WAYNE STATE UNIVERSITY

ELLIMAN BUILDING
AHU REVISION

421 EAST CANFIELD

DETROIT, MICHIGAN 48201

WSU PROJECT# 629-299881

DiCLEMENTE SIEGEL DESIGN INC.

28105 GREENFIELD ROAD
SOUTHFIELD, MICHIGAN 48076-3046

DSD PROJECT No. 17-4801

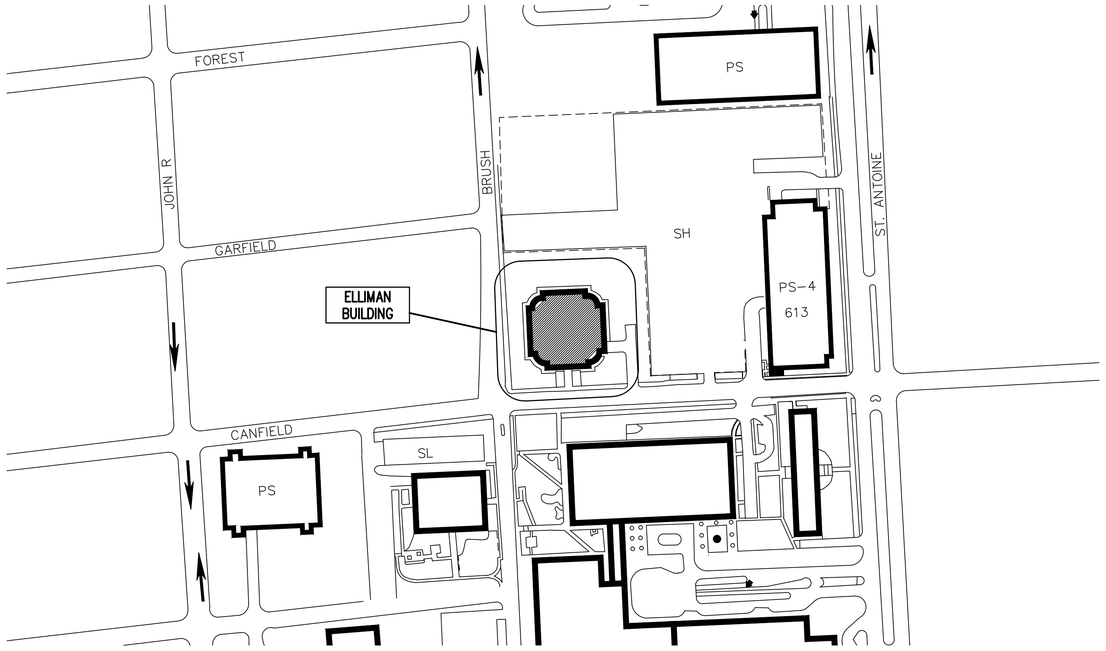
ENGINEERING AND ARCHITECTURE

GENERAL SHEET INDEX

ARCHITECTURAL SHEET INDEX

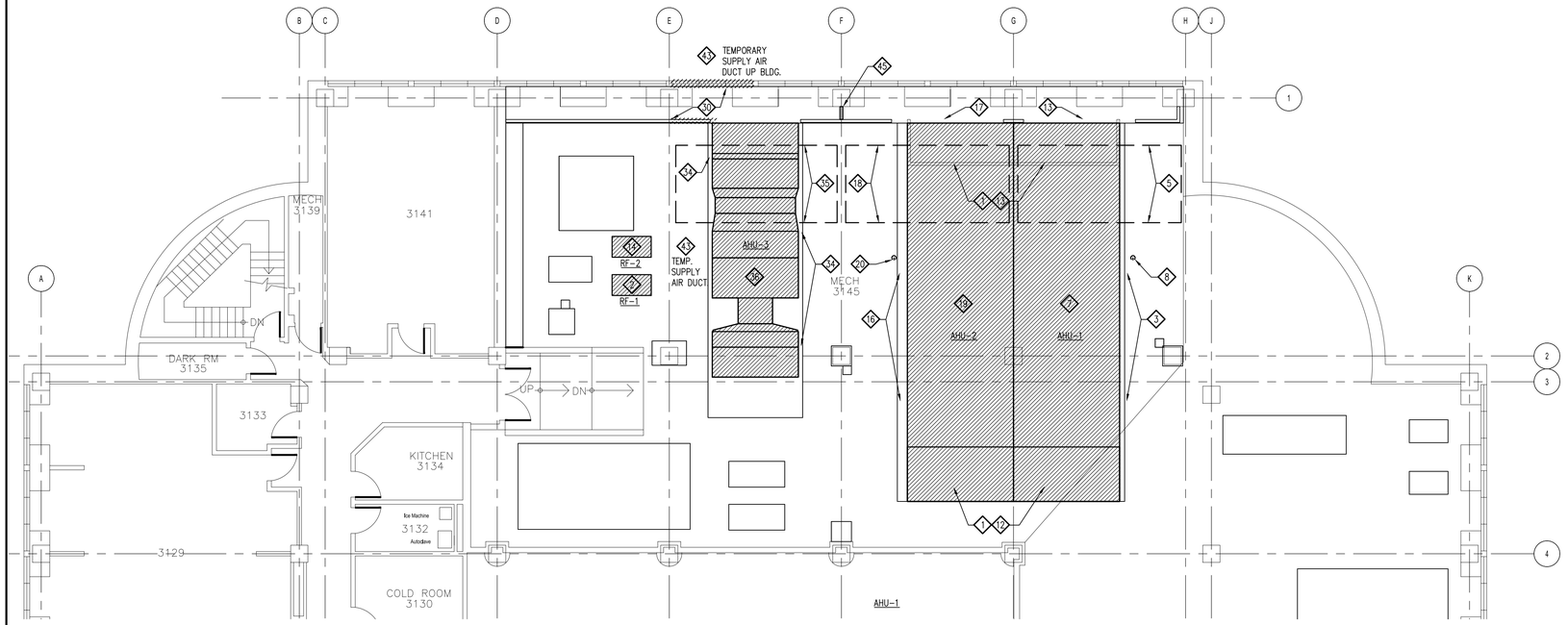
MECHANICAL SHEET INDEX

ELECTRICAL SHEET INDEX



LOCATION MAP
NOT TO SCALE

SHEET: T-1
ACADFILE: 17-4801-T-1
ISSUED FOR: BIDS
DATE: 09/26/18



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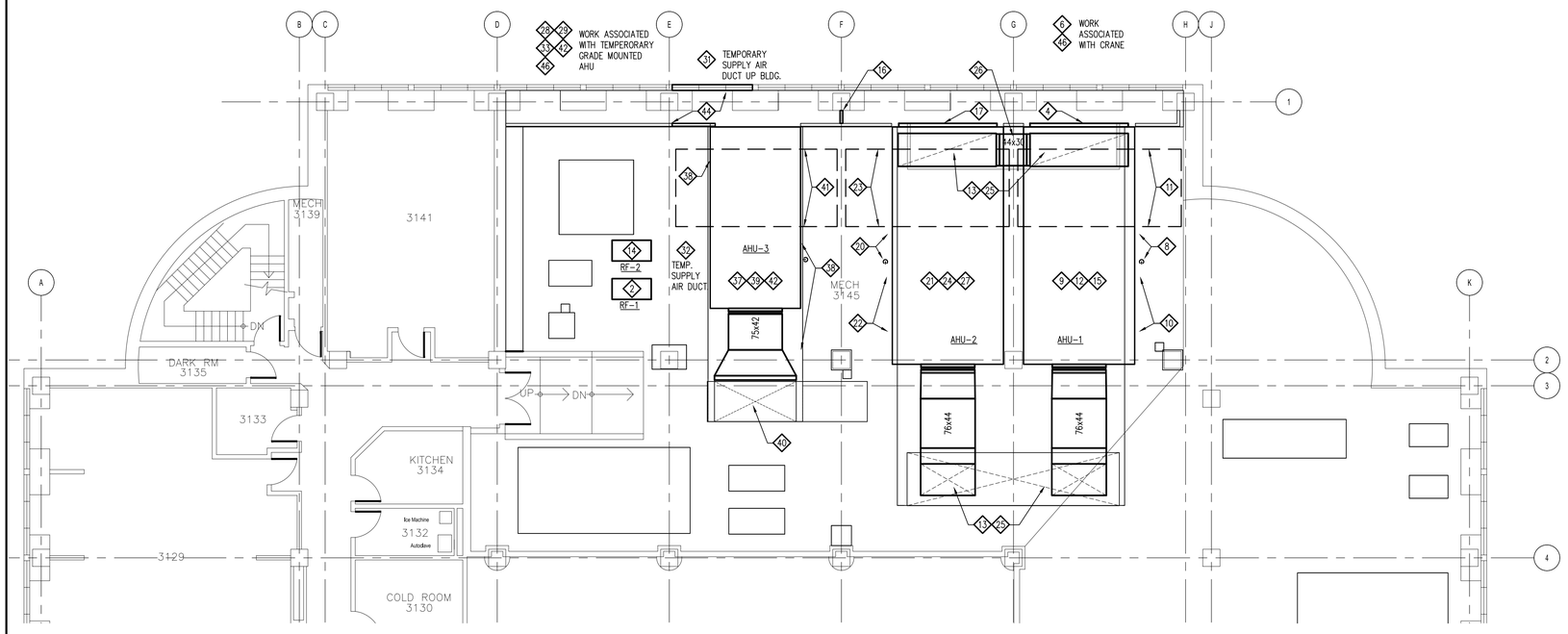
PARTIAL THIRD FLOOR PLAN – PROPOSED PHASING DEMOLITION

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

0 4 8 16 32



N

PARTIAL THIRD FLOOR PLAN – PROPOSED PHASING NEW WORK

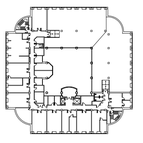
SCALE: 1/8" = 1'-0"

0 4 8 16 32

PHASING NOTES FOR AHU REPLACEMENTS:

1. MODIFY SUPPLY AIR AND RETURN AIR CONNECTIONS TO AHU-1 AND AHU-2 TO SERVE AHU-2 ONLY. MODIFY RETURN AIR PLENUM TO SERVE ONLY AHU-2 AND TAKE AHU-1 OFF LINE.
2. DISCONNECT, REMOVE AND REPLACE RF-1.
3. DISCONNECT AHU-1 (AIR, CHILLED WATER, STEAM, CONDENSATE, DRAIN, ELEC.,CONTROLS, ETC..)
4. TEMPORARILY SEAL AHU-1 CONNECTION TO OUTSIDE AIR PLENUM.
5. REMOVE ROOFING, ROOF DECK AND ONE (1) 14x4 STRUCTURAL JOIST BETWEEN COLUMNS G AND H TO FACILITATE REMOVAL AND REPLACEMENT OF AHU-1.
6. PROVIDE CRANE ON SITE TO FACILITATE UNIT REPLACEMENTS.
7. REMOVE AHU-1.
8. INCREASE SIZE OF HOUSEKEEPING PAD AND RELOCATE CONDENSATE THROUGH FLOOR CONNECTION FOR AHU-1.
9. INSTALL NEW AHU-1
10. RECONNECT CHILLED WATER PIPING, STEAM, CONDENSATE, DRAIN, ELECTRICAL POWER AND DDC CONTROLS FOR AHU-1.
11. REINSTALL 14x4 STRUCTURAL JOIST AND ROOF DECK BETWEEN COLUMN G AND H TEMPORARILY WATERPROOF ROOF DECK IN THIS AREA.
12. CONFIRM AHU-1 IS OPERATIONAL.
13. MODIFY SUPPLY AIR AND RETURN AIR CONNECTIONS TO AHU-2 TO SERVE AHU-1 ONLY. REMOVE REMAINING RETURN AIR PLENUM AT AHU-2 AND RECONNECT AHU-1 TO OUTSIDE AIR PLENUM.
14. DISCONNECT REMOVE AND REPLACE RF-2.
15. BRING AHU-1 ON LINE TO SERVE BUILDING.
16. DISCONNECT AHU-2 (AIR, CHILLED WATER, STEAM, CONDENSATE, DRAIN, ELEC.,CONTROLS, ETC..).
17. TEMPORARILY SEAL AHU-2 CONNECTION TO OUTSIDE AIR PLENUM.
18. REMOVE ROOFING, ROOF DECK AND ONE (1) 14x4 STRUCTURAL JOIST BETWEEN COLUMNS F AND G TO FACILITATE REMOVAL AND REPLACEMENT OF AHU-2.
19. REMOVE AHU-2.
20. INCREASE SIZE OF HOUSEKEEPING PAD AND RELOCATE CONDENSATE THROUGH FLOOR CONNECTION FOR AHU-2.
21. INSTALL NEW AHU-2
22. RECONNECT CHILLED WATER PIPING, STEAM, CONDENSATE, DRAIN, ELECTRICAL POWER AND DDC CONTROLS FOR AHU-2.
23. REINSTALL 14x4 STRUCTURAL JOIST AND ROOF DECK BETWEEN COLUMN F AND G. TEMPORARILY WATERPROOF ROOF DECK IN THIS AREA.
24. CONFIRM AHU-2 IS OPERATIONAL.
25. MODIFY SUPPLY AIR AND RETURN AIR CONNECTIONS TO AHU-1 TO SERVE BOTH AHU-1 AND AHU-2 AS BEFORE. RECONNECT AHU-1 TO OUTSIDE AIR PLENUM.
26. PROVIDE BYPASS CONNECTION WITH VOLUME DAMPER BETWEEN AHU-1 AND AHU-2 RETURN AIR DUCTS.
27. BRING AHU-2 ONLINE TO SERVE BUILDING ALONG WITH AHU-1.
28. PROVIDE TEMPORARY 100% OUTDOOR AIR HANDLING AT GRADE SIZED FOR 50% OF AHU-3 CAPACITY.
29. EXTEND TEMPORARY POWER FROM ELLIMAN BUILDING TO TEMPORARY AHU AT GRADE.
30. REMOVE AIR INTAKE LOUVER IN EXTERIOR WALL AND AIR PLENUM BETWEEN COLUMNS E AND F AS REQUIRED TO ACCOMMODATE TEMPORARY SUPPLY AIR DUCT.
31. PROVIDE TEMPORARY SUPPLY AIR DUCT AND ASSOCIATED SUPPORTS FROM TEMPORARY AHU AT GRADE UP SIDE OF BUILDING AND INTO OPENING BETWEEN COLUMNS E AND F.
32. EXTEND AND CONNECT TEMPORARY SUPPLY AIR DUCT TO AHU-3 SUPPLY AIR DISTRIBUTION SYSTEM AVOIDING ROOF OPENING REQUIRED FOR AHU-3 REMOVAL AND REPLACEMENT.
33. BRING TEMPORARY AHU ONLINE, TAKE AHU-3 OFFLINE AND ADJUST AHU-1 AND AHU-2 SUPPLY AIR DISTRIBUTION TO PROVIDE 50% OF THE SUPPLY AIR FOR AHU-3 SUPPLY AIR DISTRIBUTION SYSTEM UTILIZING THE EXISTING TRANSFERS AND BYPASS CONNECTIONS BETWEEN AIR SYSTEMS.
34. DISCONNECT AHU-3 (AIR, CHILLED WATER, HEATING HOT WATER, STEAM, CONDENSATE, DRAIN, ELEC.,CONTROLS, ETC..)
35. REMOVE ROOFING, ROOF DECK AND ONE (1) 14x4 STRUCTURAL JOIST BETWEEN COLUMNS E AND F TO FACILITATE REMOVAL AND REPLACEMENT OF AHU-3.
36. REMOVE AHU-3.
37. INSTALL NEW AHU-3
38. RECONNECT AIR, CHILLED WATER, HEATING HOT WATER, STEAM, CONDENSATE, DRAIN, ELECTRICAL POWER AND DDC CONTROLS FOR AHU-3.
39. CONFIRM AHU-3 IS OPERATIONAL.
40. RECONNECT SUPPLY AIR FOR AHU-3 TO EXISTING AIR DISTRIBUTION SYSTEM.
41. REINSTALL 14x4 STRUCTURAL JOIST AND ROOF DECK BETWEEN COLUMN E AND F. PROVIDE NEW AND REPAIR EXISTING ROOFING BETWEEN COLUMNS E AND H IN AREAS OF OPENING PREVIOUSLY PROVIDED.
42. BRING NEW AHU-3 ONLINE TO SERVE BASEMENT AREA AND TAKE TEMPORARY AHU OFFLINE AND ADJUST AHU-1 AND AHU-2 SUPPLY AIR DISTRIBUTION SO AS NOT TO SERVE AHU-3 SUPPLY AIR DISTRIBUTION SYSTEM BY CLOSING EXISTING TRANSFERS AND BYPASS CONNECTIONS BETWEEN AIR SYSTEMS.
43. DISCONNECT AND REMOVE TEMPORARY SUPPLY AIR DUCT CONNECTION FROM AHU-3 SUPPLY AIR MAIN BACK TO GRADE MOUNTED AHU.
44. REINSTALL AIR INTAKE LOUVER IN EXTERIOR WALL AND REBUILD AIR INTAKE PLENUM BETWEEN COLUMN LINES E AND F.
45. REMOVE TEMPORARY PARTITION ALONG COLUMN LINE F.
46. REMOVE CRANE AND TEMPORARY GRADE MOUNTED AHU FROM SITE.

END OF PHASING



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421 EAST CANFIELD
DETROIT, MICHIGAN

PROPOSED PHASING AHU'S

SCALE: AS NOTED

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SHEET NO.
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DSD FILE NAME
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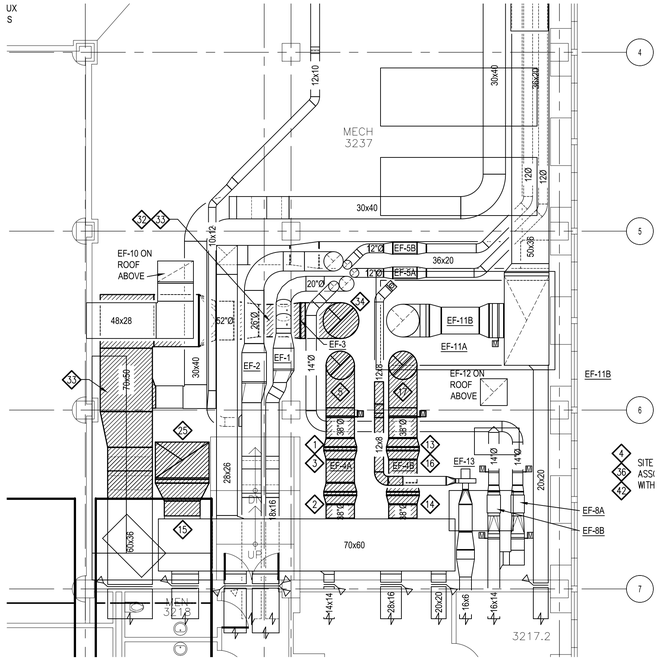

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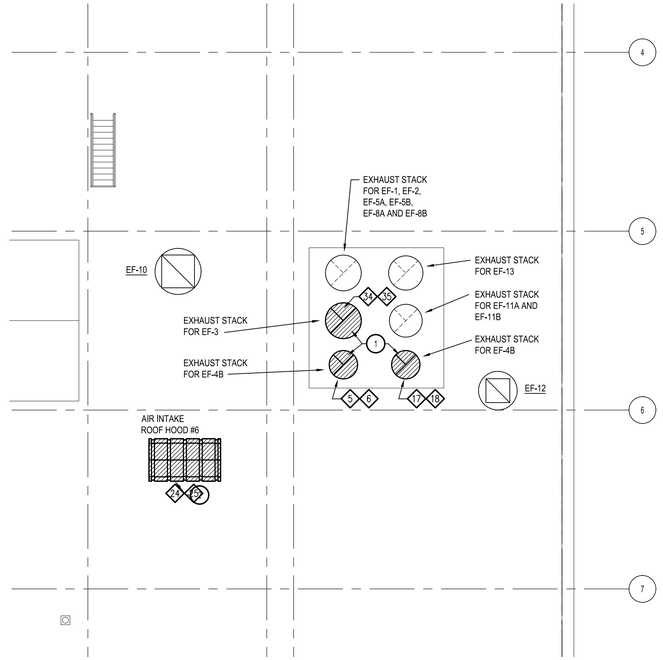

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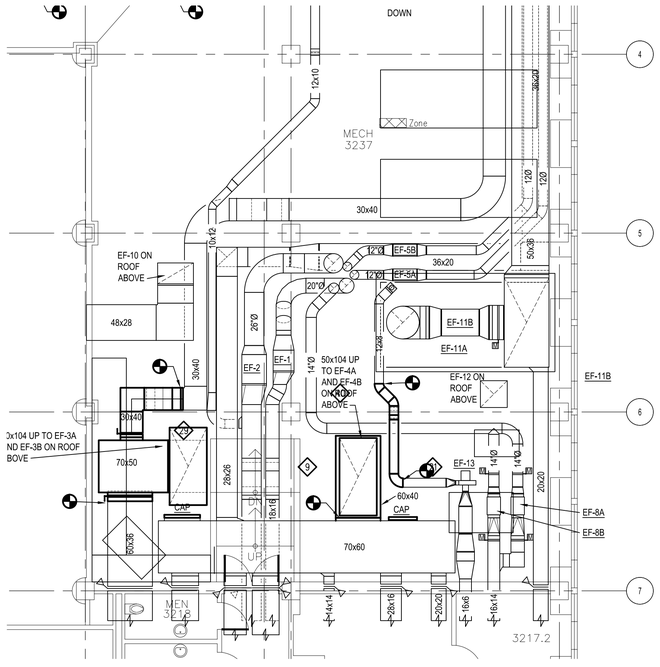

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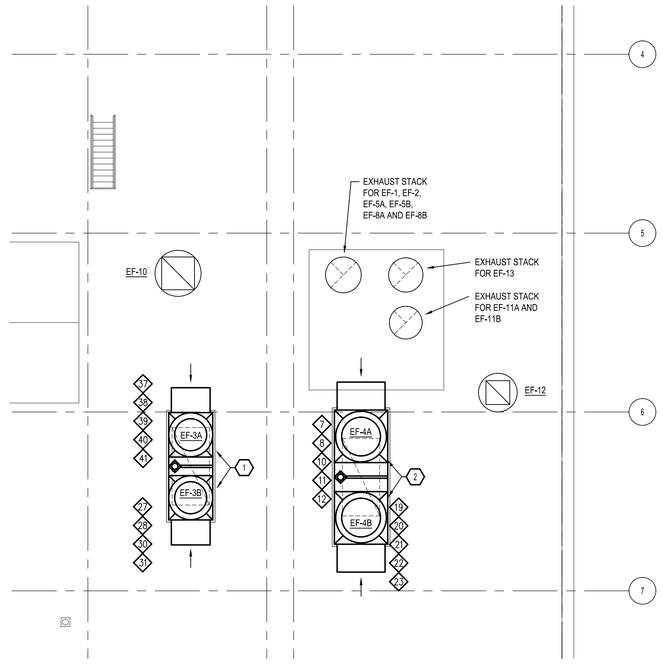

N PARTIAL THIRD FLOOR PLAN – PROPOSED PHASING NEW WORK

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

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PHASING NOTES FOR EXHAUSTS FAN REPLACEMENTS:

1. DISCONNECT AND SHUT DOWN EF-4A.
2. DISCONNECT 38"Ø EXHAUST DUCT CONNECTION FROM EF-4A AT 70x60 EXHAUST DUCT MAIN.
3. REMOVE EF-4A AND ASSOCIATED DUCTWORK, CONTROLS AND FITTINGS.
4. PROVIDE CRANE ON SITE TO FACILITATE REMOVAL OF EXISTING EXHAUST STACK AND INSTALLATION OF NEW ROOF MOUNTED EXHAUST FANS.
5. DISCONNECT AND REMOVE EF-4A EXHAUST STACK, CURB AND FLASHING. CAP AND SEAL ROOF OPENING WATER TIGHT
6. COORDINATE ROOF WORK WITH ARCHITECTURAL TRADES.
7. PROVIDE EF-4A MOUNTED ON ROOF AND ASSOCIATED DUAL FAN CURB WITH OPENING FOR SECOND FAN TEMPORARILY CAPPED, DAMPERS, INTAKE PLENUM, CONTROLS, ETC. COORDINATE WITH STRUCTURAL TRADES.
8. COORDINATE ROOFING REPAIRS WITH ARCHITECTURAL TRADES.
9. PROVIDE DUCTWORK AS INDICATED TO RECONNECT EF-4A TO 70x60 EXHAUST DUCT MAIN.
10. RECONNECT EF-4A POWER AND CONTROLS.
11. CONFIRM EF-4A IS OPERATIONAL.
12. BRING EF-4A ONLINE TO SERVE BUILDING
13. DISCONNECT AND SHUT DOWN EF-4B.
14. DISCONNECT 38"Ø EXHAUST DUCT CONNECTION FROM EF-4B AT 70x60 EXHAUST DUCT.
15. DISCONNECT 72x48 INTAKE AIR HOOD FROM 70x60 EXHAUST DUCT MAIN.
16. REMOVE EF-4B AND ASSOCIATED DUCTWORK, CONTROLS AND FITTINGS. CAP CONNECTION AT 70x60 MAIN.
17. DISCONNECT AND REMOVE EF-4B EXHAUST STACK, CURB AND FLASHING. CAP AND SEAL ROOF OPENING WATER TIGHT
18. COORDINATE ROOF WORK WITH ARCHITECTURAL TRADES.
19. REMOVE CAP FOR SECOND FAN FROM DUAL FAN ROOF CURB PROVIDED DURING EF-4A REPLACEMENT AND PROVIDE EF-4B MOUNTED ON CURB.
20. COORDINATE CURB REPAIR WITH ARCHITECTURAL TRADES.
21. CONNECT EF-4B POWER AND CONTROLS.
22. CONFIRM EF-4B IS OPERATIONAL.
23. BRING EF-4B ONLINE TO SERVE BUILDING AS BACK-UP FOR EF-4A.
24. DISCONNECT AND REMOVE INTAKE AIR ROOF HOOD AND ASSOCIATED DUCTWORK, DAMPERS AND FITTINGS.
25. COORDINATE ROOF WORK WITH ARCHITECTURAL TRADES.
26. PROVIDE NEW EXHAUSTS FAN EF-3A MOUNTED ON DUAL FAN ROOF CURB, WITH OPENING FOR SECOND FAN CAPPED, IN LOCATION OF REMOVED AIR INTAKE HOOD AND ASSOCIATED CURB DAMPERS, INTAKE PLENUM, CONTROLS, ETC. COORDINATE WITH STRUCTURAL TRADES.
27. COORDINATE ROOFING REPAIR WITH ARCHITECTURAL TRADES.
28. PROVIDE EXHAUST DUCTWORK TO CONNECT EF-3A INLET TO EXISTING 60x36 AND 30x40 EXHAUST DUCT MAINS.
29. PROVIDE POWER AND CONTROLS FOR EF-3A.
30. CONFIRM EF-3A IS OPERATIONAL.
31. BRING EF-3A ONLINE TO SERVE BUILDING.
32. SHUT-DOWN AND DISCONNECT EF-3.
33. REMOVE EF-3 AND ASSOCIATED DUCTWORK, CONTROLS AND FITTINGS.
34. DISCONNECT AND REMOVE EF-3 EXHAUST STACK, CURB AND FLASHING. CAP AND SEAL ROOF OPENING WATER TIGHT
35. COORDINATE ROOFING REPAIR WITH ARCHITECTURAL TRADES.

BASE BID ONLY:

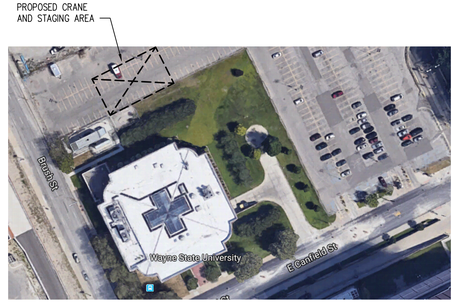
36. REMOVE CRANE FROM SITE.

END OF PHASING

ALTERNATE #2 ONLY:

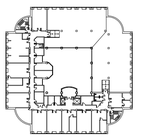
37. REMOVE CAP FOR SECOND FAN FROM DUAL FAN ROOF CURB PROVIDED DURING EF-3A REPLACEMENT AND PROVIDE EF-3B MOUNTED ON CURB.
38. COORDINATE CURB REPAIR WITH ARCHITECTURAL TRADES.
39. PROVIDE POWER AND CONTROLS FOR EF-3B.
40. CONFIRM EF-3B IS OPERATIONAL.
41. BRING EF-3B ONLINE TO SERVE BUILDING AS BACK-UP FOR EF-3A
42. REMOVE CRANE FROM SITE.

END OF PHASING



N SITE PLAN – PROPOSED CRANE AND STAGING AREA

NO SCALE



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17-4801.00

SHEET NO.
G-2

DSD FILE NAME
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ABBREVIATIONS

A.F.F.	ABOVE FINISHED FLOOR	L.P.	LOW POINT
ALUM.	ALUMINUM	MANUF.	MANUFACTURER
ARCH.	ARCHITECTURAL	MAS.	MASONRY
ASSY.	ASSEMBLY	MAX.	MAXIMUM
BD.	BOARD	MECH.	MECHANICAL
B.F.	BARRIER FREE	MET. OR MTL.	METAL
B.O.S.	BOTTOM OF STEEL	MIN.	MINIMUM
BOT.	BOTTOM	MTD.	MOUNTED
BRG.	BEARING	M.O.	MASONRY OPENING
C.J.	CONTROL JOINT	N.I.C.	NOT IN CONTRACT
CLG.	CEILING	NON. COMB.	NON COMBUSTIBLE
CLR.	CLEAR	N.T.S.	NOT TO SCALE
CLOS.	CLOSET	O.C.	ON CENTER
C.M.U.	CONCRETE MASONRY UNIT	O.H.	OVERHEAD
C.O.	CLEAN OUT	OPN'G.	OPENING
COMM.	COMMUNICATION	OPP.	OPPOSITE
COMP.	COMPACTED	PL.	PLATE
CONC.	CONCRETE	P.LAM.	PLASTIC LAMINATE
CONSTR.	CONSTRUCTION	PT.	PAINT
CONT.	CONTINUOUS	PTD.	PAINTED
CONTR.	CONTRACTOR	PR.	PAIR
CPT.	CARPET	R.	RADIUS
C.T.	CERAMIC TILE	R.A.	RETURN AIR
DET.	DETAIL	R.B.	RUBBER BASE
DIA.	DIAMETER	REINF.	REINFORCED/REINFORCING
D.O.	DOOR OPENING	REQ'D.	REQUIRED
DR.	DOOR	RM.	ROOM
DWG.	DRAWING	R.O.	ROUGH OPENING
E.J.	EXPANSION JOINT	S.C.	SOLID CORE
ELECT.	ELECTRICAL	S.F.	SQUARE FEET
EL. OR ELEV.	ELEVATION	SHT.	SHEET
ENG.	ENGINEER	SIM.	SIMILAR
EQ.	EQUAL	S.S.	STAINLESS STEEL
EQUIP.	EQUIPMENT	ST.	STONE
E.W.C.	ELECTRIC WATER COOLER	STL.	STEEL
EX.	EXISTING	STRUCT.	STRUCTURAL
EXP.	EXPANSION	SUSP.	SUSPENDED
EXT.	EXTERIOR	THK.	THICK
FIN.	FINISH	THRU	THROUGH
FL. OR FLR.	FLOOR	T.O.	TOP OF
GALV.	GALVANIZED	T.O.C.	TOP OF CURB
GA.	GAUGE	T.O. CONC.	TOP OF CONCRETE
G.C.	GENERAL CONTRACTOR	T&G	TONGUE AND GROOVE
GL.	GLASS OR GLAZING	T.S.	TUBE STEEL
GYP.	GYPSUM	T.O.S.	TOP OF STEEL
HDWR.	HARDWARE	TYP.	TYPICAL
H.D.G.	HOT-DIPPED GALVANIZED	UNEXCAV.	UNEXCAVATED
H.M.	HOLLOW METAL	U.O.N.	UNLESS OTHERWISE NOTED
HORIZ.	HORIZONTAL	V.C.T.	VINYL COMPOSITION TILE
H.P.	HIGH POINT	VERT.	VERTICAL
HT.	HEIGHT	VEST.	VESTIBULE
INSUL.	INSULATION	V.I.F.	VERIFY IN FIELD
INT.	INTERIOR	W/	WITH
JAN.	JANITOR	WD.	WOOD
JST.	JOIST	W.P.	WORK POINT
LAM.	LAMINATE		
LAV.	LAVATORY		

PLAN LEGEND

SYMBOL	DESCRIPTION
	LINE FOR ITEM TO BE REMOVED
	WALL TO REMAIN
	NEW OR RELOCATED ITEM
	EXISTING ITEM
	1 HR. FIRE RATED SEPARATION
	2 HR. FIRE RATED SEPARATION

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
XX	EXISTING COLUMN NUMBER IDENTIFICATION AND GRID
XX	EXISTING COLUMN NUMBER IDENTIFICATION AND GRID
X / X	DETAIL # / SECTION IDENTIFIER / SHEET #
X / X	DETAIL # / DETAIL DESIGNATOR / SHEET #
1 / 4 A-X 2 / 3	DETAIL # / ELEVATION DESIGNATOR / SHEET #
	WORK POINT / ELEVATION ABOVE FINISHED FLOOR OR GRADE
	MATCH LINE
	BREAK LINE
XXX	ROOM NUMBER IDENTIFIER
XXX	DOOR NUMBER IDENTIFIER
X	DEMOLITION NUMBER IDENTIFIER
X	NEW WORK NUMBER IDENTIFIER

ARCHITECTURAL SHEET INDEX

OVERVIEW OF ARCHITECTURAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ARCHITECTURAL:

1. REMOVAL OF ROOFING, INSULATION & METAL ROOF DECK.
2. REMOVAL AND REINSTALLATION OF STEEL JOISTS AND BRACING.
3. PROVIDE NEW INSULATION AND MEMBRANE ROOFING.
4. STRUCTURAL REINF. OF NEW ROOF OPENINGS.
5. INSTALLATION OF EQUIPMENT CURBS.
6. REMOVAL OF INSULATED METAL PANELS.
7. INSTALLATION OF NEW INSULATED METAL PANELS.
8. INSTALLATION OF CONCRETE HOUSEKEEPING PADS.
9. REMOVAL AND REPLACEMENT OF GYPSUM BOARD AND PLASTER CEILING ASSEMBLIES. REFER TO SHEET M-7 FOR ADDITIONAL INFORMATION.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2015 MICHIGAN BUILDING CODE

2015 MICHIGAN MECHANICAL CODE

2015 MICHIGAN PLUMBING CODE

2015 INTERNATIONAL FIRE CODE (AS REFERENCED)

2015 INTERNATIONAL FUEL GAS CODE

NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)

MICHIGAN ENERGY CODE-ASHRAE 90.1-2013

2014 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2014 MICHIGAN ELECTRICAL CODE RULES, PART 8.

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE CONTRACTOR SHALL BEAR ALL ADDITIONAL COSTS ASSOCIATED WITH USING EQUIPMENT AND/OR SYSTEMS BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT AND/OR SYSTEMS INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ARCHITECT THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

GENERAL NOTES:

1. REFER TO ELECTRICAL DRAWINGS FOR SIZE, QUANTITY, AND LOCATIONS OF FLOOR AND WALL PENETRATIONS, COORDINATE WITH ELECTRICAL CONTRACTOR.
2. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS AND EXTENT OF CEILING REQUIRED TO BE REMOVED AND REINSTALLED, COORDINATE WITH MECHANICAL CONTRACTOR.
3. ALL MEANS OF EGRESS SHALL BE MAINTAINED DURING CONSTRUCTION.

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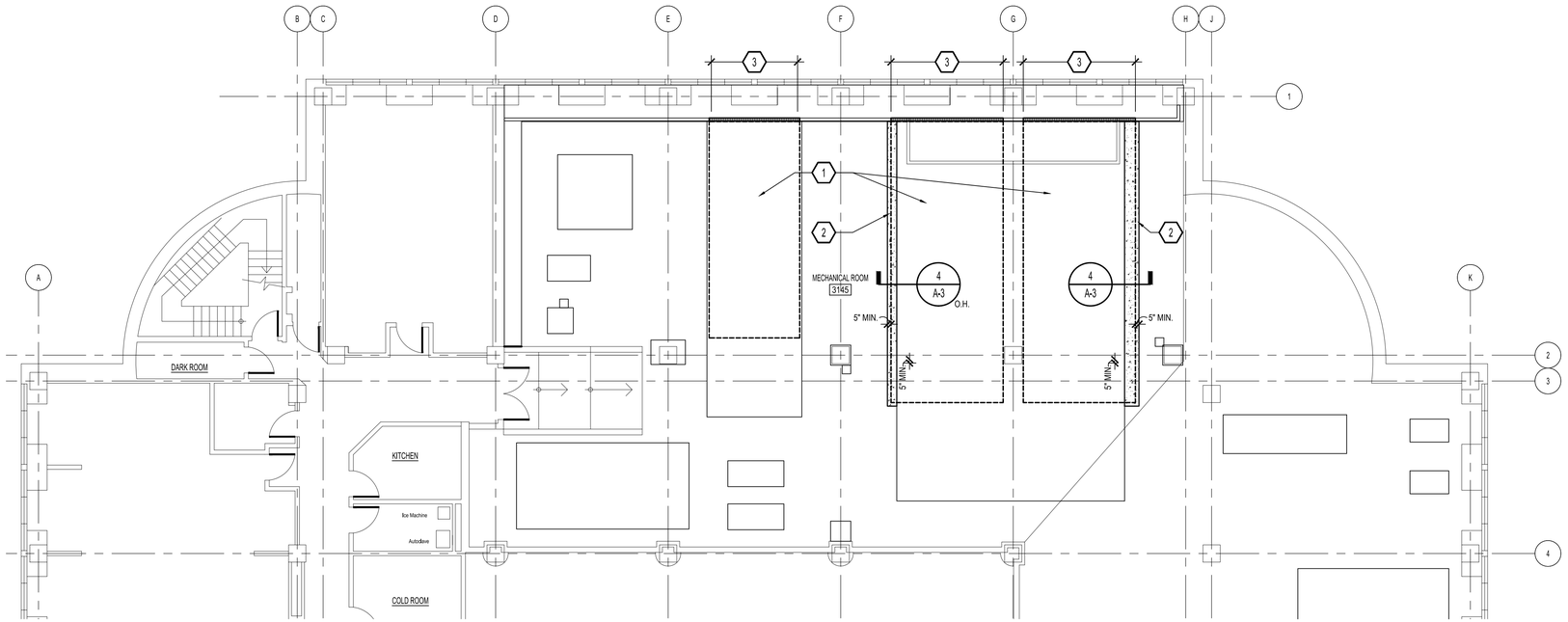
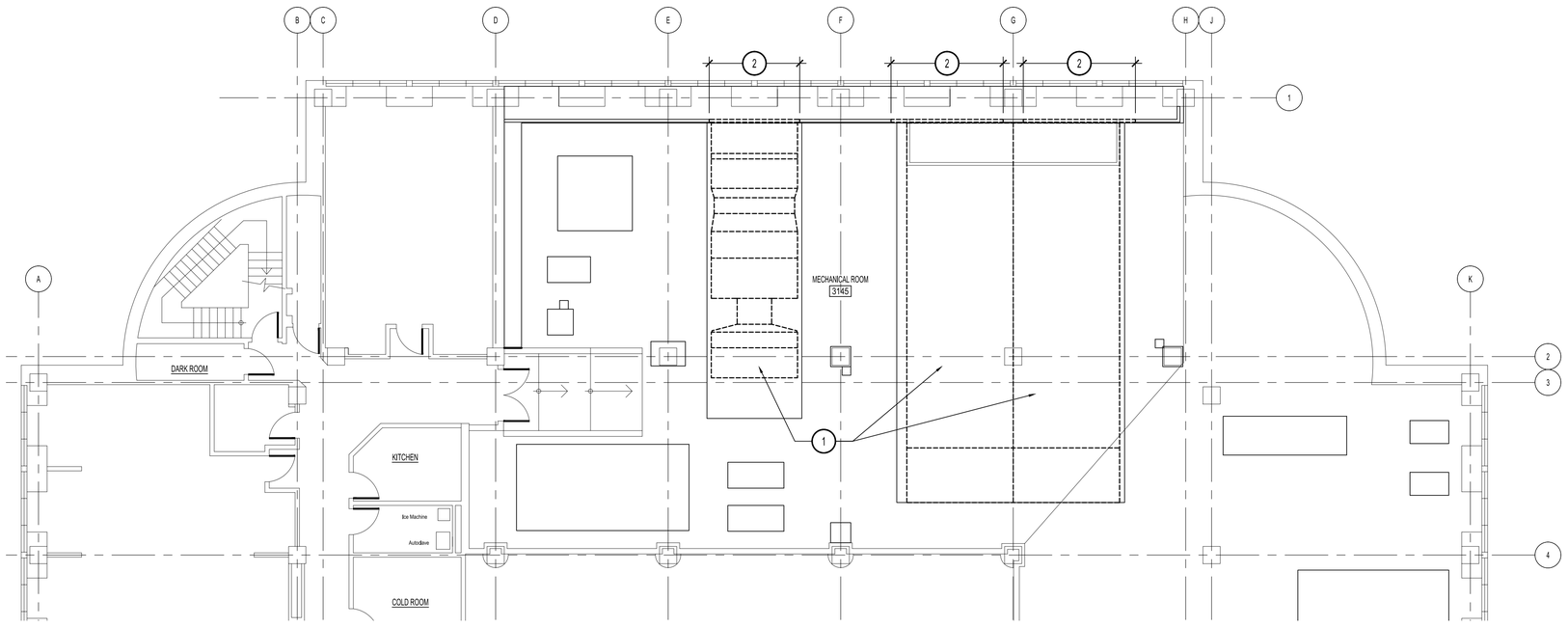
DSD FILE NAME
17-4801-A-1



N 2 A-2 PARTIAL THIRD FLOOR PLAN - NEW WORK

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

0 4 8 16 32



N 1 A-2 PARTIAL THIRD FLOOR PLAN - DEMOLITION

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

0 4 8 16 32

SHEET NOTES:

1. VERIFY EXISTING CONDITIONS IN FIELD, INCLUDING BUT NOT LIMITED TO DIMENSIONS, WALL CONSTRUCTION, WALL CAVITIES AND CONCEALED STRUCTURE.
2. NOTIFY OWNER & ARCHITECT IMMEDIATELY IF CONDITIONS DO NOT MATCH WHAT IS INDICATED ON DOCUMENTS.
3. FOR MECHANICAL DEMOLITION WORK AND NEW WORK, REFER TO MECHANICAL DRAWINGS.
4. AS REQUIRED PATCH, REPAIR AND OR PAINT / REPLACE ADJACENT SURFACES TO MATCH ORIGINAL CONDITIONS WHERE PROPOSED ARCH. & M.E.P. WORK (INCLUDING INSTALLATION OF M.E.P. EQUIPMENT) DISTURBED EXISTING CONDITIONS.
5. ALL SPACES ARE TO BE CLEANED AND ANY DAMAGE CAUSED BY THE CONTRACTOR IS TO BE PATCHED, REPAIRED AND OR PAINTED / REPLACED TO MATCH ORIGINAL CONDITIONS ONCE WORK IS COMPLETED.
6. REFER TO SHEET G-1 FOR PHASING OF CONSTRUCTION.

DEMOLITION KEYED NOTES:

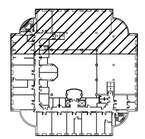
(APPLICABLE THIS SHEET ONLY)

1. MECHANICAL EQUIPMENT TO BE REMOVED, REFER TO MECH.
2. REMOVE EXISTING INSULATED METAL PANEL WALL ASSEMBLY AS REQUIRED FOR INSTALLATION OF NEW MECH. EQUIPMENT, REFER TO MECH.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. NEW MECH. EQUIPMENT, VERIFY EXACT SIZE AND LOCATION W/ MECH., REFER TO MECH.
2. NEW CONC. EQUIPMENT PAD, VERIFY EXACT SIZE AND LOCATION W/ MECH., REFER TO MECH.
3. NEW INSULATED METAL PANEL WALL SYSTEM TO MATCH EXIST.



N KEY PLAN

NO SCALE

WAYNE STATE UNIVERSITY

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	OWNER REVIEW	02/21/18

DESIGNER	JSR
DRAWN	EVL
CHECKED	JSR
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL THIRD FLOOR PLANS

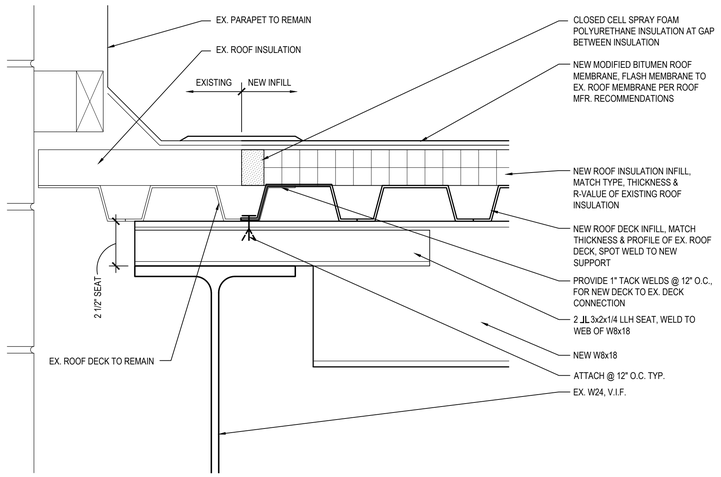
SCALE: AS NOTED

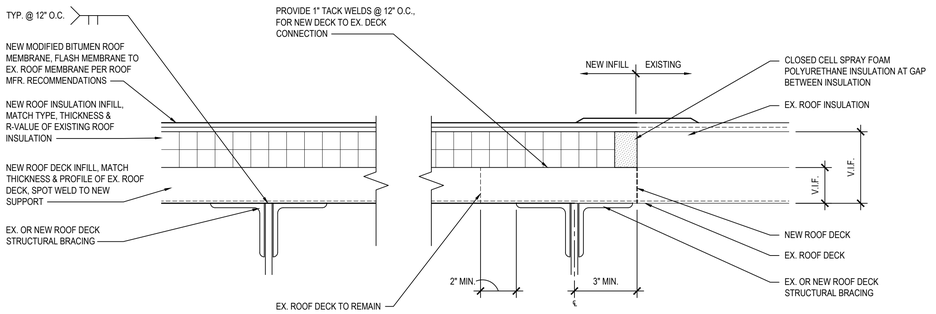
WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
A-2

DSD FILE NAME
17-4801-A-2

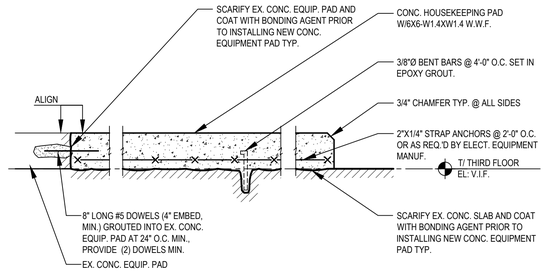




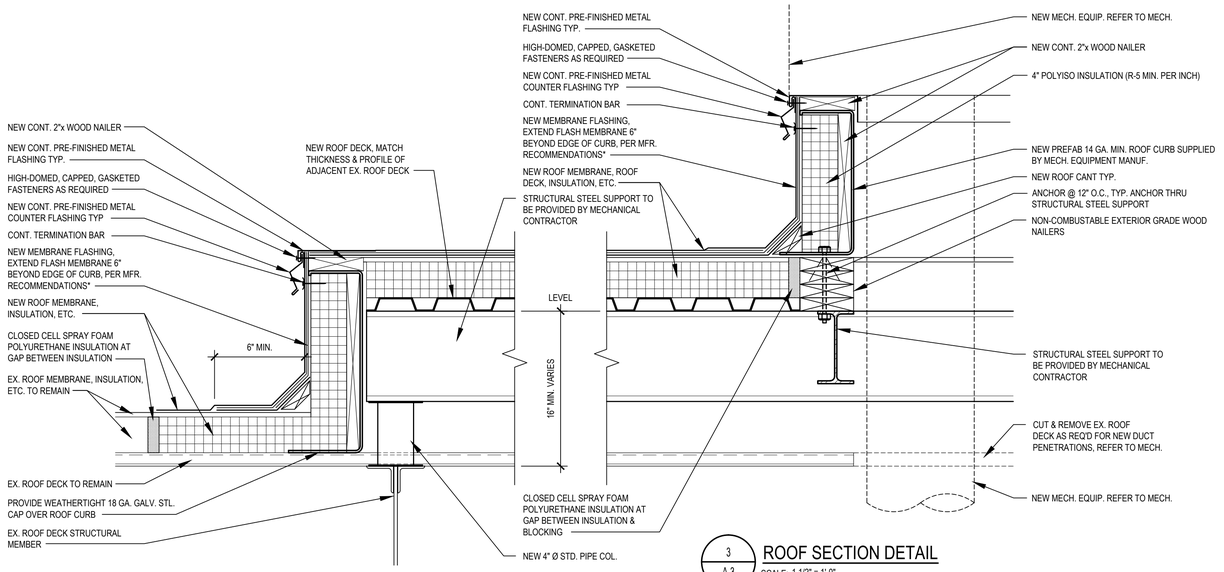
6 / A-3 TYP. ROOF INFILL SECTION DETAIL
SCALE: 3" = 1'-0"
0 1/2 1

5 / A-3 TYP. ROOF INFILL SECTION DETAIL
SCALE: 3" = 1'-0"
0 1/2 1

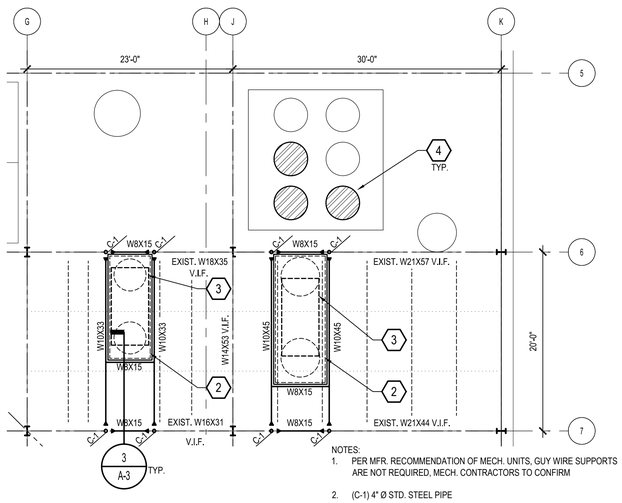
7 / A-3 ROOF SECTION DETAIL
SCALE: 1 1/2" = 1'-0"
0 1 2



7 / A-3 ROOF SECTION DETAIL
SCALE: 1 1/2" = 1'-0"
0 1 2

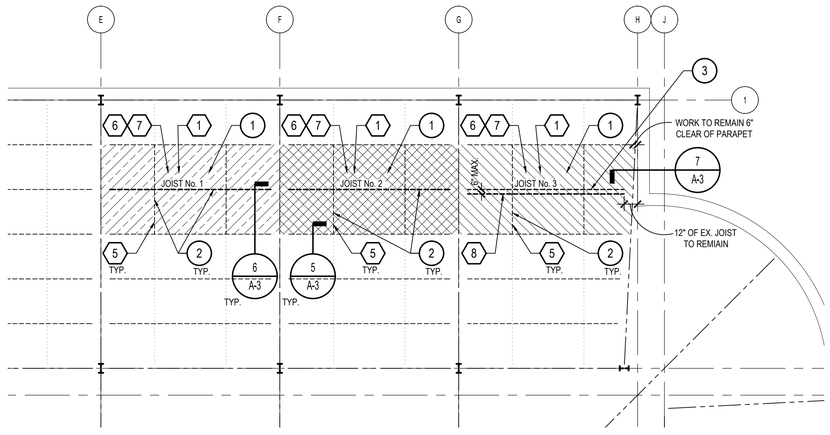


4 / A-2 TYP. EQUIP. PAD EXTENSION DETAIL
SCALE: 1 1/2" = 1'-0"
0 1 2



NOTES:
1. PER MFR. RECOMMENDATION OF MECH. UNITS, GUY WIRE SUPPORTS ARE NOT REQUIRED, MECH. CONTRACTORS TO CONFIRM
2. (C-1) 4" Ø STD. STEEL PIPE
3. ATTACH. OF MECH. UNITS SHALL BE PROVIDED BY MECH. CONTRACTOR
4. BEAM SIZE INDICATES MOMENT FRAME CONNECTION
5. COORDINATE MECH. UNIT LOCATION WITH MECHANICAL CONTRACTOR

N / 2 / A-2 PARTIAL ROOF PLAN - DEMOLITION / NEW WORK
SCALE: 1/8" = 1'-0"
0 4 8 16 32



N / 1 / A-3 PARTIAL ROOF PLAN - DEMOLITION / NEW WORK
SCALE: 1/8" = 1'-0"
0 4 8 16 32

SUGGESTED SEQUENCE OF TEMPORARY REMOVE/REPLACE THE EXISTING ROOF DECK AND FRAMING:

1. REMOVE EXISTING ROOFING MATERIAL AND EXPOSE EXISTING ROOF DECK.
2. SAW CUT AND REMOVE EXISTING ROOF METAL DECK 12" MINIMUM AWAY FROM THE EDGE OF EXISTING ROOF JOIST TO REMAIN, AND 6" FROM THE FACE OF ROOF PARAPET TO REMAIN. REFER TO PLAN 1/A-3.
3. COORDINATE WITH MECHANICAL/ELECTRICAL THE NEED TO REMOVE/REROUTE ALL LINES BELOW ROOF DECK.
4. REFER TO PLAN AND VERIFY IN FIELD, REMOVE THE IDENTIFIED EXISTING JOISTS No. 1 AND No. 2.
5. REFER TO PLAN AND V.I.F., PARTIALLY REMOVE JOIST No. 3 BY SAW CUT THE JOIST 12" FROM COLUMN LINE H IN ORDER TO MAINTAIN THE EXISTING ROOF PARAPET ABOVE. PROVIDE ANY TEMPORARY SUPPORT AS REQUIRED FOR THE PARAPET CONSTRUCTION.
6. PROVIDE TEMPORARY COVER FOR THE ROOF OPENING DURING THE INSTALLATION WORK OF MECHANICAL UNITS UNDER THE ROOF.
7. AFTER WORK IS COMPLETED, REINSTALL JOISTS No. 1 AND No. 2. REPLACE JOIST No. 3 WITH W8X18. REFER TO DETAIL NO. 7/A-3.
8. INSTALL NEW ROOF DECK (TO MATCH EXISTING ROOF DECK). REFER TO DETAILS 5/A-3 & 6/A-3.
9. PROVIDE TESTING AGENT (QC) INSPECTION REPORT TO A/E FOR REVIEW.
10. REWORK ROOFING AS REQUIRED BY AREA.
11. REWORK MECHANICAL/ELECTRICAL WORK AS REQUIRED.

SHEET NOTES:

1. VERIFY EXISTING CONDITIONS IN FIELD, INCLUDING BUT NOT LIMITED TO DIMENSIONS, WALL CONSTRUCTION, WALL CAVITIES AND CONCEALED STRUCTURE.
2. NOTIFY OWNER & ARCHITECT IMMEDIATELY IF CONDITIONS DO NOT MATCH WHAT IS INDICATED ON DOCUMENTS.
3. FOR MECHANICAL DEMOLITION WORK AND NEW WORK, REFER TO MECHANICAL DRAWINGS.
4. AS REQUIRED PATCH, REPAIR AND OR PAINT / REPLACE ADJACENT SURFACES TO MATCH ORIGINAL CONDITIONS WHERE PROPOSED ARCH. & M.E.P. WORK (INCLUDING INSTALLATION OF M.E.P. EQUIPMENT) DISTURBED EXISTING CONDITIONS.
5. ALL SPACES ARE TO BE CLEANED AND ANY DAMAGE CAUSED BY THE CONTRACTOR IS TO BE PATCHED, REPAIRED AND OR PAINTED / REPLACED TO MATCH ORIGINAL CONDITIONS ONCE WORK IS COMPLETED.
6. ROOF MEP ACCESS TO BE PHASED AS REQUIRED BY MECHANICAL AND ELECTRICAL WORK, REFER TO MECHANICAL AND ELECTRICAL DRAWINGS.
7. REFER TO MECHANICAL FOR ADDITIONAL PHASING OF CONSTRUCTION.

PHASE 1:
REMOVE / REPLACE ROOF SYSTEM AND STRUCTURAL (MEMBRANE, INSULATION, DECK, JOISTS & BRACING) AS REQ'D FOR MEP ACCESS, REFER TO MECH. & ELECT.

PHASE 2:
REMOVE / REPLACE ROOF SYSTEM AND STRUCTURAL (MEMBRANE, INSULATION, DECK, JOISTS & BRACING) AS REQ'D FOR MEP ACCESS, REFER TO MECH. & ELECT.

PHASE 3:
REMOVE / REPLACE ROOF SYSTEM AND STRUCTURAL (MEMBRANE, INSULATION, DECK, JOISTS & BRACING) AS REQ'D FOR MEP ACCESS, REFER TO MECH. & ELECT.

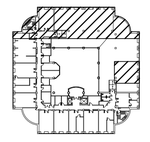
8. FOR ADDITIONAL STRUCTURAL INFORMATION REFER TO SHEET A-4 & A-5.

DEMOLITION KEYED NOTES:
(APPLICABLE THIS SHEET ONLY)

1. REMOVE EX. ROOFING SYSTEM AS REQ'D FOR MEP EQUIPMENT ACCESS, CONFIRM REQ'D OPENING SIZE W/ MECH. & ELECT. DWG'S
2. REMOVE EXISTING STEEL JOIST & BRACING AND STORE FOR REINSTALLATION
3. SAWCUT AND REMOVE EX. STEEL JOIST AS INDICATED

NEW WORK KEYED NOTES:
(APPLICABLE THIS SHEET ONLY)

1. CONTRACTOR TO PROVIDE TEMPORARY WEATHER-TIGHT ENCLOSURE DURING REQ'D MEP EQUIPMENT ACCESS, ROOF SYSTEM TO BE INFILLED / REPLACED ONCE MEP EQPM ACCESS IS COMPLETE
2. NEW MECH. EQUIPMENT, REFER TO MECH. AND ELECT.
3. NEW ROOF CURB TO BE PROVIDED AS REQUIRED FOR NEW MECH. EQUIPMENT, REFER TO DETAIL 3/A-3 AND MECH.
4. EX. EXHAUST STACK TO BE CAPPED, REFER TO MECH.
5. REINSTALL ROOF JOIST & BRACING
6. PROVIDE NEW METAL ROOF DECK MATCH EXISTING GAGE AND PROFILE
7. PROVIDE NEW MEMBRANE ROOFING & INSULATION TO MATCH EXIST. ADJACENT CONSTRUCTION, REFER TO DETAIL 5/A-3 FOR ADDITIONAL INFORMATION
8. NEW W8x18, REFER TO DTL. 6/A-3



N KEY PLAN
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DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: AHU REVISION

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL ROOF FRAMING PLAN & DETAILS

SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
A-3

DSD FILE NAME
17-4801-A-3

SPECIAL INSPECTION REQUIREMENTS - STRUCTURAL STEEL CONT.

INSPECTION TASK	INSPECTION FREQUENCY QC	INSPECTION FREQUENCY QA	REFERENCED STANDARD	IBC REFERENCE	RESPONSIBLE AGENT
INSPECTION OF BOLTING:			AISC 360, SECTION N5, TABLE N5.6-1	1705.2	SI/TA
1. INSPECTION TASKS PRIOR TO BOLTING:					
A. MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS.	O	P			
B. FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS.	O	O			
C. PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR.	O	O			
D. PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL.	O	O			
E. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS.	O	O			
F. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED.	P	O			
G. PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER.	O	O			
2. INSPECTION TASKS DURING BOLTING:			AISC 360, SECTION N5, TABLE N5.6-2	1705.2	SI/TA
A. FASTENER ASSMEBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED.	O	O			
B. JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION.	O	O			
C. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTING FROM ROTATING.	O	O			
D. FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES.	O	O			
3. INSPECTION TASKS AFTER BOLTING:			AISC 360, SECTION N5, TABLE N5.6-3	1705.2	SI/TA
A. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS.	P	P			
O: OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS. P: PERFORM THESE TASKS FOR EACH BOLTED CONNECTION.					
INSPECTION OF WELDING:			AISC 360, SECTION N5, TABLE N5.4-1	1705.2	SI/TA
1. INSPECTION TASKS PRIOR TO WELDING					
A. WELDING PROCEDURE SPECIFICATIONS (WPSS) AVAILABLE.	P	P			
B. MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE.	P	P			
C. MATERIAL IDENTIFICATION (TYPE/GRADE).	O	O			
D. WELDER IDENTIFICATION SYSTEM.	O	O			
E. FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY): - JOINT PREPARATION - DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) - CLEANLINESS (CONDITION OF STEEL SURFACES) - TACKING (TACK WELD QUALITY AND LOCATION) - BACKING TYPE AND FIT (IF AVAILABLE)	O	O			
F. CONFIGURATION OF FINISH AND ACCESS HOLES.	O	O			
G. FIT-UP OF FILLET WELDS: - DIMENSIONS (ALIGNMENT, GAPS AT ROOT) - CLEANLINESS (CONDITION OF STEEL SURFACES) - TACKING (TACK WELD QUALITY AND LOCATION)	O	O			
H. CHECK WELDING EQUIPMENT.	O	-			
2. INSPECTION TASKS DURING WELDING			AISC 360, SECTION N5, TABLE N5.4-2	1705.2	SI/TA
A. USE OF QUALIFIED WELDERS.	O	O			
B. CONTROL AND HANDLING OF WELDING CONSUMABLES: - PACKAGING - EXPOSURE CONTROL	O	O			
C. NO WELDING OVER CRACKED TACK WELDS.	O	O			
D. ENVIRONMENTAL CONDITIONS: - WIND SPEED WITHIN LIMITS - PRECIPITATION AND TEMPERATURE	O	O			
E. WPS FOLLOWED: - SETTINGS ON WELDING EQUIPMENT - TRAVEL SPEED - SELECTED WELDING MATERIALS - SHIELDING GAS TYPE/FLOW RATE - PREHEAT APPLIED - INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) - PROPER POSITION (F, V, H, OH)	O	O			
F. WELDING TECHNIQUES: - INTERPASS AND FINAL CLEANING - EACH PASS WITHIN PROFILE LIMITATIONS - EACH PASS MEETS QUALITY REQUIREMENTS	O	O			
3. INSPECTION TASKS AFTER WELDING:			AISC 360, SECTION N5, TABLE N5.4-3	1705.2	SI/TA
A. WELDS CLEANED.	O	O			
B. SIZE, LENGTH AND LOCATION OF WELDS.	P	P			
C. WELDS MEET VISUAL ACCEPTANCE CRITERIA: - CRACK PROHIBITION. - WELD/BASE-METAL FUSION. - CRATER CROSS SECTION. - WELD PROFILES. - WELD SIZE. - UNDERCUT. - POROSITY.	P	P			
D. ARC STRIKES.	P	P			
E. K-AREA.	P	P			
F. BRACING REMOVED AND WELD TABS REMOVED (IF REQUIRED).	P	P			
G. REPAIR ACTIVITY.	P	P			
H. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER.	P	P			
O: OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS. P: PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.					

STATEMENT OF SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE 2015 MICHIGAN (INTERNATIONAL) BUILDING CODE CHAPTER 17 AND AS MODIFIED HEREIN.
2. DESIGNATIONS:
   - SI SPECIAL INSPECTOR QUALIFIED WITH DEMONSTRATED COMPETENCE DOCUMENTED BY CERTIFICATIONS FROM RECOGNIZED AGENCIES SUCH AS AWS, ACI, MASONRY INSTITUTE OF MICHIGAN (MIM), ETC., AS SUBMITTED AND APPROVED BY THE BUILDING OFFICIAL. SPECIAL INSPECTOR MAY BE A FIRM WITH MULTIPLE SPECIALISTS AND A PROJECT MANAGER PROVIDING REPORTS.
   - TA TESTING AGENCY QUALIFIED TO TEST AND INSPECT MATERIALS AND ASSEMBLIES. TESTING AGENCY SHALL BE UNDER THE SUPERVISION OF THE SPECIAL INSPECTOR.
   - GE GEOTECHNICAL ENGINEER WHO PROVIDED THE ORIGINAL PROJECT GEOTECHNICAL SOILS INVESTIGATION REPORT.
   - SE SPECIALTY ENGINEER RESPONSIBLE FOR DESIGNING ASSEMBLIES SUCH AS PRECAST CONCRETE, STEEL JOISTS, COLD FORMED FRAMING ASSEMBLIES, ETC. SPECIALTY ENGINEER SHALL PROVIDE OBSERVATION OF FABRICATED AND INSTALLED ITEMS OF THEIR DESIGN IN ADDITION TO THE SPECIAL INSPECTION.
3. TA, GE AND SE SHALL SUBMIT RECORDS OF THE INSPECTION RESULTS TO THE SI. THE SI SHALL COMPILE AND SUBMIT INSPECTION RECORDS TO THE ARCHITECT/ENGINEER AND BUILDING OFFICIAL. RECORDS SHALL INCLUDE STATEMENTS OF TESTS, WHETHER INSTALLED/FABRICATED ITEM COMPLIES WITH CONTRACT DOCUMENTS, REMEDIAL WORK PERFORMED, RETESTS.
4. SI SHALL PROVIDE A DAILY REPORT OF ANY DISCREPANCIES FROM THE CONTRACT DOCUMENTS FOUND ON THE SAME DAY OF THE INSPECTION TO THE ENGINEER OF RECORD. FORMAL REPORTS OF COMPLIANCE CAN FOLLOW BY A MAXIMUM OF 2 WEEKS. SI SHALL PROVIDE AND SIGN FINAL REPORT WITH A SUMMARY OF ALL TESTS PERFORMED AND RESULTS TO THE ENGINEER OF RECORD AND BUILDING OFFICIAL, IN ACCORDANCE WITH SECTION 1704.2.4.
5. SI, TA & GE SHALL BE ENGAGED BY THE OWNER IN COMPLIANCE WITH THE MICHIGAN (INTERNATIONAL) BUILDING CODE.
6. WHERE FABRICATION OF STRUCTURAL, LOAD-BEARING OR LATERAL LOAD-RESISTING MEMBERS OR ASSEMBLIES IS BEING CONDUCTED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTIONS OF THE FABRICATED ITEMS SHALL BE PERFORMED DURING FABRICATION. SPECIAL INSPECTIONS DURING FABRICATION ARE NOT REQUIRED WHERE THE FABRICATOR MAINTAINS APPROVED DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND THE GOVERNING BUILDING CODE. APPROVAL SHALL BE BASED UPON REVIEW OF FABRICATION AND QUALITY CONTROL PROCEDURES AND PERIODIC INSPECTION OF FABRICATION PRACTICES BY THE BUILDING.
7. REFER TO SPECIAL INSPECTION SCHEDULES AND GENERAL STRUCTURAL NOTES FOR ADDITIONAL QUALITY CONTROL TESTING AND INSPECTIONS.

SPECIAL INSPECTION REQUIREMENTS - OPEN-WEB STEEL JOISTS AND JOIST GIRDERS

INSPECTION TASK	INSPECTION FREQUENCY CONTINUOUS	INSPECTION FREQUENCY PERIODIC	REFERENCED STANDARD	IBC REFERENCE	RESPONSIBLE AGENT
1. INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS:				1705.2.3	SI / TA
A. END CONNCTIONS - WELDED OR BOLTED	-	X	SJI SPECIFICATIONS LISTED IN SECTION 2207.1		
B. BRIDGING - HORIZONTAL OR DIAGONAL	-	-	-		
1. STANDARD BRIDGING	-	X	SJI SPECIFICATIONS LISTED IN SECTION 2207.1		
2. BRIDGING THAT DIFFERS FROM SJI SPECIFICATIONS LISTED IN SECTION 2207.1	-	X	-		

SPECIAL INSPECTION REQUIREMENTS - STRUCTURAL STEEL

INSPECTION TASK	INSPECTION FREQUENCY CONTINUOUS	INSPECTION FREQUENCY PERIODIC	REFERENCED STANDARD	IBC REFERENCE	RESPONSIBLE AGENT
1. INSPECTION OF STEEL FABRICATED ITEMS SHALL BE PERFORMED ON PREMISES DURING FABRICATION	-	X	ASIC QUALITY CERTIFICATION	1704.2.5	SI
A. EXCEPTIONS: SPECIAL INSPECTIONS DURING FABRICATION NOT REQUIRED WHERE THE FABRICATOR IS REGISTERED AND APPROVED IN ACCORANCE WITH SECTION 1704.2.5.1.	-	-			
2. SPECIAL INSPECTIONS AND NONDESTRUCTIVE TESTING OF STRUCTURAL STEEL ELEMENTS IN BUILDINGS, STRUCTURES AND PORTIONS THEREOF SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC360.	X	X	AISC QUALITY CERTIFICATION	1705.2.1	SI
A. SPECIAL INSPECTION OF RAILING SYSTEMS COMPOSED OF STRUCTURAL STEEL ELEMENTS SHALL BE LIMITED TO WELDING INSPECTION OF WELDS AT THE BASE OF CANTILEVERED RAIL POSTS.	-	X	AISC QUALITY CERTIFICATION	1705.2.1	SI

QUALITY CONTROL (QC) SHALL BE PROVIDED BY THE FABRICATOR AND ERECTOR.
QUALITY ASSURANCE (QA) SHALL BE PROVIDED BY OTHERS WHEN REQUIRED BY THE AUTHORITY HAVING JURISDICTION, APPLICABLE BUILDING CODE, PURCHASER, OWNER, OR ENGINEER OF RECORD.

INSPECTION TASK	INSPECTION FREQUENCY QC	INSPECTION FREQUENCY QA	REFERENCED STANDARD	IBC REFERENCE	RESPONSIBLE AGENT
INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONSTRUCTION PRIOR TO CONCRETE PLACEMENT:			AISC 360, SECTION N6, TABLE N6.1	1705.2	SI/TA
1. PLACEMENT AND INSTALLATION OF STEEL DECK.	P	P			
2. PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS.	P	P			
3. DOCUMENT ACCEPTANCE OR REJECTION OF STEEL ELEMENTS.	P	P			

O: OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.
P: PERFORM THESE TASKS FOR EACH STEEL ELEMENT.

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TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

STRUCTURAL GENERAL INFORMATION

SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
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EXISTING STRUCTURE WELDING PROCEDURE

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1, STRUCTURAL WELDING CODE. ONLY WELDERS QUALIFIED TO THE AWS CODE SHALL BE ALLOWED TO WELD ON THE STRUCTURE. ONLY A LOW-HYDROGEN WELDING PROCESS SHALL BE ALLOWED FOR WELDING ON THESE STRUCTURES. THE SHIELDED METAL ARC WELDING (I.E. SMAW OR STICK WELDING) PROCESS WITH E7018 WELDING ELECTRODES IS THE PREFERRED METHOD OF WELDING ON THESE STRUCTURAL STEEL ELEMENTS. THE FOLLOWING PRECAUTIONS MUST BE OBSERVED DURING ANY WELDING OF STEEL AT THIS SITE:
   - A. ONLY A LOW-HYDROGEN WELDING PROCESS SHALL BE USED. SMAW PROCESS IS PREFERRED, WITH THE USE OF E7018 LOW-HYDROGEN ELECTRODES, SUCH AS ATOM ARC 7018, WHICH COMES IN HERMETICALLY SEALED CONTAINERS. THESE WELDING ELECTRODES MUST BE PROTECTED FROM MOISTURE PICK-UP AND THE USE OF ELECTRODE OVENS IS HIGHLY RECOMMENDED.
   - B. IF THE VERTICAL UPHILL OR OVERHEAD WELDING POSITIONS ARE REQUIRED, A 1/8" DIAMETER WELDING ELECTRODE SHALL BE USED, WITH THE SMALLEST POSSIBLE WEAVE.
2. WELDING PROCEDURE SPECIFICATION E7018:
   - A. BASE METAL: STRUCTURAL STEEL
   - B. FILLER METAL: AWS SPECIFICATION - A5.1
   - C. AWS CLASSIFICATION: E7018
   - D. MANUFACTURER: ESAB OR ATOM ARC
   - E. ELECTRICAL CHARACTERISTICS: DIRECT CURRENT, ELECTRODE POSITIVE (I.E. REVERSE POLATITY)
   - F. BACKING MATERIAL: NONE REQUIRED
   - G. SHIELDING GAS: NONE REQUIRED
   - H. BACKUP GAS: NONE REQUIRED
3. PREHEAT: NO PREHEAT IS REQUIRED FOR BASE METAL THICKNESS UP TO AND INCLUDING 1", EXCEPT FOR THE FOLLOWING:
   - A. AS AN AID IN REMOVING MOISTURE
   - B. IF BASE METAL THICKNESS EXCEEDS 1", A 150 DEGREE (F) PREHEAT WITHIN INCHES OF THE WELD LOCATION SHALL BE EMPLOYED.
4. WELDING POSITIONS: VERTICAL, HORIZONTAL, OVERHEAD, AND DOWN FLAT.
5. TECHNIQUE: STRINGER BEAD TECHNIQUES SHALL BE PREFERRED FOR VERTICAL UP AND OVERHEAD POSITIONS, THE SMALLEST POSSIBLE WEAVE SHALL BE USED.
6. GENERAL WELDING TECHNIQUE:

OPERATION DESRIPTION	BEAD LAYERS	WELD PROC.	ELECTRODE SIZE	CURRENT TYPE (AMPS)	VOLTAGE (VOLTS)
STRINGER	AS REQ.D	SMA	3/32" E7018	90-100	19-21
BEADS		1/8"	130-160 20-22		
		5/32"	150-190 21-23		
		3/16"	220-260 22-24		

* FOR VERTICAL UP AND OVERHEAD POSITIONS, THE SMALLEST POSSIBLE WEAVE SHALL BE USED.

7. GENERAL WELDING PROCEDURE SPECIFICATION FOR LOW-HYDROGEN SMAW PROCESS:

7.1 PREPARATION OF BASE METAL: THE EDGES OR SURFACES OF THE WORK TO BE WELDED SHALL BE PREPARED BY FLAME CUTTING, PLASMA ARC CUTTING, ARC GOUGING, MACHINING, SHEARING, GRINDING, OR CHIPPING AND SHALL BE CLEANED OF ALL OIL AND GREASE AND EXCESSIVE AMOUNTS OF SCALE OR RUST PRIOR TO WELDING. MOISTURE SHALL BE REMOVED FROM THE WELD AREA BEFORE WELDING.

7.2 APPEARANCE OF WELDING LAYERS: THE WELDING CURRENT AND MANNER OF DEPOSITING THE WELD METAL SHALL BE SUCH THAT THERE WILL BE PRACTICALLY NO UNDERCUTTING (LESS THAN 1/64") ON THE FINISHED WORK.

7.3 CLEANING OF WELDS: PNEUMATIC OR OTHER MECHANICAL TOOLS MAY BE USED AS AN AID TO CLEAN SLAB OR FLUX FROM THE WELD. SUCH MECHANICAL CLEANING IS NOT CONSIDERED PEENING. ALL SLAG AND FLUX REMAINING ON ANY WELD BEAD SHALL BE REMOVED BEFORE LAYING DOWN THE NEXT SUCCESSIVE WELD BEAD. ALL COMPLETED WELDS SHALL HAVE THE WELD SPATTER REMOVED AND WELDS NOT GROUND SHALL BE WIREBRUSHED.

7.4 DEFECTS: ALL DEFECTS THAT APPEAR ON THE SURFACE OF ANY WELD BEAD SHALL BE REMOVED BY CHIPPING, GRINDING, OR ARCH GOUGING, REPAIRED AND THEN GIVEN AN EXAMINATION. SHOULD THE DEFECT APPEAR BEFORE DEPOSITING A SUCCESSIVE WELD BEAD OR BEFORE IT IS COVERED BY SUBSEQUENT WELDING, IT SHALL BE REMOVED AS INDICATED ABOVE, REPAIRED AND RE-EXAMINED BEFORE ANY SUBSEQUENT WELDING IS DONE. WELDING SHALL BE INSPECTED PER THE REQUIREMENTS OF THE AWS D1.1, STANDARD WELDING CODE, AS WELL AS THE ACCEPTABLE CRITERIA PRESENTED IN THAT CODE (AT A MINIMUM).

7.5 WELDING ELECTRODES: E7018 WELDING ELECTRODES CAN NORMALLY BE USED DIRECTLY OUT OF NEWLY OPENED, UNDAMAGED HERMETICALLY SEALED CANS. THE USE OF ATOM ARC 7018 IS STRONGLY ENCOURAGED. STORE THE ELECTRODES IN A DRY PLACE, PREFERABLY ON CRIBBING AND A FEW INCHES AWAY FROM ANY WALLS TO ALLOW FREE CIRCULATION OF AIR UNDER AND AROUND THE STACK OF ELECTRODES. DO NOT OPEN MORE CANS THAN NEEDED FOR A TYPICAL 10-HOUR SHIFT. ELECTRODES SHOULD BE STORED IN A HEATED OVEN OR BOX AT 200-300 DEGREES (F) FOR A PERIOD OF 8 HOURS BEFORE USE. DISCARD ANY ELECTRODES THAT HAVE BECOME WET BY CONTACT WITH WATER IN LIQUID FORM OR WHICH HAVE BEEN EXPOSED TO CONDITIONS OF HIGH HUMIDITY FOR A LONG PERIOD OF TIME. BAKE ANY ELECTRODES FROM CANS THAT HAVE BEEN DAMAGED OR BROKEN OPEN DURING SHIPMENT AT 300-350 DEGREES (F) FOR A PERIOD OF 12 HOURS BEFORE USE.

7.6 WELDING PROCEDURE AND PERFORMANCE QUALIFICATIONS: WELDING PROCEDURE AND PERFORMANCE QUALIFICATIONS SHALL BE IN ACCORDANCE WITH THE AWS D1.1, STRUCTURAL WELDING CODE. PERFORMANCE QUALIFICATIONS SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW.

7.7 WEATHER CONDITIONS: WELDING SHALL NOT BE PERFORMED WHEN THE SURFACES TO BE WELDED ARE WET FROM RAIN, SNOW, OR ICE IN THE WELDING AREA, NOR IN PERIODS OF HIGH WIND, UNLESS THE WELDER AND THE WORK ARE PROPERLY PROTECTED. NO WELDING SHALL BE PERFORMED WHEN THE AMBIENT TEMPERATURE IS BELOW 0 DEGREES (F).

STEEL OPEN WEB JOISTS AND JOIST GIRDERS

1. STEEL OPEN WEB JOISTS AND JOIST GIRDERS SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH LATEST STEEL JOIST INSTITUTE (SJI) SPECIFICATIONS.
2. MANUFACTURERS SHALL BE MEMBERS OF THE STEEL JOIST INSTITUTE (SJI).
3. WHERE NOTED, JOISTS AND JOIST GIRDERS SHALL BE DESIGNED FOR ADDITIONAL DISTRIBUTED LOADS, CONCENTRATED LOADS AND MOMENTS AS INDICATED.
4. ALL ROOF JOIST AND JOIST GIRDERS EXPOSED TO A WORK FLOOR SHALL BE DESIGNED FOR A SINGLE PANEL POINT LOAD ON THE LOWER CHORD IN ADDITION TO THE SPECIFIED LOADS AS FOLLOWS:
   OVER MANUFACTURING, STORAGE WAREHOUSES AND REPAIR GARAGES 2,000 LBS
   ALL OTHER OCCUPANCIES 300 LBS
5. CONTRACTOR SHALL MODIFY JOIST AND JOIST GIRDER SEATS WHERE INDICATED AND AS REQUIRED FOR END REACTIONS AND MOMENTS NOTED.
6. MINIMUM JOISTS BEARING ON A CMU WALL SHALL BE AS FOLLOWS (MEASURED FROM THE FACE OF THE WALL) UNLESS NOTED OTHERWISE:
   6" AT AN 8" WALL
   8" AT A 12" WALL
7. CONTRACTOR SHALL PROVIDE TOP CHORD EXTENSIONS AS SHOWN ON STRUCTURAL OR ARCHITECTURAL DRAWINGS.
8. CONTRACTOR SHALL PROVIDE BOTTOM CHORDS EXTENSIONS AT ALL COLUMNS AND EXTERIOR SPANDRELS AS NOTED. WHERE MOMENT CONNECTIONS ARE INDICATED ON DRAWINGS CONNECT BOTTOM CHORD AFTER DEAD LOAD IS APPLIED. SIZE CONNECTION FOR LOADS INDICATED.
9. CONTRACTOR SHALL PROVIDE CONNECTIONS FOR ADDITIONAL MEMBERS AND BRACING SHOWN WITHIN THE JOIST DEPTH.
10. CONTRACTOR SHALL PROVIDE BRIDGING MEETING THE MINIMUM REQUIREMENTS OF SJI, INCLUDING WIND UPLIFT CONSIDERATIONS, UNLESS DETAILED OTHERWISE. (PROVIDE BRIDGING AT FIRST INTERIOR PANEL POINT FROM SUPPORT FOR WIND UPLIFT.) HORIZONTAL BRIDGING SHALL BE CONTINUOUS TOP AND BOTTOM, ANCHORED AT EACH END, AND WELDED TO EACH JOIST. DIAGONAL BRIDGING SHALL BE BOLTED TO EACH JOIST AND CLAMPED AT THE INTERSECTION.
11. JOIST BRIDGING IN FIRST JOIST SPACE ADJACENT TO MASONRY WALLS AND SHORTER SPAN STEEL WIDE FLANGE BEAMS SHALL BE HORIZONTAL, NOT DIAGONAL BRIDGING.
12. JOISTS AND JOIST GIRDERS SHALL BE CAMBERED FOR DEFLECTION DUE TO DEAD LOADS OR AS SPECIFICALLY NOTED ON PLAN.
13. LIVE LOAD DEFLECTION SHALL NOT EXCEED SPAN/360 FOR JOISTS, SPECIAL JOISTS AND JOIST GIRDERS.
14. JOIST AND JOIST GIRDERS SHALL BE CONNECTED TO SUPPORT IN ACCORDANCE WITH SJI MINIMUM REQUIREMENTS, OR AS REQUIRED TO RESIST LOADS SHOWN ON THE DRAWINGS.
15. STAGGER JOISTS AS REQUIRED TO ACHIEVE MINIMUM BEARING LENGTH PER SJI.
16. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS WITH ERECTION PLANS, DETAILS AND LOADING DIAGRAMS FOR SPECIAL JOISTS AND JOIST GIRDERS AND CAMBER FOR REVIEW BY STRUCTURAL ENGINEER. SHOP DRAWINGS SHALL BE SEALED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE THE PROJECT. PROVIDE SEALED DESIGN CALCULATIONS FOR ALL SPECIAL JOISTS AND JOIST GIRDERS FOR REVIEW BY STRUCTURAL ENGINEER.
   JOISTS AND JOIST GIRDERS SHALL RECEIVE ONE COAT OF SHOP PRIMER PAINT EXCEPT THOSE RECEIVING FIREPROOFING. REFER TO ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS.

STEEL DECK

1. STEEL DECKS SHALL BE AS NOTED ON DRAWINGS, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST STEEL DECK INSTITUTE (SDI) SPECIFICATIONS.
2. MANUFACTURER SHALL BE A MEMBER OF THE STEEL DECK INSTITUTE (SDI).
3. STEEL DECK SHALL HAVE GALVANIZED COATING CONFORMING TO ASTM A653, COATING DESIGNATION G90 FOR ROOF DECK AND G60 FOR FLOOR DECK. TOUCH-UP PAINT GALVANIZED SURFACES WITH ZINC RICH PAINT AFTER CUTTING AND WELDING. CLEAN AS REQUIRED TO RECEIVE FIREPROOFING. REFER TO ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS.
4. STEEL FLOOR DECK SHALL HAVE WIDE RIB SUITABLE FOR SHEAR STUD PLACEMENT WHERE STUDS ARE REQUIRED. STEEL FLOOR DECK CONFIGURATION SHALL BE RIB WIDTH/RIB HEIGHT (WR/HR) > 1.5 TO DEVELOP THE FULL SHEAR VALUE OF THE STUD FOR THE WEIGHTS OF THE CONCRETE AS LISTED IN THE AISC 360-10 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, CHAPTER 1. PROVIDE 40% ADDITIONAL STUDS PER BEAM LENGTH IF THE DECK CONFIGURATION IS WR/HR < 1.5.
5. DESIGN OF FLOOR DECK AS A FORM SHALL CONFORM TO THE REQUIREMENTS OF SDI SPECIFICATIONS AND COMMENTARY FOR COMPOSITE STEEL FLOOR DECK, EXCEPT THAT CALCULATED THEORETICAL DEFLECTIONS AS DEFINED UNDER PARAGRAPH 3.3 SHALL NOT EXCEED SPAN/240 OR 1/2", WHICHEVER IS SMALLER.
6. CONTRACTOR SHALL PROVIDE ENGINEERING CALCULATIONS OR PUBLISHED MANUFACTURER'S DATA AND INDEPENDENTLY CERTIFIED TEST DATA VERIFYING THE SPECIFIED DECK REQUIREMENTS. PROVIDE ENGINEERED AND CHECKED SHOP DRAWINGS INDICATING LOCATION, GAGE AND SIZE OF EACH PIECE OF DECKING. ERECTION DRAWINGS SHALL CLEARLY SHOW DETAILS, SIZE AND SPACING OF CONNECTIONS TO STRUCTURAL FRAMING AND SIDE LAPS.
7. STEEL DECK SHALL BE CONTINUOUS OVER 3 SPANS IN THE DIRECTION INDICATED. SINGLE AND DOUBLE SPANS, IF REQUIRED, SHALL SATISFY LOAD AND DEFLECTION REQUIREMENTS.
8. CONTRACTOR SHALL PROVIDE ACCESSORIES INCLUDING CLOSURES, "Z" CLOSURES, COLUMN CLOSURES, SCREED ANGLES AND GIRDER FILLERS, AS REQUIRED TO CONTAIN THE SLAB CONCRETE AND AS REQUIRED TO ADEQUATELY SUPPORT THE STEEL DECK ALL SIDES ON THE STEEL FRAMING.
9. STEEL DECKING SHALL BE WELDED AS SHOWN OR MINIMUM AT MAXIMUM 12" ON CENTER TO THE SUPPORTING STEEL WITH 5/8" DIAMETER PUDDLE WELDS UNLESS OTHERWISE NOTED. WELD ROOF DECK AT MAXIMUM 6" ON CENTER TO PERIMETER, MOMENT FRAME AND BRACED FRAME STEEL MEMBERS. SIDE LAPS SHALL BE FASTENED AT MAXIMUM 30" ON CENTER.
10. STEEL DECKING SHALL BE WELDED TO STRUCTURAL STEEL BY QUALIFIED WELDERS USING PRE-QUALIFIED PROCEDURES. ESTABLISH A WELDING PROCEDURE FOR THE PLUG WELD OF THE STEEL DECKING TO THE STRUCTURAL STEEL FOR THE PARTICULAR GAGE USED. PRIOR TO THE START OF ERECTION OF THE STEEL DECK, EACH WELDER SHALL BE QUALIFIED ACCORDING TO AWS REQUIREMENTS.
11. NO LOAD SHALL BE PERMITTED TO BE HUNG FROM ANY ROOF DECK. MECHANICAL PIPING OVER 2 ½ INCHES IN DIAMETER SHALL NOT BE HUNG FROM FLOOR DECK. HANGERS FOR CEILINGS, DUCTWORK, ELECTRICAL CONDUIT, PIPING, ETC. SHALL BE DIRECTLY FROM STRUCTURAL STEEL WORK OR SUPPLEMENTARY MEMBERS.

EXISTING STEEL CLEANING

1. FOLLOW SPECIFICATIONS, SECTION 05120, FOR EXISTING STEEL SURFACE CLEANING AND PROTECTIVE COATINGS, EXCEPT SP6-COMMERCIAL BLAST CLEANING SHALL BE USED FOR ANY ARCHITECTURALLY EXPOSED STRUCTURAL STEEL.

EXISTING CONSTRUCTION

1. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS.
2. EXISTING BUILDING DIMENSIONS AND CONDITIONS SHOWN ARE BASED UPON ORIGINAL DRAWINGS OR PARTIAL SURVEY AND HAVE NOT BEEN COMPLETELY FIELD VERIFIED. THE OWNER AND ARCHITECT/STRUCTURAL ENGINEER TAKE NO RESPONSIBILITY FOR THE ACCURACY OF EXISTING DIMENSIONS SHOWN. CONTRACTOR SHALL FIELD MEASURE EXISTING DIMENSIONS PRIOR TO SHOP DRAWING PREPARATION AND FABRICATION.
3. THE ANALYSIS OF THE EXISTING STRUCTURE IS BASED UPON INFORMATION SHOWN ON ORIGINAL DRAWINGS BY __________ ARCHITECTS DATED __________, PROVIDED BY ________________.
4. CONTRACTOR SHALL VERIFY CONDITIONS COVERING OR AFFECTING THE STRUCTURAL WORK; OBTAIN AND VERIFY ALL DIMENSIONS AND ELEVATIONS TO ENSURE THE PROPER STRENGTH, FIT AND LOCATION OF THE STRUCTURAL WORK; REPORT TO THE ARCHITECT/STRUCTURAL ENGINEER ANY AND ALL CONDITIONS/DISCREPANCIES WHICH MAY INTERFERE WITH OR OTHERWISE AFFECT OR PREVENT THE PROPER EXECUTION AND COMPLETION OF THE NEW WORK IN COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS. ALL DISCREPANCIES SHALL BE FULLY RESOLVED PRIOR TO COMMENCING WORK.
5. EXISTING CONSTRUCTION NOT UNDERGOING ALTERATION IS TO REMAIN UNDISTURBED. WHERE SUCH CONSTRUCTION IS DISTURBED AS A RESULT OF THE OPERATIONS OF THIS CONTRACT, CONTRACTOR SHALL REPAIR OR REPLACE AS REQUIRED AND TO THE SATISFACTION OF THE ARCHITECT/STRUCTURAL ENGINEER AND OWNER'S REPRESENTATIVE.
6. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND ELEVATION OF EXISTING UTILITIES, SEWERS, DRAINS, ETC. IN DEMOLITION AREAS BEFORE PROCEEDING WITH THE WORK. ALL DISCREPANCIES SHALL BE DOCUMENTED AND REPORTED TO THE ARCHITECT/STRUCTURAL ENGINEER AND OWNER'S REPRESENTATIVE FOR RESOLUTION.
7. SHOULD UNCHARTED PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONTRACTOR SHALL CONSULT THE ARCHITECT/STRUCTURAL ENGINEER AND OWNER'S REPRESENTATIVE FOR RESOLUTION.
8. CONTRACTOR SHALL PROVIDE FIRE WATCH DURING FIELD CUTTING AND WELDING OPERATIONS, MEETING THE OWNER'S REQUIREMENTS.
9. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION OF EXISTING EQUIPMENT DURING EXECUTION OF WORK, SATISFYING THE OWNER'S REQUIREMENTS.
10. CONTRACTOR SHALL PROVIDE TEMPORARY PROTECTION TO PREVENT DAMAGE FROM THE WEATHER AND VANDALISM.
11. CONTRACTOR SHALL COORDINATE WORK WITH THE OWNER'S PERSONNEL TO AVOID ANY INTERFERENCE IN THEIR OPERATIONS.
12. REFER TO SHORING AND BRACING NOTES FOR ADDITIONAL REQUIREMENTS.

STRUCTURAL STEEL

1. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS AND THE STEEL CONSTRUCTION MANUAL, LOAD AND RESISTANCE FACTOR DESIGN LRFD.
2. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS AND MINIMUM YIELD STRENGTH:

W SHAPES	A572 GR. 50	FY = 50 KSI
MISCELLANEOUS SHAPES AND PLATES	A36	FY = 36 KSI
SQUARE TUBES	A500 GRADE B	FY = 46 KSI

3. ANCHOR RODS SHALL CONFORM TO ASTM F1554 GRADE 36, UNLESS NOTED GRADE 55 OR OTHER ON DRAWINGS.
4. STRUCTURAL STEEL BOLTING SHALL BE ASTM A325 TYPE N, 3/4" DIAMETER SNUG TIGHT EXCEPT WHERE OTHER SIZE, ASTM A490 N, PRE-TENSIONED OR SLIP-CRITICAL TYPE BOLTS ARE INDICATED.
5. SHEAR CONNECTORS SHALL CONFORM TO THE REQUIREMENTS OF "STRUCTURAL WELDING CODE - STEEL" OF THE AMERICAN WELDING SOCIETY, ANSI/AWS D1.1, FU = 65 KSI, AS MANUFACTURED BY NELSON STUD WELDING, DIV. OF TRW, OR APPROVED SUBSTITUTE, AND WELDED AS PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
6. WELDING SHALL BE DONE WITH APPROPRIATE E70 SERIES ELECTRODES COMPATIBLE WITH THE NEW AND EXISTING STEEL. WELDS AND WELDING PROCEDURES SHALL CONFORM TO, AND WELDERS SHALL BE QUALIFIED IN ACCORDANCE WITH, THE "STRUCTURAL WELDING CODE - STEEL" OF THE AMERICAN WELDING SOCIETY, ANSI/AWS D1.1.
7. DETAILING SHALL BE PERFORMED USING RATIONAL ENGINEERING DESIGN AND STANDARD PRACTICE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE TYPICAL DETAILS SHOWN ARE APPROXIMATE ONLY AND DO NOT INDICATE THE REQUIRED NUMBER OF BOLTS OR WELD SIZES, UNLESS SPECIFICALLY NOTED.
8. CONTRACTOR SHALL SUBMIT FOR REVIEW, TYPICAL CONNECTION DETAILS AND CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT IS BEING CONSTRUCTED FOR PROPOSED CONNECTIONS AND FOR CONNECTIONS NOT SPECIFICALLY DESIGNED AND DETAILED. FOLLOW THE DETAILS SHOWN WHERE SPECIFIC CONNECTIONS ARE DETAILED.
9. CONTRACTOR SHALL SUBMIT FOR REVIEW, ENGINEERED DRAWINGS SHOWING SHOP FABRICATION DETAILS, FIELD ASSEMBLY DETAILS AND ERECTION DIAGRAMS FOR ALL STRUCTURAL STEEL. SHOW AT MINIMUM ALL DETAILS INCLUDED IN THESE CONTRACT DOCUMENTS WITH ADDITIONAL ERECTION DETAILS AS REQUIRED TO COMPLETELY DEFINE THE INTERCONNECTION OF STRUCTURAL STEEL PIECES.
10. FABRICATOR SHALL BE AISC CERTIFIED OR HAVE AN AISC EQUIVALENT QUALITY ASSURANCE PROGRAM AS CERTIFIED BY A QUALIFIED INDEPENDENT TESTING AGENCY.
11. ANCHOR RODS, BASE PLATES AND BEARING PLATES SHALL BE LOCATED AND BUILT INTO CONNECTING WORK, PRE-SET BY TEMPLATES OR SIMILAR METHOD PRIOR TO CONCRETE PLACEMENT. PLATES SHALL BE SET IN FULL BEDS OF NON-SHRINK GROUT.
12. CONTRACTOR SHALL REFERENCE ARCHITECTURAL DRAWINGS FOR MISCELLANEOUS SHAPES AND PLATES NOT SHOWN ON STRUCTURAL DRAWINGS. THESE ITEMS SHALL BE SHOP WELDED TO THE STRUCTURAL FRAMING SECTIONS TO MINIMIZE FIELD WELDING.
13. THE LENGTH, DIMENSION AND CONNECTION DETAIL FROM NEW STRUCTURAL MEMBER TO EXISTING STRUCTURES SHALL BE FIELD VERIFIED BEFORE FABRICATION. FIELD MODIFICATIONS TO THE FABRICATED MEMBER OR CONNECTION ARE NOT ALLOWED WITHOUT PRIOR APPROVAL BY THE STRUCTURAL ENGINEER. CONTRACTOR SHALL SUBMIT SKETCHES OR SHOP DRAWINGS DETAILING PROPOSED MODIFICATIONS FOR APPROVAL.
14. NON-COMPOSITE BEAM CONNECTIONS SHALL BE CAPABLE OF SUPPORTING MINIMUM 50% OF THE MAXIMUM TOTAL UNIFORM LOAD, AISC STEEL CONSTRUCTION MANUAL, UNLESS SPECIFICALLY NOTED ON THE DRAWINGS.
15. BEAM CONNECTIONS SHALL BE STANDARD AISC APPROVED CONNECTIONS. EXTENDED SHEAR PLATE CONNECTIONS PROTRUDING FROM COLUMN WEB ONLY APPROVED WHERE BEAMS/GIRDERS ON EITHER SIDE OF COLUMN WEB HAVE EQUALLY LOADED BAYS.
16. SIMPLE SHEAR CONNECTIONS SHALL BE CAPABLE OF END ROTATION AS PER THE REQUIREMENTS OF THE AISC SPECIFICATION, SIMPLE CONNECTIONS, SPECIFICATION SECTION J1.2 AND MANUAL PART 10.
17. CONNECTIONS SHALL BE SHOP WELDED IN ACCORDANCE WITH LATEST AWS SPECIFICATIONS FOR E70XX ELECTRODES AND FIELD BOLTED WITH ASTM A325 OR ASTM A490 BOLTS.
18. CONTRACTOR SHALL INSTALL A325 AND A490 BOLTS IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS." SNUG TIGHT CONDITION SHALL BE ACHIEVED USING AN IMPACT WRENCH, TO BRING THE CONNECTED PLIES INTO FIRM CONTACT, EXCEPT WHERE NOTED AS SLIP-CRITICAL, PRE-TENSIONED OR FINGER TIGHT.
19. CONTRACTOR SHALL PROVIDE SLIP-CRITICAL CONNECTIONS AT BRACED FRAMES, MOMENT CONNECTIONS, BEAMS AND COLUMNS SUPPORTING CRANES AND EQUIPMENT, MECHANICAL PENTHOUSE AND ELEVATOR ROOM FRAMING AND WHERE BOLTS ARE IN TENSION.
20. CONTRACTOR SHALL PROVIDE 3/4" DIAMETER SHOULDER BOLTS, DOUBLE NUTS OR TACK WELDED NUTS FINGER TIGHT TO ALLOW VERTICAL MOVEMENT WITH LOCK WASHERS AT SLOTTED CONNECTIONS OF WIND COLUMNS OR AS NOTED.
21. WHERE FIELD WELDING TO EXISTING STRUCTURAL STEEL IS INDICATED, CONTRACTOR SHALL THOROUGHLY CLEAN ALL SURFACES TO RECEIVE WELD, REMOVING RUST, PAINT, DIRT AND OTHER FOREIGN MATTER IN AREA OF WORK. PROVIDE FIRE WATCH PROTECTION ACCEPTABLE TO THE OWNER.
22. BEAMS SHALL BE FABRICATED WITH THE NATURAL CAMBER UP. PROVIDE CAMBERS AS INDICATED ON THE DRAWINGS.
23. STIFFENER PLATES AND BEARING STIFFENERS ARE TO BE PROVIDED IN PAIRS.
24. CLEAN STEEL PER SSPC-SP3 AND SHALL RECEIVE ONE SHOP COAT OF PAINT. OMIT PAINT AT HOLES FOR SLIP CRITICAL TYPE CONNECTIONS, AT STRUCTURAL STEEL TO BE FIREPROOFED, ENCASED OR IN CONTACT WITH CONCRETE, AND ON TOP FLANGE OF BEAMS RECEIVING SHEAR CONNECTORS.
25. STEEL ABOVE THE ROOF AND OUTSIDE THE BUILDING ENVELOPE (EXPOSED TO WEATHER) SHALL BE CLEANED PER SSPC-SP6 AND HOT DIP GALVANIZED.
26. CONTRACTOR SHALL PROVIDE ADJUSTABLE CHANNEL SLOTS ON STEEL COLUMNS FOR MASONRY TIES AT 16" ON CENTER MAXIMUM VERTICAL SPACING AT ENDS OF ALL CMU WALLS WHICH ARE ADJACENT TO STEEL COLUMN LOCATIONS. CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH STEEL AND MASONRY CONTRACTORS.
27. CONTRACTOR SHALL CONTROL ERECTION PROCEDURES AND SEQUENCES WITH RELATION TO TEMPERATURE DIFFERENTIALS, ESPECIALLY WITH RESPECT TO STRUCTURAL STEEL FRAMING INTO CONCRETE WALLS, BEAMS OR COLUMNS.
28. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AS REQUIRED TO ENSURE STABILITY OF THE STRUCTURE UNDER FULL DESIGN LOADS UNTIL THE PERMANENT BRACING IS IN PLACE. PROVIDE NECESSARY SHORING WHERE REQUIRED DURING CONSTRUCTION.

GENERAL STRUCTURAL NOTES

1. THE STRUCTURAL NOTES ARE INTENDED TO AUGMENT THE DRAWINGS AND SPECIFICATIONS. SHOULD CONFLICTS EXIST BETWEEN THE DRAWINGS, SPECIFICATIONS AND THE STRUCTURAL NOTES, THE STRICTEST PROVISION SHALL GOVERN.
2. THE STRUCTURAL DRAWINGS FORM AN INTEGRAL PART OF CONTRACT DOCUMENTS, WHICH INCLUDE ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, CIVIL/SITE DRAWINGS AND SPECIFICATIONS. COORDINATE THE STRUCTURAL DRAWINGS WITH THE REQUIREMENTS SHOWN IN THE OTHER COMPONENTS OF THE CONTRACT DOCUMENTS.
3. TYPICAL DETAILS AND OTHER SECTIONS/DETAILS APPLY TO CONDITIONS THAT ARE SIMILAR TO THE CONDITIONS DESCRIBED IN THE SECTIONS/DETAILS, EVEN IF THEY ARE NOT SPECIFICALLY REFERENCED ON THE PLANS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS, METHODS, SEQUENCES AND PROCEDURES OF CONSTRUCTION.
5. THE STRUCTURE IS DESIGNED TO BE SELF_SUPPORTING AND STABLE AFTER IT IS FULLY COMPLETED PER REQUIREMENTS OF CONTRACT DOCUMENTS. CONTRACTOR SHALL DETERMINE ERECTION PROCEDURES AND SEQUENCE, AND ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE_DOWNS IF NECESSARY. CONTRACTOR SHALL RETAIN OWNERSHIP OF SUCH MATERIAL AFTER COMPLETION OF THE PROJECT.
6. CONSTRUCTION SHALL COMPLY FULLY WITH THE APPLICABLE PROVISIONS OF OSHA AND THE LOCAL GOVERNING CODES, CURRENT EDITION, AND ALL REQUIREMENTS SPECIFIED IN THE CODES SHALL BE ADHERED TO AS IF THEY WERE CALLED FOR OR SHOWN ON THE DRAWINGS. THIS SHALL NOT BE CONSTRUED TO MEAN THAT REQUIREMENTS SET FORTH ON THE DRAWING MAY BE MODIFIED BECAUSE THEY ARE MORE STRINGENT THAN THE CODE REQUIREMENTS OR BECAUSE THEY ARE NOT SPECIFICALLY REQUIRED BY CODE.
7. GOVERNING BUILDING CODE - MICHIGAN (INTERNATIONAL) BUILDING CODE 2015. STANDARDS LISTED IN STRUCTURAL NOTE SECTIONS REFER TO THE VERSION AND EFFECTIVE DATE IDENTIFIED IN THE REFERENCED STANDARDS CHAPTER IN THE GOVERNING BUILDING CODE.
8. WORK CONSTRUCTED PER THESE DRAWINGS SHALL BE INSPECTED BY AN INDEPENDENT TESTING AGENCY RETAINED TO ENSURE COMPLIANCE WITH THE REQUIREMENTS SHOWN ON THE DRAWINGS. SPECIAL INSPECTIONS REQUIRED BY THE GOVERNING BUILDING CODE, LOCAL BUILDING DEPARTMENT AND THE CONTRACT DOCUMENTS SHALL BE PERFORMED BY A QUALIFIED SPECIAL INSPECTOR. PROJECT SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE OR REPLACE INSPECTION.

SHOP DRAWINGS

1. SUBMIT SHOP DRAWINGS FOR REVIEW AS INDICATED IN MATERIAL SECTION OF GENERAL STRUCTURAL NOTES.
2. USE OF ENGINEERING DRAWINGS AS ERECTION DRAWINGS BY THE CONTRACTOR IS STRICTLY PROHIBITED.
3. ALLOW IN THE SCHEDULE - DETAILING, FABRICATION AND ERECTION - A MINIMUM OF 10 WORKING DAYS FOR REVIEW OF EACH SHOP DRAWING SUBMITTAL BY THE STRUCTURAL ENGINEER. SUBMIT SHOP DRAWINGS IN REASONABLE QUANTITIES AT REASONABLE INTERVALS (NOT MORE THAN 70 DRAWINGS PER SUBMITTAL PER WEEK). THE 10 WORKING DAYS STATED HEREIN, WILL BE IN ADDITION TO THE REVIEW TIME REQUIRED BY OTHER PROJECT TEAM MEMBERS. SUBMIT A SHOP DRAWING SUBMITTAL SCHEDULE PRIOR TO THE FIRST SUBMITTAL.
4. REVIEW OF SHOP DRAWINGS AND OTHER SUBMITTALS BY THE STRUCTURAL ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO CHECK THE SHOP DRAWINGS PRIOR TO SUBMITTAL. ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS NOT CONFORMING TO THE CONSTRUCTION DOCUMENTS ARE THE RESPONSIBILITY OF THE SHOP DRAWING PREPARER.
5. SHOP DRAWINGS ARE AN AID FOR FIELD PLACEMENT AND ARE SUPERSEDED BY THE CONTRACT DOCUMENTS. CONTRACTOR SHALL ENSURE THAT CONSTRUCTION IS IN ACCORDANCE WITH THE LATEST CONTRACT DOCUMENTS. SHOP DRAWING REVIEW IS ONLY FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. REVIEW OF THE SHOP DRAWINGS BY THE STRUCTURAL ENGINEER DOES NOT GUARANTEE THAT THE SHOP DRAWINGS ARE CORRECT NOR INFER THAT THE SHOP DRAWINGS SUPERSEDE THE CONTRACT DOCUMENTS.
6. CONTRACTOR SHALL PROVIDE A SET OF APPROVED SHOP DRAWINGS BEARING THE REVIEW STAMP OF THE STRUCTURAL ENGINEER, TO THE LOCAL BUILDING DEPARTMENT AND TO THE PROJECT SITE.
7. NOTES ON SUBMITTED SHOP DRAWINGS FOR WORK "BY OTHERS" CANNOT BE RESPONSIBLY APPROVED BY STRUCTURAL ENGINEER. CONTRACTOR SHALL COORDINATE RESPONSIBILITY FOR MATERIALS, CONNECTIONS, ETC. PRIOR TO SHOP DRAWING SUBMITTAL TO THE STRUCTURAL ENGINEER.
8. CONTRACTOR SHALL VERIFY ALL RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS AGAINST PURCHASED MANUFACTURER'S CERTIFIED EQUIPMENT DRAWINGS. CONTRACTOR SHALL COORDINATE DIMENSIONS THAT DEPEND UPON SPECIFIC EQUIPMENT, SUCH AS ELEVATOR OPENINGS, MECHANICAL EQUIPMENT SUPPORTS, ETC., PRIOR TO SUBMITTAL. SUCH DIMENSIONS SHALL BE PROVIDED ON THE SHOP DRAWINGS PRIOR TO SUBMITTAL TO THE STRUCTURAL ENGINEER. CONTRACTOR'S FAILURE TO PROVIDE SUCH DIMENSIONS ON SUBMITTED SHOP DRAWINGS WILL RESULT IN SHOP DRAWING RETURN WITHOUT REVIEW.

MECHANICAL & ELECTRICAL EQUIPMENT

1. PIPES OF 3 INCHES OR GREATER IN DIAMETER SHALL BE SUSPENDED FROM STEEL MEMBERS, USING PIPE HANGERS AND CLAMPS. HANGERS AND CLAMPS SHALL BE ALIGNED WITH STRUCTURAL MEMBER CENTERLINES. ONE SIDED BEAM CONNECTIONS, EXPANSION ANCHORS OR OTHER ANCHORS TO SLABS ARE NOT ALLOWED FOR PIPES OF 3 INCHES OR GREATER IN DIAMETER. SUBMIT DETAILS FOR PIPE HANGERS AND ATTACHMENTS FOR REVIEW BY ARCHITECT/STRUCTURAL ENGINEER.
2. MECHANICAL AND ELECTRICAL EQUIPMENT WEIGHTS ASSUMED FOR STRUCTURAL DESIGN ARE SHOWN ON THE PLANS. IF THE EQUIPMENT WEIGHT VARIES FROM THAT LISTED, CONSULT WITH THE ARCHITECT/STRUCTURAL ENGINEER PRIOR TO STEEL SHOP DRAWING SUBMITTAL.

SHORING AND BRACING

1. CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AND BRACING OF EXISTING CONSTRUCTION, NEW CONSTRUCTION, AND UNDERGROUND UTILITIES AS FOLLOWS:
   - A. WHERE SHOWN OR NOTED ON THE DRAWINGS.
   - B. WHERE EXISTING CONSTRUCTION IS TO BE ALTERED OR DISTURBED UNTIL PERMANENT SUPPORT IS IN PLACE.
   - C. WHERE EXISTING CONSTRUCTION IS NOT UNDERGOING ALTERATION AND IS TO REMAIN UNDISTURBED BUT IS DISTURBED AS A RESULT OF THE WORK OF THIS CONTRACT.
   - D. AS REQUIRED FOR SAFE ERECTION, INSTALLATION OF NEW CONSTRUCTION, EQUIPMENT, ETC.
   - E. WHEN NEEDED FOR CONTRACTOR'S "MEANS AND METHODS" OF CONSTRUCTION AND OTHER SAFETY RELATED ISSUES.
2. SHORING AND BRACING SHOWN ON THE DRAWINGS IS CONCEPTUAL. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS, SHORING AND BRACING CALCULATIONS, METHODS OF INSTALLATION, TRANSFER OF LOADS THROUGH TO FINAL LOAD SUPPORT, AND WORK SEQUENCE PHASING WITH NEW CONSTRUCTION.
3. SHORING AND BRACING SHALL BE PERFORMED BY A CONTRACTOR WITH MINIMUM 5 YEARS DEMONSTRATED EXPERIENCE IN SIMILAR SIZE AND SCOPE OF SHORING AND BRACING PROJECTS.
4. SHORING AND BRACING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT WITH MINIMUM 5 YEARS DEMONSTRATED EXPERIENCE IN SIMILAR SIZE AND SCOPE OF SHORING AND BRACING PROJECTS. DESIGN LOADS AND METHODS SHALL CONFORM TO APPLICABLE CODES. SOIL AND MATERIAL STRENGTHS SHALL BE VERIFIED BY TESTS, UNLESS CONSERVATIVE ESTIMATES THAT DO NOT AFFECT DEFLECTIONS AND DEFORMATIONS ARE APPROVED BY THE ARCHITECT/STRUCTURAL ENGINEER.
5. CONTRACTOR SHALL SUBMIT DRAWINGS AND CALCULATIONS SEALED AND SIGNED BY THE CONTRACTOR'S PROFESSIONAL ENGINEER SHOWING COMPLETE DESIGN INCLUDING TEMPORARY CONDITIONS, FINAL CONDITIONS AND SEQUENCE OF WORK.
6. BEFORE STARTING WORK, CONTRACTOR SHALL PERFORM CONDITION SURVEY OF THE EXISTING BUILDING STRUCTURE, EXTERIOR FAÇADE AND INTERIOR FINISHES, INCLUDING PHOTOGRAPHIC DOCUMENTATION AND SUBMIT SURVEY TO THE OWNER FOR RECORD.
7. DURING THE SHORING AND BRACING OPERATIONS, CONTRACTOR SHALL:
   - A. KEEP THE EXISTING AND NEW CONSTRUCTION IN A SAFE CONDITION.
   - B. MONITOR EXISTING AND NEW CONSTRUCTION TO DETECT ANY SIGNS OF DISTRESS OR DEFORMATION.
   - C. TAKE IMMEDIATE STEPS TO PREVENT DISTRESS, DEFORMATION OR DAMAGE.
8. CONTRACTOR SHALL CONTINUOUSLY MONITOR THE SHORING AND BRACING SYSTEM. CONTRACTOR SHALL REVIEW AND ASCERTAIN THAT ALL FIELD CONNECTIONS ARE COMPLETED ACCORDING TO THE CONTRACTOR'S DESIGN AND ISSUE APPROVAL FOR INSPECTION OF THE WORK BY THE TESTING AGENCY.
9. AFTER COMPLETION OF SHORING AND BRACING AND COMPLETION OF WORK REQUIRING SHORING AND BRACING, CONTRACTOR SHALL REPAIR ANY DAMAGE TO THE EXISTING AND NEW CONSTRUCTION, WITHOUT ANY COST TO THE OWNER, AND TO THE SATISFACTION OF THE OWNER AND ARCHITECT/STRUCTURAL ENGINEER.

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	BIDS	09/26/18
	OWNER REVIEW	04/24/18

DESIGNER	JSR
DRAWN	EVL
CHECKED	JSR
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: AHU REVISION

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

STRUCTURAL GENERAL INFORMATION

SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO. **17-4801.00**

SHEET NO. **A-5**

DSD FILE NAME 17-4801-A-5

SYMBOL LEGEND

TWO LINE SYMBOLS	SCHEMATIC SYMBOLS	DESCRIPTION
		EXISTING TO REMAIN
		EXISTING TO BE REMOVED
		NEW WORK
		NEW CONNECTION TO EXISTING
		PIPING ELBOW
		PIPING ELBOW UP
		PIPING ELBOW DOWN
		PIPING TEE
		PIPING TEE UP
		PIPING TEE DOWN
		DIELECTRIC UNION OR FLANGE CONNECTION
		ISOLATION VALVE
		GATE VALVE
		CHECK VALVE
		BUTTERFLY VALVE
		SOLENOID VALVE
		BALL VALVE
		GLOBE VALVE
		LUBRICATED PLUG VALVE
		BALANCE VALVE
		CONTROL VALVE – 2 WAY
		CONTROL VALVE – 3 WAY
		BACKWATER VALVE
		STRAINER
		THERMOMETER
		PRESSURE GAUGE WITH BALL VALVE
		CIRCUIT SETTER
		FLOW METER
		PIPE EXPANSION LOOP
		PIPE ANCHOR
		PIPE GUIDE
		CONCRETE THRUST BLOCK
		FLOW ARROW
		FIRE DAMPER HORIZONTAL POSITION
		COMBINATION FIRE/SMOKE DAMPER HORIZONTAL POSITION
		FIRE DAMPER VERTICAL POSITION
		COMBINATION FIRE/SMOKE DAMPER VERTICAL POSITION
		MOTORIZED DEVICE
		SUPPLY AIR CEILING DIFFUSER
		RETURN AIR REGISTER OR GRILLE
		EXHAUST AIR REGISTER OR GRILLE
		FLEXIBLE DUCT
		SPIN-IN FITTING WITH VOLUME DAMPER (TO BOTTOM OF DUCT)
		SPIN-IN FITTING WITH VOLUME DAMPER (TO SIDE OF DUCT)
		CONCENTRIC REDUCER (PIPE OR DUCT)
		ECCENTRIC REDUCER (PIPE OR DUCT)
T	T	THERMOSTAT
H	H	HUMIDISTAT
S	S	TEMPERATURE CONTROL SENSOR

ABBREVIATIONS

SYMBOL	DESCRIPTION
A.A.V.	AUTOMATIC AIR VENT
ABV	ABOVE
A.F.F.	ABOVE FINISHED FLOOR
A.H.U.	AIR HANDLING UNIT
B.O.D.	BOTTOM OF DUCT
B.O.P.	BOTTOM OF PIPE
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
CHWP	CHILLED WATER PUMP
C.O.	CLEAN OUT
CONN.	CONNECTION
C.W.	COLD WATER
C.V.	CONTROL VALVE
DN	DOWN
D&T	DRIP AND TRAP
EXH.	EXHAUST
E.R.	EXHAUST REGISTER
F.D.	FLOOR DRAIN
FLR.	FLOOR
H.W.	HOT WATER
I.E.	INVERT ELEVATION
M.B.H.	THOUSAND BTU/HR (BRITISH THERMAL UNITS PER HOUR)
O.A.	OUTSIDE AIR
P.R.V.	PRESSURE REDUCING VALVE
R.A.	RETURN AIR
R.A.F.	RETURN AIR FAN
R.S.	ROOF SUMP
S.A.	SUPPLY AIR
TYP.	TYPICAL
V.T.R.	VENT THROUGH ROOF
V.D.	VOLUME DAMPER

MECHANICAL SHEET INDEX

PIPING LEGEND

SYMBOL	DESCRIPTION
CD	CONDENSATE DRAIN (GRAVITY)
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CR	CONDENSATE RETURN
F	FIRE PROTECTION
NG	NATURAL GAS
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
RC	RAINWATER CONDUCTOR
SAN	SANITARY
ST	STORM
V	VENT
– –	COLD WATER
– – –	HOT WATER
– – – –	HOT WATER RECIRCULATING

ARCHITECTURAL - MECHANICAL - ELECTRICAL COORDINATION SCHEDULE

MARK	LOCATION	HP	KW	FLA	ELECTRICAL			DISCONNECT		STARTER		REMARKS
					VOLTAGE	PHASE	SCCR	FURN.	INST.	FURN.	INST.	
AHU-1	THIRD FLOOR MECHANICAL ROOM	-	-	65	460	3	-	E	E	S	E	SUPPLIED WITH (2) VFD'S EACH SIZED FOR FAN ARRAY WITH 4 FANS AT 12.5 HP EACH
AHU-2	THIRD FLOOR MECHANICAL ROOM	-	-	65	460	3	-	E	E	S	E	SUPPLIED WITH (2) VFD'S EACH SIZED FOR FAN ARRAY WITH 4 FANS AT 12.5 HP EACH
AHU-3	THIRD FLOOR MECHANICAL ROOM	-	-	11.96	460	3	-	E	E	S	E	SUPPLIED WITH (2) VFD'S EACH SIZED FOR FAN ARRAY WITH 4 FANS AT 9.5 HP EACH
RF-1	THIRD FLOOR MECHANICAL ROOM	15	-	-	460	3	-	E	E	E	E	VFD WITH BYAPSS
RF-2	THIRD FLOOR MECHANICAL ROOM	5	-	-	460	3	-	E	E	E	E	VFD WITH BYPASS
EF-3A	ON ROOF	25	-	-	460	3	-	E	E	E	E	VFD, INTERLOCKED FOR SIMULTANEOUS OPERATION WITH EF-3B
EF-3B	ON ROOF	25	-	-	460	3	-	E	E	E	E	VFD, INTERLOCKED FOR SIMULTANEOUS OPERATION WITH EF-3A
EF-4A	ON ROOF	40	-	-	460	3	-	E	E	E	E	VFD
EF-4B	ON ROOF	40	-	-	460	3	-	E	E	E	E	VFD, STANDBY FAN FOR EF-4A
EF-17 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3	¾	-	1.6	460	3	-	E	E	E	E	-
EF-18 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3	¾	-	1.6	460	3	-	E	E	E	E	-
EF-19 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3	¾	-	1.6	460	3	-	E	E	E	E	-
EF-20 (ALTERNATE #1)	THIRD FLOOR MECHANICAL ROOM	1½	-	-	460	3	-	E	E	E	E	-

LEGEND

S = SUPPLIER (MANUFACTURER)*
M = MECHANICAL
E = ELECTRICAL
VFD = VARIABLE FREQUENCY DRIVE

AHU = AIR HANDLING UNIT
RF = RETURN FAN
EF = EXHAUST FAN
P = PUMP

* – ITEMS INDICATED AS SUPPLIER SHALL BE PROVIDED WITH THE ITEM/ EQUIPMENT OR BY THE CONTRACTOR PURCHASING THE ITEM/EQUIPMENT

OVERVIEW OF MECHANICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

MECHANICAL:

BASE BID:
1. PROJECT PHASING AS PROPOSED ON DRAWING G–1.
2. DISCONNECT, REMOVE AND REPLACE AIR HANDLING UNITS AHU–1, AHU–2 AND AHU–3 ALONG WITH ASSOCIATED STEAM HUMIDIFIERS, COILS, VFD'S AND CONTROLS. MODIFICATIONS TO LOW PRESSURE STEAM AND LOW PRESSURE CONDENSATE PIPING, VALVES AND FITTINGS ASSOCIATED WITH AIR HANDLING UNIT STEAM HEATING COILS.
3. MODIFICATIONS TO CHILLED WATER PIPING, VALVES AND FITTINGS ASSOCIATED WITH AIR HANDLING UNIT COOLING COILS.
4. MODIFICATIONS TO HEATING HOT WATER PIPING, VALVES AND FITTINGS ASSOCIATED WITH AIR HANDLING UNIT HYDRONIC HEATING COILS.
5. MODIFICATION TO CONDENSATE DRAIN PIPING, VALVES AND FITTINGS ASSOCIATED WITH AIR HANDLING UNITS.
2. DISCONNECT, REMOVE AND REPLACE RETURN AIR FANS RF–1 AND RF–2.
3. DISCONNECT, REMOVE AND REPLACE INLINE AIR EXHAUST FAN EF–3 AND ASSOCIATED EXHAUST STACK WITH PLUME STYLE EXHAUST FANS EF–3A AND EF–3B WITH BYPASS PLENUM INSTALLED ON ROOF.
4. DISCONNECT, REMOVE AND REPLACE INLINE AIR EXHAUST FANS EF–4 AND EF–4B AND ASSOCIATED BYPASS AIR INLET HOOD AND EXHAUST STACKS WITH PLUME STYLE EXHAUST FANS WITH BYPASS PLENUMS INSTALLED ON ROOF. FANS TO BE INSTALLED IN PHASES TO KEEP BUILDING OPERATIONAL.
5. MODIFICATIONS TO EXISTING FIRE SUPPRESSION SYSTEM AS REQUIRED TO INSTALL NEW AIR HANDLING UNITS, RETURN AIR FANS AND DUCTWORK IN THIRD FLOOR MECHANICAL ROOM THROUGH PROPOSED ROOF OPENINGS.

ALTERNATE #1:
1. PROVIDE EXHAUST FAN AND ASSOCIATED DUCTWORK AS REQUIRED CHANGE ANY REMAINING RETURN AIR FROM BASEMENT ROOM INTO EXHAUST

ALTERNATE #2
1. DISCONNECT BOTTLE WASH, CAGE WASH AND STERILIZER IN BASEMENT FROM BUILDING EXHAUST SYSTEM.
2. PROVIDED DEDICATED EXHAUST WITH INLINE EXHAUST FAN FOR BOTTLE WASH.
3. PROVIDED DEDICATED EXHAUST WITH INLINE EXHAUST FAN FOR CAGE WASH.
4. PROVIDED DEDICATED EXHAUST WITH INLINE EXHAUST FAN FOR STERILIZER.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2015 MICHIGAN MECHANICAL CODE

2015 MICHIGAN PLUMBING CODE

2015 INTERNATIONAL FIRE CODE (AS REFERENCED)

2015 INTERNATIONAL FUEL GAS CODE

NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)

MICHIGAN ENERGY CODE–ASHRAE 90.1–2013

2014 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2014 MICHIGAN ELECTRICAL CODE RULES, PART 8.

2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE MECHANICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

GENERAL START UP, CONTROL AND BALANCE NOTES

1. START UP – EACH NEW AND MODIFIED PIECE OF MECHANICAL EQUIPMENT SHALL RECEIVE A START UP. PACKAGED EQUIPMENT WITH MOTORS SHALL INCLUDE A FACTORY REPRESENTATIVE START UP. OTHER EQUIPMENT SHALL RECEIVE A MECHANICAL CONTRACTOR OR PLUMBING CONTRACTOR START UP (BASED ON WHO PURCHASED THE EQUIPMENT OR WHO IT WAS ASSIGNED TO). START UP REPORTS SHALL INCLUDE A FUNCTIONAL TEST OF ALL MODES OF OPERATION AND A WITNESSED REPORT OF THE VALIDATION (BY THE CONTRACTOR, WHERE PERFORMED BY THE SUPPLIER OR THE OWNER'S REPRESENTATIVE WHERE PERFORMED BY THE CONTRACTOR).
2. TEMPERATURE CONTROL CONTRACTOR (TCC) OR TEMPERATURE CONTROL WIRING CONTRACTOR SHALL PERFORM A DOCUMENTED STARTUP ON THE MECHANICAL CONTROLS. THIS SHALL VALIDATE THE START UP REPORT.
3. EACH SYSTEM SHALL BE TESTED IN EACH MODE OF OPERATION.
4. DISCHARGE AIR TEMPERATURE, PRESSURE AND OTHER SYSTEM PARAMETERS ARE TO BE RECORDED DURING TESTING.
5. TEST IS TO SIMULATE VARYING SPACE DEMAND TO PROVE THE SYSTEM CONTROLS ARE AUTOMATICALLY FUNCTIONING.
6. SYSTEM SAFETY FEATURES (FREEZE THERMOSTATS, HIGH PRESSURE, ETC.) ARE TO BE TESTED TO PROVE OPERATION.
7. TCC SHALL PROVIDE A WRITTEN REPORT FOR EACH CONTROLLED COMPONENT SHOWING TESTING AND PROPER OPERATION.
8. TEST AND BALANCE – EACH NEW OR MODIFIED SYSTEM SHALL RECEIVE A HYDRONIC AND/OR AIR TEST AND BALANCE AT THE CONCLUSION OF THE INSTALLATION (AND AS DESIGNATED OTHERWISE). THE MINIMUM BALANCE SHALL INCLUDE THE SYSTEM TOTALS OF THE MAIN EQUIPMENT DELIVERING THE AIR OR WATER (INCLUDING THE HP, BHP, MOTOR AMPS, RPM AND FLOW RATES) AS WELL AS INDIVIDUAL BALANCES OF EACH ITEM MODIFIED AS A PART OF THE PROJECT, (EACH DIFFUSER, COIL, ETC.). WHERE NEW SYSTEMS ARE PROVIDED, A FULL TEST AND BALANCE SHALL BE PROVIDED IN ACCORDANCE WITH ASHRAE HVAC APPLICATIONS HANDBOOK.

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DESIGNER	WAG
DRAWN	WAG
CHECKED	DCM
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

MECHANICAL GENERAL INFORMATION

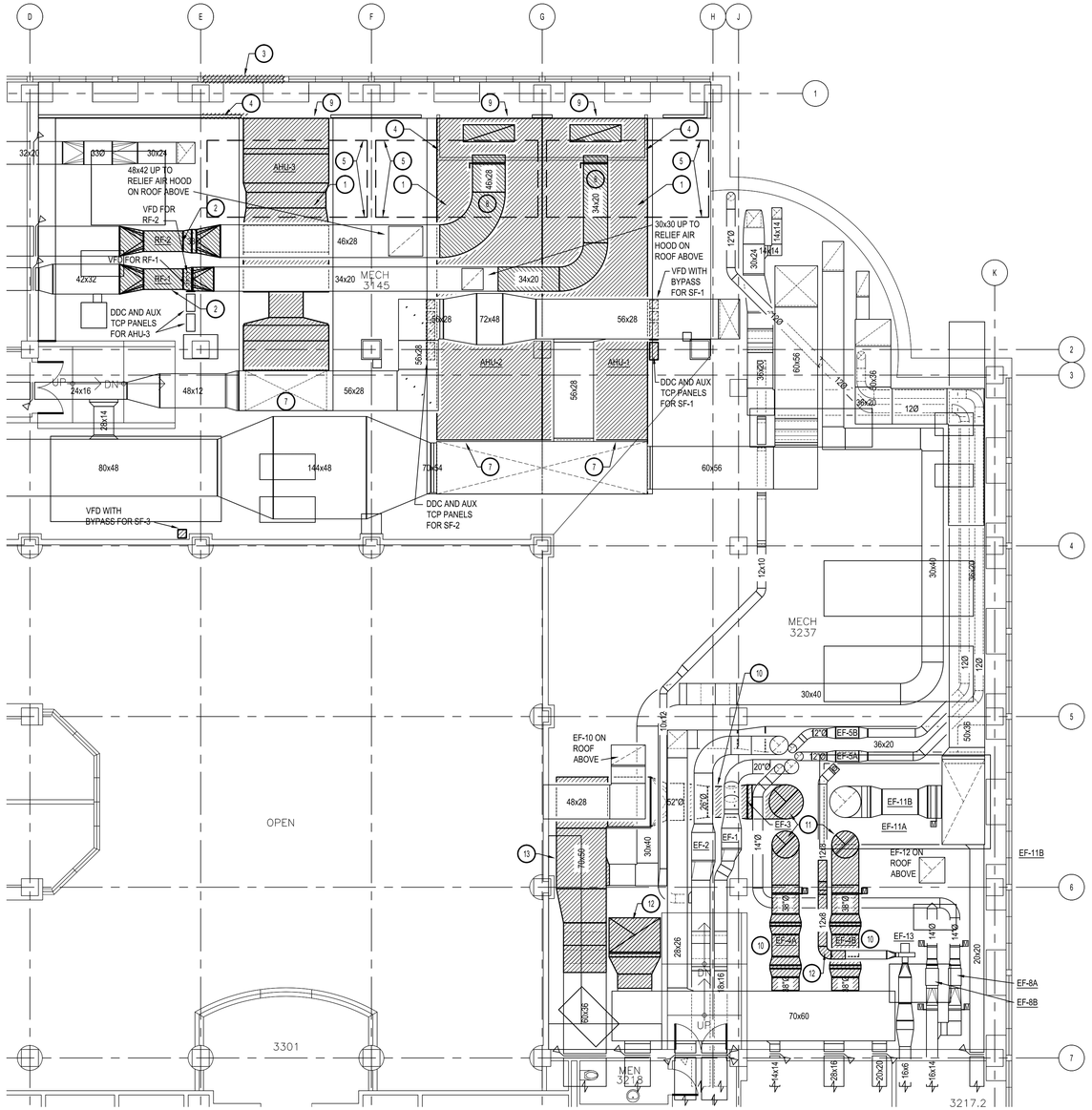
SCALE: AS NOTED

WSU PROJECT #: 629–299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-1

DSD FILE NAME
17–4801–M–1



PARTIAL THIRD FLOOR PLAN – HVAC SHEET METAL NEW WORK

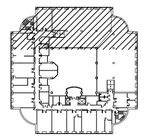
SCALE: 1/8" = 1'-0"

0 4 8 16 32

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE AIR HANDLING UNIT AND ASSOCIATED COILS, DAMPERS, FANS AND CONTROLS. SUPPLY AND RETURN AIR DUCTWORK TO REMAIN FOR REUSE.
2. DISCONNECT AND REMOVE INLINE RETURN AIR FAN AND ASSOCIATED CONTROLS.
3. DISCONNECT AND REMOVE WALL LOUVER, MOTORIZED DAMPER AND ACTUATOR ASSEMBLIES AS PART OF EXTERIOR WALL DEMOLITION. STORE ASSEMBLIES FOR FUTURE REINSTALLATION. COORDINATE WITH ARCHITECTURAL TRADES.
4. DISCONNECT REMOVE AND STORE INSULATED PANEL CONSTRUCTION AT OUTDOOR AIR PLENUM AS REQUIRED FOR INSTALLATION OF SUPPLY AIR DUCT FROM TEMPORARY AHU TO BE MOUNTED AT GRADE.
5. DISCONNECT AND REMOVE RETURN AIR PLENUM BETWEEN AHU-1 AND AHU-2 IN PHASES.
6. AREA OF ROOF OPENING REQUIRED FOR UNIT REPLACEMENT. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL TRADES.
7. DISCONNECT SUPPLY AIR DUCT CONNECTION TO AHU TO FACILITATE UNIT REPLACEMENT.
8. DISCONNECT RETURN AIR DUCT CONNECTION TO AHU TO FACILITATE UNIT REPLACEMENT.
9. DISCONNECT OUTSIDE AIR INTAKE CONNECTION AND ASSOCIATED DAMPER TO OUTSIDE AIR PLENUM TO FACILITATE AHU REPLACEMENT.
10. DISCONNECT AND REMOVE INLINE EXHAUST FAN AND ASSOCIATED DUCTWORK AND CONTROLS,
11. DISCONNECT AND REMOVE EXHAUST STACK CONNECTION UP THROUGH ROOF. COORDINATE SEALING OF THROUGH ROOF PENETRATION WITH ARCHITECTURAL TRADES.
12. DISCONNECT AND REMOVE AIR INTAKE DUCTWORK UP TO ROOF MOUNTED INTAKE HOOD. COORDINATE SEALING ON THROUGH ROOF PENETRATION WITH ARCHITECTURAL TRADES.
12. DISCONNECT AND REMOVE EXHAUST DUCTWORK AS INDICATED,



KEY PLAN
NO SCALE

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PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING

421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL THIRD FLOOR PLANS - HVAC SHEET METAL DEMOLITION

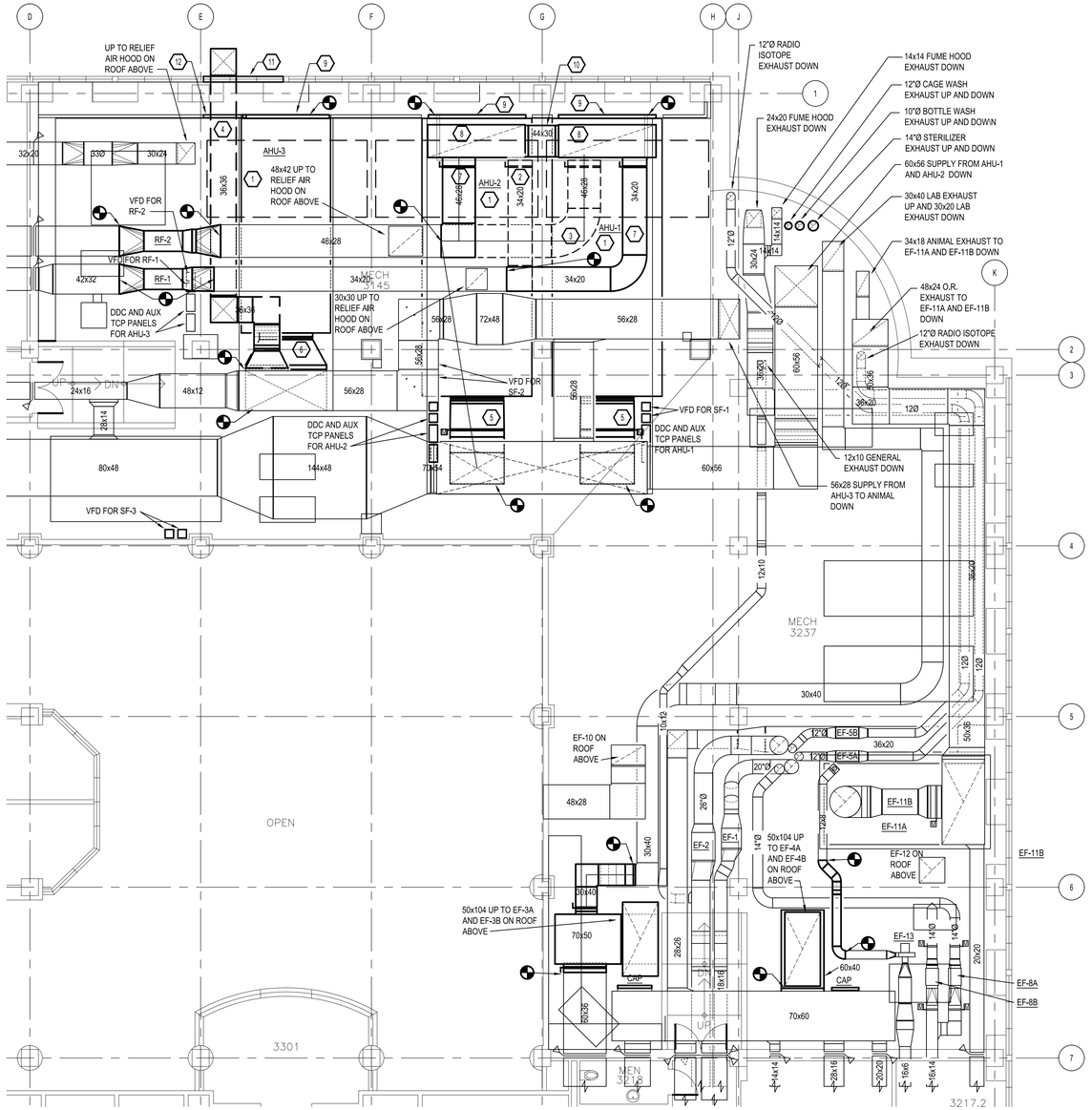
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-2

DSD FILE NAME
17-4801-M-2



PARTIAL THIRD FLOOR PLAN – HVAC SHEET METAL DEMOLTION

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

0 4 8 16 32

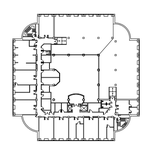
NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE NEW AIR HANDLING UNIT AND ASSOCIATED COILS, DAMPERS, FANS AND CONTROLS AS SPECIFIED. REFER TO PROPOSED CONSTRUCTION PHASING NOTES ON DRAWING G-1.
2. TEMPORARY RETURN AIR CONNECTION BETWEEN RF-1 AND AHU-2.
3. TEMPORARY RETURN AIR DUCT CONNECTION BETWEEN RF-2 AND AHU-1.
4. TEMPORARY SUPPLY AIR DUCT CONNECTION FROM GRADE MOUNTED AHU TO AHU-3 SUPPLY AIR DISTRIBUTION SYSTEM.
5. CONNECT AND EXTEND SUPPLY AIR DISCHARGE FROM AHU AND RECONNECT WITH EXISTING AIR DISTRIBUTION SYSTEM. PROVIDE MOTORIZED ISOLATION DAMPER IN DUCT TO PREVENT BACKDRAFTS WHEN AHU-1 IS OFFLINE.
6. CONNECT AND EXTEND SUPPLY AIR DISCHARGE WITH EXISTING AIR DISTRIBUTION SYSTEM.
7. RECONNECT AND EXTEND RETURN AIR DUCTWORK FROM RETURN FAN TO AHU
8. EXTEND RETURN AIR DUCTWORK FROM AHU UP HIGH NEAR CEILING TO ACCOMMODATE TEMPORARY AND FINAL RETURN AIR DUCT CONNECTIONS..
9. CONNECT INTAKE AIR OPENING FROM NEW AHU TO EXISTING OUTDOOR AIR PLENUM.
10. COORDINATE WITH ARCHITECTURAL TRADES FOR REINSTALLATION OF EXISTING WALL LOUVER AND ASSOCIATED MOTORIZED DAMPER. RECONNECT DAMPER CONTROLS.
11. COORDINATE REINSTALLATION OF AIR PLENUM INSULATED WALL PANELS WITH ARCHITECTURAL TRADES

GENERAL NEW WORK NOTES:

1. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
2. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
3. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH, TRADES. COORDINATE AS REQUIRED.
4. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH. TRADES, COORDINATE AS REQUIRED.
5. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND WALL OPENINGS REQUIRED FOR THE DEMOLITION, PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH. TRADES.
6. ALL AREAS OF WORK SHALL BE AIR/WATER BALANCED AFTER CONSTRUCTION.
7. EXISTING FIRE DAMPERS ARE INDICATED FROM OWNER'S AS BUILT DOCUMENTATION. THE MECHANICAL CONTRACTOR SHALL TEST EACH FD, AND REPLACE NON-WORKING DAMPERS, (ASSUME 25% WILL REQUIRE REPLACEMENT).
8. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.
9. CONTRACTOR SHALL COORDINATE BETWEEN NEW WORK AND DEMOLITION DRAWINGS.
10. DUCTS ARE TO BE SIZED AT 0.08"/100' PRESSURE DROP.



KEY PLAN
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	OWNER REVIEW	02/21/18

DESIGNER	WAG
DRAWN	WAG
CHECKED	DCM
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING

421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL THIRD FLOOR PLANS - HVAC SHEET METAL NEW WORK

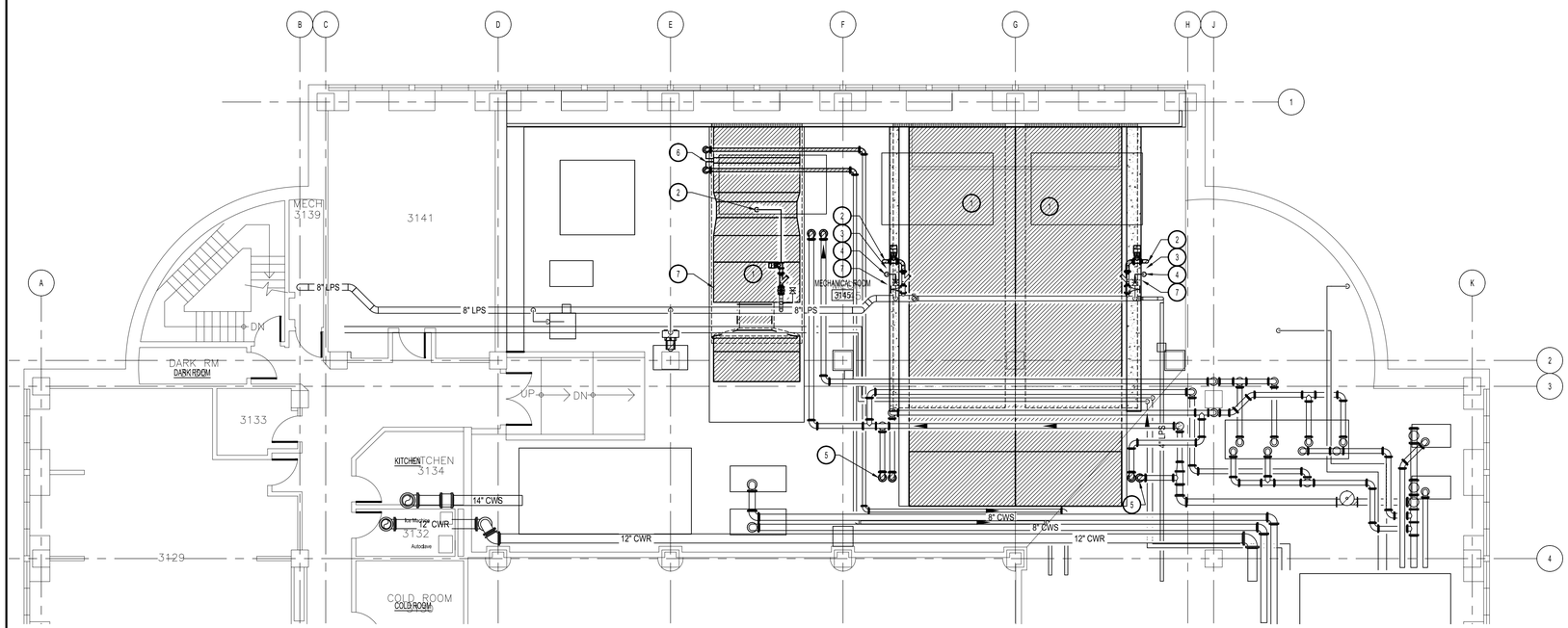
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-3

DSD FILE NAME
17-4801-M-3



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PARTIAL THIRD FLOOR PLAN – HVAC PIPING DEMOLTION

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

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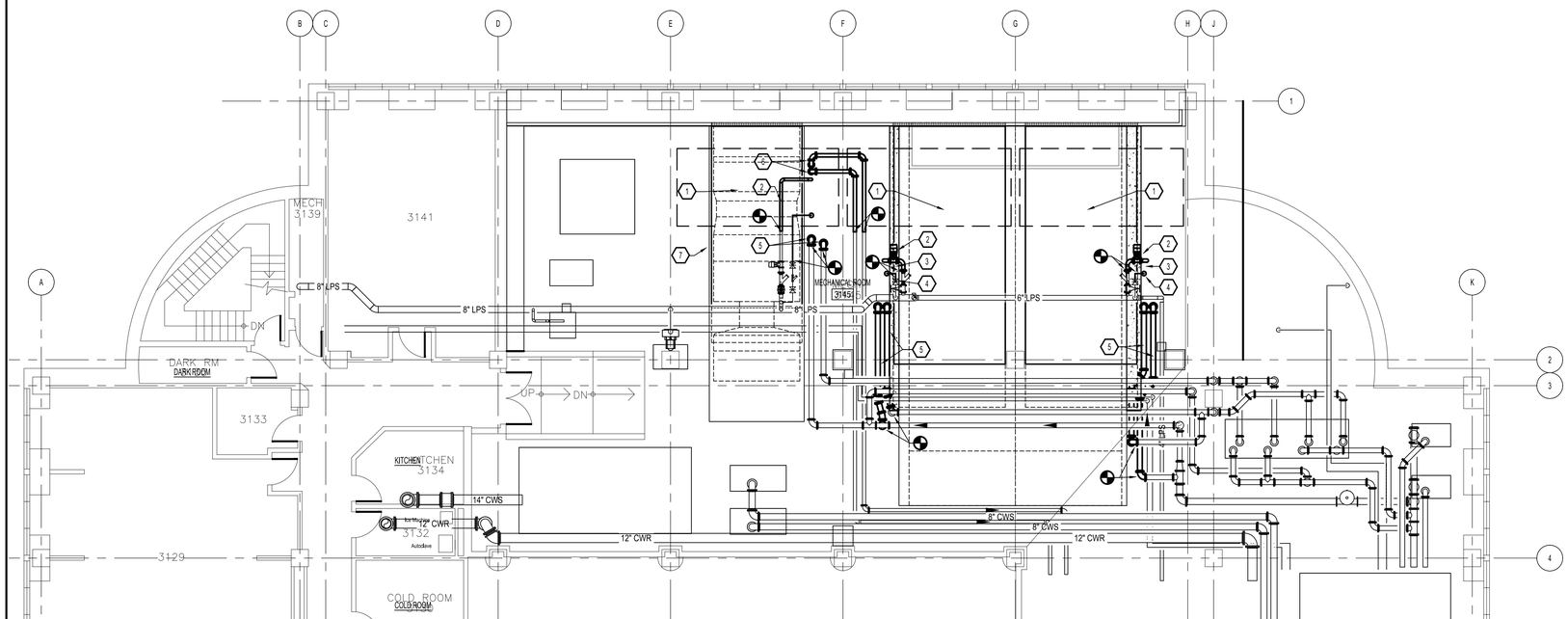

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PARTIAL THIRD FLOOR PLAN – HVAC PIPING NEW WORK

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

0 4 8 16 32

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE AIR HANDLING UNIT AND ASSOCIATED COILS, DAMPERS, FANS AND CONTROLS. LPS AND LPC PIPING TO REMAIN FOR REUSE. REFER TO PROPOSED CONSTRUCTION PHASING NOTES ON DRAWING G-1.
2. DISCONNECT AND REMOVE STEAM HEATING COIL AND ASSOCIATED LPS PIPING, VALVES AND FITTINGS FROM COIL CONNECTION BACK TO LPS 4" ISOLATION VALVE.
3. DISCONNECT AND REMOVE LPC PIPING FROM HEATING COIL AND HUMIDIFIER CONNECTIONS BACK TO THROUGH FLOOR PENETRATION.
4. DISCONNECT AND REMOVE HUMIDIFIER AND ASSOCIATED PIPING, FITTINGS AND VALVES BACK TO LPS 2" ISOLATION VALVE NEAR 4" LPS BRANCH LINE AND TO LPC THROUGH FLOOR PENETRATION. FOR AHU-1 AND AHU-2 MODIFY LOCATION OF LPC THROUGH FLOOR PENETRATION AS REQUIRED TO ACCOMMODATE ENLARGED HOUSEKEEPING PAD.
5. DISCONNECT AND REMOVE CHWR AND CHWR PIPING AND FITTINGS FROM CONNECTION AT AHU TO HIGH ABOVE AHU. RECLAIM REFRIGERANT PER EPA STANDARDS.
6. DISCONNECT AND REMOVE HYDRONIC PIPING CONNECTIONS TO AHU-3 ENERGY RECOVERY COIL AS REQUIRED TO ACCOMMODATE UNIT REMOVAL AND REPLACEMENT.
7. DISCONNECT AND REMOVE DRAIN PIPING AND ASSOCIATED TRAP AND FITTINGS FROM COIL DRAIN PAN TO INDIRECT DISCHARGE AT FLOOR DRAIN. EXISTING FLOOR DRAIN TO REMAIN.

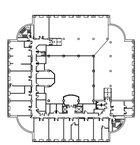
NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE NEW AIR HANDLING UNIT AND ASSOCIATED COILS, DAMPERS, FANS AND CONTROLS AS SPECIFIED. REFER TO PROPOSED CONSTRUCTION PHASING NOTES ON DRAWING G-1.
2. RECONNECT AND EXTEND 4" LPS PIPING TO AHU STEAM HEATING COIL. PROVIDE ASSOCIATED VALVES AND FITTINGS. REFER TO STEAM HEATING COIL PIPING DETAIL.
3. RECONNECT AND EXTEND LPC FROM THROUGH FLOOR PENETRATION TO AHU HEATING COIL AND HUMIDIFIER.. REFER TO STEAM HEATING COIL PIPING DETAIL AND TO HUMIDIFIER PIPING DETAIL.
4. RECONNECT AND EXTEND 2" LPS PIPING TO AHU STEAM HUMIDIFIER. PROVIDE ASSOCIATED VALVES AND FITTINGS. REFER TO STEAM HEATING COIL PIPING DETAIL.
5. RECONNECT AND EXTEND CHWS AND CHWR PIPING TO AHU CHILLED WATER COIL. PROVIDE ASSOCIATED VALVES AND FITTINGS. REFER TO CHILLED WATER COIL PIPING DETAIL.
6. RECONNECT AND EXTEND HHWS AND HHWR PIPING TO AHU HYDRONIC HOT WATER HEATING COIL. PROVIDE ASSOCIATED VALVES AND FITTINGS. REFER TO HYDRONIC HOT WATER COIL PIPING DETAIL.
7. PROVIDE DRAIN PIPING AND ASSOCIATED TRAP AND FITTINGS FROM AHU COIL DRAIN PAN TO EXISTING FLOOR DRAIN AND INDIRECTLY WASTE TO FLOOR DRAIN.

GENERAL SHEET NOTES:

1. REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
2. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
3. FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
10. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH, TRADES, COORDINATE AS REQUIRED.
11. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH, TRADES, COORDINATE AS REQUIRED.
12. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND INTERIOR WALL OPENINGS REQUIRED FOR THE DEMOLITION. PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH. TRADES.
13. ALL AREAS OF WORK SHALL BE AIR AND WATER BALANCED AFTER CONSTRUCTION.
14. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.



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KEY PLAN

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WAYNE STATE UNIVERSITY

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DESIGNER	WAG
DRAWN	JNA
CHECKED	DCM
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL THRID FLOOR PLANS - HVAC PIPING

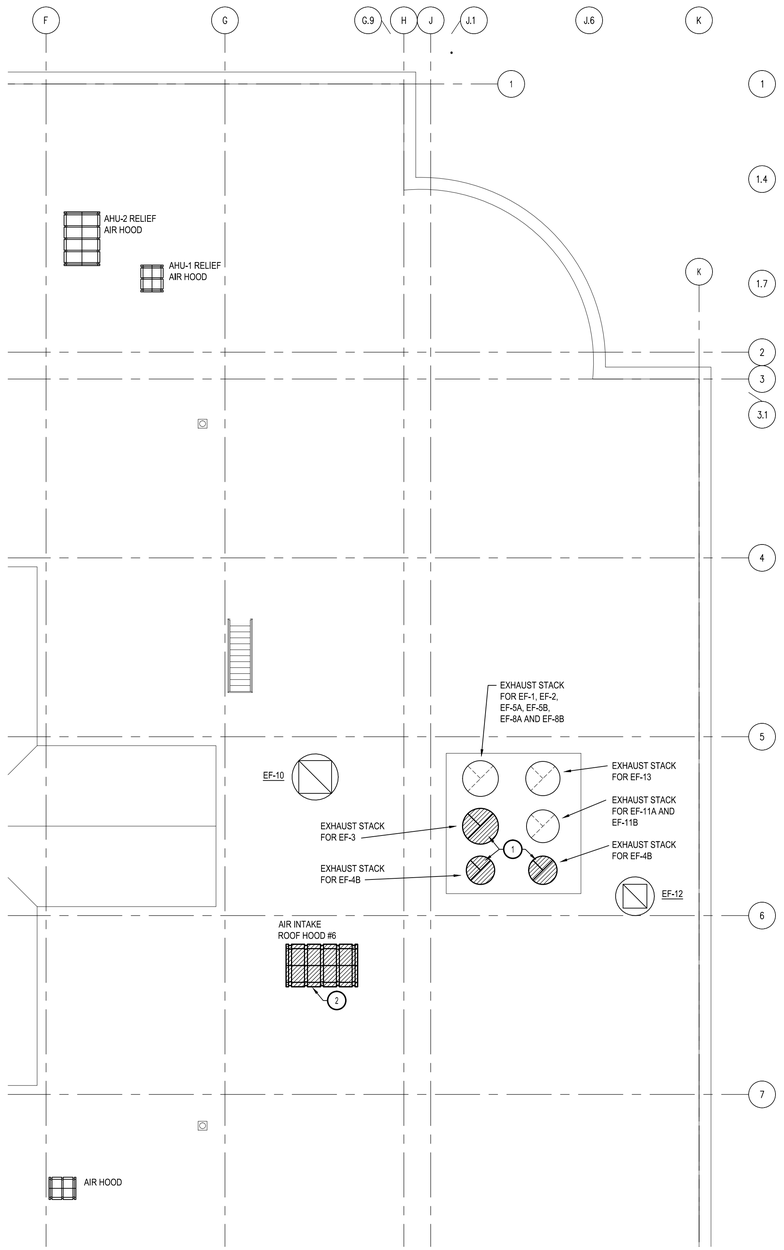
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-4

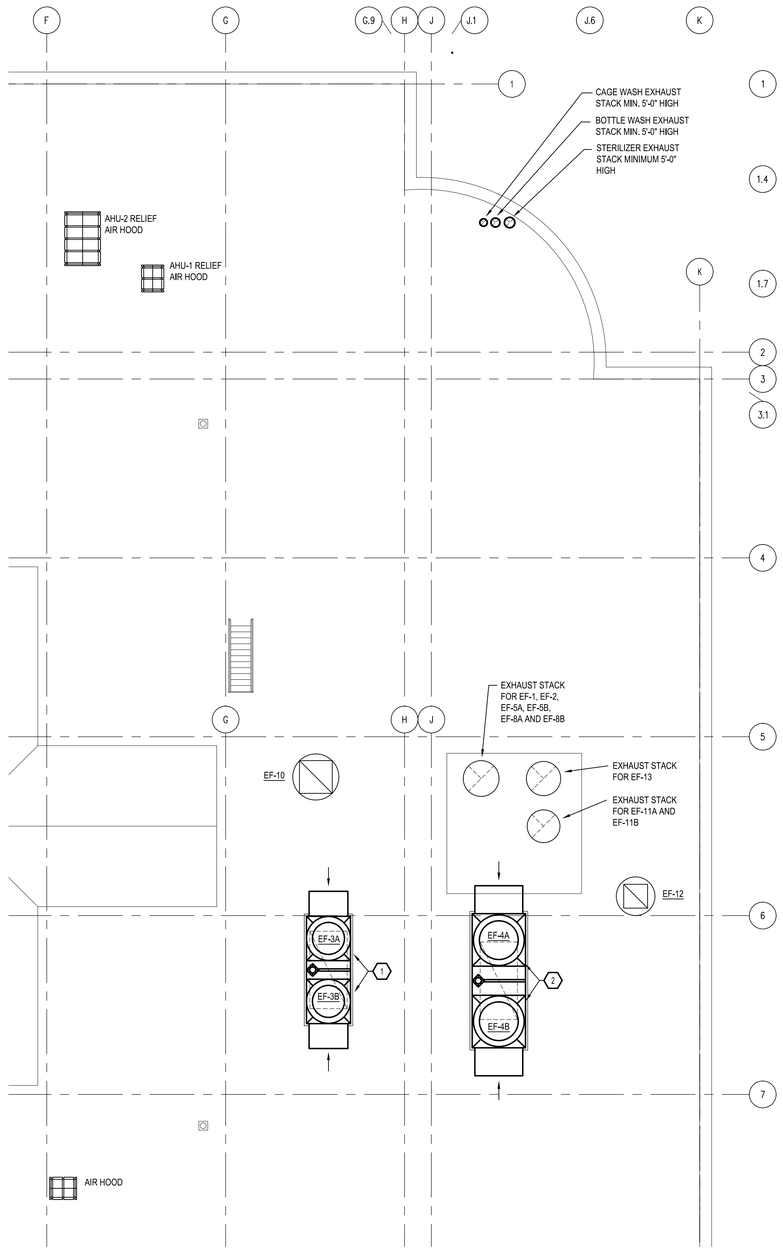
DSD FILE NAME
17-4801-M-4



PARTIAL THIRD FLOOR PLAN – HVAC SHEET METAL DEMOLTION

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

0 4 8 16 32



PARTIAL THIRD FLOOR PLAN – HVAC SHEET METAL NEW WORK

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

0 4 8 16 32

GENERAL SHEET NOTES:

1. REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
2. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
3. FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
10. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH. TRADES, COORDINATE AS REQUIRED.
11. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH. TRADES, COORDINATE AS REQUIRED.
12. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND INTERIOR WALL OPENINGS REQUIRED FOR THE DEMOLITION. PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH. TRADES.
13. ALL AREAS OF WORK SHALL BE AIR AND WATER BALANCED AFTER CONSTRUCTION.
14. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.

DEMOLITION KEYED NOTES:

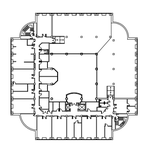
(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE EXHAUST STACK. COORDINATE ROOF REPAIRS WITH ARCHITECTURAL TRADES.
2. DISCONNECT AND REMOVE INTAKE AIR HOOD AND ASSOCIATED DUCTWORK, COORDINATE ROOFING MODIFICATIONS WITH ARCHITECTURAL AND STRUCTURAL TRADES.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE PLUME STYLE EXHAUST FANS EF-3A AND EF-3B MOUNTED ON DUAL INTAKE PLENUM AND ROOF CURB. MODIFY EXISTING THROUGH ROOF OPENING TO ACCOMMODATE NEW EXHAUST FAN(S). COORDINATE WITH ARCHITECTURAL AND STRUCTURAL TRADES.
2. PROVIDE PLUME STYLE EXHAUST FANS EF-4A AND EF-4B MOUNTED ON DUAL INTAKE PLENUM AND ROOF CURB. PROVIDE NEW THROUGH ROOF OPENING TO ACCOMMODATE NEW ROOF MOUNTED EXHAUST FANS. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL TRADES.



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PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING

421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL ROOF PLANS - HVAC SHEET METAL

SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
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DSD FILE NAME
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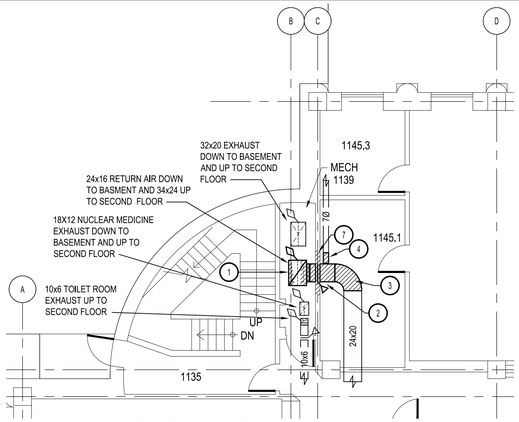
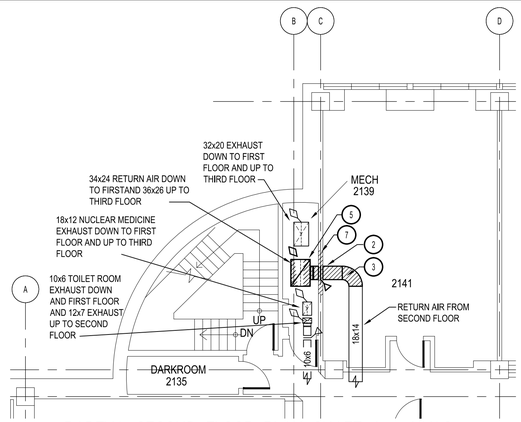


PARTIAL FIRST FLOOR PLAN SHAFT 4 – HVAC SHEET METAL DEMOLITION (ALTERNATE #1)

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

0 4 8 16 32



PARTIAL SECOND FLOOR PLAN SHAFT 4 – HVAC SHEET METAL DEMOLITION (ALTERNATE #1)

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

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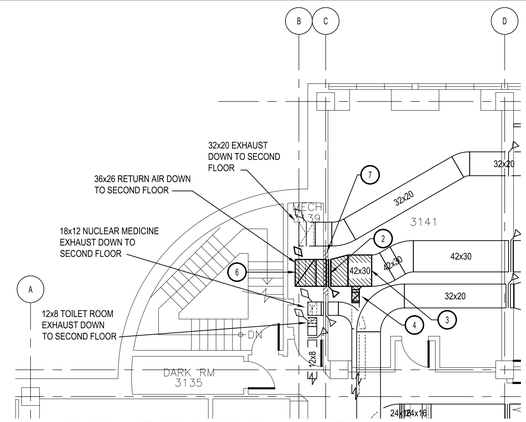


PARTIAL THIRD FLOOR PLAN SHAFT 4 – HVAC SHEET METAL DEMOLITION (ALTERNATE #1)

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

0 4 8 16 32

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE RETURN AIR DUCT IN SHAFT AND ASSOCIATED DAMPER AND THROUGH FLOOR PENETRATION TO SECOND FLOOR. 24x16 THROUGH FLOOR PENETRATION TO BASEMENT AND ASSOCIATED FIRE DAMPER AT BASEMENT TO REMAIN FOR REUSE.
2. DISCONNECT AND REMOVE RETURN AIR DUCTWORK THROUGH SHAFT WALL AND ASSOCIATED FIRE DAMPER.
3. DISCONNECT AND REMOVE RETURN AIR DUCTWORK AS INDICATED.
4. DISCONNECT AND REMOVE RETURN AIR BRANCH LINE CONNECTION AT RETURN DUCT MAIN.
5. DISCONNECT AND REMOVE RETURN AIR DUCTWORK IN SHAFT BETWEEN FIRST FLOOR AND THIRD FLOOR AND ASSOCIATED FIRE DAMPERS.
6. DISCONNECT AND REMOVE RETURN AIR DUCTWORK IN SHAFT DOWN TO SECOND FLOOR AND ASSOCIATED FIRE DAMPERS.
7. REMOVE EXISTING GYPSUM SHAFT WALL ASSEMBLY AS REQUIRED FOR REMOVAL AND INSTALLATION OF DUCTWORK.

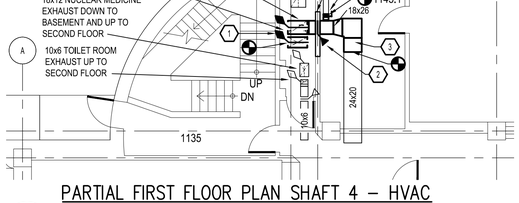
NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE 26x16 RETURN AIR DUCT, 26x14 EXHAUST AIR DUCT AND ASSOCIATED FIRE DAMPER AT THROUGH FLOOR PENETRATION TO SECOND FLOOR IN LOCATION OF PREVIOUSLY REMOVED DUCTWORK. PROVIDE TRANSITION IN SHAFT TO CONNECT 26x14 EXHAUST DUCT TO EXISTING 24x16 EXHAUST DUCT DOWN TO BASEMENT. REFER TO SHAFT 4 RISER DIAGRAM.
2. TRANSITION AS INDICATED AND RECONNECT RETURN AIR CONNECTION THROUGH WALL TO FLOOR. PROVIDE FIRE DAMPER AT SHAFT WALL PENETRATION..
3. RECONNECT RETURN AIR DUCTWORK TO EXISTING RETURN AIR DUCT.
4. RECONNECT RETURN AIR BRANCH DUCTWORK TO MODIFIED RETURN AIR MAIN DUCT.
5. PROVIDE 26x22 RETURN AIR DUCT UP TO THIRD FLOOR, 26x22 RETURN AIR TO FIRST FLOOR AND 26x14 EXHAUST AIR BETWEEN FIRST AND THIRD FLOOR ALONG WITH ASSOCIATED FIRE DAMPERS AS INDICATED IN LOCATION OF PREVIOUSLY REMOVED DUCTWORK. REFER TO SHAFT 4 RISER DIAGRAM.
6. PROVIDE 26x22 RETURN AIR DUCT AND 26X14 EXHAUST AIR IN SHAFT DOWN TO SECOND FLOOR ALONG WITH ASSOCIATED FIRE DAMPERS AS INDICATED IN LOCATION OF PREVIOUSLY REMOVED DUCTWORK. REFER TO SHAFT 4 RISER DIAGRAM.
7. PROVIDE ROOF MOUNTED EXHAUST FAN EF-20 ON ROOF ABOVE FOR BASEMENT GENERAL EXHAUST.
8. PROVIDE GYPSUM SHAFT WALL ASSEMBLY (2 HOUR RATING) TO MATCH EXISTING ADJACENT CONSTRUCTION. PROVIDE FIRE STOP AT PERIMETER OF DUCT PENETRATIONS TO MAINTAIN FIRE RATING. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

GENERAL SHEET NOTES:

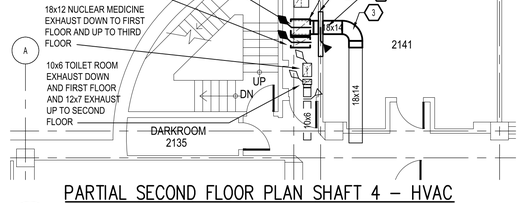
1. REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
2. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
3. FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
10. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH, TRADES, COORDINATE AS REQUIRED.
11. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH, TRADES, COORDINATE AS REQUIRED.
12. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND INTERIOR WALL OPENINGS REQUIRED FOR THE DEMOLITION. PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH, TRADES.
13. ALL AREAS OF WORK SHALL BE AIR AND WATER BALANCED AFTER CONSTRUCTION.
14. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.



PARTIAL FIRST FLOOR PLAN SHAFT 4 – HVAC SHEET METAL NEW WORK (ALTERNATE #1)

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

0 4 8 16 32



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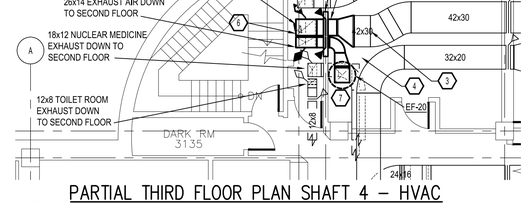

PARTIAL THIRD FLOOR PLAN SHAFT 4 – HVAC SHEET METAL NEW WORK (ALTERNATE #1)

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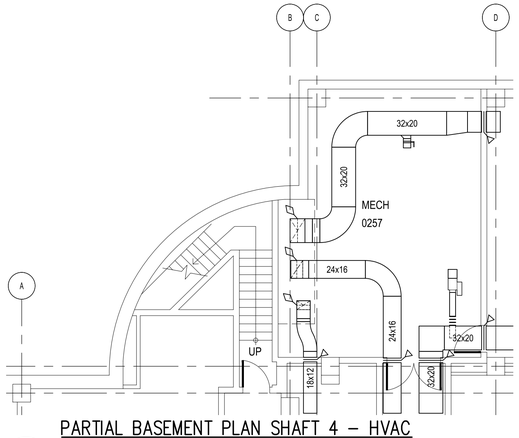
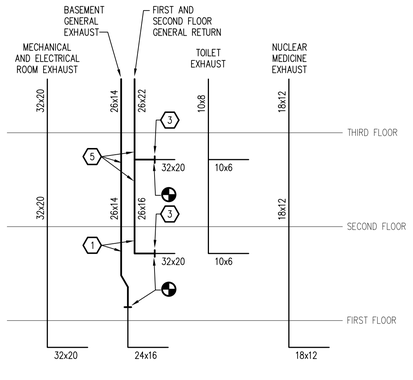


PARTIAL BASEMENT PLAN SHAFT 4 – HVAC SHEET METAL (ALTERNATE #1)

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

0 4 8 16 32



SHAFT 4 RISER DIAGRAM (ALTERNATE #1)

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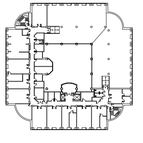

KEY PLAN

NO SCALE

WAYNE STATE UNIVERSITY

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MARK	ISSUE	DATE
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DESIGNER	WAG
DRAWN	WAG
CHECKED	DCM
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

SHAFT 4 FLOOR PLANS - HVAC SHEET METAL (ALTERNATE #1)

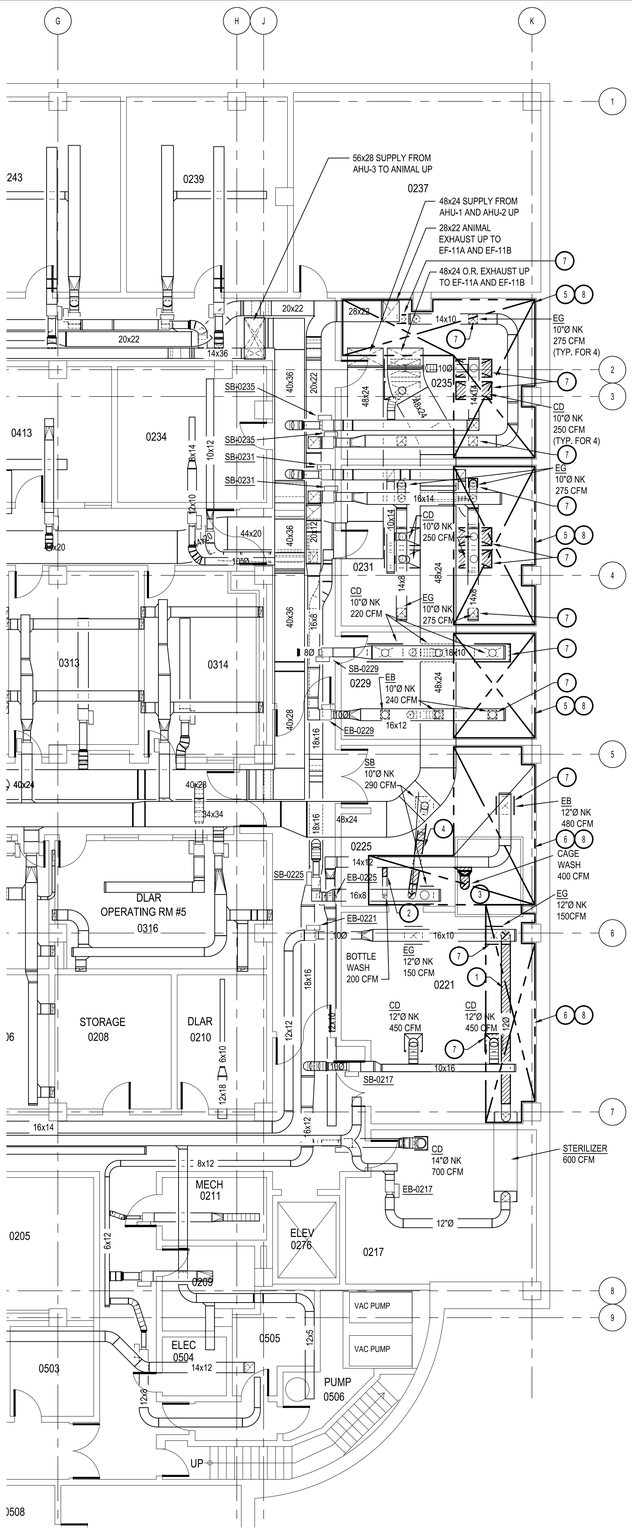
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-6

DSD FILE NAME
17-4801-M-6



PARTIAL FIRST FLOOR PLAN – HVAC SHEET METAL DEMOLITION

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

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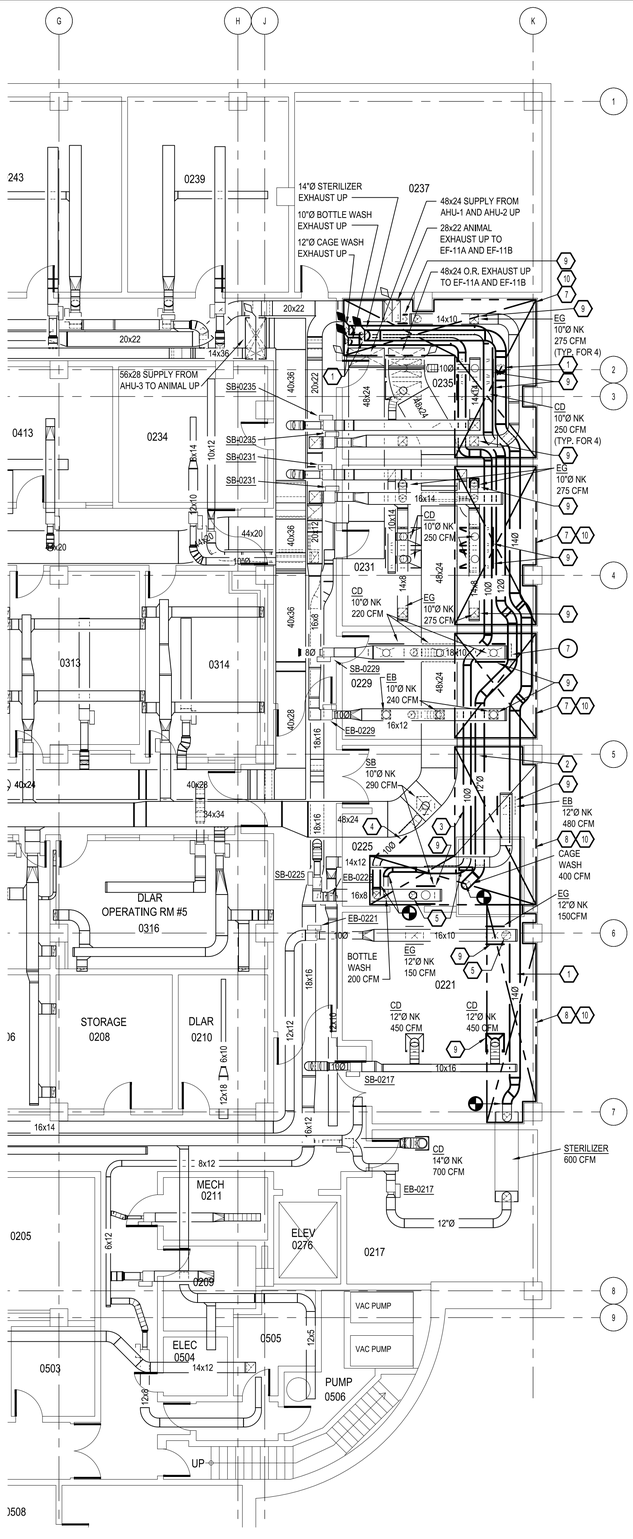


PARTIAL FIRST FLOOR PLAN – HVAC SHEET METAL NEW WORK

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

0 4 8 16 32

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE STERILIZER EXHAUST CONNECTION TO BUILDING EXHAUST SYSTEM. PREPARE CONNECTION T STERILIZER FOR REUSE.
2. DISCONNECT AND REMOVE CAGE WASH EXHAUST CONFECTION TO BUILDING EXHAUST SYSTEM AND PREPARE CONNECTION AT CAGE WASH FOR REUSE.
3. DISCONNECT AND REMOVE BOTTLE WASH EXHAUST CONNECTION TO BUILDING EXHAUST SYSTEM AND PREPARE CONNECTION AT BOTTLE WASH FOR REUSE.
4. DISCONNECT AND REMOVE SUPPLY AIR BRANCH DUCT TO FROM SUPPLY MAIN TO EXISTING CEILING DIFFUSER. EXISTING CEILING DIFFUSER TO BE REMAIN FOR REUSE.
5. PROPOSED AREA OF GYPSUM BOARD CEILING ASSEMBLY REMOVAL REQUIRED FOR MODIFICATIONS TO EXISTING AND INSTALLATION OF NEW DUCTWORK. MECHANICAL CONTRACTOR TO VERIFY LOCATIONS AND EXTENT OF CEILING TO BE REMOVED. EXISTING VIBRATION ISOLATORS TO REMAIN.
6. PROPOSED AREA OF PLASTER CEILING ASSEMBLY REMOVAL AS REQUIRED FOR MODIFICATIONS TO EXISTING AND INSTALLATION OF NEW DUCTWORK. MECHANICAL CONTRACTOR TO VERIFY LOCATIONS AND EXTENT OF CEILING TO BE REMOVED.
7. DISCONNECT, REMOVE AND TEMPORARILY STORE EXISTING CEILING DIFFUSER AND/OR GRILLES AFFECTED BY CEILING REMOVAL.
8. ELECTRICAL CONTRACTOR TO TEMPORARILY DISCONNECT, AND REMOVE ALL LIGHTING WITH IN THE PORTION OF THE GYPSUM AND PLASTER CEILING TO BE REMOVED FOR INSTALLATION OF NEW DUCTWORK. COORDINATE ALL FIXTURES THAT NEED TO BE REMOVED WITH THE MECHANICAL CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.

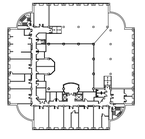
NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE DEDICATED STAINLESS STEEL EXHAUST DUCT FOR STERILIZER. RECONNECT TO STERILIZER AND EXTEND ACROSS BASEMENT AND UP INTO CHASE IN NORTH EAST CORNER OF BUILDING. PROVIDE DRAINS AT LOW POINTS IN DUCT. ROUTE DRAINS DOWN TO BELOW COUNTER IN LABS AND DISCHARGE INTO SINK SANITARY DRAINS.
2. PROVIDE DEDICATED STAINLESS STEEL EXHAUST DUCT FOR CAGE WASH. RECONNECT TO CAGE WASH AND EXTEND ACROSS BASEMENT AND UP INTO CHASE IN NORTH EAST CORNER OF BUILDING. PROVIDE DRAINS AT LOW POINTS IN DUCT. ROUTE DRAINS DOWN TO BELOW COUNTER IN LABS AND DISCHARGE INTO SINK SANITARY DRAINS.
3. PROVIDE DEDICATED STAINLESS STEEL EXHAUST DUCT FOR BOTTLE WASH. RECONNECT TO BOTTLE WASH AND EXTEND ACROSS BASEMENT AND UP INTO CHASE IN NORTH EAST CORNER OF BUILDING. PROVIDE DRAINS AT LOW POINTS IN DUCT. ROUTE DRAINS DOWN TO BELOW COUNTER IN LABS AND DISCHARGE INTO SINK SANITARY DRAINS.
4. PROVIDE NEW BRANCH SUPPLY AIR DUCT CONNECTION FROM MAIN TO EXISTING DIFFUSER, ROUTED SO AS NOT TO INTERFERE WITH NEW BOTTLE WASH EXHAUST DUCT.
5. CAP AND SEAL DUCTWORK AT LOCATION OF REMOVED BRANCH DUCT.
6. COORDINATE FLOOR CORING WITH ARCHITECTURAL TRADES.
7. COORDINATE INSTALLATION OF GYPSUM BOARD CEILING (2 LAYERS OF ⅝" GYP. BD.) HUNG ON EXISTING VIBRATION ISOLATORS WITH ARCHITECTURAL TRADES. PROVIDE 2½" SOUND ATTENUATION BLANKET LAID OVER CEILING CONSTRUCTION. PROVIDE ACOUSTICAL SEALANT AND BACKER BOARD AT EXTERIOR WALL. FINISH AND PAINT TO MATCH EXISTING ADJACENT CONSTRUCTION. ELEVATION TO MATCH EXISTING CEILING.
8. COORDINATE INSTALLATION OF PORTLAND CEMENT PLASTER CEILING WITH ARCHITECTURAL TRADES. PROVIDE 2½" SOUND ATTENUATION BLANKET INSULATION LAID OVER CEILING CONSTRUCTION. PROVIDE ACOUSTICAL SEALANT AND BACKER BOARD AT EXTERIOR WALL. FINISH AND PAINT TO MATCH EXISTING ADJACENT CONSTRUCTION. ELEVATION TO MATCH EXISTING CEILING.
9. REMOVE FROM STORAGE AND REINSTALL EXISTING DIFFUSERS AND OR GRILLES IN NEW CEILING CONSTRUCTION. BALANCE AIR FLOW TO INDICATED QUANTITIES.
10. ELECTRICAL CONTRACTOR SHALL RE-INSTALL LIGHTING FIXTURES IN PORTLAND CEMENT PLASTER CEILINGS AND GYPSUM BOARD CEILING ONCE MECHANICAL DUCTWORK HAS BEEN INSTALLED AND CEILING FRAMING IS INSTALLED. VERIFY ALL WORK WITH MECHANICAL TRADES PRIOR TO COMMENCEMENT OF WORK.

GENERAL SHEET NOTES:

1. REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
2. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
3. FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
10. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH. TRADES, COORDINATE AS REQUIRED.
11. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH. TRADES, COORDINATE AS REQUIRED.
12. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND INTERIOR WALL OPENINGS REQUIRED FOR THE DEMOLITION. PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH. TRADES.
13. ALL AREAS OF WORK SHALL BE AIR AND WATER BALANCED AFTER CONSTRUCTION.
14. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.
15. MECHANICAL CONTRACTOR TO VERIFY LOCATION AND EXTENT OF CEILING REMOVAL AND COORDINATE WITH ARCHITECTURAL TRADES.



KEY PLAN

NO SCALE

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DESIGNER	WAG
DRAWN	JNA
CHECKED	DCM
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL BASEMENT PLANS - HVAC SHEET METAL (ALTERNATE #2)

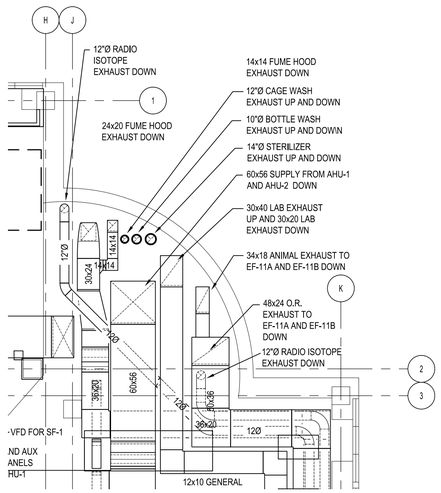
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-7

DSD FILE NAME
17-4801-M-7



N PARTIAL THIRD FLOOR PLAN – HVAC SHEET METAL NEW WORK

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

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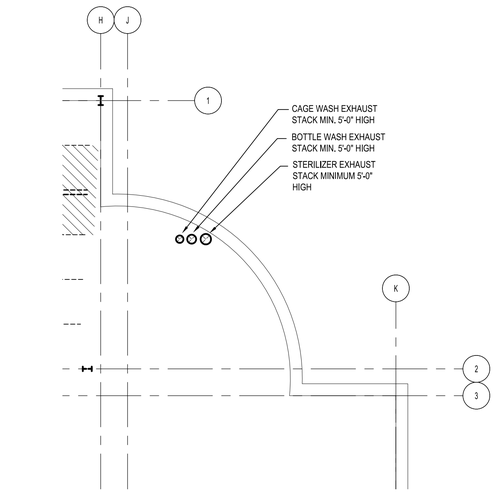

N PARTIAL ROOF FLOOR PLAN – HVAC SHEET METAL NEW WORK

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

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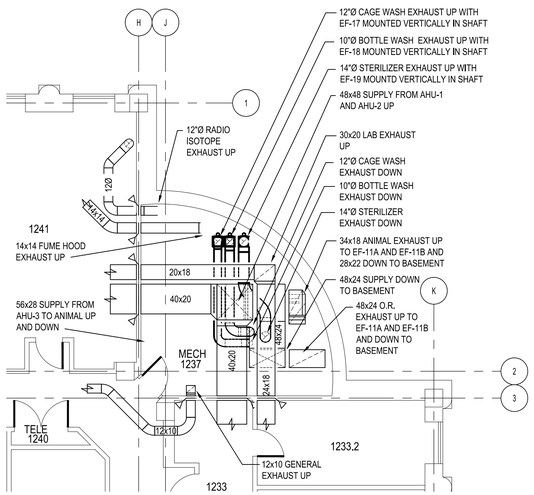

N PARTIAL FIRST FLOOR PLAN – HVAC SHEET METAL NEW WORK

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

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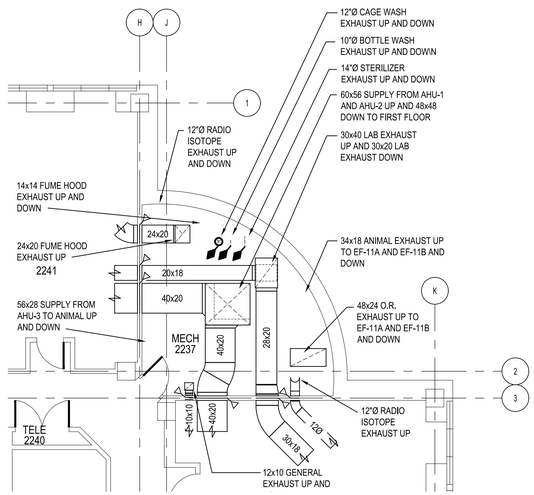

N PARTIAL SECOND FLOOR PLAN – HVAC SHEET METAL NEW WORK

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

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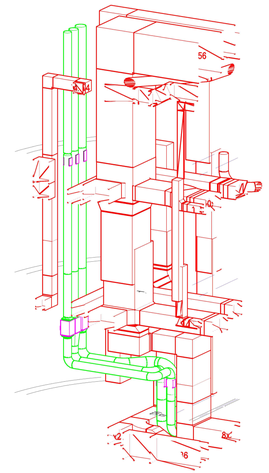

SECTION AT MECHANCAIL SHAFT

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

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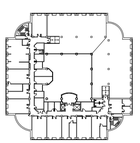

N KEY PLAN

NO SCALE

GENERAL SHEET NOTES:

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4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
10. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH, TRADES, COORDINATE AS REQUIRED.
11. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH, TRADES, COORDINATE AS REQUIRED.
12. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND INTERIOR WALL OPENINGS REQUIRED FOR THE DEMOLITION. PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH. TRADES.
13. ALL AREAS OF WORK SHALL BE AIR AND WATER BALANCED AFTER CONSTRUCTION.
14. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.

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DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

SHAFT 3 PLANS - HVAC SHEET METAL (ALTERNATE #2)

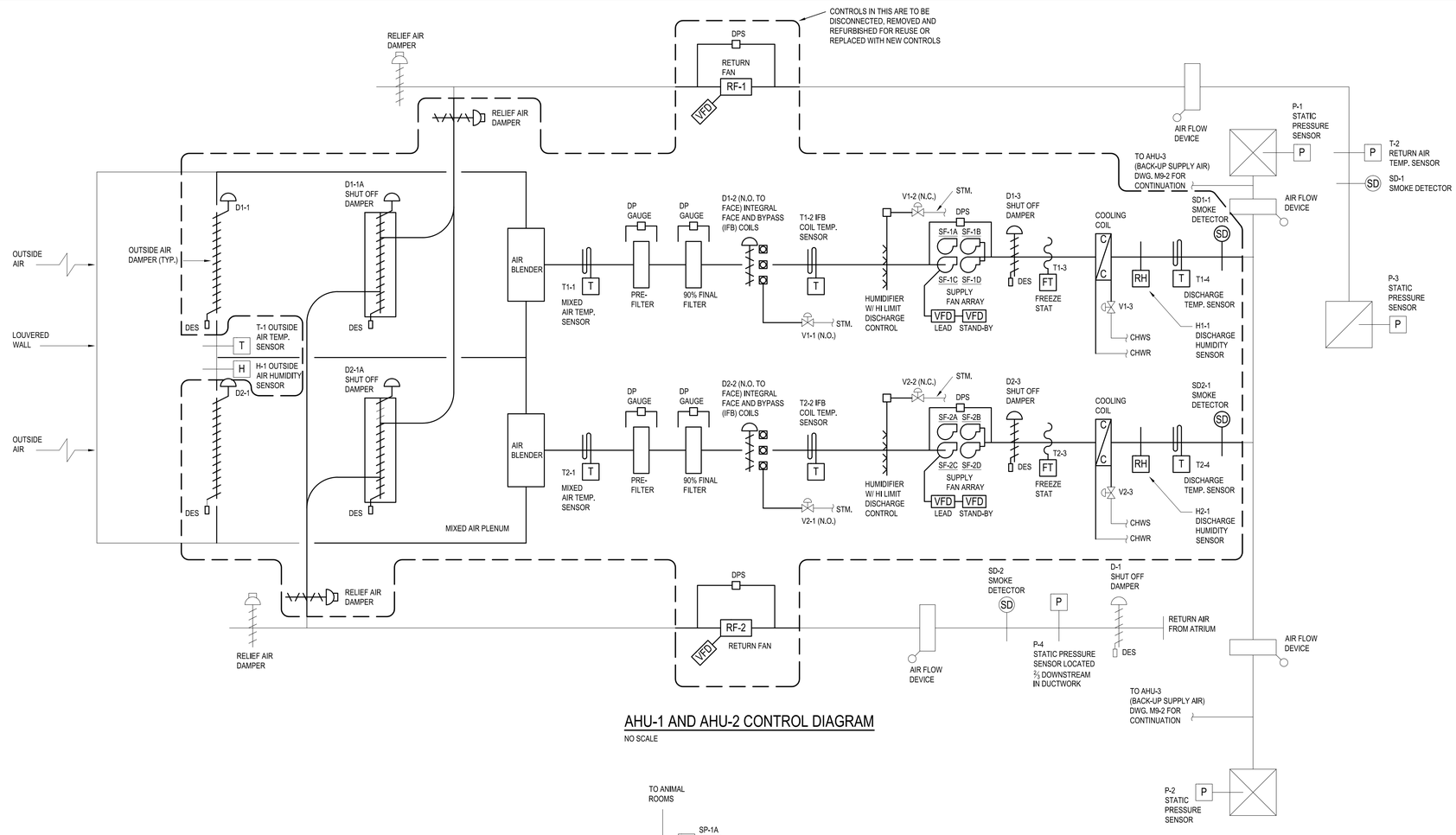
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

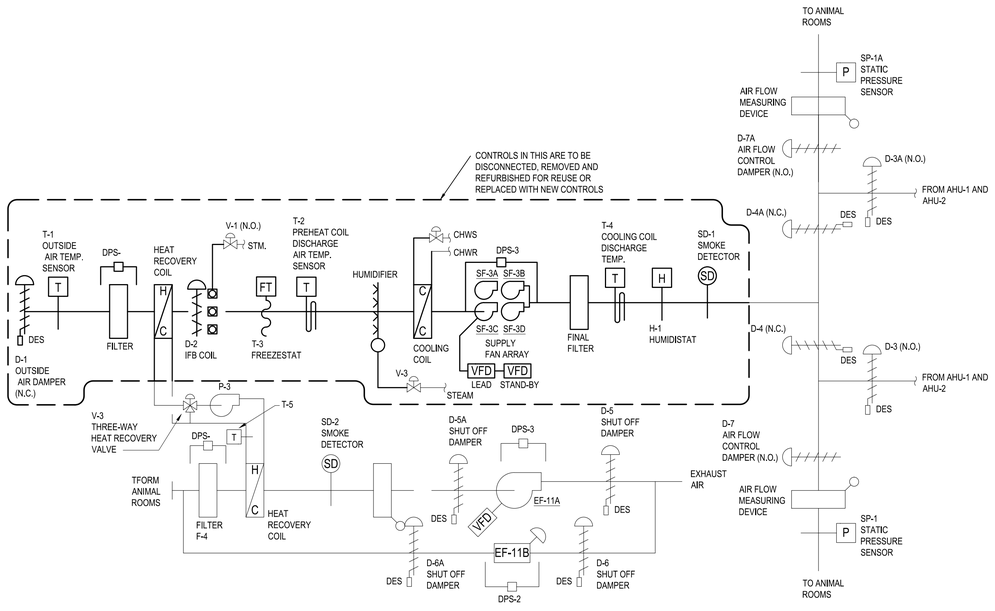
SHEET NO.
M-8

DSD FILE NAME
17-4801-M-8



AHU-1 AND AHU-2 CONTROL DIAGRAM

NO SCALE



AHU-3 CONTROL DIAGRAM

NO SCALE

AHU-1 AND AHU-2 SEQUENCE OF OPERATION:

THE SYSTEM CONSISTS OF TWO AIR HANDLING UNIT SUPPLY FAN ARRAYS AND TWO INLINE RETURN AIR FANS. THE ASSOCIATED EXHAUST FANS ARE INTERLOCKED THROUGH THE DDC TO RUN WHEN THE SUPPLY FAN ARRAY IS RUN. THE ATRIUM RETURN AIR FAN (RF-2) IS INTERLOCKED THROUGH THE DDC TO RUN WHEN THE SUPPLY FAN ARRAY RUNS, EXCEPT DURING ATRIUM SMOKE VENTILATION MODE.

THE SUPPLY FAN ARRAYS SF-1 AND SF-2 ARE SHALL BE SELECTED AND STARTED MANUALLY OR AUTOMATICALLY THROUGH THE DDC CONTROLLER. WHEN THE SYSTEM AIR FLOW DEMAND INCREASES ABOVE THE CAPACITY OF ONE OF THE SUPPLY FAN ARRAY'S AND THE STATIC PRESSURE IN ANY OF THE SUPPLY DUCT SHAFTS DROPS BELOW SET POINT, THE SECOND SUPPLY FAN ARRAY SHALL BE STARTED AUTOMATICALLY THROUGH THE DDC. THE SUPPLY FANS WILL NOT RUN UNTIL THEIR RESPECTIVE OUTSIDE AIR AND/OR SHUTOFF DAMPERS HAVE OPENED, MAKING THE DAMPER END SWITCH INTERLOCK. THE CONTROLS FOR EACH FAN ARRAY WILL BE ALLOWED TO FUNCTION AFTER THE FAN STARTS AND THE DAMPERS ARE OPEN. THE FANS SHALL BE SHUT-DOWN IN REVERSE ORDER FROM THEIR STARTING SEQUENCE, WHEN THE AIR FLOW HAS DECREASED AND THE STATIC PRESSURE IN THE SHAFTS HAS INCREASED. THE RETURN FAN (RF-1) IN INTERLOCKED THROUGH THE DDC CONTROLLER TO RUN WHEN EITHER SUPPLY FAN ARRAY SF-1 OR SF-2 IS RUNNING.

A MIXED AIR TEMPERATURE SENSOR LOCATED IN EACH SUPPLY FAN DUCT SYSTEM WILL AVERAGE THE MIXED AIR TEMPERATURE FOR THE OPERATING SUPPLY FAN ARRAY, THROUGH THE DDC CONTROLLER, AND WILL MODULATE THE RETURN AIR DAMPER AND RELIEF AIR DAMPERS TO MAINTAIN THE MIXED AIR TEMPERATURE TO THE OPERATING SUPPLY FAN ARRAY. THE OUTSIDE AIR TEMPERATURE SENSOR AND THE OUTSIDE AIR HUMIDITY SENSOR SHALL BE INPUT TO THE DC CONTROLLER FOR ENTHALPY CALCULATIONS. THE RELIEF AIR DAMPERS AND RETURN AIR DAMPER, THROUGH THE DDC CONTROLLER, SHALL MOVE TO THEIR NORMAL POSITIONS WHENEVER THE OUTSIDE AIR ENTHALPY IS GREATER THAN 30 BTU/LB.

THE PREHEAT COIL DISCHARGE TEMPERATURE SENSOR FOR EACH SUPPLY FAN ARRAY SF-1 AND SF-2, THROUGH THE DDC, WILL MODULATE THE RESPECTIVE PRE-HEAT COIL VALVE IN UNISON WITH THE FACE AND BY-PASS DAMPERS TO MAINTAIN THE DESIRED PREHEAT DISCHARGE TEMPERATURE. THE COIL VALVE SHALL OPEN FULLY WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 40°F AND THE SUPPLY FAN ARRAY IS RUNNING.

A RELATIVE HUMIDITY SENSORS AND A TEMPERATURE SENSORS BOTH LOCATED IN THE COOLING COIL DISCHARGE AIR STREAM FOR EACH SUPPLY FAN ARRAY SF-1 AND SF-2 WILL, THROUGH THE DDC CONTROLLER, THROUGH THE DDC, MODULATE THE HUMIDIFIER STEAM CONTROL VALVE AND COOLING COIL VALVE RESPECTIVELY TO MAINTAIN DUCT DISCHARGE AIR TEMPERATURE AND RELATIVE HUMIDITY SET POINTS. THE HUMIDIFIER STEAM CONTROL VALVE SHALL BE CLOSED WHEN THE UNIT IS OFF.

THE LOWEST READING OF THE STATIC PRESSURE SENSORS, LOCATED NEAR THE TOP OF EACH SUPPLY DUCT SHAFT, SHALL, THROUGH THE DDC , MODULATE THE OPERATING SUPPLY FAN ARRAY VFD TO MAINTAIN THE DESIRED FAN DISCHARGE STATIC PRESSURE.

THE STATIC PRESSURE SENSOR FOR RETURN FAN RF-1, LOCATED NEAR THE BOTTOM OF THE SHAFT, SHALL, THROUGH THE DDC CONTROLLER, MODULATE THE RETURN FAN VFD TO MAINTAIN THE DESIRED RETURN AIR STATIC PRESSURE. THE STATIC PRESSURE SENSOR FOR RF-2, LOCATED NEAR THE ATRIUM, SHALL, THROUGH THE DDC CONTROLLER, MODULATE THE RETURN FAN VFD TO MAINTAIN THE DESIRED RETURN AIR STATIC PRESSURE.

FREEZESTATS, LOCATED IN THE DISCHARGE OF EACH SUPPLY FAN ARRAY, SHALL STOP THE RESPECTIVE FAN SYSTEM IF IT SENSES A FREEZING CONDITION.

SMOKE DETECTOR, LOCATED IN THE RETURN AIR DUCT FOR FAN RF-1, SHALL LOCK THE RETURN FAN ON AND MOVE THE DAMPERS TO 100% SUPPLY IF SMOKE IS SENSED IN THE RETURN AIR DUCT , SMOKE DETECTORS, LOCATED IN THE SUPPLY AIR DUCT, SHALL STOP THE FAN IF SMOKE IS SENSED. RETURN FAN RF-2 IS STOPPED BY THE ATRIUM SMOKE VENTILATION SYSTEM WHENEVER SMOKE IS DETECTED IN THE BUILDING.

AHU-3 SEQUENCE OF OPERATION:

THE SUPPLY FAN ARRAY IS STARTED MANUALLY OR AUTOMATICALLY THROUGH THE DDC CONTROLLER. THE ELECTRIC/PNEUMATIC RELAY IS ENERGIZED. THE SHUT-OFF DAMPERS AND OUTSIDE AIR DAMPER OPENS. THE DAMPER END SWITCHED (DES) MAKE AND THE SUPPLY FAN IS ALLOWED TO RUN. THE PRIMARY EXHAUST FAN IS STARTED MANUALLY OR AUTOMATICALLY THROUGH THE DDC CONTROLLER. THE EXHAUST FAN DAMPER END SWITCH (DES) MAKES AND THE EXHAUST FAN IS ALLOWED TO RUN. THE CONTROLS SHALL BE ALLOWED TO FUNCTION WHEN THE FANS ARE RUNNING.

THE PREHEAT COIL DISCHARGE TEMPERATURE SENSOR, THROUGH THE DDC, WILL MODULATE THE PRE-HEAT COIL VALVE IN UNISON WITH THE FACE AND BY-PASS DAMPERS TO MAINTAIN THE DESIRED PREHEAT DISCHARGE TEMPERATURE. THE COIL VALVE SHALL OPEN FULLY WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 40°F.

A RELATIVE HUMIDITY SENSOR AND A TEMPERATURE SENSOR BOTH LOCATED IN THE FAN DISCHARGE WILL, THROUGH THE DDC, CONTROL THE HUMIDIFIER AND COOLING COIL VALVE RESPECTIVELY TO MAINTAIN DUCT DISCHARGE AIR TEMPERATURE AND RELATIVE HUMIDITY SET POINTS. THE HUMIDIFIER VALVE SHALL BE CLOSED WHEN THE UNIT IS OFF. THE DISCHARGE TEMPERATURE SENSOR WILL, THROUGH THE DDC, NOT ALLOW THE PREHEAT TEMPERATURE TO EXCEED THE DISCHARGE AIR SET POINT.

THE LOWEST READING STATIC PRESSURE SENSOR, LOCATE ⅔ DOWNSTREAM (MINIMUM) IN THE SUPPLY DUCTWORK, THROUGH THE DDC, MODULATED THE SUPPLY FAN ARRAY VARIABLE SPEED DRIVES (VFD'S) TO MAINTAIN THE DESIRED STATIC PRESSURE.IF THE SUPPLY FAN ARRAY SHUTS DOWN, DAMPER D-3 AUTOMATICALLY OPENS TO THE BACK-UP AIR SUPPLY.

THE LOWEST READING STATIC PRESSURE SENSOR, THROUGH THE DDC, SWITCHES CONTROL TO CONTROL THE AIR FLOW DAMPERS TO MAINTAIN THE DESIRED STATIC PRESSURE. THE AIR FLOW DAMPERS REMAIN FULL OPEN DURING NORMAL OPERATION.

IF THE PRIMARY EXHAUST FAN SHUTS DOWN, THE BACK-UP EXHAUST FAN SHALL BE AUTOMATICALLY STARTED BY THE DDC SYSTEM, THE DDC SWITCHES CONTROL TO THE VFD ON THE BACK-UP EXHAUST FAN TO MAINTAIN THE DESIRED EXHAUST AIR FLOW.

GENERAL SHEET NOTES:

1. REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
2. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
3. FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
10. AREAS WITH EXISTING CEILING TILES & GRID TO BE REMOVED & REPLACED BY ARCH, TRADES, COORDINATE AS REQUIRED.
11. AREAS WITH EXISTING PLASTER (HARD) CEILINGS TO BE CUT, REMOVED AND PATCHED BY ARCH, TRADES, COORDINATE AS REQUIRED.
12. MECHANICAL TRADES SHALL BE RESPONSIBLE FOR FLOOR CUTTING, CORE DRILLING, AND INTERIOR WALL OPENINGS REQUIRED FOR THE DEMOLITION. PATCH FLOORS AND WALLS TO MATCH EXISTING ADJACENT CONDITIONS. COORDINATE FINISHES WITH ARCH. TRADES.
13. ALL AREAS OF WORK SHALL BE AIR AND WATER BALANCED AFTER CONSTRUCTION.
14. PROVIDE NEW FIRE DAMPERS, SMOKE DAMPERS, OR COMBINATION DAMPERS IN ALL NEW AND EXISTING DUCTS WHERE DUCTS PENETRATE FIRE OR SMOKE WALLS AS APPROPRIATE.

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	OWNER REVIEW	04/24/18
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	OWNER REVIEW	10/16/17

DESIGNER	WAG
DRAWN	WAG
CHECKED	DCM
DEPT MGR	DCM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

MECHANICAL CONTROL DIAGRAMS

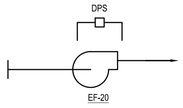
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
M-9

DSD FILE NAME
17-4801-M-9

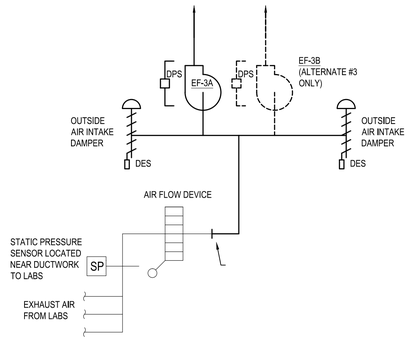


EF-20 CONTROL DIAGRAM

NO SCALE

GENERAL EXHAUST FANS EF-1, EF-2, EF-5A, EF-5B, EF-6 AND EF-20 SEQUENCE OF OPERATION:

THE GENERAL EXHAUST FANS ARE STARTED MANUALLY OR AUTOMATICALLY, THROUGH THE DDC CONTROLLER, WHENEVER SUPPLY FAN ARRAYS SF-1 AND/OR SF-2 ARE IN OPERATION.



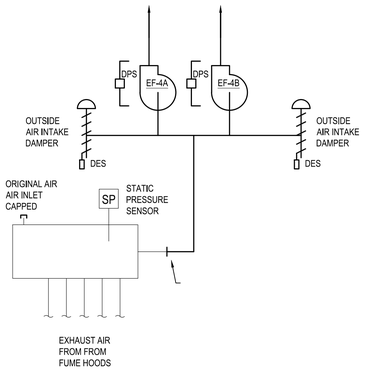
EF-3A AND EF-3B CONTROL DIAGRAM

NO SCALE

EF-3A (AND EF-3B ALTERNATE #3) SEQUENCE OF OPERATION:

THE EXHAUST FAN EF-3A IS STARTED MANUALLY OR AUTOMATICALLY, THROUGH THE DDC CONTROLLER, WHENEVER SUPPLY FAN ARRAYS SF-1 AND/OR SF-2 ARE IN OPERATION. THE STATIC PRESSURE SENSOR, THROUGH THE DDC CONTROLLER, MODULATED THE EXHAUST FAN VFD TO MAINTAIN THE DESIRED STATIC PRESSURE.

ALTERNATE #3 ONLY
THE LAG EXHAUST FAN EF-3B SHALL BE AUTOMATICALLY STARTED, THROUGH THE DDC CONTROLLER, IF THE LEAD EXHAUST FAN EF-3A FAILS.



EF-4A AND EF-4B CONTROL DIAGRAM

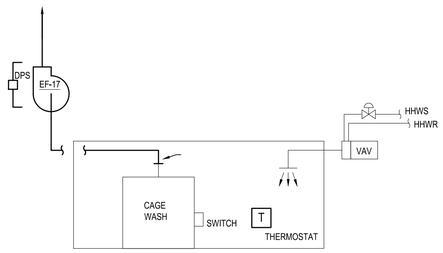
NO SCALE

EF-4A AND EF-4B SEQUENCE OF OPERATION:

THE LEAD EXHAUST FAN IS STARTED MANUALLY OR AUTOMATICALLY, THROUGH THE DDC CONTROLLER, THE STATIC PRESSURE SENSOR, THROUGH THE DDC CONTROLLER, MODULATES THE OUTSIDE AIR DILUTION DAMPERS TO MAINTAIN THE DESIRED STATIC PRESSURE IN THE EXHAUST DUCT SYSTEM. THE OUTSIDE AIR DAMPERS SHALL BE CLOSED WHEN THE FANS ARE NOT IN OPERATION.

THE LAG EXHAUST FAN SHALL BE AUTOMATICALLY STARTED, THROUGH THE DDC CONTROLLER, IF THE LEAD EXHAUST FAN FAILS OR IF THE OUTSIDE AIR DAMPERS ARE MORE THEN 60% OPEN. THE LAG EXHAUST FAN IS AUTOMATICALLY STOPPED, THROUGH THE DDC CONTROLLER, IF THE OUTSIDE AIR DAMPERS ARE LESS THAN 40% OPEN AND THE LEAD FAN IS OPERATING. A SOFTWARE ALARM FAILURE SHALL BE GENERATED IF EITHER FAN FAILS.

THE STATIC PRESSURE SET POINT IN THE EXHAUST DUCT MUST BE HIGHER THAN THE INDIVIDUAL FUME HOOD EXHAUST BRANCH LONGEST RUN PRESSURE DROP.

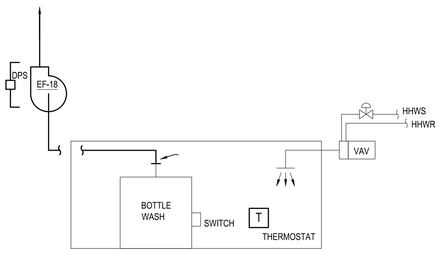


CAGE WASH EF-17 CONTROL DIAGRAM (ALTERNATE #2)

NO SCALE

CAGE WASHER SEQUENCE OF OPERATION (ALTERNATE #2):

THE EXHAUST FAN IS STARTED BY THE START SWITCH AT THECAGE WASHER. THE ASSOCIATED ROOM SUPPLY AIR VAV BOX MOVES FROM IT MINIMUM AIR FLOW OPERATING POSITION TO ITS MAXIMUM AIR FLOW OPERATING POSITION. THE EXHAUST FAN STARTS AND THE SPACE TEMPERATURE THERMOSTAT MODULATES THE VAV BOX HEATING COIL VALVE TO MAINTAIN THE SPACE TEMPERATURE SET POINT.

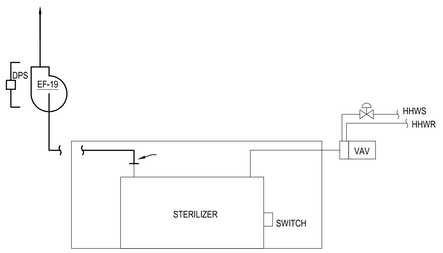


BOTTLE WASH EF-18 CONTROL DIAGRAM (ALTERNATE #2)

NO SCALE

BOTTLE WASHER SEQUENCE OF OPERATION (ALTERNATE #2):

THE EXHAUST FAN IS STARTED BY THE START SWITCH AT THE BOTTLE WASHER. THE ASSOCIATED ROOM SUPPLY AIR VAV BOX MOVES FROM IT MINIMUM AIR FLOW OPERATING POSITION TO ITS MAXIMUM AIR FLOW OPERATING POSITION. THE EXHAUST FAN STARTS AND THE SPACE TEMPERATURE THERMOSTAT MODULATES THE VAV BOX HEATING COIL VALVE TO MAINTAIN THE SPACE TEMPERATURE SET POINT.



STERILIZER EF-19 CONTROL DIAGRAM (ALTERNATE #2)

NO SCALE

STERILIZER SEQUENCE OF OPERATION (ALTERNATE #2):

THE EXHAUST FAN IS STARTED BY THE START SWITCH AT THE STERLIZER. THE ASSOCIATED ROOM SUPPLY AIR VAV BOX MOVES FROM IT CLOSED POSITION TO ITS REQUIRED AIR FLOW OPERATING POSITION. THE EXHAUST FAN STARTS AND A DISCHARGE AIR TEMPERATURE SENSOR MODULATES THE VAV BOX HEATING COIL VALVE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET POINT.

GENERAL SHEET NOTES:

1. REMOVE EXISTING MECHANICAL SERVICES AND EQUIPMENT AS INDICATED AND/OR DESCRIBED ALONG WITH SUPPORTS, HANGERS, CONTROLS AND ALL RELATED ACCESSORIES.
2. ALL ITEMS ON DEMOLITION PLAN SHALL BE CONSIDERED TO BE EXISTING UNLESS OTHERWISE NOTED.
3. FIELD VERIFY EXACT SIZE AND LOCATION OF ALL EXISTING SERVICES PRIOR TO DEMOLITION.
4. COORDINATE SHUT-DOWN OF ANY EXISTING SYSTEMS WITH THE BUILDING SERVICES PERSONNEL.
5. WHERE DUCT AND/OR PIPE INSULATION HAS BEEN DAMAGED, THE CONTRACTOR SHALL REPAIR INSULATION AS REQUIRED TO MATCH EXISTING.
6. ALL ITEMS DEMOLISHED SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
7. LIMITS OF DEMOLITION ARE INDICATED ON THE DRAWINGS. SHOULD EXISTING FIELD CONDITIONS REQUIRE MODIFICATIONS OF THESE LIMITS FOR THE PROPER INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCH MODIFICATIONS.
8. GRAVITY DRAINAGE PIPING SHALL BE SLOPED AT 1/8" PER FOOT, UNLESS OTHERWISE NOTED.
9. MECHANICAL TRADES SHALL COORDINATE ROUTING OF DUCTWORK AND PIPING WITH OTHER TRADES PRIOR TO INSTALLATION.
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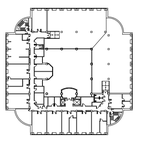

KEY PLAN

NO SCALE

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DETROIT, MICHIGAN

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SHEET NO.
M-10

DSD FILE NAME
17-4801-M-10

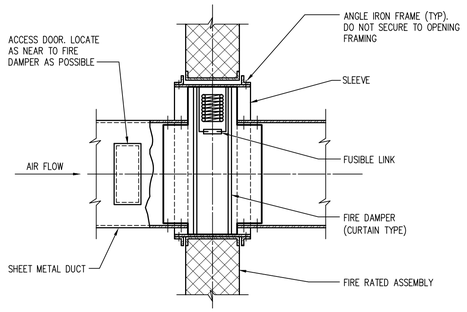
AIR HANDLING UNIT SCHEDULE

MARK	LOCATION/ AREA SERVED	SUPPLY FAN									COOLING COIL														STEAM HEATING COIL								HUMIDIFIER			FILTER				UNIT POWER		BASIS OF DESIGN MODEL NUMBER	REMARKS
		CFM @70°F.	WHEEL DIA. IN.	FAN TYPE	O.A. CFM	S.P. IN. W.G. EXT.	S.P. IN. W.G. TOT. *	RPM	B.H.P.*	MOTOR H.P.*	MIN. FA. SQ. FT.	MBH TOTAL	MBH SENS.	ROWS	FINS PER IN.	AIR ΔP IN. W.G.	ENT. AIR °F D.B.	ENT. AIR °F W.B.	LVG. AIR °F D.B.	LVG. AIR °F W.B.	E.W.T. °F	L.W.T. °F	GPM	W.P.D. FT.	FLUID TYPE	MIN. FA. SQ. FT.	MBH TOTAL	ROWS	FINS PER IN.	AIR ΔP IN. W.G.	ENT. AIR °F	LVG. AIR °F	STEAM PSIG	COND. LBS/HR	TYPE	STEAM PSIG	CAPACITY LBS/HR	PRE-FILTER EFF.	PRE-FILTER ΔP	FINAL-FILTER EFF.	FINAL-FILTER ΔP	VOLTAGE	PHASE		
AHU-1	3RD FLOOR PENTHOUSE /NORTH & EAST BSMT, 1ST, 2ND & 3RD FLOORS	45,000	(4) 24.5"	DIRECT DRIVE	–	2.00	4.531	1929	49.292	(4) 12.5	99.14	2395.23	1620.65	4	12.5	0.518	87.60	70.90	55.00	54.43	42.00	55.91	343.00	21.90	WATER	–	1497.17	1	7	0.141	30.00	60.66	12.00	1576.00	STEAM	10.00	1163.70	30%	MID-LIFE 0.609	95%	MID-LIFE 0.730	460	3	TRANE – UNIT SIZE 100	PROVIDE WITH INTERNAL CRANE RAIL AND INTERNAL LED LIGHTING. INSTALLED WEIGHT – 15022.6 LBS.
AHU-2	THIRD FLOOR PENTHOUSE /SOUTH & WEST BSMT, 1ST, 2ND & 3RD FLOOR	45,000	(4) 24.5"	DIRECT DRIVE	–	2.00	4.531	1929	49.292	(4) 12.5	99.14	2395.23	1620.65	4	12.5	0.518	87.60	70.90	55.00	54.43	42.00	55.91	343.00	21.90	WATER	–	1497.17	1	7	0.141	30.00	60.66	12.00	1576.00	STEAM	10.00	1163.70	30%	MID-LIFE 0.609	95%	MID-LIFE 0.730	460	3	TRANE – UNIT SIZE 100	PROVIDE WITH INTERNAL CRANE RAIL AND INTERNAL LED LIGHTING. INSTALLED WEIGHT – 14918.6 LBS.
AHU-3	THIRD FLOOR PENTHOUSE /BASEMENT LABORATORIES	26,450	(4) 20"	DIRECT DRIVE	26,450	–	5.441	2387	36.748	(4) 9.5	56.89	2207.53	1291.68	8	10.1	0.953	95.00	76.00	51.00	50.90	42.00	56.00	314.24	17.40	WATER	–	2057.50	2	9	0.312	-10.00	61.69	15.00	2175.00	STEAM	10.00	1171.68	30%	MID-LIFE 0.626	95%	MID-LIFE 0.748	460	3	TRANE – UNIT SIZE 57	PROVIDE WITH INTERNAL CRANE RAIL AND INTERNAL LED LIGHTING. INSTALLED WEIGHT – 11098.1 LBS.
											HEATING ENERGY RECOVERY COIL																																	
											56.50	1391.00	–	6	10.3	11.56	0.00	–	48.49	–	65.00	32.36	100.00	11.56	WATER																				

* CONTRACTOR/SUPPLIER TO ADJUST BASED ON ACTUAL UNIT COMPONENTS SELECTED.

FAN SCHEDULE

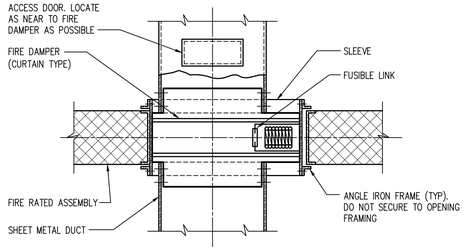
MARK	LOCATION/ SYSTEM SERVED	FAN TYPE	INLET FLOW CFM @ SYSTEM TEMP.	BYPASS FLOW CFM	ENTRAINED FLOW CFM	TOTAL SYSTEM FLOW CFM	MAX TIP SPEED (FPM)	ESP (IN.WC.)	WHEEL DIA. (IN.)	FAN RPM	SOUND LEVELS INLET dBA	SOUND LEVELS OUTLET dBA	MOTOR HP	MOTOR BHP	MOTOR RPM	MOTOR DRIVE TYPE	UNIT POWER VOLTAGE	UNIT POWER PHASE	BASIS OF DESIGN MODEL NUMBER	REMARKS
RF-1	THIRD FLOOR MECHANICAL ROOM/ AHU-1 AND AHU-2	INLINE	13,280 MAX. 2,065 MIN.	NOT APLLICABLE			10,579	3.00	22.5	1,796	78	82	15	9.73	1725	DIRECT W/VFD	460	3	COOK #225QMXD17	–
RF-2	THIRD FLOOR MECHANICAL ROOM/ AHU-1 AND AHU-2	INLINE	6,500 MAX. 2,500 MIN.				8,326	2.00	18	1,767	72	74	5	3.11	1725	DIRECT W/VFD	460	3	COOK #180QMXD17	–
EF-3A	THIRD FLOOR MECHANICAL ROOM/ LAB EXHAUST	INLINE	41,960	2,284	22,122	66,366	–	3.35	–	1,200	–	–	25	23.88	–	VFD	460	3	STROBIC "TRISTACK" #TS3S250C12	PROVIDE WITH ROOF MOUNTING CURB AND BYPASS AIR PLENUM. INTERLOCKED WITH EF-3B.
EF-3B	THIRD FLOOR MECHANICAL ROOM/ LAB EXHAUST	INLINE							–	1,200	–	–	25	23.88	–	VFD	460	3	STROBIC "TRISTACK" #TS3S250C12	PROVIDE WITH ROOF MOUNTING CURB AND BYPASS AIR PLENUM. INTERLOCKED WITH EF-3A.
EF-4A	THIRD FLOOR MECHANICAL ROOM/ FUME HOOD EXHAUST	INLINE	27,530	2,885	19,770	50,185	–	4.00	–	1,200	–	–	40	37.18	–	VFD	460	3	STROBIC "TRISTACK" #TS4S400A12	PROVIDE WITH ROOF MOUNTING CURB AND BYPASS AIR PLENUM. EF-4B TO MOUNT ON SAME PLENUM
EF-4B	THIRD FLOOR MECHANICAL ROOM/ FUME HOOD EXHAUST	INLINE	27,530	2,885	19,770	50,185	–	4.00	–	1,200	–	–	40	37.18	–	VFD	460	3	STROBIC "TRISTACK" #TS4S400A12	PROVIDE WITH ROOF MOUNTING CURB AND BYPASS AIR PLENUM. EF-4A TO MOUNT ON SAME PLENUM STANDBY FOR EF-4A.
EF-17 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3 / CAGE WASH EXHAUST	INLINE	400	NOT APLLICABLE			8,083	1.5	10"	3,085	–	–	¾	0.492	3,450	DIRECT	460	3	COOK #70TCNHB	ALL STAINLESS STEEL CONSTRUCTION. FAN TO BE MOUNTED VERTICALLY
EF-18 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3 / BOTTLE FEEDER EXHAUST	INLINE	200				6,385	1.5	10"	2,437	–	–	¾	0.261	3,450	DIRECT	460	3	COOK #70TCNHB	ALL STAINLESS STEEL CONSTRUCTION. FAN TO BE MOUNTED VERTICALLY
EF-19 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3 / STERILIZER EXHAUST	INLINE	660				6,540	1.5	10"	2,495	–	–	¾	0.374	3,450	DIRECT	460	3	COOK #80TCNHB	ALL STAINLESS STEEL CONSTRUCTION. FAN TO BE MOUNTED VERTICALLY
EF-20 (ALTERNATE #1)	ON ROOF / GENERAL BASEMENT EXH.	ROOF MOUNTED CENTRIF.	4,065				5,840	1.0	19.5	1,140	–	–	1½	1.29	1,140	DIRECT	460	3	COOK 195 ACED #195C11D	PROVIDE WITH ROOF MOUNTING CURB, GRAVITY BACKDRAFT DAMPER AND BIRDSCREEN.



HORIZONTAL FIRE DAMPER DETAIL

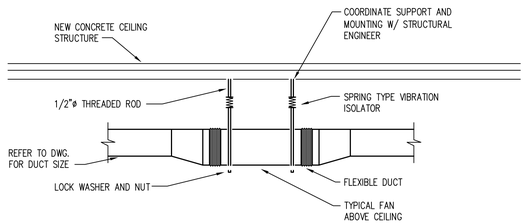
NO SCALE

NOTE:
SEE BUILDING CONSTRUCTION FOR 1½ Vs. 3 HR. RATINGS. COMPLY WITH ALL CODE REQUIREMENTS AND UL LISTING. SUBMIT SHOP DRAWINGS FOR REVIEW.



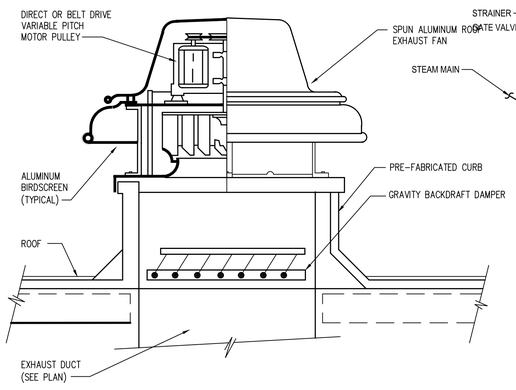
VERTICAL FIRE DAMPER DETAIL

NO SCALE



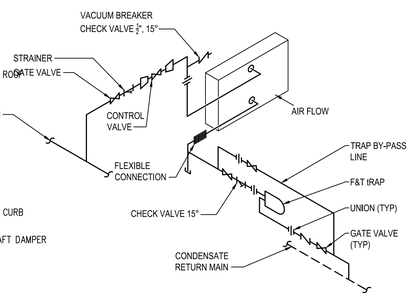
INLINE AIR FAN DETAIL

NO SCALE



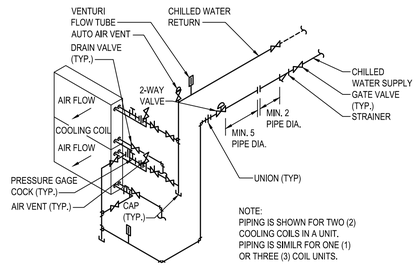
ROOF EXHAUST FAN DETAIL

NO SCALE



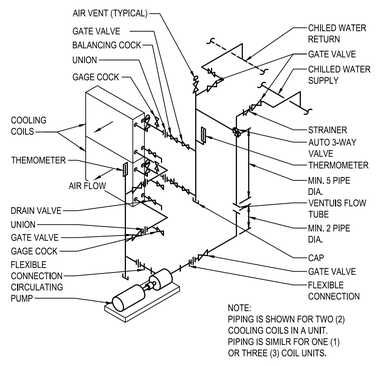
STEAM PREHEAT COIL

NO SCALE



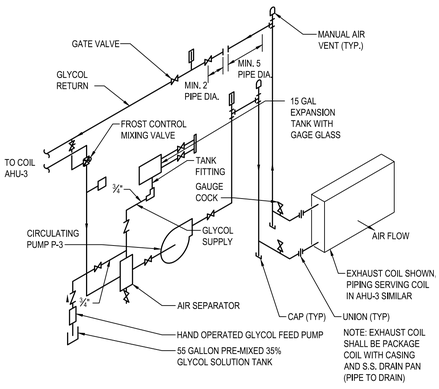
CHILLED WATER COIL (CC-1 & CC-2)

NO SCALE



AHU-3 COOLING COIL (CC-3)

NO SCALE



GLYCOL HEAT RECOVERY COIL

NO SCALE

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ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

MECHANICAL SCHEDULES AND DETAILS

SCALE: AS NOTED

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DSD FILE NAME
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ARCHITECTURAL - MECHANICAL - ELECTRICAL COORDINATION SCHEDULE

MARK	LOCATION	HP	KW	FLA	ELECTRICAL			DISCONNECT		STARTER		REMARKS
					VOLTAGE	PHASE	SCCR	FURN.	INST.	FURN.	INST.	
AHU-1	THIRD FLOOR MECHANICAL ROOM	-	-	65	460	3	-	E	E	S	E	SUPPLIED WITH (2) VFD'S EACH SIZED FOR FAN ARRAY WITH 4 FANS AT 12.5 HP EACH
AHU-2	THIRD FLOOR MECHANICAL ROOM	-	-	65	460	3	-	E	E	S	E	SUPPLIED WITH (2) VFD'S EACH SIZED FOR FAN ARRAY WITH 4 FANS AT 12.5 HP EACH
AHU-3	THIRD FLOOR MECHANICAL ROOM	-	-	11.96	460	3	-	E	E	S	E	SUPPLIED WITH (2) VFD'S EACH SIZED FOR FAN ARRAY WITH 4 FANS AT 9.5 HP EACH
RF-1	THIRD FLOOR MECHANICAL ROOM	15	-	-	460	3	-	E	E	E	E	VFD WITH BYAPSS
RF-2	THIRD FLOOR MECHANICAL ROOM	5	-	-	460	3	-	E	E	E	E	VFD WITH BYPASS
EF-3A	ON ROOF	25	-	-	460	3	-	E	E	E	E	VFD, INTERLOCKED FOR SIMULTANEOUS OPERATION WITH EF-3B
EF-3B	ON ROOF	25	-	-	460	3	-	E	E	E	E	VFD, INTERLOCKED FOR SIMULTANEOUS OPERATION WITH EF-3A
EF-4A	ON ROOF	40	-	-	460	3	-	E	E	E	E	VFD
EF-4B	ON ROOF	40	-	-	460	3	-	E	E	E	E	VFD, STANDBY FAN FOR EF-4A
EF-17 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3	¾	-	1.6	460	3	-	E	E	E	E	-
EF-18 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3	¾	-	1.6	460	3	-	E	E	E	E	-
EF-19 (ALTERNATE #2)	FIRST FLOOR IN SHAFT 3	¾	-	1.6	460	3	-	E	E	E	E	-
EF-20 (ALTERNATE #1)	THIRD FLOOR MECHANICAL ROOM	1½	-	-	460	3	-	E	E	E	E	-

LEGEND

S = SUPPLIER (MANUFACTURER)*
M = MECHANICAL
E = ELECTRICAL
VFD = VARIABLE FREQUENCY DRIVE

AHU = AIR HANDLING UNIT
RF = RETURN FAN
EF = EXHAUST FAN
P = PUMP

* – ITEMS INDICATED AS SUPPLIER SHALL BE PROVIDED WITH THE ITEM/EQUIPMENT OR BY THE CONTRACTOR PURCHASING THE ITEM/EQUIPMENT

480/277VOLT–3PHASE–4WIRE+GRND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION LP–12 LOCATION ROOM 1142
125 AMP BUS 125 M.C.B. __ M.L.O. MOUNTING: FLUSH __ SURFACE X
SPECIAL REQUIREMENTS

CKT NO.	VA	LOAD TYPE	A	B	C	LOAD TYPE	VA	CKT NO.
1	2000	LTG RM 1134–1232	20			LTG RM 1233	2000	2
3	2400	LTG RM 1206–1230		20		LTG RM 1229	2000	4
5	3200	LTG RM 1145			20	LTG RM 1225	2000	6
7	2000	LTG RM 1249	20			LTG RM 1221	2000	8
9	2000	LTG RM 1245		20		SPARE	.	10
11	2000	LTG RM 1241			20	SPARE	.	12
13	.	SPARE	20				1330	14
15	.	SPACE		15		EF–17, EF18 AND EF–19 (ALTERNATE #2)	1330	16 **
17	.	SPACE			–		1330	18

LIGHTING 21600 VA AT 125 % = 27000 VA
MISC. 3990 VA AT ___ % = 3990 VA
TOTAL 25590 VA TOTAL DEMAND = 30990 VA / 830 V = 37 A

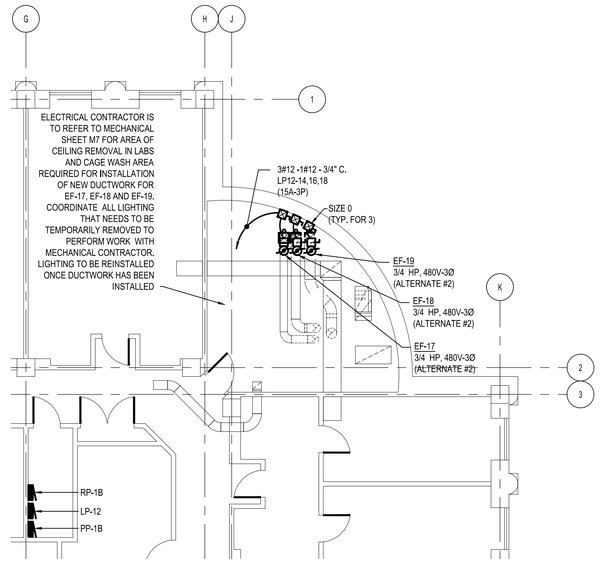
** = PROVIDE NEW 15A–3P IN EXISTING SPACE TO SERVE EXHAUST FANS

120/208VOLT–3PHASE–4WIRE+GRND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION RP–3B LOCATION MECHANICAL ROOM 3145
100 AMP BUS 100 M.C.B. __ M.L.O. MOUNTING: FLUSH __ SURFACE X
SPECIAL REQUIREMENTS

CKT NO.	VA	LOAD TYPE	A	B	C	LOAD TYPE	VA	CKT NO.
1	600	RM 3001 – 3 Φ	20			RM 3002 – LTG	500	2
3	800	RM 3129 – 3 Φ		20		RM 3129 – LTG (AHU'S)	1200	4
5	600	RM 3129 – 3 Φ			20	ROOF LTG	500	6
7	600	RM 3129 – 3 Φ	20			ROOF RECEPT 3 Φ	600	8
9	600	RM 3129 – 3 Φ		20		ATRIUM – LTG TYPE "IF"	1200	10
11	2400	HEAT TRACE – SKYLIGHT	30			ATRIUM – LTG TYPE "IF"	1200	12
13	1500	HEAT TRACE – COOLING TWR.		20		RM 329 RECEPT 3 Φ	600	14
15	.	SPARE	20			EF–14 1/3HP	865	16
17	.	SPARE		20		RM 3129 AHU 3 LTG	600	18
19	800				–	SPACE	.	20
21	800	AC–2			–	SPACE	.	22
23	800				–	SPACE	.	24
25	.	SPACE			–	SPACE	.	26
27	.	SPACE			–	SPACE	.	28
29	.	SPACE			–	SPACE	.	30

LIGHTING ___ VA AT 100 % = ___ VA
RECEPTACLE ___ VA AT 100 % = 10000 VA (FIRST 10,000 VA AT 100%)
RECEPTACLE ___ VA AT 50 % = ___ VA
MISC. ___ VA AT ___ % = ___ VA
TOTAL ___ VA TOTAL DEMAND = ___ VA / 360 V = ___ A



N PARTIAL FIRST FLOOR PLAN – NEW WORK

SCALE: 1/8" = 1'–0"

0 4 8 16 32

SYMBOL LIST

SYMBOL	DESCRIPTION
S_T	MANUAL MOTOR STARTER WITH THERMAL PROTECTION
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	COMBINATION MAGNETIC STARTER / DISCONNECT SWITCH (FUSED)
	CONTROL PANEL WITH INTEGRAL DISCONNECT
	LIGHTING / RECEPTACLE / EQUIPMENT PANEL
	DISCONNECT SWITCH, FUSED
	JUNCTION BOX
T	TRANSFORMER
	DUPLEX RECEPTACLE OUTLET
S_M	MOTOR RATED SWITCH
VFD	VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT
AFF	ABOVE FINISHED FLOOR
E	EXISTING EQUIPMENT / DEVICE
GFI	GROUND FAULT INTERRUPTER
R	RELOCATED EQUIPMENT / DEVICE
WP	WEATHERPROOF
NL	NIGHT LIGHT
ATS	AUTOMATIC TRANSFER SWITCH
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW

ELECTRICAL SHEET INDEX

OVERVIEW OF ELECTRICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ELECTRICAL:
1. TEMPORARILY REMOVE LIGHTING IN THIRD FLOOR MECHANICAL ROOM TO ALLOW FOR REMOVAL / INSTALLATION OF AIR HANDLING UNITS.
2. DEMOLITION OF EXHAUST FANS, AS NOTED, INCLUDING FEEDERS, DISCONNECTS & STARTERS.
3. REMOVE ELECTRICAL FEEDERS, STARTERS AND VARIABLE FREQUENCY DRIVES FOR AIR HANDLING UNITS TO BE REPLACED AS INDICATED.
4. PROVIDE ELECTRICAL FEEDERS, STARTERS, DISCONNECTS AND VARIABLE FREQUENCY DRIVES FOR NEW AIR HANDLING UNITS.
5. PROVIDE DUCT MOUNTED SMOKE DETECTORS AND ASSOCIATED REMOTE TEST SWITCHES TO NEW UNITS & REPROGRAM / RE–CERTIFY FIRE ALARM SYSTEM.
6. PROVIDE ELECTRICAL BRANCH FEEDERS, STARTERS AND DISCONNECTS FOR EXHAUST FANS.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2014 NATIONAL ELECTRICAL CODE AS AMENDED BY THE 2014 MICHIGAN ELECTRICAL CODE RULES, PART 8.
NFPA 101 LIFE SAFETY CODE 1997 AND 2006 (AS REFERENCED)
MICHIGAN ENERGY CODE–ASHRAE 90.1–2013
2015 INTERNATIONAL FIRE CODE (AS REFERENCED)
2015 MICHIGAN BUILDING CODE
2015 MICHIGAN MECHANICAL CODE
2015 MICHIGAN PLUMBING CODE
2015 INTERNATIONAL FUEL GAS CODE

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

NEW WORK KEYED NOTES

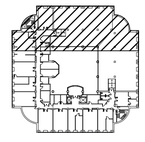
(APPLIES THIS SHEET ONLY)

1 PROVIDE 15A–2P BRANCH BREAKER IN EXISTING SPACE TO SERVE EXHAUST FANS EF–17, EF–18 & EF–19. (ALTERNATE #2)

FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE - GENERAL PURPOSE

OVERCURRENT DEVICE RATING (AMPERES)	WIRE SIZE - 3Ø, 3W SYSTEM (AWG OR Kcmil)	WIRE SIZE - 3Ø, 4W SYSTEM (AWG OR Kcmil)
15-20	3#12+#12GND, 3/4"C.	4#12+#12GND, 3/4"C.
25-30	3#10+#10GND, 3/4"C.	4#10+#10GND, 3/4"C.
35-40-45	3#8+#10GND, 3/4"C.	4#8+#10GND, 3/4"C.
50-60	3#6+#10GND, 3/4"C.	4#6+#10GND, 1"C.
70-80	3#4+#8GND, 1"C.	4#4+#8GND, 1 1/4"C.
90-100	3#2+#8GND, 1 1/4"C.	4#2+#8GND, 1 1/4"C.
110	3#1+#6GND, 1 1/4"C.	4#1+#6GND, 1 1/2"C.
125	3#1/0+#6GND, 1 1/2"C.	4#1/0+#6GND, 2"C.
150	3#2/0+#6GND, 1 1/2"C.	4#2/0+#6GND, 2"C.
175	3#3/0+#6GND, 2"C.	4#3/0+#6GND, 2"C.
200-225	3#4/0+#4GND, 2"C.	4#4/0+#4GND, 2 1/2"C.
250	3-250Kcmil+#4GND, 2"C.	4-250Kcmil+#4GND, 2 1/2"C.
300	3-350Kcmil+#4GND, 2 1/2"C.	4-350Kcmil+#4GND, 3"C.
350	3-500Kcmil+#2GND, 3"C.	4-500Kcmil+#2GND, 3 1/2"C.
400	3-600Kcmil+#2GND, 3"C.	4-600Kcmil+#2GND, 3 1/2"C.

NOTES:
- CONTRACTOR TO SIZE FEEDERS AND BRANCH CIRCUITS BASED ON THIS SCHEDULE AND OVER CURRENT DEVICE SIZE, UNLESS NOTED OTHERWISE.
- CONDUCTORS ARE BASED ON THHN/THWN UP TO AND INCLUDING #4/0. LARGER THAN #4/0 ARE BASED ON TYPE XHHW.
- ALL CALCULATIONS FOR WIRING AND CONDUIT SIZES BASED ON THE 2014 NEC
- CONDUIT SIZES SHOWN ARE MINIMUM AND ARE APPLICABLE FOR ELECTRICAL METALLIC TUBING (EMT), RIGID METAL CONDUIT (RMC) AND PVC TYPES. ACTUAL CONDUIT SIZES TO BE INSTALLED MAY VARY.



N KEY PLAN
NO SCALE

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DESIGNER	BLD
DRAWN	JMW
CHECKED	JWF
DEPT MGR	SM
PROJECT MGR	DCM

TITLE: AHU REVISION

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

ELECTRICAL GENERAL INFORMATION

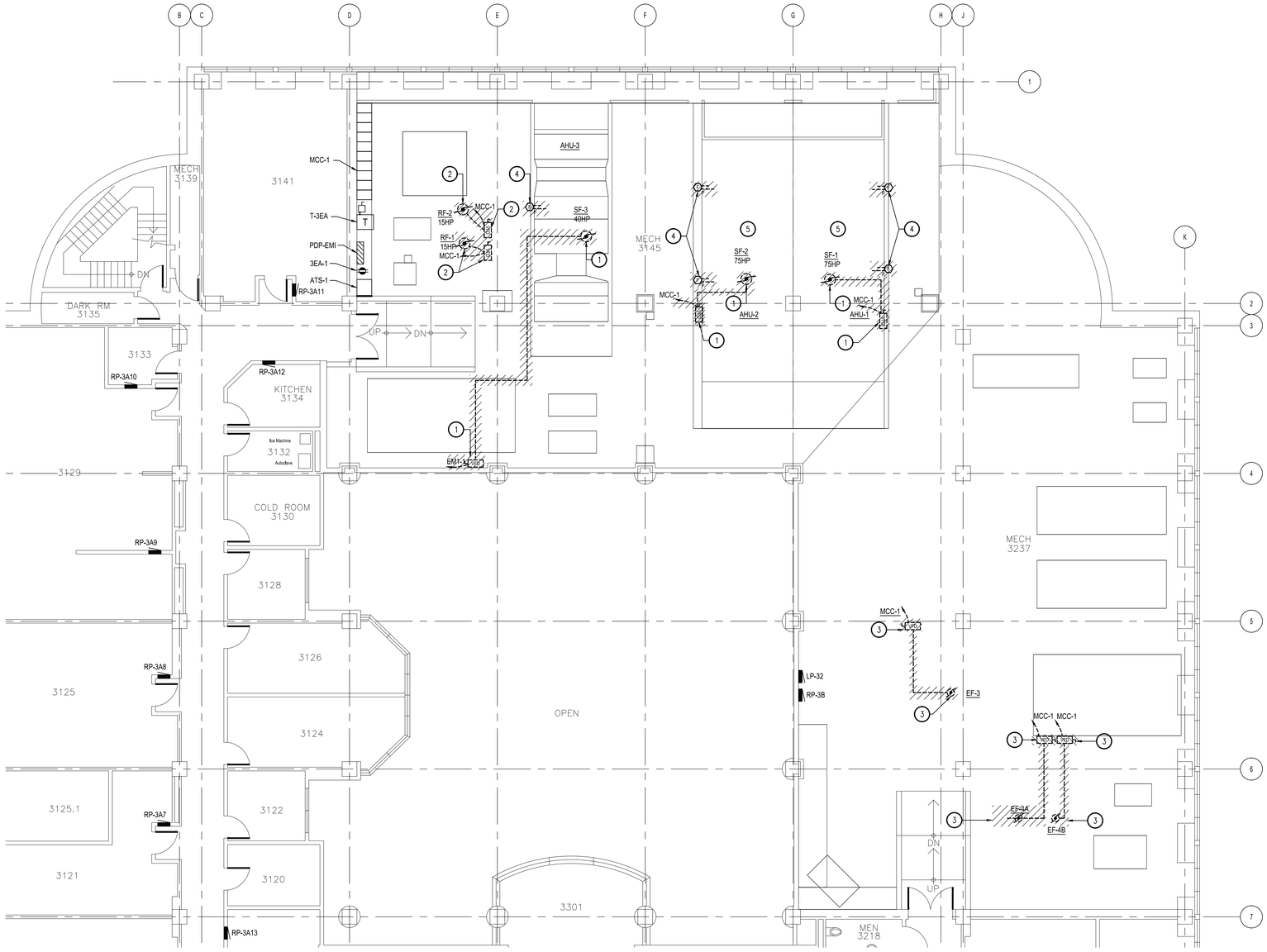
SCALE: AS NOTED

WSU PROJECT #: 629–299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
E-1

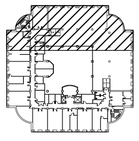
DSD FILE NAME
17–4801–E–1



PARTIAL THIRD FLOOR PLAN – ELECTRICAL DEMOLTION

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

0 4 8 16 32



KEY PLAN
NO SCALE

SHEET NOTES:

1. COORDINATE ALL ELECTRICAL WORK REQUIRED WITH MECHANICAL PLANS, SCHEDULES AND EXISTING CONDITIONS.
2. SEAL ALL WALL / FLOOR / CEILING PENETRATIONS.
3. FIRE ALARM SYSTEM (SIEMENS) TO REMAIN IN PLACE AND OPERATIONAL DURING THE CONSTRUCTION PROCESS.
4. COORDINATE ALL PHASING WORK REQUIRED WITH SHEET G-1 & G-2

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT, MAKE-CIRCUIT SAFE AND REMOVE ELECTRICAL COMPLETE FOR SUPPLY FANS INCLUDING CONDUIT, WIRE, DISCONNECT AND VARIABLE FREQUENCY DRIVE. REMOVE CONDUIT AND WIRE BACK TO SOURCE.
2. DISCONNECT, MAKE-CIRCUIT SAFE AND REMOVE ELECTRICAL COMPLETE FOR RETURN FANS INCLUDING CONDUIT WIRE. DISCONNECT AND VARIABLE FREQUENCY DRIVE. REMOVE CONDUIT AND WIRE BACK TO SOURCE.
3. DISCONNECT, MAKE-CIRCUIT SAFE AND REMOVE ELECTRICAL COMPLETE FOR EXHAUST FANS INCLUDING ALL CONDUIT, WIRE, DISCONNECTS AND VARIABLE FREQUENCY DRIVE(S). REMOVE ALL CONDUIT AND WIRE BACK TO SOURCE.
4. DISCONNECT AND REMOVE DUCT SMOKE DETECTOR. MAINTAIN WIRING TO SERVE NEW DEVICE.
5. DISCONNECT BRANCH CIRCUIT SERVING AHU LIGHTING FOR UNITS TO BE REMOVED. MAINTAIN BRANCH CIRCUIT TO SERVE NEW UNIT LIGHTING.

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	OWNER REVIEW	12/19/17
	OWNER REVIEW	10/16/17

DESIGNER	BLD
DRAWN	JMW
CHECKED	JWF
DEPT MGR	SM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL THIRD FLOOR PLAN - ELECTRICAL DEMO

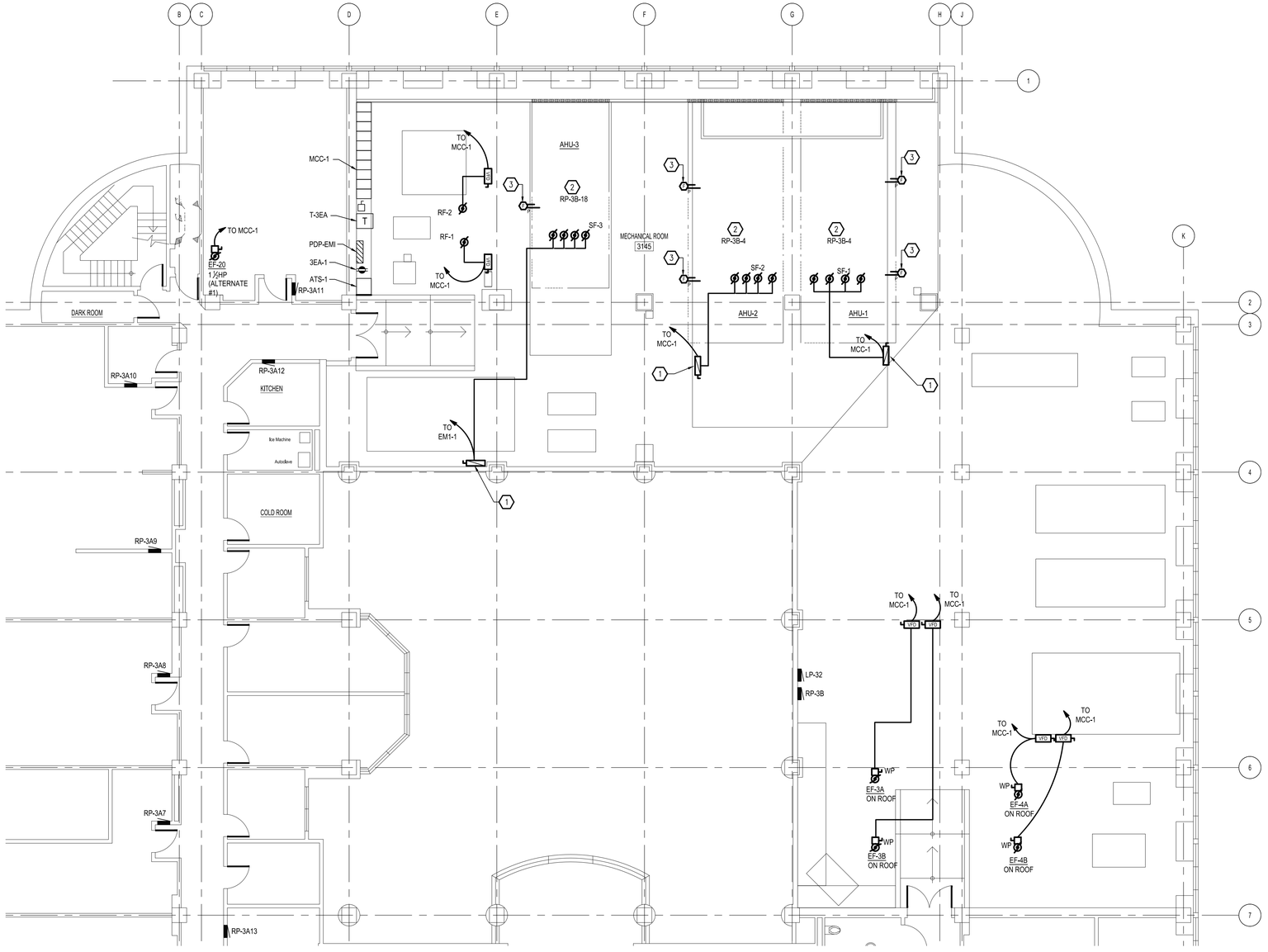
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
E-2

DSD FILE NAME
17-4801-E-2



PARTIAL THIRD FLOOR PLAN – ELECTRICAL NEW WORK

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

0 4 8 16 32

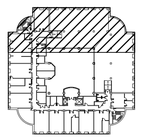
SHEET NOTES:

1. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT-CARRYING CONDUCTORS. HOMERUNS CONTAINING MORE THAN THREE CURRENT CARRYING CONDUCTORS SHALL BE DERATED IN ACCORDANCE WITH THE 2014 NEC.
2. BRANCH CIRCUIT HOMERUN CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE 2014 NEC. THE MAXIMUM ALLOWABLE VOLTAGE DROP ON A FEEDER IS 2% AND THE MAXIMUM ALLOWABLE VOLTAGE DROP ON A BRANCH CIRCUIT IS 3% PROVIDE BRANCH CIRCUIT CONDUCTORS SIZED TO ENSURE THE TOTAL VOLTAGE DROP FROM THE SOURCE TO THE POINT OF UTILIZATION IS LESS THAN OR EQUAL TO 5%.
3. SEAL ALL ASSOCIATED PENETRATIONS THRU FIRE RATED WALLS WITH FIRESTOP MATERIAL.
4. ELECTRICAL TRADES SHALL UP DATE EXISTING PANELBOARD DIRECTORIES TO REFLECT REVISIONS/ADDITIONS TO BRANCH CIRCUIT WIRING WITHIN THE PROJECT AREA.
5. ALL 120V 20A CIRCUITS OVER 100 FEET IN LENGTH TO BE #10 AWG.
6. COORDINATE ALL WORK WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
7. MAINTAIN CIRCUIT INTEGRITY FOR ALL DEVICES TO REMAIN (NOT INTENDED FOR DEMOLITION BUT INTERRUPTED BY DEMOLITION WORK).
8. COORDINATE ALL PHASING WITH SHEETS G-1 AND G-2.
9. FIRE ALARM SYSTEM IS AS MANUFACTURED BY SIEMENS. PROVIDE ALL DUCT SMOKE DETECTORS, RE-PROGRAMMING AND RE-CERTIFICATION OF SYSTEM AS REQUIRED BY THE AHJ

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE SUPPLY FAN CONTROL PANEL TO SERVE UNIT FAN ARRAY. CONTROL PANEL TO INCLUDE MAIN BREAKER, VARIABLE FREQUENCY DRIVE, REDUNDANT FREQUENCY DRIVE, VFD FUSING, OVERLOADS, AUTOMATIC CHANGE OVER, AND FRONT PANEL DISPLAY FOR EACH DRIVE.
2. PROVIDE 120V., 20A BRANCH CIRCUIT FOR UNIT SUPPLIED AND INSTALLED LIGHTING. (TOTAL OF 6–100W FIXTURES PER UNIT). CONNECT TO CIRCUIT SHOWN. COORDINATE POWER CONNECTION WITH UNIT SUPPLIED PRIOR TO ROUGH-IN.
3. PROVIDE NEW SIEMENS DUCT SMOKE DETECTORS AND REMOTE TEST SWITCH STATIONS FOR AHU-1, 2 AND 3. RECONNECT TO FIRE ALARM PANEL, RE-PROGRAM AND RE-CERTIFY SYSTEM.



KEY PLAN
NO SCALE

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DRAWN	JMW
CHECKED	JWF
DEPT MGR	SM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING

421 EAST CANFIELD
DETROIT, MICHIGAN

PARTIAL THIRD FLOOR PLAN - ELECTRICAL NEW

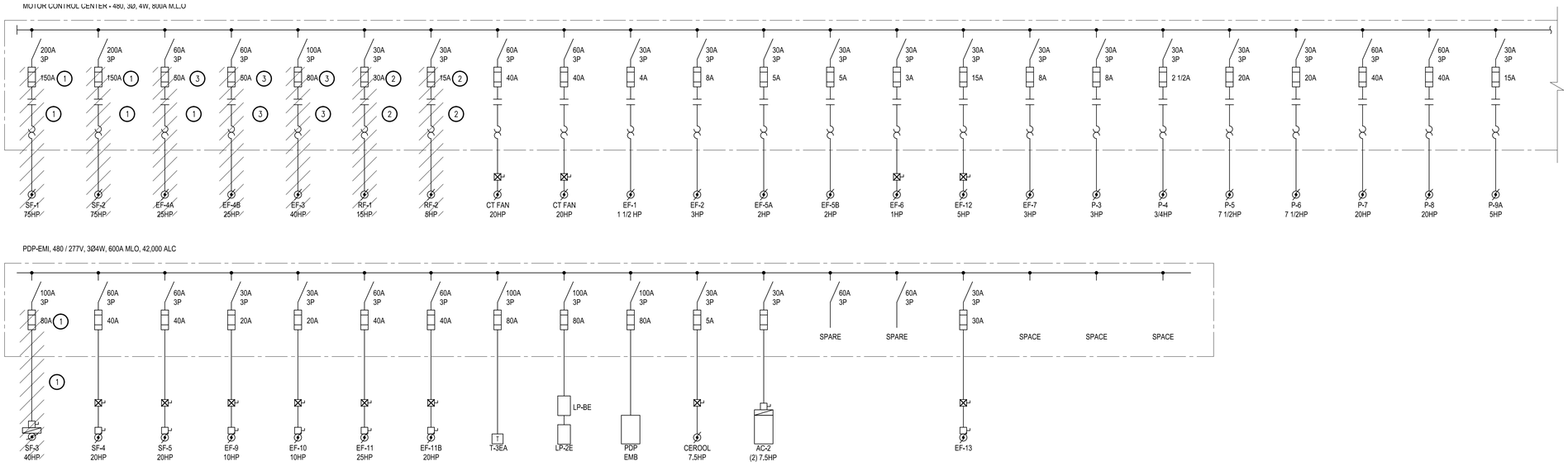
SCALE: AS NOTED

WSU PROJECT #: 629-299881
WSU BLDG NAME: ELLIMAN BUILDING
WSU BLDG #: 620

A/E PROJECT NO.
17-4801.00

SHEET NO.
E-3

DSD FILE NAME
17-4801-E-3



ONE LINE DIAGRAM – DEMO

NO SCALE

DEMOLITION KEYED NOTES:

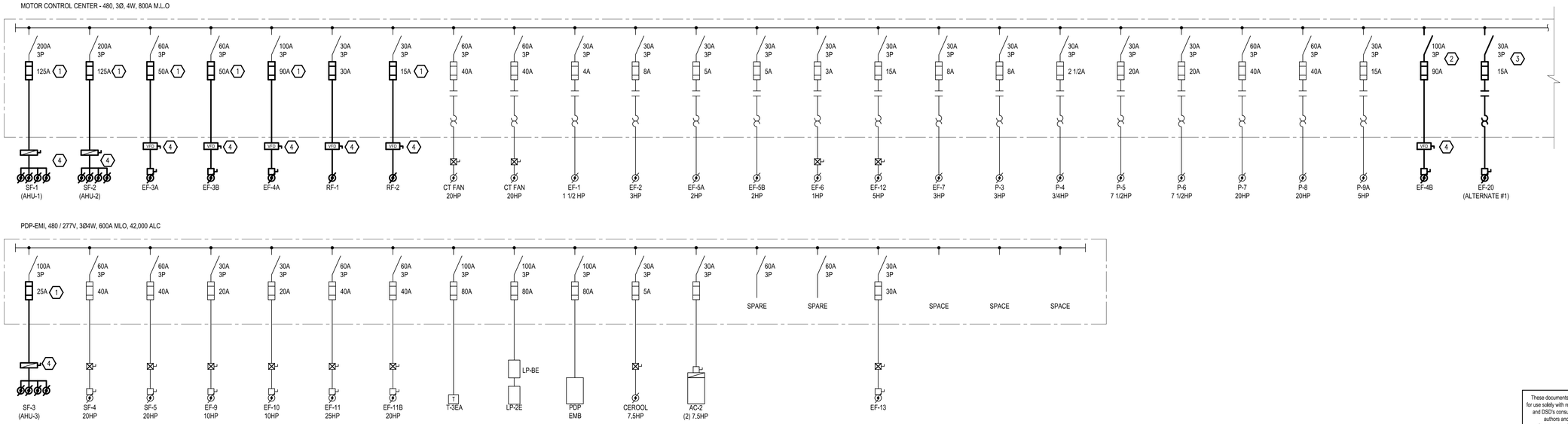
(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT, MAKE–CIRCUIT SAFE AND REMOVE ELECTRICAL COMPLETE FOR SUPPLY FAN INCLUDING CONDUIT, WIRE, DISCONNECT, FUSING IN MOTOR CONTROL CENTER, DISTRIBUTION PANEL AND VARIABLE FREQUENCY DRIVE. REMOVE CONDUIT AND WIRE BACK TO SOURCE.
2. DISCONNECT, MAKE–CIRCUIT SAFE AND REMOVE ELECTRICAL COMPLETE FOR RETURN FANS INCLUDING CONDUIT WIRE, FUSING IN MOTOR CONTROL CENTER, DISCONNECT AND VARIABLE FREQUENCY DRIVE. REMOVE CONDUIT AND WIRE BACK TO SOURCE.
3. DISCONNECT, MAKE–CIRCUIT SAFE AND REMOVE ELECTRICAL COMPLETE FOR EXHAUST FANS INCLUDING ALL CONDUIT, WIRE, FUSES AT MOTOR CONTROL CENTER, DISCONNECTS AND VARIABLE FREQUENCY DRIVE(S). REMOVE ALL CONDUIT AND WIRE BACK TO SOURCE.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE FUSING SHOWN.
2. PROVIDE NEW SWITCH AND FUSE UNIT IN EXISTING SPACE.
3. USE SPARE STARTER CUBICLE TO SERVE EF–20, ALTERNATE #1. PROVIDE FUSE CLIPS AS REQUIRED AND HAND–OFF–AUTOMATIC CONTROL.
4. PROVIDE VFD CABLE WITH 3 CONDUCTORS AND 3 SYMMETRIC GROUNDS IN CONDUIT. PROVIDE AEGIS GROUND RING ON INVERTER DUTY MOTOR.



ONE LINE DIAGRAM – NEW

NO SCALE

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CHECKED	JWF
DEPT MGR	SM
PROJECT MGR	DCM

TITLE: **AHU REVISION**

ELLIMAN BUILDING
421 EAST CANFIELD
DETROIT, MICHIGAN

ELECTRICAL ONE LINE DIAGRAM

SCALE: AS NOTED

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A/E PROJECT NO.
17-4801.00

SHEET NO.
E-4

DSD FILE NAME
17–4801–E–4