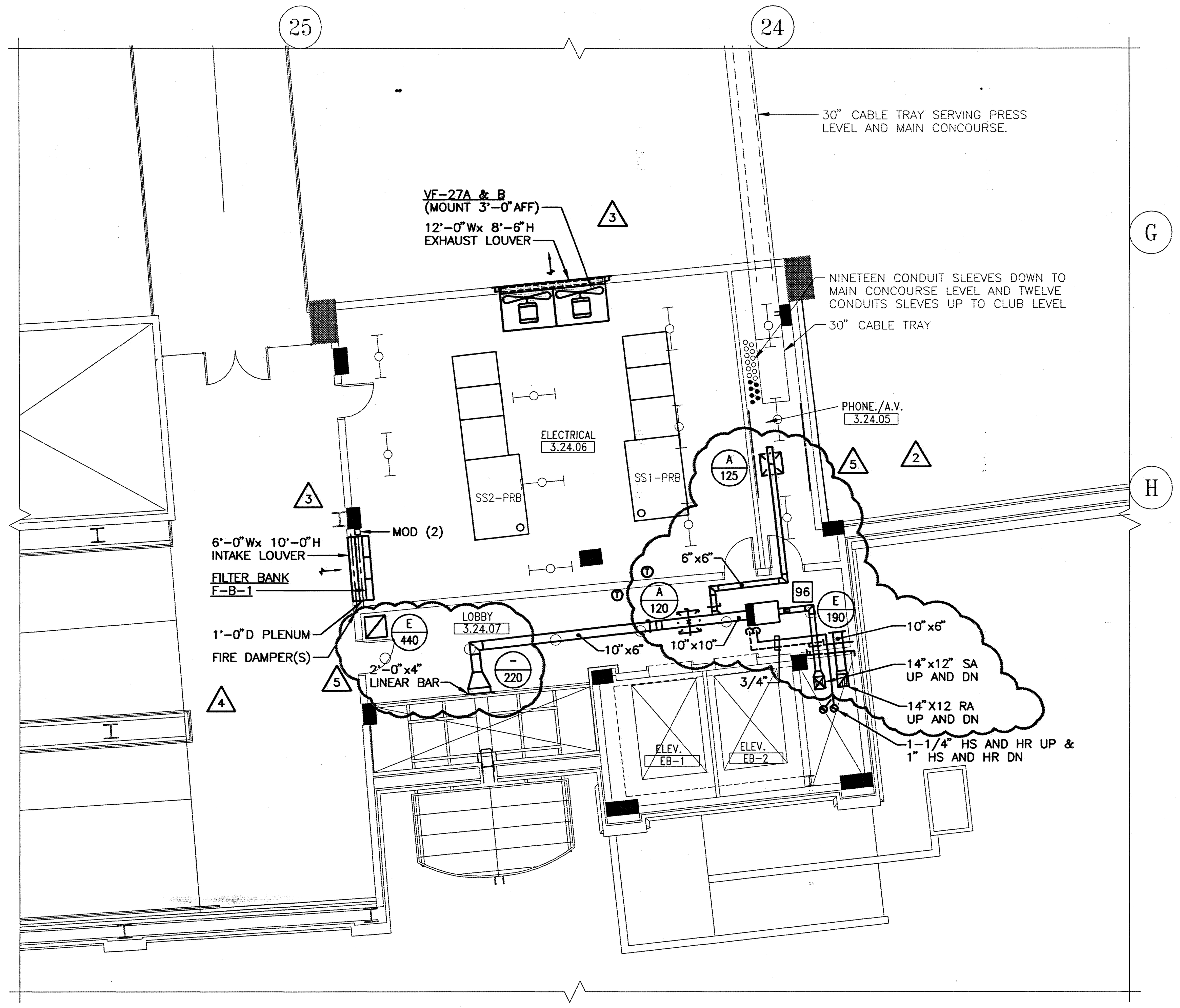
ELEVATOR CORE PLANS – PRESS LEVEL QUAD A

SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – PRESS LEVEL QUAD C

SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – PRESS LEVEL QUAD B

SCALE: 1/8"=1'-0"

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Kansas City, Missouri 64105

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NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	8-12-97	BULLETIN #76
4	12-11-97	NFL 297
5	2-13-98	NFL #349

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PMP
ISSUED: 2-28-97	

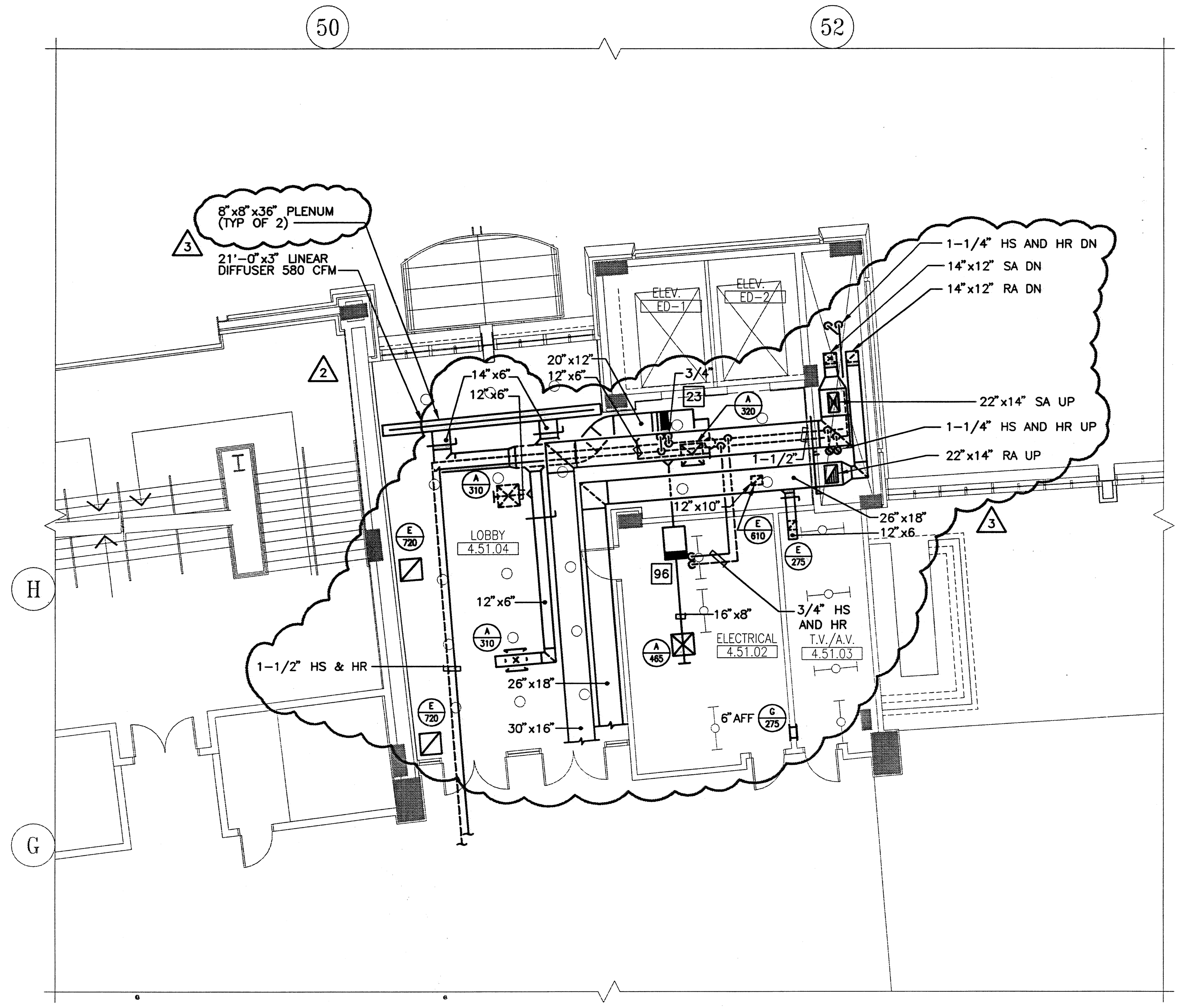
SHEET TITLE

ELEVATOR CORE PLANS – PRESS LEVEL QUADS A,B,C & D

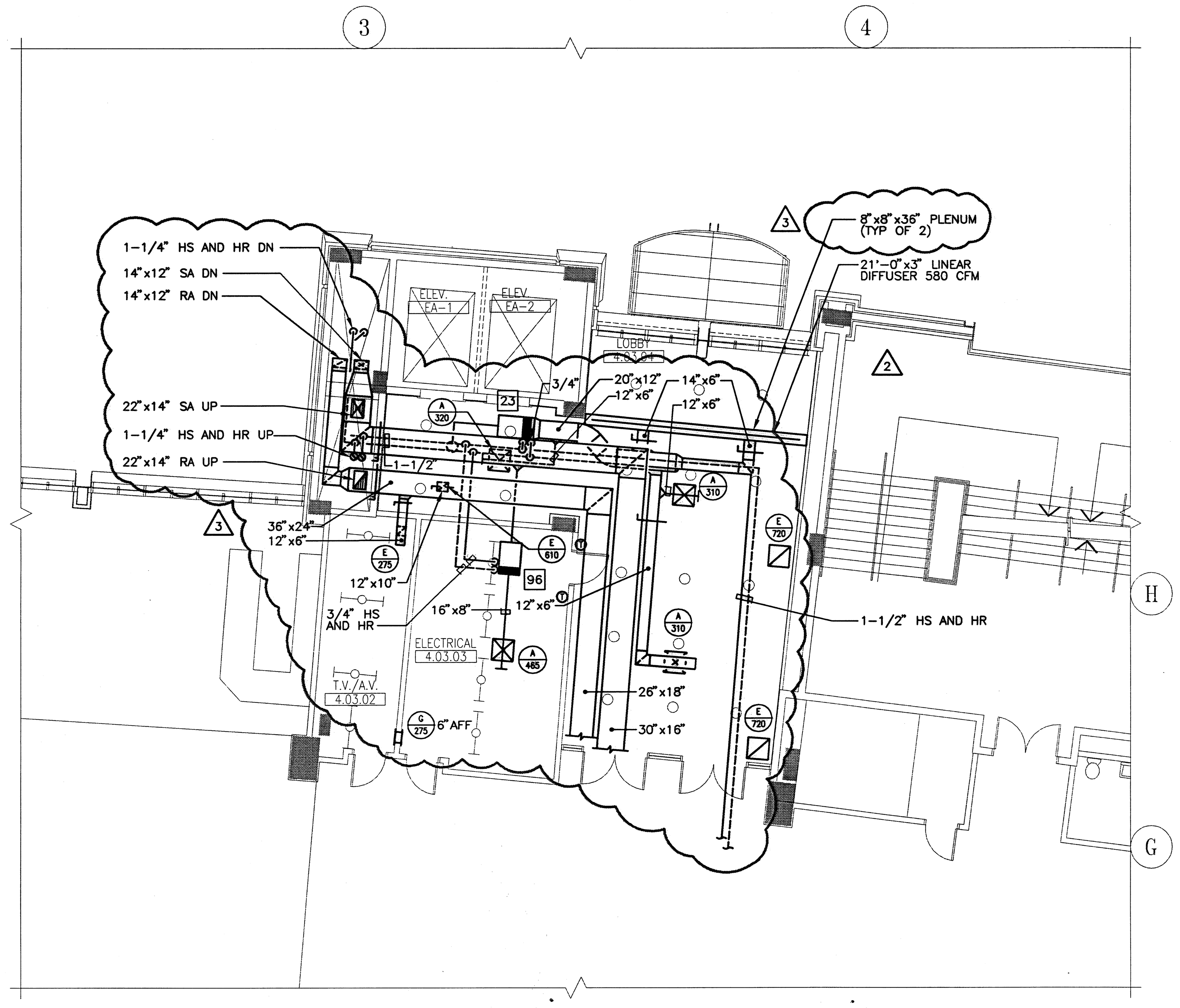
CATEGORY – SUB-CATEGORY – SHEET

M.3-20

02.12.98-14:07-6110M320 – RMF #95110



ELEVATOR CORE PLANS – CLUB LEVEL QUAD D
SCALE: 1/8"=1'-0"



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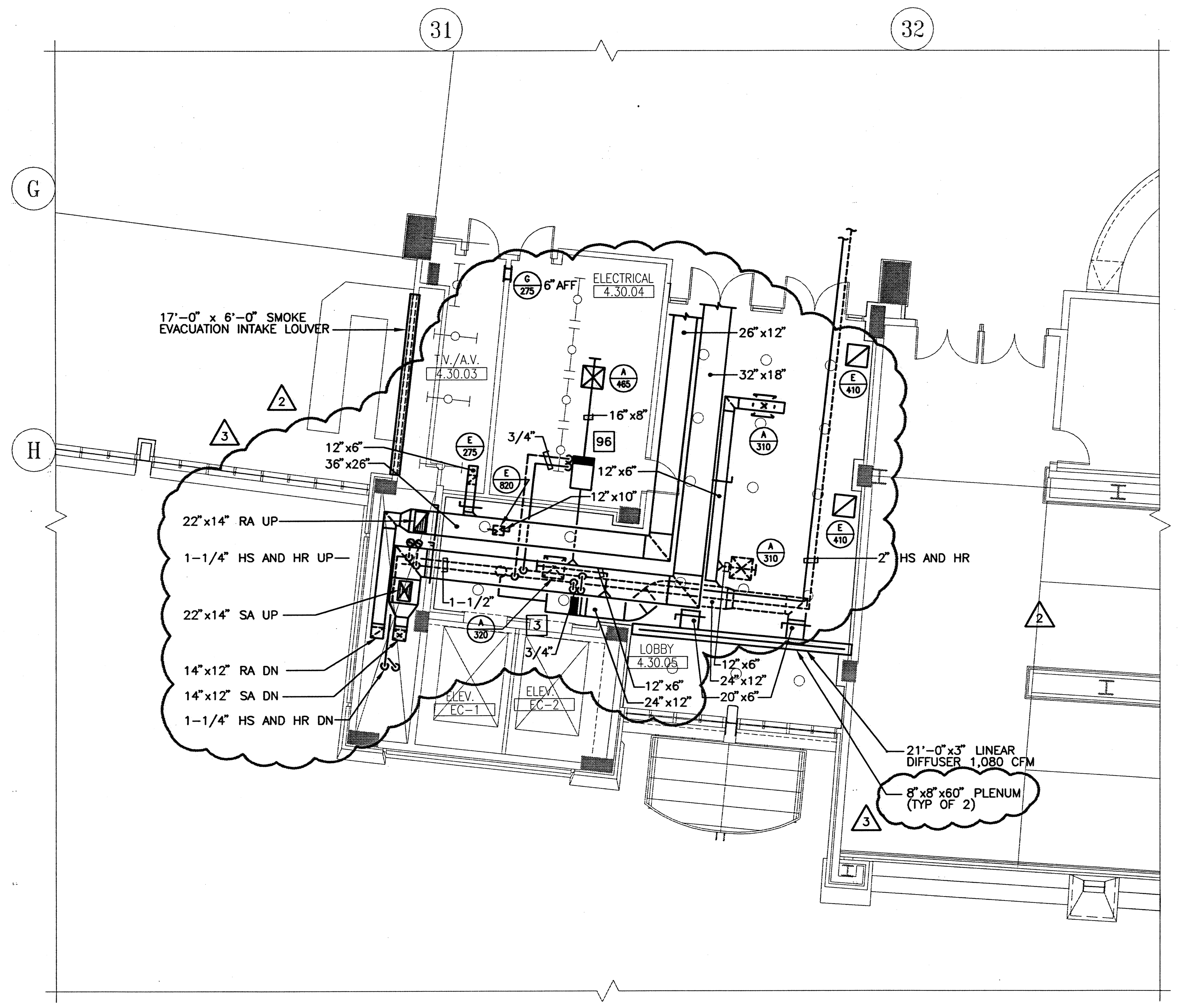
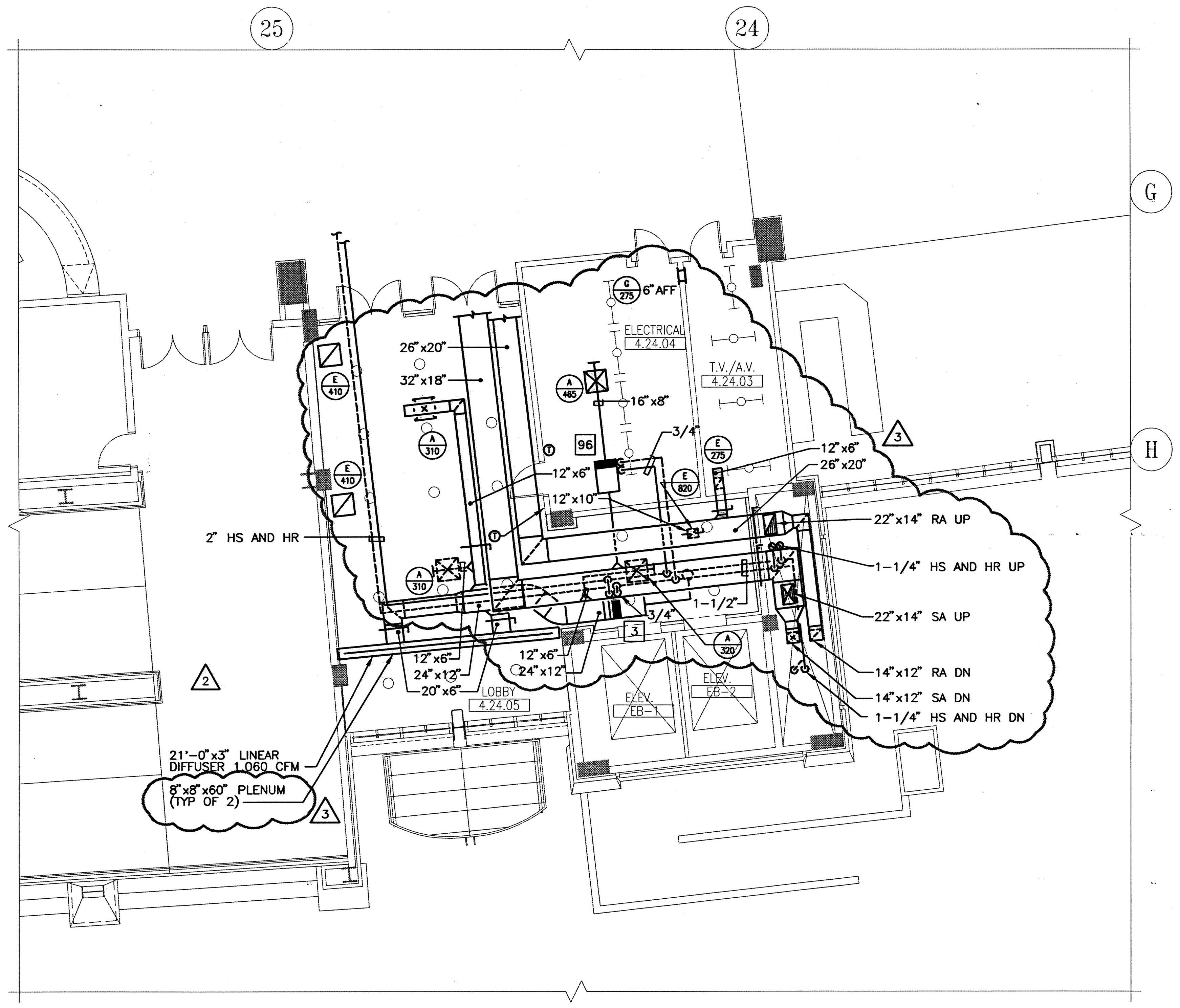
SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – CLUB LEVEL QUAD C
SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – CLUB LEVEL QUAD B
SCALE: 1/8"=1'-0"

PROJECT NORTH

HOK SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NYITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTEIN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERTS & TODD
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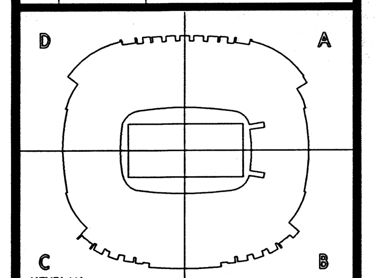
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	2-13-98	NFL #349



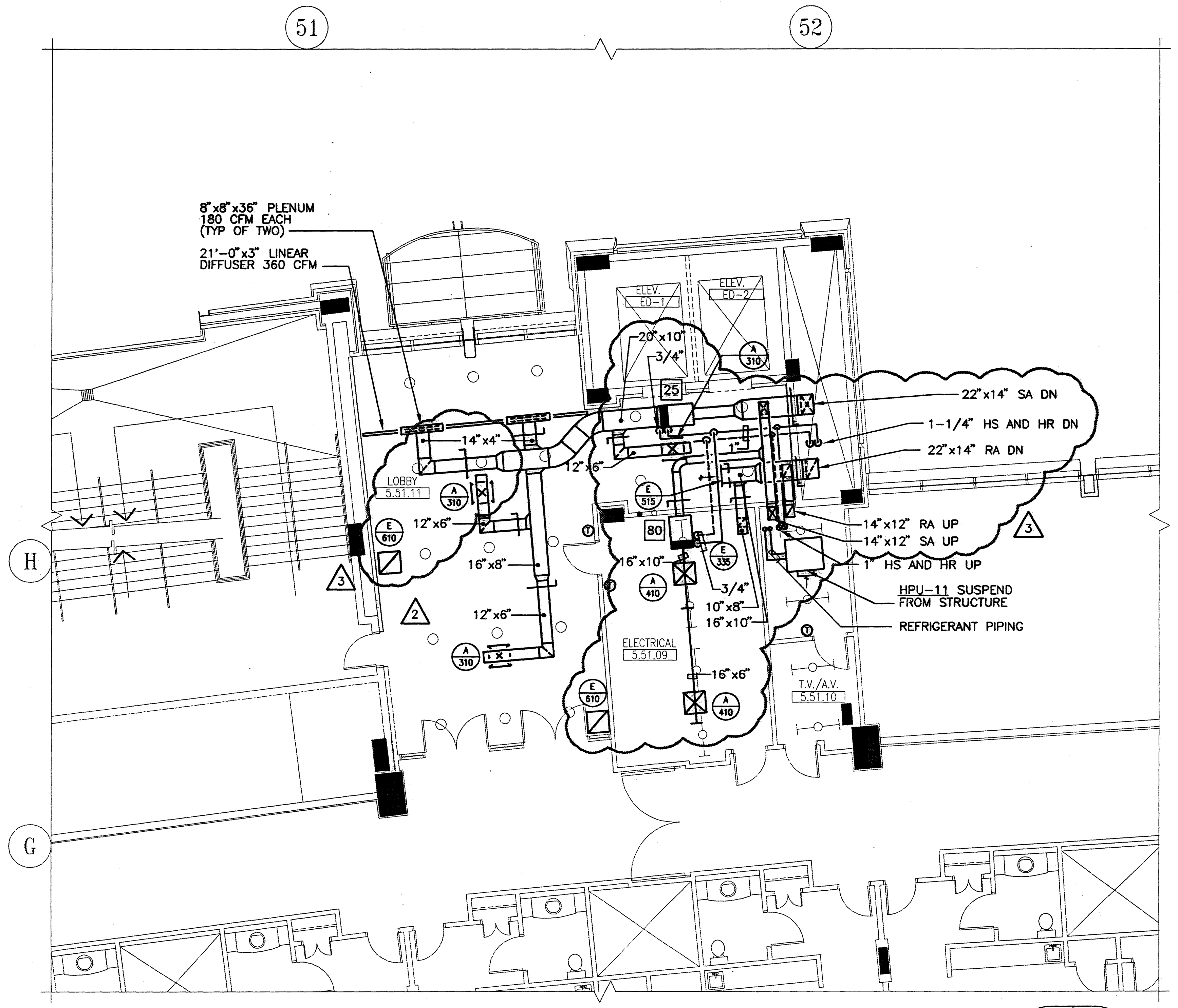
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
ELEVATOR CORE PLANS – CLUB LEVEL QUADS A,B,C & D

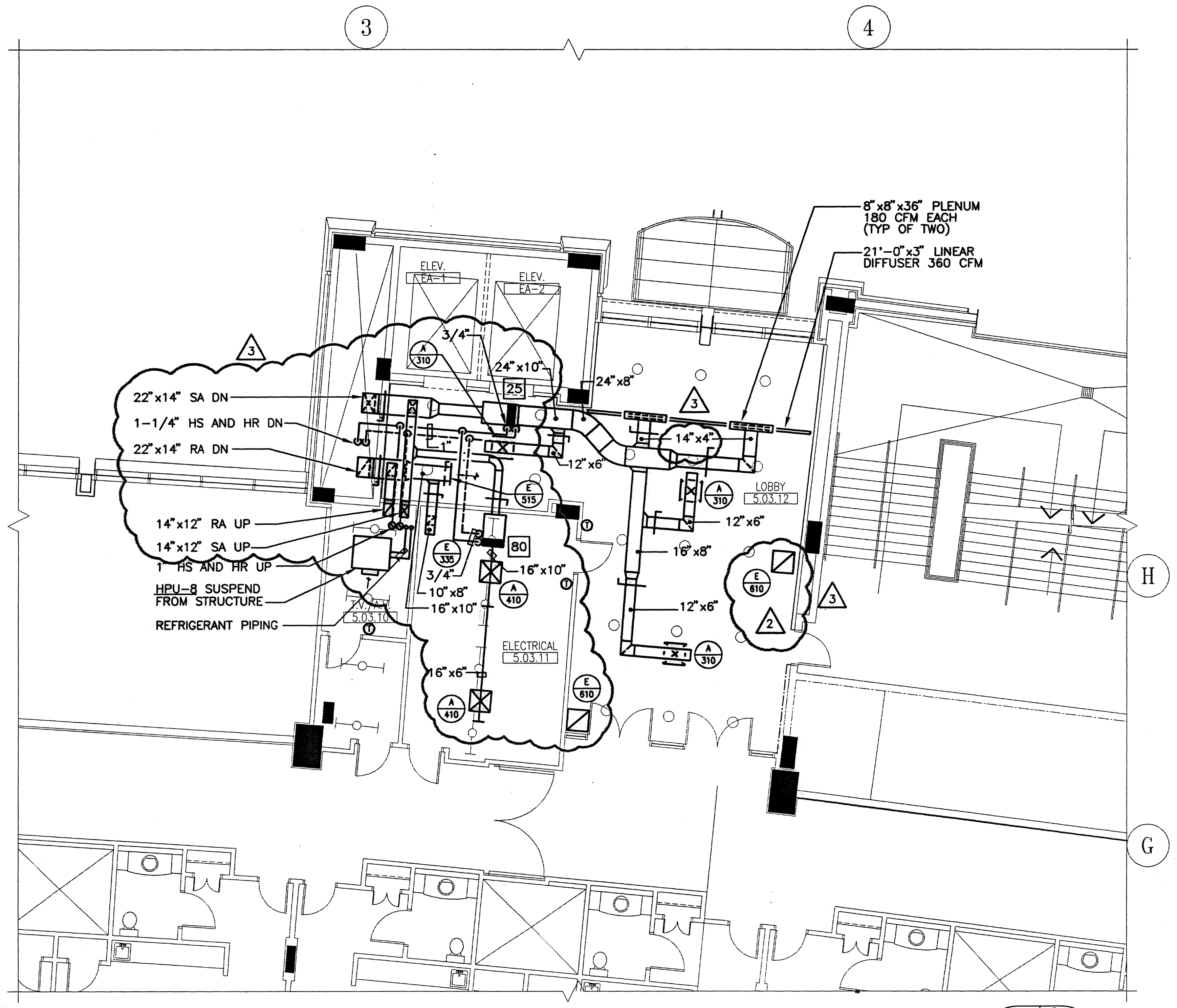
CATEGORY – SUB-CATEGORY – SHEET
M.3-21

02.12.98-14:06-5110M321 – RMF #95110



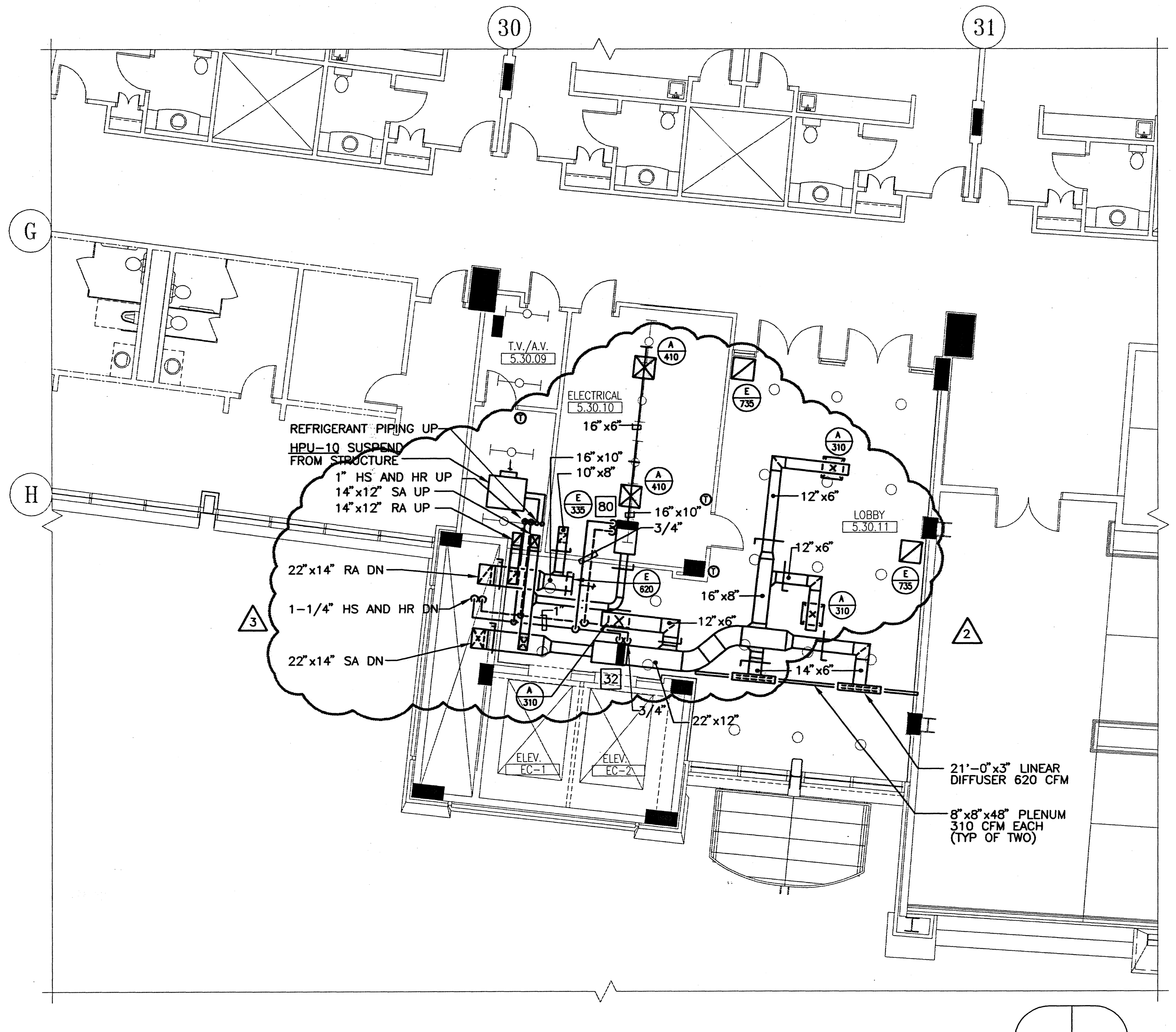
ELEVATOR CORE PLANS – LOWER SUITE LEVEL QUAD D

SCALE: 1/8"=1'-0"



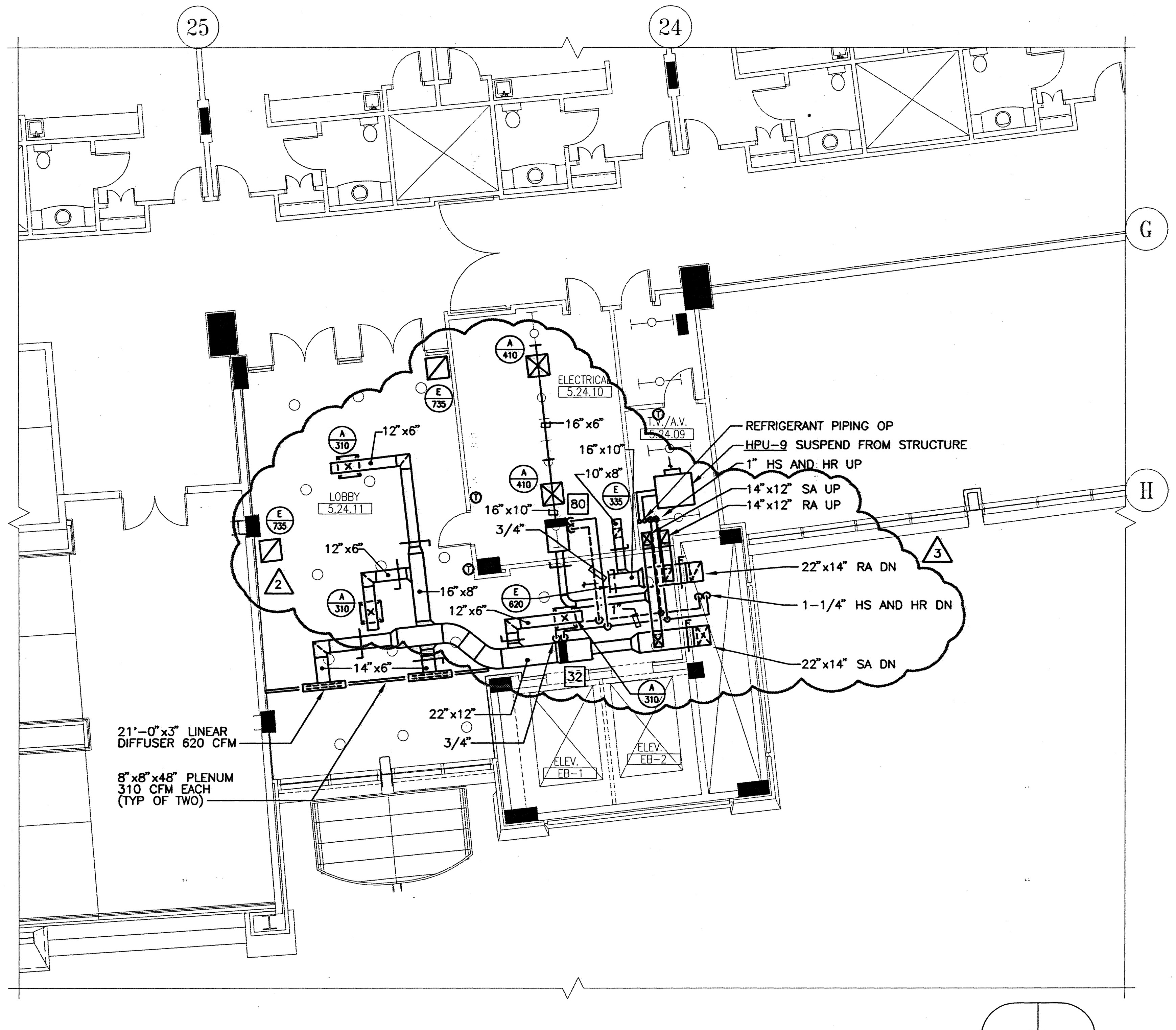
ELEVATOR CORE PLANS – LOWER SUITE LEVEL QUAD A

SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – LOWER SUITE LEVEL QUAD C

SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – LOWER SUITE LEVEL QUAD B

SCALE: 1/8"=1'-0"

PROJECT NORTH

02.12.98-14:04-6110M322 - RMF #95110

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Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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RUMMEL, KLEPPER & KAHL
BALTIMORE, MARYLAND

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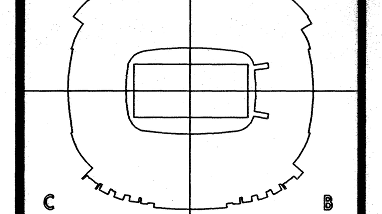
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	2-13-98	NFL #349



KEYPLAN

PROJECT NO. 95-675-00 | ISSUED BY: ---

DRAWN BY: RHK | REVIEWED BY: PMP

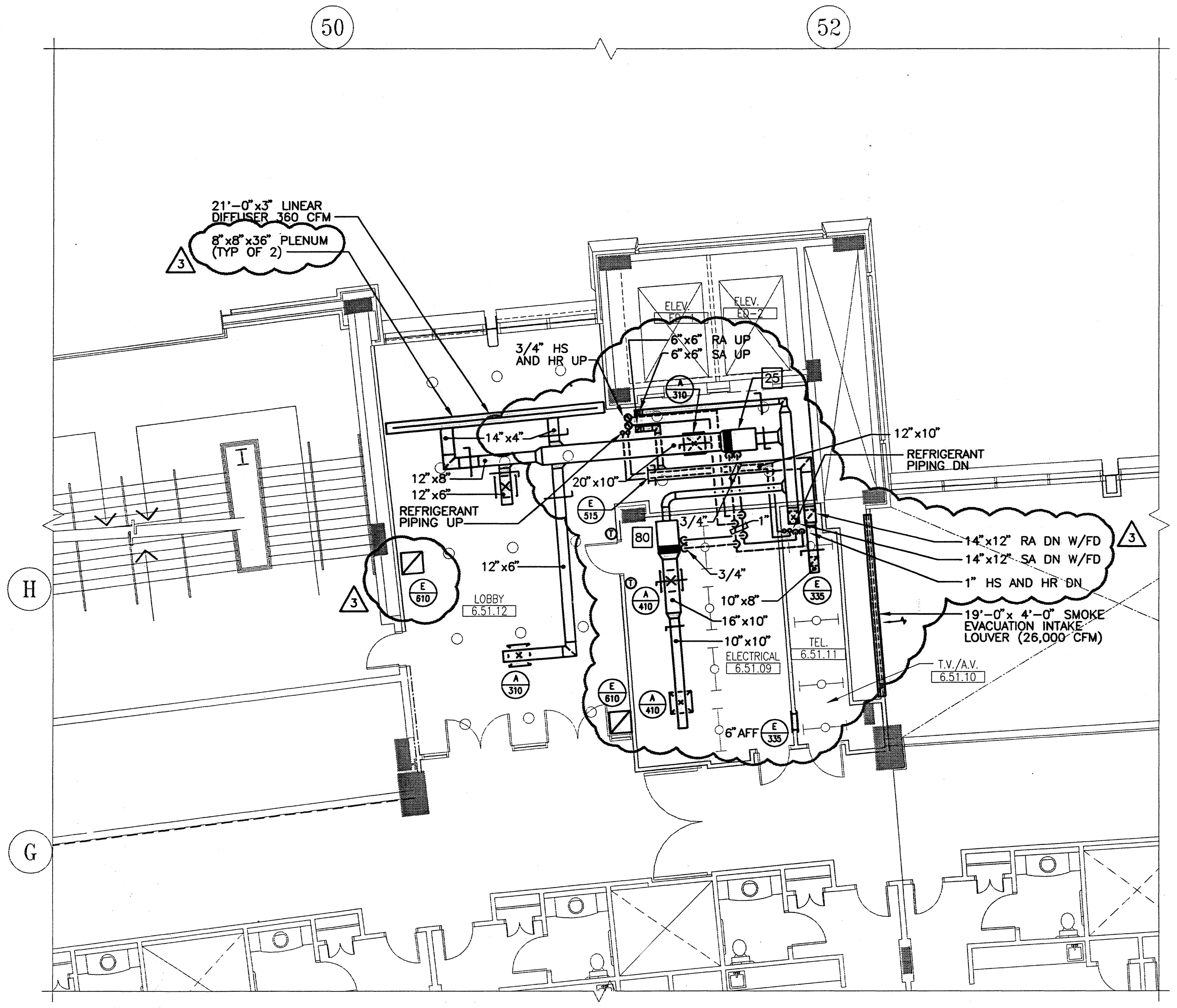
ISSUED: 2-28-97

SHEET TITLE

ELEVATOR CORE PLANS – LOWER SUITE LEVEL QUADS A,B,C & D

CATEGORY – SUB-CATEGORY – SHEET

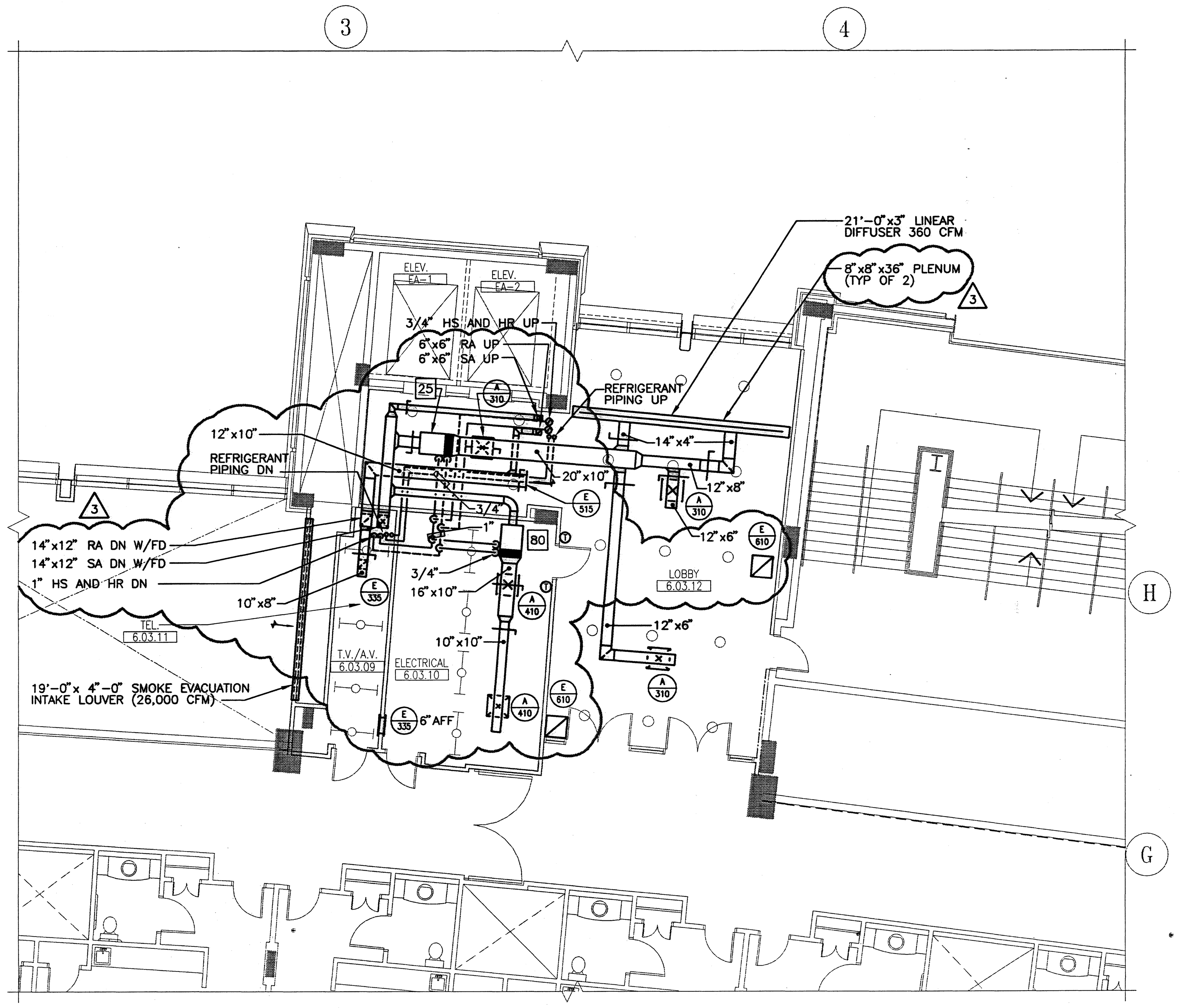
M.3-22



ELEVATOR CORE PLANS – UPPER SUITE LEVEL QUAD D

SCALE: 1/8"=1'-0"

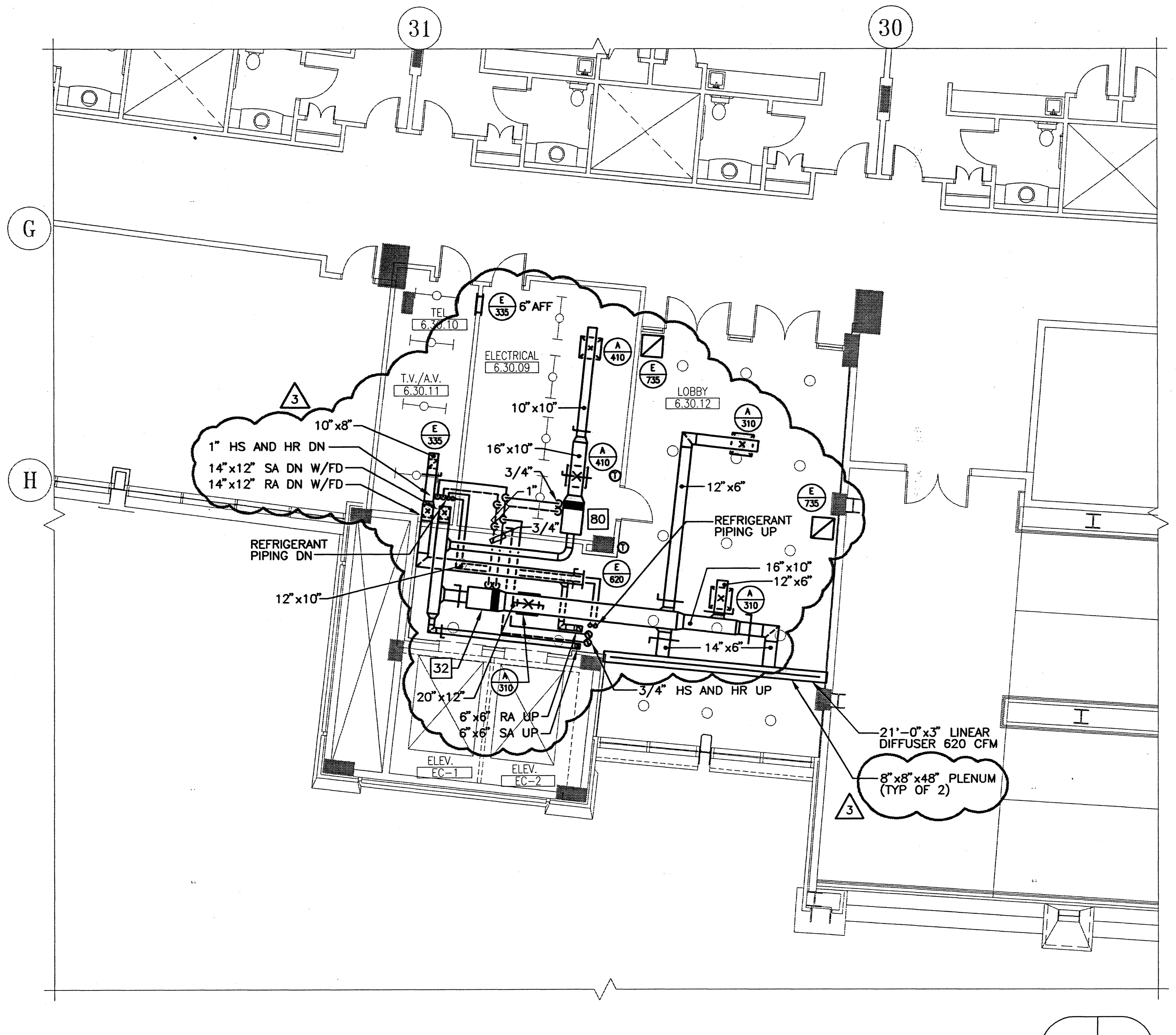
D A
C B



ELEVATOR CORE PLANS – UPPER SUITE LEVEL QUAD A

SCALE: 1/8"=1'-0"

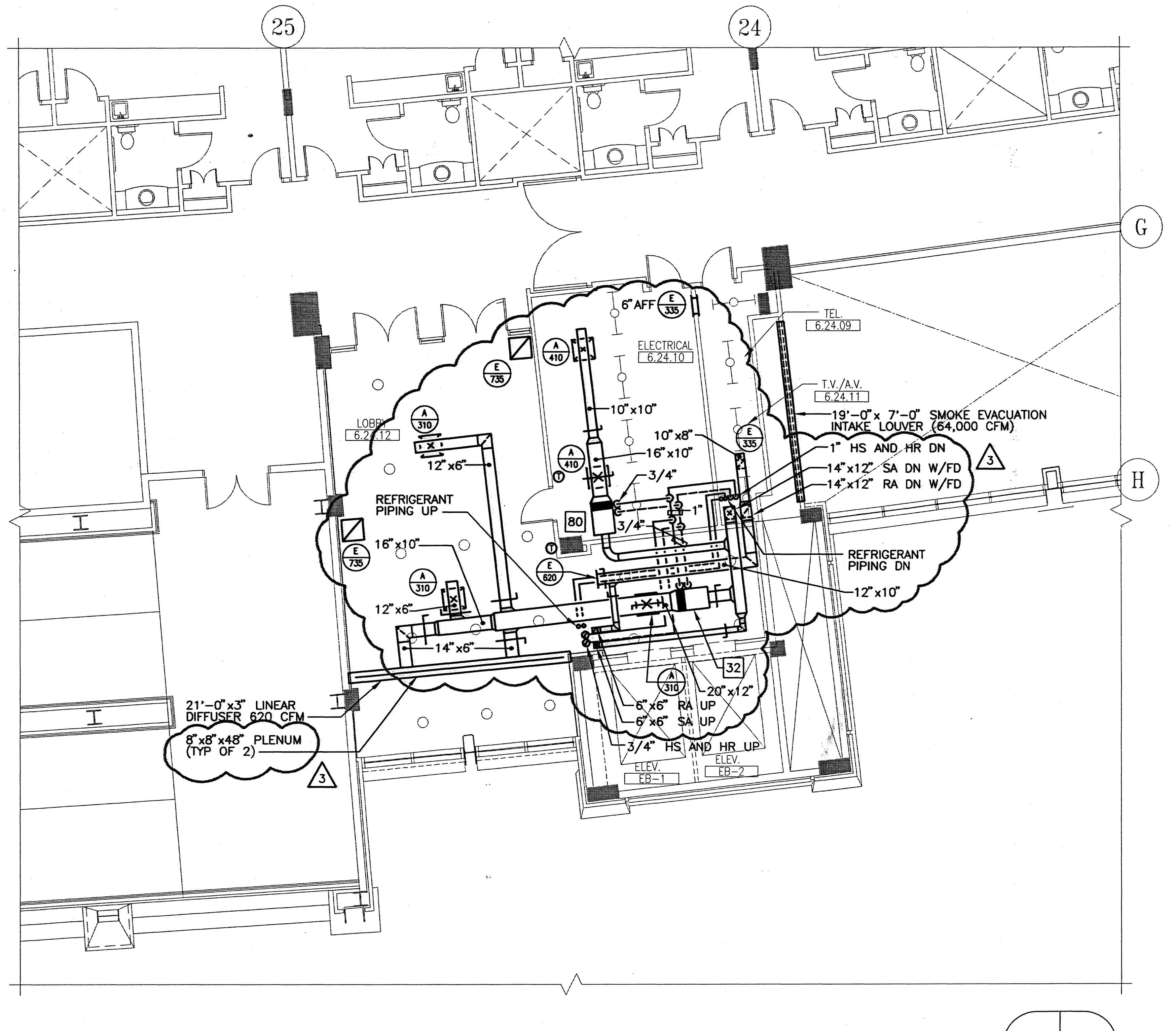
D A
C B



ELEVATOR CORE PLANS – UPPER SUITE LEVEL QUAD C

SCALE: 1/8"=1'-0"

D A
C B



ELEVATOR CORE PLANS – UPPER SUITE LEVEL QUAD B

SCALE: 1/8"=1'-0"

D A
C B

PROJECT NORTH

0 1 2 4 8

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
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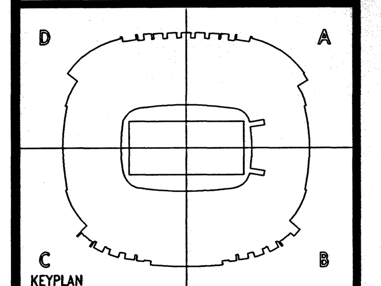
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	2-13-98	NFL #349



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PMP
ISSUED: 2-28-97	

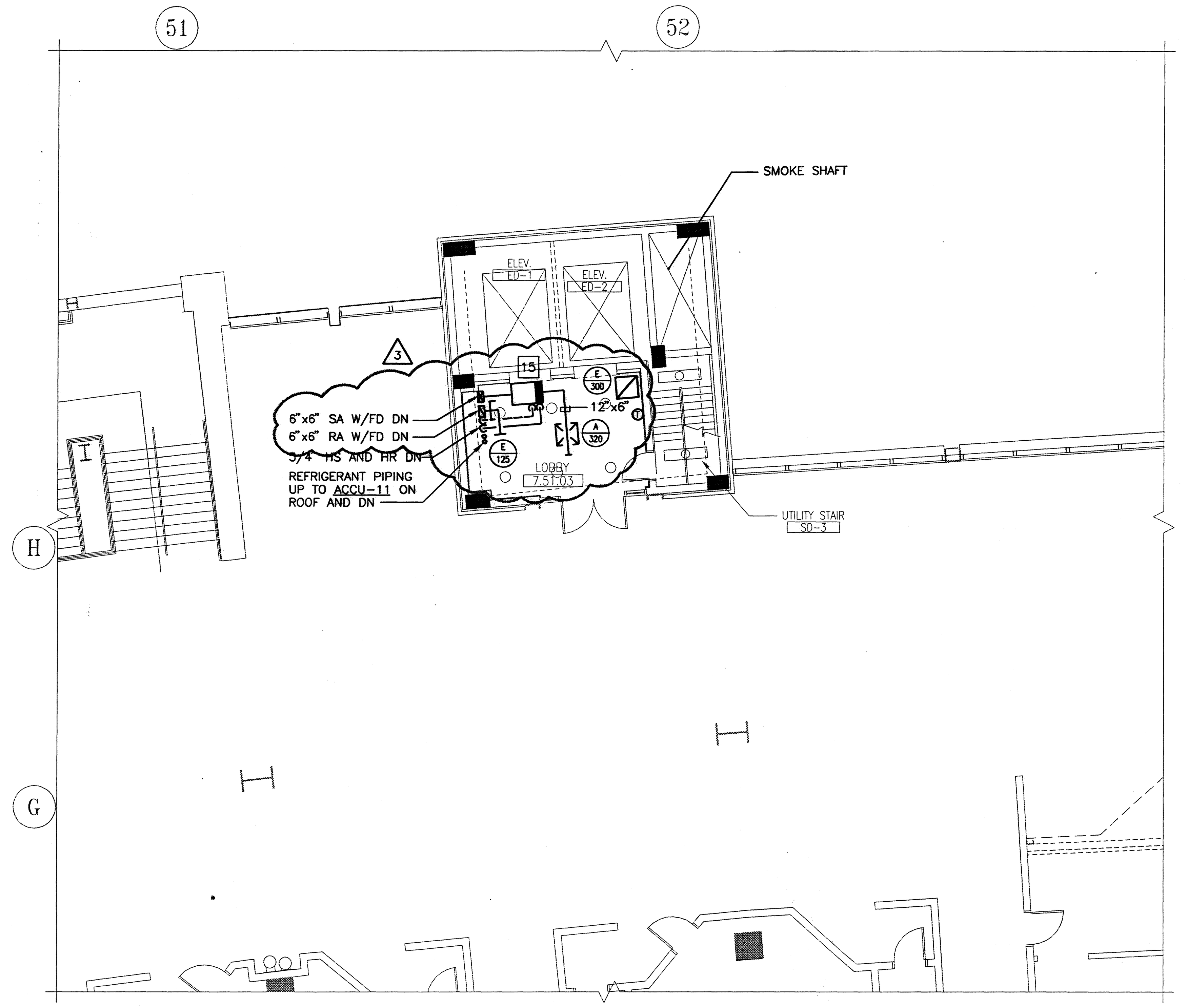
SHEET TITLE

ELEVATOR CORE PLANS – UPPER SUITE LEVEL QUADS A,B,C & D

CATEGORY – SUB-CATEGORY – SHEET

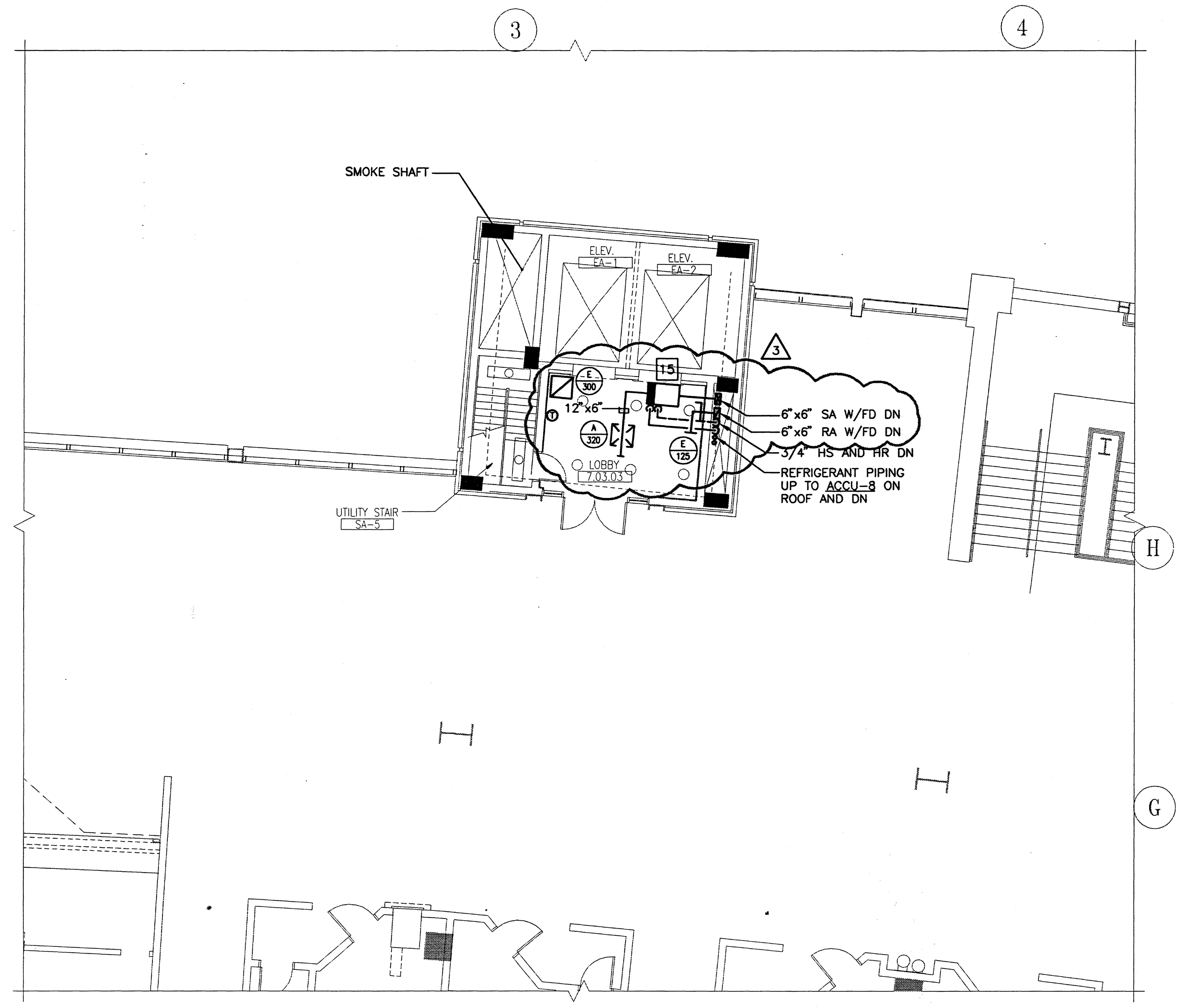
M.3-23

02.12.98-14:03-611OM323 - RMF #95110



ELEVATOR CORE PLANS – UPPER CONCOURSE QUAD D

SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – UPPER CONCOURSE QUAD A

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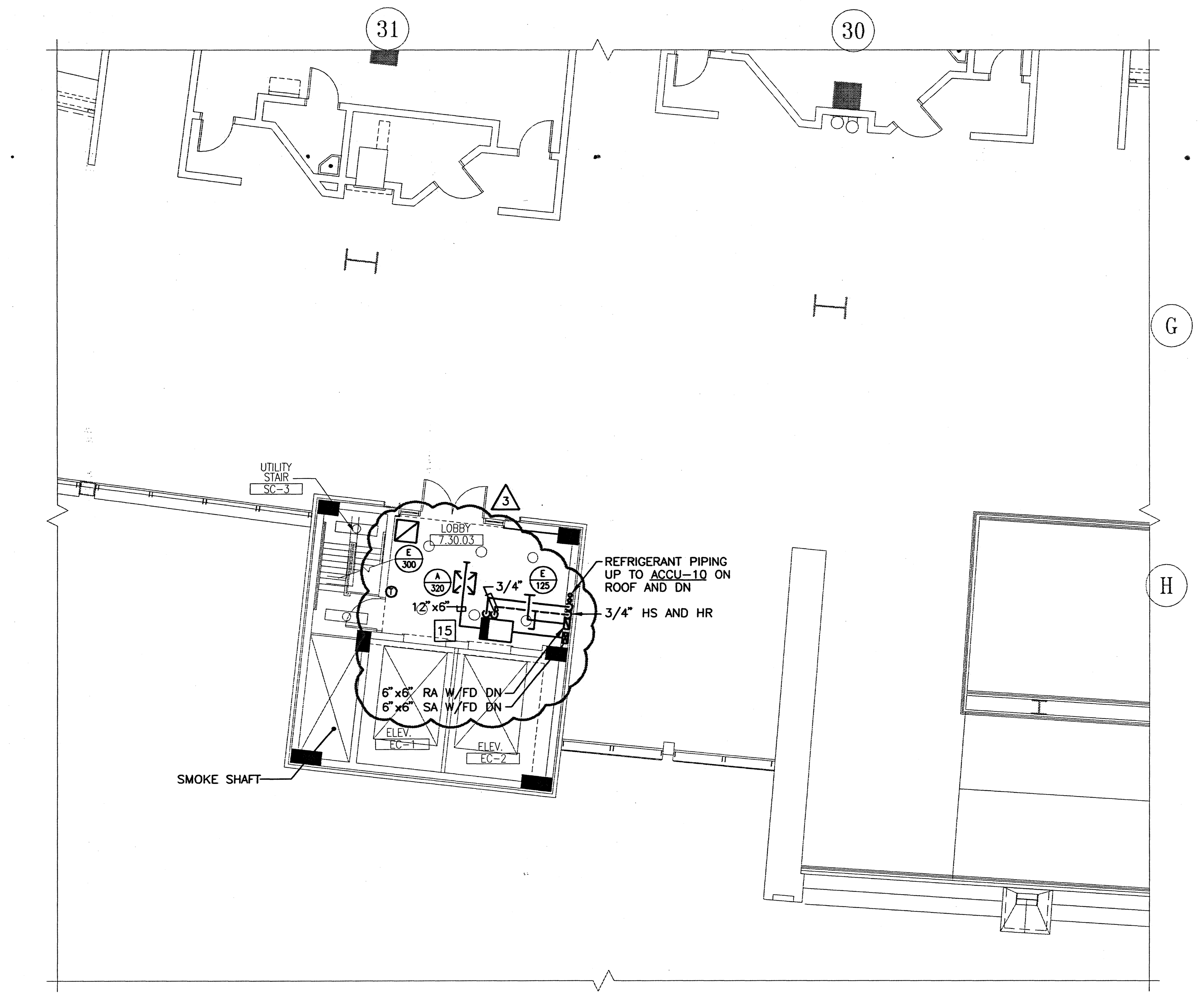
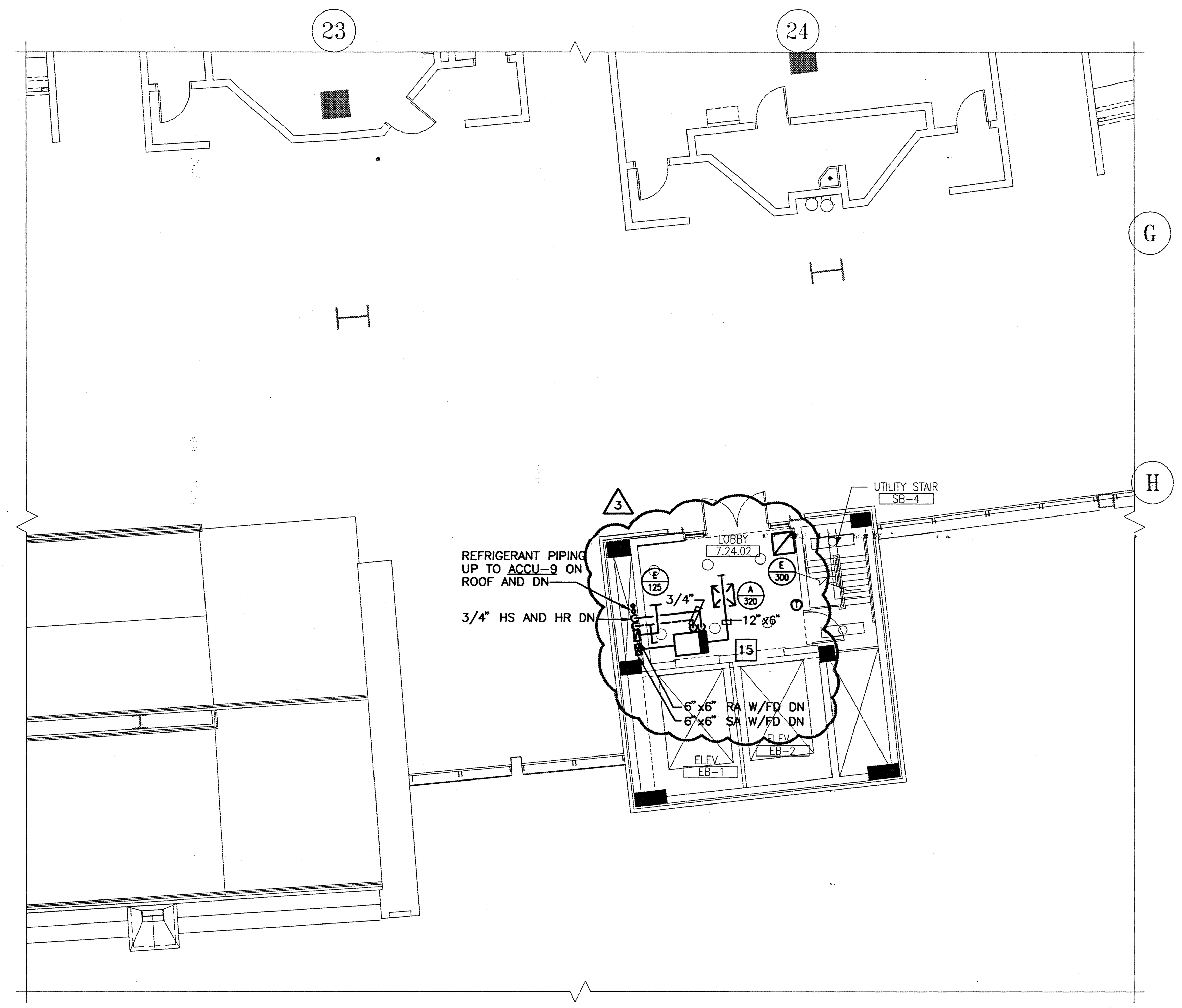


ELEVATOR CORE PLANS – UPPER CONCOURSE QUAD C

SCALE: 1/8"=1'-0"



ELEVATOR CORE PLANS – UPPER CONCOURSE QUAD B

SCALE: 1/8"=1'-0"

PROJECT NORTH

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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RUMMEL, KLEPPER & KAHL
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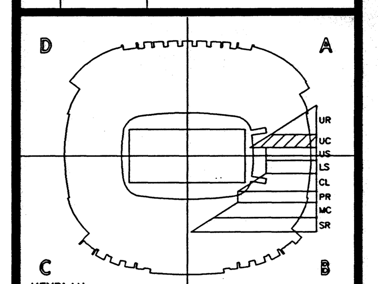
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	2-13-98	NFL #349



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PWP
ISSUED: 2-28-97	

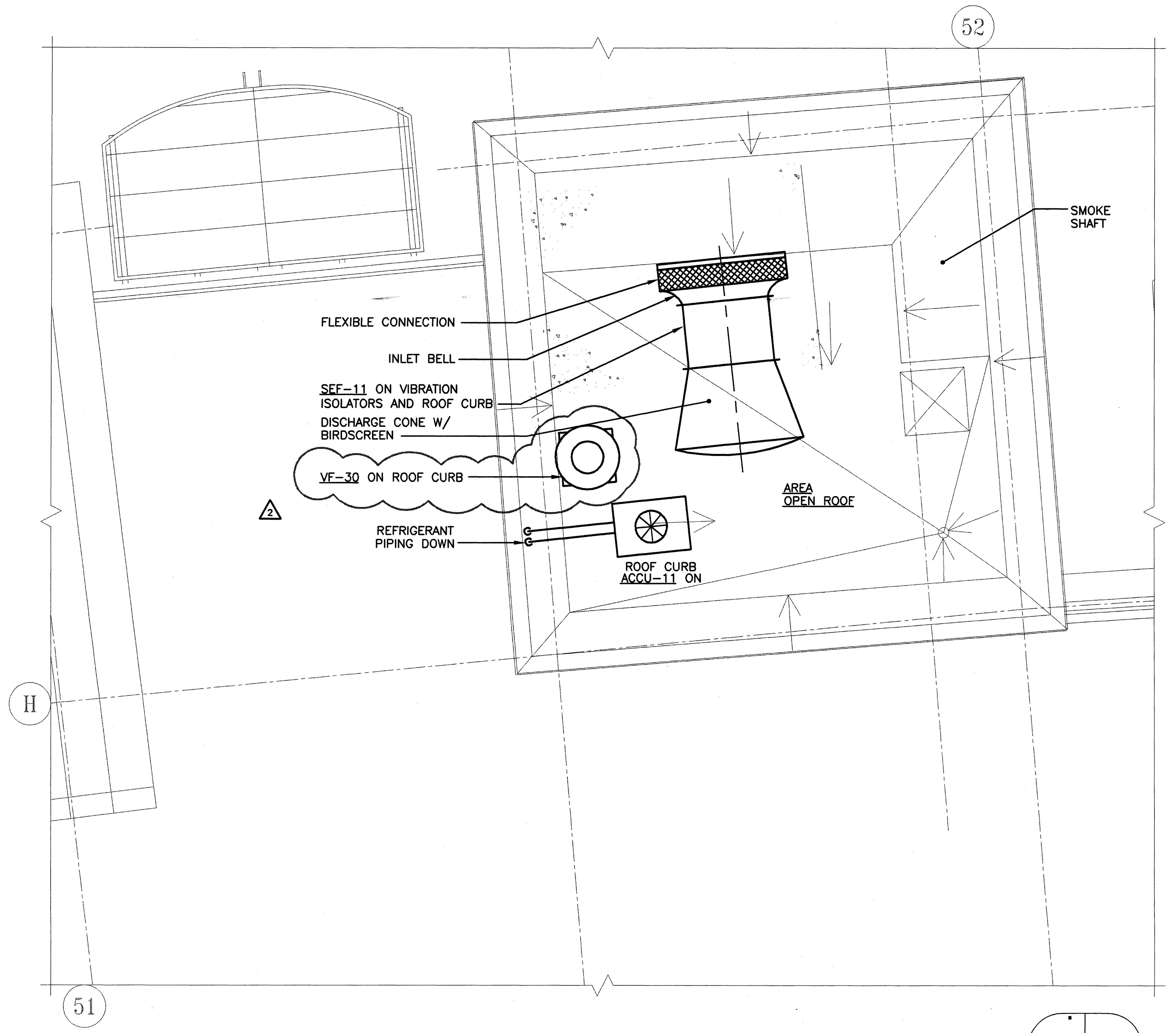
SHEET TITLE

ELEVATOR CORE PLANS UPPER CONCOURSE QUADS A,B,C & D

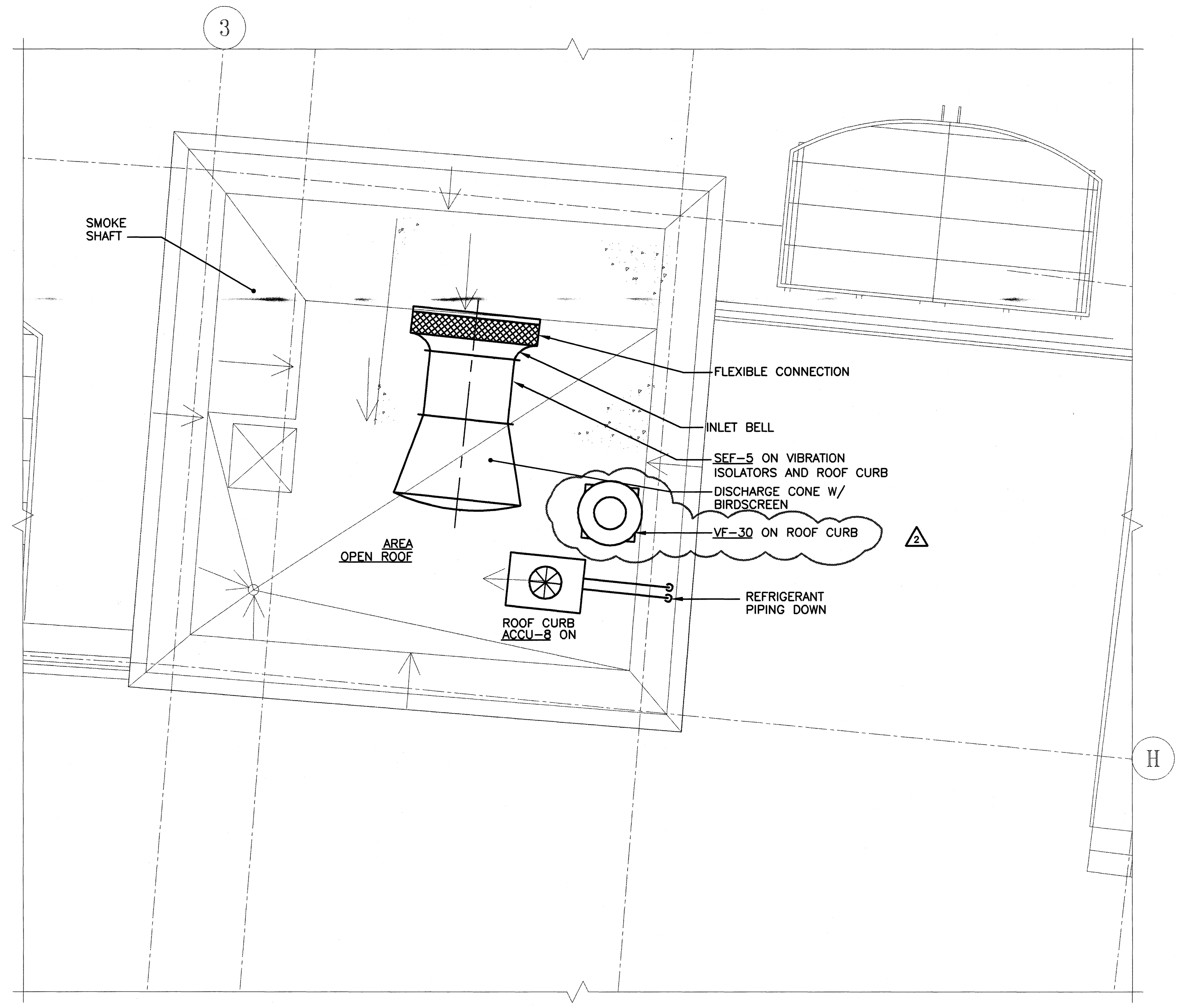
CATEGORY – SUB-CATEGORY – SHEET

M.3-24

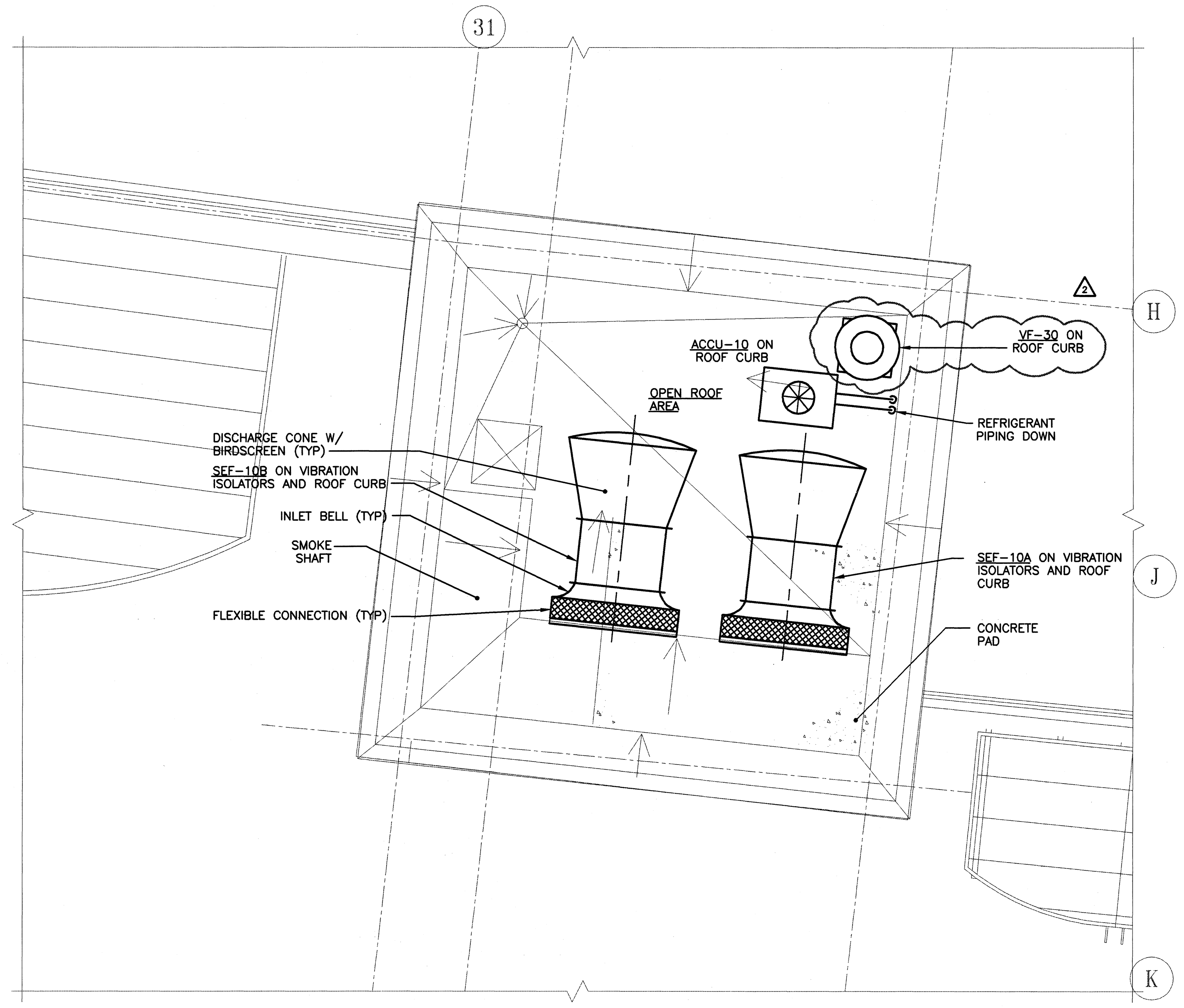
02:12:98-14:01-5110M324 - RMF #95110



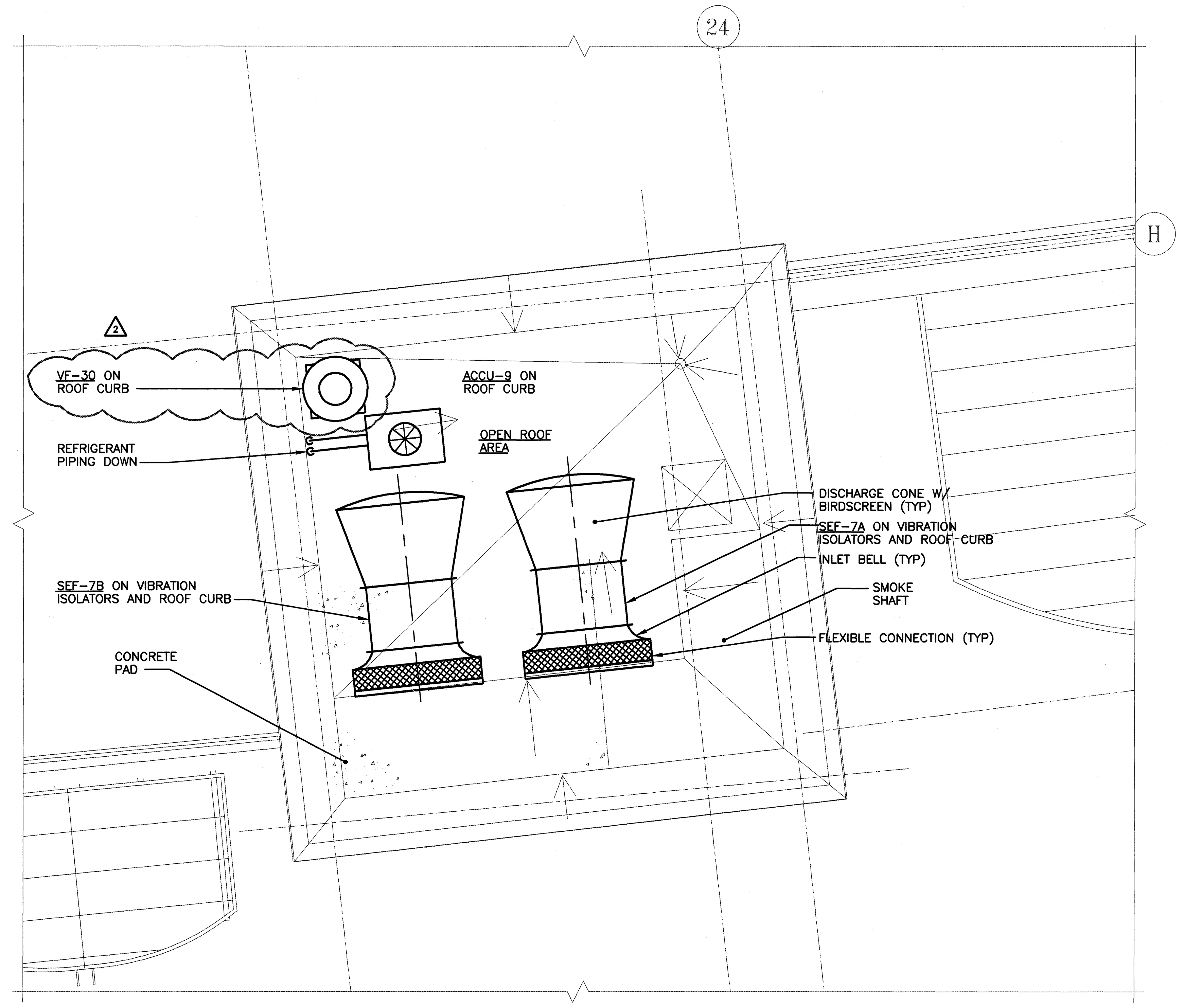
ELEVATOR CORE PLANS – ROOF – QUAD D
SCALE: 1/4"=1'-0"



ELEVATOR CORE PLANS – ROOF – QUAD A
SCALE: 1/4"=1'-0"



ELEVATOR CORE PLANS – ROOF – QUAD C
SCALE: 1/4"=1'-0"



ELEVATOR CORE PLANS – ROOF – QUAD B
SCALE: 1/4"=1'-0"

PROJECT NORTH

HOK SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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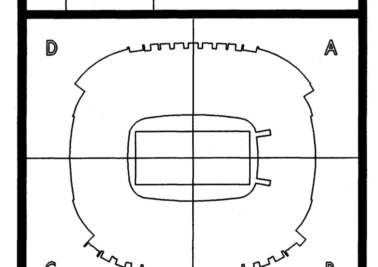
REVISIONS

NO.	DATE	DESCRIPTION



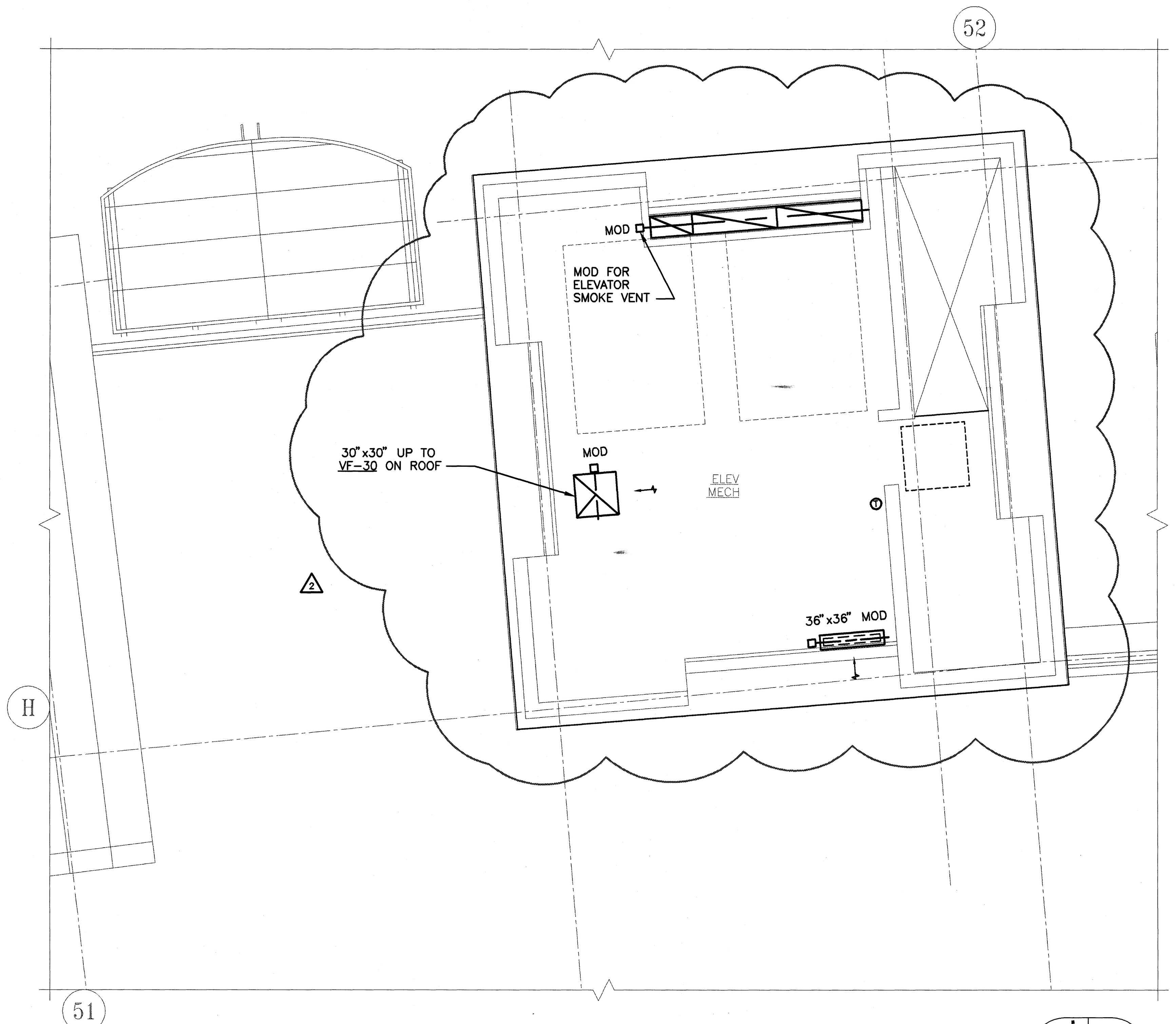
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PMP
ISSUED: 2-28-97	

SHEET TITLE
ELEVATOR CORE PLANS ROOF QUADS A,B,C & D

CATEGORY – SUB-CATEGORY – SHEET
M.3-25

03.03.97-01:13-6110M325 - RMF #95110



ELEVATOR CORE PLANS – MECH ROOM – QUAD D
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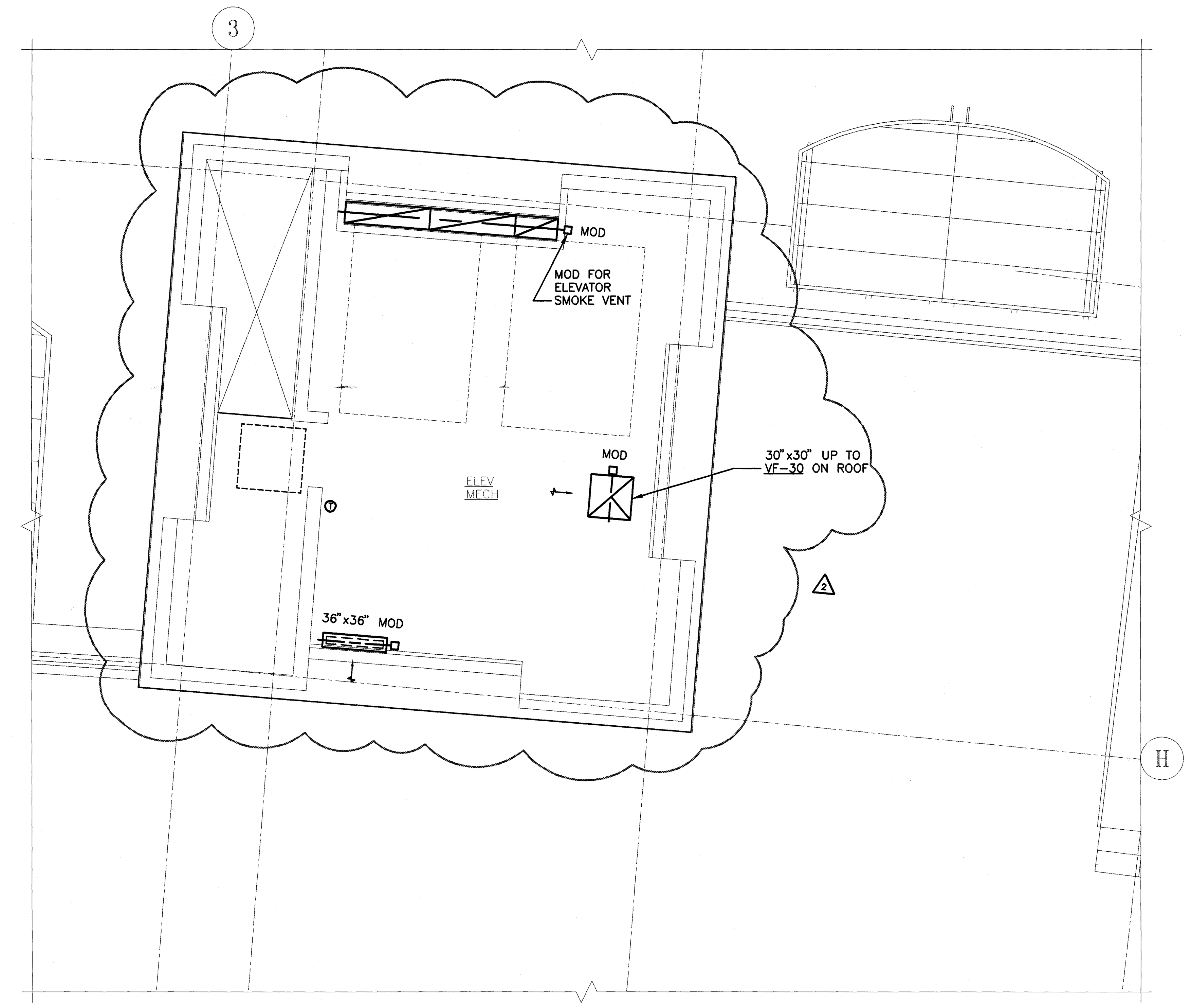

ELEVATOR CORE PLANS – MECH ROOM – QUAD A
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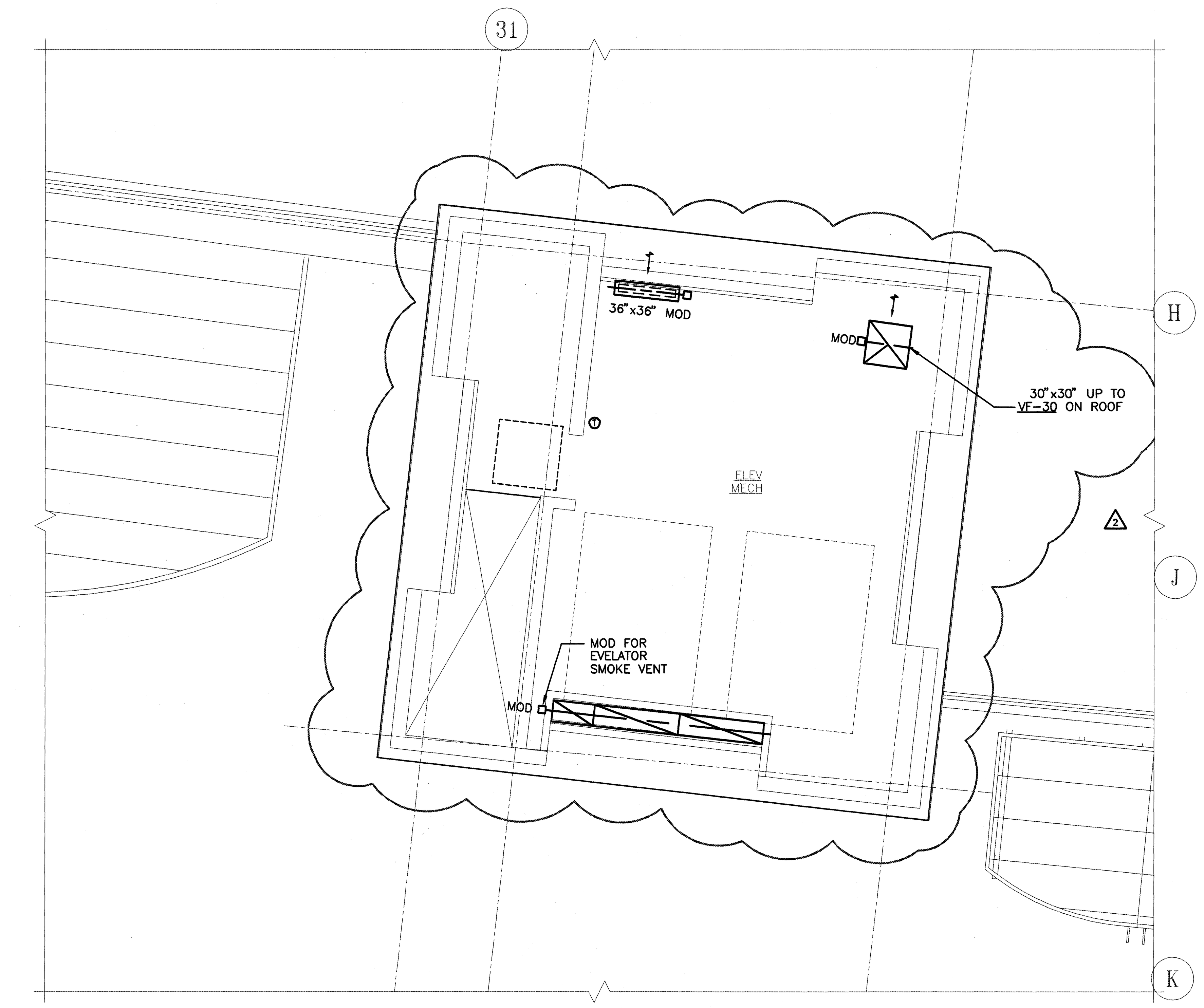

ELEVATOR CORE PLANS – MECH ROOM – QUAD C
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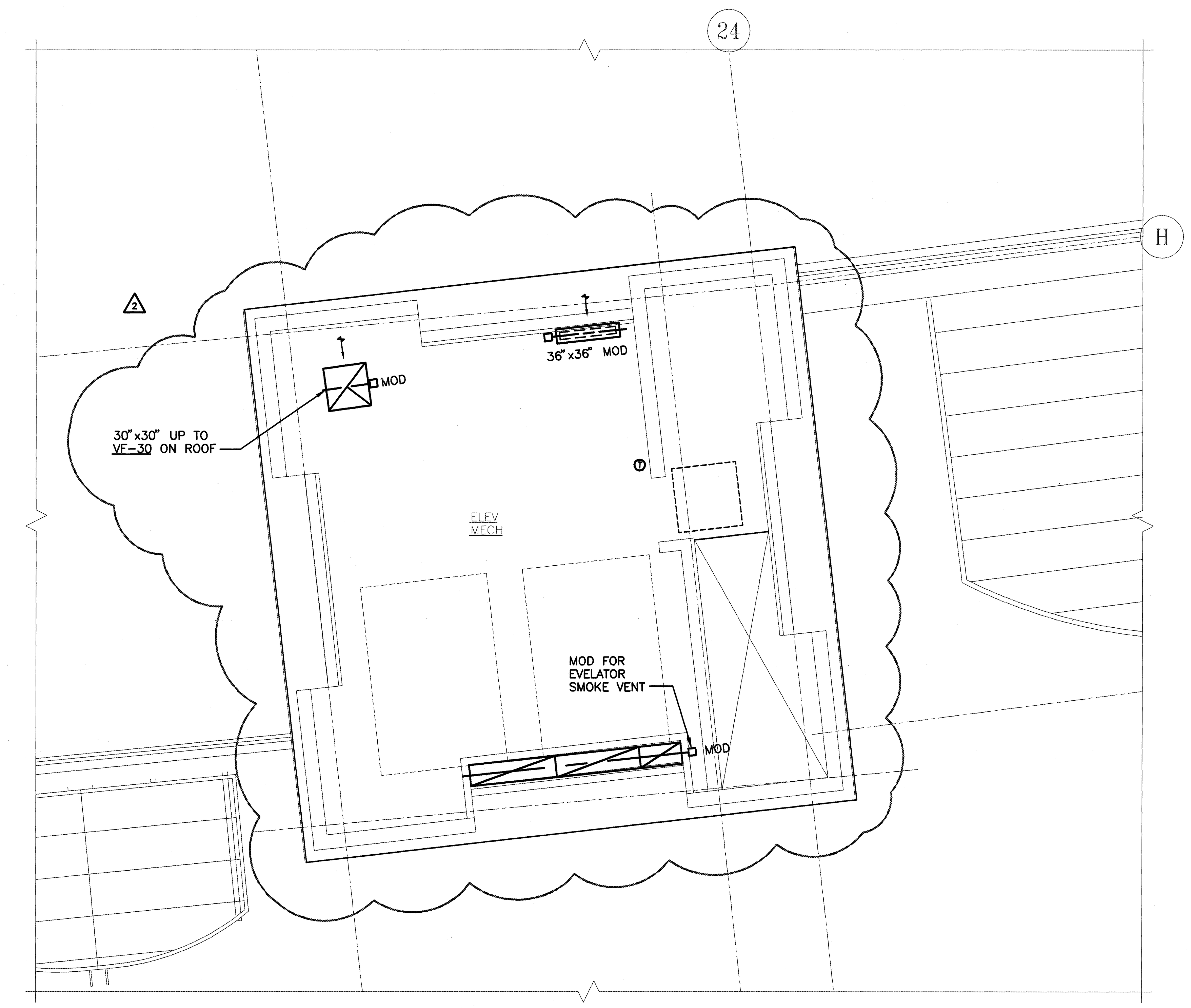

ELEVATOR CORE PLANS – MECH ROOM – QUAD B
SCALE: 1/4"=1'-0"

PROJECT NORTH

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Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA
MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
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LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA
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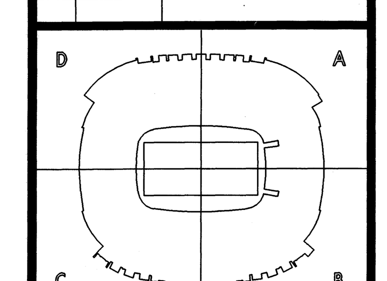
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



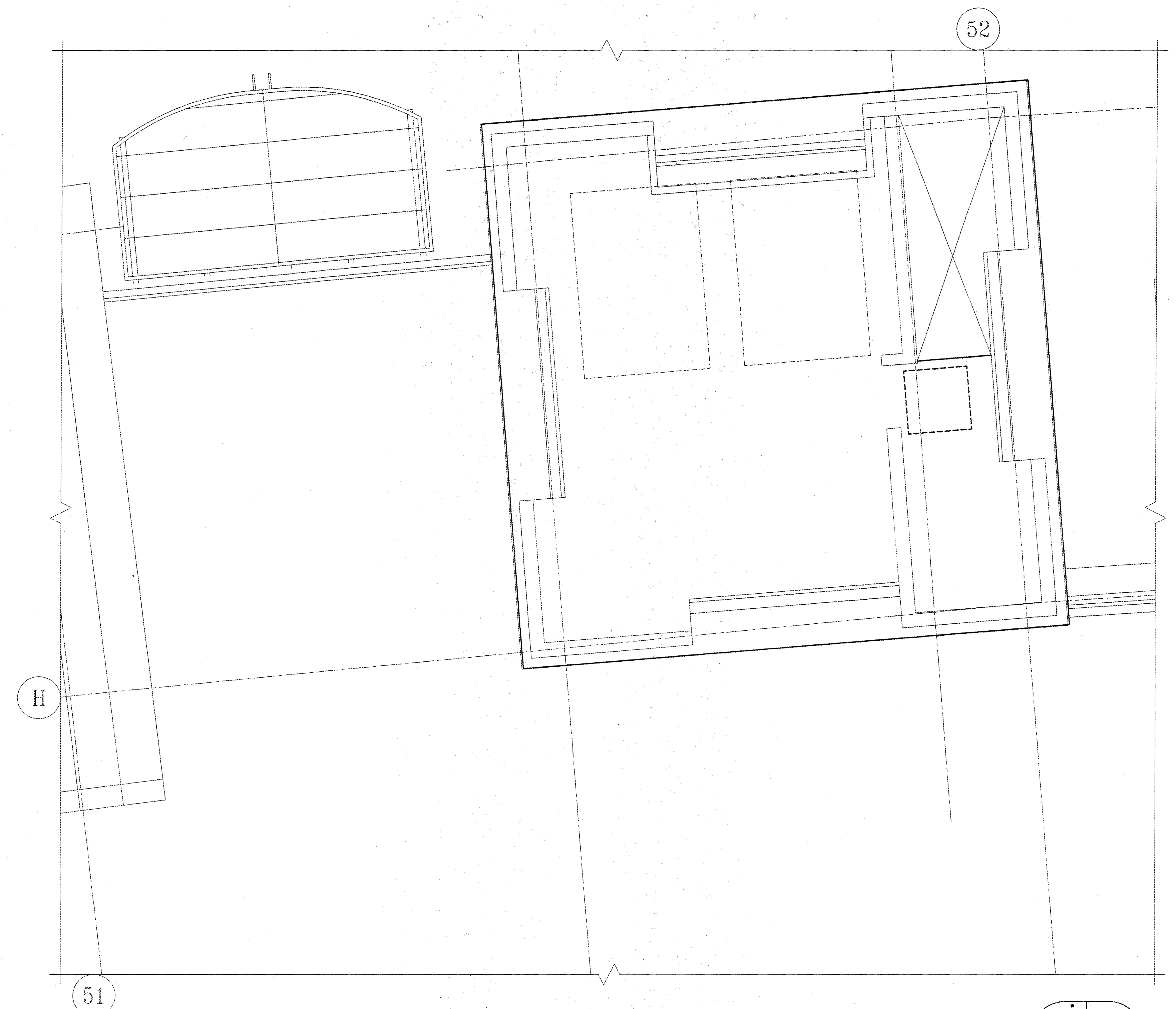
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY: ---
DRAWN BY: RHK	REVIEWED BY: PMP
ISSUED: 2-28-97	

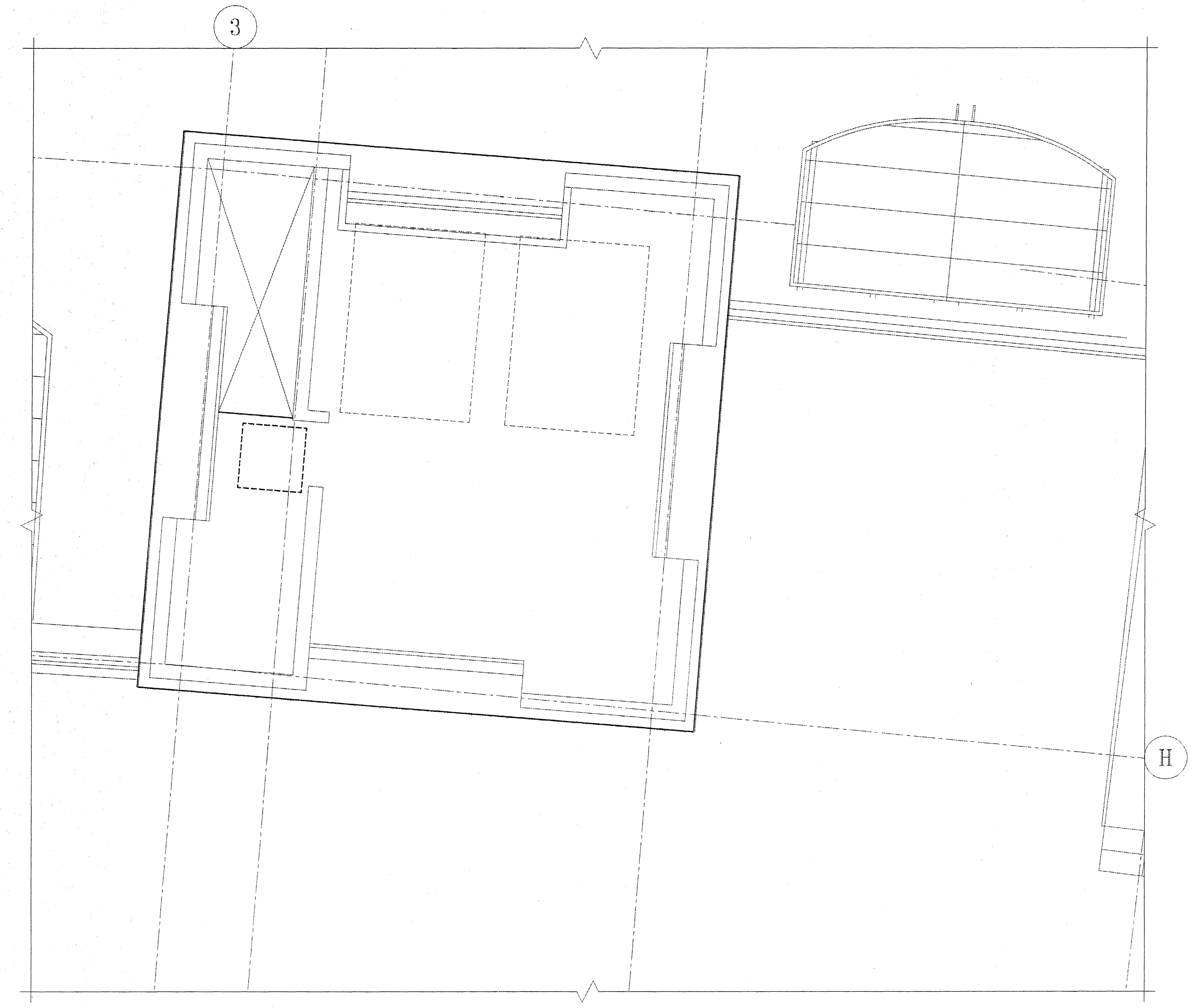
SHEET TITLE
ELEVATOR
CORE PLANS
MECH ROOMS
QUADS A,B,C & D

CATEGORY – SUB-CATEGORY – SHEET
M.3-26

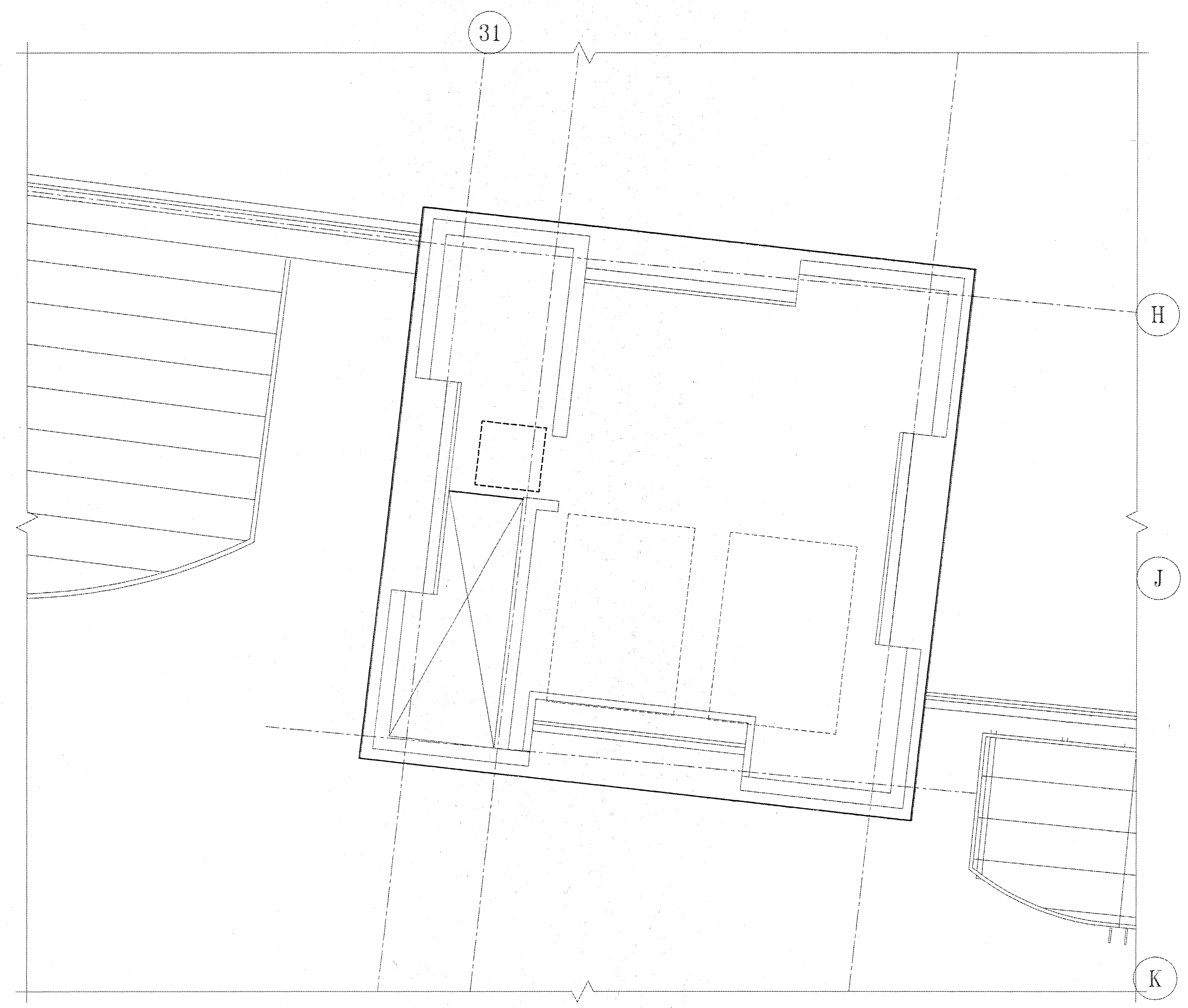
04.28.97–15:56–51104326 – RMF #95110



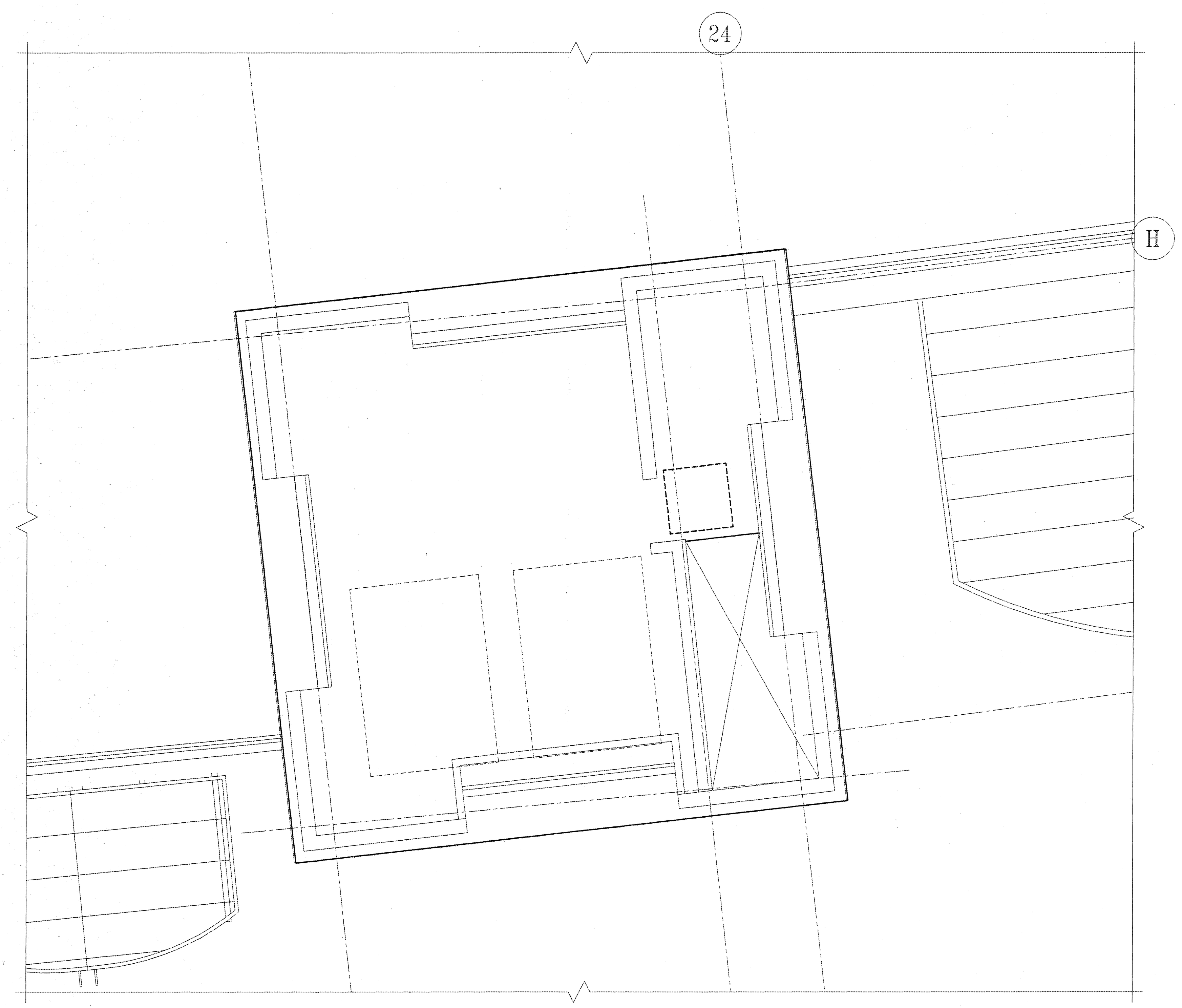
ELEVATOR CORE PLANS – MECH ROOM – QUAD D
SCALE: 1/4"=1'-0"



ELEVATOR CORE PLANS – MECH ROOM – QUAD A
SCALE: 1/4"=1'-0"



ELEVATOR CORE PLANS – MECH ROOM – QUAD C
SCALE: 1/4"=1'-0"



ELEVATOR CORE PLANS – MECH ROOM – QUAD B
SCALE: 1/4"=1'-0"

PROJECT NORTH

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HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

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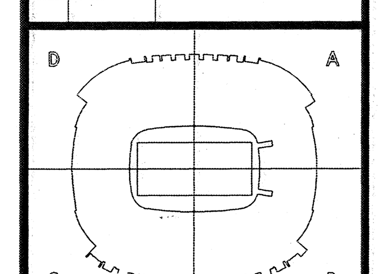
NO.	DATE	DESCRIPTION



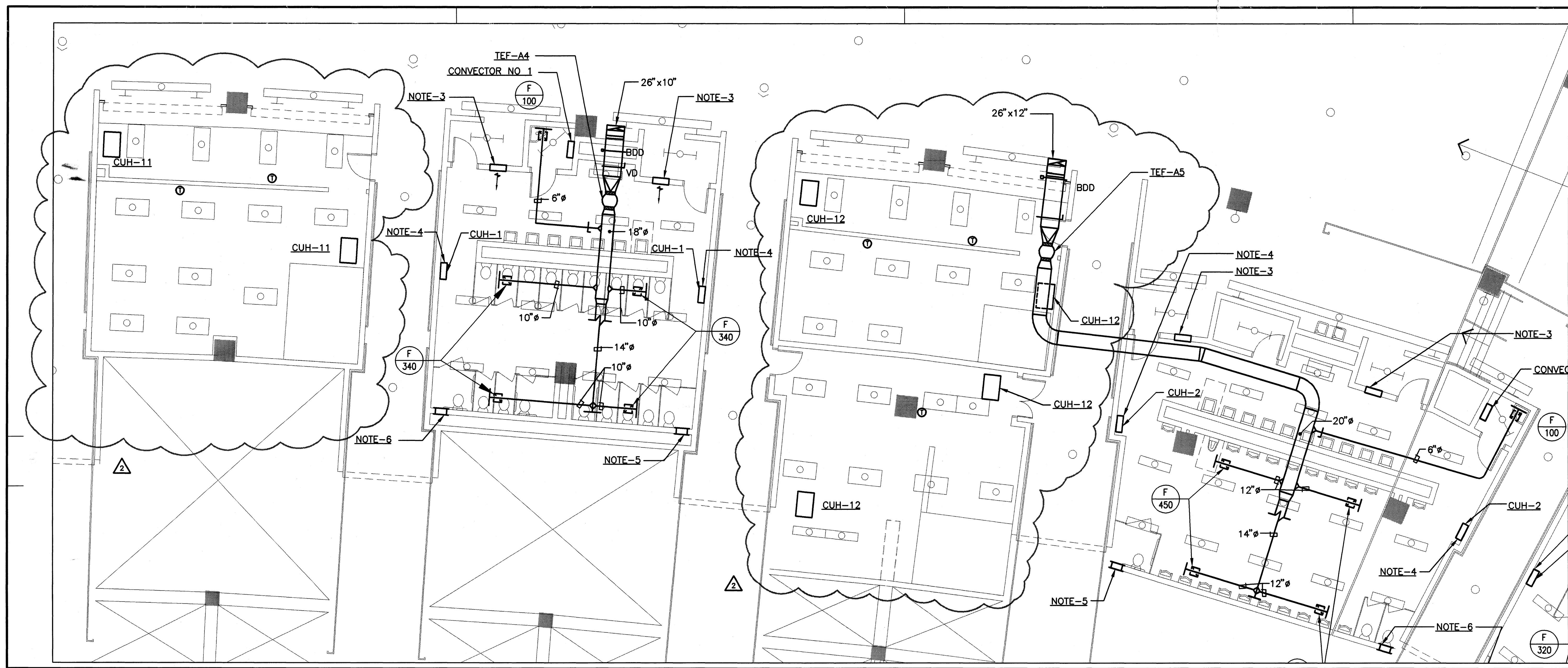
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: RHK
REVIEWED BY: PMP
ISSUED: 2-28-97

SHEET TITLE
ELEVATOR CORE PLANS MECH ROOMS QUADS A,B,C & D

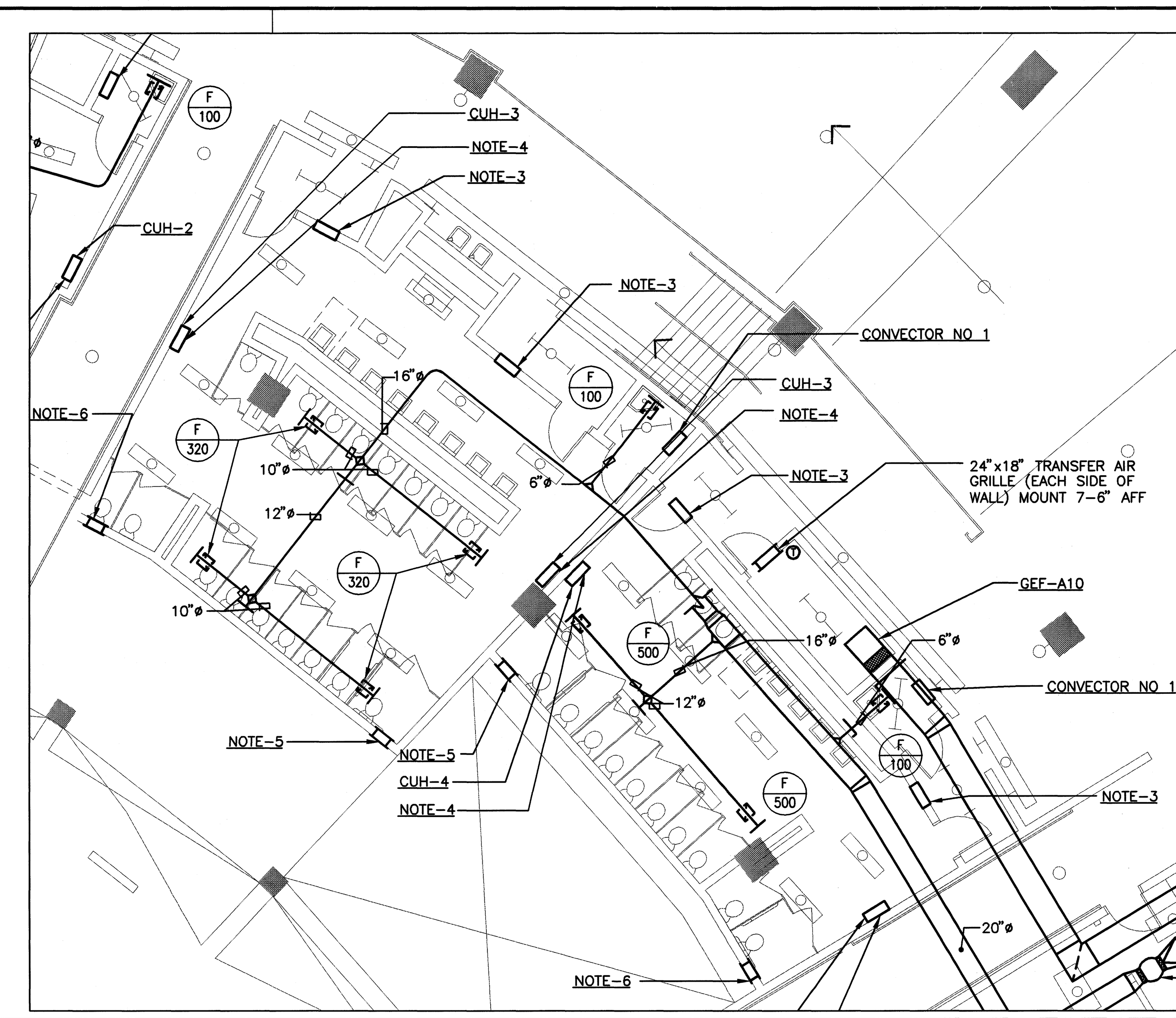
CATEGORY – SUB-CATEGORY – SHEET
M.3-27

03.03.97-01:13-S110M325 - RMF #95110



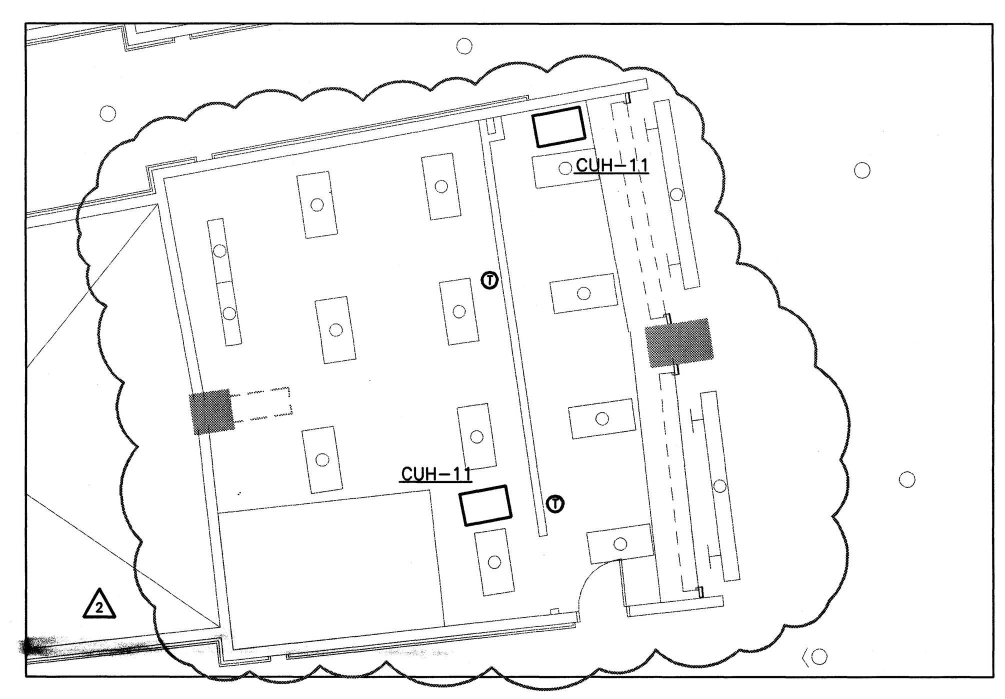
MCT-1

SCALE: 1/8"=1'0" (1)



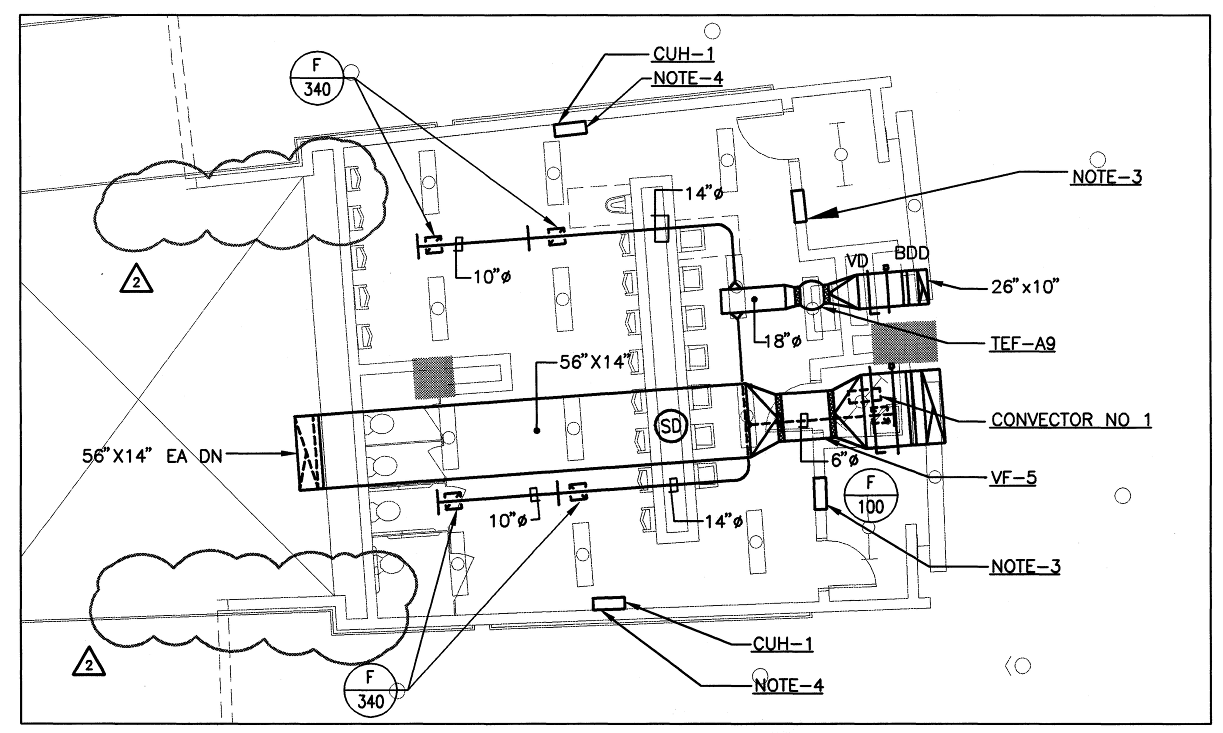
MCT-2

SCALE: 1/8"=1'0" (2)



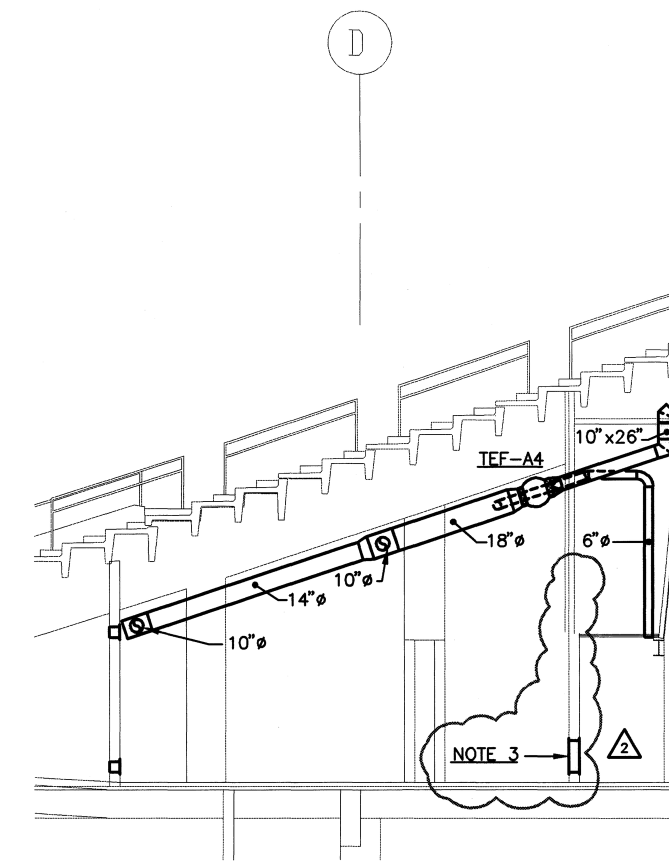
MCT-3

SCALE: 1/8"=1'0" (3)



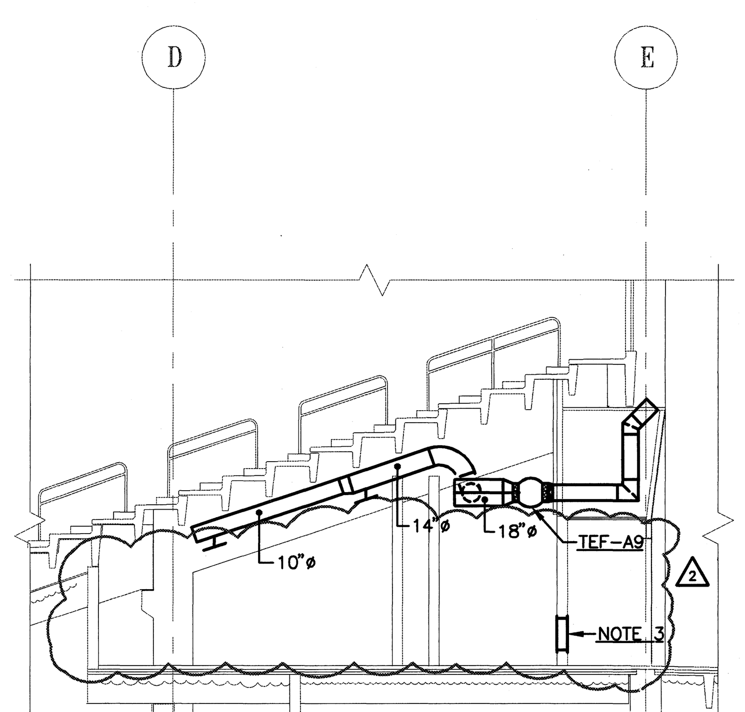
MCT-4

SCALE: 1/8"=1'0" (4)



SECTION 'A'

SCALE: 1/8"=1'0" (5)



SECTION 'B'

SCALE: 1/8"=1'0" (6)

DRAWING NOTE

1. NOT USED
2. UNIIT HEATERS MOUNTED 8'-0" AFF.
3. 24"x24" TRANSFER AIR GRILLE (EACH SIDE OF WALL) WITH MOD MOUNT 8" AFF.
4. CABINET UNIT HEATERS MOUNTED 10'-0" AFF.
5. 16"x8" GRILLE MOUNTED 8" AFF.
6. 16"x8" GRILLE MOUNTED 6'--8" AFF.

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HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
PHILADELPHIA, PENNSYLVANIA

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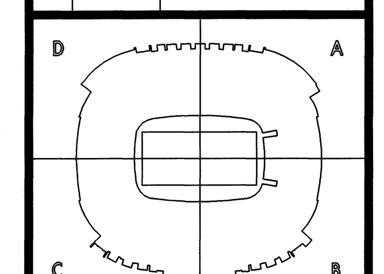
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



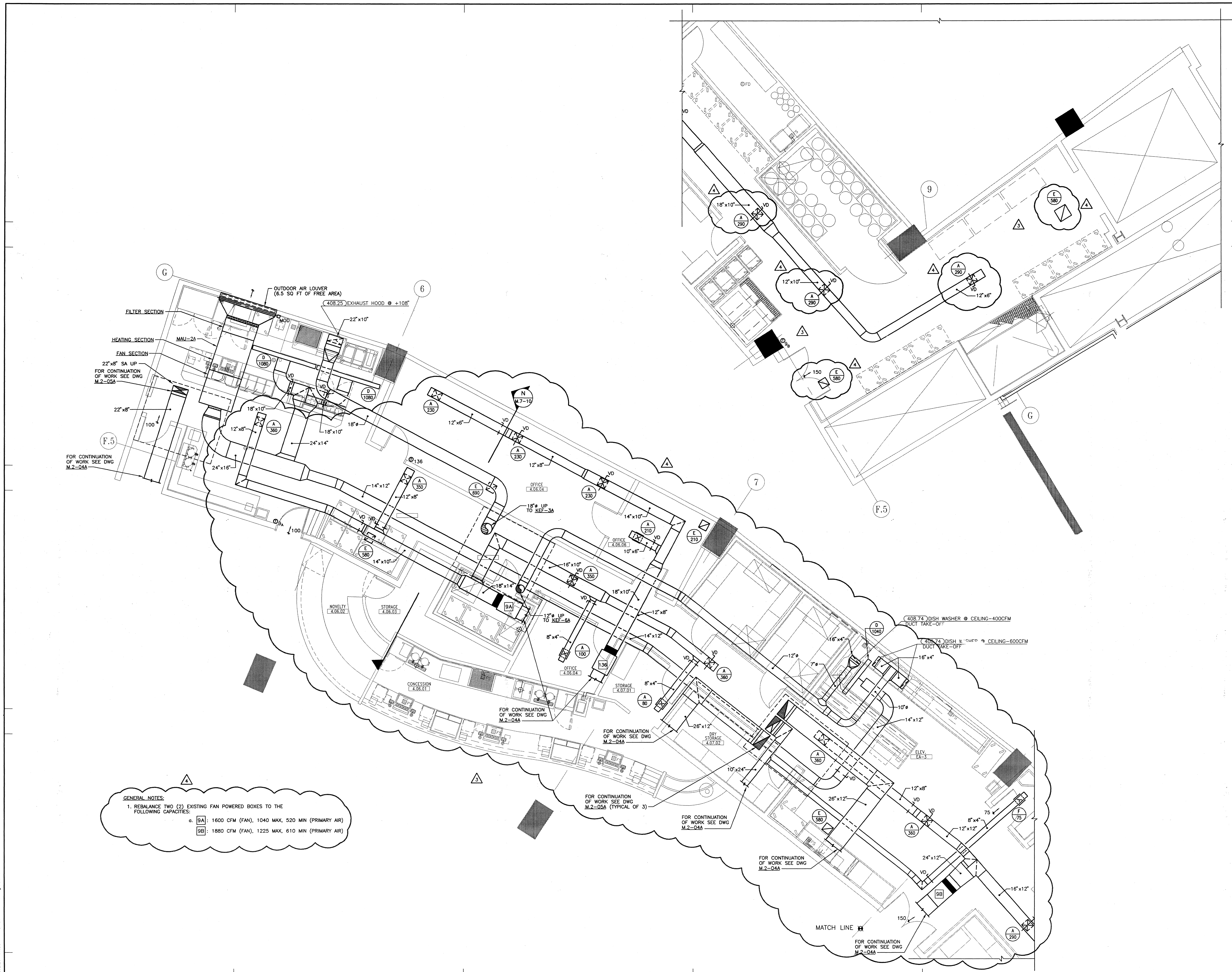
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY:
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE
PART PLANS - TYPICAL TOILET ROOMS - HVAC

CATEGORY - SUB-CATEGORY - SHEET
M.3-28

03.02.97-16:17-5110M22 - RMF #95110



12.10.97-11:33- M3-29 - RMF #95110

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Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD
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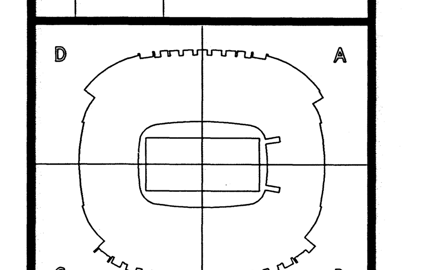
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44
3	7-25-97	BULLETIN #71
4	12-10-97	BULLETIN #102

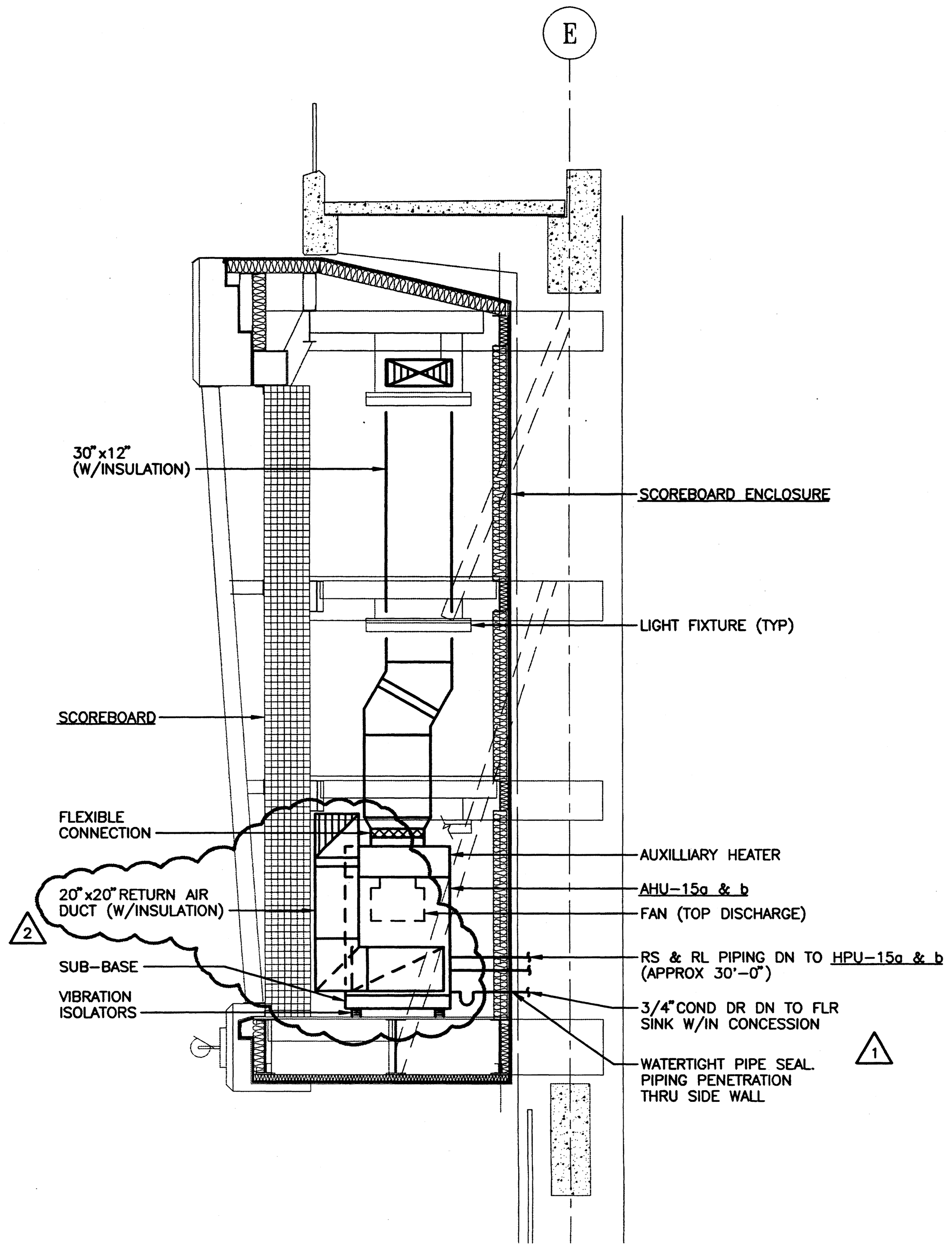


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: PBF
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
CLUB LEVEL FOOD SERVICE GRIDS 5.4 - 9.5

CATEGORY - SUB-CATEGORY - SHEET
M.3-29

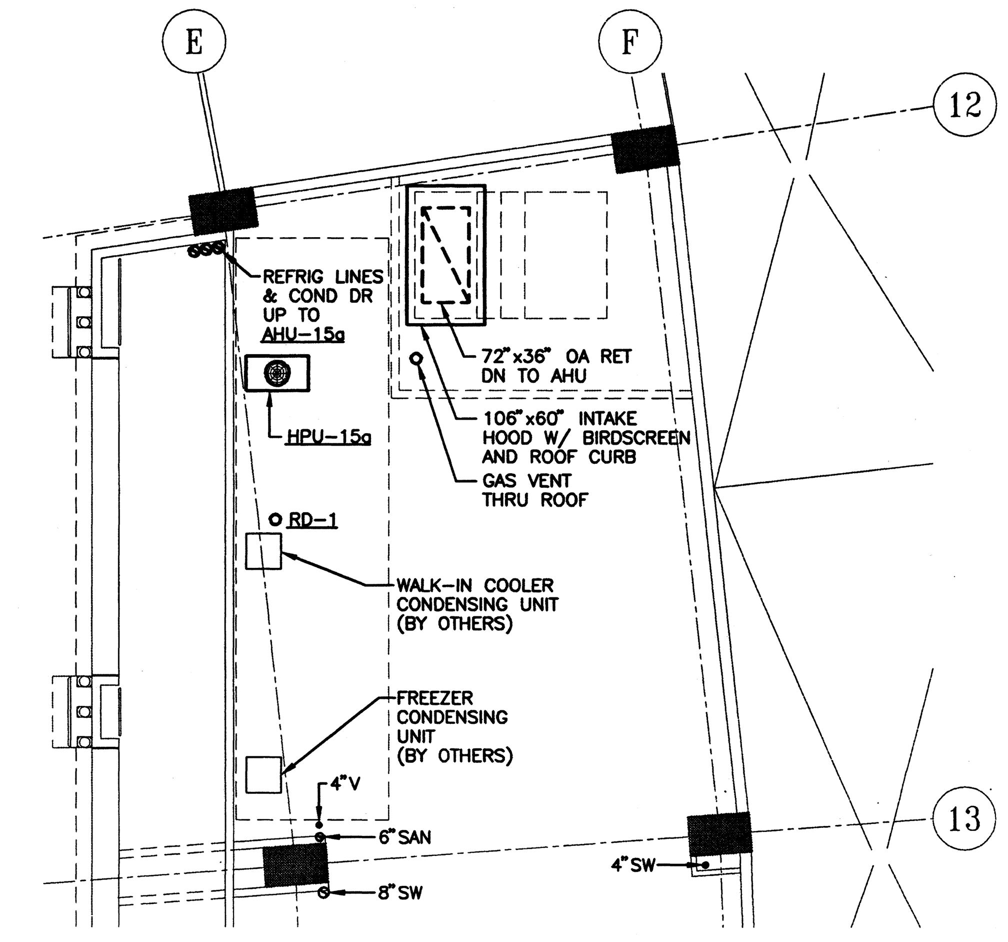


SECTION "A"

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

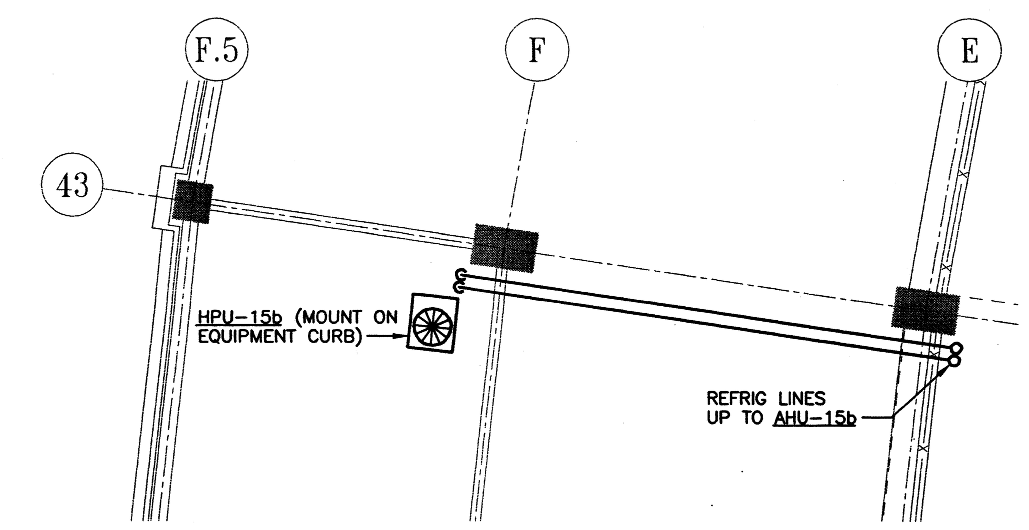
NOTES:

1. MAINTAIN 2'-0" CLEARANCE ON SIDE OF AHU FOR FILTER ACCESS.
2. SIZE REFRIGERANT LINES PER UNIT MANUFACTURER RECOMMENDATIONS. INSULATE AS REQUIRED, I.E SUCTION PIPING, OIL SEPERATOR, ETC.



CLUB LEVEL-KITCHEN ROOF-RM. 4.14.02

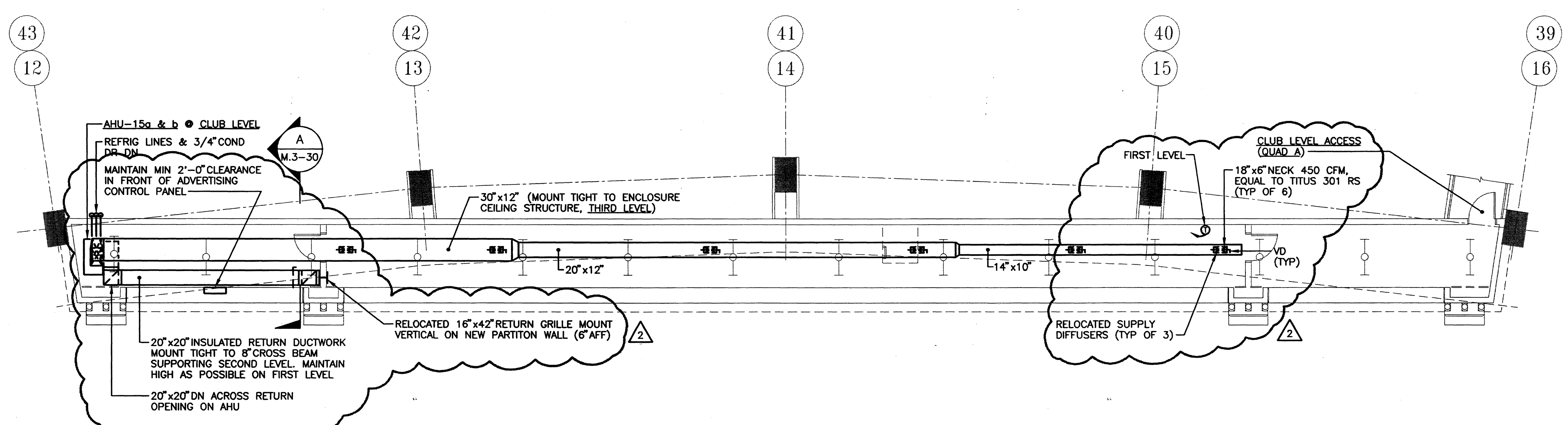
SCALE: 1/8"=1'-0"



1

MAIN CONCOURSE-OFFICE ROOF-RM. 2.42.05

SCALE: 1/8"=1'-0"



PART PLAN - SCOREBOARD

SCALE: 1/8"=1'-0"

HEAT PUMP DUTY

DESIG. :	AHU, HPU-15a & b
DUTY :	SCOREBOARD
CFM :	2700
TSP IN.H_2O :	1.0
FAN : MOTOR (HP)	1.5
RPM	1725
DIAMETER	15"ø
COOLING : EAT °F	79°F DB / 66°F WB
LAT °F	55°F DB / 53°F WB
TOTAL (MBH)	90.0
SENSIBLE (MBH)	69.0
HEATING : (LOW TEMP.)	
17°F OA (MBH)	45.5
AUX. HEAT	10.0 KW
CONDENSING UNIT :	
NO. OF COMP.	1/7.5 HP
FAN	1/.50 HP
REFRIG.	R-22
ELECTRICAL :	208V/3ø

REMARKS :

1. PROVIDE (1) 7.5 TON SPLIT SYSTEM HEAT PUMP PACKAGE WITH THE FOLLOWING ACCESSORIES:
   a. INTEGRAL CONTROL PACKAGE WITH STANDARD ONE STAGE H/C THERMOSTAT
   b. RETURN AIR GRILLE
   c. MOUNTING SUB-BASE
   d. VIBRATION ISOLATORS
2. APPROX. SIZE :
   a. AHU - 6'-6"Hx4'-2"Wx2'-6"D ; 625 LBS
      HPU - 3'-6"Lx3'-0"Wx3'-4"H ; 500 LBS
   b. AIR HANDLING UNIT DIMENSIONS SHALL ACCOMMODATE INSTALLATION OF UNIT THRU STANDARD DOORWAY CLEARANCE.

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HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
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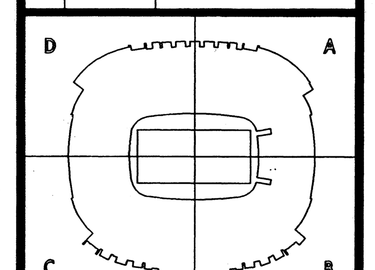
REVISIONS

NO.	DATE	DESCRIPTION
	9-12-97	BULLETIN #73
1	11-13-97	BULLETIN #101
2	4-30-98	NFL #470



KEYPLAN

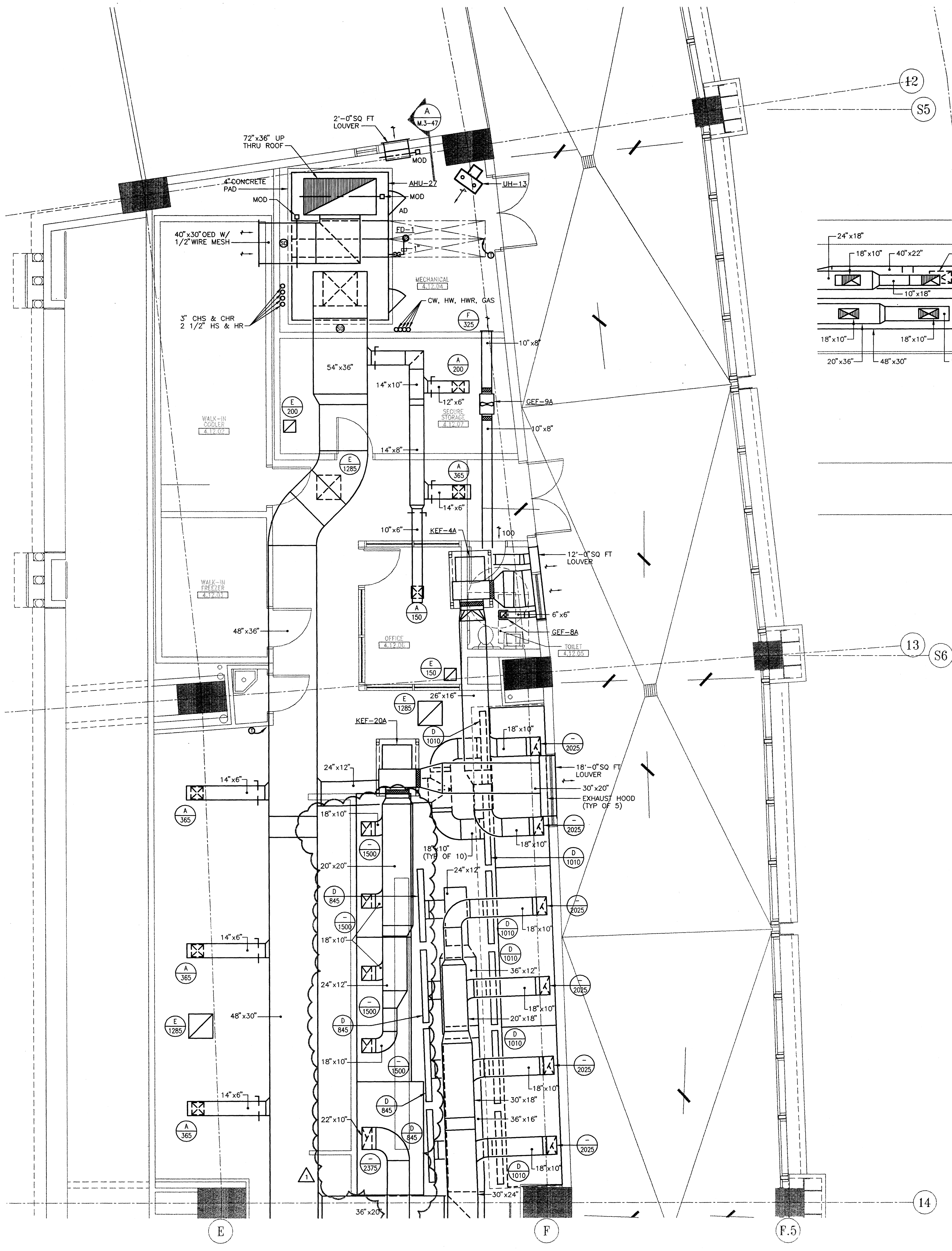
PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY: RMF
ISSUED: 9-12-97	

SHEET TITLE

SCOREBOARD PART PLAN AND SECTION

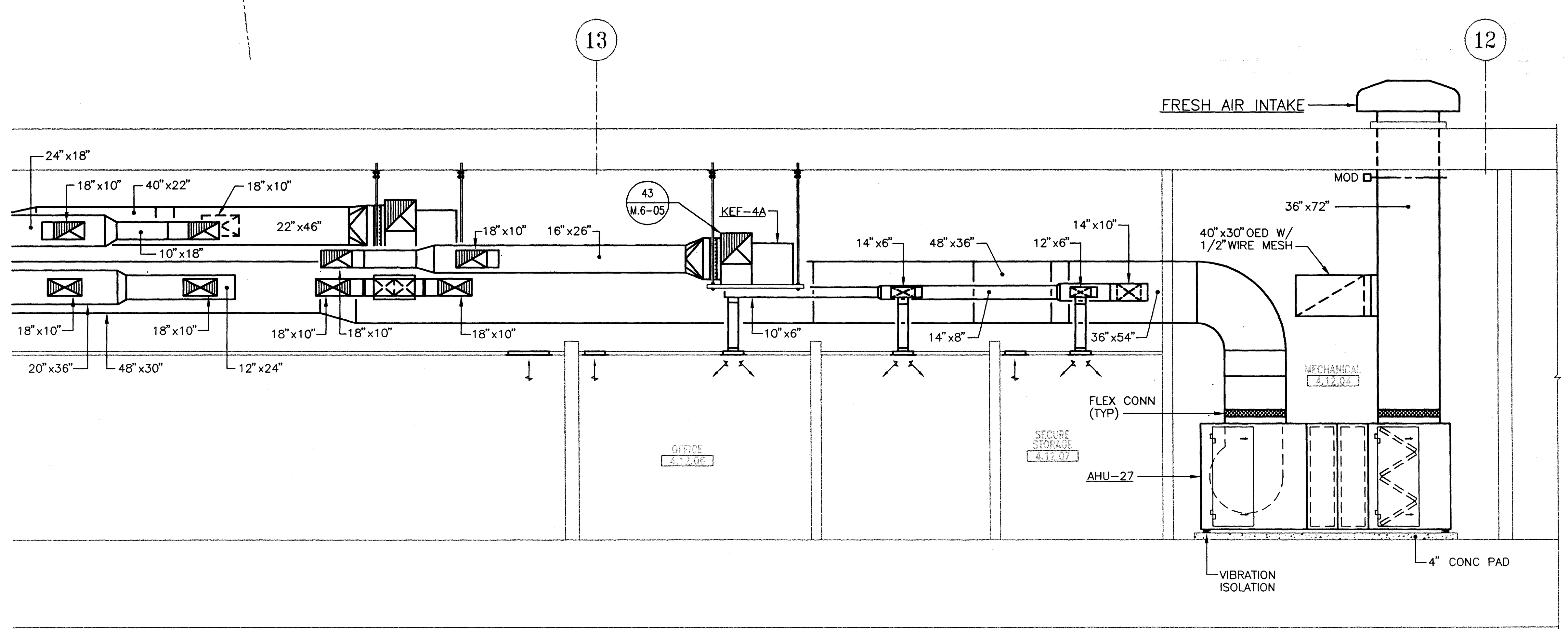
CATEGORY - SUB-CATEGORY - SHEET

M.3-30



PART PLAN KITCHEN 4.14.02
CLUB LEVEL - NORTH

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



PART PLAN KITCHEN 4.14.02
CLUB LEVEL - SECTION "A"

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

GENERAL NOTES:

1. FOR GENERAL NOTES CONCERNING MECHANICAL ABD PLUMBING CONSTRUCTION ~~REFER TO DRAWING P-3-19 OF ORIGINAL CONTRACT~~ DOCUMENTS (4-28-97).
2. REBALANCE AHU-27 TO 19,000 CFM SUPPLY AIR.

PROJECT NORTH

4 2 0 4 8

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

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HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC. MIAMI, FLORIDA
MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTEIN, INC. BALTIMORE, MARYLAND
LANDSCAPE ARCHITECT/PLANNING
WALLACE ROBERT & TODD PHILADELPHIA, PENNSYLVANIA
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REVISIONS

NO.	DATE	DESCRIPTION
	11-14-97	BULLETIN #83
1	4-24-98	NFL #455

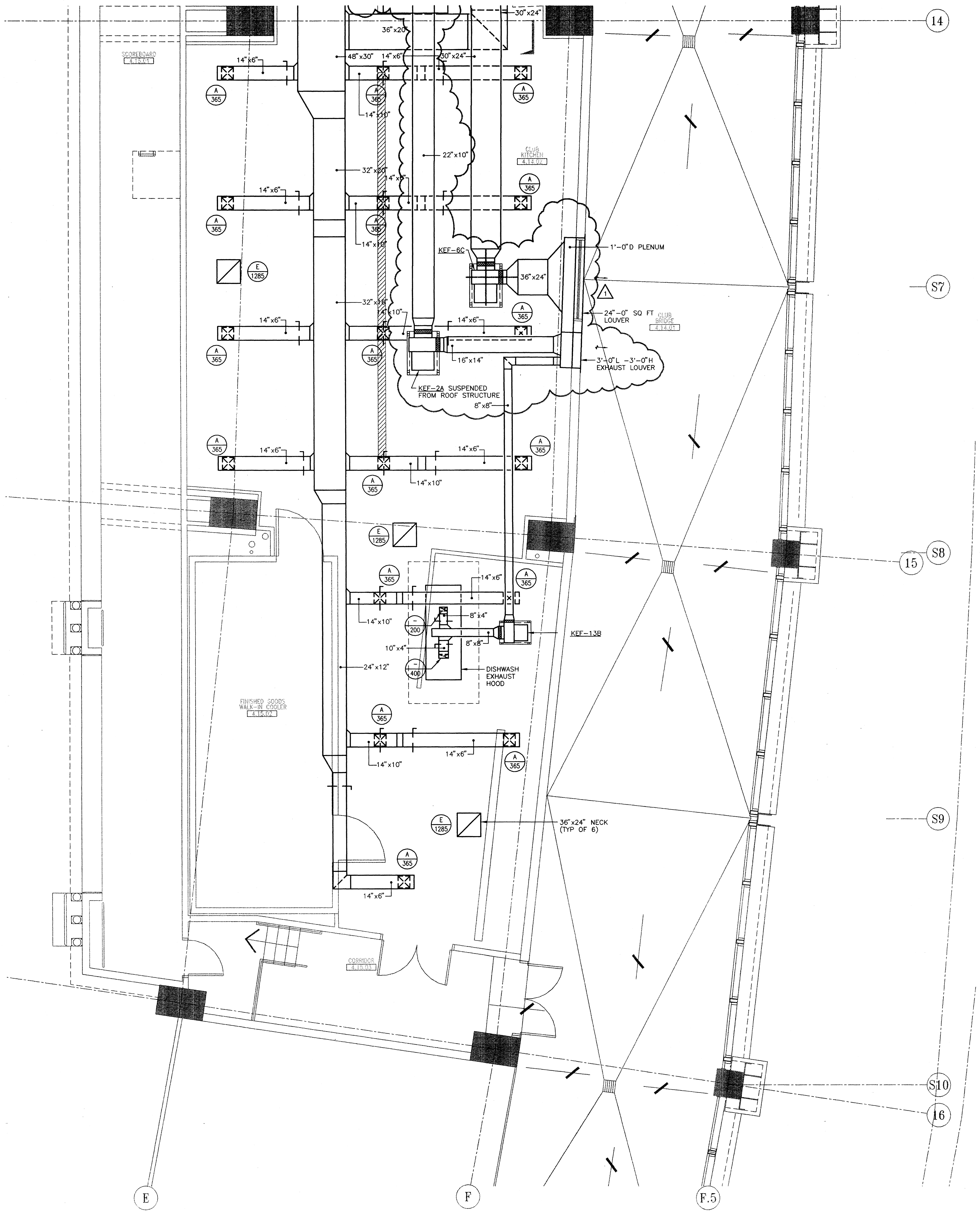
D A C B KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY: RMF
ISSUED: 11-14-97	

SHEET TITLE
PART PLAN KITCHEN 4.14.02 - CLUB LEVEL - NORTH

CATEGORY - SUB-CATEGORY - SHEET
M.3-47

04.27.98-10:43-6110M347 - RMF #95110



PART PLAN KITCHEN 4.14.02
CLUB LEVEL - SOUTH

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

GENERAL NOTES:

1. FOR GENERAL NOTES CONCERNING MECHANICAL ABD PLUMBING CONSTRUCTION REFER TO DRAWING P.3-19 OF ORIGINAL CONTRACT DOCUMENTS (4-28-97).

PROJECT NORTH

4 2 0 4 8

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

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Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTIEN, INC.
BALTIMORE, MARYLAND

LANDSCAPE ARCHITECT/PLANNING
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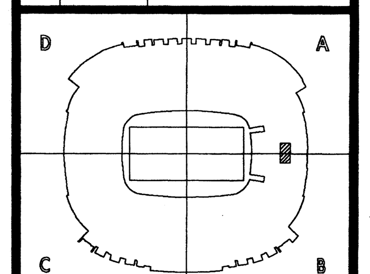
REVISIONS

NO.	DATE	DESCRIPTION
	11-14-97	BULLETIN #83
1	4-24-98	NFL #455



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY: RMF
ISSUED: 11-14-97	

SHEET TITLE
PART PLAN KITCHEN 4.14.02 - CLUB LEVEL - SOUTH

CATEGORY - SUB-CATEGORY - SHEET
M.3-48

04.27.98-10:43-6110M347 - RMF #95110

AIR HANDLING UNIT SCHEDULE

DESIG	DUTY	FAN SECTION: CFM	FAN SECTION: MIN. OA CFM	FAN SECTION: ESP INCH H₂O	FAN SECTION: MOTOR BHP	FAN SECTION: MOTOR HP	FAN SECTION: RPM	FAN SECTION: WHEEL DIA INCH	COOLING SECTION: EAT °F DB	COOLING SECTION: EAT °F WB	COOLING SECTION: LAT °F DB	COOLING SECTION: LAT °F WB	COOLING SECTION: TOTAL MBH	COOLING SECTION: SENS MBH	COOLING SECTION: GPM @ 36°F EWT 54°F LWT	COOLING SECTION: MAX H₂O PD FT H₂O	COOLING SECTION: MIN TOTAL FACE AREA	COOLING SECTION: MAXIMUM FACE VEL FPM	COOLING SECTION: No OF COILS	COOLING SECTION: MAX FIN SPACING FIN/IN	COOLING SECTION: MAXIMUM AIR PD IN H₂O	COOLING SECTION: MIN ROWS	HEATING SECTION: EAT °F	HEATING SECTION: LAT °F	HEATING SECTION: MBH @200°F EWT	HEATING SECTION: GPM @30°F ΔT	HEATING SECTION: MAXIMUM H₂O PD FT H₂O	HEATING SECTION: MAXIMUM AIR PD IN H₂O	HEATING SECTION: MIN TOTAL FACE AREA	HEATING SECTION: MAXIMUM FACE VEL FPM	HEATING SECTION: No OF COILS	HEATING SECTION: MAX FIN SPACING FIN/IN	HEATING SECTION: MIN ROWS	ELECTRICAL	REMARKS
AHU-27	CLUB - KITCHEN	17,500	17,500	1.5	11.5	15.0	1200	27 1/2	95	78	58	57.3	1,445	800	165.0	20.0	35 SQ FT	500	1	14	1.0	6	0	60	1,247	83.0	10.0	1.0	29.0	600	1	8	2	480V/3ø/60HZ	

NOTES:

(1) CHILLED AND HEATING WATER ARE 40% ETHYLENE GLYCOL SOLUTION.

(2) SUPPLY FAN MOTOR SHALL BE 2 SPEED / 2 WINDING, LOW SPEED : 8,060 CFM.

FAN SCHEDULE

DESIG	SERVICE ROOM No	LEVEL	TYPE	CFM	SP INCH H₂O	APPROX RPM	BHP	HP (MOTOR SIZE)	WHEEL DIA	DRIVE	ELECTRICAL	REMARKS
KEF-4A	KITCHEN HOOD	CLUB LEVEL	G	4,050	2.5	1,960	4.4	5.0	18	BELT	480V/3ø/60HZ	NOTE (1) (2) RELOCATED
KEF-20A	KITCHEN HOOD	CLUB LEVEL	G	6,750	2.5	1,300	4.0	5.0	24	BELT	480V/3ø/60HZ	NOTE (1) (2) NEW
KEF-6C	KITCHEN HOOD	CLUB LEVEL	G	8,100	2.5	1,200	7.0	10.0	27	BELT	480V/3ø/60HZ	NOTE (1) (2) RELOCATED
KEF-13B	DISHWASH HOOD	CLUB LEVEL	G	600	1.5	1,200	–	0.5	10	BELT	120V/3ø/60HZ	NOTE (1) (2) NEW
GEF-8A	KITCHEN BATH	CLUB LEVEL	E	100	0.50	1,200	–	.125	8"	BELT	120V/1ø/60HZ	NEW
GEF-9A	KITCHEN MECH RM	CLUB LEVEL	C	325	0.75	1,000	–	.250	10"	BELT	120V/1ø/60HZ	NEW

NOTES:

(1) FAN SHALL BE UL 762 APPROVED FOR MAXIMUM 375 DEGREES FARENHEIT, EQUIPPED WITH HINGED ACCESS DOOR AND DRAIN CONNECTION.

(2) FAN INFORMATION TRANSFERRED FROM ORIGINAL FAN SCHEDULE DWG. M.0-04 FOR CLARIFICATION PURPOSE.

UNIT HEATER SCHEDULE (HYDRONIC)

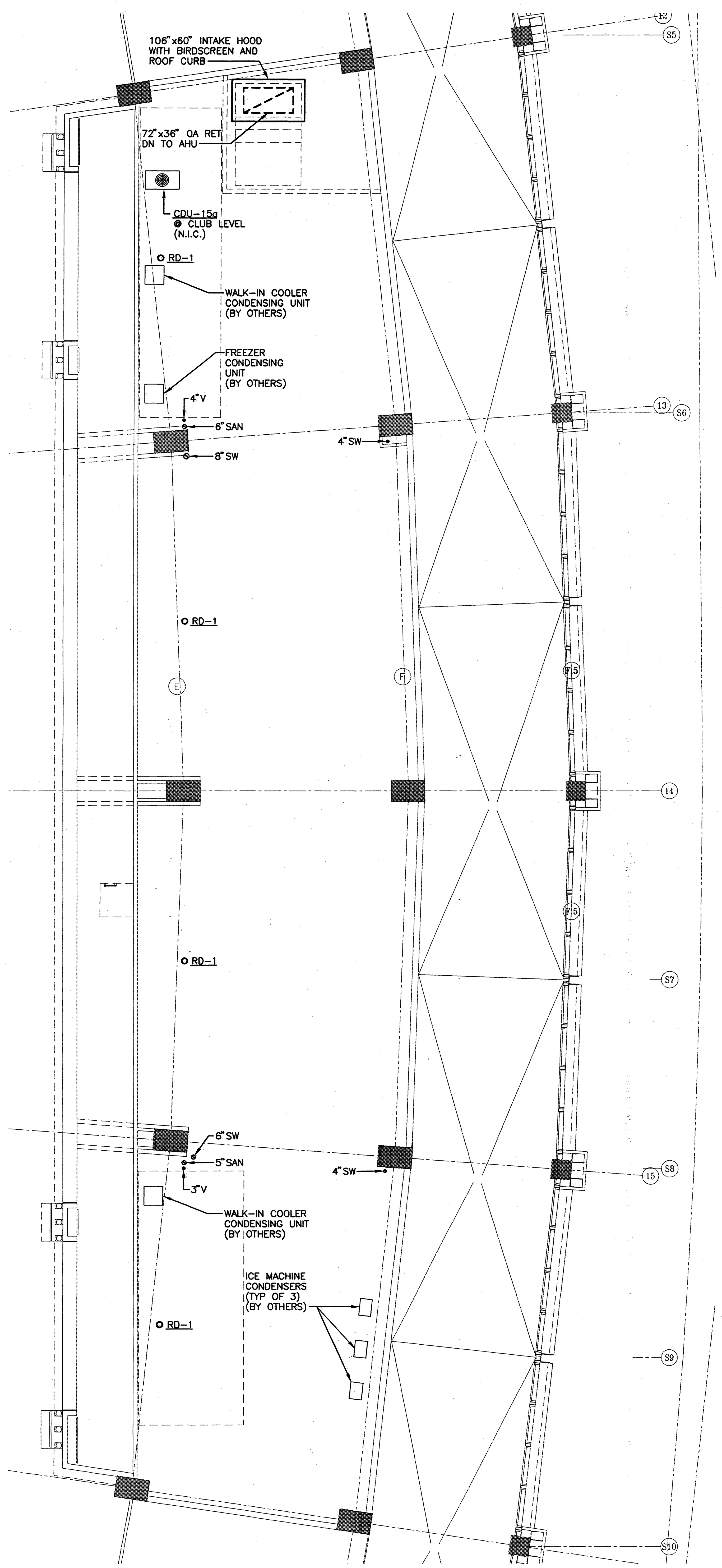
DESIG	NOMINAL CFM	CAP BTUH @ 200°F EWT	GPM @ 30°F ΔT H₂O	MAXIMUM H₂O PD FT H₂O	MOTOR HP	RPM	ELECTRICAL	REMARKS
UH-13	325	24,570	2.0	0.75	1/20	1,550	120V/1ø/60HZ	KITCHEN MECH ROOM

AIR DEVICE SCHEDULE

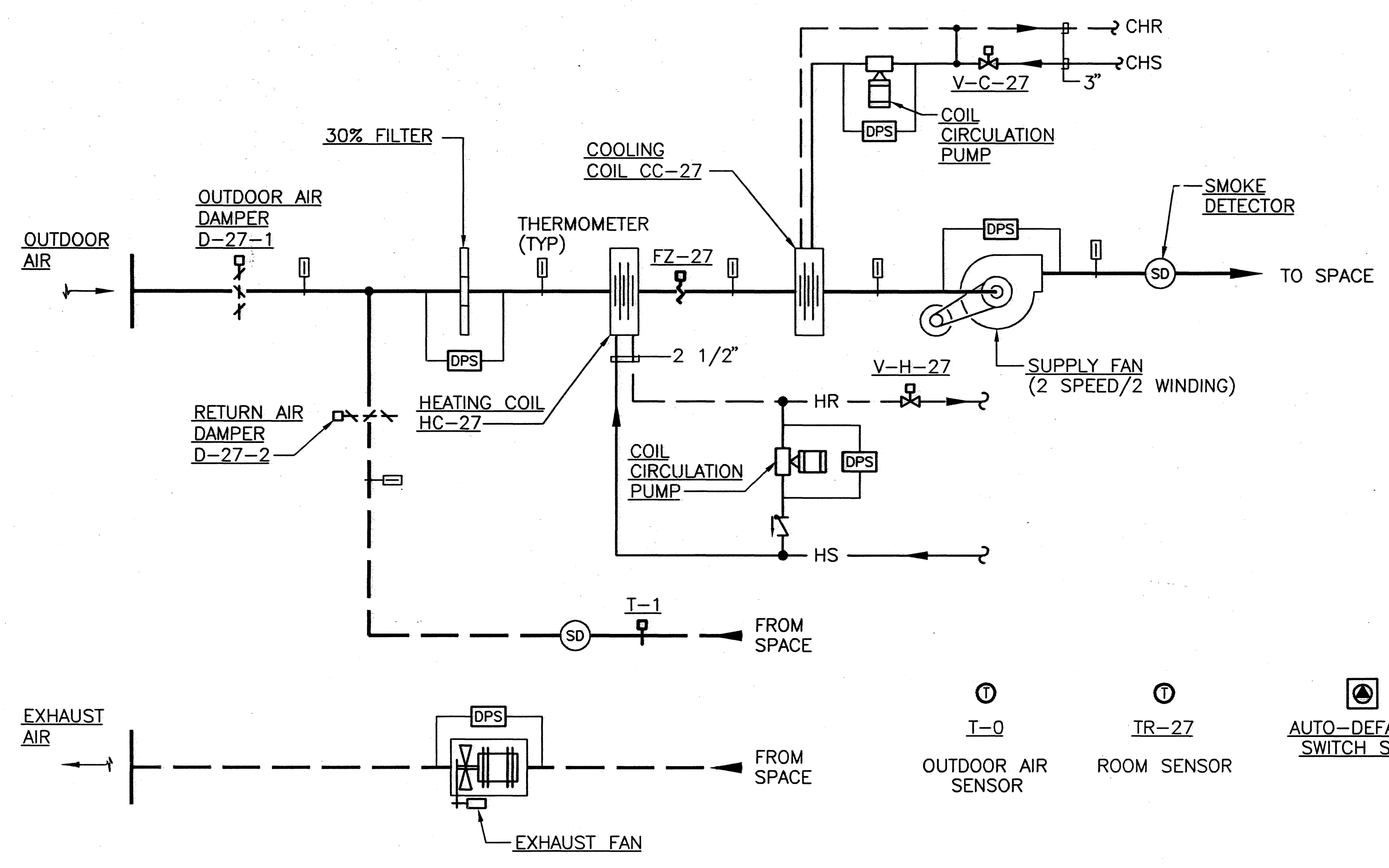
TYPE	DUTY	CFM	SIZE	BLOW	PD IN H₂O	NC	REMARKS
A	CEILING SUPPLY	151-280	9"x9"	4-WAY	0.12	21	
A	CEILING SUPPLY	281-500	12"x12"	4-WAY	0.12	23	
D	LINEAR SLOT SUPPLY	190/FT	6@1"SLOT	1-WAY	0.05	29	
E	RETURN REGISTER	171-230	8"x6"	0° DEFL	0.11	22	
E	RETURN REGISTER	231-310	10"x6"	0° DEFL	0.11	23	
E	RETURN REGISTER	311-370	12"x6"	0° DEFL	0.11	24	
E	RETURN REGISTER	1101-1500	22"x22"	0° DEFL	0.11	20	
F	EXHAUST GRILLE	0-170	6"x6"	0° DEFL	0.11	22	
F	EXHAUST GRILLE	231-310	10"x6"	0° DEFL	0.11	23	
F	EXHAUST GRILLE	311-370	12"x6"	0° DEFL	0.11	24	
F	EXHAUST GRILLE	371-460	12"x8"	0° DEFL	0.11	22	

COIL PUMP SCHEDULE

DESIG	DUTY	TYPE	GPM	HEAD FEET H₂O	SUCTION X DISCHARGE	MOTOR BHP	MOTOR HP	RPM	% EFFICIENCY	ELECTRICAL	REMARKS
CCP-27	AHU-27 COOLING OIL	C	165	35	2.5"x2.5"	2.25	3.0	1760	65%	460V/3ø/HZ	
HCP-27	AHU-27 HEATING COIL	C	30	20	1.5"x1.5"	0.7	0.5	1760	50%	460V/3ø/HZ	



PART PLAN KITCHEN 4.14.02
CLUB LEVEL - ROOF
SCALE: 1/8"=1'-0"



CONSTANT VOLUME AIR HANDLING UNIT - AHU-27

GENERAL NOTE:

1. REFER TO ORIGINAL CONTRACT DRAWINGS FOR PIPING DETAILS.

PROJECT NORTH

8 4 0 8 16

SCALE: 1/8" = 1'-0"

11.19.97-11:45-6110M349 - RMF #95110

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HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA
MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTEIN, INC.
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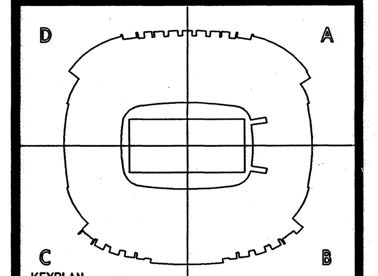
REVISIONS

NO.	DATE	DESCRIPTION
	11-14-97	BULLETIN #83

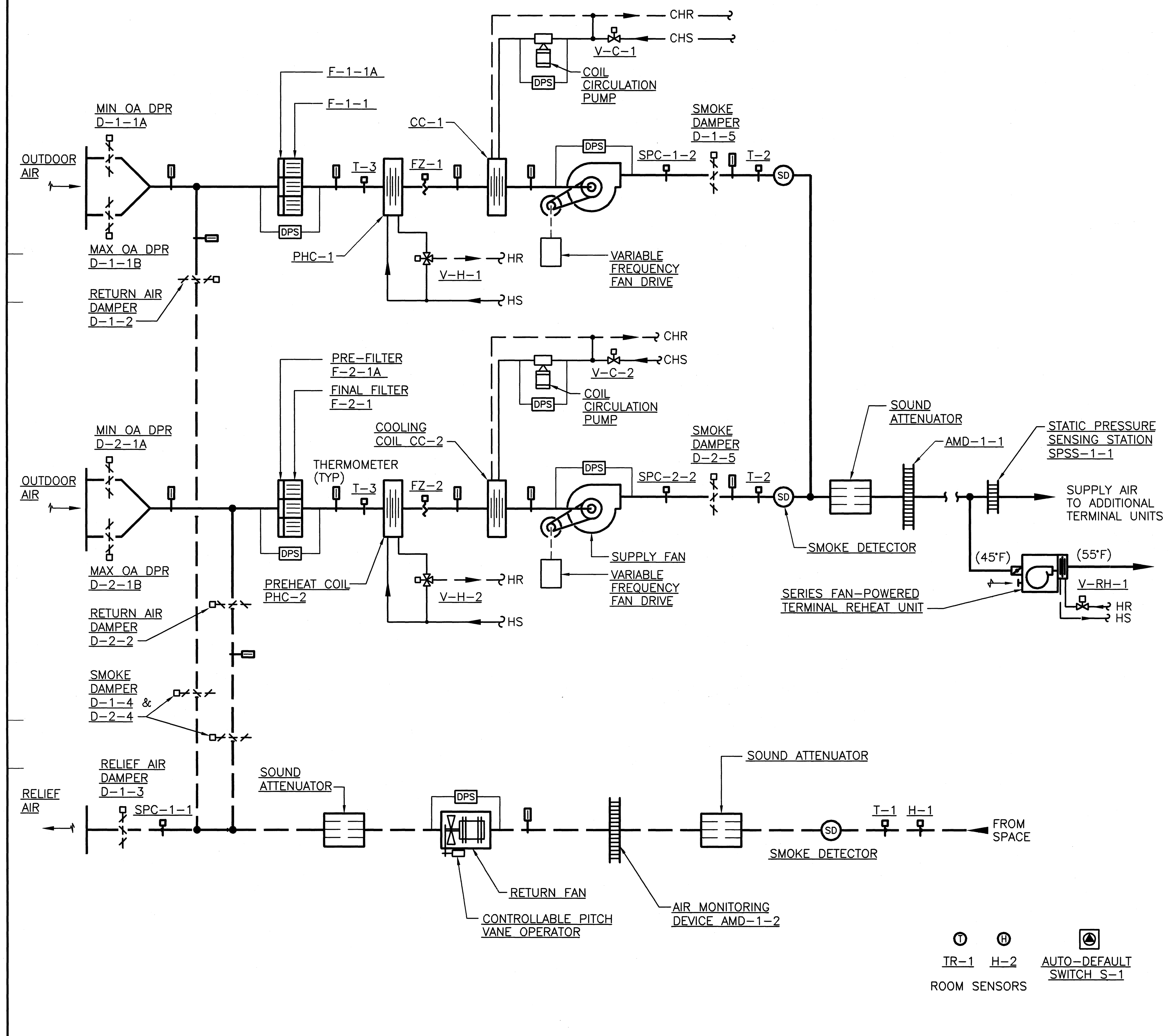


KEYPLAN

PROJECT NO. 95-675-00 | ISSUED BY:
DRAWN BY: JFL | REVIEWED BY: RMF
ISSUED: 11-14-97

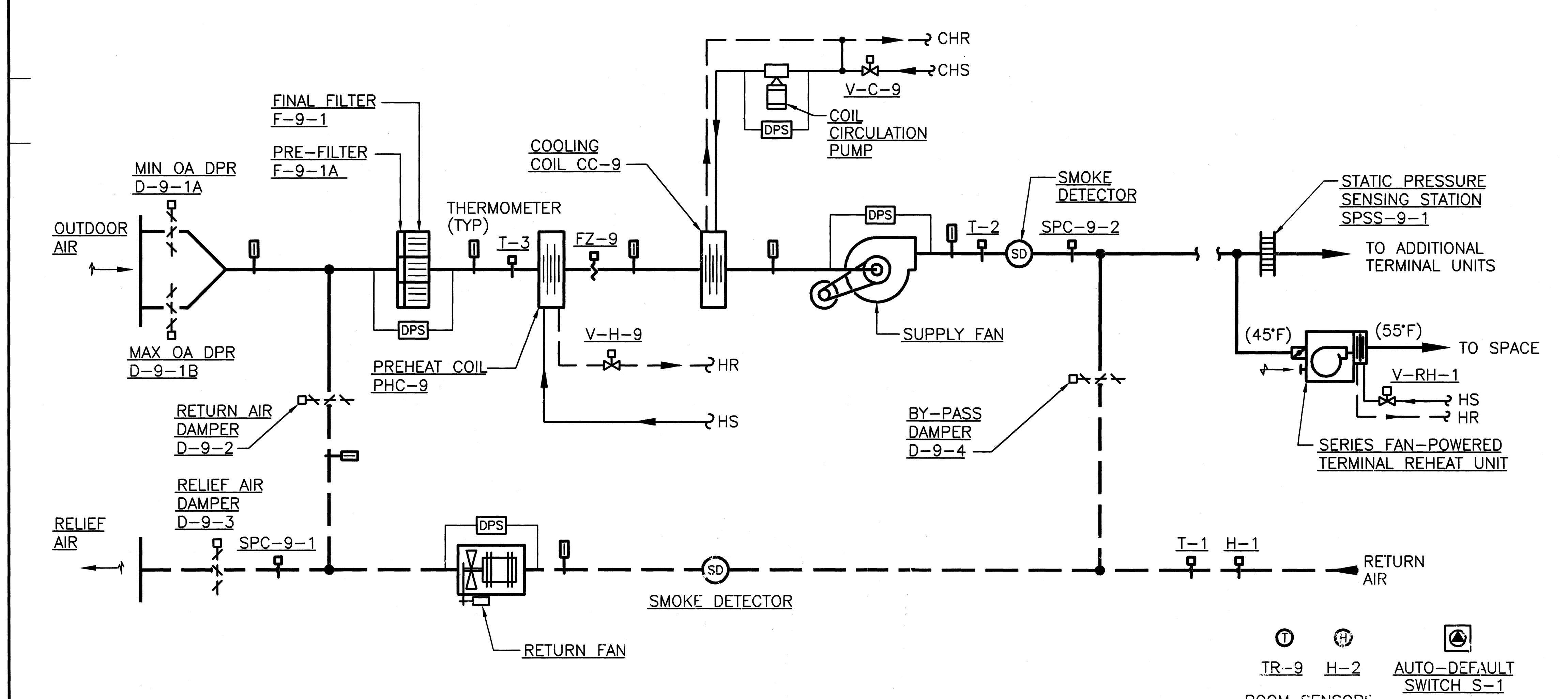
SHEET TITLE
PART PLAN KITCHEN 4.14.02 - CLUB LEVEL - ROOF AND SCHEDULES

CATEGORY - SUB-CATEGORY - SHEET
M.3-49



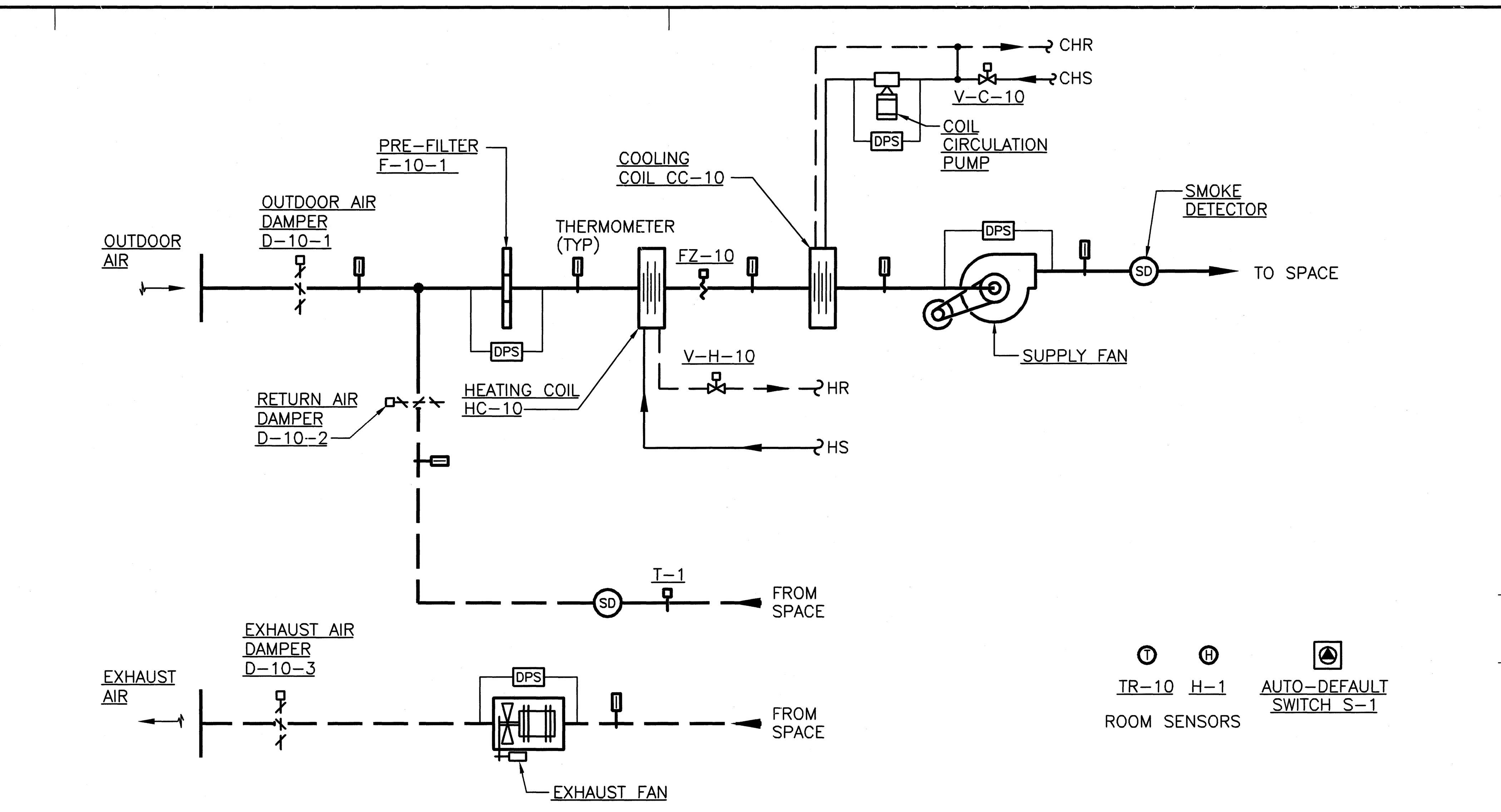
VARIABLE VOLUME AIR HANDLING UNIT – AHU-1 THRU 8

SCALE: NONE (1)



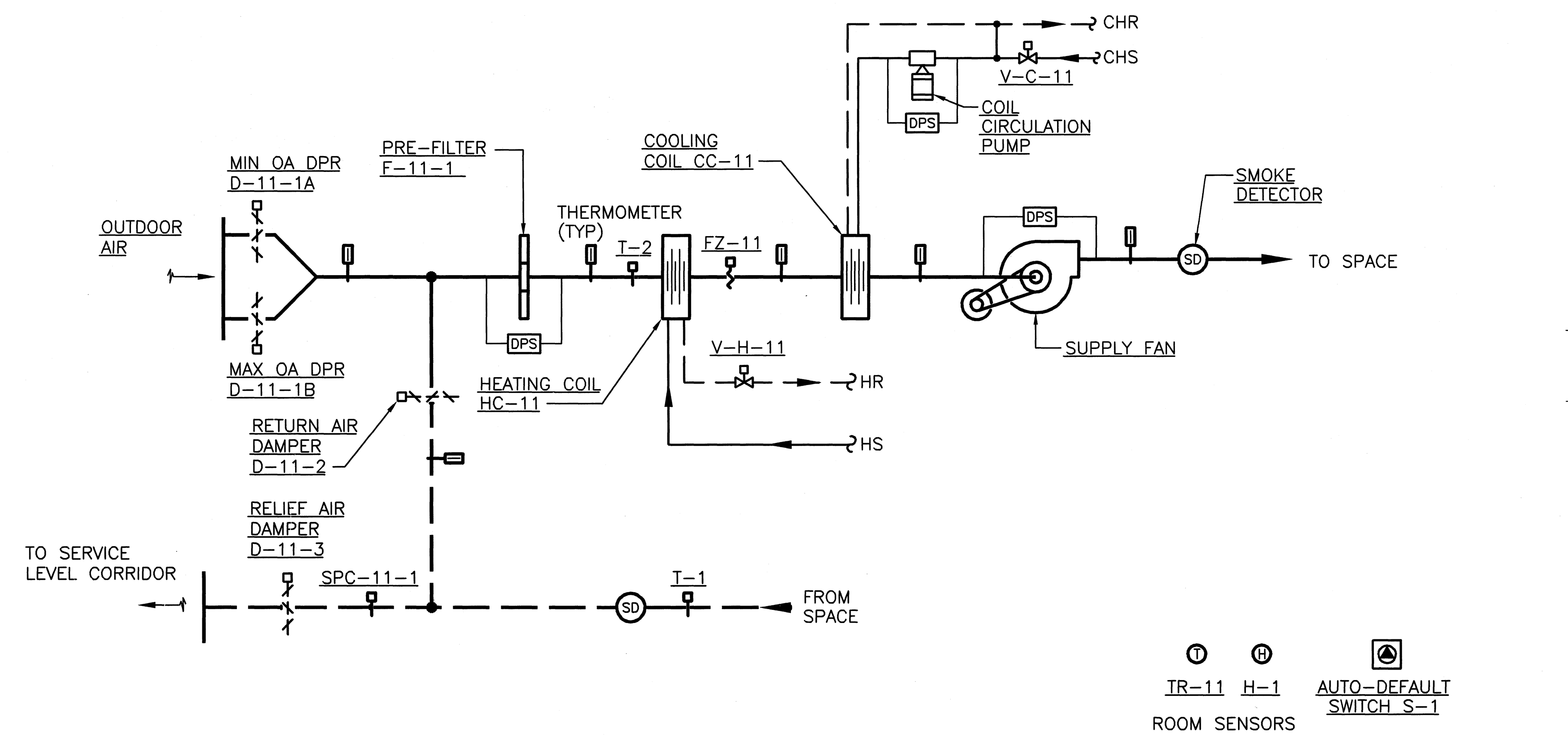
VARIABLE VOLUME (BYPASS) AIR HANDLING UNIT – AHU-9

SCALE: NONE (2)



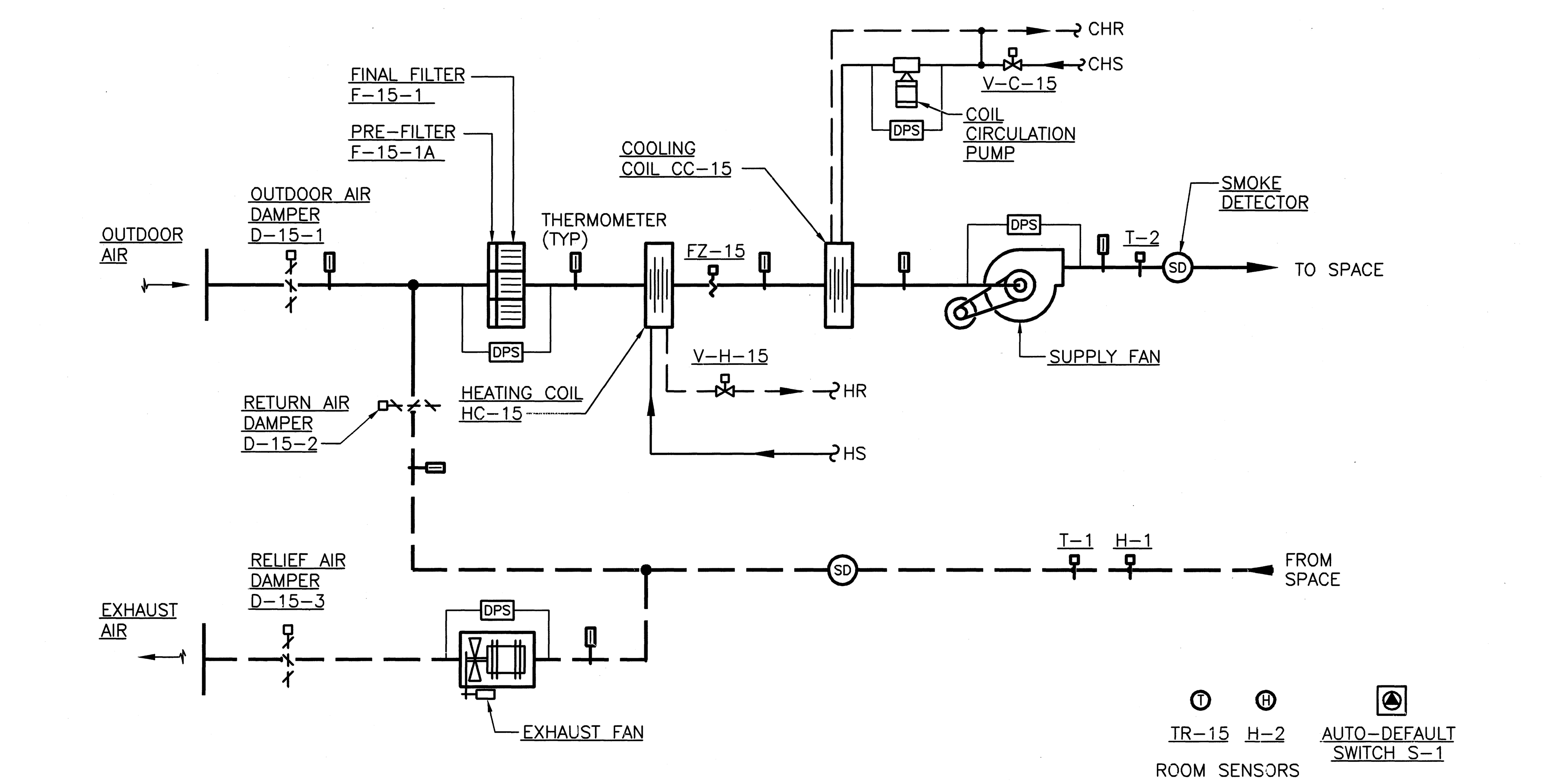
CONSTANT VOLUME AIR HANDLING UNIT – AHU-10, 14, 19

SCALE: NONE (3)



CONSTANT VOLUME AIR HANDLING UNIT – AHU-11, 12, 13, 18,

SCALE: NONE (4)



CONSTANT VOLUME AIR HANDLING UNIT – AHU-15, 16, 17

SCALE: NONE (5)

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MEP PACKAGE
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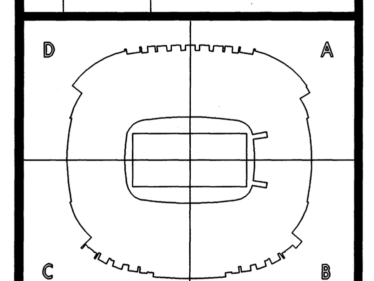
REVISIONS

NO.	DATE	DESCRIPTION

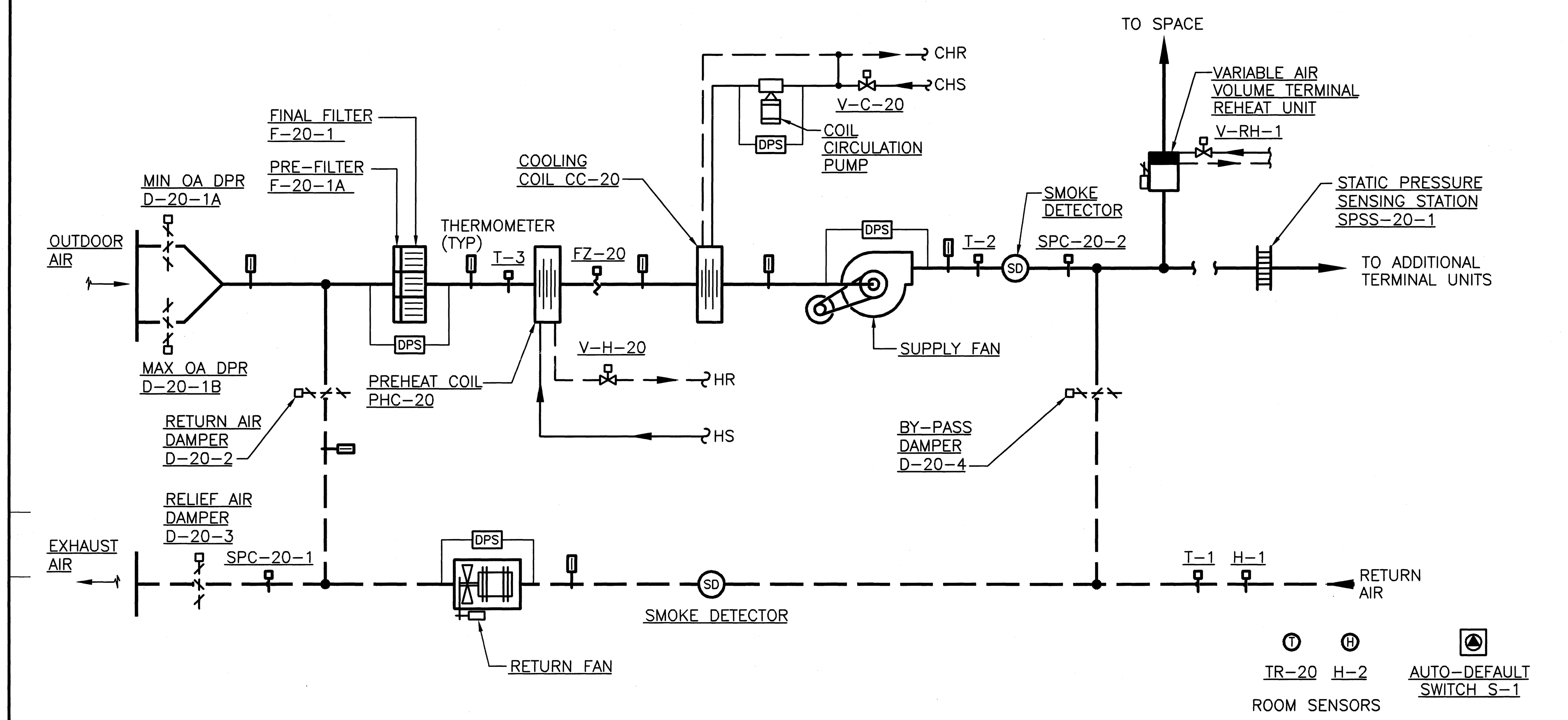


KEYPLAN

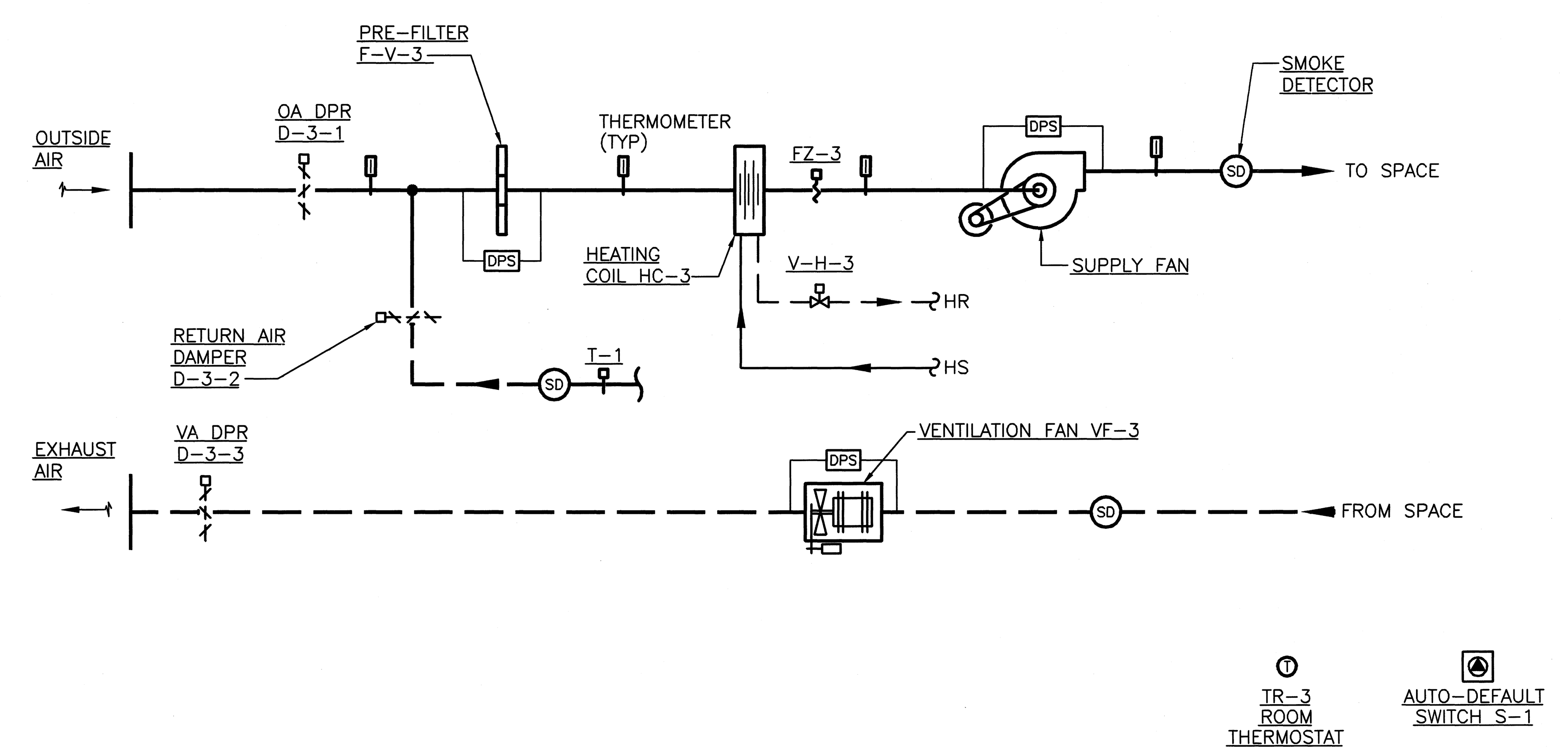
PROJECT NO. 95-675-00 | ISSUED BY:
DRAWN BY: SWS | REVIEWED BY: PJH
ISSUED: 2-28-97

SHEET TITLE
AIR SYSTEM FLOW DIAGRAMS

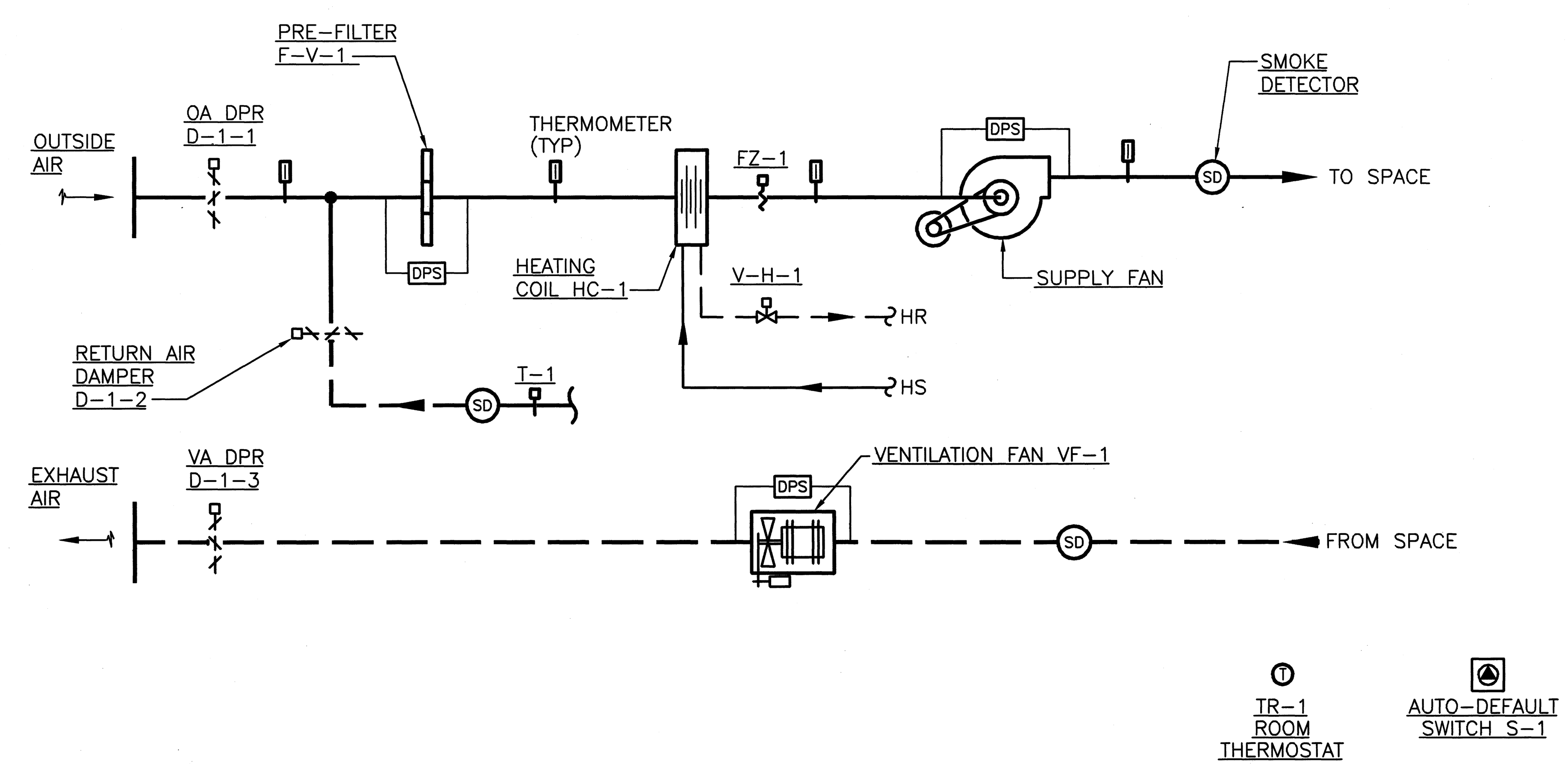
CATEGORY – SUB-CATEGORY – SHEET
M.4-01



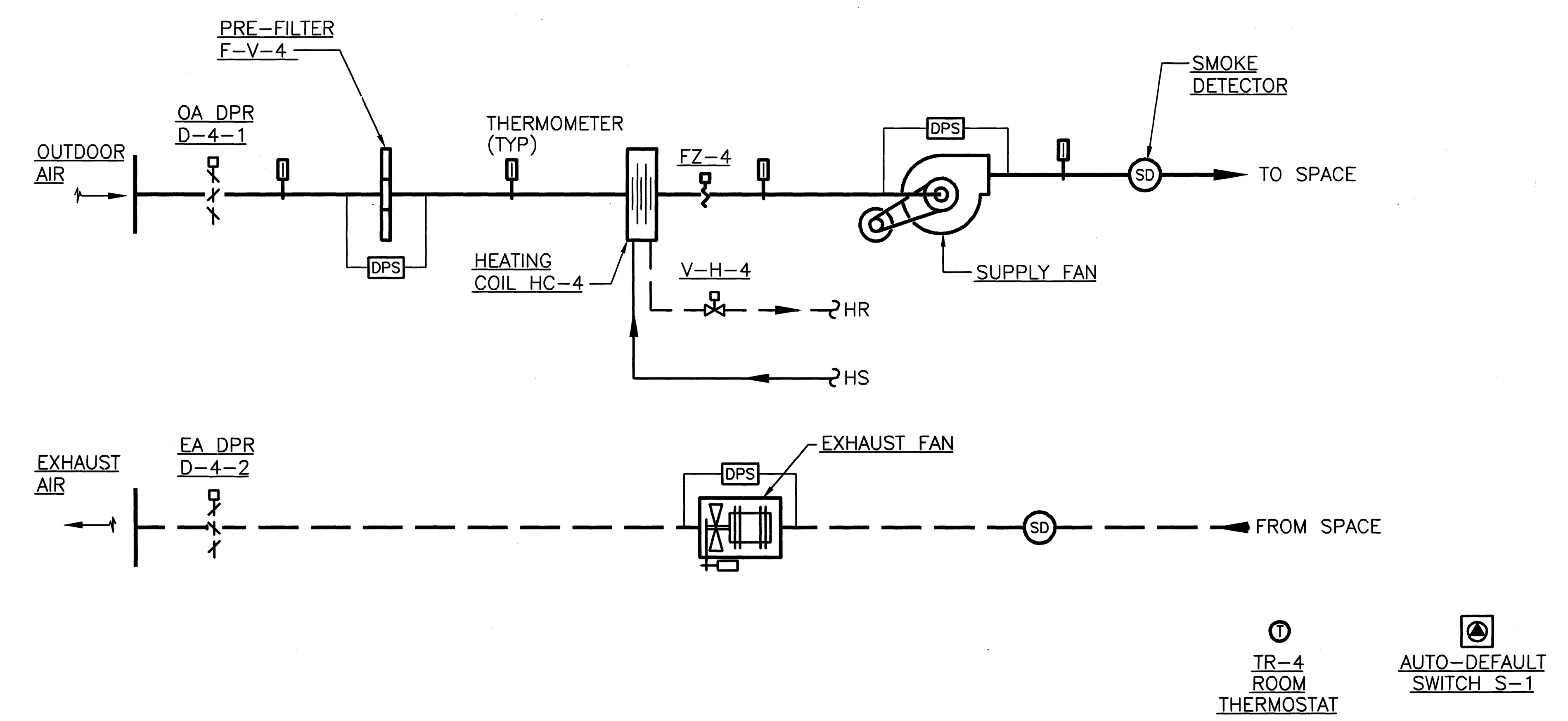
VARIABLE VOLUME (BYPASS) AIR HANDLING UNIT – AHU-20 THRU 23 SCALE: NONE (6)



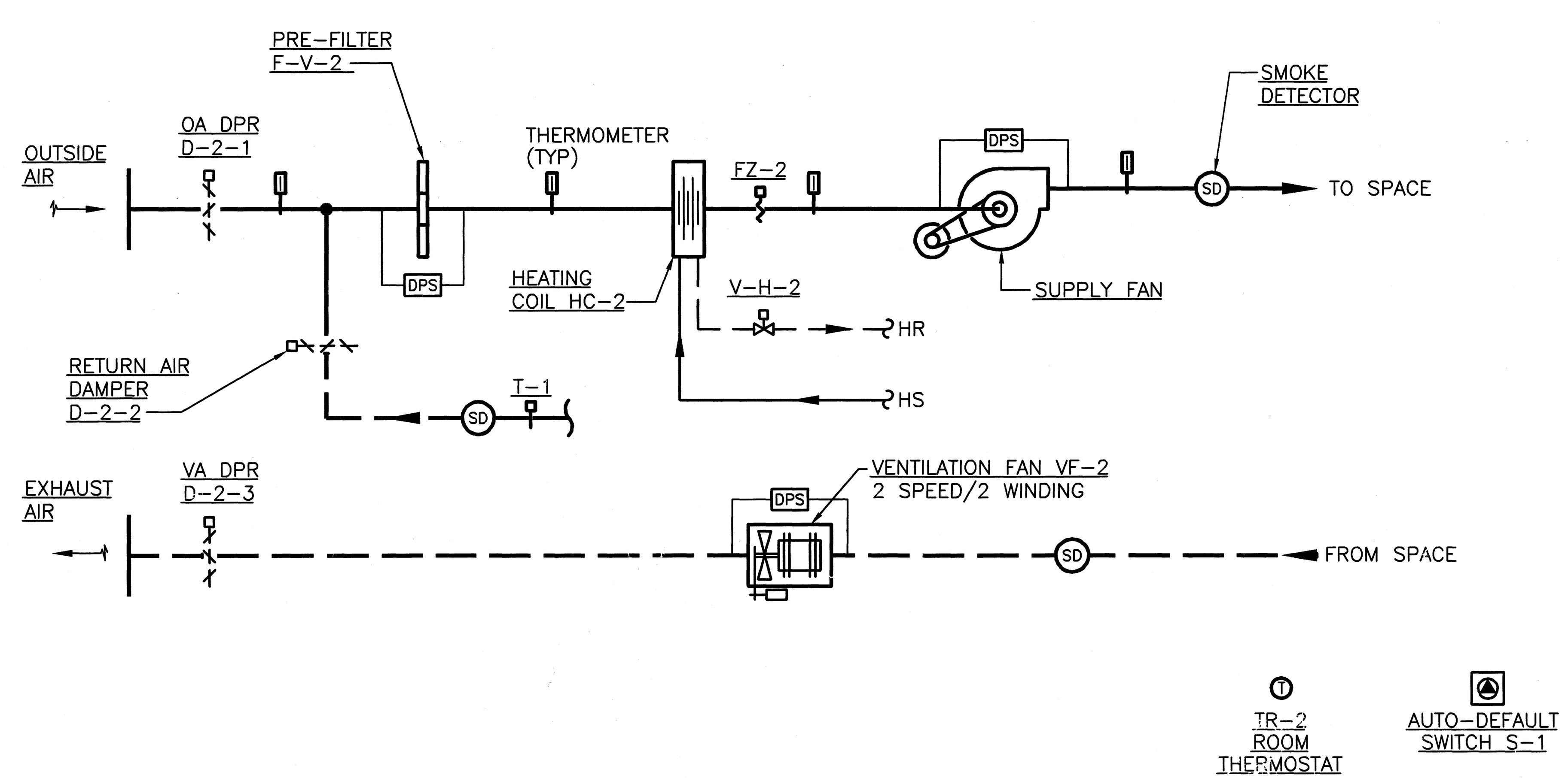
HEATING AND VENTILATING UNIT – HVU-3, 5 SCALE: NONE (9)



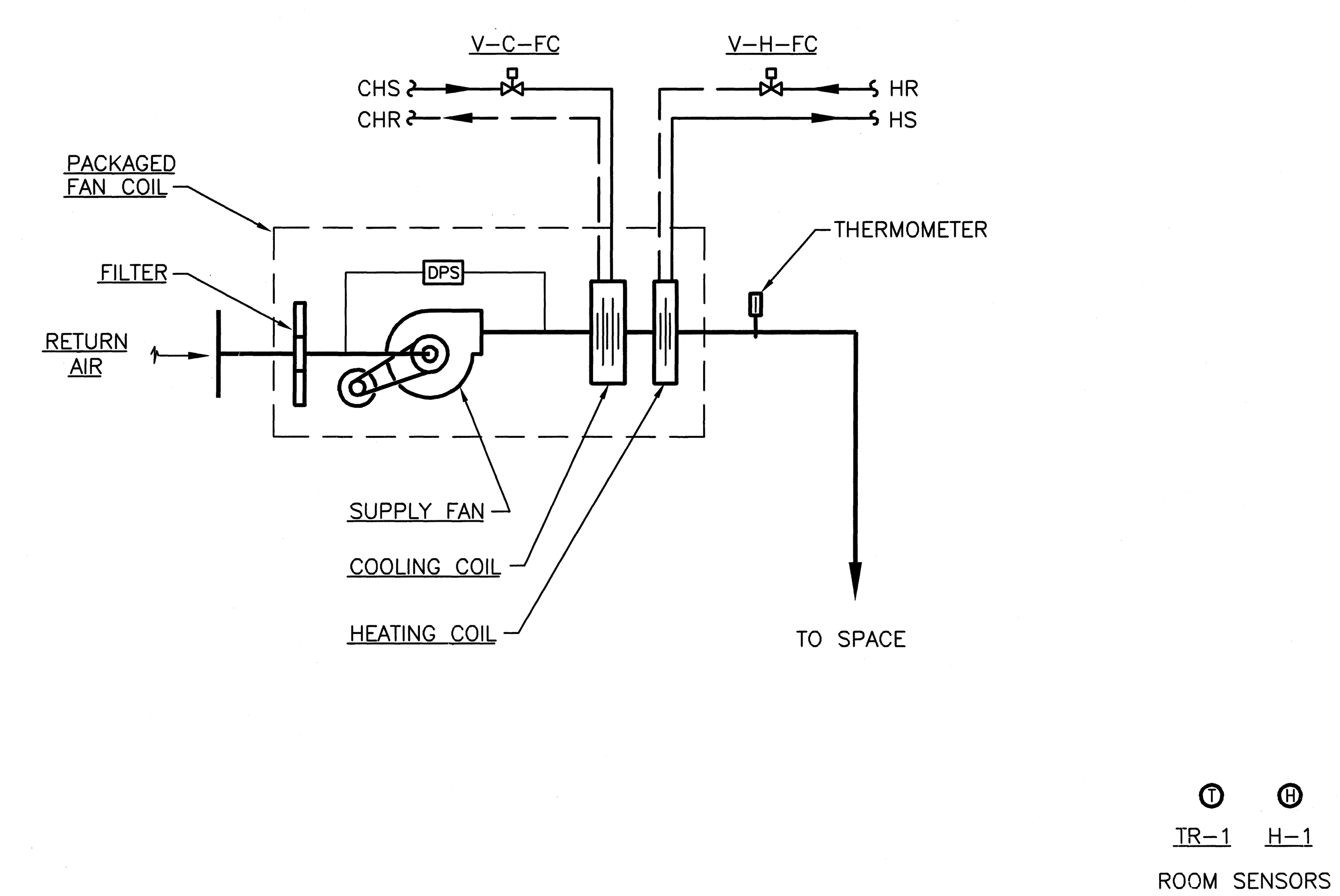
HEATING AND VENTILATING UNIT – HVU-1, 7 SCALE: NONE (7)



HEATING AND VENTILATING UNIT – HVU-4 SCALE: NONE (10)



HEATING AND VENTILATING UNIT – HVU-2, 6 SCALE: NONE (8)



TYPICAL – SUITE FAN COIL UNIT SCALE: NONE (11)

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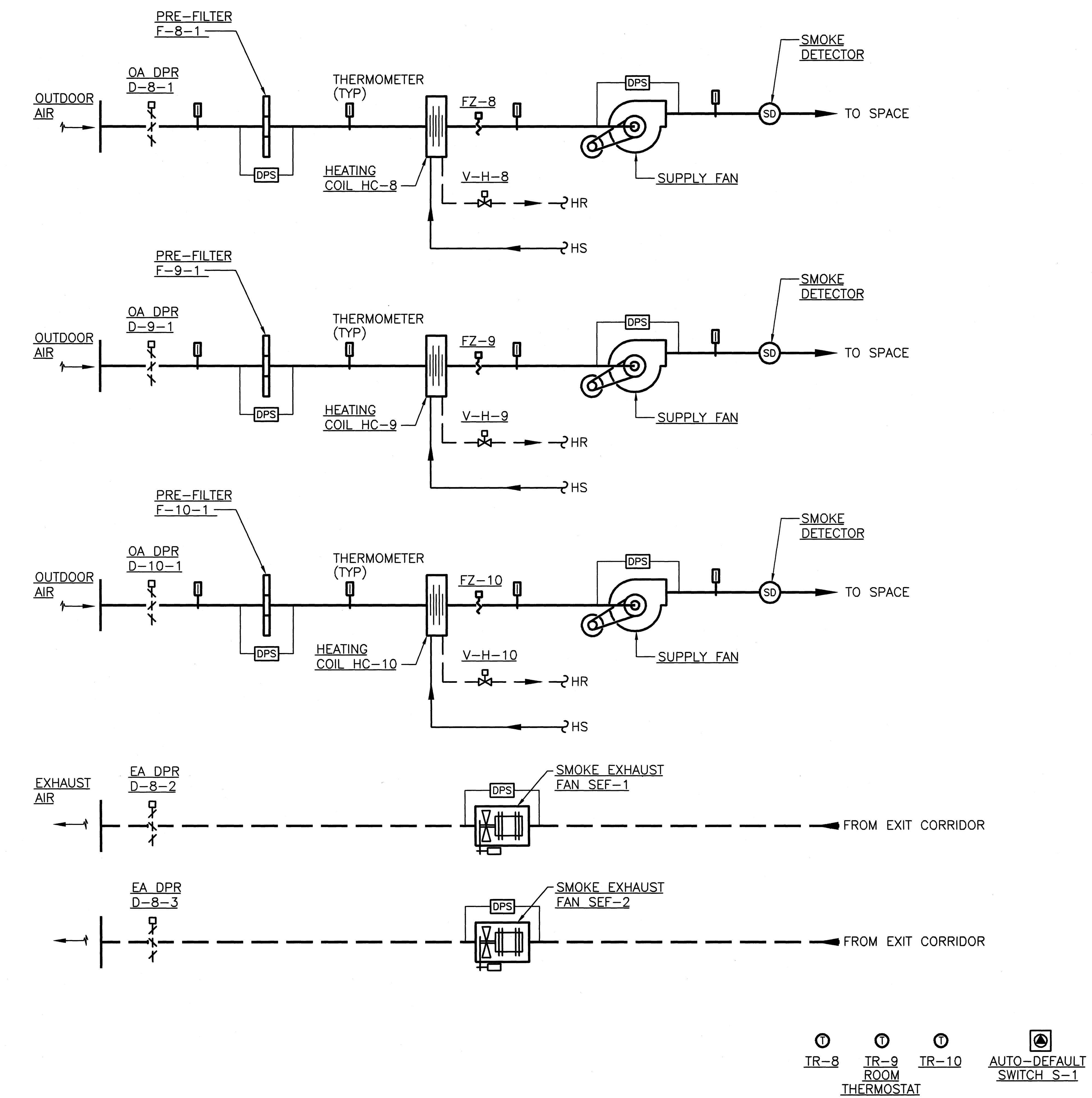
DRAWN BY: SWS	REVIEWED BY: PJH
ISSUED: 2-28-97	

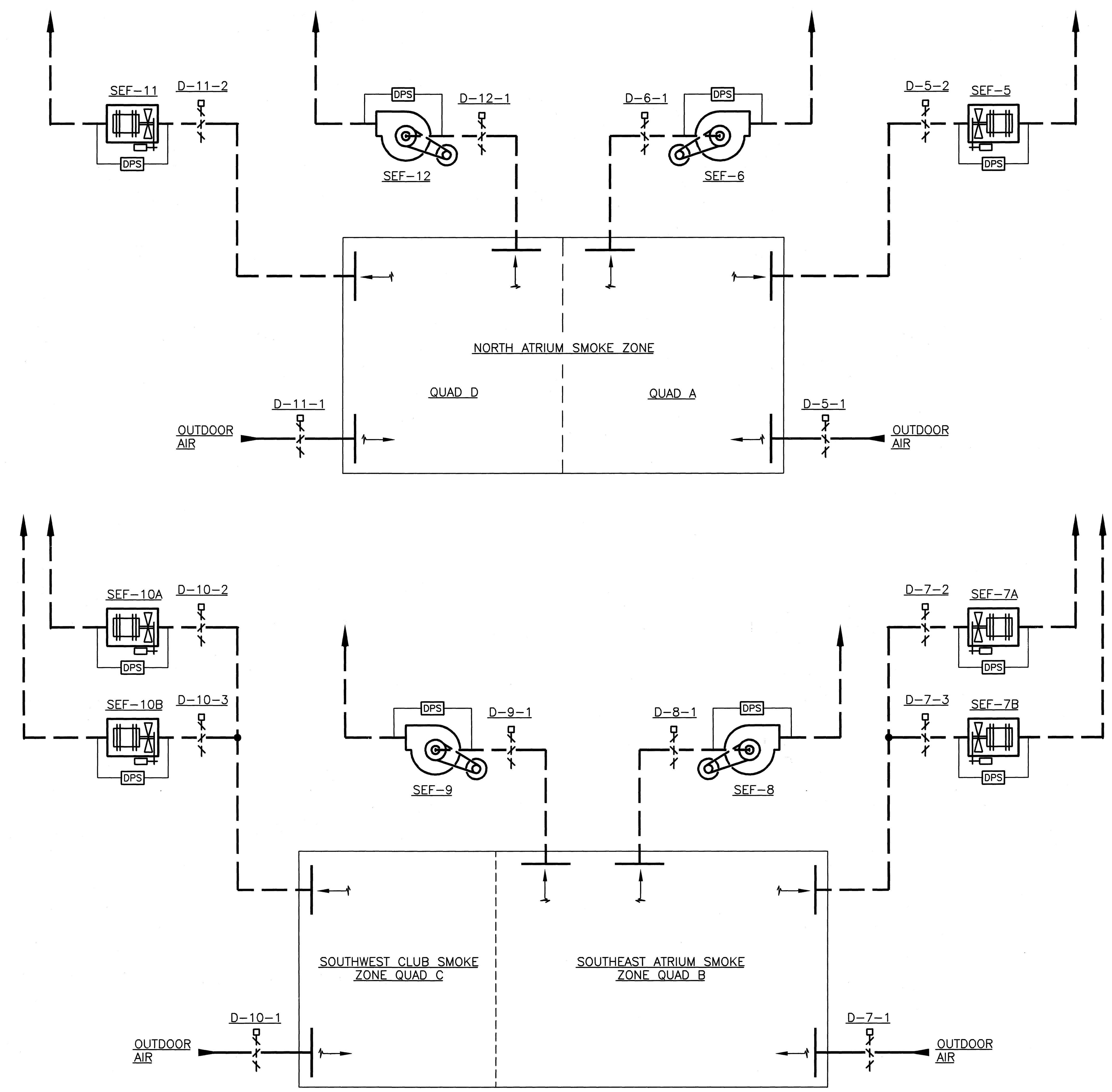
SHEET TITLE
AIR SYSTEM FLOW DIAGRAMS

CATEGORY – SUB-CATEGORY – SHEET
M.4-02



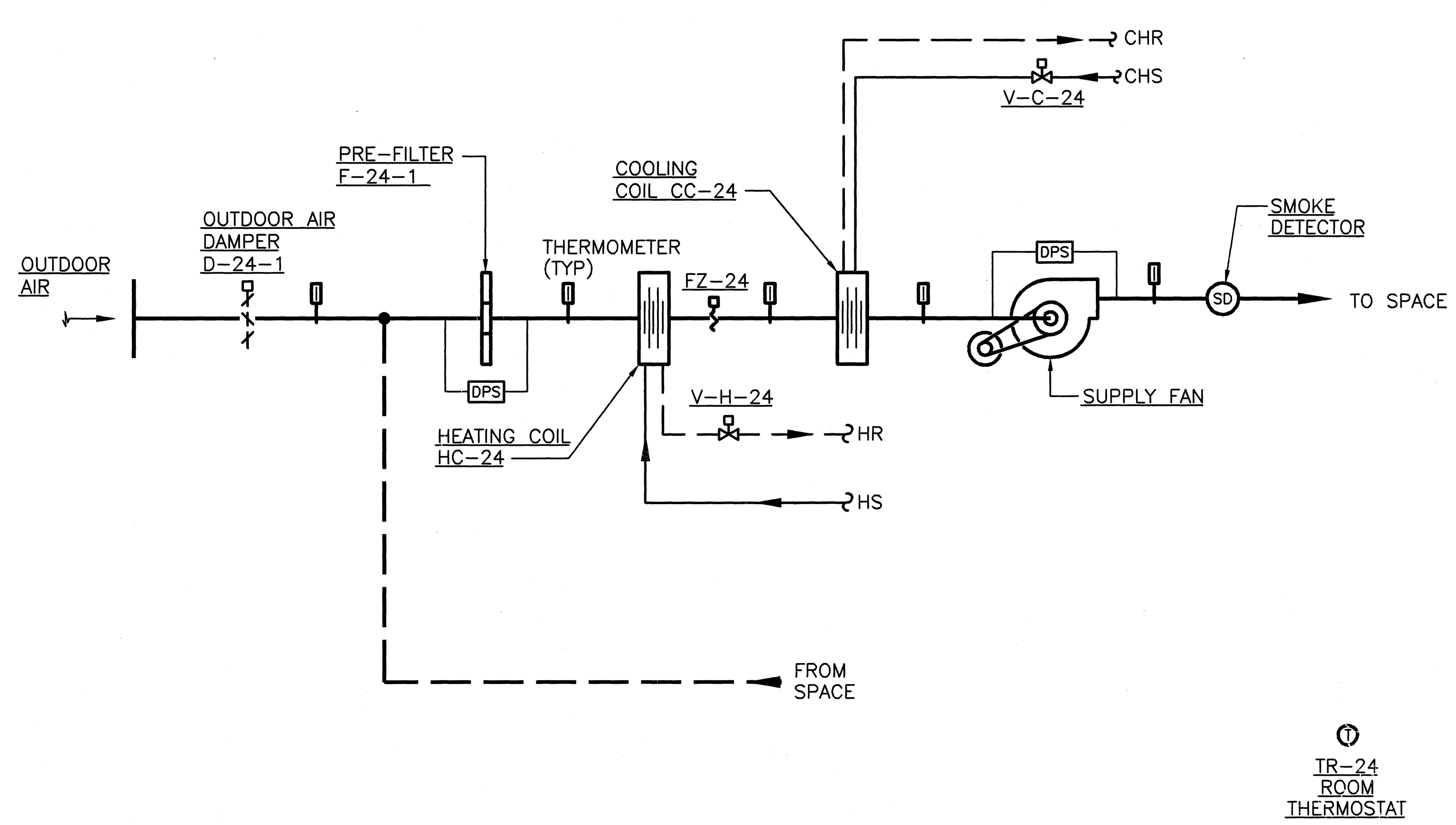
HEATING AND VENTILATING UNIT – HVU-8, 9, 10, 11, 12, 13

SCALE: NONE (12)



ATRIUM SMOKE EXHAUST SYSTEMS

SCALE: NONE (14)



CONSTANT VOLUME AIR HANDLING UNIT – AHU-24, 25, 26

SCALE: NONE (13)

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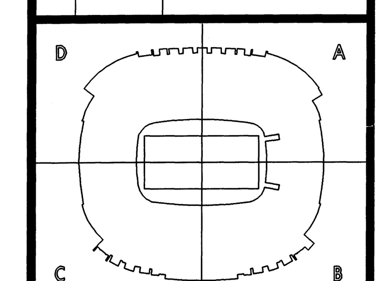
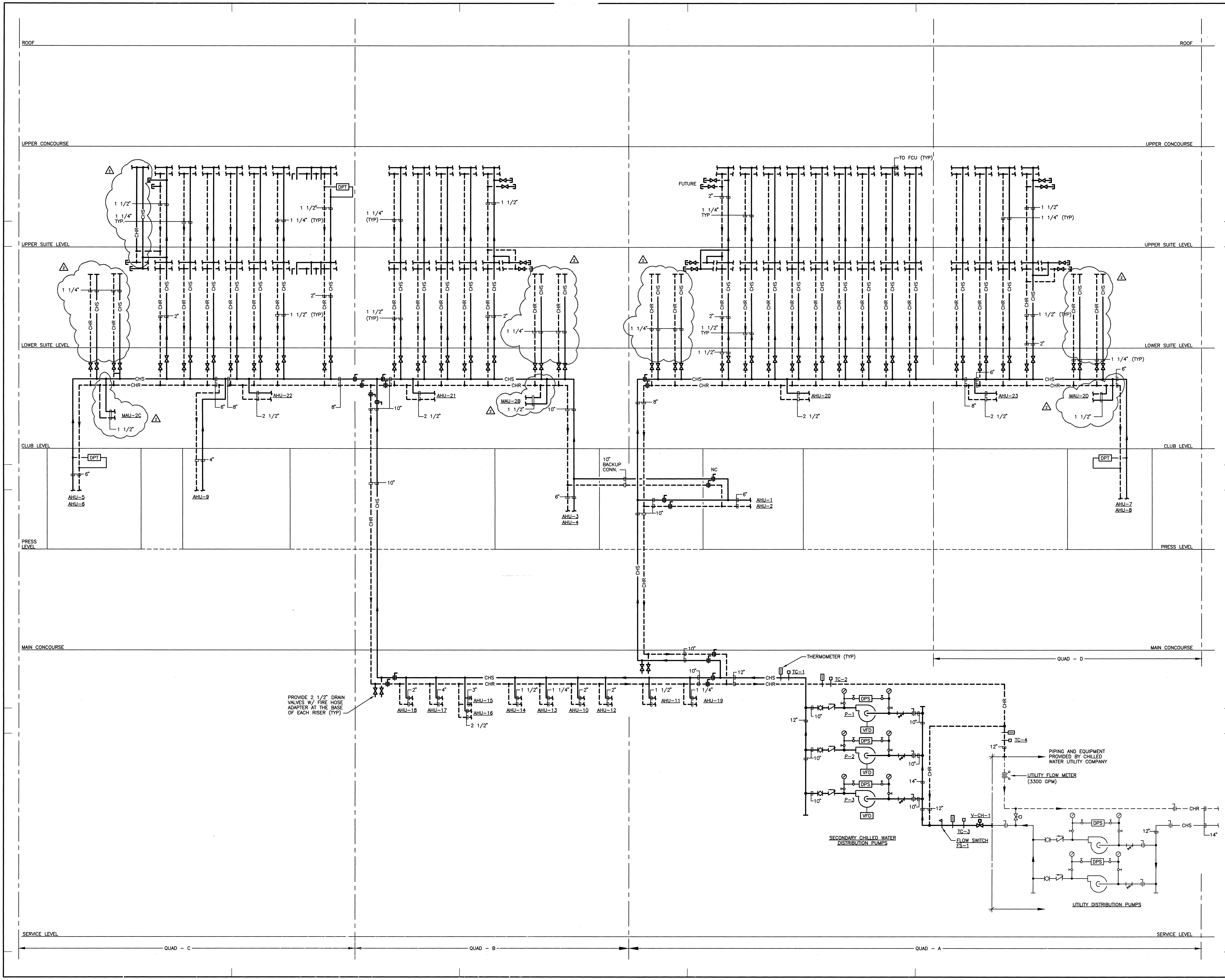


KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: SWS	REVIEWED BY: PJH
ISSUED: 2-28-97	

SHEET TITLE
AIR SYSTEM FLOW DIAGRAMS

CATEGORY – SUB-CATEGORY – SHEET
M.4-03



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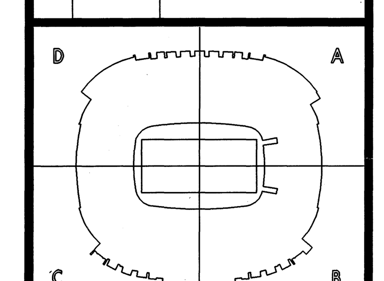
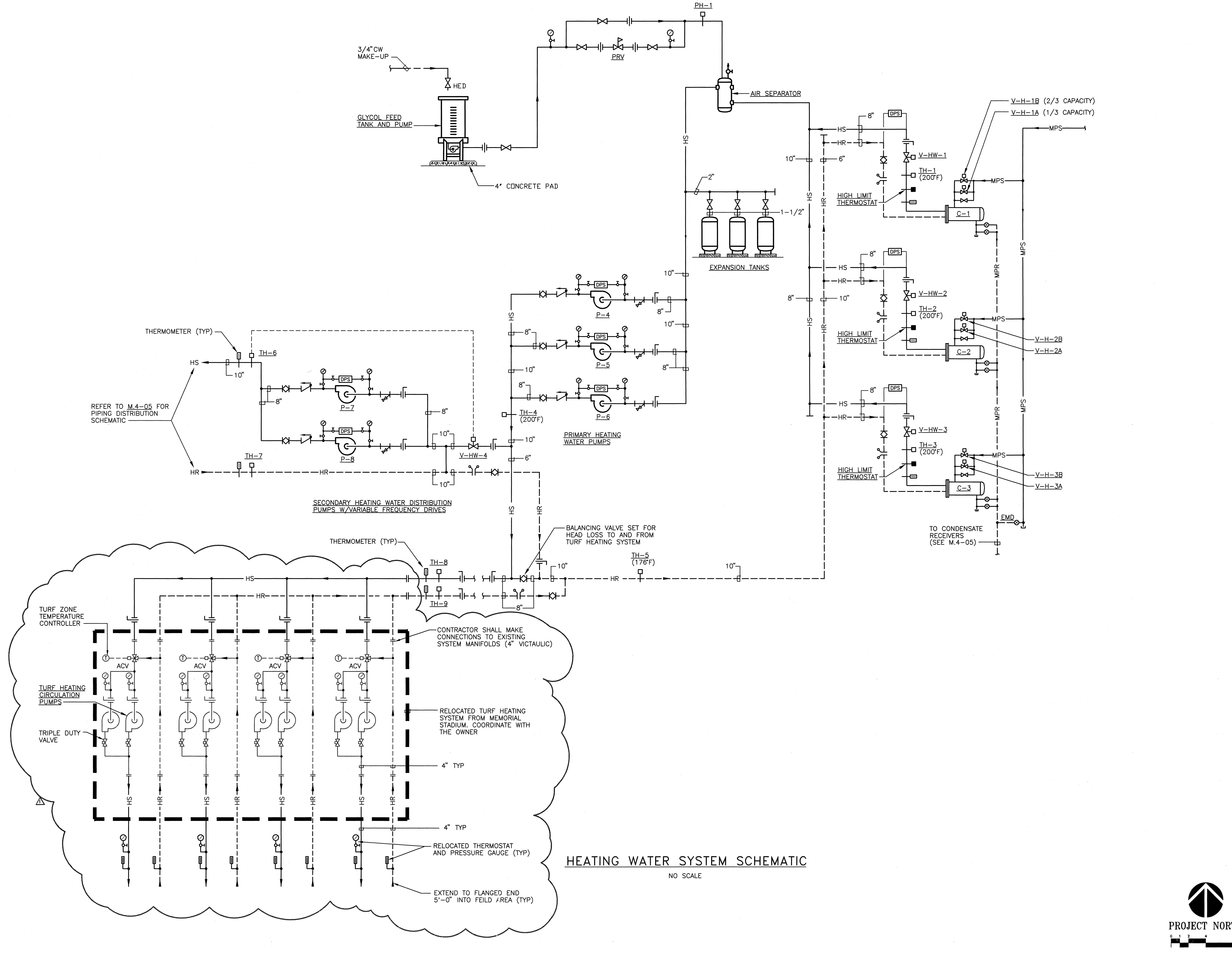
REVISIONS

NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: RPB
REVIEWED BY: PJH
ISSUED: 2-28-97
SHEET TITLE
CHILLED WATER SYSTEM SCHEMATIC
CATEGORY - SUB-CATEGORY - SHEET
M.4-04



HEATING WATER SYSTEM SCHEMATIC

NO SCALE

SPORT

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NO.	DATE	DESCRIPTION
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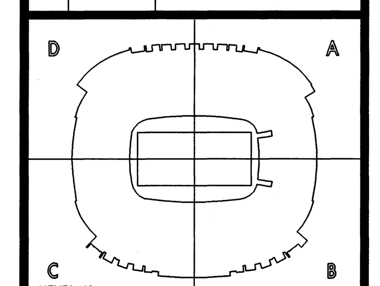


KEYPLAN

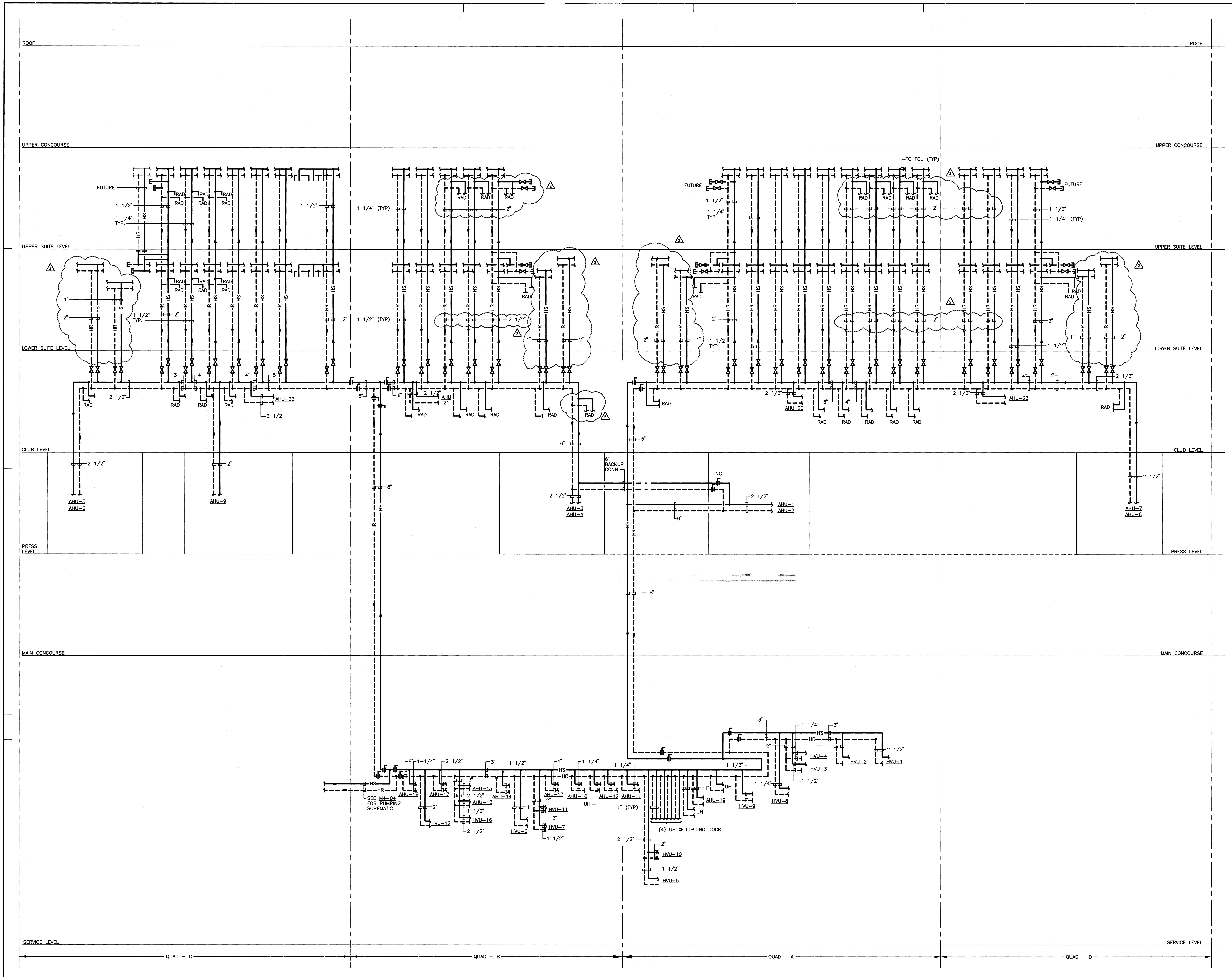
PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: MAL
REVIEWED BY: DSP
ISSUED: 2-28-97

SHEET TITLE

HEATING WATER SYSTEM SCHEMATIC

CATEGORY - SUB-CATEGORY - SHEET

M.4-05



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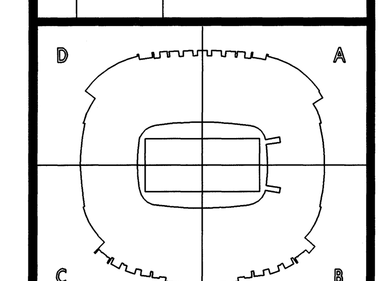
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

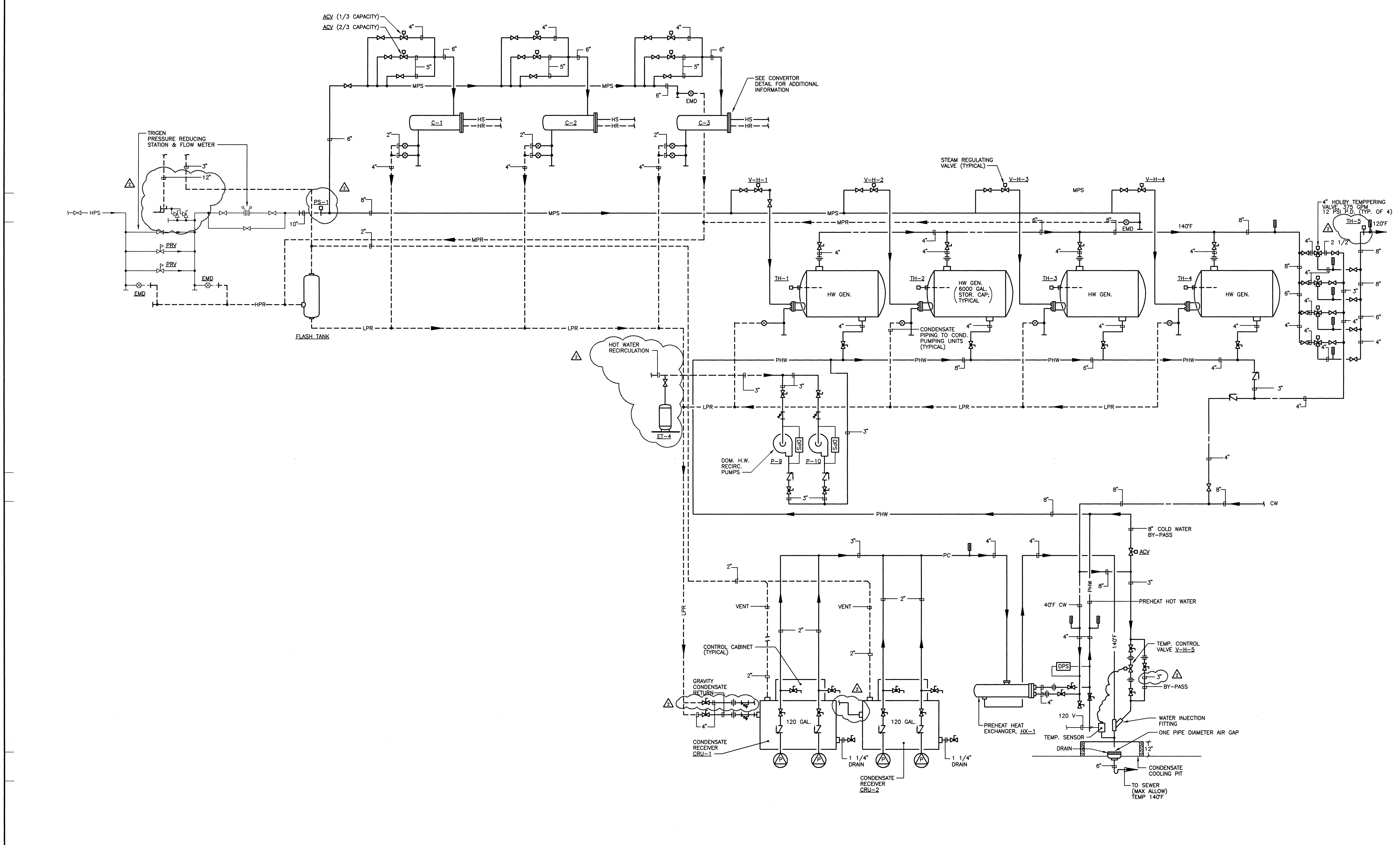


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: RPB
REVIEWED BY: PJH
ISSUED: 2-28-97

SHEET TITLE
HEATING WATER DISTRIBUTION SCHEMATIC

CATEGORY - SUB-CATEGORY - SHEET
M.4-06



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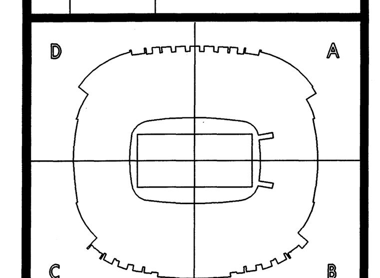
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

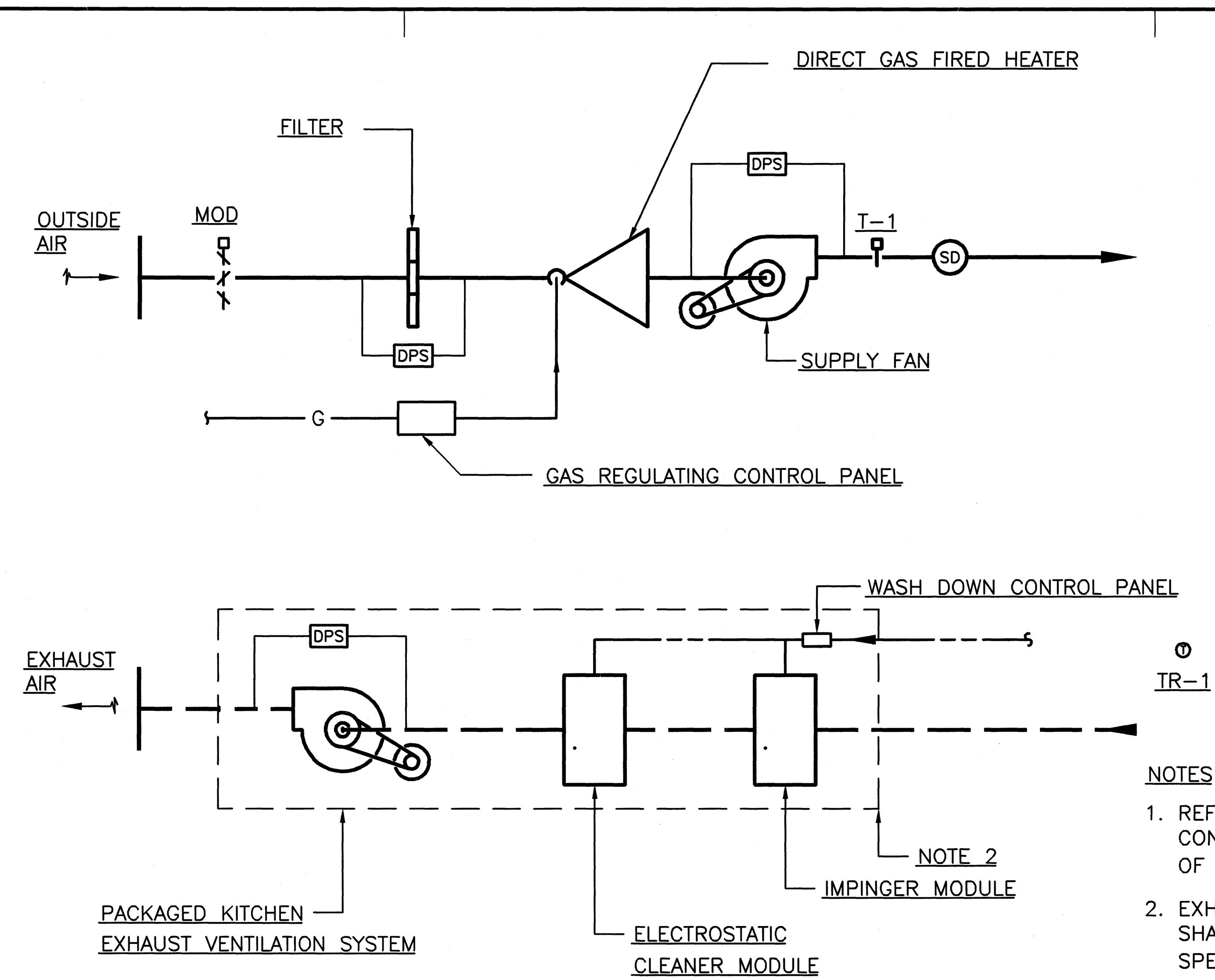


KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: RPB	REVIEWED BY: PJH
ISSUED: 2-28-97	

SHEET TITLE
STEAM SYSTEM SCHEMATIC

CATEGORY - SUB-CATEGORY - SHEET
M.4-07

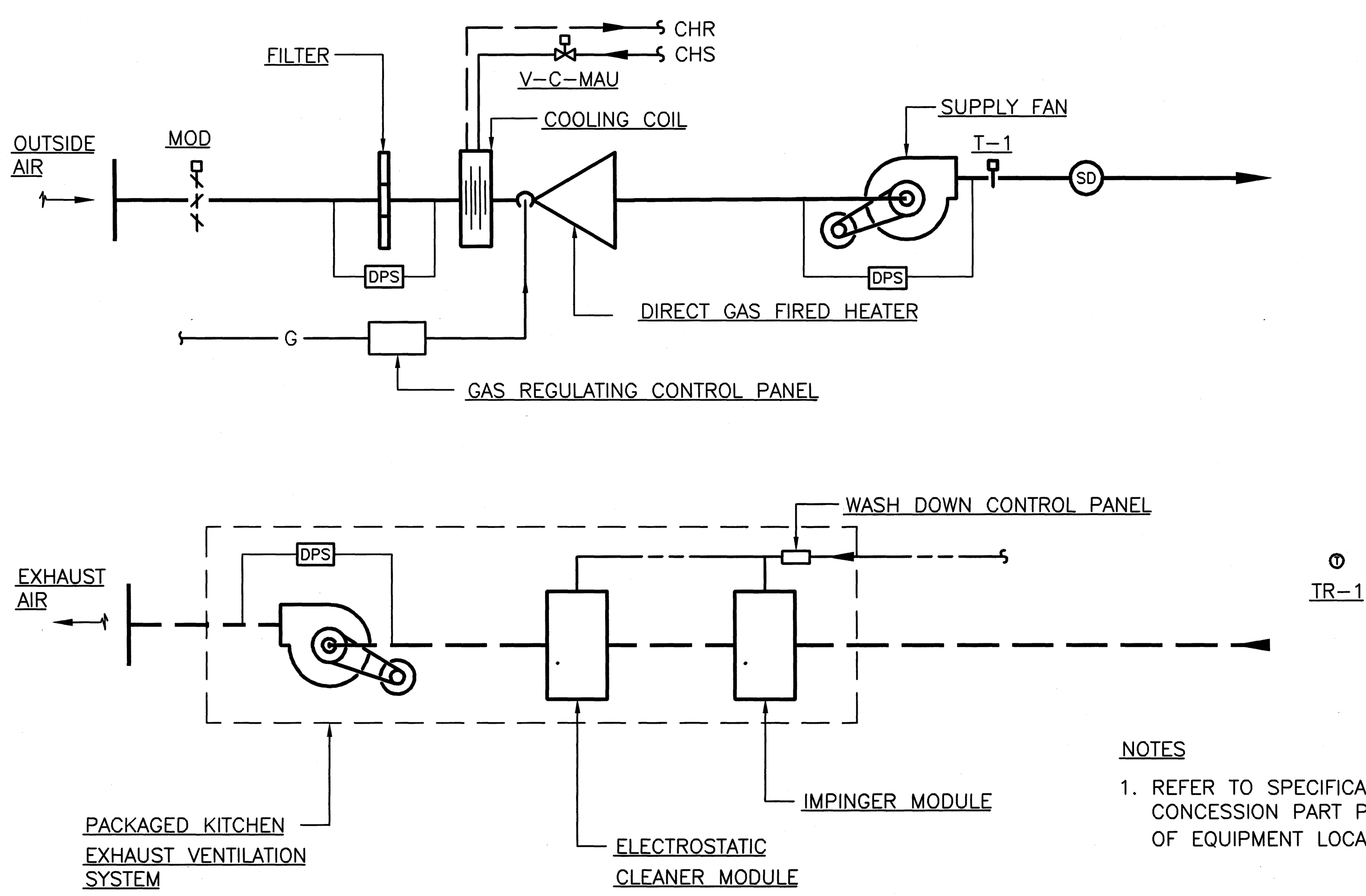


NOTES

1. REFER TO SPECIFICATION AND CONCESSION PART PLANS FOR COORDINATION OF EQUIPMENT LOCATION
2. EXHAUST VENTILATION SYSTEM TYPE SHALL BE COORDINATED WITH PROJECT SPECIFICATION AND CONCESSION PART PLANS

COOKING CONCESSION TYPE A

SCALE: NONE 12

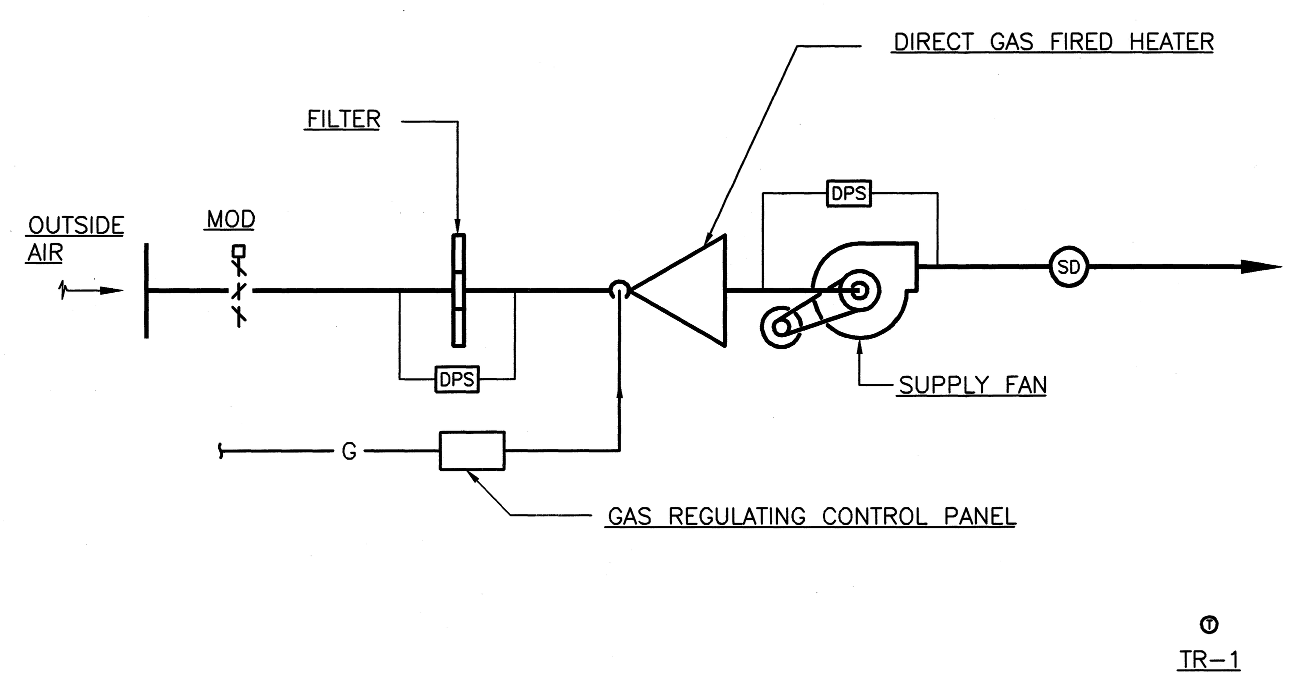


NOTES

1. REFER TO SPECIFICATION AND CONCESSION PART PLANS FOR COORDINATION OF EQUIPMENT LOCATION

COOKING CONCESSION TYPE B

SCALE: NONE 13



NOTES

1. REFER TO SPECIFICATION AND CONCESSION PART PLANS FOR COORDINATION OF EQUIPMENT LOCATION

NON-COOKING CONCESSION

SCALE: NONE 14

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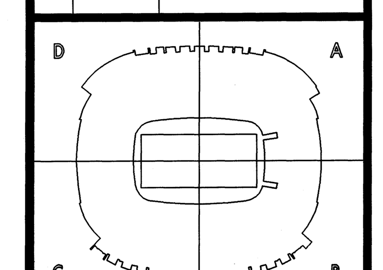
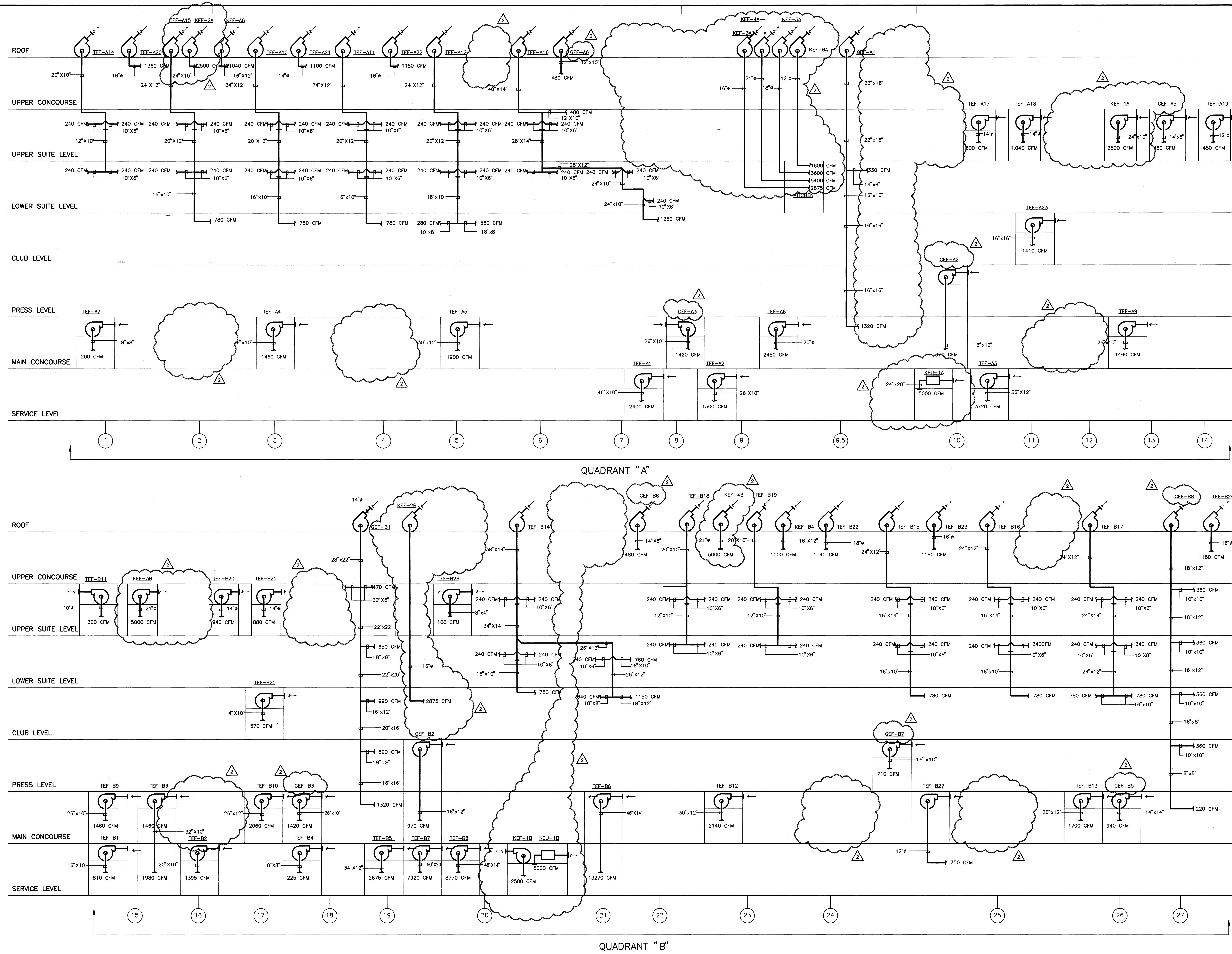


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: SWS
REVIEWED BY: PJH
ISSUED: 2-28-97

SHEET TITLE
CONCESSION AIR SYSTEM FLOW DIAGRAMS

CATEGORY - SUB-CATEGORY - SHEET
M.4-08



EXHAUST RISER DIAGRAM
NO SCALE

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REVISIONS

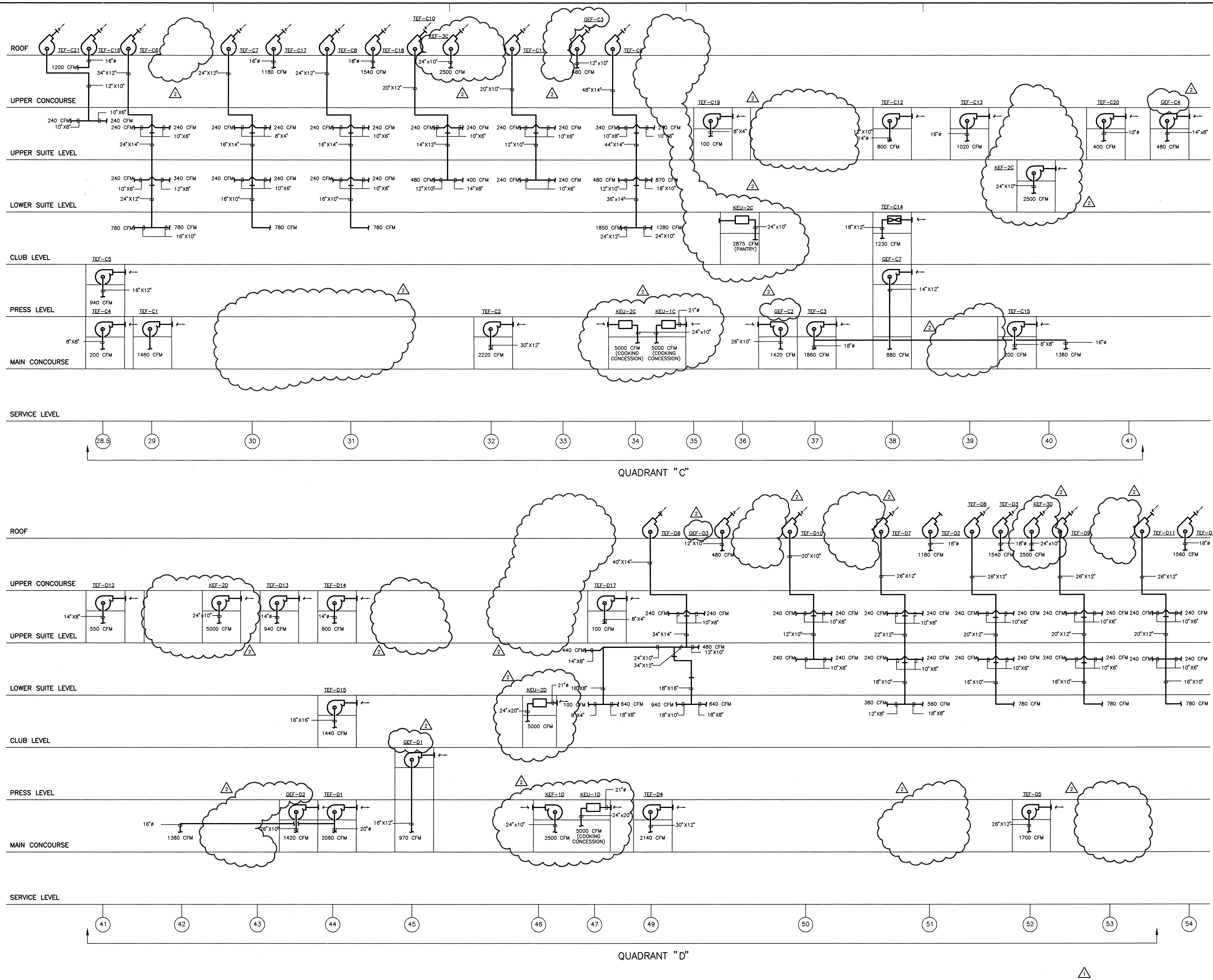
NO.	DATE	DESCRIPTION

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY:	REVIEWED BY:
ISSUED: 2-28-97	

SHEET TITLE
CONCESSION EXHAUST RISER DIAGRAM

CATEGORY – SUB-CATEGORY – SHEET
M.5-01



EXHAUST RISER DIAGRAM

NO SCALE

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Kansas City, Missouri 64105

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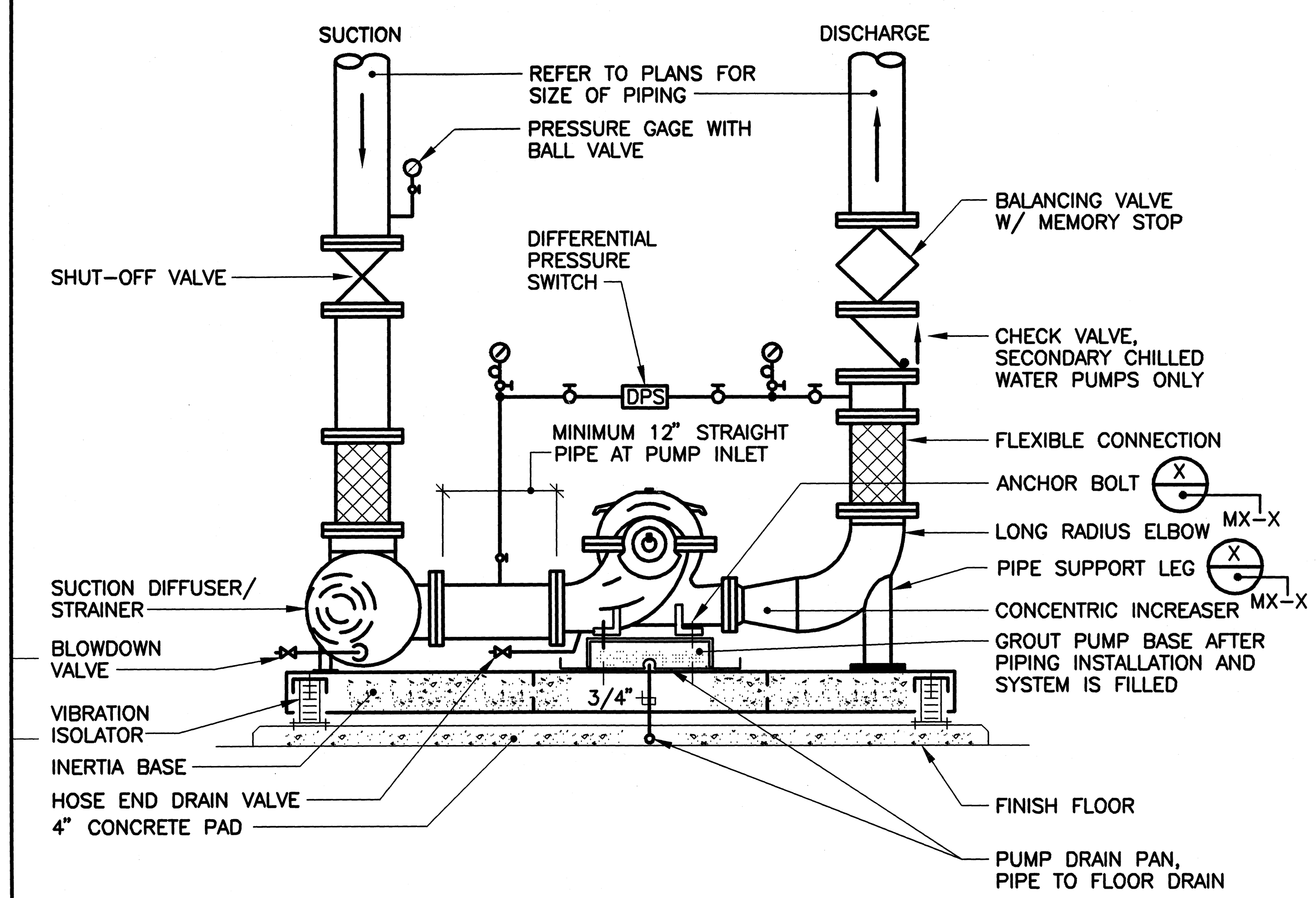
2	4-28-97	BULLETIN #44

KEYPLAN
D A C B

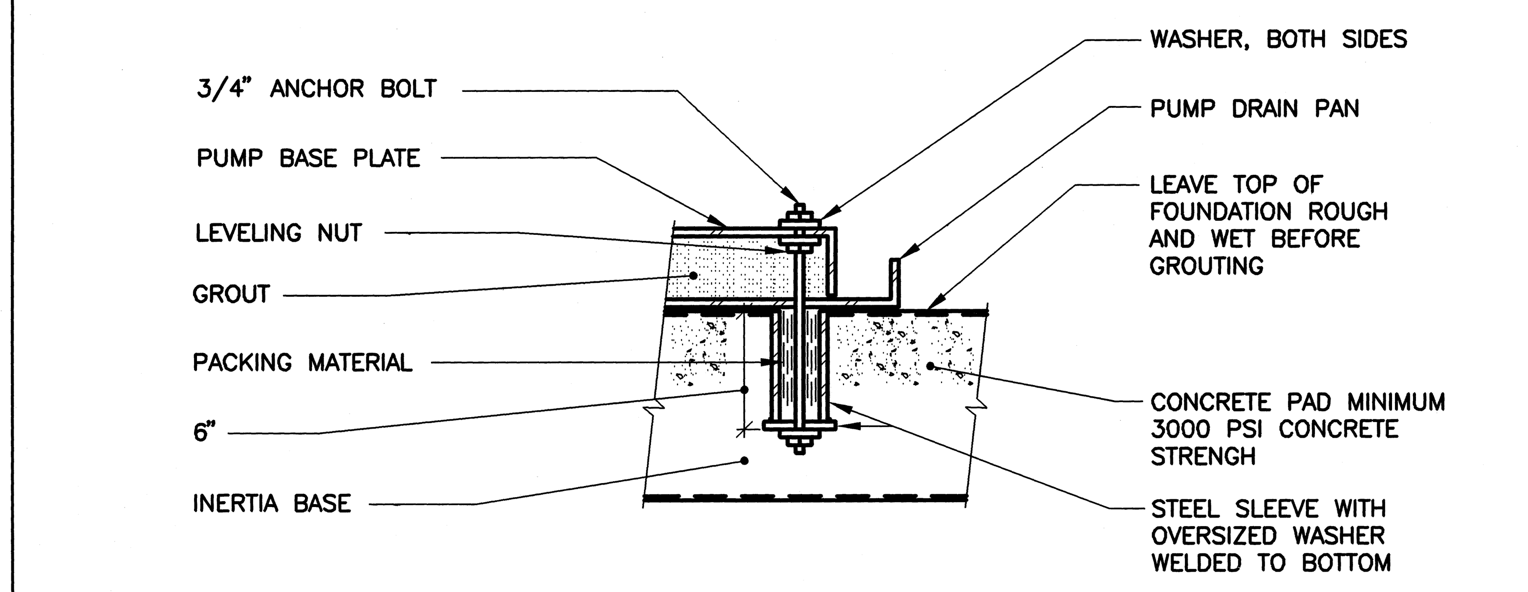
PROJECT NO. 95-675-00 | ISSUED BY:
DRAWN BY: | REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
AIR SYSTEM
EXHAUST RISER
DIAGRAM

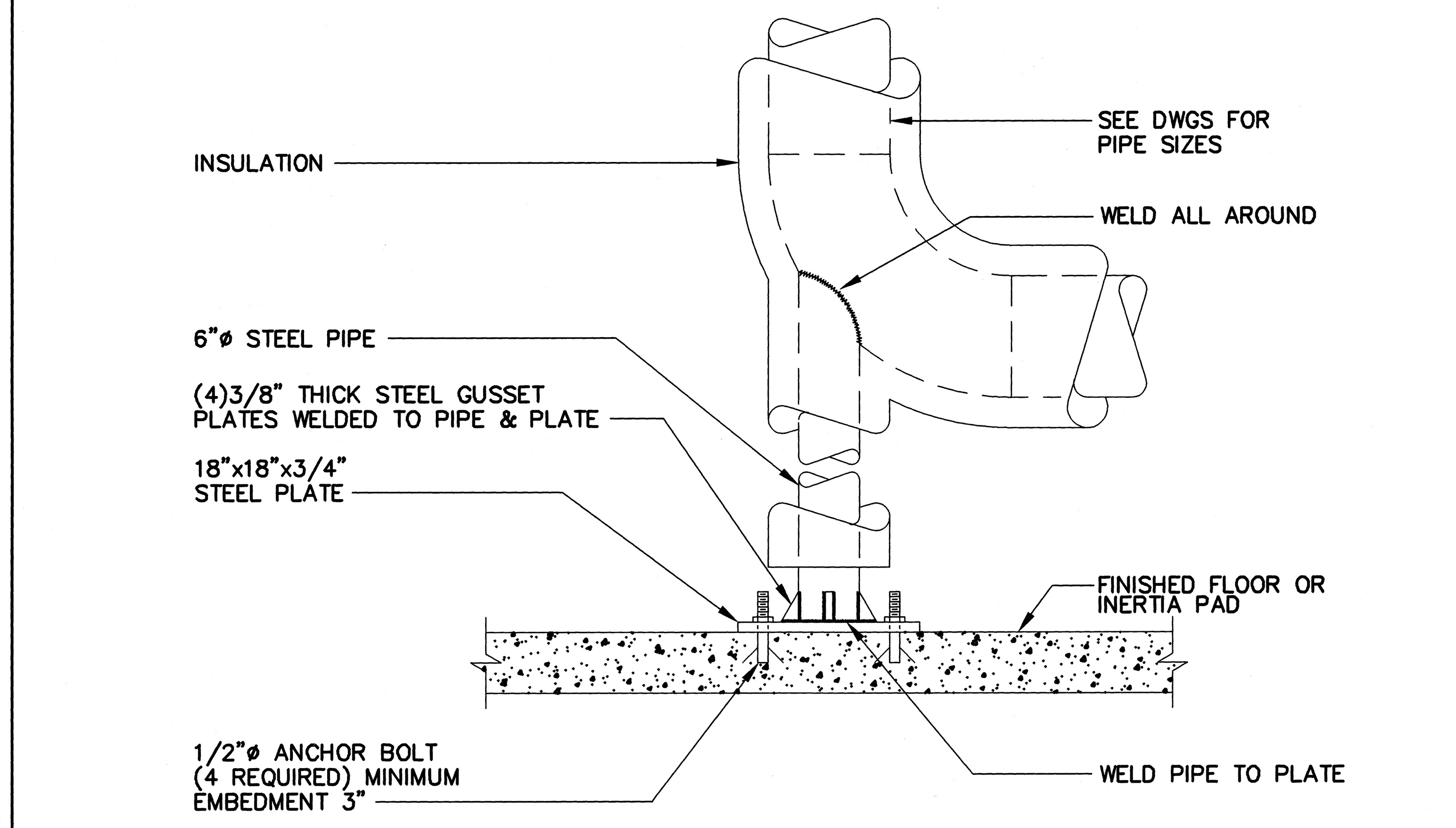
CATEGORY - SUB-CATEGORY - SHEET
M.5-02



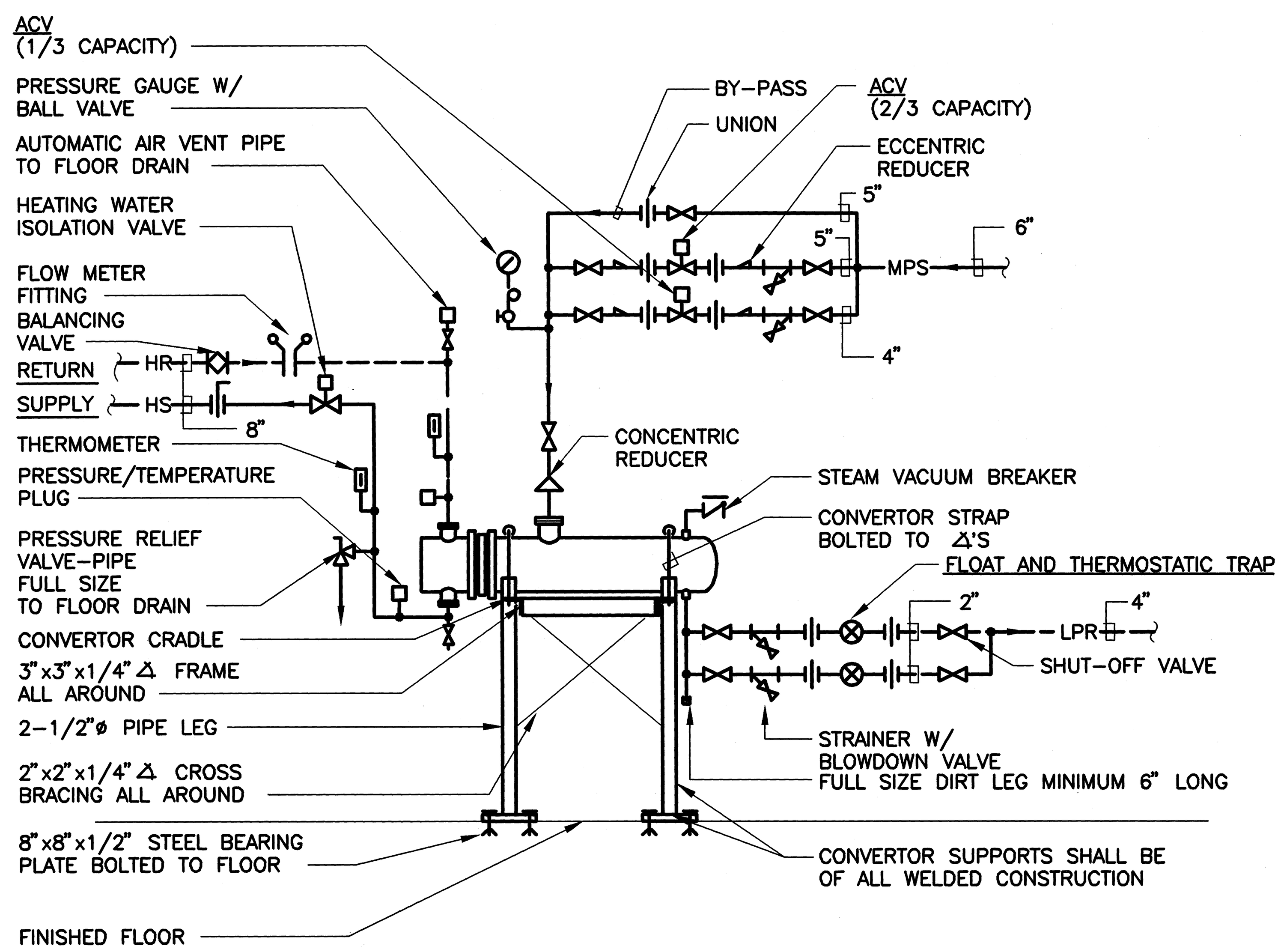
DETAIL – HORIZONTAL SPLIT CASE PUMP | SCALE: NONE | 1



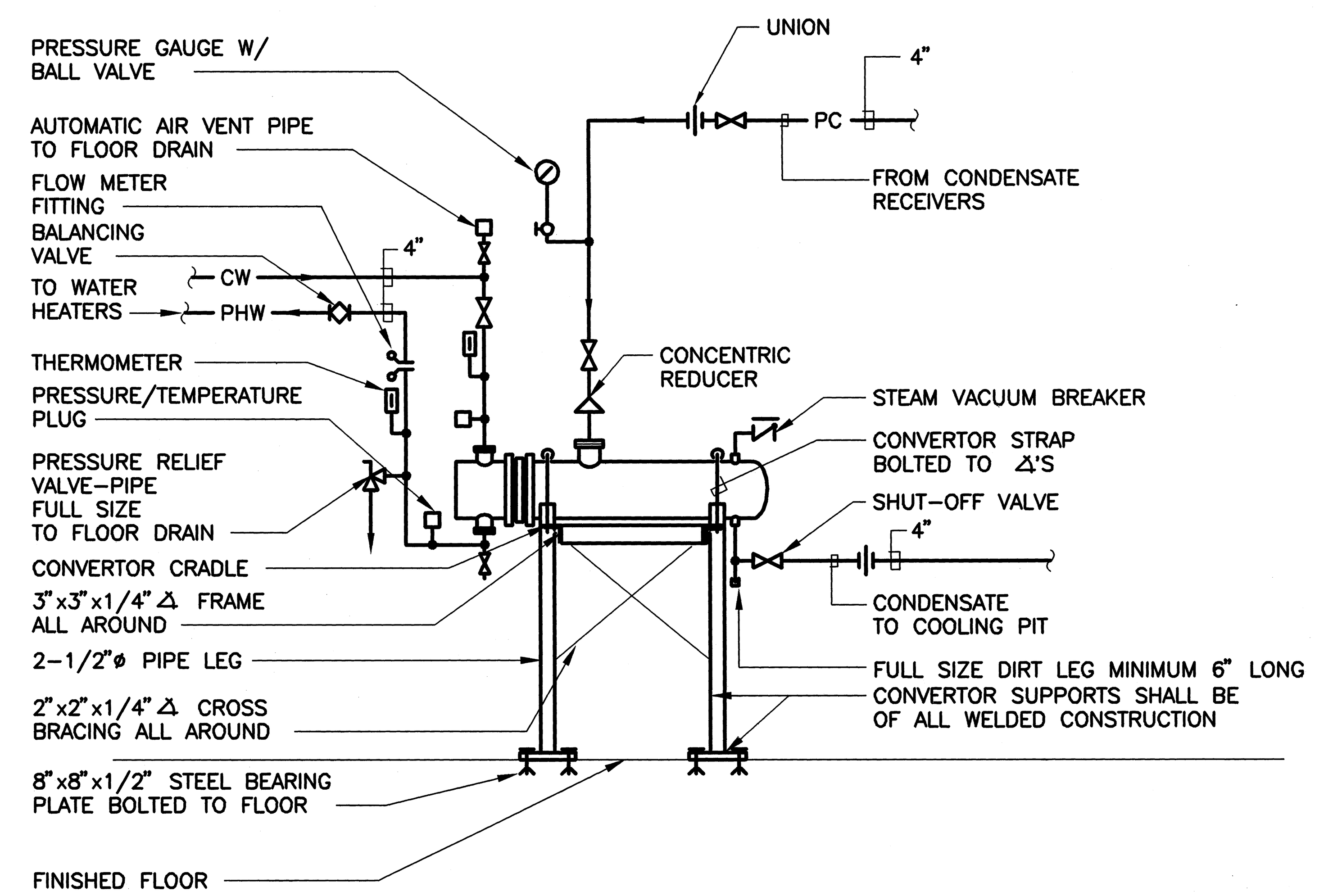
DETAIL – PUMP BASE ANCHOR SUPPORT (TYPICAL) | SCALE: NONE | 2



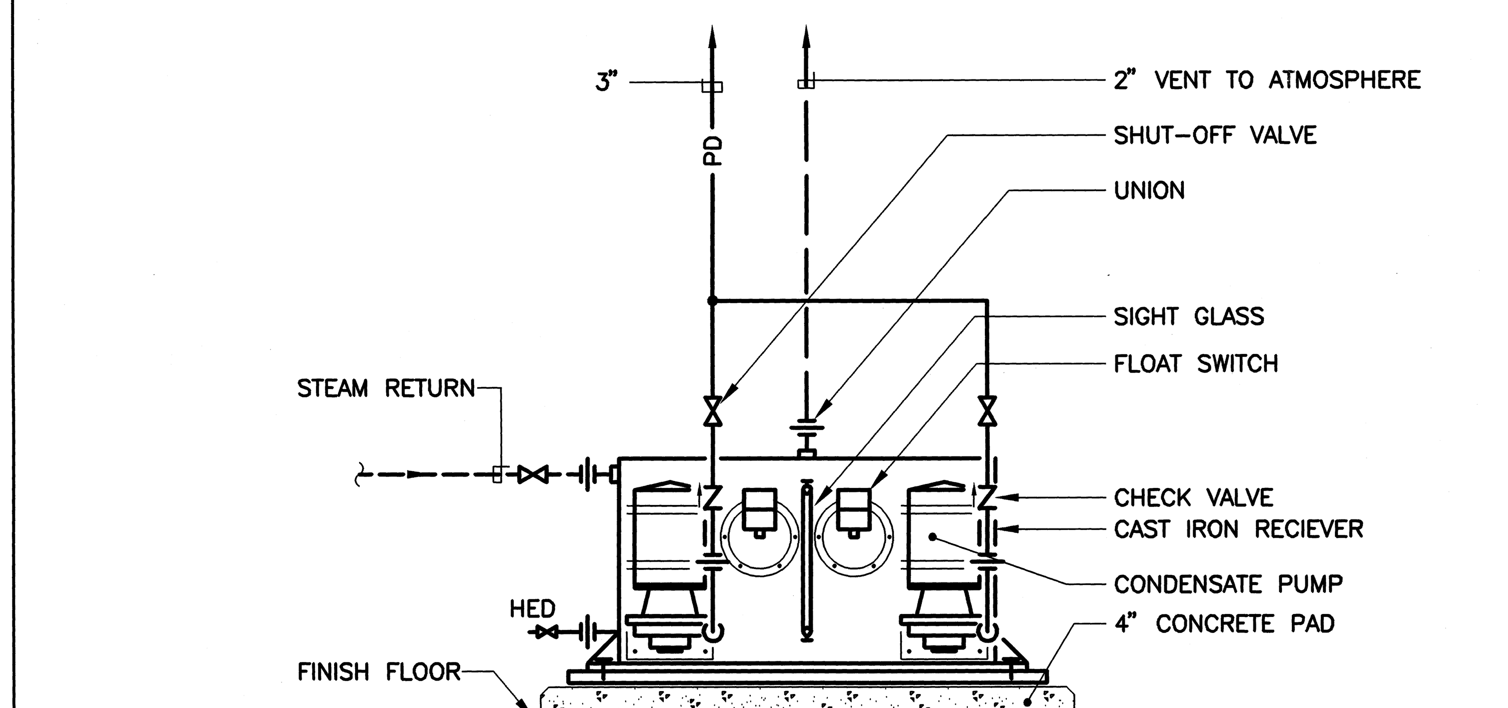
DETAIL – PIPE RISER SUPPORT | SCALE: NONE | 3



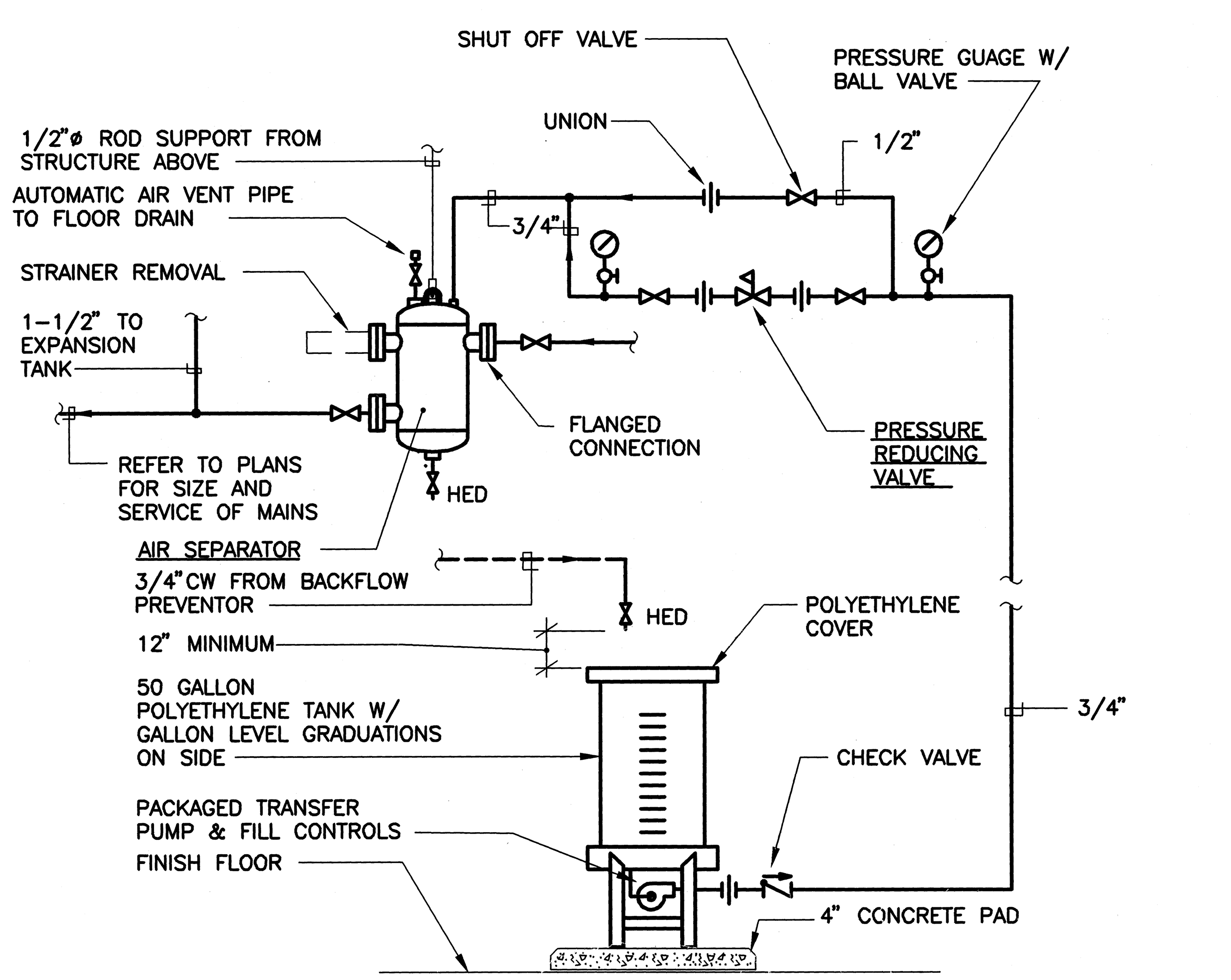
DETAIL – STEAM/HEATING WATER CONVECTOR | SCALE: NONE | 4



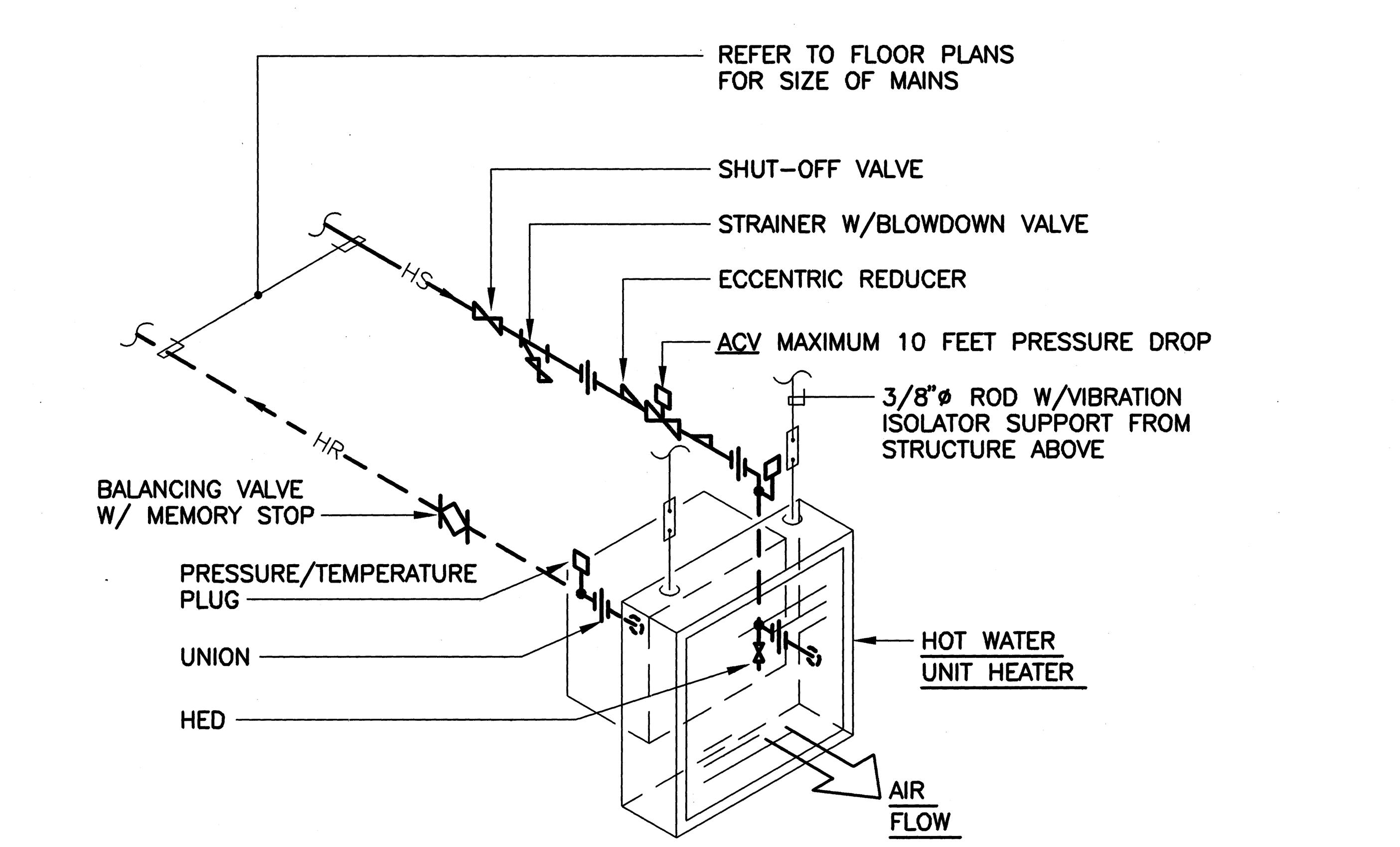
DETAIL – DOMESTIC HOT WATER PREHEATER | SCALE: NONE | 5



DETAIL – DUPLEX CONDENSATE PUMP | SCALE: NONE | 6

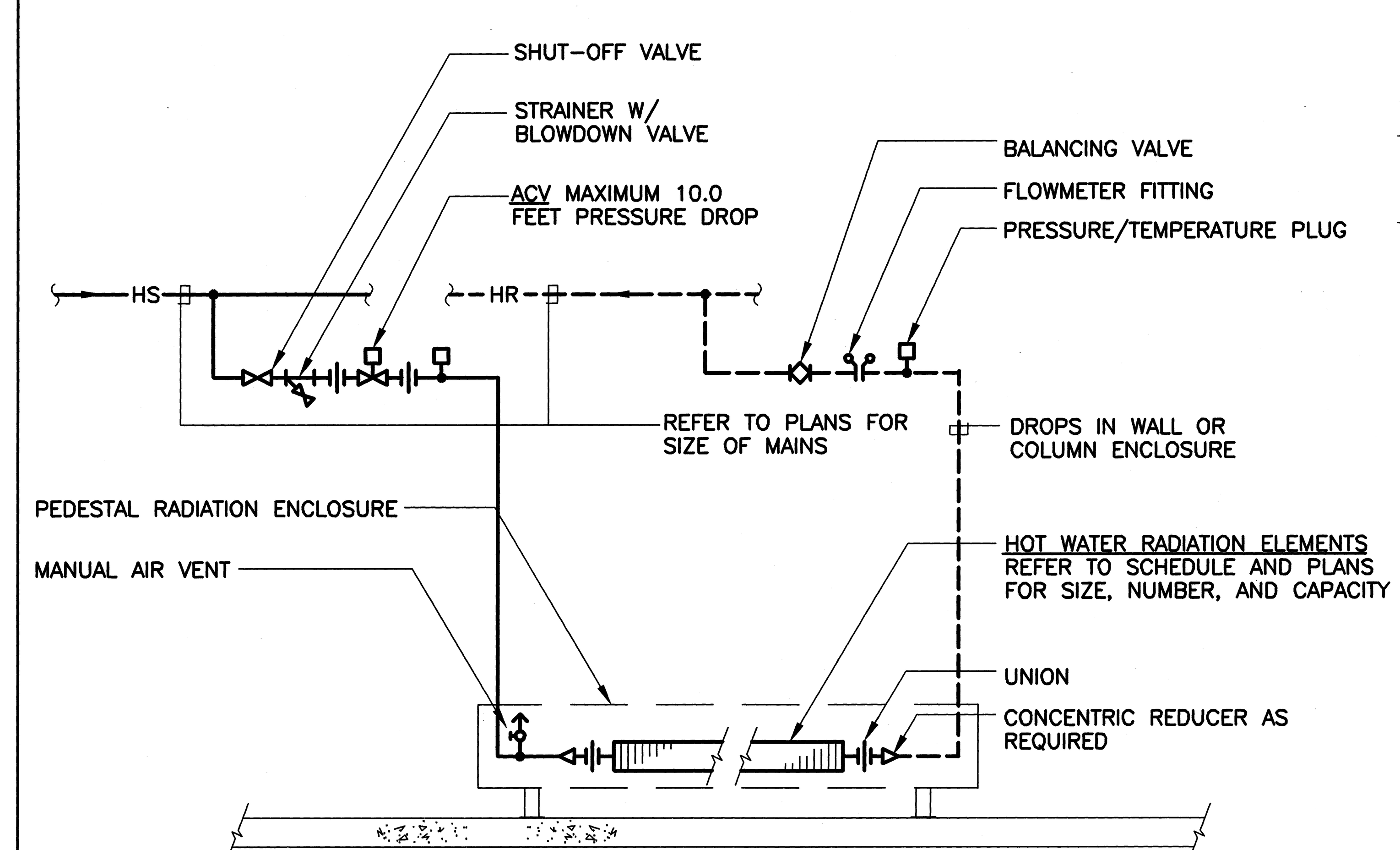


DETAIL – GLYCOL MAKE-UP SYSTEM | SCALE: NONE | 7



NOTE:
PIPING FOR CABINET UNIT HEATER SHALL BE SIMILIAR EXCEPT THAT ALL PIPING SPECIALITIES SHALL BE LOCATED IN THE UNITS PIPING COMPARTMENT

DETAIL – UNIT HEATER PIPING | SCALE: NONE | 8



DETAIL – HOT WATER RADIATION PIPING | SCALE: NONE | 9

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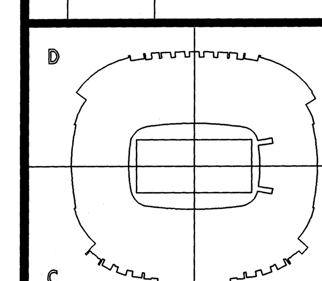
REVISIONS		
NO.	DATE	DESCRIPTION

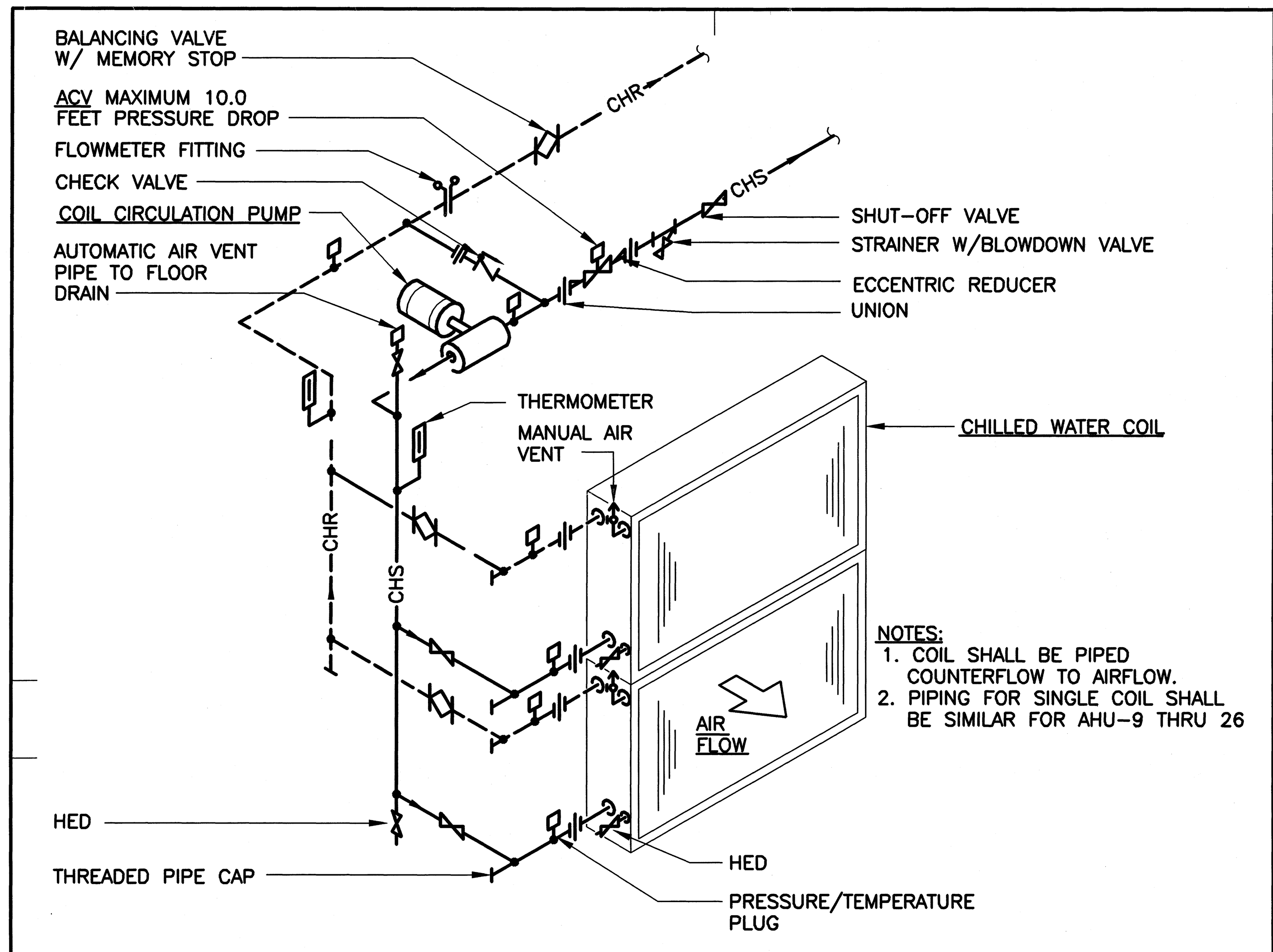


KEYPLAN

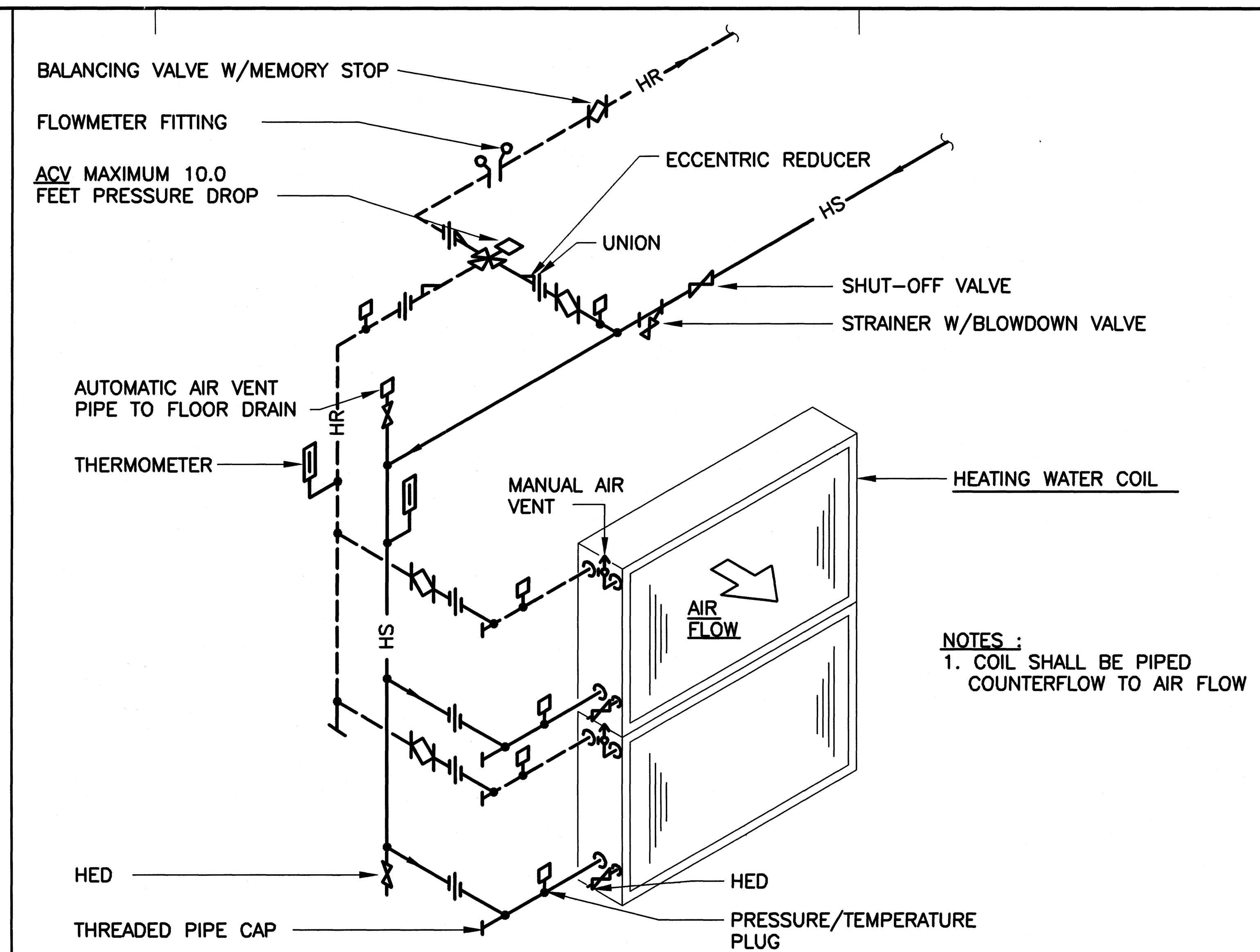
PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: CAS	REVIEWED BY:
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL DETAILS

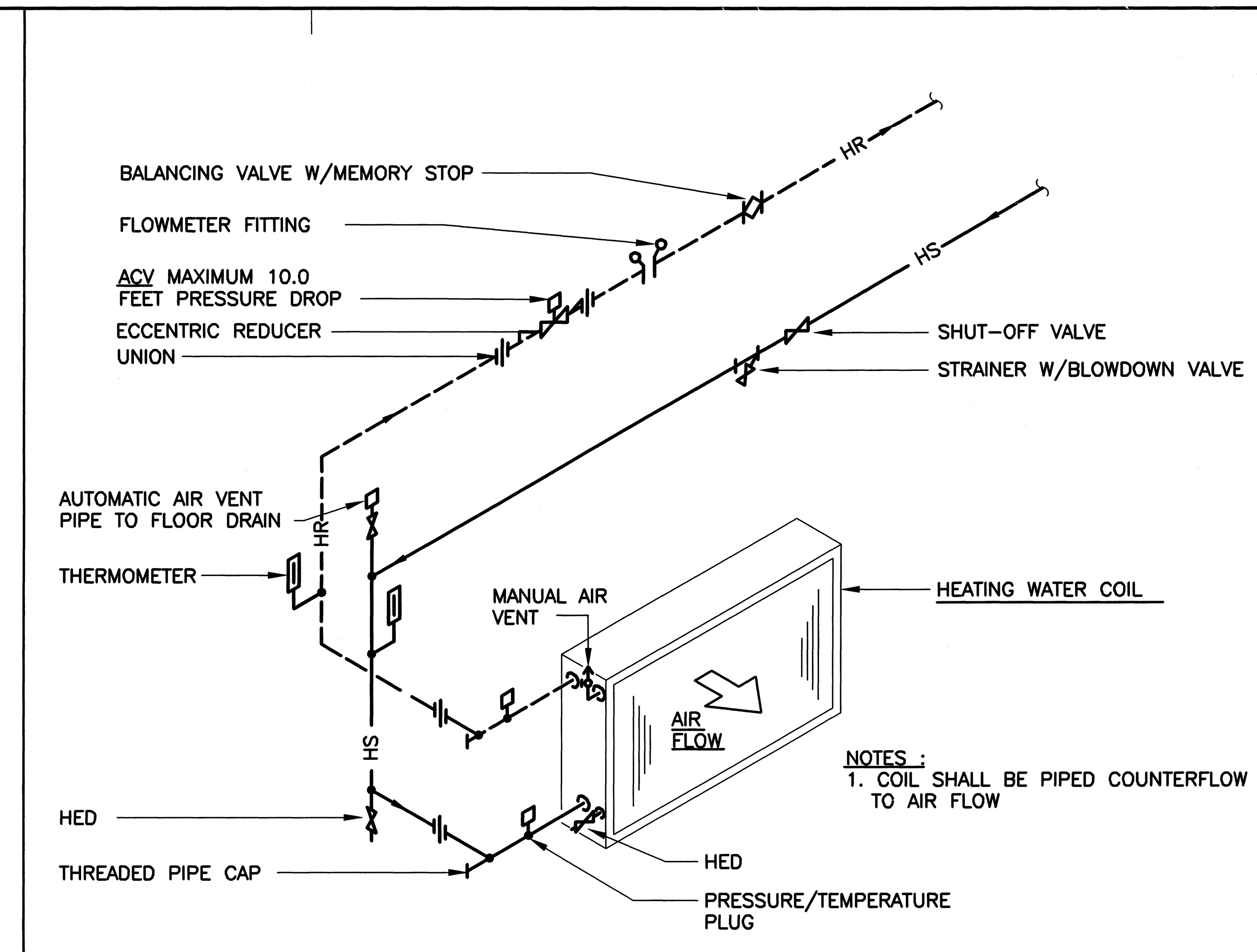
CATEGORY – SUB-CATEGORY – SHEET
M.6-01



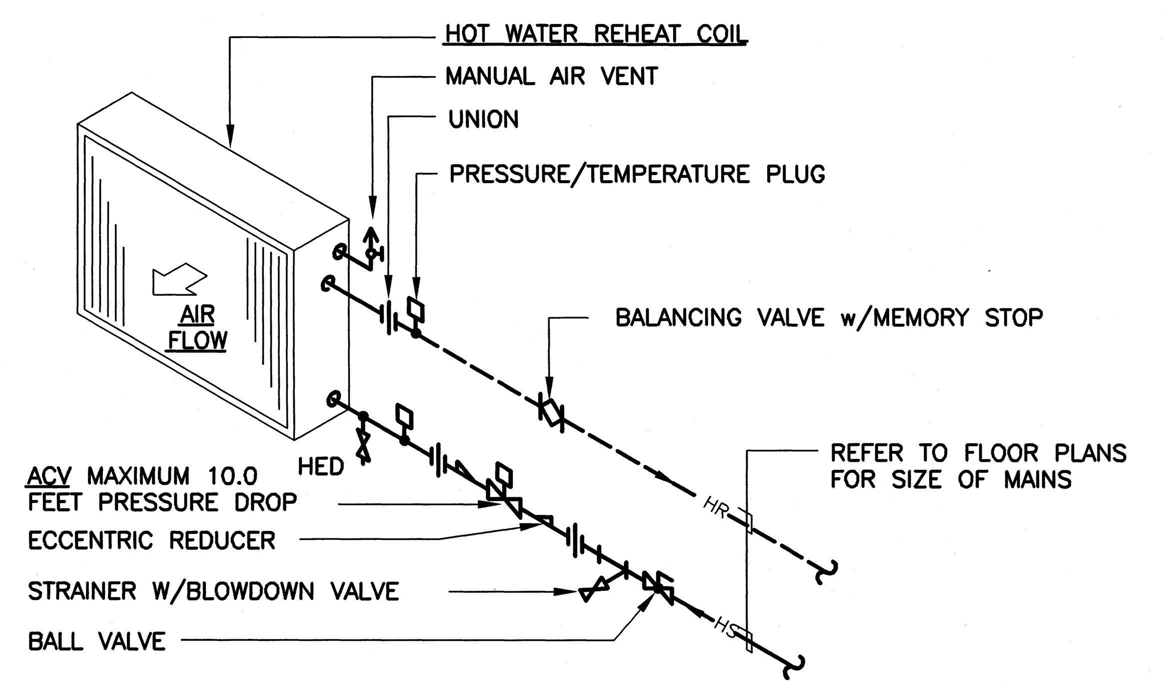
DETAIL – MULTIPLE COOLING COIL (AHU-1 THRU 8) SCALE: NONE 10



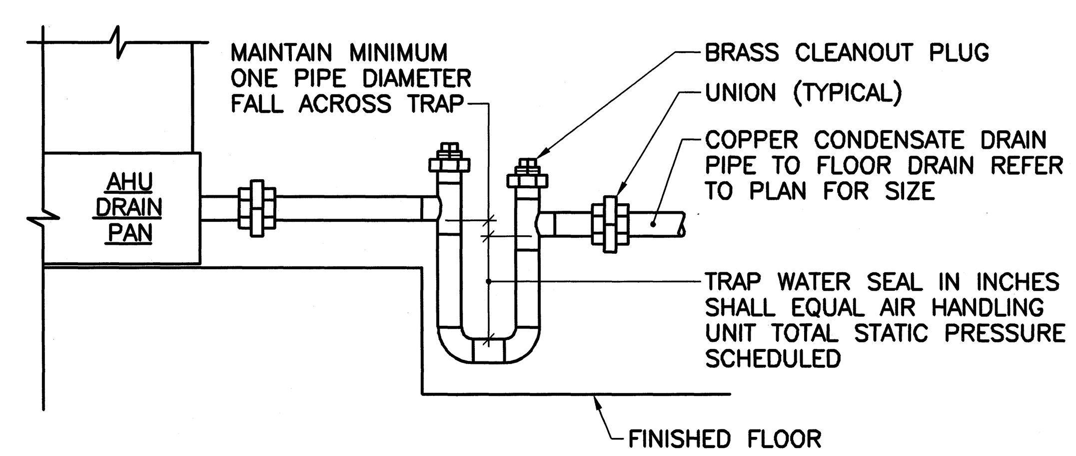
DETAIL – MULTIPLE HEATING COIL (AHU-1 THRU 8) SCALE: NONE 11



DTL-HEATING COIL(AHU-9 THRU 26 & HVU-1 THRU 13) SCALE: NONE 12

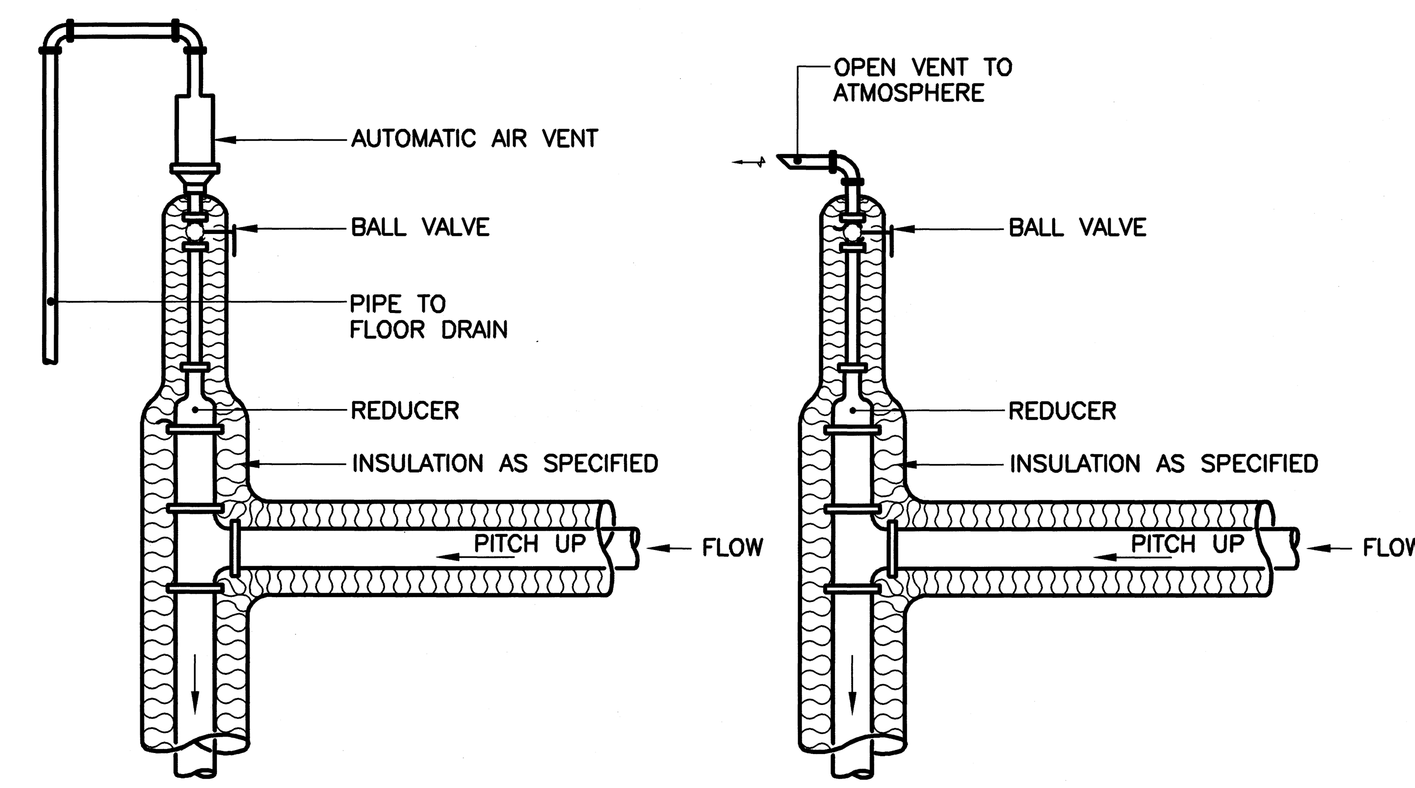


DETAIL – REHEAT COIL PIPING-2 WAY VALVE SCALE: NONE 13



COIL CONDENSATE TRAP

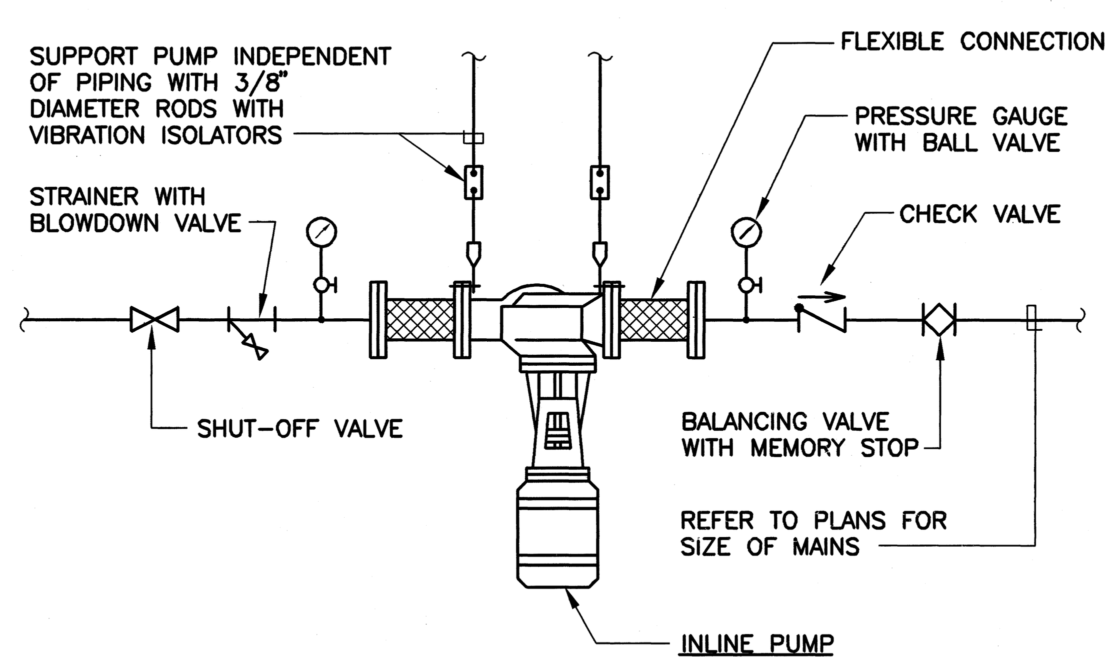
DETAIL – COIL CONDENSATE TRAP SCALE: NONE 14



AUTOMATIC AIR VENT

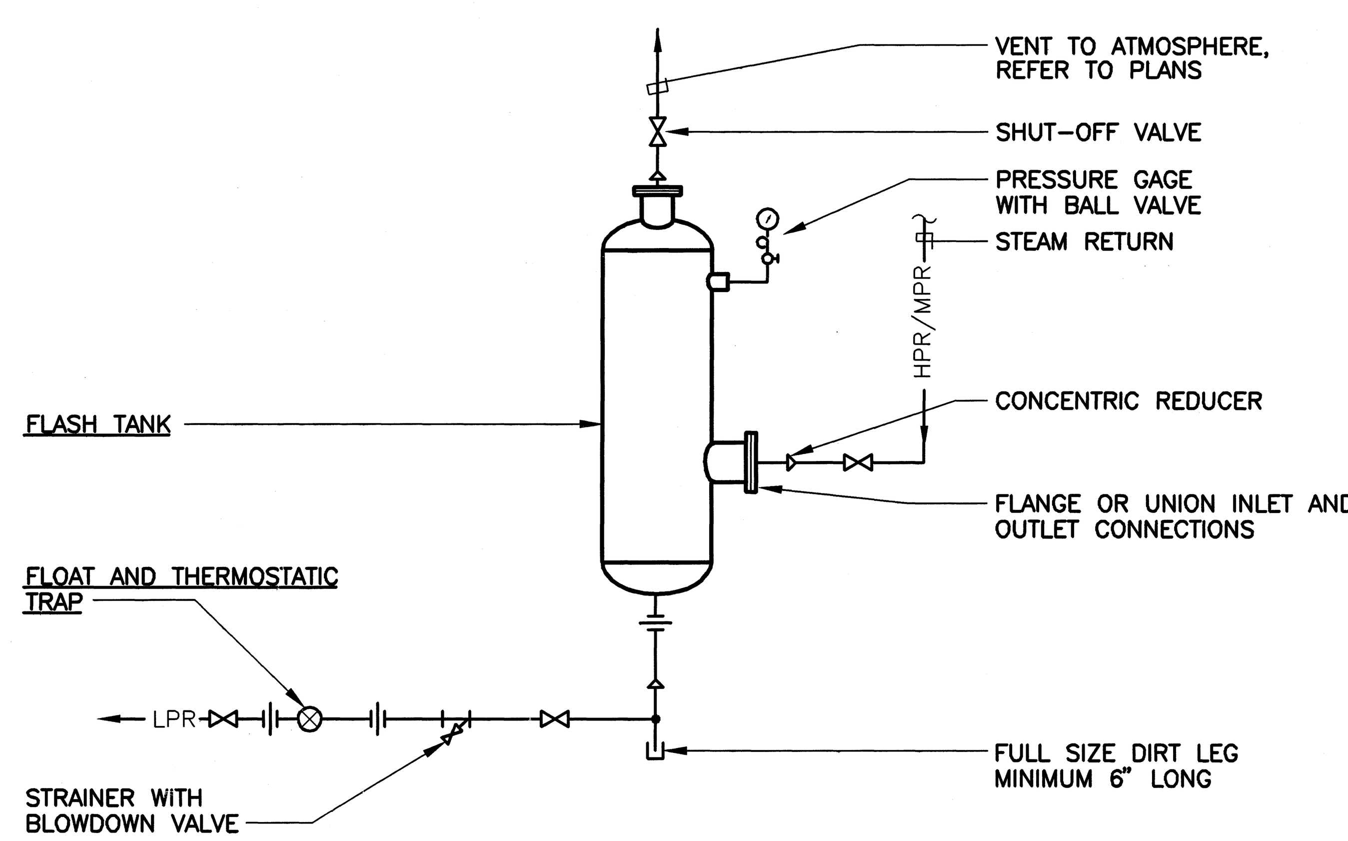
MANUAL AIR VENT

DETAIL – AIR VENT SCALE: NONE 15



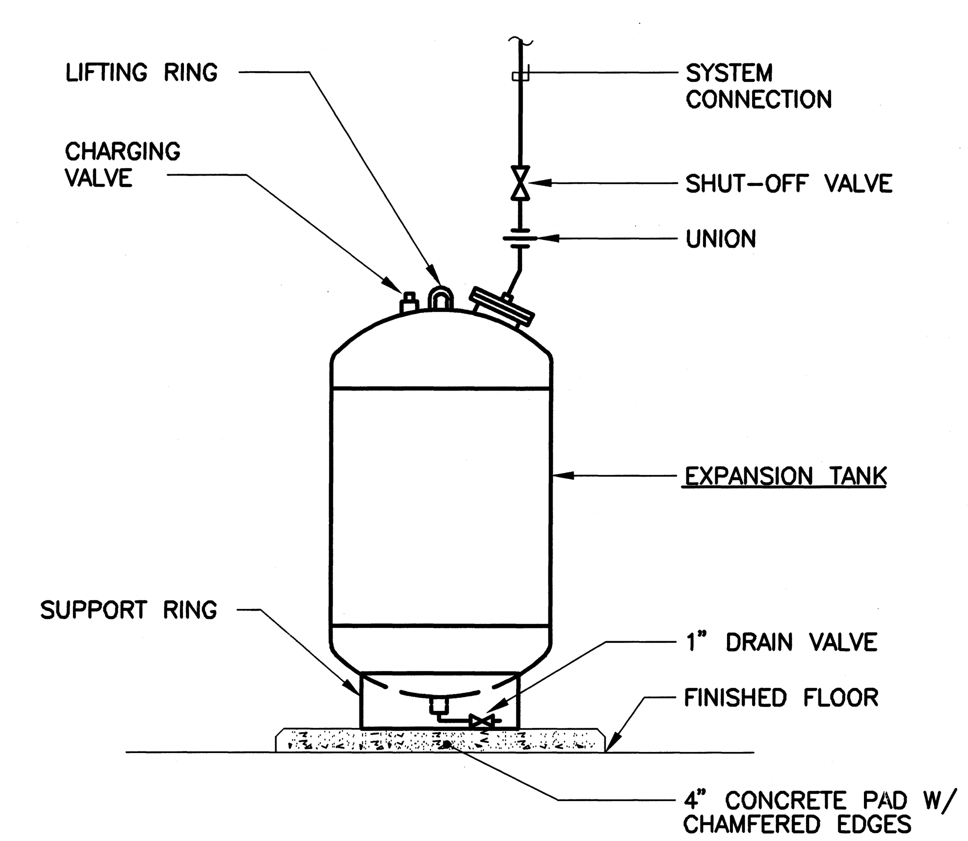
NOTE:
1. PUMP SHALL BE INSTALLED HORIZONTAL OR VERTICAL AS REQUIRED BY PUMP MANUFACTURER.

DETAIL – IN-LINE PUMP SCALE: NONE 16



NOTE:
REFER TO SCHEMATIC FOR ALL PIPE SIZES AND TRAP DESIGNATION

DETAIL – FLASH TANK SCALE: NONE 17



DETAIL – EXPANSION TANK SCALE: NONE 18

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REVISIONS

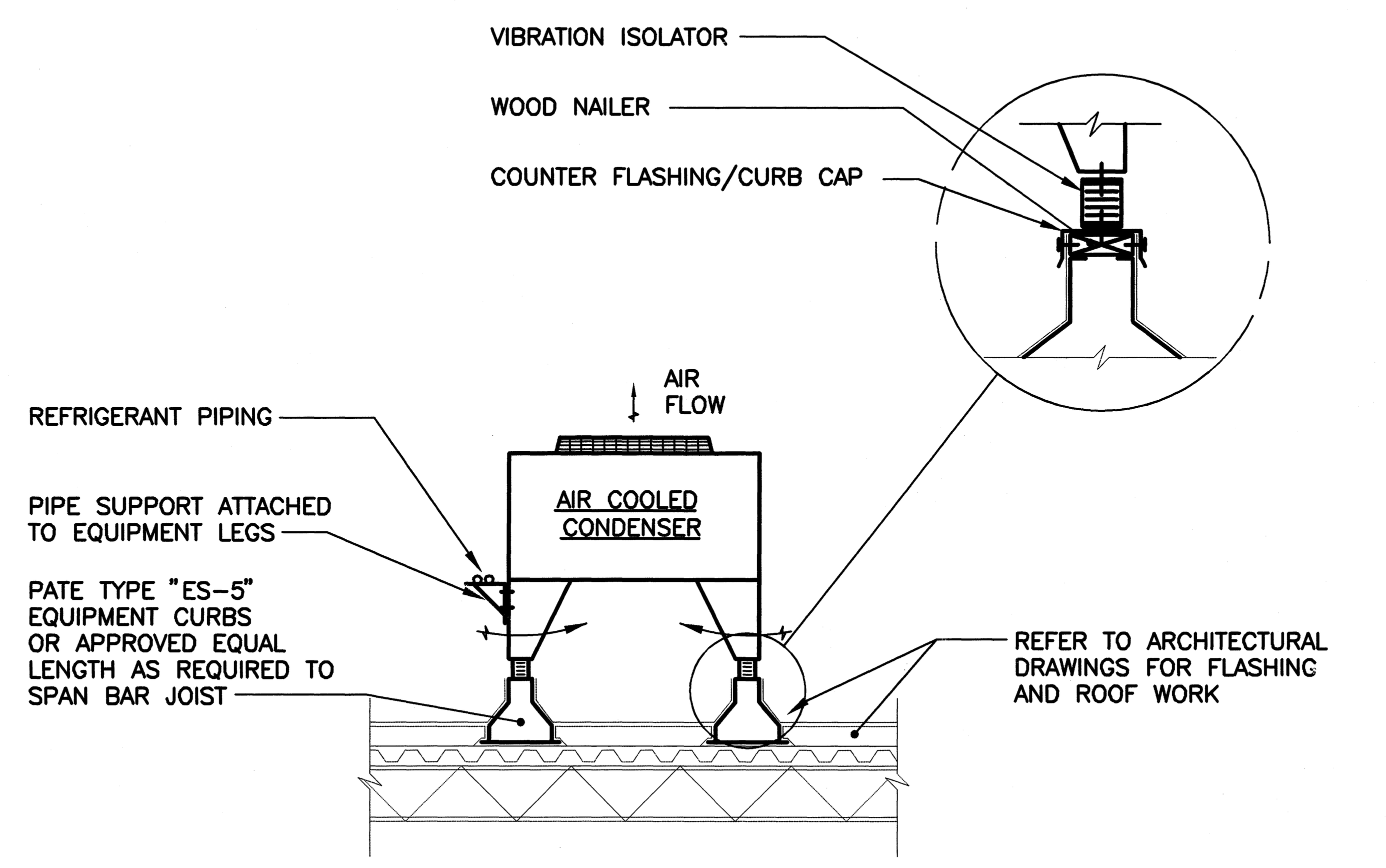
NO.	DATE	DESCRIPTION

KEYPLAN

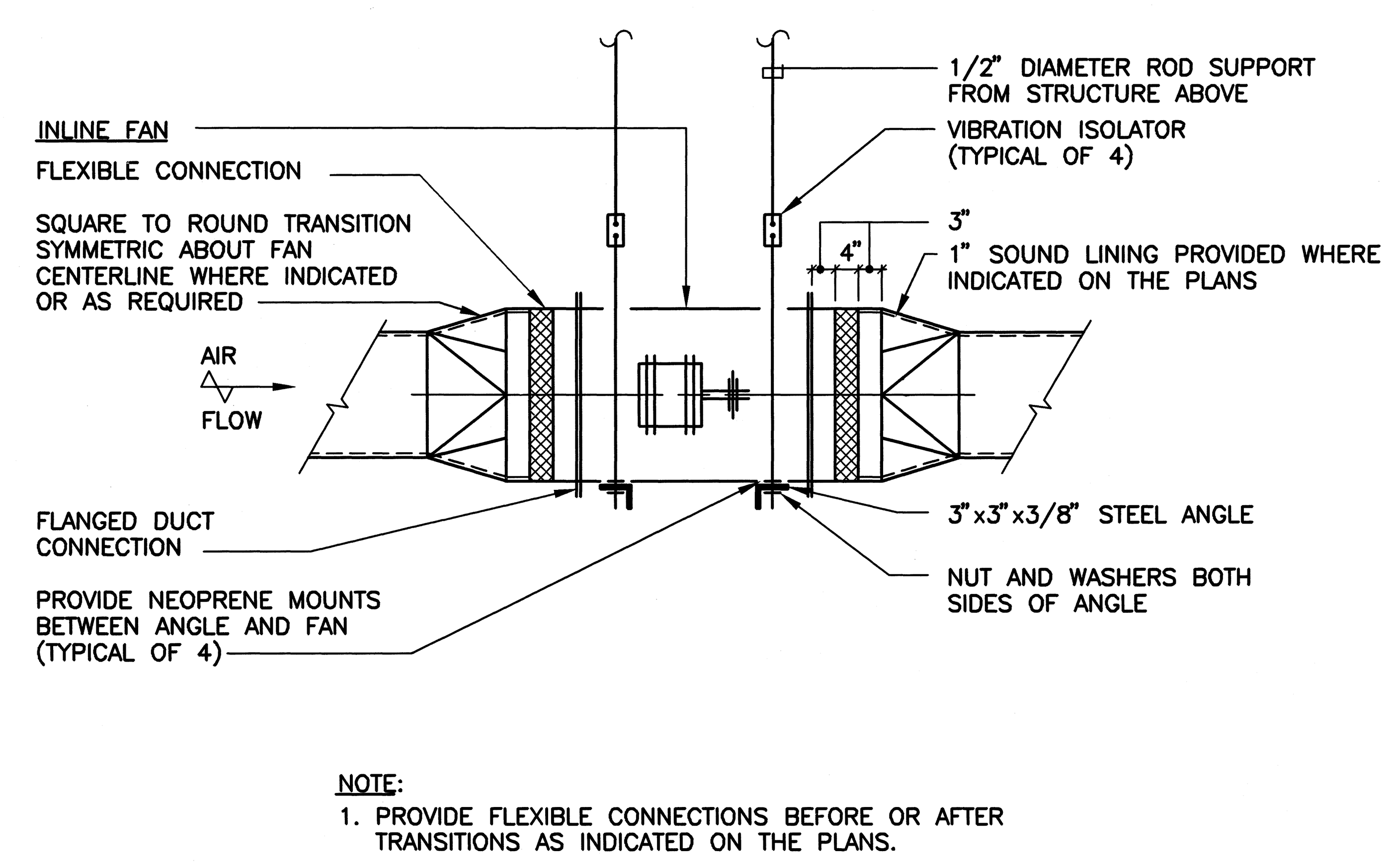
PROJECT NO. 95-675-00 | ISSUED BY:
DRAWN BY: CAS | REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
MECHANICAL DETAILS

CATEGORY – SUB-CATEGORY – SHEET
M.6–02

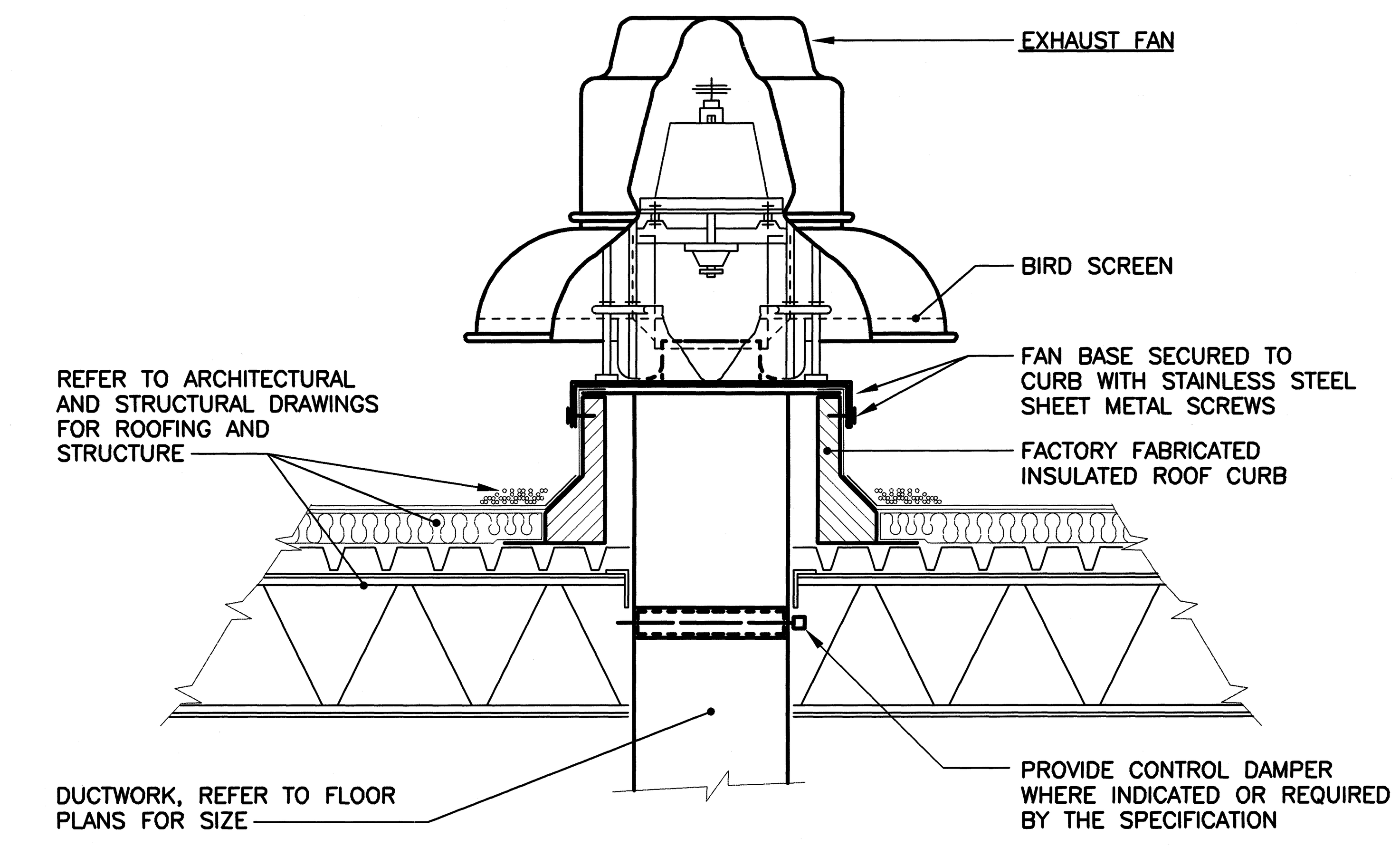


DETAIL – AIR COOLED CONDENSING UNIT — SCALE: NONE — 19

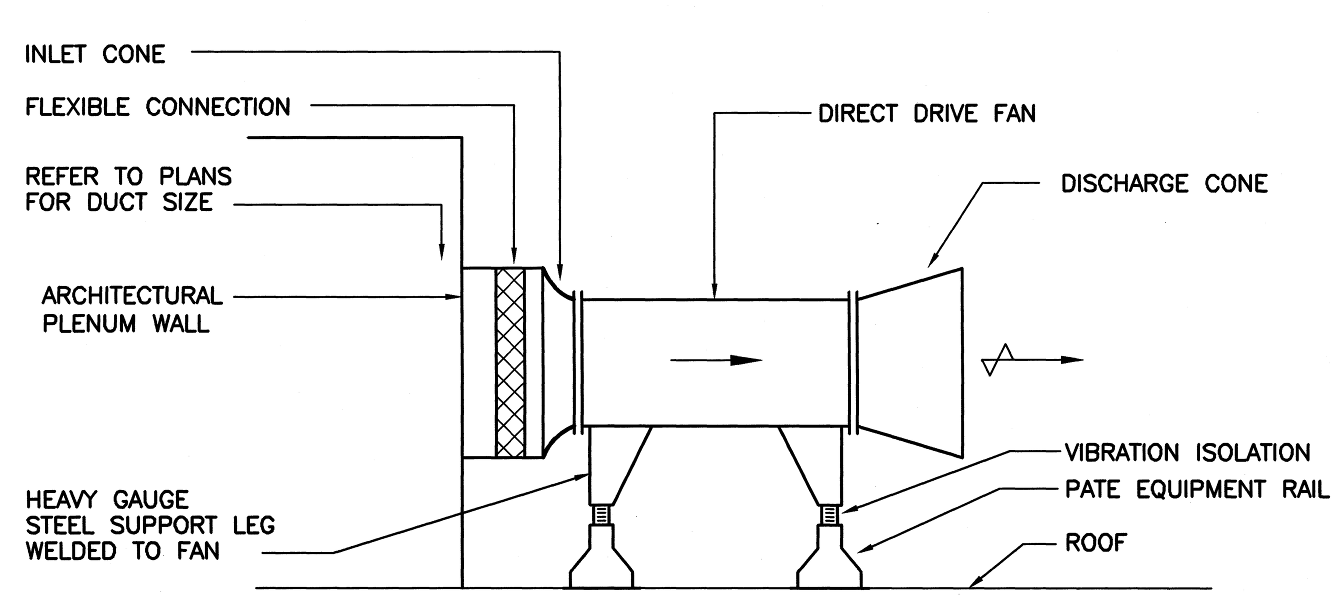


NOTE:
1. PROVIDE FLEXIBLE CONNECTIONS BEFORE OR AFTER TRANSITIONS AS INDICATED ON THE PLANS.

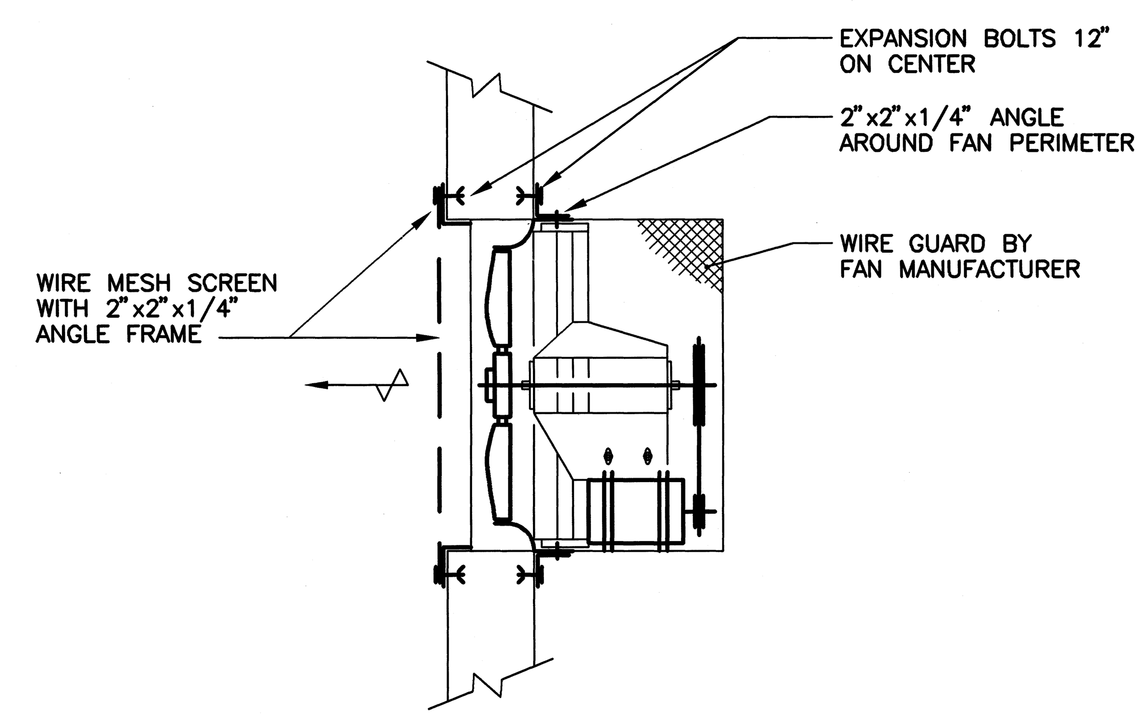
DETAIL – IN-LINE FAN INSTALLATION — SCALE: NONE — 20



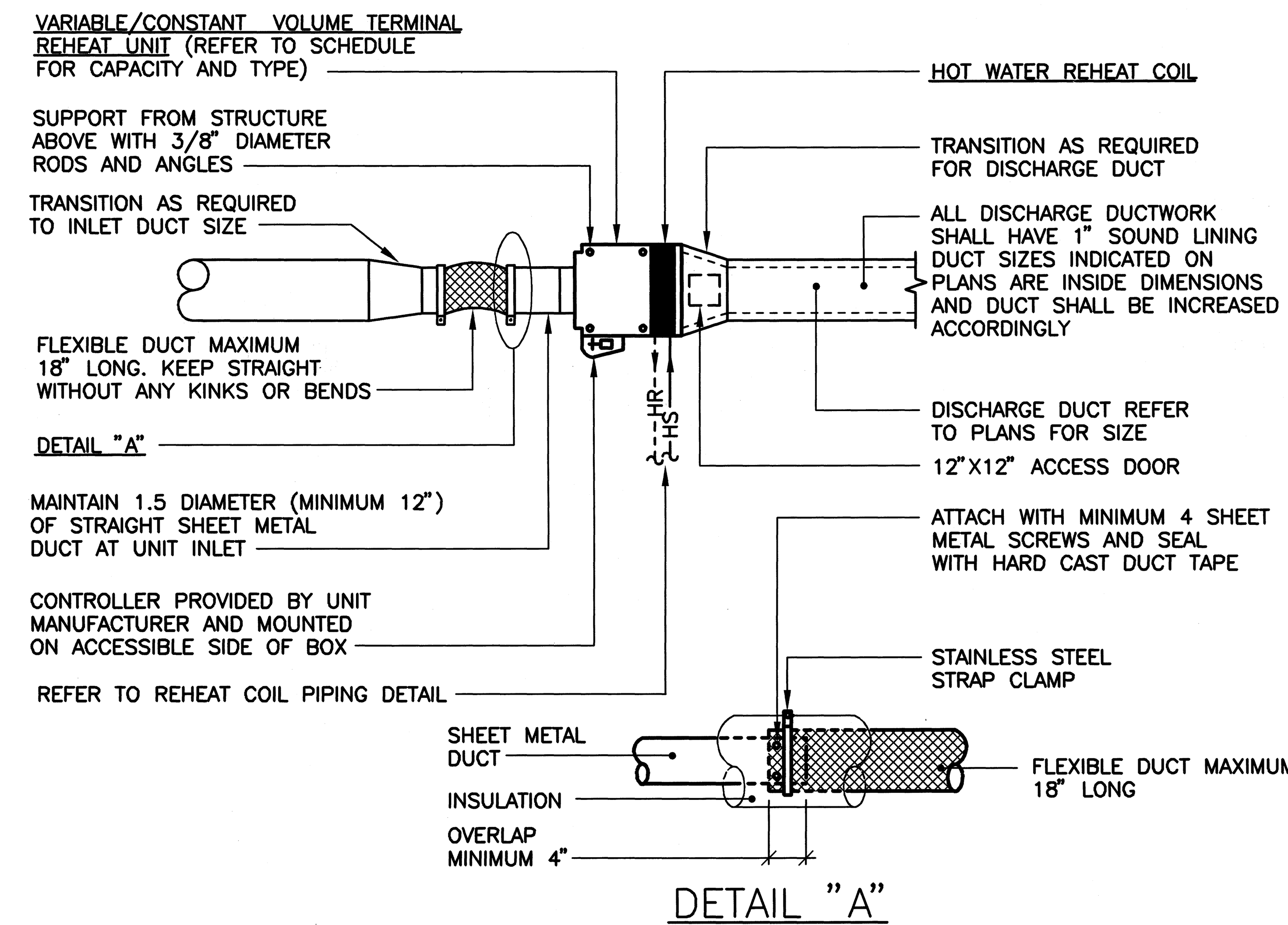
DETAIL – ROOF MOUNTED FAN — SCALE: NONE — 21



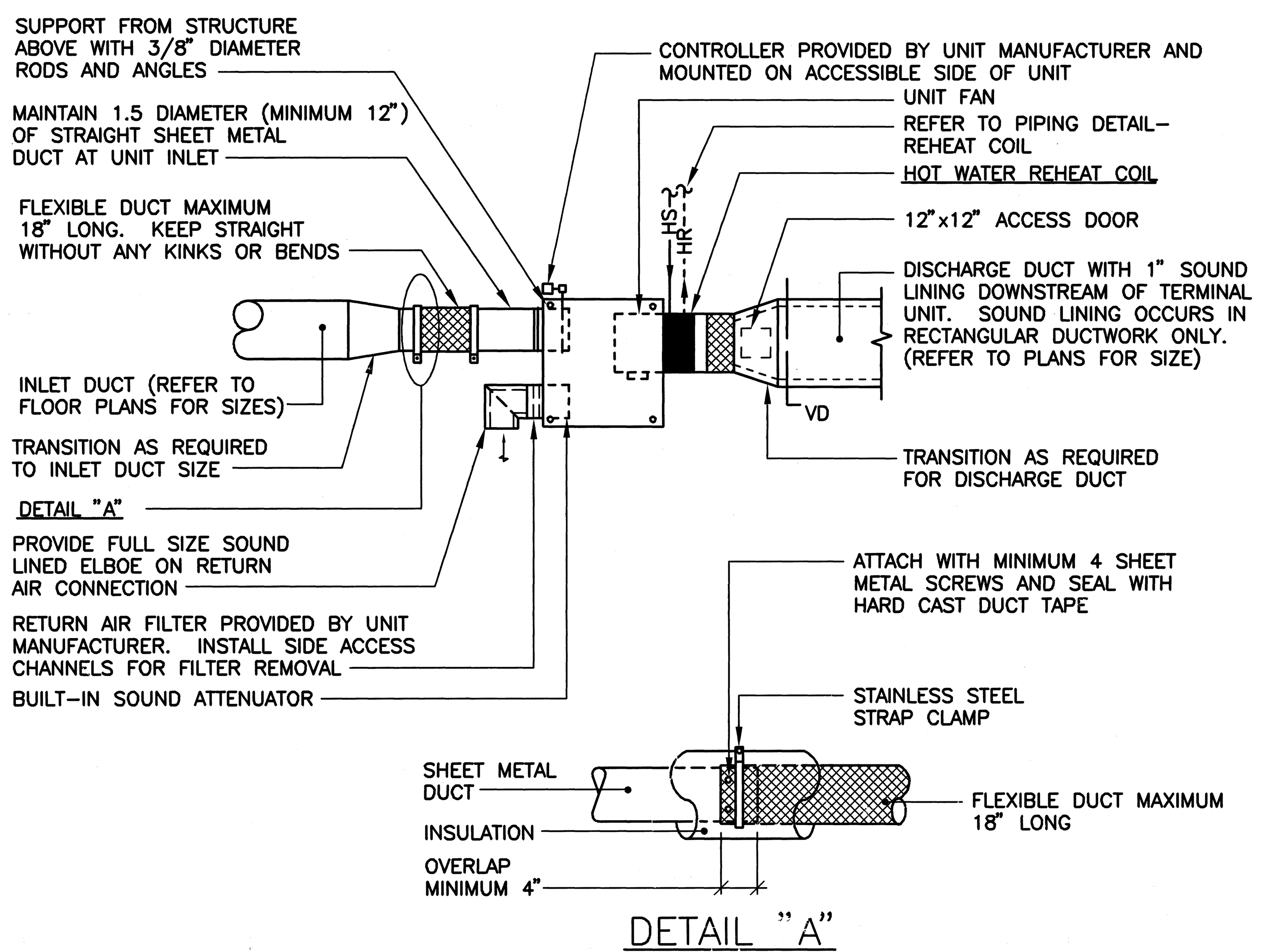
DETAIL – SMOKE EXHAUST FAN ROOF INSTALLATION — SCALE: NONE — 22



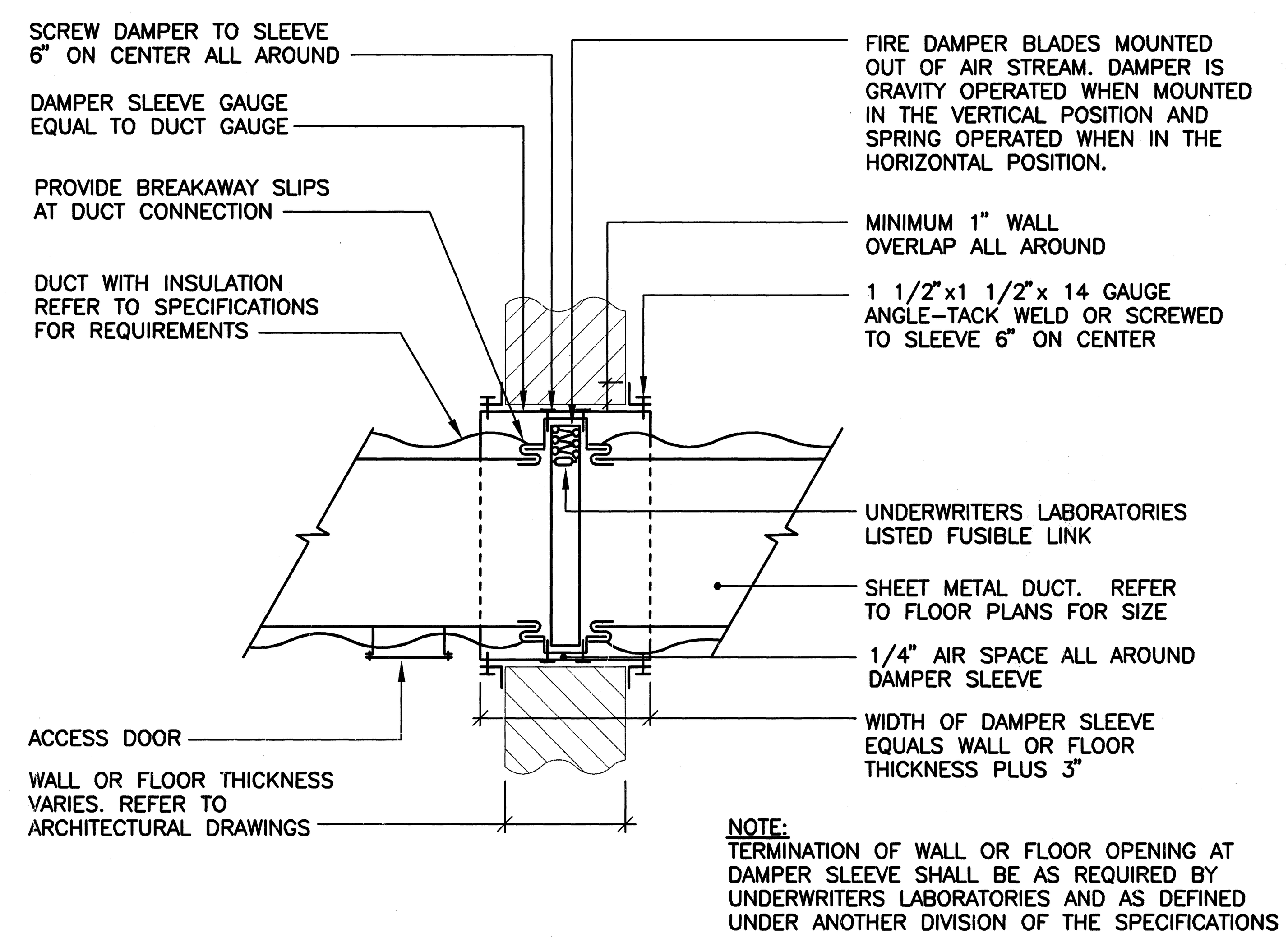
DETAIL – WALL MOUNTED FAN — SCALE: NONE — 23



DETAIL – VAV TERMINAL REHEAT UNIT — SCALE: NONE — 24

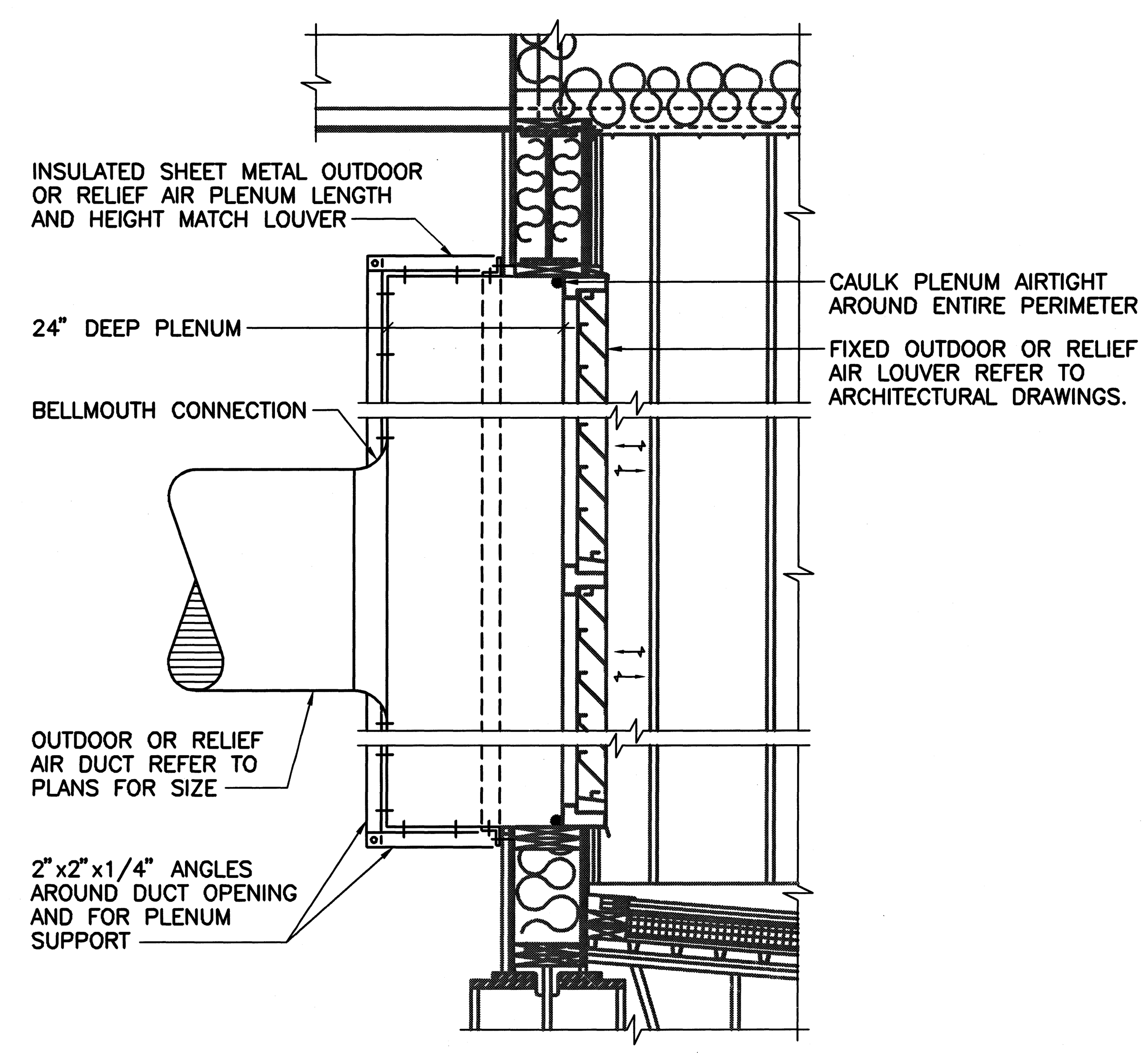


DETAIL – FAN POWERED TERMINAL REHEAT UNIT — SCALE: NONE — 25



NOTE:
TERMINATION OF WALL OR FLOOR OPENING AT DAMPER SLEEVE SHALL BE AS REQUIRED BY UNDERWRITERS LABORATORIES AND AS DEFINED UNDER ANOTHER DIVISION OF THE SPECIFICATIONS

DETAIL – FIRE DAMPER INSTALLATION (TYPICAL) — SCALE: NONE — 26



DETAIL – OUTDOOR/RELIEF AIR PLENUM — SCALE: NONE — 27

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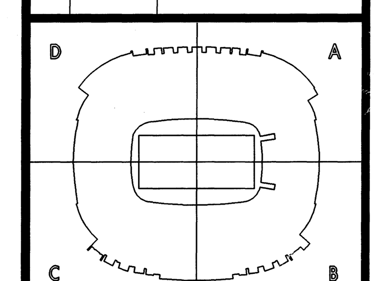
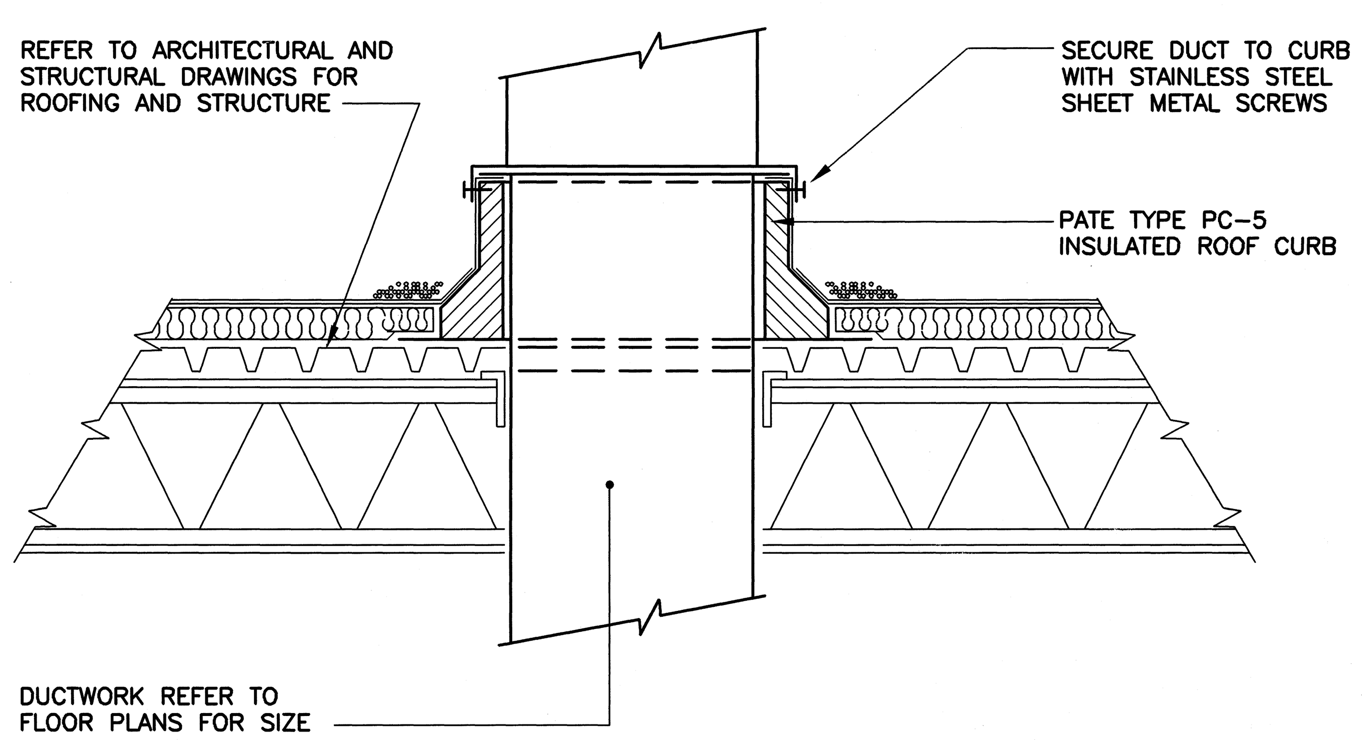
REVISIONS

NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44



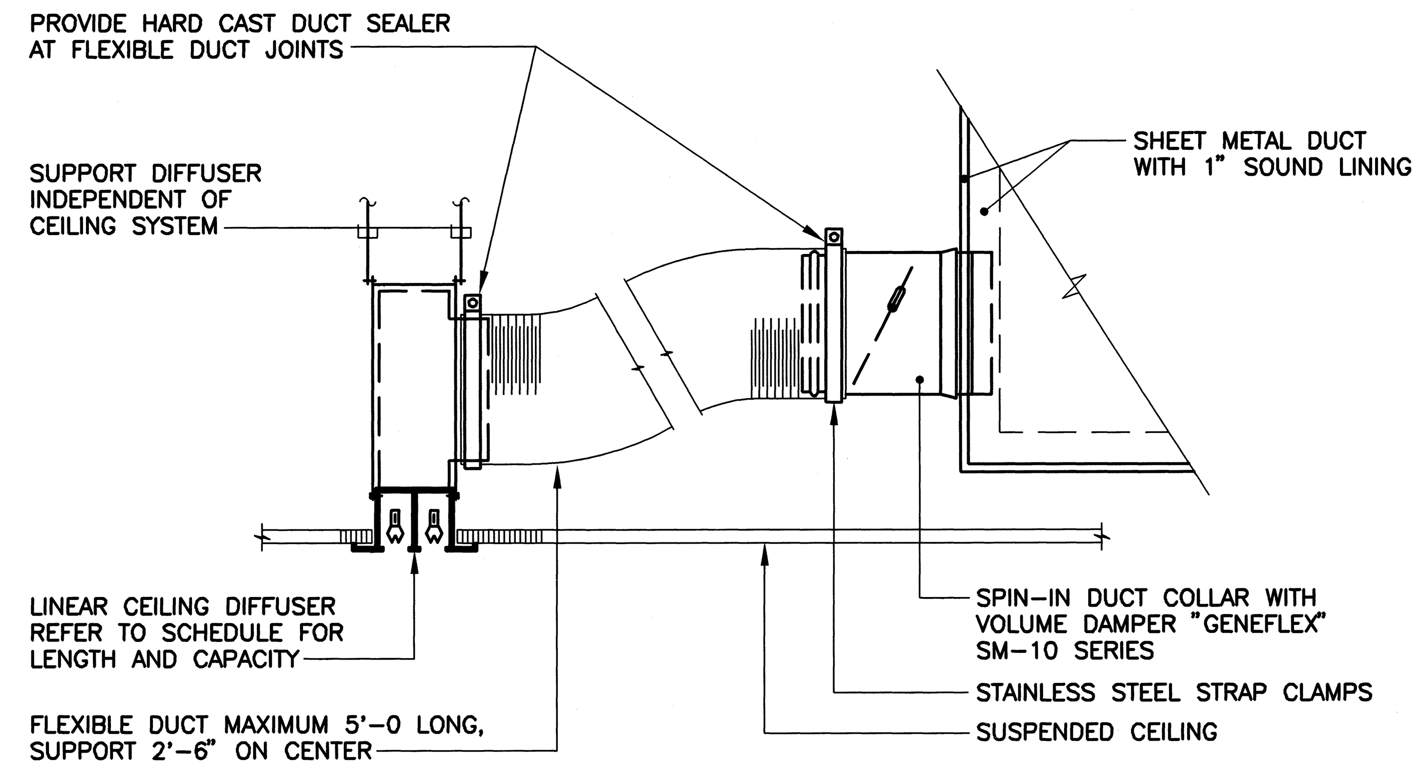
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: CAS
REVIEWED BY:
ISSUED: 2-28-97
SHEET TITLE
MECHANICAL DETAILS
CATEGORY – SUB-CATEGORY – SHEET
M.6-03



DETAIL – DUCT ROOF PENETRATION

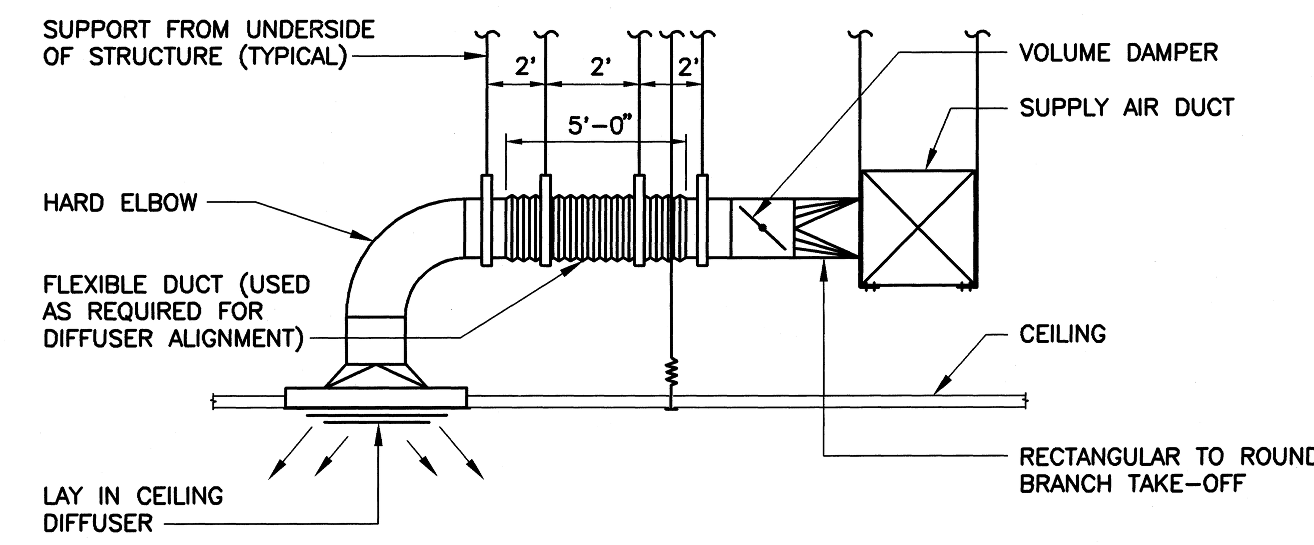
SCALE: NONE 28



NOTES:
1. DUCT INSTALLATION SHALL BE PROVIDED AS SPECIFIED. PROVIDE ADDITIONAL ROUND, RIGID SHEET METAL DUCTWORK
2. AS REQUIRED TO LIMIT FLEXIBLE DUCT LENGTH TO 5'-0" MAXIMUM.

DETAIL – DIFFUSER INSTALLATION – TYPE 'B'

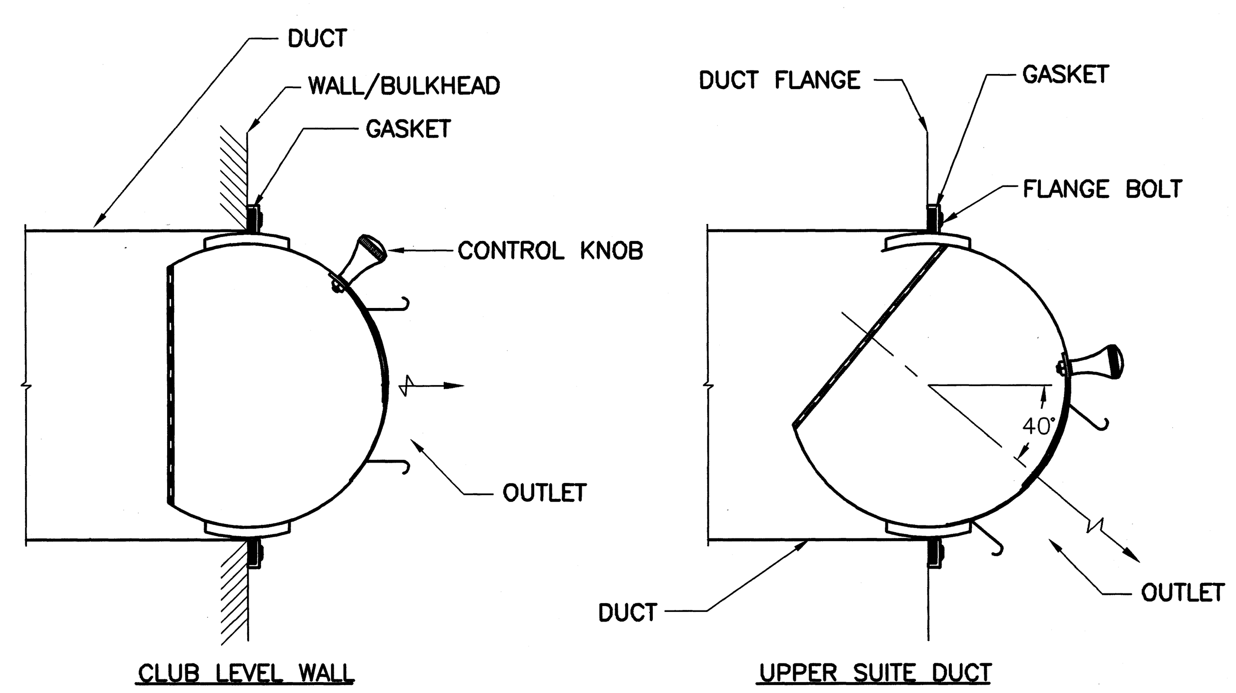
SCALE: NONE 29



NOTE: MAXIMUM SAG 1/2" PER FOOT.

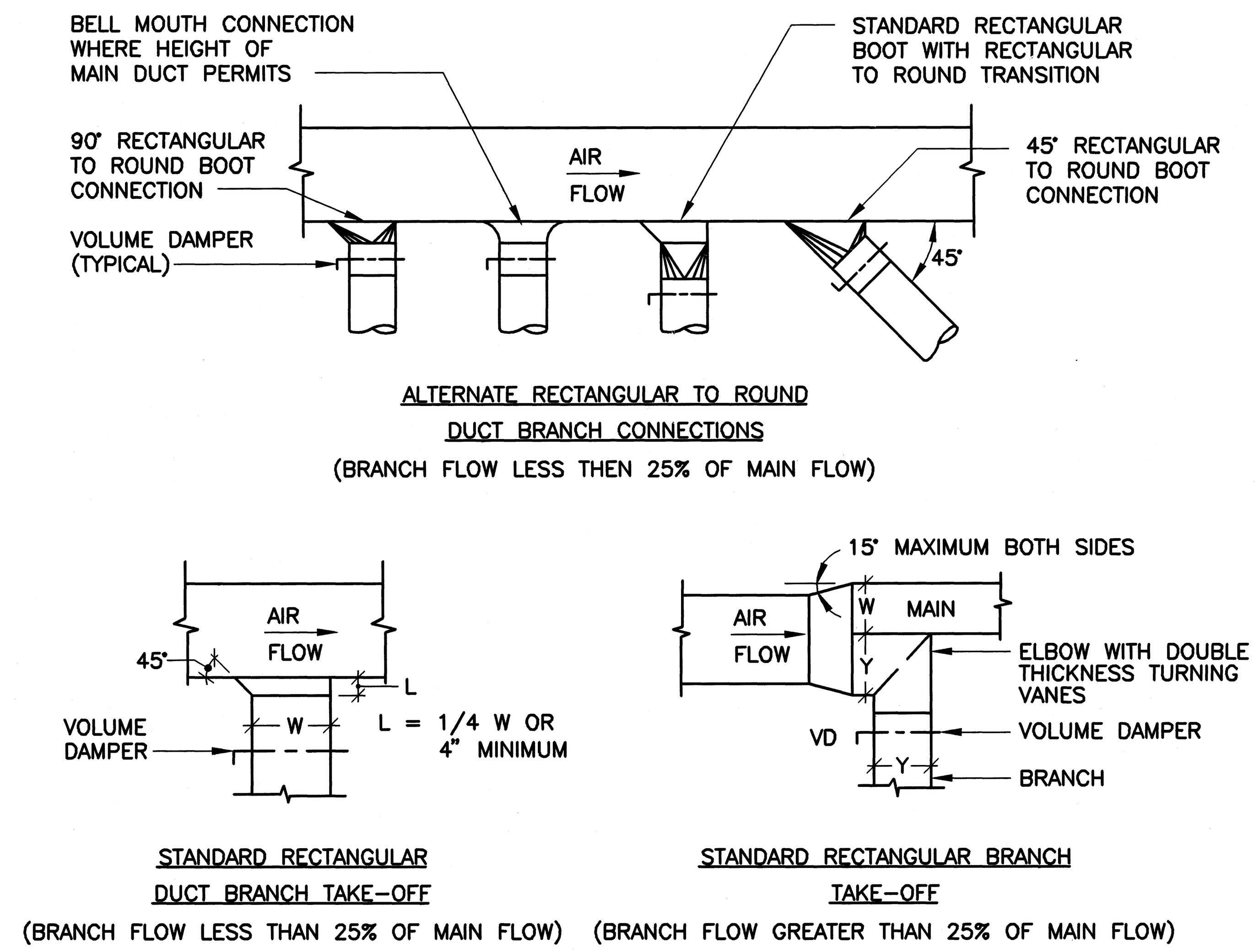
DETAIL – CEILING DIFFUSER BRANCH DUCTS

SCALE: NONE 30



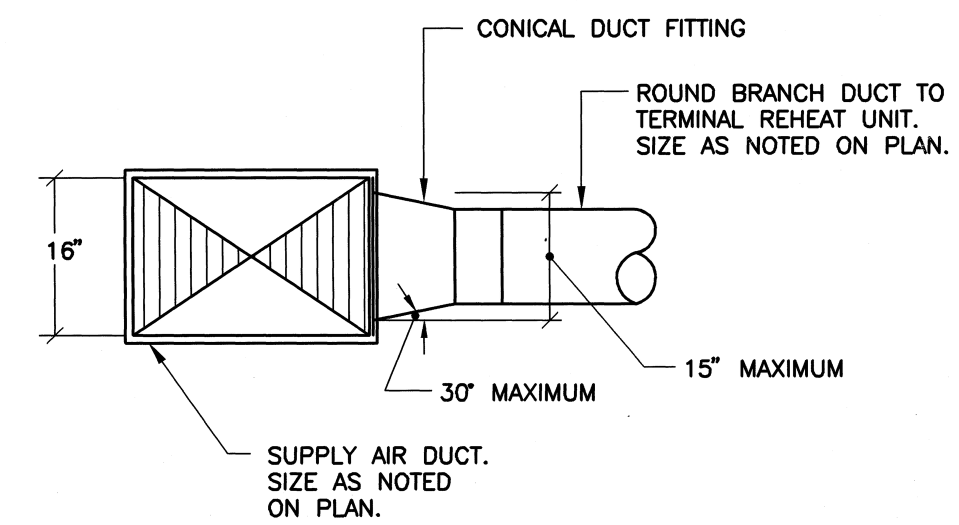
DETAIL – SPOT DIFFUSER (TYPE "J")

SCALE: NONE 31



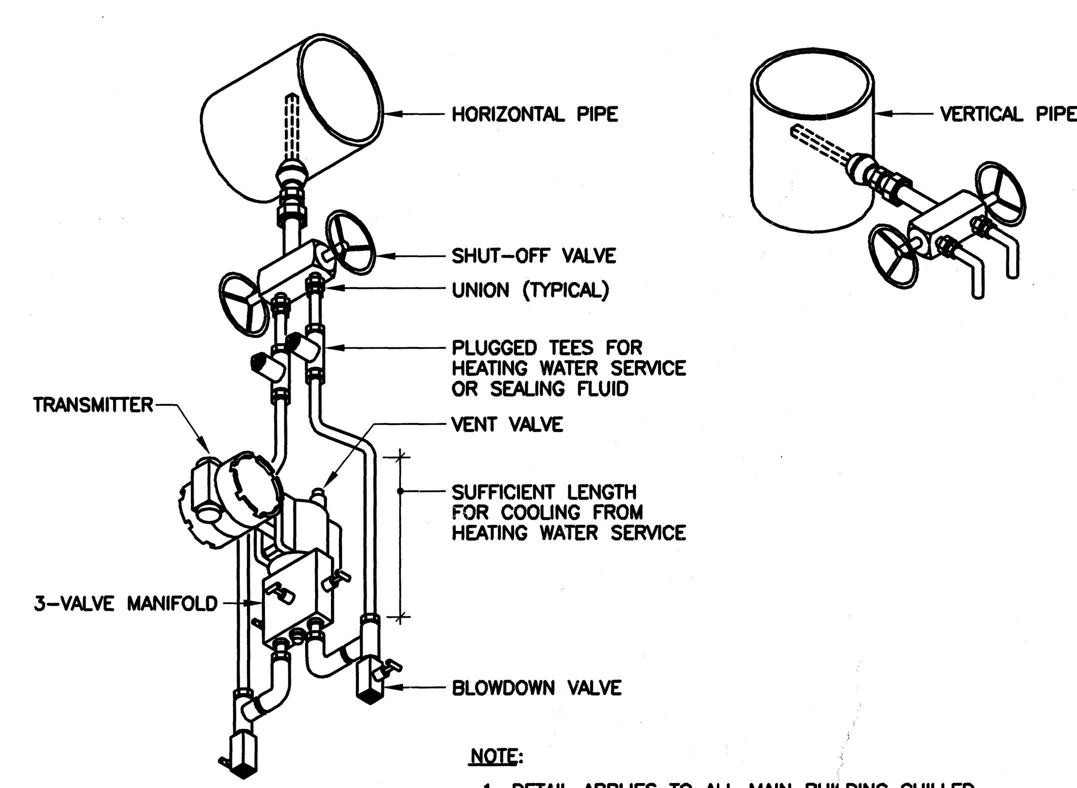
DETAIL – LOW VELOCITY BRANCH TAKE-OFF

SCALE: NONE 32



DETAIL – CONICAL DUCT TAP FITTING

SCALE: NONE 33



NOTE:
1. DETAIL APPLIES TO ALL MAIN BUILDING CHILLED AND HEATING WATER FLOW METER FITTINGS.

STRAIGHT RUN CHART

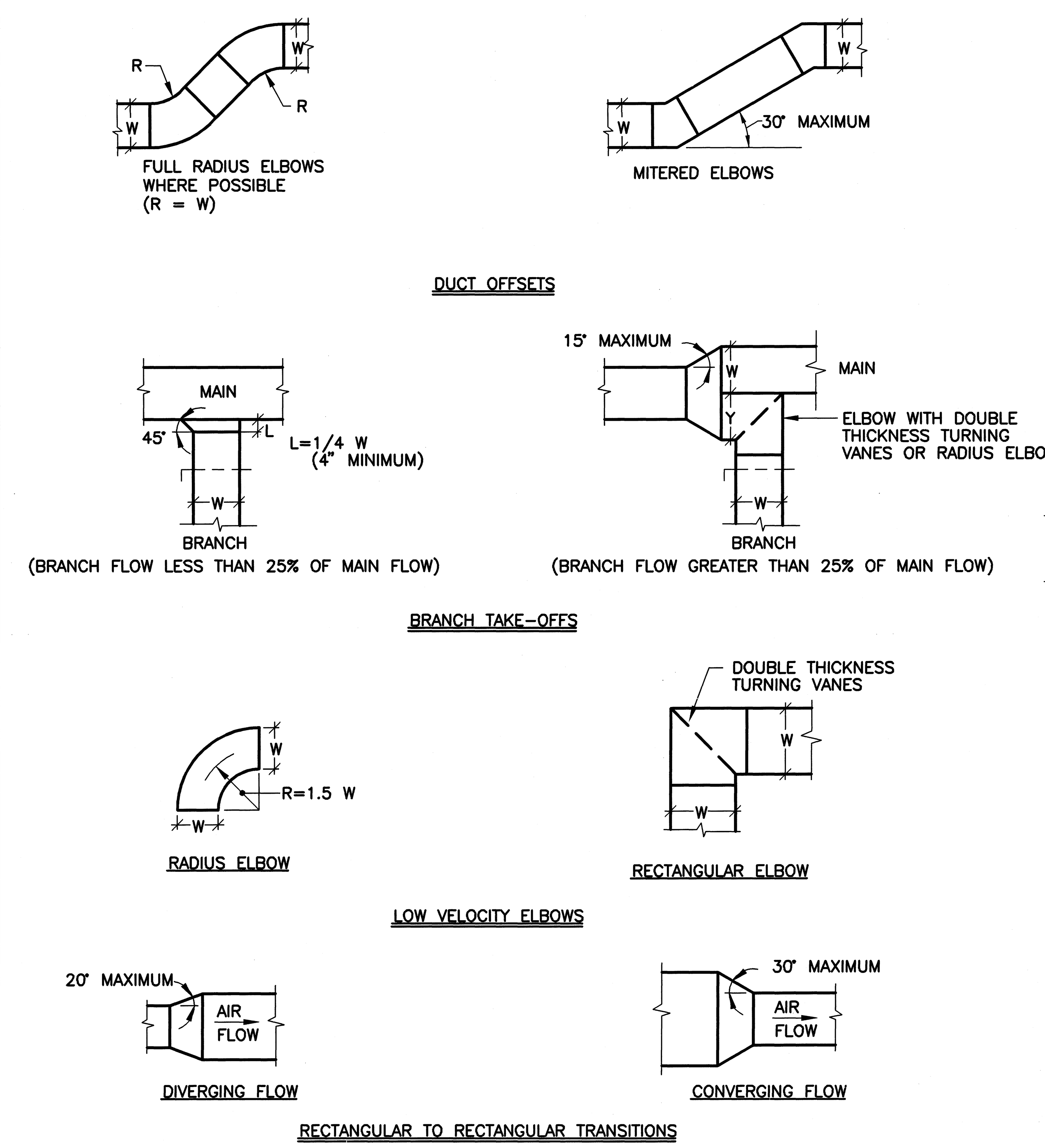
INSTALLED CONDITION	INSTALLATION DIAGRAM	DIMENSION A: WITH STRAIGHTENING VANES	DIMENSION A: WITHOUT STRAIGHTENING VANES	DIMENSION B
ELBOW	SV FM A B	7	7	3
MULTIPLE ELBOWS IN THE SAME PLANE	SV FM A B	9	9	3
MULTIPLE ELBOWS IN DIFFERENT PLANES	SV FM A B	9	18	3
INCREASE IN PIPE SIZE	SV FM A B	8	8	3
REDUCTION IN PIPE SIZE	SV FM A B	8	8	3
CONTROL VALVE OR THROTTLED VALVE	SV FM A B	9	24	4

RECOMMENDED STRAIGHT PIPE LENGTHS EXPRESSED AS A FUNCTION OF INSTALLED PIPE DIAMETER

DIFFERENTIAL PRESSURE FLOW METER

DETAIL – DIFFERENTIAL PRESSURE FLOW METER

SCALE: NONE 34



DETAIL – RECTANGULAR DUCT FITTINGS

SCALE: NONE 35

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Kansas City, Missouri 64105

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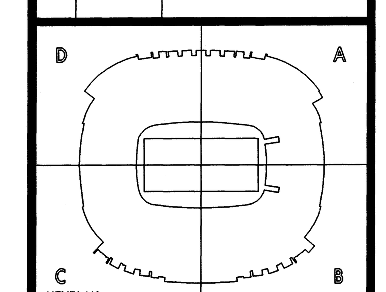
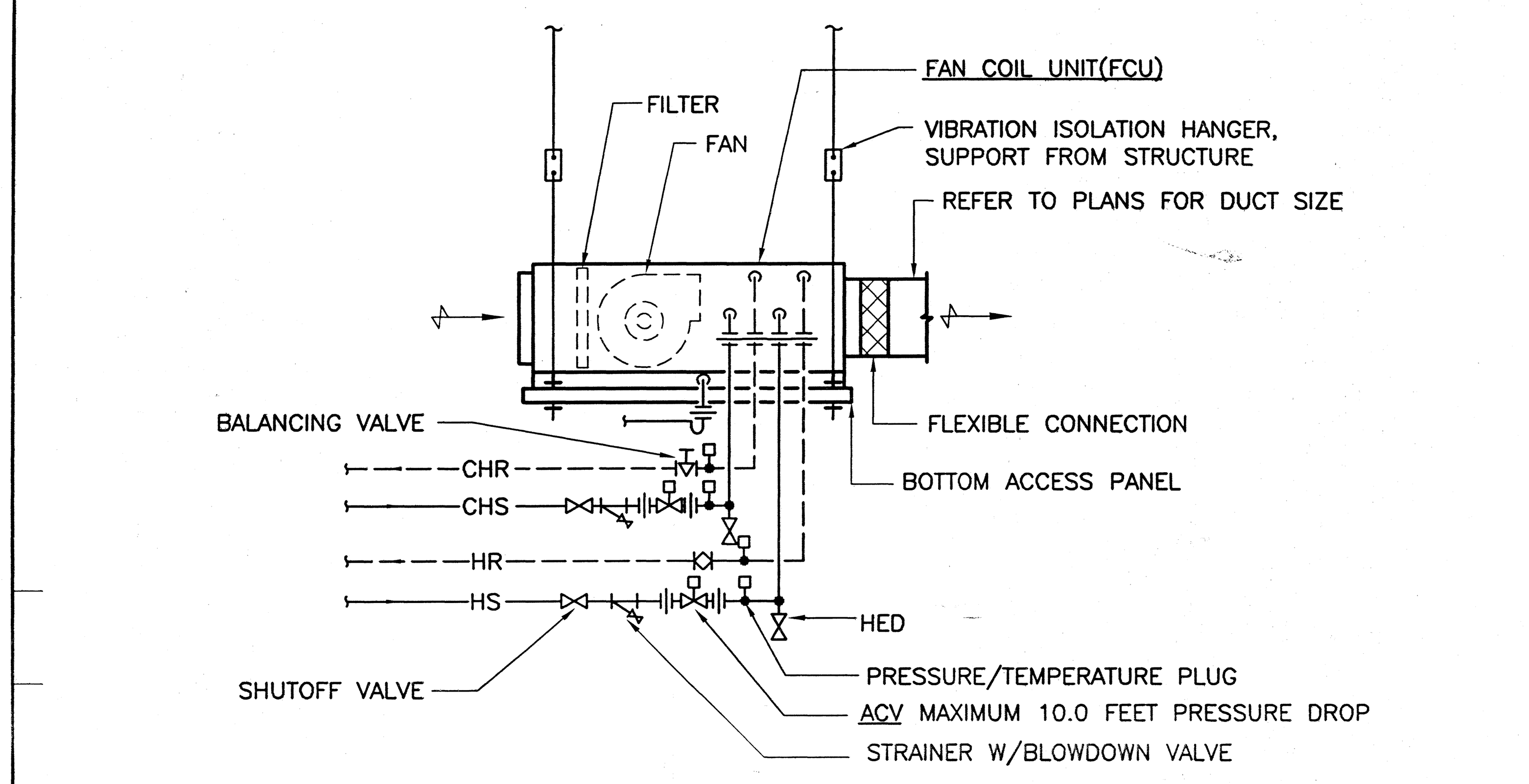
NO.	DATE	DESCRIPTION



KEYPLAN

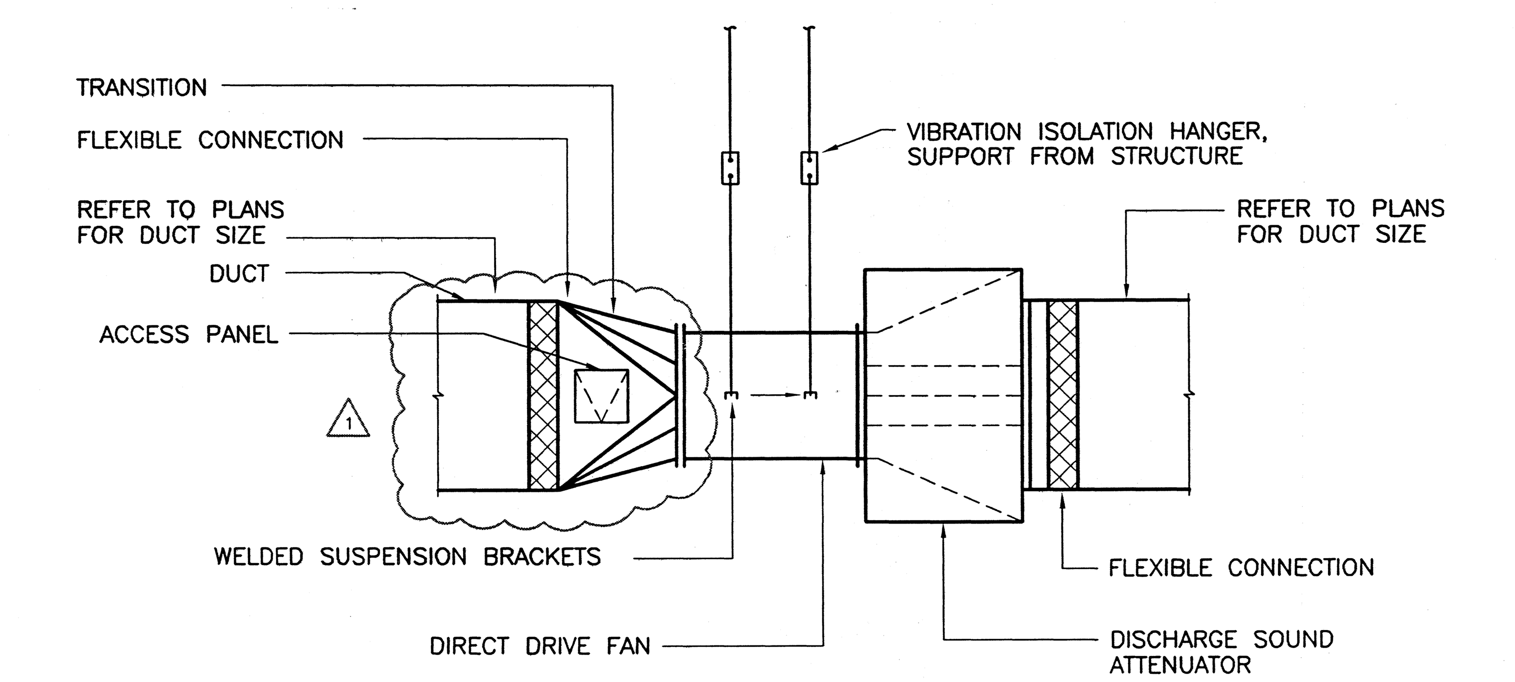
PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: MWS
REVIEWED BY:
ISSUED: 2-28-97
SHEET TITLE
MECHANICAL DETAILS

CATEGORY - SUB-CATEGORY - SHEET
M.6-04



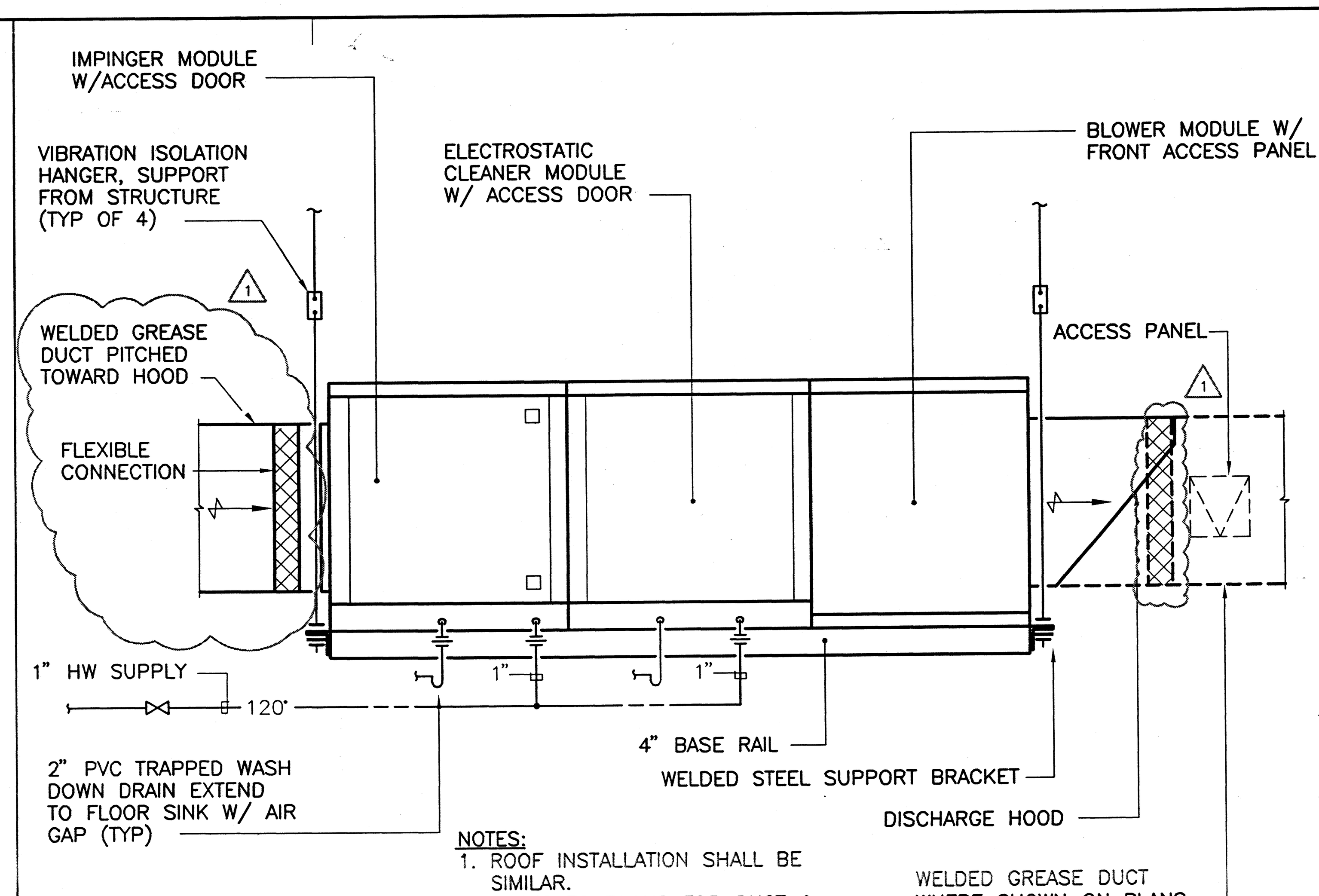
DETAIL – FAN COIL UNIT

SCALE: NONE (36)



DETAIL – VANE AXIAL FAN – SUSPENDED

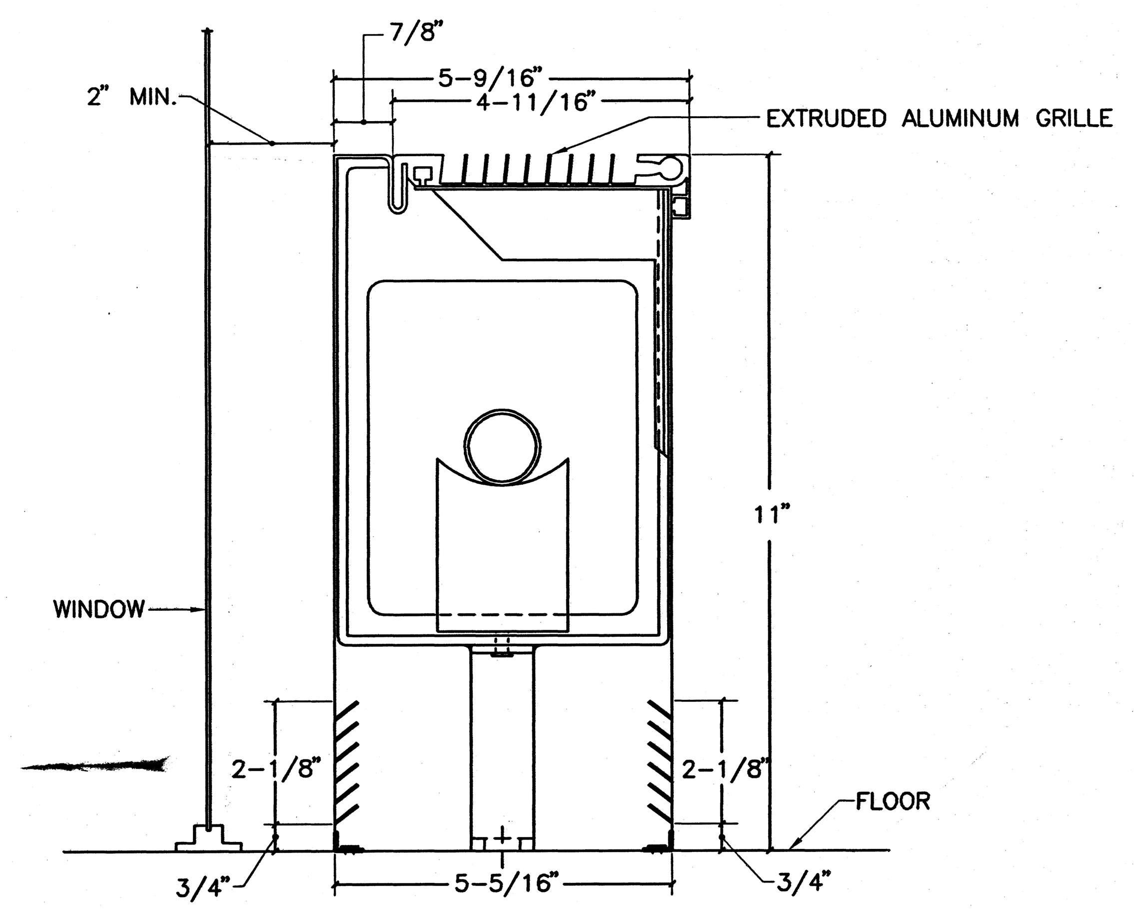
SCALE: NONE (37)



NOTES:
1. ROOF INSTALLATION SHALL BE SIMILAR.
2. REFER TO PLANS FOR DUCT & PIPE SIZES.
3. INSTALLATION SHALL ALLOW FOR MINIMUM 40" ON ONE SIDE

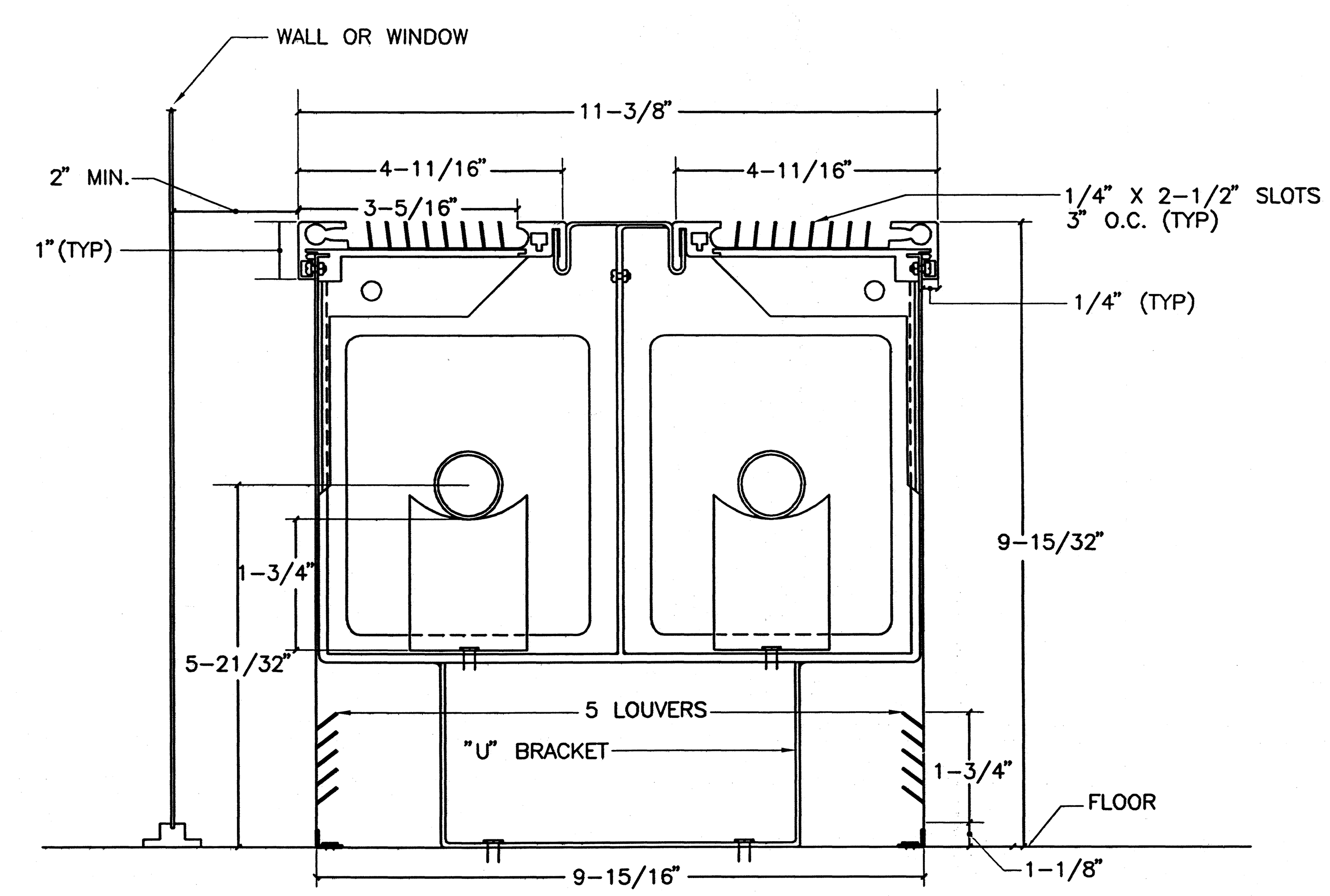
DETAIL – KITCHEN EXHAUST UNIT INSTALLATION

SCALE: NONE (38)



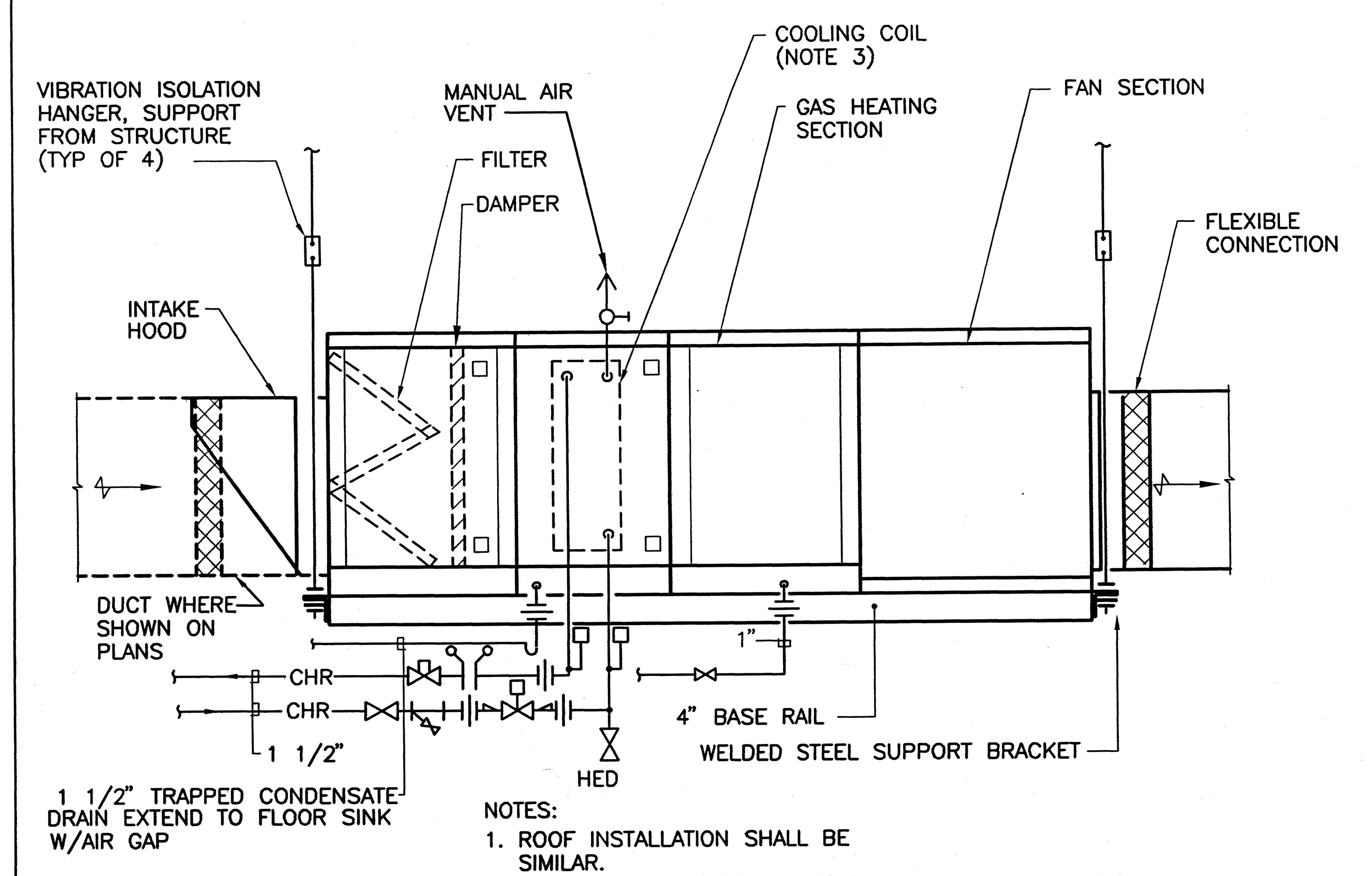
DETAIL – RADIATION – SINGLE

SCALE: NONE (39)



DETAIL – RADIATION – DOUBLE

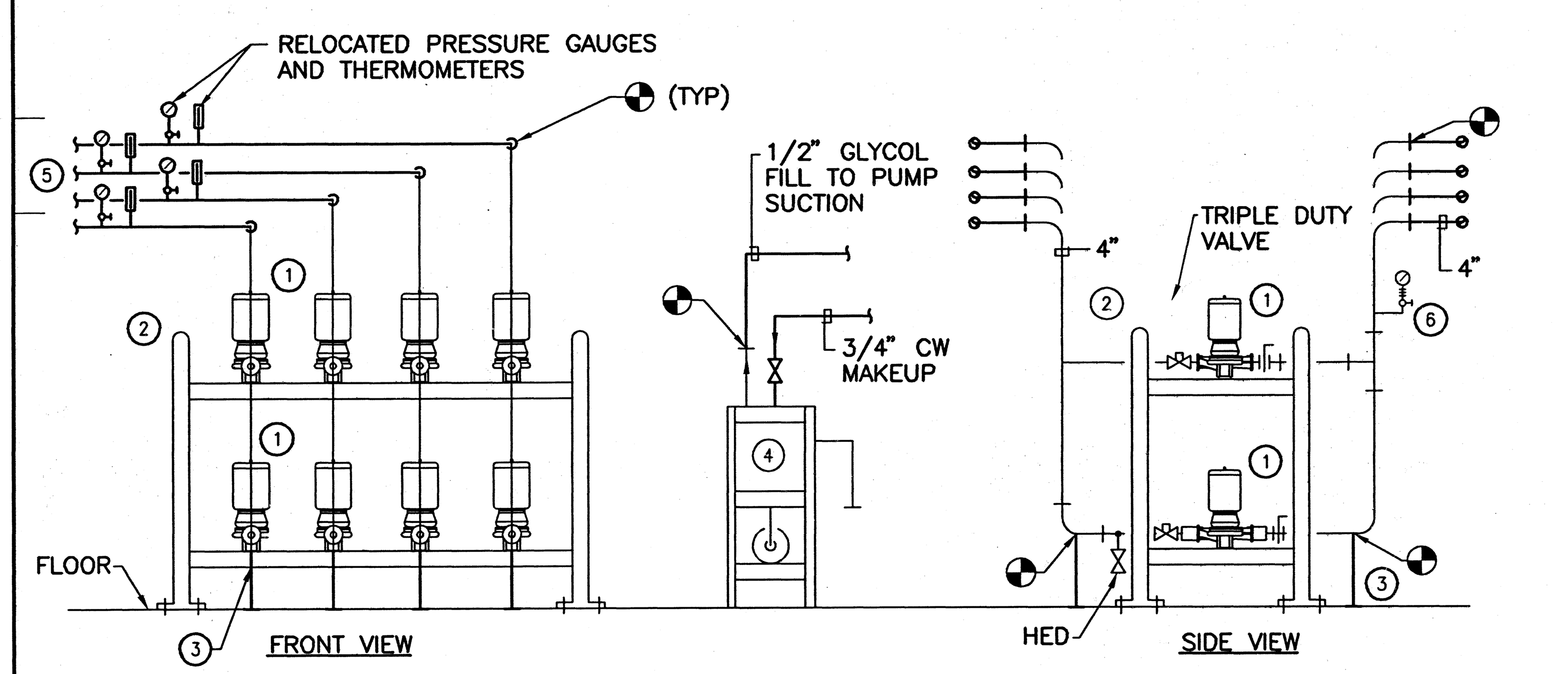
SCALE: NONE (40)



NOTES:
1. ROOF INSTALLATION SHALL BE SIMILAR.
2. REFER TO PLANS FOR DUCT & PIPE SIZES.
3. COOLING COIL ONLY FOR MAU-2B,2C& 2D
4. ALL SECTIONS SHALL HAVE ACCESS DOORS

DIRECT GAS-FIRED MAKE UP AIR UNIT

SCALE: NONE (41)



NOTES:
1. RELOCATED EXISTING ZONE PUMP (PRIMARY & STANDBY)
2. RELOCATED EXISTING STEEL FRAME; BOLT TO CONCRETE FLOOR.
3. PROVIDE PIPE SUPPORT LEG AT EACH PIPE RISER ELBOW
4. RELOCATED EXISTING GLYCOL FILL SYSTEM W/PUMP & CONTROLS.
5. EXTEND TURF HEATING ZONE SUPPLY AND RETURN PIPING BELOW SLAB TO A FLANGED END CONNECTION 5'-0" BEYOND FIELD WALL (INTO FIELD). PIPING SYSTEM SHALL MATCH EXISTING SCH. 40 STEEL VICTAULIC SYSTEM.
6. EXISTING PRESSURE GAUGE

DETAIL– TURF HEATING SYSTEM PIPING

SCALE: NONE (42)

X

SCALE: x (43)

NOTE:
REFER TO SHEET P.6-04 FOR GENERAL PIPING DETAILS WHICH APPLY TO MECHANICAL/HVAC PIPING SYSTEMS.

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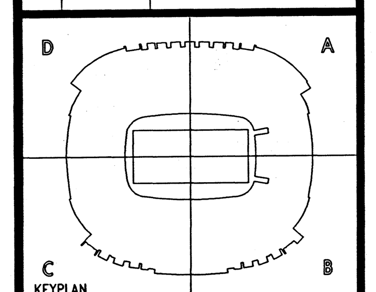
REVISIONS

NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44

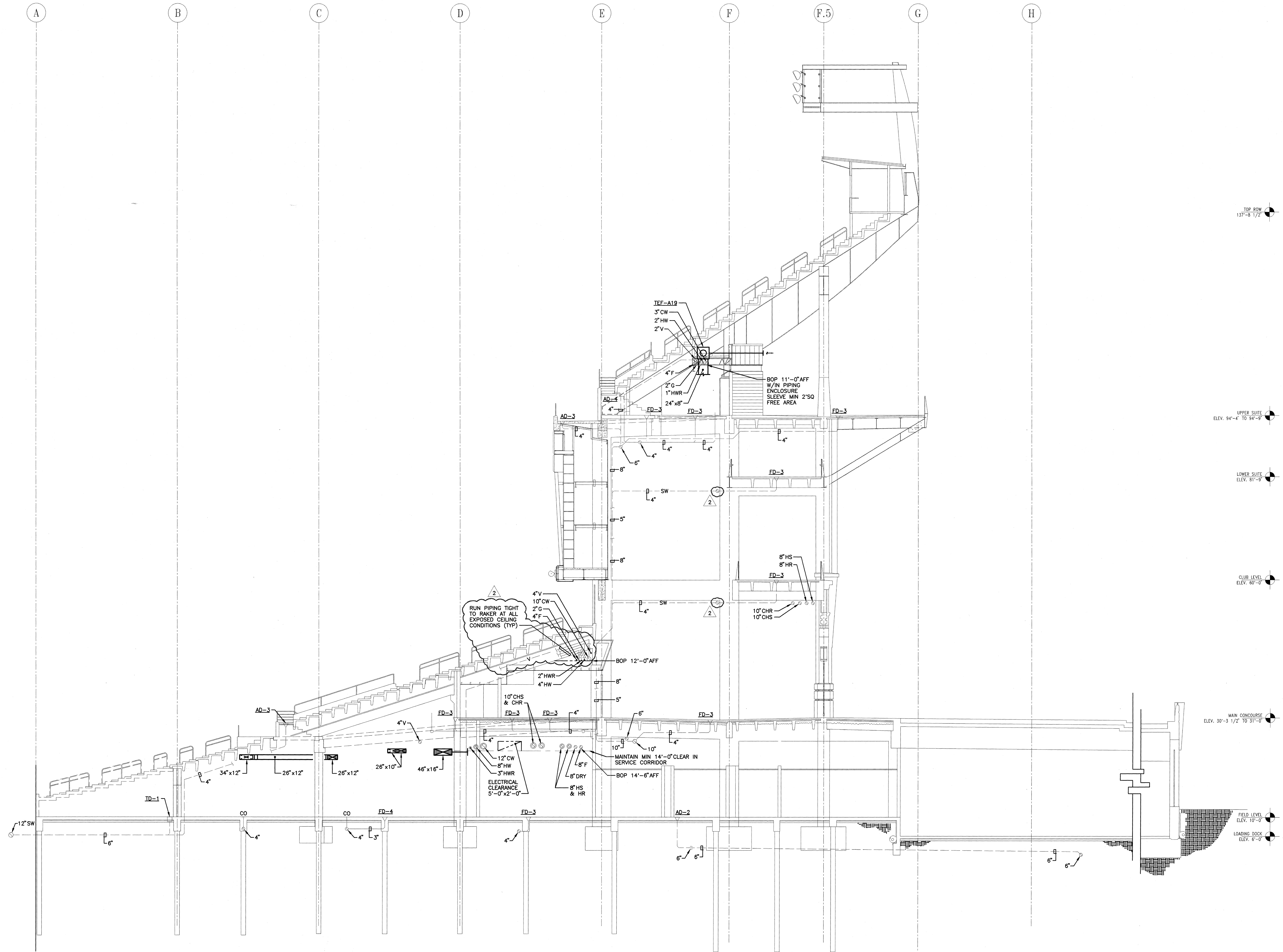


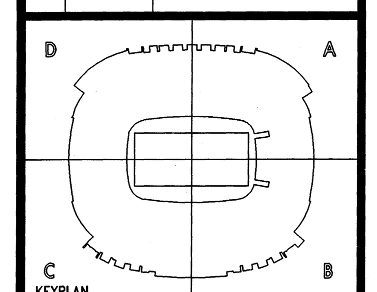
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: CAS	REVIEWED BY:
ISSUED: 2-28-97	

SHEET TITLE
MECHANICAL DETAILS

CATEGORY – SUB-CATEGORY – SHEET
M.6-05





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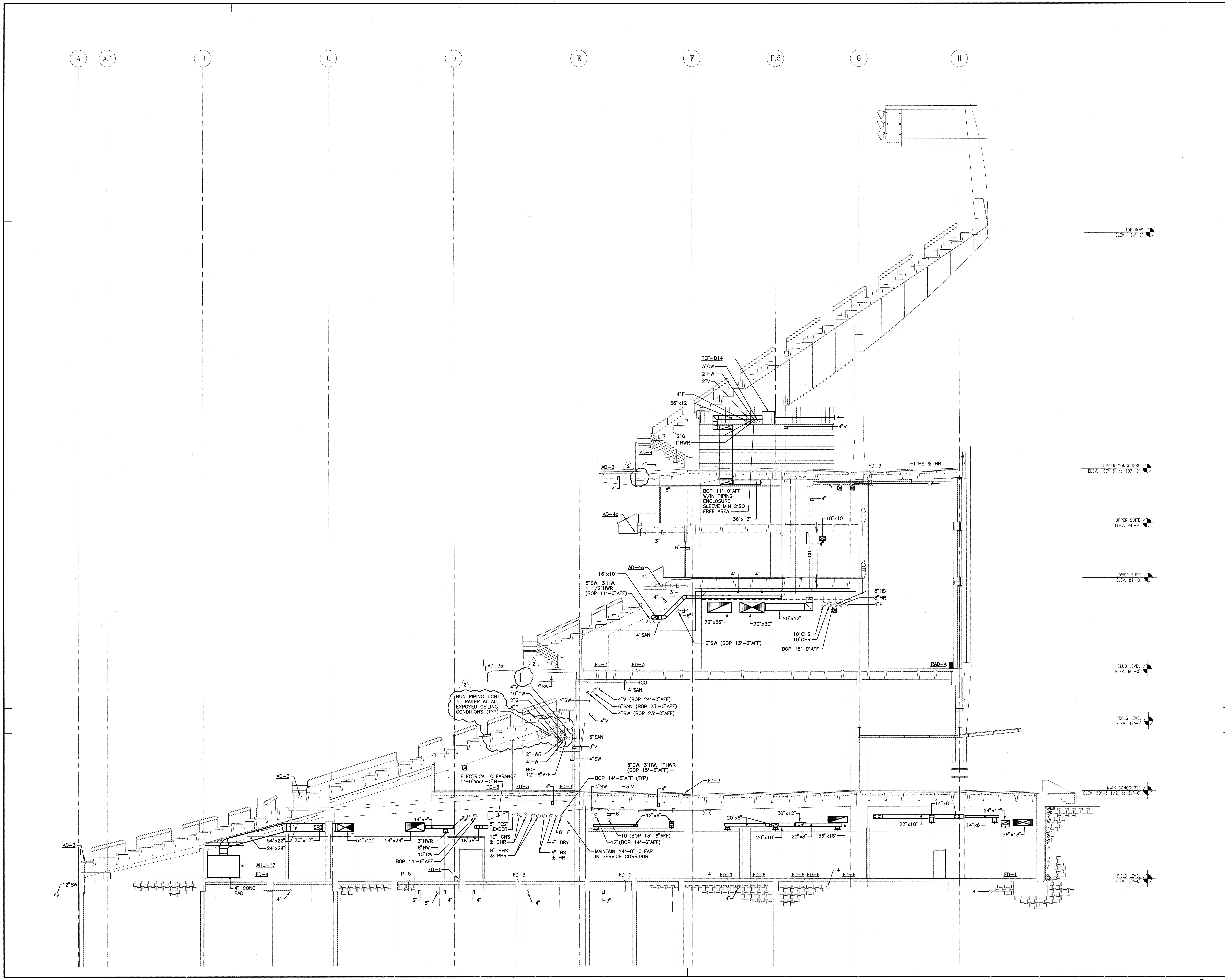
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY:
REVIEWED BY:
ISSUED: 2-28-97

SHEET TITLE
BUILDING SECTION A @ COL 14

CATEGORY - SUB-CATEGORY - SHEET
M.7-01

04.29.97-21:57- 5110P71 - RMF #95110



04.29.97-21:41- 5110P72 - RMF #95110

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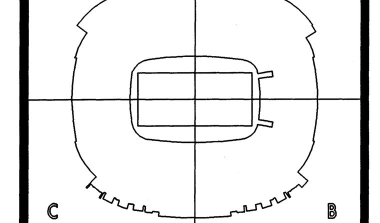
NO.	DATE	DESCRIPTION
1	4-4-97	BULLETIN #43
2	4-28-97	BULLETIN #44

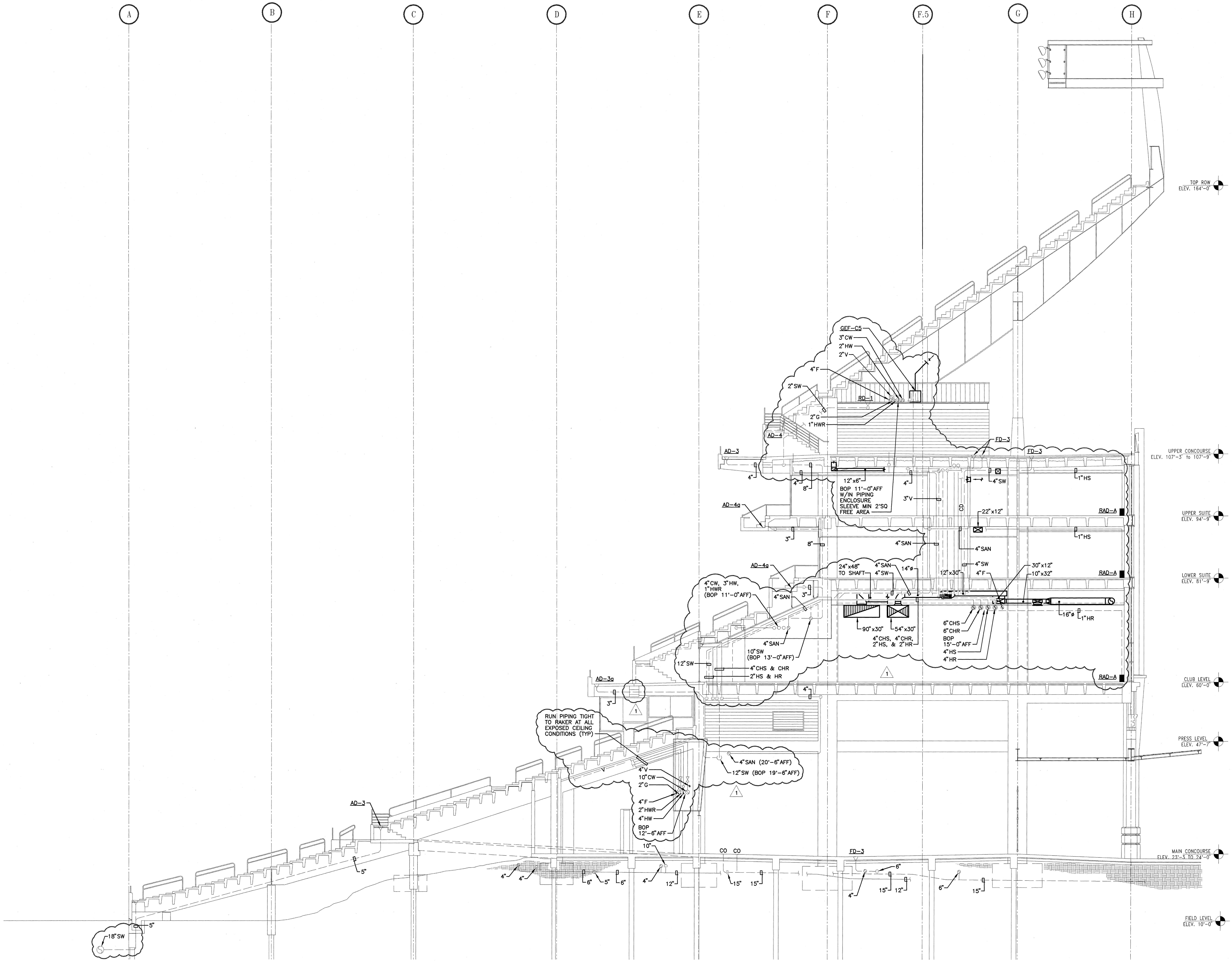


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: SWS
REVIEWED BY:
ISSUED: 2-28-97
SHEET TITLE

BUILDING SECTION B @ COL 22

CATEGORY - SUB-CATEGORY - SHEET
M.7-02



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PROJECT NO. 95-675-00	ISSUED BY:
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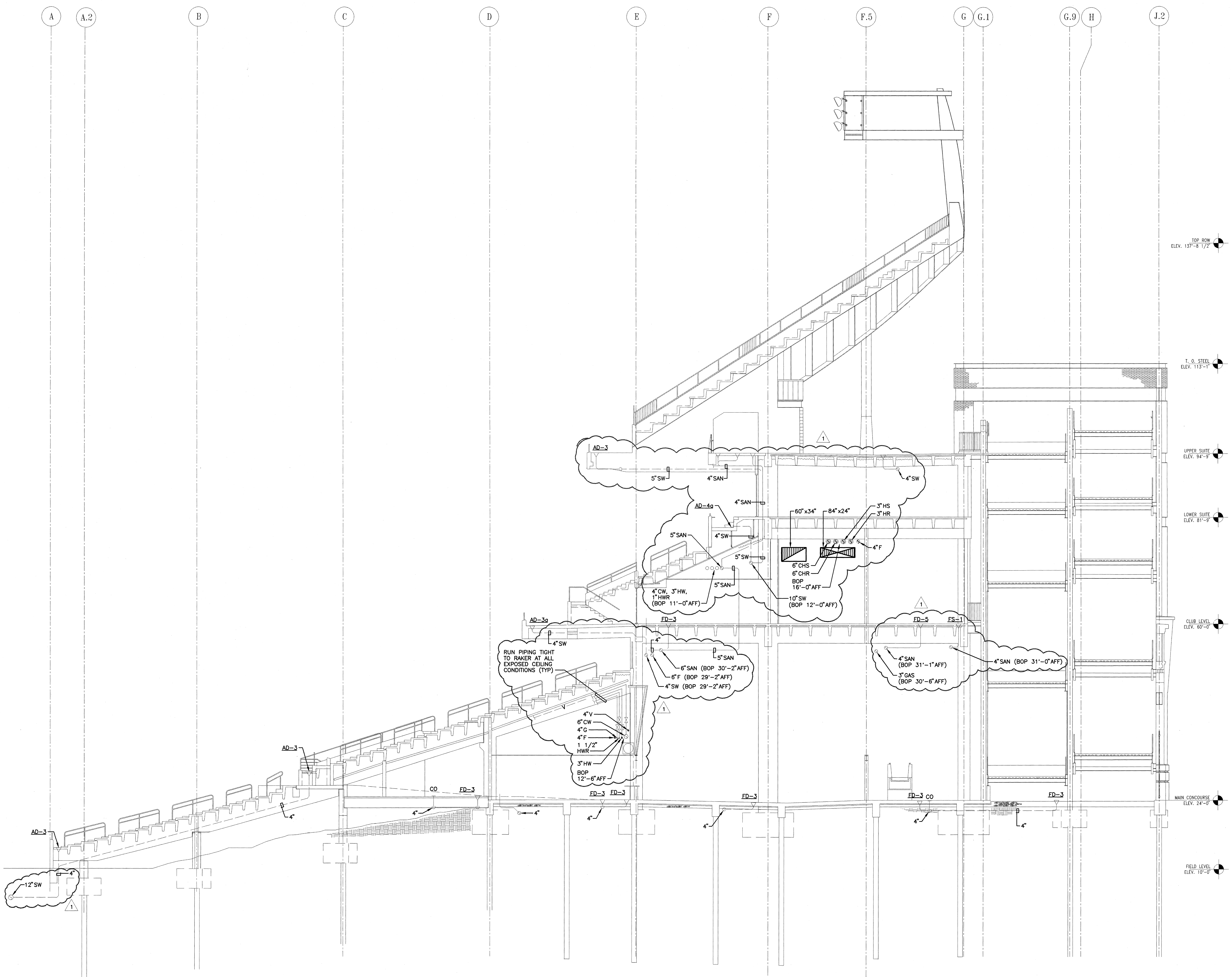
ISSUED: 2-28-97	

SHEET TITLE
BUILDING SECTION C @ COL 32

CATEGORY – SUB-CATEGORY – SHEET
M.7-03

04.29.97-20:45-5110P73 - RMF #95110



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NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
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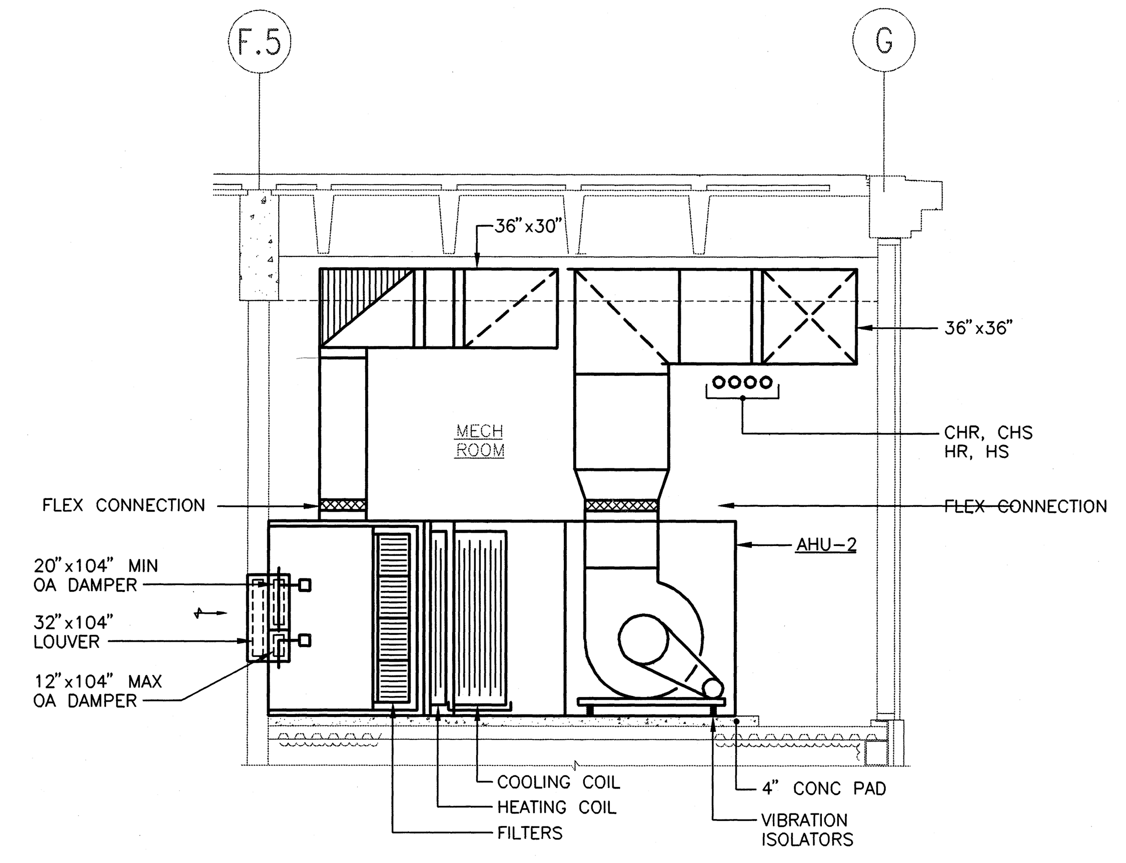
ISSUED: 2-28-97	

SHEET TITLE
BUILDING SECTION D
@ COL 47

CATEGORY - SUB-CATEGORY - SHEET
M.7-04

04.29.97-20:04-5110P74 - RMF #95110



SECTION A M.3-09
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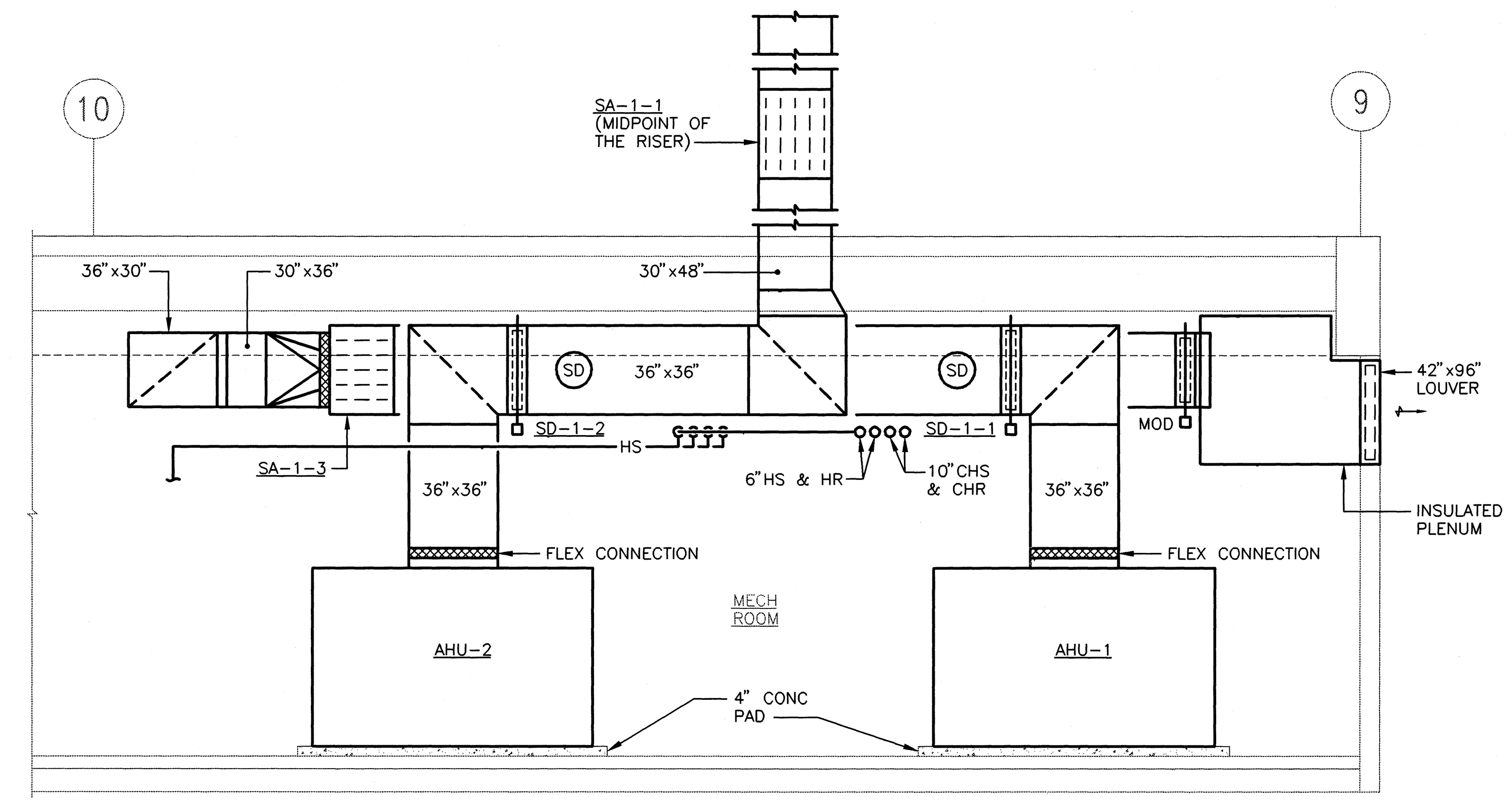

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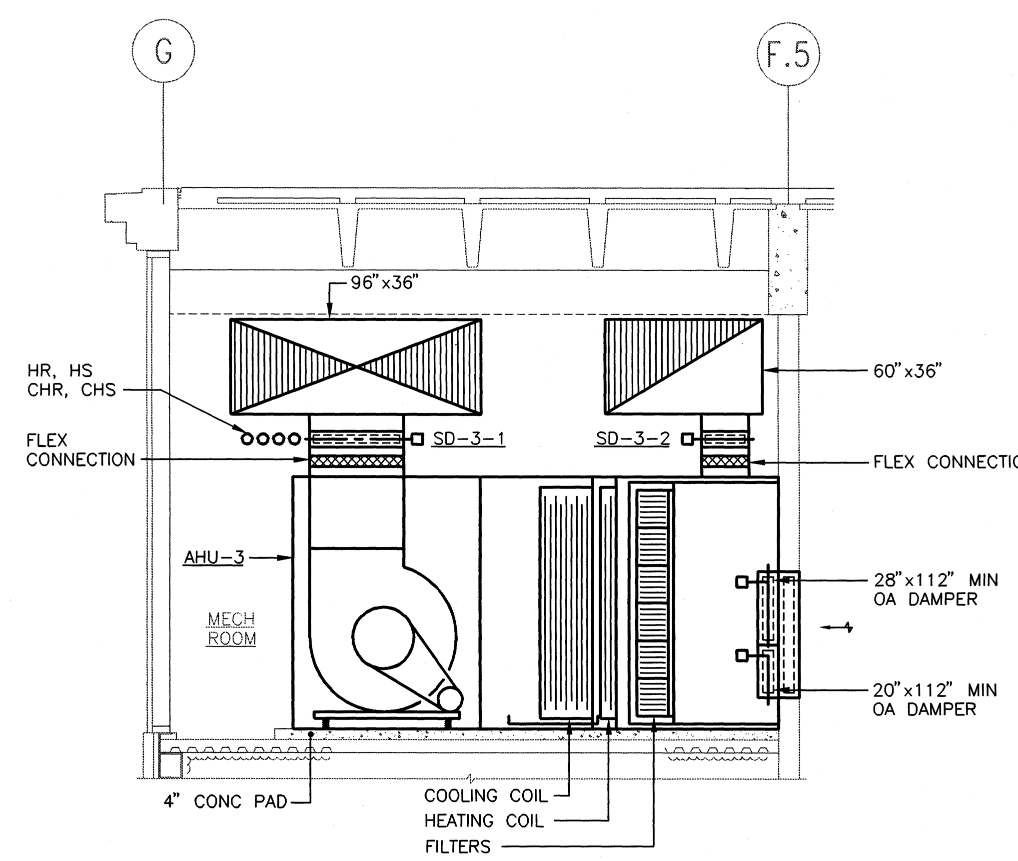

SECTION C M.3-10
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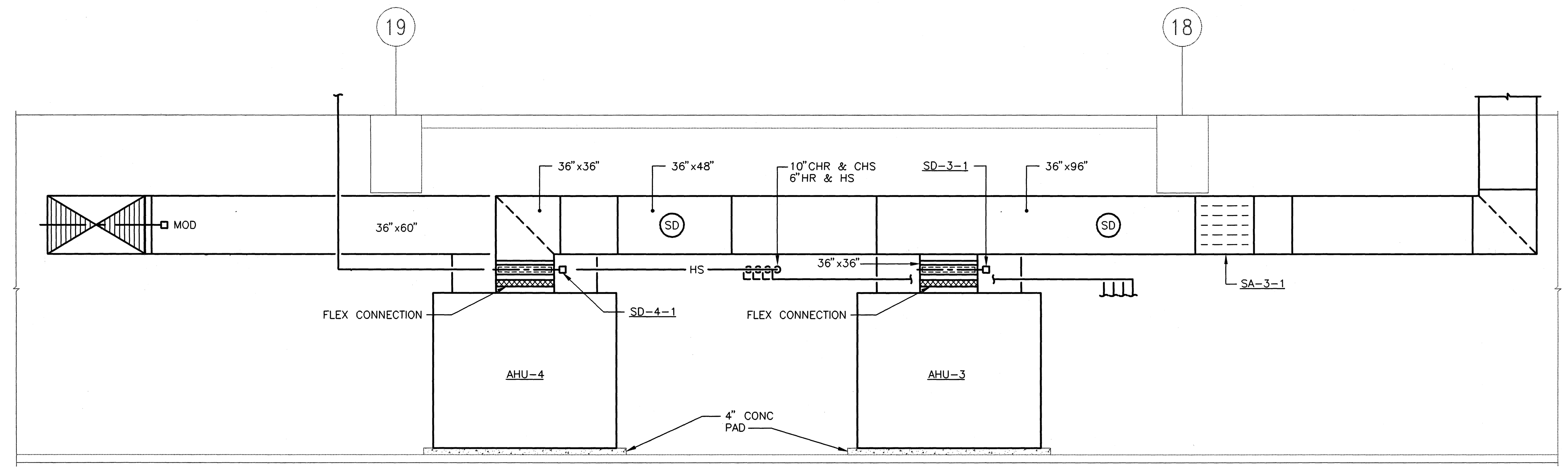

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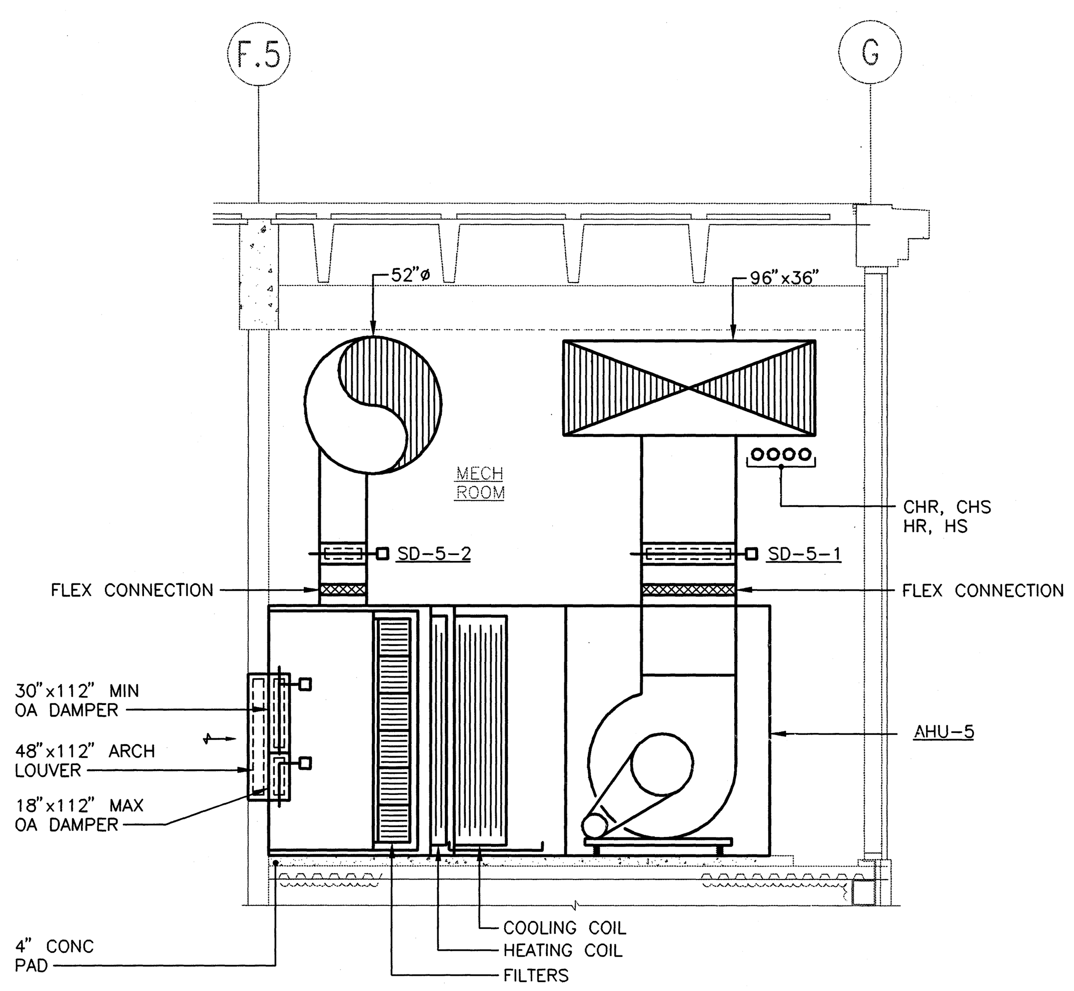

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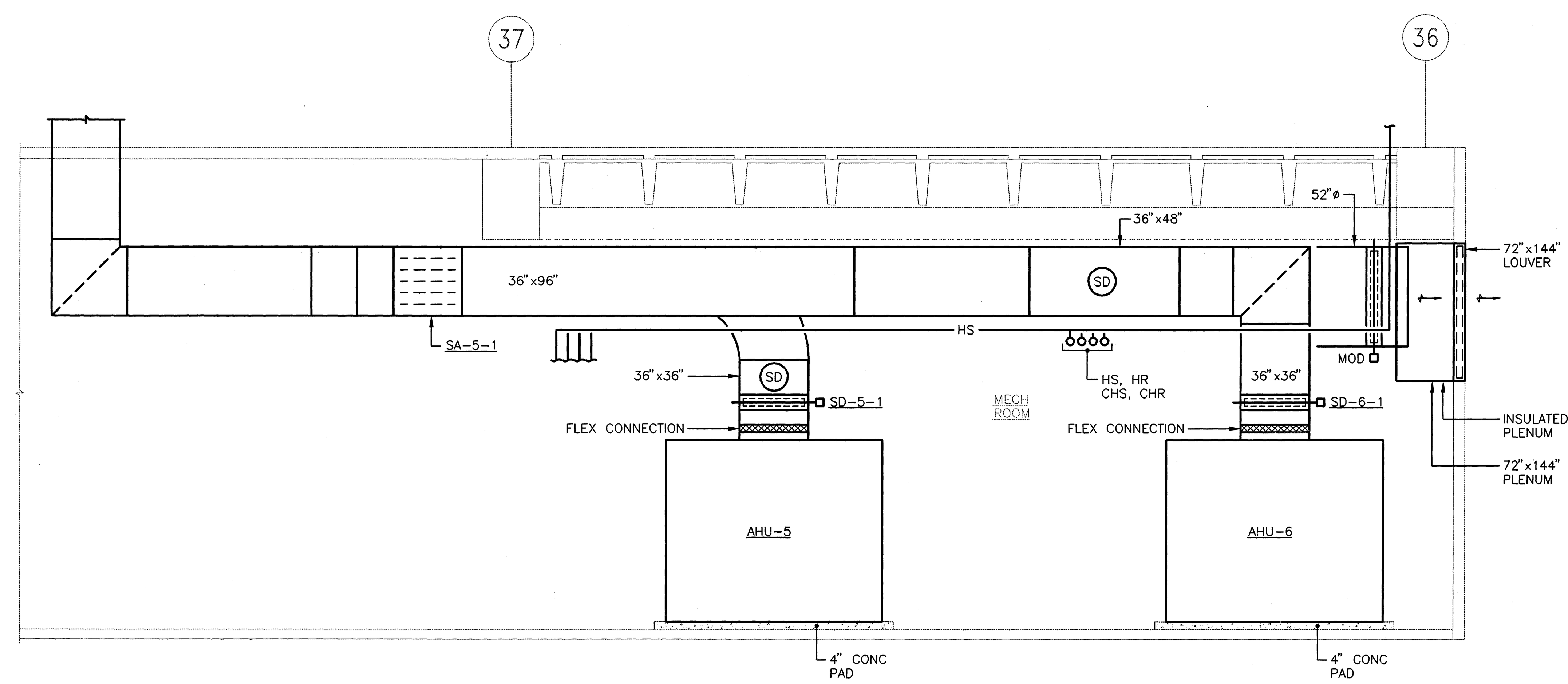

SECTION F M.3-11
SCALE: 1/4"=1'-0"

PROJECT NORTH

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REVISIONS

NO.	DATE	DESCRIPTION
1	4-28-97	BULLETIN #44

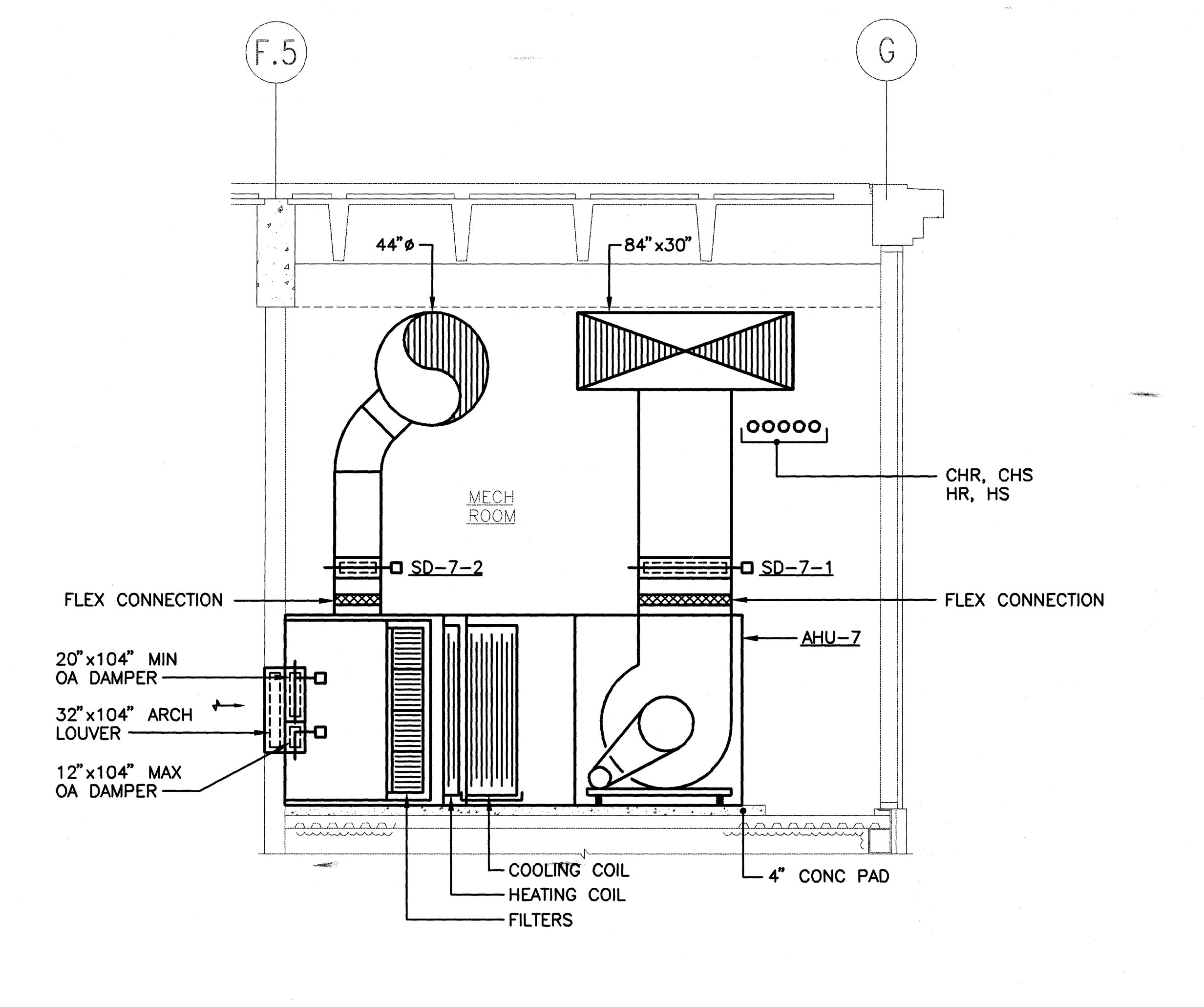
KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JRJ
REVIEWED BY: PJH
ISSUED: 4-28-97

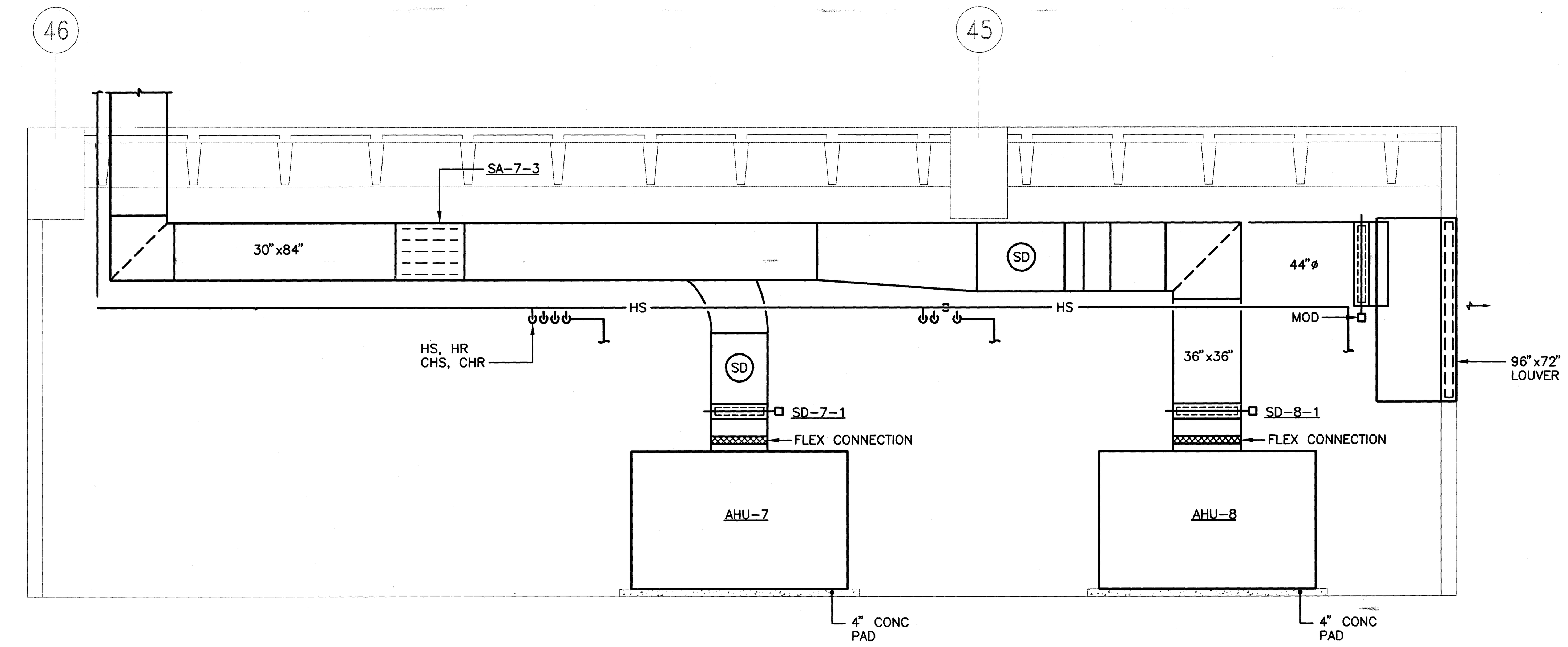
SHEET TITLE
MECHANICAL ROOM SECTIONS

CATEGORY - SUB-CATEGORY - SHEET
M.7-05

29.04.97-13:45-510M705 - RMF #95110



A
M.3-09
SECTION
SCALE: 1/4"=1'-0"



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M.3-09
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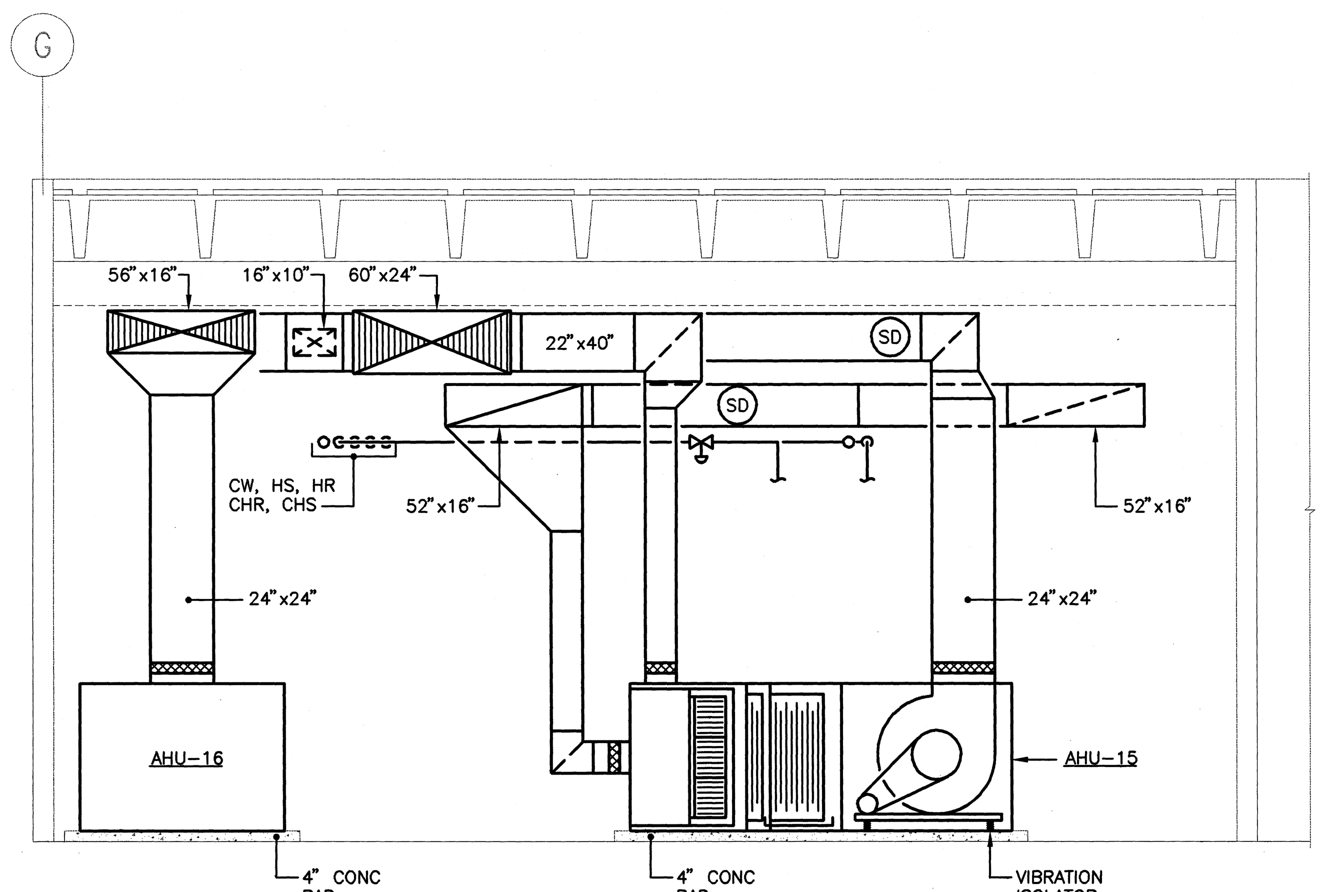

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M.3-10
SECTION
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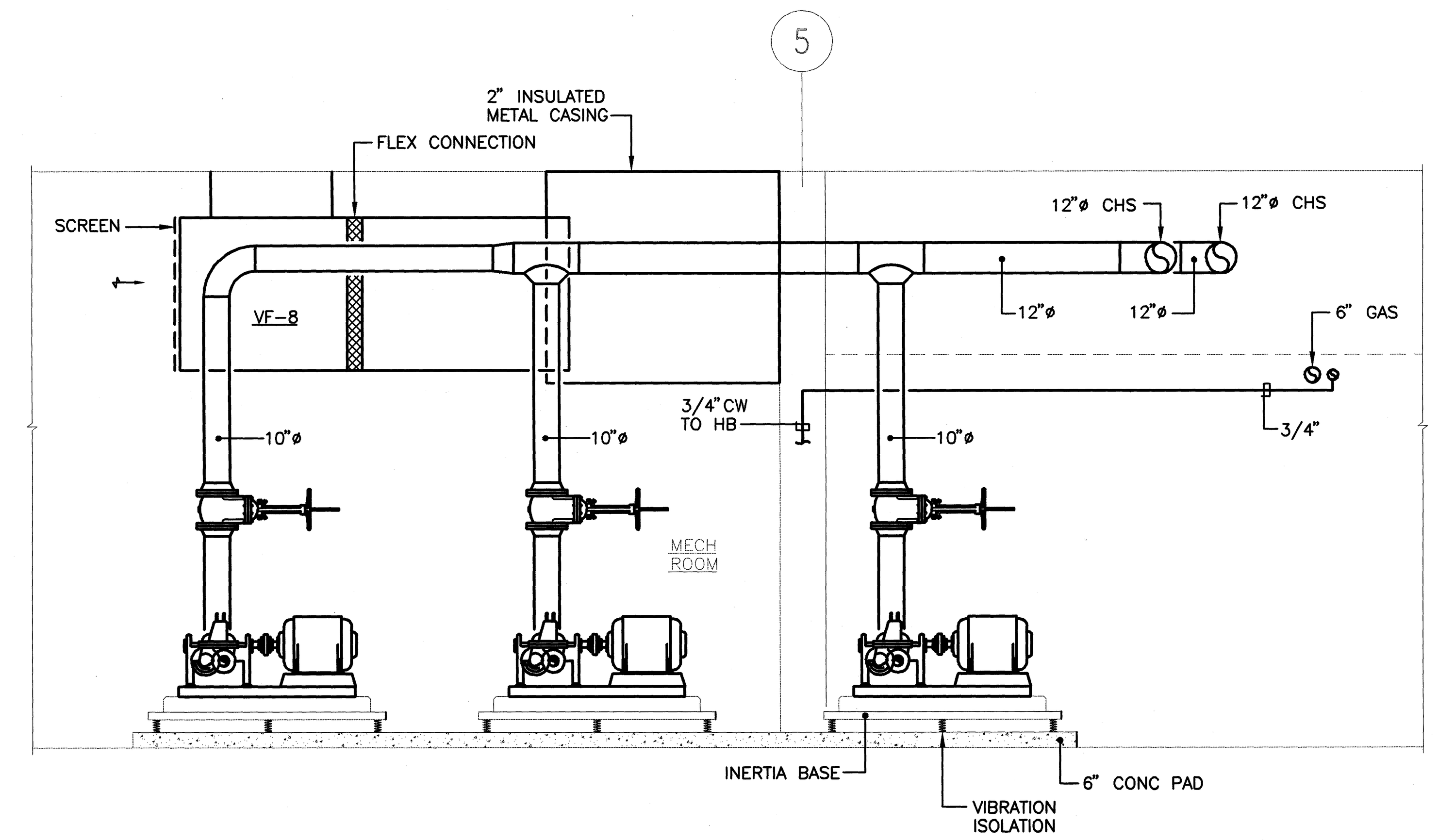

D
M.3-10
SECTION
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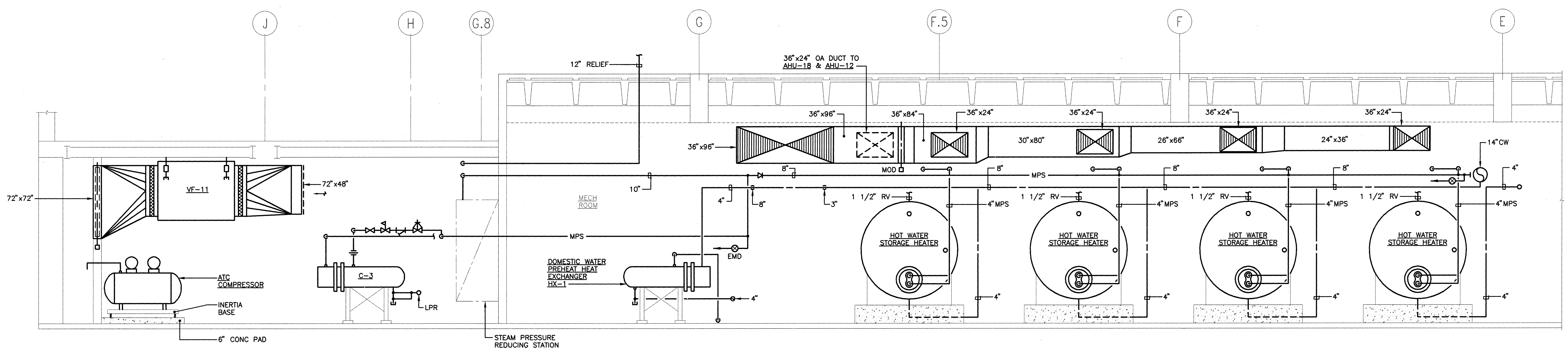

E
M.3-11
SECTION
SCALE: 1/4"=1'-0"

PROJECT NORTH

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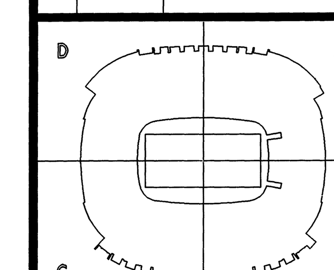
NO.	DATE	DESCRIPTION
	4-28-97	BULLETIN #44

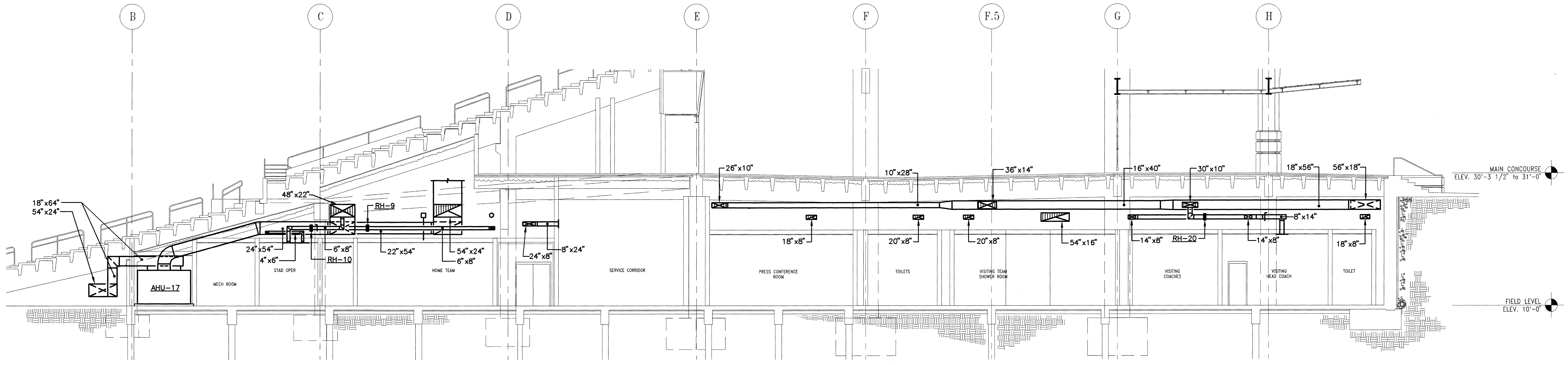


KEYPLAN

PROJECT NO. 95-675-00
ISSUED BY: ---
DRAWN BY: JRJ
REVIEWED BY: PJH
ISSUED: 4-28-97
SHEET TITLE
MECHANICAL ROOM SECTIONS

CATEGORY - SUB-CATEGORY - SHEET
M.7-06

29.04.97-13:54-6110M706 - RMF #95110



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SECTION "A"
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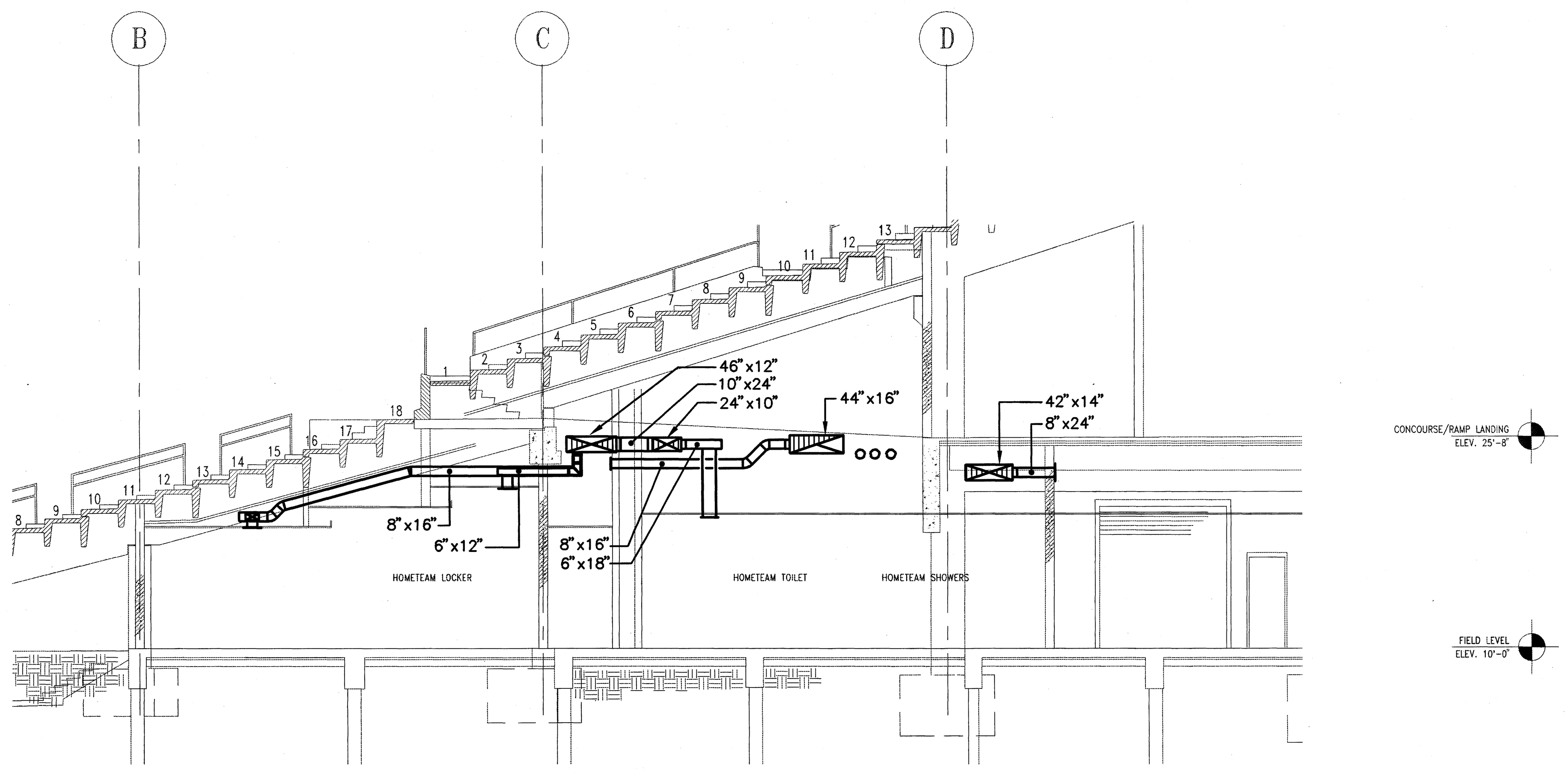

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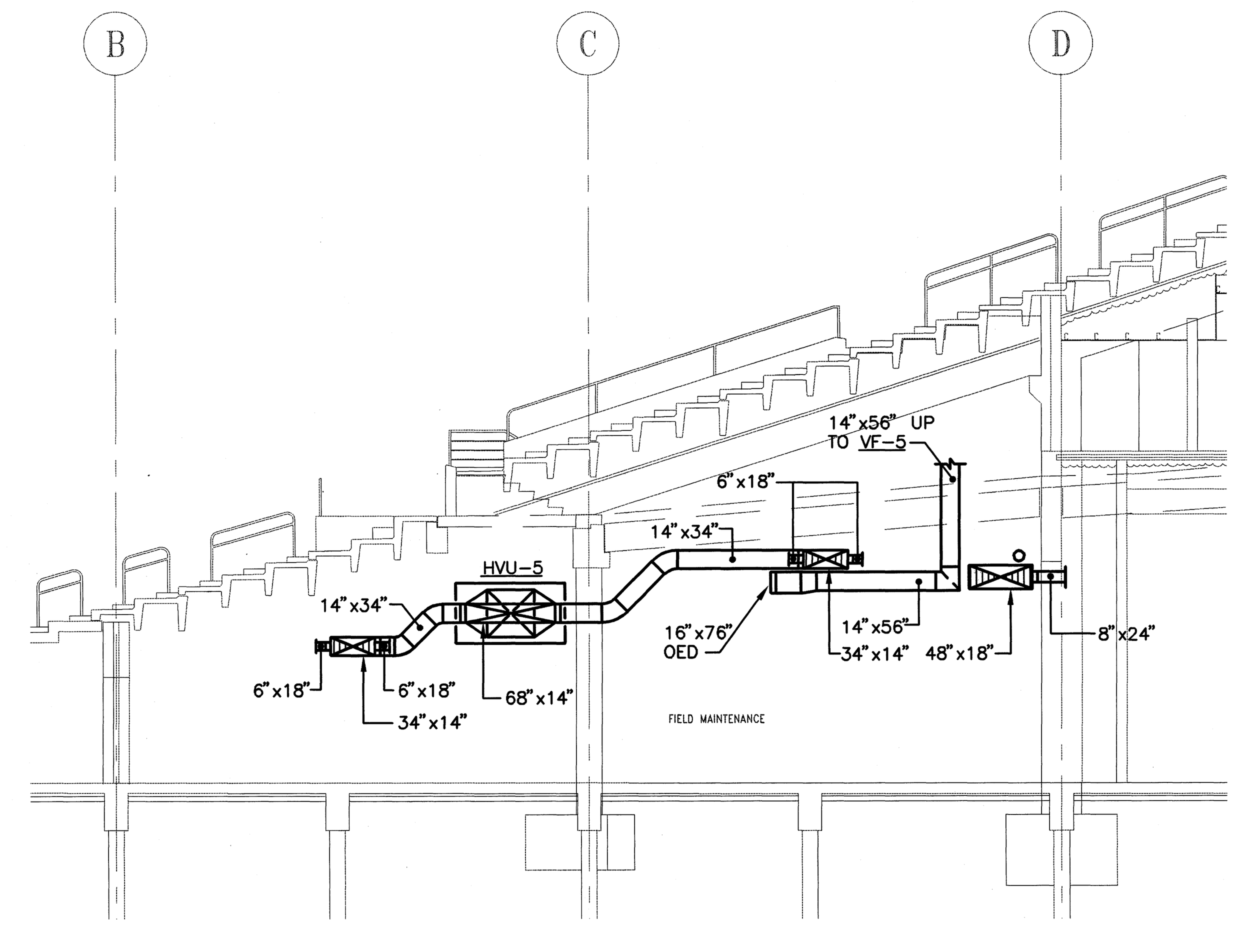

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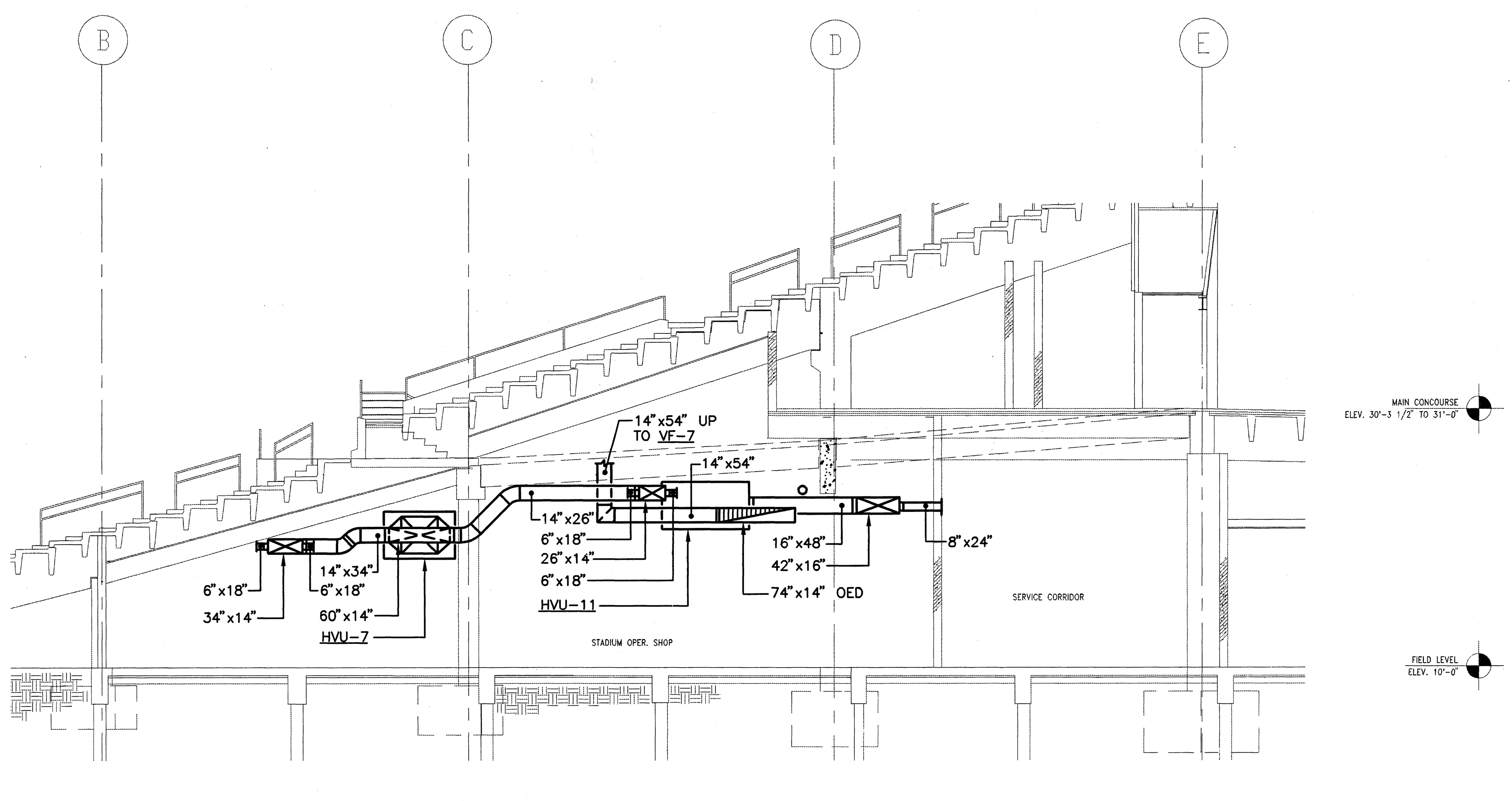

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SECTION "D"
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28.04.97-08:58-5110M707 - RMF #95110

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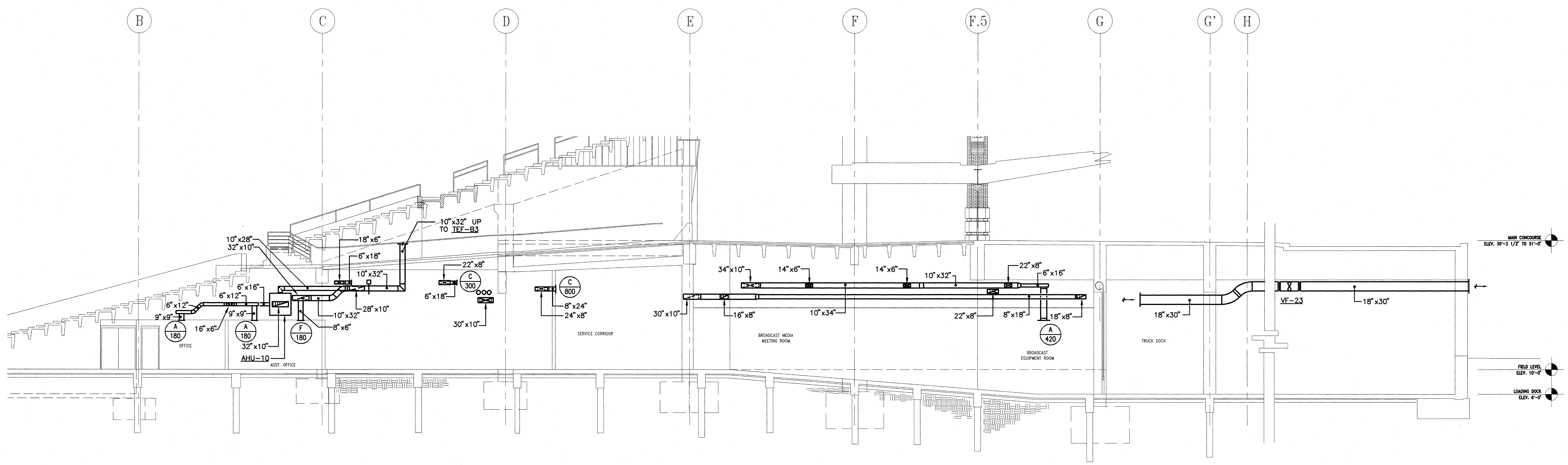
NO.	DATE	DESCRIPTION

KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY:
ISSUED: 4-4-97	

SHEET TITLE
MECHANICAL SECTIONS

CATEGORY - SUB-CATEGORY - SHEET
M.7-07



E
M.2-01B

SECTION "E"

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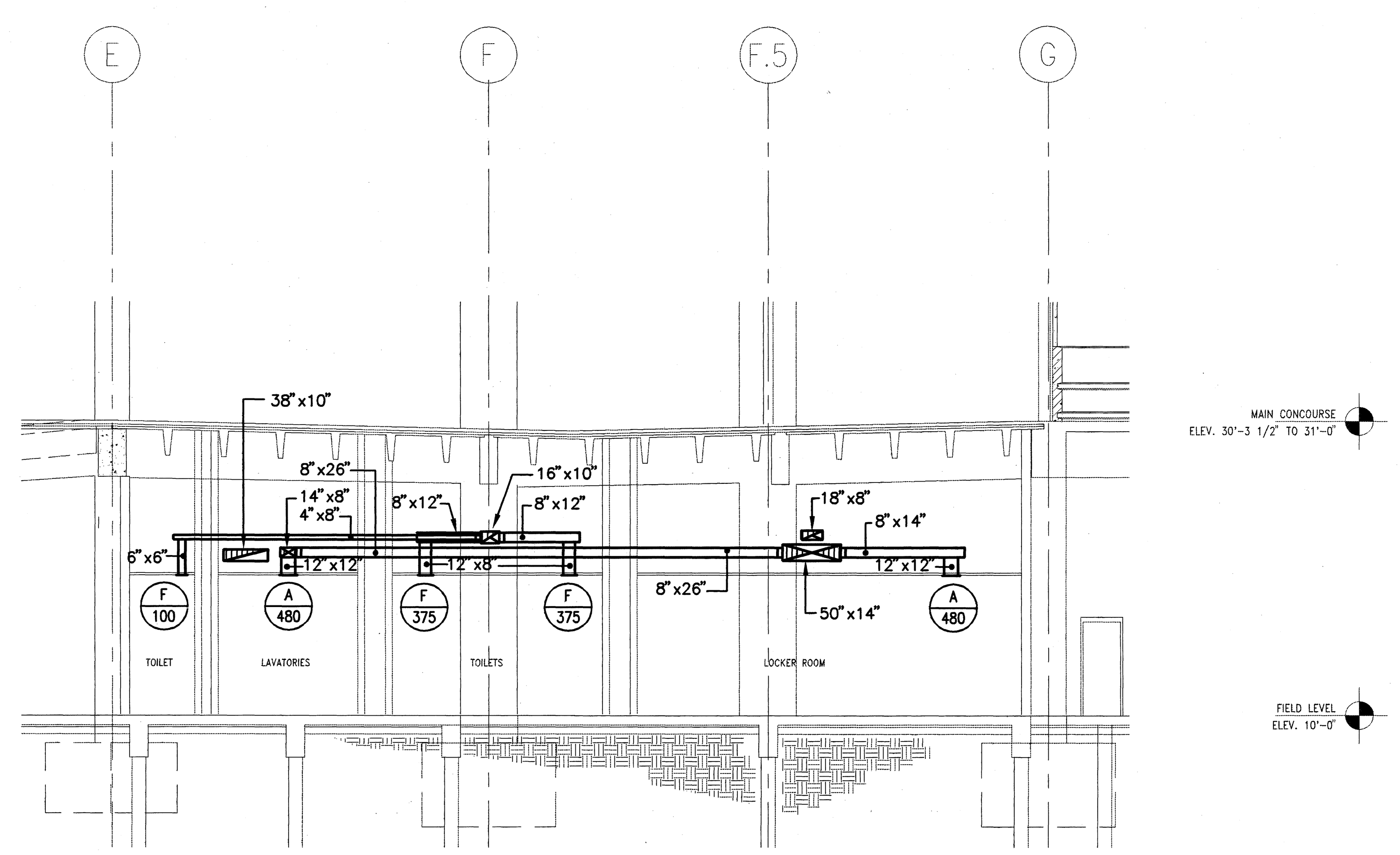

F
M.2-01A

SECTION "F"

SCALE: 1/8"=1'-0"

28.04.97-09:02-5110M708 - RMF #95110

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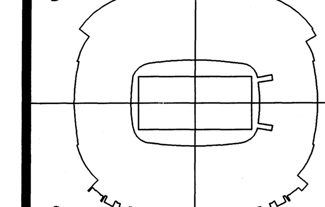
NO.	DATE	DESCRIPTION



KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY:
ISSUED: 4-4-97	

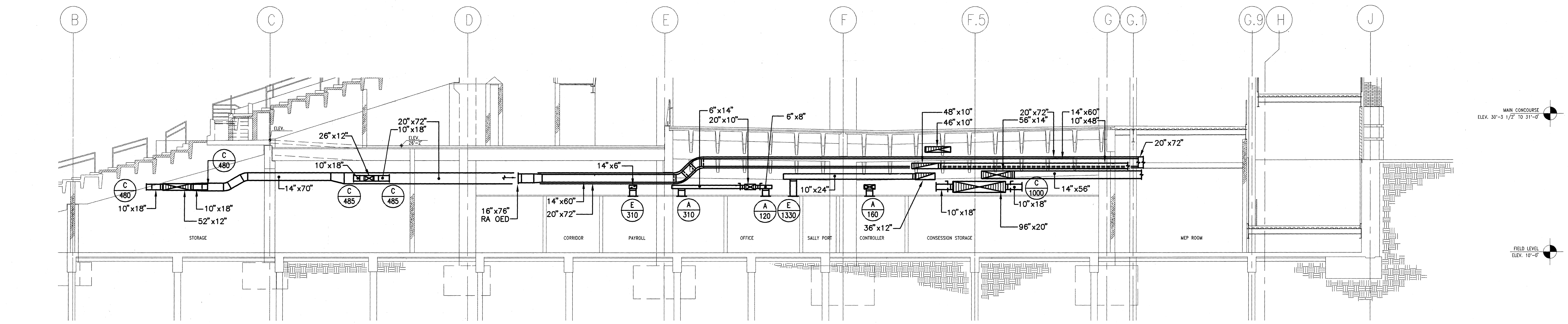
SHEET TITLE

MECHANICAL SECTIONS

CATEGORY - SUB-CATEGORY - SHEET

M.7-08

0 2 4 8 16



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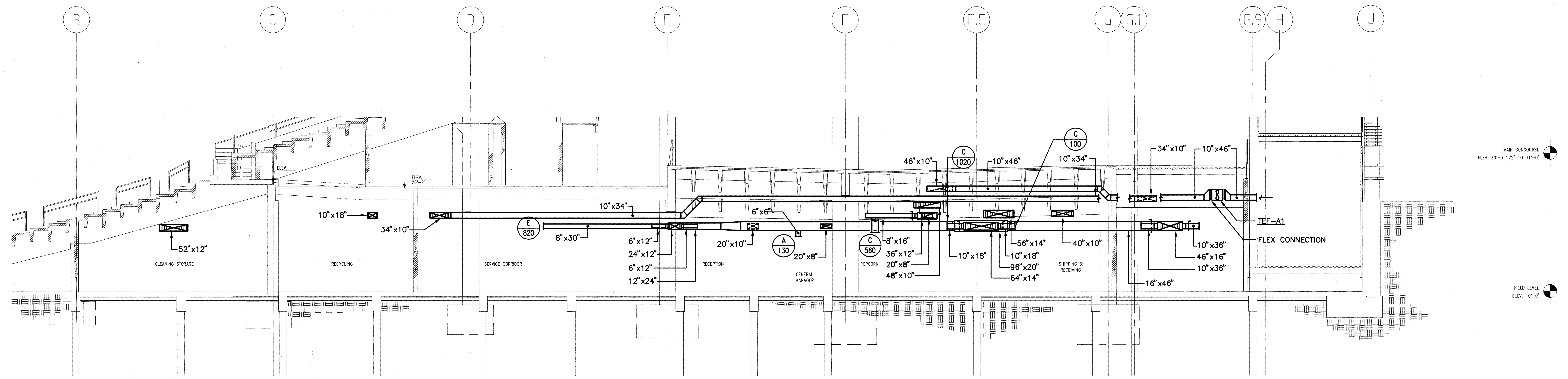

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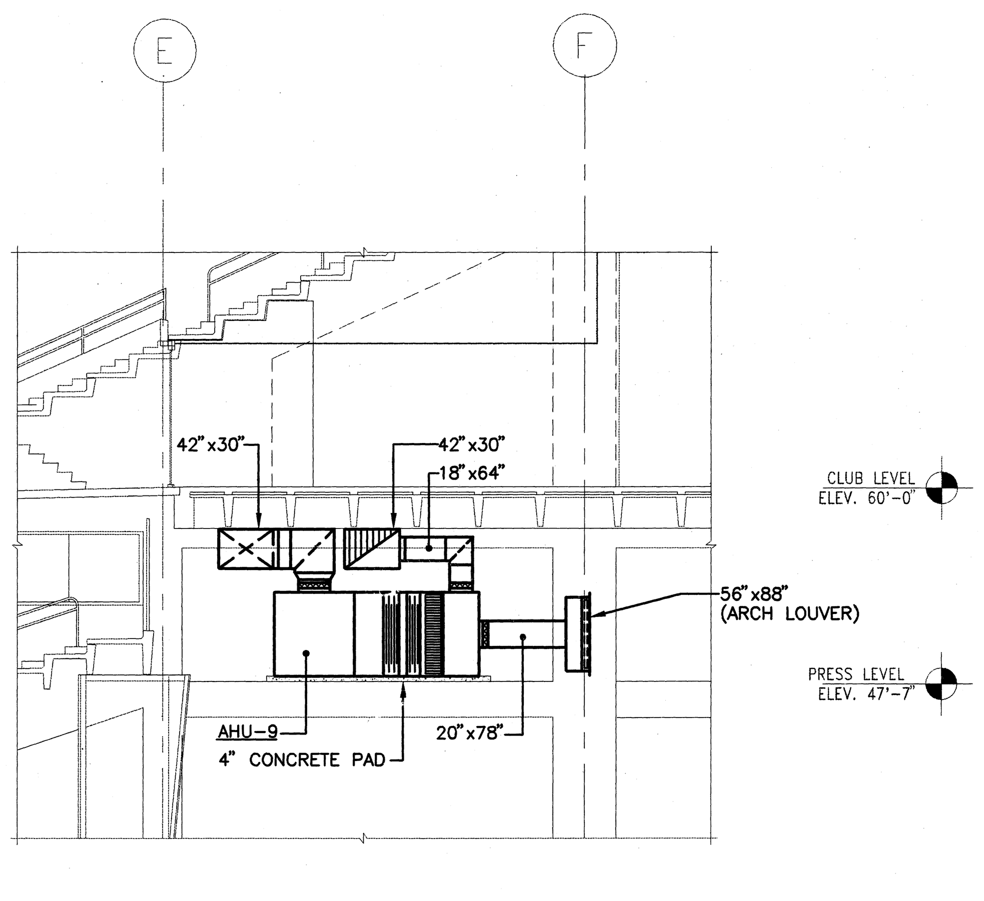

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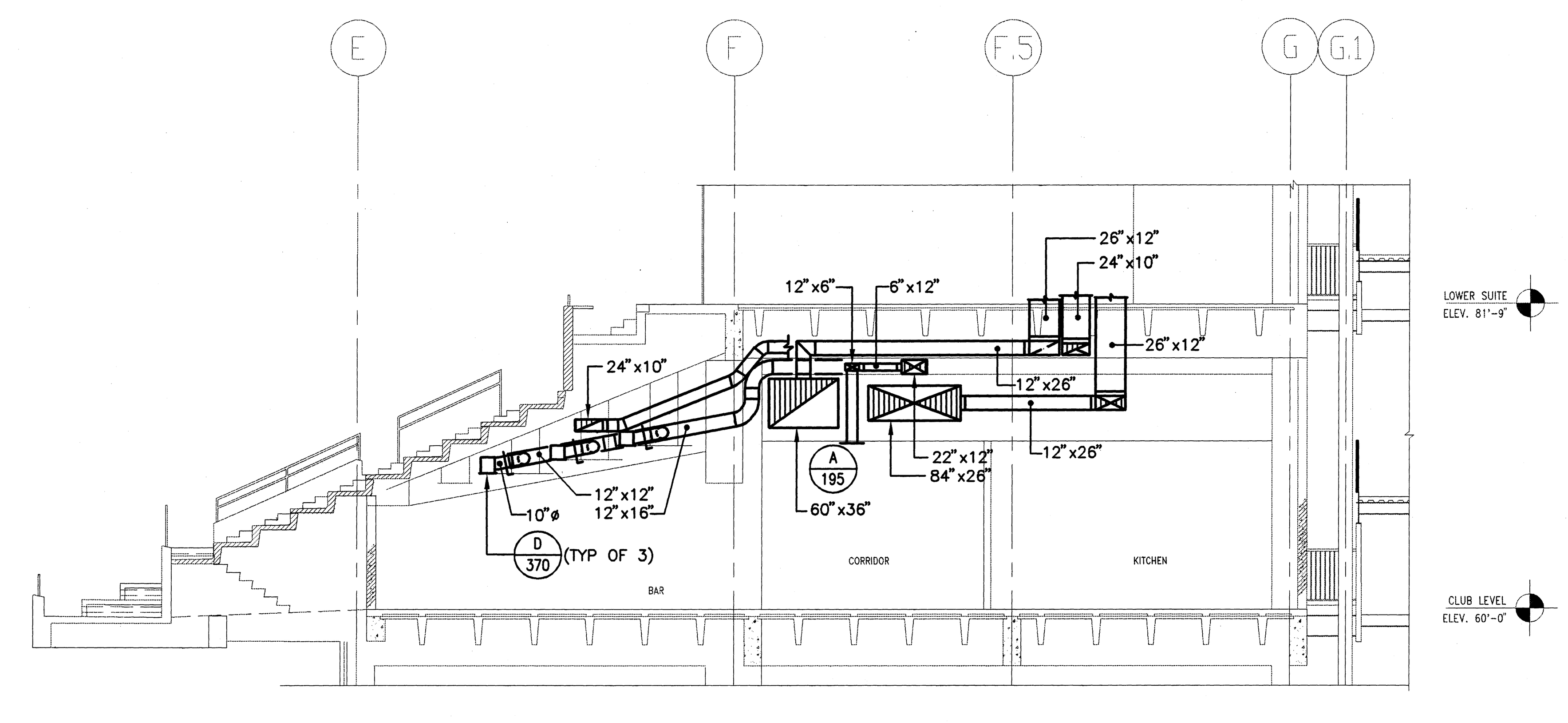

SECTION "J"
SCALE: 1/8"=1'-0"

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MIAMI, FLORIDA

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REVISIONS		
NO.	DATE	DESCRIPTION

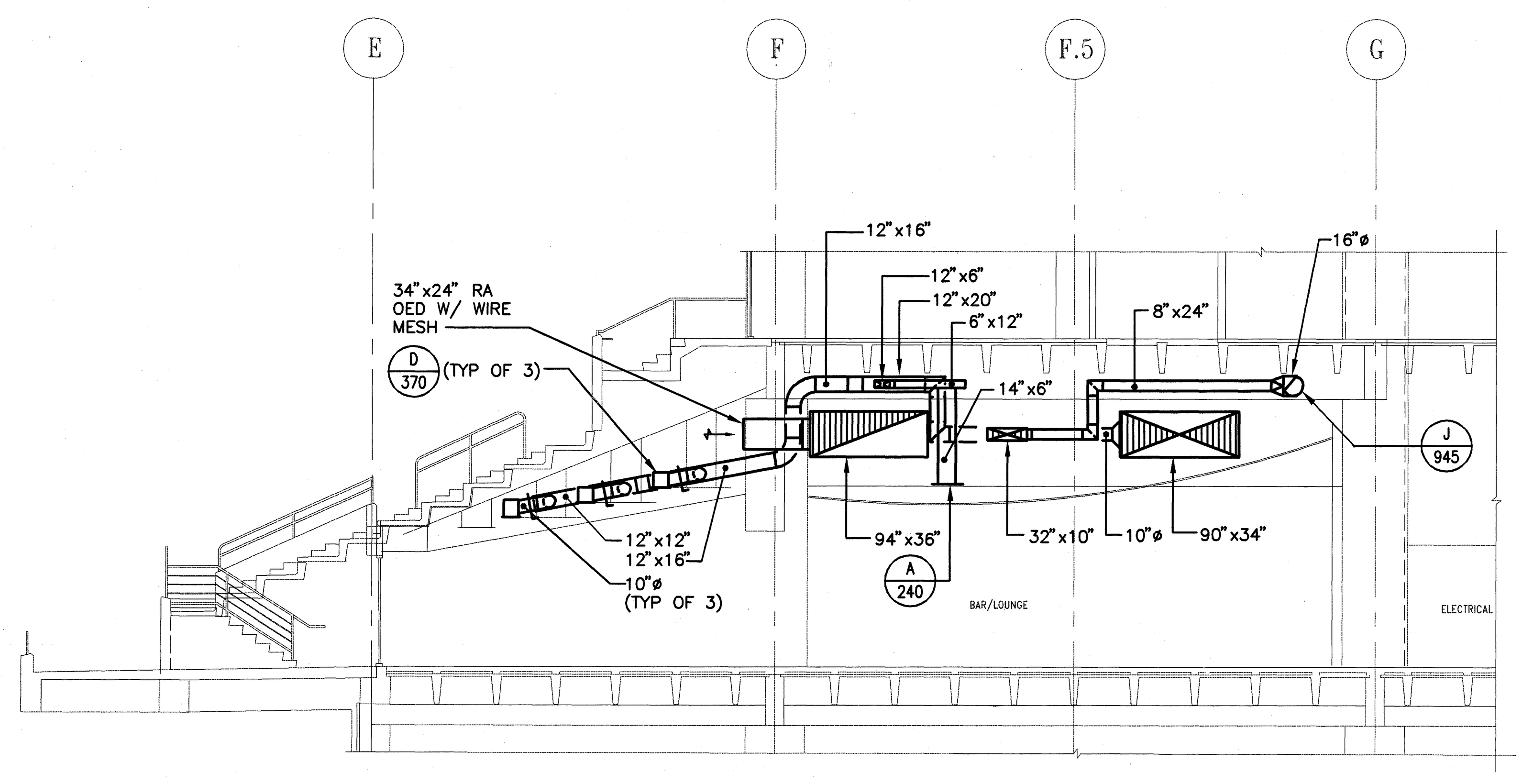
KEYPLAN

PROJECT NO. 95-675-00	ISSUED BY:
DRAWN BY: MWS	REVIEWED BY:
ISSUED: 4-4-97	

SHEET TITLE
MECHANICAL SECTIONS

CATEGORY - SUB-CATEGORY - SHEET
M.7-09

8.04.97-09.09-611DM709 - RMF #95110



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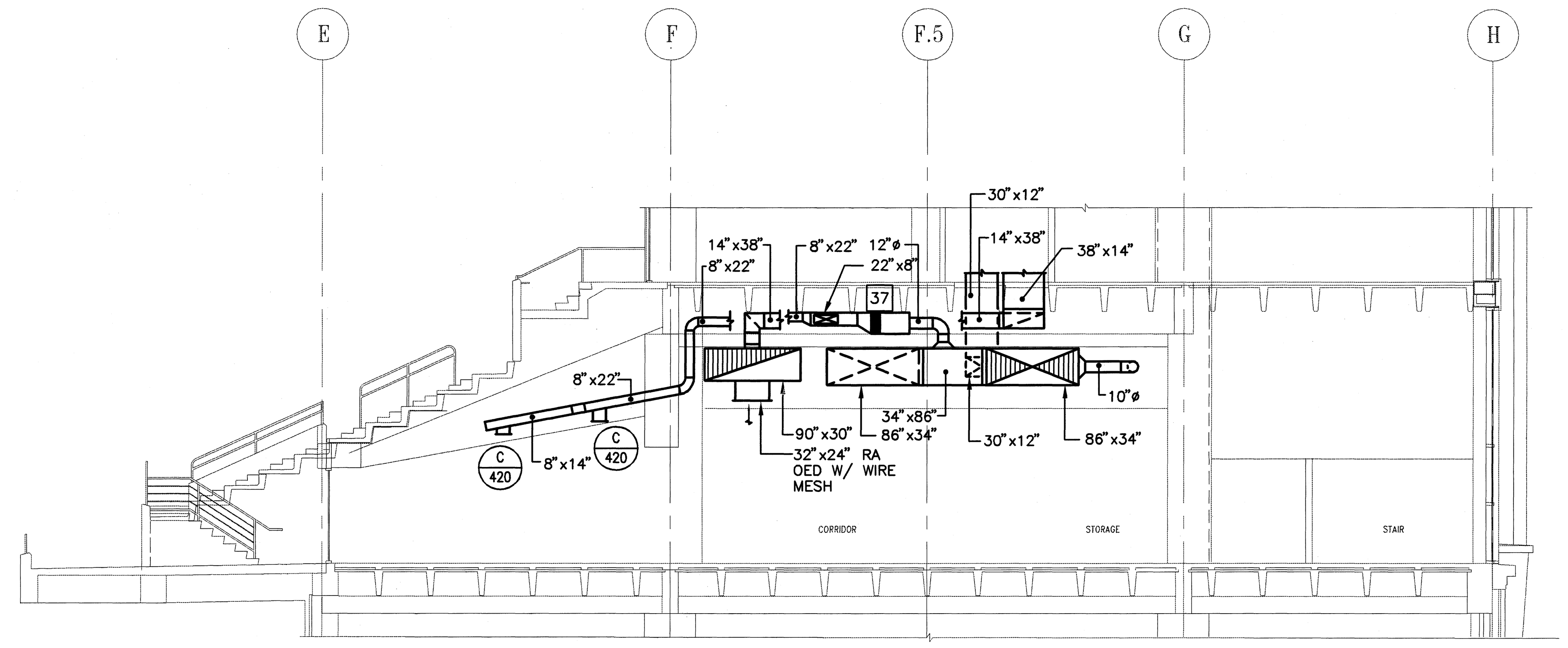
K
M2-04B



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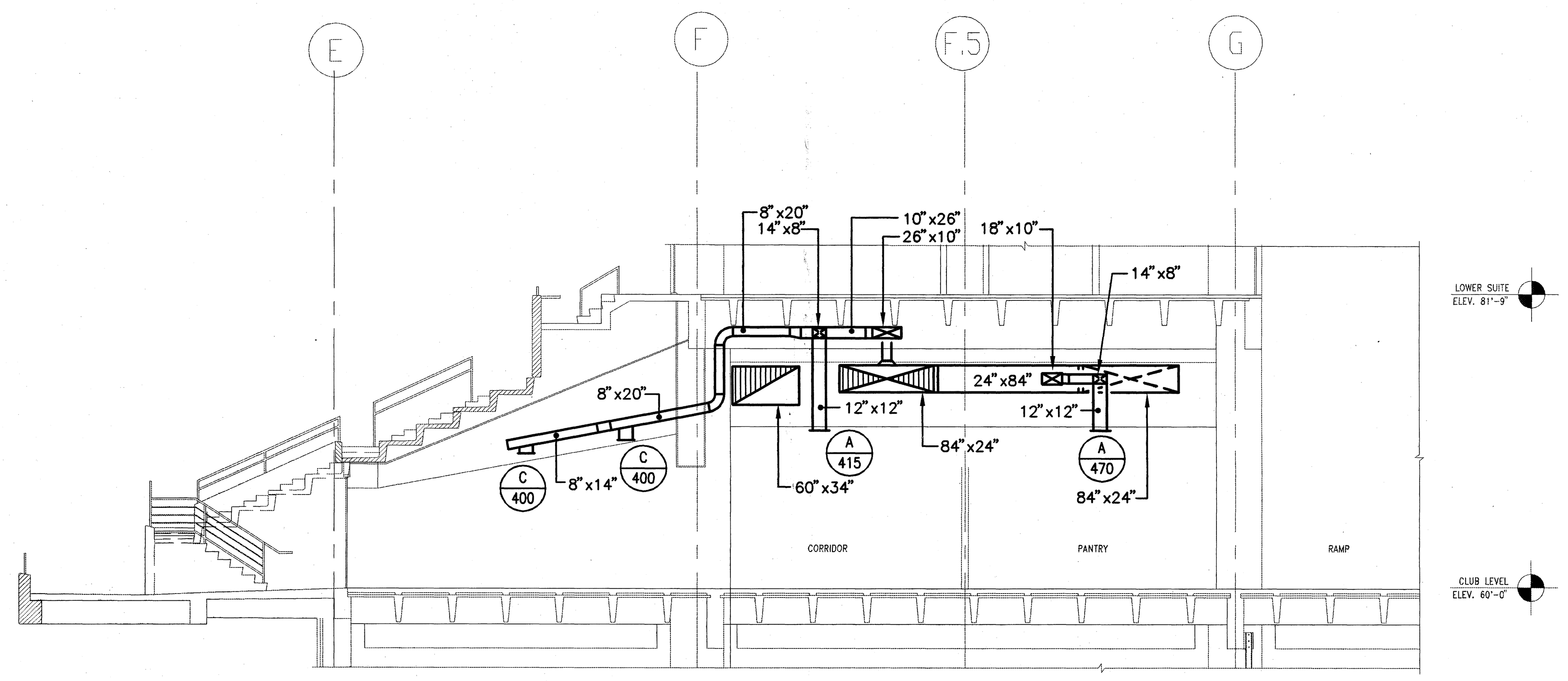
L
M2-04C



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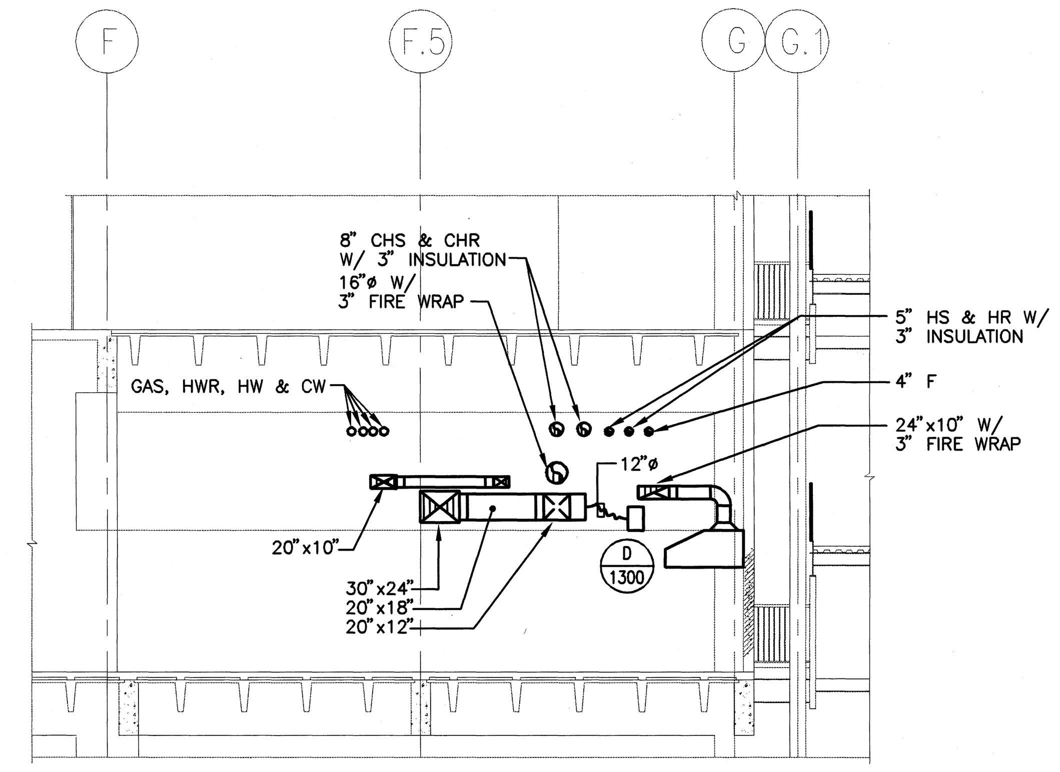

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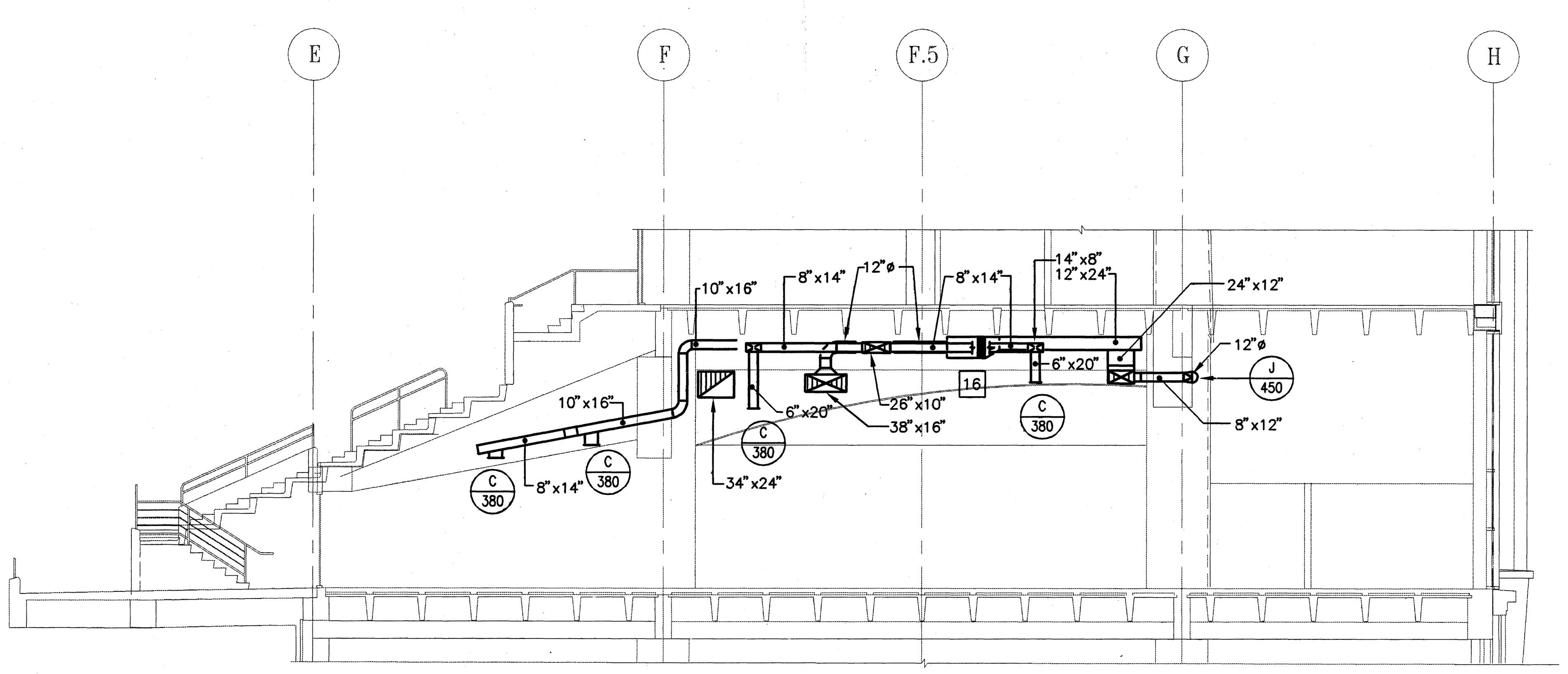
M3-29



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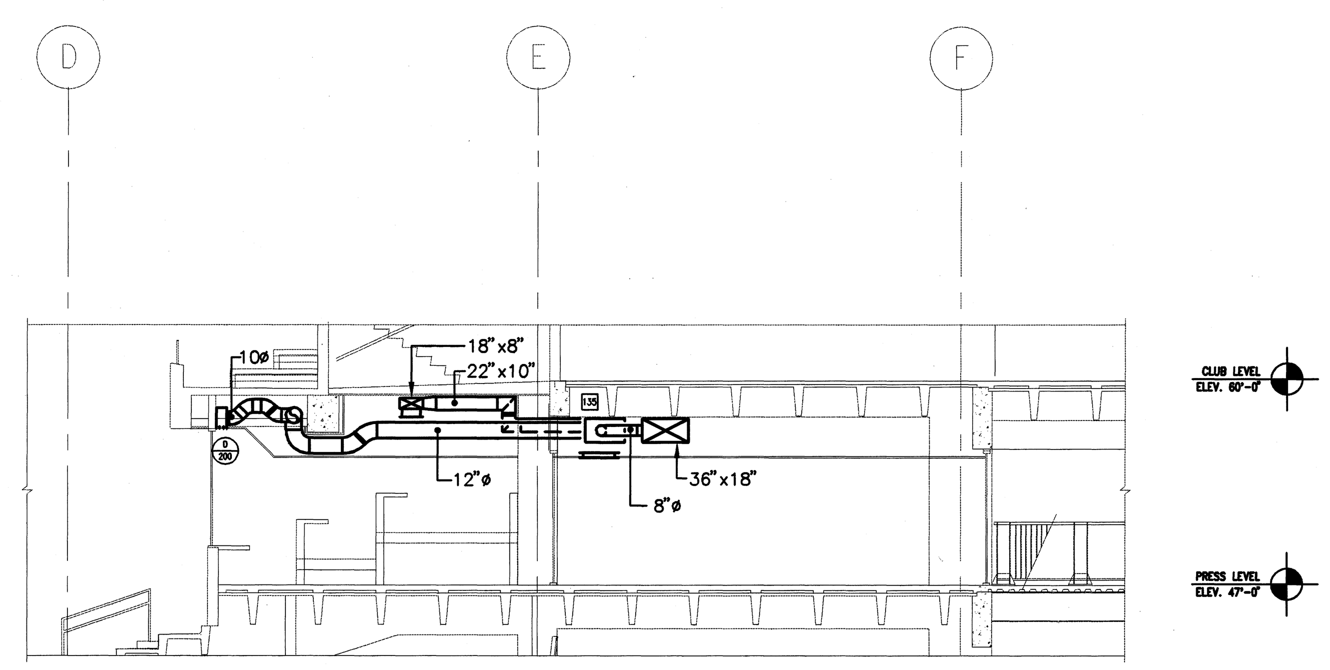
M2-04D



SECTION "P"
SCALE: 1/8"=1'-0"
K
M2-03C

0 2 4 8 16

28.04.97-09:13-6110M710 - RMF #95110

HOK SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite 700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
MIAMI, FLORIDA

MECHANICAL/ELECTRICAL/PLUMBING
ROSS MURPHY FINKELSTEIN, INC.
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BALTIMORE NFL STADIUM

PACKAGE
MEP PACKAGE
DRAWING PACKAGE
09B SUBMITTAL

REVISIONS

NO.	DATE	DESCRIPTION

KEYPLAN
D A C B

PROJECT NO. 95-675-00
ISSUED BY:
DRAWN BY: JFL
REVIEWED BY:
ISSUED: 4-4-97

SHEET TITLE
MECHANICAL SECTIONS

CATEGORY - SUB-CATEGORY - SHEET
M.7-10

I/O POINT SUMMARY

SYSTEM DESIG	POINT OR EQUIPMENT DESIGNATION	INDICATION – INPUTS: ANALOG	INDICATION – INPUTS: DIGITAL	CONTROL – OUTPUTS: ANALOG	CONTROL – OUTPUTS: DIGITAL	SOFTWARE FUNCTIONS	SOFTWARE FUNCTIONS: PROGRAM	REMARKS
AHU-1	MIN OA DPR D-1-1A/T-1	● TEMP DRY BULB		● DAMPER		X SYSTEM GRAPHIC		
& AHU-2	MAX OA DPR D-1-1B			● DAMPER		X SYSTEM GRAPHIC		
(AHU 3&4	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
;5 & 6;	LOW LIMIT T-3	● TEMP DRY BULB				X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
7 & 8;	PREHEAT COIL V-H-1/T-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
ARE	COOLING COIL V-C-1/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
SIMILAR)	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-1		● DIFF PRESSURE	● SPEED (VFD)	● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	DISCHARGE STATIC PRESS		● PRESSURE			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LIMIT
	SMOKE DPR & DETECTOR		● SMOKE DETECTOR		● OPEN/CLOSE	X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	MIN OA DPR D-2-1A			● DAMPER		X SYSTEM GRAPHIC		
	MAX OA DPR D-2-1B			● DAMPER		X SYSTEM GRAPHIC		
	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
	LOW LIMIT T-3	● TEMP DRY BULB				X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	PREHEAT COIL V-H-2/T-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	COOLING COIL V-C-2			● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-2		● DIFF PRESSURE	● SPEED (VFD)	● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	DISCHARGE STATIC PRESS		● PRESSURE			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LIMIT
	SMOKE DPR & DETECTOR		● SMOKE DETECTOR		● OPEN/CLOSE	X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	AMD-1-1/SPSS-1-1	● PRESSURE, ● FLOW				X SYSTEM GRAPHIC	X FLOW	
	RETURN DPR D-1-2			● DAMPER		X SYSTEM GRAPHIC		
	RETURN DPR D-2-2			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF DPR D-1-3			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF STATIC PRESS	● PRESSURE				X SYSTEM GRAPHIC		
	RETURN FAN RF-1/AMD-1-2	● FLOW	● DIFF PRESSURE	● VANE OPERATOR	● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC	X FLOW	INTERLOCK W/SF'S
	SMOKE DPR'S (2) & DETECTOR		● SMOKE DETECTOR		●● OPEN/CLOSE	X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	ROOM TEMPERATURE TR-1	● TEMP DRY BULB				X SYSTEM GRAPHIC		
	ROOM HUMIDITY H-2	● HUMIDITY				X SYSTEM GRAPHIC		
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
AHU-9	MIN OA DPR D-9-1A/T-1	● TEMP DRY BULB		● DAMPER		X SYSTEM GRAPHIC		
	MAX OA DPR D-9-1B			● DAMPER		X SYSTEM GRAPHIC		
	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
	LOW LIMIT T-3	● TEMP DRY BULB				X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	PREHEAT COIL V-H-9/T-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	COOLING COIL V-C-9/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-9		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	DISCHARGE STATIC PRESS.		● PRESSURE			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LIMIT
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	SPSS-9-1/BY-PASS DPR D-9-4	● PRESSURE		● DAMPER		X SYSTEM GRAPHIC		
	RETURN DPR D-9-2			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF DPR D-9-3			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF STATIC PRESS	● PRESSURE				X SYSTEM GRAPHIC		
	RETURN FAN RF-9		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/SF'S
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	ROOM TEMPERATURE TR-9	● TEMP DRY BULB				X FIRE ALARM, X SYSTEM GRAPHIC		
	ROOM HUMIDITY H-2	● HUMIDITY				X SYSTEM GRAPHIC		
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
AHU-10	OA DPR D-10-1/T-1	● TEMP DRY BULB			● OPEN/CLOSE	X SYSTEM GRAPHIC		
(AHU-14	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
& 19	HEATING COIL V-C-10/TR-10	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
ARE	COOLING COIL V-C-10/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
SIMILAR)	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-10		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	RETURN DPR D-10-2				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST DPR D-10-3				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/OA
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM		ALARM HIGH LEVEL
AHU-11	MIN OA DPR D-11-1A/T-1	● TEMP DRY BULB		● DAMPER		X SYSTEM GRAPHIC		
(AHU-12,	MAX OA DPR D-11-1B			● DAMPER		X SYSTEM GRAPHIC		
13 & 18	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
ARE	LOW LIMIT T-2	● TEMP DRY BULB				X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
SIMILAR)	HEATING COIL V-H-11/TR-11	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	COOLING COIL V-C-11/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-11		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	RETURN DPR D-11-2			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF DPR D-11-3			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF STATIC PRESS	● PRESSURE				X SYSTEM GRAPHIC		
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
AHU-15	OA DPR D-15-1/T-1	● TEMP DRY BULB			● OPEN/CLOSE	X SYSTEM GRAPHIC		
(AHU-16,	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
& 17	HEATING COIL V-H-15/T-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
ARE	COOLING COIL V-C-10/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
SIMILAR)	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-15		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X SYSTEM GRAPHIC		SEE DIV 16000
	RETURN DPR D-15-2				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST DPR D-15-3				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/OA
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	ROOM TEMPERATURE TR-15	● TEMP DRY BULB				X SYSTEM GRAPHIC		
	ROOM HUMIDITY H-2	● HUMIDITY				X SYSTEM GRAPHIC		
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM		ALARM HIGH LEVEL

I/O POINT SUMMARY

SYSTEM DESIG	POINT OR EQUIPMENT DESIGNATION	INDICATION – INPUTS: ANALOG	INDICATION – INPUTS: DIGITAL	CONTROL – OUTPUTS: ANALOG	CONTROL – OUTPUTS: DIGITAL	SOFTWARE FUNCTIONS	SOFTWARE FUNCTIONS: PROGRAM	REMARKS
AHU-20	MIN OA DPR D-20-1A/T-I	● TEMP DRY BULB		● DAMPER		X SYSTEM GRAPHIC		
(AHU-21,	MAX OA DPR D-20-1B			● DAMPER		X SYSTEM GRAPHIC		
22, 23	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
ARE	LOW LIMIT T-3	● TEMP DRY BULB				X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
SIMILAR)	PREHEAT COIL V-H-20/T-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	COOLING COIL V-C-20/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN SF-20		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	DISCHARGE STATIC PRESS		● PRESSURE			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LIMIT
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	SPSS-20-1/BY-PASS DPR D-20-4	● PRESSURE		● DAMPER		X SYSTEM GRAPHIC		
	RETURN DPR D-20-2			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF DPR D-20-3			● DAMPER		X SYSTEM GRAPHIC		
	RELIEF STATIC PRESS	● PRESSURE				X SYSTEM GRAPHIC		
	RETURN FAN RF-20		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/SF
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	ROOM TEMPERATURE TR-20	● TEMP DRY BULB				X SYSTEM GRAPHIC		
	ROOM HUMIDITY H-2	● HUMIDITY				X SYSTEM GRAPHIC		
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
AHU-24	OA DPR D-24-1				● OPEN/CLOSE	X SYSTEM GRAPHIC		
(AHU-25,	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
26 ARE	HEATING COIL V-H-24/TR-24	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
SIMILAR)	COOLING COIL V-C-24			● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
	COIL CIRCULATION PUMP		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		ALARM FAILURE
	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	CARBON DIOXIDE MONITOR		● SMOKE DETECTOR			X ALARM		ALARM HIGH LEVEL
HVU-1	OA DPR D-1-1/T-1	● TEMP DRY BULB			● OPEN/CLOSE	X SYSTEM GRAPHIC		
(HVU-3,	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
5 & 7	HEATING COIL V-H-1/TR-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
ARE	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
SIMILAR)	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	RETURN DPR D-1-2				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST DPR D-1-3				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/OA
	RETURN SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	EXHAUST SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
HVU-2	OA DPR D-2-1/T-1	● TEMP DRY BULB			● OPEN/CLOSE	X SYSTEM GRAPHIC		
(HVU-6,	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
IS	HEATING COIL V-H-2/TR-2	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
SIMILAR)	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	RETURN DPR D-2-2				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	VENTILATION DPR D-2-3				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	VENTILATION FAN VF-2		● DIFF PRESSURE		● OFF/LOW SPEED, ● OFF/HIGH SPEED	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/OA
	RETURN SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	VENT SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LIMIT
HVU-4	OA DPR D-4-1				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
	HEATING COIL V-H-4/TR-4	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	EXHAUST DPR D-4-2				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	EXHAUST FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		INTERLOCK W/SF
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
HVU-8	OA DPR D-8-1				● OPEN/CLOSE	X SYSTEM GRAPHIC		
9 & 10	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
(HVU-11,	HEATING COIL V-H-8/TR-8	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
12 & 13	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
ARE	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
SIMILAR)	OA DPR D-9-1				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
	HEATING COIL V-H-9/TR-9	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	OA DPR D-10-1				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	FILTER		● DIFF PRESSURE			X STATUS, X SYSTEM GRAPHIC		
	HEATING COIL V-H-10/TR-10	● TEMP DRY BULB	● FREEZESTAT	● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	
	SMOKE DETECTOR		● SMOKE DETECTOR			X FIRE ALARM, X SYSTEM GRAPHIC		SEE DIV 16000
	EXHAUST DPR D-8-2				● OPEN/CLOSE	X SYSTEM GRAPHIC		ALARM FAILURE
	SMOKE EXHAUST FAN SEF-1		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		INTERLOCK W/SF
	EXHAUST DPR D-8-3				● OPEN/CLOSE	X SYSTEM GRAPHIC		
	SMOKE EXHAUST FAN SEF-2		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC		
	AUTO-DEFAULT S-1		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
	CARBON DIOXIDE MONITOR		● CONTACT			X ALARM, X SYSTEM GRAPHIC		ALARM HIGH LEVEL
SUITE	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X RUN TIME, X SS OPTIMIZATION	ALARM FAILURE
FAN	HEATING COIL/TR-1	● TEMP DRY BULB		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM LOW (T)
COIL	COOLING COIL/H-1	● HUMIDITY		● VALVE		X ALARM, X SYSTEM GRAPHIC		ALARM HIGH (T)
UNIT	EXHAUST DPR (TYP OF 25)				● OPEN/CLOSE	X SYSTEM GRAPHIC		
(TYP OF	EXHAUST FAN (TYP OF 25)		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X SYSTEM GRAPHIC		ALARM FAILURE
108)								
FAN	SUPPLY FAN		● DIFF PRESSURE		● ON/OFF	X STATUS, X ALARM, X START/STOP, X SYSTEM GRAPHIC	X SS OPTIMIZATION	ALARM FAILURE
COIL	HEATING COIL/TR-1	● TEMP DRY BULB		● VALVE		X SYSTEM GRAPHIC		ALARM LOW (T)
UNITS	COOLING COIL			● VALVE		X SYSTEM GRAPHIC		ALARM HIGH (T)
(TYP OF 3)								

hok SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning,
Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NITRAY, INC.
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MECHANICAL/ELECTRICAL/PLUMBING
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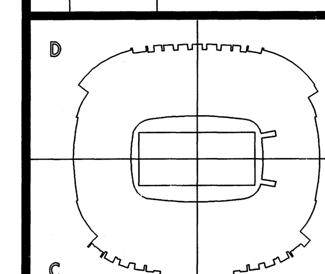
NO.	DATE	DESCRIPTION
	4-28-97	BULLETIN #44



KEYPLAN

PROJECT NO.: 95-675-00
ISSUED BY:
DRAWN BY: JTP
REVIEWED BY: DSP
ISSUED: 4-28-97

SHEET TITLE
CONTROL POINT LIST

CATEGORY - SUB-CATEGORY - SHEET
M.8-01

I/O POINT SUMMARY

SYSTEM DESIG	POINT OR EQUIPMENT DESIGNATION	INDICATION - INPUTS: ANALOG											INDICATION - INPUTS: DIGITAL							CONTROL - OUTPUTS: ANALOG				CONTROL - OUTPUTS: DIGITAL						SOFTWARE FUNCTIONS								SOFTWARE FUNCTIONS: PROGRAM						REMARKS
		TEMP DRY BULB	HUMIDITY	PRESSURE	FLOW	ENERGY UNITS	KILOWATT	AMPERES	KVA	KVAR	POWER FACTOR	DIFF PRESSURE	STATUS	DIFF PRESSURE	FLOW	FREEZESTAT	SMOKE DETECTOR	CONTACT	LEVEL	DAMPER	VALVE	SPEED	SET POINT	ON/OFF	OFF/LOW SPEED	OFF/LOW/HIGH SPEED	OPEN/CLOSE	ALARM RESET	HIGH LIMIT	STATUS	ALARM	HIGH LEVEL	LOW LEVEL	FIRE ALARM	START/STOP	LEAD/LAG	SYSTEM GRAPHIC	FLOW	RUN TIME	SS OPTIMIZATION	TREND	TOTALIZATION	ENERGY UNITS	
ATRIUM	SMOKE EXHAUST FAN SEF-5													●										●			●			X	X				X		X							ALARM FAILURE
SMOKE	SMOKE EXHAUST FAN SEF-6													●										●			●			X	X				X		X							ALARM FAILURE
EXHAUST	OA DPR D-5-1																										●										X							
	SMOKE EXHAUST FAN SEF-11													●										●			●			X	X				X		X							ALARM FAILURE
	SMOKE EXHAUST FAN SEF-12													●										●			●			X	X				X		X							ALARM FAILURE
	OA DPR D-11-1																										●										X							
	FIRE ALARM INTERFACE																●											●						X			X							SEE DIV 16000
	SMOKE EXHAUST FAN SEF-7A													●										●			●			X	X				X		X							ALARM FAILURE
	SMOKE EXHAUST FAN SEF-7B													●										●			●			X	X				X		X							ALARM FAILURE
	SMOKE EXHAUST FAN SEF-8													●										●			●			X	X				X		X							ALARM FAILURE
	OA DPR D-7-1																										●										X							
	SMOKE EXHAUST FAN SEF-9													●										●			●			X	X				X		X							ALARM FAILURE
	SMOKE EXHAUST FAN SEF-10A													●										●			●			X	X				X		X							ALARM FAILURE
	SMOKE EXHAUST FAN SEF-10B													●										●			●			X	X				X		X							ALARM FAILURE
	OA DPR D-10-1																										●										X							
	FIRE ALARM INTERFACE																●											●						X			X							SEE DIV 16000
HEATING	STEAM CONVERTOR C-1	●												●							●						●		●	X	X					X	X				X			ALARM HIGH (T)
WATER	STEAM CONVERTOR C-2	●												●							●						●		●	X	X					X	X				X			ALARM HIGH (T)
SYSTEM	STEAM CONVERTOR C-3	●												●							●						●		●	X	X					X	X				X			ALARM HIGH (T)
	HEATING PUMP P-4													●										●						X	X				X	X	X		X		X			ALARM FAILURE
	HEATING PUMP P-5													●										●						X	X				X	X	X		X		X			ALARM FAILURE
	HEATING PUMP P-6													●										●						X	X				X	X	X		X		X			ALARM FAILURE
	PRIMARY HEATING SUPPLY TH-4	●																													X						X				X			ALARM LOW (T)
	PRIMARY HEATING RETURN TH-5	●																																			X				X			
	HEATING PUMP P-7													●								●		●						X	X				X	X	X		X		X			ALARM FAILURE
	HEATING PUMP P-8													●								●		●						X	X				X	X	X		X		X			ALARM FAILURE
	SECONDARY HEATING SUPPLY TH-6	●																			●										X						X				X			ALARM LOW (T)
	SECONDARY HEATING RETURN TH-7	●																																			X				X			
	TURF HEATING SUPPLY TH-8	●																																			X				X			
	TURF HEATING RETURN TH-9	●																																			X				X			
	GLYCOL TANK/FILL			●									●						●												X		X				X							ALARM LOW LEVEL
	DIFF PRESSURE AHU-5 &6	●										●																			X						X							ALARM LOW (P)
	DIFF PRESS TRANS FAN COILS	●										●																			X						X							ALARM LOW (P)
	DIFF PRESS TRANS AHU-7& 8	●										●																			X						X							ALARM LOW (P)
CHILLED	UTILITY FLOWMETER				●																																X	X			X	X	X	
WATER	PRIMARY CHILLED SUPPLY TC-3	●																													X						X				X			ALARM HIGH (T)
SYSTEM	PRIMARY CHILLED RETURN TC-4	●																																			X				X			
	FLOW SWITCH FS-1																	●												X							X							
	CHILLED PUMP P-1													●								●		●						X	X				X	X	X		X		X			ALARM FAILURE
	CHILLED PUMP P-2													●								●		●						X	X				X	X	X		X		X			ALARM FAILURE
	CHILLED PUMP P-3													●								●		●						X	X				X	X	X		X		X			ALARM FAILURE
	SECONDARY CHILLED SUPPLY TC-1	●																			●										X						X				X			ALARM HIGH (T)
	SECONDARY CHILLED RETURN TC-2	●																																			X				X			
	DIFF PRESS TRANS AHU-5 & 6	●										●																			X						X							ALARM LOW (P)
	DIFF PRESS TRANS FAN COILS	●										●																			X						X							ALARM LOW (P)
	DIFF PRESS TRANS AHU-7 & 8	●										●																			X						X							ALARM LOW (P)
STEAM	UTILITY FLOWMETER				●																																X	X				X	X	
SYSTEM	STEAM PRESSURE			●																											X						X				X			ALARM LOW (P)
	CONDENSATE DISCHARGE V-H-5	●																			●										X						X				X			ALARM HIGH (T)
	CONDENSATE RECEIVER CRU-1																		●												X						X				X			ALARM HIGH LEVEL
	CONDENSATE RECEIVER CRU-2																		●												X						X				X			ALARM HIGH LEVEL
DOMESTIC	TANK TEMPERATURE (TYP OF 4)	●																													X						X				X			ALARM LOW (T)
WATER	HW RECIRC PUMP													●										●						X	X				X	X	X		X		X			ALARM FAILURE
HEATERS	HW RECIRC PUMP													●										●						X	X				X	X	X		X		X			
	LOOP TEMP SENSORS (TYP OF 4)	●																													X						X				X			ALARM LOW (T)
	HW MAIN SUPPLY TEMP TH-5	●																													X						X				X			ALARM LOW (T)
DOMESTIC	BOOSTER PUMP (TYP OF 8)												●																	X	X						X				X			ALARM FAILURE
WATER	PRESSURE SENSOR (TYP OF 6)			●																											X						X				X			ALARM LOW (P)
BOOSTER	TEMPERATURE SENSOR	●																																			X				X			
PUMPS	COMMON SUCTION			●																											X						X				X			ALARM LOW (P)
	COMMON DISCHARGE			●																											X						X				X			ALARM LOW (P)
CONC	TOILET EXHAUST FAN													●										●						X	X						X							ALARM FAILURE
TOILET	INTAKE DPR																										●										X							
ROOMS (TYP OF 39)	CABINET HEATER(S)																							●													X							
NON	MAKE-UP AIR UNIT/T-1	●												●										●						X	X				X		X							ALARM FAILURE
COOKING	OA DPR																			●																	X							
CONCESS	FILTER													●																X							X							
(TYP OF	GAS REGULATOR/TR-1	●																			●										X						X							ALARM LOW (T)
33)	CABINET HEATER(S)																							●													X							
	SMOKE DETECTOR																●																	X			X							
COOKING	OA DPR																			●																	X							
CONCESS	FILTER													●																X							X							
TYPE A	MAKE-UP AIR UNIT/T-1	●												●										●						X	X				X		X							ALARM FAILURE
(TYP OF	GAS REGULATOR/TR-1	●																			●										X						X							ALARM LOW (T)
12)	SMOKE DETECTOR																●																	X			X							
	EXHAUST SYSTEM(S)													●										●						X	X				X		X							ALARM FAILURE
	WASH DOWN CONTROL(S)																							●													X							
	CABINET HEATER(S)																							●													X							
COOKING	OA DPR																			●																	X							
CONCESS	FILTER													●																X							X							
TYPE B	MAKE-UP AIR UNIT/T-1	●												●										●						X	X				X		X							ALARM FAILURE
(TYP OF	COOLING COIL																				●										X						X							ALARM HIGH (T)
4)	GAS REGULATOR/TR-1	●																			●										X						X							ALARM LOW (T)
	SMOKE DETECTOR																●																	X			X							
	EXHAUST SYSTEM(S)													●										●						X	X				X		X							ALARM FAILURE
	WASH DOWN CONTROL(S)																							●													X							
	CABINET HEATER(S)																							●													X							

I/O POINT SUMMARY

SYSTEM DESIG	POINT OR EQUIPMENT DESIGNATION	INDICATION - INPUTS: ANALOG											INDICATION - INPUTS: DIGITAL							CONTROL - OUTPUTS: ANALOG				CONTROL - OUTPUTS: DIGITAL						SOFTWARE FUNCTIONS								SOFTWARE FUNCTIONS: PROGRAM						REMARKS
		TEMP DRY BULB	HUMIDITY	PRESSURE	FLOW	ENERGY UNITS	KILOWATT	AMPERES	KVA	KVAR	POWER FACTOR	DIFF PRESSURE	STATUS	DIFF PRESSURE	FLOW	FREEZESTAT	SMOKE DETECTOR	CONTACT	LEVEL	DAMPER	VALVE	SPEED	SET POINT	ON/OFF	OFF/LOW SPEED	OFF/LOW/HIGH SPEED	OPEN/CLOSE	ALARM RESET	HIGH LIMIT	STATUS	ALARM	HIGH LEVEL	LOW LEVEL	FIRE ALARM	START/STOP	LEAD/LAG	SYSTEM GRAPHIC	FLOW	RUN TIME	SS OPTIMIZATION	TREND	TOTALIZATION	ENERGY UNITS	
BLDG	XFORMER TEMP (TYP OF 13)																	●													X													ALARM HIGH (T)
SERVICES	DIGITAL METERING (TYP OF 14)					●																																				X	X	
	HEAT TRACE ALARM QUAD A																	●													X													ALARM FAILURE
	HEAT TRACE ALARM QUAD B																	●													X													ALARM FAILURE
	HEAT TRACE ALARM QUAD C																	●													X													ALARM FAILURE
	HEAT TRACE ALARM QUAD D																	●													X													ALARM FAILURE
	OUTDOOR AIR TEMP	●																																							X			
	ATC AIR COMPRESSOR(S)			●																											X													ALARM LOW (P)
	ATC AIR DYER(S)																	●													X													ALARM HIGH (T)
	FIRE ALARM																	●													X													
	SEWAGE EJECTOR SP-1 QUAD B												●					●												X	X													ALARM HIGH LEVEL
	SEWAGE EJECTOR SP-2 QUAD B												●					●												X	X													ALARM HIGH LEVEL
	BOWL DRAINAGE SP-3 QUAD A												●					●												X	X													ALARM HIGH LEVEL
	BOWL DRAINAGE SP-4 QUAD B												●					●												X	X													ALARM HIGH LEVEL
	LOADING DOCK SP-5												●					●												X	X													ALARM HIGH LEVEL
	FIELD DRAINAGE SP-6 EAST												●					●												X	X													ALARM HIGH LEVEL
	FIELD DRAINAGE SP-7 WEST												●					●																										ALARM HIGH LEVEL
	ELECTRIC MANHOLE SP-8												●					●																										ALARM HIGH LEVEL

I/O POINT SUMMARY NOTES:

1. CONTRACTOR MUST REVIEW THE ENTIRE CONSTRUCTION DOCUMENT PACKAGE TO VERIFY THE TOTAL NUMBER OF CONTROL POINTS AND EQUIPMENT ITEMS.
2. WHEN ADDITIONAL CONTROL POINTS , OTHER THAN THOSE INDICATED, ARE REQUIRED TO EFFECT THE SPECIFIED CONTROL SEQUENCES THEY SHALL BE PROVIDED AT NO ADDITIONAL COST.
3. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR COORDINATION OF TRANSFORMER, DIGITAL METERING, HEAT TRACE, AND FIRE ALARM POINTS. PROVIDE WIRING TO ALL ELECTRICAL POINTS.
4. SYSTEM GRAPHICS WITH FINAL POINT IDENTIFICATION SHALL BE DEVELOPED FOR EACH SYSTEM OR SUB-SYSTEM. GRAPHICS SHALL CLEARLY SHOW THE ARRANGEMENT AND OVERALL LAYOUT OF COMPONENTS.
5. LABELING AND NUMBERING SEQUENCE FOR ALL POINTS SHALL BE SUBMITTED FOR APPROVAL BEFORE ANY PROGRAMMING PROCEEDS. LABEL AND NUMBER SHALL RELATE TO UNIT OR SYSTEM AND IMPLY FUNCTION OF POINT.

HOK SPORT

HELLMUTH OBATA & KASSABAUM, INC.
Architecture, Engineering, Planning, Interiors, Facility Programming
323 West 8th Street, Suite700
Kansas City, Missouri 64105

STRUCTURAL ENGINEER
BLISS & NYITRAY, INC.
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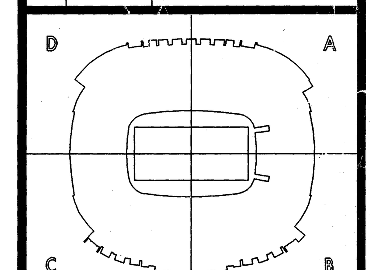
REVISIONS NO.	DATE	DESCRIPTION
	4-28-97	BULLETIN #44

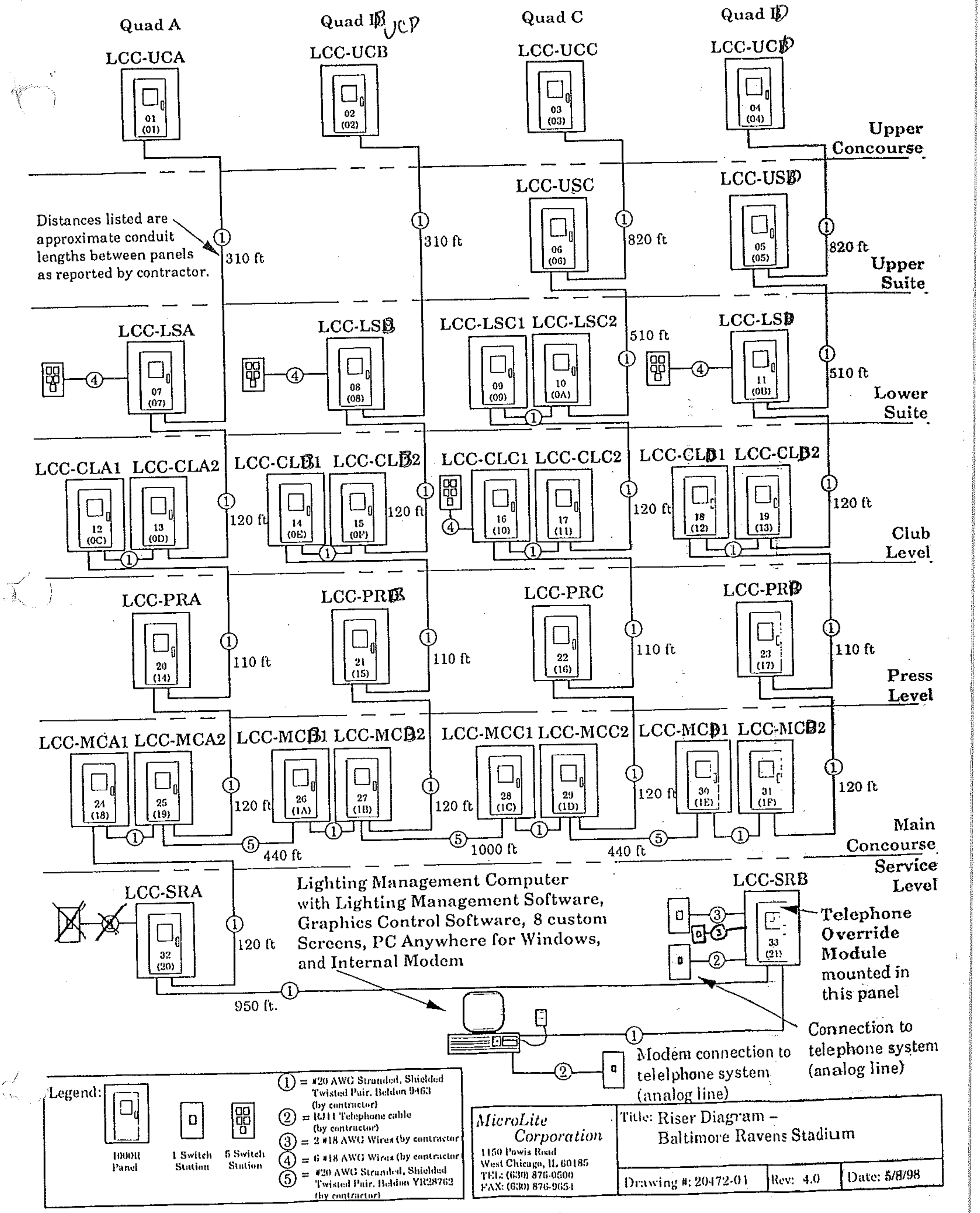


KEYPLAN

PROJECT NO.: 95-675-00
ISSUED BY:
DRAWN BY: JTP
REVIEWED BY: DSP
ISSUED: 4-28-97

SHEET TITLE
CONTROL POINT LIST

CATEGORY - SUB-CATEGORY - SHEET
M.8-02



Quad A
Quad B UCP
Quad C
Quad D
LCC-UCA
LCC-UCB
LCC-UCC
LCC-UCD
Upper Concourse
Distances listed are approximate conduit lengths between panels as reported by contractor.
310 ft
310 ft
LCC-USC
820 ft
LCC-USD
820 ft
Upper Suite
LCC-LSA
LCC-LSB
LCC-LSC1
LCC-LSC2
510 ft
LCC-LSD
510 ft
Lower Suite
LCC-CLA1
LCC-CLA2
LCC-CLB1
LCC-CLB2
LCC-CLC1
LCC-CLC2
LCC-CLD1
LCC-CLD2
120 ft
120 ft
120 ft
120 ft
Club Level
LCC-PRA
LCC-PRB
LCC-PRC
LCC-PRD
110 ft
110 ft
110 ft
110 ft
Press Level
LCC-MCA1
LCC-MCA2
LCC-MCB1
LCC-MCB2
LCC-MCC1
LCC-MCC2
LCC-MCD1
LCC-MCD2
120 ft
120 ft
120 ft
120 ft
440 ft
1000 ft
440 ft
Main Concourse
Service Level
LCC-SRA
120 ft
950 ft.
Lighting Management Computer with Lighting Management Software, Graphics Control Software, 8 custom Screens, PC Anywhere for Windows, and Internal Modem
LCC-SRB
Telephone Override Module mounted in this panel
Connection to telephone system (analog line)
Modem connection to telelphone system (analog line)
Legend:
1000R Panel
1 Switch Station
5 Switch Station
1 = #20 AWG Stranded, Shielded Twisted Pair, Belden 9463 (by contractor)
2 = RJ11 Telephone cable (by contractor)
3 = 2 #18 AWG Wires (by contractor)
4 = 6 #18 AWG Wires (by contractor)
5 = #20 AWG Stranded, Shielded Twisted Pair, Belden YR28762 (by contractor)
MicroLite Corporation
1150 Powis Road
West Chicago, IL 60185
TEL: (630) 876-0500
FAX: (630) 876-9654
Title: Riser Diagram – Baltimore Ravens Stadium
Drawing #: 20472-01
Rev: 4.0
Date: 5/8/98

ADDENDUM No. 2
Engineering Consulting Services
For
HVAC Controls, Lighting Controls and Submetering Systems
M&T Bank Stadium
MSA Project No. 20-071

Date Issued: May 4, 2020

This Addendum is hereby made a part of the Contract Documents dated April 17, 2020, on the subject work as though originally included therein. The following amendments, additions, and/or corrections shall govern this work. **This form should be acknowledged below and submitted with the Proposals.**

This Addendum incorporates the following items:

1. Questions and Answers.

Issued by:

Maryland Stadium Authority
333 W. Camden Street, Suite 500
Baltimore, MD 21201
Sandra Fox, Procurement Officer

____
Company

____________________________ ____________________________
Acknowledgment Date
(Name and Title)

Maryland Stadium Authority
The Warehouse at Camden Yards
333 W. Camden Street, Suite 500
Baltimore, MD 21201
410-333-1560
1-877-MDSTADIUM
Fax: 410-333-1888

www.mdstad.com

Voice: 800-201-7165
TTY: 800-735-2258

1. Under the Fire Alarm Scope, the last sentence says to coordinate system functions with the fire alarm system manufacturers, as required, for a fully functional system. Can you elaborate on your expectations? Does this sentence imply the existing system isn't fully functional? If so, please explain.

   The current system is fully functional. There are several functions that are shared between the BAS and life safety systems. When the BAS is replaced, all shared functions must still operate as intended.

2. We understand that we are to provide a design to replace sensors, actuators, control valves, etc. However, is it also the intent to remove and replace the Johnson Control System, such as server software, local area network control panels, terminal equipment controllers, etc.? ***Yes.***

3. We understand the exhaust fans, unit heaters, cabinet heaters, concession fans and walk-in coolers are to be added to the new BAS. Are they not currently connected to the existing BAS?

   Some are but not all. The field heat system is on the current BAS but not shown on the drawings provided with Addendum 1. This will need to be moved to the new BAS.

4. Is it the intent the Johnson Control system be replaced with the Schneider system? ***Yes.***

5. Will MSA provide the design team with a full set of Johnson Control System shop drawings, including all of the associated components and installed equipment sequence of operations?

   We will provide what we have.

6. Will MSA provide the design team with a full set of Simplex Fire Alarm system shop drawings?

   We will provide what we have.

7. Will MSA provide the design team with a full set of Siemens Fire Alarm system shop drawings?

   We will provide what we have.

8. Will MSA provide the design team with a full set of Microlite System shop drawings?

   We will provide what we have.

9. Will MSA provide the design team with a full set of Emon sub metering system shop drawings?

   We will provide what we have.

10. Will MSA provide the design team with drawings showing locations of the Emon meters?

    We will provide what we have.

11. We assume that the level of detail required would include developing a set of construction drawings showing floor plan locations of the equipment and systems to be upgraded/replaced. Please confirm. – ***Confirmed.***

12. We assume that we are required to field survey to determine and document existing conditions as related to and required by the project. Please confirm. – ***Confirmed.***

13. We did not see any mention of cost estimating. Please confirm that no cost estimating is required. If it is required, please explain/describe your expectations. ***Confirmed.***

14. A design schedule was provided in the RFP. Please confirm that this schedule is accurate and reflects your expectations. – ***Confirmed.***

15. In regards to the existing IT infrastructure, please provide a description or a list of IT equipment, manufacturers' information, storage capacity, etc. that currently exists.

    This information will be discussed during design.

16. Under the HVAC controls scope, the last bullet mentions the "warehouse system currently to be installed." Please describe what is currently being installed in the warehouse.

    A complete new Schneider EcoStruxure BAS is being installed in the Warehouse.

17. Under the lighting controls scope, it says the existing lighting controls shall be replaced, but doesn't provide a basis of design. Is there a basis of design? If so, what is it?

    RFP states that the intent is to use the Schneider EcoStruxure system as the new lighting controls.

18. Under the sub metering scope, it mentions that the existing system shall be expanded as determined by MSA. Can you elaborate on what MSA is considering that this system would be expanded to serve?

    The current systems serves all utilities we need. Design team will work with MSA to determine if there are any more metering points needed to accurately and completely measure usage.

Procurement

John F. Samoryk
Vice President

Maryland Stadium Authority
The Warehouse at Camden Yards
333 W. Camden Street, Suite 500
Baltimore, MD 21201
410-333-1560
1-877-MDSTADIUM
Fax: 410-333-1888

www.mdstad.com

Voice: 800-201-7165
TTY: 800-735-2258

ADDENDUM No. 3
Engineering Consulting Services
For
HVAC Controls, Lighting Controls and Submetering Systems
M&T Bank Stadium
MSA Project No. 20-071

Date Issued: May 11, 2020

This Addendum is hereby made a part of the Contract Documents dated April 17, 2020, on the subject work as though originally included therein. The following amendments, additions, and/or corrections shall govern this work. **This form should be acknowledged below and submitted with the Proposals.**

This Addendum incorporates the following items:

1. **Revisions**. RFP, Section 3, General Requirements. Section 3.2.1 is hereby removed and replaced with the following:

3.2.1 General

A. All Invoices must be submitted to invoices@mdstad.com. All invoices shall contain the following address: Maryland Stadium Authority, 333 West Camden Street, Suite 500, Baltimore, Maryland 21201.

B. The Consultant shall submit invoices monthly.

C. The Consultant shall verify all invoices for services at the time of submission.

D. Invoices must include the following information, without error:

1) Consultant name and address;

2) Remittance address;

3) Federal taxpayer identification (FEIN) number, social security number, as appropriate;

4) Invoice period (i.e. time period during which services covered by invoice were performed);

5) Invoice date;

6) Invoice number;

7) MSA assigned Contract number;

8) MSA assigned (Blanket) Purchase Order number(s);

9) Goods or services provided;

10) Amount due; and

11) Any additional documentation required by regulation or the Contract.

E. Invoices that contain both fixed price and time and material items shall clearly identify each item as either fixed price or time and material billing.

F. The Maryland Stadium Authority reserves the right to reduce or withhold Contract payment in the event the Consultant does not provide the Maryland Stadium Authority with all required deliverables within the time frame specified in the Contract or otherwise breaches the terms and conditions of the Contract until such time as the Consultant brings itself into full compliance with the Contract.

G. Intentionally Omitted.

H. The Maryland Stadium Authority is generally exempt from federal excise taxes, Maryland sales and use taxes, District of Columbia sales taxes and transportation taxes. The Consultant; however, is not exempt from such sales and use taxes and may be liable for the same.

I. Invoices for final payment shall be clearly marked as "FINAL" and submitted when all work requirements have been completed and no further charges are to be incurred under the Contract. In no event shall any invoice be submitted later than 60 calendar days from the Contract termination date.

2. **Clarification**: The MBE goal is 29% of the total dollar value of the contract with no sub-goals.

3. **Addition**. Attached are drawings from a controls upgrade project that was completed in 2009.

4. **Questions and Answers.**

Issued by:

Maryland Stadium Authority
333 W. Camden Street, Suite 500
Baltimore, MD 21201
Sandra Fox, Procurement Officer

____
Company

____________________________ __________________________
Acknowledgment Date
(Name and Title)

Questions and Answers

1. **For the conversion from pneumatic to DDC, will there need to be phasing or can it be done with some controls non-functional till the DDC comes on line?**

   A phased construction is not anticipated but will need further discussion during the design phase to understand the operational impacts when systems are non-functional.

2. **Should provisions in the design be made for future connections or equipment such as elevators, domestic water pumps, hot water heaters, and sump pumps?**
   a. **If yes, should it be status monitoring only?**

   The intent of this project is to connect all equipment which supports a fully functional building. The design shall allow for future equipment to be added as needed only to the level of having the infrastructure in place to do so.

3. **Should the documents comply with project haystack and ASHRAE 135 native BacNet protocols?**

   This will be discussed during the design phase.

4. **We recommend a minimum of 1 year of trending data to be collected and stored with onsite storage. Is this acceptable or should it go to cloud storage?**

   Yes, this is acceptable.

5. **Are there any AFDD (Automatic Fault diagnostic and detection) systems running at the plant?**

   No.

6. **Does the sub-metering include power panels, water distribution and gas systems?**

   Refer to Addendum 1 for list of utilities.

7. **Will a new front end graphics station be required?**

   Yes.

8. **If prime offeror is MBE, how much of the goal can they self-fulfill?**

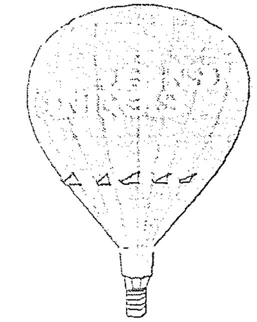
Up to 50% (14.5%) of the total dollar value of the contract.

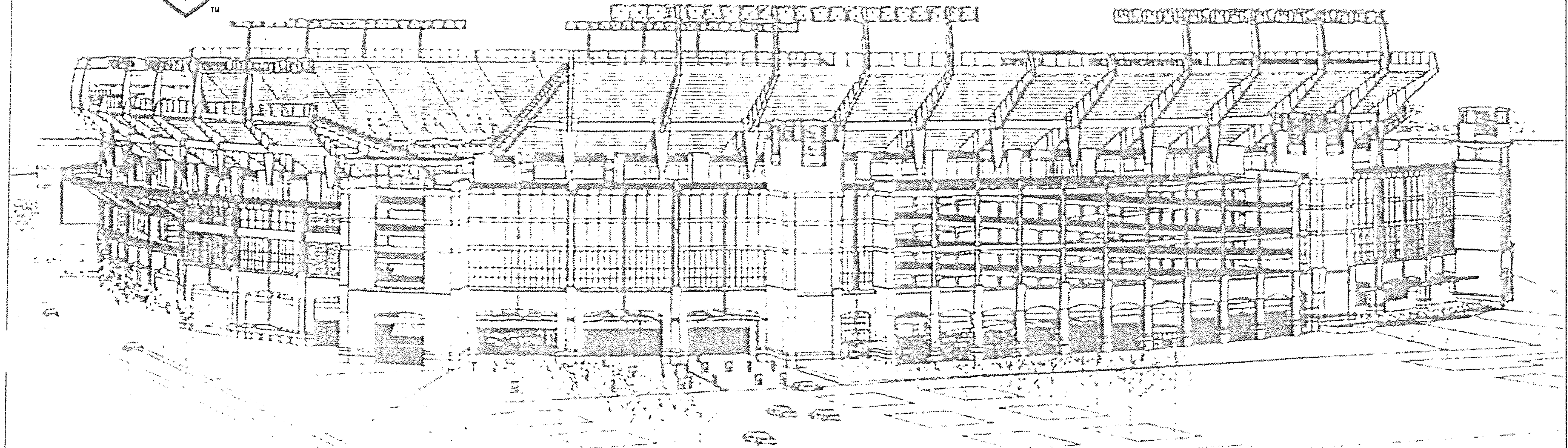
9. **Attachment B- Financial Proposal Form shows add alternate for the chiller at Oriole Park. Does the fee for the generator scope parking Lot C fall under the base bid, the chiller add alternate or should it be broken out as its own add alternate?**

The generator plant shall be included in the base bid.

BALTIMORE NFL STADIUM
AT CAMDEN YARDS
HOME OF THE BALTIMORE RAVENS

RAVENS B





JOHNSON CONTROLS
Creating a better climate for business.

- ■ Environmental Control System
- ■ Building Automation System
- ☐ Fire Management System
- ☐ Security System
- ☐ Lighting Services
- ☐ Telecommunication System
- ☐ Integrated Motor Control Center
- ☐ Air and Water Systems Balancing
- ☐ Instrumentation System Installation
- ☐ Building Operations Management
- ☐ Energy Conservation Control
- ☐ Custom Programmed Maintenance

Automatic Temperature Controls
Heating
Air Conditioning
Air Filters
Water Treatment
Coil Cleaning
Control Center
Fire Management
Security Management
Sound and Communication
Programmed Clocks
Contract Operations
Time-Shared Automated Building Service
Refrigeration
Electrical Equipment
Emergency Generator / Lighting Equipment
Industrial Controls / Recording / Indication Equipment

T A B L E O F C O N T E N T S

NOTE: ALL AHU/HVU EQUIPMENT TO HAVE ONE (1) DISCHARGE AIR THERMOMETER

T-2100-202 (-40TO160F)

PROJECT

BALTIMORE NFL STADIUM
AT CAMDEN YARDS
HOME OF THE BALTIMORE RAVENS

ARCHITECT	ENGINEER
HELLMUTH, OBATA, KASSABAUM, P.C. 323 WEST 8TH STREET, SUITE 700 KANSAS CITY, MISSOURI 64105	ROSS MURPHY FINKELSTEIN, INC. 190 WEST OSTEND STREET BALTIMORE, MARYLAND 21230
USER DEFINED	**CONTRACTOR**
S.E. - J. D. PRUSAK P.M. - W. J. THOMPSON A.E. - R. T. SCHLOTTERBECK	THE POOLE & KENT COMPANY 4530 HOLLINS FERRY ROAD BALTIMORE, MARYLAND 21227

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	12:01 PM
FILE NAME	TITLERV1.vsd

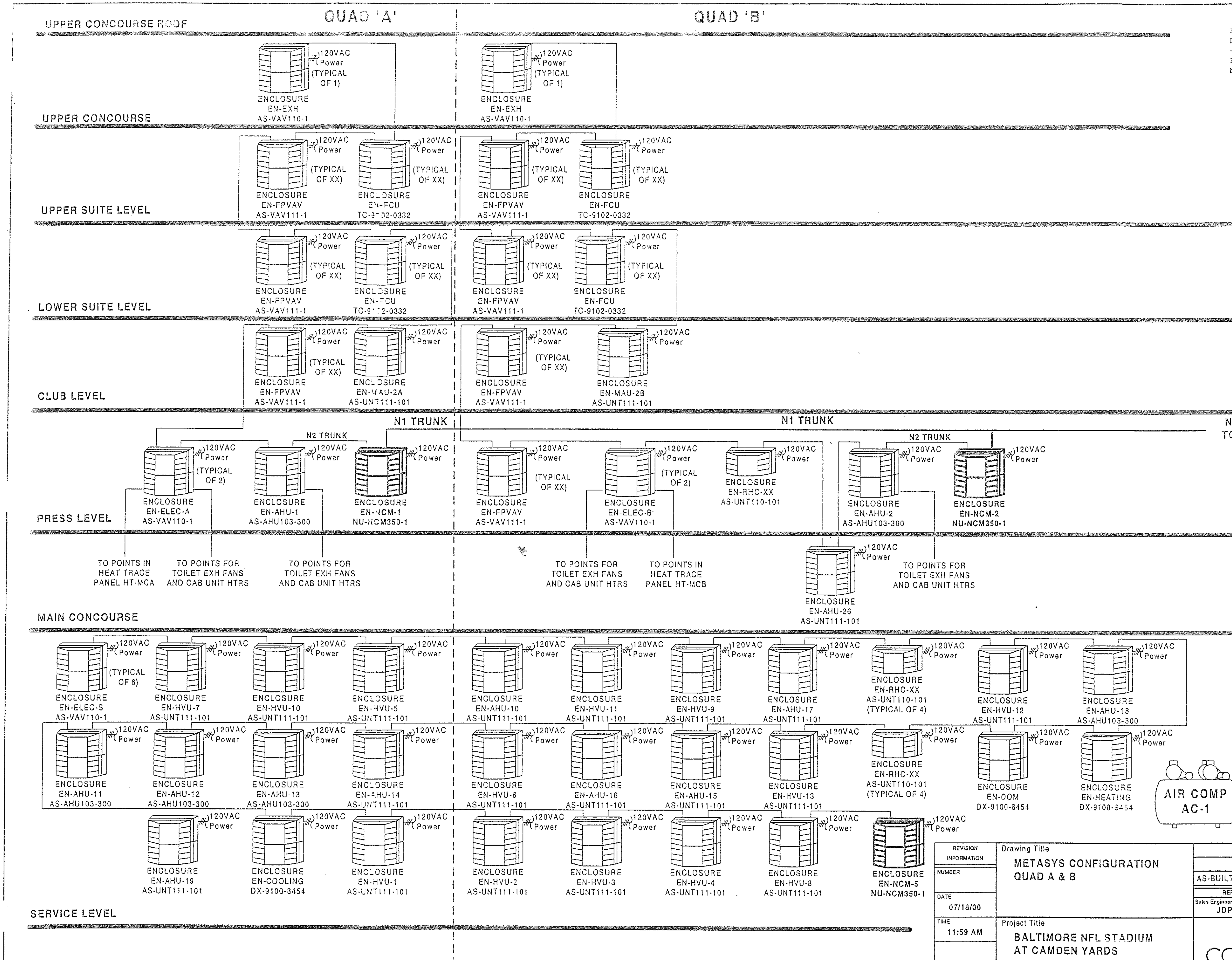
REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

JOHNSON CONTROLS
Systems & Services Division

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, Maryland 21152
TEL: 410-584-1160
FAX: 410-472-4928

BL-6559

SALES ENGINEER	PROJECT MANAGER	APPLICATION ENGINEER	DATE	CONTRACT NUMBER
JDP	WJT	RTS	0915/97	7052-0098



BILL OF MATERIALS

Estimate: networka/b 70520098.pre

Desig.	Qty	Part #	Description
Panel Devices:			
NCM-1,2,5	3	EN-EWC22-0	UNIV PKG MOD,F/NCM-30C
	3	NU-NCM350-1	NETWORK CTRL, ETHERNET-

N1 TRUNK CABLE = TO BE IN STRUCTURED WIRING SYSTEM SUPPLIED BY JOB ELECTRICIAN

N2 TRUNK CABLE = 3 CONDUCTOR #18AWG SHIELDED TWISTED WIRE SOLID OR STRANDED BELDON OR EQUAL

FIELD POINT WIRING TO BE 2 OR 3 CONDUCTOR #18AWG SHIELDED TWISTED WIRE SOLID OR STRANDED BELDON OR EQUAL

REVISION INFORMATION	Drawing Title
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DATE 07/18/00	
TIME 11:59 AM	Project Title: BALTIMORE NFL STADIUM AT CAMDEN YARDS, BALTIMORE, MARYLAND
FILE NAME NETWORK1.vsd	

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

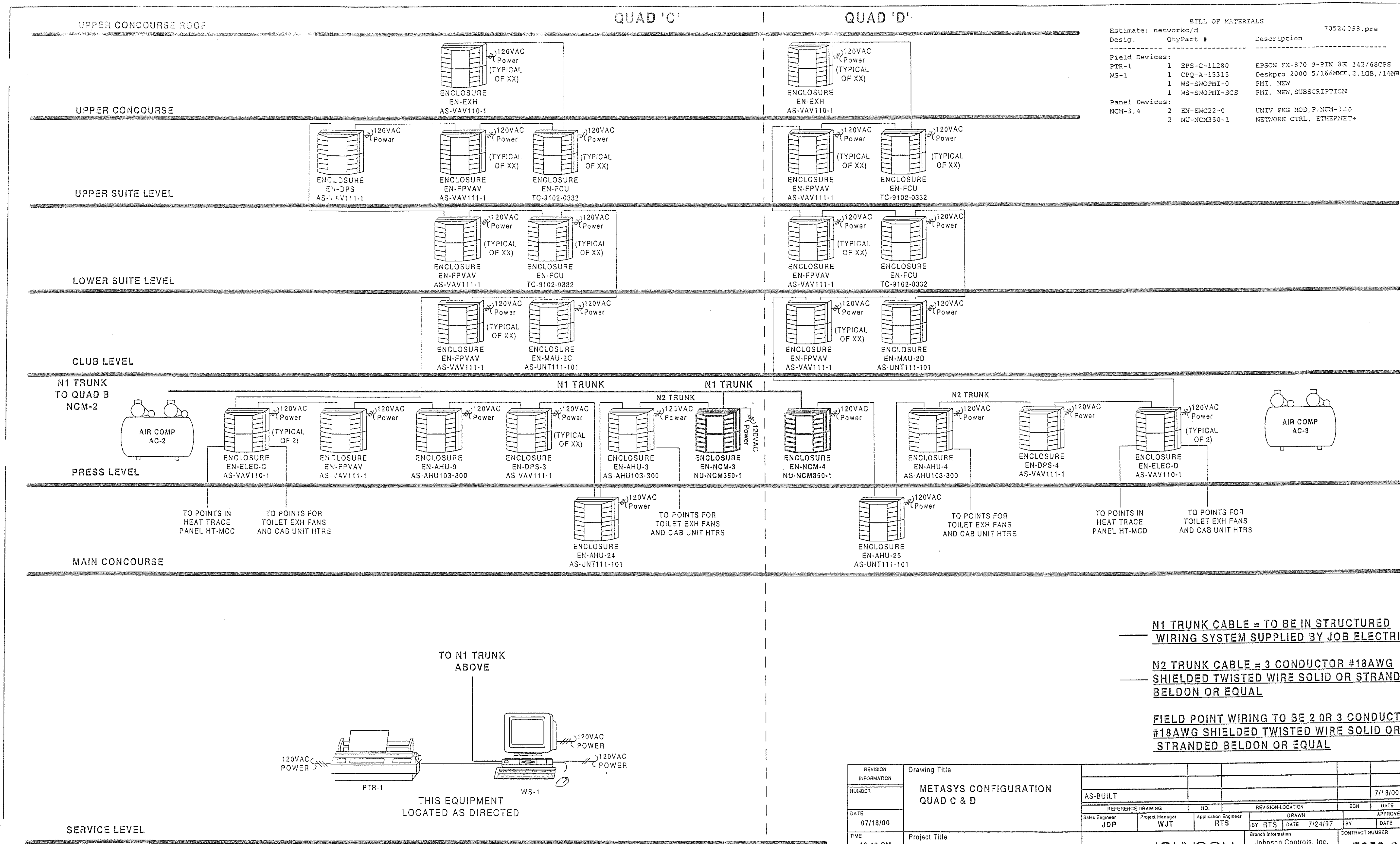
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 7/24/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch information: Johnson Controls, Inc. 60 Loveton Circle Sparks, Md 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-00A



BILL OF MATERIALS

Estimate: networkc/d 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
PTR-1	1	EPS-C-11280	EPSON FX-870 9-PIN 8K 342/68CPS
WS-1	1	CPQ-A-15315	Deskpro 2000 5/166MMX,2.1GB,/16MB
	1	WS-SWOPMI-0	PMI, NEW
	1	WS-SWOPMI-SCS	PMI, NEW,SUBSCRIPTION
Panel Devices:			
NCM-3,4	2	EN-EWC22-0	UNIV PKG MOD,F/NCM-300
	2	NU-NCM350-1	NETWORK CTRL, ETHERNET+

N1 TRUNK CABLE = TO BE IN STRUCTURED WIRING SYSTEM SUPPLIED BY JOB ELECTRICIAN

N2 TRUNK CABLE = 3 CONDUCTOR #18AWG SHIELDED TWISTED WIRE SOLID OR STRANDED BELDON OR EQUAL

FIELD POINT WIRING TO BE 2 OR 3 CONDUCTOR #18AWG SHIELDED TWISTED WIRE SOLID OR STRANDED BELDON OR EQUAL

REVISION INFORMATION	Drawing Title: METASYS CONFIGURATION QUAD C & D
NUMBER	
DATE 07/18/00	
TIME 12:02 PM	Project Title: BALTIMORE NFL STADIUM AT CAMDEN YARDS
FILE NAME NETWORK2.vsd	BALTIMORE, MARYLAND

	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

REFERENCE DRAWING

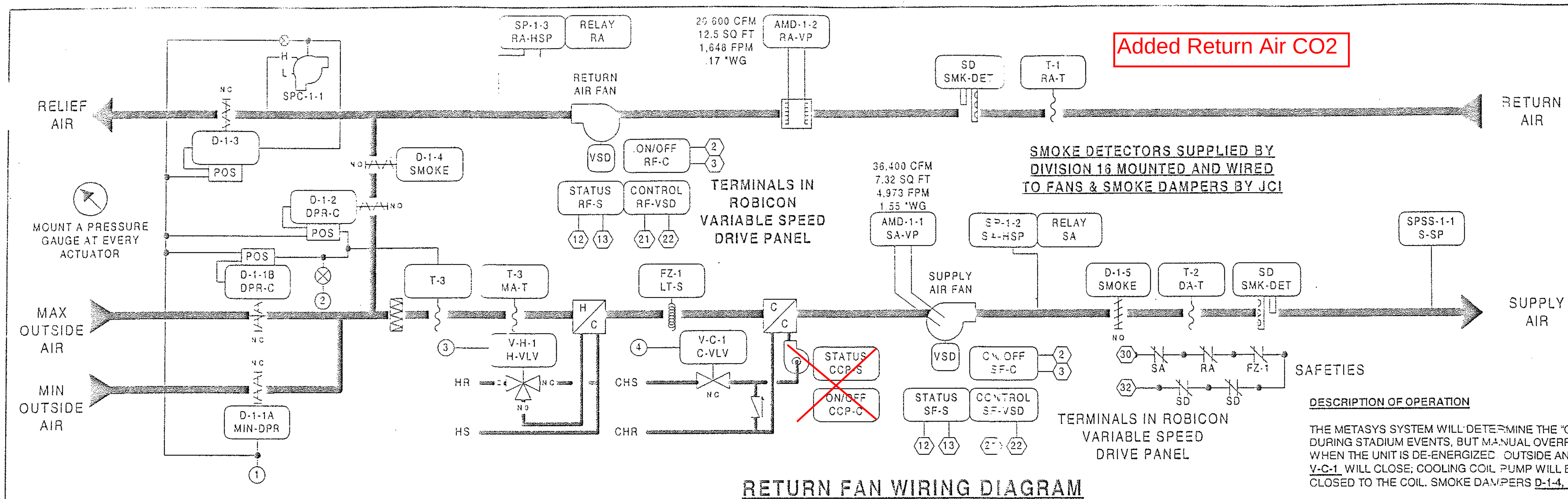
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 7/24/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information: Johnson Controls, Inc. 60 Loveton Circle Sparks, Md 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-00B



DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED OUTSIDE AND RELIEF AIR DAMPERS D-1-1A, D-1-1B, D-1-3 AND COOLING COIL VALVE V-C-1 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-1-2 WILL BE OPEN AND HEATING COIL VALVE V-H-1 WILL BE CLOSED TO THE COIL. SMOKE DAMPERS D-1-4, D-1-5 WILL REMAIN OPEN UNDER CONTROL OF SMOKE DETECTION SYSTEM.

WARM-UP MODE - SUPPLY AND RETURN FANS WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-1 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-1-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-1-1A, D-1-1B AND RELIEF AIR DAMPER D-1-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY AND RETURN FANS WILL BE RUNNING, RETURN AIR DAMPER D-1-2 IS OPEN. MINIMUM OUTSIDE AIR DAMPER D-1-1A WILL OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FORTY-FIVE (45F) MODULATE V-H-1 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, T-2 WILL GRADUALLY MODULATE DAMPERS D-1-1B OPEN WHILE SIMULTANEOUSLY CLOSING D-1-2. STATIC PRESSURE CONTROLLER SPC-1-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-1-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-3, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE T-2 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-1 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND RETURN FANS AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-1-1A WILL OPEN. OUTSIDE DAMPER D-1-1B AND RETURN DAMPER D-1-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), MAXIMUM OUTSIDE AIR DAMPERS D-1-1B WILL CLOSE, OPENING RETURN AIR DAMPER D-1-2. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-1-1B AND D-1-2 AND CHILLED WATER VALVE V-C-1 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-1 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND RETURN FANS AND CLOSE ALL SYSTEM DAMPERS.

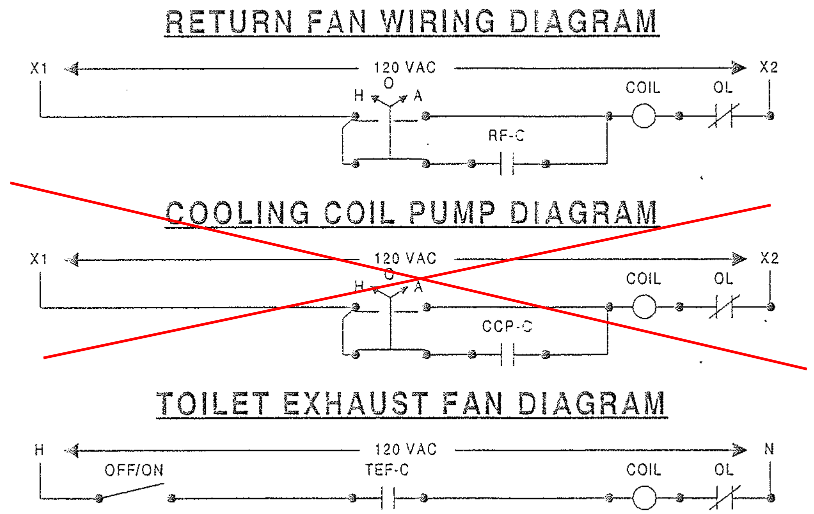
FAN CONTROL - SYSTEM STATIC PRESSURE SENSING STATION SPSS-1-1 THROUGH A STATIC PRESSURE TRANSMITTER AND THE METASYS CONTROLLER WILL MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVE TO MAINTAIN ITS SETTING. ON A RISE IN STATIC AS SENSED BY SPSS-1-1 THE SUPPLY FAN DRIVE WILL GRADUALLY MODULATE FAN SPEED TO ITS MINIMUM POSITION TO MAINTAIN ITS SETTING. HIGH LIMIT STATIC PRESSURE CONTROLLER SPC-1-2 WHICH WILL OVERRIDE SPSS-1-1 TO PREVENT THE DISCHARGE FROM RISING ABOVE IT'S SET POINT. SUPPLY DUCT AIR MONITORING STATION AMD-1-1 AND RETURN DUCT AIR MONITORING STATION AMD-1-2 THROUGH VELOCITY PRESSURE TRANSMITTERS WILL SEND SIGNALS TO THE METASYS CONTROLLER WHICH WILL COMPARE TOTAL SUPPLY AND RETURN AIR QUANTITIES AND MODULATE THE RETURN VARIABLE SPEED DRIVE BASED ON SETPOINT TO SYNCHRONIZE RETURN FAN VOLUME WITH THE SUPPLY FAN VOLUME SO AS TO MAINTAIN CONSTANT MINIMUM BALANCED OUTSIDE AIR FLOW. DIFFERENTIAL WILL BE REDUCED TO ZERO (0) (NO OUTSIDE AIR) DURING WARM-UP AND UNOCCUPIED MODES OF OPERATION. MANUALLY RESET HIGH LIMIT STATIC PRESSURE CONTROLLERS SPC-1-2 AND SPC-1-3 WILL STOP THEIR RESPECTIVE SUPPLY AND RETURN FANS WHENEVER THEIR SETTING IS REACHED. ALL FANS WILL BE REQUIRED TO BE MANUALLY RESTARTED IF DE-ENERGIZED BY STATIC PRESSURE CONTROLS. SUPPLY FANS WILL BE MANUALLY CONTROLLED USING A BY-PASS STARTER IF THEIR RESPECTIVE VARIABLE FREQUENCY FAN DRIVE FAILS.

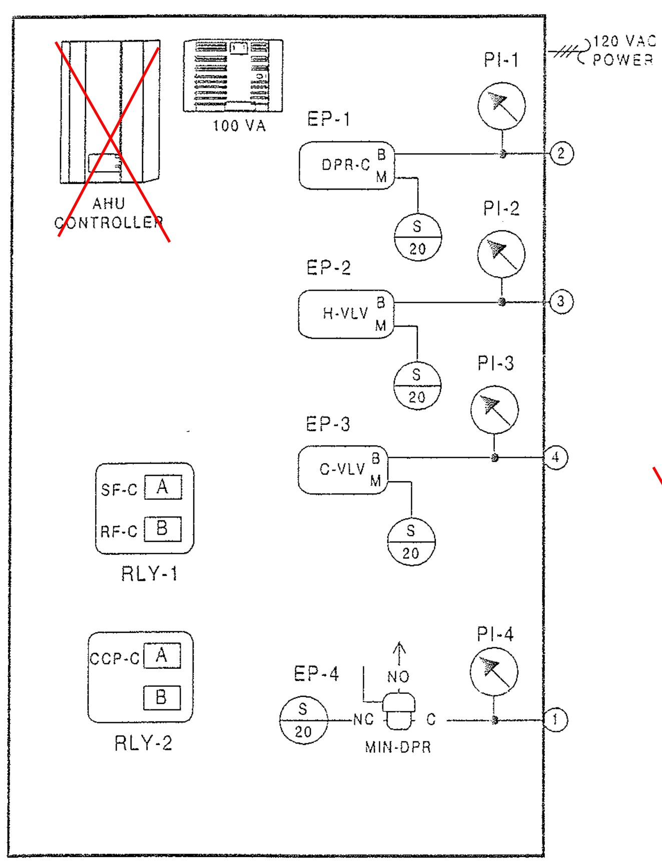
TOILET EXHAUST FANS TEF-A10.A11,A12,A15,A16,A23 - THE FAN STARTS WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

BILL OF MATERIALS

Estimate: ahu-1 — 7052-0098 pre

Desig.	Qty	Part #	Description
Field Devices:			
D-1-1A,D-1-1B,D-1-2,D-1-3	4	---	SEE DAMPER SCHEDULE
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
DPR-C,MIN-DPR	2	D-3153-2	DMPR ACT,8-13#
	5	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-1	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	2	--	SEE VALVE SCHEDULE
MA-T,DA-T,RA-T	3	TE-6316P-1	SENS,T-Ni,0.1%,17' AVG
RA-VP	1	DPT-2641-2	XDUCR DP 0/0.25" 4-20ma
S-SP	1	DPT-2641-7	XDUCR DP 0/10.0" 4-20ma
SA-HSP,RA-HSP	2	AFS-460	DUCT AIR FLOW HIGH STATIC
SA-VP	1	DPT-2641-5	XDUCR DP 0/2.5" 4-20ma
SPC-1-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-3	1	T-3610-1001	STAT,LOW VOL ,3' AVG, DCT
TEF	3	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 2-3/8
	3	PD-101-35	RLY BASE,3PDT,11PIN 10A
	3	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
Panel Devices:			
EN-AHU-1	1	AS-AHU103-300	AHU TERM BD IN ENCL
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
EP-4	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3,4	4	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC
SA,RA	2	PD-101-35	RLY BASE,3PDT,11PIN 10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC



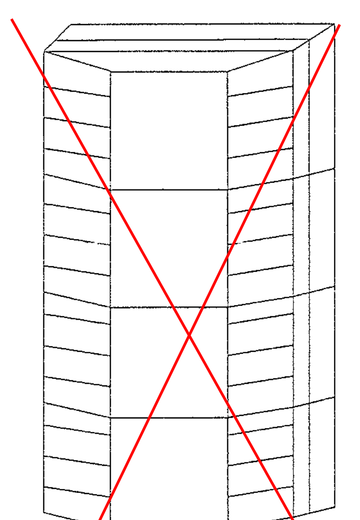


SEE BL-6559-01A FOR MORE WIRING DETAILS

FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-A10	ROOF	RPUCA	13	UP CONCOURSE
TEF-A11	ROOF	RPUCA	17	UP CONCOURSE
TEF-A12	ROOF	RPUCA	21	UP CONCOURSE
TEF-A15	ROOF	RPUCA	9	UP CONCOURSE
TEF-A16	ROOF	STARTER		ROOF
TEF-A23	CLUB LEVEL	RP2CLA	11	CLUB LEVEL

CONTROLLED FROM MAU PANEL - UPPER CONCOURSE BO3

USE (3) PD-109-51 & (3) PD-101-35 AT (3) PANEL/STARTER LOCATIONS



ENCLOSURE EN-AHU-1
AS-AHU103-300
LOCATED ADJACENT TO UNIT
NCM-1/N2 ADD = 1

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 02:17 PM
FILE NAME AHU-1.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-1
CLUB/SUITES QUAD A

PRESS LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REVISION-LOCATION	ECN	DATE	BY
AS-BUILT		7/18/00	CME

REFERENCE DRAWING — NO.
Sales Engineer JDP — Project Manager WJT — Application Engineer RTS
DRAWN BY RTS DATE 08/25/97
APPROVED BY — DATE

JOHNSON CONTROLS
Systems & Services Division

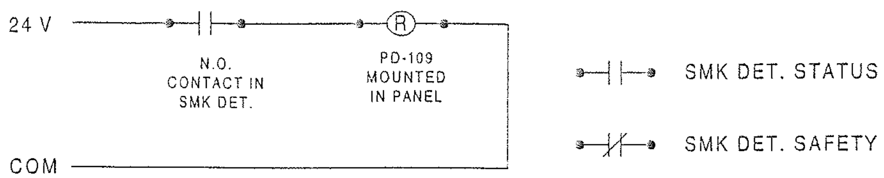
Branch information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-01

STATUS

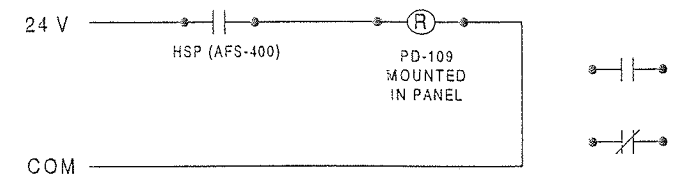
SAFETY

TYPICAL FOR ALL AHU'S, HVU'S, AND MAU'S



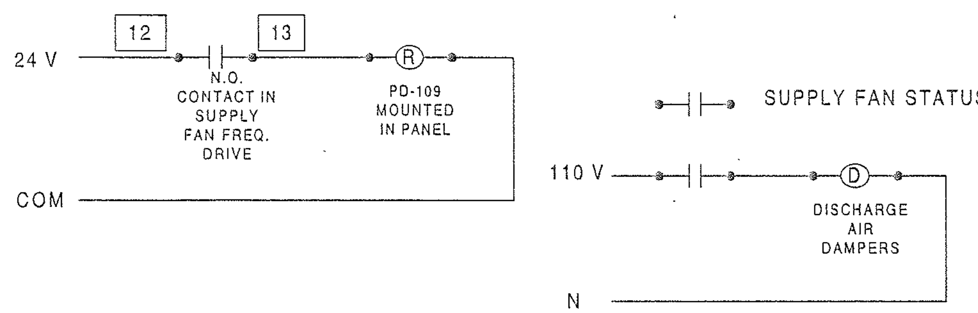
SMK DUCT DETECTOR IN SUPPLY USED FOR SYSTEM

TYPICAL FOR AHU-1,2,3,4



SAME APPLICATION ON BOTH SUPPLY AND RETURN FANS

TYPICAL FOR AHU-1,2,3,4



REVISION INFORMATION

NUMBER

DATE 07/18/00

TIME 02:07 PM

FILE NAME Miscahu.vsd

Drawing Title

WIRING DETAILS

Project Title

BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY CME DATE 7/18/00	BY DATE

JOHNSON CONTROLS

Systems & Services Division

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, Md 21152

CONTRACT NUMBER 7052-0098

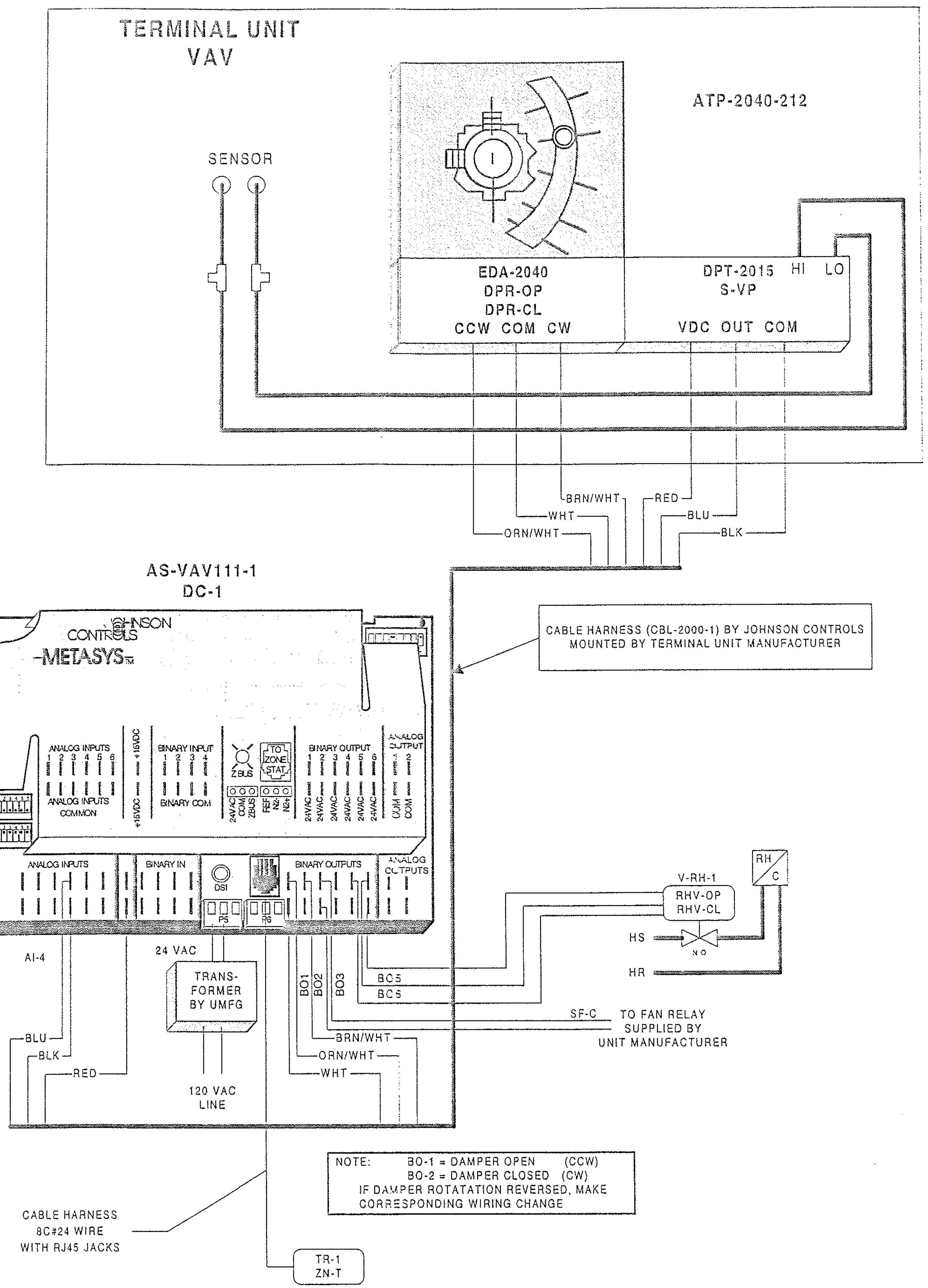
DRAWING NUMBER BL-6559-01A

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-1				AHU						EN-AHU-1	Press Lev MER A		M.3-09												Power to Controller
		AHU-1	*			AHU	1	1				EN-AHU-1	Press Lev MER A	0	M.3-09												N2 Trunk
	BO-1	AHU-1	MIN-DPR	Min OA Damper Control	Closed Open	AHU	1	1	BO-1		BO#,24V	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-1			V11HGA-100			2/18	2-Wire	SAV-24VAC		A50	
	BO-2	AHU-1	SF-C	Supply Fan Control	Off On	AHU	1	1	BO-2	RLY	BO#,24V,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-2	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-3	AHU-1	RF-C	Return Fan Control	Off On	AHU	1	1	BO-3	RLY	BO#,24V,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-3	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-4	AHU-1	CCP-C	Clg Coil Pump 1 Control	Off On	AHU	1	1	BO-4	RLY	BO#,24V,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-4	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-5	AHU-1	TEF-C	Toilet Exh Fan Control	Off On	AHU	1	1	BO-5		BO#,24V	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-5			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-6	AHU-1				AHU	1	1	BO-6			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-6											
	BO-7	AHU-1				AHU	1	1	BO-7			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-7											
	BO-8	AHU-1				AHU	1	1	BO-8			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-8											
	BO-9	AHU-1				AHU	1	1	BO-9			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-9											
	BO-10	AHU-1				AHU	1	1	BO-10			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BO-10											
	AO-1	AHU-1	DPR-C	Damper Control	% Open	AHU	1	1	AO-1		AO#,AOCOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-1	H-VLV	Heating Coil Valve	% Open	AHU	1	1	AO-2		AO#,AOCOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-1	C-VLV	Clg Coil Valve	% Open	AHU	1	1	AO-3		AO#,AOCOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-1	SF-VSD	Sup Fan Var Spd Drive	%	AHU	1	1	AO-4		AO#,AOCOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AO-4						2/18	Device dependent	0-20mA OUT		A21	
	AO-5	AHU-1	RF-VSD	Ret Fan Var Spd Drive	%	AHU	1	1	AO-5		AO#,AOCOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AO-5						2/18	Device dependent	0-20mA OUT		A21	
	AO-6	AHU-1				AHU	1	1	AO-6			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AO-6											
	BI-1	AHU-1	SF-S	Supply Fan Status	Off On	AHU	1	1	BI-1		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-1	RF-S	Return Fan Status	Off On	AHU	1	1	BI-2		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-2						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-3	AHU-1	SMK-DET	Smoke Detectors	Normal Alarm	AHU	1	1	BI-3		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-3						2/22	Device dependent	Contact (NO)		A40	
	BI-4	AHU-1	LT-S	Low Temperature Stat	Normal Alarm	AHU	1	1	BI-4		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-4						2/22	NO,M1	A70 (NC)		A41	
	BI-5	AHU-1	CCP-S	Clg Coil Pump 1 Status	Off On	AHU	1	1	BI-5		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-5						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-6	AHU-1	SA-HSP	Supply Air Static Press	Normal Alarm	AHU	1	1	BI-6		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-6						2/22	Device dependent	AFS-460 & Relay		A40	
	BI-7	AHU-1	RA-HSP	Return Air Static Press	Normal Alarm	AHU	1	1	BI-7		BI#,BICOM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-7						2/22	Device dependent	AFS-460 & Relay		A40	
	BI-8	AHU-1				AHU	1	1	BI-8			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-BI-8											
	AI-1	AHU-1	RA-VP	Return Air Vel Pressure	In. Wg	AHU	1	1	AI-1		AI#,+VDC	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-1						2/18	-,+	DPT-2641		A2	
	AI-2	AHU-1	RA-T	Return Air Temperature	Deg F	AHU	1	1	AI-2		AI#,AICM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-2						2/18	2-Wire	TE-6316P-1		A4	
	AI-3	AHU-1	DA-T	Disch Air Temperature	Deg F	AHU	1	1	AI-3		AI#,AICM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-3						2/18	2-Wire	TE-6316P-1		A4	
	AI-4	AHU-1	MA-T	Mixed Air Temperature	Deg F	AHU	1	1	AI-4		AI#,AICM	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-4						2/18	2-Wire	TE-6316P-1		A4	
	AI-5	AHU-1				AHU	1	1	AI-5			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-5											
	AI-6	AHU-1				AHU	1	1	AI-6			EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-6											
	AI-7	AHU-1	S-SP	Supply Static Pressure	In. Wg	AHU	1	1	AI-7		AI#,+VDC	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-7						2/18	-,+	DPT-2641		A2	
	AI-8	AHU-1	S-VP	Supply Vel Pressure	In. Wg	AHU	1	1	AI-8		AI#,+VDC	EN-AHU-1	Press Lev MER A	0	M.3-09	AH-1-AI-8						2/18	-,+	DPT-2641		A2	

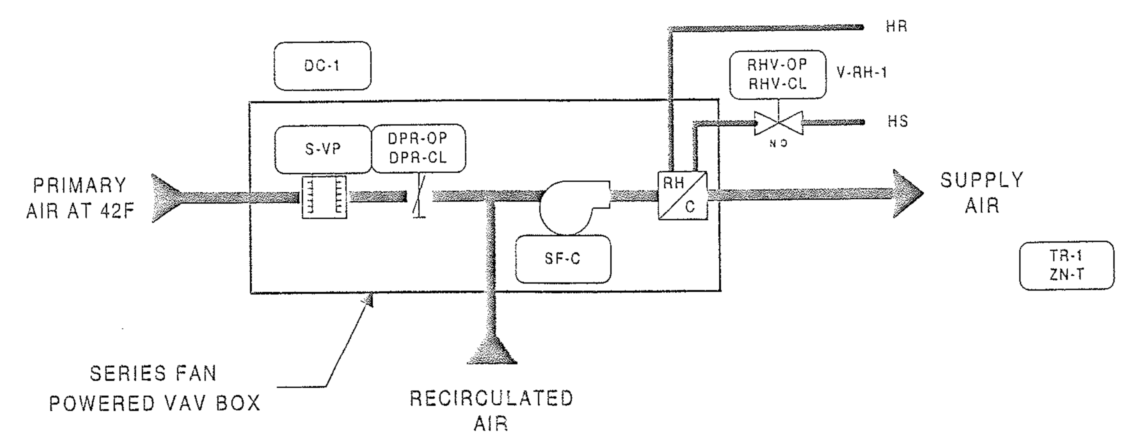
BILL OF MATERIALS

Estimate: quad a vavbox 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	46	AS-VAV110-1	VAV 6AI,4BI,8BO,8K
V-RH-1	46	--	SEE VALVE SCHEDULE
VAV	46	ATP-2040-212	ACT,2MIN+1.5"DP,1/2"CPLG
ZN-T	30	TE-6410W-1000	MSTAT,NI,BCK,JACK



SERIES FAN POWERED VARIABLE AIR VOLUME (VAV) WITH REHEAT COIL



NOTE: VAV CONTROLLER (AS-VAV111-1) DAMPER ACTUATOR & DIFFERENTIAL PRESSURE TRANSMITTER (ATP-2040-212) ARE FACTORY MOUNTED BY TITUS

DESCRIPTION OF OPERATION

PRIMARY AIR VALVE WILL OPEN TO THEIR MINIMUM POSITION AND TERMINAL UNIT FAN WILL START AND RUN CONTINUOUSLY WHENEVER AIR HANDLING UNIT IS RUNNING. TERMINAL UNIT FANS WILL START THIRTY (30) SECONDS BEFORE OPENING OF AIR VALVES TO PREVENT BACK SPINNING OF FAN. FANS WILL ALSO BE OPERATED AS DEFINED IN THE UNOCCUPIED MODES. PRIMARY AIR VALVES WILL BE CLOSED DURING UNOCCUPIED HEATING MODE. ROOM SENSOR TR-1 WILL ON A RISE IN TEMPERATURE GRADUALLY MODULATE REHEAT COIL VALVE V-RH-1 CLOSED AND ON A CONTINUED RISE WILL GRADUALLY MODULATE PRIMARY AIR VALVE FROM IT'S MINIMUM TO MAXIMUM SETTING TO MAINTAIN IT'S SETTING OF SEVENTY-FIVE (75F). ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. DURING OPERATION OF THE WARM-UP MODE ALL PRIMARY AIR VALVES OPEN TO THEIR MAXIMUM POSITION AND TERMINAL FANS START TO PERMIT FULL AIR FLOW TO THE SPACES. REHEAT COIL VALVE V-RH-1 IS MODULATED IN RESPONSE TO ROOM SENSOR TO MAINTAIN SPACE TEMPERATURE.

REVISION INFORMATION

NUMBER

DATE 07/18/00

TIME 02:18 PM

FILE NAME VAVBOX-A.vsd

DRAWING TITLE

FAN POWERED TERMINAL REHEAT UNITS

QUAD A

PROJECT TITLE

BALTIMORE NFL STADIUM AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
JDP	WJT	RTS	BY RTS	DATE 08/26/97	BY	DATE

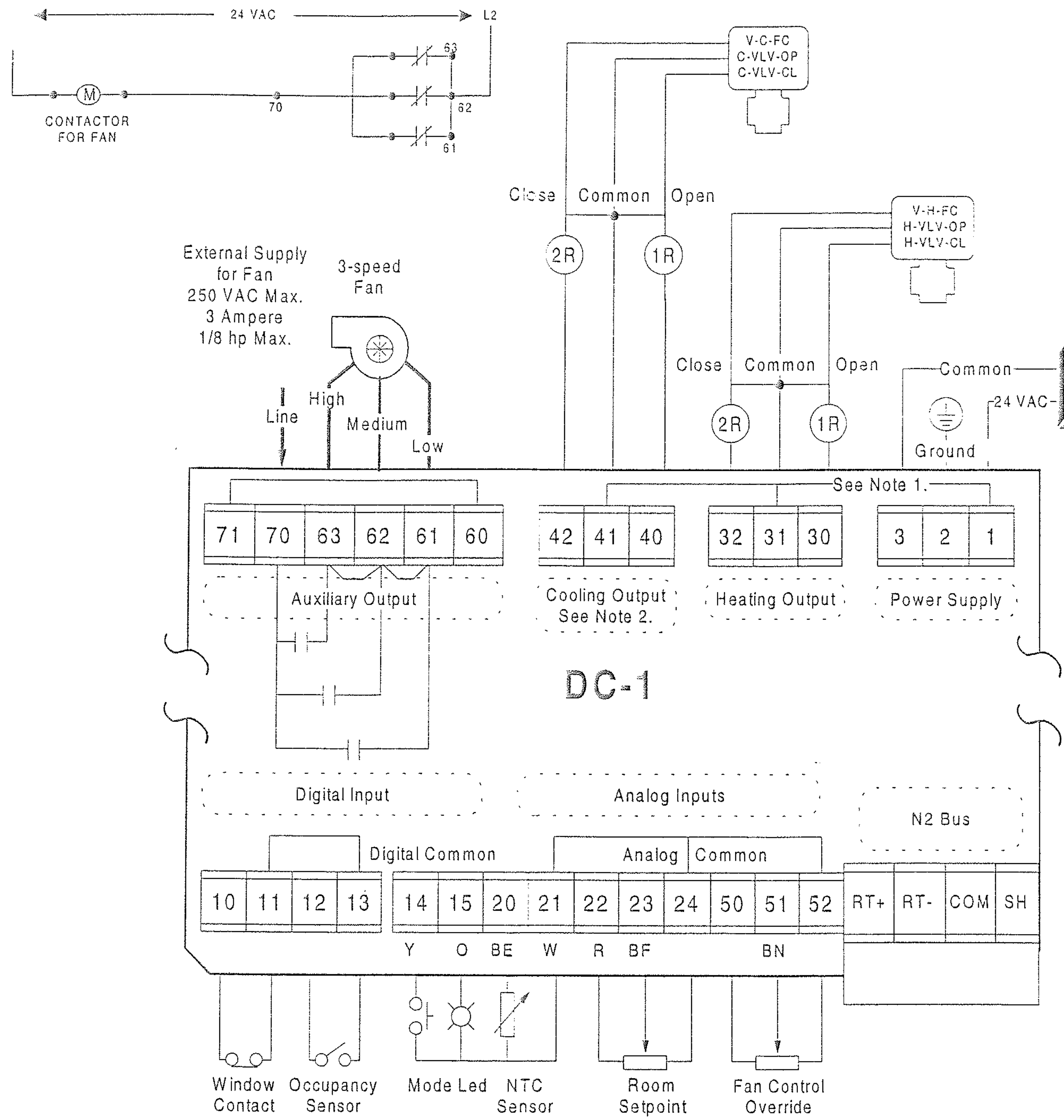
JOHNSON CONTROLS
Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-02

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		FP-VAV-A					VAV						EN-FPVAV	At VAVBOX														Power to Controller
		FP-VAV-A	*				VAV	1	X				EN-FPVAV	At VAVBOX	0													N2 Trunk
	AI-1	FP-VAV-A	ZN-T	Zone Temperature	Deg F		VAV	1	X	AI-1		PHONE JACK	EN-FPVAV	At VAVBOX	0		FP-x-AI-1						3/26	PHONE JACK	Metastat-Ph Jack		U2	
	AI-2	FP-VAV-A					VAV	1	X	AI-2			EN-FPVAV	At VAVBOX	0		FP-x-AI-2											
	AI-3	FP-VAV-A					VAV	1	X	AI-3			EN-FPVAV	At VAVBOX	0		FP-x-AI-3											
	AI-4	FP-VAV-A	S-VP	Supply Vel Pressure	In. Wg		VAV	1	X	AI-4		AI#,AICM,+15VDC	EN-FPVAV	At VAVBOX	0		FP-x-AI-4						3/18	OUT,COM,+VDC	DPT-2000		U9	
	AI-5	FP-VAV-A					VAV	1	X	AI-5			EN-FPVAV	At VAVBOX	0		FP-x-AI-5											
	AI-6	FP-VAV-A					VAV	1	X	AI-6			EN-FPVAV	At VAVBOX	0		FP-x-AI-6											
	BI-1	FP-VAV-A					VAV	1	X	BI-1			EN-FPVAV	At VAVBOX	0		FP-x-BI-1											
	BI-2	FP-VAV-A					VAV	1	X	BI-2			EN-FPVAV	At VAVBOX	0		FP-x-BI-2											
	BI-3	FP-VAV-A					VAV	1	X	BI-3			EN-FPVAV	At VAVBOX	0		FP-x-BI-3											
	BI-4	FP-VAV-A					VAV	1	X	BI-4			EN-FPVAV	At VAVBOX	0		FP-x-BI-4											
	BO-1	FP-VAV-A	DPR-OP	Damper Open	Off	On	VAV	1	X	BO-1		BO-a,BO-b.24VAC	EN-FPVAV	At VAVBOX	0		FP-x-BO-1						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-2	FP-VAV-A	DPR-CL	Damper Close	Off	On	VAV	1	X	BO-2		BO-a,BO-b.24VAC	EN-FPVAV	At VAVBOX	0		FP-x-BO-2						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-3	FP-VAV-A	SF-C	Supply Fan Control	Off	On	VAV	1	X	BO-3		BO#,24VAC	EN-FPVAV	At VAVBOX	0		FP-x-BO-3	2/18	COIL	RELAY	NO,COM		2/14	See starter detail	Starter (NO)		U51	
	BO-4	FP-VAV-A					VAV	1	X	BO-4			EN-FPVAV	At VAVBOX	0		FP-x-BO-4											
	BO-5	FP-VAV-A	RHV-OP	Reheat Valve Open	Off	On	VAV	1	X	BO-5		BO-a,BO-b.24VAC	EN-FPVAV	At VAVBOX	0		FP-x-BO-5						3/18	BLK,RED,WHT	VA-7150		U58	
	BO-6	FP-VAV-A	RHV-CL	Reheat Valve Close	Off	On	VAV	1	X	BO-6		BO-a,BO-b.24VAC	EN-FPVAV	At VAVBOX	0		FP-x-BO-6						3/18	BLK,RED,WHT	VA-7150		U58	
	AO-1	FP-VAV-A					VAV	1	X	AO-1			EN-FPVAV	At VAVBOX	0		FP-x-AO-1											
	AO-2	FP-VAV-A					VAV	1	X	AO-2			EN-FPVAV	At VAVBOX	0		FP-x-AO-2											

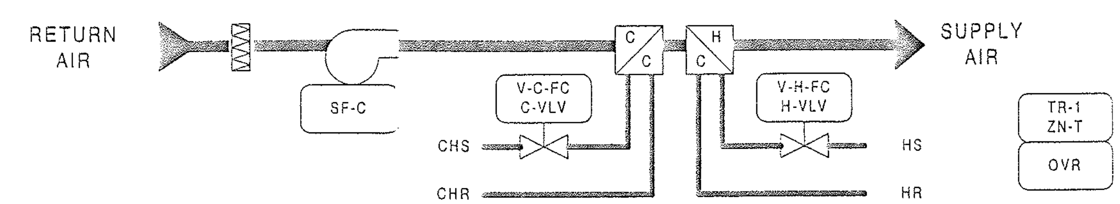


Note 1: For PAT, DAT, and On-Off outputs, terminals 1, 31, and 41 are internally connected.

BILL OF MATERIALS

Estimate: quad a fcu 7C520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	27	TC-9102-0332	FAN CONT3-SPEED 2-STG H/C
V-H-FC, V-C-FC	54	--	SEE VALVE SCHEDULE
ZN-T	27	TM-9161-5002	MSTAT F/TC-9100 55-85F FSC



TRANSFORMER SUPPLIED BY UNIT MANUFACTURER

NOTE: FCU CONTROLLER (TC-9102-0322) ARE FACTORY MOUNTED BY TRANE

VALVE	WIRING
EXTEND --	CLOSE
RETRACT --	OPEN

TRUNK

WHT - REF
BLK - (-)
RED - (+)

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODE GENERALLY OCCURS DURING THE NORMAL WORK WEEK AND STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON INDIVIDUAL UNITS WILL FREQUENTLY BE REQUIRED. SUITE OWNERS WILL HAVE THE ABILITY TO UTILIZE SUITES FOR PRIVATE FUNCTIONS AT ANYTIME. WHEN FAN COIL UNITS ARE DE-ENERGIZED, COOLING COIL VALVE V-C-FC AND HEATING COIL VALVE V-H-FC WILL BE CLOSED TO COILS.

OCCUPIED MODE - FAN COIL UNIT SUPPLY FAN WILL BE STARTED THROUGH ITS FAN SPEED SWITCH AND RUN CONTINUOUSLY. STARTING OF THE FAN COIL UNIT WILL INITIATE THE START OF THE RELATED EXHAUST FAN. THE EXHAUST AIR VOLUME INDUCES THE NATURAL VENTILATION OF THE SUITE AND MUST THEREFORE BE ENERGIZED WHENEVER THE SUITE IS OCCUPIED. ROOM SENSOR TR-1 WILL MODULATE HEATING COIL VALVE V-H-FC AND COOLING COIL VALVE V-C-FC IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F).

UNOCCUPIED MODE - ROOM SENSOR TR-1 WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F) ACTIVATE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), FAN COIL UNIT WILL BE DE-ENERGIZED AND HEATING COIL VALVE WILL CLOSE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 02:34 PM
FILE NAME FANCOILA.vsd

DRAWING TITLE
SUITE FAN COIL UNITS
QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM AT CAMDEN YARDS
BALTIMORE, MARYLAND

AS-BUILT 7/18/00 CME

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 08/28/97	BY DATE

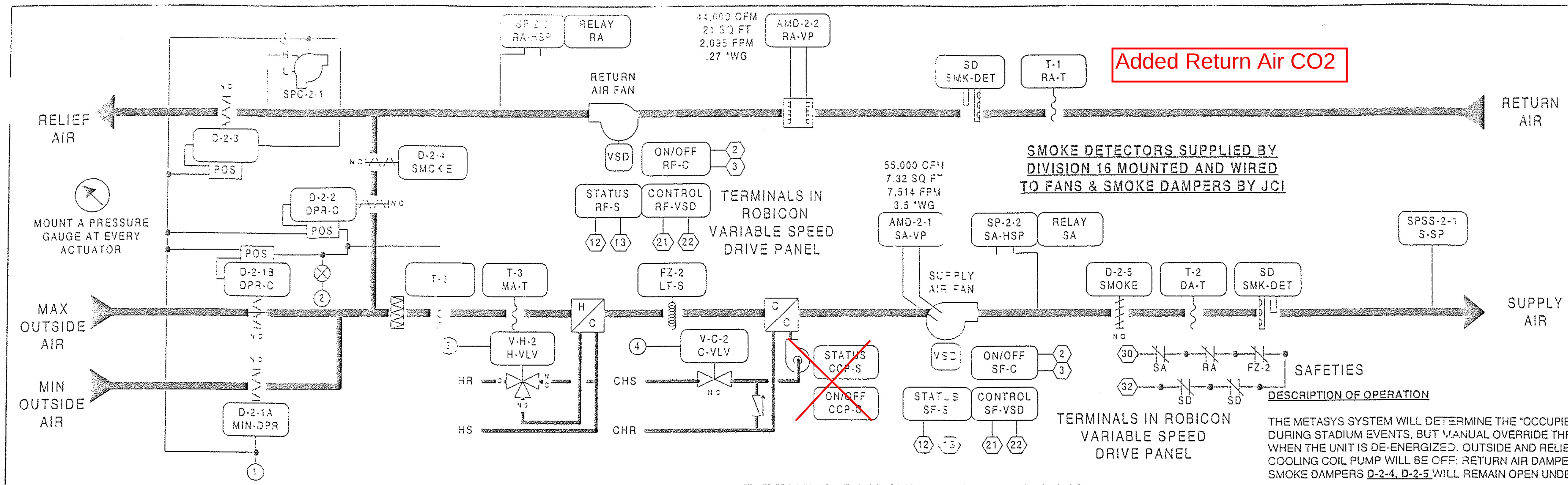
JOHNSON CONTROLS
Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

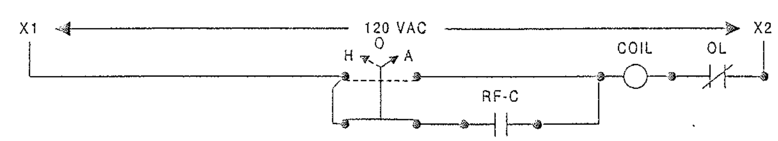
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-03

Full Spreadsheet		Software				Digital Controller Information						Panel Information				
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number
		FCU-A				TC						EN-FCU	At FCU			
		FCU-A	*			TC	1	Y				EN-FCU	At FCU	0		
	BO-1	FCU-A	H-VLV-OP	Htg Valve Open	Off On	TC	1	Y	BO-1		32,31/COM,30	EN-FCU	At FCU	0		FC-x-BO-1
	BO-2	FCU-A	H-VLV-CL	Htg Valve Close	Off On	TC	1	Y	BO-2		32,31/COM,30	EN-FCU	At FCU	0		FC-x-BO-2
	BO-3	FCU-A	C-VLV-OP	Clg Valve Open	Off On	TC	1	Y	BO-3		42,41/COM,40	EN-FCU	At FCU	0		FC-x-BO-3
	BO-4	FCU-A	C-VLV-CL	Clg Valve Close	Off On	TC	1	Y	BO-4		42,41/COM,40	EN-FCU	At FCU	0		FC-x-BO-4
	BO-5	FCU-A	F-SPD-1	Fan (Speed 1)	Off On	TC	1	Y	BO-5		71,70 LINE 63,62,(	EN-FCU	At FCU	0		FC-x-BO-5
	BO-6	FCU-A	F-SPD-2	Fan (Speed 2)	Off On	TC	1	Y	BO-6		71,70 LINE 63,62,(	EN-FCU	At FCU	0		FC-x-BO-6
	BO-7	FCU-A	F-SPD-3	Fan (Speed 3)	Off On	TC	1	Y	BO-7		71,70 LINE 63,62,(	EN-FCU	At FCU	0		FC-x-BO-7
	BI-1	FCU-A				TC	1	Y	BI-1			EN-FCU	At FCU	0		FC-x-BI-1
	BI-2	FCU-A				TC	1	Y	BI-2			EN-FCU	At FCU	0		FC-x-BI-2
	BI-3	FCU-A				TC	1	Y	BI-3			EN-FCU	At FCU	0		FC-x-BI-3
	AI-1	FCU-A	ZN-T	Zone Temperature	Deg F	TC	1	Y	AI-1		14 MODE,15 LED	EN-FCU	At FCU	0		FC-x-AI-1
	AI-2	FCU-A	ZN-SET	Zone Temp Set Point	Deg F	TC	1	Y	AI-2		22,23,21/24	EN-FCU	At FCU	0		FC-x-AI-2
	AI-4	FCU-A	OVR	Fan Override	Lo-Md-Hi	TC	1	Y	AI-4		51,21/24	EN-FCU	At FCU	0		FC-x-AI-4

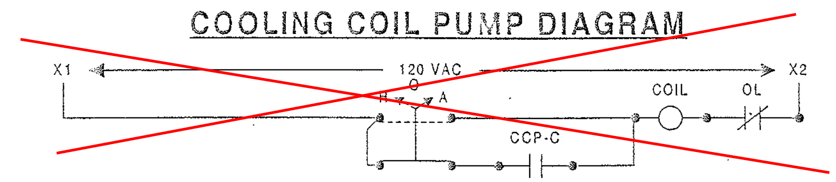
	Intermediate Device					Field Device					
Point Type	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
											Power to Controller
											N2 Trunk
BO-1						3/18	BLK,WHT,RED	VA-7150 (Heating)			
BO-2						3/18	BLK,WHT,RED	VA-7150 (Heating)			
BO-3						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
BO-4						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
BO-5						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
BO-6						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
BO-7						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
BI-1											
BI-2											
BI-3											
AI-1						3/22	14 MODE,15 LED	TM-9100 (Mode & LED)			
AI-2						3/22	22,23,21/24	TM-9100 (Setpoint)			
AI-4						2/22	51,21/24	TM-9100 (Fan Override)			



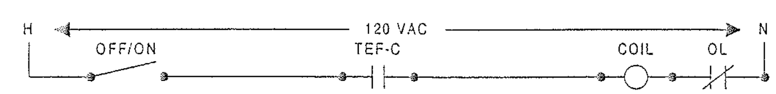
RETURN FAN WIRING DIAGRAM



COOLING COIL PUMP DIAGRAM



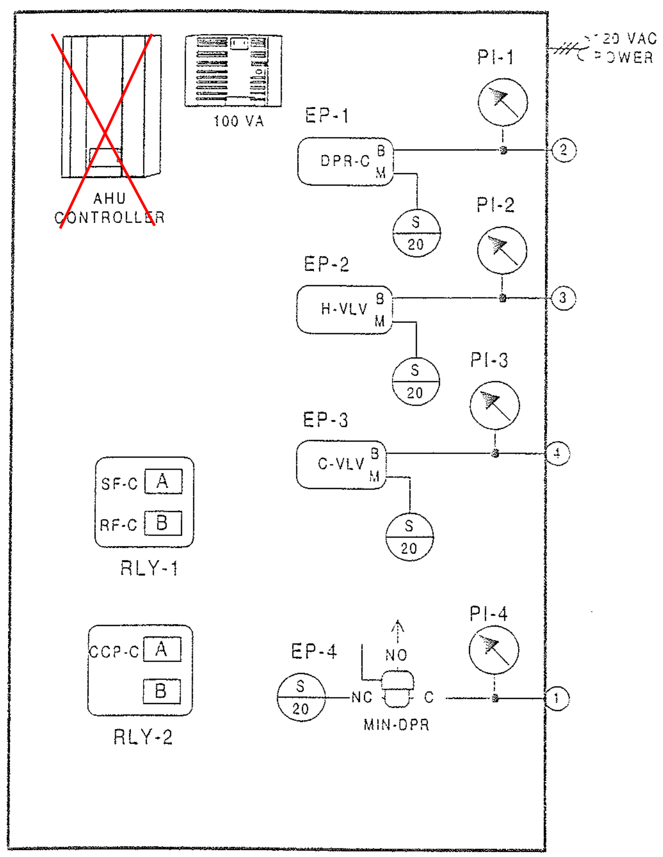
TOILET EXHAUST FAN DIAGRAM

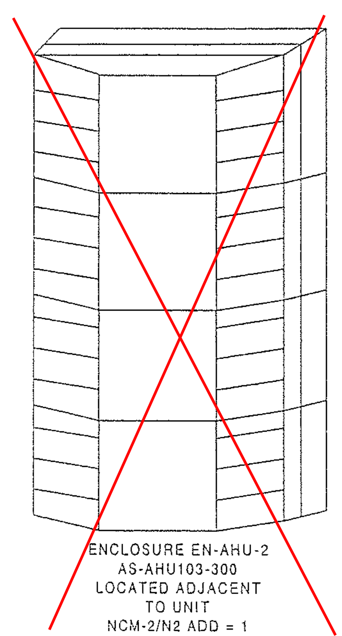


FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B14	ROOF	STARTER		ROOF
TEF-B15	ROOF	FPUCB	17	UP CONCOURSE
TEF-B16	ROOF	FPUCB	13	UP CONCOURSE
TEF-B17	ROOF	STARTER		ROOF
TEF-B25	CLUB LEVEL	FP2CLB	11	CLUB LEVEL

CONTROLLED FROM MAU PANEL - UPPER CONCOURSE B03

USE (4) PD-109-51 & (4) PD-101-35 AT (4) PANEL/STARTER LOCATIONS





SEE BL-6559-01A FOR ADDITIONAL WIRING DETAIL

BILL OF MATERIALS

Estimate: ahu-2 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-2-1A,D-2-1B5		---	SEE DAMPER SCHEDULE
D-2-2,D-2-3			
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
DPR-C,MIN-DPR	2	D-3153-1	DMPR ACT,8-13#
	5	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-2	1	A70HA-12	STAT,LL,20',EL.MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
MA-T,DA-T, RA-T	3	TE-6316P-1	SENS,T-Ni,0.1%,17' AVG
RA-VP	1	DPT-2641-3	XDUCR DP 0.1.5" 4-20ma
S-SP	1	DPT-2641-7	XDUCR DP 0.10.0" 4-20ma
SA-HSP,RA-HSP	2	AFS-460	DUCT AIR FLOW HIGH STATIC
SA-VP	1	DPT-2641-6	XDUCR DP 0.5.0" 4-20ma
SPC-2-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-3	1	T-3610-1001	STAT,LOW VOL ,8' AVG, DCT
TEP	4	BZ-1000-11	ENCL,4-5/8X 3-1/8 X 3-3/8
	4	PD-101-35	RLY BASE,3PDT,11PIN,10A
	4	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
Panel Devices:			
EN-AHU-2	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD,TVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
EP-4	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3,4	4	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC
SA,RA	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-2-1A, D-2-1B, D-2-3 AND COOLING COIL VALVE V-C-2 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-2-2 WILL BE OPEN AND HEATING COIL VALVE V-H-2 WILL BE CLOSED TO THE COIL. SMOKE DAMPERS D-2-4, D-2-5 WILL REMAIN OPEN UNDER CONTROL OF SMOKE DETECTION SYSTEM.

WARM-UP MODE - SUPPLY AND RETURN FANS WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-2 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-2-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-2-1A, D-2-1B AND RELIEF AIR DAMPER D-2-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY AND RETURN FANS WILL BE RUNNING, RETURN AIR DAMPER D-2-2 IS OPEN. MINIMUM OUTSIDE AIR DAMPER D-2-1A WILL OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FORTY-FIVE (45F) MODULATE V-H-2 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, T-2 WILL GRADUALLY MODULATE DAMPERS D-2-1B OPEN WHILE SIMULTANEOUSLY CLOSING D-2-2. STATIC PRESSURE CONTROLLER SPC-2-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-2-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-3, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE T-2 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-2 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND RETURN FANS AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-2-1A WILL OPEN. OUTSIDE DAMPER D-2-1B AND RETURN DAMPER D-2-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), MAXIMUM OUTSIDE AIR DAMPERS D-2-1B WILL CLOSE, OPENING RETURN AIR DAMPER D-2-2. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-2-1B AND D-2-2 AND CHILLED WATER VALVE V-C-2 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-2 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND RETURN FANS AND CLOSE ALL SYSTEM DAMPERS.

FAN CONTROL - SYSTEM STATIC PRESSURE SENSING STATION SPSS-2-1 THROUGH A STATIC PRESSURE TRANSMITTER AND THE METASYS CONTROLLER WILL MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVE TO MAINTAIN ITS SETTING. ON A RISE IN STATIC AS SENSED BY SPSS-2-1 THE SUPPLY FAN DRIVE WILL GRADUALLY MODULATE FAN SPEED TO ITS MINIMUM POSITION TO MAINTAIN ITS SETTING. HIGH LIMIT STATIC PRESSURE CONTROLLER SPC-2-2 WHICH WILL OVERRIDE SPSS-2-1 TO PREVENT THE DISCHARGE FROM RISING ABOVE IT'S SET POINT. SUPPLY DUCT AIR MONITORING STATION AMD-2-1 AND RETURN DUCT AIR MONITORING STATION AMD-2-2 THROUGH VELOCITY PRESSURE TRANSMITTERS WILL SEND SIGNALS TO THE METASYS CONTROLLER WHICH WILL COMPARE TOTAL SUPPLY AND RETURN AIR QUANTITIES AND MODULATE RETURN FAN VARIABLE SPEED DRIVE BASED ON SETPOINT TO SYNCHRONIZE RETURN FAN VOLUME WITH THE SUPPLY FAN VOLUME SO AS TO MAINTAIN CONSTANT MINIMUM BALANCED OUTSIDE AIR FLOW. DIFFERENTIAL WILL BE REDUCED TO ZERO (0) (NO OUTSIDE AIR) DURING WARM-UP AND UNOCCUPIED MODES OF OPERATION. MANUALLY RESET HIGH LIMIT STATIC PRESSURE CONTROLLERS SPC-2-2 AND SPC-2-3 WILL STOP THEIR RESPECTIVE SUPPLY AND RETURN FANS WHENEVER THEIR SETTING IS REACHED. ALL FANS WILL BE REQUIRED TO BE MANUALLY RESTARTED IF DE-ENERGIZED BY STATIC PRESSURE CONTROLS. SUPPLY FANS WILL BE MANUALLY CONTROLLED USING A BY-PASS STARTER IF THEIR RESPECTIVE VARIABLE FREQUENCY FAN DRIVE FAILS.

TOILET EXHAUST FANS TEF-B14,B15,B16,B17,B25 - THE FAN WILL START WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	02:37 PM
FILE NAME	AHU-2.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-2
CLUB/SUITES QUAD B

PRESS LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

		ECN	DATE	BY
AS-BUILT			7/18/00	CME

REFERENCE DRAWING | NO | REVISION-LOCATION

Sales Engineer: JDP | Project Manager: WJT | Application Engineer: RTS

DRAWN BY RTS DATE 08-25-97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

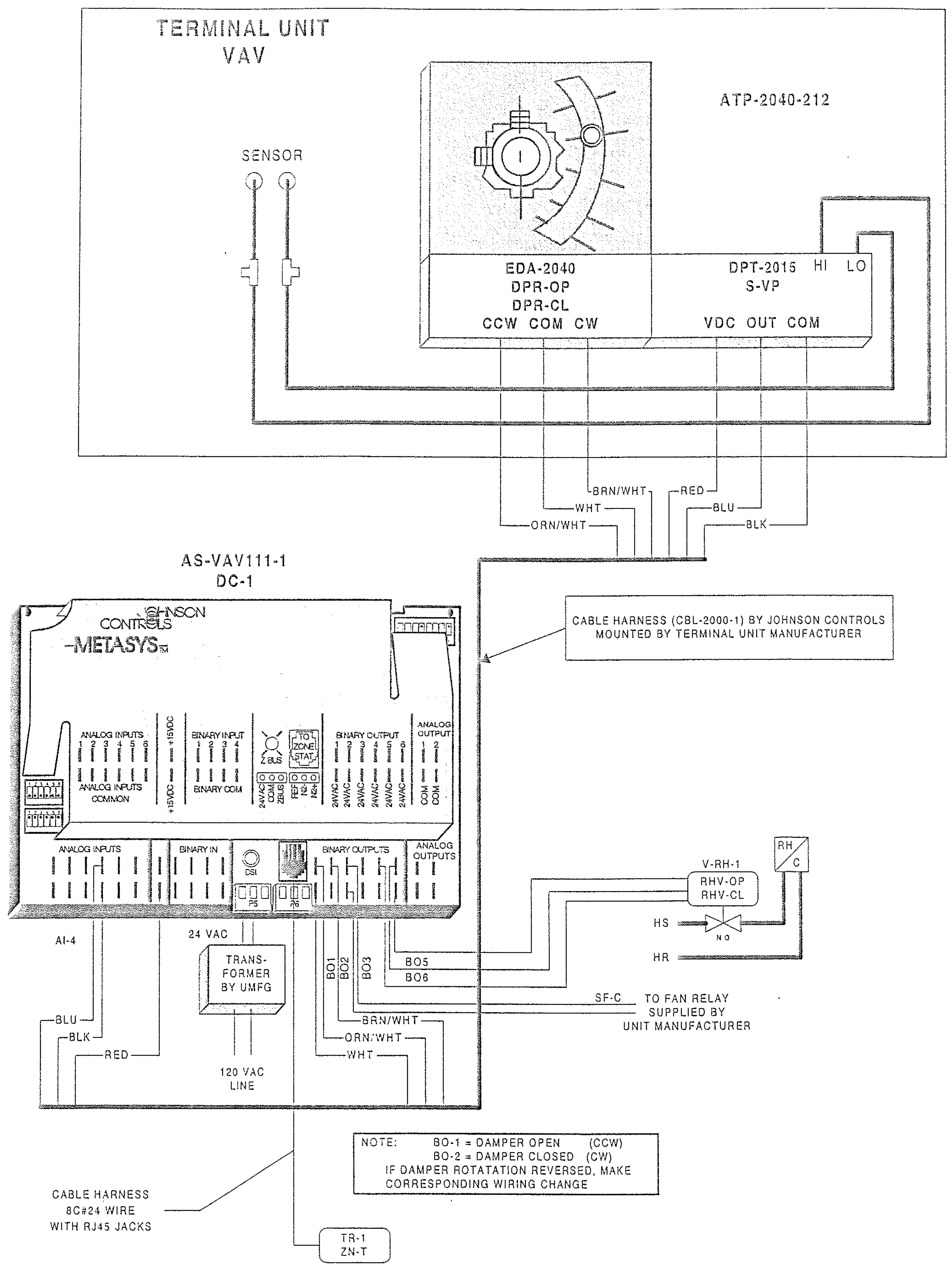
Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

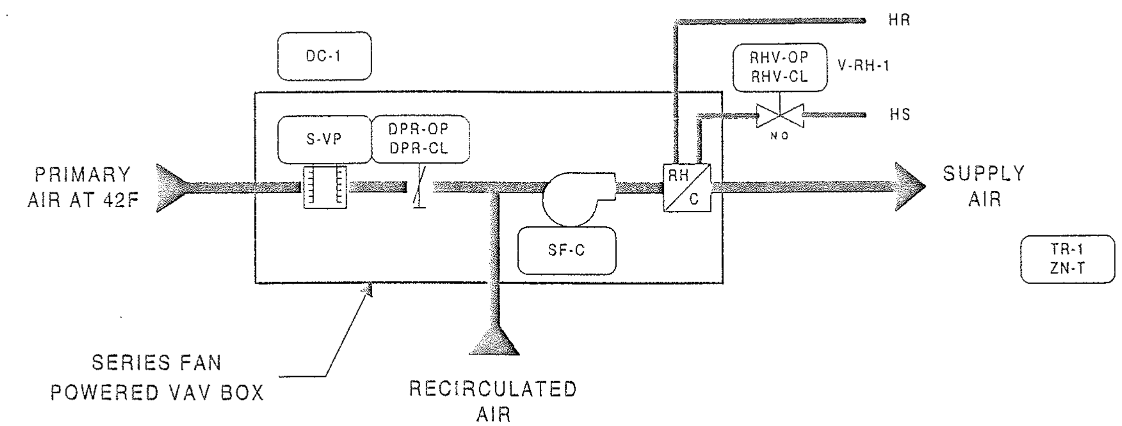
DRAWING NUMBER BL-6559-04

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-2				AHU						EN-AHU-2	Press Lev MER B		M.3-10												Power to Controller
		AHU-2	*			AHU	1	1				EN-AHU-2	Press Lev MER B	0	M.3-10												N2 Trunk
	BO-1	AHU-2	MIN-DPR	Min OA Damper Control	Closed Open	AHU	1	1	BO-1		BO#,24V	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-1			V11HGA-100			2/18	2-Wire	SAV-24VAC		A50	
	BO-2	AHU-2	SF-C	Supply Fan Control	Off On	AHU	1	1	BO-2	RLY	BO#,24V,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-2	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-3	AHU-2	RF-C	Return Fan Control	Off On	AHU	1	1	BO-3	RLY	BO#,24V,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-3	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-4	AHU-2	CCP-C	Clg Coil Pump 2 Control	Off On	AHU	1	1	BO-4	RLY	BO#,24V,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-4	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-5	AHU-2	TEF-C	Toilet Exh Fan Control	Off On	AHU	1	1	BO-5		BO#,24V	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-5			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-6	AHU-2				AHU	1	1	BO-6			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-6											
	BO-7	AHU-2				AHU	1	1	BO-7			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-7											
	BO-8	AHU-2				AHU	1	1	BO-8			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-8											
	BO-9	AHU-2				AHU	1	1	BO-9			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-9											
	BO-10	AHU-2				AHU	1	1	BO-10			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BO-10											
	AO-1	AHU-2	DPR-C	Damper Control	% Open	AHU	1	1	AO-1		AO#,AOCOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-2	H-VLV	Heating Coil Valve	% Open	AHU	1	1	AO-2		AO#,AOCOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-2	C-VLV	Clg Coil Valve	% Open	AHU	1	1	AO-3		AO#,AOCOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-2	SF-VSD	Sup Fan Var Spd Drive	%	AHU	1	1	AO-4		AO#,AOCOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AO-4						2/18	Device dependent	0-20mA OUT		A21	
	AO-5	AHU-2	RF-VSD	Ret Fan Var Spd Drive	%	AHU	1	1	AO-5		AO#,AOCOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AO-5						2/18	Device dependent	0-20mA OUT		A21	
	AO-6	AHU-2				AHU	1	1	AO-6			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AO-6											
	BI-1	AHU-2	SF-S	Supply Fan Status	Off On	AHU	1	1	BI-1		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-2	RF-S	Return Fan Status	Off On	AHU	1	1	BI-2		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-2						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-3	AHU-2	SMK-DET	Smoke Detectors	Normal Alarm	AHU	1	1	BI-3		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-3						2/22	Device dependent	Contact (NO)		A40	
	BI-4	AHU-2	LT-S	Low Temperature Stat	Normal Alarm	AHU	1	1	BI-4		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-4						2/22	NO,M1	A70 (NC)		A41	
	BI-5	AHU-2	CCP-S	Clg Coil Pump 2 Status	Off On	AHU	1	1	BI-5		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-5						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-6	AHU-2	SA-HSP	Supply Air Static Press	Normal Alarm	AHU	1	1	BI-6		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-6						2/22	Device dependent	AFS-460 & Relay		A40	
	BI-7	AHU-2	RA-HSP	Return Air Static Press	Normal Alarm	AHU	1	1	BI-7		BI#,BICOM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-7						2/22	Device dependent	AFS-460 & Relay		A40	
	BI-8	AHU-2				AHU	1	1	BI-8			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-BI-8											
	AI-1	AHU-2	RA-VP	Return Air Vel Pressure	In. Wg	AHU	1	1	AI-1		AI#,+VDC	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-1						2/18	-,+	DPT-2641		A2	
	AI-2	AHU-2	RA-T	Return Air Temperature	Deg F	AHU	1	1	AI-2		AI#,AICM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-2						2/18	2-Wire	TE-6316P-1		A4	
	AI-3	AHU-2	DA-T	Disch Air Temperature	Deg F	AHU	1	1	AI-3		AI#,AICM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-3						2/18	2-Wire	TE-6316P-1		A4	
	AI-4	AHU-2	MA-T	Mixed Air Temperature	Deg F	AHU	1	1	AI-4		AI#,AICM	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-4						2/18	2-Wire	TE-6316P-1		A4	
	AI-5	AHU-2				AHU	1	1	AI-5			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-5											
	AI-6	AHU-2				AHU	1	1	AI-6			EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-6											
	AI-7	AHU-2	S-SP	Supply Static Pressure	In. Wg	AHU	1	1	AI-7		AI#,+VDC	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-7						2/18	-,+	DPT-2641		A2	
	AI-8	AHU-2	S-VP	Supply Vel Pressure	In. Wg	AHU	1	1	AI-8		AI#,+VDC	EN-AHU-2	Press Lev MER B	0	M.3-10	AH-1-AI-8						2/18	-,+	DPT-2641		A2	

	BILL OF MATERIALS		
Estimate: quad b vavbox			70520098.pre
Desig.	QtyPart #		Description
Field Devices:			
DC-1	53	AS-VAV110-1	VAV 6AI,4BI,8BO,8K
V-RH-1	53	--	SEE VALVE SCHEDULE
VAV	53	ATP-2040-212	ACT,2MIN+1.5"DP,1/2"CPLG
ZN-T	35	TE-6410W-1000	MSTAT,NI,BOX,JACK



SERIES FAN POWERED VARIABLE AIR VOLUME (VAV) WITH REHEAT COIL



NOTE: VAV CONTROLLER (AS-VAV111-1) DAMPER ACTUATOR & DIFFERENTIAL PRESSURE TRANSMITTER (ATP-2040-212) ARE FACTORY MOUNTED BY TITUS

DESCRIPTION OF OPERATION

PRIMARY AIR VALVE WILL OPEN TO THEIR MINIMUM POSITION AND TERMINAL UNIT FAN WILL START AND RUN CONTINUOUSLY WHENEVER AIR HANDLING UNIT IS RUNNING. TERMINAL UNIT FANS WILL START THIRTY (30) SECONDS BEFORE OPENING OF AIR VALVES TO PREVENT BACK SPINNING OF FAN. FANS WILL ALSO BE OPERATED AS DEFINED IN THE UNOCCUPIED MODES. PRIMARY AIR VALVES WILL BE CLOSED DURING UNOCCUPIED HEATING MODE. ROOM SENSOR TR-1 WILL ON A RISE IN TEMPERATURE GRADUALLY MODULATE REHEAT COIL VALVE V-RH-1 CLOSED AND ON A CONTINUED RISE WILL GRADUALLY MODULATE PRIMARY AIR VALVE FROM IT'S MINIMUM TO MAXIMUM SETTING TO MAINTAIN IT'S SETTING OF SEVENTY-FIVE (75F). ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. DURING OPERATION OF THE WARM-UP MODE ALL PRIMARY AIR VALVES OPEN TO THEIR MAXIMUM POSITION AND TERMINAL FANS START TO PERMIT FULL AIR FLOW TO THE SPACES. REHEAT COIL VALVE V-RH-1 IS MODULATED IN RESPONSE TO ROOM SENSOR TO MAINTAIN SPACE TEMPERATURE.

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	02:39 PM
FILE NAME	VAVBOX-B.vsd

DRAWING TITLE
FAN POWERED TERMINAL REHEAT UNITS

QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
JDP	WJT	RTS	BY RTS	DATE 08/26/97	BY	DATE

JOHNSON CONTROLS
Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-05

Full Spreadsheet		Software					Digital Controller Information					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination
		FP-VAV-B					VAV					
		FP-VAV-B	*				VAV	1	X			
	AI-1	FP-VAV-B	ZN-T	Zone Temperature	Deg F		VAV	1	X	AI-1		PHONE JACK
	AI-2	FP-VAV-B					VAV	1	X	AI-2		
	AI-3	FP-VAV-B					VAV	1	X	AI-3		
	AI-4	FP-VAV-B	S-VP	Supply Vel Pressure	In. Wg		VAV	1	X	AI-4		AI#,AICM,+15VDC
	AI-5	FP-VAV-B					VAV	1	X	AI-5		
	AI-6	FP-VAV-B					VAV	1	X	AI-6		
	BI-1	FP-VAV-B					VAV	1	X	BI-1		
	BI-2	FP-VAV-B					VAV	1	X	BI-2		
	BI-3	FP-VAV-B					VAV	1	X	BI-3		
	BI-4	FP-VAV-B					VAV	1	X	BI-4		
	BO-1	FP-VAV-B	DPR-OP	Damper Open	Off	On	VAV	1	X	BO-1		BO-a,BO-b,24VAC
	BO-2	FP-VAV-B	DPR-CL	Damper Close	Off	On	VAV	1	X	BO-2		BO-a,BO-b,24VAC
	BO-3	FP-VAV-B	SF-C	Supply Fan Control	Off	On	VAV	1	X	BO-3		BO#,24VAC
	BO-4	FP-VAV-B					VAV	1	X	BO-4		
	BO-5	FP-VAV-B	RHV-OP	Reheat Valve Open	Off	On	VAV	1	X	BO-5		BO-a,BO-b,24VAC
	BO-6	FP-VAV-B	RHV-CL	Reheat Valve Close	Off	On	VAV	1	X	BO-6		BO-a,BO-b,24VAC
	AO-1	FP-VAV-B					VAV	1	X	AO-1		
	AO-2	FP-VAV-B					VAV	1	X	AO-2		

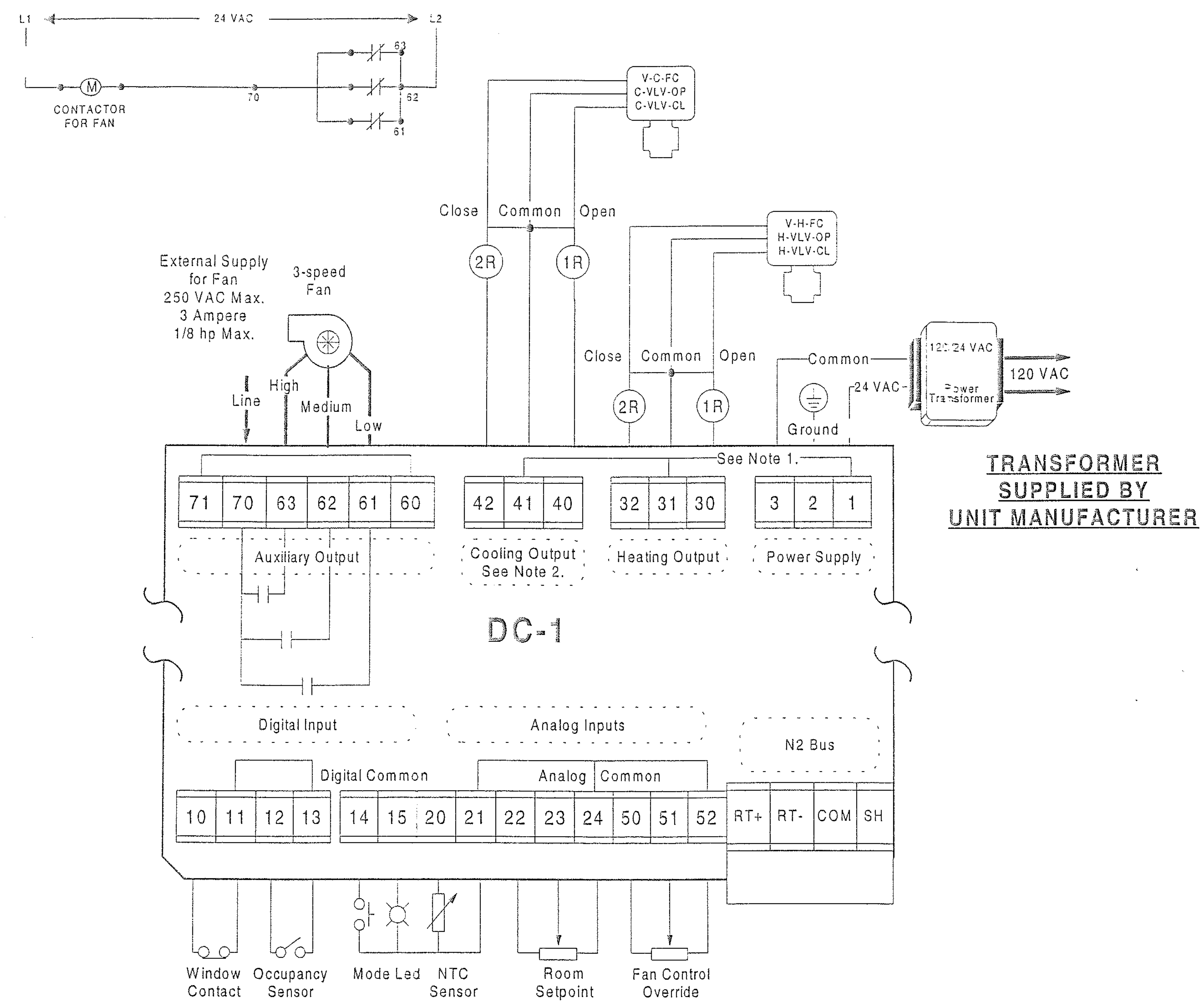
	Panel Information					Intermediate Device				
Point Type	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location
	EN-FPVAV	At VAVBOX								
	EN-FPVAV	At VAVBOX	0							
AI-1	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-1					
AI-2	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-2					
AI-3	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-3					
AI-4	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-4					
AI-5	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-5					
AI-6	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-6					
BI-1	EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-1					
BI-2	EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-2					
BI-3	EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-3					
BI-4	EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-4					
BO-1	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-1					
BO-2	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-2					
BO-3	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-3	2/18	COIL	RELAY	NO,COM	
BO-4	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-4					
BO-5	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-5					
BO-6	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-6					
AO-1	EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-1					
AO-2	EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-2					

	Field Device					
Point Type	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
						Power to Controller
						N2 Trunk
AI-1	8/26	PHONE JACK	Metastat-Ph Jack		U2	
AI-2						
AI-3						
AI-4	3/18	OUT,COM,+VDC	DPT-2000		U9	
AI-5						
AI-6						
BI-1						
BI-2						
BI-3						
BI-4						
BO-1	3/18	CW,CCW,COM	EDA-2040		U54	
BO-2	3/18	CW,CCW,COM	EDA-2040		U54	
BO-3	2/14	See starter detail	Starter (NO)		U51	
BO-4						
BO-5	3/18	BLK,RED,WHT	VA-7150		U58	
BO-6	3/18	BLK,RED,WHT	VA-7150		U58	
AO-1						
AO-2						

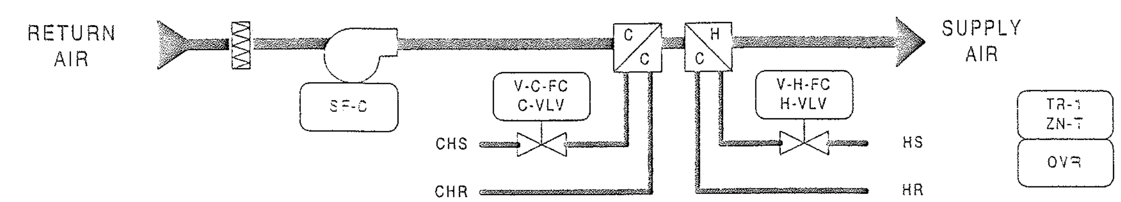
BILL OF MATERIALS

Estimate: quad b fcu 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	27	TC-9102-0332	FAN CONT3-SPEED 2-STG H/C
V-H-FC, V-C-FC	54	--	SEE VALVE SCHEDULE
ZN-T	27	TM-9161-5002	MSTAT F/TC-9100 55-85F FSC



Note 1: For PAT, DAT, and On-Off outputs, terminals 1, 31, and 41 are internally connected.



NOTE: FCU CONTROLLER (TC-9102-0322) ARE FACTORY MOUNTED BY TRANE

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODE GENERALLY OCCURS DURING THE NORMAL WORK WEEK AND STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON INDIVIDUAL UNITS WILL FREQUENTLY BE REQUIRED. SUITE OWNERS WILL HAVE THE ABILITY TO UTILIZE SUITES FOR PRIVATE FUNCTIONS AT ANYTIME. WHEN FAN COIL UNITS ARE DE-ENERGIZED, COOLING COIL VALVE V-C-FC AND HEATING COIL VALVE V-H-FC WILL BE CLOSED TO COILS.

OCCUPIED MODE - FAN COIL UNIT SUPPLY FAN WILL BE STARTED THROUGH ITS FAN SPEED SWITCH AND RUN CONTINUOUSLY. STARTING OF THE FAN COIL UNIT WILL INITIATE THE START OF THE RELATED EXHAUST FAN. THE EXHAUST AIR VOLUME INDUCES THE NATURAL VENTILATION OF THE SUITE AND MUST THEREFORE BE ENERGIZED WHENEVER THE SUITE IS OCCUPIED. ROOM SENSOR TR-1 WILL MODULATE HEATING COIL VALVE V-H-FC AND COOLING COIL VALVE V-C-FC IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F).

UNOCCUPIED MODE - ROOM SENSOR TR-1 WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F) ACTIVATE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), FAN COIL UNIT WILL BE DE-ENERGIZED AND HEATING COIL VALVE WILL CLOSE.

REVISION INFORMATION		DRAWING TITLE		
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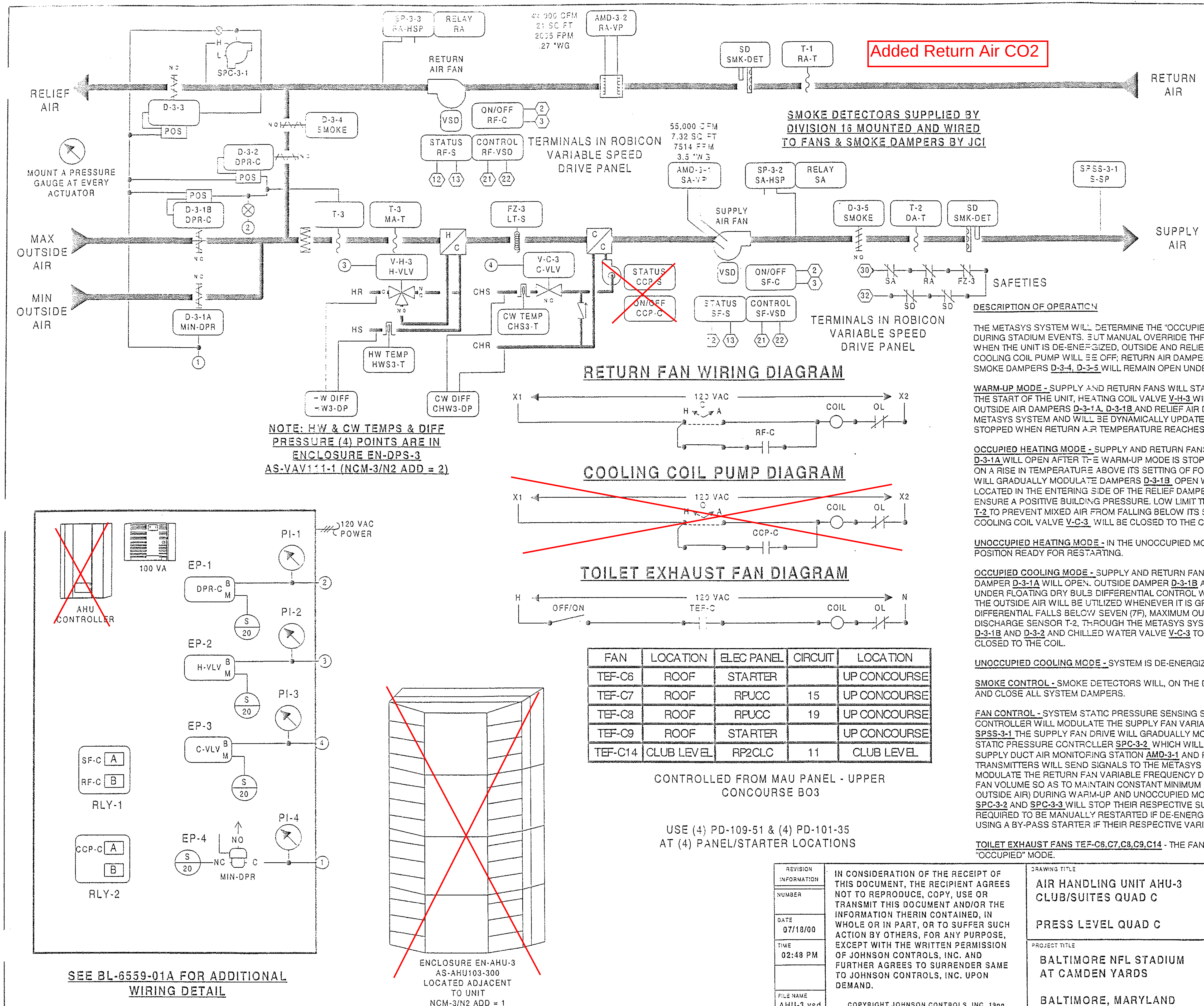
DATE 07/18/00			REFERENCE DRAWING / NO. / REVISION-LOCATION / ECN / DATE / BY	
TIME 02:43 PM		PROJECT TITLE	Sales Engineer JDP / Project Manager WJT / Application Engineer RTS / DRAWN BY RTS DATE 8/28/97 / APPROVED BY DATE	
FILE NAME FANCOILB.vsd	COPYRIGHT JOHNSON CONTROLS, INC. 19nn	BALTIMORE NFL STADIUM AT CAMDEN YARDS BALTIMORE, MARYLAND	JOHNSON CONTROLS Controls Group — Branch Information: Johnson Controls, Inc. 60 Loveton Circle Sparks, MD 21152	CONTRACT NUMBER 7052-0098 DRAWING NUMBER BL-6559-06

Full Spreadsheet		Software				Digital Controller Information					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination
		FCU-B				TC					
		FCU-B				TC	1	Y			
	BO-1	FCU-B	H-VLV-OP	Htg Valve Open	Off On	TC	1	Y	BO-1		32,31/COM,30
	BO-2	FCU-B	H-VLV-CL	Htg Valve Close	Off On	TC	1	Y	BO-2		32,31/COM,30
	BO-3	FCU-B	C-VLV-OP	Clg Valve Open	Off On	TC	1	Y	BO-3		42,41/COM,40
	BO-4	FCU-B	C-VLV-CL	Clg Valve Close	Off On	TC	1	Y	BO-4		42,41/COM,40
	BO-5	FCU-B	F-SPD-1	Fan (Speed 1)	Off On	TC	1	Y	BO-5		71,70 LINE/63,62,6
	BO-6	FCU-B	F-SPD-2	Fan (Speed 2)	Off On	TC	1	Y	BO-6		71,70 LINE/63,62,6
	BO-7	FCU-B	F-SPD-3	Fan (Speed 3)	Off On	TC	1	Y	BO-7		71,70 LINE/63,62,6
	BI-1	FCU-B				TC	1	Y	BI-1		
	BI-2	FCU-B				TC	1	Y	BI-2		
	BI-3	FCU-B				TC	1	Y	BI-3		
	AI-1	FCU-B	ZN-T	Zone Temperature	Deg F	TC	1	Y	AI-1		14 MODE,15 LED,
	AI-2	FCU-B	ZN-SET	Zone Temp Set Point	Deg F	TC	1	Y	AI-2		22,23,21/24
	AI-4	FCU-B	OVR	Fan Override	Lo-Md-Hi	TC	1	Y	AI-4		51,21/24

	Panel Information					Intermediate Device					Field Device						
Point Type	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
	EN-FCU	At FCU														Power to Controller
	EN-FCU	At FCU	0													N2 Trunk
BO-1	EN-FCU	At FCU	0		FCU-x-BO-1						3/18	BLK,WHT,RED	VA-7150 (Heating)			
BO-2	EN-FCU	At FCU	0		FCU-x-BO-2						3/18	BLK,WHT,RED	VA-7150 (Heating)			
BO-3	EN-FCU	At FCU	0		FCU-x-BO-3						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
BO-4	EN-FCU	At FCU	0		FCU-x-BO-4						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
BO-5	EN-FCU	At FCU	0		FCU-x-BO-5						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
BO-6	EN-FCU	At FCU	0		FCU-x-BO-6						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
BO-7	EN-FCU	At FCU	0		FCU-x-BO-7						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
BI-1	EN-FCU	At FCU	0		FCU-x-BI-1											
BI-2	EN-FCU	At FCU	0		FCU-x-BI-2											
BI-3	EN-FCU	At FCU	0		FCU-x-BI-3											
AI-1	EN-FCU	At FCU	0		FCU-x-AI-1						3/22	14 MODE,15 LED,	TM-9100 (Mode & LED)			
AI-2	EN-FCU	At FCU	0		FCU-x-AI-2						3/22	22,23,21/24	TM-9100 (Setpoint)			
AI-4	EN-FCU	At FCU	0		FCU-x-AI-4						2/22	51,21/24	TM-9100 (Fan Override)			



FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-C6	ROOF	STARTER		UP CONCOURSE
TEF-C7	ROOF	RPUCC	15	UP CONCOURSE
TEF-C8	ROOF	RPUCC	19	UP CONCOURSE
TEF-C9	ROOF	STARTER		UP CONCOURSE
TEF-C14	CLUB LEVEL	RP2CLC	11	CLUB LEVEL

CONTROLLED FROM MAU PANEL - UPPER CONCOURSE BO3

USE (4) PD-109-51 & (4) PD-101-35 AT (4) PANEL/STARTER LOCATIONS

BILL OF MATERIALS

Estimate: ahu-3 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-3-1A,D-3-1B, D-3-2,D-3-3	5	---	SEE DAMPER SCHEDULE
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
DPR-C,MIN-DPR	2	D-3153-2	DMPR ACT,8-13#
	5	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-3	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
HW3-DP,CW3-DP	2	C-252	DELTA TRANS RCS/HALP
HWS3-T,CHS3-T	2	TE-631AP-1	SENS,T-Ni,0.1%,F/WZ1000-5
	2	WZ-1000-5	WELL,BRASS,1/2"NPT+COMPND
MA-T,DA-T, RA-T	3	TE-631SP-1	SENS,T-Ni,0.1%,17' AVG
RA-VP	1	DPT-2641-3	XDUCR DP 0/0.5" 4-20ma
S-SP	1	DPT-2641-7	XDUCR DP 0/10.0" 4-20ma
SA-HSP,RA-HSP	2	AFS-460	DUCT AIR FLOW HIGH STATIC
SA-VP	1	DPT-2641-6	XDUCR DP 0/5.0" 4-20ma
SPC-3-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-3	1	T-3610-1001	STAT,LOW VOL ,3' AVG, DCT
TEF	4	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	4	PD-101-35	RLY BASE,3PDT,11PIN,10A
	4	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
Panel Devices:			
EN-AHU-3	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
EP-4	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3,4	4	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY, DPDT 5 AMP 240VAC
SA,RA	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS. BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-3-1A, D-3-1B, D-3-3 AND COOLING COIL VALVE V-C-3 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-3-2 WILL BE OPEN AND HEATING COIL VALVE V-H-3 WILL BE CLOSED TO THE COIL. SMOKE DAMPERS D-3-4, D-3-5 WILL REMAIN OPEN UNDER CONTROL OF SMOKE DETECTION SYSTEM.

WARM-UP MODE - SUPPLY AND RETURN FANS WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-3 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-3-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-3-1A, D-3-1B AND RELIEF AIR DAMPER D-3-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY AND RETURN FANS WILL BE RUNNING, RETURN AIR DAMPER D-3-2 IS OPEN. MINIMUM OUTSIDE AIR DAMPER D-3-1A WILL OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FORTY-FIVE (45F) MODULATE V-H-3 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, T-2 WILL GRADUALLY MODULATE DAMPERS D-3-1B OPEN WHILE SIMULTANEOUSLY CLOSING D-3-2. STATIC PRESSURE CONTROLLER SPC-3-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-3-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-3, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE T-2 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-3 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND RETURN FANS AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-3-1A WILL OPEN. OUTSIDE DAMPER D-3-1B AND RETURN DAMPER D-3-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), MAXIMUM OUTSIDE AIR DAMPERS D-3-1B WILL CLOSE, OPENING RETURN AIR DAMPER D-3-2. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-3-1B AND D-3-2 AND CHILLED WATER VALVE V-C-3 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-3 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND RETURN FANS AND CLOSE ALL SYSTEM DAMPERS.

FAN CONTROL - SYSTEM STATIC PRESSURE SENSING STATION SPSS-3-1 THROUGH A STATIC PRESSURE TRANSMITTER AND THE METASYS CONTROLLER WILL MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVE TO MAINTAIN ITS SETTING. ON A RISE IN STATIC AS SENSED BY SPSS-3-1 THE SUPPLY FAN DRIVE WILL GRADUALLY MODULATE FAN SPEED TO ITS MINIMUM POSITION TO MAINTAIN ITS SETTING. HIGH LIMIT STATIC PRESSURE CONTROLLER SPC-3-2 WHICH WILL OVERRIDE SPSS-3-1 TO PREVENT THE DISCHARGE FROM RISING ABOVE IT'S SET POINT. SUPPLY DUCT AIR MONITORING STATION AMD-3-1 AND RETURN DUCT AIR MONITORING STATION AMD-3-2 THROUGH VELOCITY PRESSURE TRANSMITTERS WILL SEND SIGNALS TO THE METASYS CONTROLLER WHICH WILL COMPARE TOTAL SUPPLY AND RETURN AIR QUANTITIES AND MODULATE THE RETURN FAN VARIABLE FREQUENCY DRIVE BASED ON SETPOINT TO SYNCHRONIZE RETURN FAN VOLUME WITH THE SUPPLY FAN VOLUME SO AS TO MAINTAIN CONSTANT MINIMUM BALANCED OUTSIDE AIR FLOW. DIFFERENTIAL WILL BE REDUCED TO ZERO (0) (NO OUTSIDE AIR) DURING WARM-UP AND UNOCCUPIED MODES OF OPERATION. MANUALLY RESET HIGH LIMIT STATIC PRESSURE CONTROLLERS SPC-3-2 AND SPC-3-3 WILL STOP THEIR RESPECTIVE SUPPLY AND RETURN FANS WHENEVER THEIR SETTING IS REACHED. ALL FANS WILL BE REQUIRED TO BE MANUALLY RESTARTED IF DE-ENERGIZED BY STATIC PRESSURE CONTROLS. SUPPLY FANS WILL BE MANUALLY CONTROLLED USING A BY-PASS STARTER IF THEIR RESPECTIVE VARIABLE FREQUENCY FAN DRIVE FAILS.

TOILET EXHAUST FANS TEF-C6,C7,C8,C9,C14 - THE FAN WILL START WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 02:48 PM
FILE NAME AHU-3.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-3
CLUB/SUITES QUAD C

PRESS LEVEL QUAD C

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

AS-BUILT 7/18/00 CME

REFERENCE DRAWING | NO | REVISION-LOCATION | ECN | DATE | BY

Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 08/28/97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

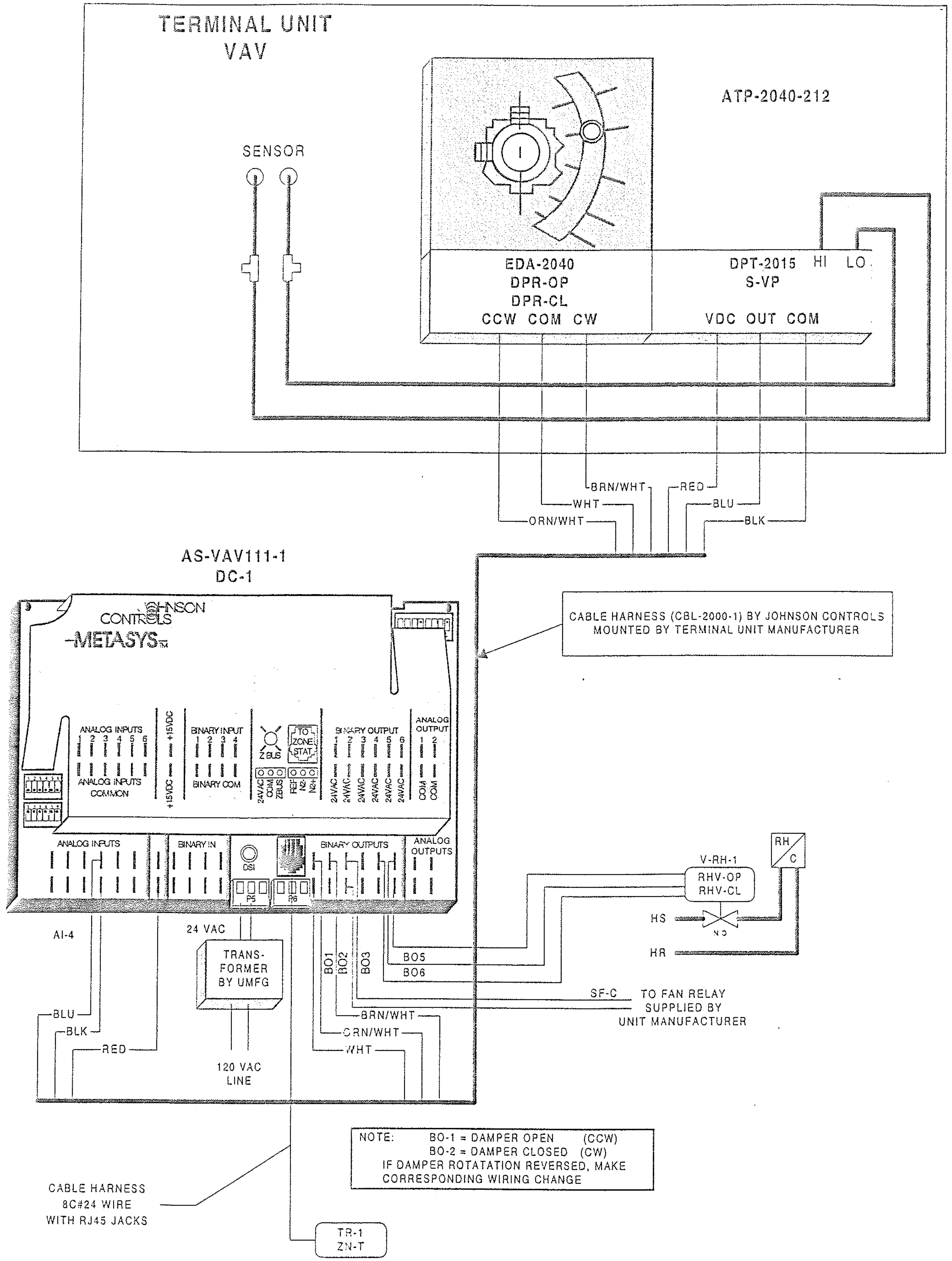
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-07

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-3				AHU						EN-AHU-3	Press Lev MER C		M.3-11												Power to Controller
		AHU-3	*			AHU	1	1				EN-AHU-3	Press Lev MER C	0	M.3-11												N2 Trunk
	BO-1	AHU-3	MIN-OPR	Min OA Damper Control	Closed Open	AHU	1	1	BO-1		BO#,24V	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-1			V11HGA-100			2/18	2-Wire	SAV-24VAC		A50	
	BO-2	AHU-3	SF-C	Supply Fan Control	Off On	AHU	1	1	BO-2	RLY	BO#,24V,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-2	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-3	AHU-3	RF-C	Return Fan Control	Off On	AHU	1	1	BO-3	RLY	BO#,24V,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-3	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-4	AHU-3	CCP-C	Clg Coil Pump 3 Control	Off On	AHU	1	1	BO-4	RLY	BO#,24V,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-4	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-5	AHU-3	TEF-C	Toilet Exh Fan Control	Off On	AHU	1	1	BO-5		BO#,24V	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-5			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-6	AHU-3				AHU	1	1	BO-6			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-6											
	BO-7	AHU-3				AHU	1	1	BO-7			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-7											
	BO-8	AHU-3				AHU	1	1	BO-8			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-8											
	BO-9	AHU-3				AHU	1	1	BO-9			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-9											
	BO-10	AHU-3				AHU	1	1	BO-10			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BO-10											
	AO-1	AHU-3	DPR-C	Damper Control	% Open	AHU	1	1	AO-1		AO#,ACCOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-3	H-VLV	Heating Coil Valve	% Open	AHU	1	1	AO-2		AO#,ACCOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-3	C-VLV	Clg Coil Valve	% Open	AHU	1	1	AO-3		AO#,ACCOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-3	SF-VSD	Sup Fan Var Spd Drive	%	AHU	1	1	AO-4		AO#,ACCOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AO-4						2/18	Device dependent	0-20mA OUT		A21	
	AO-5	AHU-3	RF-VSD	Ret Fan Var Spd Drive	%	AHU	1	1	AO-5		AO#,ACCOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AO-5						2/18	Device dependent	0-20mA OUT		A21	
	AO-6	AHU-3				AHU	1	1	AO-6			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AO-6											
	BI-1	AHU-3	SF-S	Supply Fan Status	Off On	AHU	1	1	BI-1		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-3	RF-S	Return Fan Status	Off On	AHU	1	1	BI-2		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-2						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-3	AHU-3	SMK-DET	Smoke Detectors	Normal Alarm	AHU	1	1	BI-3		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-3						2/22	Device dependent	Contact (NO)		A40	
	BI-4	AHU-3	LT-S	Low Temperature Stat	Normal Alarm	AHU	1	1	BI-4		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-4						2/22	NO,M1	A70 (NC)		A41	
	BI-5	AHU-3	CCP-S	Clg Coil Pump 3 Status	Off On	AHU	1	1	BI-5		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-5						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-6	AHU-3	SA-HSP	Supply Air Static Press	Normal Alarm	AHU	1	1	BI-6		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-6						2/22	Device dependent	AFS-460 & Relay		A40	
	BI-7	AHU-3	RA-HSP	Return Air Static Press	Normal Alarm	AHU	1	1	BI-7		BI#,BICOM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-7						2/22	Device dependent	AFS-460 & Relay		A40	
	BI-8	AHU-3				AHU	1	1	BI-8			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-BI-8											
	AI-1	AHU-3	RA-VP	Return Air Vel Pressure	In. Wg	AHU	1	1	AI-1		AI#,+VDC	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-1						2/18	-,+	DPT-2641		A2	
	AI-2	AHU-3	RA-T	Return Air Temperature	Deg F	AHU	1	1	AI-2		AI#,AICM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-2						2/18	2-Wire	TE-6316P-1		A4	
	AI-3	AHU-3	DA-T	Disch Air Temperature	Deg F	AHU	1	1	AI-3		AI#,AICM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-3						2/18	2-Wire	TE-6316P-1		A4	
	AI-4	AHU-3	MA-T	Mixed Air Temperature	Deg F	AHU	1	1	AI-4		AI#,AICM	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-4						2/18	2-Wire	TE-6316P-1		A4	
	AI-5	AHU-3				AHU	1	1	AI-5			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-5											
	AI-6	AHU-3				AHU	1	1	AI-6			EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-6											
	AI-7	AHU-3	S-SP	Supply Static Pressure	In. Wg	AHU	1	1	AI-7		AI#,+VDC	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-7						2/18	-,+	DPT-2641		A2	
	AI-8	AHU-3	S-VP	Supply Vel Pressure	In. Wg	AHU	1	1	AI-8		AI#,+VDC	EN-AHU-3	Press Lev MER C	0	M.3-11	AH-1-AI-8						2/18	-,+	DPT-2641		A2	

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HEATING				VAV						EN-DPS-3	Press _ev MER C														Power to Controller
		HEATING	*			VAV	1	2				EN-DPS-3	Press _ev MER C	0													N2 Trunk
	AI-1	HEATING	HWS3-T	HW Sup Temp At AHU-3	Deg F	VAV	1	2	AI-1		AI#,AICM	EN-DPS-3	Press _ev MER C	0		DPS--2-AI-1						2/18	2-Wire	TE-631AP-1		U1	
	AI-2	HEATING	HW3-DP	HW Diff Press At AHU-3	PSI	VAV	1	2	AI-2		AI#,AICM,+15VDC	EN-DPS-3	Press _ev MER C	0		DPS--2-AI-2						3/18	Device dependent	Rob/Hal 252C		U5	4-20ma with 500 OHM Resistor
	AI-3	COOLING	CHS3-T	CW Sup Temp At AHU-3	Deg F	VAV	1	2	AI-3		AI#,AICM	EN-DPS-3	Press _ev MER C	0		DPS--2-AI-3						2/18	2-Wire	TE-631AP-1		U1	
	AI-4	COOLING	CHW3-DP	CW Diff Press At AHU-3	PSI	VAV	1	2	AI-4		AI#,AICM,+15VDC	EN-DPS-3	Press _ev MER C	0		DPS--2-AI-4						3/18	Device dependent	Rob/Hal 252C		U5	4-20ma with 500 OHM Resistor
	AI-5	HEATING				VAV	1	2	AI-5			EN-DPS-3	Press _ev MER C	0		DPS--2-AI-5											
	AI-6	HEATING				VAV	1	2	AI-6			EN-DPS-3	Press _ev MER C	0		DPS--2-AI-6											
	BI-1	HEATING				VAV	1	2	BI-1			EN-DPS-3	Press _ev MER C	0		DPS--2-BI-1											
	BI-2	HEATING				VAV	1	2	BI-2			EN-DPS-3	Press _ev MER C	0		DPS--2-BI-2											
	BI-3	HEATING				VAV	1	2	BI-3			EN-DPS-3	Press _ev MER C	0		DPS--2-BI-3											
	BI-4	HEATING				VAV	1	2	BI-4			EN-DPS-3	Press _ev MER C	0		DPS--2-BI-4											
	BO-1	HEATING				VAV	1	2	BO-1			EN-DPS-3	Press _ev MER C	0		DPS--2-BO-1											
	BO-2	HEATING				VAV	1	2	BO-2			EN-DPS-3	Press _ev MER C	0		DPS--2-BO-2											
	BO-3	HEATING				VAV	1	2	BO-3			EN-DPS-3	Press _ev MER C	0		DPS--2-BO-3											
	BO-4	HEATING				VAV	1	2	BO-4			EN-DPS-3	Press _ev MER C	0		DPS--2-BO-4											
	BO-5	HEATING				VAV	1	2	BO-5			EN-DPS-3	Press _ev MER C	0		DPS--2-BO-5											
	BO-6	HEATING				VAV	1	2	BO-6			EN-DPS-3	Press _ev MER C	0		DPS--2-BO-6											
	AO-1	HEATING				VAV	1	2	AO-1			EN-DPS-3	Press _ev MER C	0		DPS--2-AO-1											
	AO-2	HEATING				VAV	1	2	AO-2			EN-DPS-3	Press _ev MER C	0		DPS--2-AO-2											

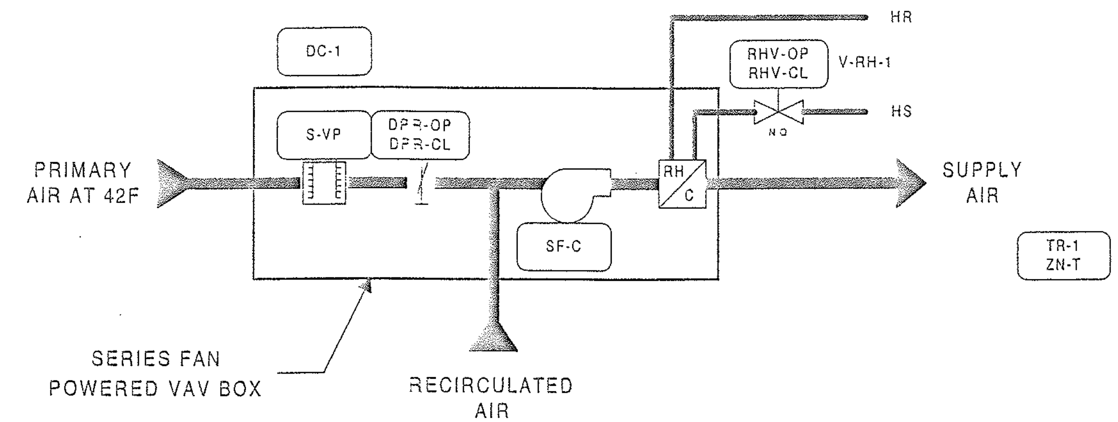


BILL OF MATERIALS

Estimate: quad c vavbox 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	60	AS-VAV110-1	VAV 6AI,4BI,8BO,8K
V-RH-1	60	--	SEE VALVE SCHEDULE
VAV	60	ATP-2040-212	ACT 2MIN+1.5"DP,1/2"CPLG
ZN-T	38	TE-6410W-1000	MSTAT,NI,BOX,JACK

SERIES FAN POWERED VARIABLE AIR VOLUME (VAV) WITH REHEAT COIL



NOTE: VAV CONTROLLER (AS-VAV111-1) DAMPER ACTUATOR & DIFFERENTIAL PRESSURE TRANSMITTER (ATP-2040-212) ARE FACTORY MOUNTED BY TITUS

DESCRIPTION OF OPERATION

PRIMARY AIR VALVE WILL OPEN TO THEIR MINIMUM POSITION AND TERMINAL UNIT FAN WILL START AND RUN CONTINUOUSLY WHENEVER AIR HANDLING UNIT IS RUNNING. TERMINAL UNIT FANS WILL START THIRTY (30) SECONDS BEFORE OPENING OF AIR VALVES TO PREVENT BACK SPINNING OF FAN. FANS WILL ALSO BE OPERATED AS DEFINED IN THE UNOCCUPIED MODES. PRIMARY AIR VALVES WILL BE CLOSED DURING UNOCCUPIED HEATING MODE. ROOM SENSOR **TR-1** WILL ON A RISE IN TEMPERATURE GRADUALLY MODULATE REHEAT COIL VALVE **V-RH-1** CLOSED AND ON A CONTINUED RISE WILL GRADUALLY MODULATE PRIMARY AIR VALVE FROM IT'S MINIMUM TO MAXIMUM SETTING TO MAINTAIN IT'S SETTING OF SEVENTY-FIVE (75F). ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. DURING OPERATION OF THE WARM-UP MODE ALL PRIMARY AIR VALVES OPEN TO THEIR MAXIMUM POSITION AND TERMINAL FANS START TO PERMIT FULL AIR FLOW TO THE SPACES. REHEAT COIL VALVE **V-RH-1** IS MODULATED IN RESPONSE TO ROOM SENSOR TO MAINTAIN SPACE TEMPERATURE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 02:50 PM
FILE NAME VAVBOX-C.vsd

DRAWING TITLE
FAN POWERED TERMINAL REHEAT UNITS
QUAD C

PROJECT TITLE
BALTIMORE NFL STADIUM AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 08/28/97	BY DATE

JOHNSON CONTROLS
Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

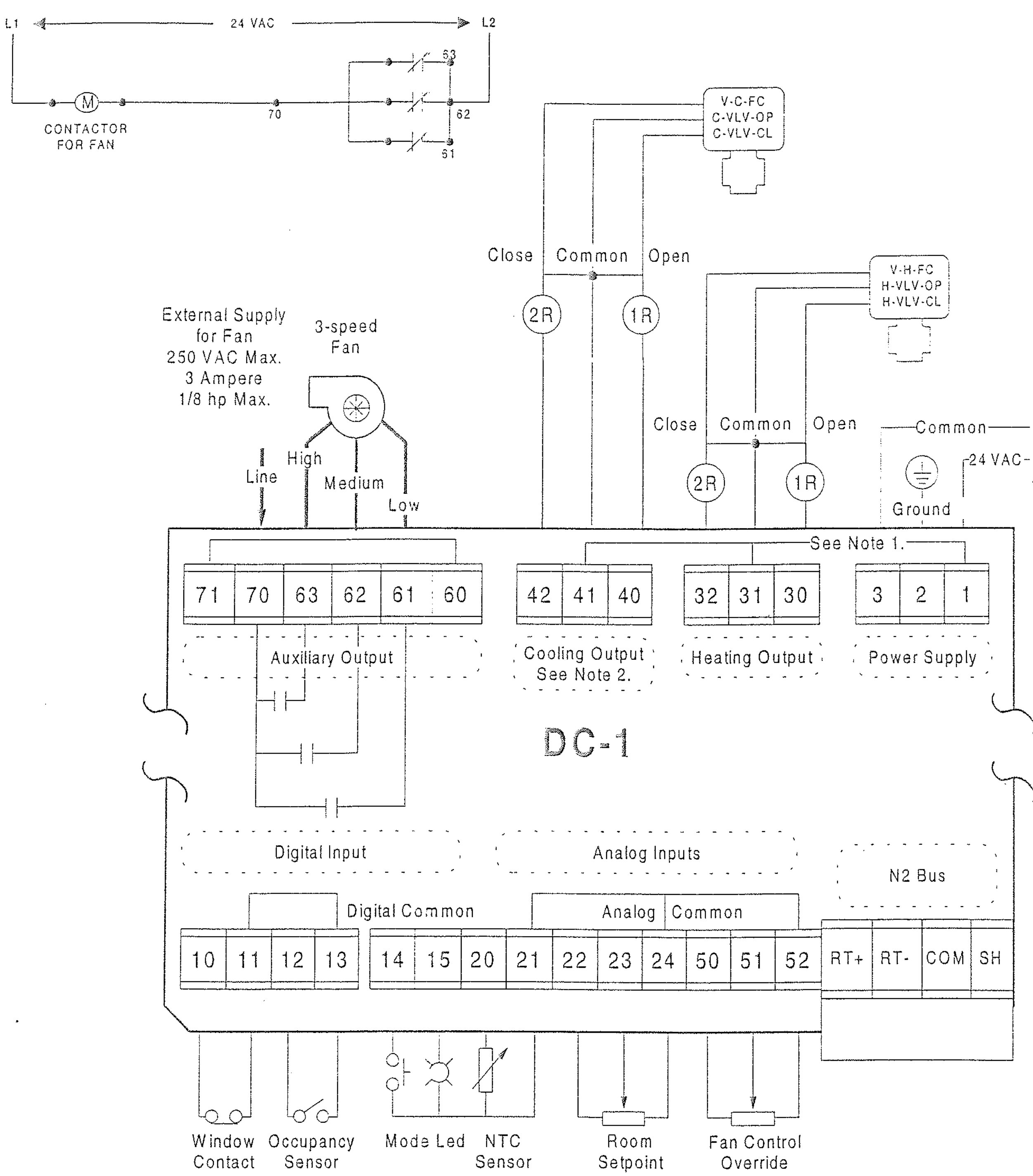
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-08

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		FP-VAV-C				VAV						EN-FPVAV	At VAVBOX														Power to Controller
		FP-VAV-C	*			VAV	1	X				EN-FPVAV	At VAVBOX	0													N2 Trunk
	AI-1	FP-VAV-C	ZN-T	Zone Temperature	Deg F	VAV	1	X	AI-1		PHONE JACK	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-1						8/26	PHONE JACK	Metastat-Ph Jack		U2	
	AI-2	FP-VAV-C				VAV	1	X	AI-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-2											
	AI-3	FP-VAV-C				VAV	1	X	AI-3			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-3											
	AI-4	FP-VAV-C	S-VP	Supply Vel Pressure	in. Wg	VAV	1	X	AI-4		AI#,AICM,+15VDC	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-4						3/18	OUT,COM,+VDC	DPT-2000		U9	
	AI-5	FP-VAV-C				VAV	1	X	AI-5			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-5											
	AI-6	FP-VAV-C				VAV	1	X	AI-6			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-6											
	BI-1	FP-VAV-C				VAV	1	X	BI-1			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-1											
	BI-2	FP-VAV-C				VAV	1	X	BI-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-2											
	BI-3	FP-VAV-C				VAV	1	X	BI-3			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-3											
	BI-4	FP-VAV-C				VAV	1	X	BI-4			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-4											
	BO-1	FP-VAV-C	DPR-OP	Damper Open	Off On	VAV	1	X	BO-1		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-1						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-2	FP-VAV-C	DPR-CL	Damper Close	Off On	VAV	1	X	BO-2		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-2						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-3	FP-VAV-C	SF-C	Supply Fan Control	Off On	VAV	1	X	BO-3		BO#,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-3	2/18	COIL	RELAY	NO,CCM		2/14	See starter detail	Starter (NO)		U51	
	BO-4	FP-VAV-C				VAV	1	X	BO-4			EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-4											
	BO-5	FP-VAV-C	RHV-OP	Reheat Valve Open	Off On	VAV	1	X	BO-5		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-5						3/18	BLK,RED,WHT	VA-7150		U58	
	BO-6	FP-VAV-C	RHV-CL	Reheat Valve Close	Off On	VAV	1	X	BO-6		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-6						3/18	BLK,RED,WHT	VA-7150		U58	
	AO-1	FP-VAV-C				VAV	1	X	AO-1			EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-1											
	AO-2	FP-VAV-C				VAV	1	X	AO-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-2											

BILL OF MATERIALS

Estimate: quad c fcu 70520098.pre

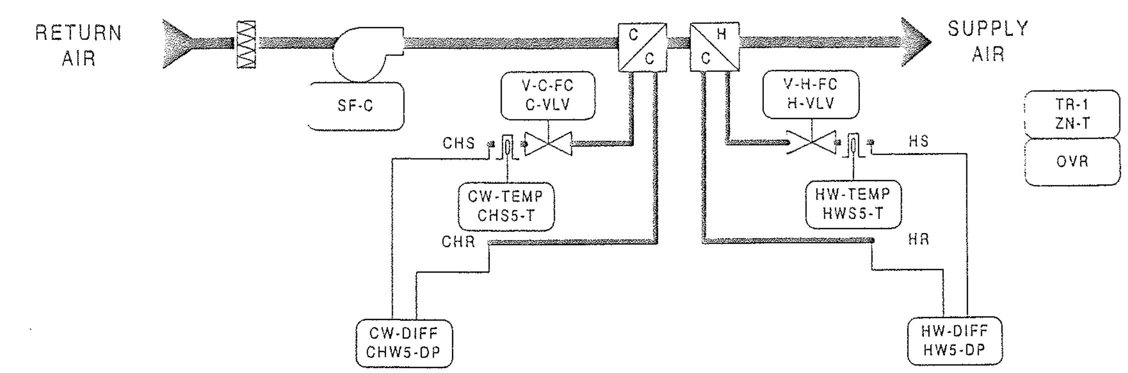
Desig.	Qty	Part #	Description
Field Devices:			
DC-1	27	TC-9102-0332	FAN CONT3-SPEED 2-STG H/C
HW5-DP, CHW5-DP	2	C-252	DELTA TRANS ROB/HALP
HWS5-T, CHS5-T	2	TE-631AP-1	SENS,T-Ni,0.1%,F/WZ1000-5
	2	WZ-1000-5	WELL,BRASS,1/2"NPT+COMPND
V-H-FC, V-C-FC	54	--	SEE VALVE SCHEDULE
ZN-T	27	TM-9161-5002	MSTAT F/TC-9100 55-85F FSC



Note 1: For PAT, DAT, and On-Off outputs, terminals 1, 31, and 41 are internally connected.

TRANSFORMER SUPPLIED BY UNIT MANUFACTURER

NOTE: FCU CONTROLLER (TC-9102-0322) ARE FACTORY MOUNTED BY TRANE



NOTE: HW & CW TEMPS & DIFF PRESSURE (4) POINTS ARE IN ENCLOSURE EN-DPS AS-VAV111-1 (NCM-3/N2 ADD = 3) LOCATE ON UPPER SUITE LEVEL

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODE GENERALLY OCCURS DURING THE NORMAL WORK WEEK AND STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON INDIVIDUAL UNITS WILL FREQUENTLY BE REQUIRED. SUITE OWNERS WILL HAVE THE ABILITY TO UTILIZE SUITES FOR PRIVATE FUNCTIONS AT ANYTIME. WHEN FAN COIL UNITS ARE DE-ENERGIZED, COOLING COIL VALVE V-C-FC AND HEATING COIL VALVE V-H-FC WILL BE CLOSED TO COILS.

OCCUPIED MODE - FAN COIL UNIT SUPPLY FAN WILL BE STARTED THROUGH ITS FAN SPEED SWITCH AND RUN CONTINUOUSLY. STARTING OF THE FAN COIL UNIT WILL INITIATE THE START OF THE RELATED EXHAUST FAN. THE EXHAUST AIR VOLUME INDUCES THE NATURAL VENTILATION OF THE SUITE AND MUST THEREFORE BE ENERGIZED WHENEVER THE SUITE IS OCCUPIED. ROOM SENSOR TR-1 WILL MODULATE HEATING COIL VALVE V-H-FC AND COOLING COIL VALVE V-C-FC IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F).

UNOCCUPIED MODE - ROOM SENSOR TR-1 WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F) ACTIVATE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), FAN COIL UNIT WILL BE DE-ENERGIZED AND HEATING COIL VALVE WILL CLOSE.

REVISION INFORMATION			
NUMBER		DRAWING TITLE	SUITE FAN COIL UNITS
DATE	07/18/00		QUAD C
TIME	03:04 PM	PROJECT TITLE	BALTIMORE NFL STADIUM AT CAMDEN YARDS
FILE NAME	FANCOILC.vsd		BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN BY	DRAWN DATE	APPROVED BY	APPROVED DATE
JDP	WJT	RTS	RTS	08/28/97		

JOHNSON CONTROLS

Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

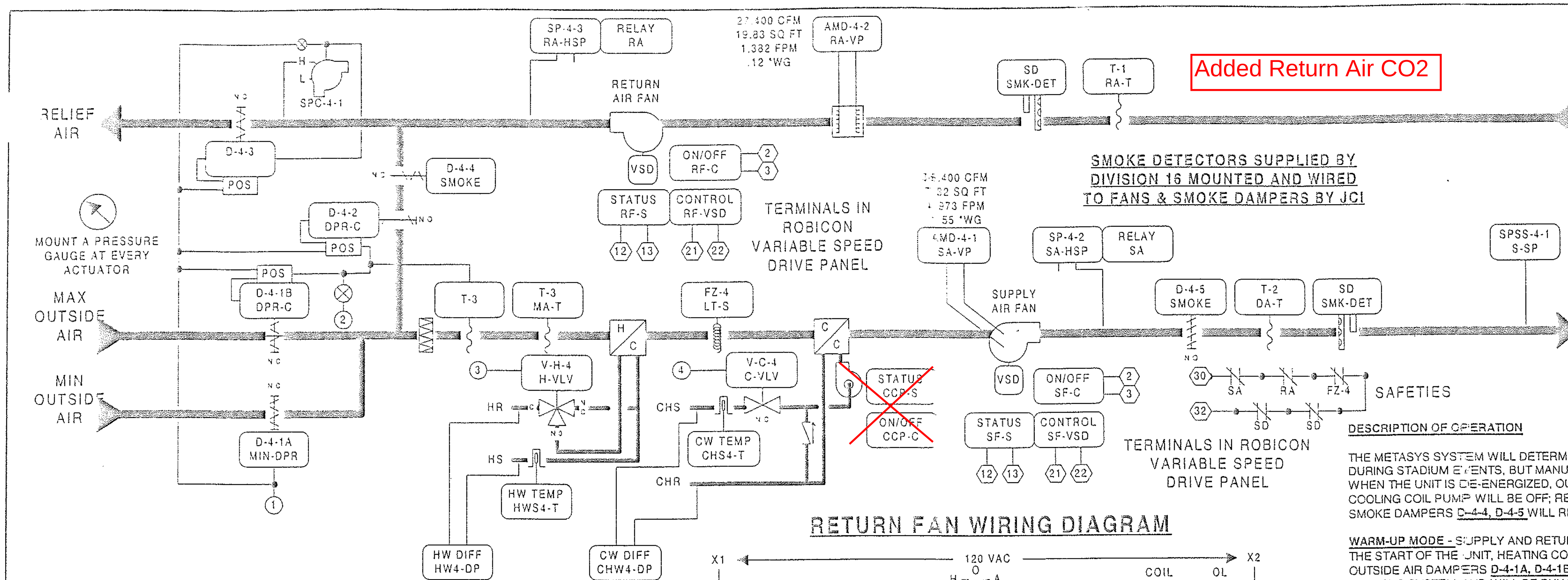
CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-09

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		FCU-C					TC						EN-FCU	At FCU														Power to Controller
		FCU-C	*				TC	1	Y				EN-FCU	At FCU	0													N2 Trunk
	BO-1	FCU-C	H-VLV-OP	Htg Valve Open	Off	On	TC	1	Y	BO-1		32,31/COM,30	EN-FCU	At FCU	0		FCU-x-BO-1						3/18	BLK,WHT,RED	VA-7150 (Heating)			
	BO-2	FCU-C	H-VLV-CL	Htg Valve Close	Off	On	TC	1	Y	BO-2		32,31/COM,30	EN-FCU	At FCU	0		FCU-x-BO-2						3/18	BLK,WHT,RED	VA-7150 (Heating)			
	BO-3	FCU-C	C-VLV-OP	Clg Valve Open	Off	On	TC	1	Y	BO-3		42,41/COM,40	EN-FCU	At FCU	0		FCU-x-BO-3						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
	BO-4	FCU-C	C-VLV-CL	Clg Valve Close	Off	On	TC	1	Y	BO-4		42,41/COM,40	EN-FCU	At FCU	0		FCU-x-BO-4						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
	BO-5	FCU-C	F-SPD-1	Fan (Speed 1)	Off	On	TC	1	Y	BO-5		71,70 LINE/63,62,6	EN-FCU	At FCU	0		FCU-x-BO-5						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
	BO-6	FCU-C	F-SPD-2	Fan (Speed 2)	Off	On	TC	1	Y	BO-6		71,70 LINE/63,62,6	EN-FCU	At FCU	0		FCU-x-BO-6						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
	BO-7	FCU-C	F-SPD-3	Fan (Speed 3)	Off	On	TC	1	Y	BO-7		71,70 LINE/63,62,6	EN-FCU	At FCU	0		FCU-x-BO-7						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
	BI-1	FCU-C					TC	1	Y	BI-1			EN-FCU	At FCU	0		FCU-x-BI-1											
	BI-2	FCU-C					TC	1	Y	BI-2			EN-FCU	At FCU	0		FCU-x-BI-2											
	BI-3	FCU-C					TC	1	Y	BI-3			EN-FCU	At FCU	0		FCU-x-BI-3											
	AI-1	FCU-C	ZN-T	Zone Temperature	Deg F		TC	1	Y	AI-1		14 MODE,15 LED,2	EN-FCU	At FCU	0		FCU-x-AI-1						3/22	14 MODE,15 LED	TM-9100 (Mode & LED)			
	AI-2	FCU-C	ZN-SET	Zone Temp Set Point	Deg F		TC	1	Y	AI-2		22,23,21/24	EN-FCU	At FCU	0		FCU-x-AI-2						3/22	22,23,21/24	TM-9100 (Setpoint)			
	AI-4	FCU-C	OVR	Fan Override	Lo-Med-Hi		TC	1	Y	AI-4		51,21/24	EN-FCU	At FCU	0		FCU-x-AI-4						2/22	51,21/24	TM-9100 (Fan Override)			

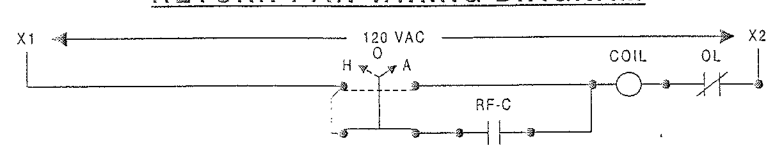
Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HEATING				VAV						EN-DPS	Upper Suite Level														Power to Controller
		HEATING				VAV	1	3				EN-DPS	Upper Suite Level	0													N2 Trunk
	AI-1	HEATING	HWS5-T	HW Sup Temp At FCU	Deg F	VAV	1	3	AI-1		AI#,AICM	EN-DPS	Upper Suite Level	0		DPS-3-AI-1						2/18	2-Wire	TE-631AP-1		U1	
	AI-2	HEATING	HW5-DP	HW Diff Press At FCU	PSI	VAV	1	3	AI-2		AI#,AICM,+15VDC	EN-DPS	Upper Suite Level	0		DPS-3-AI-2						3/18	Device dependent	Rob/Hal 252C		U5	4-20ma with 500 OHM Resistor
	AI-3	COOLING	CHS5-T	CW Sup Temp At FCU	Deg F	VAV	1	3	AI-3		AI#,AICM	EN-DPS	Upper Suite Level	0		DPS-3-AI-3						2/18	2-Wire	TE-631AP-1		U1	
	AI-4	COOLING	CHW5-DP	CW Diff Press At FCU	PSI	VAV	1	3	AI-4		AI#,AICM,+15VDC	EN-DPS	Upper Suite Level	0		DPS-3-AI-4						3/18	Device dependent	Rob/Hal 252C		U5	4-20ma with 500 OHM Resistor
	AI-5	HEATING				VAV	1	3	AI-5			EN-DPS	Upper Suite Level	0		DPS-3-AI-5											
	AI-6	HEATING				VAV	1	3	AI-6			EN-DPS	Upper Suite Level	0		DPS-3-AI-6											
	BI-1	HEATING				VAV	1	3	BI-1			EN-DPS	Upper Suite Level	0		DPS-3-BI-1											
	BI-2	HEATING				VAV	1	3	BI-2			EN-DPS	Upper Suite Level	0		DPS-3-BI-2											
	BI-3	HEATING				VAV	1	3	BI-3			EN-DPS	Upper Suite Level	0		DPS-3-BI-3											
	BI-4	HEATING				VAV	1	3	BI-4			EN-DPS	Upper Suite Level	0		DPS-3-BI-4											
	BO-1	HEATING				VAV	1	3	BO-1			EN-DPS	Upper Suite Level	0		DPS-3-BO-1											
	BO-2	HEATING				VAV	1	3	BO-2			EN-DPS	Upper Suite Level	0		DPS-3-BO-2											
	BO-3	HEATING				VAV	1	3	BO-3			EN-DPS	Upper Suite Level	0		DPS-3-BO-3											
	BO-4	HEATING				VAV	1	3	BO-4			EN-DPS	Upper Suite Level	0		DPS-3-BO-4											
	BO-5	HEATING				VAV	1	3	BO-5			EN-DPS	Upper Suite Level	0		DPS-3-BO-5											
	BO-6	HEATING				VAV	1	3	BO-6			EN-DPS	Upper Suite Level	0		DPS-3-BO-6											
	AO-1	HEATING				VAV	1	3	AO-1			EN-DPS	Upper Suite Level	0		DPS-3-AO-1											
	AO-2	HEATING				VAV	1	3	AO-2			EN-DPS	Upper Suite Level	0		DPS-3-AO-2											

Added Return Air CO2

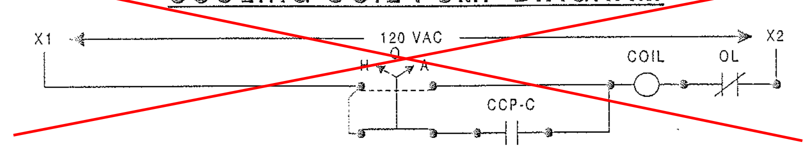


NOTE: HW & CW TEMPS & DIFF PRESSURE (4) POINTS ARE IN ENCLOSURE EN-DPS-4 AS-VAV111-1 (NCM-4/N2 ADD = 2)

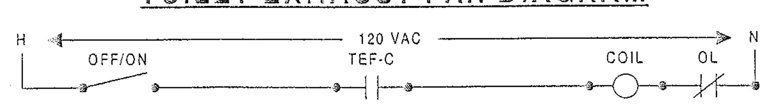
RETURN FAN WIRING DIAGRAM



~~COOLING COIL PUMP DIAGRAM~~



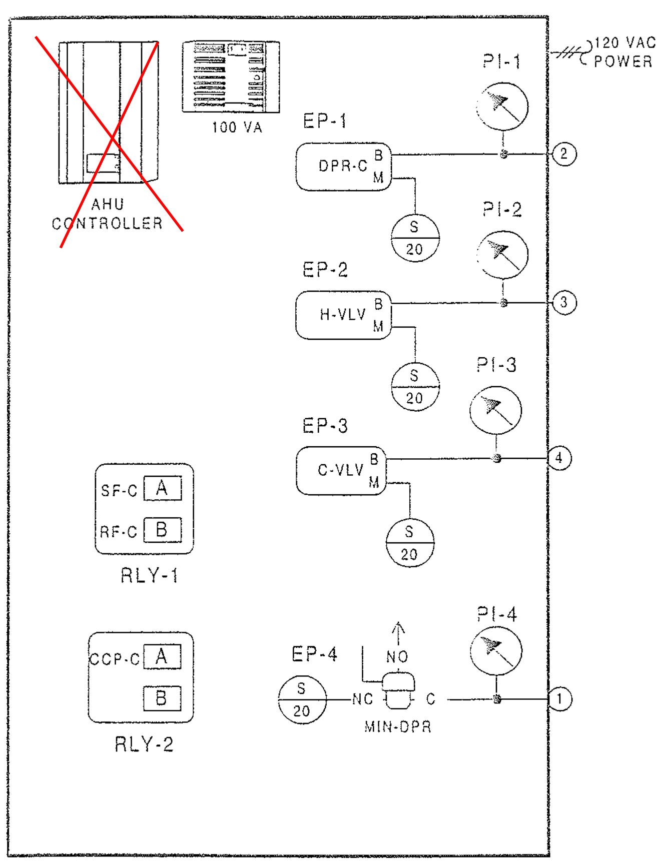
TOILET EXHAUST FAN DIAGRAM



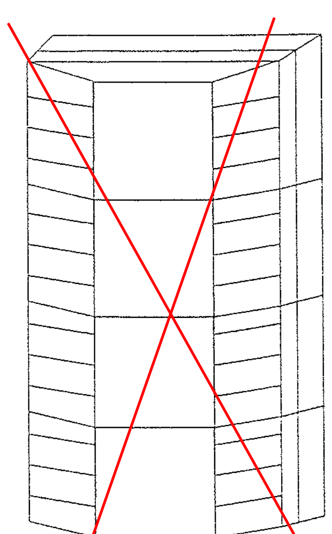
FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-D6	ROOF	STARTER		UP CONCOURSE
TEF-D7	ROOF	RPUCD	21	UP CONCOURSE
TEF-D8	ROOF	RPUCD	11	UP CONCOURSE
TEF-D9	ROOF	RPUCD	17	UP CONCOURSE
TEF-D11	ROOF	RPUCD	7	UP CONCOURSE
TEF-D15	CLUB LEVEL	RP2CLD	11	CLUB LEVEL
TEF-D17	UPPER SUITE	RPUSC	33	UPPER SUITE

CONTROLLED FROM MAU PANEL LOCATED ON UPPER CONCOURSE

USE (5) PD-109-51 & (5) PD-101-35 AT (5) PANEL/STARTER LOCATIONS



SEE BL-6559-01A FOR ADDITIONAL WIRING DETAIL



ENCLOSURE EN-AHU-4
AS-AHU103-300
LOCATED ADJACENT TO UNIT
NCM-4/N2 ADD = 1

BILL OF MATERIALS

Estimate ahu-4 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-4-1A,D-4-1B1		---	SEE DAMPER SCHEDULE
D-4-2,D-4-3			
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
DPR-C,MIN-DPR	2	D-3153-2	DMPR ACT,8-13#
	5	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-4	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
HW4-DP,CW4-DP	2	C-262	DELTA TRANS RCB/HALP
HWS4-T,CHS4-T	2	TE-631AP-1	SENS,T-Ni,0.1%,F/WZ1000-5
	2	WZ-1000-5	WELL,BRASS,1/2"NPT+COMPND
MA-T,DA-T, RA-T	3	TE-6316P-1	SENS,T-Ni,0.1%,17' AVG
RA-VP	1	DPT-2641-2	XDUCR DP 0/0.25" 4-20ma
S-SP	1	DPT-2641-7	XDUCR DP 0/10.0" 4-20ma
SA-HSP,RA-HSP	2	AFS-460	DUCT AIR FLOW HIGH STATIC
SA-VP	1	DPT-2641-5	XDUCR DP 0/2.5" 4-20ma
SPC-4-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-3	1	T-3610-1001	STAT,LOW VOL ,8' AVG, DCT
TEF	5	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	5	PD-101-35	RLY BASE,3PDT,11PIN,10A
	5	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
Panel Devices:			
EN-AHU-4	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
EP-4	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3,4	4	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY: 2SPDT 5 AMP 240VAC
SA,RA	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-4-1A, D-4-1B, D-4-3 AND COOLING COIL VALVE V-C-4 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-4-2 WILL BE OPEN AND HEATING COIL VALVE V-H-4 WILL BE CLOSED TO THE COIL. SMOKE DAMPERS D-4-4, D-4-5 WILL REMAIN OPEN UNDER CONTROL OF SMOKE DETECTION SYSTEM.

WARM-UP MODE - SUPPLY AND RETURN FANS WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-4 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-4-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-4-1A, D-4-1B AND RELIEF AIR DAMPER D-4-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY AND RETURN FANS WILL BE RUNNING, RETURN AIR DAMPER D-4-2 IS OPEN. MINIMUM OUTSIDE AIR DAMPER D-4-1A WILL OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FORTY-FIVE (45F) MODULATE V-H-4 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, T-2 WILL GRADUALLY MODULATE DAMPERS D-4-1B OPEN WHILE SIMULTANEOUSLY CLOSING D-4-2. STATIC PRESSURE CONTROLLER SPC-4-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-4-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-3, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE T-2 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-4 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND RETURN FANS AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-4-1A WILL OPEN. OUTSIDE DAMPER D-4-1B AND RETURN DAMPER D-4-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), MAXIMUM OUTSIDE AIR DAMPERS D-4-1B WILL CLOSE, OPENING RETURN AIR DAMPER D-4-2. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-4-1B AND D-4-2 AND CHILLED WATER VALVE V-C-1 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-4 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND RETURN FANS AND CLOSE ALL SYSTEM DAMPERS.

FAN CONTROL - SYSTEM STATIC PRESSURE SENSING STATION SPSS-4-1 THROUGH A STATIC PRESSURE TRANSMITTER AND THE METASYS CONTROLLER WILL MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVE TO MAINTAIN ITS SETTING. ON A RISE IN STATIC AS SENSED BY SPSS-4-1 THE SUPPLY FAN DRIVE WILL GRADUALLY MODULATE FAN SPEED TO ITS MINIMUM POSITION TO MAINTAIN ITS SETTING. HIGH LIMIT STATIC PRESSURE CONTROLLER SPC-4-2 WHICH WILL OVERRIDE SPSS-4-1 TO PREVENT THE DISCHARGE FROM RISING ABOVE IT'S SET POINT. SUPPLY DUCT AIR MONITORING STATION AMD-4-1 AND RETURN DUCT AIR MONITORING STATION AMD-4-2 THROUGH VELOCITY PRESSURE TRANSMITTERS WILL SEND SIGNALS TO THE METASYS CONTROLLER WHICH WILL COMPARE TOTAL SUPPLY AND RETURN AIR QUANTITIES AND MODULATE THE RETURN FAN VARIABLE FREQUENCY DRIVE BASED ON SETPOINT TO SYNCHRONIZE RETURN FAN VOLUME WITH THE SUPPLY FAN VOLUME SO AS TO MAINTAIN CONSTANT MINIMUM BALANCED OUTSIDE AIR FLOW. DIFFERENTIAL WILL BE REDUCED TO ZERO (0) (NO OUTSIDE AIR) DURING WARM-UP AND UNOCCUPIED MODES OF OPERATION. MANUALLY RESET HIGH LIMIT STATIC PRESSURE CONTROLLERS SPC-4-2 AND SPC-4-3 WILL STOP THEIR RESPECTIVE SUPPLY AND RETURN FANS WHENEVER THEIR SETTING IS REACHED. ALL FANS WILL BE REQUIRED TO BE MANUALLY RESTARTED IF DE-ENERGIZED BY STATIC PRESSURE CONTROLS. SUPPLY FANS WILL BE MANUALLY CONTROLLED USING A BY-PASS STARTER IF THEIR RESPECTIVE VARIABLE FREQUENCY FAN DRIVE FAILS.

TOILET EXHAUST FANS TEF-D6,D7,D8,D9,D11,D15,D17 - THE FAN WILL START WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE 'OCCUPIED' MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:07 PM
FILE NAME AHU-4.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-4
CLUB/SUITES QUAD D

PRESS LEVEL QUAD D

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REV'S ON-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 08/25/97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-10

Full Spreadsheet — Software / Digital Controller Information

Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination
		AHU-4					AHU					
		AHU-4	*				AHU	1	1			
	BO-1	AHU-4	MIN-DPR	Min OA Damper Control	Closed	Open	AHU	1	1	BO-1		BO#,24V
	BO-2	AHU-4	SF-C	Supply Fan Control	Off	On	AHU	1	1	BO-2	RLY	BO#,24V,BICOM
	BO-3	AHU-4	RF-C	Return Fan Control	Off	On	AHU	1	1	BO-3	RLY	BO#,24V,BICOM
	BO-4	AHU-4	CCP-C	Clg Coil Pump Control	Off	On	AHU	1	1	BO-4	RLY	BO#,24V,BICOM
	BO-5	AHU-4	TEF-C	Toilet Exh Fan Control	Off	On	AHU	1	1	BO-5		BO#,24V
	BO-6	AHU-4					AHU	1	1	BO-6		
	BO-7	AHU-4					AHU	1	1	BO-7		
	BO-8	AHU-4					AHU	1	1	BO-8		
	BO-9	AHU-4					AHU	1	1	BO-9		
	BO-10	AHU-4					AHU	1	1	BO-10		
	AO-1	AHU-4	DPR-C	Damper Control	% Open		AHU	1	1	AO-1		AO#,AOCOM
	AO-2	AHU-4	H-VLV	Heating Coil Valve	% Open		AHU	1	1	AO-2		AO#,AOCOM
	AO-3	AHU-4	C-VLV	Clg Coil Valve	% Open		AHU	1	1	AO-3		AO#,AOCOM
	AO-4	AHU-4	SF-VSD	Sup Fan Var Spd Drive	%		AHU	1	1	AO-4		AO#,AOCOM
	AO-5	AHU-4	RF-VSD	Ret Fan Var Spd Drive	%		AHU	1	1	AO-5		AO#,AOCOM
	AO-6	AHU-4					AHU	1	1	AO-6		
	BI-1	AHU-4	SF-S	Supply Fan Status	Off	On	AHU	1	1	BI-1		BI#,BICOM
	BI-2	AHU-4	RF-S	Return Fan Status	Off	On	AHU	1	1	BI-2		BI#,BICOM
	BI-3	AHU-4	SMK-DET	Smoke Detectors	Normal	Alarm	AHU	1	1	BI-3		BI#,BICOM
	BI-4	AHU-4	LT-S	Low Temperature Stat	Normal	Alarm	AHU	1	1	BI-4		BI#,BICOM
	BI-5	AHU-4	CCP-S	Clg Coil Pump Status	Off	On	AHU	1	1	BI-5		BI#,BICOM
	BI-6	AHU-4	SA-HSP	Supply Air Static Press	Normal	Alarm	AHU	1	1	BI-6		BI#,BICOM
	BI-7	AHU-4	RA-HSP	Return Air Static Press	Normal	Alarm	AHU	1	1	BI-7		BI#,BICOM
	BI-8	AHU-4					AHU	1	1	BI-8		
	AI-1	AHU-4	RA-VP	Return Air Vel Pressure	In. Wg		AHU	1	1	AI-1		AI#,+VDC
	AI-2	AHU-4	RA-T	Return Air Temperature	Deg F		AHU	1	1	AI-2		AI#,AICM
	AI-3	AHU-4	DA-T	Disch Air Temperature	Deg F		AHU	1	1	AI-3		AI#,AICM
	AI-4	AHU-4	MA-T	Mixed Air Temperature	Deg F		AHU	1	1	AI-4		AI#,AICM
	AI-5	AHU-4					AHU	1	1	AI-5		
	AI-6	AHU-4					AHU	1	1	AI-6		
	AI-7	AHU-4	S-SP	Supply Static Pressure	In. Wg		AHU	1	1	AI-7		AI#,+VDC
	AI-8	AHU-4	S-VP	Supply Vel Pressure	In. Wg		AHU	1	1	AI-8		AI#,+VDC

Panel Information / Intermediate Device / Field Device

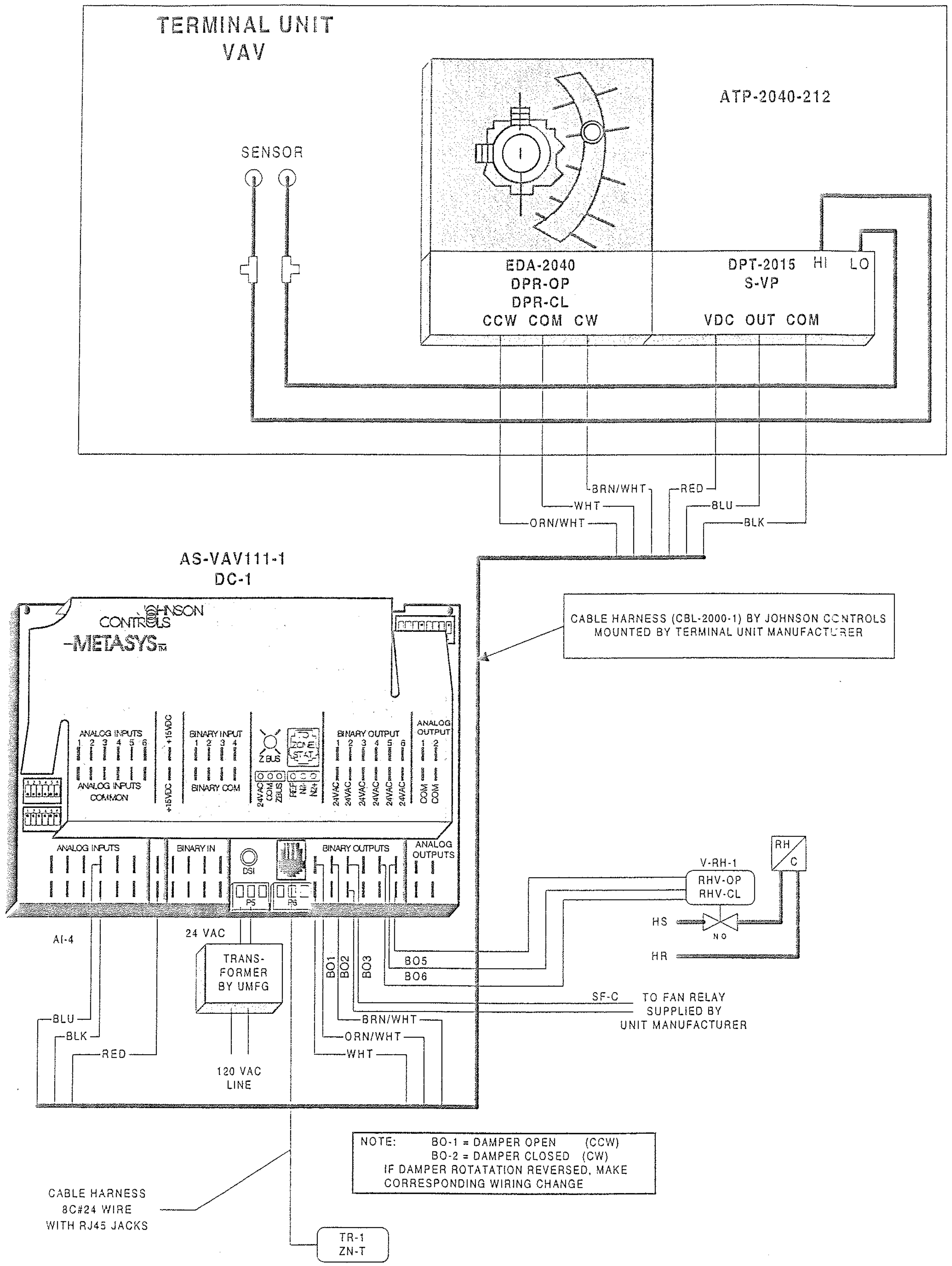
Point Type	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
	EN-AHU-4	Press Lev MER D		M.3-12												Power to Controller
	EN-AHU-4	Press Lev MER D	0	M.3-12												N2 Trunk
BO-1	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-1			V11HGA-100			2/18	2-Wire	SAV-24VAC		A50	
BO-2	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-2	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
BO-3	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-3	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
BO-4	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-4	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
BO-5	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-5			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
BO-6	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-6											
BO-7	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-7											
BO-8	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-8											
BO-9	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-9											
BO-10	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BO-10											
AO-1	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
AO-2	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
AO-3	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
AO-4	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AO-4						2/18	Device dependent	0-20mA OUT		A21	
AO-5	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AO-5						2/18	Device dependent	0-20mA OUT		A21	
AO-6	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AO-6											
BI-1	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
BI-2	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-2						2/22	Device dependent	Aux Contact (NO)		A40	
BI-3	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-3						2/22	Device dependent	Contact (NO)		A40	
BI-4	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-4						2/22	NO,M1	A70 (NC)		A41	
BI-5	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-5						2/22	Device dependent	Aux Contact (NO)		A40	
BI-6	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-6						2/22	Device dependent	AFS-460 & Relay		A40	
BI-7	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-7						2/22	Device dependent	AFS-460 & Relay		A40	
BI-8	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-BI-8											
AI-1	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-1						2/18	-,+	DPT-2641		A2	
AI-2	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-2						2/18	2-Wire	TE-6316P-1		A4	
AI-3	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-3						2/18	2-Wire	TE-6316P-1		A4	
AI-4	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-4						2/18	2-Wire	TE-6316P-1		A4	
AI-5	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-5											
AI-6	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-6											
AI-7	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-7						2/18	-,+	DPT-2641		A2	
AI-8	EN-AHU-4	Press Lev MER D	0	M.3-12	AH-1-AI-8						2/18	-,+	DPT-2641		A2	

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HEATING				VAV						EN-DPS-4	Press Lev MER D														Power to Controller
		HEATING				VAV	1	2				EN-DPS-4	Press Lev MER D	0													N2 Trunk
	AI-1	HEATING	HWS4-T	HW Sup Temp At AHU-4	Deg F	VAV	1	2	AI-1		AI#,AICM	EN-DPS-4	Press Lev MER D	0		DPS--2-AI-1						2/18	2-Wire	TE-631AP-1		U1	
	AI-2	HEATING	HW4-DP	HW Diff Press At AHU-4	PSI	VAV	1	2	AI-2		AI#,AICM,+15VDC	EN-DPS-4	Press Lev MER D	0		DPS--2-AI-2						3/18	Device dependent	Rob/Hal 252C		U5	4-20ma with 500 OHM Resistor
	AI-3	COOLING	CHS4-T	CW Sup Temp At AHU-4	Deg F	VAV	1	2	AI-3		AI#,AICM	EN-DPS-4	Press Lev MER D	0		DPS--2-AI-3						2/18	2-Wire	TE-631AP-1		U1	
	AI-4	COOLING	CHW4-DP	CW Diff Press At AHU-4	PSI	VAV	1	2	AI-4		AI#,AICM,+15VDC	EN-DPS-4	Press Lev MER D	0		DPS--2-AI-4						3/18	Device dependent	Rob/Hal 252C		U5	4-20ma with 500 OHM Resistor
	AI-5	HEATING				VAV	1	2	AI-5			EN-DPS-4	Press Lev MER D	0		DPS--2-AI-5											
	AI-6	HEATING				VAV	1	2	AI-6			EN-DPS-4	Press Lev MER D	0		DPS--2-AI-6											
	BI-1	HEATING				VAV	1	2	BI-1			EN-DPS-4	Press Lev MER D	0		DPS--2-BI-1											
	BI-2	HEATING				VAV	1	2	BI-2			EN-DPS-4	Press Lev MER D	0		DPS--2-BI-2											
	BI-3	HEATING				VAV	1	2	BI-3			EN-DPS-4	Press Lev MER D	0		DPS--2-BI-3											
	BI-4	HEATING				VAV	1	2	BI-4			EN-DPS-4	Press Lev MER D	0		DPS--2-BI-4											
	BO-1	HEATING				VAV	1	2	BO-1			EN-DPS-4	Press Lev MER D	0		DPS--2-BO-1											
	BO-2	HEATING				VAV	1	2	BO-2			EN-DPS-4	Press Lev MER D	0		DPS--2-BO-2											
	BO-3	HEATING				VAV	1	2	BO-3			EN-DPS-4	Press Lev MER D	0		DPS--2-BO-3											
	BO-4	HEATING				VAV	1	2	BO-4			EN-DPS-4	Press Lev MER D	0		DPS--2-BO-4											
	BO-5	HEATING				VAV	1	2	BO-5			EN-DPS-4	Press Lev MER D	0		DPS--2-BO-5											
	BO-6	HEATING				VAV	1	2	BO-6			EN-DPS-4	Press Lev MER D	0		DPS--2-BO-6											
	AO-1	HEATING				VAV	1	2	AO-1			EN-DPS-4	Press Lev MER D	0		DPS--2-AO-1											
	AO-2	HEATING				VAV	1	2	AO-2			EN-DPS-4	Press Lev MER D	0		DPS--2-AO-2											

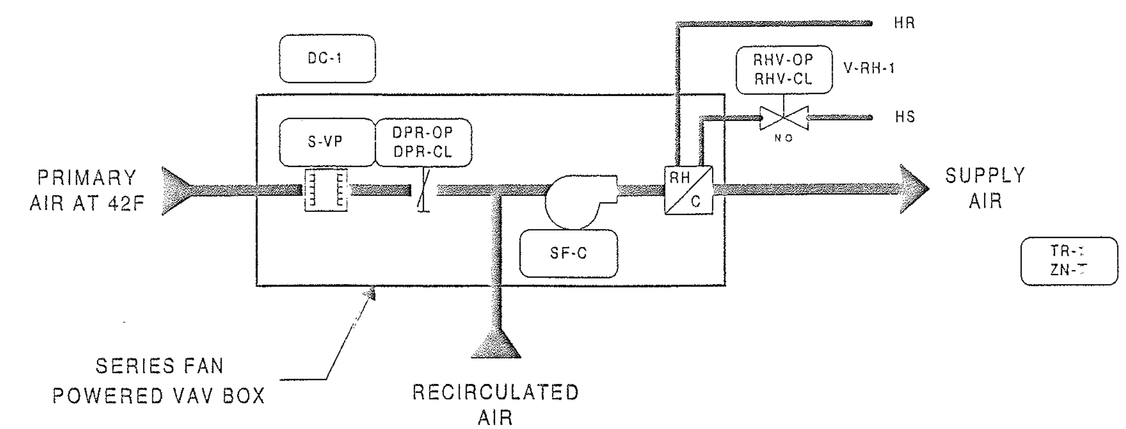
BILL OF MATERIALS

Estimate: quad d vavbox 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	46	AS-VAV110-1	VAV 6AI,4BI,8BO,8K
V-RH-1	46	--	SEE VALVE SCHEDULE
VAV	46	ATP-2040-212	ACT,2MIN+1.5"DP,1/2"CPLG
ZN-T	28	TE-6410W-1000	MSTAT,NI,BOX,JACK



SERIES FAN POWERED VARIABLE AIR VOLUME (VAV) WITH REHEAT COIL



NOTE: VAV CONTROLLER (AS-VAV111-1) DAMPER ACTUATOR & DIFFERENTIAL PRESSURE TRANSMITTER (ATP-2040-212) ARE FACTORY MOUNTED BY TITUS

DESCRIPTION OF OPERATION

PRIMARY AIR VALVE WILL OPEN TO THEIR MINIMUM POSITION AND TERMINAL UNIT FAN WILL START AND RUN CONTINUOUSLY WHENEVER AIR HANDLING UNIT IS RUNNING. TERMINAL UNIT FANS WILL START THIRTY (30) SECONDS BEFORE OPENING OF AIR VALVES TO PREVENT BACK SPINNING OF FAN. FANS WILL ALSO BE OPERATED AS DEFINED IN THE UNOCCUPIED MODES. PRIMARY AIR VALVES WILL BE CLOSED DURING UNOCCUPIED HEATING MODE. ROOM SENSOR TR-1 WILL ON A RISE IN TEMPERATURE GRADUALLY MODULATE REHEAT COIL VALVE V-RH-1 CLOSED AND ON A CONTINUED RISE WILL GRADUALLY MODULATE PRIMARY AIR VALVE FROM IT'S MINIMUM TO MAXIMUM SETTING TO MAINTAIN IT'S SETTING OF SEVENTY-FIVE (75F). ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. DURING OPERATION OF THE WARM-UP MODE ALL PRIMARY AIR VALVES OPEN TO THEIR MAXIMUM POSITION AND TERMINAL FANS START TO PERMIT FULL AIR FLOW TO THE SPACES. REHEAT COIL VALVE V-RH-1 IS MODULATED IN RESPONSE TO ROOM SENSOR TO MAINTAIN SPACE TEMPERATURE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 02:54 PM
FILE NAME VAVBOX-D.vsd

DRAWING TITLE
FAN POWERED TERMINAL REHEAT UNITS
QUAD D

PROJECT TITLE
BALTIMORE NFL STADIUM AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

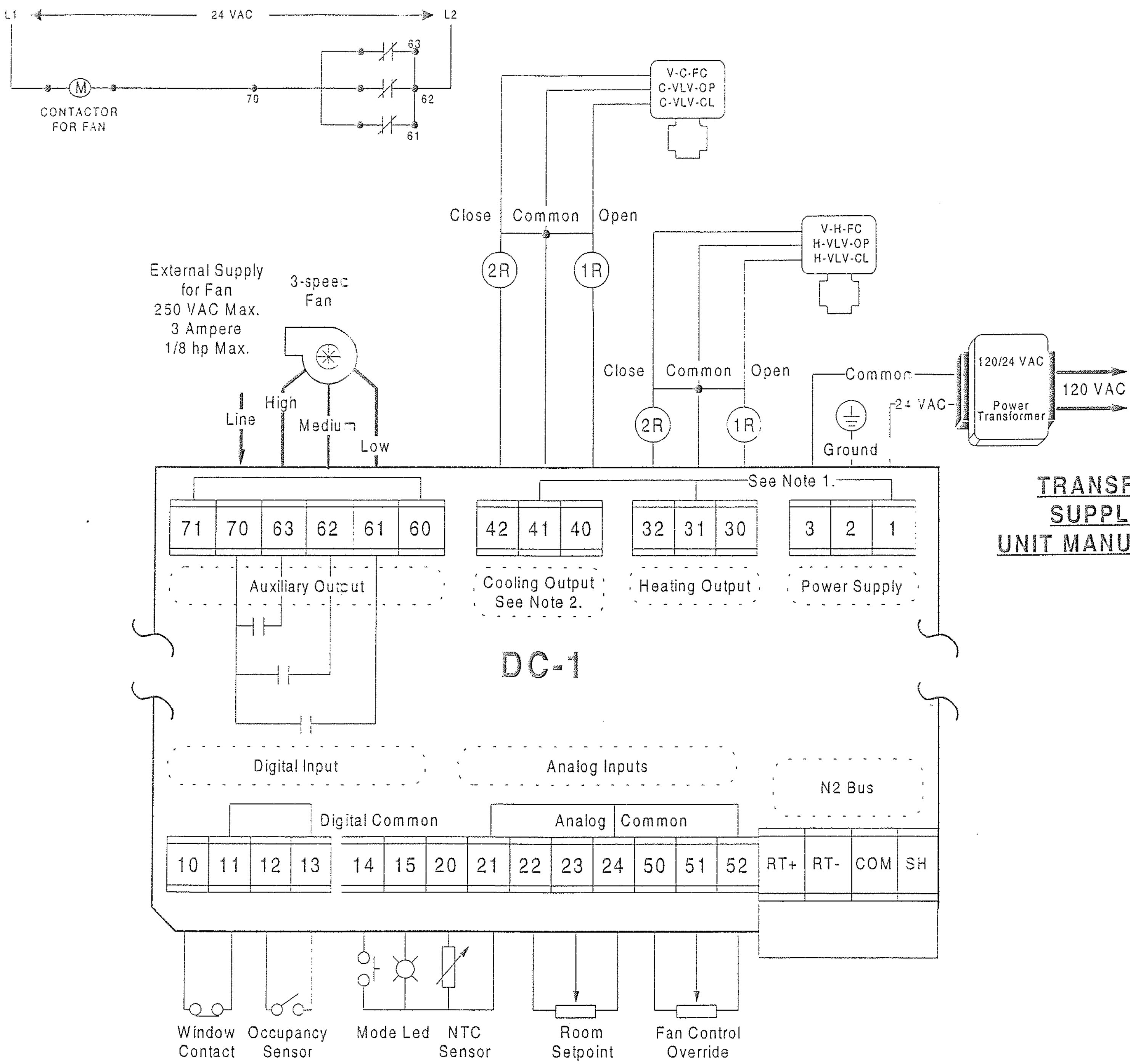
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 08/28/97	BY DATE

JOHNSON CONTROLS
Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-11

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		FP-VAV-D					VAV						EN-FPVAV	At VAVBOX														Power to Controller
		FP-VAV-D	*				VAV	1	X				EN-FPVAV	At VAVBOX	0													N2 Trunk
	AI-1	FP-VAV-D	ZN-T	Zone Temperature	Deg F		VAV	1	X	AI-1		PHONE JACK	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-1						8/26	PHONE JACK	Metastat-Ph Jack		U2	
	AI-2	FP-VAV-D					VAV	1	X	AI-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-2											
	AI-3	FP-VAV-D					VAV	1	X	AI-3			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-3											
	AI-4	FP-VAV-D	S-VP	Supply Vel Pressure	In. Wg		VAV	1	X	AI-4		AI#,AICM,+15VDC	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-4						3/18	OUT,COM,+VDC	DPT-2000		U9	
	AI-5	FP-VAV-D					VAV	1	X	AI-5			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-5											
	AI-6	FP-VAV-D					VAV	1	X	AI-6			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-6											
	BI-1	FP-VAV-D					VAV	1	X	BI-1			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-1											
	BI-2	FP-VAV-D					VAV	1	X	BI-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-2											
	BI-3	FP-VAV-D					VAV	1	X	BI-3			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-3											
	BI-4	FP-VAV-D					VAV	1	X	BI-4			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-4											
	BO-1	FP-VAV-D	DPR-OP	Damper Open	Off	On	VAV	1	X	BO-1		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-1						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-2	FP-VAV-D	DPR-CL	Damper Close	Off	On	VAV	1	X	BO-2		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-2						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-3	FP-VAV-D	SF-C	Supply Fan Control	Off	On	VAV	1	X	BO-3		BO#,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-3	2/18	COIL	RELAY	NC,COM		2/14	See starter detail	Starter (NO)		U51	
	BO-4	FP-VAV-D					VAV	1	X	BO-4			EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-4											
	BO-5	FP-VAV-D	RHV-OP	Reheat Valve Open	Off	On	VAV	1	X	BO-5		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-5						3/18	BLK,RED,WHT	VA-7150		U58	
	BO-6	FP-VAV-D	RHV-CL	Reheat Valve Close	Off	On	VAV	1	X	BO-6		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-6						3/18	BLK,RED,WHT	VA-7150		U58	
	AO-1	FP-VAV-D					VAV	1	X	AO-1			EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-1											
	AO-2	FP-VAV-D					VAV	1	X	AO-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-2											



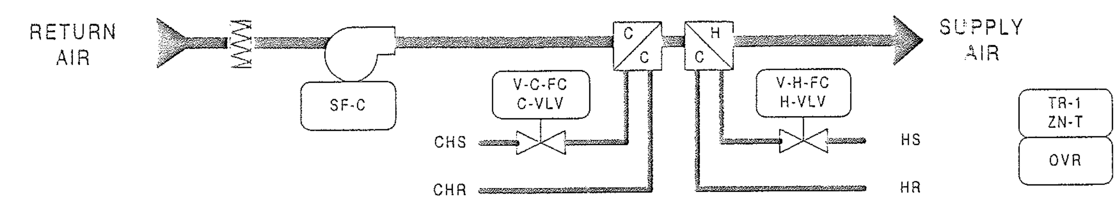
Note 1: For PAT, DAT, and On-Off outputs, terminals 1, 31, and 41 are internally connected.

TRANSFORMER SUPPLIED BY UNIT MANUFACTURER

BILL OF MATERIALS

Estimate: quad d fcu 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	27	TC-9102-0332	FAN CONT3-SPEED 2-STG H/C
V-H-FC, V-C-FC	54	--	SEE VALVE SCHEDULE
ZN-T	27	TM-9161-5002	MSTAT F/TC-9100 55-85F FSC



NOTE: FCU CONTROLLER (TC-9102-0322) ARE FACTORY MOUNTED BY TRANE

DESCRIPTION OF OPERATION

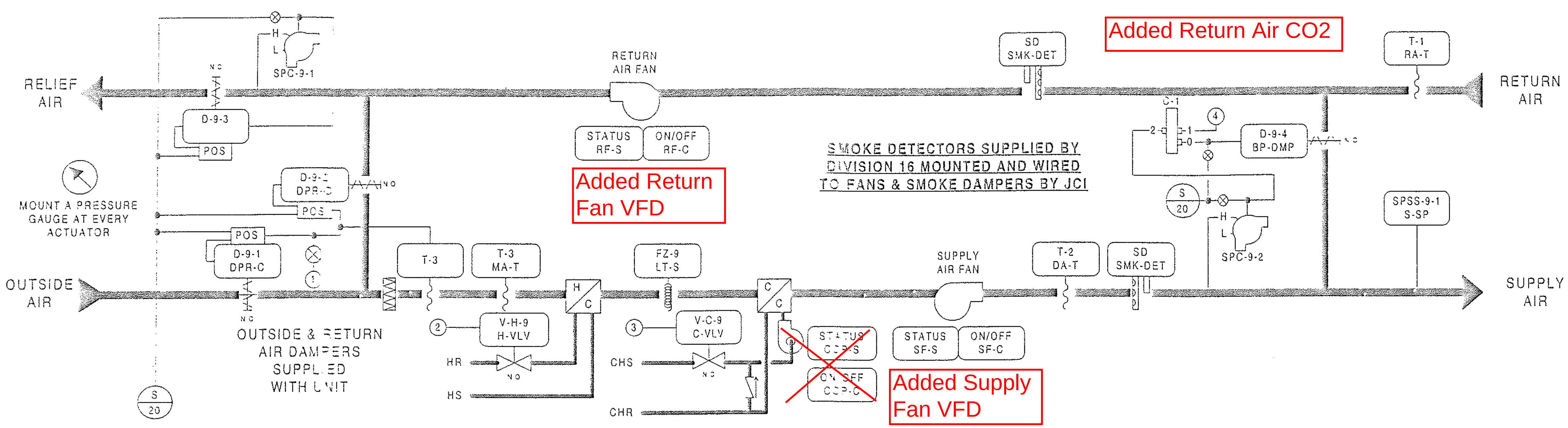
THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODE GENERALLY OCCURS DURING THE NORMAL WORK WEEK AND STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON INDIVIDUAL UNITS WILL FREQUENTLY BE REQUIRED. SUITE OWNERS WILL HAVE THE ABILITY TO UTILIZE SUITES FOR PRIVATE FUNCTIONS AT ANYTIME. WHEN FAN COIL UNITS ARE DE-ENERGIZED, COOLING COIL VALVE **V-C-FC** AND HEATING COIL VALVE **V-H-FC** WILL BE CLOSED TO COILS.

OCCUPIED MODE - FAN COIL UNIT SUPPLY FAN WILL BE STARTED THROUGH ITS FAN SPEED SWITCH AND RUN CONTINUOUSLY. STARTING OF THE FAN COIL UNIT WILL INITIATE THE START OF THE RELATED EXHAUST FAN. THE EXHAUST AIR VOLUME INDUCES THE NATURAL VENTILATION OF THE SUITE AND MUST THEREFORE BE ENERGIZED WHENEVER THE SUITE IS OCCUPIED. ROOM SENSOR **TR-1** WILL MODULATE HEATING COIL VALVE **V-H-FC** AND COOLING COIL VALVE **V-C-FC** IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F).

UNOCCUPIED MODE - ROOM SENSOR **TR-1** WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F) ACTIVATE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), FAN COIL UNIT WILL BE DE-ENERGIZED AND HEATING COIL VALVE WILL CLOSE.

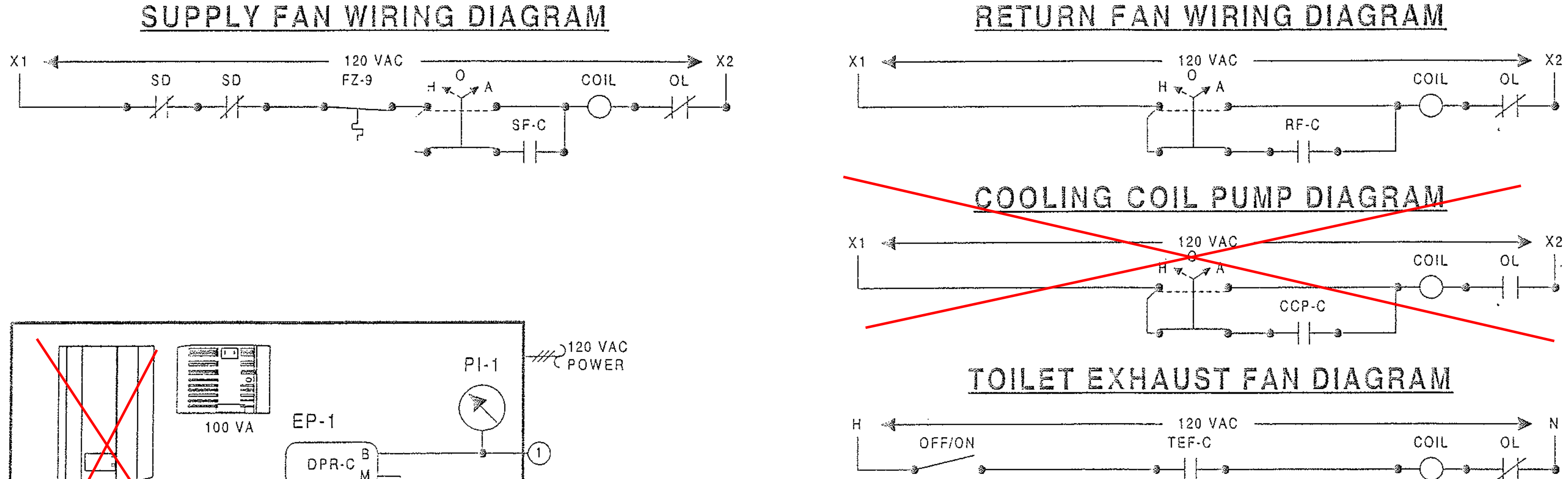
REVISION INFORMATION		DRAWING TITLE			
NUMBER		SUITE FAN COIL UNITS	AS-BUILT	7/18/00	CME
DATE 07/18/00		QUAD D	REFERENCE DRAWING / NO. / REVISION-LOCATION	ECN / DATE	BY
TIME 03:03 PM		PROJECT TITLE	Sales Engineer JDP / Project Manager WJT / Application Engineer RTS	DRAWN BY RTS DATE 08/28/97	APPROVED BY / DATE
FILE NAME FANCOILD.vsd		BALTIMORE NFL STADIUM AT CAMDEN YARDS BALTIMORE, MARYLAND	JOHNSON CONTROLS Controls Group	Branch Information: Johnson Controls, Inc. 60 Loveton Circle Sparks, MD 21152	CONTRACT NUMBER 7052-0098 / DRAWING NUMBER BL-6559-12

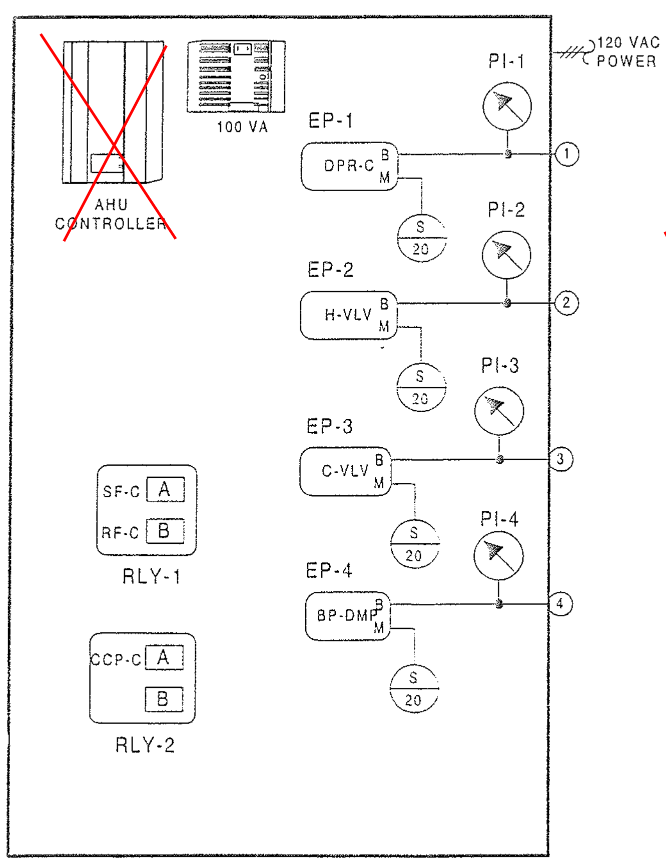
Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		FCU-D				TC						EN-FCU	At FCU														Power to Controller
		FCU-D	*			TC	1	Y				EN-FCU	At FCU	0													N2 Trunk
	BO-1	FCU-D	H-VLV-OP	Htg Valve Open	Off On	TC	1	Y	BO-1		32,31/COM,30	EN-FCU	At FCU	0		FCU-x-BO-1						3/18	BLK,WHT,RED	VA-7150 (Heating)			
	BO-2	FCU-D	H-VLV-CL	Htg Valve Close	Off On	TC	1	Y	BO-2		32,31/COM,30	EN-FCU	At FCU	0		FCU-x-BO-2						3/18	BLK,WHT,RED	VA-7150 (Heating)			
	BO-3	FCU-D	C-VLV-OP	Clg Valve Open	Off On	TC	1	Y	BO-3		42,41/COM,40	EN-FCU	At FCU	0		FCU-x-BO-3						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
	BO-4	FCU-D	C-VLV-CL	Clg Valve Close	Off On	TC	1	Y	BO-4		42,41/COM,40	EN-FCU	At FCU	0		FCU-x-BO-4						3/18	BLK,WHT,RED	VA-7150 (Cooling)			
	BO-5	FCU-D	F-SPD-1	Fan (Speed 1)	Off On	TC	1	Y	BO-5		71,70 LINE/63,62,61	EN-FCU	At FCU	0		FCU-x-BO-5						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
	BO-6	FCU-D	F-SPD-2	Fan (Speed 2)	Off On	TC	1	Y	BO-6		71,70 LINE/63,62,61	EN-FCU	At FCU	0		FCU-x-BO-6						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
	BO-7	FCU-D	F-SPD-3	Fan (Speed 3)	Off On	TC	1	Y	BO-7		71,70 LINE/63,62,61	EN-FCU	At FCU	0		FCU-x-BO-7						4/14	HI,MED,LOW,NEU	Starter Coil (3 spd fan)			
	BI-1	FCU-D				TC	1	Y	BI-1			EN-FCU	At FCU	0		FCU-x-BI-1											
	BI-2	FCU-D				TC	1	Y	BI-2			EN-FCU	At FCU	0		FCU-x-BI-2											
	BI-3	FCU-D				TC	1	Y	BI-3			EN-FCU	At FCU	0		FCU-x-BI-3											
	AI-1	FCU-D	ZN-T	Zone Temperature	Deg F	TC	1	Y	AI-1		14 MODE,15 LED,2	EN-FCU	At FCU	0		FCU-x-AI-1						3/22	14 MODE,15 LED	TM-9100 (Mode & LED)			
	AI-2	FCU-D	ZN-SET	Zone Temp Set Point	Deg F	TC	1	Y	AI-2		22,23,21/24	EN-FCU	At FCU	0		FCU-x-AI-2						3/22	22,23,21/24	TM-9100 (Setpoint)			
	AI-4	FCU-D	OVR	Fan Override	Lo-Md-Hi	TC	1	Y	AI-4		51,21/24	EN-FCU	At FCU	0		FCU-x-AI-4						2/22	51,21/24	TM-9100 (Fan Override)			

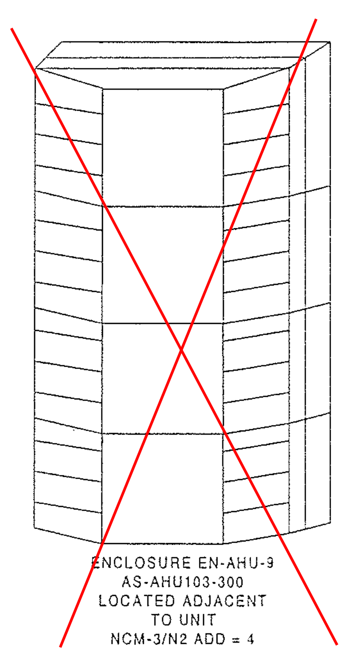


Desig.	Qty	Part #	Description
BILL OF MATERIALS			
Estimate: ahu-9			70520098.pre
Field Devices:			
C-1	1	C-5226-3	SIGNAL TRANSMITTER
D-9-1, D-9-2, D-9-3	3	---	SEE DAMPER SCHEDULE
DPR-C	3	D-3153-1	DMPR ACT, 8-13#, W/PILOT
	3	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
FZ-9	1	A70HA-1C	STAT, LL, 20', EL, MAN, 15/55F
H-VLV, C-VLV	1	--	SEE VALVE SCHEDULE
MA-T, DA-T, RA-T	3	TE-6316P-1	SENS, T-Ni, 0.1%, 17' AVG
SPC-9-1	1	R-317-1	CNTRLR DP, 0.05-1"WG
SPC-9-2	1	R-317-7	CNTRLR DP, 0.6-12"WG
T-3	1	T-3610-1001	STAT, LOW VOL, 8' AVG, DCT
TEF-C5	1	BZ-1000-11	ENCL, 4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE, 3PDT, 11PIN, 10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
Panel Devices:			
EN-AHU-9	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD, CVR & BACKBN
EP-1,2,3,4	4	EP-8000-4	XDUCR, EP, 4-20ma, HI VOL
PI-1,2,3,4	4	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

SUPPLY FAN WIRING DIAGRAM
RETURN FAN WIRING DIAGRAM
~~COOLING COIL PUMP DIAGRAM~~
TOILET EXHAUST FAN DIAGRAM







FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-C5	PRESS LEV	PRPPRC	63	PRESS LEV

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-9-1, D-9-3 AND COOLING COIL VALVE V-C-9 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-9-2 WILL BE OPEN AND HEATING COIL VALVE V-H-9 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY AND RETURN FANS WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-9 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-9-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-9-1, AND RELIEF AIR DAMPER D-9-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY AND RETURN FANS WILL BE RUNNING, RETURN AIR DAMPER D-9-2 IS OPEN. OUTSIDE AIR DAMPER D-9-1 WILL OPEN ITS MINIMUM OPEN POSITION AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FORTY-FIVE (45F) MODULATE V-H-9 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, T-2 WILL GRADUALLY MODULATE DAMPER D-9-1 OPEN WHILE SIMULTANEOUSLY CLOSING D-9-2. STATIC PRESSURE CONTROLLER SPC-9-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-9-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-3, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE T-2 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-9 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND RETURN FANS AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-9-1 AND RETURN DAMPER D-9-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), OUTSIDE AIR DAMPERS D-9-1 WILL CLOSE, OPENING RETURN AIR DAMPER D-9-2. DISCHARGE SENSOR T-2, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-9-1 AND D-9-2 AND CHILLED WATER VALVE V-C-9 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-9 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND RETURN FANS AND CLOSE ALL SYSTEM DAMPERS.

FAN CONTROL - SYSTEM STATIC PRESSURE SENSING STATION SPSS-9-1 THROUGH A STATIC PRESSURE TRANSMITTER AND THE METASYS CONTROLLER WILL MODULATE THE BYPASS DAMPER D-9-4 TO MAINTAIN ITS SETTING. ON A RISE IN STATIC AS SENSED BY SPSS-9-1 DAMPER D-9-4 WILL GRADUALLY MODULATE OPEN TO ITS MAXIMUM POSITION TO MAINTAIN ITS SETTING. HIGH LIMIT STATIC PRESSURE CONTROLLER SPC-9-2 WHICH WILL OVERRIDE SPSS-9-1 AND OPEN D-9-4 TO PREVENT THE DISCHARGE FROM RISING ABOVE IT'S SET POINT.

TOILET EXHAUST FAN TEF-C5 - THE FAN WILL START WHEN AHU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:08 PM
FILE NAME AHU-9.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-9
PRESS LEVEL QUAD B & C
PRESS LEVEL QUAD C

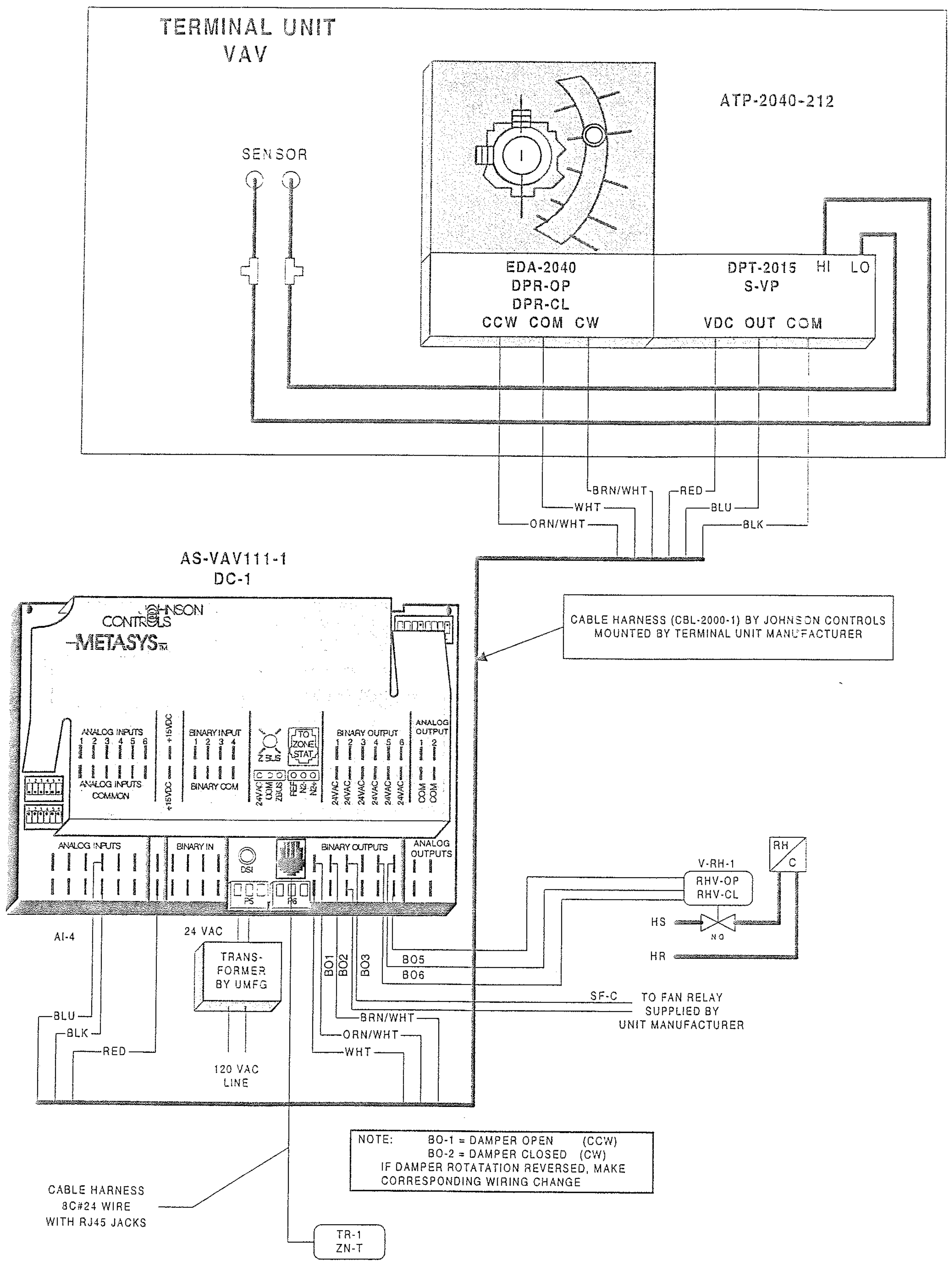
PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

NO.	REVISION-LOCATION	ECN	DATE	BY
	AS-BUILT		7/18/00	CME

REFERENCE DRAWING
Sales Engineer JDP · Project Manager WJT · Application Engineer RTS
DRAWN BY RTS DATE 08/29/97
APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division
Branch information: JOHNSON CONTROLS, 60 LOVETON CIRCLE, SPARKS, MD 21152
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-13

Full Spreadsheet		Software					Digital Controller Information						Panel Information						Intermediate Device					Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-9					AHU						EN-AHU-9	Press Level MER		M.3-13												Power to Controller
		AHU-9	·				AHU	1	4				EN-AHU-9	Press Level MER	0	M.3-13												N2 Trunk
	BO-1	AHU-9	SF-C	Supply Fan Control	Off	On	AHU	1	4	BO-1	RLY	BO#,24V,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-1	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-2	AHU-9	RF-C	Return Fan Control	Off	On	AHU	1	4	BO-2	RLY	BO#,24V,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-2	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-3	AHU-9					AHU	1	4	BO-3			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-3											
	BO-4	AHU-9	CCP-C	Clg Coil Pump 9 Control	Off	On	AHU	1	4	BO-4	RLY	BO#,24V,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-4	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-5	AHU-9	TEF5-C	Toilet Exh Fan C5 Control	Off	On	AHU	1	4	BO-5		BO#,24V	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-5						2/18	Device dependent	24VAC OUT		A50	
	BO-6	AHU-9					AHU	1	4	BO-6			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-6											
	BO-7	AHU-9					AHU	1	4	BO-7			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-7											
	BO-8	AHU-9					AHU	1	4	BO-8			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-8											
	BO-9	AHU-9					AHU	1	4	BO-9			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-9											
	BO-10	AHU-9					AHU	1	4	BO-10			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BO-10											
	AO-1	AHU-9	DPR-C	Damper Control	% Open		AHU	1	4	AO-1		AO#,AOCOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-9	H-VLV	Heating Coil Valve	% Open		AHU	1	4	AO-2		AO#,AOCOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-9	C-VLV	Clg Coil Valve	% Open		AHU	1	4	AO-3		AO#,AOCOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-9	BP-DMP	Bypass Damper	% Open		AHU	1	4	AO-4		AO#,AOCOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AO-4	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-5	AHU-9					AHU	1	4	AO-5			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AO-5											
	AO-6	AHU-9					AHU	1	4	AO-6			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AO-6											
	BI-1	AHU-9	SF-S	Supply Fan Status	Off	On	AHU	1	4	BI-1		BI#,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-9	RF-S	Return Fan Status	Off	On	AHU	1	4	BI-2		BI#,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-2						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-3	AHU-9	SMK-DET	Smoke Detectors	Normal	Alarm	AHU	1	4	BI-3		BI#,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-3						2/22	Device dependent	Contact (NO)		A40	
	BI-4	AHU-9	LT-S	Low Temperature Stat	Normal	Alarm	AHU	1	4	BI-4		BI#,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-4						2/22	NO,M1	A70 (NC)		A41	
	BI-5	AHU-9	CCP-S	Clg Coil Pump 9 Status	Off	On	AHU	1	4	BI-5		BI#,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-5						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-6	AHU-9	SA-HSP	Supply Air Static Press	Normal	Alarm	AHU	1	4	BI-6		BI#,BICOM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-6						2/22	Device dependent	Contact (NO)		A40	
	BI-7	AHU-9					AHU	1	4	BI-7			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-7											
	BI-8	AHU-9					AHU	1	4	BI-8			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-BI-8											
	AI-1	AHU-9					AHU	1	4	AI-1			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-1											
	AI-2	AHU-9	RA-T	Return Air Temperature	Deg F		AHU	1	4	AI-2		AI#,AICM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-2						2/18	2-Wire	TE-6315P-1		A4	
	AI-3	AHU-9	DA-T	Disch Air Temperature	Deg F		AHU	1	4	AI-3		AI#,AICM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-3						2/18	2-Wire	TE-6315P-1		A4	
	AI-4	AHU-9	MA-T	Mixed Air Temperature	Deg F		AHU	1	4	AI-4		AI#,AICM	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-4						2/18	2-Wire	TE-6315P-1		A4	
	AI-5	AHU-9					AHU	1	4	AI-5			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-5											
	AI-6	AHU-9					AHU	1	4	AI-6			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-6											
	AI-7	AHU-9	S-SP	Supply Static Pressure	In. Wg		AHU	1	4	AI-7		AI#,+VDC	EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-7						2/18	-,+	DPT-2641		A2	
	AI-8	AHU-9					AHU	1	4	AI-8			EN-AHU-9	Press Level MER	0	M.3-13	AHU-9-4-AI-8											

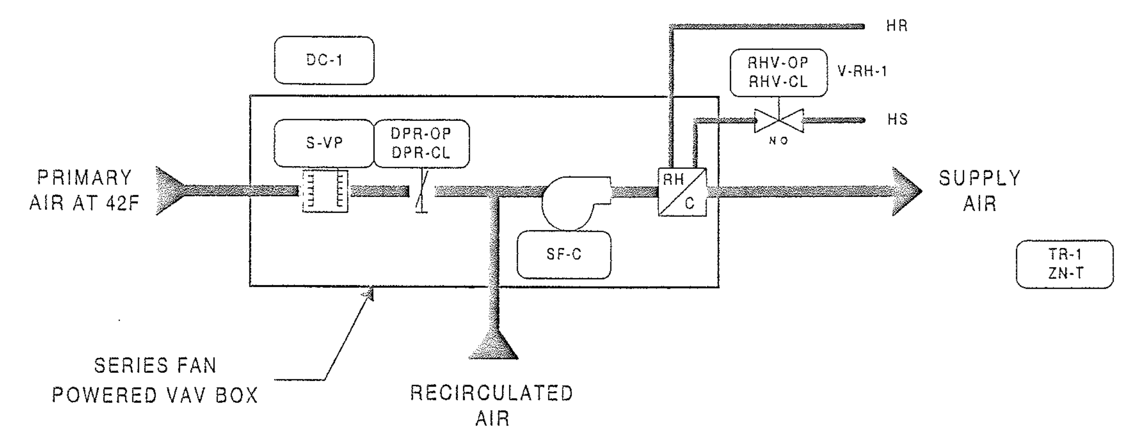


BILL OF MATERIALS

Estimate: ahu-9 vavbox 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DC-1	30	AS-VAV110-1	VAV 6AI,4BI,8BO,8K
V-RH-1	30	--	SEE VALVE SCHEDULE
VAV	30	ATP-2040-212	ACT,2MIN+1.5"DP,1/2"CPLG
ZN-T	21	TE-6410W-1000	MSTAT,NI,BOX,JACK

SERIES FAN POWERED VARIABLE AIR VOLUME (VAV) WITH REHEAT COIL



NOTE: VAV CONTROLLER (AS-VAV111-1) DAMPER ACTUATOR & DIFFERENTIAL PRESSURE TRANSMITTER (ATP-2040-212) ARE FACTORY MOUNTED BY TITUS

DESCRIPTION OF OPERATION

PRIMARY AIR VALVE WILL OPEN TO THEIR MINIMUM POSITION AND TERMINAL UNIT FAN WILL START AND RUN CONTINUOUSLY WHENEVER AIR HANDLING UNIT IS RUNNING. TERMINAL UNIT FANS WILL START THIRTY (30) SECONDS BEFORE OPENING OF AIR VALVES TO PREVENT BACK SPINNING OF FAN. FANS WILL ALSO BE OPERATED AS DEFINED IN THE UNOCCUPIED MODES. PRIMARY AIR VALVES WILL BE CLOSED DURING UNOCCUPIED HEATING MODE. ROOM SENSOR **TR-1** WILL ON A RISE IN TEMPERATURE GRADUALLY MODULATE REHEAT COIL VALVE **V-RH-1** CLOSED AND ON A CONTINUED RISE WILL GRADUALLY MODULATE PRIMARY AIR VALVE FROM IT'S MINIMUM TO MAXIMUM SETTING TO MAINTAIN IT'S SETTING OF SEVENTY-FIVE (75F). ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. DURING OPERATION OF THE WARM-UP MODE ALL PRIMARY AIR VALVES OPEN TO THEIR MAXIMUM POSITION AND TERMINAL FANS START TO PERMIT FULL AIR FLOW TO THE SPACES. REHEAT COIL VALVE **V-RH-1** IS MODULATED IN RESPONSE TO ROOM SENSOR TO MAINTAIN SPACE TEMPERATURE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 02:54 PM
FILE NAME VAVBOX-E.vsd

DRAWING TITLE
FAN POWERED TERMINAL REHEAT UNITS
QUAD C PRESS LEVEL

PROJECT TITLE
BALTIMORE NFL STADIUM AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

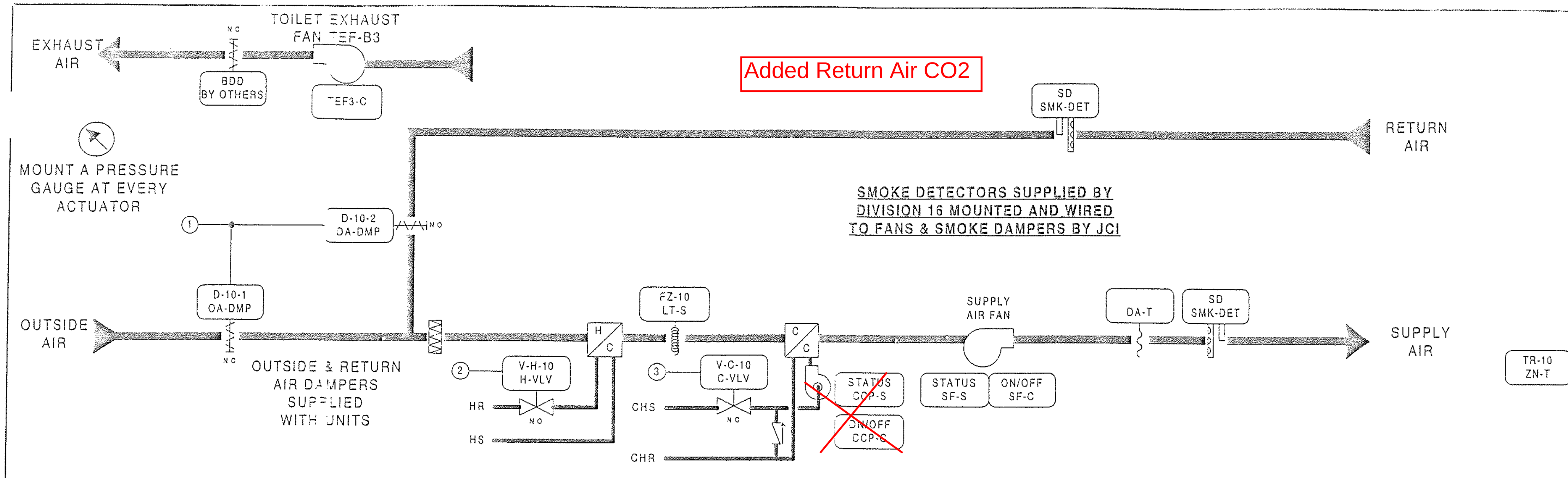
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 08/28/97	BY DATE

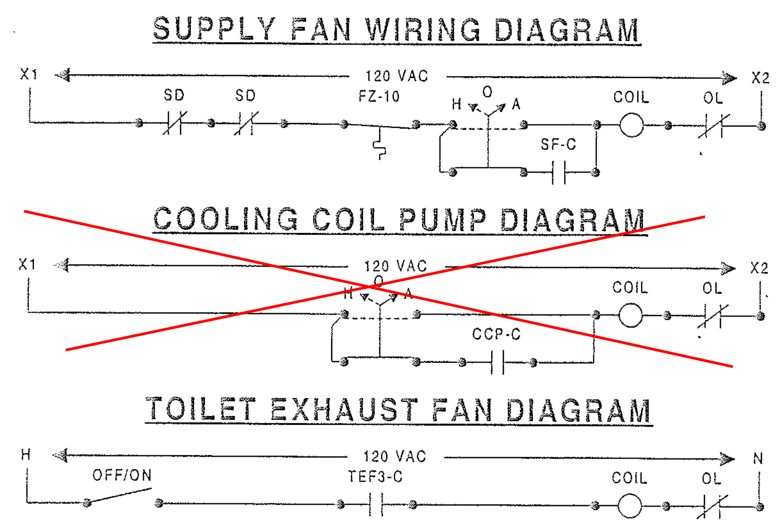
JOHNSON CONTROLS
Controls Group

Branch Information
Johnson Controls, Inc.
60 Loveton Circle
Sparks, MD 21152

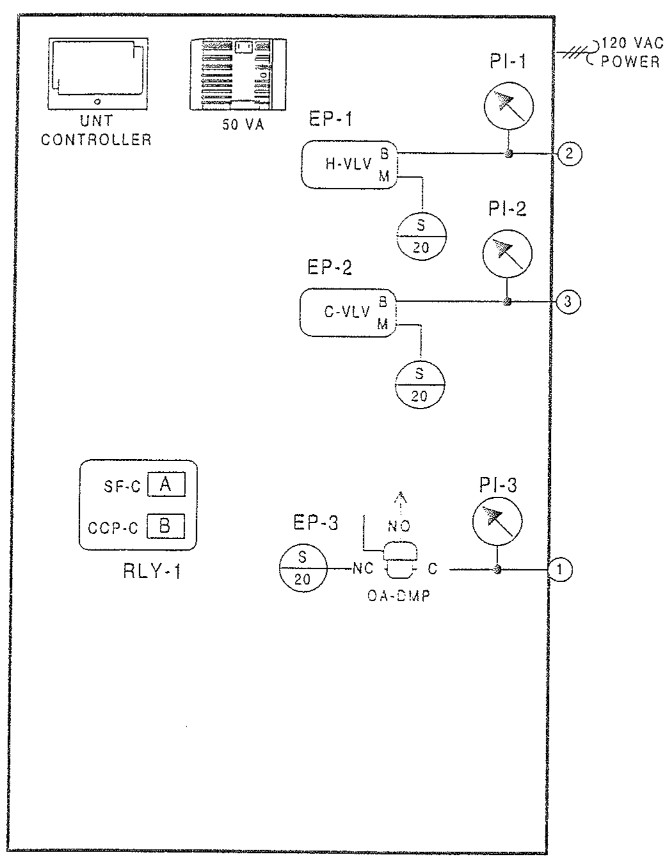
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-14

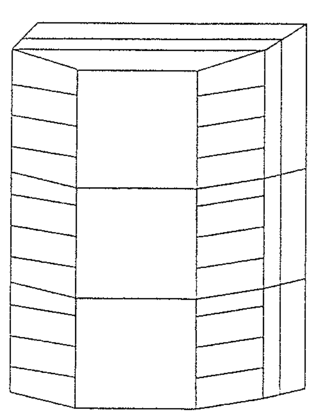
Full Spreadsheet		Software					Digital Controller Information						Panel Information						Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		FP-VAV-C9					VAV						EN-FPVAV	At VAVBOX														Power to Controller
		FP-VAV-C9	*				VAV	1	Z				EN-FPVAV	At VAVBOX	0													N2 Trunk
	AI-1	FP-VAV-C9	ZN-T	Zone Temperature	Deg F		VAV	1	Z	AI-1		PHONE JACK	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-1						8/26	PHONE JACK	Metastat-Ph Jack		U2	
	AI-2	FP-VAV-C9					VAV	1	Z	AI-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-2											
	AI-3	FP-VAV-C9					VAV	1	Z	AI-3			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-3											
	AI-4	FP-VAV-C9	S-VP	Supply Vel Pressure	In. Wg		VAV	1	Z	AI-4		AI#,AICM,+15VDC	EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-4						3/18	OUT,COM,+VDC	DPT-2000		U9	
	AI-5	FP-VAV-C9					VAV	1	Z	AI-5			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-5											
	AI-6	FP-VAV-C9					VAV	1	Z	AI-6			EN-FPVAV	At VAVBOX	0		FPVAV-x-AI-6											
	BI-1	FP-VAV-C9					VAV	1	Z	BI-1			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-1											
	BI-2	FP-VAV-C9					VAV	1	Z	BI-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-2											
	BI-3	FP-VAV-C9					VAV	1	Z	BI-3			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-3											
	BI-4	FP-VAV-C9					VAV	1	Z	BI-4			EN-FPVAV	At VAVBOX	0		FPVAV-x-BI-4											
	BO-1	FP-VAV-C9	DPR-OP	Damper Open	Off	On	VAV	1	Z	BO-1		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-1						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-2	FP-VAV-C9	DPR-CL	Damper Close	Off	On	VAV	1	Z	BO-2		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-2						3/18	CW,CCW,COM	EDA-2040		U54	
	BO-3	FP-VAV-C9	SF-C	Supply Fan Control	Off	On	VAV	1	Z	BO-3		BO#,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-3	2/18	COIL	RELAY	NO,COM		2/14	See starter detail	Starter (NO)		U51	
	BO-4	FP-VAV-C9					VAV	1	Z	BO-4			EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-4											
	BO-5	FP-VAV-C9	RHV-OP	Reheat Valve Open	Off	On	VAV	1	Z	BO-5		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-5						3/18	BLK,RED,WHT	VA-7150		U58	
	BO-6	FP-VAV-C9	RHV-CL	Reheat Valve Close	Off	On	VAV	1	Z	BO-6		BO-a,BO-b,24VAC	EN-FPVAV	At VAVBOX	0		FPVAV-x-BO-6						3/18	BLK,RED,WHT	VA-7150		U58	
	AO-1	FP-VAV-C9					VAV	1	Z	AO-1			EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-1											
	AO-2	FP-VAV-C9					VAV	1	Z	AO-2			EN-FPVAV	At VAVBOX	0		FPVAV-x-AO-2											





FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B3	M CONCOURSE	STARTER		M CONCOURSE





ENCLOSURE EN-AHU-10
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 1

BILL OF MATERIALS

Estimate ahu-10 — 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T	1	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
FZ-10	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
TEF-B3	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-10	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-10-1, AND COOLING COIL VALVE V-C-10 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-10-2 WILL BE OPEN AND HEATING COIL VALVE V-H-10 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-10 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-10-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-10-1 CLOSED. EXHAUST FAN TEF-B3 WILL BE OFF AND EXHAUST AIR DAMPER D-10-3 (BDD) WILL BE CLOSED DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-10 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-10-2 WILL CLOSE. OUTSIDE AIR DAMPER D-10-1 WILL OPEN AND EXHAUST FAN TEF-B3 WILL START AND RUN CONTINUOUSLY CAUSING EXHAUST AIR DAMPER D-10-3 (BDD) TO OPEN AFTER THE WARM-UP MODE IS STOPPED. ROOM SENSOR TR-10 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF EVENTY-FIVE (75F) MODULATE V-H-10 CLOSED TO THE HEATING COIL. COOLING COIL VALVE V-C-10 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-10. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND EXHAUST FAN TEF-B3 AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-10-1 AND EXHAUST AIR DAMPER D-10-3 (BDD) WILL OPEN. ROOM SENSOR TR-10 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL MODULATE CHILLED WATER VALVE V-C-10 TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F). THE HEATING COIL VALVE V-H-10 WILL BE CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B3 - THE FAN WILL START WHEN THE AHU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:09 PM
FILE NAME AHU-10.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-10
GAME DAY SERVICES

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

AS-BUILT				7/18/00	CME
REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer JDP | Project Manager WJT | Application Engineer RTS
DRAWN BY RTS DATE 09/02/97 | APPROVED BY DATE

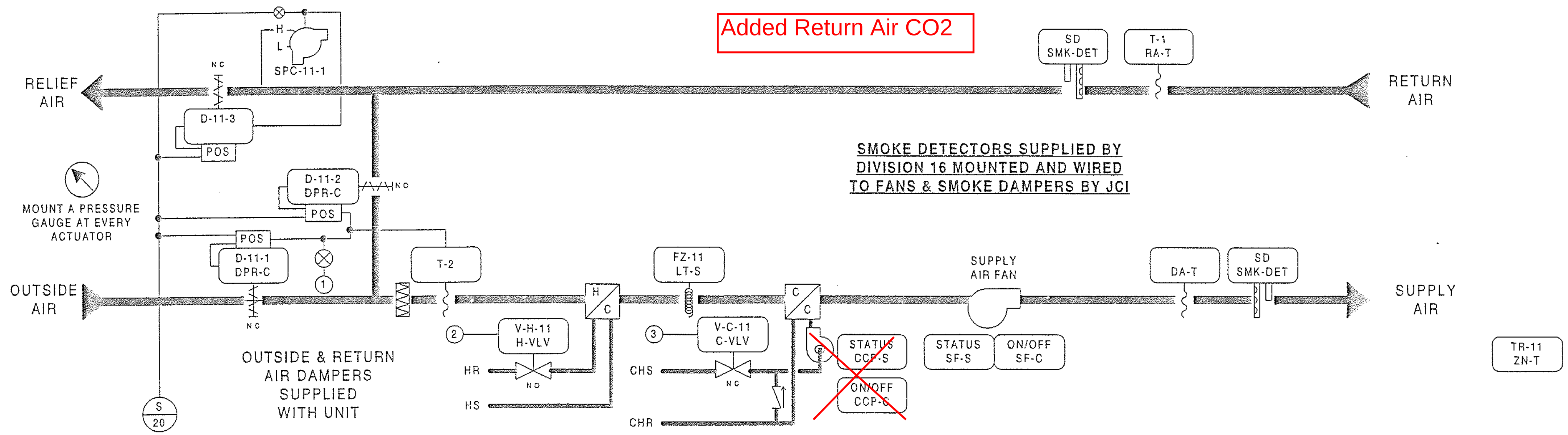
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

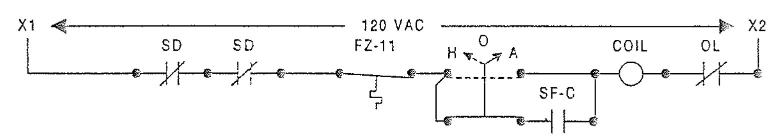
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-15

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-10					UNT						EN-AHU10	Service Level B		M.2-01B												Power to Controller
		AHU-10	*				UNT	1	1				EN-AHU10	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	AHU-10	DA-T	Disch Air Temperature	Deg F		UNT	1	1	AI-1		AI#,AICM	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AI-1						2/18	2-Wire	TE-6315P-1		U1	
	AI-2	AHU-10					UNT	1	1	AI-2			EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AI-2											
	AI-3	AHU-10					UNT	1	1	AI-3			EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AI-3											
	AI-4	AHU-10	ZN-T	Zone Temperature	Deg F		UNT	1	1	AI-4		PHONE JACK	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AI-4						8/26	TE-6410W-1000	TE-6410-		U2	
	AI-5	AHU-10					UNT	1	1	AI-5			EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AI-5											
	AI-6	AHU-10					UNT	1	1	AI-6			EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AI-6											
	BI-1	AHU-10	SF-S	Supply Fan Status	Off	On	UNT	1	1	BI-1		BI#,24VAC	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-10	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	1	BI-2		BI#,24VAC	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-10	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	1	BI-3		BI#,24VAC	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-10	CCP-S	Clg Coil Pump 10 Status	Off	On	UNT	1	1	BI-4		BI#,24VAC	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-10	SF-C	Supply Fan Control	Off	On	UNT	1	1	BO-1	RLY	BO#,24V,COM	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-10	TEF3-C	Toilet Exh Fan B3 Cntrl	Off	On	UNT	1	1	BO-2		BO#,24VAC	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	AHU-10	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	1	BO-3		BO#,24VAC	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BO-3			V11HGA-100			2/18	2-Wire	SAV-24VAC (sw lo)		U51	
	BO-4	AHU-10	CCP-C	Clg Coil Pump 10 Control	Off	On	UNT	1	1	BO-4	RLY	BO#,24V,COM	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-10					UNT	1	1	BO-5			EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BO-5											
	BO-6	AHU-10					UNT	1	1	BO-6			EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-BO-6											
	AO-1	AHU-10	H-VLV	Heating Coil Valve	% Open		UNT	1	1	AO-1		AO#,AOCM,24VA	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-10	C-VLV	Cooling Coil Valve	% Open		UNT	1	1	AO-2		AO#,AOCM,24VA	EN-AHU10	Service Level B	0	M.2-01B	AHU10-1-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	

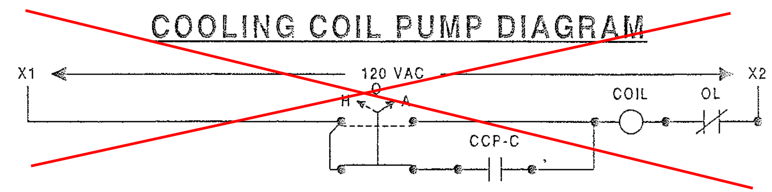
Added Return Air CO2



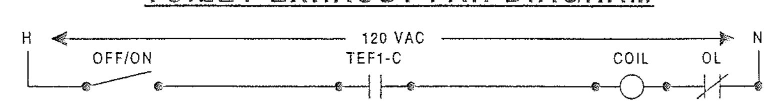
SUPPLY FAN WIRING DIAGRAM



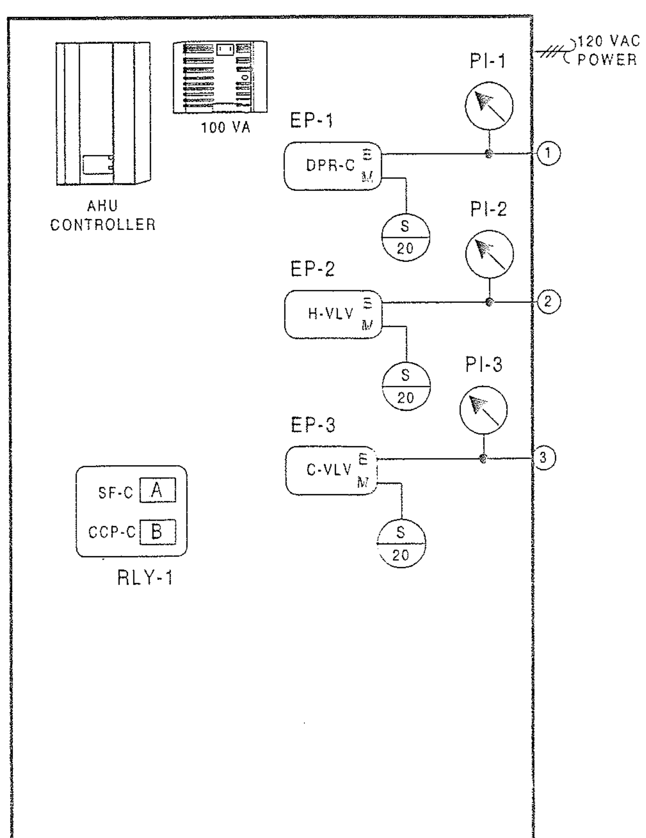
~~COOLING COIL PUMP DIAGRAM~~

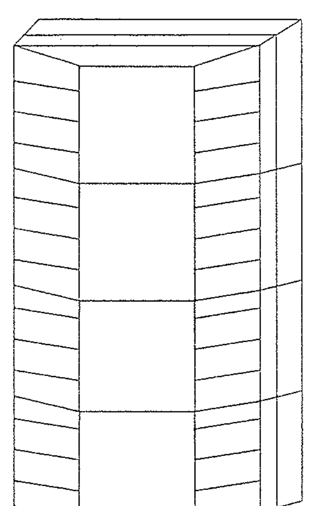


TOILET EXHAUST FAN DIAGRAM



FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B1	SERVICE LEVEL	RP2SRB	51	SERVICE LEVEL





ENCLOSURE EN-AHU-11
AS-AHU103-300
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 2

BILL OF MATERIALS

Estimate: ahu-11 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T,RA-T	2	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-11	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
SPC-11-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-2	1	T-3610-1001	STAT,LOW VOL ,8' AVG, DCT
TEF-B1	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-11	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-11-1, D-11-3 AND COOLING COIL VALVE V-C-11 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-11-2 WILL BE OPEN AND HEATING COIL VALVE V-H-11 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-11 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-11-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-11-1, AND RELIEF AIR DAMPER D-11-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-11-2 IS OPEN. OUTSIDE AIR DAMPER D-11-1 WILL OPEN ITS MINIMUM OPEN POSITION AFTER THE WARM-UP MODE IS STOPPED. ROOM SENSOR TR-11, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-11 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, TR-11 WILL GRADUALLY MODULATE DAMPER D-11-1 OPEN WHILE SIMULTANEOUSLY CLOSING D-11-2. STATIC PRESSURE CONTROLLER SPC-11-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-11-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-2, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE TR-11 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-11 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-11 WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50) ACTIVATE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY FAN AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-11-1 AND RETURN DAMPER D-11-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), OUTSIDE AIR DAMPERS D-11-1 WILL CLOSE, OPENING RETURN AIR DAMPER D-11-2. ROOM SENSOR TR-11, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-11-1 AND D-11-2 AND CHILLED WATER VALVE V-C-11 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-11 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY FAN AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B1 - FAN WILL START WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:10 PM
FILE NAME AHU-11.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-11
STADIUM OPERATIONS

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

AS-BUILT				7/18/00	CME
REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY

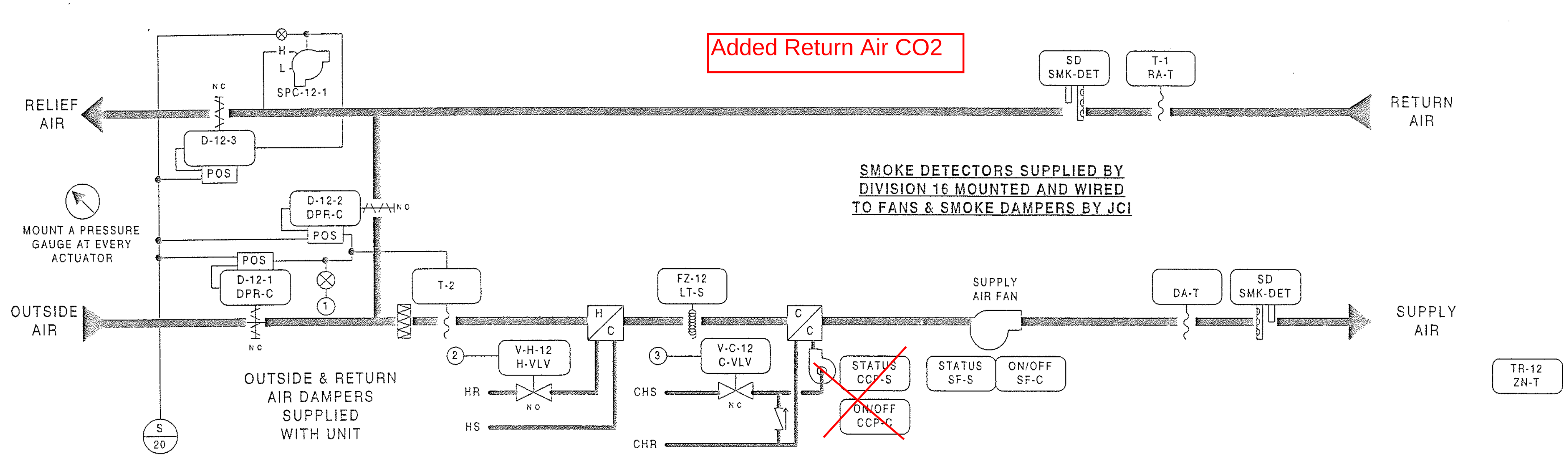
Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 09/02/97 | APPROVED BY DATE

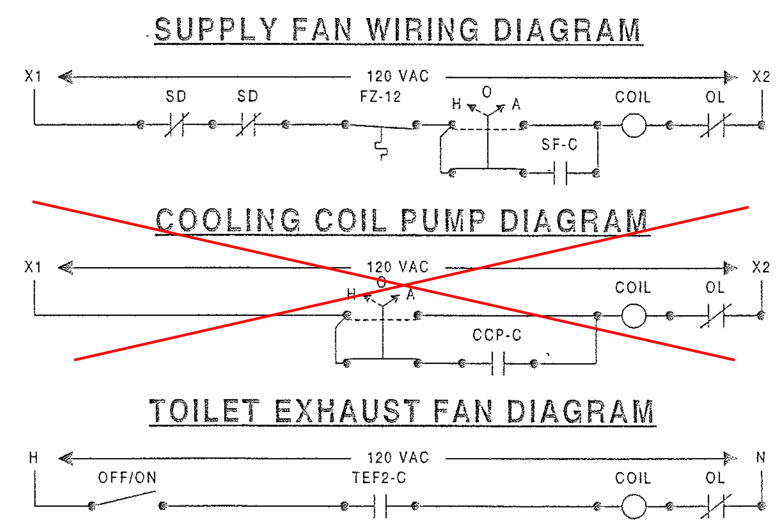
JOHNSON CONTROLS
Systems & Services Division

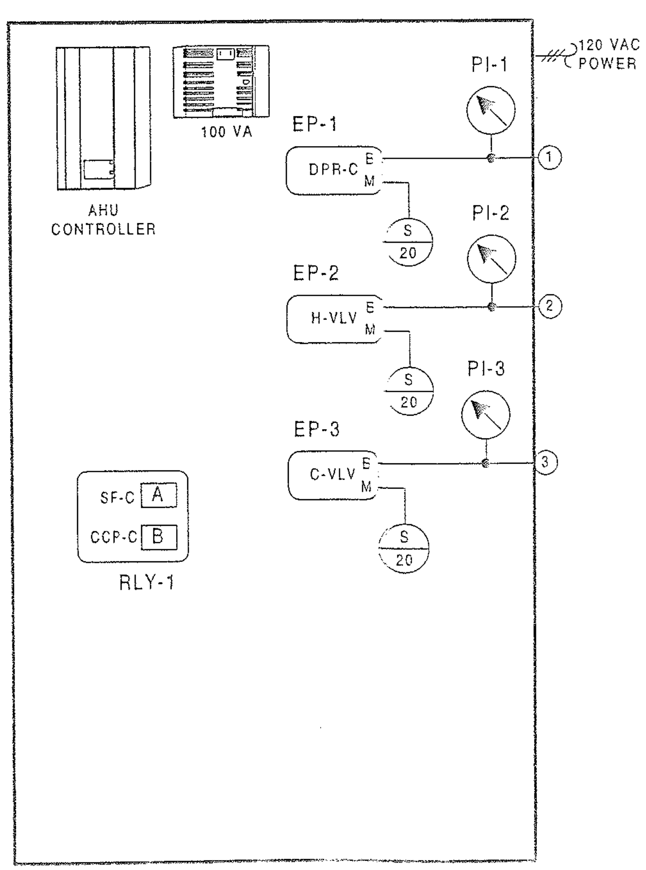
Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

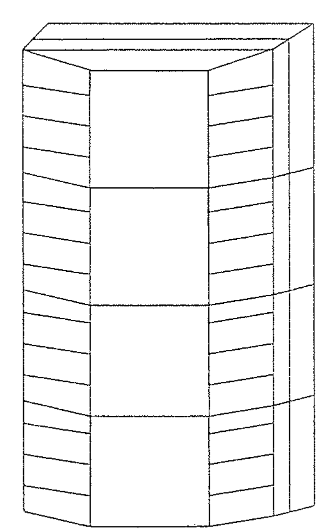
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-16

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-11				AHU						EN-AHU11	Service Level B		M.2-01B												Power to Controller
		AHU-11	*			AHU	1	2				EN-AHU11	Service Level B	0	M.2-01B												N2 Trunk
	BO-1	AHU-11	SF-C	Supply Fan Control	Off On	AHU	1	2	BO-1	RLY	BO#,24V,BICOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-1	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-2	AHU-11	TEF1-C	Toilet Exh Fan B1 Control	Off On	AHU	1	2	BO-2		BO#,24V	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-3	AHU-11	CCP-C	Clg Coil Pump 11 Control	Off On	AHU	1	2	BO-3	RLY	BO#,24V,BICOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-3	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-4	AHU-11				AHU	1	2	BO-4			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-4											
	BO-5	AHU-11				AHU	1	2	BO-5			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-5											
	BO-6	AHU-11				AHU	1	2	BO-6			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-6											
	BO-7	AHU-11				AHU	1	2	BO-7			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-7											
	BO-8	AHU-11				AHU	1	2	BO-8			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-8											
	BO-9	AHU-11				AHU	1	2	BO-9			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-9											
	BO-10	AHU-11				AHU	1	2	BO-10			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BO-10											
	AO-1	AHU-11	DPR-C	Damper Control	% Open	AHU	1	2	AO-1		AO#,AOCOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-11	H-VLV	Heating Coil Valve	% Open	AHU	1	2	AO-2		AO#,AOCOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-11	C-VLV	Cooling Coil Valve	% Open	AHU	1	2	AO-3		AO#,AOCOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-11				AHU	1	2	AO-4			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AO-4											
	AO-5	AHU-11				AHU	1	2	AO-5			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AO-5											
	AO-6	AHU-11				AHU	1	2	AO-6			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AO-6											
	BI-1	AHU-11	SF-S	Supply Fan Status	Off On	AHU	1	2	BI-1		BI#,BICOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-11	SMK-DET	Smoke Detectors	Normal Alarm	AHU	1	2	BI-2		BI#,BICOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-2						2/22	Device dependent	Contact (NO)		A40	
	BI-3	AHU-11	LT-S	Low Temperature Stat	Normal Alarm	AHU	1	2	BI-3		BI#,BICOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-3						2/22	Device dependent	Contact (NO)		A40	
	BI-4	AHU-11	CCP-S	Clg Coil Pump 11 Status	Off On	AHU	1	2	BI-4		BI#,BICOM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-4						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-5	AHU-11				AHU	1	2	BI-5			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-5											
	BI-6	AHU-11				AHU	1	2	BI-6			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-6											
	BI-7	AHU-11				AHU	1	2	BI-7			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-7											
	BI-8	AHU-11				AHU	1	2	BI-8			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-BI-8											
	AI-1	AHU-11	DA-T	Disch Air Temperature	Deg F	AHU	1	2	AI-1		AI#,AICM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-1						2/18	2-Wire	TE-6315P-1		A4	
	AI-2	AHU-11	RA-T	Return Air Temperature	Deg F	AHU	1	2	AI-2		AI#,AICM	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-2						2/18	2-Wire	TE-6315P-1		A4	
	AI-3	AHU-11				AHU	1	2	AI-3			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-3											
	AI-4	AHU-11	ZN-T	Zone Temperature	Deg F	AHU	1	2	AI-4		PHONE JACK	EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-4						8/26	PHONE JACK	TE-6410W-1000		A5	
	AI-5	AHU-11				AHU	1	2	AI-5			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-5											
	AI-6	AHU-11				AHU	1	2	AI-6			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-6											
	AI-7	AHU-11				AHU	1	2	AI-7			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-7											
	AI-8	AHU-11				AHU	1	2	AI-8			EN-AHU11	Service Level B	0	M.2-01B	AHU11-2-AI-8											









ENCLOSURE EN-AHU-12
AS-AHU103-300
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 3

FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B2	SERVICE LEVEL	RP2SRB	53	SERVICE LEVEL

BILL OF MATERIALS

Estimate: ahu-12 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T,RA-T	2	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-12	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
SPC-12-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-2	1	T-3610-1001	STAT,LOW VOL ,8' AVG, DCT
TEF-B2	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-12	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-12-1, D-12-3 AND COOLING COIL VALVE V-C-12 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-12-2 WILL BE OPEN AND HEATING COIL VALVE V-H-12 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-12 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-12-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-12-1, AND RELIEF AIR DAMPER D-12-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-12-2 IS OPEN. OUTSIDE AIR DAMPER D-12-1 WILL OPEN ITS MINIMUM OPEN POSITION AFTER THE WARM-UP MODE IS STOPPED. ROOM SENSOR TR-12, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-12 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, TR-12 WILL GRADUALLY MODULATE DAMPER D-12-1 OPEN WHILE SIMULTANEOUSLY CLOSING D-12-2. STATIC PRESSURE CONTROLLER SPC-12-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-12-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-2, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE TR-12 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-12 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-12 WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50) ACTIVATE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY FAN AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-12-1 AND RETURN DAMPER D-12-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), OUTSIDE AIR DAMPERS D-12-1 WILL CLOSE, OPENING RETURN AIR DAMPER D-12-2. ROOM SENSOR TR-12, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-12-1 AND D-12-2 AND CHILLED WATER VALVE V-C-12 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-12 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY FAN AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B2 - FAN WILL START WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:17 PM
FILE NAME AHU-12.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-12
BROADCAST MEDIA

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

AS-BUILT 7/18/00 CME

REFERENCE DRAWING | NO | REVISION-LOCATION | ECN | DATE | BY

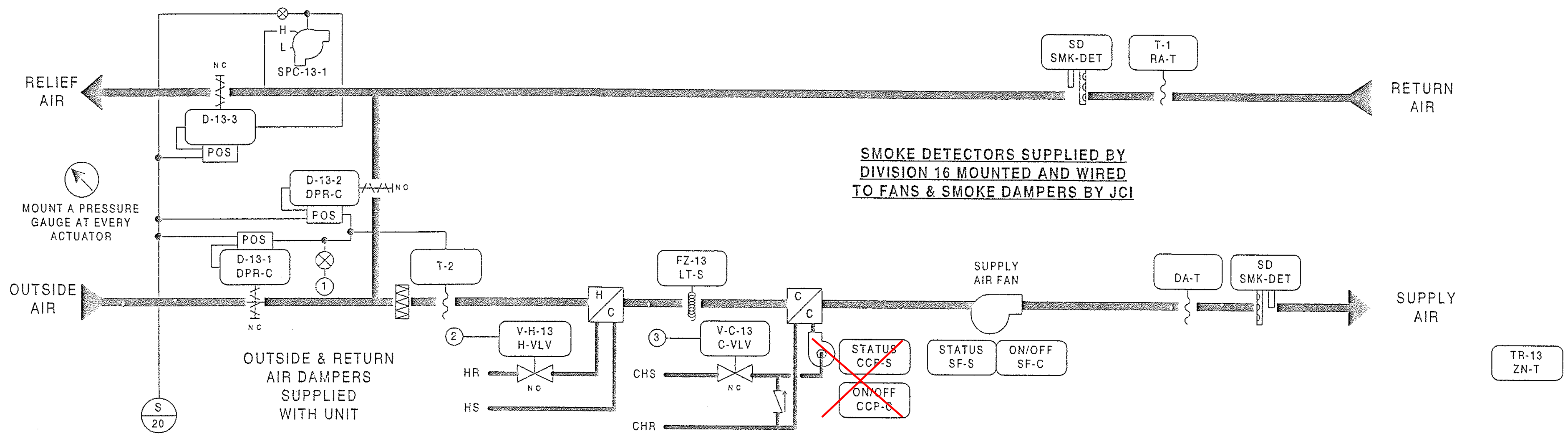
Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 09/02/97

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-17

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-12					AHU						EN-AHU12	Service Level B		M.2-01B												Power to Controller
		AHU-12	*				AHU	1	3				EN-AHU12	Service Level B	0	M.2-01B												N2 Trunk
	BO-1	AHU-12	SF-C	Supply Fan Control	Off	On	AHU	1	3	BO-1	RLY	BO#,24V,BICOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-1	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-2	AHU-12	TEF2-C	Toilet Exh Fan B2 Control	Off	On	AHU	1	3	BO-2		BO#,24V	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-3	AHU-12	CCP-C	Clg Coil Pump 12 Control	Off	On	AHU	1	3	BO-3	RLY	BO#,24V,BICOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-3	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-4	AHU-12					AHU	1	3	BO-4			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-4											
	BO-5	AHU-12					AHU	1	3	BO-5			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-5											
	BO-6	AHU-12					AHU	1	3	BO-6			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-6											
	BO-7	AHU-12					AHU	1	3	BO-7			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-7											
	BO-8	AHU-12					AHU	1	3	BO-8			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-8											
	BO-9	AHU-12					AHU	1	3	BO-9			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-9											
	BO-10	AHU-12					AHU	1	3	BO-10			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BO-10											
	AO-1	AHU-12	DPR-C	Damper Control	% Open		AHU	1	3	AO-1		AO#,AOCOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-12	H-VLV	Heating Coil Valve	% Open		AHU	1	3	AO-2		AO#,AOCOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-12	C-VLV	Cooling Coil Valve	% Open		AHU	1	3	AO-3		AO#,AOCOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-12					AHU	1	3	AO-4			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AO-4											
	AO-5	AHU-12					AHU	1	3	AO-5			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AO-5											
	AO-6	AHU-12					AHU	1	3	AO-6			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AO-6											
	BI-1	AHU-12	SF-S	Supply Fan Status	Off	On	AHU	1	3	BI-1		BI#,BICOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-12	SMK-DET	Smoke Detectors	Normal	Alarm	AHU	1	3	BI-2		BI#,BICOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-2						2/22	Device dependent	Contact (NO)		A40	
	BI-3	AHU-12	LT-S	Low Temperature Stat	Normal	Alarm	AHU	1	3	BI-3		BI#,BICOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-3						2/22	NO,M1	A70 (NC)		A41	
	BI-4	AHU-12	CCP-S	Clg Coil Pump 12 Status	Off	On	AHU	1	3	BI-4		BI#,BICOM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-4						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-5	AHU-12					AHU	1	3	BI-5			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-5											
	BI-6	AHU-12					AHU	1	3	BI-6			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-6											
	BI-7	AHU-12					AHU	1	3	BI-7			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-7											
	BI-8	AHU-12					AHU	1	3	BI-8			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-BI-8											
	AI-1	AHU-12	DA-T	Disch Air Temperature	Deg F		AHU	1	3	AI-1		AI#,AICM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-1						2/18	2-Wire	TE-6315P-1		A4	
	AI-2	AHU-12	RA-T	Return Air Temperature	Deg F		AHU	1	3	AI-2		AI#,AICM	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-2						2/18	2-Wire	TE-6315P-1		A4	
	AI-3	AHU-12					AHU	1	3	AI-3			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-3											
	AI-4	AHU-12	ZN-T	Zone Temperature	Deg F		AHU	1	3	AI-4		PHONE JACK	EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-4						8/26	PHONE JACK	TE-6410W-1000		A5	
	AI-5	AHU-12					AHU	1	3	AI-5			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-5											
	AI-6	AHU-12					AHU	1	3	AI-6			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-6											
	AI-7	AHU-12					AHU	1	3	AI-7			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-7											
	AI-8	AHU-12					AHU	1	3	AI-8			EN-AHU12	Service Level B	0	M.2-01B	AHU12-3-AI-8											



BILL OF MATERIALS

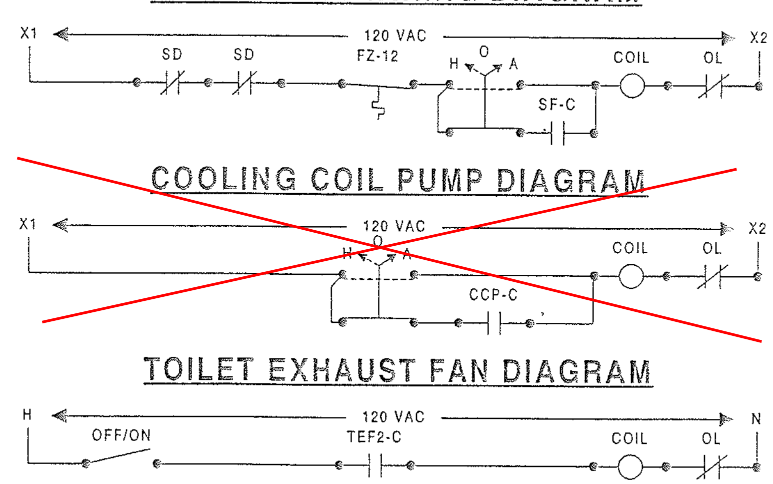
Estimate: ahu-13 — 70520098.pre

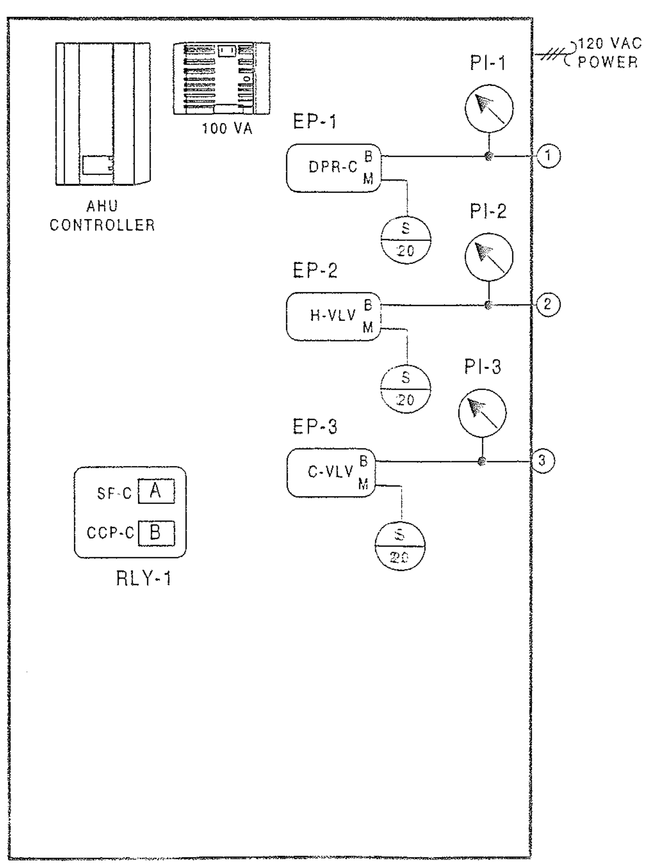
Desig.	Qty	Part #	Description
Field Devices:			
DA-T,RA-T	2	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
DPR-C	3	D-3153-1	DMPR ACT,8-13#,W/PILOT
	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
FZ-13	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
SPC-13-1	1	R-317-1	CNTRLR DP,0.05-1"WG
T-2	1	T-3610-1001	STAT,LOW VOL ,8' AVG, DCT
TEF-B4,SEF-3 ,SEF-4	3	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	3	PD-101-35	RLY BASE,3PDT,11PIN,10A
	3	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-13	1	AS-AHU103-300	AHU TERM BD IN EWC35
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

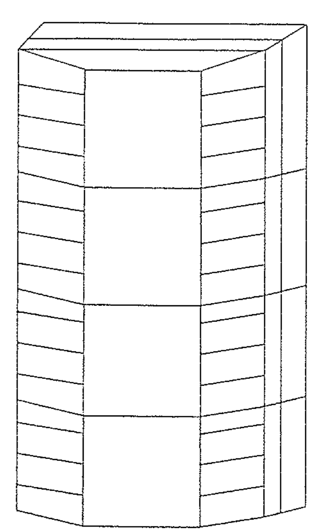
SUPPLY FAN WIRING DIAGRAM

~~COOLING COIL PUMP DIAGRAM~~

TOILET EXHAUST FAN DIAGRAM







ENCLOSURE EN-AHU-13
AS AHU103-300
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 4

FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B4	SERVICE LEVEL	RP2SRB	45	SERVICE LEVEL
SEF-3	SERVICE LEVEL	STARTER		SERVICE LEVEL
SEF-4	SERVICE LEVEL	STARTER		SERVICE LEVEL

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AND RELIEF AIR DAMPERS D-13-1, D-13-3 AND COOLING COIL VALVE V-C-13 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-13-2 WILL BE OPEN AND HEATING COIL VALVE V-H-13 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-13 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-13-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPERS D-13-1, AND RELIEF AIR DAMPER D-13-3 CLOSED. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-13-2 IS OPEN. OUTSIDE AIR DAMPER D-13-1 WILL OPEN ITS MINIMUM OPEN POSITION AFTER THE WARM-UP MODE IS STOPPED. ROOM SENSOR TR-13, THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-13 CLOSED TO THE HEATING COIL. ON A FURTHER RISE, TR-13 WILL GRADUALLY MODULATE DAMPER D-13-1 OPEN WHILE SIMULTANEOUSLY CLOSING D-13-2. STATIC PRESSURE CONTROLLER SPC-13-1 LOCATED IN THE ENTERING SIDE OF THE RELIEF DAMPER WILL OVERRIDE THE CONTROL AND MODULATE D-13-3 TO MAINTAIN IT'S SETTING TO ENSURE A POSITIVE BUILDING PRESSURE. LOW LIMIT THERMOSTAT T-2, SENSITIVE TO THE COLDEST SPOT IN THE AIR STREAM, WILL OVERRIDE TR-13 TO PREVENT MIXED AIR FROM FALLING BELOW ITS SETTING OF FORTY (40F). ON A FALL IN TEMPERATURE, THE REVERSE WILL OCCUR. COOLING COIL VALVE V-C-13 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-13 WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50) ACTIVATE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY FAN AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-13-1 AND RETURN DAMPER D-13-2 WILL, THROUGH THE METASYS SYSTEM CONTROL UNIT, BE UNDER FLOATING DRY BULB DIFFERENTIAL CONTROL WHICH WILL COMPARE THE TEMPERATURE OF THE RETURN AND OUTSIDE AIR STREAMS. THE OUTSIDE AIR WILL BE UTILIZED WHENEVER IT IS GREATER THAN SEVEN (7F) LESS THAN THE RETURN AIR TEMPERATURE. WHEN THE DIFFERENTIAL FALLS BELOW SEVEN (7F), OUTSIDE AIR DAMPERS D-13-1 WILL CLOSE, OPENING RETURN AIR DAMPER D-13-2. ROOM SENSOR TR-13, THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL IN SEQUENCE MODULATE OUTSIDE AND RETURN DAMPERS D-13-1 AND D-13-2 AND CHILLED WATER VALVE V-C-13 TO MAINTAIN ITS SETTING OF FORTY-FIVE (45F). HEATING COIL VALVE V-H-13 WILL REMAIN CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY FAN AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B4 - FAN WILL START WHEN THE AHU SUPPLY FAN IS STARTED AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

SMOKE EXHAUST FANS SEF-3,SEF-4 - LEAD FAN WILL START WHEN HVU-11, HVU-12 OR HVU-13 SUPPLY FANS ARE STARTED. SEE DRAWINGS FOR INDIVIDUAL HVU CONTROLS.

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	03:15 PM
FILE NAME	AHU-13.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-13
SECURITY

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/02/97	BY DATE

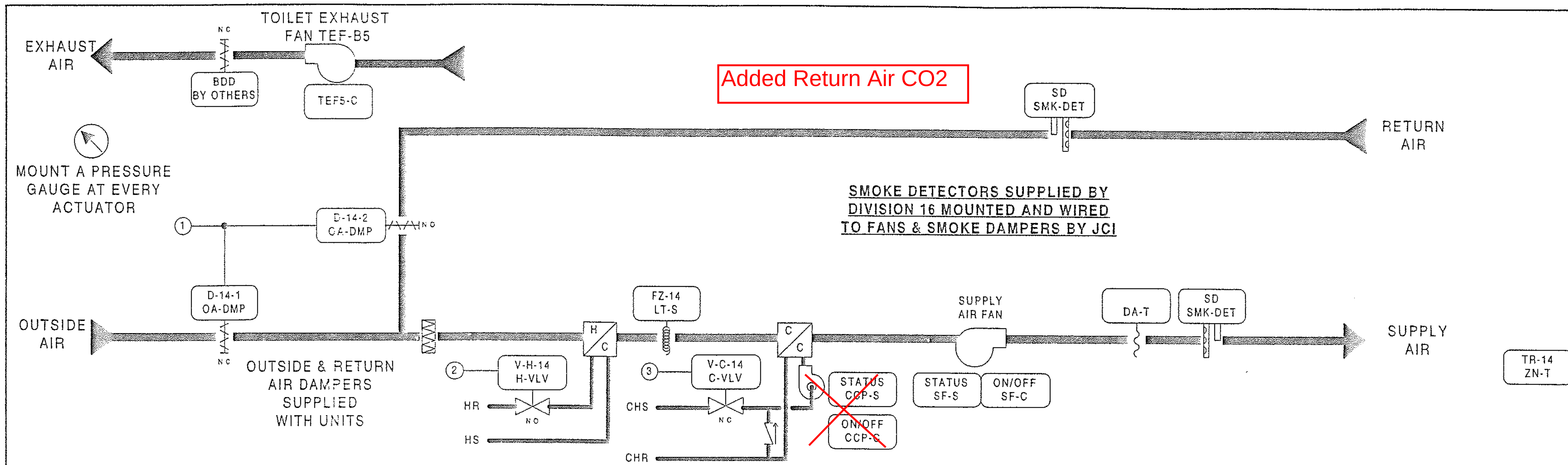
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

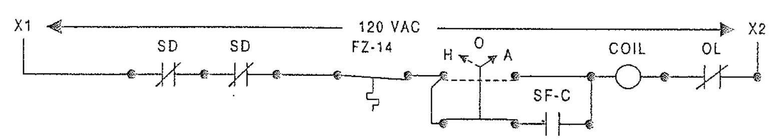
CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-18

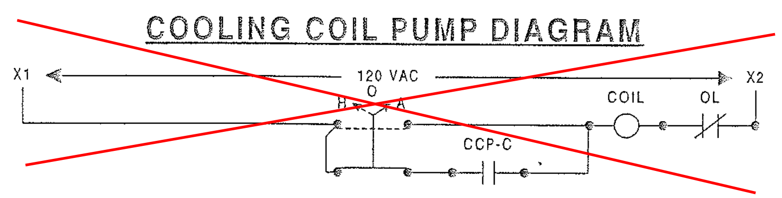
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-13					AHU						EN-AHU13	Service Level B		M.2-01B												Power to Controller
		AHU-13	*				AHU	1	4				EN-AHU13	Service Level B	0	M.2-01B												N2 Trunk
	BO-1	AHU-13	SF-C	Supply Fan Control	Off	On	AHU	1	4	BO-1	RLY	BO#,24V,BICOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-1	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-2	AHU-13	TEF4-C	Toilet Exh Fan B4 Control	Off	On	AHU	1	4	BO-2		BO#,24V	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-3	AHU-13	CCP-C	Clg Coil Pump 13 Control	Off	On	AHU	1	4	BO-3	RLY	BO#,24V,BICOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-3	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		A53	
	BO-4	AHU-13	SEF3-C	Smoke Exh Fan 3 Control	Off	On	AHU	1	4	BO-4		BO#,24V	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-5	AHU-13	SEF4-C	Smoke Exh Fan 4 Control	Off	On	AHU	1	4	BO-5		BO#,24V	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-5			PD-109-51			2/18	Device dependent	24VAC OUT		A50	
	BO-6	AHU-13					AHU	1	4	BO-6			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-6											
	BO-7	AHU-13					AHU	1	4	BO-7			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-7											
	BO-8	AHU-13					AHU	1	4	BO-8			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-8											
	BO-9	AHU-13					AHU	1	4	BO-9			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-9											
	BO-10	AHU-13					AHU	1	4	BO-10			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BO-10											
	AO-1	AHU-13	DPR-C	Damper Control	% Open		AHU	1	4	AO-1		AO#,AOCOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AO-1	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-2	AHU-13	H-VLV	Heating Coil Valve	% Open		AHU	1	4	AO-2		AO#,AOCOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AO-2	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-3	AHU-13	C-VLV	Cooling Coil Valve	% Open		AHU	1	4	AO-3		AO#,AOCOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AO-3	2/18	+,-	EP-8000-4	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		A28	
	AO-4	AHU-13					AHU	1	4	AO-4			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AO-4											
	AO-5	AHU-13					AHU	1	4	AO-5			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AO-5											
	AO-6	AHU-13					AHU	1	4	AO-6			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AO-6											
	BI-1	AHU-13	SF-S	Supply Fan Status	Off	On	AHU	1	4	BI-1		BI#,BICOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-1						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-2	AHU-13	SMK-DET	Smoke Detectors	Normal	Alarm	AHU	1	4	BI-2		BI#,BICOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-2						2/22	Device dependent	Contact (NO)		A40	
	BI-3	AHU-13	LT-S	Low Temperature Stat	Normal	Alarm	AHU	1	4	BI-3		BI#,BICOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-3						2/22	NO,M1	A70 (NC)		A41	
	BI-4	AHU-13	CCP-S	Clg Coil Pump 13 Status	Off	On	AHU	1	4	BI-4		BI#,BICOM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-4						2/22	Device dependent	Aux Contact (NO)		A40	
	BI-5	AHU-13					AHU	1	4	BI-5			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-5											
	BI-6	AHU-13					AHU	1	4	BI-6			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-6											
	BI-7	AHU-13					AHU	1	4	BI-7			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-7											
	BI-8	AHU-13					AHU	1	4	BI-8			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-BI-8											
	AI-1	AHU-13	DA-T	Disch Air Temperature	Deg F		AHU	1	4	AI-1		AI#,AICM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-1						2/18	2-Wire	TE-6315P-1		A4	
	AI-2	AHU-13	RA-T	Return Air Temperature	Deg F		AHU	1	4	AI-2		AI#,AICM	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-2						2/18	2-Wire	TE-6315P-1		A4	
	AI-3	AHU-13					AHU	1	4	AI-3			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-3											
	AI-4	AHU-13	ZN-T	Zone Temperature	Deg F		AHU	1	4	AI-4		PHONE JACK	EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-4						8/26	PHONE JACK	TE-6410W-1000		A5	
	AI-5	AHU-13					AHU	1	4	AI-5			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-5											
	AI-6	AHU-13					AHU	1	4	AI-6			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-6											
	AI-7	AHU-13					AHU	1	4	AI-7			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-7											
	AI-8	AHU-13					AHU	1	4	AI-8			EN-AHU13	Service Level B	0	M.2-01B	AHU13-4-AI-8											



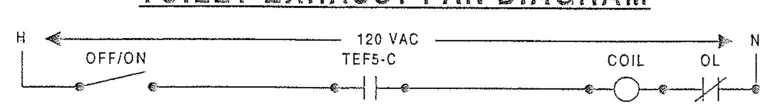
SUPPLY FAN WIRING DIAGRAM



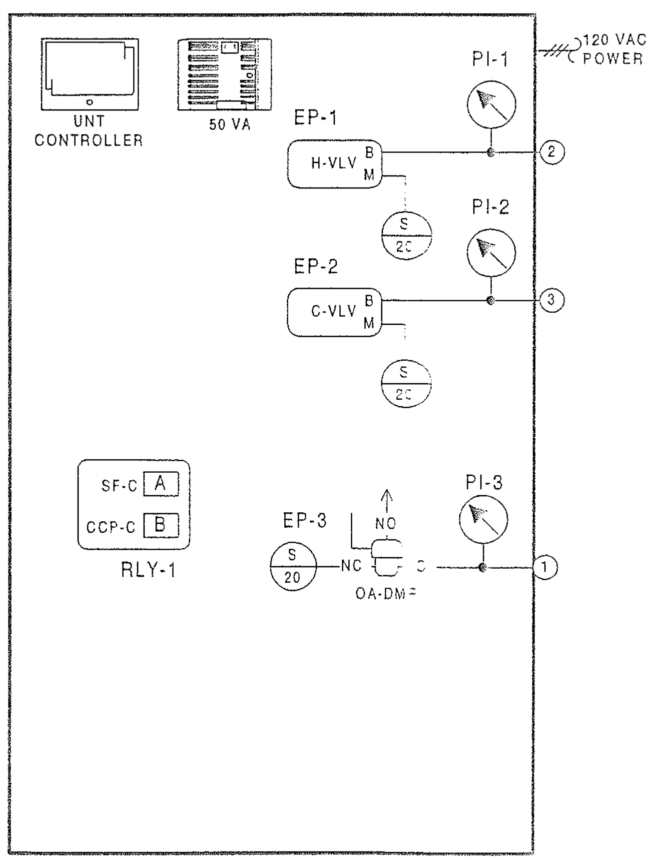
COOLING COIL PUMP DIAGRAM

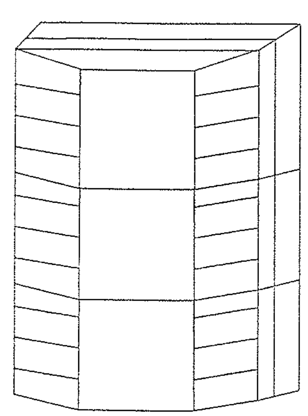


TOILET EXHAUST FAN DIAGRAM



FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B5	SERVICE LEVEL	STARTER		SERVICE LEVEL





ENCLOSURE EN-AHU-14
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 5

BILL OF MATERIALS

Estimate: ahu-14 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T	1	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
FZ-14	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
TEF-B5	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-14	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-14-1, AND COOLING COIL VALVE V-C-14 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-14-2 WILL BE OPEN AND HEATING COIL VALVE V-H-14 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-14 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-14-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-14-1 CLOSED. EXHAUST FAN TEF-B5 WILL BE OFF AND EXHAUST AIR DAMPER D-14-3 (BDD) WILL BE CLOSED DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-14 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. RETURN AIR DAMPER D-14-2 WILL CLOSE. OUTSIDE AIR DAMPER D-14-1 WILL OPEN AND EXHAUST FAN TEF-B5 WILL START AND RUN CONTINUOUSLY CAUSING EXHAUST AIR DAMPER D-14-3 (BDD) TO OPEN AFTER THE WARM-UP MODE IS STOPPED. ROOM SENSOR TR-14 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-14 CLOSED TO THE HEATING COIL. COOLING COIL VALVE V-C-14 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-14. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND EXHAUST FAN TEF-B5 AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-14-1 AND EXHAUST AIR DAMPER D-14-3 (BDD) WILL OPEN. ROOM SENSOR TR-14 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL MODULATE CHILLED WATER VALVE V-C-14 TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F). THE HEATING COIL VALVE V-H-14 WILL BE CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B5 - THE FAN WILL START WHEN THE AHU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:16 PM
FILE NAME AHU-14.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-14
OFFICIALS

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

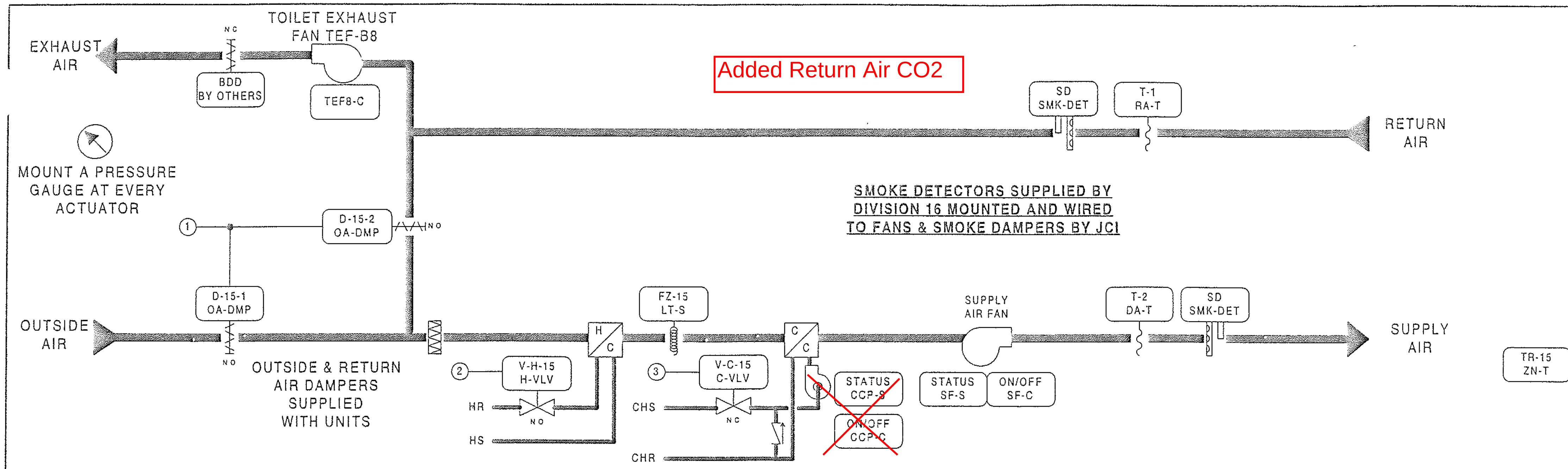
Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 09/03/97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-19

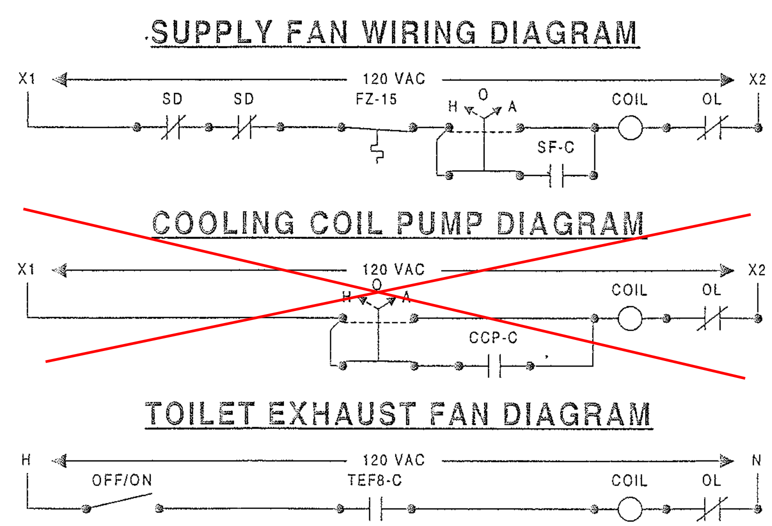
Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-14				UNT						EN-AHU14	Service Level B		M.2-01B												Power to Controller
		AHU-14	*			UNT	1	5				EN-AHU14	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	AHU-14	DA-T	Disch Air Temperature	Deg F	UNT	1	5	AI-1		AI#,AICM	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AI-1						2/18	2-Wire	TE-6315P-1		U1	
	AI-2	AHU-14				UNT	1	5	AI-2			EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AI-2											
	AI-3	AHU-14				UNT	1	5	AI-3			EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AI-3											
	AI-4	AHU-14	ZN-T	Zone Temperature	Deg F	UNT	1	5	AI-4		PHONE JACK	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	AHU-14				UNT	1	5	AI-5			EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AI-5											
	AI-6	AHU-14				UNT	1	5	AI-6			EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AI-6											
	BI-1	AHU-14	SF-S	Supply Fan Status	Off On	UNT	1	5	BI-1		BI#,24VAC	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-14	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	5	BI-2		BI#,24VAC	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-14	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	5	BI-3		BI#,24VAC	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-14	CCP-S	Clg Coil Pump 14 Status	Off On	UNT	1	5	BI-4		BI#,24VAC	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-14	SF-C	Supply Fan Control	Off On	UNT	1	5	BO-1	RLY	BO#,24V,COM	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-14	TEF5-C	Toilet Exh Fan B5 Control	Off On	UNT	1	5	BO-2		BO#,24VAC	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	AHU-14	OA-DMP	Outside Air Damper	Closed Open	UNT	1	5	BO-3		BO#,24VAC	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BO-3			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	AHU-14	CCP-C	Clg Coil Pump 14 Control	Off On	UNT	1	5	BO-4	RLY	BO#,24V,COM	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-14				UNT	1	5	BO-5			EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BO-5											
	BO-6	AHU-14				UNT	1	5	BO-6			EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-BO-6											
	AO-1	AHU-14	H-VLV	Heating Coil Valve	% Open	UNT	1	5	AO-1		AO#,AOCM,24VA	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-14	C-VLV	Cooling Coil Valve	% Open	UNT	1	5	AO-2		AO#,AOCM,24VA	EN-AHU14	Service Level B	0	M.2-01B	AHU14-5-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	

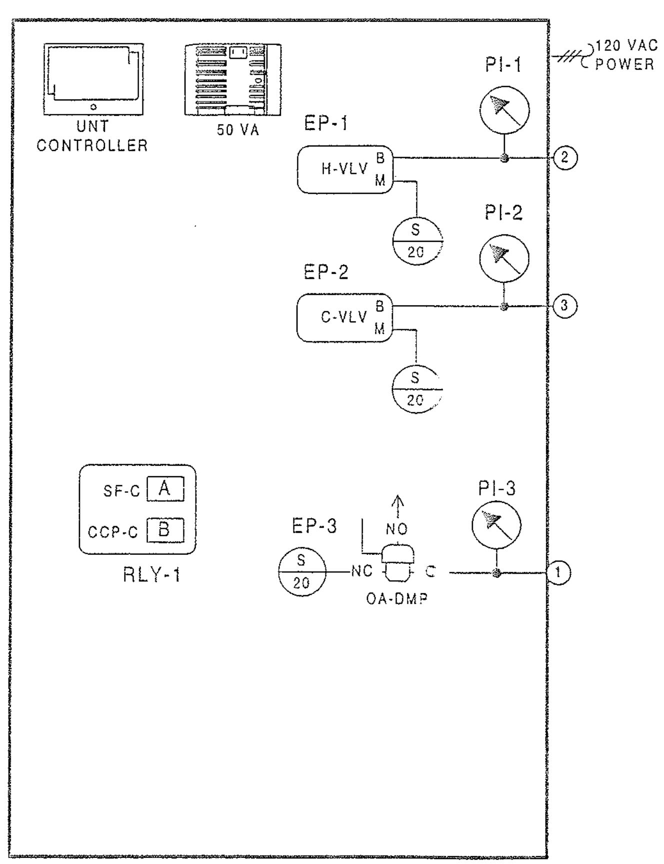


BILL OF MATERIALS

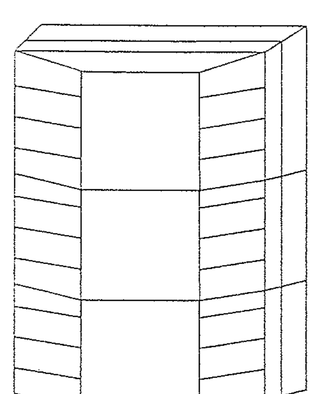
Estimate: ahu-15 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T,RA-T	2	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
FZ-15	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
TEF-B8	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-15	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-C	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-C	RELAY; 2SPDT 5 AMP 240VAC





FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B8	SERVICE LEVEL	STARTER		SERVICE LEVEL



ENCLOSURE EN-AHU-15
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 6

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-15-1, AND COOLING COIL VALVE V-C-15 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-15-2 WILL BE OPEN AND HEATING COIL VALVE V-H-15 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-15 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-15-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-15-1 CLOSED. EXHAUST FAN TEF-B8 WILL BE OFF AND EXHAUST AIR DAMPER D-15-3 (BDD) WILL BE CLOSED DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-15-2 WILL CLOSE. OUTSIDE AIR DAMPER D-15-1 WILL OPEN AND EXHAUST FAN TEF-B8 WILL START AND RUN CONTINUOUSLY CAUSING EXHAUST AIR DAMPER D-15-3 (BDD) TO OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE AIR SENSOR T-2 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FIFTY-FIVE (55F) MODULATE V-H-15 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. COOLING COIL VALVE V-C-15 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-15. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND EXHAUST FAN TEF-B8 AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-15-1 AND EXHAUST AIR DAMPER D-15-3 (BDD) WILL OPEN. DISCHARGE AIR SENSOR T-2 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL MODULATE CHILLED WATER VALVE V-C-15 TO MAINTAIN ITS SETTING OF FIFTY-FIVE (55F). THE HEATING COIL VALVE V-H-15 WILL BE CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B8 - THE FAN WILL START WHEN THE AHU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:16 PM
FILE NAME AHU-15.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-15
VISITING LOCKER NO. 1

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/03/97	BY DATE

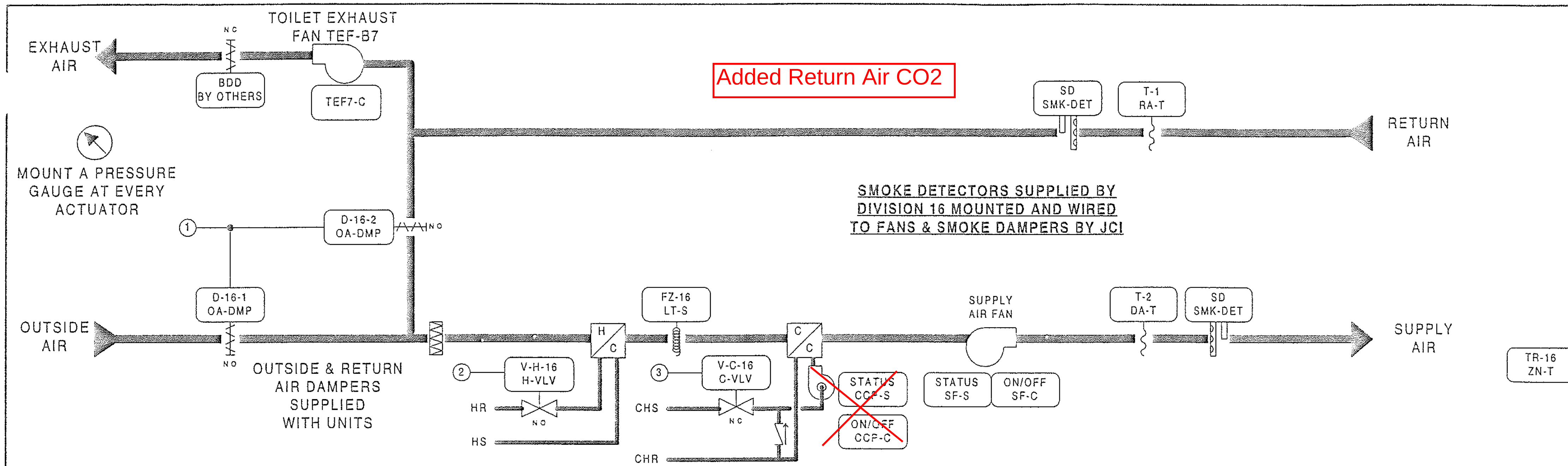
JOHNSON CONTROLS
Systems & Services Division

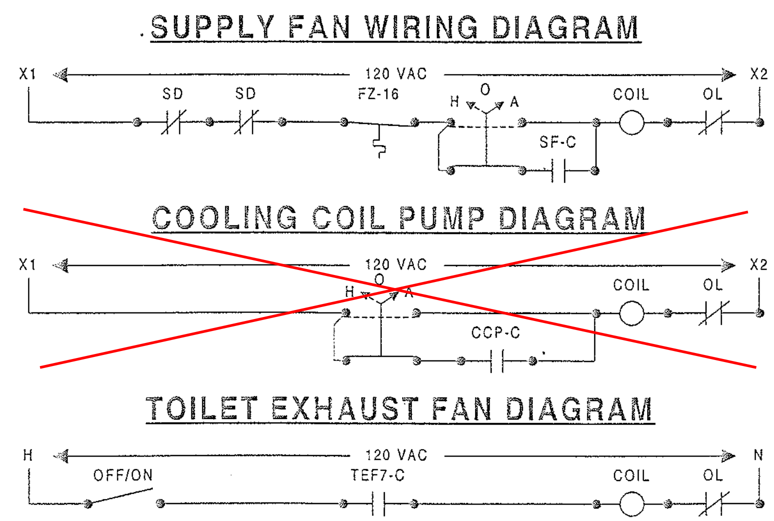
Branch information
JOHNSON CONTROLS
50 LOVETON CIRCLE
SPARKS, MD 21152

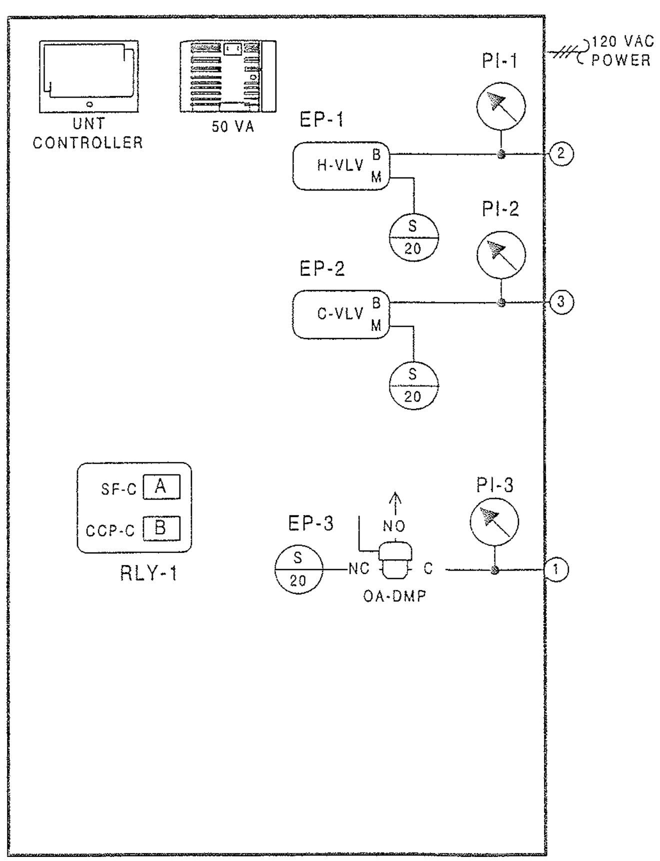
CONTRACT NUMBER 7052-0098

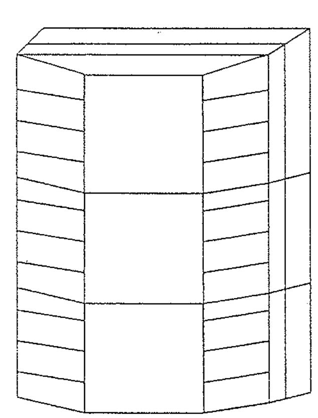
DRAWING NUMBER BL-6559-20

Full Spreadsheet		Software					Digital Controller Information						Panel Information						Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-15					UNT						EN-AHU15	Service Level B		M.2-01B												Power to Controller
		AHU-15	*				UNT	1	6				EN-AHU15	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	AHU-15	RA-T	Return Air Temperature	Deg F		UNT	1	6	AI-1		AI#,AICM	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AI-1						2/18	2-Wire	TE-6315P-1		U1	
	AI-2	AHU-15					UNT	1	6	AI-2			EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AI-2											
	AI-3	AHU-15	DA-T	Disch Air Temperature	Deg F		UNT	1	6	AI-3		AI#,AICM	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AI-3						2/18	2-Wire	TE-6315P-1		U1	
	AI-4	AHU-15	ZN-T	Zone Temperature	Deg F		UNT	1	6	AI-4		PHONE JACK	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	AHU-15					UNT	1	6	AI-5			EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AI-5											
	AI-6	AHU-15					UNT	1	6	AI-6			EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AI-6											
	BI-1	AHU-15	SF-S	Supply Fan Status	Off	On	UNT	1	6	BI-1		BI#,24VAC	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-15	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	6	BI-2		BI#,24VAC	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-15	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	6	BI-3		BI#,24VAC	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-15	CCP-S	Clg Coil Pump 15 Status	Off	On	UNT	1	6	BI-4		BI#,24VAC	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-15	SF-C	Supply Fan Control	Off	On	UNT	1	6	BO-1	RLY	BO#,24V,COM	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-15	TEF8-C	Toilet Exh Fan B8 Control	Off	On	UNT	1	6	BO-2		BO#,24VAC	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	AHU-15	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	6	BO-3		BO#,24VAC	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BO-3			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	AHU-15	CCP-C	Clg Coil Pump 15 Control	Off	On	UNT	1	6	BO-4	RLY	BO#,24V,COM	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-15					UNT	1	6	BO-5			EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BO-5											
	BO-6	AHU-15					UNT	1	6	BO-6			EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-BO-6											
	AO-1	AHU-15	H-VLV	Heating Coil Valve	% Open		UNT	1	6	AO-1		AO#,AOCM,24VA	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-15	C-VLV	Cooling Coil Valve	% Open		UNT	1	6	AO-2		AO#,AOCM,24VA	EN-AHU15	Service Level B	0	M.2-01B	AHU15-6-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	









ENCLOSURE EN-AHU-16
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 7

FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B7	SERVICE LEVEL	STARTER		SERVICE LEVEL

BILL OF MATERIALS

Estimate: ahu-16 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T,RA-T	2	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
FZ-16	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
TEF-B7	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-16	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-16-1, AND COOLING COIL VALVE V-C-16 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-16-2 WILL BE OPEN AND HEATING COIL VALVE V-H-16 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-16 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-16-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-16-1 CLOSED. EXHAUST FAN TEF-B7 WILL BE OFF AND EXHAUST AIR DAMPER D-16-3 (BDD) WILL BE CLOSED DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-16-2 WILL CLOSE. OUTSIDE AIR DAMPER D-16-1 WILL OPEN AND EXHAUST FAN TEF-B7 WILL START AND RUN CONTINUOUSLY CAUSING EXHAUST AIR DAMPER D-16-3 (BDD) TO OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE AIR SENSOR T-2 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FIFTY-FIVE (55F) MODULATE V-H-16 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. COOLING COIL VALVE V-C-16 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-16. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND EXHAUST FAN TEF-B7 AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-16-1 AND EXHAUST AIR DAMPER D-16-3 (BDD) WILL OPEN. DISCHARGE AIR SENSOR T-2 THROUGH THE METASYS SYSTEM CONTROL UNIT . WILL MODULATE CHILLED WATER VALVE V-C-16 TO MAINTAIN ITS SETTING OF FIFTY-FIVE (55F). THE HEATING COIL VALVE V-H-16 WILL BE CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B7 - THE FAN WILL START WHEN THE AHU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:17 PM
FILE NAME AHU-16.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-16
VISITING LOCKER NO. 2
SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

AS-BUILT			7/18/00	CME	
REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

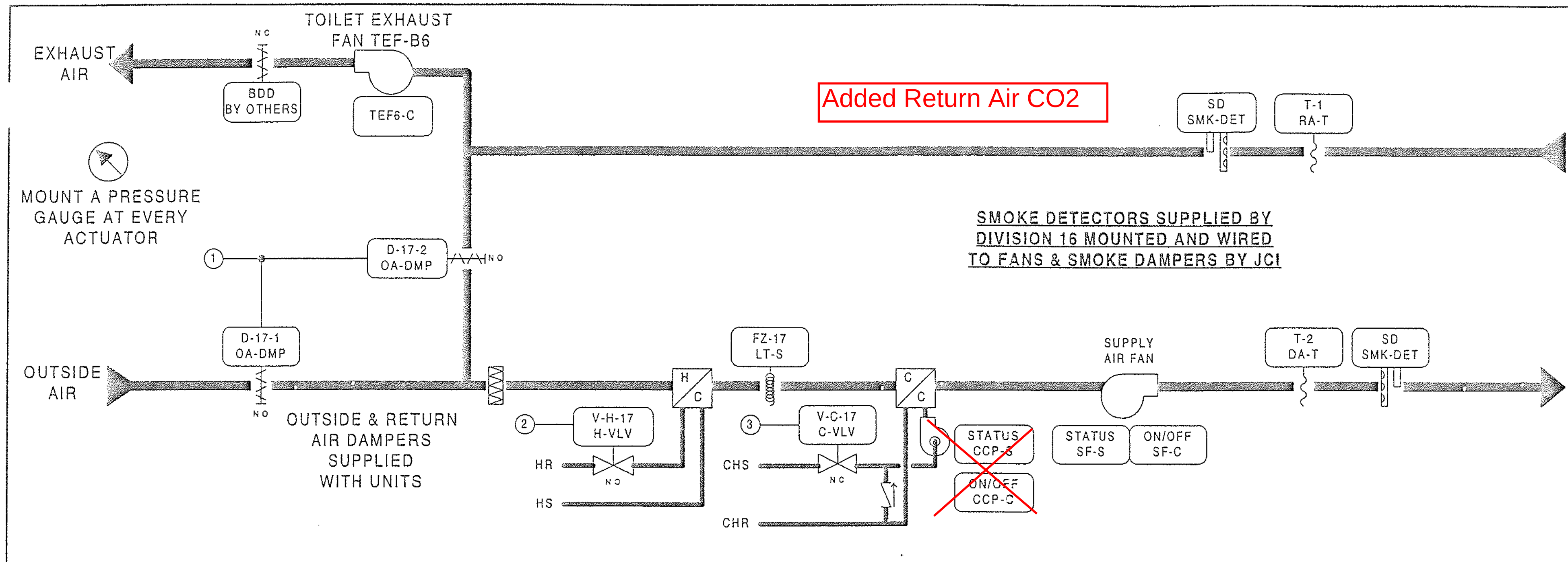
Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 09/04/97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

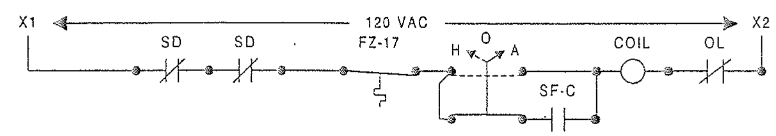
Branch Information
JOHNSON CONTROLS
511 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-21

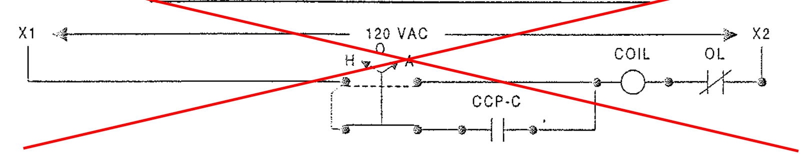
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-16					UNT						EN-AHU16	Service Level B		M.2-01B												Power to Controller
		AHU-16	*				UNT	1	7				EN-AHU16	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	AHU-16	RA-T	Return Air Temperature	Deg F		UNT	1	7	AI-1		AI#,AICM	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AI-1						2/18	2-Wire	TE-6315P-1		U1	
	AI-2	AHU-16					UNT	1	7	AI-2			EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AI-2											
	AI-3	AHU-16	DA-T	Disch Air Temperature	Deg F		UNT	1	7	AI-3		AI#,AICM	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AI-3						2/18	2-Wire	TE-6315P-1		U1	
	AI-4	AHU-16	ZN-T	Zone Temperature	Deg F		UNT	1	7	AI-4		PHONE JACK	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	AHU-16					UNT	1	7	AI-5			EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AI-5											
	AI-6	AHU-16					UNT	1	7	AI-6			EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AI-6											
	BI-1	AHU-16	SF-S	Supply Fan Status	Off	On	UNT	1	7	BI-1		BI#,24VAC	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-16	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	7	BI-2		BI#,24VAC	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-16	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	7	BI-3		BI#,24VAC	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-16	CCP-S	Clg Coil Pump 16 Status	Off	On	UNT	1	7	BI-4		BI#,24VAC	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-16	SF-C	Supply Fan Control	Off	On	UNT	1	7	BO-1	RLY	BO#,24V,COM	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-16	TEF7-C	Toilet Exh Fan B7 Control	Off	On	UNT	1	7	BO-2		BO#,24VAC	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	AHU-16	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	7	BO-3		BO#,24VAC	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BO-3			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	AHU-16	CCP-C	Clg Coil Pump 16 Control	Off	On	UNT	1	7	BO-4	RLY	BO#,24V,COM	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-16					UNT	1	7	BO-5			EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BO-5											
	BO-6	AHU-16					UNT	1	7	BO-6			EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-BO-6											
	AO-1	AHU-16	H-VLV	Heating Coil Valve	% Open		UNT	1	7	AO-1		AO#,AOCM,24VA	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-16	C-VLV	Cooling Coil Valve	% Open		UNT	1	7	AO-2		AO#,AOCM,24VA	EN-AHU16	Service Level B	0	M.2-01B	AHU16-7-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	



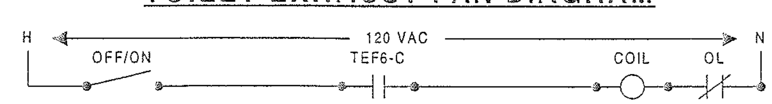
SUPPLY FAN WIRING DIAGRAM



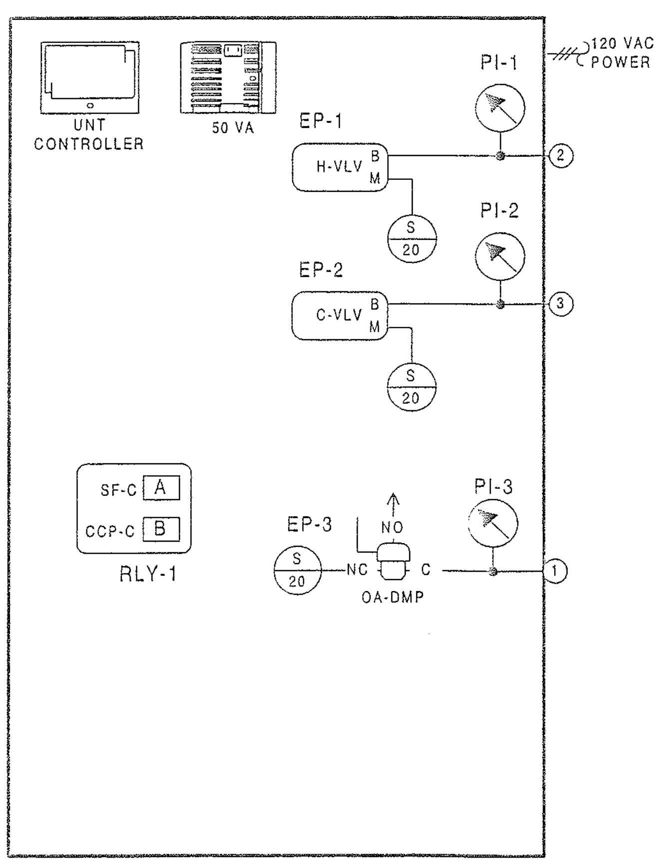
~~COOLING COIL PUMP DIAGRAM~~

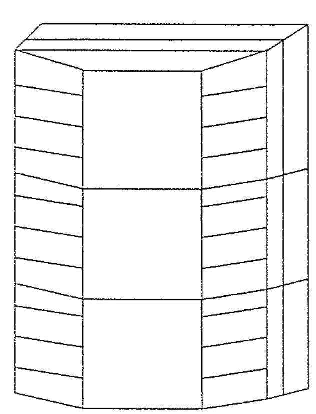


TOILET EXHAUST FAN DIAGRAM



FAN	LOCATION	ELEC PANEL	CIRCUIT	LOCATION
TEF-B6	M CONCOURSE	STARTER		M CONCOURSE





ENCLOSURE EN-AHU-17
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 8

BILL OF MATERIALS

Estimate: ahu-17 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
DA-T,RA-T	2	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
FZ-17	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
TEF-B6	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-17	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-17-1, AND COOLING COIL VALVE V-C-17 WILL CLOSE; COOLING COIL PUMP WILL BE OFF; RETURN AIR DAMPER D-17-2 WILL BE OPEN AND HEATING COIL VALVE V-H-17 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-17 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-17-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-17-1 CLOSED. EXHAUST FAN TEF-B6 WILL BE OFF AND EXHAUST AIR DAMPER D-17-3 (BDD) WILL BE CLOSED DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE RETURN AIR TEMPERATURE REACHES THE SETTING OF T-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-17-2 WILL CLOSE. OUTSIDE AIR DAMPER D-17-1 WILL OPEN AND EXHAUST FAN TEF-B6 WILL START AND RUN CONTINUOUSLY CAUSING EXHAUST AIR DAMPER D-17-3 (BDD) TO OPEN AFTER THE WARM-UP MODE IS STOPPED. DISCHARGE AIR SENSOR T-2 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF FIFTY-FIVE (55F) MODULATE V-H-17 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED. COOLING COIL VALVE V-C-17 WILL BE CLOSED TO THE COIL AND COIL CIRCULATION PUMP WILL BE OFF DURING THE HEATING MODE.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-17. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED COOLING MODE - SUPPLY AND EXHAUST FAN TEF-B6 AND COOLING COIL CIRCULATING PUMP START AND RUN CONTINUOUSLY. OUTSIDE DAMPER D-17-1 AND EXHAUST AIR DAMPER D-17-3 (BDD) WILL OPEN. DISCHARGE AIR SENSOR T-2 THROUGH THE METASYS SYSTEM CONTROL UNIT . WILL MODULATE CHILLED WATER VALVE V-C-17 TO MAINTAIN ITS SETTING OF FIFTY-FIVE (55F). THE HEATING COIL VALVE V-H-17 WILL BE CLOSED TO THE COIL.

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND THE FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-B6 - THE FAN WILL START WHEN THE AHU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:13 PM
FILE NAME AHU-17.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-17
HOME TEAM AREA

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

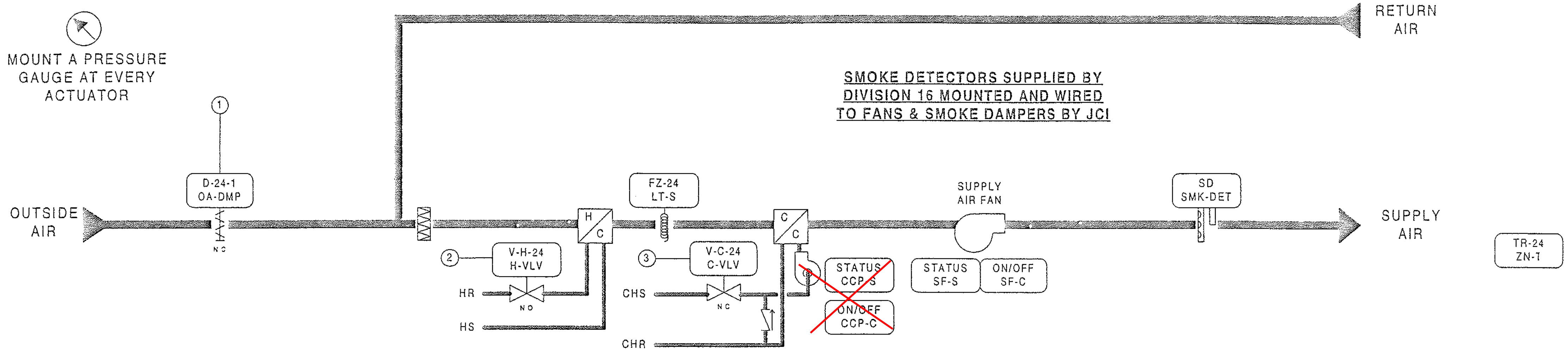
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/04/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

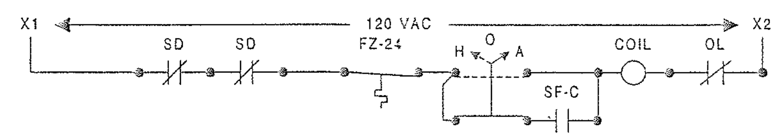
Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

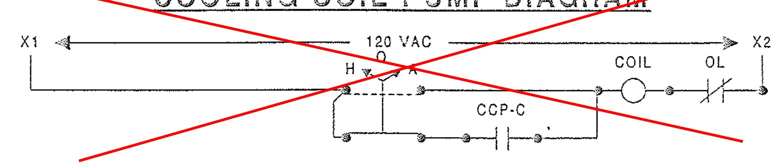
DRAWING NUMBER BL-6559-22

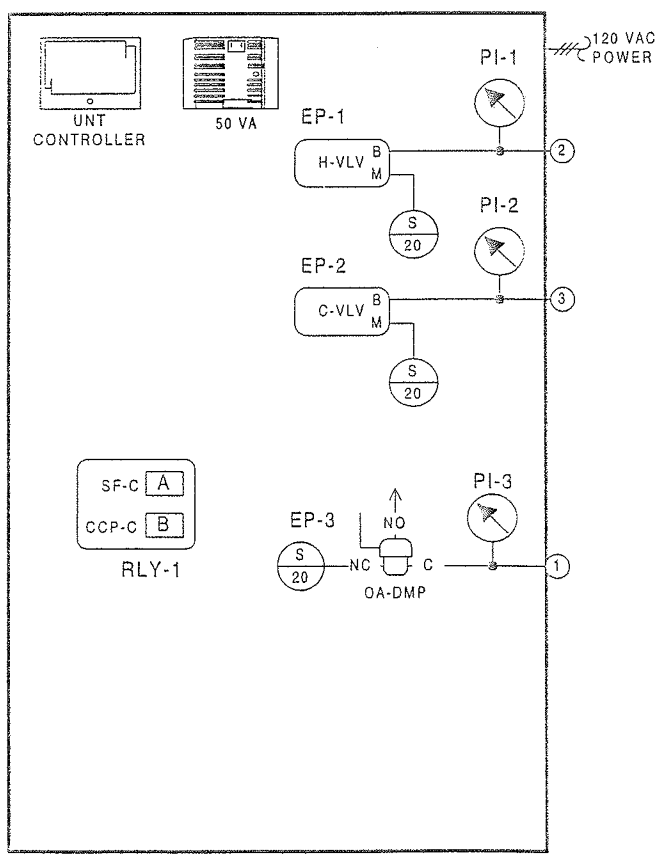


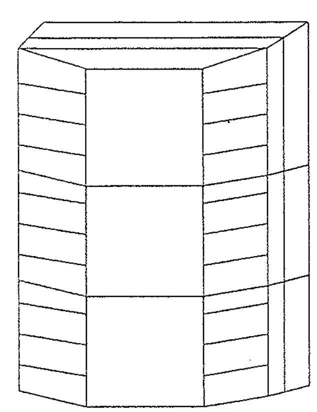
SUPPLY FAN WIRING DIAGRAM



~~COOLING COIL PUMP DIAGRAM~~







ENCLOSURE EN-AHU-24
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-3/N2 ADD = 5

BILL OF MATERIALS

Estimate: ahu-24 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-24-1	1	---	SEE DAMPER SCHEDULE
FZ-24	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-24	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0,10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-24-1, AND COOLING COIL VALVE V-C-24 WILL CLOSE; COOLING COIL PUMP WILL BE OFF, AND HEATING COIL VALVE V-H-24 WILL BE CLOSED TO THE COIL.

OCCUPIED MODE - SUPPLY FAN WILL BE RUNNING, OUTSIDE AIR DAMPER D-24-1 WILL OPEN. ROOM SENSOR TR-24 THROUGH THE METASYS SYSTEM CONTROL UNIT WILL MODULATE HEATING COIL VALVE V-H-24 AND COOLING COIL VALVE V-C-24 IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F). COOLING COIL PUMP WILL START AND RUN CONTINUOUSLY WHENEVER THE COOLING COIL VALVE V-C-24 IS MODULATED OPEN.

UNOCCUPIED MODE - ROOM SENSOR TR-24. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED EXCEPT OUTSIDE AIR DAMPER D-24-1 WILL REMAIN CLOSED ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:25 PM
FILE NAME AHU-24.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-24
TICKET OFFICE

MAIN CONSOURSE QUAD C

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

Reference Drawing	No	Revision-Location	ECN	Date	By
AS-BUILT				7/18/00	CME

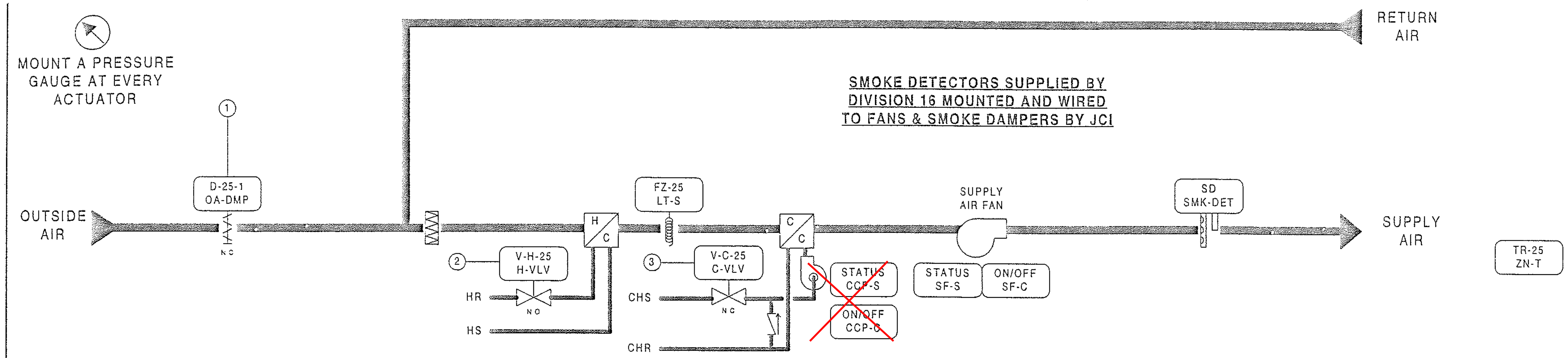
Sales Engineer	Project Manager	Application Engineer	Drawn	Approved
JDP	WJT	RTS	BY RTS DATE 09/05/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING BL-65[illegible]9-26

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-24					UNT						EN-AHU24	AT UNIT														Power to Controller
		AHU-24	*				UNT	1	5				EN-AHU24	AT UNIT	0													N2 Trunk
	AI-1	AHU-24					UNT	1	5	AI-1			EN-AHU24	AT UNIT	0		AHU24-5-AI-1											
	AI-2	AHU-24					UNT	1	5	AI-2			EN-AHU24	AT UNIT	0		AHU24-5-AI-2											
	AI-3	AHU-24					UNT	1	5	AI-3			EN-AHU24	AT UNIT	0		AHU24-5-AI-3											
	AI-4	AHU-24	ZN-T	Zone Temperature	Deg F		UNT	1	5	AI-4		PHONE JACK	EN-AHU24	AT UNIT	0		AHU24-5-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	AHU-24					UNT	1	5	AI-5			EN-AHU24	AT UNIT	0		AHU24-5-AI-5											
	AI-6	AHU-24					UNT	1	5	AI-6			EN-AHU24	AT UNIT	0		AHU24-5-AI-6											
	BI-1	AHU-24	SF-S	Supply Fan Status	Off	On	UNT	1	5	BI-1		BI#,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-24	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	5	BI-2		BI#,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-24	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	5	BI-3		BI#,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-24	CCP-S	Clg Coil Pump Status	Off	On	UNT	1	5	BI-4		BI#,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-24	SF-C	Supply Fan Control	Off	On	UNT	1	5	BO-1	RLY	BO#,24V,COM	EN-AHU24	AT UNIT	0		AHU24-5-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-24					UNT	1	5	BO-2			EN-AHU24	AT UNIT	0		AHU24-5-BO-2											
	BO-3	AHU-24	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	5	BO-3		BO#,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-BO-3			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	AHU-24	CCP-C	Clg Coil Pump Control	Off	On	UNT	1	5	BO-4	RLY	BO#,24V,COM	EN-AHU24	AT UNIT	0		AHU24-5-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-24					UNT	1	5	BO-5			EN-AHU24	AT UNIT	0		AHU24-5-BO-5											
	BO-6	AHU-24					UNT	1	5	BO-6			EN-AHU24	AT UNIT	0		AHU24-5-BO-6											
	AO-1	AHU-24	H-VLV	Heating Coil Valve	% Open		UNT	1	5	AO-1		AO#,AOCM,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-24	C-VLV	Cooling Coil Valve	% Open		UNT	1	5	AO-2		AO#,AOCM,24VAC	EN-AHU24	AT UNIT	0		AHU24-5-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	

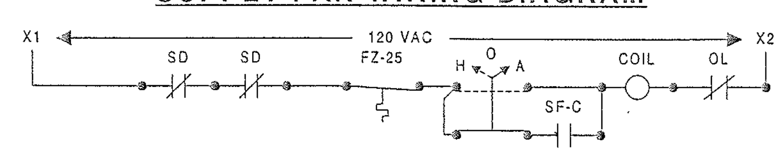


BILL OF MATERIALS

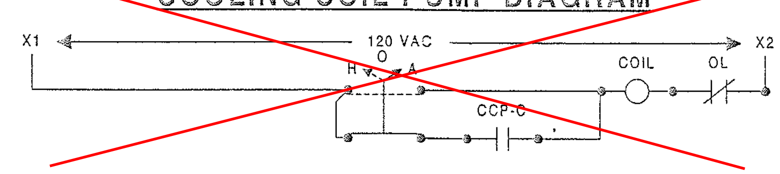
Estimate: ahu-25 70520098.pre

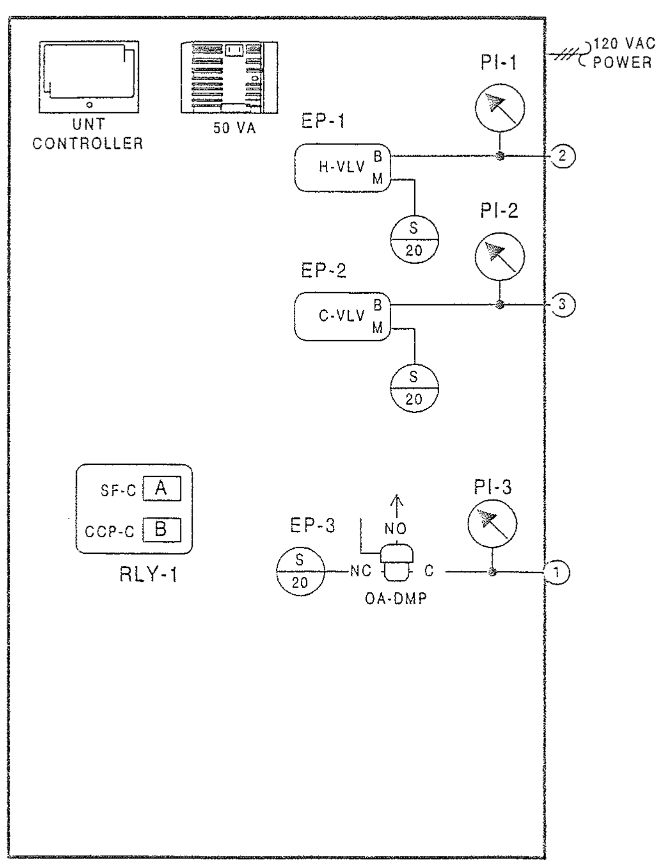
Desig.	Qty	Part #	Description
Field Devices:			
D-25-1	1	---	SEE DAMPER SCHEDULE
FZ-25	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-25	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0-10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

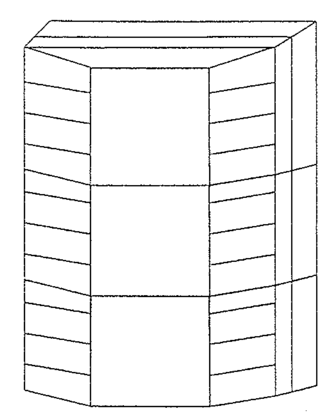
SUPPLY FAN WIRING DIAGRAM



~~COOLING COIL PUMP DIAGRAM~~







ENCLOSURE EN-AHU-25
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-4/N2 ADD = 3

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-25-1, AND COOLING COIL VALVE V-C-25 WILL CLOSE; COOLING COIL PUMP WILL BE OFF, AND HEATING COIL VALVE V-H-25 WILL BE CLOSED TO THE COIL.

OCCUPIED MODE - SUPPLY FAN WILL BE RUNNING, OUTSIDE AIR DAMPER D-25-1 WILL OPEN. ROOM SENSOR TR-25 THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL MODULATE HEATING COIL VALVE V-H-25 AND COOLING COIL VALVE V-C-25 IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F). COOLING COIL PUMP WILL START AND RUN CONTINUOUSLY WHENEVER THE COOLING COIL VALVE V-C-25 IS MODULATED OPEN.

UNOCCUPIED MODE - ROOM SENSOR TR-25, WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED EXCEPT OUTSIDE AIR DAMPER D-25-1 WILL REMAIN CLOSED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:24 PM
FILE NAME AHU-25.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-25
TICKET OFFICE

MAIN CONSOURSE QUAD D

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN		APPROVED	
JDP	WJT	RTS	BY RTS	DATE 09/05/97	BY	DATE

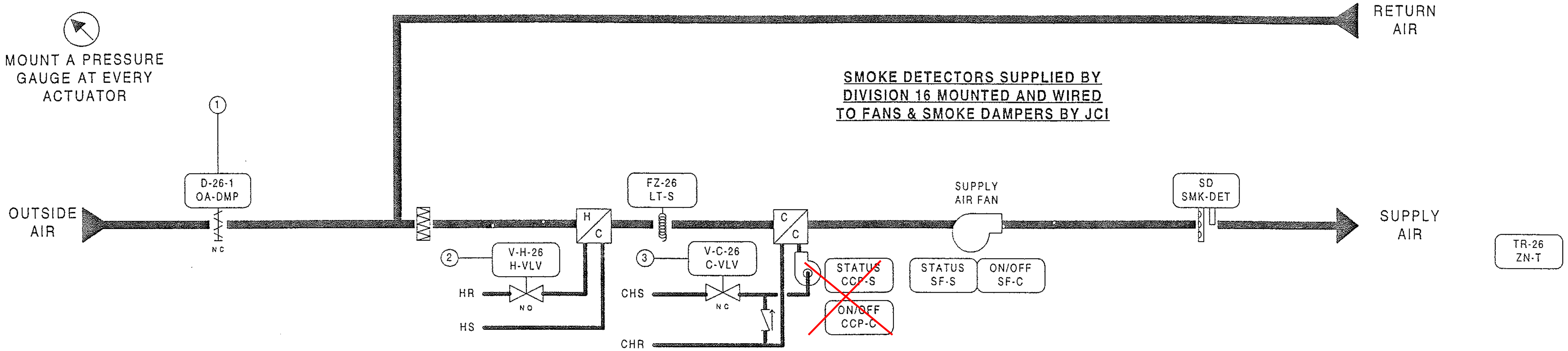
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

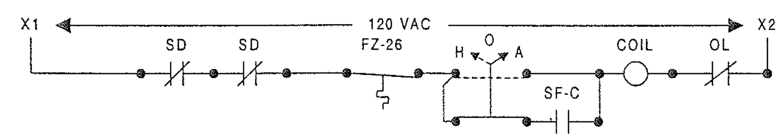
CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-27

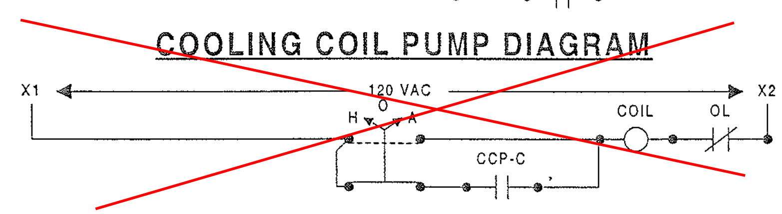
Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-25				UNT						EN-AHU25	AT UNIT														Power to Controller
		AHU-25	*			UNT	1	3				EN-AHU25	AT UNIT	0													N2 Trunk
	AI-1	AHU-25				UNT	1	3	AI-1			EN-AHU25	AT UNIT	0		AHU25-3-AI-1											
	AI-2	AHU-25				UNT	1	3	AI-2			EN-AHU25	AT UNIT	0		AHU25-3-AI-2											
	AI-3	AHU-25				UNT	1	3	AI-3			EN-AHU25	AT UNIT	0		AHU25-3-AI-3											
	AI-4	AHU-25	ZN-T	Zone Temperature	Deg F	UNT	1	3	AI-4		PHONE JACK	EN-AHU25	AT UNIT	0		AHU25-3-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	AHU-25				UNT	1	3	AI-5			EN-AHU25	AT UNIT	0		AHU25-3-AI-5											
	AI-6	AHU-25				UNT	1	3	AI-6			EN-AHU25	AT UNIT	0		AHU25-3-AI-6											
	BI-1	AHU-25	SF-S	Supply Fan Status	Off On	UNT	1	3	BI-1		BI#,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-25	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	3	BI-2		BI#,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-25	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	3	BI-3		BI#,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-25	CCP-S	Clg Coil Pump Status	Off On	UNT	1	3	BI-4		BI#,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-25	SF-C	Supply Fan Control	Off On	UNT	1	3	BO-1	RLY	BO#,24V,COM	EN-AHU25	AT UNIT	0		AHU25-3-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-25				UNT	1	3	BO-2			EN-AHU25	AT UNIT	0		AHU25-3-BO-2											
	BO-3	AHU-25	OA-DMP	Outside Air Damper	Closed Open	UNT	1	3	BO-3		BO#,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-BO-3			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	AHU-25	CCP-C	Clg Coil Pump Control	Off On	UNT	1	3	BO-4	RLY	BO#,24V,COM	EN-AHU25	AT UNIT	0		AHU25-3-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-25				UNT	1	3	BO-5			EN-AHU25	AT UNIT	0		AHU25-3-BO-5											
	BO-6	AHU-25				UNT	1	3	BO-6			EN-AHU25	AT UNIT	0		AHU25-3-BO-6											
	AO-1	AHU-25	H-VLV	Heating Coil Valve	% Open	UNT	1	3	AO-1		AO#,AOCM,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-25	C-VLV	Cooling Coil Valve	% Open	UNT	1	3	AO-2		AO#,AOCM,24VAC	EN-AHU25	AT UNIT	0		AHU25-3-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	

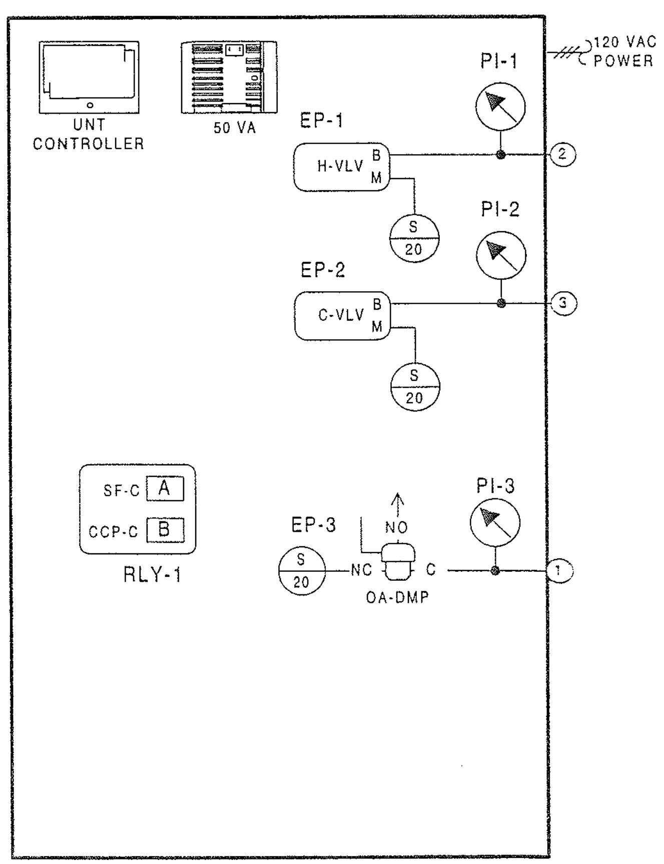


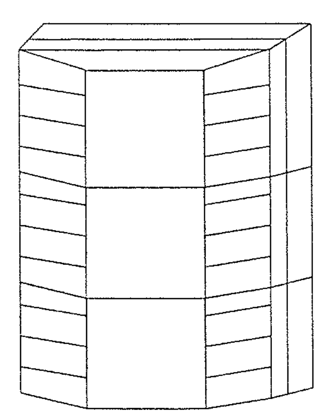
SUPPLY FAN WIRING DIAGRAM



~~COOLING COIL PUMP DIAGRAM~~







ENCLOSURE EN-AHU-26
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-2/N2 ADD = 2

BILL OF MATERIALS

Estimate: ahu-26 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-26-1	1	---	SEE DAMPER SCHEDULE
FZ-26	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV,C-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-AHU-26	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	2	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1,2	2	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-3	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT IS DE-ENERGIZED, OUTSIDE AIR DAMPER D-26-1, AND COOLING COIL VALVE V-C-26 WILL CLOSE; COOLING COIL PUMP WILL BE OFF, AND HEATING COIL VALVE V-H-26 WILL BE CLOSED TO THE COIL.

OCCUPIED MODE - SUPPLY FAN WILL BE RUNNING, OUTSIDE AIR DAMPER D-26-1 WILL OPEN. ROOM SENSOR TR-26 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL MODULATE HEATING COIL VALVE V-H-26 AND COOLING COIL VALVE V-C-26 IN SEQUENCE TO MAINTAIN ITS SETTING OF SEVENTY-FIVE (75F). COOLING COIL PUMP WILL START AND RUN CONTINUOUSLY WHENEVER THE COOLING COIL VALVE V-C-26 IS MODULATED OPEN.

UNOCCUPIED MODE - ROOM SENSOR TR-26. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED EXCEPT OUTSIDE AIR DAMPER D-26-1 WILL REMAIN CLOSED. ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:25 PM
FILE NAME AHU-26.vsd

DRAWING TITLE
AIR HANDLING UNIT AHU-26
TICKET OFFICE

MAIN CONSOURSE QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 9/05/97 | APPROVED BY DATE

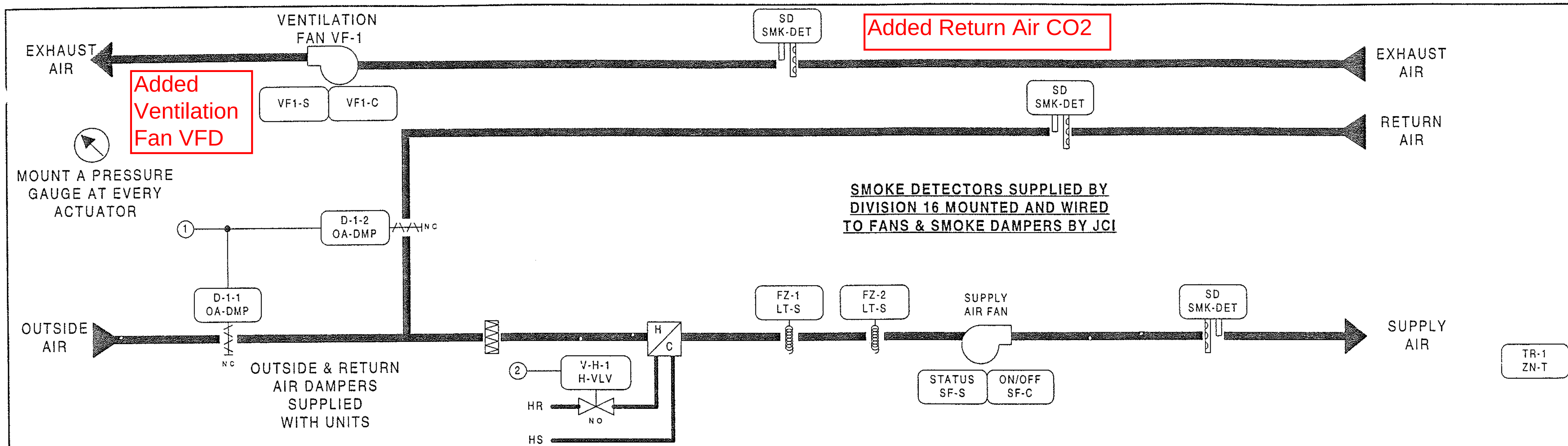
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-28

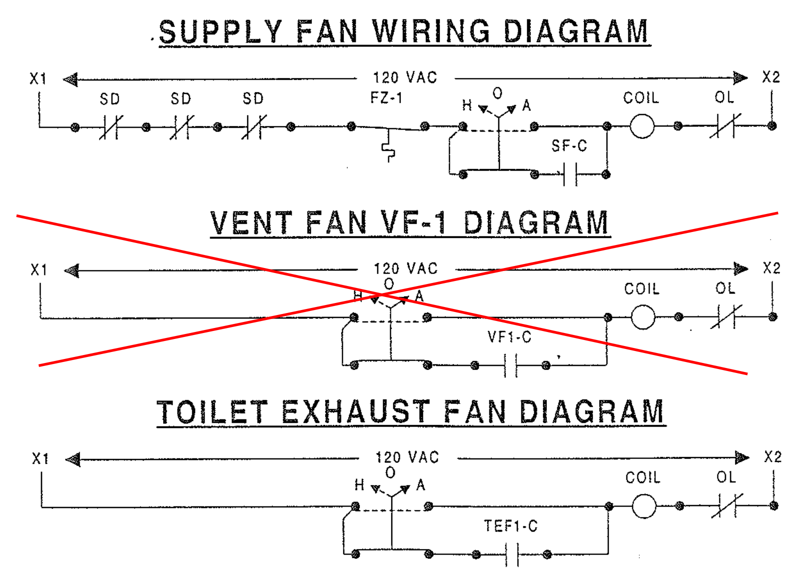
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		AHU-26					UNT						EN-AHU26	AT UNIT														Power to Controller
		AHU-26	*				UNT	1	2				EN-AHU26	AT UNIT	0													N2 Trunk
	AI-1	AHU-26					UNT	1	2	AI-1			EN-AHU26	AT UNIT	0		AHU26-2-AI-1											
	AI-2	AHU-26					UNT	1	2	AI-2			EN-AHU26	AT UNIT	0		AHU26-2-AI-2											
	AI-3	AHU-26					UNT	1	2	AI-3			EN-AHU26	AT UNIT	0		AHU26-2-AI-3											
	AI-4	AHU-26	ZN-T	Zone Temperature	Deg F		UNT	1	2	AI-4		PHONE JACK	EN-AHU26	AT UNIT	0		AHU26-2-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	AHU-26					UNT	1	2	AI-5			EN-AHU26	AT UNIT	0		AHU26-2-AI-5											
	AI-6	AHU-26					UNT	1	2	AI-6			EN-AHU26	AT UNIT	0		AHU26-2-AI-6											
	BI-1	AHU-26	SF-S	Supply Fan Status	Off	On	UNT	1	2	BI-1		BI#,24VAC	EN-AHU26	AT UNIT	0		AHU26-2-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	AHU-26	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	2	BI-2		BI#,24VAC	EN-AHU26	AT UNIT	0		AHU26-2-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	AHU-26	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	2	BI-3		BI#,24VAC	EN-AHU26	AT UNIT	0		AHU26-2-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	AHU-26	CCP-S	Clg Coil Pump Status	Off	On	UNT	1	2	BI-4		BI#,24VAC	EN-AHU26	AT UNIT	0		AHU26-2-BI-4						2/22	Device dependent	Aux Contact (NO)		U70	
	BO-1	AHU-26	SF-C	Supply Fan Control	Off	On	UNT	1	2	BO-1	RLY	BO#,24V,COM	EN-AHU26	AT UNIT	0		AHU26-2-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	AHU-26					UNT	1	2	BO-2			EN-AHU26	AT UNIT	0		AHU26-2-BO-2											
	BO-3	AHU-26	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	2	BO-3		BO#,24VAC	EN-AHU26	AT UNIT	0		AHU26-2-BO-3			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	AHU-26	CCP-C	Clg Coil Pump Control	Off	On	UNT	1	2	BO-4	RLY	BO#,24V,COM	EN-AHU26	AT UNIT	0		AHU26-2-BO-4	3/18	B,COILS,COM	RELAY-B	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-5	AHU-26					UNT	1	2	BO-5			EN-AHU26	AT UNIT	0		AHU26-2-BO-5											
	BO-6	AHU-26					UNT	1	2	BO-6			EN-AHU26	AT UNIT	0		AHU26-2-BO-6											
	AO-1	AHU-26	H-VLV	Heating Coil Valve	% Open		UNT	1	2	AO-1		AO#,AOCM,24VA(	EN-AHU26	AT UNIT	0		AHU26-2-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	AHU-26	C-VLV	Cooling Coil Valve	% Open		UNT	1	2	AO-2		AO#,AOCM,24VA(	EN-AHU26	AT UNIT	0		AHU26-2-AO-2	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	

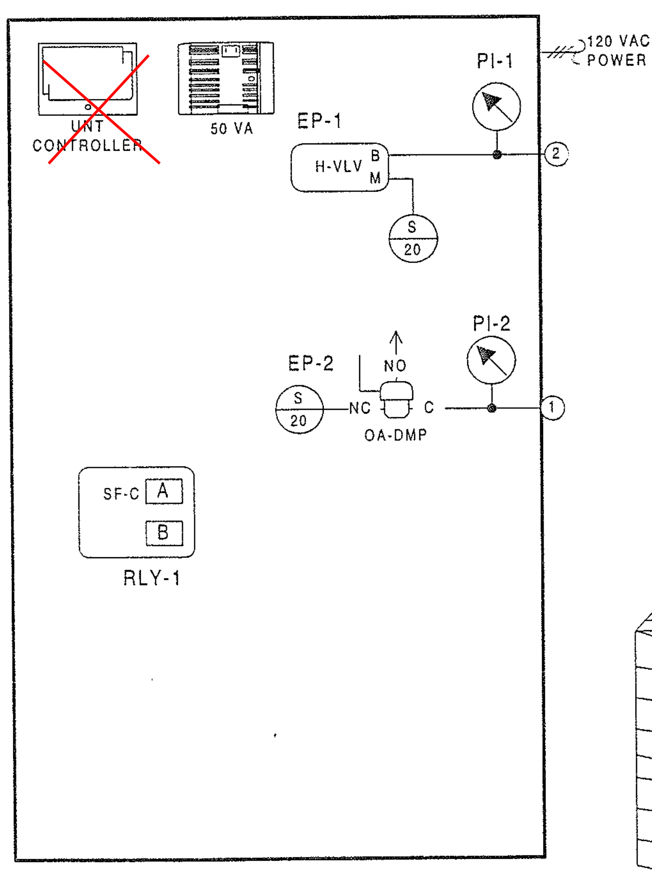


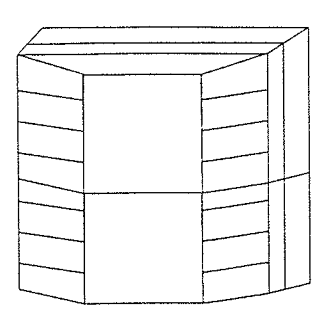
BILL OF MATERIALS

Estimate: hvu-1 — 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
FZ-1	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
VF-1,TEF-A1	2	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-1	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-2	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC







ENCLOSURE EN-HVU-1
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 11

FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-1	SERVICE LEVEL		LOCAL	SERVICE LEVEL
VF-1	SERVICE LEVEL	MCC1SRA	4B	SERVICE LEVEL
TEF-A1	SERVICE LEVEL	MCC1SRA	9E	SERVICE LEVEL

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-1-1, WILL CLOSE. UNOCCUPIED RETURN AIR DAMPER D-1-2 WILL BE OPEN AND HEATING COIL VALVE V-H-1 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-1 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-1-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-1-1 CLOSED. VENTILATION FAN VF-1 AND EXHAUST FAN TEF-A1 WILL BE OFF DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-1 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-1-2 WILL CLOSE. OUTSIDE AIR DAMPER D-1-1 WILL OPEN AND VENTILATION FAN VF-1 AND EXHAUST FAN TEF-A1 WILL START AND RUN CONTINUOUSLY AFTER THE WARM-UP MODE IS STOPPED. RETURN AIR DAMPER D-1-2 WILL CLOSE. ROOM SENSOR TR-1 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-1 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE. THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-1. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-1-1 WILL OPEN AND RETURN AIR DAMPER D-1-2 WILL CLOSE. HEATING COIL VALVE V-H-1 WILL BE CLOSED TO THE COIL.

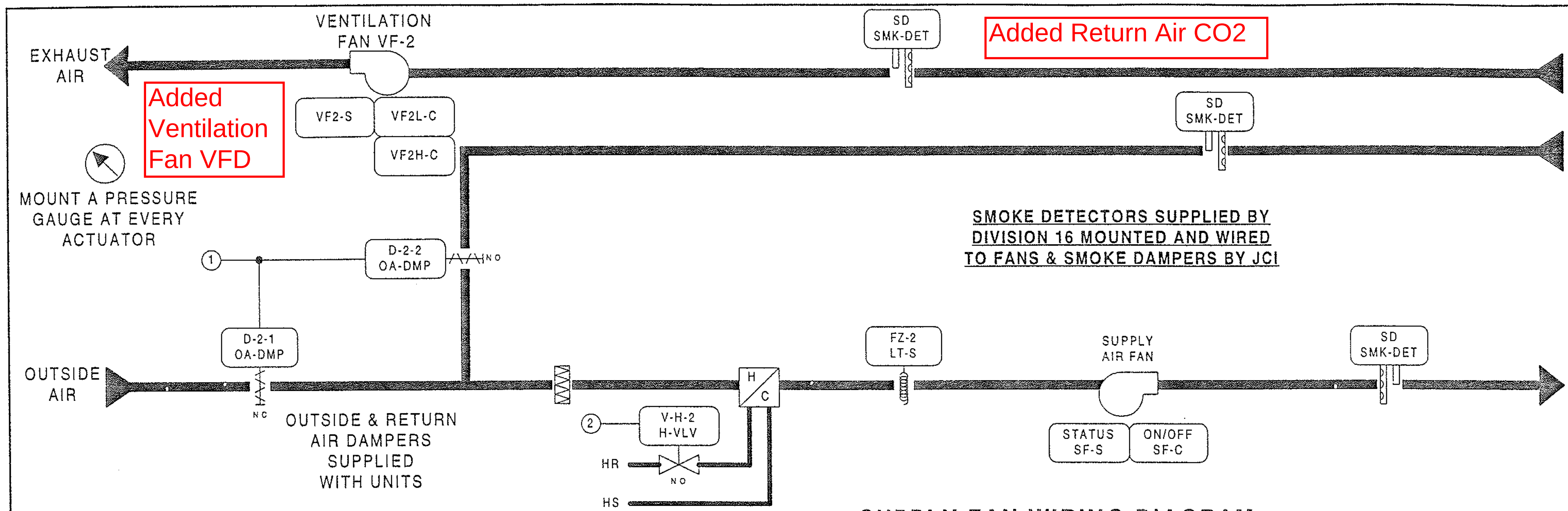
UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

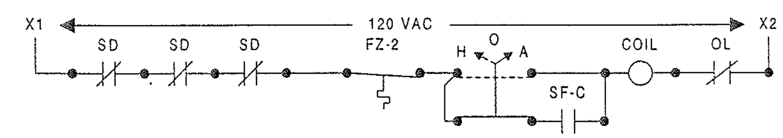
TOILET EXHAUST FAN TEF-A1 - THE FAN WILL START WHEN THE HVU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION		DRAWING TITLE				
NUMBER	IN CONSIDERATION OF THE RECEIPT OF THIS DOCUMENT, THE RECIPIENT AGREES NOT TO REPRODUCE, COPY, USE OR TRANSMIT THIS DOCUMENT AND/OR THE INFORMATION THERIN CONTAINED, IN WHOLE OR IN PART, OR TO SUFFER SUCH ACTION BY OTHERS, FOR ANY PURPOSE, EXCEPT WITH THE WRITTEN PERMISSION OF JOHNSON CONTROLS, INC. AND FURTHER AGREES TO SURRENDER SAME TO JOHNSON CONTROLS, INC. UPON DEMAND.	HEAT-VENT UNIT HVU-1 CONCESSION STO/COMMISSARY SERVICE LEVEL QUAD A	AS-BUILT		7/18/00	CME
DATE 07/18/00			REFERENCE DRAWING / NO. / REVISION-LOCATION	ECN	DATE	BY
TIME 03:27 PM		PROJECT TITLE	Sales Engineer JDP / Project Manager WJT / Application Engineer RTS	DRAWN BY RTS DATE 09/05/97	APPROVED BY	DATE
FILE NAME HVU-1.vsd	COPYRIGHT JOHNSON CONTROLS, INC. 19nn	BALTIMORE NFL STADIUM AT CAMDEN YARDS BALTIMORE, MARYLAND	JOHNSON CONTROLS Systems & Services Division	Branch information: JOHNSON CONTROLS 60 LOVETON CIRCLE SPARKS, MD 21152	CONTRACT NUMBER 7052-0098	DRAWING NUMBER BL-6559-29

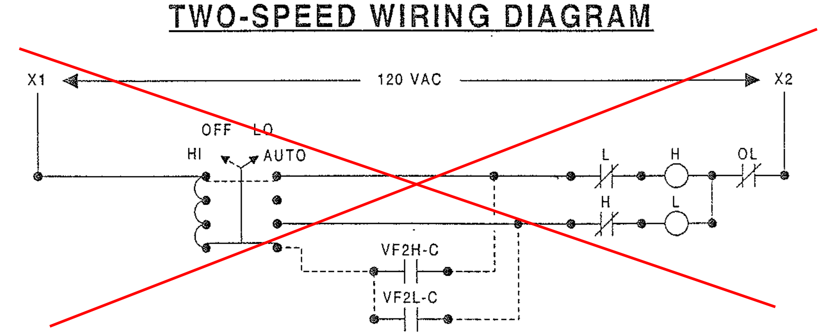
Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-1				UNT						EN-HVU-1	Service Level A		M.2-01A												Power to Controller
		HVU-1	*			UNT	1	11				EN-HVU-1	Service Level A	0	M.2-01A												N2 Trunk
	AI-1	HVU-1				UNT	1	11	AI-1			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AI-1											
	AI-2	HVU-1				UNT	1	11	AI-2			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AI-2											
	AI-3	HVU-1				UNT	1	11	AI-3			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AI-3											
	AI-4	HVU-1	ZN-T	Zone Temperature	Deg F	UNT	1	11	AI-4		PHONE JACK	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-1				UNT	1	11	AI-5			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AI-5											
	AI-6	HVU-1				UNT	1	11	AI-6			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AI-6											
	BI-1	HVU-1	SF-S	Supply Fan Status	Off On	UNT	1	11	BI-1		BI#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-1	VF1-S	Vent Fan 1 Status	Off On	UNT	1	11	BI-2		BI#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-1	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	11	BI-3		BI#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-1	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	11	BI-4		BI#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-1	SF-C	Supply Fan Control	Off On	UNT	1	11	BO-1	RLY	BO#,24V,COM	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-1	OA-DMP	Outside Air Damper	Closed Open	UNT	1	11	BO-2		BO#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BO-2			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-1	VF1-C	Vent Fan 1 Control	Off On	UNT	1	11	BO-3		BO#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BO-3			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	HVU-1	TEF1-C	Toilet Exh Fan A1 Control	Off On	UNT	1	11	BO-4		BO#,24VAC	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	HVU-1				UNT	1	11	BO-5			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BO-5											
	BO-6	HVU-1				UNT	1	11	BO-6			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-BO-6											
	AO-1	HVU-1	H-VLV	Heating Coil Valve	% Open	UNT	1	11	AO-1		AO#,AOCM,24VA	EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-1				UNT	1	11	AO-2			EN-HVU-1	Service Level A	0	M.2-01A	HVU-1-11-AO-2											



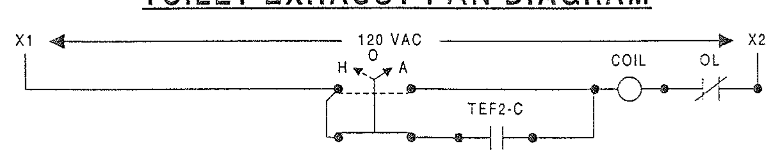
SUPPLY FAN WIRING DIAGRAM

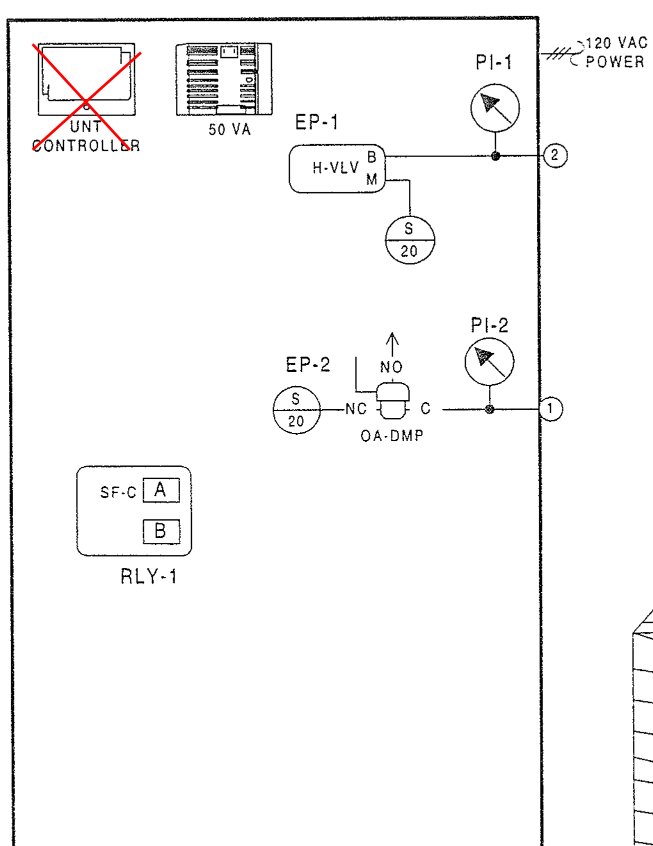


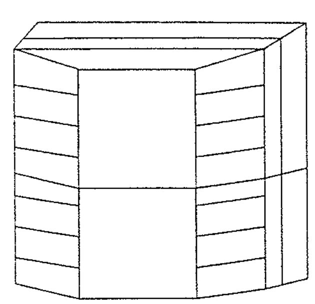
VENT FAN VF-2 DIAGRAM
TWO-SPEED WIRING DIAGRAM



TOILET EXHAUST FAN DIAGRAM







ENCLOSURE EN-HVU-2
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 12

FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-2	SERVICE LEVEL		LOCAL	SERVICE LEVEL
VF-2	SERVICE LEVEL	MCC1SRA	4C	SERVICE LEVEL

BILL OF MATERIALS

Estimate: hvu-2 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
FZ-2	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13*
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
VF-2,TEF-A1	3	BZ-1000-11	ENCL,4-5/8X 5-1 8 X 3-3/8
	3	PD-101-35	RLY BASE,3PDT,11PIN,10A
	3	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-2	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,XFR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-2	1	V11HGA-100	3-W SOLENOID,N OV,24 VAC
PI-1,2	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-2-1, WILL CLOSE. UNOCCUPIED RETURN AIR DAMPER D-2-2 WILL BE OPEN AND HEATING COIL VALVE V-H-2 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-2 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-2-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-2-1 CLOSED. VENTILATION FAN VF-2 AND EXHAUST FAN TEF-A2 WILL BE OFF DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-2 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-2-2 WILL CLOSE. OUTSIDE AIR DAMPER D-2-1 WILL OPEN AND VENTILATION FAN VF-2 (LOW SPEED) AND EXHAUST FAN TEF-A2 WILL START AND RUN CONTINUOUSLY AFTER THE WARM-UP MODE IS STOPPED. RETURN AIR DAMPER D-2-2 WILL CLOSE. ROOM SENSOR TR-2 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-2 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-2. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FAN (HIGH SPEED) START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-2-1 WILL OPEN AND RETURN AIR DAMPER D-2-2 WILL CLOSE. HEATING COIL VALVE V-H-2 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-A2 - THE FAN WILL START WHEN THE HVU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:28 PM
FILE NAME HVU-2.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-2
CONCESSION LOCKERS

SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/08/97	BY DATE

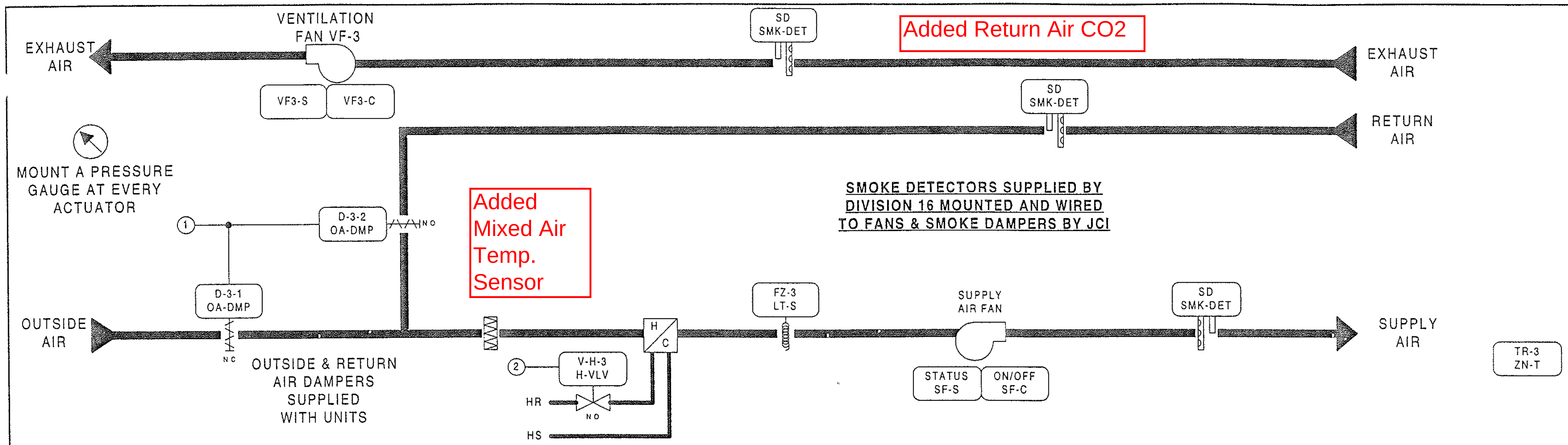
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-30

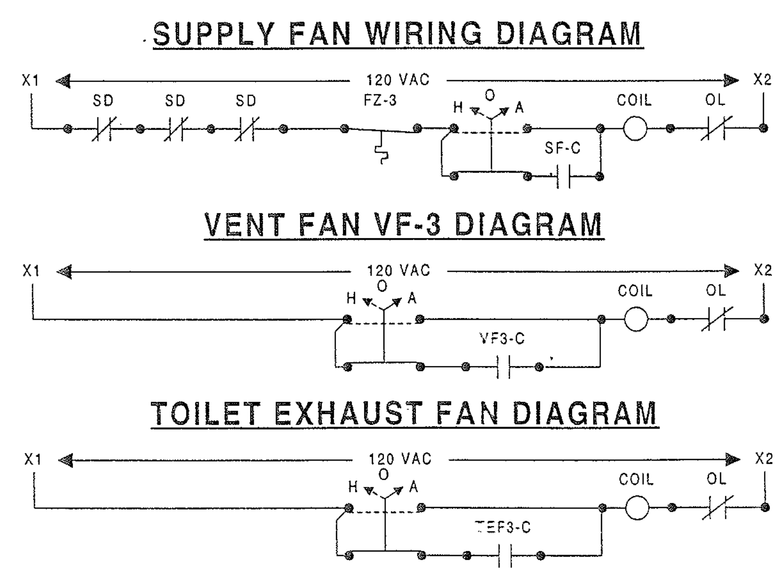
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-2					UNT						EN-HVU-2	Service Level A		M.2-01A												Power to Controller
		HVU-2	*				UNT	1	12				EN-HVU-2	Service Level A	0	M.2-01A												N2 Trunk
	AI-1	HVU-2					UNT	1	12	AI-1			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AI-1											
	AI-2	HVU-2					UNT	1	12	AI-2			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AI-2											
	AI-3	HVU-2					UNT	1	12	AI-3			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AI-3											
	AI-4	HVU-2	ZN-T	Zone Temperature	Deg F		UNT	1	12	AI-4		PHONE JACK	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-2					UNT	1	12	AI-5			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AI-5											
	AI-6	HVU-2					UNT	1	12	AI-6			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AI-6											
	BI-1	HVU-2	SF-S	Supply Fan Status	Off	On	UNT	1	12	BI-1		BI#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-2	VF2-S	Vent Fan 2 Status	Off	On	UNT	1	12	BI-2		BI#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-2	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	12	BI-3		BI#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-2	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	12	BI-4		BI#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-2	SF-C	Supply Fan Control	Off	On	UNT	1	12	BO-1	RLY	BO#,24V,COM	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-2	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	12	BO-2		BO#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BO-2			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-2	VF2L-C	Vent Fan 2 Control Low	Off	On	UNT	1	12	BO-3		BO#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BO-3			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	HVU-2	VF2H-C	Vent Fan 2 Control High	Off	On	UNT	1	12	BO-4		BO#,24VAC	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	HVU-2					UNT	1	12	BO-5			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BO-5											
	BO-6	HVU-2					UNT	1	12	BO-6			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-BO-6											
	AO-1	HVU-2	H-VLV	Heating Coil Valve	% Open		UNT	1	12	AO-1		AO#,AOCM,24VA	EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-2					UNT	1	12	AO-2			EN-HVU-2	Service Level A	0	M.2-01A	HVU-2-12-AO-2											

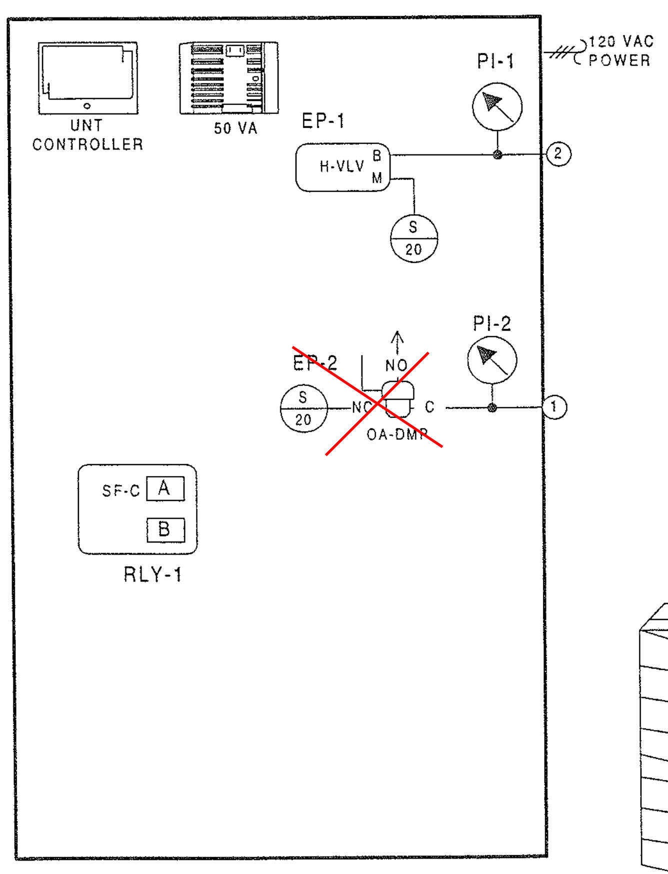


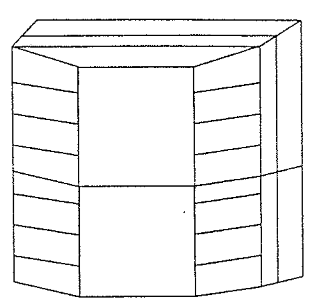
BILL OF MATERIALS

Estimate: hvu-3 — 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
FZ-3	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
VF-3,TEF-A3	2	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-3	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-2	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC







ENCLOSURE EN-HVU-3
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 13

FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-3	SERVICE LEVEL		LOCAL	SERVICE LEVEL
VF-3	SERVICE LEVEL	MCC1SRA	4D	SERVICE LEVEL

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-3-1, WILL CLOSE. UNOCCUPIED RETURN AIR DAMPER D-3-2 WILL BE OPEN AND HEATING COIL VALVE V-H-3 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-3 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-3-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-3-1 CLOSED. VENTILATION FAN VF-3 AND EXHAUST FAN TEF-A3 WILL BE OFF DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-3 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-3-2 WILL CLOSE. OUTSIDE AIR DAMPER D-3-1 WILL OPEN AND VENTILATION FAN VF-3 AND EXHAUST FAN TEF-A3 WILL START AND RUN CONTINUOUSLY AFTER THE WARM-UP MODE IS STOPPED. RETURN AIR DAMPER D-3-2 WILL CLOSE. ROOM SENSOR TR-3 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-3 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-3. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-3-1 WILL OPEN AND RETURN AIR DAMPER D-3-2 WILL CLOSE. HEATING COIL VALVE V-H-3 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

TOILET EXHAUST FAN TEF-A3 - THE FAN WILL START WHEN THE HVU SUPPLY FAN STARTS AND THE SYSTEM IS IN THE "OCCUPIED" MODE.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:29 PM
FILE NAME HVU-3.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-3
GAME DAY LOCKERS

SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

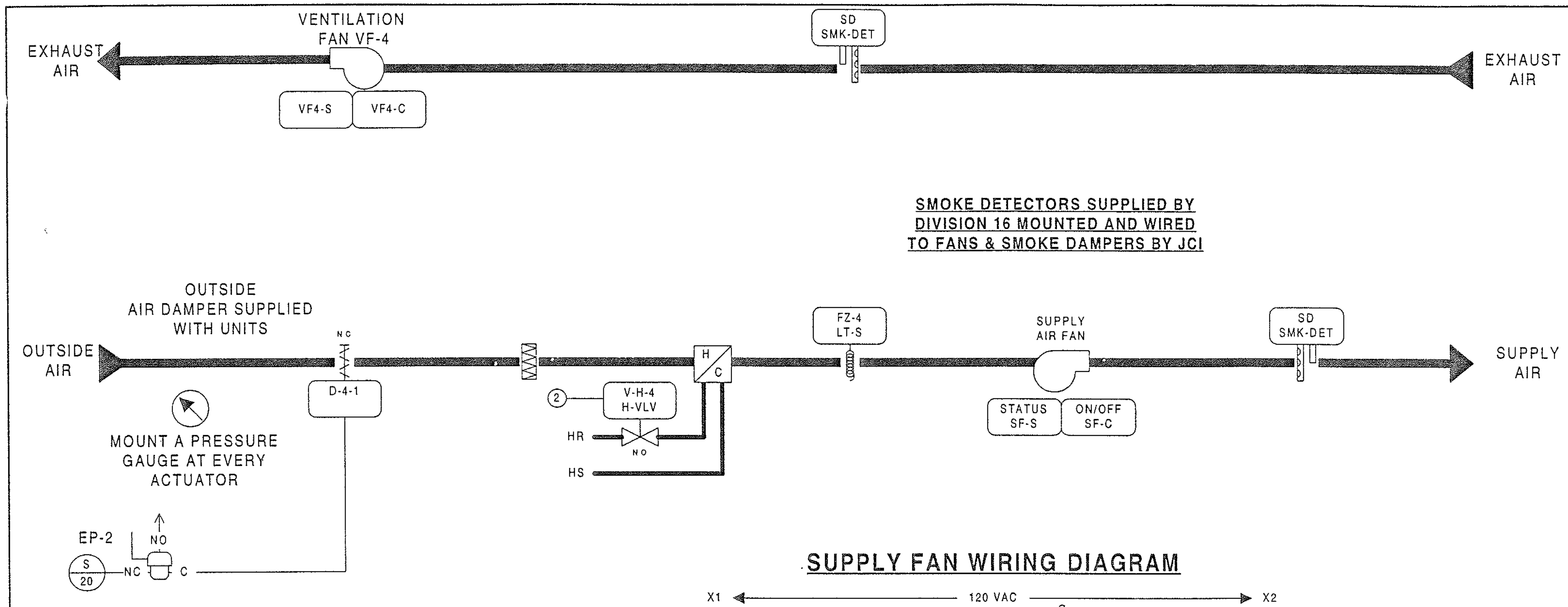
Sales Engineer JDP — Project Manager WJT — Application Engineer RTS
DRAWN BY RTS DATE 09/05/97
APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

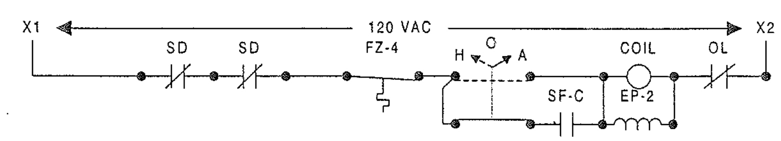
Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-31

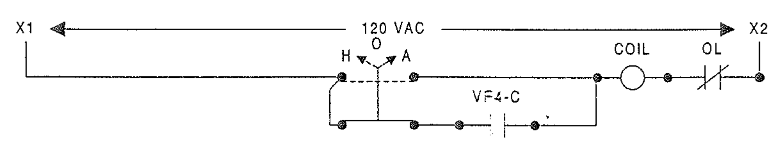
Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-3				UNT						EN-HVU-3	Service Level A		M.2-01A												Power to Controller
		HVU-3	*			UNT	1	13				EN-HVU-3	Service Level A	0	M.2-01A												N2 Trunk
	AI-1	HVU-3				UNT	1	13	AI-1			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AI-1											
	AI-2	HVU-3				UNT	1	13	AI-2			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AI-2											
	AI-3	HVU-3				UNT	1	13	AI-3			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AI-3											
	AI-4	HVU-3	ZN-T	Zone Temperature	Deg F	UNT	1	13	AI-4		PHONE JACK	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-3				UNT	1	13	AI-5			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AI-5											
	AI-6	HVU-3				UNT	1	13	AI-6			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AI-6											
	BI-1	HVU-3	SF-S	Supply Fan Status	Off On	UNT	1	13	BI-1		BI#,24VAC	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-3	VF3-S	Vent Fan 3 Status	Off On	UNT	1	13	BI-2		BI#,24VAC	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-3	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	13	BI-3		BI#,24VAC	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-3	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	13	BI-4		BI#,24VAC	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-3	SF-C	Supply Fan Control	Off On	UNT	1	13	BO-1	RLY	BO#,24V,COM	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-3	OA-DMP	Outside Air Damper	Closed Open	UNT	1	13	BO-2		BO#,24VAC	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BO-2			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-3	VF3-C	Vent Fan 3 Control	Off On	UNT	1	13	BO-3		BO#,24VAC	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BO-3			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	HVU-3				UNT	1	13	BO-4			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BO-4											
	BO-5	HVU-3				UNT	1	13	BO-5			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BO-5											
	BO-6	HVU-3				UNT	1	13	BO-6			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-BO-6											
	AO-1	HVU-3	H-VLV	Heating Coil Valve	% Open	UNT	1	13	AO-1		AO#,AOCM,24VA	EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-3				UNT	1	13	AO-2			EN-HVU-3	Service Level A	0	M.2-01A	HVU-3-13-AO-2											

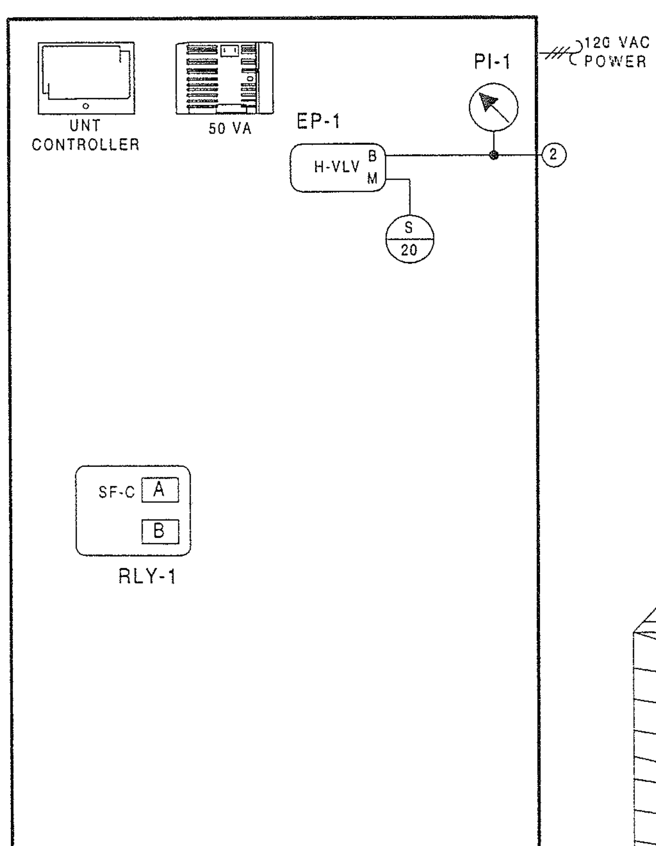


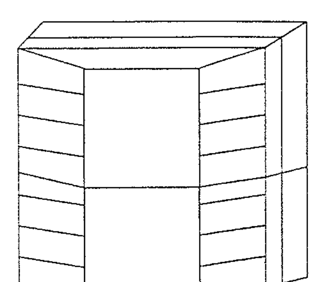
SUPPLY FAN WIRING DIAGRAM



VENT FAN VF-4 DIAGRAM







ENCLOSURE EN-HVU-4
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5/N2 ADD = 14

BILL OF MATERIALS

Estimate: hvu-4 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-4-1	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
EP-2	1	V11HAA-100	3-W SOLENOID,W/OV,120VAC
FZ-4	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
VF-4	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-4	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-4-1, WILL CLOSE. HEATING COIL VALVE V-H-4 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-4-1 WILL OPEN AND VENTILATION FAN VF-4 WILL START AND RUN CONTINUOUSLY . ROOM SENSOR TR-4 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-4 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-4. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE OCCUPIED MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-4-1 WILL OPEN. HEATING COIL VALVE V-H-4 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-4	SERVICE LEVEL		LOCAL	SERVICE LEVEL
VF-4	SERVICE LEVEL	MCC1SRA	4E	SERVICE LEVEL

REVISION INFORMATION		
NUMBER		
DATE 07/18/00		
TIME 03:31 PM		
FILE NAME HVU-4		

DRAWING TITLE
HEAT-VENT UNIT HVU-4
RECYCLE

SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REVISION-LOCATION	ECN	DATE	BY
AS-BUILT		7/18/00	CME

REFERENCE DRAWING	NO		
Sales Engineer JDP	Project Manager WJT	Application Engineer RTS	
DRAWN BY RTS DATE 09/05/97	APPROVED BY	DATE	

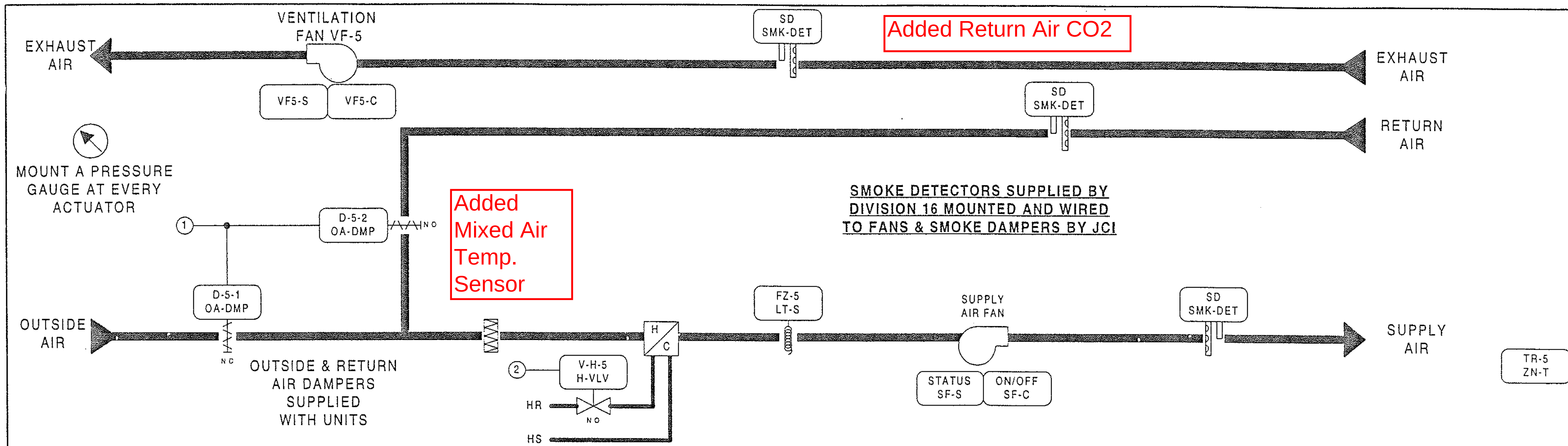
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

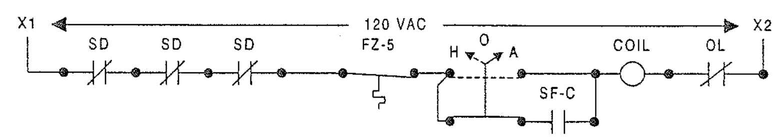
CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-32

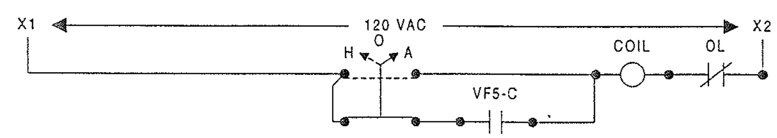
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-4					UNT						EN-HVU-4	Service Level A		M.2-01A												Power to Controller
		HVU-4	*				UNT	1	14				EN-HVU-4	Service Level A	0	M.2-01A												N2 Trunk
	AI-1	HVU-4					UNT	1	14	AI-1			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AI-1											
	AI-2	HVU-4					UNT	1	14	AI-2			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AI-2											
	AI-3	HVU-4					UNT	1	14	AI-3			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AI-3											
	AI-4	HVU-4	ZN-T	Zone Temperature	Deg F		UNT	1	14	AI-4		PHONE JACK	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-4					UNT	1	14	AI-5			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AI-5											
	AI-6	HVU-4					UNT	1	14	AI-6			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AI-6											
	BI-1	HVU-4	SF-S	Supply Fan Status	Off	On	UNT	1	14	BI-1		BI#,24VAC	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-4	VF4-S	Vent Fan 4 Status	Off	On	UNT	1	14	BI-2		BI#,24VAC	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-4	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	14	BI-3		BI#,24VAC	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-4	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	14	BI-4		BI#,24VAC	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-4	SF-C	Supply Fan Control	Off	On	UNT	1	14	BO-1	RLY	BO#,24V,COM	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-4	VF4-C	Vent Fan 4 Control	Off	On	UNT	1	14	BO-2		BO#,24VAC	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-4					UNT	1	14	BO-3			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BO-3											
	BO-4	HVU-4					UNT	1	14	BO-4			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BO-4											
	BO-5	HVU-4					UNT	1	14	BO-5			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BO-5											
	BO-6	HVU-4					UNT	1	14	BO-6			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-BO-6											
	AO-1	HVU-4	H-VLV	Heating Coil Valve	% Open		UNT	1	14	AO-1		AO#,AOCM,24VA	EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-4					UNT	1	14	AO-2			EN-HVU-4	Service Level A	0	M.2-01A	HVU-4-14-AO-2											

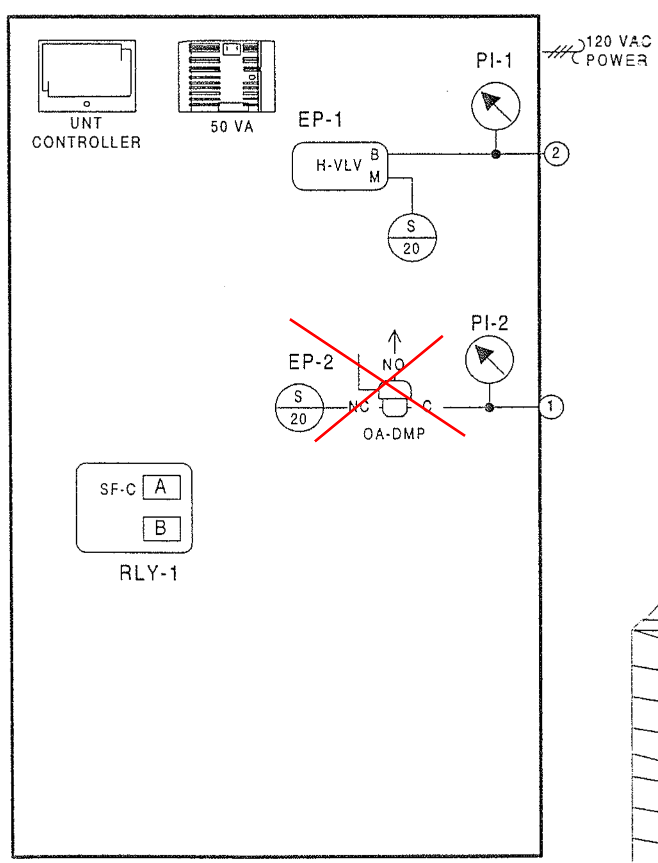


SUPPLY FAN WIRING DIAGRAM

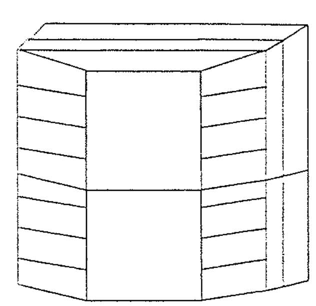


VENT FAN VF-5 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-5	SERVICE LEVEL	MCC1SRA	5D	SERVICE LEVEL
VF-5	M CONCOURSE		LOCAL	M CONCOURSE



ENCLOSURE EN-HVU-5
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 15

BILL OF MATERIALS

Estimate: hvu-5 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
FZ-5	1	A70HA-1C	STAT,LL,20',EL,MAN,15,55F
H-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
VF-5	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-5	1	AS-UNT111-101	UNT111 MTD IN UPM, W 50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-2	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-5-1, WILL CLOSE. UNOCCUPIED RETURN AIR DAMPER D-5-2 WILL BE OPEN AND HEATING COIL VALVE V-H-5 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-5 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-5-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-5-1 CLOSED. VENTILATION FAN VF-5 WILL BE OFF DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-5 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-5-2 WILL CLOSE. OUTSIDE AIR DAMPER D-5-1 WILL OPEN AND VENTILATION FAN VF-5 WILL START AND RUN CONTINUOUSLY AFTER THE WARM-UP MODE IS STOPPED. RETURN AIR DAMPER D-5-2 WILL CLOSE. ROOM SENSOR TR-5 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-5 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-5. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-5-1 WILL OPEN AND RETURN AIR DAMPER D-5-2 WILL CLOSE. HEATING COIL VALVE V-H-5 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:33 PM
FILE NAME HVU-5.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-5
FIELD MAINTENANCE

SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/05/97	BY DATE

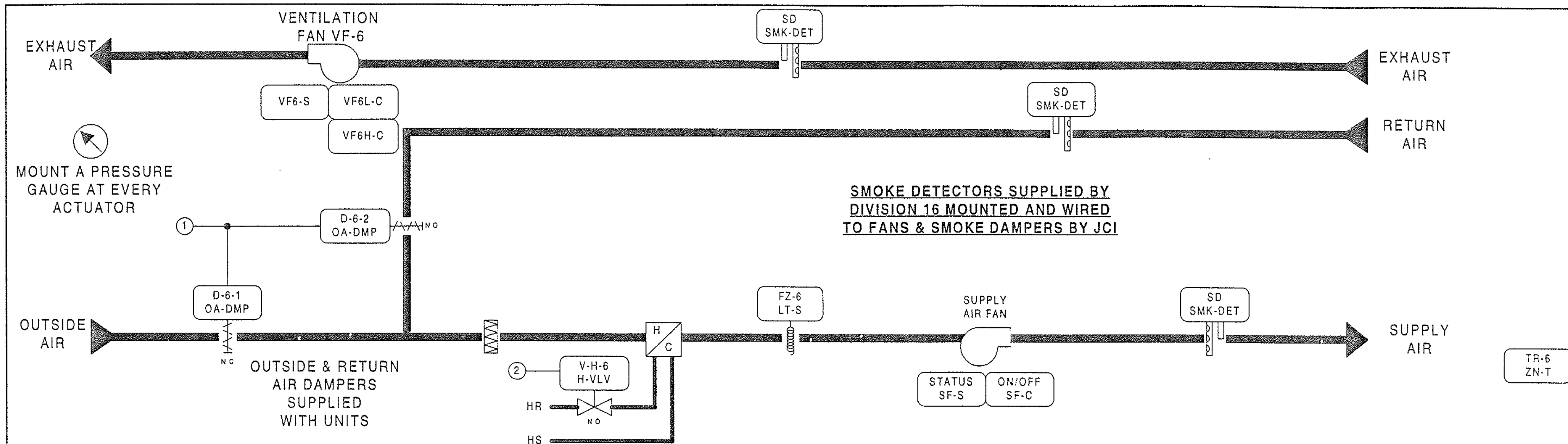
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-33

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-5					UNT						EN-HVU-5	Service Level A		M.2-01A												Power to Controller
		HVU-5	*				UNT	1	15				EN-HVU-5	Service Level A	0	M.2-01A												N2 Trunk
	AI-1	HVU-5					UNT	1	15	AI-1			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AI-1											
	AI-2	HVU-5					UNT	1	15	AI-2			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AI-2											
	AI-3	HVU-5					UNT	1	15	AI-3			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AI-3											
	AI-4	HVU-5	ZN-T	Zone Temperature	Deg F		UNT	1	15	AI-4		PHONE JACK	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-5					UNT	1	15	AI-5			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AI-5											
	AI-6	HVU-5					UNT	1	15	AI-6			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AI-6											
	BI-1	HVU-5	SF-S	Supply Fan Status	Off	On	UNT	1	15	BI-1		BI#,24VAC	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-5	VF5-S	Vent Fan 5 Status	Off	On	UNT	1	15	BI-2		BI#,24VAC	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-5	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	15	BI-3		BI#,24VAC	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-5	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	15	BI-4		BI#,24VAC	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-5	SF-C	Supply Fan Control	Off	On	UNT	1	15	BO-1	RLY	BO#,24V,COM	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-5	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	15	BO-2		BO#,24VAC	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BO-2			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-5	VF5-C	Vent Fan 5 Control	Off	On	UNT	1	15	BO-3		BO#,24VAC	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BO-3			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	HVU-5					UNT	1	15	BO-4			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BO-4											
	BO-5	HVU-5					UNT	1	15	BO-5			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BO-5											
	BO-6	HVU-5					UNT	1	15	BO-6			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-BO-6											
	AO-1	HVU-5	H-VLV	Heating Coil Valve	% Open		UNT	1	15	AO-1		AO#,AOCM,24VA	EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-5					UNT	1	15	AO-2			EN-HVU-5	Service Level A	0	M.2-01A	HVU-5-15-AO-2											

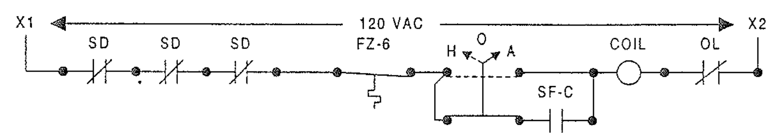


BILL OF MATERIALS

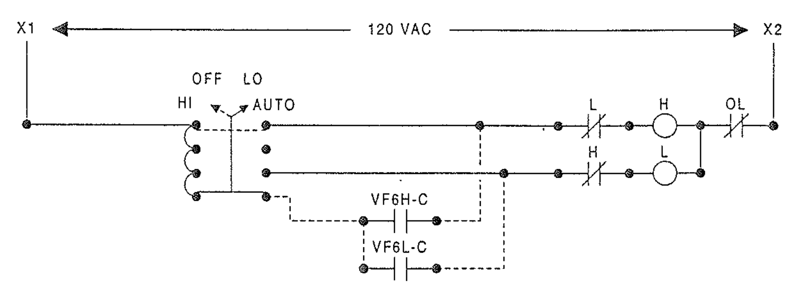
Estimate: hvu-6 70520098.pre

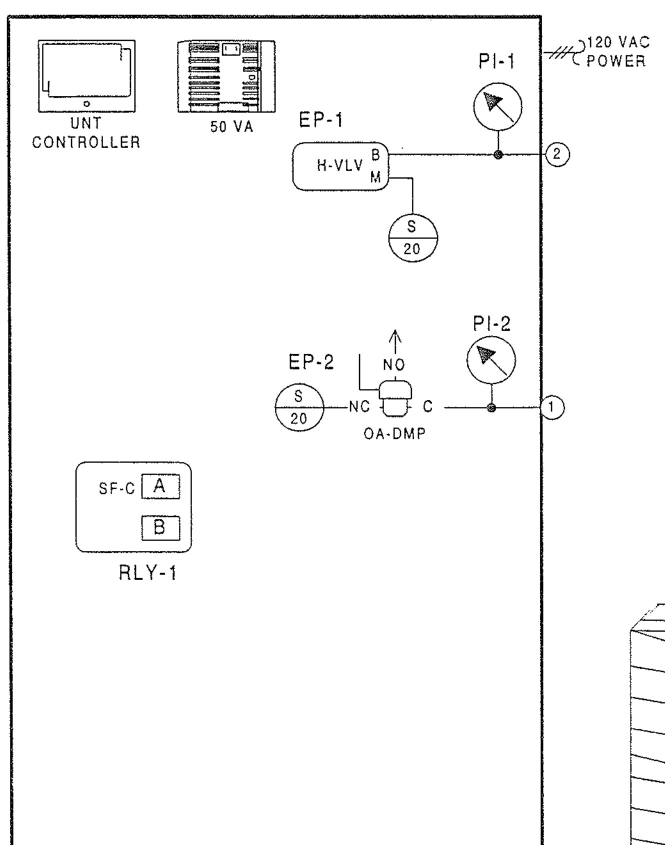
Desig.	Qty	Part #	Description
Field Devices:			
FZ-6	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
VF-6	2	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-6	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-2	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

SUPPLY FAN WIRING DIAGRAM

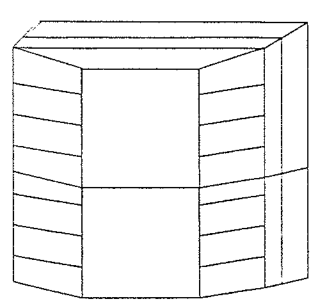


VENT FAN VF-6 DIAGRAM
TWO-SPEED WIRING DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-6	SERVICE LEVEL		LOCAL	SERVICE LEVEL
VF-6	SERVICE LEVEL		LOCAL	SERVICE LEVEL



ENCLOSURE EN-HVU-6
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5-N2 ADD = 16

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-6-1, WILL CLOSE. UNOCCUPIED RETURN AIR DAMPER D-6-2 WILL BE OPEN AND HEATING COIL VALVE V-H-6 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-6 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-6-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-6-1 CLOSED. VENTILATION FAN VF-6 WILL BE OFF DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-6 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-6-2 WILL CLOSE. OUTSIDE AIR DAMPER D-6-1 WILL OPEN AND VENTILATION FAN VF-6 (LOW SPEED) WILL START AND RUN CONTINUOUSLY AFTER THE WARM-UP MODE IS STOPPED. RETURN AIR DAMPER D-6-2 WILL CLOSE. ROOM SENSOR TR-6 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-6 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-6. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FAN (HIGH SPEED) START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-6-1 WILL OPEN AND RETURN AIR DAMPER D-6-2 WILL CLOSE. HEATING COIL VALVE V-H-6 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:33 PM
FILE NAME HVU-6.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-6
SHOP EAST

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

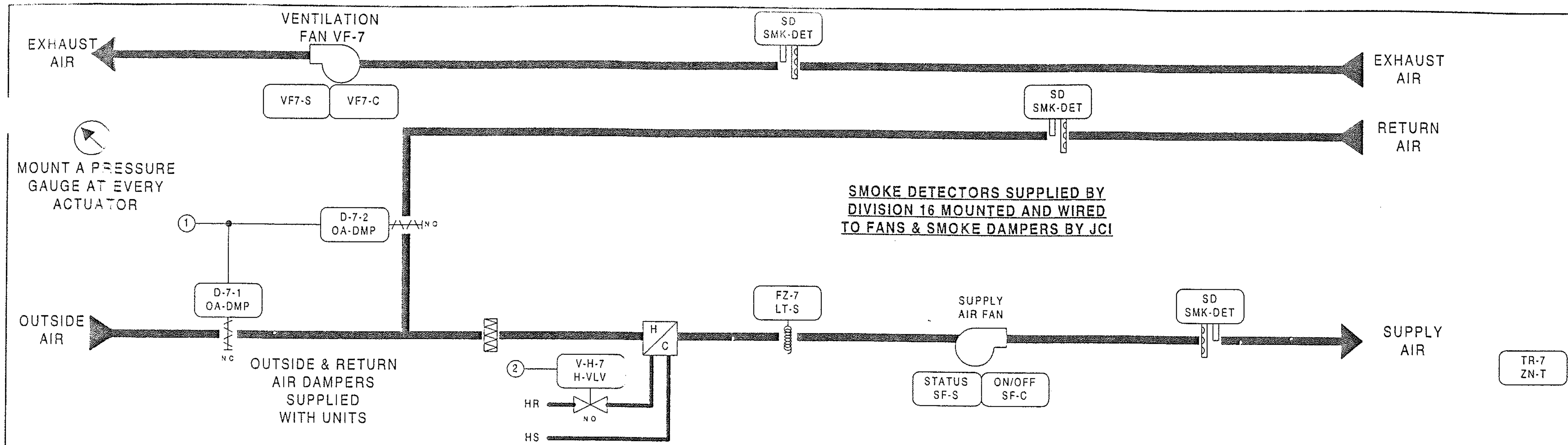
Sales Engineer JDP | Project Manager WJT | Application Engineer RTS
DRAWN BY RTS DATE 09/08/97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-34

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-6					UNT						EN-HVU-6	Service Level B		M.2-01B												Power to Controller
		HVU-6	*				UNT	1	16				EN-HVU-6	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	HVU-6					UNT	1	16	AI-1			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AI-1											
	AI-2	HVU-6					UNT	1	16	AI-2			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AI-2											
	AI-3	HVU-6					UNT	1	16	AI-3			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AI-3											
	AI-4	HVU-6	ZN-T	Zone Temperature	Deg F		UNT	1	16	AI-4		PHONE JACK	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-6					UNT	1	16	AI-5			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AI-5											
	AI-6	HVU-6					UNT	1	16	AI-6			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AI-6											
	BI-1	HVU-6	SF-S	Supply Fan Status	Off	On	UNT	1	16	BI-1		BI#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-6	VF6-S	Vent Fan 6 Status	Off	On	UNT	1	16	BI-2		BI#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-6	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	16	BI-3		BI#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-6	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	16	BI-4		BI#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-6	SF-C	Supply Fan Control	Off	On	UNT	1	16	BO-1	RLY	BO#,24V,COM	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-6	OA-DMP	Outside Air Damper	Closed	Open	UNT	1	16	BO-2		BO#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BO-2			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-6	VF6L-C	Vent Fan 6 Control Low	Off	On	UNT	1	16	BO-3		BO#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BO-3			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	HVU-6	VF6H-C	Vent Fan 6 Control High	Off	On	UNT	1	16	BO-4		BO#,24VAC	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	HVU-6					UNT	1	15	BO-5			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BO-5											
	BO-6	HVU-6					UNT	1	16	BO-6			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-BO-6											
	AO-1	HVU-6	H-VLV	Heating Coil Valve	% Open		UNT	1	16	AO-1		AO#,AOCM,24VA	EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-6					UNT	1	16	AO-2			EN-HVU-6	Service Level B	0	M.2-01B	HVU-6-16-AO-2											

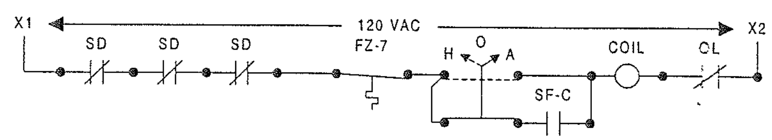


BILL OF MATERIALS

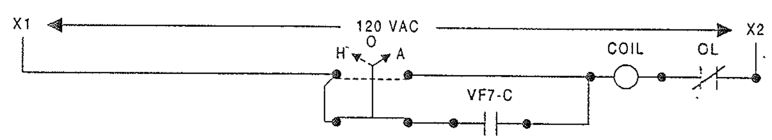
Estimate: hvu-7 70520098.pre

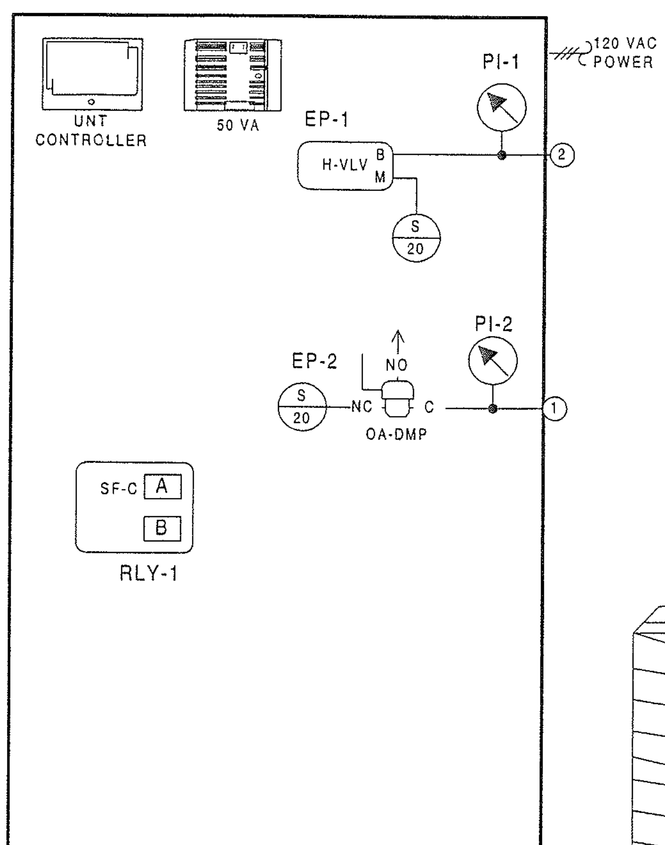
Desig.	Qty	Part #	Description
Field Devices:			
FZ-7	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
OA-DMP	2	D-3153-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
VF-7	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-7	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
EP-2	1	V11HGA-100	3-W SOLENOID,W/OV,24 VAC
PI-1,2	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

SUPPLY FAN WIRING DIAGRAM

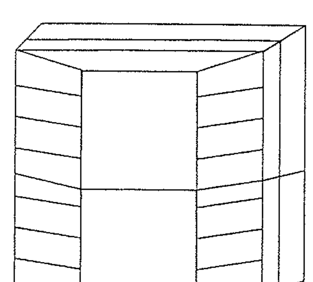


VENT FAN VF-7 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-7	SERVICE LEVEL		LOCAL	SERVICE LEVEL
VF-7	M CONCOURSE		LOCAL	M CONCOURSE



ENCLOSURE EN-HVU-7
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5/N2 ADD = 17

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND VENTILATION FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-7-1, WILL CLOSE. UNOCCUPIED RETURN AIR DAMPER D-7-2 WILL BE OPEN AND HEATING COIL VALVE V-H-7 WILL BE CLOSED TO THE COIL.

WARM-UP MODE - SUPPLY FAN WILL START AS DETERMINED BY THE OPTIMAL START PROGRAM OF THE METASYS SYSTEM. ON THE START OF THE UNIT, HEATING COIL VALVE V-H-7 WILL OPEN FULL TO COIL AND RETURN AIR DAMPER D-7-2 WILL BE FULLY OPEN WITH THE OUTSIDE AIR DAMPER D-7-1 CLOSED. VENTILATION FAN VF-7 WILL BE OFF DURING THE WARM-UP MODE. DURATION OF THE WARM-UP MODE IS DETERMINED BY THE METASYS SYSTEM AND WILL BE DYNAMICALLY UPDATED TO END FIFTEEN (15) MINUTES PRIOR TO OCCUPANCY TIME. WARM-UP MODE IS STOPPED WHEN THE ZONE AIR TEMPERATURE REACHES THE SETTING OF TR-7 (70F).

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING, RETURN AIR DAMPER D-7-2 WILL CLOSE. OUTSIDE AIR DAMPER D-7-1 WILL OPEN AND VENTILATION FAN VF-7 WILL START AND RUN CONTINUOUSLY AFTER THE WARM-UP MODE IS STOPPED. RETURN AIR DAMPER D-7-2 WILL CLOSE. ROOM SENSOR TR-7 THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-7 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-7, WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE WARM-UP MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND VENTILATION FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-7-1 WILL OPEN AND RETURN AIR DAMPER D-7-2 WILL CLOSE. HEATING COIL VALVE V-H-7 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	03:32 PM
FILE NAME	HVU-7.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-7
SHOP WEST
SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
		AS-BUILT		7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/05/97	BY DATE

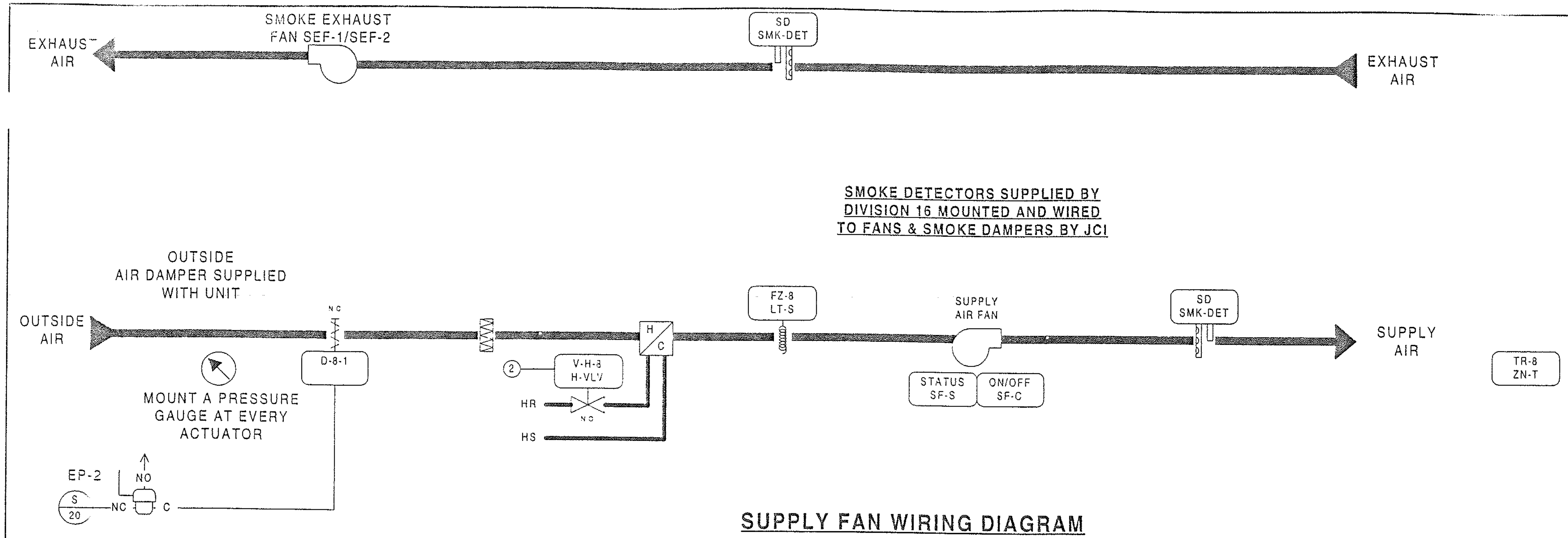
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-35

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-7				UNT						EN-HVU-7	Service Level B		M.2-01B												Power to Controller
		HVU-7	*			UNT	1	17				EN-HVU-7	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	HVU-7				UNT	1	17	AI-1			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AI-1											
	AI-2	HVU-7				UNT	1	17	AI-2			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AI-2											
	AI-3	HVU-7				UNT	1	17	AI-3			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AI-3											
	AI-4	HVU-7	ZN-T	Zone Temperature	Deg F	UNT	1	17	AI-4		PHONE JACK	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-7				UNT	1	17	AI-5			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AI-5											
	AI-6	HVU-7				UNT	1	17	AI-6			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AI-6											
	BI-1	HVU-7	SF-S	Supply Fan Status	Off On	UNT	1	17	BI-1		BI#,24VAC	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-7	VF7-S	Vent Fan 7 Status	Off On	UNT	1	17	BI-2		BI#,24VAC	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	HVU-7	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	17	BI-3		BI#,24VAC	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	HVU-7	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	17	BI-4		BI#,24VAC	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BI-4						2/22	NO,M1	A70 (NC)		U71	
	BO-1	HVU-7	SF-C	Supply Fan Control	Off On	UNT	1	17	BO-1	RLY	BO#,24V,COM	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-7	OA-DMP	Outside Air Damper	Closed Open	UNT	1	17	BO-2		BO#,24VAC	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BO-2			V11HGA-100			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-3	HVU-7	VF7-C	Vent Fan 7 Control	Off On	UNT	1	17	BO-3		BO#,24VAC	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BO-3			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-4	HVU-7				UNT	1	17	BO-4			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BO-4											
	BO-5	HVU-7				UNT	1	17	BO-5			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BO-5											
	BO-6	HVU-7				UNT	1	17	BO-6			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-BO-6											
	AO-1	HVU-7	H-VLV	Heating Coil Valve	% Open	UNT	1	17	AO-1		AO#,AOCM,24VA	EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-7				UNT	1	17	AO-2			EN-HVU-7	Service Level B	0	M.2-01B	HVU-7-17-AO-2											



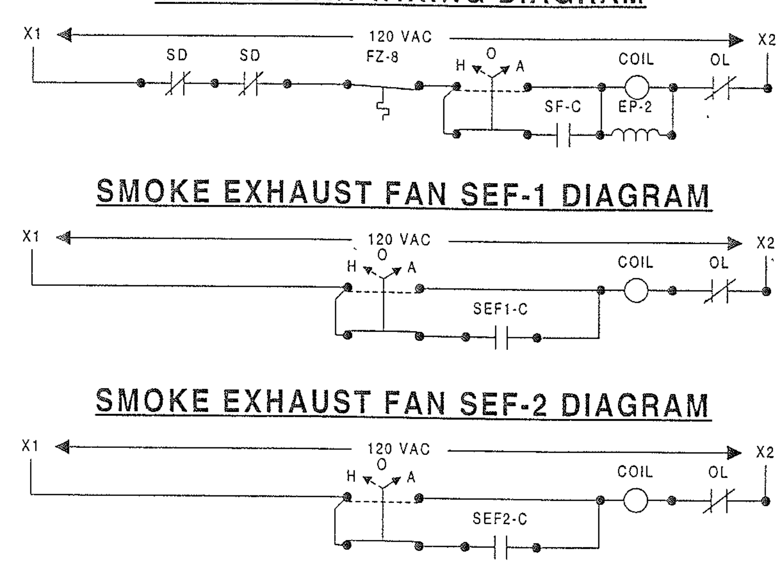
SMOKE DETECTORS SUPPLIED BY DIVISION 16 MOUNTED AND WIRED TO FANS & SMOKE DAMPERS BY JCI

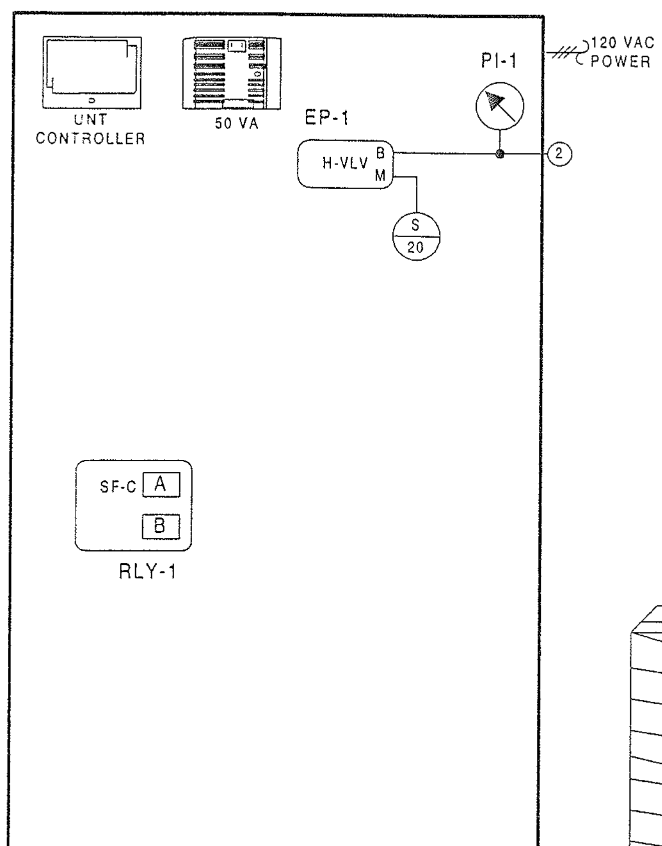
```
                      BILL OF MATERIALS
Estimate: hvu-8                                   ~0520098.pre
Desig.       QtyPart #            Description
------------ ------------------   ------------------------------
Field Devices:
D-8-1        1  D-3153-2          DMPR ACT,8-13#
             1  G-2010-11         GAGE,2",0-30 PSIG,STEM
EP-2         1  V11HAA-100        3-W SOLENOID,W/OV,120VAC
FZ-8         1  A70HA-1C          STAT,LL,20',EL,MAN,15/55F
H-VLV        1  --                SEE VALVE SCHEDULE
ZN-T         1  TE-6410W-1000     MSTAT,NI,BOX,JACK
Panel Devices:
EN-HVU-8     1  AS-UNT111-101     UNT111 MTD IN UPM, W/50VA
             1  EN-EXP101-0       UNIV PKG MOD,CVR & BACKBN
EP-1         1  EP-8000-2         XDUCR,EP,0/10V,HI VOL
PI-1         1  G-2010-11         GAGE,2",0-30 PSIG,STEM
RLY-1        1  AS-RLY002-0       RELAY; 2SPDT 5 AMP 240VAC
```

SUPPLY FAN WIRING DIAGRAM

SMOKE EXHAUST FAN SEF-1 DIAGRAM

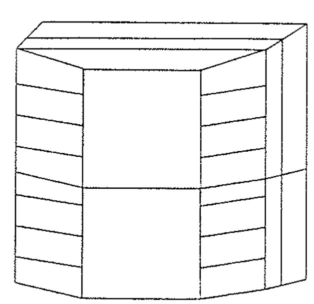
SMOKE EXHAUST FAN SEF-2 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-8	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-1	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-2	SERVICE LEVEL		LOCAL	SERVICE LEVEL

NOTE: FOR SMOKE EXHAUST FANS SEF-1 AND SEF-2 METASYS POINT CONNECTIONS SEE AHU-19 CONTROL DIAGRAM BL-6559-25 POINT LIST NCM-5 PS-10



ENCLOSURE EN-HVU-8
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5/N2 ADD = 18

DESCRIPTION OF OPERATION

STARTING OF THE HVU SUPPLY FAN WILL INITIATE A START OF THE LEAD SMOKE EXHAUST FAN SEF-1 OR SEF-2. IF THE LEAD FAN FAILS OR FAILS TO START, THE LAG EXHAUST FAN SEF-1 OR SEF-2 WILL START AND RUN CONTINOUSLY.

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND SMOKE EXHAUST FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-8-1, WILL CLOSE. HEATING COIL VALVE V-H-8 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-8-1 WILL OPEN. ROOM SENSOR TR-8 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-8 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-8. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE HEATING MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND SMOKE EXHAUST FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-8-1 WILL OPEN. HEATING COIL VALVE V-H-8 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS FOR HVU-8 WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND CLOSE OUTSIDE DAMPER D-8-1. CROSS ZONED CEILING SMOKE DETECTORS IN THE SERVICE CORRIDOR OR A SPRINKLER WATER FLOW ALARM ON THE SERVICE LEVEL WILL ENERGIZE THE TWO (2) SMOKE EXHAUST FANS THROUGH THE FIRE ALARM SYSTEM. HVU-8,HVU-9 AND HVU-10 SERVICE THE AREA WILL BE DE-ENERGIZED AND ALL THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSITION WHEN THE SMOKE EXHAUST IS ENERGIZED BY THE FIRE ALARM SYSTEM. SERVICE LEVEL SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM. TWO (2) SERVICE LEVEL EXIT CORRIDOR SMOKE EXHAUST SYSTEMS EXIST WITH A TOTAL OF FOUR (4) EXHAUST FANS. TWO (2) SMOKE EXHAUST FANS ARE RELATED TO THREE (3) HEATING AND VENTILATING UNITS. IF EITHER EXIT CORRIDOR SMOKE EXHAUST SYSTEM IS ACTIVATED, THE OTHER SYSTEM WILL ALSO BE ENERGIZED. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:32 PM
FILE NAME HVU-8.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-8
FREIGHT ELEVATOR LOBBY
SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

AS-BUILT				7/18/00	CME
REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/05/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

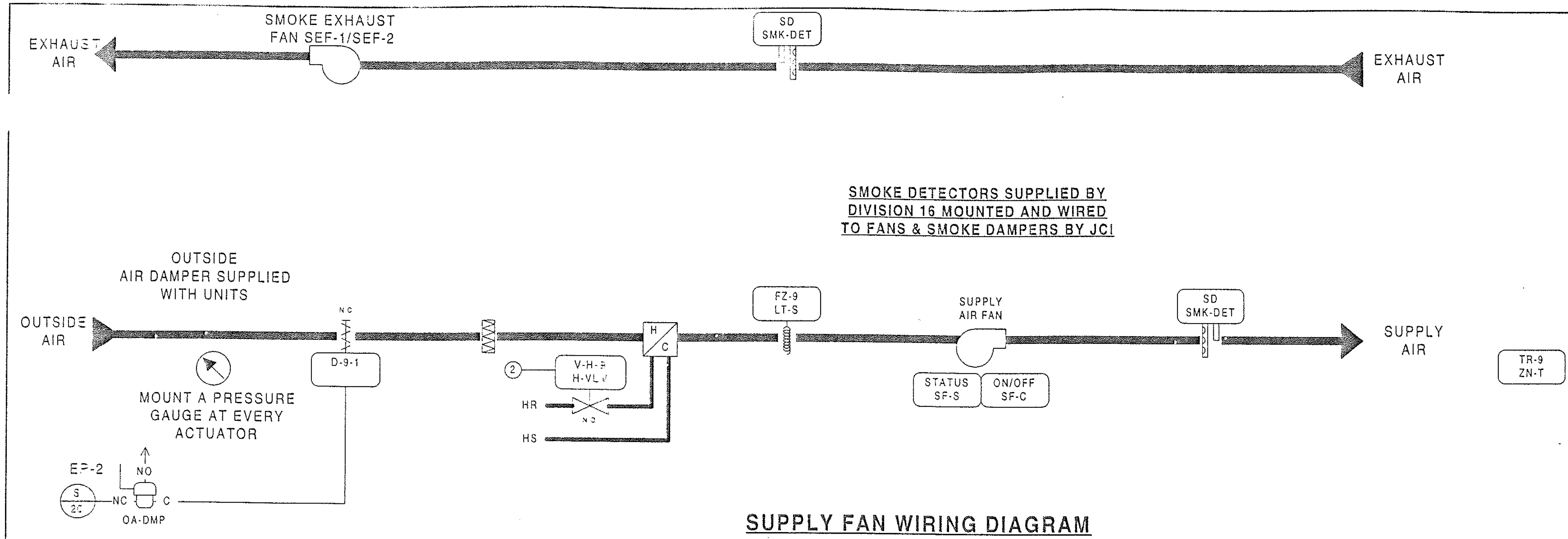
Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-36

Full Spreadsheet		Software				Digital Controller Information					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination
		HVU-8				UNT					
		HVU-8	*			UNT	1	18			
	AI-1	HVU-8				UNT	1	18	AI-1		
	AI-2	HVU-8				UNT	1	18	AI-2		
	AI-3	HVU-8				UNT	1	18	AI-3		
	AI-4	HVU-8	ZN-T	Zone Temperature	Deg F	UNT	1	18	AI-4		PHONE JACK
	AI-5	HVU-8				UNT	1	18	AI-5		
	AI-6	HVU-8				UNT	1	18	AI-6		
	BI-1	HVU-8	SF-S	Supply Fan Status	Off On	UNT	1	18	BI-1		BI#,24VAC
	BI-2	HVU-8	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	18	BI-2		BI#,24VAC
	BI-3	HVU-8	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	18	BI-3		BI#,24VAC
	BI-4	HVU-8				UNT	1	18	BI-4		
	BO-1	HVU-8	SF-C	Supply Fan Control	Off On	UNT	1	18	BO-1	RLY	BO#,24V,COM
	BO-2	HVU-8				UNT	1	18	BO-2		
	BO-3	HVU-8				UNT	1	18	BO-3		
	BO-4	HVU-8				UNT	1	18	BO-4		
	BO-5	HVU-8				UNT	1	18	BO-5		
	BO-6	HVU-8				UNT	1	18	BO-6		
	AO-1	HVU-8	H-VLV	Heating Coil Valve	% Open	UNT	1	18	AO-1		AO#,AOCM,24VA
	AO-2	HVU-8				UNT	1	18	AO-2		

	Panel Information					Intermediate Device				
Point Type	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location
	EN-HVU-8	Service Level A		M.2-01A						
	EN-HVU-8	Service Level A	0	M.2-01A						
AI-1	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AI-1					
AI-2	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AI-2					
AI-3	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AI-3					
AI-4	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AI-4					
AI-5	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AI-5					
AI-6	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AI-6					
BI-1	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BI-1					
BI-2	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BI-2					
BI-3	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BI-3					
BI-4	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BI-4					
BO-1	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM	
BO-2	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BO-2					
BO-3	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BO-3					
BO-4	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BO-4					
BO-5	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BO-5					
BO-6	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-BO-6					
AO-1	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O	
AO-2	EN-HVU-8	Service Level A	0	M.2-01A	HVU-8-18-AO-2					

	Field Device					
Point Type	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
						Power to Controller
						N2 Trunk
AI-1						
AI-2						
AI-3						
AI-4	8/26	PHONE JACK	TE-6410W-1000		U2	
AI-5						
AI-6						
BI-1	2/22	Device dependent	Aux Contact (NO)		U70	
BI-2	2/22	Device dependent	Contact (NO)		U70	
BI-3	2/22	NO,M1	A70 (NC)		U71	
BI-4						
BO-1	2/14	See starter detail	Starter (NO)-(sw lo)		U60	
BO-2						
BO-3						
BO-4						
BO-5						
BO-6						
AO-1	3/18	Device dependent	0-10V OUT		U23	
AO-2						

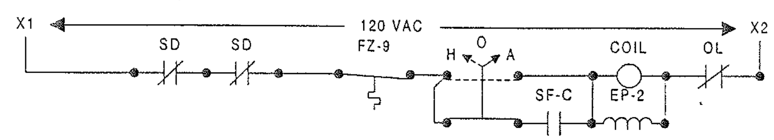


BILL OF MATERIALS

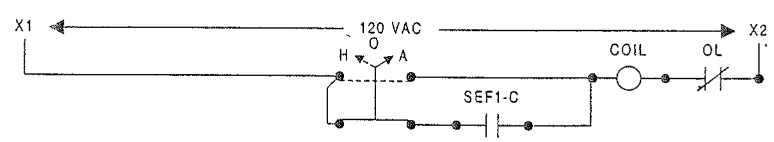
Estimate: hvu-9 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-9-1	1	D-3153-2	DMPR ACT, 8-13#
	1	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
EP-2	1	V11HAA-100	3-W SOLENOID, W/OV, 120VAC
FZ-9	1	A70HA-1C	STAT, LL, 20', EL, MAN, 15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT, NI, BOX, JACK
Panel Devices:			
EN-HVU-9	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD, CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR, EP, 0/10V, HI VOL
PI-1	1	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

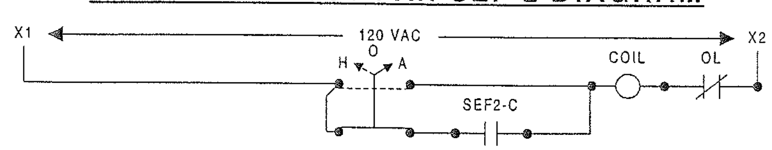
SUPPLY FAN WIRING DIAGRAM

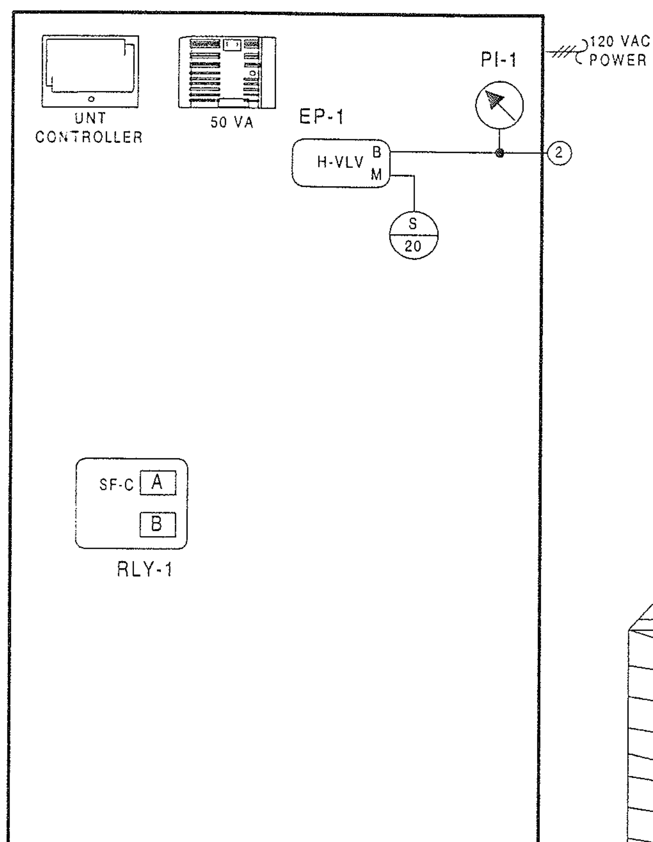


SMOKE EXHAUST FAN SEF-1 DIAGRAM



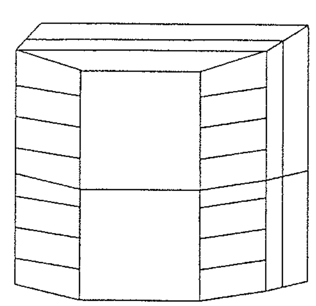
SMOKE EXHAUST FAN SEF-2 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-9	SERVICE LEVEL	MCC1SRA	5F	SERVICE LEVEL
SEF-1	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-2	SERVICE LEVEL		LOCAL	SERVICE LEVEL

NOTE: FOR SMOKE EXHAUST FANS SEF-1 AND SEF-2 METASYS POINT CONNECTIONS SEE AHU-19 CONTROL DIAGRAM BL-6559-25 POINT LIST NCM-5 PS-10



ENCLOSURE EN-HVU-9
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5/N2 ADD = 19

DESCRIPTION OF OPERATION

STARTING OF THE HVU SUPPLY FAN WILL INITIATE A START OF THE LEAD SMOKE EXHAUST FAN SEF-1 OR SEF-2. IF THE LEAD FAN FAILS OR FAILS TO START, THE LAG EXHAUST FAN SEF-1 OR SEF-2 WILL START AND RUN CONTINOUSLY.

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND SMOKE EXHAUST FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-9-1. WILL CLOSE. HEATING COIL VALVE V-H-9 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-9-1 WILL OPEN. ROOM SENSOR TR-9 THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-9 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-9. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE HEATING MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND SMOKE EXHAUST FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-9-1 WILL OPEN. HEATING COIL VALVE V-H-9 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS FOR HVU-9 WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND CLOSE OUTSIDE DAMPER D-9-1. CROSS ZONED CEILING SMOKE DETECTORS IN THE SERVICE CORRIDOR OR A SPRINKLER WATER FLOW ALARM ON THE SERVICE LEVEL WILL ENERGIZE THE TWO (2) SMOKE EXHAUST FANS THROUGH THE FIRE ALARM SYSTEM. HVU-8,HVU-9 AND HVU-10 SERVICE THE AREA WILL BE DE-ENERGIZED AND ALL THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSITION WHEN THE SMOKE EXHAUST IS ENERGIZED BY THE FIRE ALARM SYSTEM. SERVICE LEVEL SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM. TWO (2) SERVICE LEVEL EXIT CORRIDOR SMOKE EXHAUST SYSTEMS EXIST WITH A TOTAL OF FOUR (4) EXHAUST FANS. TWO (2) SMOKE EXHAUST FANS ARE RELATED TO THREE (3) HEATING AND VENTILATING UNITS. IF EITHER EXIT CORRIDOR SMOKE EXHAUST SYSTEM IS ACTIVATED, THE OTHER SYSTEM WILL ALSO BE ENERGIZED. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:34 PM
FILE NAME HVU-9.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-9
SERVICE TUNNEL
SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer JDP | Project Manager WJT | Application Engineer RTS
DRAWN BY RTS DATE 09/05/97
APPROVED BY DATE

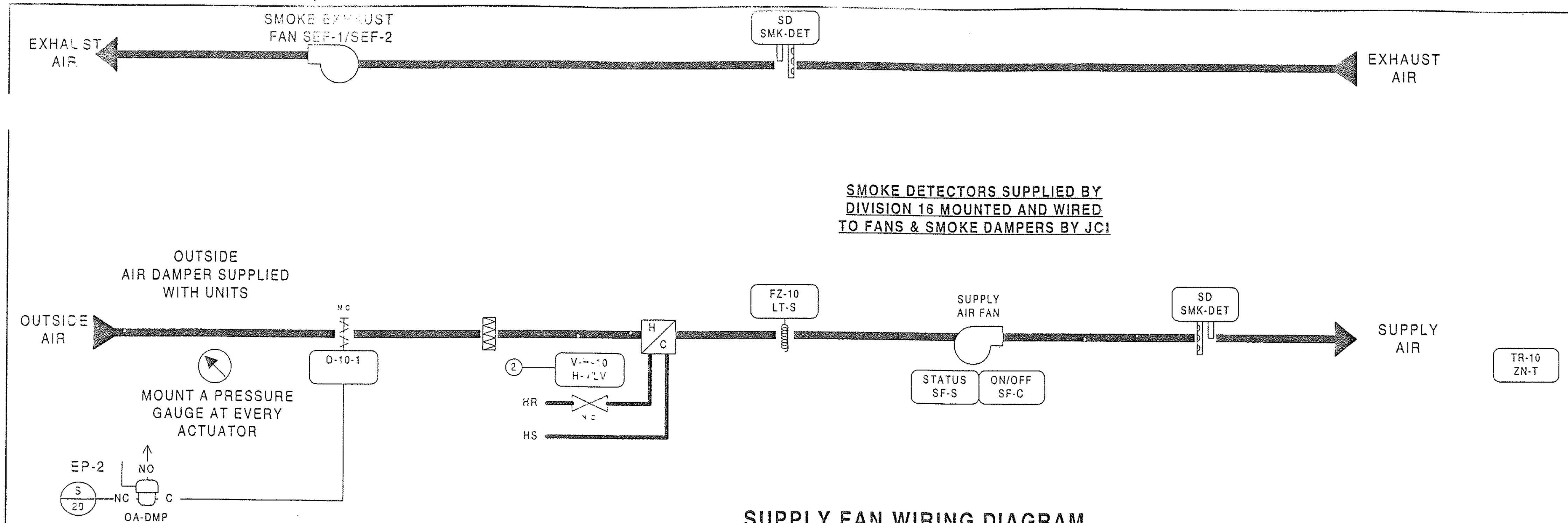
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-37

Full Spreadsheet		Software				Digital Controller Information						Panel Information				
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number
		HVU-9				UNT						EN-HVU-9	Service Level A		M.2-01A	
		HVU-9	*			UNT	1	19				EN-HVU-9	Service Level A	0	M.2-01A	
	AI-1	HVU-9				UNT	1	19	AI-1			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AI-1
	AI-2	HVU-9				UNT	1	19	AI-2			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AI-2
	AI-3	HVU-9				UNT	1	19	AI-3			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AI-3
	AI-4	HVU-9	ZN-T	Zone Temperature	Deg F	UNT	1	19	AI-4		PHONE JACK	EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AI-4
	AI-5	HVU-9				UNT	1	19	AI-5			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AI-5
	AI-6	HVU-9				UNT	1	19	AI-6			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AI-6
	BI-1	HVU-9	SF-S	Supply Fan Status	Off On	UNT	1	19	BI-1		BI#,24VAC	EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BI-1
	BI-2	HVU-9	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	19	BI-2		BI#,24VAC	EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BI-2
	BI-3	HVU-9	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	19	BI-3		BI#,24VAC	EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BI-3
	BI-4	HVU-9				UNT	1	19	BI-4			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BI-4
	BO-1	HVU-9	SF-C	Supply Fan Control	Off On	UNT	1	19	BO-1	RLY	BO#,24V,COM	EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BO-1
	BO-2	HVU-9				UNT	1	19	BO-2			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BO-2
	BO-3	HVU-9				UNT	1	19	BO-3			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BO-3
	BO-4	HVU-9				UNT	1	19	BO-4			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BO-4
	BO-5	HVU-9				UNT	1	19	BO-5			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BO-5
	BO-6	HVU-9				UNT	1	19	BO-6			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-BO-6
	AO-1	HVU-9	H-VLV	Heating Coil Valve	% Open	UNT	1	19	AO-1		AO#,AOCM,24VA	EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AO-1
	AO-2	HVU-9				UNT	1	19	AO-2			EN-HVU-9	Service Level A	0	M.2-01A	HVU-9-19-AO-2

	Intermediate Device					Field Device					
Point Type	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
											Power to Controller
											N2 Trunk
AI-1											
AI-2											
AI-3											
AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
AI-5											
AI-6											
BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
BI-2						2/22	Device dependent	Contact (NO)		U70	
BI-3						2/22	NO,M1	A70 (NC)		U71	
BI-4											
BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
BO-2											
BO-3											
BO-4											
BO-5											
BO-6											
AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
AO-2											

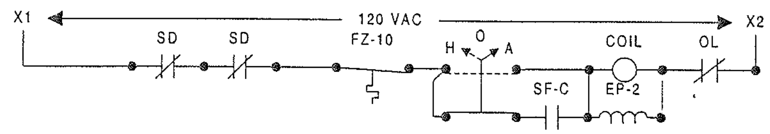


BILL OF MATERIALS

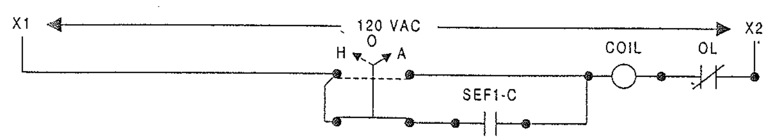
Estimate: hvu-10 — 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-10-1	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
EP-2	1	V11HAA-100	3-W SOLENOID,W/OV,120VAC
FZ-10	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-10	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

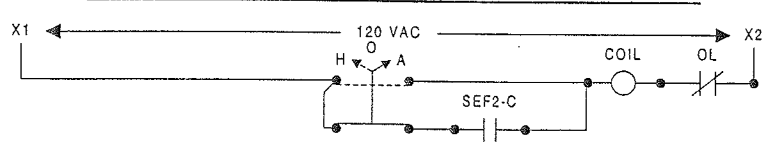
SUPPLY FAN WIRING DIAGRAM

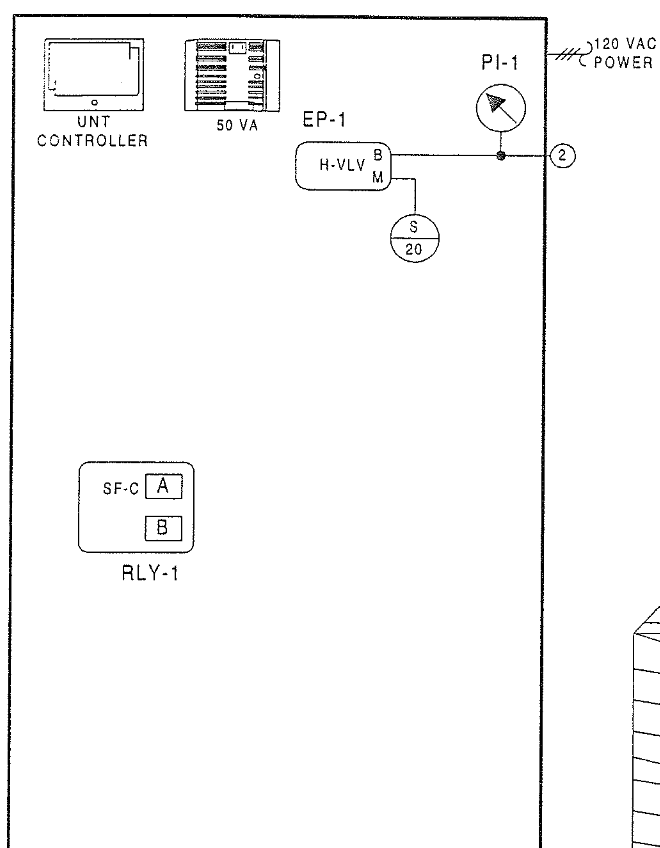


SMOKE EXHAUST FAN SEF-1 DIAGRAM



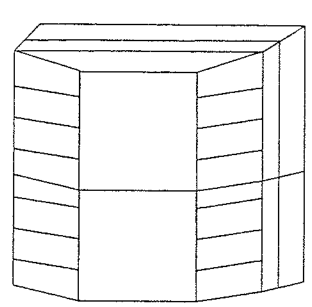
SMOKE EXHAUST FAN SEF-2 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-10	SERVICE LEVEL	MCC1SRA	9B	SERVICE LEVEL
SEF-1	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-2	SERVICE LEVEL		LOCAL	SERVICE LEVEL

NOTE: FOR SMOKE EXHAUST FANS SEF-1 AND SEF-2 METASYS POINT CONNECTIONS SEE AHU-19 CONTROL DIAGRAM BL-6559-25 POINT LIST NCM-5 PS-10



ENCLOSURE EN-HVU-10
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5 N2 ADD = 20

DESCRIPTION OF OPERATION

STARTING OF THE HVU SUPPLY FAN WILL INITIATE A START OF THE LEAD SMOKE EXHAUST FAN SEF-1 OR SEF-2. IF THE LEAD FAN FAILS OR FAILS TO START, THE LAG EXHAUST FAN SEF-1 OR SEF-2 WILL START AND RUN CONTINOUSLY.

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND SMOKE EXHAUST FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-10-1, WILL CLOSE. HEATING COIL VALVE V-H-10 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-10-1 WILL OPEN. ROOM SENSOR TR-10 THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-10 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-10. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE HEATING MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND SMOKE EXHAUST FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-10-1 WILL OPEN. HEATING COIL VALVE V-H-10 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS FOR HVU-10 WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND CLOSE OUTSIDE DAMPER D-10-1. CROSS ZONED CEILING SMOKE DETECTORS IN THE SERVICE CORRIDOR OR A SPRINKLER WATER FLOW ALARM ON THE SERVICE LEVEL WILL ENERGIZE THE TWO (2) SMOKE EXHAUST FANS THROUGH THE FIRE ALARM SYSTEM. HVU-8,HVU-9 AND HVU-10 SERVICE THE AREA WILL BE DE-ENERGIZED AND ALL THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSITION WHEN THE SMOKE EXHAUST IS ENERGIZED BY THE FIRE ALARM SYSTEM. SERVICE LEVEL SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM. TWO (2) SERVICE LEVEL EXIT CORRIDOR SMOKE EXHAUST SYSTEMS EXIST WITH A TOTAL OF FOUR (4) EXHAUST FANS. TWO (2) SMOKE EXHAUST FANS ARE RELATED TO THREE (3) HEATING AND VENTILATING UNITS. IF EITHER EXIT CORRIDOR SMOKE EXHAUST SYSTEM IS ACTIVATED, THE OTHER SYSTEM WILL ALSO BE ENERGIZED. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:35 PM
FILE NAME HVU-10.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-10
SERVICE TUNNEL
SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

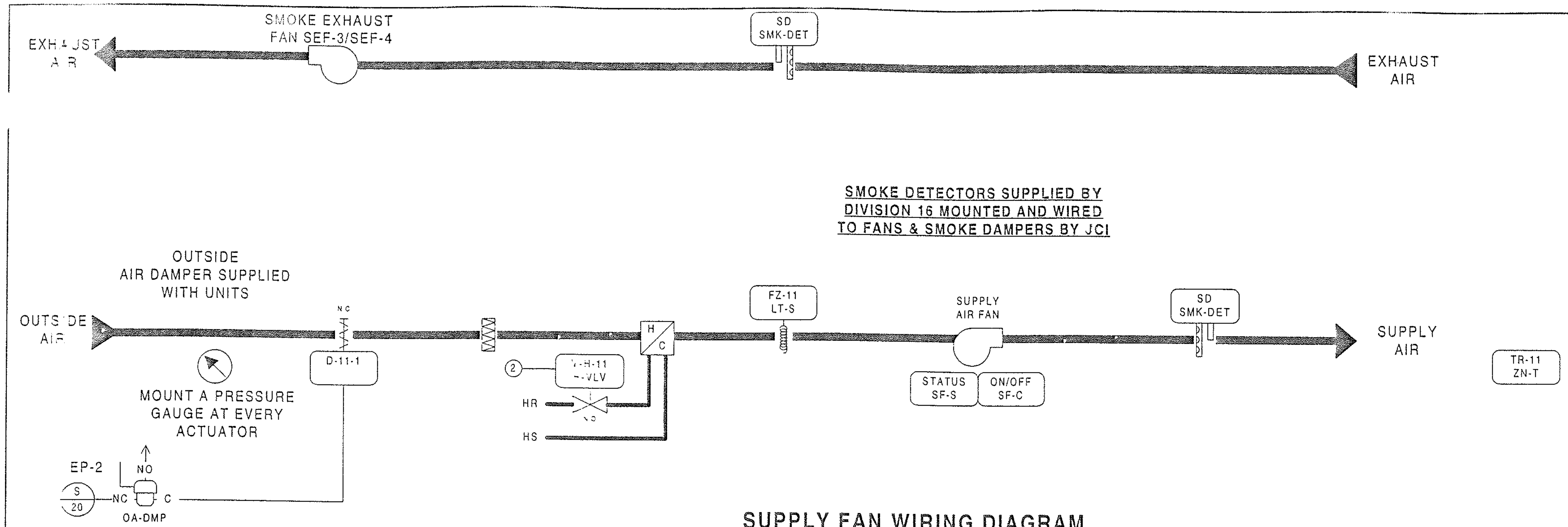
Sales Engineer JDP — Project Manager WJT — Application Engineer RTS — DRAWN BY RTS DATE 09/05/97 — APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-38

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-10				UNT						EN-HVU10	Service Level A		M.2-01A												Power to Controller
		HVU-10	*			UNT	1	20				EN-HVU10	Service Level A	0	M.2-01A												N2 Trunk
	AI-1	HVU-10				UNT	1	20	AI-1			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AI-1											
	AI-2	HVU-10				UNT	1	20	AI-2			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AI-2											
	AI-3	HVU-10				UNT	1	20	AI-3			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AI-3											
	AI-4	HVU-10	ZN-T	Zone Temperature	Deg F	UNT	1	20	AI-4		PHONE JACK	EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-10				UNT	1	20	AI-5			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AI-5											
	AI-6	HVU-10				UNT	1	20	AI-6			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AI-6											
	BI-1	HVU-10	SF-S	Supply Fan Status	Off On	UNT	1	20	BI-1		BI#,24VAC	EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-10	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	20	BI-2		BI#,24VAC	EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	HVU-10	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	20	BI-3		BI#,24VAC	EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	HVU-10				UNT	1	20	BI-4			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BI-4											
	BO-1	HVU-10	SF-C	Supply Fan Control	Off On	UNT	1	20	BO-1	RLY	BO#,24V,COM	EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-10				UNT	1	20	BO-2			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BO-2											
	BO-3	HVU-10				UNT	1	20	BO-3			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BO-3											
	BO-4	HVU-10				UNT	1	20	BO-4			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BO-4											
	BO-5	HVU-10				UNT	1	20	BO-5			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BO-5											
	BO-6	HVU-10				UNT	1	20	BO-6			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-BO-6											
	AO-1	HVU-10	H-VLV	Heating Coil Valve	% Open	UNT	1	20	AO-1		AO#,AOCM,24VA	EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-10				UNT	1	20	AO-2			EN-HVU10	Service Level A	0	M.2-01A	HVU10-20-AO-2											



BILL OF MATERIALS

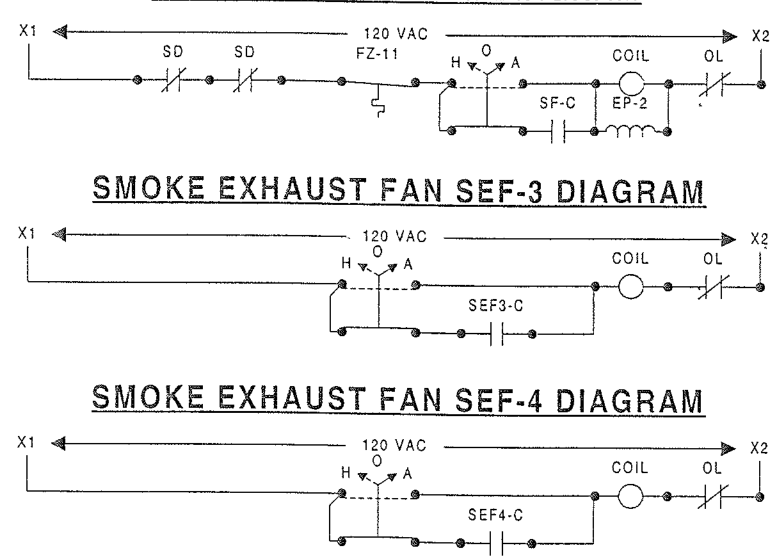
Estimate: hvu-11 — 70520098.pre

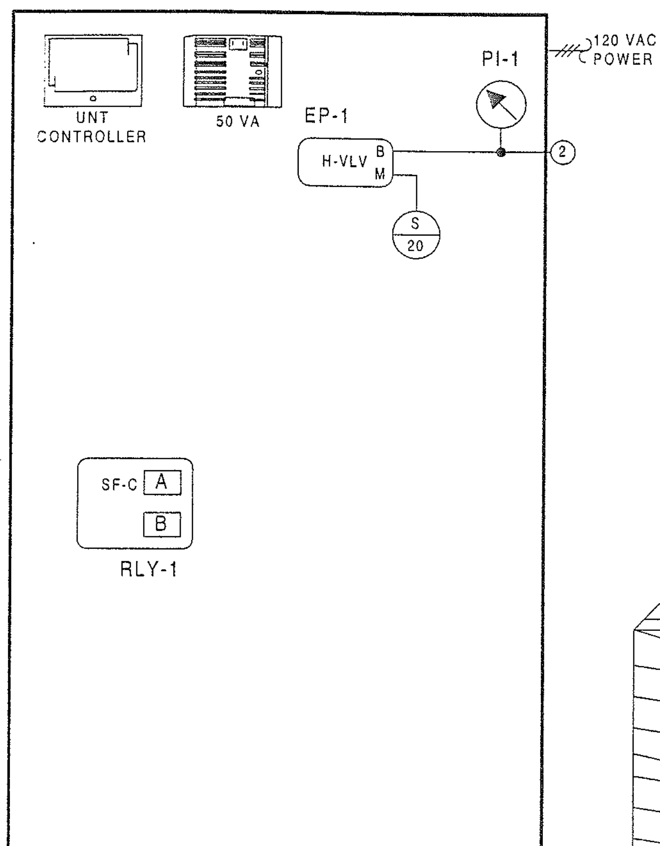
Desig.	Qty	Part #	Description
Field Devices:			
D-11-1	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
EP-2	1	V11HAA-100	3-W SOLENOID,W/OV,120VAC
FZ-11	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-11	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

SUPPLY FAN WIRING DIAGRAM

SMOKE EXHAUST FAN SEF-3 DIAGRAM

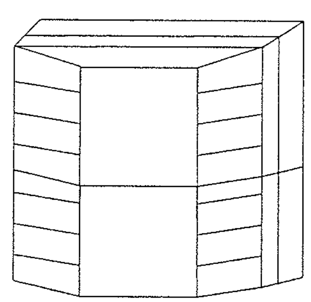
SMOKE EXHAUST FAN SEF-4 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-11	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-3	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-4	SERVICE LEVEL		LOCAL	SERVICE LEVEL

NOTE: FOR SMOKE EXHAUST FANS SEF-1 AND SEF-2 METASYS POINT CONNECTIONS SEE AHU-19 CONTROL DIAGRAM BL-6559-25 POINT LIST NCM-5 PS-10



ENCLOSURE EN-HVU-11
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5/N2 ADD = 21

DESCRIPTION OF OPERATION

STARTING OF THE HVU SUPPLY FAN WILL INITIATE A START OF THE LEAD SMOKE EXHAUST FAN SEF-3 OR SEF-4. IF THE LEAD FAN FAILS OR FAILS TO START, THE LAG EXHAUST FAN SEF-3 OR SEF-4 WILL START AND RUN CONTINOUSLY.

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND SMOKE EXHAUST FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-11-1, WILL CLOSE. HEATING COIL VALVE V-H-11 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-11-1 WILL OPEN. ROOM SENSOR TR-11 THROUGH THE METASYS SYSTEM CONTROL UNIT , WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-11 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-11. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE HEATING MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND SMOKE EXHAUST FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-11-1 WILL OPEN. HEATING COIL VALVE V-H-11 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS FOR HVU-11 WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND CLOSE OUTSIDE DAMPER D-11-1. CROSS ZONED CEILING SMOKE DETECTORS IN THE SERVICE CORRIDOR OR A SPRINKLER WATER FLOW ALARM ON THE SERVICE LEVEL WILL ENERGIZE THE TWO (2) SMOKE EXHAUST FANS THROUGH THE FIRE ALARM SYSTEM. HVU-11,HVU-12 AND HVU-13 SERVICE THE AREA WILL BE DE-ENERGIZED AND ALL THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSITION WHEN THE SMOKE EXHAUST IS ENERGIZED BY THE FIRE ALARM SYSTEM. SERVICE LEVEL SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM. TWO (2) SERVICE LEVEL EXIT CORRIDOR SMOKE EXHAUST SYSTEMS EXIST WITH A TOTAL OF FOUR (4) EXHAUST FANS. TWO (2) SMOKE EXHAUST FANS ARE RELATED TO THREE (3) HEATING AND VENTILATING UNITS. IF EITHER EXIT CORRIDOR SMOKE EXHAUST SYSTEM IS ACTIVATED, THE OTHER SYSTEM WILL ALSO BE ENERGIZED. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:35 PM
FILE NAME HVU-11.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-11
SERVICE TUNNEL
SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

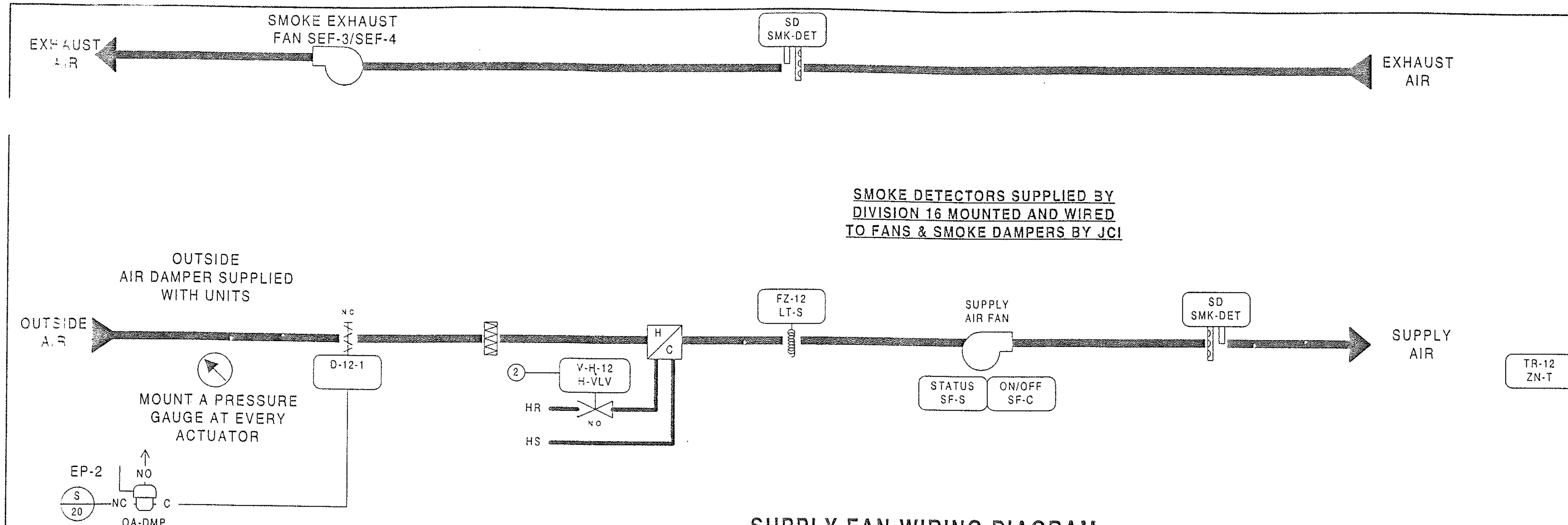
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/05/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-39

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
b		HVU-11					UNT						EN-HVU11	Service Level B		M.2-01B												Power to Controller
		HVU-11	*				UNT	1	21				EN-HVU11	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	HVU-11					UNT	1	21	AI-1			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AI-1											
	AI-2	HVU-11					UNT	1	21	AI-2			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AI-2											
	AI-3	HVU-11					UNT	1	21	AI-3			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AI-3											
	AI-4	HVU-11	ZN-T	Zone Temperature	Deg F		UNT	1	21	AI-4		PHONE JACK	EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-11					UNT	1	21	AI-5			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AI-5											
	AI-6	HVU-11					UNT	1	21	AI-6			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AI-6											
	BI-1	HVU-11	SF-S	Supply Fan Status	Off	On	UNT	1	21	BI-1		BI#,24VAC	EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-11	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	21	BI-2		BI#,24VAC	EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	HVU-11	LT-S	Low Temperature Stat	Normal	Alarm	UNT	1	21	BI-3		BI#,24VAC	EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	HVU-11					UNT	1	21	BI-4			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BI-4											
	BO-1	HVU-11	SF-C	Supply Fan Control	Off	On	UNT	1	21	BO-1	RLY	BO#,24V,COM	EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-11					UNT	1	21	BO-2			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BO-2											
	BO-3	HVU-11					UNT	1	21	BO-3			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BO-3											
	BO-4	HVU-11					UNT	1	21	BO-4			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BO-4											
	BO-5	HVU-11					UNT	1	21	BO-5			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BO-5											
	BO-6	HVU-11					UNT	1	21	BO-6			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-BO-6											
	AO-1	HVU-11	H-VLV	Heating Coil Valve	% Open		UNT	1	21	AO-1		AO#,AOCM,24VA	EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-11					UNT	1	21	AO-2			EN-HVU11	Service Level B	0	M.2-01B	HVU11-21-AO-2											

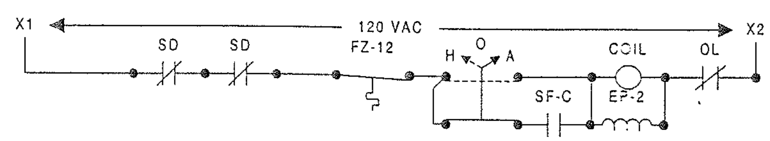


BILL OF MATERIALS

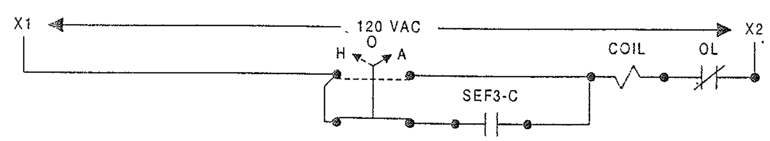
Estimate: hvu-12 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-12-1	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
EP-2	1	V11HAA-100	3-W SOLENOID,W/OV,120VAC
FZ-12	1	A70HA-1C	STAT,LL,20',EL,MAN,15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-HVU-12	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

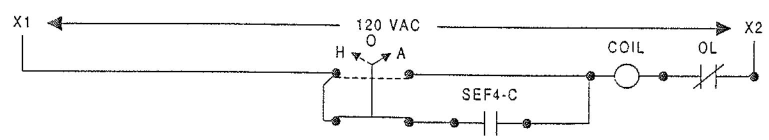
SUPPLY FAN WIRING DIAGRAM

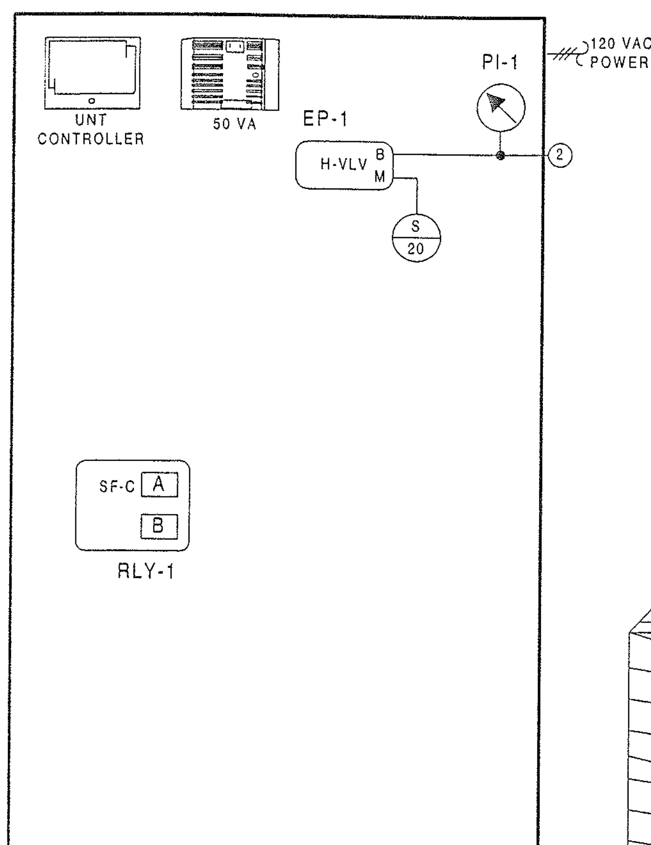


SMOKE EXHAUST FAN SEF-3 DIAGRAM



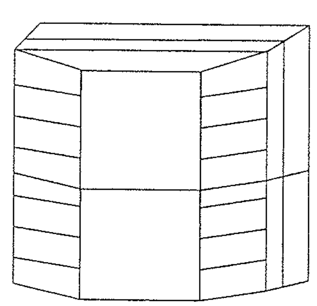
SMOKE EXHAUST FAN SEF-4 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-12	SERVICE LEVEL	MCC2SRB	3B	SERVICE LEVEL
SEF-3	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-4	SERVICE LEVEL		LOCAL	SERVICE LEVEL

NOTE: FOR SMOKE EXHAUST FANS SEF-3 AND SEF-4 METASYS POINT CONNECTIONS SEE AHU-13 CONTROL DIAGRAM BL-6559-18 POINT LIST NCM-5 PS-4



ENCLOSURE EN-HVU-12
AS-UNT111-101
LOCATED ADJACENT TO UNIT
NCM-5/N2 ADD = 22

DESCRIPTION OF OPERATION

STARTING OF THE HVU SUPPLY FAN WILL INITIATE A START OF THE LEAD SMOKE EXHAUST FAN SEF-3 OR SEF-4. IF THE LEAD FAN FAILS OR FAILS TO START, THE LAG EXHAUST FAN SEF-3 OR SEF-4 WILL START AND RUN CONTINOUSLY.

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND SMOKE EXHAUST FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-12-1, WILL CLOSE. HEATING COIL VALVE V-H-12 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-12-1 WILL OPEN. ROOM SENSOR TR-12 THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-12 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-12. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE HEATING MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND SMOKE EXHAUST FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-12-1 WILL OPEN. HEATING COIL VALVE V-H-12 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS FOR HVU-12 WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND CLOSE OUTSIDE DAMPER D-12-1. CROSS ZONED CEILING SMOKE DETECTORS IN THE SERVICE CORRIDOR OR A SPRINKLER WATER FLOW ALARM ON THE SERVICE LEVEL WILL ENERGIZE THE TWO (2) SMOKE EXHAUST FANS THROUGH THE FIRE ALARM SYSTEM. HVU-11,HVU-12 AND HVU-13 SERVICE THE AREA WILL BE DE-ENERGIZED AND ALL THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSITION WHEN THE SMOKE EXHAUST IS ENERGIZED BY THE FIRE ALARM SYSTEM. SERVICE LEVEL SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM. TWO (2) SERVICE LEVEL EXIT CORRIDOR SMOKE EXHAUST SYSTEMS EXIST WITH A TOTAL OF FOUR (4) EXHAUST FANS. TWO (2) SMOKE EXHAUST FANS ARE RELATED TO THREE (3) HEATING AND VENTILATING UNITS. IF EITHER EXIT CORRIDOR SMOKE EXHAUST SYSTEM IS ACTIVATED, THE OTHER SYSTEM WILL ALSO BE ENERGIZED. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM.

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	03:36 PM
FILE NAME	HVU-12.vsd

DRAWING TITLE

HEAT-VENT UNIT HVU-12
SERVICE TUNNEL

SERVICE LEVEL QUAD B

PROJECT TITLE

BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

				ECN	DATE	BY
AS-BUILT					7/18/00	CME
REFERENCE DRAWING		NO	REVISION-LOCATION	ECN	DATE	BY

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/09/97	BY DATE

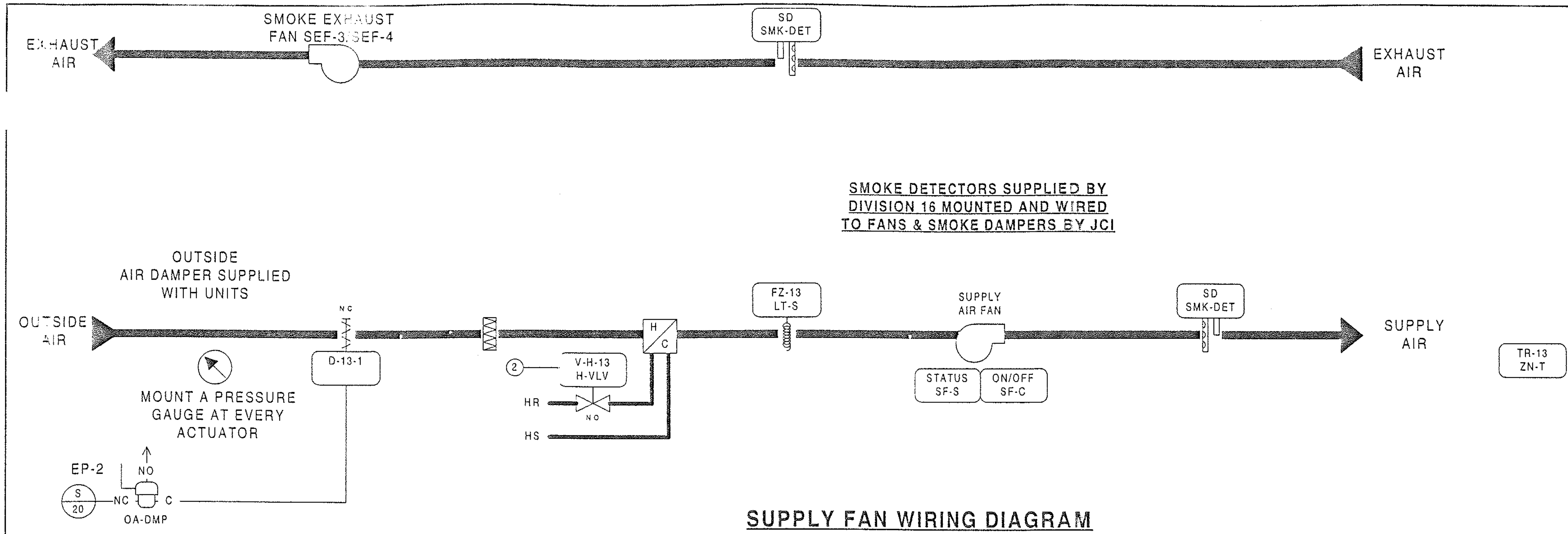
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-40

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-12				UNT						EN-HVU12	Service Level B		M.2-01B												Power to Controller
		HVU-12	*			UNT	1	22				EN-HVU12	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	HVU-12				UNT	1	22	AI-1			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AI-1											
	AI-2	HVU-12				UNT	1	22	AI-2			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AI-2											
	AI-3	HVU-12				UNT	1	22	AI-3			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AI-3											
	AI-4	HVU-12	ZN-T	Zone Temperature	Deg F	UNT	1	22	AI-4		PHONE JACK	EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-12				UNT	1	22	AI-5			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AI-5											
	AI-6	HVU-12				UNT	1	22	AI-6			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AI-6											
	BI-1	HVU-12	SF-S	Supply Fan Status	Off On	UNT	1	22	BI-1		BI#,24VAC	EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-12	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	22	BI-2		BI#,24VAC	EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	HVU-12	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	22	BI-3		BI#,24VAC	EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BI-3						2/22	NC,M1	A70 (NC)		U71	
	BI-4	HVU-12				UNT	1	22	BI-4			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BI-4											
	BO-1	HVU-12	SF-C	Supply Fan Control	Off On	UNT	1	22	BO-1	RLY	BO#,24V,COM	EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-12				UNT	1	22	BO-2			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BO-2											
	BO-3	HVU-12				UNT	1	22	BO-3			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BO-3											
	BO-4	HVU-12				UNT	1	22	BO-4			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BO-4											
	BO-5	HVU-12				UNT	1	22	BO-5			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BO-5											
	BO-6	HVU-12				UNT	1	22	BO-6			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-BO-6											
	AO-1	HVU-12	H-VLV	Heating Coil Valve	% Open	UNT	1	22	AO-1		AO#,AOCM,24VA	EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-12				UNT	1	22	AO-2			EN-HVU12	Service Level B	0	M.2-01B	HVU12-22-AO-2											

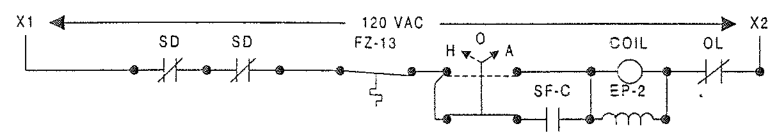


BILL OF MATERIALS

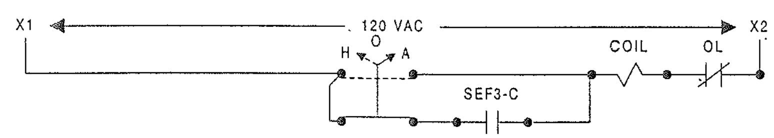
Estimate: hvu-13 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-13-1	1	D-3153-2	DMPR ACT, 8-13#
	1	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
EP-2	1	V11HAA-100	3-W SOLENOID, W/CV, 120VAC
FZ-13	1	A70HA-1C	STAT, LL, 20', EL, MAN, 15/55F
H-VLV	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT, NI, BOX, JACK
Panel Devices:			
EN-HVU-13	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD, CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR, EP, 0/10V, HI VOL
PI-1	1	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

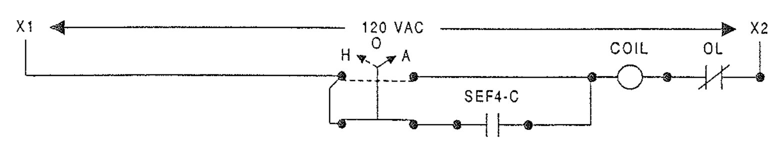
SUPPLY FAN WIRING DIAGRAM

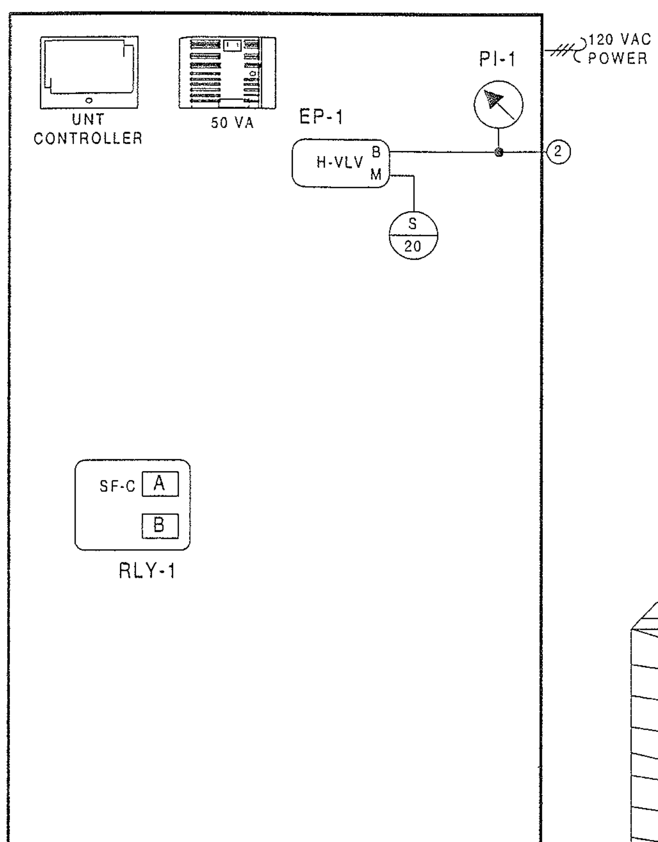


SMOKE EXHAUST FAN SEF-3 DIAGRAM



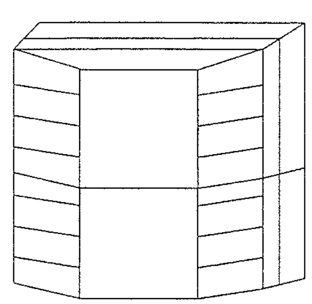
SMOKE EXHAUST FAN SEF-4 DIAGRAM





FAN	LOCATION	ELEC PANEL	STARTER	LOCATION
HVU-13	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-3	SERVICE LEVEL		LOCAL	SERVICE LEVEL
SEF-4	SERVICE LEVEL		LOCAL	SERVICE LEVEL

NOTE: FOR SMOKE EXHAUST FANS SEF-3 AND SEF-4 METASYS POINT CONNECTIONS SEE AHU-13 CONTROL DIAGRAM BL-6559-18 POINT LIST NCM-5 PS-4



ENCLOSURE EN-HVU-13
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-5/N2 ADD = 23

DESCRIPTION OF OPERATION

STARTING OF THE HVU SUPPLY FAN WILL INITIATE A START OF THE LEAD SMOKE EXHAUST FAN SEF-3 OR SEF-4. IF THE LEAD FAN FAILS OR FAILS TO START, THE LAG EXHAUST FAN SEF-3 OR SEF-4 WILL START AND RUN CONTINOUSLY.

THE METASYS SYSTEM WILL DETERMINE THE "OCCUPIED AND UNOCCUPIED" MODES OF OPERATION. OCCUPIED MODES GENERALLY OCCUR DURING STADIUM EVENTS, BUT MANUAL OVERRIDE THROUGH THE METASYS SYSTEM ON SELECTED UNITS WILL FREQUENTLY BE REQUIRED. WHEN THE UNIT AND SMOKE EXHAUST FAN ARE DE-ENERGIZED, OUTSIDE AIR DAMPER D-13-1, WILL CLOSE. HEATING COIL VALVE V-H-13 WILL BE CLOSED TO THE COIL.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-13-1 WILL OPEN. ROOM SENSOR TR-13 THROUGH THE METASYS SYSTEM CONTROL UNIT, WILL ON A RISE IN TEMPERATURE ABOVE ITS SETTING OF SEVENTY-FIVE (75F) MODULATE V-H-13 CLOSED TO THE HEATING COIL. ON A FALL IN TEMPERATURE, THIS CYCLE IS REVERSED.

UNOCCUPIED HEATING MODE - ROOM SENSOR TR-13. WILL ON A FALL IN TEMPERATURE TO ITS SETTING OF FIFTY (50F). ACTIVATE THE SYSTEM TO RUN IN THE HEATING MODE AS HEREINBEFORE DESCRIBED.ON A RISE IN TEMPERATURE TO FIFTY-FIVE (55F), THE SYSTEM WILL BE DE-ENERGIZED. IN THE UNOCCUPIED MODE ALL AIR HANDLING UNIT DAMPERS AND CONTROLS WILL RETURN TO THEIR NORMAL POSITION READY FOR RESTARTING.

OCCUPIED VENTILATING MODE - SUPPLY AND SMOKE EXHAUST FANS START AND RUN CONTINUOUSLY. OUTSIDE AIR DAMPER D-13-1 WILL OPEN. HEATING COIL VALVE V-H-13 WILL BE CLOSED TO THE COIL.

UNOCCUPIED VENTILATING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF.

SMOKE CONTROL - SMOKE DETECTORS FOR HVU-13 WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND CLOSE OUTSIDE DAMPER D-13-1. CROSS ZONED CEILING SMOKE DETECTORS IN THE SERVICE CORRIDOR OR A SPRINKLER WATER FLOW ALARM ON THE SERVICE LEVEL WILL ENERGIZE THE TWO (2) SMOKE EXHAUST FANS THROUGH THE FIRE ALARM SYSTEM. HVU-11,HVU-12 AND HVU-13 SERVICE THE AREA WILL BE DE-ENERGIZED AND ALL THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSITION WHEN THE SMOKE EXHAUST IS ENERGIZED BY THE FIRE ALARM SYSTEM. SERVICE LEVEL SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM. TWO (2) SERVICE LEVEL EXIT CORRIDOR SMOKE EXHAUST SYSTEMS EXIST WITH A TOTAL OF FOUR (4) EXHAUST FANS. TWO (2) SMOKE EXHAUST FANS ARE RELATED TO THREE (3) HEATING AND VENTILATING UNITS. IF EITHER EXIT CORRIDOR SMOKE EXHAUST SYSTEM IS ACTIVATED, THE OTHER SYSTEM WILL ALSO BE ENERGIZED. FIRE ALARM SYSTEM CONTROL IS INDEPENDENT OF THE METASYS SYSTEM.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:35 PM
FILE NAME HVU-13.vsd

DRAWING TITLE
HEAT-VENT UNIT HVU-13
FREIGHT ELEVATOR LOBBY

SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer JDP | Project Manager WJT | Application Engineer RTS | DRAWN BY RTS DATE 09/09/97 | APPROVED BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information: JOHNSON CONTROLS, 60 LOVETON CIRCLE, SPARKS, MD 21152

CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-41

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		HVU-13				UNT						EN-HVU13	Service Level B		M.2-01B												Power to Controller
		HVU-13	*			UNT	1	23				EN-HVU13	Service Level B	0	M.2-01B												N2 Trunk
	AI-1	HVU-13				UNT	1	23	AI-1			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AI-1											
	AI-2	HVU-13				UNT	1	23	AI-2			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AI-2											
	AI-3	HVU-13				UNT	1	23	AI-3			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AI-3											
	AI-4	HVU-13	ZN-T	Zone Temperature	Deg F	UNT	1	23	AI-4		PHONE JACK	EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	HVU-13				UNT	1	23	AI-5			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AI-5											
	AI-6	HVU-13				UNT	1	23	AI-6			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AI-6											
	BI-1	HVU-13	SF-S	Supply Fan Status	Off On	UNT	1	23	BI-1		BI#,24VAC	EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	HVU-13	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	23	BI-2		BI#,24VAC	EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BI-2						2/22	Device dependent	Contact (NO)		U70	
	BI-3	HVU-13	LT-S	Low Temperature Stat	Normal Alarm	UNT	1	23	BI-3		BI#,24VAC	EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BI-3						2/22	NO,M1	A70 (NC)		U71	
	BI-4	HVU-13				UNT	1	23	BI-4			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BI-4											
	BO-1	HVU-13	SF-C	Supply Fan Control	Off On	UNT	1	23	BO-1	RLY	BO#,24V,COM	EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BO-1	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-2	HVU-13				UNT	1	23	BO-2			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BO-2											
	BO-3	HVU-13				UNT	1	23	BO-3			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BO-3											
	BO-4	HVU-13				UNT	1	23	BO-4			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BO-4											
	BO-5	HVU-13				UNT	1	23	BO-5			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BO-5											
	BO-6	HVU-13				UNT	1	23	BO-6			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-BO-6											
	AO-1	HVU-13	H-VLV	Heating Coil Valve	% Open	UNT	1	23	AO-1		AO#,AOCM,24VA	EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	HVU-13				UNT	1	23	AO-2			EN-HVU13	Service Level B	0	M.2-01B	HVU13-23-AO-2											

BILL OF MATERIALS

Estimate: cooling 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
FS-1	1	F61KB-11C	SW,FLOW,SPDT,1-6" PIPE
TC-1,2,3,4	4	TE-631AP-1	SENS,T-Ni,0.1%,F/WZ1000-5
	4	WZ-1000-5	WELL,BRASS,1/2"NPT+COMPND
V-CH-1	1	--	SEE VALVE SCHEDULE
Panel Devices:			
DC-1	1	DX-9100-8454	DIGITAL CONTR., EXTENDED
	1	DX-9100-8990	MTG BASE (DX9100-8454)
EN-COOL	1	EN-EWC25-0	UNITY PKG MOD,DUAL,W/50VA
EP-1	1	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DPT-1 CHW3-DP | TC-5 CHS3-T

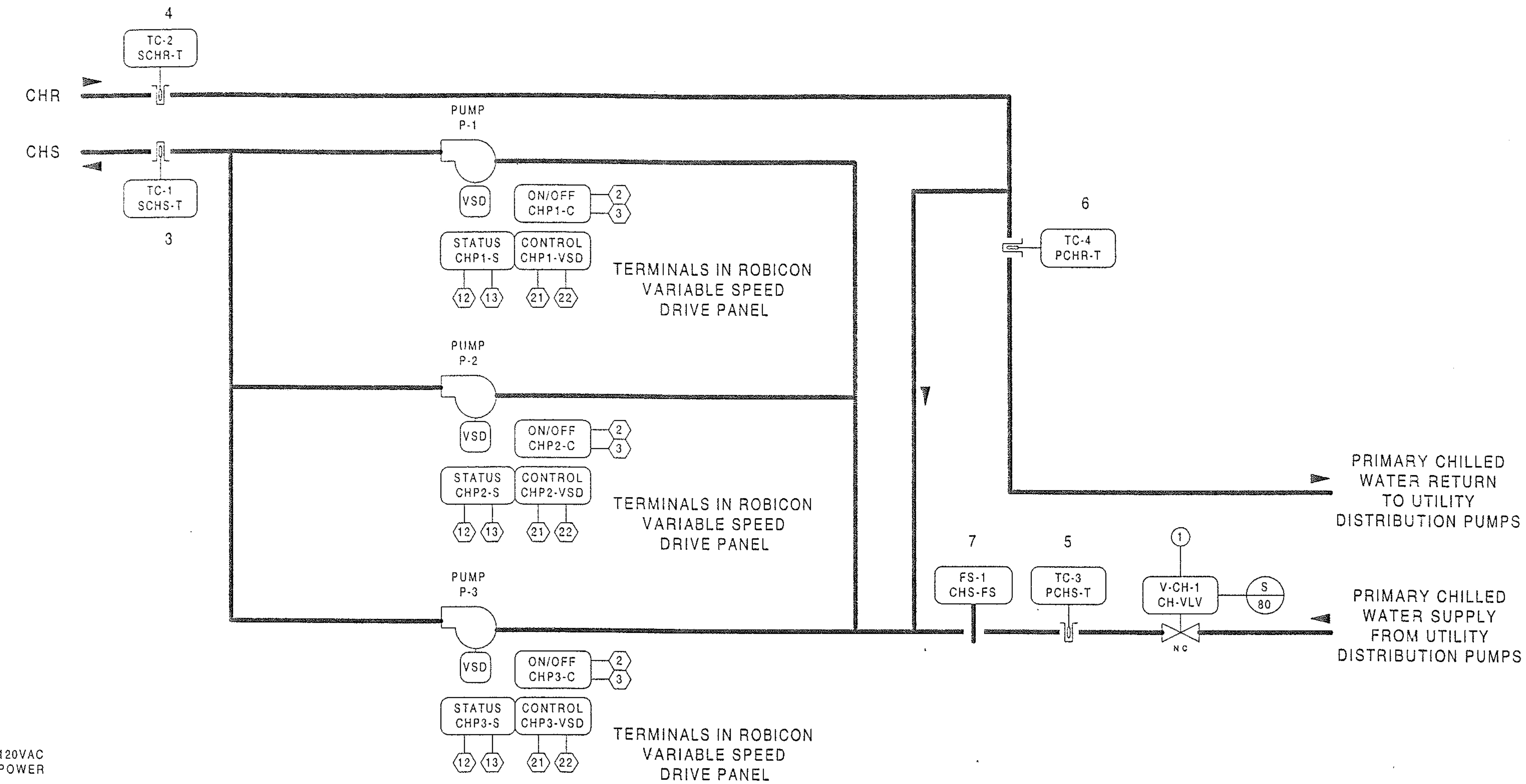
FOR WATER LINE CONNECTIONS
SEE AHU-3 DRAWING BL-6559-07
FOR POINT CONNECTIONS
SEE POINT SCHEDULE
NCM-3/PS-1

DPT-2 CHW5-DP | TC-6 CHS5-T

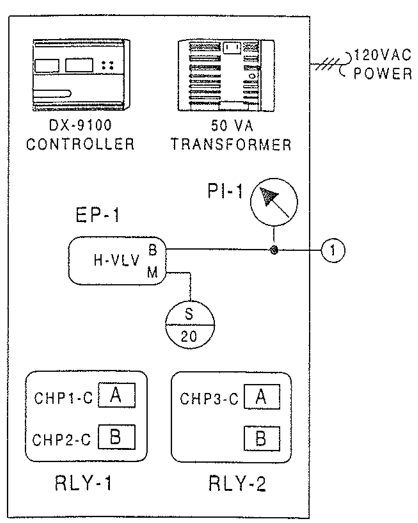
FOR WATER LINE CONNECTIONS
SEE FCU DRAWING BL-6559-09
FOR POINT CONNECTIONS
SEE POINT SCHEDULE
NCM-3/PS-4

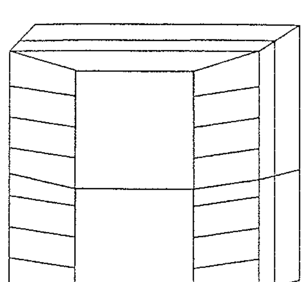
DPT-3 CHW4-DP | TC-4 CHS4-T

FOR WATER LINE CONNECTIONS
SEE AHU-4 DRAWING BL-6559-10
FOR POINT CONNECTIONS
SEE POINT SCHEDULE
NCM-4/PS-1



PRIMARY CHILLED WATER PUMPS
UTILITY FLOW METER
AND BY-PASS VALVE
PROVIDED BY CHILLED
WATER UTILITY COMPANY





ENCLOSURE EN-COOL
DX-9100-8001
LOCATED IN MECHANICAL ROOM
NCM-5/N2 ADD = 24

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL CONTROL THE CHILLED WATER SYSTEM. WHEN THE SYSTEM IS DE-ENERGIZED, THE PRIMARY CHILLED WATER VALVE V-CH-1 WILL CLOSE AND BUILDING SECONDARY CHILLED WATER DISTRIBUTION PUMPS P-1,P-2, AND P-3 WILL BE OFF. CONTROL OF UTILITY DISTRIBUTION PUMPS WILL BE PROVIDED BY THE UTILITY COMPANY. WHEN THE CHILLED WATER SYSTEM IS ENERGIZED BY THE BUILDING HEATING-COOLING CONTROL, CHILLED WATER VALVE V-CH-1 WILL MODULATE OPEN TO ITS MAXIMUM POSITION. THE SECONDARY CHILLED WATER DISTRIBUTION PUMPS MAY BE STARTED MANUALLY OR THROUGH THE METASYS SYSTEM AFTER PRIMARY CHILLED WATER FLOW HAS BEEN CONFIRMED BY UTILITY FLOW METER AND SYSTEM FLOW SWITCH FS-1. THE VARIABLE FREQUENCY DRIVE (VFD) SYSTEM FOR THE SECONDARY CHILLED WATER DISTRIBUTION PUMPS WILL BE CONFIGURED WITH THREE (3) INDEPENDENT VFD CABINETS, ONE FOR EACH PUMP. VFD CABINETS WILL BE CAPABLE OF MANUAL OPERATION THROUGH OPERATOR INTERVENTION IF REQUIRED. AFTER PRIMARY CHILLED WATER FLOW HAS BEEN CONFIRMED, THE LEAD PUMP AS SELECTED BY THE METASYS SYSTEM LEAD/LAG PROGRAM AND ACTING THROUGH THE VFD WILL START AT REDUCED SPEED AND RUN CONTINUOUSLY. REDUCED SPEED STARTING WILL BE THE MINIMUM SETTING OF THE VARIABLE FREQUENCY PUMP DRIVE AND WILL BE FULLY ADJUSTABLE THROUGHOUT THE RANGE OF THE DRIVE. IF PUMP P-1 FAILS OR FAILS TO START AS SENSED BY THE VFD PANEL CONTACT, PUMP P-2 OR P-3 WILL AUTOMATICALLY START AND RUN CONTINUOUSLY. A FAILURE OF ANY DISTRIBUTION PUMP AS SENSED BY THEIR RESPECTIVE VFD PANEL CONTACT WILL BE ALARMED ON THE METASYS SYSTEM. EACH DISTRIBUTION PUMP WILL BE STARTED AT REDUCED SPEED THROUGH INDIVIDUAL VARIABLE FREQUENCY PUMP DRIVES AND SEQUENCED WITH THE PROGRAMMED LEAD/LAG OPERATION. THREE (3) DIFFERENTIAL PRESSURE TRANSMITTERS DPT-1,DPT-2 AND DPT-3 WITH ADJUSTABLE SETPOINT, THROUGH THE METASYS SYSTEM WILL MODULATE THE VARIABLE FREQUENCY PUMP DRIVE TO MAINTAIN THEIR SETPOINT. THE TRANSMITTER CALLING FOR AN INCREASE IN DIFFERENTIAL PRESSURE ABOVE ITS MINIMUM SETPOINT WILL TAKE CONTROL OF THE PUMP DRIVE. ON A FALL IN THE REQUIRED DIFFERENTIAL PRESSURE AS SENSED BY EITHER TRANSMITTER THE PUMP DRIVE WILL GRADUALLY INCREASE THE PUMP SPEED FROM MINIMUM TO MAXIMUM AS REQUIRED TO MAINTAIN THE SETPOINT. ON A RISE IN DIFFERENTIAL PRESSURE THE REVERSE WILL OCCUR. THREE (3) DIFFERENTIAL PRESSURE TRANSMITTERS DPT-1,DPT-2 AND DPT-3 AND THREE (3) TEMPERATURE SENSORS TC-5,TC-6 AND TC-7 WILL BE LOCATED THROUGHOUT THE STADIUM COMPLEX AS FOLLOWS:

DPT-1 AND TC-5 WILL BE LOCATED ADJACENT TO AHU-3 ON THE PRESS LEVEL QUAD C
DPT-2 AND TC-6 WILL BE LOCATED AT THE TOP OF HYDRAULICALLY REMOTE CHS AND CHR RISER SERVING SUITES UPPER SUITES QUAD C
DPT-3 AND TC-7 WILL BE LOCATED ADJACENT TO AHU-4 ON THE PRESS LEVEL QUAD D

ON A CONTINUED FALL IN DIFFERENTIAL PRESSURE AS SENSED BY EITHER TRANSMITTER WITH PUMP P-1 AT MAXIMUM SPEED, A SECOND OR LAG DISTRIBUTION PUMP P-2 OR P-3 AS APPLICABLE WILL BE STARTED. PRIOR TO STARTING THE SECOND PUMP, P-1 WILL BE REDUCED TO FIFTY (50) PERCENT FULL LOAD. THE SECOND PUMP WILL BE STARTED THROUGH ITS VARIABLE FREQUENCY DRIVE AT REDUCED SPEED. WHEN THE SECOND PUMP IS PROVEN OPERATIONAL BY ITS RESPECTIVE VFD PANEL CONTACT, BOTH PUMPS WILL BE GRADUALLY MODULATED AT THE SAME SPEED TO MAINTAIN THE SETPOINTS OF THE DPT-1,DPT-2 OR DPT-3 AS DETERMINED THROUGH THE METASYS SYSTEM. ON A CONTINUED FALL IN DIFFERENTIAL PRESSURE AS SENSED BY EITHER TRANSMITTER WITH PUMPS P-1 AND P-2 AT MAXIMUM SPEED, THE THIRD DISTRIBUTION PUMP P-3 WILL BE STARTED. PRIOR TO STARTING THE THIRD PUMP, P-1 AND P-2 WILL BE REDUCED TO SIXTY-SEVEN (67) PERCENT FULL LOAD. THE THIRD PUMP WILL BE STARTED THROUGH ITS VARIABLE FREQUENCY PUMP DRIVE AT REDUCED SPEED. WHEN THE THIRD PUMP IS PROVEN OPERATIONAL BY ITS RESPECTIVE VFD PANEL CONTACT, ALL THREE (3) PUMPS WILL BE GRADUALLY MODULATED AT THE SAME SPEED TO MAINTAIN THE SETPOIINTS OF THE DPT-1,DPT-2 OR DPT-3 AS DETERMINED THROUGH THE METASYS SYSTEM. ON A RISE IN DIFFERENTIAL PRESSURE ABOVE THE SETPOINT OF ALL TRANSMITTERS THE REVERSE SEQUENCE WILL OCCUR. WHEN ALL THREE (3) DISTRIBUTION PUMPS HAVE BEEN REDUCED IN SPEED TO SIXTY-SEVEN (67) PERCENT OF THE MAXIMUM SPEED (ADJUSTABLE) PUMP P-1 WILL BE STOPPED. PUMPS P-2 AND P-3 WILL AGAIN BE GRADUALLY MODULATED AT THE SAME SPEED TO MAINTAIN THE SETPOINTS OF DPT-1,DPT-2 OR DPT-3. ON A CONTINUED RISE IN DIFFERENTIAL PRESSURE WITH PUMPS P-2 AND P-3 REDUCED IN SPEED TO FIFTY (50) PERCENT OF THE MAXIMUM SPEED (ADJUSTABLE) PUMP P-2 WILL BE STOPPED. PUMP P-3 WILL BE GRADUALLY MODULATED TO MAINTAIN THE SETPOINTS OF DPT-1,DPT-2 OR DPT-3. DISTRIBUTION PUMP CYCLES WILL BE LIMITED BY AN ADJUSTABLE TIME PERIOD OF ONE (1) HOUR. PUMP STARTS AND STOPS WILL BE LIMITED BY THE TIME PERIOD AND INDICATED ON THE METASYS SYSTEM. DISTRIBUTION PUMPS OPERATING IN PARALLEL WILL RUN AT THE SAME SPEED THROUGH THEIR RESPECTIVE VFD. SPEED ADJUSTMENTS WILL OCCUR QUICKLY WHEN A PUMP IS BROUGHT ON LINE. TEMPERATURE SENSOR TC-1 LOCATED IN THE CHILLED WATER SUPPLY LINE DOWNSTREAM OF PUMPS P-1,P-2 AND P-3 WILL MODULATE VALVE V-CH-1 TO MAINTAIN ITS SETTING OF THIRTY-SIX (36F). TEMPERATURE SENSORS TC-2, TC-3 AND TC-4 WILL MONITOR CHILLED WATER TEMPERATURE AT LOCATIONS INDICATED. UTILITY FLOW METER WILL BE USED TO MONITOR AND TREND CHILLED WATER CONSUMPTION AT THE FACILITY. DURING A STADIUM EVENT, THE METASYS SYSTEM WILL BE PROGRAMMED TO TREND THE TEMPERATURE READINGS FROM TC-1,TC-2,TC-3 AND TC-4 : RECORD PRIMARY CHILLED WATER FLOW: AND INDICATE SECONDARY CHILLED WATER DISTRIBUTION PUMP OPERATION IN TEN MINUTE INCREMENTS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:37 PM
FILE NAME COOLING.vsd

DRAWING TITLE
CHILLED WATER SYSTEM
MECHANICAL ROOM NORTH SERVICE LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer: JDP | Project Manager: WJT | Application Engineer: RTS | DRAWN BY RTS DATE 09/10/97 | APPROVED BY DATE

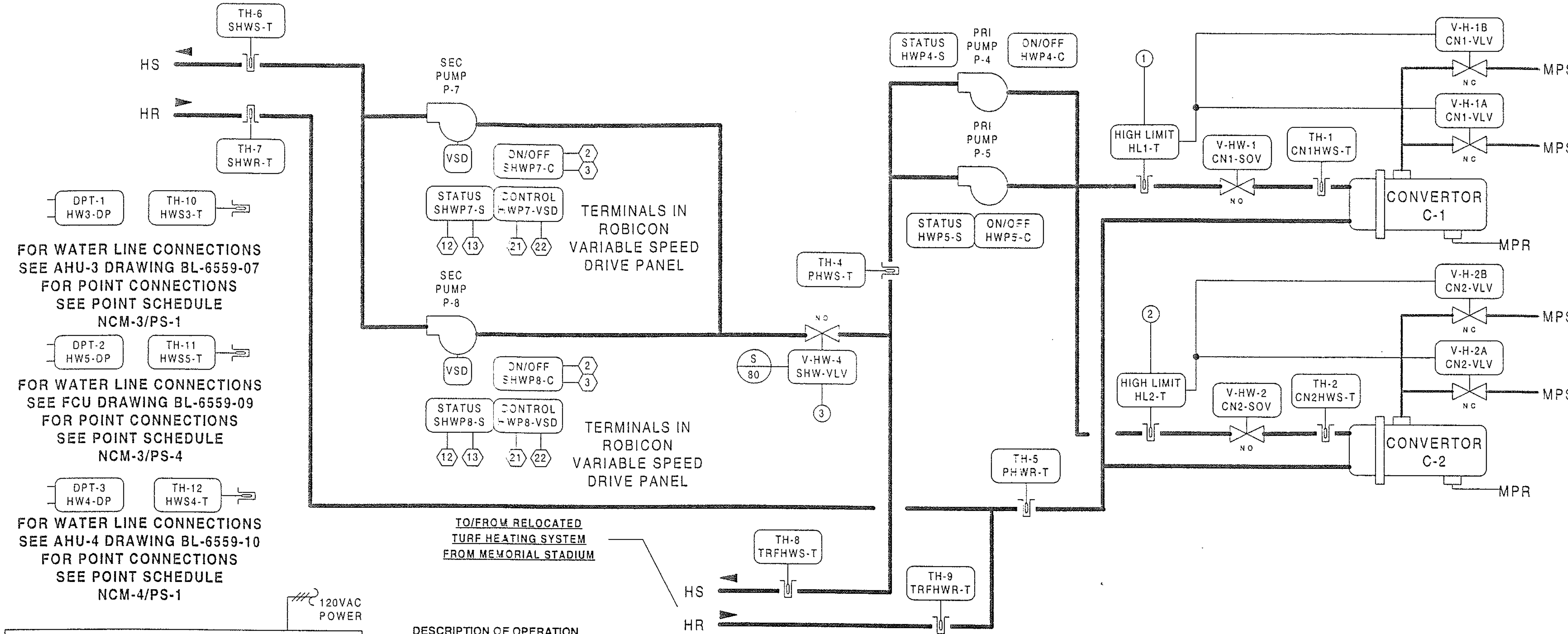
JOHNSON CONTROLS
Systems & Services Division

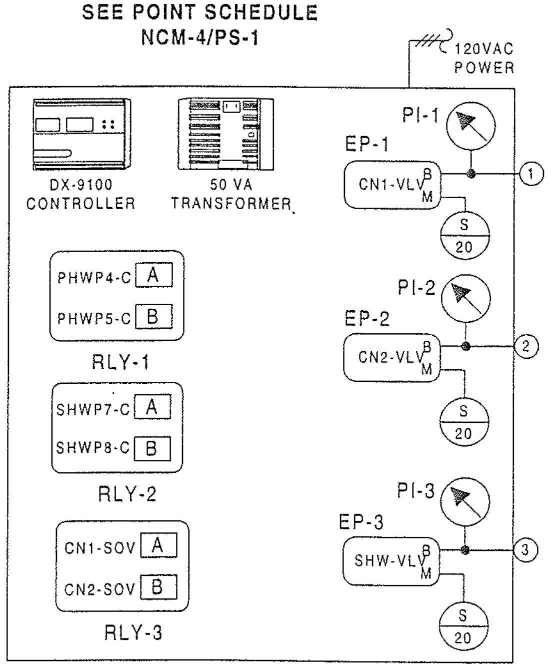
Branch Information: JOHNSON CONTROLS, 60 LOVETON CIRCLE, SPARKS, MD 21152

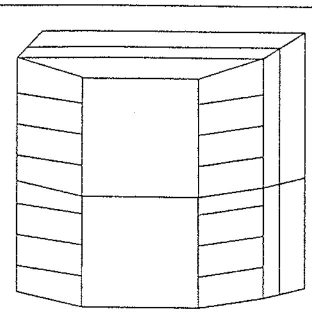
CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-42

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		COOLING				DX9100						EN-COOL	Service Lev MER A		M.3-14												Power to Controller
		COOLING	•			DX9100	1	24				EN-COOL	Service Lev MER A	0	M.3-14												N2 Trunk
	DI-1	COOLING	CHP1-S	Chill Wtr Pump 1 Status	Off On	DX9100	1	24	DI-1		DI#,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-1						2/22	Device dependent	Aux Contact (NO)		D70	
	DI-2	COOLING	CHP2-S	Chill Wtr Pump 2 Status	Off On	DX9100	1	24	DI-2		DI#,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-2						2/22	Device dependent	Aux Contact (NO)		D70	
	DI-3	COOLING	CHP3-S	Chill Wtr Pump 3 Status	Off On	DX9100	1	24	DI-3		DI#,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-3						2/22	Device dependent	Aux Contact (NO)		D70	
	DI-4	COOLING	CHS-FS	Chill Wtr Sup Flow Sw	Open Closed	DX9100	1	24	DI-4		DI#,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-4						2/22	Device dependent	Contact (NO)		D70	
	DI-5	COOLING				DX9100	1	24	DI-5			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-5											
	DI-6	COOLING				DX9100	1	24	DI-6			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-6											
	DI-7	COOLING				DX9100	1	24	DI-7			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-7											
	DI-8	COOLING				DX9100	1	24	DI-8			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DI-8											
	AO-1	COOLING	CH-VLV	Main Chill Wtr Valve	%	DX9100	1	24	AO-1		AO#,AOCOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-1	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
	AO-2	COOLING	CHP1-VSD	Ch Wat Pmp 1 Var Spd Dr	%	DX9100	1	24	AO-2		AO#,AOCOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-2						2/18	Device dependent	0-20mA OUT		D21	
	AO-9	COOLING	CHP2-VSD	Ch Wat Pmp 2 Var Spd Dr	%	DX9100	1	24	AO-9		AO#,AOCOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-9						2/18	Device dependent	0-20mA OUT		D21	
	AO-10	COOLING	CHP3-VSD	Ch Wat Pmp 3 Var Spd Dr	%	DX9100	1	24	AO-10		AO#,AOCOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-10						2/18	Device dependent	0-20mA OUT		D21	
	AO-11	COOLING				DX9100	1	24	AO-11			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-11											
	AO-12	COOLING				DX9100	1	24	AO-12			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-12											
	AO-13	COOLING				DX9100	1	24	AO-13			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-13											
	AO-14	COOLING				DX9100	1	24	AO-14			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AO-14											
	DO-3	COOLING	CHP1-C	Chill Water Pump 1 Cntrl	Off On	DX9100	1	24	DO-3	RLY	DO#,24V,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DO-3	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		D60	
	DO-4	COOLING	CHP2-C	Chill Water Pump 2 Cntrl	Off On	DX9100	1	24	DO-4	RLY	DO#,24V,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DO-4	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		D60	
	DO-5	COOLING	CHP3-C	Chill Water Pump 3 Cntrl	Off On	DX9100	1	24	DO-5	RLY	DO#,24V,COM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DO-5	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		D60	
	DO-6	COOLING				DX9100	1	24	DO-6			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DO-6											
	DO-7	COOLING				DX9100	1	24	DO-7			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DO-7											
	DO-8	COOLING				DX9100	1	24	DO-8			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-DO-8											
	AI-1	COOLING	PCHS-T	Pri Chill Wtr Supply Temp	Deg F	DX9100	1	24	AI-1		AI#,AICOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-1						2/18	2-Wire	TE-631AP-1		D3	
	AI-2	COOLING	PCHR-T	Pri Chill Wtr Return Temp	Deg F	DX9100	1	24	AI-2		AI#,AICOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-2						2/18	2-Wire	TE-631AP-1		D3	
	AI-3	COOLING	SCHS-T	Sec Chill Wtr Supply Temp	Deg F	DX9100	1	24	AI-3		AI#,AICOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-3						2/18	2-Wire	TE-631AP-1		D3	
	AI-4	COOLING	SCHR-T	Sec Chill Wtr Supply Temp	Deg F	DX9100	1	24	AI-4		AI#,AICOM	EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-4						2/18	2-Wire	TE-631AP-1		D3	
	AI-5	COOLING				DX9100	1	24	AI-5			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-5											
	AI-6	COOLING				DX9100	1	24	AI-6			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-6											
	AI-7	COOLING				DX9100	1	24	AI-7			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-7											
	AI-8	COOLING				DX9100	1	24	AI-8			EN-COOL	Service Lev MER A	0	M.3-14	COOL-24-AI-8											







ENCLOSURE EN-HEAT
DX-9100-8001
LOCATED IN MECHANICAL ROOM
NCM-5/N2 ADD = 25

BILL OF MATERIALS

Estimate: heating — 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
HL1-T,HL2-T	2	T-8020-1	CONTRLR,IMMERSION,PROP
	2	T-8020-101	WELL,BRASS,F/T-8020
TH-1,2,4,5,6,7,8,9	8	TE-631AP-1	SENS,T-Ni,0.1%,F/WZ1000-5
TH-1,2,4,5,6,7,8,9,	8	WZ-1000-5	WELL,BRASS,1/2"NPT+COMPND
V-H-1,V-H-2	4	--	SEE VALVE SCHEDULE
V-HW-1,2,4	3	--	SEE VALVE SCHEDULE
Panel Devices:			
DC-1	1	DX-9100-8454	DIGITAL CONTR., EXTENDED
	1	DX-9100-8990	MTG BASE (DX9100-8454)
EN-HEAT	1	EN-EWC25-0	UNIV PKG MOD,DUAL,W/50VA
EP-1,2,3	3	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
PI-1,2,3	3	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2,3	3	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL CONTROL THE HOT WATER SYSTEM. WHEN THE SYSTEM IS DE-ENERGIZED, THE STEAM/HEATING WATER CONVERTORS AND BUILDING HEATING PUMPS WILL BE OFF. THE HEATING SYSTEM WILL GENERALLY RUN ALL YEAR WITH REDUCED CAPACITY IN THE COOLING SEASON. WHEN THE HEATING WATER SYSTEM IS ENERGIZED, THE PRIMARY HEATING WATER PUMPS AND CONVERTORS WILL BROUGHT ON-LINE IN STAGES TO MAINTAIN PROGRAMMED HEATING WATER TERMPERATURE DIFFERENCE. THE LEAD PUMP P-4 AND CONVERTOR C-1 AS SELECTED BY THE METASYS SYSTEM LEAD/LAG PROGRAM WILL BE ENERGIZED TO START AND RUN CONTINUOUSLY AFTER ISOLATION VALVE V-HW-1 OPENS. IF THE LEAD COMPONENTS FAIL OR FAIL TO START AS SENSED BY THEIR RESPECTIVE AUX CONTACT , THE LAG COMPONENTS WILL AUTOMATICALLY START AND RUN CONTINUOUSLY. A FAILURE OF ANY COMPONENT AS SENSED BY THEIR RESPECTIVE AUX CONTACT WILL BE ALARMED ON THE METASYS SYSTEM. STEAM CONTROL VALVES V-H1A AND V-H-1B SERVING CONVERTOR C-1 WILL BE MODULATED IN SEQUENCE BY TEMPERATURE SENSOR TH-1 TO MAINTAIN HEATING WATER SUPPLY TEMPERATURE OF 200F. CONTROL FOR CONVERTOR C-2 WILL BE SIMILAR TO C-1 AND INDEPENDENT OF EACH OTHER. EACH CONVERTOR WILL BE PROVIDED WITH A HIGH LIMIT THERMOSTAT IN THE SUPPLY LINE WHICH WILL PREVENT SUPPLY WATER TEMPERATURE FROM EXCEEDING 210F. PRIMARY HEATING WATER SUPPLY AND RETURN WATER TEMPERATURE SENSORS TH-4 AND TH-5 WILL BE USED TO STAGE CONVERTOR OPERATION. WITH THE LEAD HEATING PUMP AND CONVERTOR OPERATIONAL, IF THE HEATING WATER TEMPERATURE DIFFERENCE EXCEEDS TWENTY-FOUR (24F) THE LAG PUMP AND CONVERTOR WILL BE ENERGIZED. THE SYSTEM DESIGN REQUIRES A MAXIMUM OF TWO (2) CONVERTORS TO CARRY THE BUILDING LOAD. WHEN TWO (2) HEATING PUMPS AND CONVERTORS ARE OPERATIONAL AND THE PRIMARY HEATING WATER TEMPERATURE DIFFERENCE IS REDUCED TO TWELVE (12F) , THE LEAD PUMP AND CONVERTOR WILL BE DE-ENERGIZED. THE VARIABLE FREQUENCY DRIVE (VFD) SYSTEM FOR THE SECONDARY HEATING WATER DISTRIBUTION PUMPS WILL BE CONFIGURED WITH TWO (2) INDEPENDENT VFD CABINETS, ONE FOR EACH PUMP. VFD CABINETS WILL BE CAPABLE OF MANUAL OPERATION THROUGH OPERATOR INTERVENTION IF REQUIRED. AFTER PRIMARY HEATING WATER FLOW HAS BEEN CONFIRMED, THE LEAD PUMP AS SELECTED BY THE METASYS SYSTEM LEAD/LAG PROGRAM AND ACTING THROUGH THE VFD WILL START AT REDUCED SPEED AND RUN CONTINUOUSLY. REDUCED SPEED STARTING WILL BE THE MINIMUM SETTING OF THE VARIABLE FREQUENCY PUMP DRIVE AND WILL BE FULLY ADJUSTABLE THROUGHOUT THE RANGE OF THE DRIVE. IF PUMP P-7 FAILS OR FAILS TO START AS SENSED BY THE VFD PANEL CONTACT, PUMP P-8 WILL AUTOMATICALLY START AND RUN CONTINUOUSLY. A FAILURE OF ANY DISTRIBUTION PUMP AS SENSED BY THEIR RESPECTIVE VFD PANEL CONTACT WILL BE ALARMED ON THE METASYS SYSTEM. EACH DISTRIBUTION PUMP WILL BE STARTED AT REDUCED SPEED THROUGH INDIVIDUAL VARIABLE FREQUENCY PUMP DRIVES AND SEQUENCED WITH THE PROGRAMMED LEAD/LAG OPERATION. THREE (3) DIFFERENTIAL PRESSURE TRANSMITTERS DPT-1,DPT-2 AND DPT-3 WITH ADJUSTABLE SETPOINT, THROUGH THE METASYS SYSTEM WILL MODULATE THE VARIABLE FREQUENCY PUMP DRIVE TO MAINTAIN THEIR SETPOINT. THE TRANSMITTER CALLING FOR AN INCREASE IN DIFFERENTIAL PRESSURE ABOVE ITS MINIMUM SETPOINT WILL TAKE CONTROL OF THE PUMP DRIVE. ON A FALL IN THE REQUIRED DIFFERENTIAL PRESSURE AS SENSED BY EITHER TRANSMITTER THE PUMP DRIVE WILL GRADUALLY INCREASE THE PUMP SPEED FROM MINIMUM TO MAXIMUM AS REQUIRED TO MAINTAIN THE SETPOINT. ON A RISE IN DIFFERENTIAL PRESSURE THE REVERSE WILL OCCUR. THREE (3) DIFFERENTIAL PRESSURE TRANSMITTERS DPT-1,DPT-2 AND DPT-3 AND THREE (3) TEMPERATURE SENSORS TH-10,TH-11 AND TH-12 WILL BE LOCATED THROUGHOUT THE STADIUM COMPLEX AS FOLLOWS:

DPT-1 AND TH-10 WILL BE LOCATED ADJACENT TO AHU-3 ON THE PRESS LEVEL QUAD C
DPT-2 AND TH-11 WILL BE LOCATED AT THE TOP OF HYDRAULICALLY REMOTE CHS AND CHR RISER SERVING SUITES UPPER SUITES QUAD C
DPT-3 AND TH-12 WILL BE LOCATED ADJACENT TO AHU-4 ON THE PRESS LEVEL QUAD D

ON A CONTINUED FALL IN DIFFERENTIAL PRESSURE AS SENSED BY EITHER TRANSMITTER WITH PUMP P-7 AT MAXIMUM SPEED, THE LAG DISTRIBUTION PUMP P-8 WILL BE STARTED. PRIOR TO STARTING THE SECOND PUMP, P-7 WILL BE REDUCED TO FIFTY (50) PERCENT FULL LOAD. THE SECOND PUMP WILL BE STARTED THROUGH ITS VARIABLE FREQUENCY DRIVE AT REDUCED SPEED. WHEN THE SECOND PUMP IS PROVEN OPERATIONAL BY ITS RESPECTIVE VFD PANEL CONTACT, BOTH PUMPS WILL BE GRADUALLY MODULATED AT THE SAME SPEED TO MAINTAIN THE SETPOINTS OF THE DPT-1,DPT-2 OR DPT-3 AS DETERMINED THROUGH THE METASYS SYSTEM. ON A RISE IN DIFFERENTIAL PRESSURE ABOVE THE SETPOINT OF ALL TRANSMITTERS THE REVERSE SEQUENCE WILL OCCUR. WHEN BOTH DISTRIBUTION PUMPS HAVE BEEN REDUCED IN SPEED TO FIFTY (50) PERCENT OF THE MAXIMUM SPEED (ADJUSTABLE) PUMP P-7 WILL BE STOPPED. PUMP P-8 WILL AGAIN BE GRADUALLY MODULATED AT THE SAME SPEED TO MAINTAIN THE SETPOINTS OF DPT-1,DPT-2 OR DPT-3. DISTRIBUTION PUMP, HEATING PUMP AND CONVERTOR CYCLES WILL BE LIMITED BY AN ADJUSTABLE TIME PERIOD OF ONE (1) HOUR. PUMP STARTS AND STOPS WILL BE LIMITED BY THE TIME PERIOD AND INDICATED ON THE METASYS SYSTEM. DISTRIBUTION PUMPS OPERATING IN PARALLEL WILL RUN AT THE SAME SPEED THROUGH THEIR RESPECTIVE VFD. SPEED ADJUSTMENTS WILL OCCUR QUICKLY WHEN A PUMP IS BROUGHT ON LINE. TEMPERATURE SENSOR TH-6 LOCATED IN THE SECONDARY HEATING WATER SUPPLY LINE DOWNSTREAM OF PUMPS P-7 AND P-8 WILL MODULATE VALVE V-HW-4 TO MAINTAIN ITS SETTING OF 200F AT ZERO (0F) OUTDOOR AIR TEMPERATURE. TEMPERATURE RESET WILL BE A LINEAR FUNCTION BETWEEN ZERO (0F) AND SIXTY-FIVE (65F) OUTDOOR AIR TEMPERATURE. AS OUTDOOR AIR TEMPERATURE RISES ABOVE 65F SUPPLY WATER WILL REMAIN CONSTANT AT 120F. DURING A STADIUM EVENT, THE METASYS SYSTEM WILL BE PROGRAMMED TO TREND THE TEMPERATURE READINGS FROM ALL SENSORS TH-1 THRU TH-9 AND INDICATE PUMP AND CONVERTOR OPERATION, INCLUDING TURF HEATING IN TEN (10) MINUTE INCREMENTS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:39 PM
FILE NAME HEATING.vsd

DRAWING TITLE
HOT WATER SYSTEM
MECHANICAL ROOM SOUTH
SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

AS-BUILT		7/18/00	CME	
REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE / BY
Sales Engineer JDP	Project Manager WJT	Application Engineer RTS	DRAWN BY RTS DATE 09/10/97	APPROVED BY / DATE

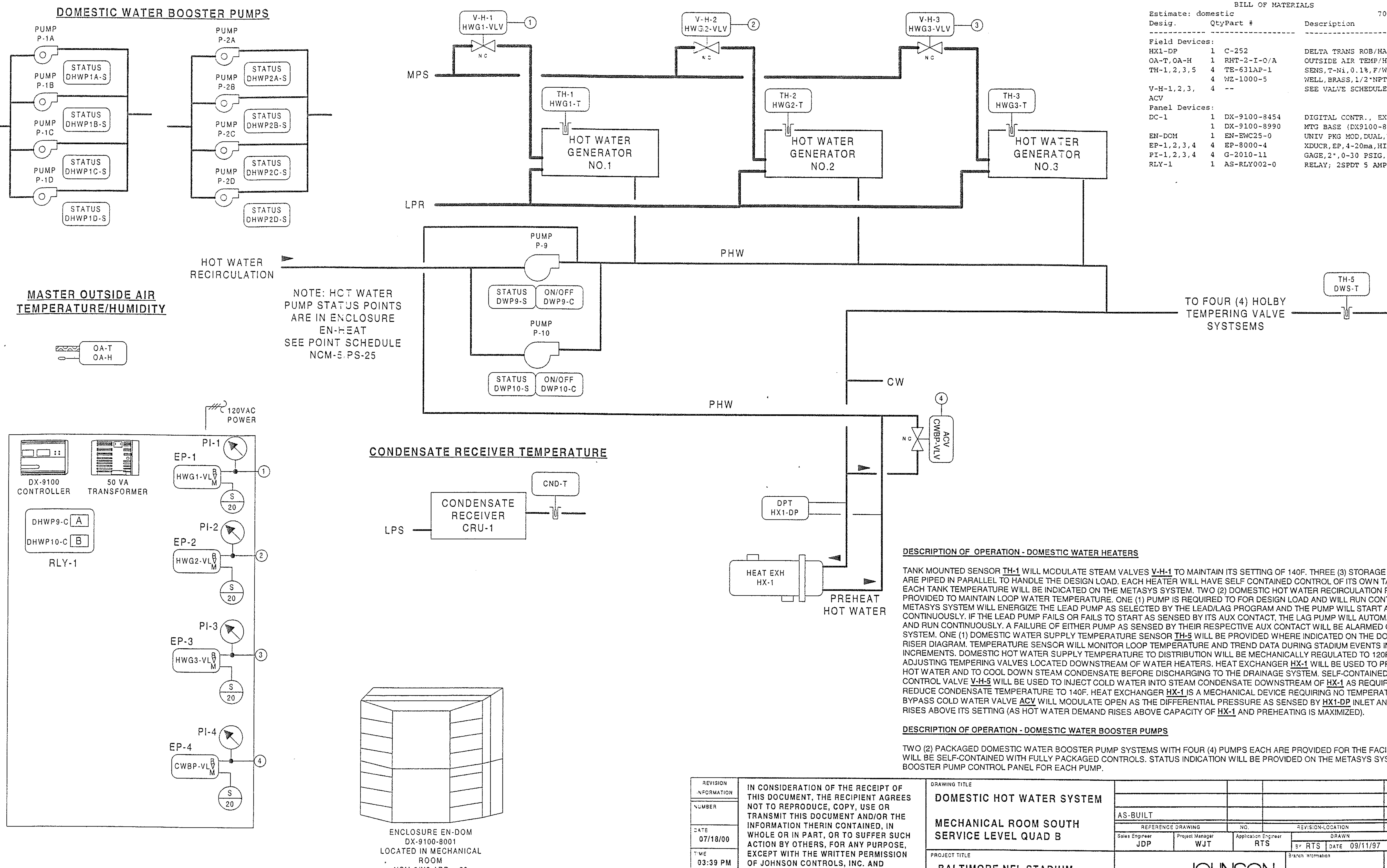
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-43

Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination
Full Spreadsheet		Software					Digital Controller Information					
		HEATING					DX9100					
		HEATING	*				DX9100	1	25			
	DI-1	HEATING	PHWP4-S	Pri HW Pump 4 Status	Off	On	DX9100	1	25	DI-1		DI#,COM
	DI-2	HEATING	PHWP5-S	Pri HW Pump 5 Status	Off	On	DX9100	1	25	DI-2		DI#,COM
	DI-3	HEATING	SHWP7-S	Sec HW Pump 7 Status	Off	On	DX9100	1	25	DI-3		DI#,COM
	DI-4	HEATING	SHWP8-S	Sec HW Pump 8 Status	Off	On	DX9100	1	25	DI-4		DI#,COM
	DI-5	HEATING	DWP9-S	Dom HW Pump 9 Status	Off	On	DX9100	1	25	DI-5		DI#,COM
	DI-6	HEATING	DWP10-S	Dom HW Pump 10 Status	Off	On	DX9100	1	25	DI-6		DI#,COM
	DI-7	HEATING					DX9100	1	25	DI-7		
	DI-8	HEATING					DX9100	1	25	DI-8		
	AO-1	HEATING	CN1-VLV	Conv 1 Steam Valves	%		DX9100	1	25	AO-1		AO#,AOCOM
	AO-2	HEATING	CN2-VLV	Conv 2 Steam Valves	%		DX9100	1	25	AO-2		AO#,AOCOM
	AO-9	HEATING	HWP7-VSD	Sec HW Pump 1 Var Spd Dr	%		DX9100	1	25	AO-9		AO#,AOCOM
	AO-10	HEATING	HWP8-VSD	Sec HW Pump 2 Var Spd Dr	%		DX9100	1	25	AO-10		AO#,AOCOM
	AO-11	HEATING	SHW-VLV	Sec HW Control Valve	%		DX9100	1	25	AO-11		AO#,AOCOM
	AO-12	HEATING					DX9100	1	25	AO-12		
	AO-13	HEATING					DX9100	1	25	AO-13		
	AO-14	HEATING					DX9100	1	25	AO-14		
	DO-3	HEATING	PHWP4-C	Pri HW Pump 4 Control	Off	On	DX9100	1	25	DO-3	RLY	DO#,24V,COM
	DO-4	HEATING	PHWP5-C	Pri HW Pump 5 Control	Off	On	DX9100	1	25	DO-4	RLY	DO#,24V,COM
	DO-5	HEATING	SHWP7-C	Sec HW Pump 7 Control	Off	On	DX9100	1	25	DO-5	RLY	DO#,24V,COM
	DO-6	HEATING	SHWP8-C	Sec HW Pump 8 Control	Off	On	DX9100	1	25	DO-6	RLY	DO#,24V,COM
	DO-7	HEATING	CN1-SOV	Conv 1 Shut Off Valve	Off	On	DX9100	1	25	DO-7	RLY	DO#,24V,COM
	DO-8	HEATING	CN2-SOV	Conv 2 Shut Off Valve	Off	On	DX9100	1	25	DO-8	RLY	DO#,24V,COM
	AI-1	HEATING	CN1HWS-T	Conv 1 HW Supply Temp	Deg F		DX9100	1	25	AI-1		AI#,AICOM
	AI-2	HEATING	CN2HWS-T	Conv 2 HW Supply Temp	Deg F		DX9100	1	25	AI-2		AI#,AICOM
	AI-3	HEATING	PHWS-T	Pri HW Supply Temp	Deg F		DX9100	1	25	AI-3		AI#,AICOM
	AI-4	HEATING	PHWR-T	Pri HW Return Temp	Deg F		DX9100	1	25	AI-4		AI#,AICOM
	AI-5	HEATING	SHWS-T	Sec HW Supply Temp	Deg F		DX9100	1	25	AI-5		AI#,AICOM
	AI-6	HEATING	SHWR-T	Sec HW Return Temp	Deg F		DX9100	1	25	AI-6		AI#,AICOM
	AI-7	HEATING	TRFHWS-T	Turf HW Supply Temp	Deg F		DX9100	1	25	AI-7		AI#,AICOM
	AI-8	HEATING	TRFHWR-T	Turf HW Return Temp	Deg F		DX9100	1	25	AI-8		AI#,AICOM

Point Type	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
	Panel Information					Intermediate Device					Field Device					
	EN-HEAT	Service Lev MER B		M.3-16												Power to Controller
	EN-HEAT	Service Lev MER B	0	M.3-16												N2 Trunk
DI-1	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-1						2/22	Device dependent	Aux Contact (NO)		D70	
DI-2	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-2						2/22	Device dependent	Aux Contact (NO)		D70	
DI-3	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-3						2/22	Device dependent	Aux Contact (NO)		D70	
DI-4	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-4						2/22	Device dependent	Aux Contact (NO)		D70	
DI-5	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-5						2/22	Device dependent	Aux Contact (NO)		D70	
DI-6	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-6						2/22	Device dependent	Aux Contact (NO)		D70	
DI-7	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-7											
DI-8	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DI-8											
AO-1	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-1	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
AO-2	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-2	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
AO-9	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-9						2/18	Device dependent	0-20mA OUT		D21	
AO-10	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-10						2/18	Device dependent	0-20mA OUT		D21	
AO-11	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-11	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
AO-12	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-12											
AO-13	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-13											
AO-14	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AO-14											
DO-3	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DO-3	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		D60	
DO-4	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DO-4	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		D60	
DO-5	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DO-5	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		D60	
DO-6	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DO-6	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		D60	
DO-7	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DO-7	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		D60	
DO-8	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-DO-8	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		D60	
AI-1	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-1						2/18	2-Wire	TE-631AP-1		D3	
AI-2	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-2						2/18	2-Wire	TE-631AP-1		D3	
AI-3	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-3						2/18	2-Wire	TE-631AP-1		D3	
AI-4	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-4						2/18	2-Wire	TE-631AP-1		D3	
AI-5	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-5						2/18	2-Wire	TE-631AP-1		D3	
AI-6	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-6						2/18	2-Wire	TE-631AP-1		D3	
AI-7	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-7						2/18	2-Wire	TE-631AP-1		D3	
AI-8	EN-HEAT	Service Lev MER B	0	M.3-16	HEAT-25-AI-8						2/18	2-Wire	TE-631AP-1		D3	



BILL OF MATERIALS

Estimate: domestic 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
HX1-DP	1	C-252	DELTA TRANS ROB/HALP
OA-T,OA-H	1	RHT-2-I-O/A	OUTSIDE AIR TEMP/HUMD
TH-1,2,3,5	4	TE-631AP-1	SENS,T-Ni,0.1%,F/WZ1000-5
	4	WZ-1000-5	WELL,BRASS,1/2"NPT+COMPND
V-H-1,2,3, ACV	4	--	SEE VALVE SCHEDULE
Panel Devices:			
DC-1	1	DX-9100-8454	DIGITAL CONTR., EXTENDED
	1	DX-9100-8990	MTG BASE (DX9100-8454)
EN-DOM	1	EN-EWC25-0	UNIV PKG MOD,DUAL,W/50VA
EP-1,2,3,4	4	EP-8000-4	XDUCR,EP,4-20ma,HI VOL
PI-1,2,3,4	4	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1	1	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION - DOMESTIC WATER HEATERS

TANK MOUNTED SENSOR TH-1 WILL MODULATE STEAM VALVES V-H-1 TO MAINTAIN ITS SETTING OF 140F. THREE (3) STORAGE WATER HEATERS ARE PIPED IN PARALLEL TO HANDLE THE DESIGN LOAD. EACH HEATER WILL HAVE SELF CONTAINED CONTROL OF ITS OWN TANK TEMPERATURE. EACH TANK TEMPERATURE WILL BE INDICATED ON THE METASYS SYSTEM. TWO (2) DOMESTIC HOT WATER RECIRCULATION PUMPS ARE PROVIDED TO MAINTAIN LOOP WATER TEMPERATURE. ONE (1) PUMP IS REQUIRED TO FOR DESIGN LOAD AND WILL RUN CONTINUOUSLY. THE METASYS SYSTEM WILL ENERGIZE THE LEAD PUMP AS SELECTED BY THE LEAD/LAG PROGRAM AND THE PUMP WILL START AND RUN CONTINUOUSLY. IF THE LEAD PUMP FAILS OR FAILS TO START AS SENSED BY ITS AUX CONTACT, THE LAG PUMP WILL AUTOMATICALLY START AND RUN CONTINUOUSLY. A FAILURE OF EITHER PUMP AS SENSED BY THEIR RESPECTIVE AUX CONTACT WILL BE ALARMED ON THE METASYS SYSTEM. ONE (1) DOMESTIC WATER SUPPLY TEMPERATURE SENSOR TH-5 WILL BE PROVIDED WHERE INDICATED ON THE DOMESTIC WATER RISER DIAGRAM. TEMPERATURE SENSOR WILL MONITOR LOOP TEMPERATURE AND TREND DATA DURING STADIUM EVENTS IN TEN (10) MINUTE INCREMENTS. DOMESTIC HOT WATER SUPPLY TEMPERATURE TO DISTRIBUTION WILL BE MECHANICALLY REGULATED TO 120F USING MANUALLY ADJUSTING TEMPERING VALVES LOCATED DOWNSTREAM OF WATER HEATERS. HEAT EXCHANGER HX-1 WILL BE USED TO PREHEAT DOMESTIC HOT WATER AND TO COOL DOWN STEAM CONDENSATE BEFORE DISCHARGING TO THE DRAINAGE SYSTEM. SELF-CONTAINED TEMPERATURE CONTROL VALVE V-H-5 WILL BE USED TO INJECT COLD WATER INTO STEAM CONDENSATE DOWNSTREAM OF HX-1 AS REQUIRED TO FURTHER REDUCE CONDENSATE TEMPERATURE TO 140F. HEAT EXCHANGER HX-1 IS A MECHANICAL DEVICE REQUIRING NO TEMPERATURE CONTROLS. BYPASS COLD WATER VALVE ACV WILL MODULATE OPEN AS THE DIFFERENTIAL PRESSURE AS SENSED BY HX1-DP INLET AND OUTLET PIPING RISES ABOVE ITS SETTING (AS HOT WATER DEMAND RISES ABOVE CAPACITY OF HX-1 AND PREHEATING IS MAXIMIZED).

DESCRIPTION OF OPERATION - DOMESTIC WATER BOOSTER PUMPS

TWO (2) PACKAGED DOMESTIC WATER BOOSTER PUMP SYSTEMS WITH FOUR (4) PUMPS EACH ARE PROVIDED FOR THE FACILITY. EACH SYSTEM WILL BE SELF-CONTAINED WITH FULLY PACKAGED CONTROLS. STATUS INDICATION WILL BE PROVIDED ON THE METASYS SYSTEM THROUGH THE BOOSTER PUMP CONTROL PANEL FOR EACH PUMP.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:39 PM
FILE NAME DOMESTIC.vsd

DRAWING TITLE
DOMESTIC HOT WATER SYSTEM
MECHANICAL ROOM SOUTH
SERVICE LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/11/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

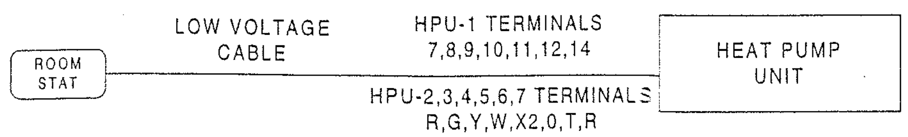
Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-44

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		DOMESTIC				DX9100						EN-COM	Service Lev MER B		M.3-16												Power to Controller
		DOMESTIC	*			DX9100	1	26				EN-COM	Service Lev MER B		M.3-16												N2 Trunk
	DI-1	DOMESTIC	DHWP1A-S	Dom HW Pump 1A Status	Off On	DX9100	1	26	DI-1		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-1						2/22	Device dependent	Contact (NO)		D70	
	DI-2	DOMESTIC	DHWP1B-S	Dom HW Pump 1B Status	Off On	DX9100	1	26	DI-2		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-2						2/22	Device dependent	Contact (NO)		D70	
	DI-3	DOMESTIC	DHWP1C-S	Dom HW Pump 1C Status	Off On	DX9100	1	26	DI-3		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-3						2/22	Device dependent	Contact (NO)		D70	
	DI-4	DOMESTIC	DHWP1D-S	Dom HW Pump 1D Status	Off On	DX9100	1	26	DI-4		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-4						2/22	Device dependent	Contact (NO)		D70	
	DI-5	DOMESTIC	DHWP2A-S	Dom HW Pump 2A Status	Off On	DX9100	1	26	DI-5		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-5						2/22	Device dependent	Contact (NO)		D70	
	DI-6	DOMESTIC	DHWP2B-S	Dom HW Pump 2B Status	Off On	DX9100	1	26	DI-6		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-6						2/22	Device dependent	Contact (NO)		D70	
	DI-7	DOMESTIC	DHWP2C-S	Dom HW Pump 2C Status	Off On	DX9100	1	26	DI-7		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-7						2/22	Device dependent	Contact (NO)		D70	
	DI-8	DOMESTIC	DHWP2D-S	Dom HW Pump 2D Status	Off On	DX9100	1	26	DI-8		DI#,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DI-8						2/22	Device dependent	Contact (NO)		D70	
	AO-1	DOMESTIC	HWG1-VLV	HW Gen 1 Steam Valve	%	DX9100	1	26	AO-1		AO#,AOCOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-1	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
	AO-2	DOMESTIC	HWG2-VLV	HW Gen 2 Steam Valve	%	DX9100	1	26	AO-2		AO#,AOCOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-2	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
	AO-9	DOMESTIC	HWG3-VLV	HW Gen 3 Steam Valve	%	DX9100	1	26	AO-9		AO#,AOCOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-9	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
	AO-10	DOMESTIC	CWBP-VLV	Cold Water Bypass Valve	%	DX9100	1	26	AO-10		AO#,AOCOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-10	2/18	+,-	EP-8000-2	SUPPLY,O		1/4"	Barb Fitting	EP-PNEU.		D22	
	AO-11	DOMESTIC				DX9100	1	26	AO-11			EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-11											
	AO-12	DOMESTIC				DX9100	1	26	AO-12			EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-12											
	AO-13	DOMESTIC				DX9100	1	26	AO-13			EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-13											
	AO-14	DOMESTIC				DX9100	1	26	AO-14			EN-COM	Service Lev MER B		M.3-16	DOM-26-AO-14											
	DO-3	DOMESTIC	DHWP9-C	Dom HW Pump 9 Control	Off On	DX9100	1	26	DO-3	RLY	DO#,24V,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DO-3	3/18	A,COILS,COM	RELAY-A	COM,NO		2/14	See starter detail	Starter (NO)		D60	
	DO-4	DOMESTIC	DHWP10-C	Dom HW Pump 10 Control	Off On	DX9100	1	26	DO-4	RLY	DO#,24V,COM	EN-COM	Service Lev MER B		M.3-16	DOM-26-DO-4	3/18	B,COILS,COM	RELAY-B	COM,NO		2/14	See starter detail	Starter (NO)		D60	
	DO-5	DOMESTIC				DX9100	1	26	DO-5			EN-COM	Service Lev MER B		M.3-16	DOM-26-DO-5											
	DO-6	DOMESTIC				DX9100	1	26	DO-6			EN-COM	Service Lev MER B		M.3-16	DOM-26-DO-6											
	DO-7	DOMESTIC				DX9100	1	26	DO-7			EN-COM	Service Lev MER B		M.3-16	DOM-26-DO-7											
	DO-8	DOMESTIC				DX9100	1	26	DO-8			EN-COM	Service Lev MER B		M.3-16	DOM-26-DO-8											
	AI-1	DOMESTIC	OA-T	Outdoor Air Temperature	Deg F	DX9100	1	26	AI-1		AI#,15V	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-1						2/18	-,+	RH-2-I-O/A		D1	
	AI-2	DOMESTIC	HWG1-T	HW Gen 1 HW Supply Temp	Deg F	DX9100	1	26	AI-2		AI#,AICOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-2						2/18	2-Wire	TE-631AP-1		D3	
	AI-3	DOMESTIC	HWG2-T	HW Gen 2 HW Supply Temp	Deg F	DX9100	1	26	AI-3		AI#,AICOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-3						2/18	2-Wire	TE-631AP-1		D3	
	AI-4	DOMESTIC	HWG3-T	HW Gen 3 HW Supply Temp	Deg F	DX9100	1	26	AI-4		AI#,AICOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-4						2/18	2-Wire	TE-631AP-1		D3	
	AI-5	DOMESTIC	HX1-DP	Dom HW Diff Pressure	PSI	DX9100	1	26	AI-5		AI#,+15V	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-5						2/18	Device dependent	Rob/Hal 252C		D1	
	AI-6	DOMESTIC	CND-T	Condensate Water Temp	Deg F	DX9100	1	26	AI-6		AI#,AICOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-6						2/18	2-Wire	TE-631AP-1		D3	
	AI-7	DOMESTIC	OA-H	Outdoor Air Humidity	% RH	DX9100	1	26	AI-7		AI#,15V	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-7						2/18	-,+	RH-2-I-O/A		D1	
	AI-8	DOMESTIC	DWS-T	Hot Water Supply Temp	Deg F	DX9100	1	26	AI-8		AI#,AICOM	EN-COM	Service Lev MER B		M.3-16	DOM-26-AI-8						2/18	2-Wire	TE-631AP-1		D3	

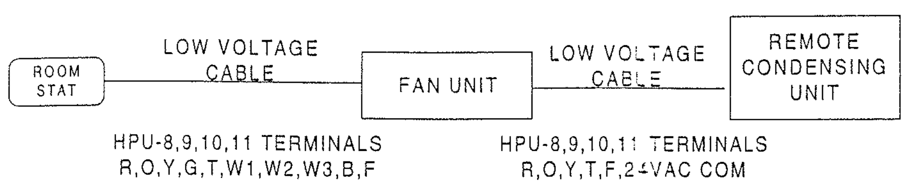
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		SEF-A					VAV						EN-EXH	AT FAN														Power to Controller
		SEF-A	•				VAV	1	2				EN-EXH	AT FAN	0													N2 Trunk
	AI-1	SEF-A					VAV	1	2	AI-1			EN-EXH	AT FAN	0		EXH-2-AI-1											
	AI-2	SEF-A					VAV	1	2	AI-2			EN-EXH	AT FAN	0		EXH-2-AI-2											
	AI-3	SEF-A					VAV	1	2	AI-3			EN-EXH	AT FAN	0		EXH-2-AI-3											
	AI-4	SEF-A					VAV	1	2	AI-4			EN-EXH	AT FAN	0		EXH-2-AI-4											
	AI-5	SEF-A					VAV	1	2	AI-5			EN-EXH	AT FAN	0		EXH-2-AI-5											
	AI-6	SEF-A					VAV	1	2	AI-6			EN-EXH	AT FAN	0		EXH-2-AI-6											
	BI-1	SEF-A	SEF5-S	Smoke Exh Fan 5 Status	Off	On	VAV	1	2	BI-1		BI#,24VAC	EN-EXH	AT FAN	0		EXH-2-BI-1						2/22	Device dependent	Aux Contact		U70	
	BI-2	SEF-A	SEF6-S	Smoke Exh Fan 6 Status	Off	On	VAV	1	2	BI-2		BI#,24VAC	EN-EXH	AT FAN	0		EXH-2-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	SEF-A					VAV	1	2	BI-3			EN-EXH	AT FAN	0		EXH-2-BI-3											
	BI-4	SEF-A					VAV	1	2	BI-4			EN-EXH	AT FAN	0		EXH-2-BI-4											
	BO-1	SEF-A					VAV	1	2	BO-1			EN-EXH	AT FAN	0		EXH-2-BO-1											
	BO-2	SEF-A					VAV	1	2	BO-2			EN-EXH	AT FAN	0		EXH-2-BO-2											
	BO-3	SEF-A					VAV	1	2	BO-3			EN-EXH	AT FAN	0		EXH-2-BO-3											
	BO-4	SEF-A					VAV	1	2	BO-4			EN-EXH	AT FAN	0		EXH-2-BO-4											
	BO-5	SEF-A					VAV	1	2	BO-5			EN-EXH	AT FAN	0		EXH-2-BO-5											
	BO-6	SEF-A					VAV	1	2	BO-6			EN-EXH	AT FAN	0		EXH-2-BO-6											
	BO-7	SEF-A					VAV	1	2	BO-7			EN-EXH	AT FAN	0		EXH-2-BO-7											
	BO-8	SEF-A					VAV	1	2	BO-8			EN-EXH	AT FAN	0		EXH-2-BO-8											

PACKAGED HEAT PUMP UNITS
(TYPICAL OF 7)

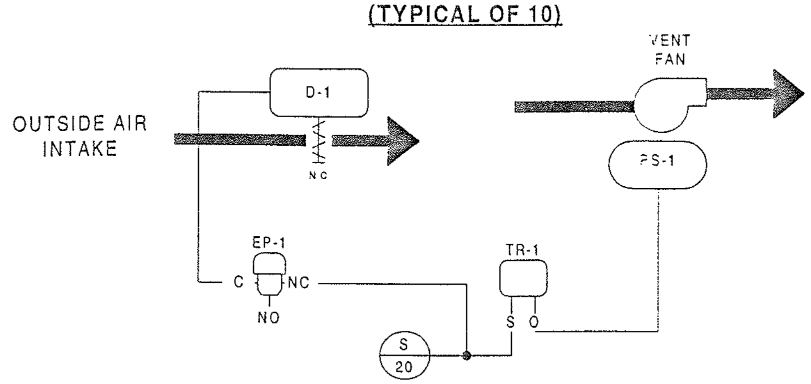


NOTE: ROOM THERMOSTATS SUPPLIED WITH PACKAGED UNITS

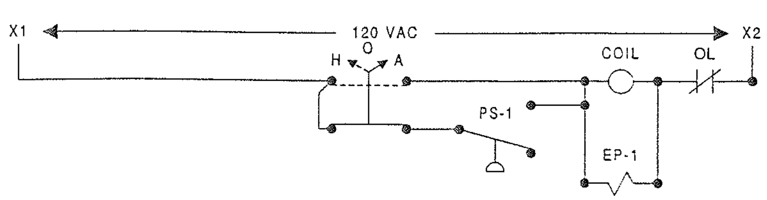
PACKAGED HEAT PUMP UNITS WITH REMOTE CONDENSING UNITS
(TYPICAL OF 5)



GENERAL MECHANICAL ROOM VENTILATION
(TYPICAL OF 10)

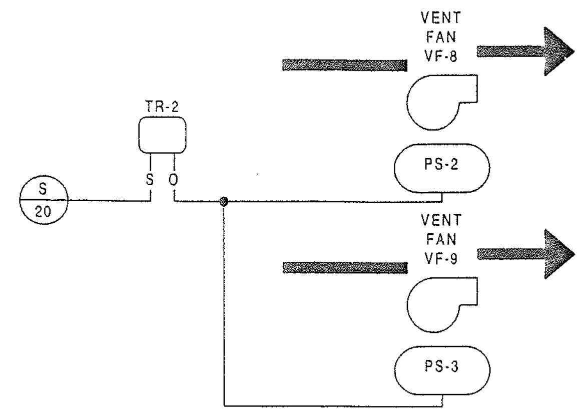


FAN WIRING DIAGRAM

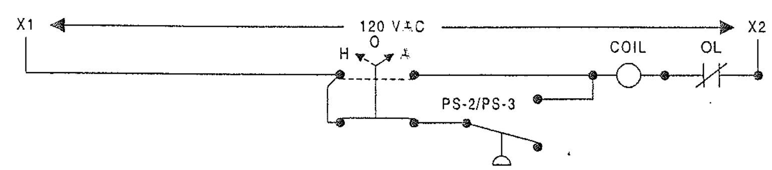


VENT FAN	LOCATION
VF-25	PRESS LEVEL MECH ROOM QUAD A
VF-25	PRESS LEVEL MECH ROOM QUAD B
VF-25	PRESS LEVEL MECH ROOM QUAD C
VF-25	PRESS LEVEL MECH ROOM QUAD D
VF-11	SERVICE LEVEL MECH ROOM QUAD B
VF-12	SERVICE LEVEL MECH ROOM QUAD B
VF-13	SERVICE LEVEL MECH ROOM QUAD B
VF-30	ELEVATOR MECH ROOM QUAD A
VF-30	ELEVATOR MECH ROOM QUAD B
VF-30	ELEVATOR MECH ROOM QUAD C

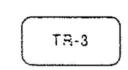
MECHANICAL ROOM QUAD A VENTILATION



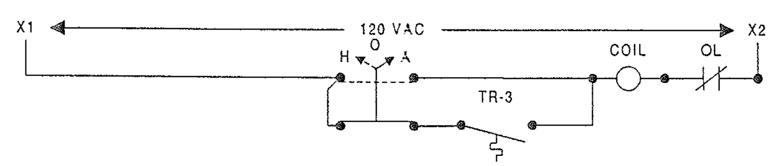
FAN WIRING DIAGRAM



ELECTRICAL ROOM VENTILATION
(TYPICAL OF 8)



FAN WIRING DIAGRAM

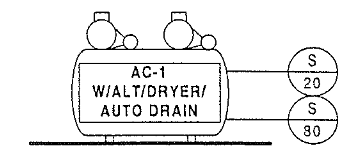


VENT FAN	LOCATION
VF-26	PRESS LEVEL ELECTRICAL ROOM QUAD A
VF-27	PRESS LEVEL ELECTRICAL ROOM QUAD B
VF-28	PRESS LEVEL ELECTRICAL ROOM QUAD C
VF-29	PRESS LEVEL ELECTRICAL ROOM QUAD D
VF-10	SERVICE LEVEL MECH ROOM B QUAD B
VF-24	SERVICE LEVEL MECH ROOM B QUAD B
VF-31	SERVICE ELEVATOR MECH ROOM QUAD A
VF-31	SERVICE ELEVATOR MECH ROOM QUAD B

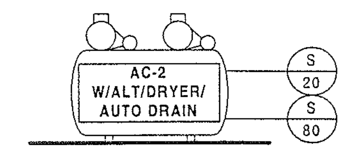
BILL OF MATERIALS

Estimate: miscellaneous 70520098.pre

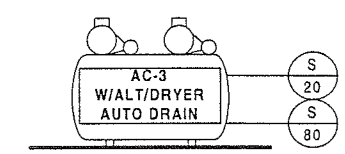
Desig.	Qty	Part #	Description
Field Devices:			
AC-1	1	AD-030-3C4	3 HP 460/3 80G DA DRY AD
AC-2,3	2	AD-007-1C4	3/4HP 460/3 30G DA DRY AD
D-1	10	D-4073-2	DMPR ACT,8-13#
EP-1	10	V11HAA-100	3-W SOLENOID,W/OV,120VAC
PS,1,2,3	12	P10BC-7C	SW,PE,SPDT,2#DIF
TR-1,2	11	T-4000-3139	CVR,WHT,JCI,HOR
	11	T-4002-124	STAT MOUNTING BRACKET
	11	T-4002-201	STAT,DIR,HORIZ,F
TR-3	8	T26S-18C	STAT,RM,H/C,ADJ,40/90F



3 H.P. LOCATED IN SERVICE LEVEL
MECHANICAL ROOM QUAD B



3/4 H.P. LOCATED IN PRESS LEVEL
AHU-3 MECHANICAL ROOM QUAD C



3/4 H.P. LOCATED IN PRESS LEVEL
AHU-4 MECHANICAL ROOM QUAD D

PACKAGED AIR CONITIONING UNITS

PACKAGED AIR CONDITIONING SYSTEMS INCLUDE ELECTRIC HEAT PUMP UNITS AND SPLIT SYSTEM DIRECT EXPANSION COOLING UNITS WITH ELECTRIC HEAT. THESE SYSTEMS WILL BE PROVIDED WITH PACKAGED ELECTRONIC CONTROLS AND REMOTE MOUNTED PROGRAMMABLE THERMOSTAT.

GENERAL MECHANICAL ROOM VENTILATION - ROOM THERMOSTAT **TR-1** CONTROLS THE VENTILATION FAN. ON A RISE IN ROOM TEMPERATURE ABOVE THE SETTING OF **TR-1** TO NINETY-FIVE (95F), FAN WILL START AND RUN CONTINUOUSLY AND OUTSIDE AIR INTAKE DAMPER WILL OPEN FULL. ON A FALL IN TEMPERATURE TO EIGHTY-FIVE (85F) , FAN WILL BE DE-ENERGIZED AND THE OUTSIDE AIR INTAKE DAMPER WILL CLOSE.

MECHANICAL ROOM QUAD A VENTILATION - ROOM THERMOSTAT **TR-2** CONTROLS IN SEQUENCE TWO (2) VENTILATION FANS **VF-8** AND **VF-9**. ON A RISE IN ROOM TEMPERATURE ABOVE THE SETTING OF **TR-2**, TO NINETY-FIVE (95F), FAN **VF-8** WILL START AND RUN CONTINOUSLY. ON A CONTINUED RISE IN ROOM TEMPERATURE ABOVE THE SETTING OF **TR-2**, FAN **VF-9** WILL START AND RUN CONTINUOUSLY. ON A FALL IN TEMPERATURE TO EIGHTY-FIVE (85F) THE REVERSE SEQUENCE WILL OCCUR. ON A CONTINUED FALL IN TEMPERATURE FAN **VF-8** WILL BE DE-ENERGIZED.

ELECTRIC ROOM VENTILATION - ROOM THERMOSTAT **TR-3** WILL CONTROL THE VENTILATION FAN. ON A RISE IN ROOM TEMPERATURE ABOVE THE SETTING OF **TR-3** TO NINETY-FIVE (95F) , THE FAN WILL START AND RUN CONTINUOUSLY. ON A FALL IN TEMPERATURE TO EIGHTY-FIVE (85F) , FAN WILL BE DE-ENERGIZED.

REVISION INFORMATION	Drawing Title: MISCELLANEOUS SYSTEMS AS SHOWN	
NUMBER		
DATE: 07/18/00		
TIME: 03:42 PM	Project Title: BALTIMORE NFL STADIUM AT CAMDEN YARDS BALTIMORE, MARYLAND	
FILE NAME: MISC.vsd		

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

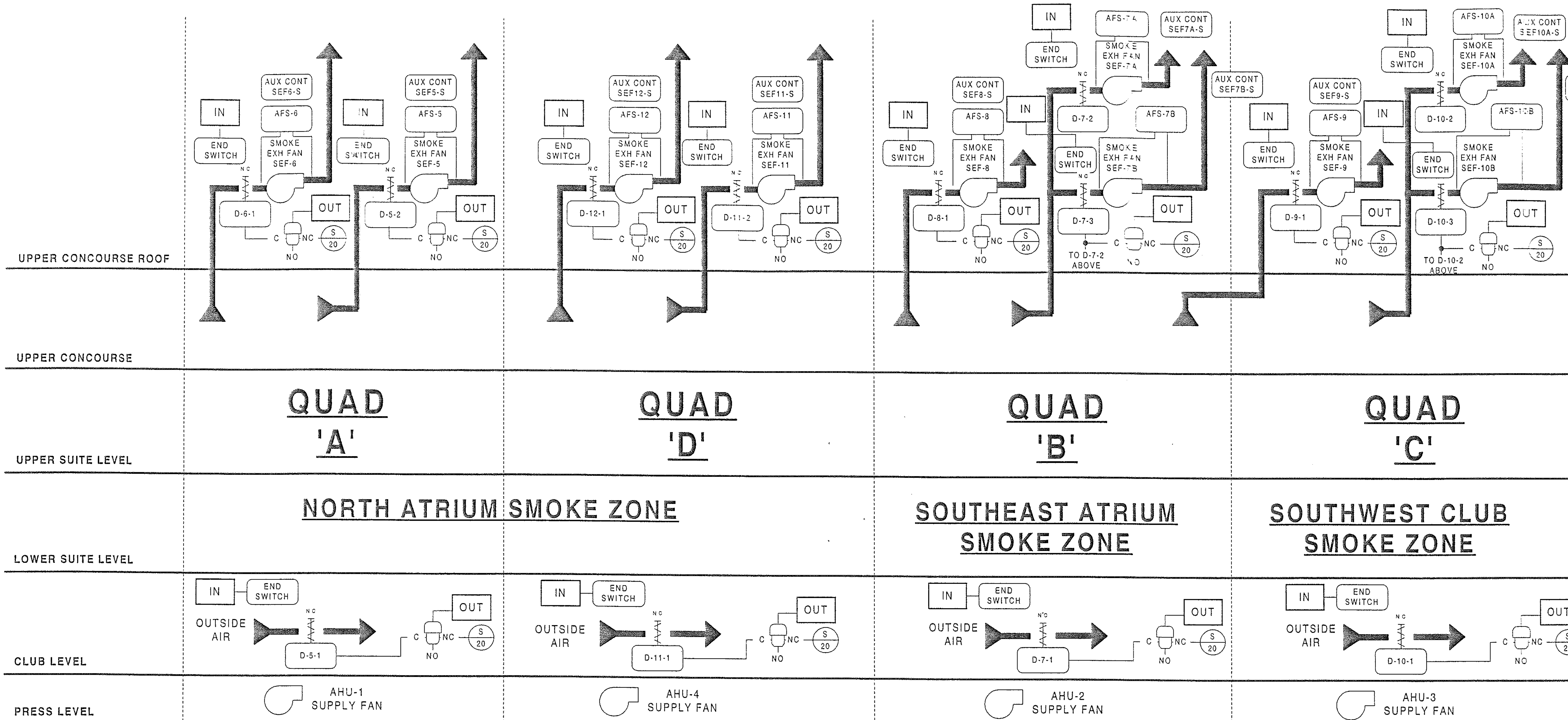
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/11/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information: Johnson Controls, Inc.
60 Loveton Circle
Sparks, Md 21152

CONTRACT NUMBER: 7052-0098

DRAWING NUMBER: BL-6559-45



CROSS ZONED CEILING SMOKE DETECTORS, HVAC SMOKE DETECTORS, OR A SPRINKLER WATER FLOW ALARM WITHIN THE ATRIUM WILL ENERGIZE THE SMOKE EXHAUST SYSTEM THROUGH THE FIRE ALARM SYSTEM. WHEN A START SIGNAL HAS BEEN RECEIVED, FOUR (4) SMOKE EXHAUST FANS SEF-5,6,11,12 WILL START AND RUN CONTINUOUSLY AFTER INTAKE DAMPERS D-5-1 AND D-11-1 AND EXHAUST AIR DAMPERS HAVE BEEN PROVEN OPEN BY END SWITCHES. EACH EXHAUST FAN SHALL BE PROVIDED WITH A SAIL SWITCH TO PROVIDE POSITIVE STATUS FOR OPERATION ON THE FIRE ALARM SYSTEM. AIR HANDLING UNITS AHU-1 AND 4 SERVING THE ATRIUM WILL BE DE-ENERGIZED AND ALL OF THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSTION WHEN THE SMOKE EXHAUST IS ENERGIZED. ATRIUM SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM PANEL.

CROSS ZONED CEILING SMOKE DETECTORS, HVAC SMOKE DETECTORS, OR A SPRINKLER WATER FLOW ALARM WITHIN THE ATRIUM WILL ENERGIZE THE SMOKE EXHAUST SYSTEM THROUGH THE FIRE ALARM SYSTEM. WHEN A START SIGNAL HAS BEEN RECEIVED, FOUR (4) SMOKE EXHAUST FANS SEF-7A,7B,8,9 WILL START AND RUN CONTINUOUSLY AFTER INTAKE DAMPERS D-10-1 AND D-7-1 AND EXHAUST AIR DAMPERS HAVE BEEN PROVEN OPEN BY END SWITCHES. EACH EXHAUST FAN SHALL BE PROVIDED WITH A SAIL SWITCH TO PROVIDE POSITIVE STATUS FOR OPERATION ON THE FIRE ALARM SYSTEM. AIR HANDLING UNITS AHU-2 AND 3 SERVING THE ATRIUM WILL BE DE-ENERGIZED AND ALL OF THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSTION WHEN THE SMOKE EXHAUST IS ENERGIZED. ATRIUM SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM PANEL.

CROSS ZONED CEILING SMOKE DETECTORS, HVAC SMOKE DETECTORS, OR A SPRINKLER WATER FLOW ALARM WITHIN THE ATRIUM WILL ENERGIZE THE SMOKE EXHAUST SYSTEM THROUGH THE FIRE ALARM SYSTEM. WHEN A START SIGNAL HAS BEEN RECEIVED, TWO (2) SMOKE EXHAUST FANS SEF-10A,10B WILL START AND RUN CONTINUOUSLY AFTER INTAKE DAMPERS D-10-1 AND D-7-1 AND EXHAUST AIR DAMPERS HAVE BEEN PROVEN OPEN BY END SWITCHES. EACH EXHAUST FAN SHALL BE PROVIDED WITH A SAIL SWITCH TO PROVIDE POSITIVE STATUS FOR OPERATION ON THE FIRE ALARM SYSTEM. AIR HANDLING UNITS AHU-2 AND 3 SERVING THE ATRIUM WILL BE DE-ENERGIZED AND ALL OF THEIR DAMPERS WILL RETURN TO THEIR NORMALLY CLOSED POSTION WHEN THE SMOKE EXHAUST IS ENERGIZED. ATRIUM SMOKE EXHAUST FANS WILL BE AUTOMATICALLY AND MANUALLY STARTED AND STOPPED FROM THE FIRE ALARM PANEL.

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                    BILL OF MATERIALS
Estimate: smoke exh                                70520098.pre
Desig.       QtyPart #            Description
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Field Devices:
AIR FLOW      10  AFS-222         FAN AIR FLOW SWITCH
D-5-1,D-7-1,  4   ---             SEE DAMPER SCHEDULE
D-10-1,D-11-
1
END SW        12  TS-470          DPR POSITION SWITCH
SOLE VALVE    12  V11HAA-100      3-W SOLENOID,W/OV,120VAC
Panel Devices:
EN-EXH        4   EN-EWC15-0      UNIV PKG MOD,SING,W/50VA
DC-1          4   AS-VAV110-1     VAV 6AI,4BI,8BO,8K
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C NC NO END SWITCH — SOLENOID AIR VALVE AND DAMPER END SWITCH SUPPLIED BY JCI

IN OUT — INPUT AND OUTPUT MODULES SUPPLIED BY FIRE ALARM SYSTEM UNDER DIVISION 16

REVISION INFORMATION	Drawing Title					
NUMBER	ATRIUM SMOKE EXHAUST NORTH ATRIUM SMOKE ZONE	AS-BUILT			7/18/00	CME
		REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN / DATE	BY
DATE 07/18/00	QUAD A & D	Sales Engineer JDP	Project Manager WJT	Application Engineer RTS	DRAWN BY RTS DATE 09/11/97	APPROVED BY DATE
TIME 03:43 PM	Project Title BALTIMORE NFL STADIUM AT CAMDEN YARDS	JOHNSON CONTROLS Systems & Services Division	Branch Information Johnson Controls, Inc. 60 Loveton Circle Sparks, Md 21152		CONTRACT NUMBER 7052-0098	
FILE NAME SMOKE.vsd	BALTIMORE, MARYLAND				DRAWING NUMBER BL-6559-46	

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		SEF-B					VAV						EN-EXH	AT FAN														Power to Controller
		SEF-B	*				VAV	1	3				EN-EXH	AT FAN	0													N2 Trunk
	AI-1	SEF-B					VAV	1	3	AI-1			EN-EXH	AT FAN	0		EXH-3-AI-1											
	AI-2	SEF-B					VAV	1	3	AI-2			EN-EXH	AT FAN	0		EXH-3-AI-2											
	AI-3	SEF-B					VAV	1	3	AI-3			EN-EXH	AT FAN	0		EXH-3-AI-3											
	AI-4	SEF-B					VAV	1	3	AI-4			EN-EXH	AT FAN	0		EXH-3-AI-4											
	AI-5	SEF-B					VAV	1	3	AI-5			EN-EXH	AT FAN	0		EXH-3-AI-5											
	AI-6	SEF-B					VAV	1	3	AI-6			EN-EXH	AT FAN	0		EXH-3-AI-6											
	BI-1	SEF-B	SEF7A-S	Smoke Exh Fan 7A Status	Off	On	VAV	1	3	BI-1		BI#,24VAC	EN-EXH	AT FAN	0		EXH-3-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	SEF-B	SEF7B-S	Smoke Exh Fan 7B Status	Off	On	VAV	1	3	BI-2		BI#,24VAC	EN-EXH	AT FAN	0		EXH-3-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	SEF-B	SEF8-S	Smoke Exh Fan 8 Status	Off	On	VAV	1	3	BI-3		BI#,24VAC	EN-EXH	AT FAN	0		EXH-3-BI-3						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-4	SEF-B					VAV	1	3	BI-4			EN-EXH	AT FAN	0		EXH-3-BI-4											
	BO-1	SEF-B					VAV	1	3	BO-1			EN-EXH	AT FAN	0		EXH-3-BO-1											
	BO-2	SEF-B					VAV	1	3	BO-2			EN-EXH	AT FAN	0		EXH-3-BO-2											
	BO-3	SEF-B					VAV	1	3	BO-3			EN-EXH	AT FAN	0		EXH-3-BO-3											
	BO-4	SEF-B					VAV	1	3	BO-4			EN-EXH	AT FAN	0		EXH-3-BO-4											
	BO-5	SEF-B					VAV	1	3	BO-5			EN-EXH	AT FAN	0		EXH-3-BO-5											
	BO-6	SEF-B					VAV	1	3	BO-6			EN-EXH	AT FAN	0		EXH-3-BO-6											
	BO-7	SEF-B					VAV	1	3	BO-7			EN-EXH	AT FAN	0		EXH-3-BO-7											
	BO-8	SEF-B					VAV	1	3	BO-8			EN-EXH	AT FAN	0		EXH-3-BO-8											

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		SEF-C					VAV						EN-EXH	AT FAN														Power to Controller
		SEF-C	*				VAV	1	6				EN-EXH	AT FAN	0													N2 Trunk
	AI-1	SEF-C					VAV	1	6	AI-1			EN-EXH	AT FAN	0		EXH-6-AI-1											
	AI-2	SEF-C					VAV	1	6	AI-2			EN-EXH	AT FAN	0		EXH-6-AI-2											
	AI-3	SEF-C					VAV	1	6	AI-3			EN-EXH	AT FAN	0		EXH-6-AI-3											
	AI-4	SEF-C					VAV	1	6	AI-4			EN-EXH	AT FAN	0		EXH-6-AI-4											
	AI-5	SEF-C					VAV	1	6	AI-5			EN-EXH	AT FAN	0		EXH-6-AI-5											
	AI-6	SEF-C					VAV	1	6	AI-6			EN-EXH	AT FAN	0		EXH-6-AI-6											
	BI-1	SEF-C	SEF9-S	Exh Fan 1 Status	Off	On	VAV	1	6	BI-1		BI#,24VAC	EN-EXH	AT FAN	0		EXH-6-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	SEF-C	SEF10A-S	Exh Fan 1 Status	Off	On	VAV	1	6	BI-2		BI#,24VAC	EN-EXH	AT FAN	0		EXH-6-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	SEF-C	SEF10B-S	Exh Fan 1 Status	Off	On	VAV	1	6	BI-3		BI#,24VAC	EN-EXH	AT FAN	0		EXH-6-BI-3						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-4	SEF-C					VAV	1	6	BI-4			EN-EXH	AT FAN	0		EXH-6-BI-4											
	BO-1	SEF-C					VAV	1	6	BO-1			EN-EXH	AT FAN	0		EXH-6-BO-1											
	BO-2	SEF-C					VAV	1	6	BO-2			EN-EXH	AT FAN	0		EXH-6-BO-2											
	BO-3	SEF-C					VAV	1	6	BO-3			EN-EXH	AT FAN	0		EXH-6-BO-3											
	BO-4	SEF-C					VAV	1	6	BO-4			EN-EXH	AT FAN	0		EXH-6-BO-4											
	BO-5	SEF-C					VAV	1	6	BO-5			EN-EXH	AT FAN	0		EXH-6-BO-5											
	BO-6	SEF-C					VAV	1	6	BO-6			EN-EXH	AT FAN	0		EXH-6-BO-6											
	BO-7	SEF-C					VAV	1	6	BO-7			EN-EXH	AT FAN	0		EXH-6-BO-7											
	BO-8	SEF-C					VAV	1	6	BO-8			EN-EXH	AT FAN	0		EXH-6-BO-8											

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		SEF-D				VAV						EN-EXH	AT FAN														Power to Controller
		SEF-D				VAV	1	4				EN-EXH	AT FAN	0													N2 Trunk
	AI-1	SEF-D				VAV	1	4	AI-1			EN-EXH	AT FAN	0		EXH-4-AI-1											
	AI-2	SEF-D				VAV	1	4	AI-2			EN-EXH	AT FAN	0		EXH-4-AI-2											
	AI-3	SEF-D				VAV	1	4	AI-3			EN-EXH	AT FAN	0		EXH-4-AI-3											
	AI-4	SEF-D				VAV	1	4	AI-4			EN-EXH	AT FAN	0		EXH-4-AI-4											
	AI-5	SEF-D				VAV	1	4	AI-5			EN-EXH	AT FAN	0		EXH-4-AI-5											
	AI-6	SEF-D				VAV	1	4	AI-6			EN-EXH	AT FAN	0		EXH-4-AI-6											
	BI-1	SEF-D	SEF11-S	Smoke Exh Fan 11 Status	Off On	VAV	1	4	BI-1		BI#,24VAC	EN-EXH	AT FAN	0		EXH-4-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	SEF-D	SEF12-S	Smoke Exh Fan 12 Status	Off On	VAV	1	4	BI-2		BI#,24VAC	EN-EXH	AT FAN	0		EXH-4-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	SEF-D				VAV	1	4	BI-3			EN-EXH	AT FAN	0		EXH-4-BI-3											
	BI-4	SEF-D				VAV	1	4	BI-4			EN-EXH	AT FAN	0		EXH-4-BI-4											
	BO-1	SEF-D				VAV	1	4	BO-1			EN-EXH	AT FAN	0		EXH-4-BO-1											
	BO-2	SEF-D				VAV	1	4	BO-2			EN-EXH	AT FAN	0		EXH-4-BO-2											
	BO-3	SEF-D				VAV	1	4	BO-3			EN-EXH	AT FAN	0		EXH-4-BO-3											
	BO-4	SEF-D				VAV	1	4	BO-4			EN-EXH	AT FAN	0		EXH-4-BO-4											
	BO-5	SEF-D				VAV	1	4	BO-5			EN-EXH	AT FAN	0		EXH-4-BO-5											
	BO-6	SEF-D				VAV	1	4	BO-6			EN-EXH	AT FAN	0		EXH-4-BO-6											
	BO-7	SEF-D				VAV	1	4	BO-7			EN-EXH	AT FAN	0		EXH-4-BO-7											
	BO-8	SEF-D				VAV	1	4	BO-8			EN-EXH	AT FAN	0		EXH-4-BO-8											

ELECTRICAL SUBSTATIONS

TMP-S — HIGH TEMPERATURE ALARM IN SUBSTATION ENCLOSURE (CONTACT BY DIVISION 16)

DCM-S — DIGITAL ELECTRIC METER IN SUBSTATION ENCLOSURE (CONTACT BY DIVISION 16)

SUBSTATION	LOCATION	JCI PANEL
SS1-PRA	PRESS LEVEL ELECTRICAL ROOM QUAD A	EN-ELEC-A1
SS2-PRA	PRESS LEVEL ELECTRICAL ROOM QUAD A	EN-ELEC-A2
SS1-PRB	PRESS LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-B1
SS2-PRB	PRESS LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-B2
SS1-PRC	PRESS LEVEL ELECTRICAL ROOM QUAD C	EN-ELEC-C1
SS2-PRC	PRESS LEVEL ELECTRICAL ROOM QUAD C	EN-ELEC-C2
SS1-PRD	PRESS LEVEL ELECTRICAL ROOM QUAD D	EN-ELEC-D1
SS2-PRD	PRESS LEVEL ELECTRICAL ROOM QUAD D	EN-ELEC-D2
SS1-SRB	SERVICE LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-S1
SS2-SRB	SERVICE LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-S2
SS3-SRB	SERVICE LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-S3
SSFP-SRB	SERVICE LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-S4
SSGE-SRB	SERVICE LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-S5
SSGL-SRB	SERVICE LEVEL ELECTRICAL ROOM QUAD B	EN-ELEC-S6

HEAT TRACE PANELS

HTP-S — PANEL ALARM CONTACT IN ENCLOSURE (CONTACT BY DIVISION 16)

HEAT TRACE	LOCATION	JCI PANEL
QUAD A	MAIN CONCOURSE ELECTRICAL ROOM QUAD A	EN-ELEC-A1
QUAD B	MAIN CONCOURSE ELECTRICAL ROOM QUAD B	EN-ELEC-B1
QUAD C	MAIN CONCOURSE ELECTRICAL ROOM QUAD C	EN-ELEC-C1
QUAD D	MAIN CONCOURSE ELECTRICAL ROOM QUAD D	EN-ELEC-D1

CONCOURSE LEVEL TOILET EXHAUST FANS

TEFA4-C

EXHAUST FAN	LOCATION	JCI PANEL
TEF-A4	MAIN CONCOURSE LEVEL QUAD A	EN-ELEC-A1
TEF-A5	MAIN CONCOURSE LEVEL QUAD A	EN-ELEC-A1
TEF-A6	MAIN CONCOURSE LEVEL QUAD A	EN-AHU-1
TEF-A9	MAIN CONCOURSE LEVEL QUAD A	EN-AHU-1
TEF-B9	MAIN CONCOURSE LEVEL QUAD B	EN-AHU-2
TEF-B10	MAIN CONCOURSE LEVEL QUAD B	EN-AHU-2
TEF-B12	MAIN CONCOURSE LEVEL QUAD B	EN-AHU-2
TEF-B13	MAIN CONCOURSE LEVEL QUAD B	EN-AHU-2
TEF-C1	MAIN CONCOURSE LEVEL QUAD C	EN-ELEC-C1
TEF-C2	MAIN CONCOURSE LEVEL QUAD C	EN-ELEC-C1
TEF-C3	MAIN CONCOURSE LEVEL QUAD C	EN-AHU-3
TEF-D1	MAIN CONCOURSE LEVEL QUAD D	EN-AHU-4
TEF-D4	MAIN CONCOURSE LEVEL QUAD D	EN-ELEC-D1
TEF-D5	MAIN CONCOURSE LEVEL QUAD D	EN-ELEC-D1

BILL OF MATERIALS

Estimate: electric 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
TEF,CUH	14	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	14	PD-101-35	RLY BASE,3PDT,11PIN,10A
	14	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
Panel Devices:			
DC-1	14	AS-VAV110-1	VAV 6AI,4BI,8BO,8K
EN-ELEC-x	14	EN-EWC15-0	UNIV PKG MOD,SING,W 50VA

ELECTRICAL SUB-STATIONS

SUBSTATION TRANSFORMER HIGH TEMPERATURE ALARMS AND SUBSTATION ELECTRIC USAGE WILL BE MONITORED THROUGH THE METATSYS SYSTEM.

ELECTRIC HEAT TRACE SYSTEMS

THE FOUR (4) MAIN HEAT TRACE SYSTEM PANEL ALARMS WILL BE MONITORED THROUGH THE METAYS SYSTEM.

CONCOURSE LEVEL TOILET ROOMS

CONCOURSE LEVEL TOILET ROOMS HAVE THREE (2) MODES OF STANDARD OPERATION AS FOLLOWS:

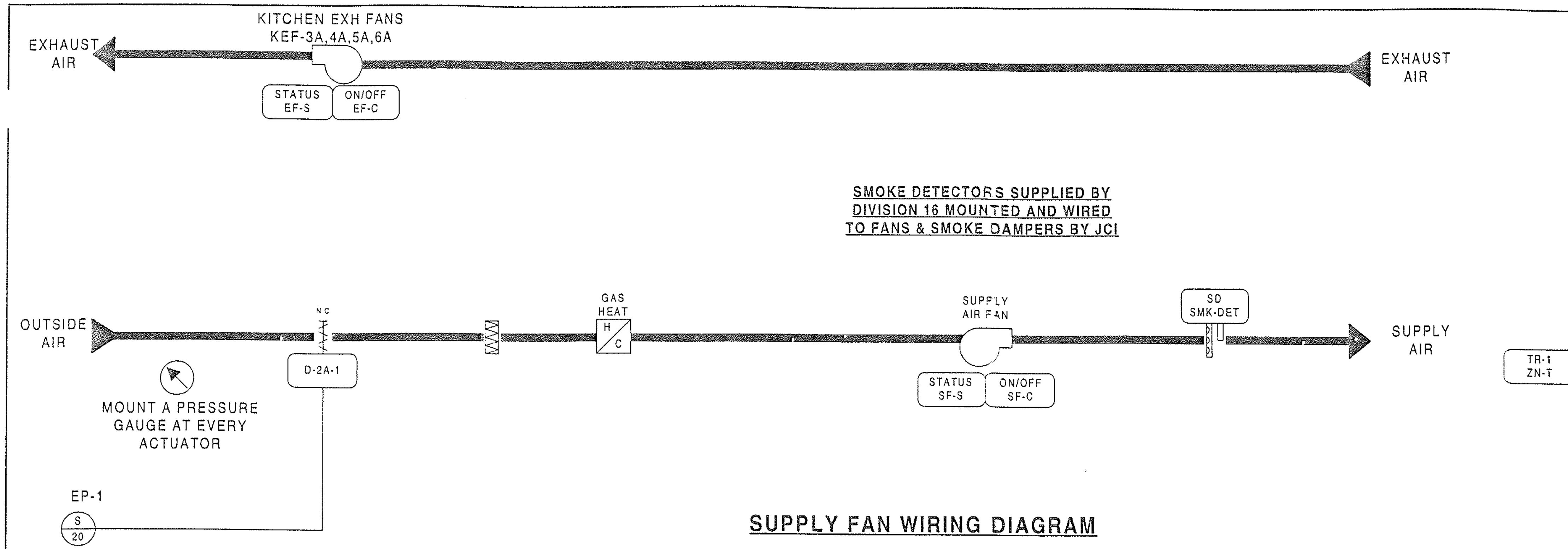
1. OCCUPIED - FULLY OPERATIONAL DURING STADIUM EVENT.
2. UNOCCUPIED - NOT VENTILATED BETWEEN STADIUM EVENTS DURING THE NFL SEASON.

THE METASYS SYSTEM WILL HAVE THE ABILITY TO CONTROL INDIVIDUAL TOILET ROOM COMPONENTS (ON/OFF) AS REQUIRED BY THE MODE OF OPERATION. IN THE OCCUPIED MODE, INDIVIDUAL TOILET EXHAUST FANS WILL START AND RUN CONTINUOUSLY. GRAVITY OPERATED BACKDRAFT DAMPER ON FAN WILL RESPOND TO FAN OPERATION. IN THE UNOCCUPIED MODE INDIVIDUAL TOILET EXHAUST FANS WILL BE DE-ENERGIZED AND BACKDRAFT DAMPERS WILL CLOSE. PLUMBING LINE ARE VALVED OFF AND DRAINED, FIXTURES HAD TRAPS ARE PROTECTED FROM FREEZING WITH GLYCOL. THE JANITOR'S CLOSET ASSOCIATED WITH EACH TOILET ROOM WILL REMAIN HEATED THROUGHOUT THE HEATING SEASON. ISOLATION OF WATER PIPING AND DRAINING OF TOILET ROOM BRANCH LINES OCCURS IN THIS ROOM. HEATERS IN JANITOR'S CLOSET WILL BE ADJUSTED TO MAINTAIN FIFTY-FIVE (55F).

CABINET HEATERS FAN AND HEATING ELEMENTS WILL BE CYCLED ON AND OFF TO MAINTAIN A FIFTY-FIVE (55F) SPACE TEMPERATURE IN THE OCCUPIED OR UNOCCUPIED MODE .

REVISION INFORMATION	Drawing Title					
NUMBER	SUBSTATION ELEC METERING HEAT TRACE PANELS MAIN CONCOURSE TOILET EXHAUST FANS	AS-BUILT			7/18/00	CME
		REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN DATE	BY
DATE 07/18/00		Sales Engineer JDP	Project Manager WJT	Application Engineer RTS	DRAWN BY RTS DATE 09/11/97	APPROVED BY DATE
TIME 03:44 PM	Project Title BALTIMORE NFL STADIUM AT CAMDEN YARDS	JOHNSON CONTROLS Systems & Services Division		Branch Information Johnson Controls, Inc. 60 Loveton Circle Sparks, Md 21152	CONTRACT NUMBER 7052-0098	
FILE NAME ELECTRIC.vsd	BALTIMORE, MARYLAND				DRAWING NUMBER BL-6559-47	

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		ELEC-A1					VA'√						EN-ELECA	AT UNIT														Power to Controller
		ELEC-A1	*				VA'√	1	4				EN-ELECA	AT UNIT	0													N2 Trunk
	AI-1	ELEC-A1					VA'√	1	4	AI-1			EN-ELECA	AT UNIT	0		ELECA-4-AI-1											
	AI-2	ELEC-A1					VA'√	1	4	AI-2			EN-ELECA	AT UNIT	0		ELECA-4-AI-2											
	AI-3	ELEC-A1					VA'√	1	4	AI-3			EN-ELECA	AT UNIT	0		ELECA-4-AI-3											
	AI-4	ELEC-A1					VA'√	1	4	AI-4			EN-ELECA	AT UNIT	0		ELECA-4-AI-4											
	AI-5	ELEC-A1					VA'√	1	4	AI-5			EN-ELECA	AT UNIT	0		ELECA-4-AI-5											
	AI-6	ELEC-A1					VA'√	1	4	AI-6			EN-ELECA	AT UNIT	0		ELECA-4-AI-6											
	BI-1	ELEC-A1					VA'√	1	4	BI-1			EN-ELECA	AT UNIT	0		ELECA-4-BI-1											
	BI-2	ELEC-A1	HTP-A	Heat Trace Panel Quad A	Normal	Alarm	VA'√	1	4	BI-2		BI#,24VAC	EN-ELECA	AT UNIT	0		ELECA-4-BI-2						2/22	Device dependent	Panel Contact (NO)		U70	
	BI-3	ELEC-A1	TMP-A1	Substation SS1-PRA Temp	Normal	Alarm	VA'√	1	4	BI-3		BI#,24VAC	EN-ELECA	AT UNIT	0		ELECA-4-BI-3						2/22	Device dependent	Panel Contact (NO)		U70	
	BI-4	ELEC-A1	ELE-A1	Substation SS1-PRA Elec	Kw		VA'√	1	4	BI-4		BI#,24VAC	EN-ELECA	AT UNIT	0		ELECA-4-BI-4						2/22	Device dependent	Panel Contact (NO)		U70	
	BO-1	ELEC-A1	TEFA4-C	Toilet Exh Fan A4 Cntrl	Off	On	VA'√	1	4	BO-1		BO#,24VAC	EN-ELECA	AT UNIT	0		ELECA-4-BO-1			PD-109-51			2/18	Device dependent	24VAC OUT		U51	
	BO-2	ELEC-A1	TEFA5-C	Toilet Exh Fan A5 Cntrl	Off	On	VA'√	1	4	BO-2		BO#,24VAC	EN-ELECA	AT UNIT	0		ELECA-4-BO-2			PD-109-51			2/18	Device dependent	24VAC OUT		U51	
	BO-3	ELEC-A1					VA'√	1	4	BO-3			EN-ELECA	AT UNIT	0		ELECA-4-BO-3											
	BO-4	ELEC-A1					VA'√	1	4	BO-4			EN-ELECA	AT UNIT	0		ELECA-4-BO-4											
	BO-5	ELEC-A1					VA'√	1	4	BO-5			EN-ELECA	AT UNIT	0		ELECA-4-BO-5											
	BO-6	ELEC-A1					VA'√	1	4	BO-6			EN-ELECA	AT UNIT	0		ELECA-4-BO-6											
	BO-7	ELEC-A1					VA'√	1	4	BO-7			EN-ELECA	AT UNIT	0		ELECA-4-BO-7											
	BO-8	ELEC-A1					VA'√	1	4	BO-8			EN-ELECA	AT UNIT	0		ELECA-4-BO-8											

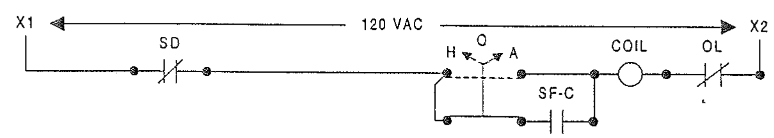


BILL OF MATERIALS

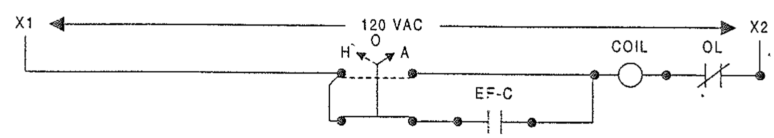
Estimate: mau-2a 70520098.pre

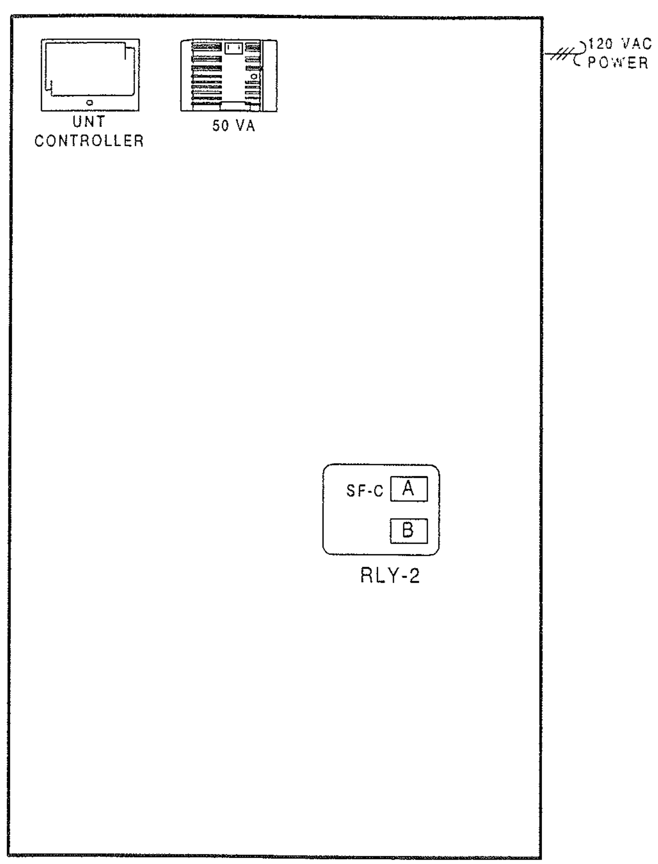
Desig.	Qty	Part #	Description
Field Devices:			
D-2A-1	1	---	SEE DAMPER SCHEDULE
	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
EP-1	1	V11HAA-100	3-W SOLENOID,W/OV,120VAC
T-1	1	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
EF-3A,4A,5A, 6A	2	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	2	PD-101-35	RLY BASE,3PDT,11PIN,10A
	2	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-MAU-2A	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

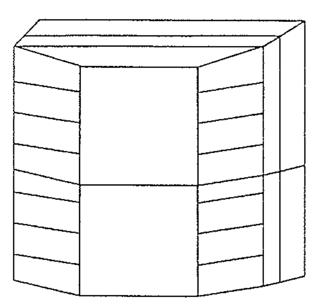
SUPPLY FAN WIRING DIAGRAM



TYPICAL EXHAUST FAN WIRING DIAGRAM







ENCLOSURE EN-MAU-2A
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-1/N2 ADD = 3

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL HAVE THE ABILITY TO CONTROL INDIVIDUAL CONCESSION COMPONENTS (ON/OFF) AS REQUIRED BY THE MODE OF OPERATION. IN THE OCCUPIED MODE, INDIVIDUAL CONCESSION MAKEUP AIR UNIT **MAU-2A** AND EXHAUST FANS **KEF-3A,4A,5A,6A** WILL START AND RUN CONTINUOUSLY. WHEN THE UNIT AND EXHAUST FANS ARE ENERGIZED, OUTSIDE AIR DAMPER **D-2A-1**, WILL OPEN. ROOM SENSOR **TR-1** WILL CYCLE DIRECT GAS FIRED HEATER TO MAINTAIN ITS SETPOINT. DISCHARGE SENSOR **T-1** WILL MONITOR SUPPLY TEMPERATURE AND PROVE GAS FIRING OF UNIT.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER **D-2A-1** WILL OPEN AND EXHAUST FANS WILL START AND RUN CONTINUOUSLY. THE DIRECT GAS FIRED HEATER WILL BE ACTIVATED BY ZONE SENSOR **TR-1** TO MAINTAIN ITS SETTING OF FIFTY (50F). THE DIRECT GAS FIRED HEATER WILL BE MONITORED BY **T-1.** THE SYSTEM WILL ALARM WHEN ROOM SENSOR **TR-1** DROPS BELOW FIFTY (50F). DIRECT GAS FIRED HEATER CONTROL PANEL WILL BE INTERLOCKED WITH GAS EMERGENCY SHUT OFF SYSTEM ASSOCIATED WITH GAS COOKING EQUIPMENT. AUTOMATIC SHUT-DOWN WILL BE PROVIDED AS REQUIRED BY NFPA.

UNOCCUPIED HEATING MODE - MAKE-UP AIR UNIT AND EXHAUST FANS WILL BE DE-ENERGIZED AND OUTSIDE AIR DAMPER WILL CLOSE. ELECTRIC UNIT HEATERS (WITH BUILT-IN THERMOSTAT) WILL CYCLE (ON/OFF) TO MAINTAIN FIFTY (50F).

OCCUPIED COOLING MODE - NONE

UNOCCUPIED COOLING MODE - NONE

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION	
NUMBER	
DATE	07/18/00
TIME	03:46 PM
FILE NAME	MAU-2A.vsd

DRAWING TITLE
MAKE-UP AIR UNIT 2A
KITCHEN FOOD SERVICE

CLUB LEVEL QUAD A

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/16/97	BY DATE

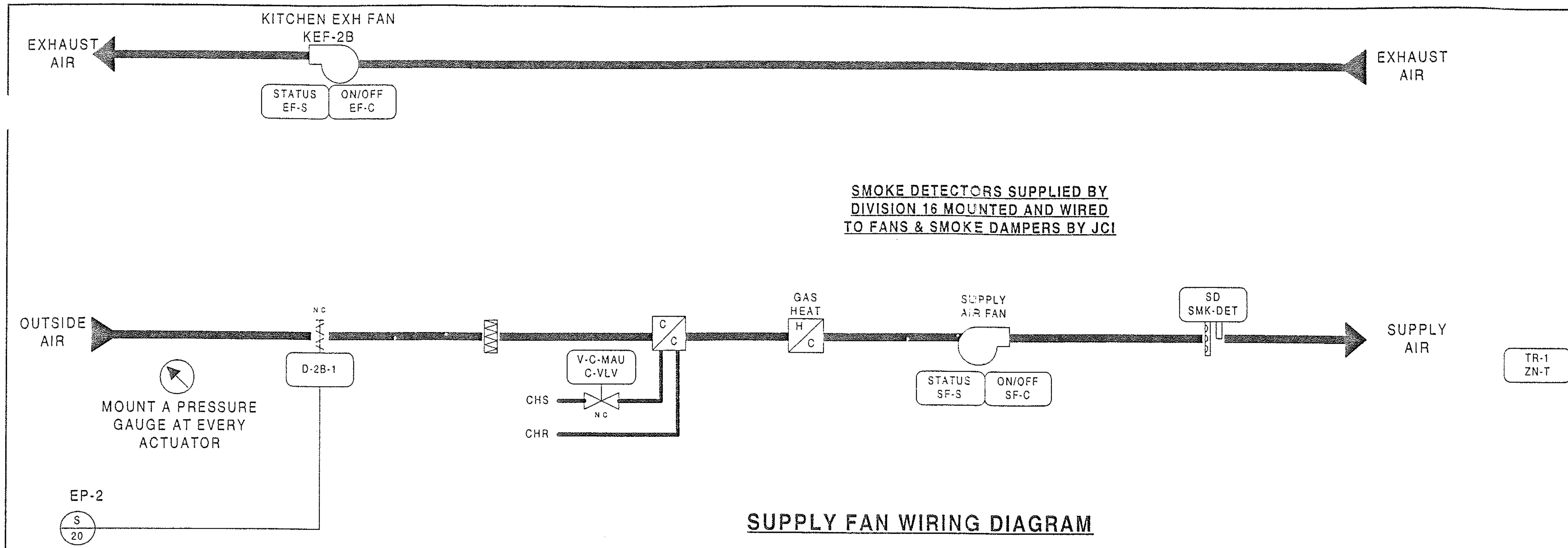
JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

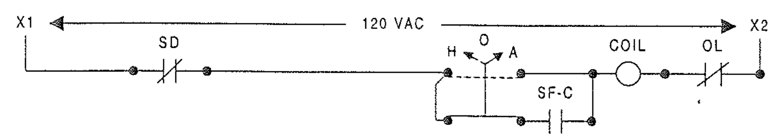
CONTRACT NUMBER 7052-0098

DRAWING NUMBER BL-6559-48

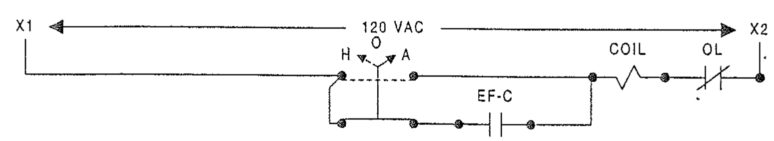
Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Locaticm	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		MAU-2A					UNT						EN-MAU2B	AT UNIT														Power to Controller
		MAU-2A	*				UNT	1	3				EN-MAU2B	AT UNIT	0													N2 Trunk
	AI-1	MAU-2A					UNT	1	3	AI-1			EN-MAU2B	AT UNIT	0		MAU2B-3-AI-1											
	AI-2	MAU-2A					UNT	1	3	AI-2			EN-MAU2B	AT UNIT	0		MAU2B-3-AI-2											
	AI-3	MAU-2A					UNT	1	3	AI-3			EN-MAU2B	AT UNIT	0		MAU2B-3-AI-3											
	AI-4	MAU-2A	ZN-T	Zone Temperature	Deg F		UNT	1	3	AI-4		PHONE JACK	EN-MAU2B	AT UNIT	0		MAU2B-3-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	MAU-2A					UNT	1	3	AI-5			EN-MAU2B	AT UNIT	0		MAU2B-3-AI-5											
	AI-6	MAU-2A					UNT	1	3	AI-6			EN-MAU2B	AT UNIT	0		MAU2B-3-AI-6											
	BI-1	MAU-2A	SF-S	Supply Fan Status	Off	On	UNT	1	3	BI-1		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-3-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	MAU-2A	EF-S	Exh Fan Status	Off	On	UNT	1	3	BI-2		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-3-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	MAU-2A	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	3	BI-3		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-3-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	MAU-2A					UNT	1	3	BI-4			EN-MAU2B	AT UNIT	0		MAU2B-3-BI-4											
	BO-1	MAU-2A					UNT	1	3	BO-1			EN-MAU2B	AT UNIT	0		MAU2B-3-BO-1											
	BO-2	MAU-2A					UNT	1	3	BO-2			EN-MAU2B	AT UNIT	0		MAU2B-3-BO-2											
	BO-3	MAU-2A	SF-C	Supply Fan Control	Off	On	UNT	1	3	BO-3	RLY	BO#,24V,COM	EN-MAU2B	AT UNIT	0		MAU2B-3-BO	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-4	MAU-2A	EF-C	Exh Fan Control	Off	On	UNT	1	3	BO-4		BO#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-3-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	MAU-2A					UNT	1	3	BO-5			EN-MAU2B	AT UNIT	0		MAU2B-3-BO-5											
	BO-6	MAU-2A					UNT	1	3	BO-6			EN-MAU2B	AT UNIT	0		MAU2B-3-BO-6											
	AO-1	MAU-2A					UNT	1	3	AO-1			EN-MAU2B	AT UNIT	0		MAU2B-3-AO-1											
	AO-2	MAU-2A					UNT	1	3	AO-2			EN-MAU2B	AT UNIT	0		MAU2B-3-AO-2											

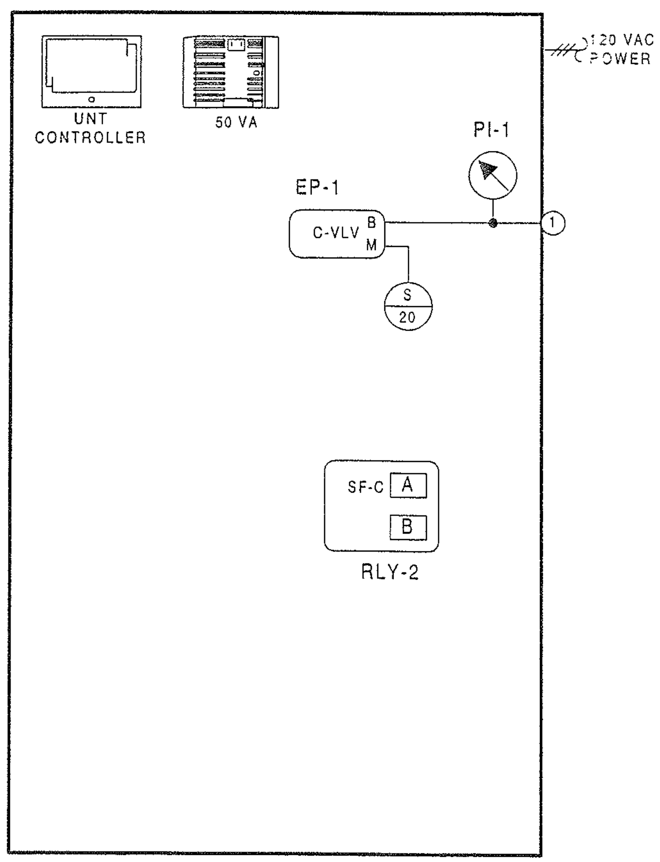


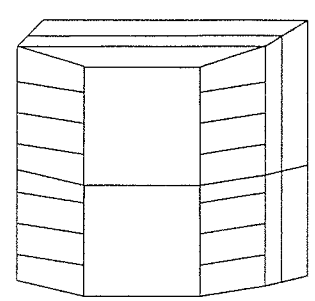
SUPPLY FAN WIRING DIAGRAM



TYPICAL EXHAUST FAN WIRING DIAGRAM







ENCLOSURE EN-MAU-2B
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-2/N2 ADD = 4

BILL OF MATERIALS

Estimate: mau-2b 70520098.pre

Desig.	Qty	Part #	Description
Field Devices:			
D-2B-1	1	---	SEE DAMPER SCHEDULE
	1	D-3153-2	DMPR ACT,8-13#
	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
EF-2B	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
EP-2	1	V11HAA-100	3-W SOLENOID,W/CV,120VAC
T-1	1	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
V-C-MAU	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-MAU-2B	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL HAVE THE ABILITY TO CONTROL INDIVIDUAL CONCESSION COMPONENTS (ON/OFF) AS REQUIRED BY THE MODE OF OPERATION. IN THE OCCUPIED MODE, INDIVIDUAL CONCESSION MAKEUP AIR UNIT **MAU-2B** AND EXHAUST FAN **KEF-2B** WILL START AND RUN CONTINUOUSLY. WHEN THE UNIT AND EXHAUST FANS ARE ENERGIZED, OUTSIDE AIR DAMPER **D-2B-1,** WILL OPEN. ROOM SENSOR **TR-1** WILL CYCLE DIRECT GAS FIRED HEATER TO MAINTAIN ITS SETPOINT. DISCHARGE SENSOR **T-1** WILL MONITOR SUPPLY TEMPERATURE AND PROVE GAS FIRING OF UNIT.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER **D-2B-1** WILL OPEN AND EXHAUST FANS WILL START AND RUN CONTINUOUSLY. THE DIRECT GAS FIRED HEATER WILL BE ACTIVATED BY ZONE SENSOR **TR-1** TO MAINTAIN ITS SETTING OF FIFTY (50F). THE DIRECT GAS FIRED HEATER WILL BE MONITORED BY **T-1.** THE SYSTEM WILL ALARM WHEN ROOM SENSOR **TR-1** DROPS BELOW FIFTY (50F). DIRECT GAS FIRED HEATER CONTROL PANEL WILL BE INTERLOCKED WITH GAS EMERGENCY SHUT OFF SYSTEM ASSOCIATED WITH GAS COOKING EQUIPMENT. AUTOMATIC SHUT-DOWN WILL BE PROVIDED AS REQUIRED BY NFPA.

UNOCCUPIED HEATING MODE - MAKE-UP AIR UNIT AND EXHAUST FANS WILL BE DE-ENERGIZED AND OUTSIDE AIR DAMPER WILL CLOSE. ELECTRIC UNIT HEATERS (WITH BUILT-IN THERMOSTAT) WILL CYCLE (ON/OFF) TO MAINTAIN FIFTY (50F).

OCCUPIED COOLING MODE - SUPPLY FAN WILL BE RUNNING AND OUTSIDE AIR DAMPER WILL BE OPEN. ROOM SENSOR **TR-1** THROUGH THE METAYS SYSTEM WIL MODULATE CHILLED WATER VALVE **V-C-MAU** TO MAINTAIN ROOM TEMPERATURE SETTING OF EIGHTY (80F).

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF. OUTSIDE AIR DAMPER AND CHILLED WATER VALVE WILL BE CLOSED.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:48 PM
FILE NAME MAU-2B.vsd

DRAWING TITLE
MAKE-UP AIR UNIT 2B
CLC-2-PANTRY
CLUB LEVEL QUAD B

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REVISION-LOCATION	ECN	DATE	BY
AS-BUILT		7/18/00	CME

REFERENCE DRAWING	NO.

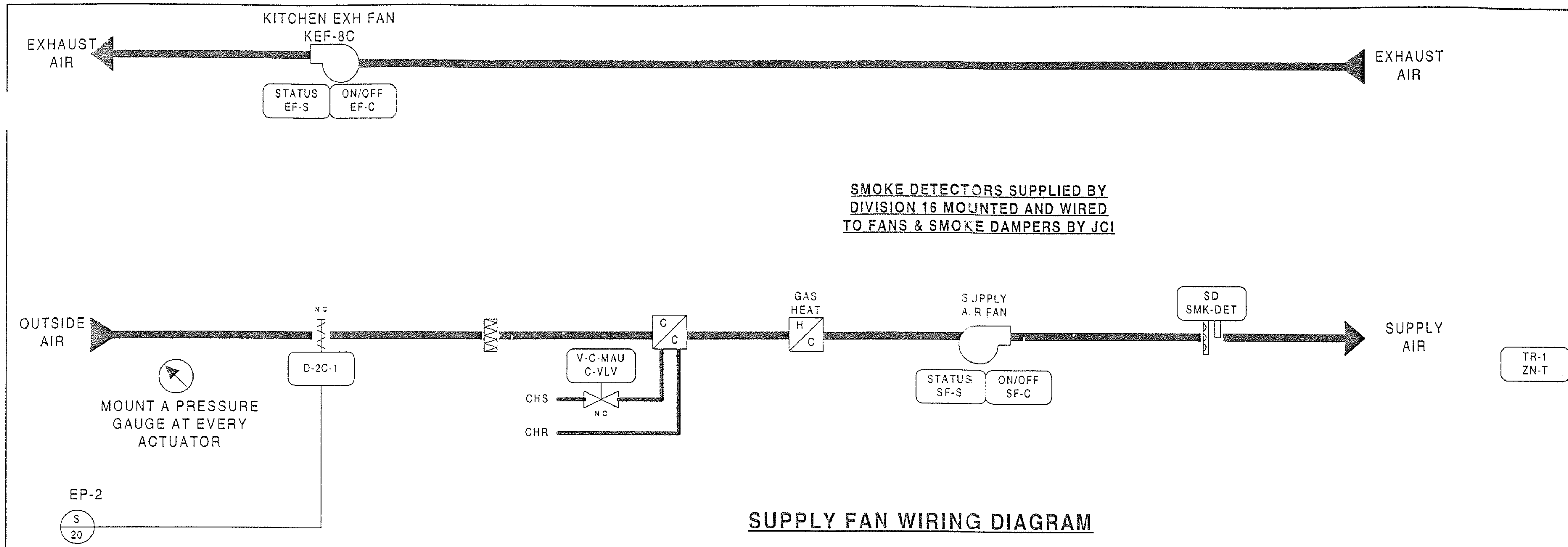
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/16/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-49

Full Spreadsheet		Software					Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units		DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		MAU-2B					UNT						EN-MAU2B	AT UNIT														Power to Controller
		MAU-2B	*				UNT	1	4				EN-MAU2B	AT UNIT	0													N2 Trunk
	AI-1	MAU-2B					UNT	1	4	AI-1			EN-MAU2B	AT UNIT	0		MAU2B-4-AI-1											
	AI-2	MAU-2B					UNT	1	4	AI-2			EN-MAU2B	AT UNIT	0		MAU2B-4-AI-2											
	AI-3	MAU-2B					UNT	1	4	AI-3			EN-MAU2B	AT UNIT	0		MAU2B-4-AI-3											
	AI-4	MAU-2B	ZN-T	Zone Temperature	Deg F		UNT	1	4	AI-4		PHONE JACK	EN-MAU2B	AT UNIT	0		MAU2B-4-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	MAU-2B					UNT	1	4	AI-5			EN-MAU2B	AT UNIT	0		MAU2B-4-AI-5											
	AI-6	MAU-2B					UNT	1	4	AI-6			EN-MAU2B	AT UNIT	0		MAU2B-4-AI-6											
	BI-1	MAU-2B	SF-S	Supply Fan Status	Off	On	UNT	1	4	BI-1		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-4-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	MAU-2B	EF-S	Exh Fan Status	Off	On	UNT	1	4	BI-2		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-4-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	MAU-2B	SMK-DET	Smoke Detectors	Normal	Alarm	UNT	1	4	BI-3		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-4-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	MAU-2B					UNT	1	4	BI-4			EN-MAU2B	AT UNIT	0		MAU2B-4-BI-4											
	BO-1	MAU-2B					UNT	1	4	BO-1			EN-MAU2B	AT UNIT	0		MAU2B-4-BO-1											
	BO-2	MAU-2B					UNT	1	4	BO-2			EN-MAU2B	AT UNIT	0		MAU2B-4-BO-2											
	BO-3	MAU-2B	SF-C	Supply Fan Control	Off	On	UNT	1	4	BO-3	RLY	BO#,24V.COM	EN-MAU2B	AT UNIT	0		MAU2B-4-BO-3	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-4	MAU-2B	EF-C	Exh Fan Control	Off	On	UNT	1	4	BO-4		BO#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-4-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	MAU-2B					UNT	1	4	BO-5			EN-MAU2B	AT UNIT	0		MAU2B-4-BO-5											
	BO-6	MAU-2B					UNT	1	4	BO-6			EN-MAU2B	AT UNIT	0		MAU2B-4-BO-6											
	AO-1	MAU-2B	C-VLV	Cooling Coil Valve	% Open		UNT	1	4	AO-1		AO#,AOCM,24VA(	EN-MAU2B	AT UNIT	0		MAU2B-4-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	MAU-2B					UNT	1	4	AO-2			EN-MAU2B	AT UNIT	0		MAU2B-4-AO-2											

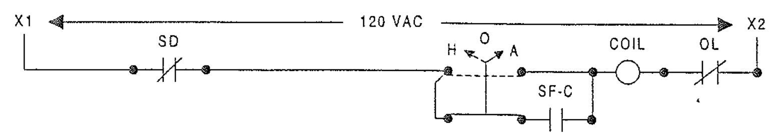


BILL OF MATERIALS

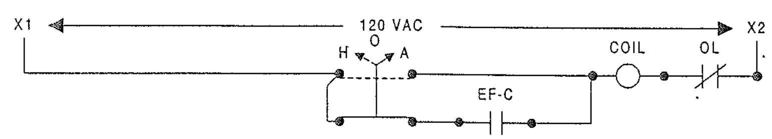
Estimate: mau-2c — 70520098.pre

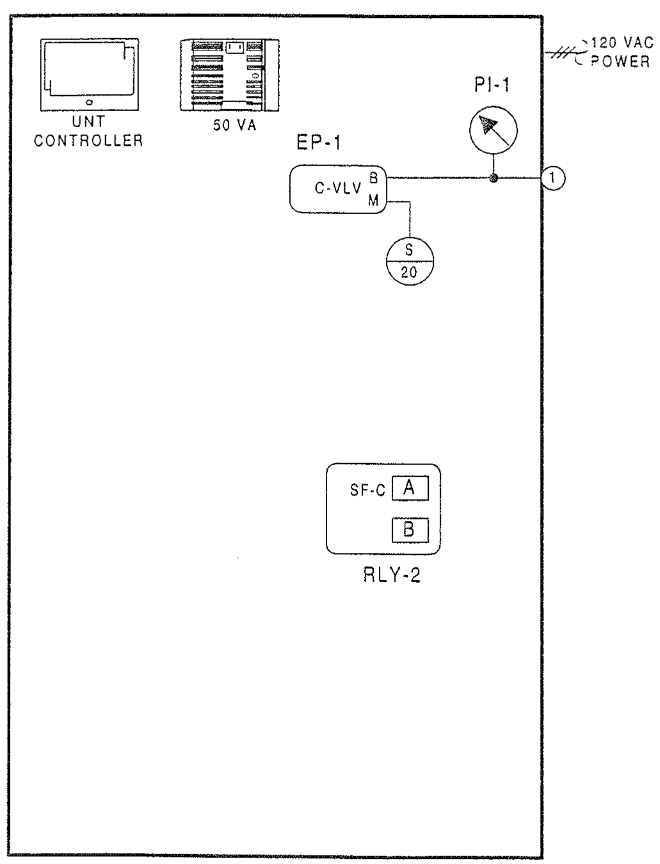
Desig.	Qty	Part #	Description
Field Devices:			
D-2C-1	1	---	SEE DAMPER SCHEDULE
	1	D-3153-2	DMPR ACT, 8-13#
	1	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
EF-8C	1	BZ-1000-11	ENCL, 4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE, 3PDT, 11PIN, 10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
EP-2	1	V11HAA-100	3-W SOLENOID, N.OV, 120VAC
T-1	1	TE-6315P-1	SENS, T-Ni, 0.1%, 8' AVG
V-C-MAU	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT, NI, BOX, JACK
Panel Devices:			
EN-MAU-2C	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD, CTR & BACKBN
EP-1	1	EP-8000-2	XDUCR, EP, 0/10V, HI VOL
PI-1	1	G-2010-11	GAGE, 2", 0-30 PSIG, STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

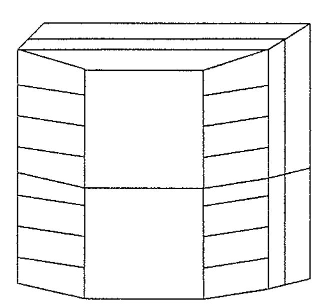
SUPPLY FAN WIRING DIAGRAM



TYPICAL EXHAUST FAN WIRING DIAGRAM







ENCLOSURE EN-MAU-2C
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-3/N2 ADD = 7

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL HAVE THE ABILITY TO CONTROL INDIVIDUAL CONCESSION COMPONENTS (ON/OFF) AS REQUIRED BY THE MODE OF OPERATION. IN THE OCCUPIED MODE, INDIVIDUAL CONCESSION MAKEUP AIR UNIT **MAU-2C** AND EXHAUST FAN **KEF-8C** WILL START AND RUN CONTINUOUSLY. WHEN THE UNIT AND EXHAUST FANS ARE ENERGIZED, OUTSIDE AIR DAMPER **D-2C-1,** WILL OPEN. ROOM SENSOR **TR-1** WILL CYCLE DIRECT GAS FIRED HEATER TO MAINTAIN ITS SETPOINT. DISCHARGE SENSOR **T-1** WILL MONITOR SUPPLY TEMPERATURE AND PROVE GAS FIRING OF UNIT.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER **D-2C-1** WILL OPEN AND EXHAUST FANS WILL START AND RUN CONTINUOUSLY. THE DIRECT GAS FIRED HEATER WILL BE ACTIVATED BY ZONE SENSOR **TR-1** TO MAINTAIN ITS SETTING OF FIFTY (50F). THE DIRECT GAS FIRED HEATER WILL BE MONITORED BY **T-1.** THE SYSTEM WILL ALARM WHEN ROOM SENSOR **TR-1** DROPS BELOW FIFTY (50F). DIRECT GAS FIRED HEATER CONTROL PANEL WILL BE INTERLOCKED WITH GAS EMERGENCY SHUT OFF SYSTEM ASSOCIATED WITH GAS COOKING EQUIPMENT. AUTOMATIC SHUT-DOWN WILL BE PROVIDED AS REQUIRED BY NFPA.

UNOCCUPIED HEATING MODE - MAKE-UP AIR UNIT AND EXHAUST FANS WILL BE DE-ENERGIZED AND OUTSIDE AIR DAMPER WILL CLOSE. ELECTRIC UNIT HEATERS (WITH BUILT-IN THERMOSTATS) WILL CYCLE (ON/OFF) TO MAINTAIN FIFTY (50F).

OCCUPIED COOLING MODE - SUPPLY FAN WILL BE RUNNING AND OUTSIDE AIR DAMPER WILL BE OPEN. ROOM SENSOR **TR-1** THROUGH THE METAYS SYSTEM WIL MODULATE CHILLED WATER VALVE **V-C-MAU** TO MAINTAIN ROOM TEMPERATURE SETTING OF EIGHTY (80F).

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF. OUTSIDE AIR DAMPER AND CHILLED WATER VALVE WILL BE CLOSED.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:49 PM
FILE NAME MAU-2C.vsd

DRAWING TITLE
MAKE-UP AIR UNIT 2C
CLC-3-PANTRY
CLUB LEVEL QUAD C

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS
BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

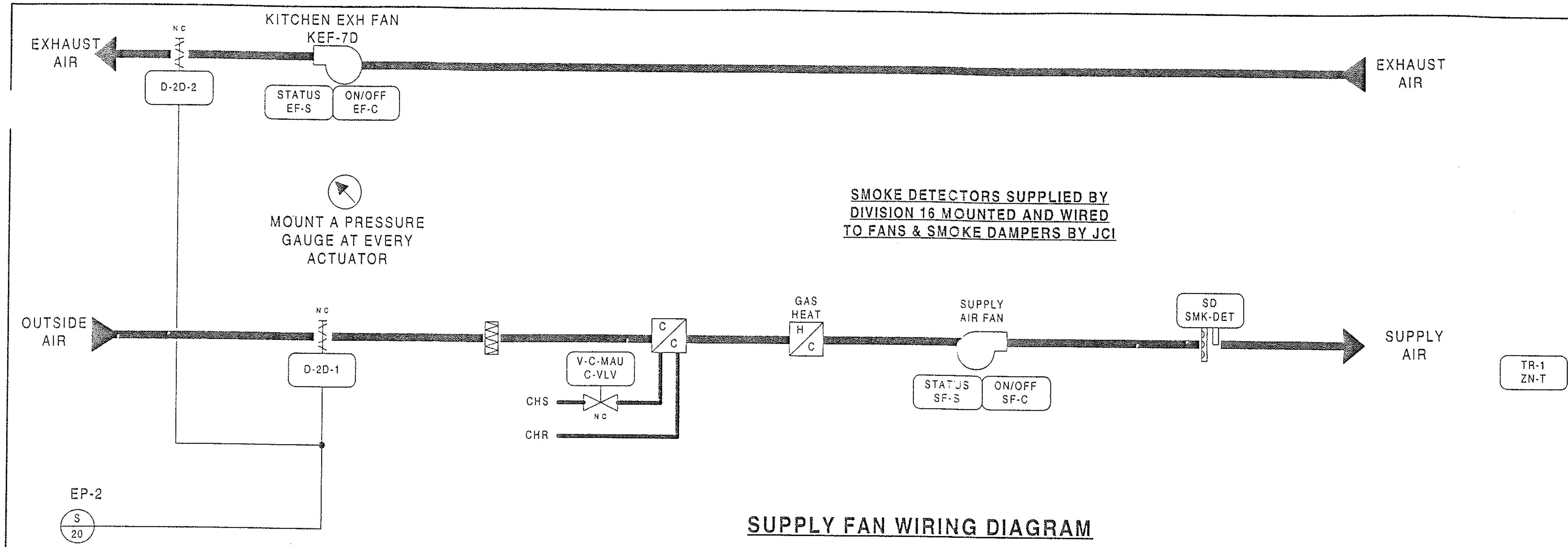
Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/15/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

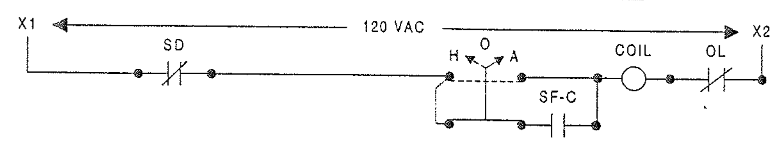
CONTRACT NUMBER 7052-0098
DRAWING NUMBER BL-6559-50

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		MAU-2C				UNT						EN-MAU2C	AT UNIT														Power to Controller
		MAU-2C	*			UNT	1	7				EN-MAU2C	AT UNIT	0													N2 Trunk
	AI-1	MAU-2C				UNT	1	7	AI-1			EN-MAU2C	AT UNIT	0		MAU2C-7-AI-1											
	AI-2	MAU-2C				UNT	1	7	AI-2			EN-MAU2C	AT UNIT	0		MAU2C-7-AI-2											
	AI-3	MAU-2C				UNT	1	7	AI-3			EN-MAU2C	AT UNIT	0		MAU2C-7-AI-3											
	AI-4	MAU-2C	ZN-T	Zone Temperature	Deg F	UNT	1	7	AI-4		PHONE JACK	EN-MAU2C	AT UNIT	0		MAU2C-7-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	MAU-2C				UNT	1	7	AI-5			EN-MAU2C	AT UNIT	0		MAU2C-7-AI-5											
	AI-6	MAU-2C				UNT	1	7	AI-6			EN-MAU2C	AT UNIT	0		MAU2C-7-AI-6											
	BI-1	MAU-2C	SF-S	Supply Fan Status	Off On	UNT	1	7	BI-1		BI#,24VAC	EN-MAU2C	AT UNIT	0		MAU2C-7-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	MAU-2C	EF-S	Exh Fan Status	Off On	UNT	1	7	BI-2		BI#,24VAC	EN-MAU2C	AT UNIT	0		MAU2C-7-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	MAU-2C	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	7	BI-3		BI#,24VAC	EN-MAU2C	AT UNIT	0		MAU2C-7-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	MAU-2C				UNT	1	7	BI-4			EN-MAU2C	AT UNIT	0		MAU2C-7-BI-4											
	BO-1	MAU-2C				UNT	1	7	BO-1			EN-MAU2C	AT UNIT	0		MAU2C-7-BO-1											
	BO-2	MAU-2C				UNT	1	7	BO-2			EN-MAU2C	AT UNIT	0		MAU2C-7-BO-2											
	BO-3	MAU-2C	SF-C	Supply Fan Control	Off On	UNT	1	7	BO-3	RLY	BO#,24V,COM	EN-MAU2C	AT UNIT	0		MAU2C-7-BO-3	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-4	MAU-2C	EF-C	Exh Fan Control	Off On	UNT	1	7	BO-4		BO#,24VAC	EN-MAU2C	AT UNIT	0		MAU2C-7-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	MAU-2C				UNT	1	7	BO-5			EN-MAU2C	AT UNIT	0		MAU2C-7-BO-5											
	BO-6	MAU-2C				UNT	1	7	BO-6			EN-MAU2C	AT UNIT	0		MAU2C-7-BO-6											
	AO-1	MAU-2C	C-VLV	Cooling Coil Valve	% Open	UNT	1	7	AO-1		AO#,ACCM,24VAC	EN-MAU2C	AT UNIT	0		MAU2C-7-AO-1	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	MAU-2C				UNT	1	7	AO-2			EN-MAU2C	AT UNIT	0		MAU2C-7-AO-2											

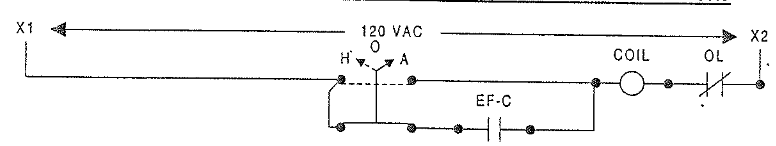


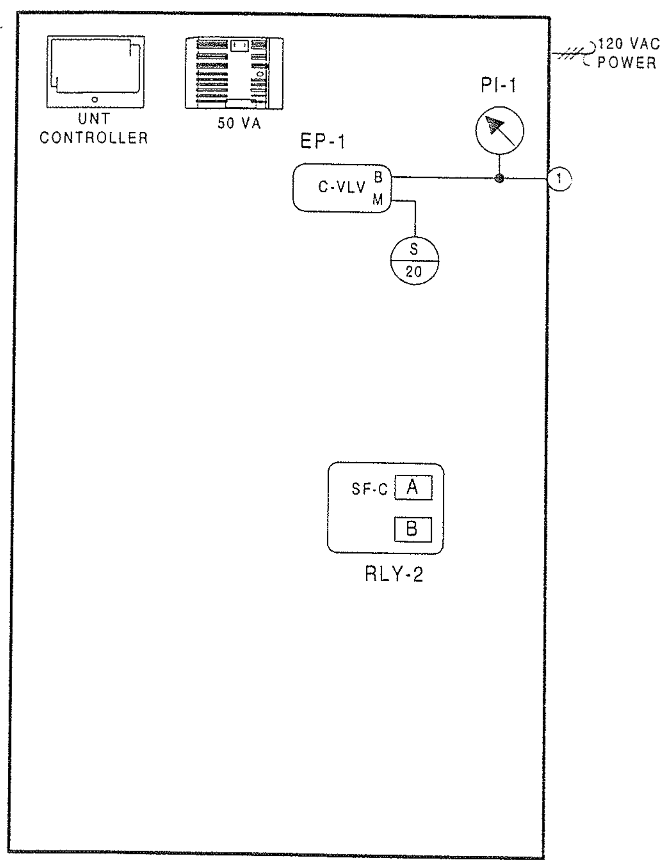
	BILL OF MATERIALS		
Estimate: mau-2d			70520098.pre
Desig.	Qty	Part #	Description
Field Devices:			
D-2D-1, D-2D-2	2	---	SEE DAMPER SCHEDULE
	2	D-4073-2	DMPR ACT,8-13#
	2	G-2010-11	GAGE,2",0-30 PSIG,STEM
EF-7D	1	BZ-1000-11	ENCL,4-5/8X 5-1/8 X 3-3/8
	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RELAY PLUG-IN 3PDT 24VAC
EP-2	1	V11HAA-100	3-W SOLENOID,W/OV,120VAC
T-1	1	TE-6315P-1	SENS,T-Ni,0.1%,8' AVG
V-C-MAU	1	--	SEE VALVE SCHEDULE
ZN-T	1	TE-6410W-1000	MSTAT,NI,BOX,JACK
Panel Devices:			
EN-MAU-2D	1	AS-UNT111-101	UNT111 MTD IN UPM, W/50VA
	1	EN-EXP101-0	UNIV PKG MOD,CVR & BACKBN
EP-1	1	EP-8000-2	XDUCR,EP,0/10V,HI VOL
PI-1	1	G-2010-11	GAGE,2",0-30 PSIG,STEM
RLY-1,2	2	AS-RLY002-0	RELAY; 2SPDT 5 AMP 240VAC

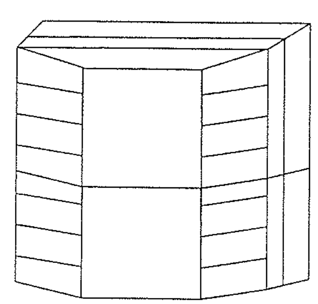
SUPPLY FAN WIRING DIAGRAM



TYPICAL EXHAUST FAN WIRING DIAGRAM







ENCLOSURE EN-MAU-2D
AS-UNT111-101
LOCATED ADJACENT
TO UNIT
NCM-4/N2 ADD = 5

DESCRIPTION OF OPERATION

THE METASYS SYSTEM WILL HAVE THE ABILITY TO CONTROL INDIVIDUAL CONCESSION COMPONENTS (ON/OFF) AS REQUIRED BY THE MODE OF OPERATION. IN THE OCCUPIED MODE, INDIVIDUAL CONCESSION MAKEUP AIR UNIT MAU-2D AND EXHAUST FAN KEF-7D WILL START AND RUN CONTINUOUSLY. WHEN THE UNIT AND EXHAUST FANS ARE ENERGIZED, OUTSIDE AIR DAMPER D-2D-1,AND EXHAUST AIR DAMPER D-2D-2 WILL OPEN. ROOM SENSOR TR-1 WILL CYCLE DIRECT GAS FIRED HEATER TO MAINTAIN ITS SETPOINT. DISCHARGE SENSOR T-1 WILL MONITOR SUPPLY TEMPERATURE AND PROVE GAS FIRING OF UNIT.

OCCUPIED HEATING MODE - SUPPLY FAN WILL BE RUNNING. OUTSIDE AIR DAMPER D-2D-1 AND EXHAUST AIR DAMPER D-2D-2 WILL OPEN AND EXHAUST FANS WILL START AND RUN CONTINUOUSLY. THE DIRECT GAS FIRED HEATER WILL BE ACTIVATED BY ZONE SENSOR TR-1 TO MAINTAIN ITS SETTING OF FIFTY (50F). THE DIRECT GAS FIRED HEATER WILL BE MONITORED BY T-1. THE SYSTEM WILL ALARM WHEN ROOM SENSOR TR-1 DROPS BELOW FIFTY (50F). DIRECT GAS FIRED HEATER CONTROL PANEL WILL BE INTERLOCKED WITH GAS EMERGENCY SHUT OFF SYSTEM ASSOCIATED WITH GAS COOKING EQUIPMENT. AUTOMATIC SHUT-DOWN WILL BE PROVIDED AS REQUIRED BY NFPA.

UNOCCUPIED HEATING MODE - MAKE-UP AIR UNIT AND EXHAUST FANS WILL BE DE-ENERGIZED AND OUTSIDE AIR DAMPER WILL CLOSE. ELECTRIC UNIT HEATERS (WITH BUILT-IN THERMOSTATS) WILL CYCLE (ON/OFF) TO MAINTAIN FIFTY (50F).

OCCUPIED COOLING MODE - SUPPLY FAN WILL BE RUNNING AND OUTSIDE AIR DAMPER WILL BE OPEN. ROOM SENSOR TR-1 THROUGH THE METAYS SYSTEM WIL MODULATE CHILLED WATER VALVE V-C-MAU TO MAINTAIN ROOM TEMPERATURE SETTING OF EIGHTY (80F).

UNOCCUPIED COOLING MODE - SYSTEM IS DE-ENERGIZED AND FANS ARE OFF. OUTSIDE AIR DAMPER AND CHILLED WATER VALVE WILL BE CLOSED.

SMOKE CONTROL - SMOKE DETECTORS WILL, ON THE DETECTION OF PRODUCTS OF COMBUSTION, SHUT DOWN THE SUPPLY AND EXHAUST FANS AND CLOSE ALL SYSTEM DAMPERS.

REVISION INFORMATION
NUMBER
DATE 07/18/00
TIME 03:50 PM
FILE NAME MAU-2D.vsd

DRAWING TITLE
MAKE-UP AIR UNIT 2D
CLC-4-PANTRY

CLUB LEVEL QUAD D

PROJECT TITLE
BALTIMORE NFL STADIUM
AT CAMDEN YARDS

BALTIMORE, MARYLAND

REFERENCE DRAWING	NO.	REVISION-LOCATION	ECN	DATE	BY
AS-BUILT				7/18/00	CME

Sales Engineer	Project Manager	Application Engineer	DRAWN	APPROVED
JDP	WJT	RTS	BY RTS DATE 09/16/97	BY DATE

JOHNSON CONTROLS
Systems & Services Division

Branch Information
JOHNSON CONTROLS
60 LOVETON CIRCLE
SPARKS, MD 21152

CONTRACT NUMBER
7052-0098

DRAWING NUMBER
BL-6559-51

Full Spreadsheet		Software				Digital Controller Information						Panel Information					Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Trunk	N2 Addr	Cable Destination Bay/Terminal	Module Type	Termination	Panel	Panel Location	Slot Number	Reference Drawing	Cable Number	Wiring/Tubing	Termination In	Device	Termination Out	Location	Wiring/Tubing	Terminations	Device	Location	Ref Detail	Comment
		MAU-2D				UNT						EN-MAU2B	AT UNIT														Power to Controller
		MAU-2D	*			UNT	1	5				EN-MAU2B	AT UNIT	0													N2 Trunk
	AI-1	MAU-2D				UNT	1	5	AI-1			EN-MAU2B	AT UNIT	0		MAU2B-5-AI-1											
	AI-2	MAU-2D				UNT	1	5	AI-2			EN-MAU2B	AT UNIT	0		MAU2B-5-AI-2											
	AI-3	MAU-2D				UNT	1	5	AI-3			EN-MAU2B	AT UNIT	0		MAU2B-5-AI-3											
	AI-4	MAU-2D	ZN-T	Zone Temperature	Deg F	UNT	1	5	AI-4		PHONE JACK	EN-MAU2B	AT UNIT	0		MAU2B-5-AI-4						8/26	PHONE JACK	TE-6410W-1000		U2	
	AI-5	MAU-2D				UNT	1	5	AI-5			EN-MAU2B	AT UNIT	0		MAU2B-5-AI-5											
	AI-6	MAU-2D				UNT	1	5	AI-6			EN-MAU2B	AT UNIT	0		MAU2B-5-AI-6											
	BI-1	MAU-2D	SF-S	Supply Fan Status	Off On	UNT	1	5	BI-1		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-5-BI-1						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-2	MAU-2D	EF-S	Exh Fan Status	Off On	UNT	1	5	BI-2		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-5-BI-2						2/22	Device dependent	Aux Contact (NO)		U70	
	BI-3	MAU-2D	SMK-DET	Smoke Detectors	Normal Alarm	UNT	1	5	BI-3		BI#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-5-BI-3						2/22	Device dependent	Contact (NO)		U70	
	BI-4	MAU-2D				UNT	1	5	BI-4			EN-MAU2B	AT UNIT	0		MAU2B-5-BI-4											
	BO-1	MAU-2D				UNT	1	5	BO-1			EN-MAU2B	AT UNIT	0		MAU2B-5-BO-1											
	BO-2	MAU-2D				UNT	1	5	BO-2			EN-MAU2B	AT UNIT	0		MAU2B-5-BO-2											
	BO-3	MAU-2D	SF-C	Supply Fan Control	Off On	UNT	1	5	BO-3	RLY	BO#,24V,COM	EN-MAU2B	AT UNIT	0		MAU2B-5-BO-	3/18	A,COILS,COM	RELAY-A	NO,COM		2/14	See starter detail	Starter (NO)-(sw lo)		U60	
	BO-4	MAU-2D	EF-C	Exh Fan Control	Off On	UNT	1	5	BO-4		BO#,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-5-BO-4			PD-109-51			2/18	Device dependent	24VAC OUT (sw lo)		U51	
	BO-5	MAU-2D				UNT	1	5	BO-5			EN-MAU2B	AT UNIT	0		MAU2B-5-BO-5											
	BO-6	MAU-2D				UNT	1	5	BO-6			EN-MAU2B	AT UNIT	0		MAU2B-5-BO-6											
	AO-1	MAU-2D	C-VLV	Cooling Coil Valve	% Open	UNT	1	5	AO-1		AO#,AOCM,24VAC	EN-MAU2B	AT UNIT	0		MAU2B-5-AO-	2/18	+,-	EP-8000-2	SUPPLY, O		3/18	Device dependent	0-10V OUT		U23	
	AO-2	MAU-2D				UNT	1	5	AO-2			EN-MAU2B	AT UNIT	0		MAU2B-5-AO-2											

BALTIMORE NFL STADIUM
7052-0098

Damper Schedule

Tag				Damper Information														Actuator Information							
												Duct Size		Damper Size											
Item	System	Service	Ref. Dwg.	Qty.	Code No.	Fail Pos.	Dmpr. Type	Dmpr. Oper.	Blade Type	Bear. Type	Seals	W (in.)	H (in.)	W (in.)	H (in.)	Area (ft²)	Mtg.	Qty.	Code No.	Pilot	Type	Control Signal	Mtg.	Coupld. Detail	Comments
D-1-1A	AHU-1	Min Out Air	M.3-09	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	17"	148"	17"	17.5		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X170									37"	17"	4.4									
				1	COPAS-370X170									37"	17"	4.4									
				1	COPAS-370X170									37"	17"	4.4									
				1	COPAS-370X170									37"	17"	4.4									
D-1-1B	AHU-1	Max Out Air	M.3-09	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	28"	148"	28"	28.8		1	D-3153-1	D-9502	Pneu	8-13#			
				1	COPAS-370X280									37"	28"	7.2		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X280									37"	28"	7.2									
				1	COPAS-370X280									37"	28"	7.2									
				1	COPAS-370X280									37"	28"	7.2									
D-1-2	AHU-1	Return Air	M.3-09	1	COPAS-600X320		Control	Opposed	Double	Acetal	Standard	60"	32"	60"	32"	13.3		1	D-3153-1	D-9502	Pneu	8-13#			
D-1-3	AHU-1	Relief Air	M.3-09	1	COPAS-360X300		Control	Opposed	Double	Acetal	Standard	36"	30"	36"	30"	7.5		1	D-3153-1	D-9502	Pneu	8-13#			
D-2-1A	AHU-2	Min Out Air	M.3-10	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	30"	148"	30"	30.8		1	D-3153-1	D-9502	Pneu	8-13#			
				1	COPAS-370X300									37"	30"	7.7		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X300									37"	30"	7.7									
				1	COPAS-370X300									37"	30"	7.7									
				1	COPAS-370X300									37"	30"	7.7									
D-2-1B	AHU-2	Max Out Air	M.3-10	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	42"	148"	42"	43.2		1	D-3153-1	D-9502	Pneu	8-13#			
				1	COPAS-370X420									37"	42"	10.8		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X420									37"	42"	10.8									
				1	COPAS-370X420									37"	42"	10.8									
				1	COPAS-370X420									37"	42"	10.8									
D-2-2	AHU-2	Return Air	M.3-10	1	COPAS-740X300		Control	Opposed	Double	Acetal	Standard	74"	30"	74"	30"	15.4		1	D-3153-1	D-9502	Pneu	8-13#			
D-2-3	AHU-2	Relief Air	M.3-10	1	COPAS-600X360		Control	Opposed	Double	Acetal	Standard	60"	36"	60"	36"	15.0		1	D-3153-1	D-9502	Pneu	8-13#			
D-3-1A	AHU-3	Min Out Air	M.3-11	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	27"	148"	27"	27.8		1	D-3153-2	D-9502	n/a	8-13#			
				1	COPAS-370X270									37"	27"	6.9									
				1	COPAS-370X270									37"	27"	6.9									
				1	COPAS-370X270									37"	27"	6.9									
				1	COPAS-370X270									37"	27"	6.9									
D-3-1B	AHU-3	Max Out Air	M.3-11	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	45"	148"	45"	46.3		1	D-3153-1	D-9502	Pneu	8-13#			
				1	COPAS-370X450									37"	45"	11.6		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X450									37"	45"	11.6									
				1	COPAS-370X450									37"	45"	11.6									
				1	COPAS-370X450									37"	45"	11.6									
D-3-2	AHU-3	Return Air	M.3-11	1	COPAS-800X300		Control	Opposed	Double	Acetal	Standard	80"	30"	80"	30"	16.7		1	D-3153-1	D-9502	Pneu	8-13#			
D-3-3	AHU-3	Relief Air	M.3-11	1	COPAS-540X420		Control	Opposed	Double	Acetal	Standard	54"	42"	54"	42"	15.8		1	D-3153-1	D-9502	Pneu	8-13#			
D-4-1A	AHU-4	Min Out Air	M.3-12	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	17"	148"	17"	17.5		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X170									37"	17"	4.4									
				1	COPAS-370X170									37"	17"	4.4									
				1	COPAS-370X170									37"	17"	4.4									
				1	COPAS-370X170									37"	17"	4.4									
D-4-1B	AHU-4	Max Out Air	M.3-12	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	148"	28"	148"	28"	28.8		1	D-3153-1	D-9502	Pneu	8-13#			
				1	COPAS-370X280									37"	28"	7.2		1	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-370X280									37"	28"	7.2									
				1	COPAS-370X280									37"	28"	7.2									
				1	COPAS-370X280									37"	28"	7.2									
D-4-2	AHU-4	Return Air	M.3-12	1	COPAS-600X280		Control	Opposed	Double	Acetal	Standard	60"	28"	60"	28"	11.7		1	D-3153-1	D-9502	Pneu	8-13#			
D-4-3	AHU-4	Relief Air	M.3-12	1	COPAS-600X280		Control	Opposed	Double	Acetal	Standard	60"	28"	60"	28"	11.7		1	D-3153-1	D-9502	Pneu	8-13#			

Damper Schedule

Tag				Damper Information														Actuator Information							
												Duct Size		Damper Size											
Item	System	Service	Ref. Dwg.	Qty.	Code No.	Fail Pos.	Dmpr. Type	Dmpr. Oper.	Blade Type	Bear. Type	Seals	W (in.)	H (in.)	W (in.)	H (in.)	Area (ft²)	Mtg.	Qty.	Code No.	Pilot	Type	Control Signal	Mtg.	Coupld. Detail	Comments
D-9-3	AHU-9	Relief Air	M.3-13	1	COPAS-380X180		Control	Opposed	Double	Acetal	Standard	38"	18"	38"	18"	4.8		1	D-3153-2	n/a	Pneu	8-13#			
D-9-4	AHU-9	Bypass Air	M.3-13	1	COPAS-300X160		Control	Opposed	Double	Acetal	Standard	30"	16"	30"	16"	3.3		1	D-3153-1	D-9502	Pneu	8-13#			
	"A" Press MER	VF-25 Intake	M.3-09	1	COPAS-320X320		Control	Opposed	Double	Acetal	Standard	32"	32"	32"	32"	7.1		1	D-4073-2	n/a	Pneu	8-13#			
	"B" Press MER	VF-25 Intake	M.3-10	1	COPAS-320X320		Control	Opposed	Double	Acetal	Standard	32"	32"	32"	32"	7.1		1	D-4073-2	n/a	Pneu	8-13#			
	"C" Press MER	VF-25 Intake	M.3-11	1	COPAS-320X320		Control	Opposed	Double	Acetal	Standard	32"	32"	32"	32"	7.1		1	D-4073-2	n/a	Pneu	8-13#			
	"D" Press MER	VF-25 Intake	M.3-12	1	COPAS-240X240		Control	Opposed	Double	Acetal	Standard	24"	24"	24"	24"	4.0		1	D-4073-2	n/a	Pneu	8-13#			
	"B" Plant MER	VF-24 Intake	M.3-17	2	COPAS-360X360		Control	Opposed	Double	Acetal	Standard	36"	36"	36"	36"	9.0		1	D-4073-2	n/a	Pneu	8-13#			
	"B" Plant MER	VF-11,12,13	M.3-17	1	COPAS-960X360		Control	Opposed	Double	Acetal	Standard	96"	36"	96"	36"	24.0		1	D-3153-2	n/a	Pneu	8-13#			
	"B" Plant MER	VF-11 Exh	M.3-17	1	COPAS-720X720		Control	Opposed	Double	Acetal	Standard	72"	72"	72"	72"	36.0		2	D-3153-1	D-9502	Pneu	8-13#			
	"B" Plant MER	VF-12 Exh	M.3-17	1	COPAS-720X720		Control	Opposed	Double	Acetal	Standard	72"	72"	72"	72"	36.0		2	D-3153-1	D-9502	Pneu	8-13#			
	"B" Plant MER	VF-13 Exh	M.3-17	1	COPAS-720X720		Control	Opposed	Double	Acetal	Standard	72"	72"	72"	72"	36.0		2	D-3153-1	D-9502	Pneu	8-13#			
	Elev Core MER	Out Intake	M.3-26	4	COPAS-360X360		Control	Opposed	Double	Acetal	Standard	36"	36"	36"	36"	9.0		1	D-4073-2	n/a	Pneu	8-13#			
	Elev Core MER	VF-30 Exh	M.3-26	4	COPAS-300X300		Control	Opposed	Double	Acetal	Standard	30"	30"	30"	30"	6.3		1	D-4073-2	n/a	Pneu	8-13#			
D-24-1	AHU-24	Outside Air	M.2-02C	1	COPAS-160X140		Control	Opposed	Double	Acetal	Standard	16"	14"	16"	14"	1.6		1	D-4073-2	n/a	Pneu	8-13#			
D-25-1	AHU-25	Outside Air	M.2-02D	1	COPAS-160X140		Control	Opposed	Double	Acetal	Standard	16"	14"	16"	14"	1.6		1	D-4073-2	n/a	Pneu	8-13#			
D-26-1	AHU-26	Outside Air	M.3-10	1	COPAS-160X140		Control	Opposed	Double	Acetal	Standard	16"	14"	16"	14"	1.6		1	D-4073-2	n/a	Pneu	8-13#			
D-5-1	"A" Smoke Intake	Outside Air	M.2-04A	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	192"	64"	192"	64"	85.3		1	D-3153-1	D-9502	Pneu	8-13#			
			M.4-03	1	COPAS-480X640									48"	64"	21.3		3	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-480X640									48"	64"	21.3									
				1	COPAS-480X640									48"	64"	21.3									
				1	COPAS-480X640									48"	64"	21.3									
D-7-1	"B" Smoke Intake	Outside Air	M.2-04B	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	192"	108"	192"	108"	144.0		2	D-3153-1	D-9502	Pneu	8-13#			
			M.4-03	1	COPAS-480X540									48"	54"	18.0		5	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
D-10-1	"C" Smoke Intake	Outside Air	M.2-04C	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	192"	108"	192"	108"	144.0		6	D-3153-1	D-9502	Pneu	8-13#			
			M.4-03	1	COPAS-480X540									48"	54"	18.0		5	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
				1	COPAS-480X540									48"	54"	18.0									
D-11-1	"D" Smoke Intake	Outside Air	M.2-04D	-	(Coupled Damper)		Control	Opposed	Double	Acetal	Standard	192"	64"	192"	64"	85.3		1	D-3153-1	D-9502	Pneu	8-13#			
			M.4-03	1	COPAS-480X640									48"	64"	21.3		3	D-3153-2	n/a	Pneu	8-13#			
				1	COPAS-480X640									48"	64"	21.3									
				1	COPAS-480X640									48"	64"	21.3									
				1	COPAS-480X640									48"	64"	21.3									
D-2A-1	MAU-2A	Outside Air		1	COPAS-840X600		Control	Opposed	Single	Acetal	Standard	84"	60"	84"	60"	35.0		2	D-3153-2		Pneu	8-13#			
D-2B-1	MAU-2B	Outside Air		1	COPAS-360X360		Control	Opposed	Double	Acetal	Standard	36"	36"	36"	36"	9.0		1	D-4073-2		Pneu	8-13#			
D-2C-1	MAU-2C	Outside Air		1	COPAS-360X360		Control	Opposed	Double	Acetal	Standard	36"	36"	36"	36"	9.0		1	D-4073-2		Pneu	8-13#			
D-2D-1	MAU-2D	Outside Air		1	COPAS-360X360		Control	Opposed	Double	Acetal	Standard	36"	36"	36"	36"	9.0		1	D-4073-2		Pneu	8-13#			
	KEF-7D	Exhaust Air		1	COPAS-360X240		Control	Opposed	Double	Acetal	Standard	36"	24"	36"	24"	6.0		1	D-4073-2		Pneu	8-13#			
D-27-1	AHU-27	Outside Air		1	COPAS-360X720		Control	Opposed	Double	Acetal	Standard	36"	72"	36"	72"	18.0		1	D-3153-2	n/a	Pneu	8-13#			
D-27-2	AHU-27	Return Air		1	COPAS-400X300		Control	Opposed	Double	Acetal	Standard	40"	30"	40"	30"	8.3		1	D-3153-2	n/a	Pneu	8-13#			
D-27-3	GEF-9A	Exhaust Air		1	COPAS-240X240		Control	Opposed	Double	Acetal	Standard	24"	24"	24"	24"	4.0		1	D-4073-2	n/a	Pneu	8-13#			

ADDENDUM No. 4
Engineering Consulting Services
For
HVAC Controls, Lighting Controls and Submetering Systems
M&T Bank Stadium
MSA Project No. 20-071

Date Issued: May 14, 2020

This Addendum is hereby made a part of the Contract Documents dated April 17, 2020, on the subject work as though originally included therein. The following amendments, additions, and/or corrections shall govern this work. **This form should be acknowledged below and submitted with the Proposals.**

This Addendum incorporates the following items:

1. **Questions and Answers.**
2. **Chiller Plant Drawing attached.**

Issued by:

Maryland Stadium Authority
333 W. Camden Street, Suite 500
Baltimore, MD 21201
Sandra Fox, Procurement Officer

____
Company

____
Acknowledgment
(Name and Title)

____
Date

Maryland Stadium Authority
The Warehouse at Camden Yards
333 W. Camden Street, Suite 500
Baltimore, MD 21201
410-333-1560
1-877-MDSTADIUM
Fax: 410-333-1888

www.mdstad.com

Voice: 800-201-7165
TTY: 800-735-2258

Questions and Answers

1. **Could you provide a copy of the Lot C generator drawings?**

   The generator plant consists of two 1825 kW Caterpillar generators. The generators provide emergency power for M&T Bank Stadium as well as the ability for peak shaving at both M&T and Oriole Park. The controls system is outdated and cannot easily be modified. The intent is to design and construct new controls for the generators that allow for both of the above functions. The 1997 Powercon drawings will be provided during design.

2. **Could you provide a copy of the Chiller Plant Drawings or Points list?**

   Chiller Plant Drawing attached. This is not inclusive of modifications made over the years. The consultant shall design to the current needs of the plant.

3. **Is there any chance of an extension on the due date?**

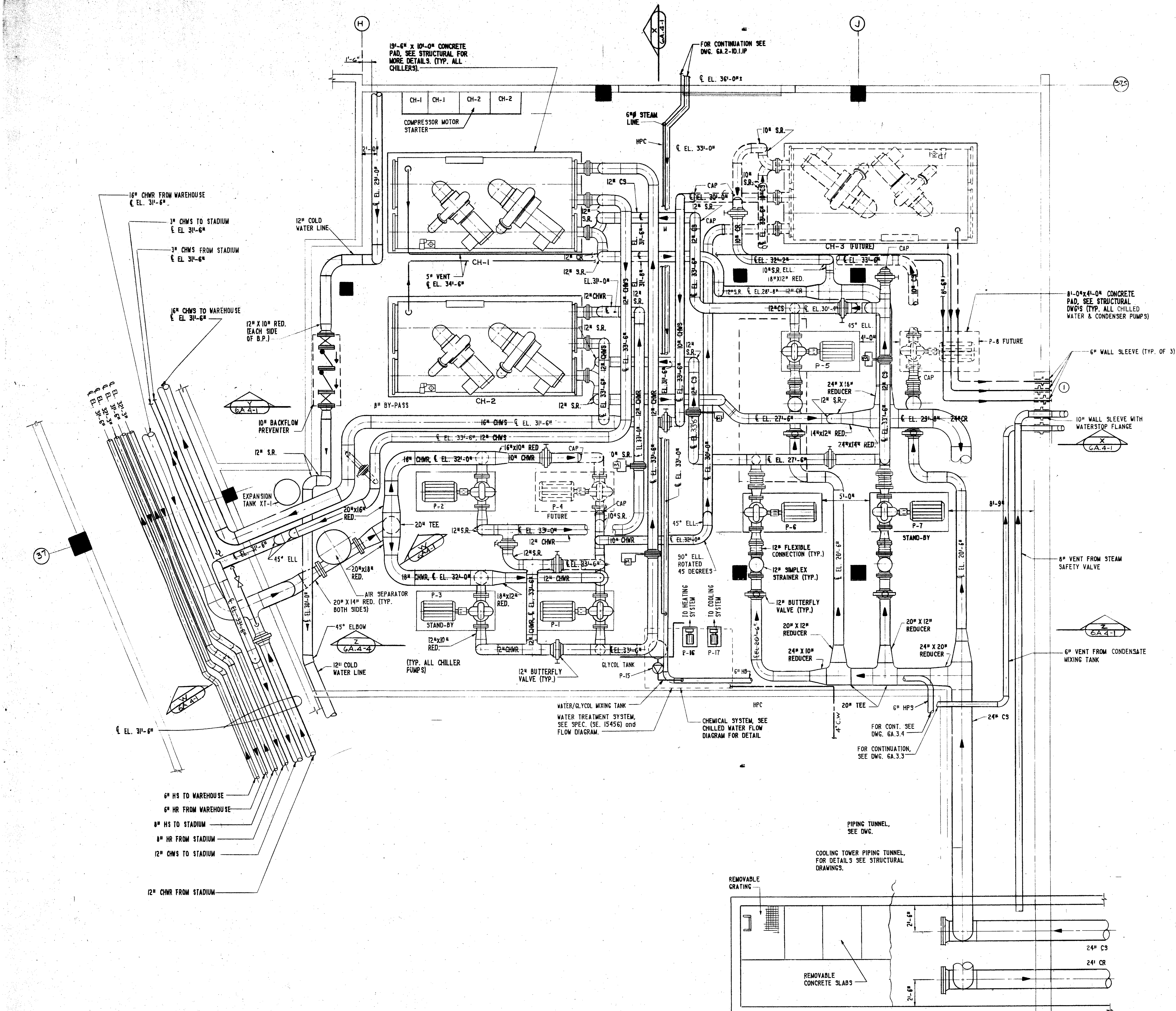
   No. The due date must remain as is to meet approval dates.

4. **Letters of Intended Commitment to work on the project are mentioned in section 5.4.2.E.2. Are you looking for commitment letters for each key personnel included in the proposal, or just commitment letters from each firm included on the team?**

   Commitment letters are only needed from each firm.

5. **We have experienced control system specialists who can provide technical support, but are not licensed Professional Engineers (PEs). Are we able to include and submit this level of non-PE engineering support staff resumes with our response package?**

   Yes.



MECHANICAL ROOM NO. 1 (CHILLER ROOM)

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

DRAWING NOTE:

1. ALL VENT LINES SHALL BE INSTALLED WITH STAINLESS STEEL, 24 MESH SCREEN.

GENERAL NOTE:

1. FOR LEGEND AND NOTES, SEE SHEET 6A.6-1.

HOK SPORT
HELLMUTH, OBATA & KASSABAUM, INC.
ARCHITECTURE
INTERIORS PLANNING
GRAPHICS ENGINEERING
323 WEST 8TH STREET
SUITE 700
KANSAS CITY, MISSOURI 64105
816 221-1576

Construction Manager
Barton Malow/Sverdrup
8903 Presidential Parkway
Suite 202
Upper Marlboro, Maryland 20772

Consultants
Bliss & Nyitray, Inc. Structural Engineers
Kidde Consultants, Inc. Mechanical, Electrical, Plumbing Engineers
Rummel, Klepper & Kahl Site/Civil Engineers
The Joiner-Rose Group Acoustical Engineering
Wallace, Roberts & Todd Landscape Architecture
Catherine Mahan & Associates Landscape Architects
Sheladia Associates, Inc. Survey Engineers
TLB Associates Inc. Geotechnical Engineers

THE NEW BASEBALL PARK
for
THE MARYLAND STADIUM AUTHORITY
and
THE BALTIMORE ORIOLES
BALTIMORE, MARYLAND

REVISIONS NO.	DATE	DESCRIPTION

KEY PLAN

PROJECT NO. 04-88015	ISSUED 6-15-90
DRAWN NG/LC	REVIEWED AL
SHEET TITLE MECHANICAL ROOM NO. 1	
CATEGORY SUBCATEGORY SHEET 6A.3-1	

ADDENDUM No. 5
Engineering Consulting Services
For
HVAC Controls, Lighting Controls and Submetering Systems
M&T Bank Stadium
MSA Project No. 20-071

Date Issued: May 15, 2020

This Addendum is hereby made a part of the Contract Documents dated April 17, 2020, on the subject work as though originally included therein. The following amendments, additions, and/or corrections shall govern this work. **This form should be acknowledged below and submitted with the Proposals.**

This Addendum incorporates the following items:

Question and Answer

1. **Can you confirm that the design of new generator controls is not part of this project?**
   - **Will a separate project be undertaken for the generator controls upgrade design prior to installation of the new controls under this project?**

   Please see revised scope of work on the next page with regard to the generator plant.

Issued by:

Maryland Stadium Authority
333 W. Camden Street, Suite 500
Baltimore, MD 21201
Sandra Fox, Procurement Officer

____
Company

____________________________ __________________________
Acknowledgment (Name and Title) Date

Maryland Stadium Authority
The Warehouse at Camden Yards
333 W. Camden Street, Suite 500
Baltimore, MD 21201
410-333-1560
1-877-MDSTADIUM
Fax: 410-333-1888

www.mdstad.com

Voice: 800-201-7165
TTY: 800-735-2258

2. Revisions:

Revise the RFP scope of work with regard to the generator plant as follows:

The consultant shall complete a condition assessment of the generator plant. The condition assessment at a minimum, shall identify any deficiencies and provide recommendations to MSA how best proceed with a controls upgrade of the generator plant. The controls upgrade shall include recommendation on both the generator and HVAC/lighting controls.

Upon conclusion of the condition assessment and in consultation with the consultant MSA will decide next steps. Future design work required to implement next steps will be negotiated between with the consultant and a change order issued, if required.

3. **Delete**: "Offeror Information Sheet" under Section 5 Proposal Format (5.4.2C Tab B). The Transmittal letter is required.

Maryland Stadium Authority
The Warehouse at Camden Yards
333 W. Camden Street, Suite 500
Baltimore, MD 21201
410-333-1560
1-877-MDSTADIUM
Fax: 410-333-1888

www.mdstad.com

Voice: 800-201-7165
TTY: 800-735-2258

ADDENDUM No. 6
Engineering Consulting Services
For
HVAC Controls, Lighting Controls and Submetering Systems
M&T Bank Stadium
MSA Project No. 20-071

Date Issued: May 20, 2020

This Addendum is hereby made a part of the Contract Documents dated April 17, 2020, on the subject work as though originally included therein. The following amendments, additions, and/or corrections shall govern this work. **This form should be acknowledged below and submitted with the Proposals.**

This Addendum incorporates the following items:

Question and Answer

1. **We have captured the controls points from the Johnson controls drawings however the RFP indicates heaters that do not appear to be included in the current controls system? Are there existing MEP schedules that list all of this units or should we assume a specific number of units to be integrated?**

   Refer to Addendum 1 for this answer.

2. **Is it possible to obtain the Warehouse ECO Strucxure BAS shop drawings and submittals:**

   Not at this time.

3. **Will the MSA consider an alternative proposal for design, bid and construction services that provides an equal or better end product and reduces the total cost to MSA?**

   No, the intent of this project is to combine control systems across the complex therefore we must use the Schenider platform.

Issued by:

Maryland Stadium Authority
333 W. Camden Street, Suite 500
Baltimore, MD 21201
Sandra Fox, Procurement Officer

____
Company

____________________________ ____________________________
Acknowledgment Date
(Name and Title)