Central Utility Plant (CUP)

W. 13th and N. Senate Ave.

PACKAGE

SEAL|DATE 06/10/22

Central Utility Plant DD 100%

OWNER

IU Health
Indiana University Health
340 W. 10th Street
Indianapolis, Indiana 46202

MECHANICAL/ELECTRICAL ENGINEER

Applied Engineering Services, Inc.
5975 Castle Creek Parkway N. Drive
Indianapolis, Indiana 46250
(317) 810-4141

ARCHITECT

VPS Architecture
905 North Capitol Avenue, Suite 100,
Indianapolis, IN 46204
(317)353-3281

STRUCTURAL ENGINEER

CE Solutions
8770 North Street, Suite 100,
Fishers, IN 46038
(317) 818-1912

CIVIL ENGINEER

Cripe
9339 Priority Way West Drive, Suite 100
Indianapolis, Indiana 46240
(317) 844-6777

VOLUME

1

APPLIED PROJECT NO.

21-154

OWNER PROJECT NO.

12345

DATE

01/20/23

PROJECT ADDRESS

**Southeast Corner of
W. 13th Street and N Senate
Indianapolis, Indiana**

VOLUME	SET NO.	DATE	PACKAGE	APPLIED PROJECT NO.	PROJECT NAME
1		01/20/23	Central Utility Plant DD 100%	21-154	Central Utility Plant (CUP)

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 4:09:04 PM AES\Proj. No: 21-154

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GENERAL

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G002A	SHEET INDEX

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A102 D	SECOND FLOOR DIMENSION PLAN
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A401	BUILDING SECTIONS
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A403	BUILDING SECTION
A404	WALL SECTIONS
A405	WALL SECTIONS
A406	WALL SECTIONS
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M308	FIRST FLOOR PIPING PLAN - AREA E
M310	FIRST FLOOR PIPING PLAN - AREA G
M311	SECOND FLOOR PIPING PLAN - AREA A
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M504	MECHANICAL EQUIPMENT DETAILS
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M602	MECHANICAL SCHEDULES
M603	MECHANICAL SCHEDULES
M604	MECHANICAL SCHEDULES
M605	MECHANICAL SCHEDULES
M606	MECHANICAL SCHEDULES
M607	MECHANICAL SCHEDULES
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H309	FIRST FLOOR HVAC PLAN - AREA F
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EL304LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA A
EL305	FIRST FLOOR LIGHTING PLAN - AREA B
EL305LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA B
EL306	FIRST FLOOR LIGHTING PLAN - AREA C
EL306LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA C
EL307	FIRST FLOOR LIGHTING PLAN - AREA D
EL307LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA D
EL308	FIRST FLOOR LIGHTING PLAN - AREA E
EL308LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA E
EL309	FIRST FLOOR LIGHTING PLAN - AREA F
EL309LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA F
EL310	FIRST FLOOR LIGHTING PLAN - AREA G
EL310LT	FIRST FLOOR PHOTOMETRIC PLAN - AREA G
EL311	SECOND FLOOR LIGHTING PLAN - AREA A
EL311LT	SECOND FLOOR PHOTOMETRIC PLAN - AREA A
EL312	SECOND FLOOR LIGHTING PLAN - AREA B
EL312LT	SECOND FLOOR PHOTOMETRIC PLAN - AREA B
EL313	SECOND FLOOR LIGHTING PLAN - AREA C
EL313LT	SECOND FLOOR PHOTOMETRIC PLAN - AREA C
EL314	SECOND FLOOR LIGHTING PLAN - AREA D
EL314LT	SECOND FLOOR PHOTOMETRIC PLAN - AREA D
EL315	SECOND FLOOR LIGHTING PLAN - AREA E
EL315LT	SECOND FLOOR PHOTOMETRIC PLAN - AREA E
EL316	SECOND FLOOR LIGHTING PLAN - AREA F
EL316LT	SECOND FLOOR PHOTOMETRIC PLAN - AREA F
EL317	ROOF LIGHTING PLAN - AREA A
EL317LT	ROOF PHOTOMETRIC PLAN - AREA A
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EL318LT	ROOF PHOTOMETRIC PLAN - AREA B
EL319	ROOF LIGHTING PLAN - AREA C
EL319LT	ROOF PHOTOMETRIC PLAN - AREA C
EL320	ROOF LIGHTING PLAN - AREA D
EL320LT	ROOF PHOTOMETRIC PLAN - AREA D
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EL322LT	ROOF PHOTOMETRIC PLAN - AREA F
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EL602	LIGHTING PANEL

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ES306	FIRST FLOOR SYSTEMS PLAN - AREA C
ES307	FIRST FLOOR SYSTEMS PLAN - AREA D
ES308	FIRST FLOOR SYSTEMS PLAN - AREA E
ES309	FIRST FLOOR SYSTEMS PLAN - AREA F
ES310	FIRST FLOOR SYSTEMS PLAN - AREA G
ES311	SECOND FLOOR SYSTEMS PLAN - AREA A
ES312	SECOND FLOOR SYSTEMS PLAN - AREA B
ES313	SECOND FLOOR SYSTEMS PLAN - AREA C
ES314	SECOND FLOOR SYSTEMS PLAN - AREA D
ES315	SECOND FLOOR SYSTEMS PLAN - AREA E
ES316	SECOND FLOOR SYSTEMS PLAN - AREA F
ES317	ROOF SYSTEMS PLAN - AREA A
ES319	ROOF SYSTEMS PLAN - AREA C
ES320	ROOF SYSTEMS PLAN - AREA D
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ES402	MEZZANINE SYSTEMS PLANS
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EP304	FIRST FLOOR 13,200V POWER PLAN - AREA A
EP305	FIRST FLOOR 13,200V POWER PLAN - AREA B
EP306	FIRST FLOOR 13,200V POWER PLAN - AREA C
EP307	FIRST FLOOR 13,200V POWER PLAN - AREA D
EP308	FIRST FLOOR 13,200V POWER PLAN - AREA E
EP309	FIRST FLOOR 13,200V POWER PLAN - AREA F
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EP312	SECOND FLOOR 13,200V POWER PLAN - AREA B
EP313	SECOND FLOOR 13,200V POWER PLAN - AREA C
EP314	SECOND FLOOR 13,200V POWER PLAN - AREA D
EP315	SECOND FLOOR 13,200V POWER PLAN - AREA E
EP316	SECOND FLOOR 13,200V POWER PLAN - AREA F
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EP335	FIRST FLOOR 480V POWER PLAN - AREA B
EP336	FIRST FLOOR 480V POWER PLAN - AREA C
EP337	FIRST FLOOR 480V POWER PLAN - AREA D
EP338	FIRST FLOOR 480V POWER PLAN - AREA E
EP339	FIRST FLOOR 480V POWER PLAN - AREA F
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EP343	SECOND FLOOR 480V POWER PLAN - AREA C
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EP351	ROOF 480V POWER PLAN - AREA E
EP352	ROOF 480V POWER PLAN - AREA F
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EP365	FIRST FLOOR 208V POWER PLAN - AREA B
EP366	FIRST FLOOR 208V POWER PLAN - AREA C
EP367	FIRST FLOOR 208V POWER PLAN - AREA D
EP368	FIRST FLOOR 208V POWER PLAN - AREA E
EP369	FIRST FLOOR 208V POWER PLAN - AREA F
EP370	FIRST FLOOR 208V POWER PLAN - AREA G
EP371	SECOND FLOOR 208V POWER PLAN - AREA A
EP372	SECOND FLOOR 208V POWER PLAN - AREA B
EP373	SECOND FLOOR 208V POWER PLAN - AREA C
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EP375	SECOND FLOOR 208V POWER PLAN - AREA E
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EP379	ROOF 208V POWER PLAN - AREA C
EP380	ROOF 208V POWER PLAN - AREA D
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EP393	SECOND FLOOR GROUNDING PLAN - OVERALL
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EP503	SUBSTATION DETAILS - USS-CH-1 / CH-2
EP504	SUBSTATION DETAILS - USS-MECH1/MECH2 AND ESS
EP505	SUBSTATION DETAILS - PS DIAGRAM AND ELEVATION
EP506	ELECTRICAL DETAILS
EP507	ELECTRICAL DETAILS
EP508	ELECTRICAL DETAILS
EP509	ELECTRICAL DETAILS
EP510	ELECTRICAL DETAILS
EP511	ELECTRICAL DETAILS
EP512	ELECTRICAL DETAILS
EP513	ELECTRICAL DETAILS
EP514	ELECTRICAL DETAILS
EP515	ELECTRICAL DETAILS
EP601	POWER SCHEDULES
EP602	POWER SCHEDULES
EP603	POWER SCHEDULES
EP604	POWER SCHEDULES
EP605	POWER SCHEDULES
EP606	ELECTRICAL DETAILS
EP607	POWER SCHEDULES
EP608	POWER SCHEDULES
EP609	POWER SCHEDULES
EP701	PRIMARY ONE LINE DIAGRAM
EP702	MSS SINGLE LINE DIAGRAM
EP703	PS ONE LINE DIAGRAM
EP704	USS-MECH1 SINGLE LINE DIAGRAM
EP705	USS-MECH2 SINGLE LINE DIAGRAM
EP706	USS-CH1 SINGLE LINE DIAGRAM
EP707	USS-CH2 SINGLE LINE DIAGRAM
EP708	USS-CUP-ESS SINGLE LINE DIAGRAM
EP709	SWBD1 SINGLE LINE DIAGRAM
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EP711	SWBD3 SINGLE LINE DIAGRAM
EP712	SWBD4 SINGLE LINE DIAGRAM
EP713	SWBD5 SINGLE LINE DIAGRAM
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EP716	ELECTRICAL SCADA SYSTEM SCHEMATIC DIAGRAM
EP717	ONELINE DIAGRAM FOR ARC FLASH - OVERALL
EP718	HEAT TRACE SCHEMATIC
UE501	ELECTRICAL SITE DETAILS
UE502	ELECTRICAL SITE DETAILS

SPECIALTY - REFERENCE

C100	OVERALL SITE LAYOUT
C703	SSB TO AAHC DEMARK MANHOLES
C705	CUP TO SSB
C706	CUP SITE DEMARK POINTS

SPECIALTY - UTILITY TUNNEL

UT100	UTILITY TUNNEL
UT101	UTILITY TUNNEL - CUP
UT101.1	MECHANICAL
UT101.2	PLUMBING - FIRE PROTECTION
UT101.3	POWER - SYSTEMS
UT101.4	LIGHTING
UT101.5	UTILITY SUPPORT DETAILS
UT102	UTILITY TUNNEL - SSB
UT102.1	SSB - MECHANICAL
UT102.2	SSB - FIRE PROTECTION
UT102.3	SSB - SYSTEMS
UT103	PNEUMATIC TUBES

SPECIALTY - PNEUMATIC TUBES

PT0.000	PNEUMATIC TUBE COVER SHEET
PT1.000	PNEUMATIC TUBE RISER DIAGRAM
PT2.LL1	PNEUMATIC TUBE PLANS - LOWER LEVEL 1
PT2.LL2	PNEUMATIC TUBE PLANS - LOWER LEVEL 2
PT3.000	PNEUMATIC TUBE EQUIPMENT
PT3.100	PNEUMATIC TUBE MISC. PARTS
PT3.200	PNEUMATIC TUBE WALL & FLOOR PENETRATIONS

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
9975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

VPS ARCHITECTURE
905 North Capitol Avenue, Suite 100,
Indianapolis, IN 46204
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317.818.1912 cesolutionsinc.com

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Solutions by Design Since 1937
9339 Priority Way West Drive, Suite 100
Indianapolis, IN 46240
(317) 844-6777 | www.cripe.biz

100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

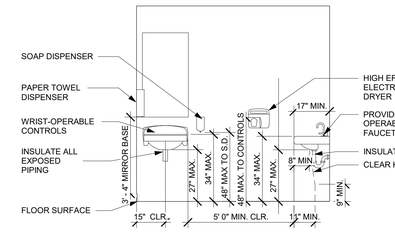
DESIGNED BY	Designer
CHECKED BY	Checker
APPROVED BY	Approver
PROJECT NO.	21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

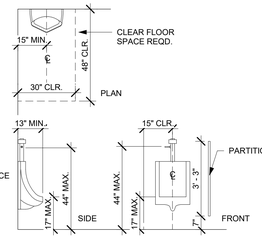
SHEET TITLE: **SHEET INDEX**

SHEET NUMBER: **G002B**

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 4:09:04 PM AESI Proj. No: 21-154

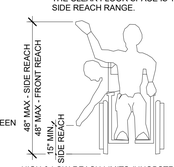


PUBLIC ACCESSIBLE LAVATORY ELEVATION
NTS



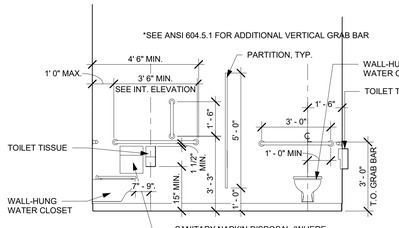
ACCESSIBLE URINAL ELEVATION/PLAN
NTS

REACH NOTES:
1. AN OBSTRUCTION BETWEEN THE ELEMENT AND THE CLEAR FLOOR SPACE IS 10" MAXIMUM ATB48" SIDE REACH RANGE.

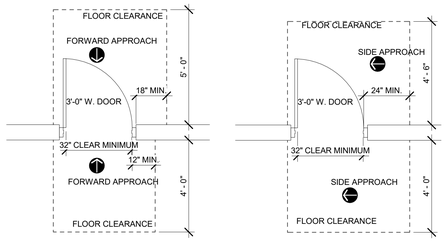


HIGH & LOW REACH LIMITS (UNOBSTRUCTED)
TOILET ROOM ACCESSORIES SUCH AS SOAP DISPENSERS, PAPER TOWEL DISPENSERS, AND TRASH RECEPTACLES MUST BE OPERABLE WITHIN THESE MAXIMUM REACH DIMENSIONS.

REACH DETAIL
NTS

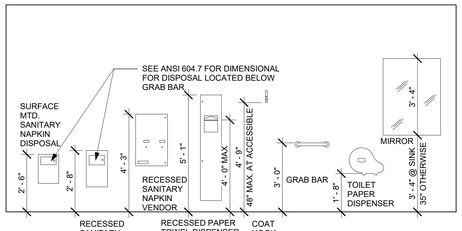


PUBLIC ACCESSIBLE STALL ELEVATION
NTS



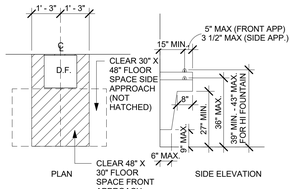
NOTE: THIS REQUIREMENT APPLIES TO ALL NEW OR RELOCATED DOORS WITH BOTH CLOSER AND LATCHES.

MIN. REQUIRED FLOOR CLEARANCE @ DOORS
NTS

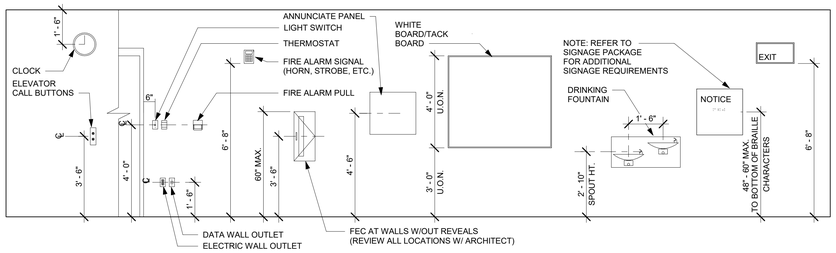


PUBLIC RESTROOM MOUNTING HEIGHTS
NTS

DRINKING FOUNTAIN NOTES:
1. DIMENSIONS SHOWN BELOW APPLY TO EITHER HI-LOW ACCESSIBLE DRINKING FOUNTAINS OR SINGLE ACCESSIBLE DRINKING FOUNTAIN AS SHOWN



ACCESSIBLE DRINKING FOUNTAIN
NTS



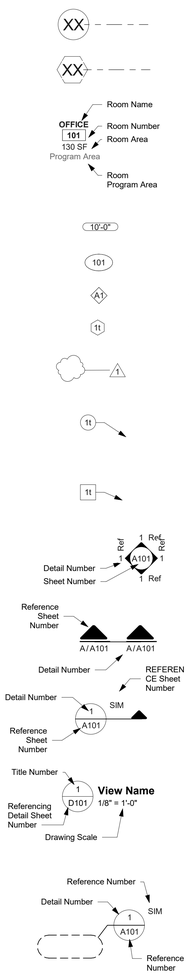
PUBLIC AREAS MOUNTING HEIGHTS
NTS

ABBREVIATIONS:
FDVC= FIRE DEPARTMENT VALVE CABINET
FEC= FIRE EXTINGUISHER CABINET

NOTES:
USE FOR REFERENCE AND MOUNTING HEIGHTS TO COMPLY WITH LOCAL AND FEDERAL ACCESSIBILITY REQUIREMENTS.
CONTRACTOR TO ALERT ARCHITECT WITH ANY DISCREPANCY IN DRAWINGS THAT CAINOT MEET DIMENSIONS PROVIDED HERE.
COORDINATE WITH MEP DRAWINGS. COORDINATE WITH ARCHITECT IF THERE ARE DISCREPANCIES.

REFERENCE SYMBOLS

1. APPLY TO 'A' SERIES DRAWINGS ONLY
2. REFER TO REFLECTED CEILING PLANS & ROOF PLANS FOR ADDITIONAL SYMBOLS FOR THOSE DRAWINGS.
3. REFER TO CIVIL, STRUCTURAL, AND MEP DRAWINGS FOR SYMBOLS PERTAINING TO THOSE DRAWINGS.

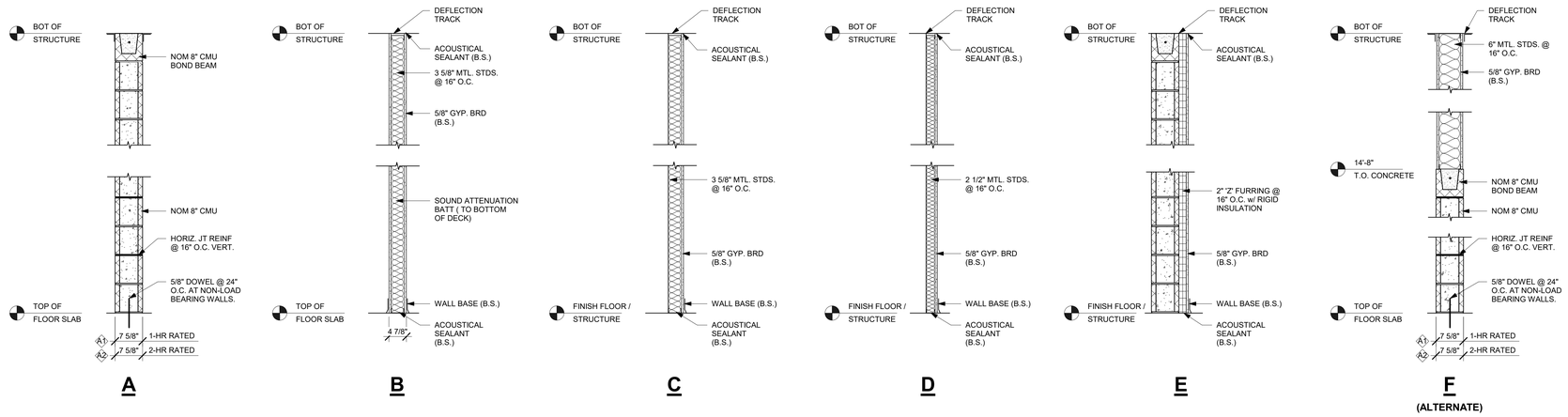


ABBREVIATIONS

L	ANGLE
°	DEGREES
Ø	DIAMETER
#	NUMBER
+/-	PLUS OR MINUS
ACOUST	ACOUSTIC/ ACOUSTICAL
ACP	ACOUSTIC CEILING PANEL
ACT	ACOUSTIC CEILING TILE
ADA	AMERICAN DISABILITIES ACT
ADJ	ADJUSTABLE
A/E	ARCHITECT/ENGINEER
AED	AUTOMATED EXTERNAL DEFIBRILLATOR
AFF	ABOVE FINISHED FLOOR
ANOD	ANODIZED
AL	ALUMINUM
ALT	ALTERNATE
AP	ACCESS PANEL
APPROX	APPROXIMATE
BD	BOARD
BEJ	BRICK EXTENSION JOINT
BLDG	BUILDING
BLKG	BLOCKING
BLW	BELOW
BOT	BOTTOM
BS	BOTH SIDES
BTWN	BETWEEN
C/C	CENTER TO CENTER
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CG	CORNER GUARD
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRIDOR
CPT	CARPET
CR	CARD READER
CT	CERAMIC TILE
CTB	CERAMIC TILE BASE
DBL	DOUBLE
DEMO	DEMOLISH/DEMOLITION
DET	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATION/ELEVATOR
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP.	EQUIPMENT
ETR	EXISTING TO REMAIN
EXIST.	EXISTING
EXP	EXPANSION / EXPOSED
EXT	EXTERIOR
EWC	ELECTRIC WATER COOLER
F	FLUSH
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET & FIRE EXTINGUISHER
FFE	FINISH FLOOR ELEVATION
FF & E	FURNISHING, FIXTURES AND EQUIPMENT
FG	FULL GLASS
FHC	FIRE HOSE CABINET
FL	FLOOR
FR	FIRE RESISTANT
FRT	FIRE RETARDANT TREATED
FT	FLOOR TILE
FVC	FIRE VALVE CABINET
GA	GAUGE
GB	GRAB BAR
GALV	GALVANIZED
GL	GLASS
GYP	GYPSUM
H	HIGH
HDW	HARDWARE
HG	HALF GLASS
HT	HEIGHT
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
INSUL	INSULATION
INT	INTERIOR
JAN	JANITOR
JT	JOINT
L	ANGLE
LAV	LAVATORY
LAM	LAMINATE
LB	POUND
LG	LENGTH, LONG
LH	LEFT HAND
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LVP	LUXURY VINYL PLANK
LVT	LUXURY VINYL TILE
MAS	MASONRY
MAX	MAXIMUM
MB	MARKER BOARD
ME	MATCH EXIST
MECH	MECHANICAL
MEP	MECH./ELEC./ PLUMBING
MFR	MANUFACTURE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL
MUL	MULLION
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NL	NARROW LIGHT
NO.	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED/ CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED/ OWNER INSTALLED
OH	OVERHEAD
OPG	OPENING
OPP	OPPOSITE
O.H.	OPPOSITE HAND
O/O	OUT TO OUT
PC	PRECAST CONCRETE
PLAM	PLASTIC LAMINATE
PLUMB	PLUMBING
PLYWD	PLYWOOD
PR	PAIR
PREP	PREPARE
PT	PAINT
PTD	PAINTED
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
QZT	QUARTZ TOP
R	RISER
RAD	RADIOS
RB	RESILIENT WALL BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REINM	REINFORCE/REINFORCING
REQD	REQUIRED
REV	REVISION
RH	RIGHT HAND
RM	ROOM
RO	ROUGH OPENING
RE:	REFER TO
REF	REFERENCE
SCH	SCHEDULE
SCW	SOLID CORE WOOD
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SM	SHEET METAL
SQ	SQUARE
STD	STANDARD
SIM	SIMILAR
SS	SOLID SURFACE
SST	STAINLESS STEEL
STL	STEEL
STRUCT	STRUCTURAL
SUSP	SUSPENDED/SUSPENSION
SYM	SYMMETRICAL
T	TREAD
TB	TACK BOARD
TBD	TO BE DETERMINED
TEMP	TEMPERED
TG	TEMPERED GLASS
THK	THICK
TO	TOP OF
TYP	TYPICAL
TZ	TERRAZZO
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
W	WIDE, WIDTH
W/	WITH
WCP	WOOD CEILING PLANK
WCT	WOOD CEILING TILE
WD	WOOD
W/O	WITHOUT
WP	WALL PROTECTION
WR	WATER RESISTANCE
WT	WALL TILE, WEIGHT

HATCH PATTERN LEGEND

- BATT INSULATION / SOUND ATTENUATION BLANKET
- CONCRETE
- CONCRETE MASONRY UNIT
- RIGID INSULATION
- GYPSUM BOARD
- BRICK



TYPICAL PARTITION TYPE
3/4" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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VPS ARCHITECTURE
905 North Capitol Ave, Suite 100
Indianapolis, IN 46204
(317) 353-3281

CE Solutions structural engineers
8770 North St., Ste. 100 Fishers, IN 46038 | 317.818.1912 | cesolutionsinc.com

Cripe
Solutions by Design Since 1937
9339 Priority Way West Drive, Suite 100
Indianapolis, IN 46240
(317) 844-6777 | www.cripe.biz

100% Design Development Documents
February 10th, 2023

REVISIONS

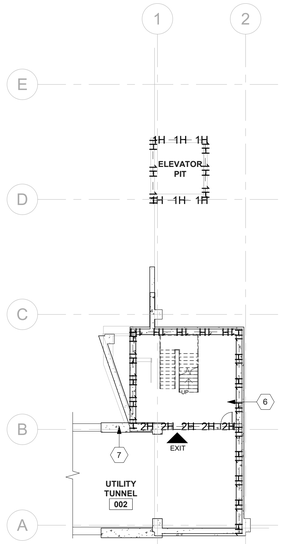
NO.	DATE	DESCRIPTION

DESIGNED BY: Designer	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: Checker	
APPROVED BY: Approver	
PROJECT NO.	

SHEET TITLE
GENERAL PROJECT INFORMATION

SHEET NUMBER
A001

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:44 PM AESI Proj. No:



LOWER LEVEL LIFE SAFETY PLAN
1/16" = 1'-0"

LIFE SAFETY PLAN LEGEND

- EXIT — INDICATES ROOM, SUITE, OR BUILDING EXIT
- INDICATES PATH OF EGRESS TRAVEL
- INDICATES MAXIMUM OVERALL DIAGONAL DISTANCE
- INDICATES DISTANCE BETWEEN EXITS
- 1H 1H — INDICATES 1-HOUR RATED WALL CONSTRUCTION
- 2H 2H — INDICATES 2-HOUR RATED WALL CONSTRUCTION
- F.E.C. — INDICATES RECESSED FIRE EXTINGUISHER CABINET LOCATION
- F.E. — INDICATES BRACKET-MOUNTED FIRE EXTINGUISHER LOCATION
- INDICATES EXTENTS OF MEZZANINE ABOVE

OCCUPANCY TYPE LEGEND

- GROUP B
- GROUP F-1
- GROUP H-3

APPLICABLE CODES AND STANDARDS

MUNICIPAL:
INDIANAPOLIS REGIONAL CENTER PLAN 2020, REGIONAL CENTERS DESIGN GUIDELINES
MARION COUNTY THOROUGHFARE PLAN
INDIANAPOLIS REGIONAL PEDESTRIAN PLAN
INDIANAPOLIS METROPOLITAN PLANNING AREA MULTI-MODAL CORRIDOR AND PUBLIC SPACE DESIGN GUIDELINES
ZONING CODE, CBD-S
INDIANAPOLIS DEPARTMENT OF PUBLIC WORKS SPECIFICATIONS AND MANUALS
CITIZENS ENERGY GROUP WASTEWATER STANDARDS MANUAL
CITIZENS ENERGY GROUP WATER STANDARDS MANUAL
IPL GOLD BOOK
INDIANAPOLIS-MARION COUNTY CONSOLIDATED ZONING AND SUBDIVISION ORDINANCE

STATE OF INDIANA:
INDIANA BUILDING CODE 2014 EDITION (2012 IBC W/ 2014 INDIANA AMENDMENTS)
INDIANA PLUMBING CODE 2012 EDITION (2006 IPC W/ INDIANA AMENDMENTS)
INDIANA ELECTRICAL CODE (2008 NATIONAL ELECTRICAL CODE W/ INDIANA AMENDMENTS)
INDIANA MECHANICAL CODE (2012 INTERNATIONAL MECHANICAL CODE W/ 2014 INDIANA AMENDMENTS)
INDIANA ENERGY CONVERSATION CODE (ASHRAE 90.1 2007 W/ INDIANA AMENDMENTS)
INDIANA SAFETY CODE FOR ELEVATORS, ESCALATORS, MAN LIFTS AND HOISTS (ANSI/ ASME A17.1 2007 W/ INDIANA AMENDMENTS)
INDIANA FIRE PREVENTION CODE (2012 INTERNATIONAL FIRE CODE W/ INDIANA AMENDMENTS)
INDIANA SUPPLEMENTARY FIRE SAFETY RULES, 2003
INDIANA SAFETY CODE FOR ELEVATORS, ESCALATORS, MAN LIFTS AND HOISTS: (ANSI/ASME 2007 W/ INDIANA AMENDMENTS)
NEW ELEVATOR SAFETY CODE, 2011
INDIANA FUEL GAS CODE: (2012 INTERNATIONAL FUEL GAS CODE W/ INDIANA AMENDMENTS
NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS (NFPA)
2018 EDITION OF THE "GUIDELINE FOR DESIGN AND CONSTRUCTION OF HOSPITALS" PUBLISHED BY THE AMERICAN INSTITUTE OF ARCHITECTS.
INDIANA WASTEWATER TREATMENT FACILITIES; ISSUANCE OF PERMITS; CONSTRUCTION AND PERMIT REQUIREMENTS CODE (327-IAC-3)
INDIANA PUBLIC WATER SUPPLY CODE (327-IAC-8)

FEDERAL:
NATIONAL FIRE PROTECTION ASSOCIATION, NFPA 101 LIFE SAFETY CODE, 2012 EDITION
INDIANA UNIVERSITY HEALTH MEDICAL CENTER CAMPUS K. CONCEPT BASIS OF DESIGN (BOD) NARRATIVE PHASE I DELIVERABLES VOLUME 1 - INTRODUCTION AND CAMPUS-WIDE DESIGN REQUIREMENTS NOVEMBER 4, 2020
NATIONAL FIRE PROTECTION ASSOCIATION, NFPA 99, STANDARDS FOR HEALTH CARE FACILITIES CODE 2012 EDITION, EXCEPT FOR CHAPTERS 7--FORMATION TECHNOLOGY AND COMMUNICATIONS SYSTEMS FOR HEALTH CARE FACILITIES; 8--PLUMBING; 12--EMERGENCY MANAGEMENT; AND 13--SECURITY MANAGEMENT ALSO ADOPTED 2012 HCFC TENTATIVE INTERIM AMENDMENT 12-2, 12-3, 12-4, 12-5 AND 12-6.
2010 ADA STANDARDS FOR ACCESSIBLE DESIGN IS ENFORCED BY THE U.S. DEPARTMENT OF JUSTICE; ICC/ANSI A117.1—03 IS THE REFERENCED STANDARD IN THE 2009 INTERNATIONAL BUILDING CODE FOR ACCESSIBILITY.
FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR 150/5390-2C DATED 04/24/2012.
UNITED STATES CODE TITLE 21 – FOOD AND DRUGS CHAPTER 9 - SUBCHAPTER V – DRUGS AND DEVICES PART A - SEC. 353A - PHARMACY COMPOUNDING REFERENCES
UNITED STATES PHARMACOPEIA'S (USP'S) GENERAL CHAPTER 797
PHARMACEUTICAL COMPOUNDING—STERILE PREPARATIONS
USP GENERAL CHAPTER 800 HAZARDOUS DRUGS HANDLING IN HEALTHCARE SETTINGS IS NOT CURRENTLY ENACTED BUT WOULD BE FOLLOWED AS A BEST PRACTICE AND IS EXPECTED TO BE ADOPTED IN NEAR-TERM FUTURE. [BECAUSE IT IS LIKELY TO BE ENACTED PRIOR TO PROJECT OCCUPANCY IT IS KEPT AS A MANDATORY REQUIRED STANDARD, RATHER THAN BEING LISTED AS A VOLUNTARY STANDARD.

STANDARDS:
PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY JULY 26, 2011; UNITED STATES ACCESS BOARD. (PROPOSED FOR REFERENCE IN THE PUBLIC RIGHT OF WAY, EVEN THOUGH THIS IS NOT ENACTED ENFORCEABLE STANDARD)
DESIGN GUIDE FOR IMPROVING HOSPITAL SAFETY IN EARTHQUAKES, FLOODS, AND HIGH WINDS FEMA 577 / JUNE 2007 THIS IS NOT A PRESCRIPTIVE OR ADOPTED STANDARD BUT SHOULD BE USED AS A REFERENCE DOCUMENT TO HAVE DISCUSSIONS IF PERFORMANCE STANDARDS EXCEEDING CODE REQUIREMENTS IS DESIRED. IT IS CITED AS A SOURCE FOR REFERENCE, AND TO BE USED FOR A SOURCE OF COMMON TERMINOLOGY AND FRAMEWORK IN THOSE DISCUSSIONS.)
2018 GUIDELINES FOR DESIGN AND CONSTRUCTION OF HOSPITALS AND OUTPATIENT FACILITIES; FACILITY GUIDELINES INSTITUTE.
ACR GUIDANCE DOCUMENT FOR SAFE MR PRACTICES: 2013
ASHRAE STANDARD 188 LEGIONELLOSIS: RISK MANAGEMENT FOR BUILDING WATER SYSTEMS, GUIDELINE 12 MINIMIZING THE RISK OF LEGIONELLOSIS ASSOCIATED WITH BUILDING WATER SYSTEMS
ASHRAE 189.3-2017: DESIGN, CONSTRUCTION, AND OPERATION OF SUSTAINABLE HIGH-PERFORMANCE HEALTH CARE FACILITIES
ASHRAE STANDARD 170-2013: VENTILATION OF HEALTH CARE FACILITIES
ASHRAE STANDARD 62.1-2018: VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY
ASHRAE STANDARD 90.1-2019: ENERGY STANDARD FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS (ASHRAE 90.1-2007 IS THE BASIS FOR THE INDIANA ENERGY CODE, HOWEVER ASHRAE 90.1-2019 IS THE CURRENT VERSION AND IS THE BASIS OF DESIGN FOR THE IUHMCC. MANDATORY REQUIREMENTS OF ASHRAE STANDARD 90.1-2010 MUST ALSO BE ACHIEVED FOR LEED V4 CERTIFICATION.)
LEED RATING SYSTEM (THIS IS NOT A PRESCRIPTIVE STANDARD; IT IS A THIRD-PARTY CERTIFICATION SYSTEM WITH A REFERENCE GUIDE.)
LEED FOR BUILDING DESIGN AND CONSTRUCTION V4: NEW CONSTRUCTION AND MAJOR RENOVATION
LEED FOR BUILDING DESIGN AND CONSTRUCTION V4: HEALTHCARE
LEED FOR INTERIOR DESIGN AND CONSTRUCTION V4: COMMERCIAL INTERIORS
SITES RATING SYSTEM (THIS IS NOT A PRESCRIPTIVE STANDARD; IT IS A THIRD-PARTY CERTIFICATION SYSTEM.)
THE SUSTAINABLE SITES INITIATIVE (SITES) V2
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
AMERICAN SOCIETY FOR TESTING AND MATERIALS
AMERICAN CONCRETE INSTITUTE
AMERICANS WITH DISABILITIES ACT (ADA)
AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AMERICAN WATER WORKS ASSOCIATION
MIDWEST INSULATION CONTRACTORS ASSOCIATION
AMERICAN NATIONAL STANDARDS INSTITUTE
AMERICAN PETROLEUM INSTITUTE
BUILDING INDUSTRY ASSOCIATION
TIA/EIA
BICSI
INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)UNDERWRITERS LABORATORIES (UL) LISTINGS

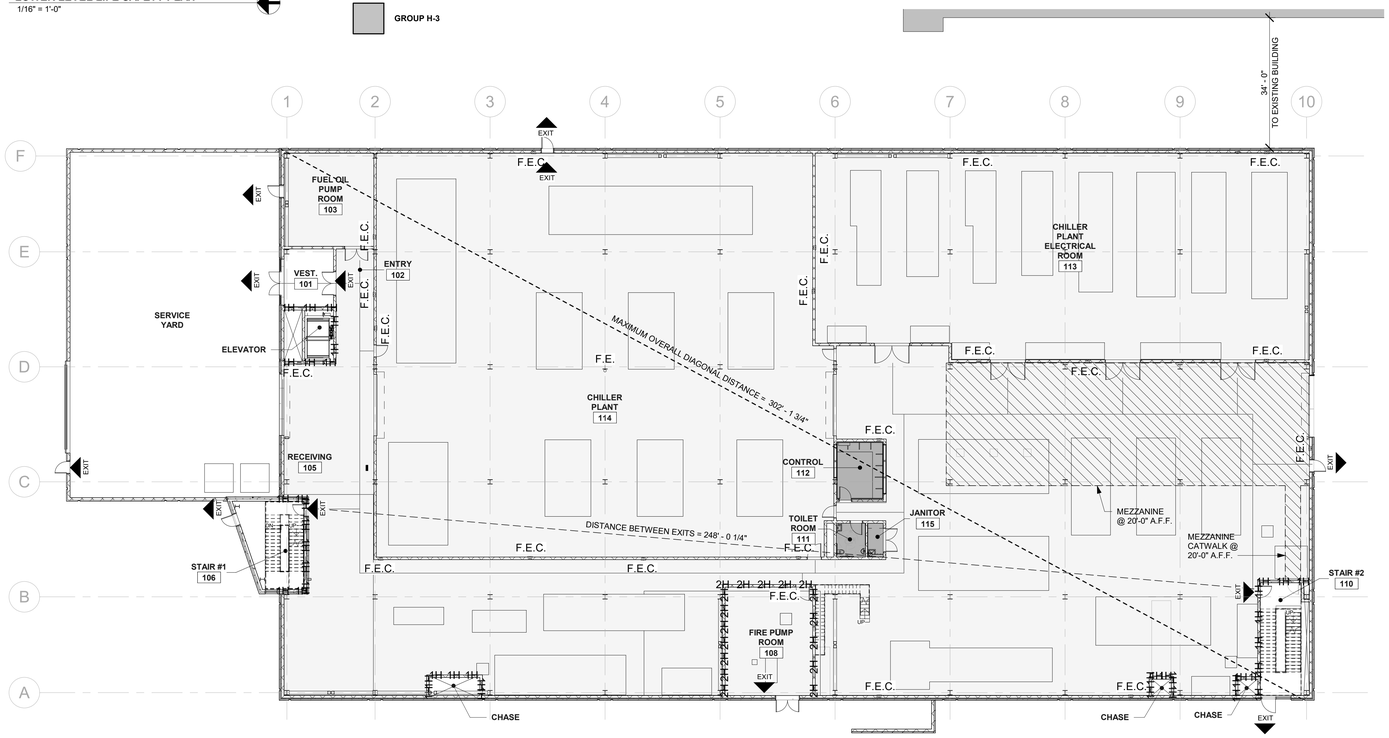
BUILDING CODE SUMMARY

PROJECT SCOPE:	A NEW CENTRAL UTILITY PLANT (CUP) CONSTRUCTED ON GRADE AS A STANDALONE BUILDING OF TWO-LEVEL, F-1 OCCUPANCY THAT IS SIZED TO SUPPORT THE UTILITY LOADS DEMANDED BY THE INDIANA UNIVERSITY HEALTH MEDICAL CENTER (IUH MCC) AND CONFIGURED SUCH THAT IT IS ABLE TO EXPAND TO SUPPORT ANY FUTURE GROWTH ON THE INDIANA UNIVERSITY HEALTH MEDICAL CENTER CAMPUS (IUH MCC). MECHANICAL AND PLUMBING UTILITIES, SUCH AS HOT WATER, COLD WATER, AND HIGH-PRESSURE STEAM, GENERATED IN THE CUP WILL BE DISTRIBUTED TO THE IUHMC VIA PIPING IN A NEW UTILITY TUNNEL. BOTH NORMAL AND EMERGENCY POWER WILL BE DISTRIBUTED TO THE IUHMC VIA BELOW GRADE CONDUIT DUCT BANKS. A NEW, BELOW GRADE AES SERVICE LINE, PROVIDED BY AES, WILL ENTER THE CUP BUILDING. THE CUP IS INTENDED TO BE A TWO (2) STORY BUILDING WITH MECHANICAL AND PLUMBING EQUIPMENT LOCATED ON THE FIRST FLOOR; OFFICES, A LOCKER ROOM/BREAK ROOM, ELECTRICAL EQUIPMENT, AND REQUIRED INTAKE LOUVERS WILL BE LOCATED ON THE SECOND FLOOR; COOLING TOWERS, EXHAUST FANS, AND BOILER EXHAUSTS ARE TO BE LOCATED ON THE ROOF. ADDITIONALLY, THERE WILL BE FIVE (5) FUEL OIL STORAGE TANKS THAT WILL BE DIRECT BURIED ON THE SITE, BENEATH THE SERVICE YARD AND EASTERN SITE, IN A MANNER THAT ALLOWS FOR PROPER SUCTION FROM THE TANKS BY THE NEARBY FUEL PUMP ROOM WITHIN THE CUP. A TRUCK LAYBY AT GRADE WILL BE PROVIDED FOR REFUELING. THE SERVICE YARD WILL BE SCREENED FROM PUBLIC VIEW, AND WILL ACT AS A SPACE FOR PARKING, AS WELL AS DELIVERIES THROUGH AN OVERHEAD DOOR TO BE SIZED BASED ON THE LARGEST PIECE OF MACHINERY THAT IT WILL NEED TO ACCOMMODATE. A NEW UTILITY TUNNEL WILL BE CONSTRUCTED TO DELIVER UTILITIES, MEDICAL GASES, AND PNEUMATIC TUBES TO THE IUHMC. IT IS TO EXIT FROM THE CUP AND TERMINATE INTO THE DESIGNATED MECHANICAL SPACE WITHIN THE IUHMC. THE EXISTING PNEUMATIC TUBE SYSTEM WILL BE REDIRECTED FROM THE EXISTING, ABOVE GRADE PEOPLE MOVER AND BROUGHT BELOW GRADE TO MEET THE NEW UTILITY TUNNEL.
OCCUPANCY CLASSIFICATIONS:	MIXED OCCUPANCY INCLUDING THE FOLLOWING: 1. BUSINESS OCCUPANCY, GROUP B (AS AN INCIDENTAL USE) 2. MODERATE-HAZARD FACTORY INDUSTRIAL, GROUP F-1 3. HIGH-HAZARD, GROUP H-3, WHERE CLASS I, II OR IIIA FLAMMABLE OR COMBUSTIBLE LIQUIDS ARE USED OR STORED IN NORMALLY CLOSED CONTAINERS OR SYSTEMS PRESSURIZED AT 15 POUNDS PER SQUARE INCH GAUGE (103.4 KPA) OR LESS
CONSTRUCTION TYPE:	TYPE II – B, FULLY SPRINKLERED
ALLOWABLE HEIGHT:	TABULAR HEIGHT = 55 FEET AND 2 STORIES HEIGHT ALLOWABLE DUE TO AUTOMATIC SPRINKLERS = 75 FEET AND 3 STORIES WITH AUTOMATIC SPRINKLER INCREASE
ALLOWABLE FLOOR AREA:	TABULAR AREA = 15,500 SF. PER STORY AREA INCREASE DUE TO AUTOMATIC SPRINKLERS = 15,500 * 31,000 = 46,500 SF PER STORY ACTUAL PROPOSED AREA PER FLOOR = 39,293 SF
SPRINKLER HEIGHT INCREASE:	WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, THE VALUE SPECIFIED IN TABLE 503 FOR MAXIMUM BUILDING HEIGHT IS INCREASED BY 20 FEET (6096 MM) AND THE MAXIMUM NUMBER OF STORIES IS INCREASED BY ONE. THESE INCREASES ARE PERMITTED IN ADDITION TO THE BUILDING AREA INCREASE IN ACCORDANCE WITH SECTIONS 506.2 AND 506.3.
AREA INCREASE DUE TO STREET FRONTAGE:	EVERY BUILDING SHALL ADJOIN OR HAVE ACCESS TO A PUBLIC WAY TO RECEIVE A BUILDING AREA INCREASE FOR FRONTAGE. WHERE A BUILDING HAS MORE THAN 25 PERCENT OF ITS PERIMETER ON A PUBLIC WAY OR OPEN SPACE HAVING A WIDTH OF NOT LESS THAN 20 FEET (6096 MM), THE FRONTAGE INCREASE SHALL BE DETERMINED IN ACCORDANCE WITH EQUATION 5-2: $I_f = [F/P - 0.25] W/30$ (EQUATION 5-2) WHERE: I_f = AREA INCREASE DUE TO FRONTAGE F = BUILDING PERIMETER THAT FRONTS ON A PUBLIC WAY OR OPEN SPACE HAVING 20 FEET (6096 MM) OPEN MINIMUM WIDTH (FEET) = 231'-0" + 145'-3" + 145'-3" = 521'-6" P = PERIMETER OF ENTIRE BUILDING (FEET) = (231'-0" X 2=462'-0")+(145'-3" X 2=290'-6")=752'-6" W = WIDTH OF PUBLIC WAY OR OPEN SPACE (FEET) IN ACCORDANCE WITH SECTION 506.2.1. $I_f = [(521' - 6" / 752' - 6") - 0.25] 20/30$ $I_f = (.4430).6667 = .2953$ X 15,500 SF. = 4,577.15 SF.
PROPOSED BUILDING AREA BY FLOOR:	LOWER LEVEL = 4,663 GROSS SF. FIRST FLOOR = 39,293 GROSS SF. SECOND FLOOR = 39,293 GROSS SF. TOTAL = 78,586 GROSS SF.
FIRE SEPARATION DISTANCE IN FEET:	A PORTION OF THE EXISTING ADJACENT JCI BUILDING IS SCHEDULED TO BE DEMOLISHED AND A PORTION IS SCHEDULED TO REMAIN IN PLACE, RESULTING IN A FIRE SEPARATION DISTANCE OF APPROXIMATELY 17 FEET. FOR OCCUPANCY GROUP F-1, CONSTRUCTION TYPE II-B, A FIRE SEPARATION DISTANCE OF BETWEEN 10 FEET AND 30 FEET REQUIRES NO FIRE RATING FOR EXTERIOR WALLS.
SEPARATED OCCUPANCIES:	PER TABLE 508.4: 1. NO SEPARATION IS REQUIRED BETWEEN B AND F-1 OCCUPANCIES. 2. A 1-HOUR FIRE SEPARATION IS REQUIRED BETWEEN AN H-3 AND B/F-1 OCCUPANCIES.
DESIGN OCCUPANT LOAD:	THE DESIGN OCCUPANT LOAD IS PERMITTED TO BE DETERMINED BASED UPON THE ACTUAL ANTICIPATED OCCUPANT LOAD. THE ASSUMPTION IS THAT THE CUP WILL BE OCCUPIED TWENTY-FOUR (24) HOURS PER DAY, SEVEN (7) DAYS PER WEEK, AND 365 DAYS PER YEAR. THERE WILL BE THREE (3) SHIFTS PER DAY OF FIVE (5) FULL TIME EMPLOYEES EACH SHIFT.
OCCUPANT LOAD FACTOR:	ACCESSORY STORAGE AREAS, MECHANICAL EQUIPMENT ROOM = 300 GROSS BUSINESS AREAS = 100 GROSS LOCKER ROOMS = 50 GROSS
MEANS OF EGRESS SIZING:	REQUIRED CAPACITY BASED ON OCCUPANT LOAD: STAIRWAYS = 0.3 INCH PER OCCUPANT. OTHER EGRESS COMPONENTS = 0.15 INCH PER OCCUPANT IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM.
EGRESS ACCESS TRAVEL DISTANCE:	FOR FULLY SPRINKLERED BUILDING: OCCUPANCY GROUP F-1 – 250 FEET OCCUPANCY GROUP H-3 – 150 FEET OCCUPANCY GROUP B – 300 FEET
NUMBER OF EXITS AND EXIT CONFIGURATION:	EACH STORY AND OCCUPIED ROOF SHALL HAVE A MINIMUM NUMBER OF EXITS, OR ACCESS TO EXITS. WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM THE SEPARATION DISTANCE OF THE EXIT DOORS OR EXIT ACCESS DOORWAYS SHALL NOT BE LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED. MAXIMUM OVERALL DIAGONAL = 302' - 1 3/4" / 3 = 100' - 8 9/16" MINIMUM EXIT SEPARATION
PLUMBING FIXTURES:	MINIMUM PLUMBING FIXTURES MUST BE PROVIDED IN ACCORDANCE WITH TABLE 2902.1. THE DESIGN OCCUPANT LOAD IS PERMITTED TO BE DETERMINED BASED UPON THE ACTUAL ANTICIPATED OCCUPANT LOAD. THE TOTAL OCCUPANT LOAD SHALL BE DIVIDED IN HALF FOR A DISTRIBUTION OF 50 PERCENT OF EACH SEX. FIXTURE COUNTS PROVIDED ARE BASED UPON 50% MALE / 50% FEMALE FOR THE BUILDING. MAXIMUM ANTICIPATED OCCUPANT LOAD = (5) FULLTIME EMPLOYEES PER SHIFT WITH (3) SHIFTS PER DAY, (24) HOURS PER DAY, (7) DAYS A WEEK. REQUIRED PLUMBING FIXTURES FOR F-1 OCCUPANCY: WATER CLOSETS: 1 PER 100 OCCUPANTS LAVATORIES: 1 PER 100 OCCUPANTS DRINKING FOUNTAIN: 1 PER 400 OCCUPANTS SERVICE SINKS: 1 PER BUILDING

GENERAL TUNNEL REQUIREMENTS

TUNNELS	**TRAVEL DISTANCE LIMITS**	SOME TUNNELS MAY ONLY BE PARTIALLY CONSTRUCTED WHICH WILL RESULT IN COMMON PATH OF TRAVEL ISSUES. WHERE A PARTIALLY CONSTRUCTED TUNNEL HAS A COMMON PATH OF TRAVEL OF MORE THAN 100' A VARIANCE* WILL BE REQUIRED OR THE SPACE MUST BE DESIGNATED A CONFINED SPACE WITH RESTRICTED ACCESS. IF A VARIANCE IS NECESSARY, A LADDER AND HATCH MAY BE REQUIRED DEPENDING ON HOW LONG THE TUNNEL IS.
	PARTIALLY CONSTRUCTED TUNNELS	**1. TUNNELS - EXITS:** TRAVEL DISTANCE WITHIN TUNNELS FROM THE MOST REMOTE POINT TO AN EXIT IS LIMITED TO A MAXIMUM OF: A. **PEDESTRIAN TUNNELS: 250'**. THIS COULD TECHNICALLY ALLOW UP TO A **500'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. (1) WHERE AN **ESFR SPRINKLER SYSTEM** IS INSTALLED IN THE TUNNEL THE TRAVEL DISTANCE MAXIMUM IS INCREASED TO **400'** FROM THE MOST REMOTE POINT TO AN EXIT. THIS COULD TECHNICALLY ALLOW UP TO AN **800'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. [ESFR: 1016.2.2, IBC] (2) WHERE A **HORIZONTAL EXIT** IS INSTALLED (AND NO SPRINKLERS) THE MAXIMUM PERMITTED "**EXIT STAIR DOOR TO HORIZONTAL EXIT DOOR**" TRAVEL DISTANCE IS INCREASED TO **500'** FROM THE MOST REMOTE POINT. THIS COULD TECHNICALLY ALLOW UP TO A **1,000'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. (3) WITH A **HORIZONTAL EXIT AND ESFR SPRINKLER SYSTEM** THE MAXIMUM "**EXIT STAIR TO HORIZONTAL EXIT DOOR**" DISTANCE IS INCREASED TO **800'**. THIS COULD TECHNICALLY ALLOW UP TO A **1,600'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. B. **MATERIAL MOVEMENT TUNNELS: 200'**. THIS COULD TECHNICALLY ALLOW UP TO A **400'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. (1) WHERE AN **ESFR SPRINKLER SYSTEM** IS INSTALLED IN THE TUNNEL THE TRAVEL DISTANCE MAXIMUM IS INCREASED TO **400'** FROM THE MOST REMOTE POINT TO AN EXIT. THIS COULD TECHNICALLY ALLOW UP TO AN **800'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. [ESFR: 1016.2.2, IBC] (2) WHERE A **HORIZONTAL EXIT** IS INSTALLED (AND NO SPRINKLERS) THE MAXIMUM PERMITTED "**EXIT STAIR DOOR TO HORIZONTAL EXIT DOOR**" TRAVEL DISTANCE IS INCREASED TO **400'** FROM THE MOST REMOTE POINT. THIS COULD TECHNICALLY ALLOW UP TO A **800'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. (3) WITH A **HORIZONTAL EXIT AND ESFR SPRINKLER SYSTEM** THE MAXIMUM "**EXIT STAIR TO HORIZONTAL EXIT DOOR**" DISTANCE IS INCREASED TO **800'**. THIS COULD TECHNICALLY ALLOW UP TO A **1,600'** LONG TUNNEL WITHOUT AN INTERMEDIATE EXIT STAIR. C. **UTILITY TUNNEL:** IF THIS SPACE WILL BE TREATED AS A CONFINED SPACE UNDER IOSHA RULES IT WILL NOT BE REGULATED BY NFPA 101 OR IBC. IF THE SPACE IS NOT CLASSIFIED A CONFINED SPACE THE RULES APPLICABLE TO THE MATERIALS MOVEMENT TUNNELS WILL APPLY.
	UNDERGROUND BUILDING CLASSIFICATION	**TUNNELS MORE THAN 30' DEEP - UNDERGROUND BUILDING RULES:** A. FLOORS OF PEDESTRIAN & MATERIALS MOVEMENT TUNNELS 30' OR MORE BELOW THE FINISHED FLOOR OF THE LOWEST LEVEL OF EXIT DISCHARGE ARE CLASSIFIED AN **UNDERGROUND BUILDING** AND REQUIRE THE FOLLOWING: (1) SMOKE CONTROL SYSTEM AND ASSOCIATED SMOKE DETECTION (2) SPRINKLER SYSTEM (3) SMOKE-PROOF EXIT STAIRS (4) STANDPIPES (5) FIRE ALARM SYSTEMS (6) STANDBY POWER (7) EMERGENCY POWER B. **PIPE/MECHANICAL TUNNELS NOT INTENDED FOR OCCUPANCY** ARE EXEMPT FROM THESE UNDERGROUND BUILDING REQUIREMENTS.

* A VARIANCE IS A VARIANCE FROM THE INDIANA BUILDING CODE APPROVED FROM THE FIRE PREVENTION AND BUILDING SAFETY COMMISSION. EQUIVALENCIES/WAIVERS FROM THE JOINT COMMISSION OR CMS ARE NOT POSSIBLE FOR NEW CONSTRUCTION.



FIRST FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:03:11 PM AESI Proj. No:

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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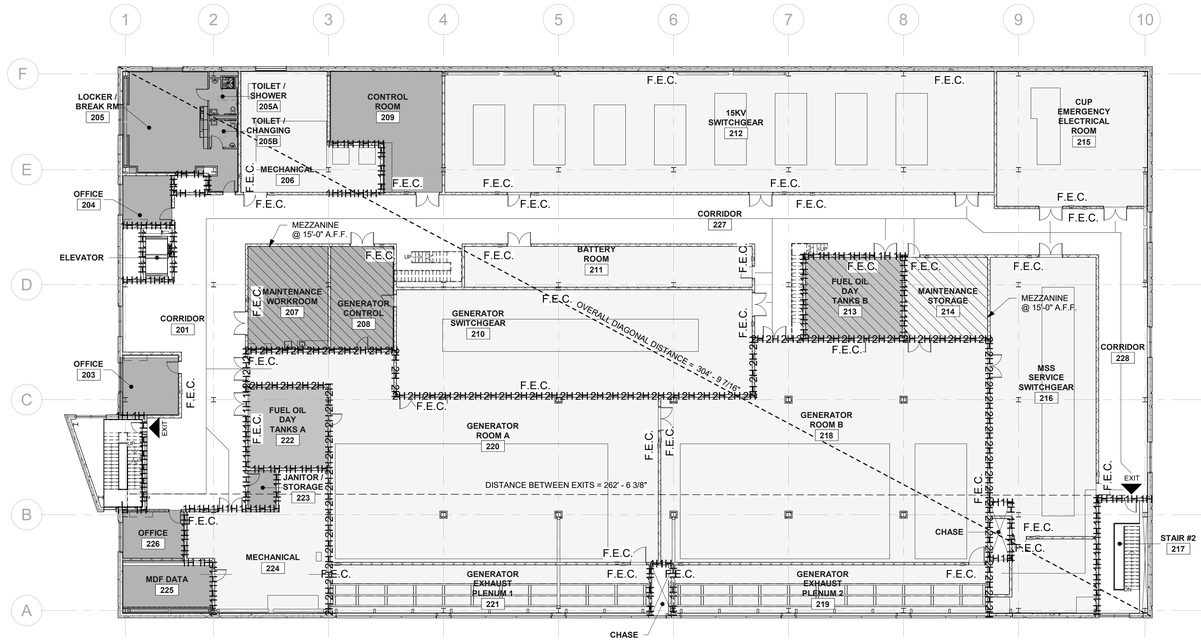
APPROVED BY: Approver	
PROJECT NO.	

SHEET TITLE

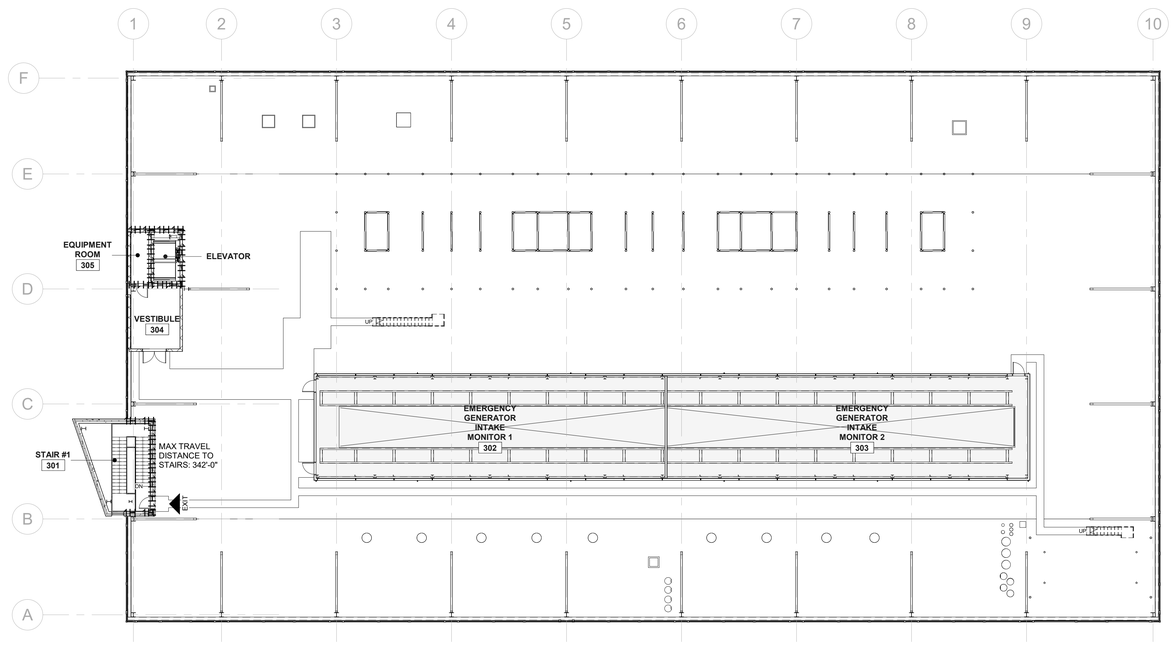
APPLICABLE CODES AND LIFE SAFETY PLAN

SHEET NUMBER

A002



SECOND FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"



MECHANICAL PENTHOUSE LIFT SAFETY PLAN
1/16" = 1'-0"

GENERAL LIFE SAFETY PLAN NOTES:

1. FOR COLUMN TO COLUMN DIMENSIONS AND TYPICAL INTERIOR PARTITION CONSTRUCTION, REFER TO STRUCTURAL DRAWINGS.

LIFE SAFETY PLAN LEGEND

- EXIT — INDICATES ROOM, SUITE, OR BUILDING EXIT
- INDICATES PATH OF EGRESS TRAVEL
- INDICATES MAXIMUM OVERALL DIAGONAL DISTANCE
- INDICATES DISTANCE BETWEEN EXITS
- 1H1H — INDICATES 1-HOUR RATED WALL CONSTRUCTION
- 2H2H — INDICATES 2-HOUR RATED WALL CONSTRUCTION
- F.E.C. — INDICATES RECESSED FIRE EXTINGUISHER CABINET LOCATION
- F.E. — INDICATES BRACKET-MOUNTED FIRE EXTINGUISHER LOCATION
- INDICATES EXTENTS OF MEZZANINE ABOVE

OCCUPANCY TYPE LEGEND

- GROUP B
- GROUP F-1
- GROUP H-3

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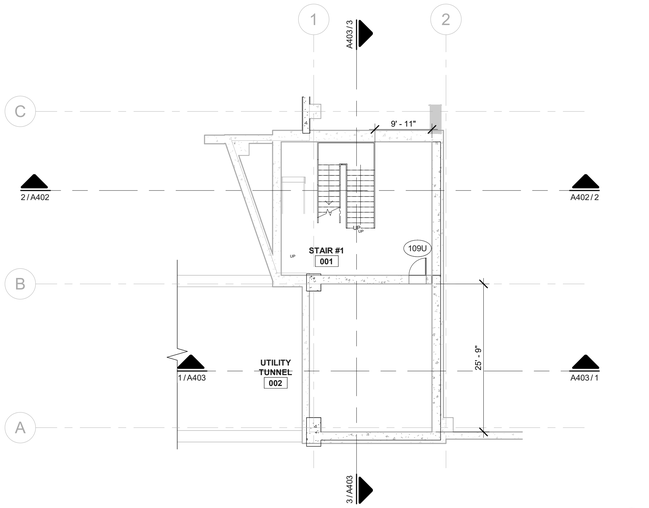
DESIGNED BY: Mike Davis
CHECKED BY: Mike Davis
APPROVED BY: Mike Davis
PROJECT NO.

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

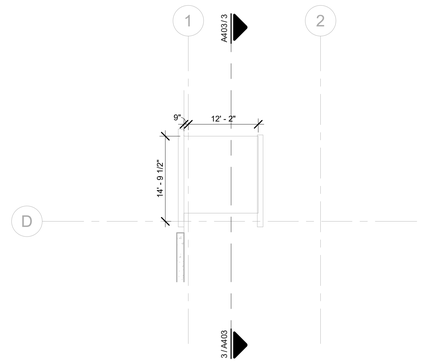
SHEET TITLE: LIFE SAFETY PLANS

SHEET NUMBER: A003

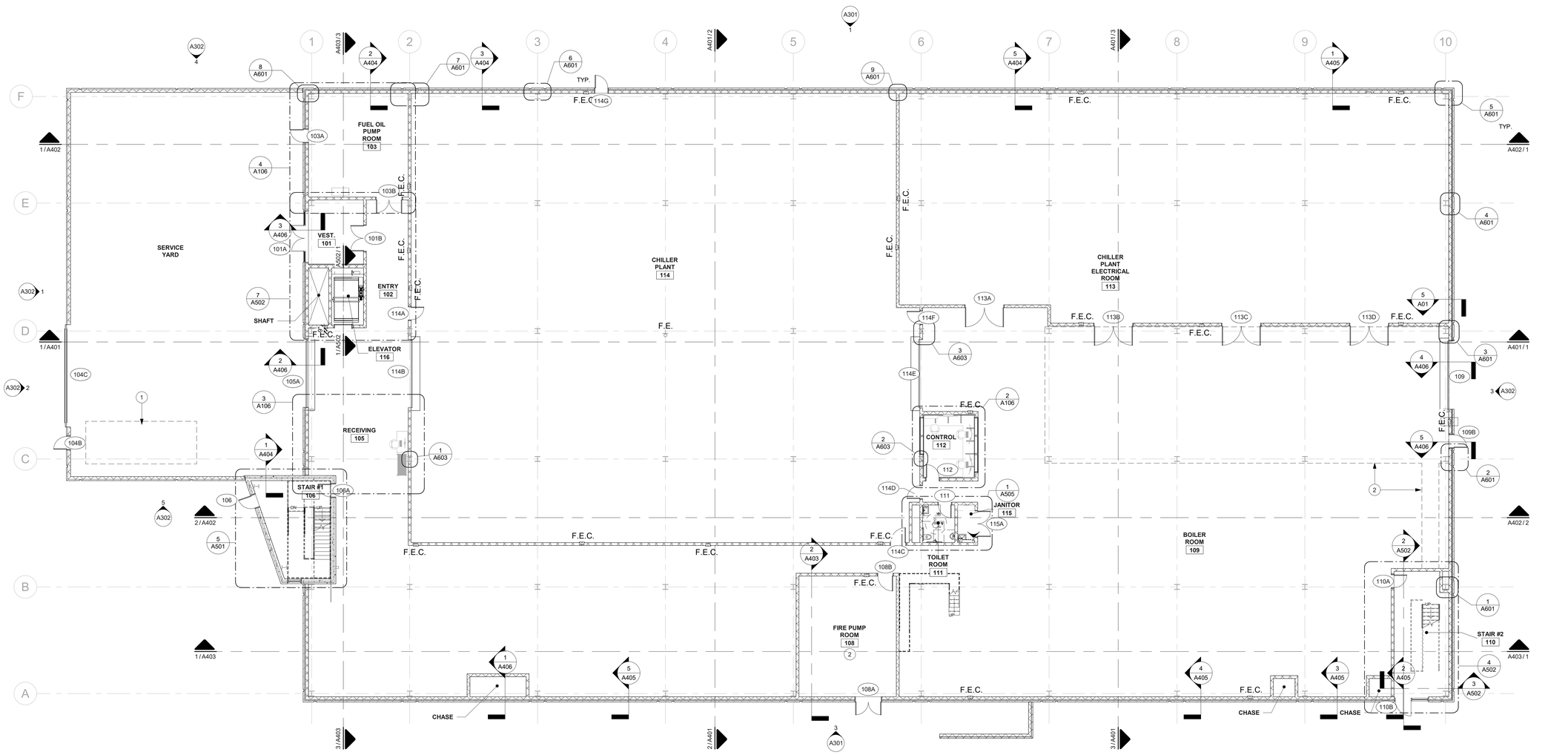
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 3:03:56 PM AESI Proj. No:



LOWER LEVEL ARCHITECTURAL FLOOR PLAN
3/32" = 1'-0"



LOWER LEVEL ARCHITECTURAL FLOOR PLAN - ELEVATOR PIT
3/32" = 1'-0"



FIRST FLOOR ARCHITECTURAL FLOOR PLAN
3/32" = 1'-0"

LEVEL 1 PROPOSED VS PROGRAM AREAS TABLE			
ROOM NAME	ROOM NUMBER	ACTUAL AREA	PROGRAM AREA
VEST.	101	194 SF	N/A
ENTRY	102	299 SF	N/A
FUEL OIL PUMP ROOM	103	570 SF	772
SERVICE YARD	104	4918 SF	
RECEIVING	105	5135 SF	974
STAIR #1	106	342 SF	N/A
FIRE PUMP ROOM	108	646 SF	442
BOILER ROOM	109	10241 SF	
STAIR #2	110	367 SF	N/A
TOILET ROOM	111	67 SF	N/A
CONTROL	112	173 SF	N/A
CHILLER PLANT ELECTRICAL ROOM	113	6798 SF	3274
CHILLER PLANT	114	12275 SF	12956
JANITOR	115	36 SF	N/A
ELEVATOR	116	100 SF	
Grand total: 15		42160 SF	

LOWER LEVEL ACTUAL VS PROGRAM AREAS TABLE			
ROOM NAME	ROOM NUMBER	ACTUAL AREA	PROGRAM AREA
STAIR #1	001	579 SF	N/A
UTILITY TUNNEL	002	580 SF	N/A
Grand total: 2		1159 SF	

GENERAL FLOOR PLAN NOTES

1. DIMENSIONS OF INTERIOR WALLS ARE TO THE FACE OF CMU OR GYPSUM BOARD & DO NOT INCLUDE FINISHES OR PROTECTIVE COVERINGS UNLESS NOTED OTHERWISE.
2. LOCATE OUTSIDE EDGE OF NEW HM DOOR FRAMES A MINIMUM OF 4" FROM NEAREST CORNER, INTERSECTING PARTITION, COLUMN ENCLOSURE, ETC., OR CENTER IN ROOM AS INDICATED, TYPICAL, UNLESS NOTED OTHERWISE.
3. PROVIDE FIRE TREATED WOOD BLOCKING OR STEEL FLAT STRAP AND BACKING PLATE AT, BUT NOT LIMITED TO, THE FOLLOWING LOCATIONS: TOILET ACCESSORIES, CASEWORK, MILLWORK, DOOR STOPS, AND ALL OTHER WALL-MOUNTED EQUIPMENT OR DEVICES.
4. REFER TO **A703** FOR ROOM FINISH SCHEDULE.

ARCHITECTURAL PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION
1	FUEL TANK BELOW GRADE
2	MEZZANINE OR WALKWAY ABOVE
3	FUTURE SOLID SURFACE COUNTERTOP. SINK AND PLASTIC LAMINATE CASEWORK, BY OWNER.
4	ROOF STRUCTURES, REFER TO SCTRUAL AND MECHANICAL PLAN

OWNER

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APPROVED BY: Approver
PROJECT NO.
CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
FIRST FLOOR ARCHITECTURAL PLAN

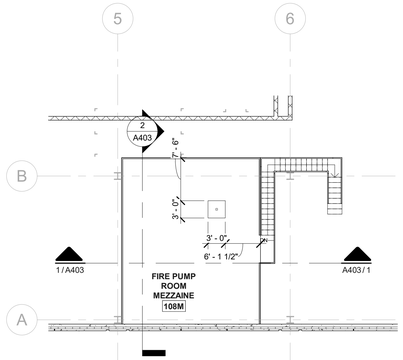
SHEET NUMBER
A101

ORIGINAL SHEET SIZE: 8.30" X 42" (ARCH E1)
2/9/2023 3:36:16 PM AESI Proj. No:

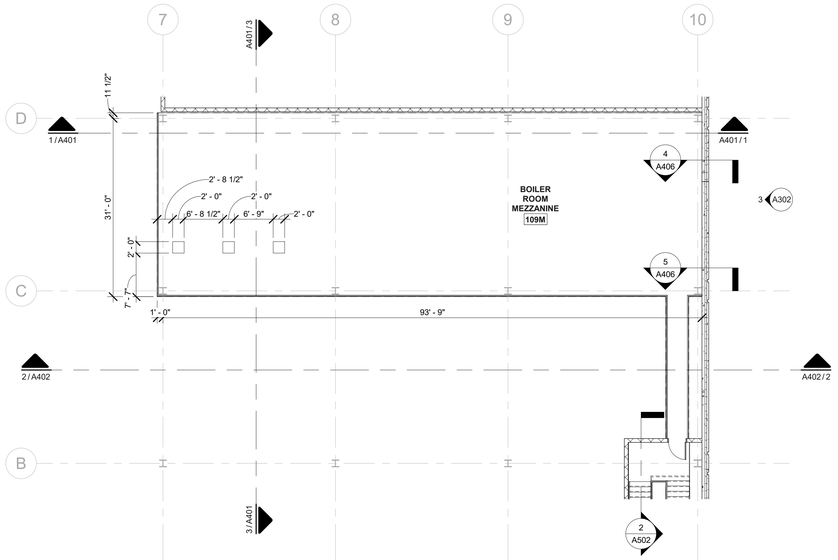
DIMENSION PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION

GENERAL DIMENSION NOTES

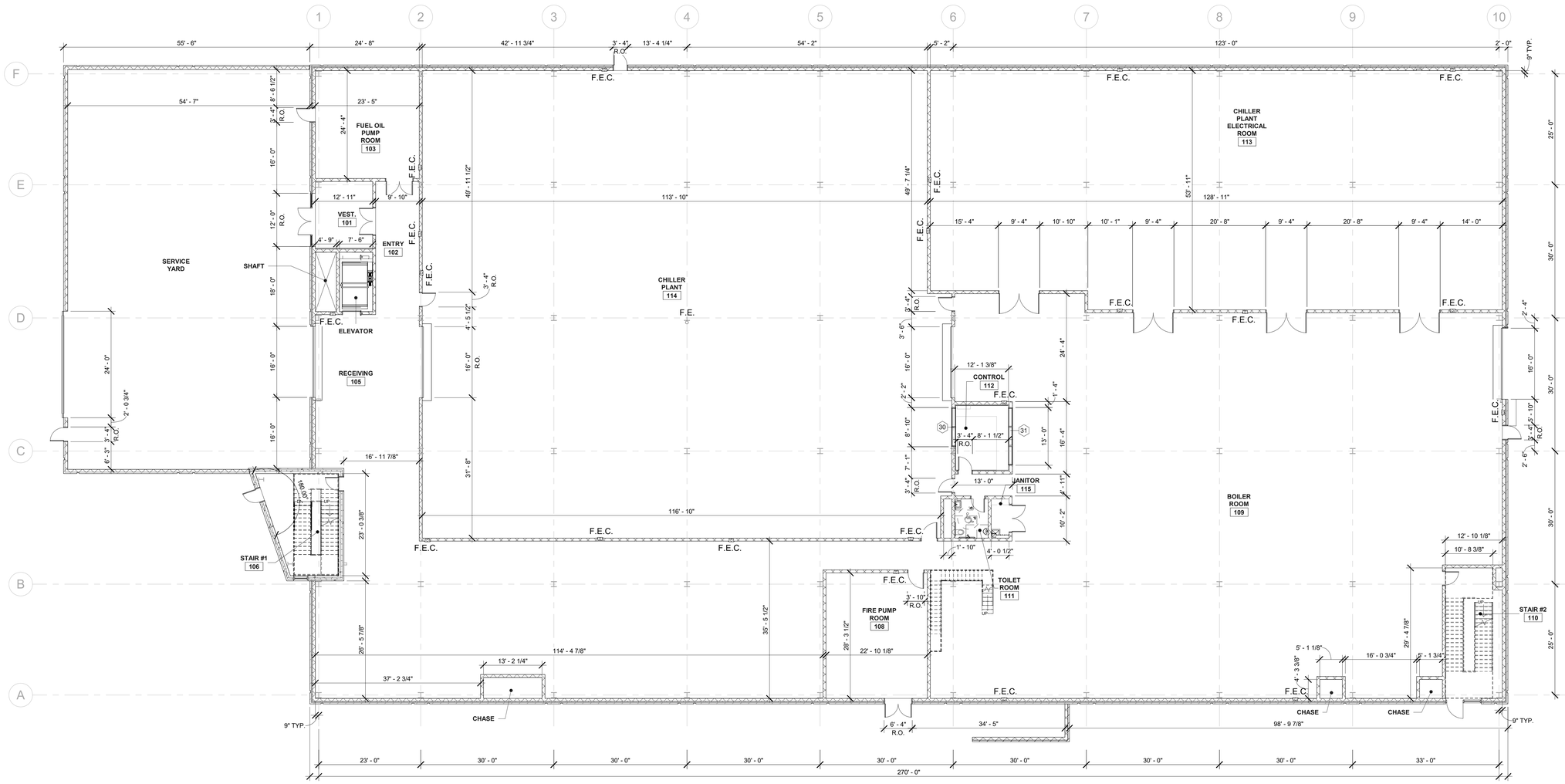
1. FIELD VERIFY ALL EXISTING CONDITIONS, NOTIFY ARCHITECT/ENGINEER IMMEDIATELY OF ANY DISCREPANCIES THAT EXIST.
2. ALL DIMENSIONS ON FLOOR PLANS ARE FROM FACE OF FINISH GYPSUM BOARD, FACE OF MASONRY, FACE OF CONCRETE, OR CENTERLINE OF COLUMNS UNLESS NOTED OTHERWISE.
3. ALL DOORS ARE TO BE 8" FROM FACE OF WALL UNLESS NOTED OTHERWISE



FIRST FLOOR MEZZANINE
3/32" = 1'-0"



FIRST FLOOR MEZZANINE
3/32" = 1'-0"



FIRST FLOOR DIMENSION PLAN
3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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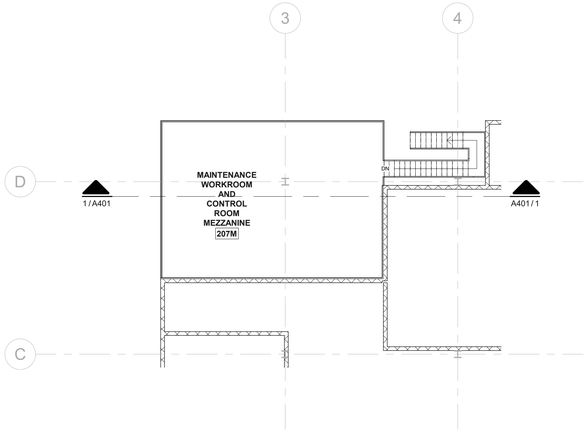
SHEET TITLE

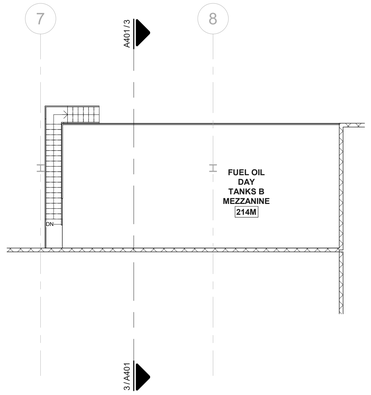
FIRST FLOOR DIMENSION PLAN

SHEET NUMBER

A101 D



SECOND FLOOR MEZZANINE - 207 & 208
3/32" = 1'-0"



SECOND FLOOR MEZZANINE - 213 & 214
3/32" = 1'-0"

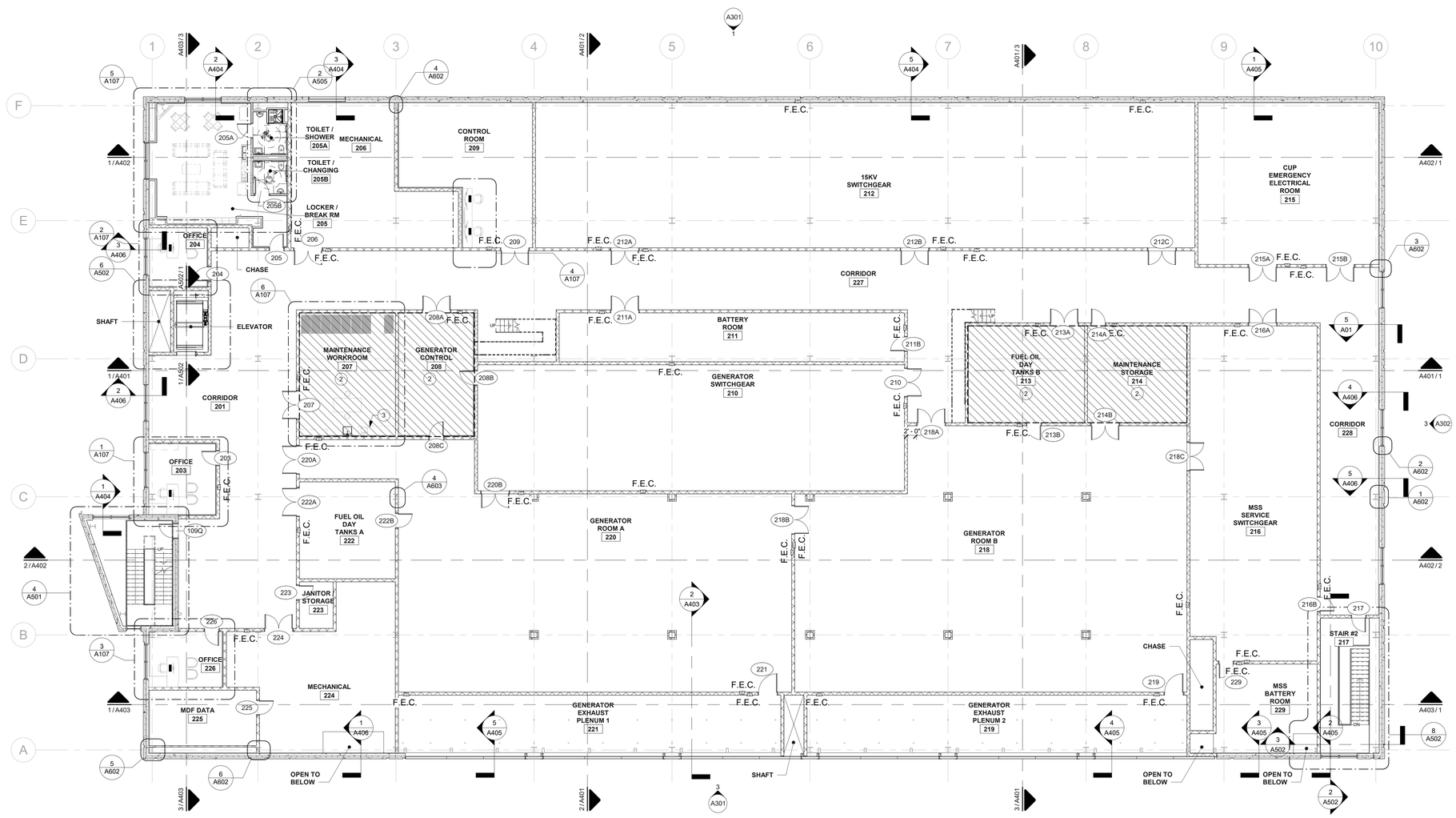
ARCHITECTURAL PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION
1	FUEL TANK BELOW GRADE
2	MEZZANINE OR WALKWAY ABOVE
3	FUTURE SOLID SURFACE COUNTERTOP. SINK AND PLASTIC LAMINATE CASEWORK, BY OWNER.
4	ROOF STRUCTURES, REFER TO SCTRUAL AND MECHANICAL PLAN

GENERAL FLOOR PLAN NOTES

1. DIMENSIONS OF INTERIOR WALLS ARE TO THE FACE OF CMU OR GYPSUM BOARD & DO NOT INCLUDE FINISHES OR PROTECTIVE COVERINGS UNLESS NOTED OTHERWISE.
2. LOCATE OUTSIDE EDGE OF NEW HM DOOR FRAMES A MINIMUM OF 4" FROM NEAREST CORNER, INTERSECTING PARTITION, COLUMN ENCLOSURE, ETC., OR CENTER IN ROOM AS INDICATED, TYPICAL, UNLESS NOTED OTHERWISE.
3. PROVIDE FIRE TREATED WOOD BLOCKING OR STEEL FLAT STRAP AND BACKING PLATE AT, BUT NOT LIMITED TO, THE FOLLOWING LOCATIONS: TOILET ACCESSORIES, CASEWORK, MILLWORK, DOOR STOPS, AND ALL OTHER WALL-MOUNTED EQUIPMENT OR DEVICES.
4. REFER TO **A703** FOR ROOM FINISH SCHEDULE.

LEVEL 2 ACTUAL VS PROGRAM AREAS

ROOM NAME	ROOM NUMBER	ACTUAL AREA	PROGRAM AREA
CORRIDOR	201	1905 SF	WRS01
OFFICE	203	225 SF	WRS01
OFFICE	204	162 SF	273 WRS01
LOCKER / BREAK RM	205	621 SF	839 WRS01
TOILET / SHOWER	205A	67 SF	
TOILET / CHANGING	205B	53 SF	
MECHANICAL	206	883 SF	
MAINTENANCE WORKROOM	207	557 SF	
GENERATOR CONTROL	208	435 SF	
CONTROL ROOM	209	738 SF	747
GENERATOR SWITCHGEAR	210	2540 SF	1331
BATTERY ROOM	211	797 SF	
15KV SWITCHGEAR	212	4535 SF	3931
FUEL OIL DAY TANKS B	213	531 SF	350
MAINTENANCE STORAGE	214	455 SF	
CUP EMERGENCY ELECTRICAL ROOM	215	1390 SF	678
MSS SERVICE SWITCHGEAR	216	1982 SF	2398
STAIR #2	217	383 SF	
GENERATOR ROOM B	218	4550 SF	5045
GENERATOR EXHAUST PLENUM 2	219	1103 SF	
GENERATOR ROOM A	220	4049 SF	4757
GENERATOR EXHAUST PLENUM 1	221	1109 SF	1875
FUEL OIL DAY TANKS A	222	439 SF	412
JANITOR / STORAGE	223	74 SF	
MECHANICAL	224	1008 SF	
MDF DATA	225	282 SF	220
OFFICE	226	194 SF	WRS01
CORRIDOR	227	3628 SF	
CORRIDOR	228	810 SF	WRS01
MSS BATTERY ROOM	229	450 SF	
Grand total: 30		35952 SF	



SECOND FLOOR ARCHITECTURAL FLOOR PLAN
3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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SHEET TITLE

SECOND FLOOR ARCHITECTURAL PLAN

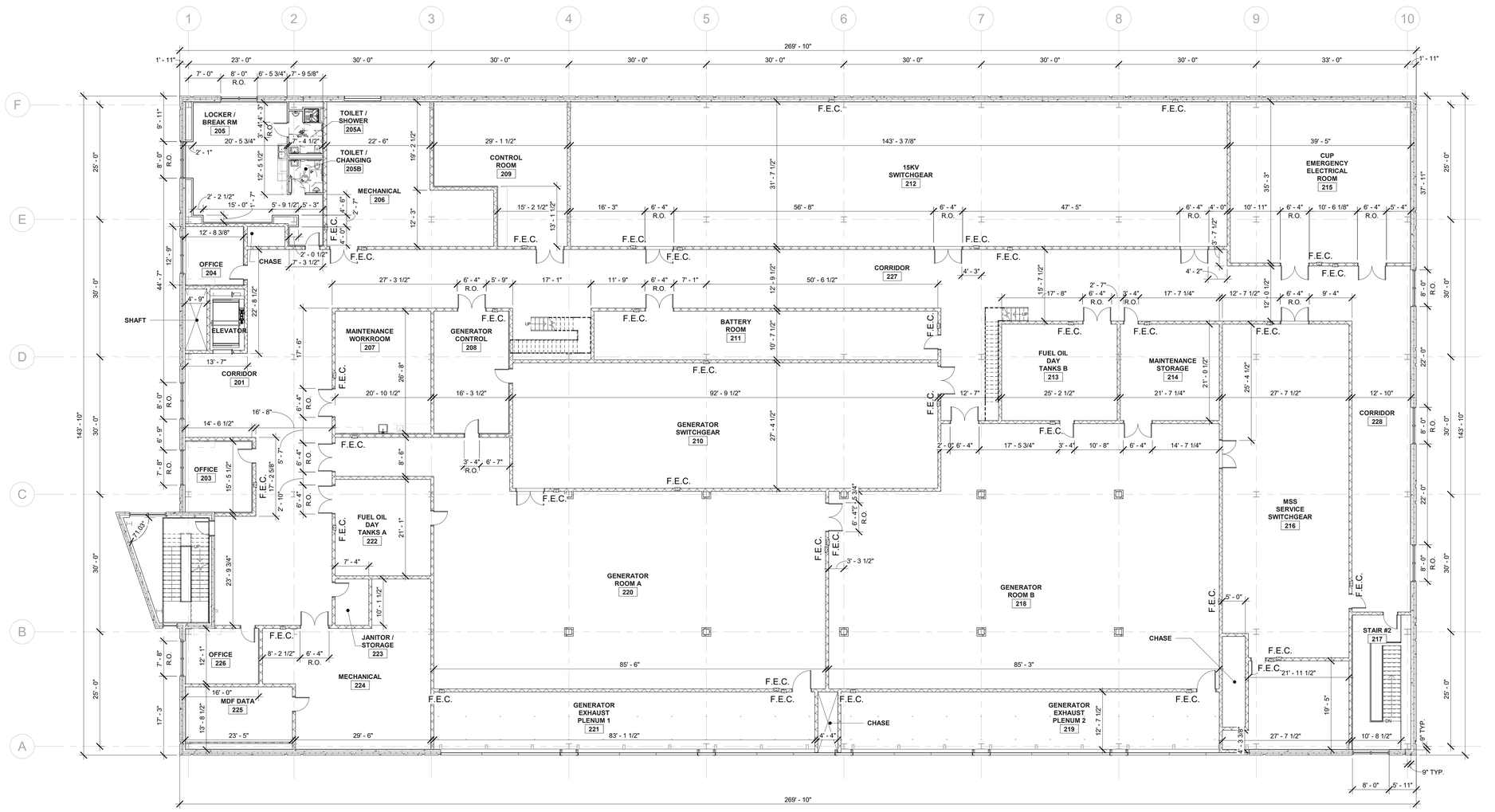
SHEET NUMBER

A102

DIMENSION PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION

GENERAL DIMENSION NOTES

1. FIELD VERIFY ALL EXISTING CONDITIONS. NOTIFY ARCHITECT/ENGINEER IMMEDIATELY OF ANY DISCREPANCIES THAT EXIST.
2. ALL DIMENSIONS ON FLOOR PLANS ARE FROM FACE OF FINISH GYPSUM BOARD, FACE OF MASONRY, FACE OF CONCRETE, OR CENTERLINE OF COLUMNS UNLESS NOTED OTHERWISE.
3. ALL DOORS ARE TO BE 8" FROM FACE OF WALL UNLESS NOTED OTHERWISE



SECOND FLOOR DIMENSION PLAN
3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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SHEET TITLE

SECOND FLOOR DIMENSION PLAN

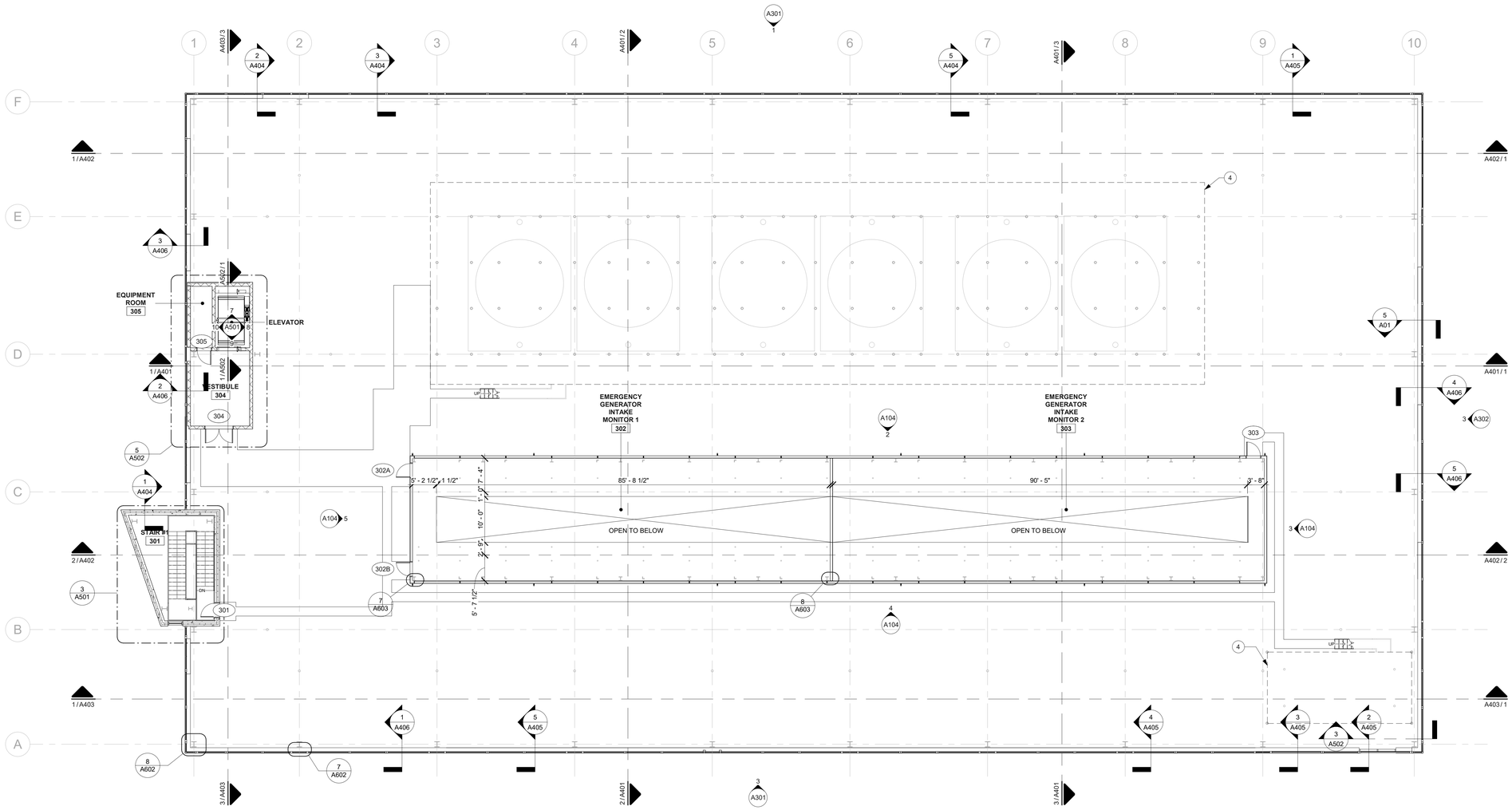
SHEET NUMBER

A102 D

ARCHITECTURAL PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION
1	FUEL TANK BELOW GRADE
2	MEZZANINE OR WALKWAY ABOVE
3	FUTURE SOLID SURFACE COUNTERTOP, SINK AND PLASTIC LAMINATE CASEWORK, BY OWNER.
4	ROOF STRUCTURES, REFER TO SCTRUAL AND MECHANICAL PLAN

GENERAL FLOOR PLAN NOTES

1. DIMENSIONS OF INTERIOR WALLS ARE TO THE FACE OF CMU OR GYPSUM BOARD & DO NOT INCLUDE FINISHES OR PROTECTIVE COVERINGS UNLESS NOTED OTHERWISE.
2. PROVIDE FIRE TREATED WOOD BLOCKING OR STEEL FLAT STRAP AND BACKING PLATE AT, BUT NOT LIMITED TO, THE FOLLOWING LOCATIONS: TOILET ACCESSORIES, CASEWORK, MILLWORK, DOOR STOPS, AND ALL OTHER WALL-MOUNTED EQUIPMENT OR DEVICES.



PENTHOUSE FLOOR PLAN
3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:36:49 PM AESI Proj. No:

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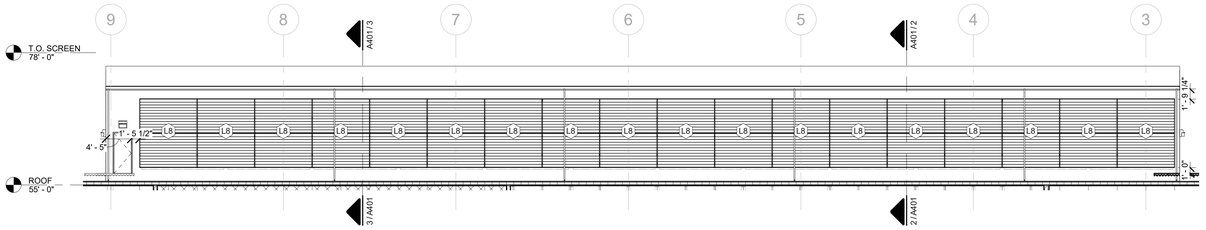
SHEET TITLE

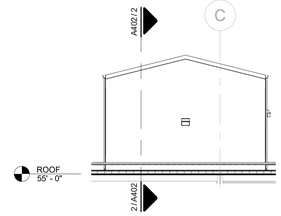
PENTHOUSE ARCHITECTURAL PLAN

SHEET NUMBER

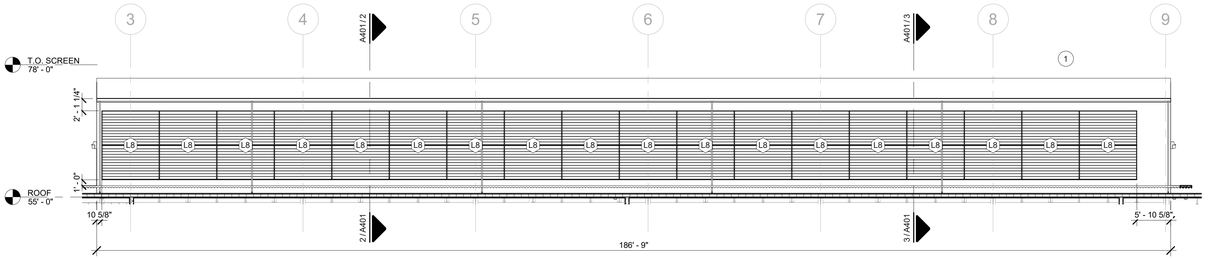
A103



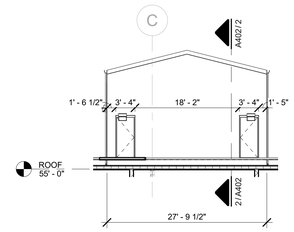
2 A104 **EAST AIR MONITOR ELEVATION**
3/32" = 1'-0"



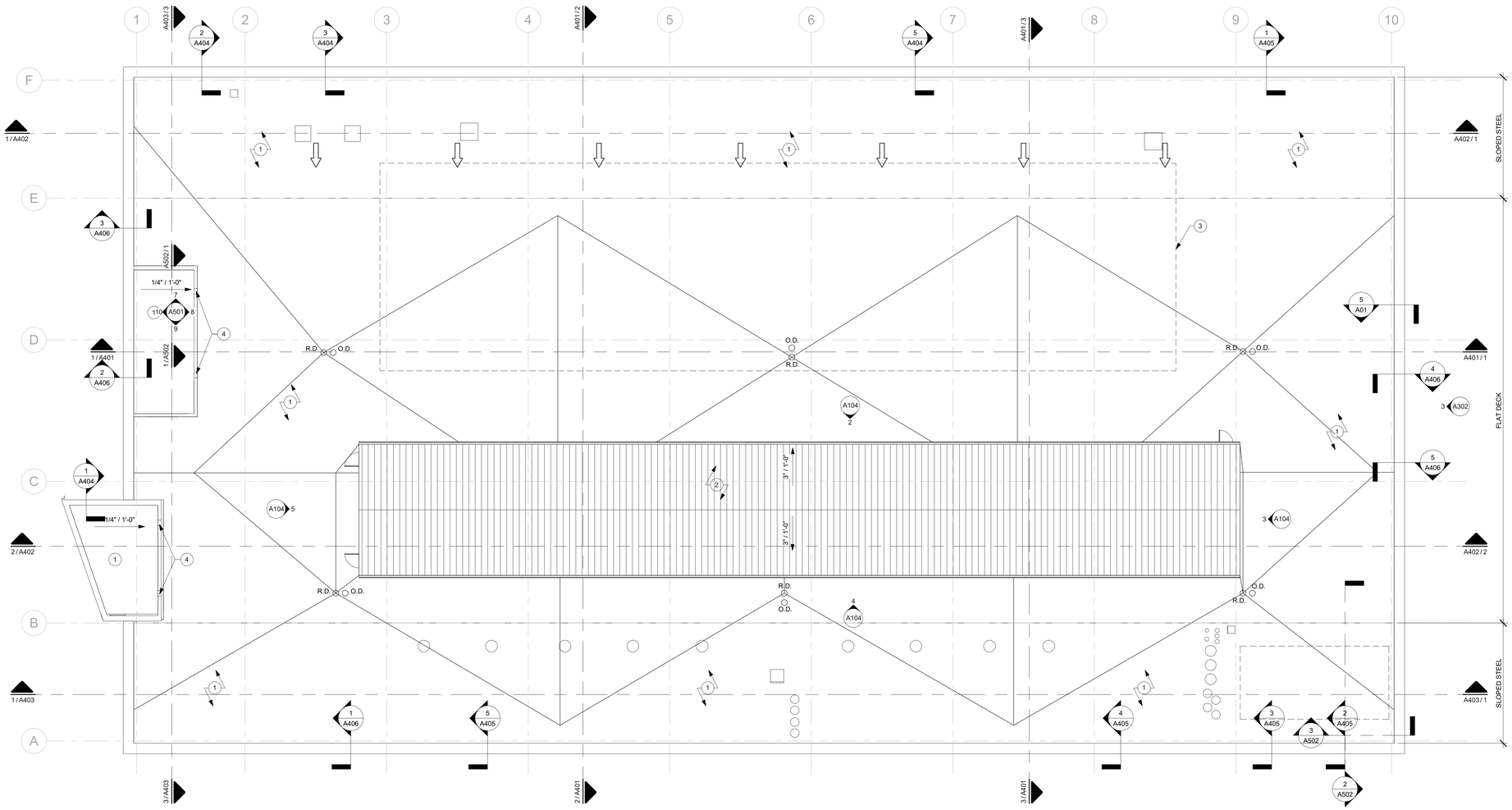
3 A104 **SOUTH AIR MONITOR ELEVATION**
3/32" = 1'-0"



4 A104 **WEST AIR MONITOR ELEVATION**
3/32" = 1'-0"



5 A104 **NORTH AIR MONITOR ELEVATION**
3/32" = 1'-0"



ROOF PLAN
3/32" = 1'-0"

ROOF PLAN REFERENCE NOTES

#	KEYNOTE INFORMATION
1	THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING (ADHERED) ON 6" MINIMUM POLYISO INSULATION ON 1/2" DENS-DECK (MECHANICALLY FASTENED) ON METAL ROOF DECK AND STRUCTURAL STEEL FRAMING. PROVIDE 1/4" PER FOOT MINIMUM POSITIVE SLOPE TO DRAIN. (U.N.O.)
2	METAL ROOFING
3	STEEL PLATFORM FOR COOLING TOWERS. REFER TO MECHANICAL AND STRUCTURAL DRAWINGS
4	SCUPPERS

ROOF PLAN LEGEND

● V.P.	INDICATES VENT PIPE
⇨	INDICATES DIRECTION OF ROOF STRUCTURE SLOPE
→	INDICATES DIRECTION OF ROOF SLOPE @ 1/4" PER FOOT MINIMUM
═	INDICATES MECHANICAL SCREEN
⊗ O.D.	OVERHEAD DRAIN
⊗ R.D.	ROOF DRAIN

GENERAL ROOF PLAN NOTES

1. NOT ALL ROOF PENETRATIONS OR OTHER DETAILS REQUIRED ELSEWHERE IN THE DOCUMENTS TO COMPLETE THE ROOF WORK ARE CALLED OUT ON THE ROOF PLAN. PROVIDE TYPICAL ROOFING DETAILS AS INDICATED ELSEWHERE IN THE DOCUMENTS OR AS RECOMMENDED BY ROOFING MANUFACTURER AT ALL SUCH CONDITIONS WHETHER SHOWN OR NOT, INCLUDING WITHOUT LIMITATION THE FOLLOWING : CONDUIT PENETRATIONS, GUY WIRE TIE DOWN POINTS, PROTECTED WOOD SLEEPERS, CONDENSATE LINES,EXHAUST DUCTS, STEEL DUNNAGE, LIGHTNING PROTECTION ATTACHMENTS, ETC.
2. COORDINATE PROTECTIVE ROOF WALKWAY WITH ROOF TOP EQUIPMENT SUBMITTALS. PROVIDE WALKWAY TO ALL LOCATIONS REQUIRING REGULAR MAINTENANCE.
3. ALL ROOF PENETRATIONS SHALL BE FLASHED PER ROOFING MANUFACTURER'S SPECIFICATIONS FOR A COMPLETE WATERTIGHT INSTALLATION.
4. PROVIDE TAPERED INSULATION CRICKETS AT ALL .EXHAUST FANS, ROOF TOP UNITS, ROOF CURBS, ETC. TO ASSURE PROPER DRAINAGE.
5. ALL SADDLES AND CRICKETS SHALL HAVE A MINIMUM SLOPE OF 1/4" PER FOOT.

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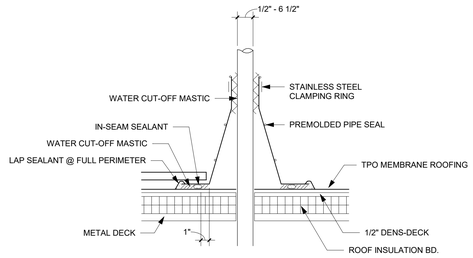
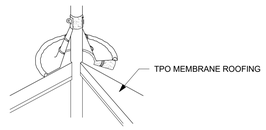
ROOF PLAN

SHEET NUMBER

A104

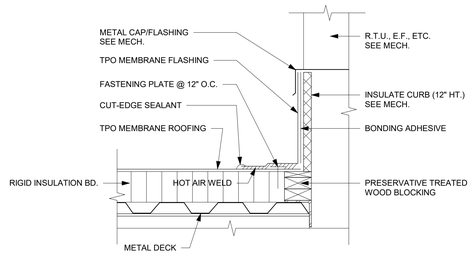
ORIGINAL SHEET SIZE: [S: 30" X 42" (ARCH E1)]
2/9/2023 3:36:56 PM AESI Proj. No:



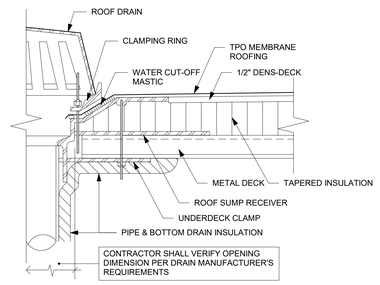


NOTES:
1. PRE-MOLDED PIPE SEAL MUST HAVE INTACT RIB AT TOP EDGE, REGARDLESS OF PIPE DIAMETER
2. APPLY IN-SEAM SEALANT 1/2 INCH FROM INSIDE EDGE OF PIPE SEAL FLANGE

3 / A105 **ROOF PENETRATION DETAIL**
3" = 1'-0"



2 / A105 **CURB DETAIL**
1 1/2" = 1'-0"



1 / A105 **ROOF DRAIN DETAIL**
3" = 1'-0"

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ROOF DETAILS

SHEET NUMBER

A105

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/9/2023 3:36:59 PM AESI Proj. No:

EQUIPMENT/ FURNITURE - FIRST FLOOR (X)

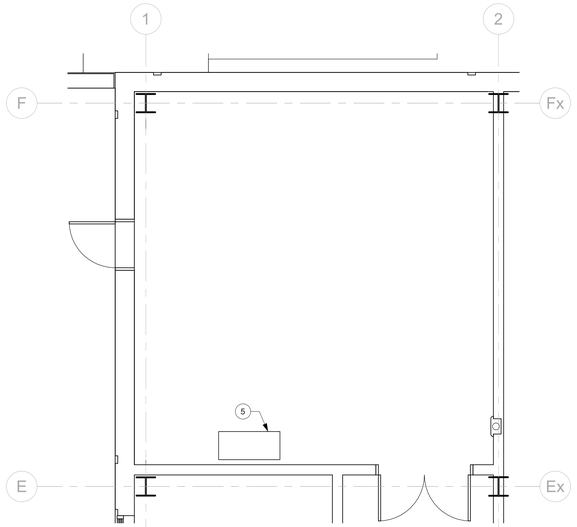
EQUIPMENT NUMBER	EQUIPMENT/ FURNITURE DESCRIPTION	COUNT	VENDOR PROVIDED	VENDOR INSTALLED	OWNER PROVIDED	OWNER INSTALLED	CONTRACTOR PROVIDED	CONTRACTOR INSTALLED
1	MOBILE SHELVING UNIT	1			Yes	Yes	No	No
2	TASK CHAIR	4	Yes	Yes	No	No		
3	COMPUTER	5			Yes	Yes		
4	DESK	1	Yes	Yes	No	No		
5	STORAGE CABINET	1	Yes	Yes	No	No		
6	TELEVISION AND WALL MOUNT	1			Yes	No	No	Yes

GENERAL EQUIPMENT PLAN NOTES

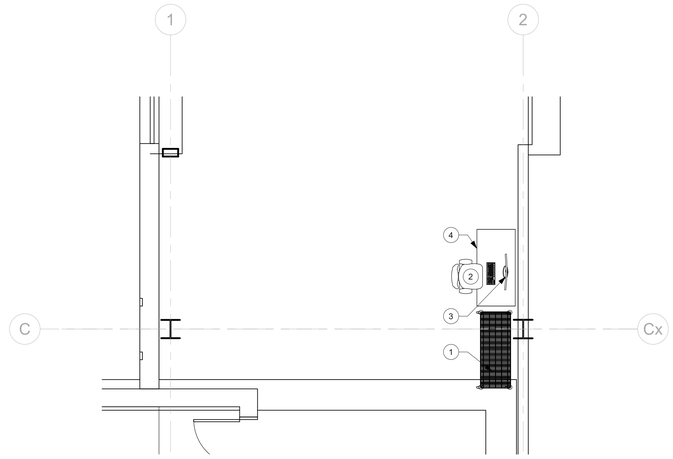
1. REFER TO MECHANICAL, PLUMBING AND ELECTRICAL DRAWING FOR EQUIPMENT DETAILS
2. EQUIPMENT/ FURNITURE TOTAL COUNTS ARE PER SHEET.

ENLARGED PLAN REFERENCE NOTES - FIRST FLOOR (X)

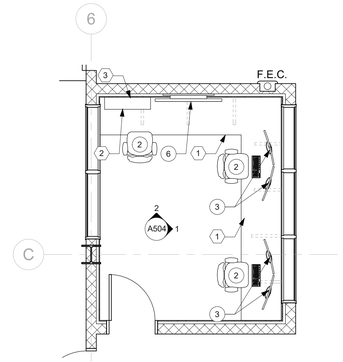
#	KEYNOTE INFORMATION
1	SOLID SURFACE COUNTERTOP WITH 4" BACKSPLASH AND RETURNS
2	PLASTIC LAMINATE SHELF
3	RADIO CHARGING STATION



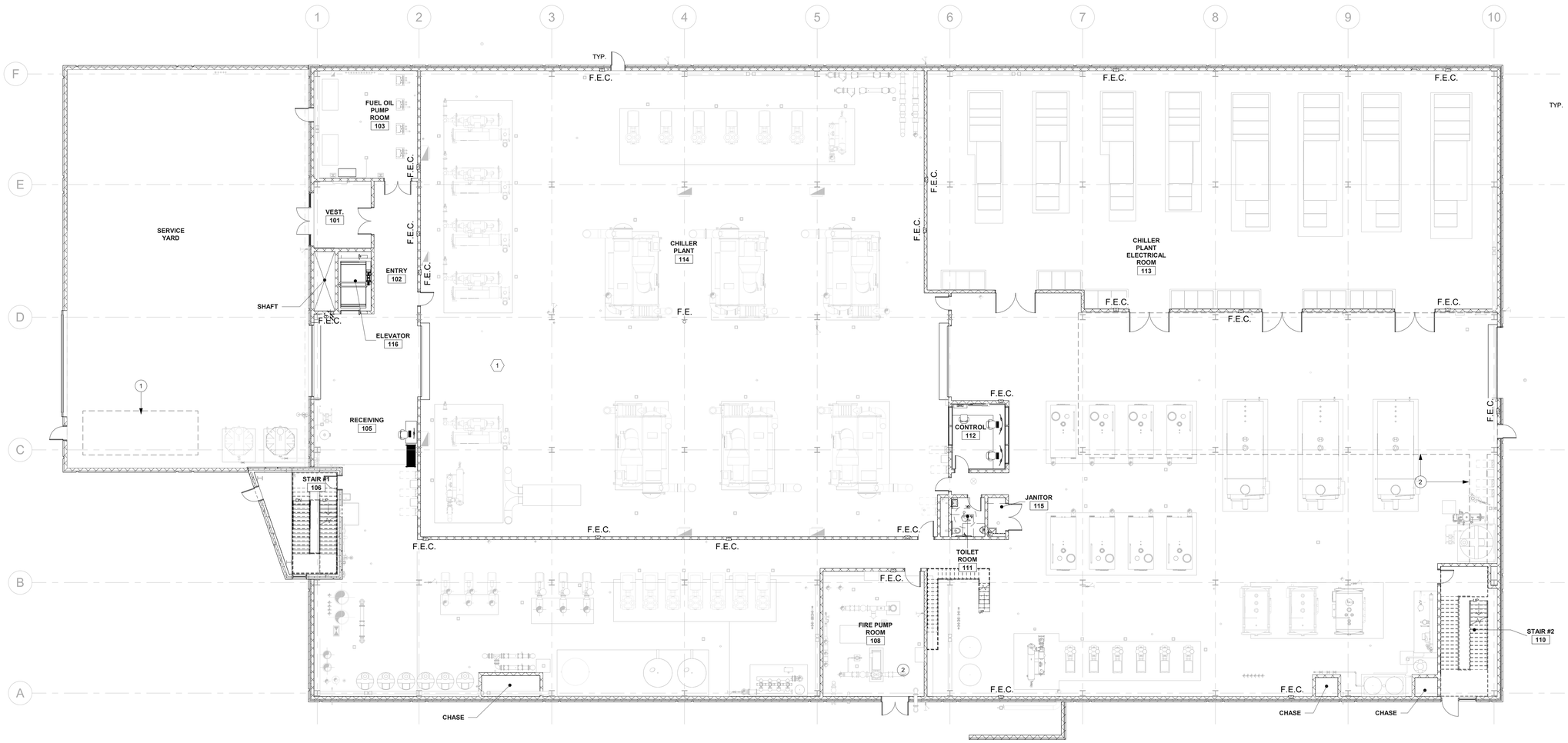
4 / A106 **ENLARGED PLAN @ FUEL OIL PUMP ROOM 103**
1/4" = 1'-0"



3 / A106 **ENLARGED PLAN @ RECEIVING**
1/4" = 1'-0"



2 / A106 **ENLARGED PLAN @ CONTROL 112**
1/4" = 1'-0"



FIRST FLOOR EQUIPMENT AND FURNITURE PLAN
3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:37:21 PM AESI Proj. No:
0 1/2" 1" 2"

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FIRST FLOOR EQUIPMENT AND FURNITURE PLAN

SHEET NUMBER

A106

EQUIPMENT/ FURNITURE - SECOND FLOOR (X)

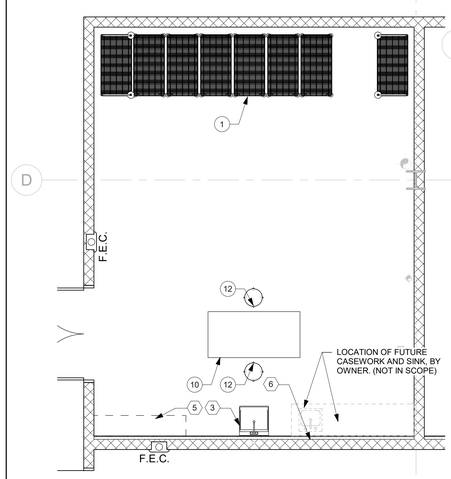
EQUIPMENT NUMBER	EQUIPMENT/ FURNITURE DESCRIPTION	COUNT	VENDOR PROVIDED	VENDOR INSTALLED	OWNER PROVIDED	OWNER INSTALLED	CONTRACTOR PROVIDED	CONTRACTOR INSTALLED
1	TRACK STORAGE SYSTEM	1	No		Yes	Yes	No	No
2	WALL MOUNTED PHONE	1			Yes	Yes		No
3	TASK CHAIR	5	Yes	Yes				
4	COMPUTER MONITOR	7			Yes	Yes		
5	SOFA	3	Yes	Yes				
6	DINING TABLE	2	Yes	Yes				
7	CHANGING CHAIR	1	Yes	Yes				
8	DESK	3	Yes	Yes				
9	GUEST CHAIR	6	Yes	Yes				
10	WORK TABLE	1	Yes	Yes				
11	COFFEE TABLE	1	Yes	Yes				
12	WORK STOOL	2	Yes	Yes				
13	DINING CHAIRS	8	Yes	Yes				
14	COFFEE MAKER	1			Yes	Yes		
15	MICROWAVE	1			Yes	Yes		
16	REFRIGERATOR	1			Yes	Yes		
17	WALL MOUNTED TELEVISION	2			Yes	Yes	No	No
18	TELEVISION WALL MOUNT	1			Yes	Yes	No	No
19	LOCKER	10					Yes	Yes
20	ICE MAKER	1			Yes	Yes		No
21	SHOWER SHELF	1					Yes	Yes

GENERAL EQUIPMENT PLAN NOTES

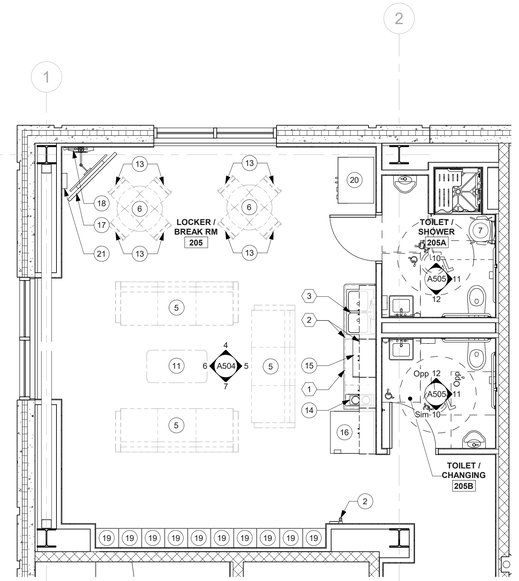
1. REFER TO MECHANICAL, PLUMBING AND ELECTRICAL DRAWING FOR EQUIPMENT DETAILS
2. EQUIPMENT/ FURNITURE TOTAL COUNTS ARE PER SHEET.

ENLARGED PLAN REFERENCE NOTES - SECOND FLOOR (X)

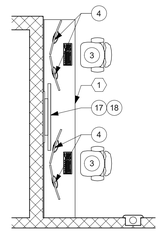
#	INFORMATION
1	SOLID SURFACE COUNTERTOP AND 4" BACKSPLASH
2	PLASTIC LAMINATE CASEWORK, SEE INTERIOR ELEVATIONS
3	PLUMBING FIXTURE, SEE PLUMBING DRAWINGS
5	PLASTIC LAMINATE SHELVES ON STANDARDS
6	INSTALL PLUMBING STUBS FOR FUTURE SINK. SEE PLUMBING DRAWINGS



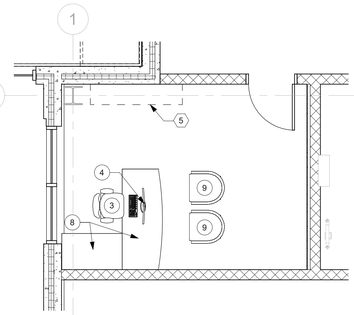
6 A107 ENLARGED PLAN @ MAINTENANCE WORKROOM 207
1/4" = 1'-0"



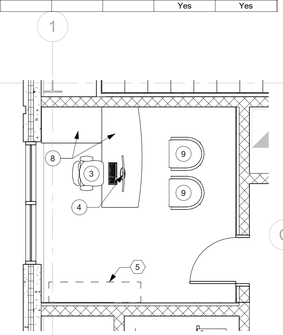
5 A107 ENLARGED PLAN @ BREAK ROOM
1/4" = 1'-0"



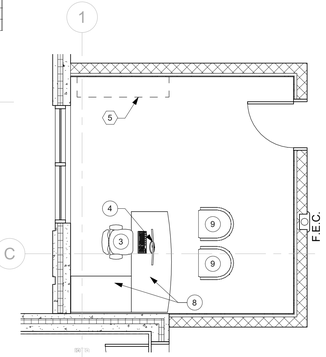
4 A107 ENLARGED PLAN @ CONTROL 209
1/4" = 1'-0"



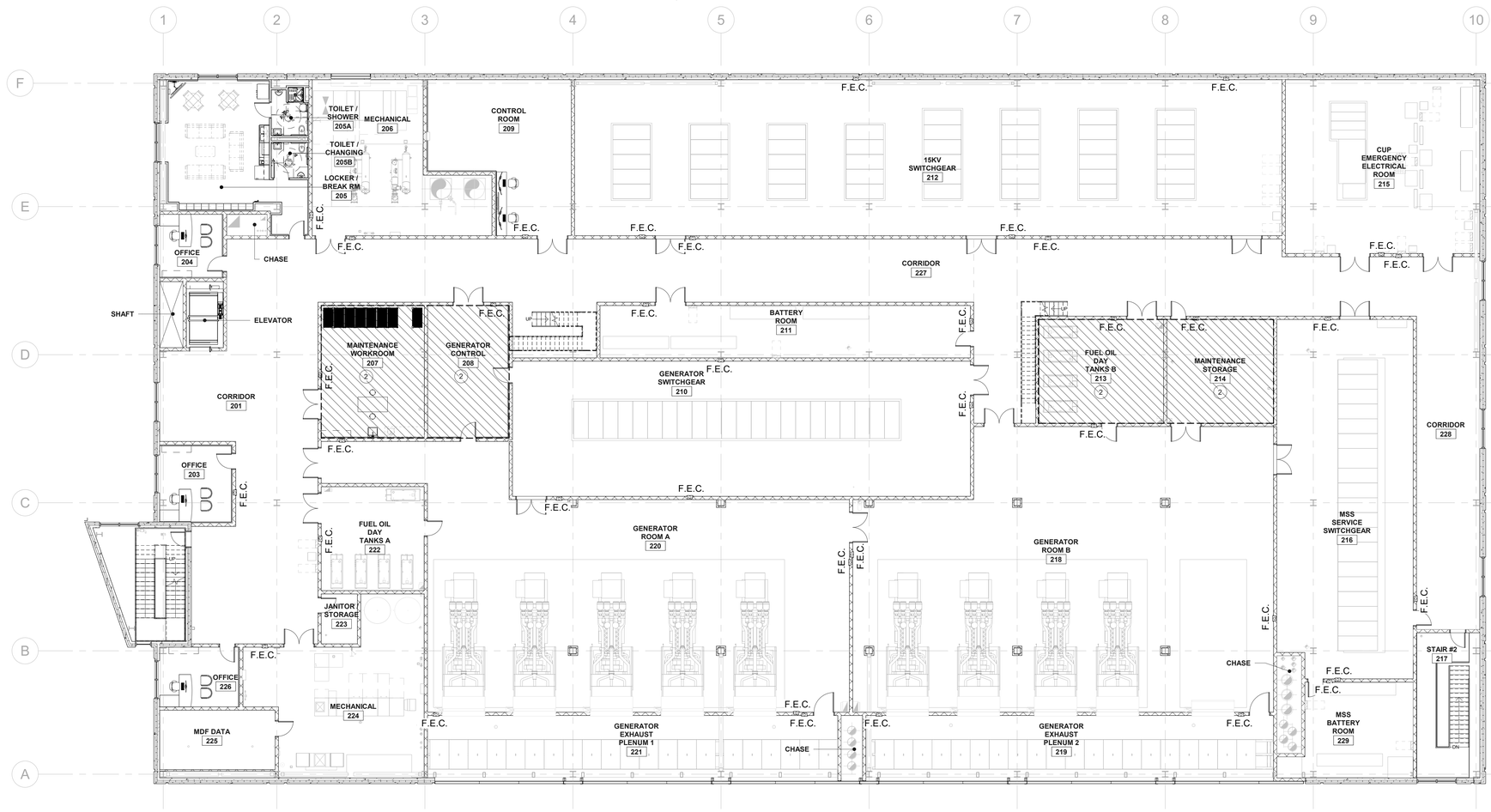
3 A107 ENLARGED PLAN @ OFFICE 226
1/4" = 1'-0"



2 A107 ENLARGED PLAN @ OFFICE 204
1/4" = 1'-0"



1 A107 ENLARGED PLAN @ OFFICE 203
1/4" = 1'-0"



SECOND FLOOR EQUIPMENT AND FURNITURE PLAN
3/32" = 1'-0"

ORIGINAL SHEET SIZE (8.30" X 42" (ARCH E1)
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SHEET TITLE

SECOND FLOOR EQUIPMENT AND FURNITURE PLAN

SHEET NUMBER

A107

REFLECTED CEILING PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION
1	EXPOSED STRUCTURE ABOVE
2	MEZZANINE
3	CONCRETE CAP
4	HATCH TO MEZZANINE ABOVE

REFLECTED CEILING PLAN LEGEND

REFER TO MECHANICAL, ELECTRICAL AND/OR PLUMBING DRAWINGS FOR SPECIFICATIONS OF ITEMS

- INDICATES AREA OF 5/8" GYPSUM BOARD CEILING/SOFFIT/BULKHEAD ON 3 5/8" METAL STUDS @ 16" O.C. (U.N.O.) PAINT
- INDICATES 2' X 2' LAY-IN CEILING TILE WITH METAL GRID
- 2' x 4' RECESSED LIGHT FIXTURE
- 2' x 2' RECESSED LIGHT FIXTURE
- 1' x 4' RECESSED LIGHT FIXTURE
- STRIP FIXTURE WITH WIRE GUARD
- RECESSED CAN TYPE LIGHT FIXTURE
- 2' X 2' SUPPLY AIR
- 2' X 2' RETURN AIR
- EXHAUST FAN
- E.S. EXPOSED STRUCTURE

GENERAL REFLECTED CEILING PLAN NOTES

1. CEILING ELEVATION TAGS REFER TO HEIGHT ABOVE FINISHED FLOOR IN AREAS TO REMAIN
2. CENTER PENETRATIONS IN ACOUSTICAL CEILING SYSTEMS WITHIN INDIVIDUAL CEILING PANELS, SUCH AS SPRINKLER HEADS, DIFFUSERS, LIGHT FIXTURES, ETC., UNLESS NOTED OTHERWISE.
3. PAINT EXPOSED HARD CEILING SURFACES U.N.O.
4. THE REFLECTED CEILING PLANS SHOW THE DESIGN INTENT OF MECHANICAL & ELECTRICAL BUILDING SYSTEMS TO BE INTEGRATED INTO CEILINGS. REFLECTED CEILING PLANS SHALL TAKE PRECEDENCE OVER MECHANICAL & ELECTRICAL DRAWINGS. REFER DISCREPANCIES TO THE ARCHITECT FOR DIRECTION.
5. ALL CUT EDGE OF CEILING PANELS SHALL BE PAINTED TO MATCH PANEL FACE.
6. REFER TO FINISH SCHEDULE FOR CEILING TYPES.
7. ALL BULKHEADS CONSTRUCTION SHALL BE 3 5/8" 22 GA. STUDS @ 16"O.C. WITH 5/8" GYP. BD. U.N.O.

FIRST FLOOR REFLECTED CEILING PLAN
3/32" = 1'-0"

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PROJECT NO.	

SHEET TITLE

FIRST FLOOR REFLECTED CEILING PLAN

SHEET NUMBER

A201

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:38:05 PM AESI Proj. No:
0 1/2" 1" 2"

REFLECTED CEILING PLAN REFERENCE NOTES	
#	KEYNOTE INFORMATION
1	EXPOSED STRUCTURE ABOVE
2	MEZZANINE
3	CONCRETE CAP
4	HATCH TO MEZZANINE ABOVE

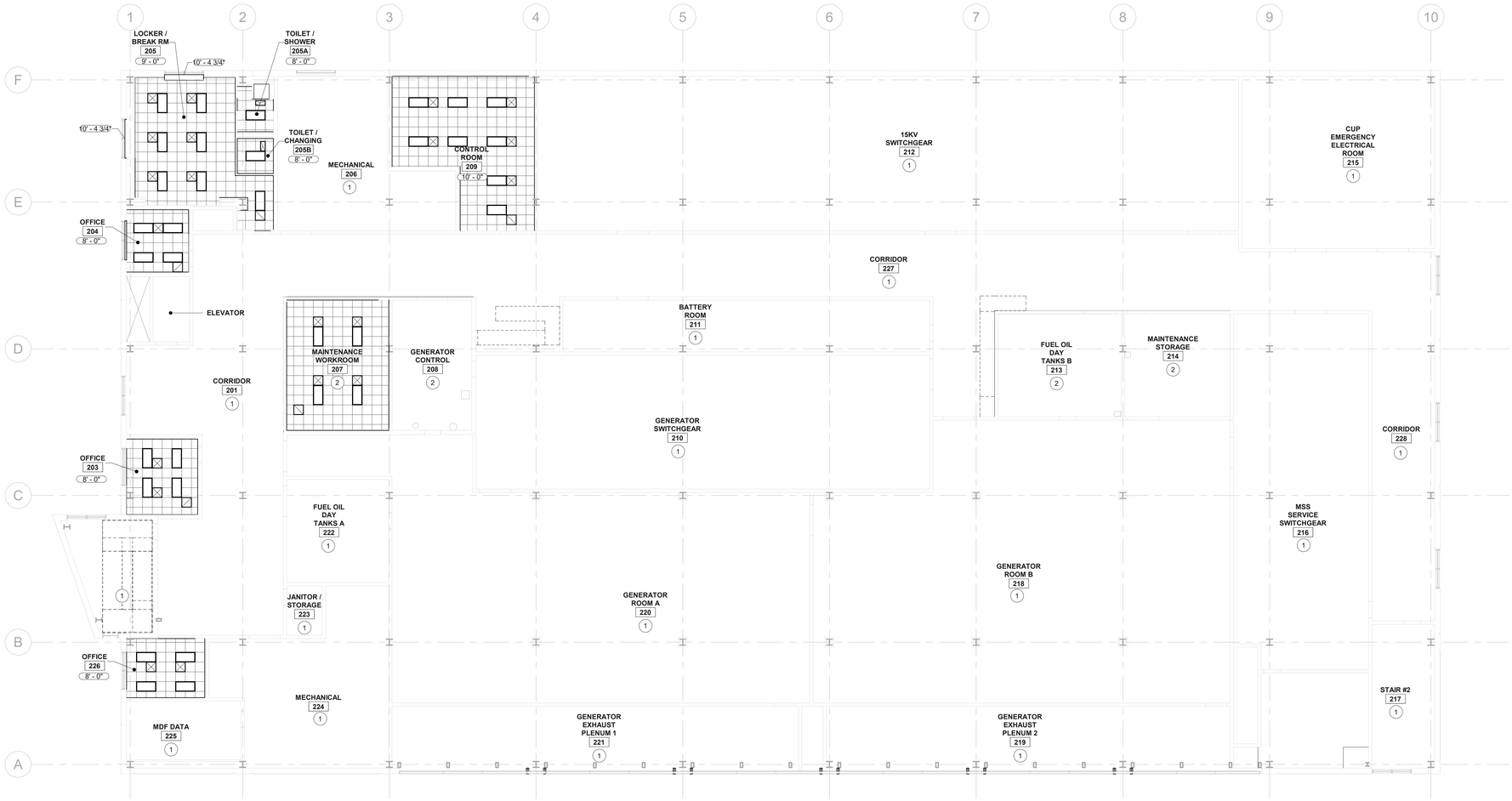
REFLECTED CEILING PLAN LEGEND

REFER TO MECHANICAL, ELECTRICAL AND/OR PLUMBING DRAWINGS FOR SPECIFICATIONS OF ITEMS

- INDICATES AREA OF 5/8" GYPSUM BOARD CEILING/SOFFIT/BULKHEAD ON 3 5/8" METAL STUDS @ 16" O.C. (U.N.O.) PAINT
- INDICATES 2' X 2' LAY-IN CEILING TILE WITH METAL GRID
- 2' x 4' RECESSED LIGHT FIXTURE
- 2' x 2' RECESSED LIGHT FIXTURE
- 1' x 4' RECESSED LIGHT FIXTURE
- STRIP FIXTURE WITH WIRE GUARD
- RECESSED CAN TYPE LIGHT FIXTURE
- 2' X 2' SUPPLY AIR
- 2' X 2' RETURN AIR
- EXHAUST FAN
- E.S. EXPOSED STRUCTURE

GENERAL REFLECTED CEILING PLAN NOTES

1. CEILING ELEVATION TAGS REFER TO HEIGHT ABOVE FINISHED FLOOR IN AREAS TO REMAIN
2. CENTER PENETRATIONS IN ACOUSTICAL CEILING SYSTEMS WITHIN INDIVIDUAL CEILING PANELS, SUCH AS SPRINKLER HEADS, DIFFUSERS, LIGHT FIXTURES, ETC., UNLESS NOTED OTHERWISE.
3. PAINT EXPOSED HARD CEILING SURFACES U.N.O.
4. THE REFLECTED CEILING PLANS SHOW THE DESIGN INTENT OF MECHANICAL & ELECTRICAL BUILDING SYSTEMS TO BE INTEGRATED INTO CEILINGS. REFLECTED CEILING PLANS SHALL TAKE PRECEDENCE OVER MECHANICAL & ELECTRICAL DRAWINGS. REFER DISCREPANCIES TO THE ARCHITECT FOR DIRECTION.
5. ALL CUT EDGE OF CEILING PANELS SHALL BE PAINTED TO MATCH PANEL FACE.
6. REFER TO FINISH SCHEDULE FOR CEILING TYPES.
7. ALL BULKHEADS CONSTRUCTION SHALL BE 3 5/8" 22 GA. STUDS @ 16"O.C. WITH 5/8" GYP. BD. U.N.O.



SECOND FLOOR REFLECTED CEILING PLAN
3/32" = 1'-0"

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SHEET TITLE

SECOND FLOOR REFLECTED CEILING PLAN

SHEET NUMBER

A202

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:38:09 PM AESI Proj. No:
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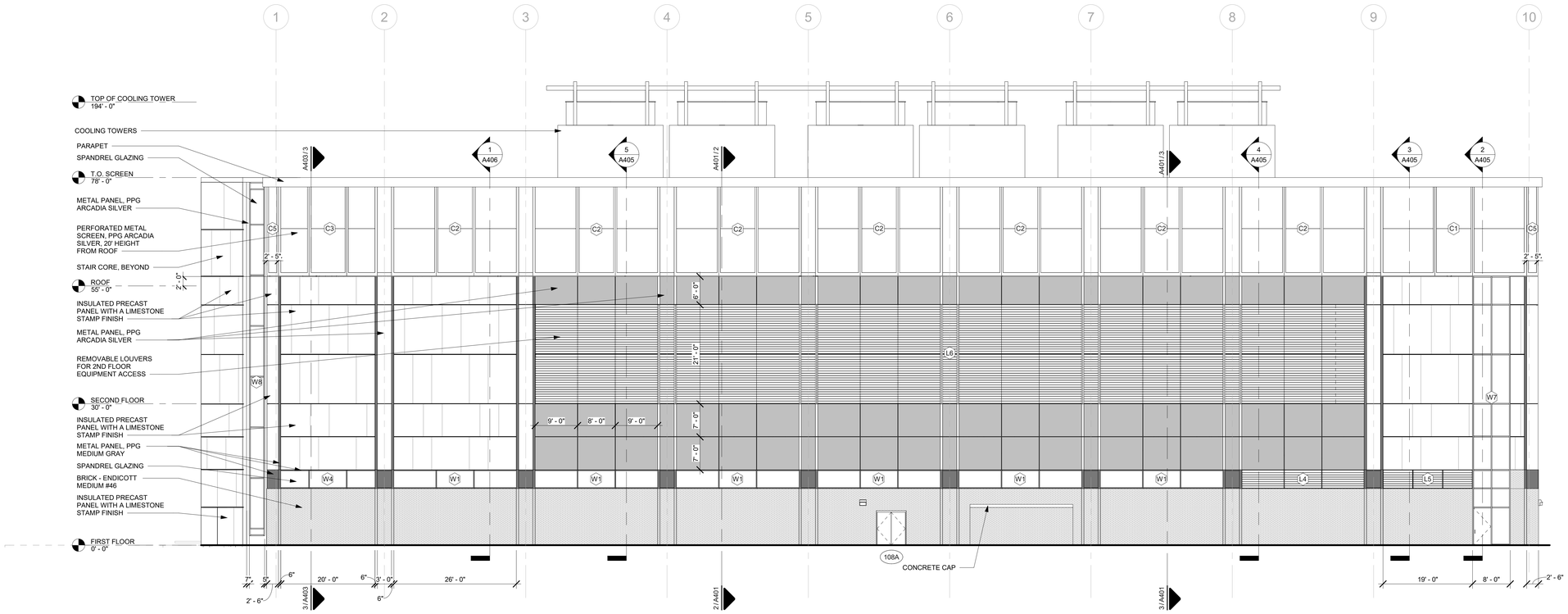
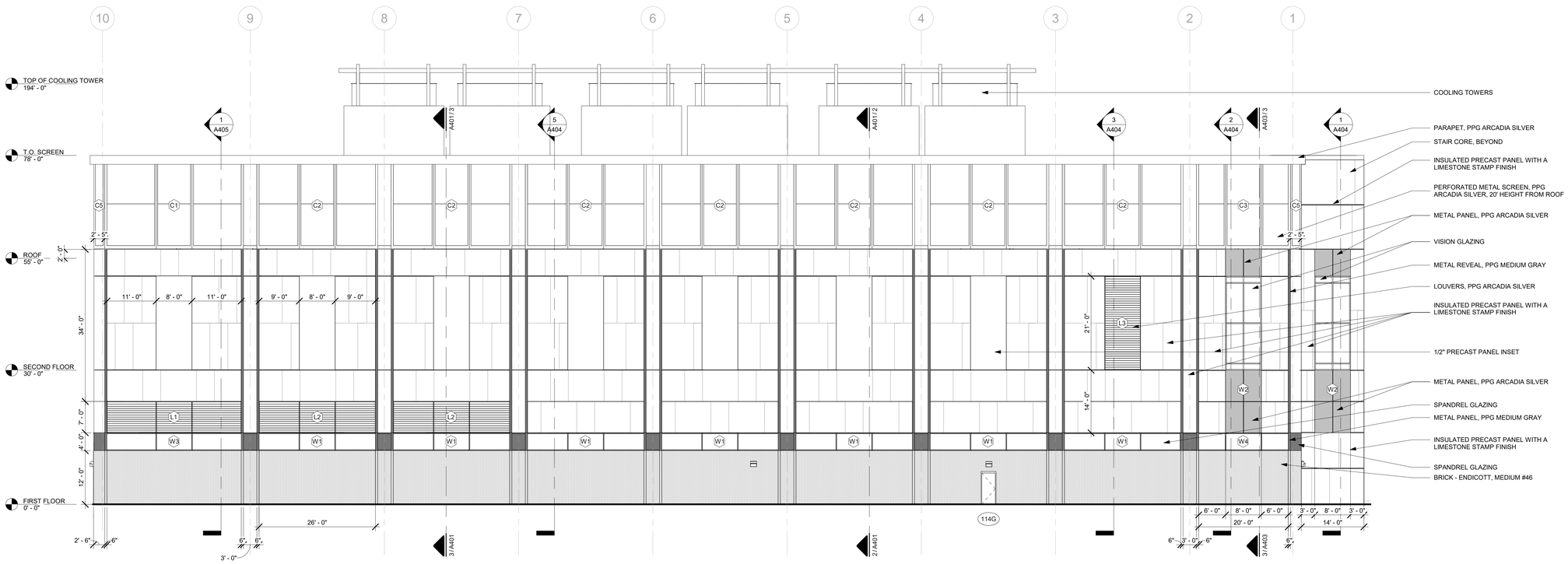


3 A301 **WEST BUILDING ELEVATION**
3/32" = 1'-0"



1 A301 **EAST BUILDING ELEVATION**
3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:38:19 PM AESI Proj. No:

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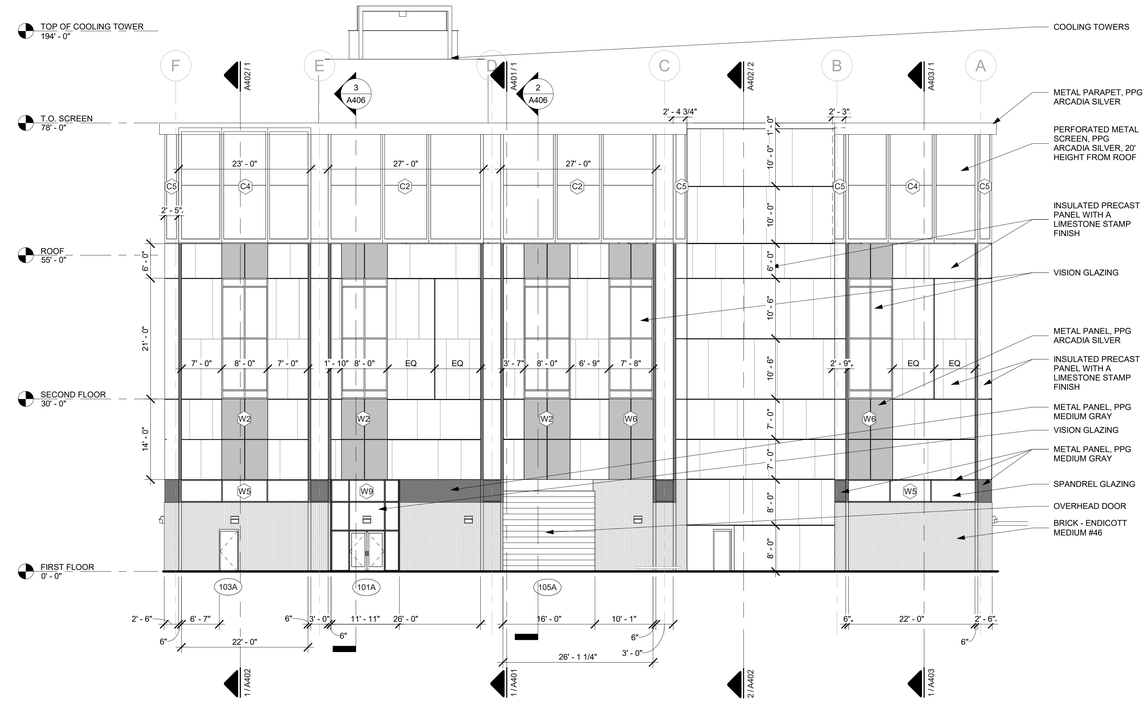
CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

EXTERIOR ELEVATIONS

SHEET NUMBER

A301



2 A302 **NORTH BUILDING ELEVATION**
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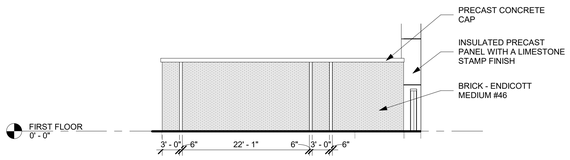
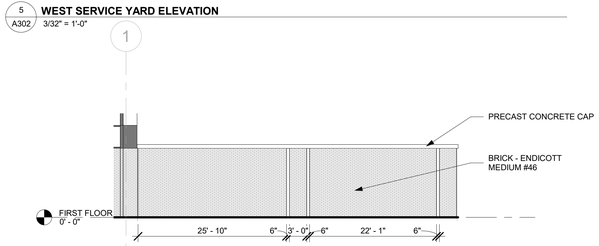
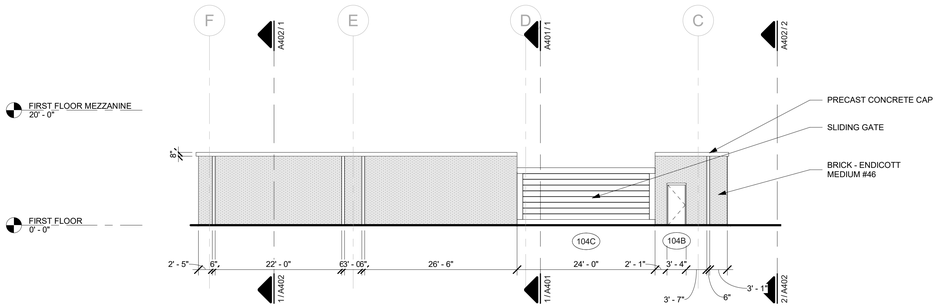


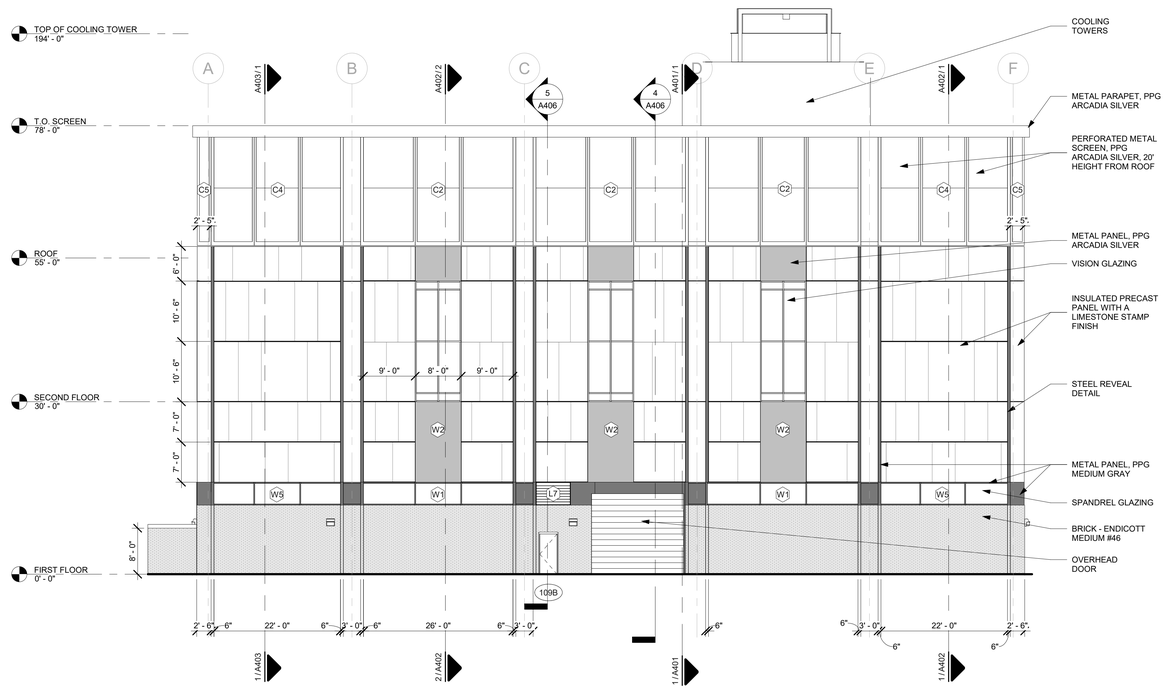
5 A302 **WEST SERVICE YARD ELEVATION**
3/32" = 1'-0"



4 A302 **EAST SERVICE YARD ELEVATON**
3/32" = 1'-0"



1 A302 **NORTH SERVICE YARD ELEVATION**
3/32" = 1'-0"



3 A302 **SOUTH BUILDING ELEVATION**
3/32" = 1'-0"

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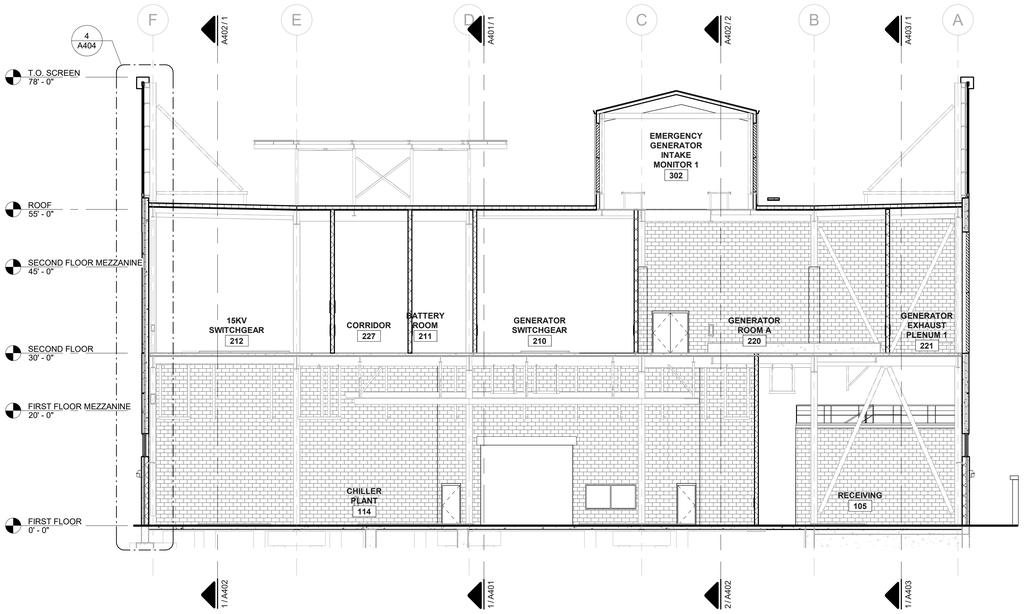
EXTERIOR ELEVATIONS

SHEET NUMBER

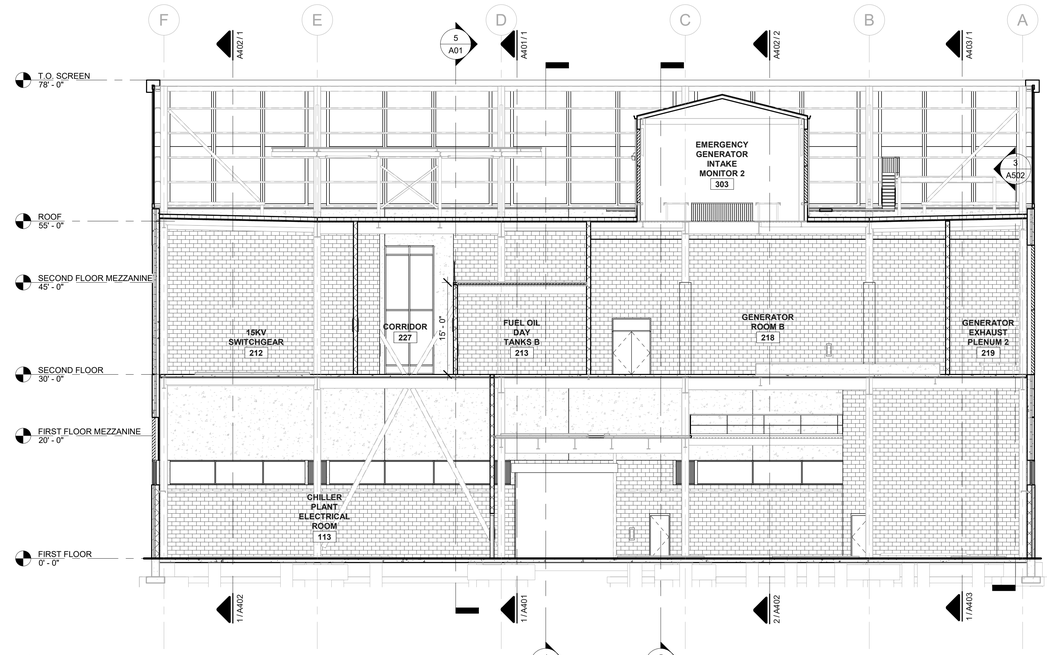
A302

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:38:27 PM AESI Proj. No:

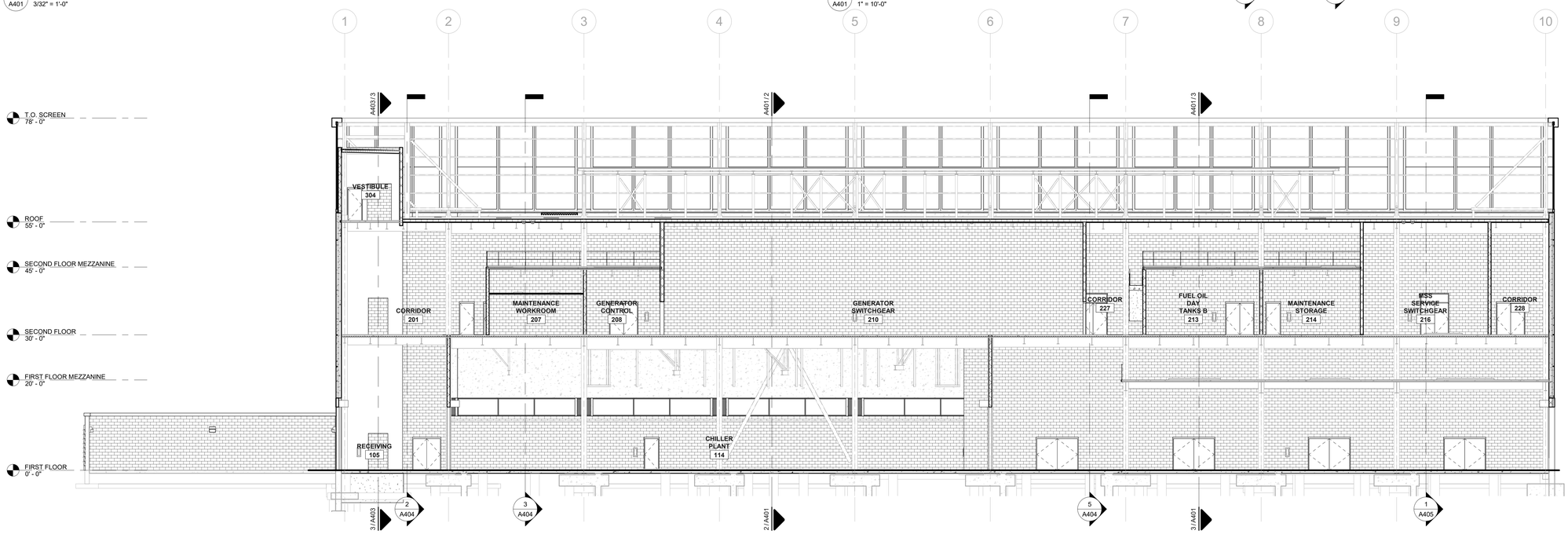
BUILDING SECTION REFERENCE NOTES	
#	KEYNOTE INFORMATION



2 / A401 **BUILDING SECTION**
3/32" = 1'-0"



3 / A401 **BUILDING SECTION**
1" = 10'-0"



1 / A401 **BUILDING SECTION**
3/32" = 1'-0"

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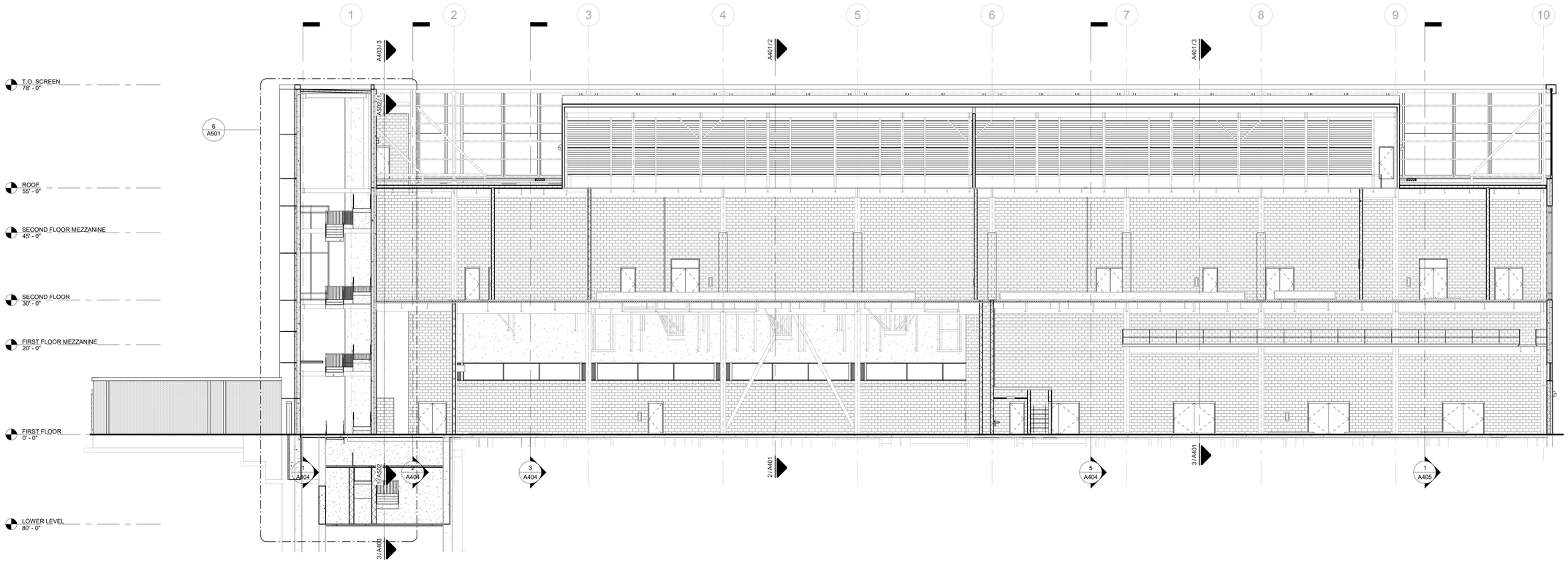
BUILDING SECTIONS

SHEET NUMBER

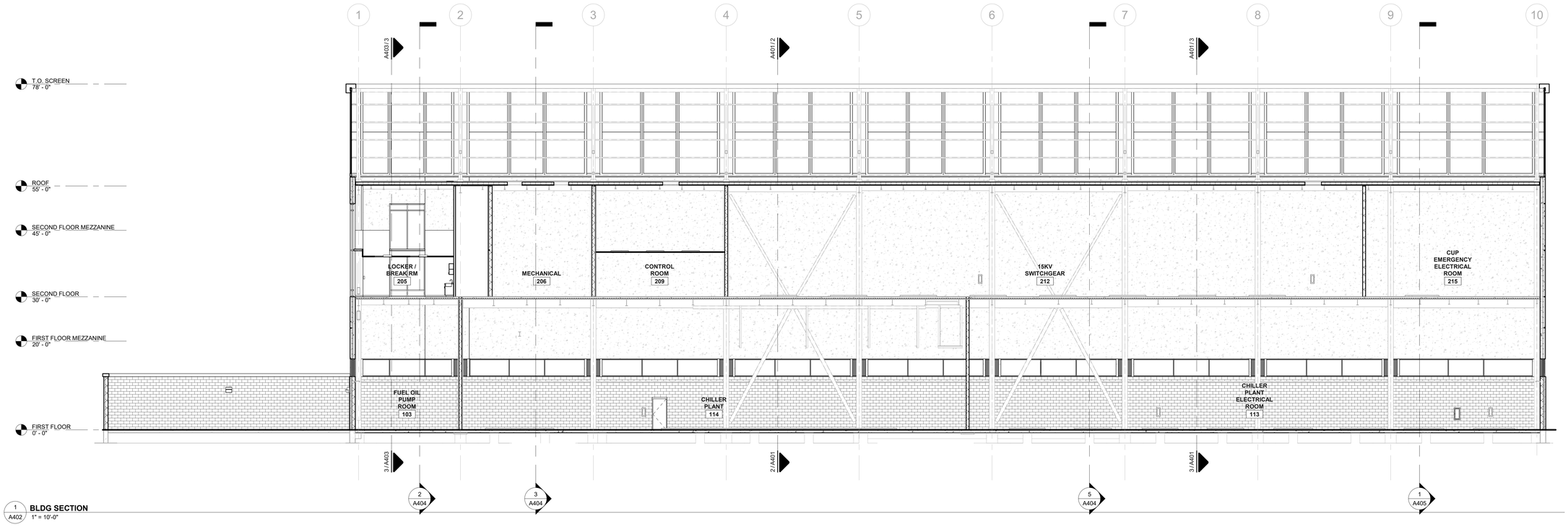
A401

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:38:47 PM AESI Proj. No:
0 1/2" 1" 2"

BUILDING SECTION REFERENCE NOTES	
#	KEYNOTE INFORMATION



2 A402 **BLDG SECTION**
1" = 10'-0"



1 A402 **BLDG SECTION**
1" = 10'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:39:15 PM AESI Proj. No:

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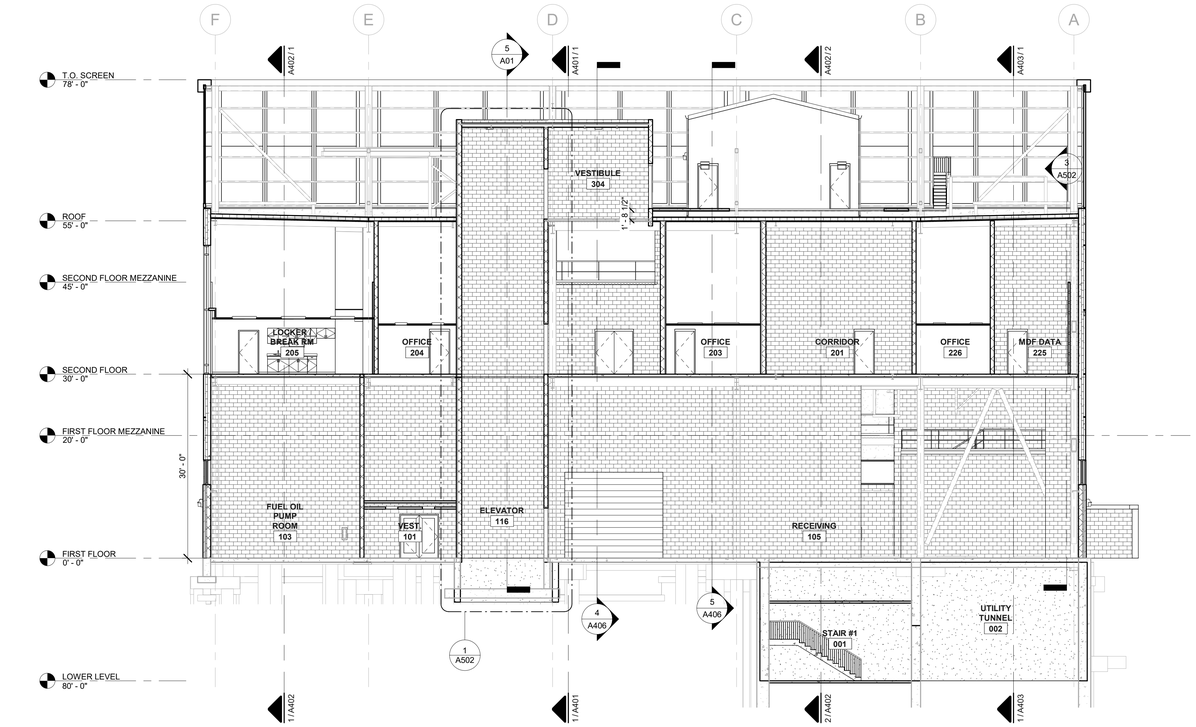
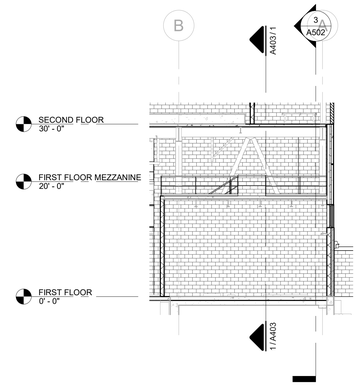
BUILDING SECTIONS

SHEET NUMBER
A402

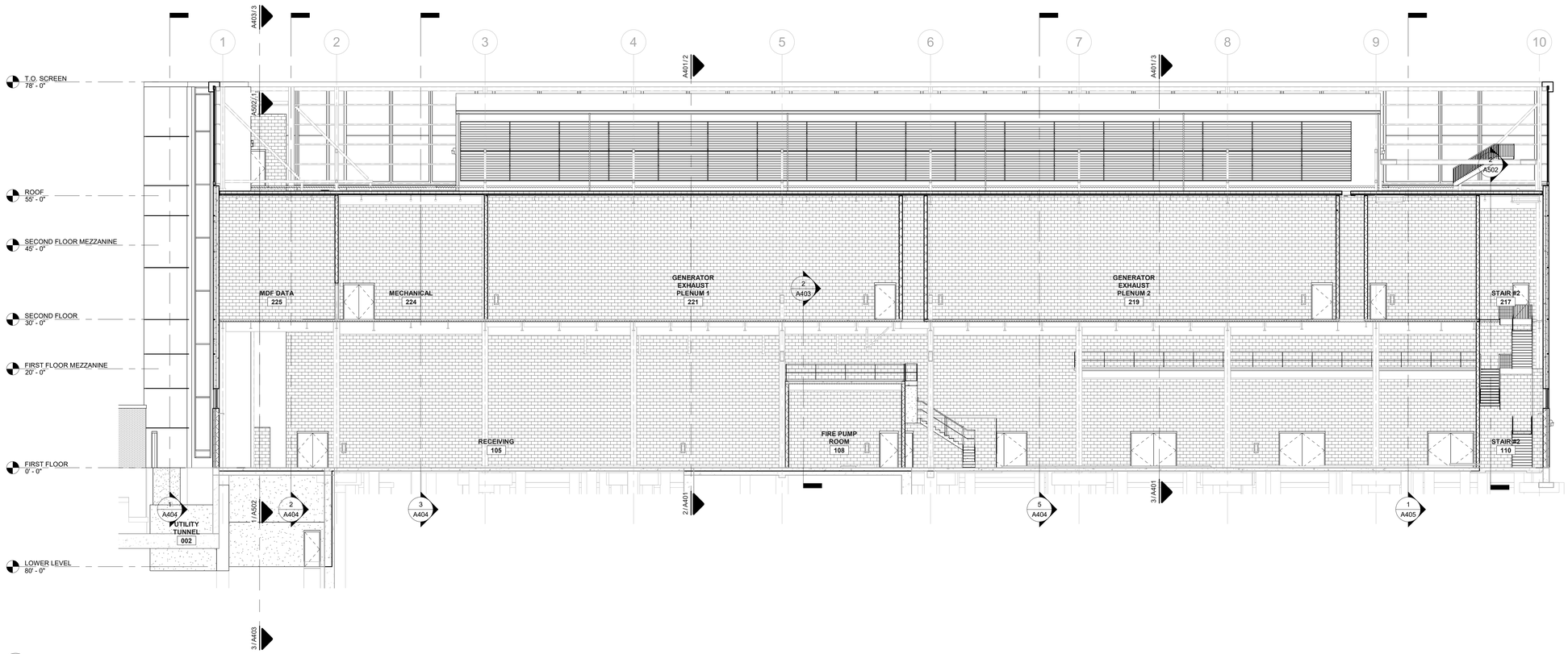
BUILDING SECTION REFERENCE NOTES	
#	KEYNOTE INFORMATION



3 A403 **BLDG SECTION**
1" = 10'-0"



2 A403 **BLDG SECTION**
3/32" = 1'-0"



1 A403 **BLDG SECTION**
1" = 10'-0"

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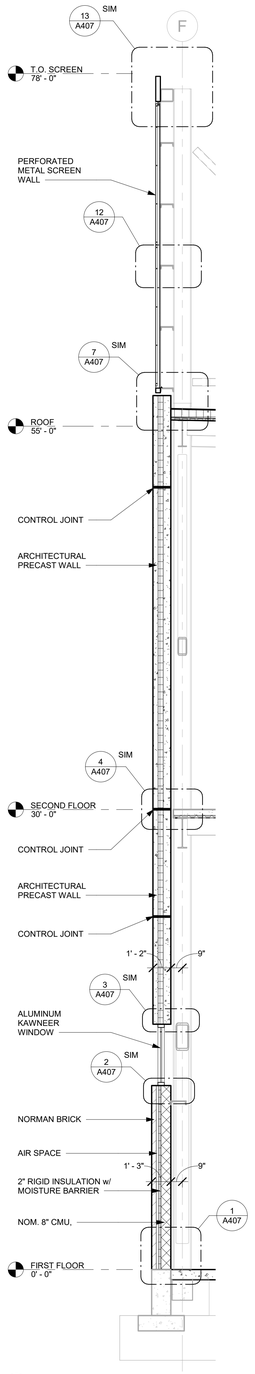
SHEET TITLE

BUILDING SECTION

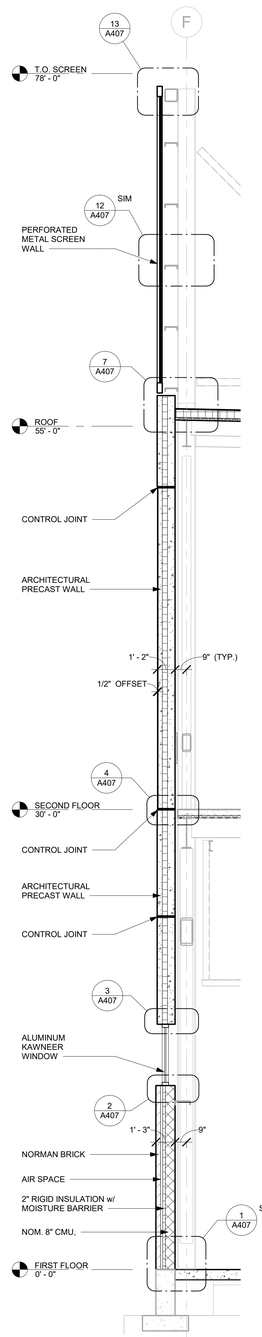
SHEET NUMBER

A403

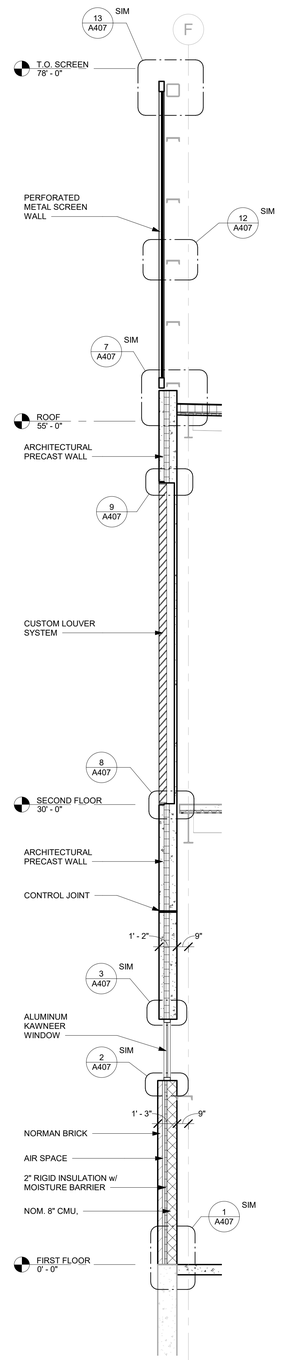
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:39:33 PM AESI Proj. No:
0 1/2" 1" 2"



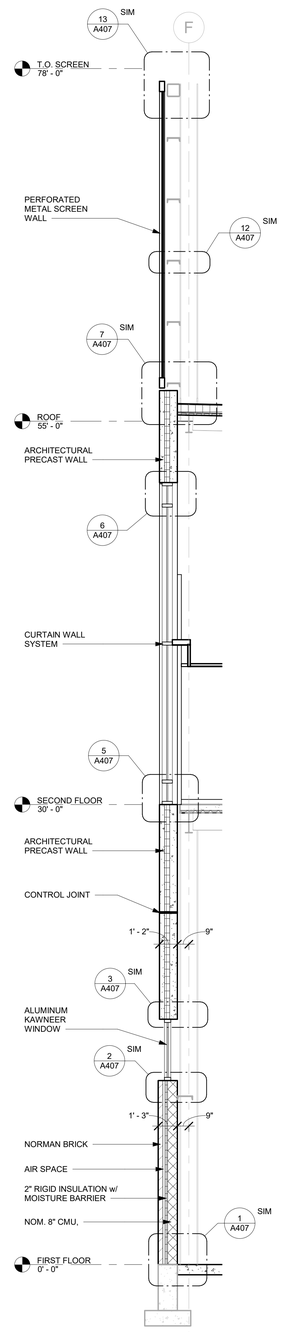
5 A404 **WALL SECTION** 1/4" = 1'-0"



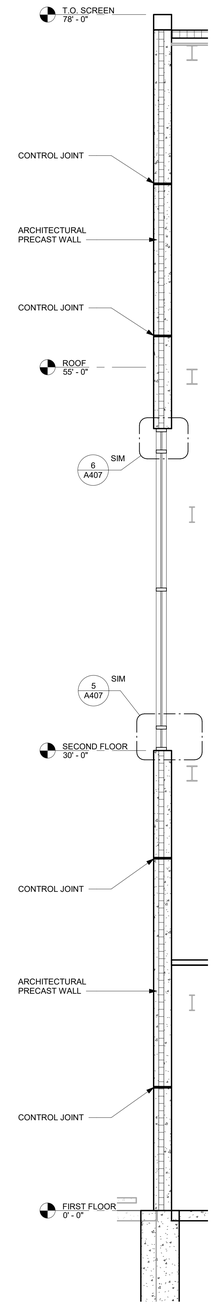
4 A404 **WALL SECTION** 1/4" = 1'-0"



3 A404 **WALL SECTION** 1/4" = 1'-0"



2 A404 **WALL SECTION** 1/4" = 1'-0"



1 A404 **WALL SECTION** 1/4" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/8/2023 3:39:39 PM AESI Proj. No:

0 1/2" 1" 2"

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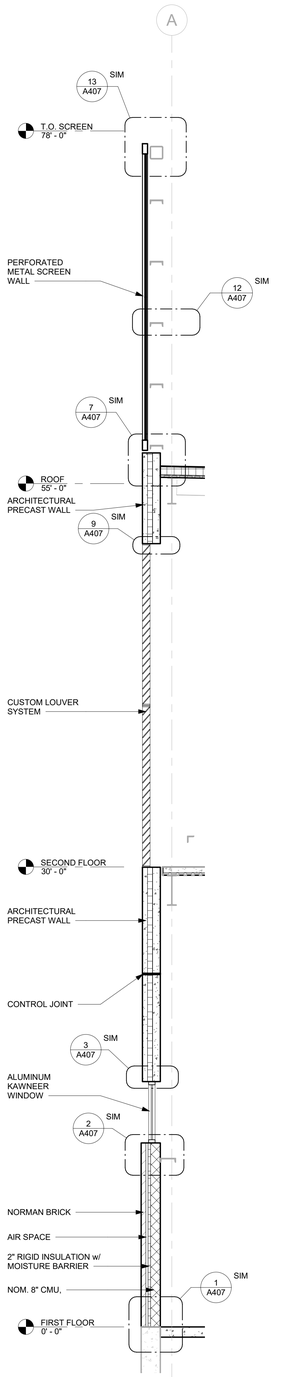
SHEET TITLE

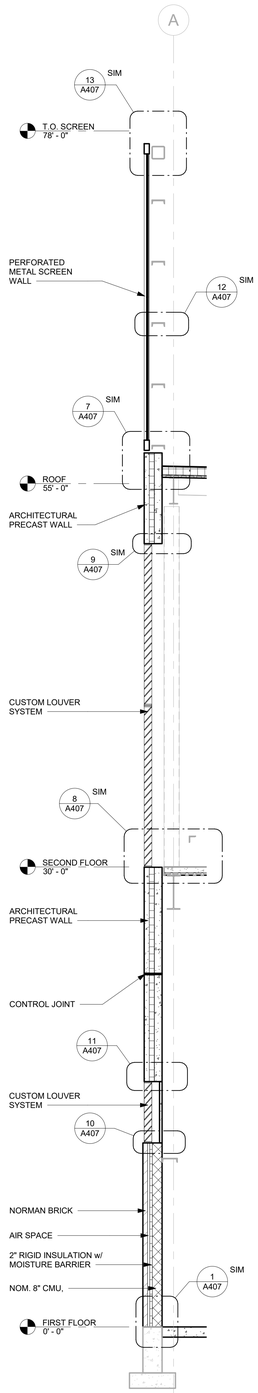
WALL SECTIONS

SHEET NUMBER

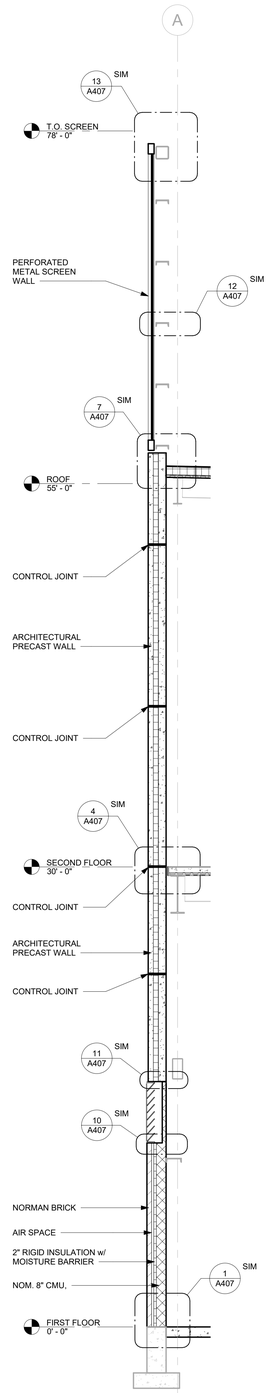
A404



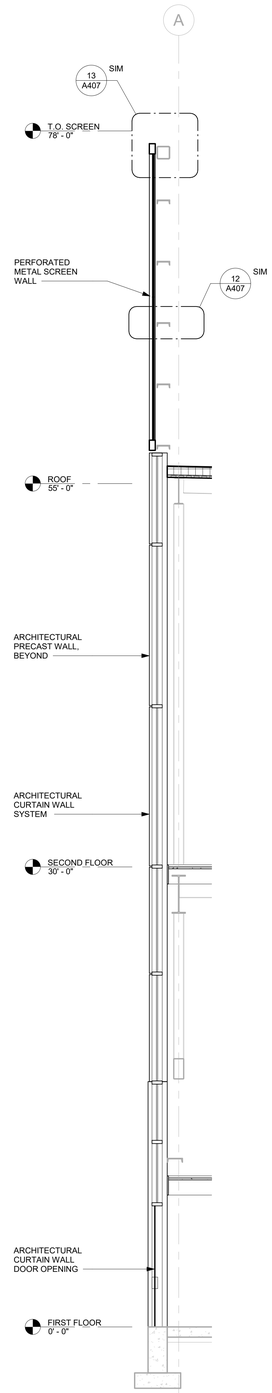
5 A405 **WALL SECTION**
1/4" = 1'-0"



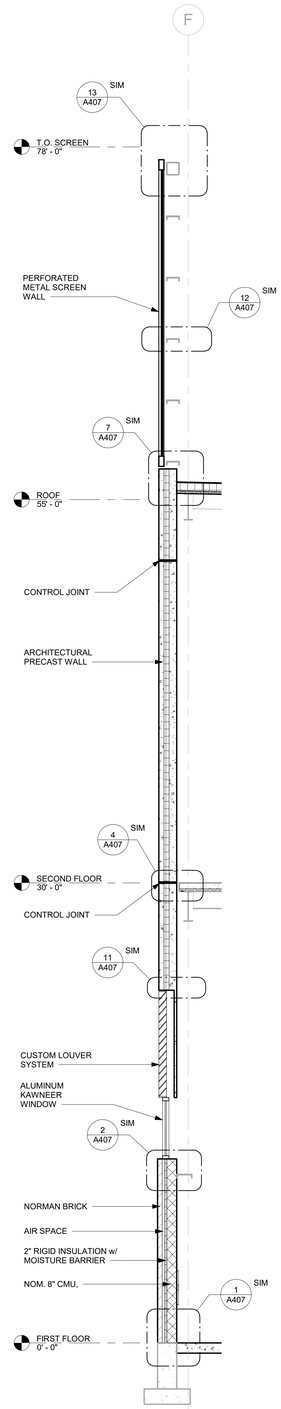
4 A405 **WALL SECTION**
1/4" = 1'-0"



3 A405 **WALL SECTION**
1/4" = 1'-0"



2 A405 **WALL SECTION**
1/4" = 1'-0"



1 A405 **WALL SECTION**
1/4" = 1'-0"

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SHEET TITLE

WALL SECTIONS

SHEET NUMBER

A405

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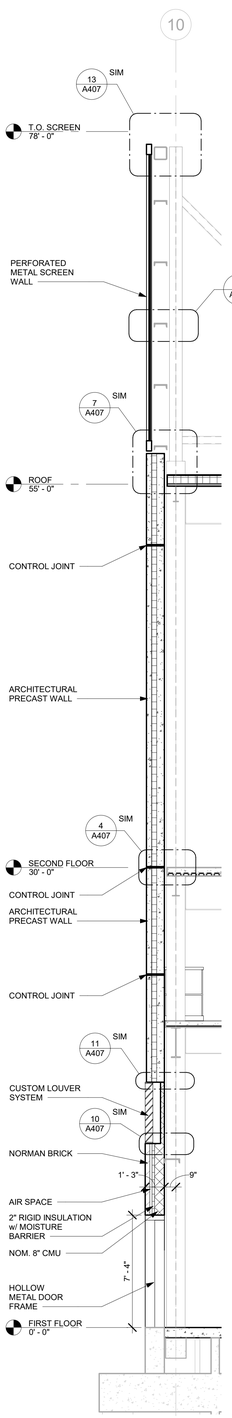
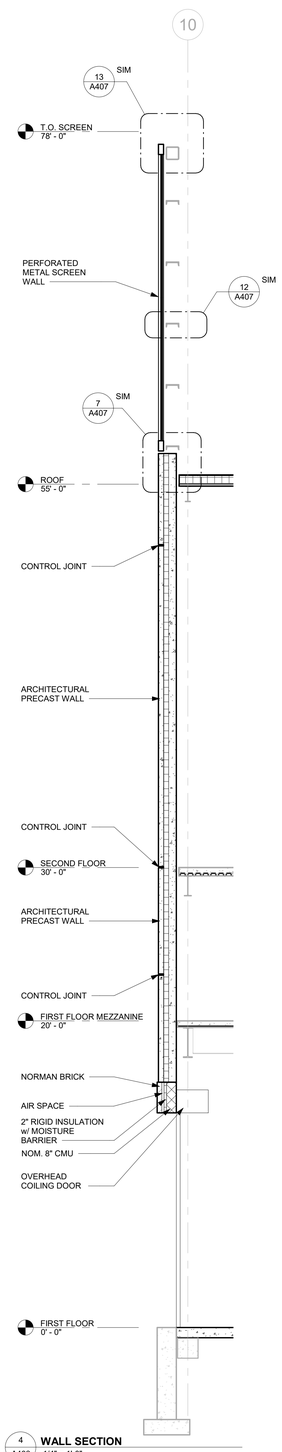
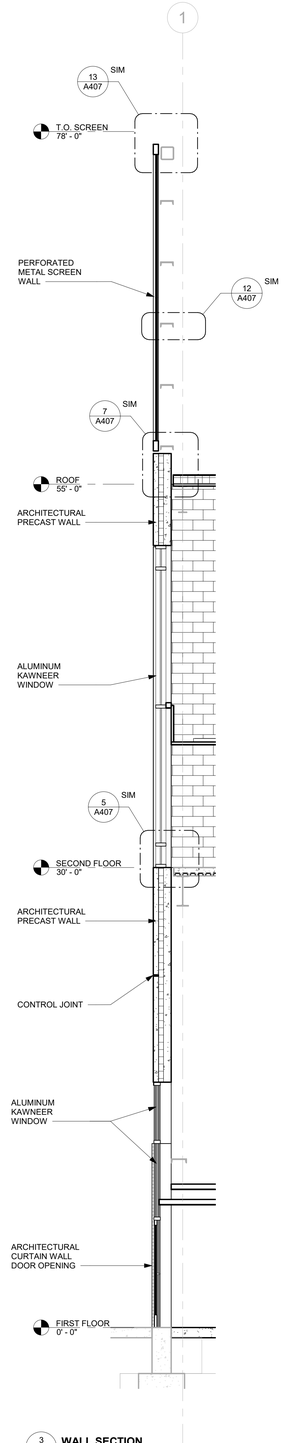
2/9/2023 3:39:44 PM AESI Proj. No:
0 1/2" 1" 2"



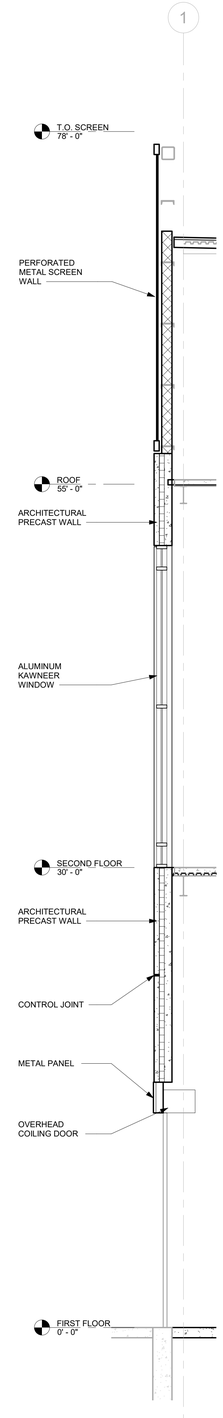
5 A406 **WALL SECTION** 1/4" = 1'-0"



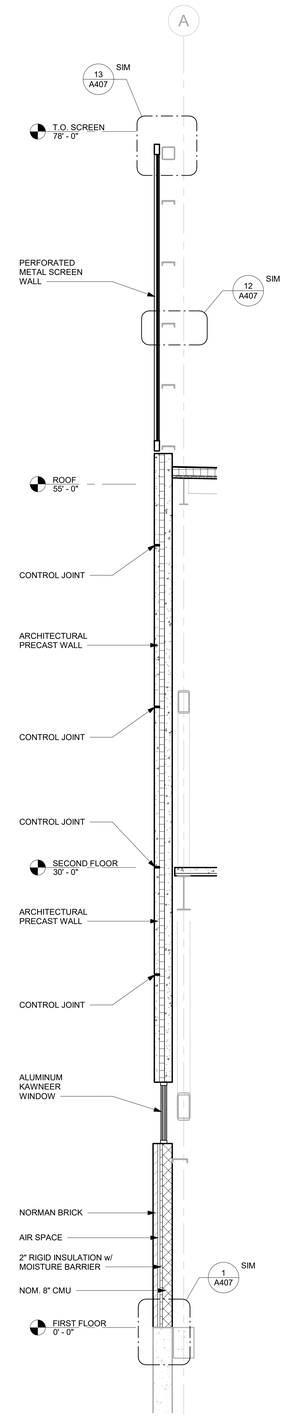
4 A406 **WALL SECTION** 1/4" = 1'-0"



3 A406 **WALL SECTION** 1/4" = 1'-0"



2 A406 **WALL SECTION** 1/4" = 1'-0"



1 A406 **WALL SECTION** 1/4" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:39:55 PM AESI Proj. No:

0 1/2" 1" 2"

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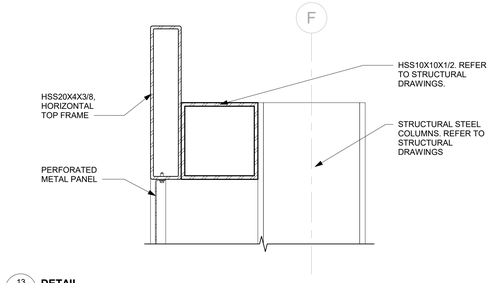
SHEET TITLE

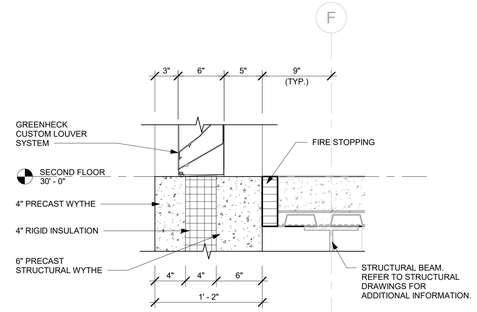
WALL SECTIONS

SHEET NUMBER

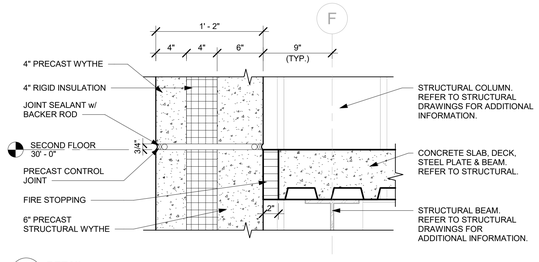
A406



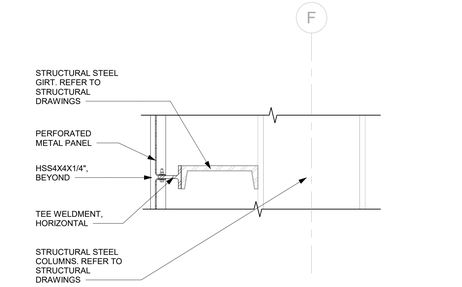
13 A407 **DETAIL**
1 1/2" = 1'-0"



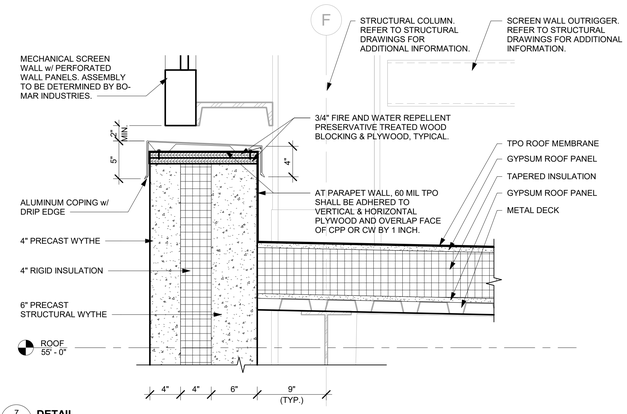
8 A407 **DETAIL**
1 1/2" = 1'-0"



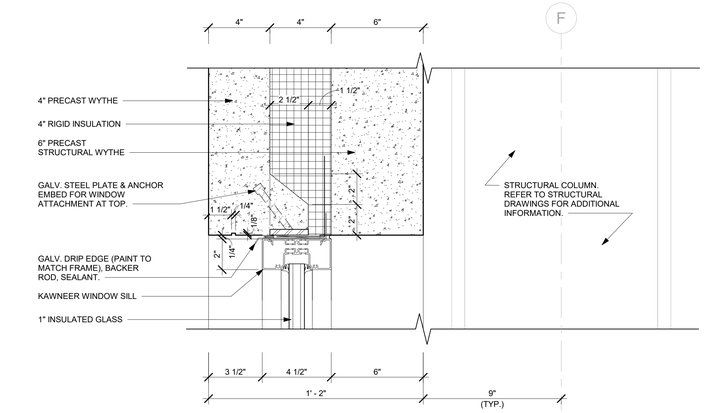
4 A407 **DETAIL**
1 1/2" = 1'-0"



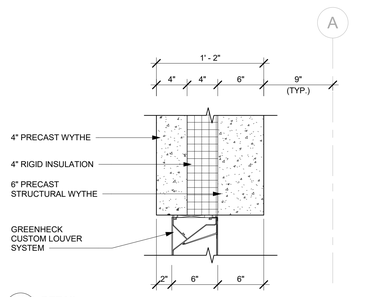
12 A407 **DETAIL**
1 1/2" = 1'-0"



7 A407 **DETAIL**
1 1/2" = 1'-0"

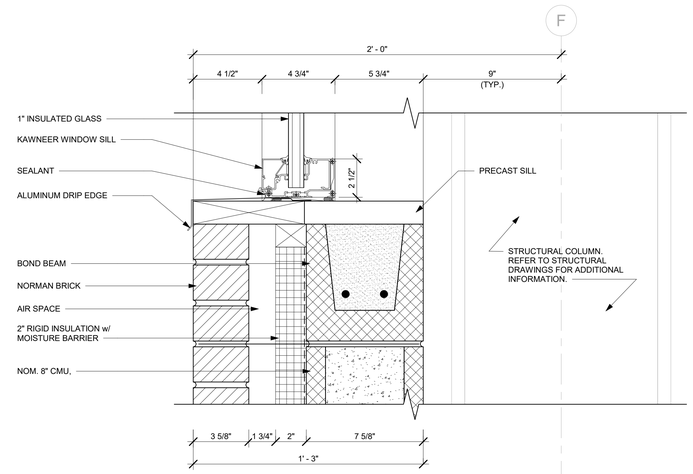


3 A407 **DETAIL**
3" = 1'-0"

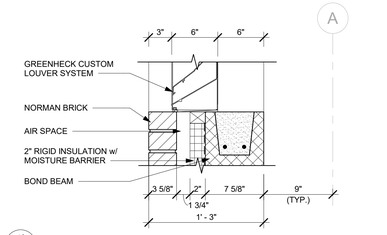


11 A407 **DETAIL**
1 1/2" = 1'-0"

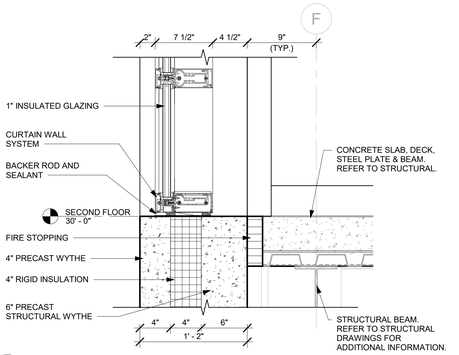
6 A407 **DETAIL**
1 1/2" = 1'-0"



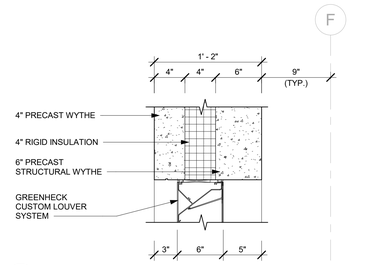
2 A407 **DETAIL**
3" = 1'-0"



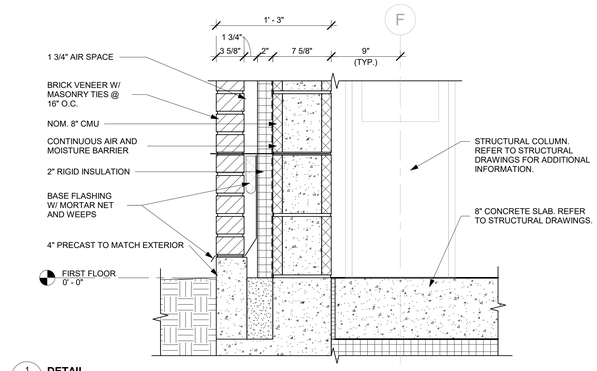
10 A407 **DETAIL**
1 1/2" = 1'-0"



5 A407 **DETAIL**
1 1/2" = 1'-0"



9 A407 **DETAIL**
1 1/2" = 1'-0"



1 A407 **DETAIL**
1 1/2" = 1'-0"

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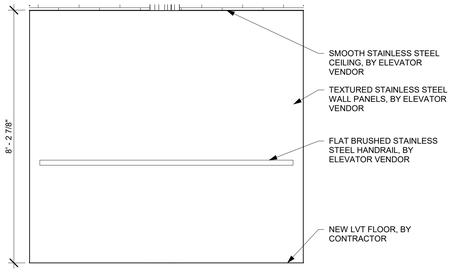
SHEET TITLE

EXTERIOR ASSEMBLY DETAILS

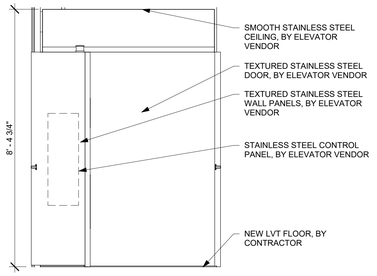
SHEET NUMBER

A407

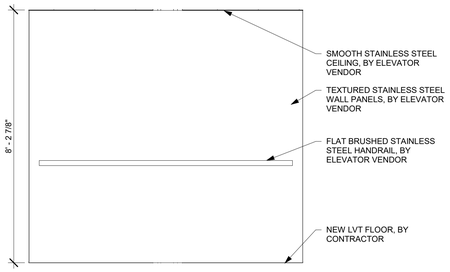
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/9/2023 3:40:01 PM AESI Proj. No:



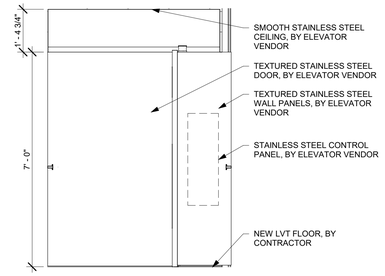
10 A501 **NORTH ELEVATOR ELEVATION**
1/2" = 1'-0"



9 A501 **WEST ELEVATOR ELEVATION**
1/2" = 1'-0"



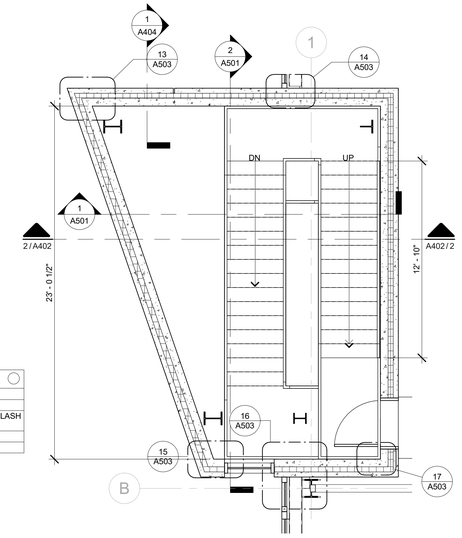
8 A501 **SOUTH ELEVATOR ELEVATION**
1/2" = 1'-0"



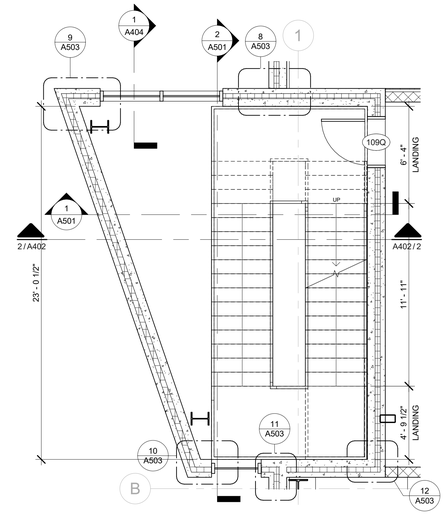
7 A501 **EAST ELEVATOR ELEVATION**
1/2" = 1'-0"

ENLARGED PLAN REFERENCE NOTES - FIRST FLOOR

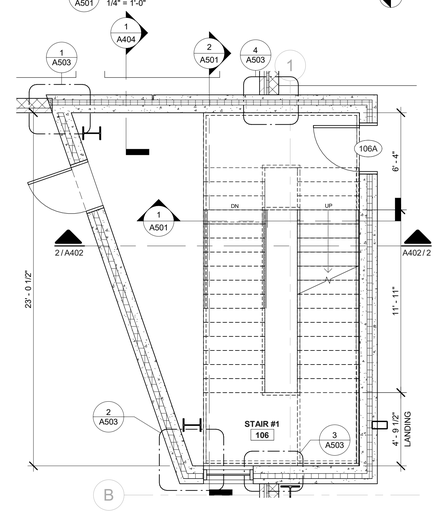
#	KEYNOTE INFORMATION
1	SOLID SURFACE COUNTERTOP WITH 4" BACKSPLASH AND RETURNS
2	PLASTIC LAMINATE SHELF
3	RADIO CHARGING STATION



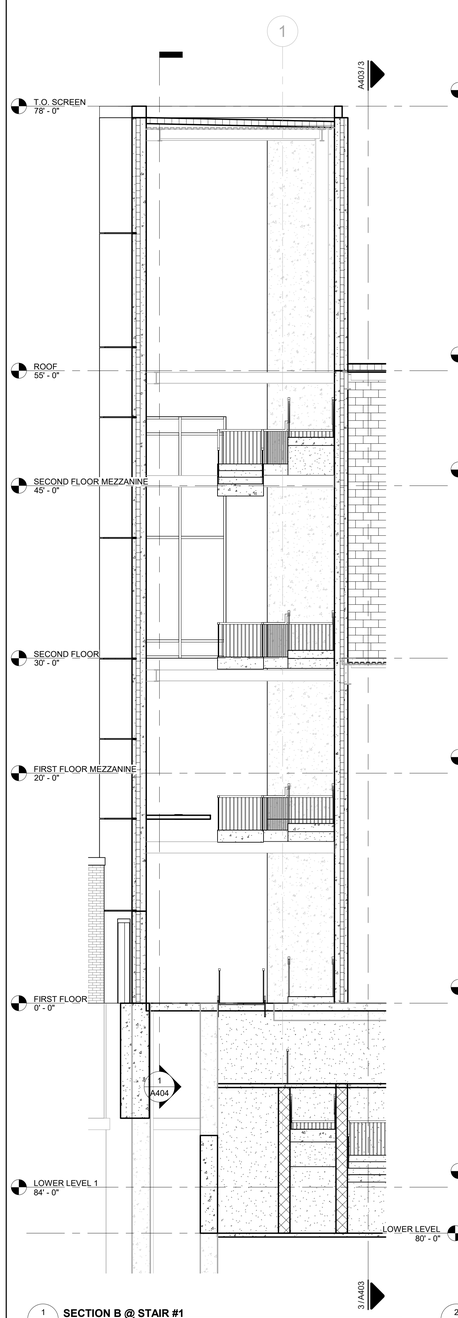
3 A501 **ENLARGED PLAN @ THIRD FLOOR**
1/4" = 1'-0"



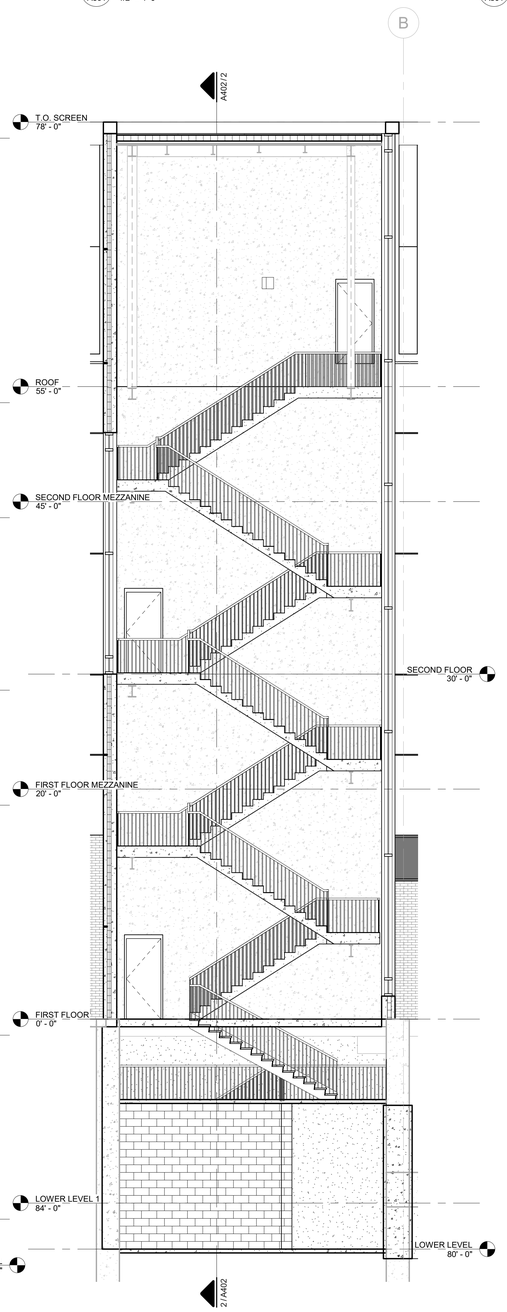
4 A501 **ENLARGED PLAN @ SECOND FLOOR**
1/4" = 1'-0"



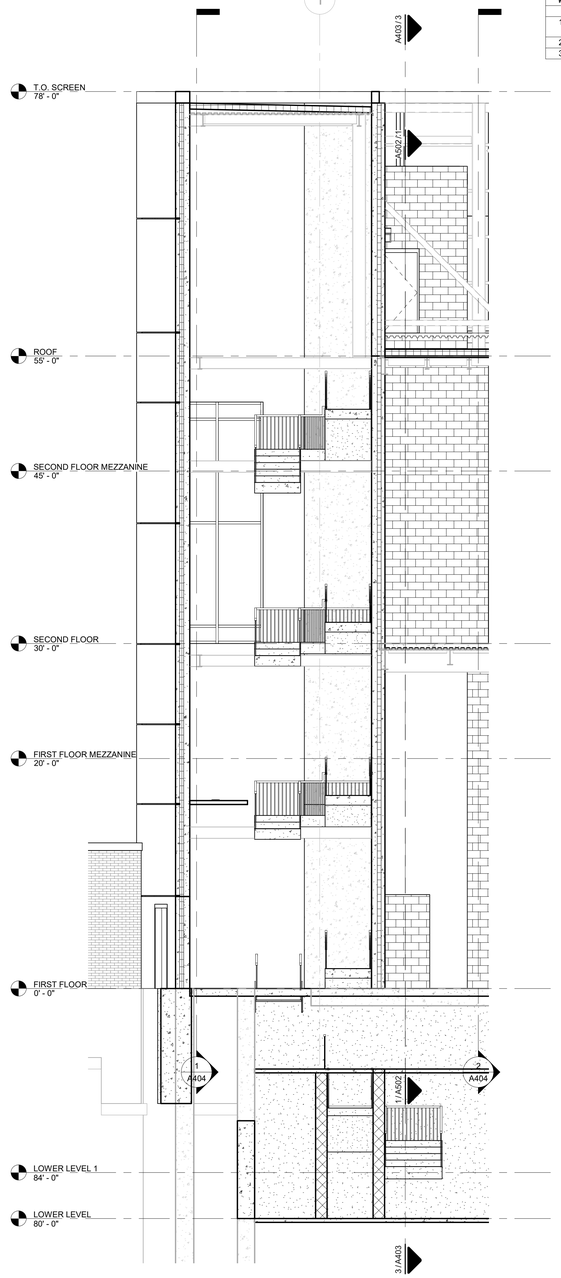
5 A501 **ENLARGED PLAN @ FIRST FLOOR**
1/4" = 1'-0"



1 A501 **SECTION B @ STAIR #1**
3/16" = 1'-0"



2 A501 **SECTION A @ STAIR #1**
3/16" = 1'-0"



6 A501 **BUILDING SECTION**
3/16" = 1'-0"

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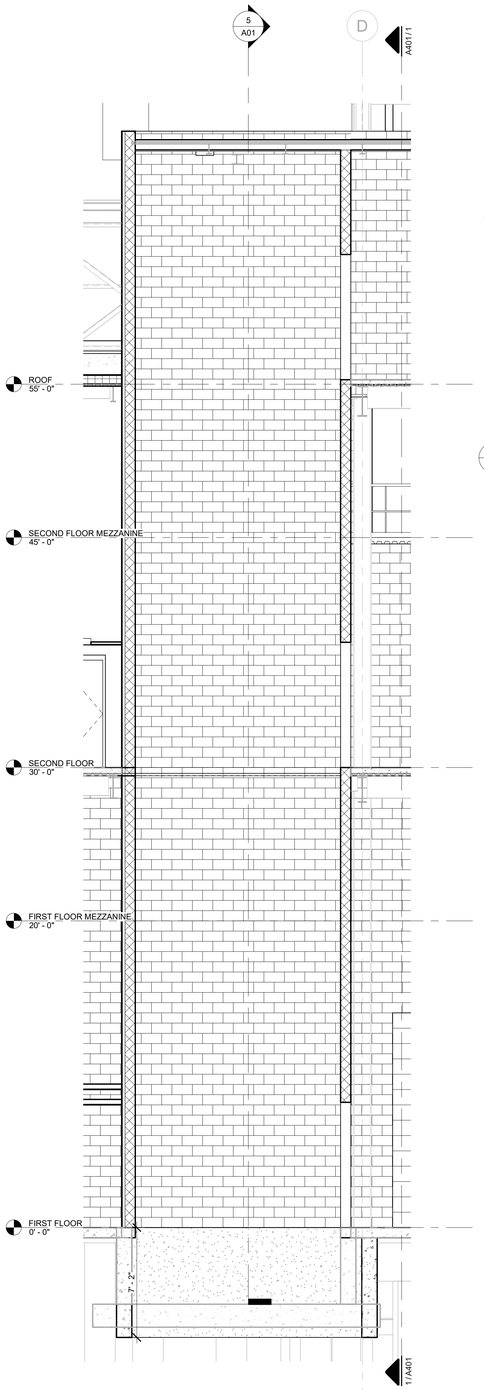
SHEET TITLE

STAIR AND ELEVATOR ENLARGED PLAN & DETAILS

SHEET NUMBER

A501

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/8/2023 3:40:12 PM AESI Proj. No:
0 1/2" 1" 2"



1 A502 **BLDG SECTION**
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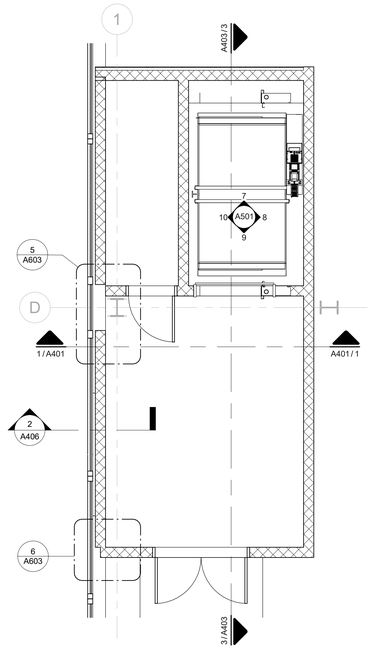

5 A502 **ENLARGED ELEVATOR PLAN - ROOF**
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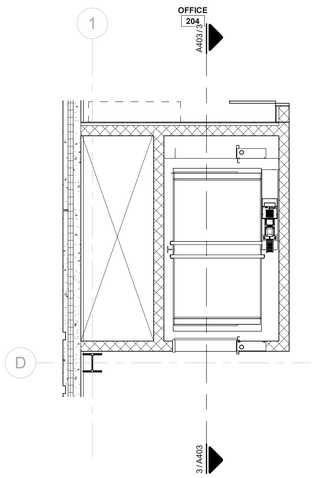
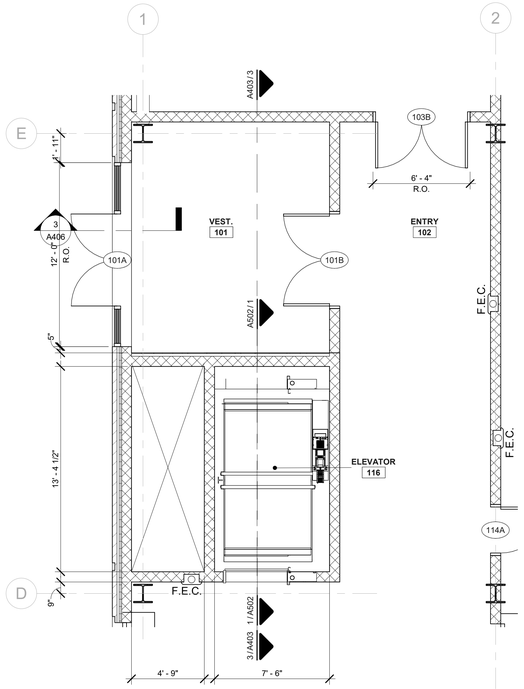
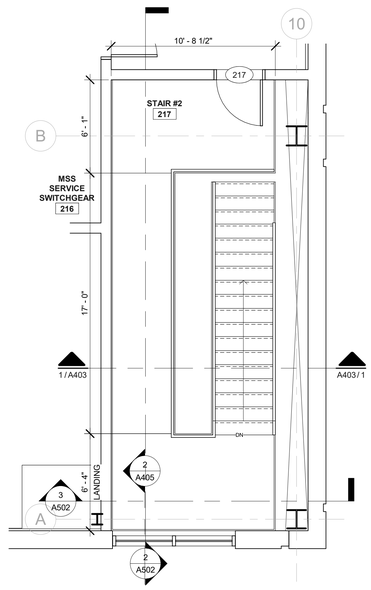


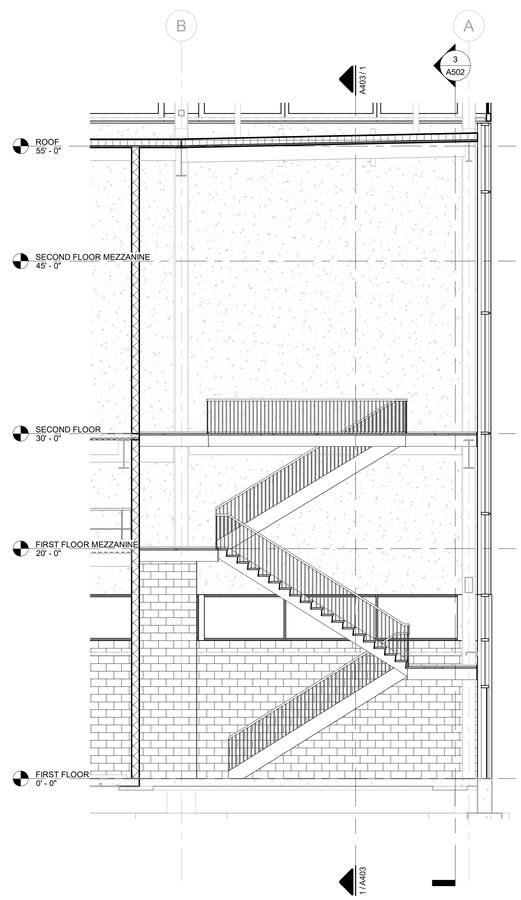
6 A502 **ENLARGED ELEVATOR PLAN - SECOND FLOOR**
1/4" = 1'-0"



7 A502 **ENLARGED ELEVATOR PLAN - FIRST FLOOR**
1/4" = 1'-0"



8 A502 **ENLARGED STAIRWELL PLAN - SECOND FLOOR**
1/4" = 1'-0"



2 A502 **SECTION @ STAIR #2**
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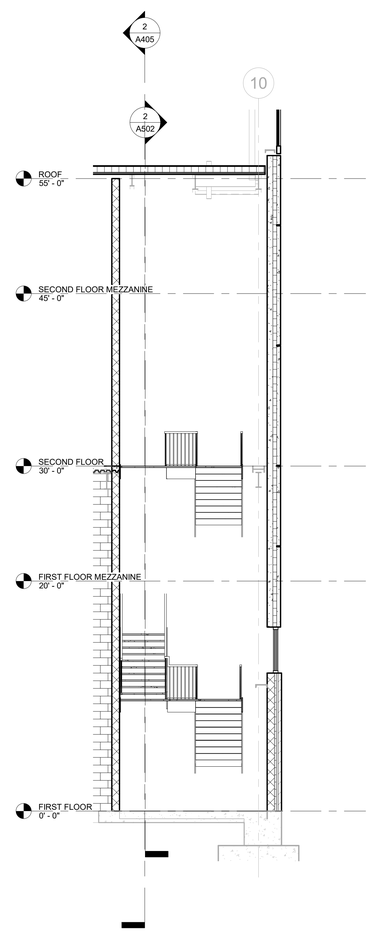
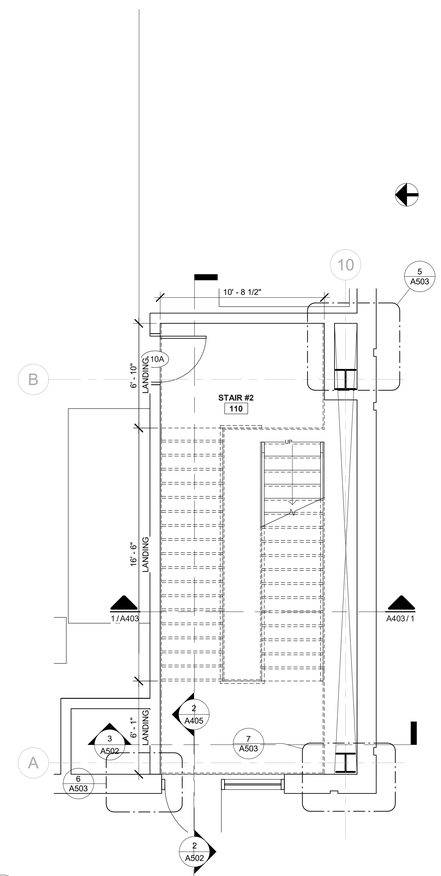


3 A502 **Section 8**
3/16" = 1'-0"



4 A502 **ENLARGED STAIRWELL PLAN - FIRST FLOOR**
1/4" = 1'-0"

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SHEET TITLE

STAIR AND ELEVATOR ENLARGED PLAN

SHEET NUMBER

A502

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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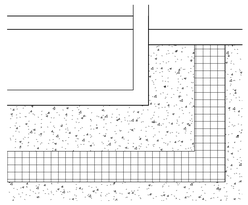
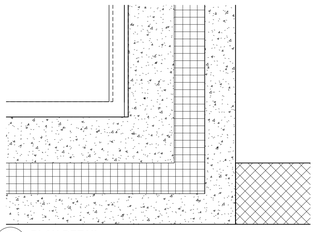


17 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



12 A503 **PLAN DETAIL**
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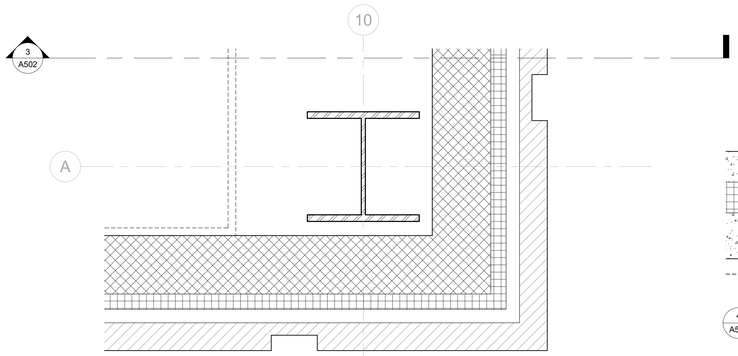

7 A503 **PLAN DETAIL**
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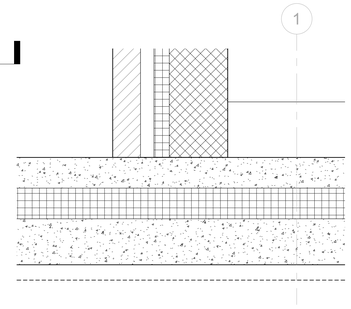
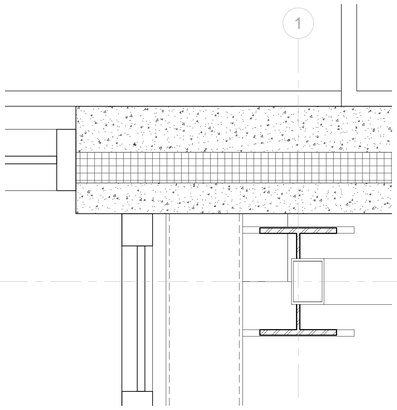
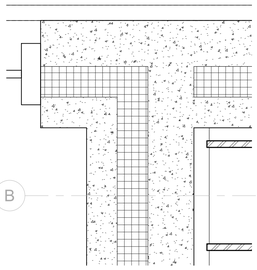


4 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



16 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



11 A503 **PLAN DETAIL**
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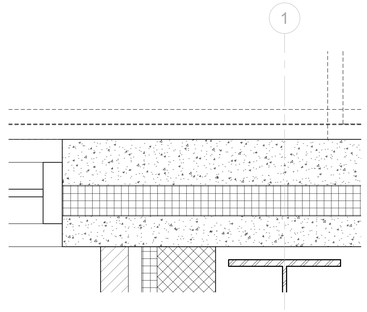

3 A503 **PLAN DETAIL**
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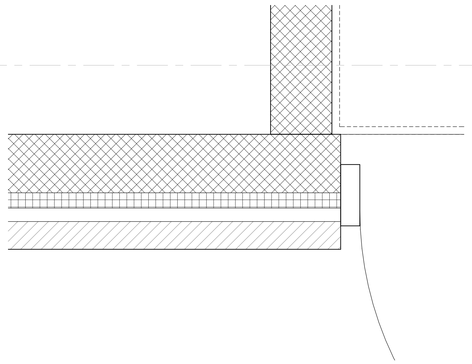

6 A503 **PLAN DETAIL**
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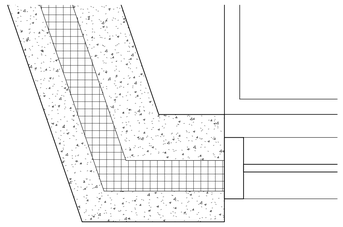
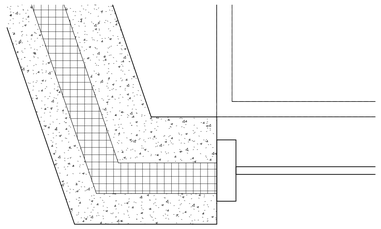
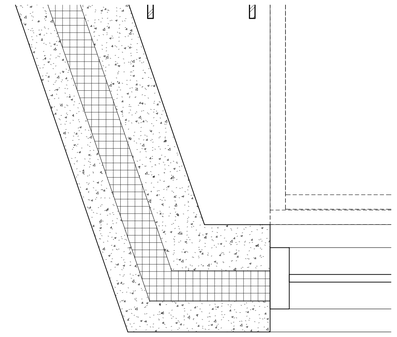


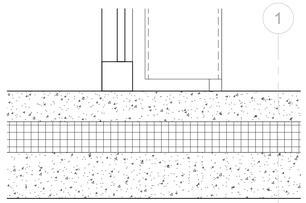
15 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



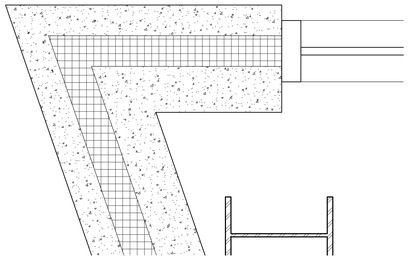
10 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



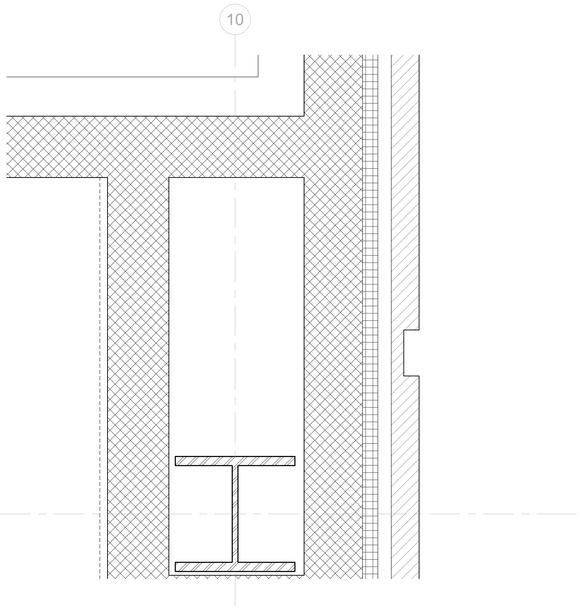
2 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



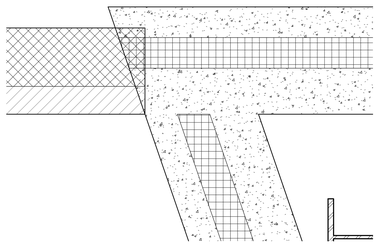
14 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



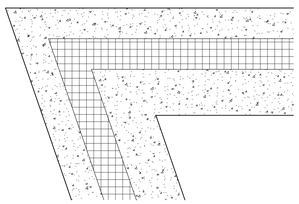
9 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



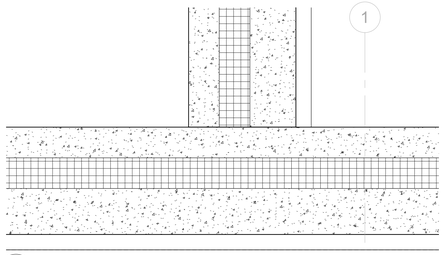
5 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



1 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



13 A503 **PLAN DETAIL**
1 1/2" = 1'-0"



8 A503 **PLAN DETAIL**
1 1/2" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied
Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

VPS
ARCHITECTURE
905 North Capitol Ave, Suite 100
Indianapolis, IN 46204
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Fishers, IN 46038
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Indianapolis, IN 46240
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100% Design Development Documents
February 10th, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **Designer**
CHECKED BY **Checker**
APPROVED BY **Approver**
PROJECT NO.

CERTIFICATION
PRELIMINARY NOT FOR CONSTRUCTION

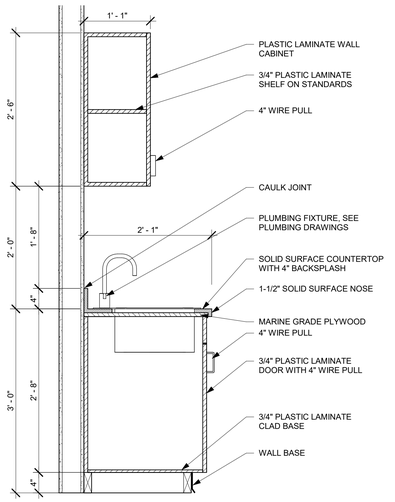
SHEET TITLE

STAIR DETAILS

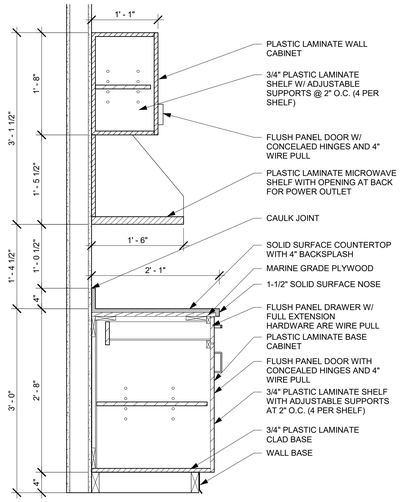
SHEET NUMBER

A503

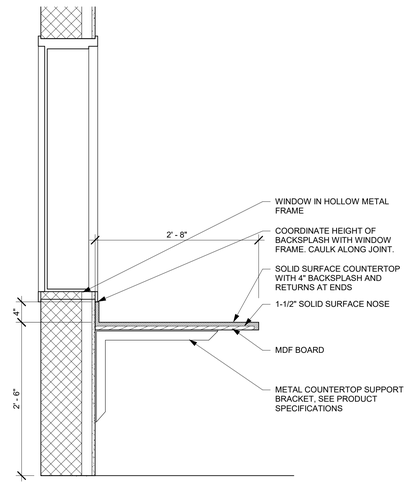
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:40:29 PM AESI Proj. No:
0 1/2" 1" 2"



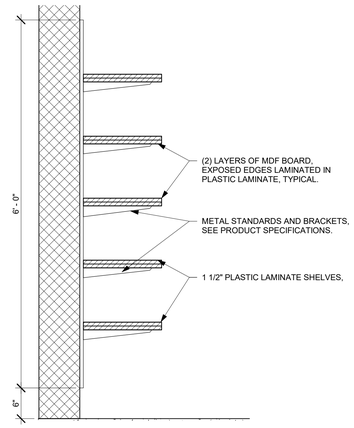
21 A504 **SECTION AT BREAK SINK**
1" = 1'-0"



20 A504 **SECTION AT MICROWAVE SHELF**
1" = 1'-0"

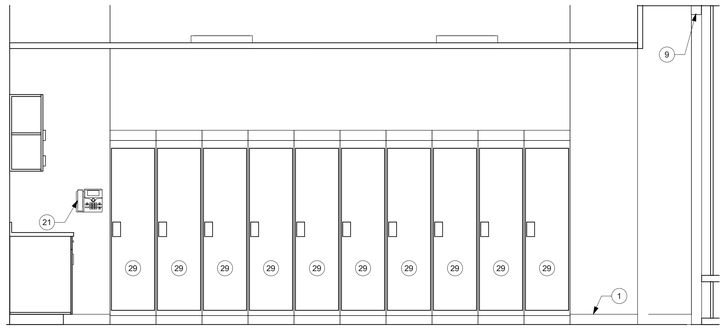


19 A504 **SECTION AT COUNTERTOP**
1" = 1'-0"

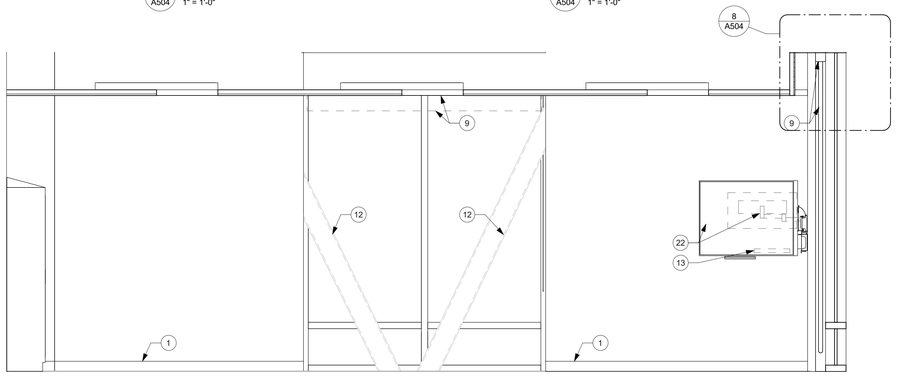


18 A504 **SECTION AT ADJUSTABLE SHELVING**
1" = 1'-0"

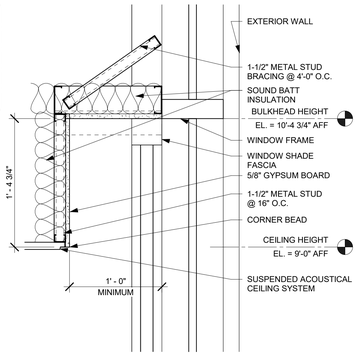
(X)	INTERIOR ELEVATION NOTES
#	KEYNOTE INFORMATION
1	WALL BASE, SEE ROOM FINISH SCHEDULE.
2	25" DEEP PLASTIC LAMINATE COUNTERTOP WITH SIDE AND BACK SPLASH, AS INDICATED
3	25" DEEP SOLID SURFACE COUNTERTOP WITH SIDE AND BACK SPLASH, AS INDICATED
4	24" DEEP BASE CABINET; COUNFIGURE DOOR(S), DRAWERS(S), AND SHELVE(S) AS INDICATED
5	18" DEEP MICROWAVE SHELF.
6	16" DEEP PLASTIC LAMINATE SHELF ON ADJUSTABLE STANDARDS AND BRACKETS.
7	NEW EQUIPMENT/ FURNITURE. SEE EQUIPMENT/ FURNITURE SCHEDULE.
8	COUNTER SUPPORT BRACKET
9	WINDOW SHADE AND FASCIA. SEE INTERIOR SPECIFICATIONS.
10	WATER BOX. SEE PLUMBING DRAWINGS.
11	PLUMBING FIXTURE. SEE PLUMBING DRAWINGS.
12	CROSS-BRACING, SEE STRUCTURAL DRAWINGS.
13	COAT HOOK, SEE PRODUCT SPECIFICATIONS.
14	MIRROR. SEE PRODUCT SPECIFICATIONS.
15	SOAP DISPENSER. SEE PRODUCT SPECIFICATIONS.
16	PAPER TOWEL DISPENSER. SEE PRODUCT SPECIFICATIONS.
17	GRAB BAR. SEE PRODUCT SPECIFICATIONS.
18	TOILET TISSUE DISPENSER. SEE PRODUCT SPECIFICATIONS.
19	CURTAIN ROD, SEE PRODUCT SPECIFICATIONS.
20	SHOWER CURTAIN, SEE PRODUCT SPECIFICATIONS.
21	WALL MOUNTED PHONE. SEE EQUIPMENT/ FURNITURE SCHEDULE.
22	TELEVISION AND BRACKET. SEE EQUIPMENT/ FURNITURE SCHEDULE.
24	SHOWER SHELF. SEE PRODUCT SPECIFICATIONS.
25	FLOAT FLOOR UNDERLAYMENT SO FINISHED FLOOR MEETS TOP OF ENTRANCE TO SHOWER.
26	UTILITY SHELF. SEE PRODUCT SPECIFICATIONS.
27	SHOWER SEAT. SEE PRODUCT SPECIFICATIONS.
28	TOWEL BAR. SEE PRODUCT SPECIFICATIONS.
29	LOCKERS WITH SLOPED TOPS. SEE PRODUCT SPECIFICATIONS.
30	RADIO CHARGING STATION, OWNER PROVIDED AND INSTALLED.



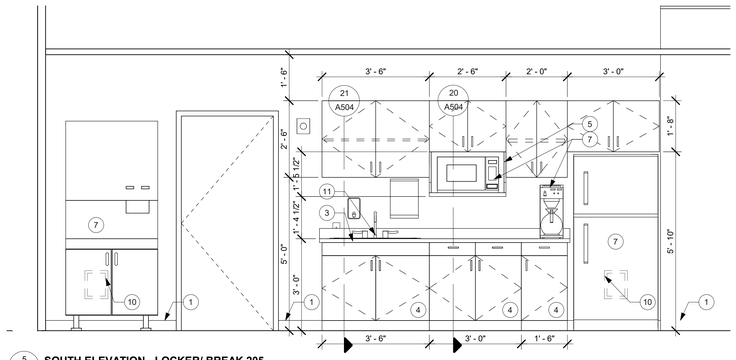
7 A504 **WEST ELEVATION - LOCKER/ BREAK 205**
1/2" = 1'-0"



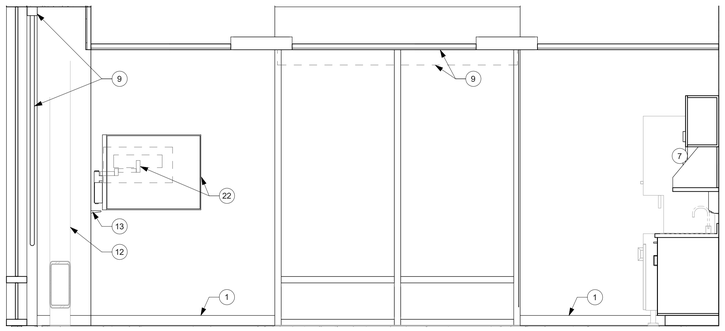
6 A504 **NORTH ELEVATION - LOCKER/ BREAK 205**
1/2" = 1'-0"



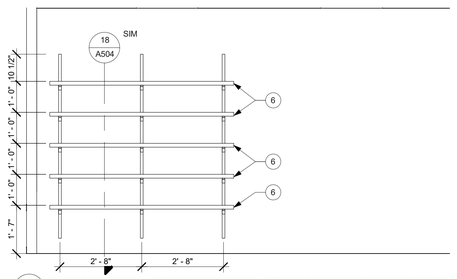
8 A504 **DETAIL OF BULKHEAD AND WINDOW SHADE**
1 1/2" = 1'-0"



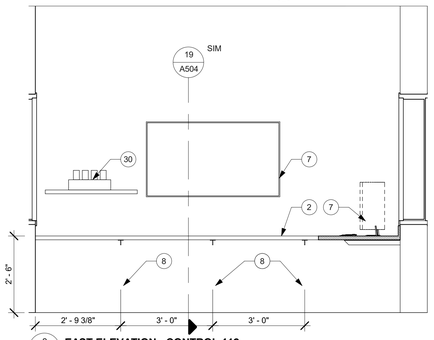
5 A504 **SOUTH ELEVATION - LOCKER/ BREAK 205**
1/2" = 1'-0"



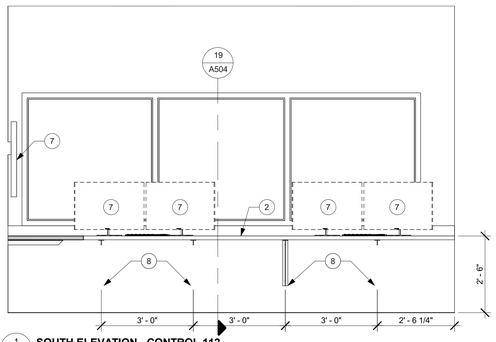
4 A504 **EAST ELEVATION - LOCKER/ BREAK 205**
1/2" = 1'-0"



3 A504 **EAST ELEVATION - OFFICE 203/ 226 SIM, OFFICE 204/ WORKROOM 207 OPP.**
1/2" = 1'-0"



2 A504 **EAST ELEVATION - CONTROL 112**
1/2" = 1'-0"



1 A504 **SOUTH ELEVATION - CONTROL 112**
1/2" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

VPS ARCHITECTURE
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Indianapolis, IN 46204
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CE Solutions structural engineers
8770 North St., Ste. 100 Fishers, IN 46038
317.818.1912 cesolutionsinc.com

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Indianapolis, IN 46240
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100% Design Development Documents
February 10th, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **Designer**
CHECKED BY **Checker**
APPROVED BY **Approver**
PROJECT NO.

CERTIFICATION
PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
INTERIOR ELEVATIONS

SHEET NUMBER
A504

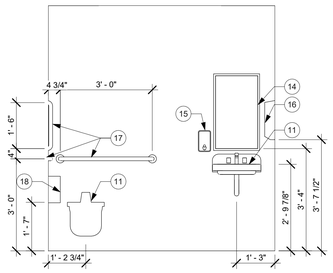
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:40:39 PM AESI Proj. No:
0 1/2" 1" 2"

TOILET ACCESSORY SCHEDULE (X)

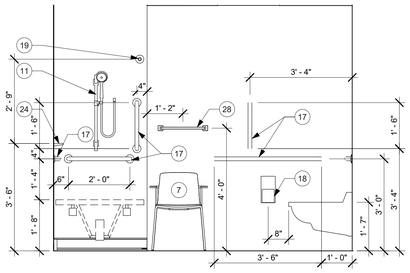
EQUIPMENT NUMBER	EQUIPMENT DESCRIPTION	MANUFACTURER	COUNT	VENDOR FURNISHED	VENDOR INSTALLED	CONTRACTOR FURNISHED	CONTRACTOR INSTALLED
1	GRAB BARS	Bradley Corporation	12			Yes	Yes
2	MIRROR	Bradley Corporation	3			Yes	Yes
3	COAT HOOK	Bradley Corporation	2			Yes	Yes
5	SHOWER CURTAIN	GRAINGER	1			Yes	Yes
6	SHOWER CURTAIN ROD	Bradley Corporation	1			Yes	Yes
7	SHOWER SEAT	Bradley Corporation	1			Yes	Yes
8	LIQUID SOAP DISPENSER	Bradley Corporation	4	Yes	Yes		No
9	TOILET TISSUE DISPENSER	Bradley Corporation	3	Yes	Yes	No	No
10	TOWEL BAR	Bradley Corporation	1			Yes	Yes
11	PAPER TOWEL DISPENSER	Bradley Corporation	4	Yes	Yes		No
12	UTILITY SHELF	Bradley Corporation	1			Yes	Yes

ENLARGED PLAN REFERENCE NOTES - SECOND FLOOR (X)

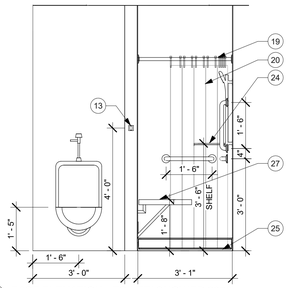
X	KEYNOTE INFORMATION
1	PLUMBING FIXTURE. SEE PLUMBING DRAWINGS.
2	PLASTIC LAMINATE SHELVES ON STANDARDS.



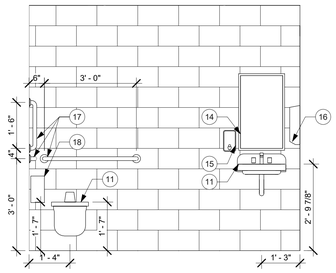
12 A505 **WEST ELEVATION - TOILET/ SHOWER 205A**
1/2" = 1'-0"



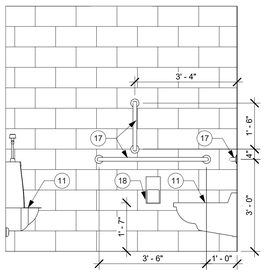
11 A505 **SOUTH ELEVATION - TOILET/ SHOWER 205A**
1/2" = 1'-0"



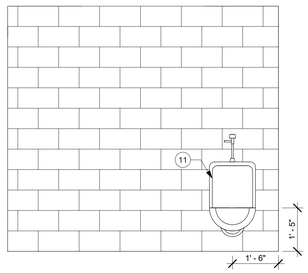
10 A505 **EAST ELEVATION - TOILET/ SHOWER 205A**
1/2" = 1'-0"



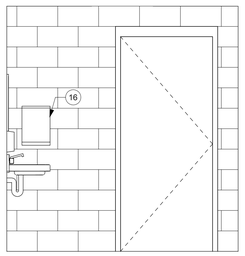
9 A505 **NORTH ELEVATION - TOILET ROOM 111**
1/2" = 1'-0"



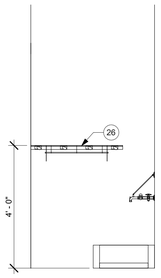
8 A505 **WEST ELEVATION - TOILET ROOM 111**
1/2" = 1'-0"



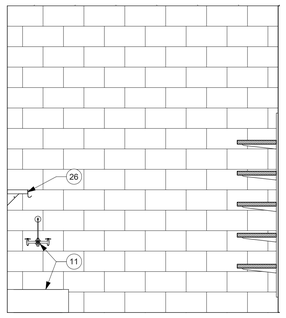
7 A505 **SOUTH ELEVATION - TOILET ROOM 111**
1/2" = 1'-0"



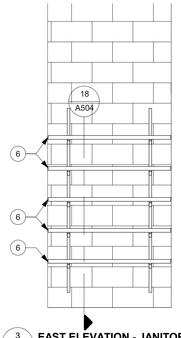
6 A505 **EAST ELEVATION - TOILET ROOM 111**
1/2" = 1'-0"



5 A505 **WEST ELEVATION - JANITOR 115**
1/2" = 1'-0"



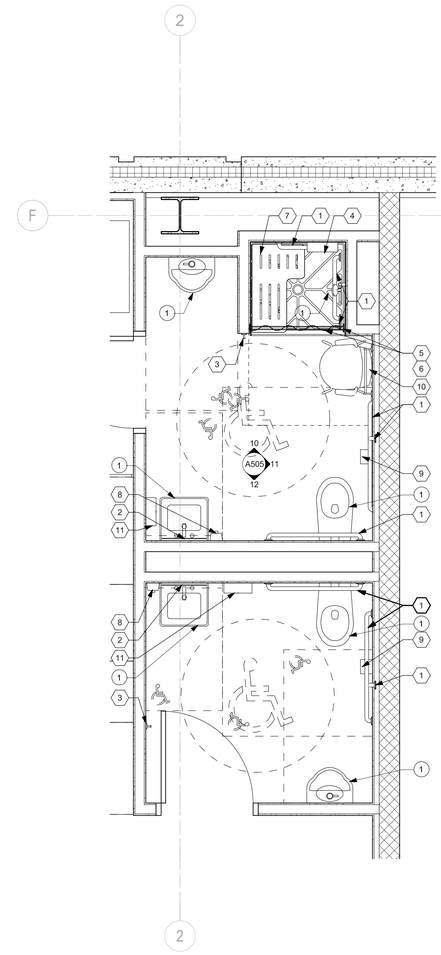
4 A505 **SOUTH ELEVATION - JANITOR 115**
1/2" = 1'-0"



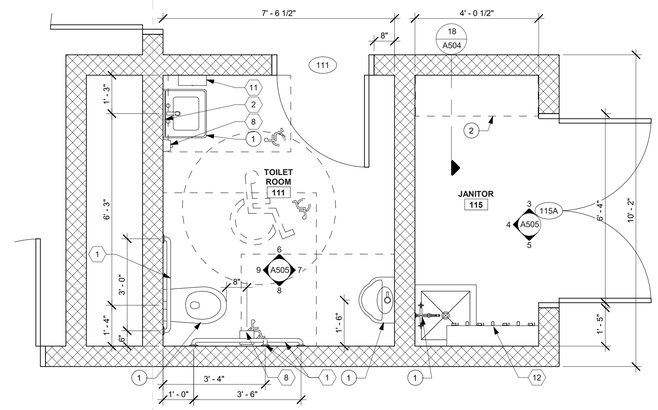
3 A505 **EAST ELEVATION - JANITOR 115**
1/2" = 1'-0"

INTERIOR ELEVATION NOTES (X)

#	KEYNOTE INFORMATION
1	WALL BASE. SEE ROOM FINISH SCHEDULE.
2	25" DEEP PLASTIC LAMINATE COUNTERTOP WITH SIDE AND BACK SPLASH, AS INDICATED
3	25" DEEP SOLID SURFACE COUNTERTOP WITH SIDE AND BACK SPLASH, AS INDICATED
4	24" DEEP BASE CABINET, COUNFIGURE DOOR(S), DRAWERS(S), AND SHELVE(S) AS INDICATED
5	18" DEEP MICROWAVE SHELF.
6	16" DEEP PLASTIC LAMINATE SHELF ON ADJUSTABLE STANDARDS AND BRACKETS.
7	NEW EQUIPMENT/ FURNITURE. SEE EQUIPMENT/ FURNITURE SCHEDULE.
8	COUNTER SUPPORT BRACKET
9	WINDOW SHADE AND FASCIA. SEE INTERIOR SPECIFICATIONS.
10	WATER BOX. SEE PLUMBING DRAWINGS.
11	PLUMBING FIXTURE. SEE PLUMBING DRAWINGS.
12	CROSS-BRACING, SEE STRUCTURAL DRAWINGS.
13	COAT HOOK, SEE PRODUCT SPECIFICATIONS.
14	MIRROR. SEE PRODUCT SPECIFICATIONS.
15	SOAP DISPENSER. SEE PRODUCT SPECIFICATIONS.
16	PAPER TOWEL DISPENSER. SEE PRODUCT SPECIFICATIONS.
17	GRAB BAR. SEE PRODUCT SPECIFICATIONS.
18	TOILET TISSUE DISPENSER. SEE PRODUCT SPECIFICATIONS.
19	CURTAIN ROD, SEE PRODUCT SPECIFICATIONS.
20	SHOWER CURTAIN, SEE PRODUCT SPECIFICATIONS.
21	WALL MOUNTED PHONE. SEE EQUIPMENT/ FURNITURE SCHEDULE.
22	TELEVISION AND BRACKET. SEE EQUIPMENT/ FURNITURE SCHEDULE.
24	SHOWER SHELF. SEE PRODUCT SPECIFICATIONS.
25	FLOAT FLOOR UNDERLAYMENT SO FINISHED FLOOR MEETS TOP OF ENTRANCE TO SHOWER.
26	UTILITY SHELF. SEE PRODUCT SPECIFICATIONS.
27	SHOWER SEAT. SEE PRODUCT SPECIFICATIONS.
28	TOWEL BAR. SEE PRODUCT SPECIFICATIONS.
29	LOCKERS WITH SLOPED TOPS. SEE PRODUCT SPECIFICATIONS.
30	RADIO CHARGING STATION, OWNER PROVIDED AND INSTALLED.



2 A505 **ENLARGED PLAN @ TOILET / CHANGING 205A & 205B**
1/2" = 1'-0"



1 A505 **ENLARGED PLAN @ TOILET 111**
1/2" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: Designer	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: Checker	
APPROVED BY: Approver	
PROJECT NO.	

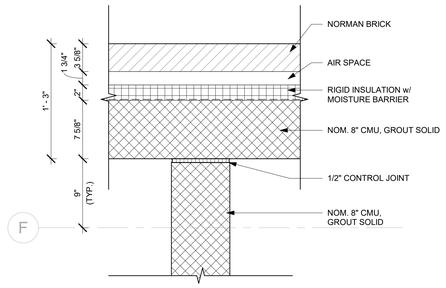
SHEET TITLE

ENLARGED TOILET ROOM PLANS AND ELEVATIONS

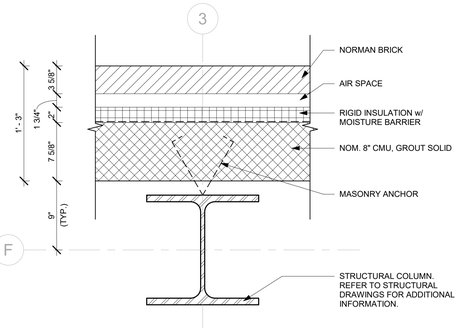
SHEET NUMBER

A505

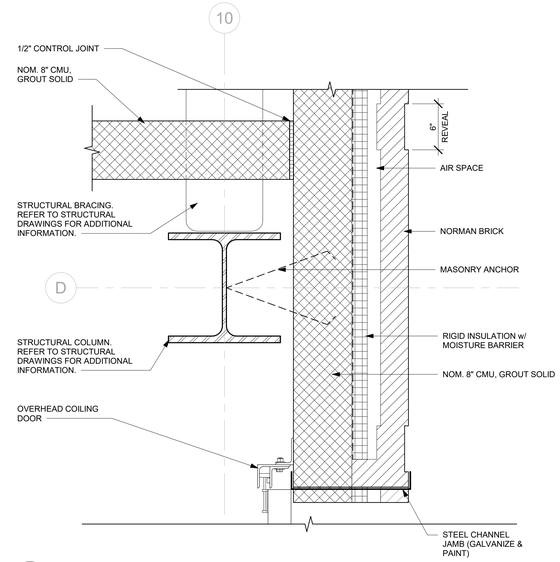
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:40:48 PM AESI Proj. No:



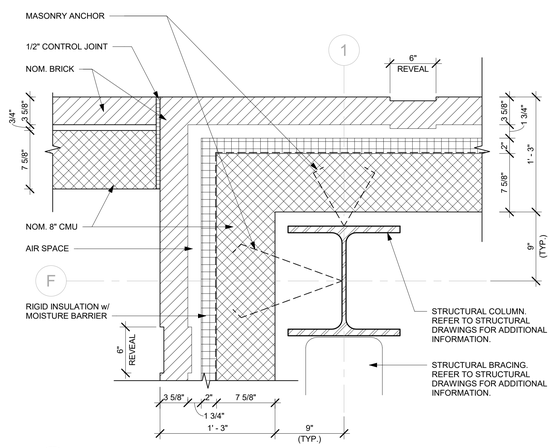
9 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



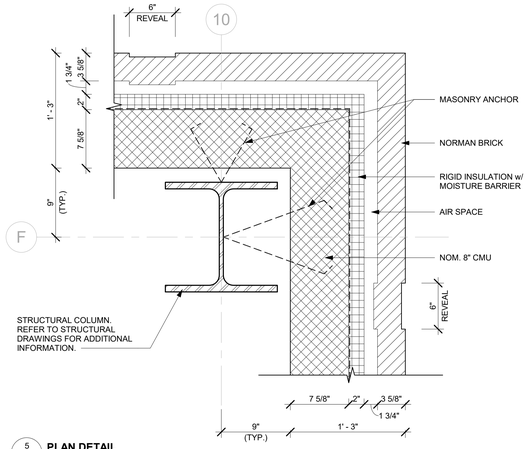
6 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



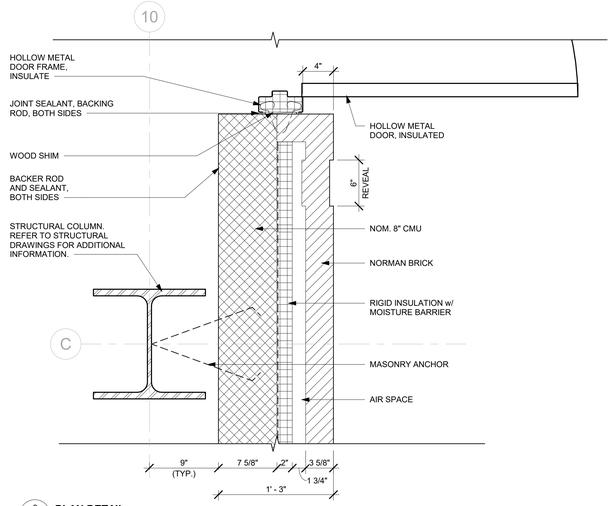
3 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



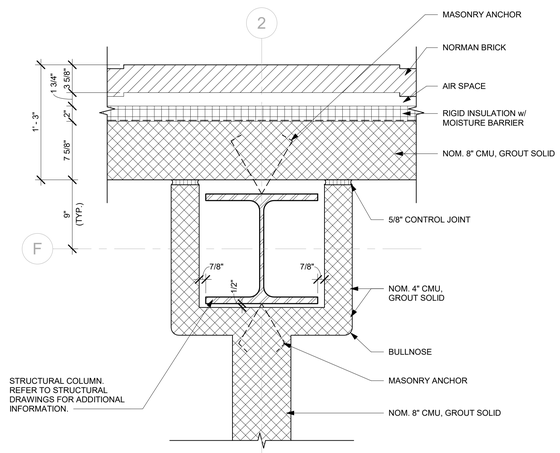
8 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



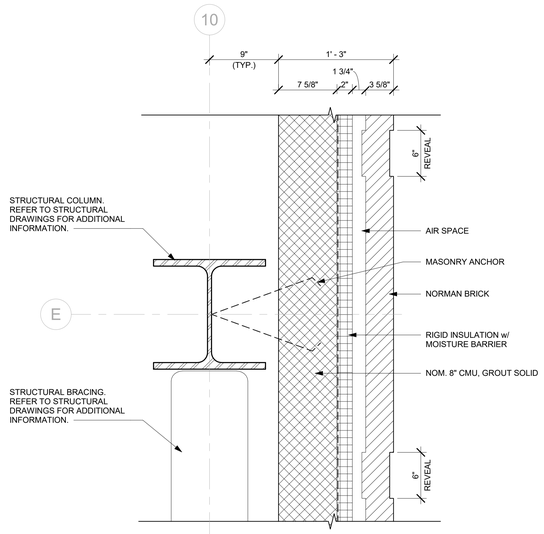
5 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



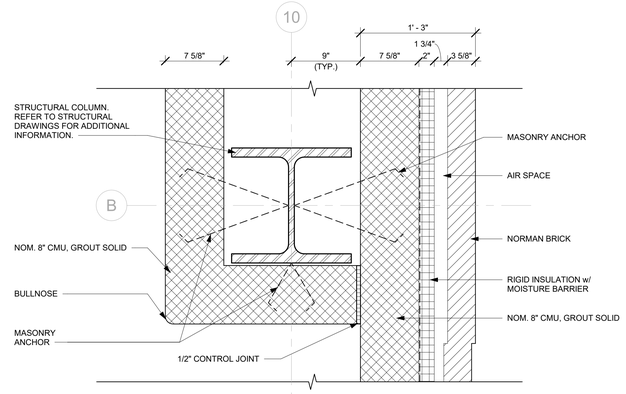
2 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



7 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



4 A601 **PLAN DETAIL**
1 1/2" = 1'-0"



1 A601 **PLAN DETAIL**
1 1/2" = 1'-0"

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APPROVED BY **Approver**	
PROJECT NO.	

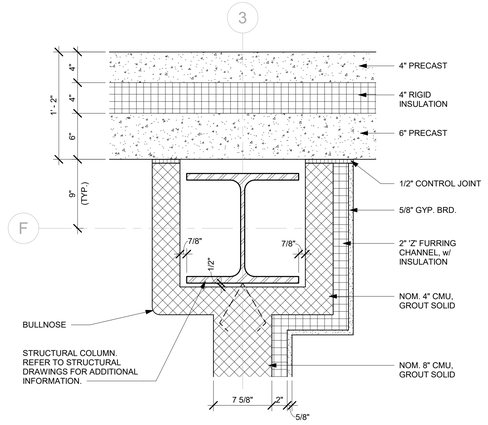
SHEET TITLE

EXTERIOR DETAILS

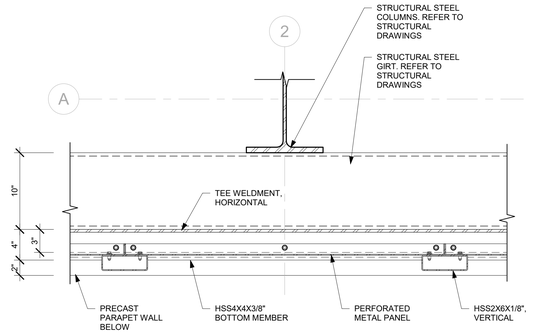
SHEET NUMBER

A601

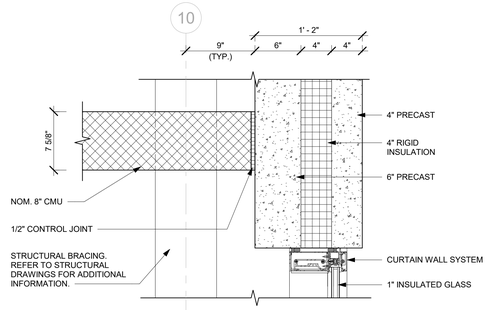
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/9/2023 3:40:51 PM AESI Proj. No:



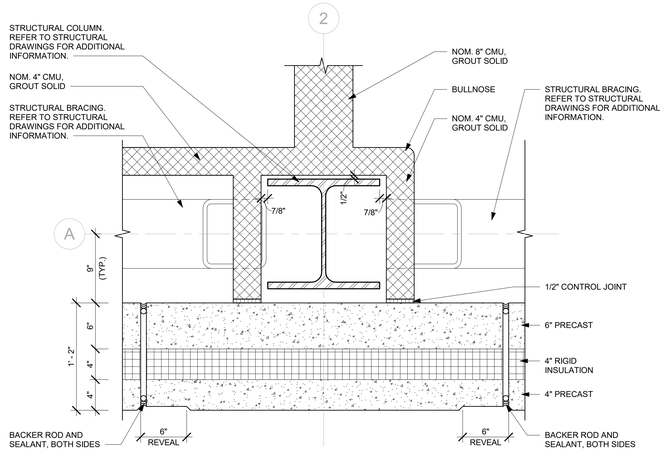
4 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



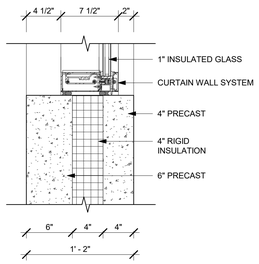
7 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



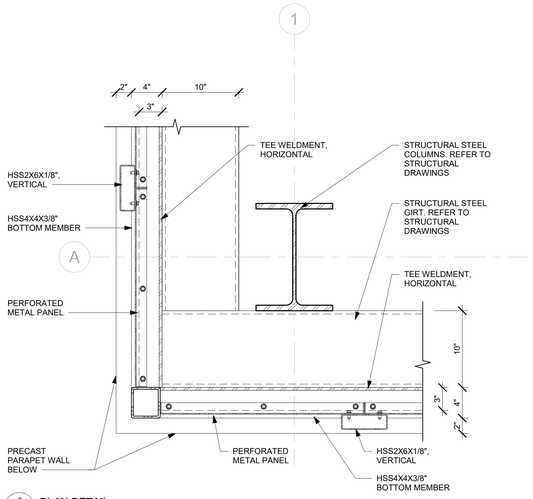
3 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



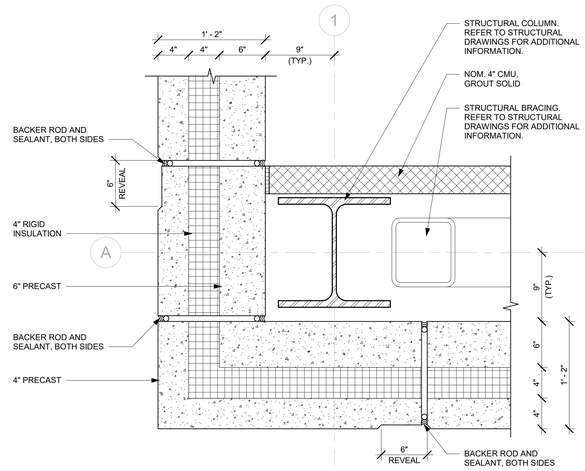
6 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



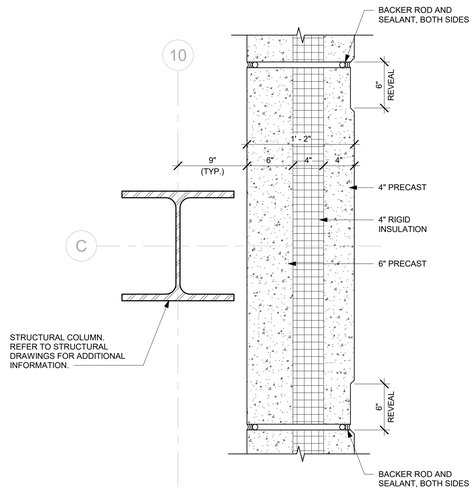
2 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



8 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



5 A602 **PLAN DETAIL**
1 1/2" = 1'-0"



1 A602 **PLAN DETAIL**
1 1/2" = 1'-0"

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SHEET TITLE

EXTERIOR DETAILS

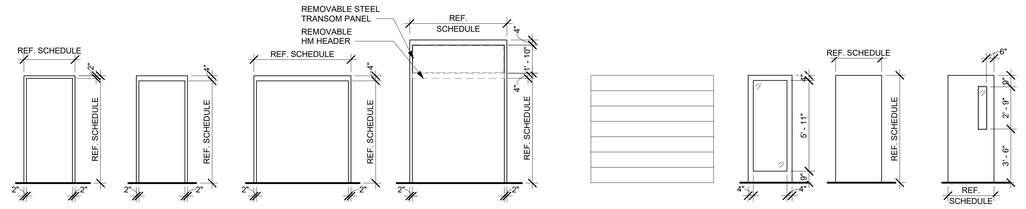
SHEET NUMBER

A602

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/9/2023 3:40:55 PM AESI Proj. No:

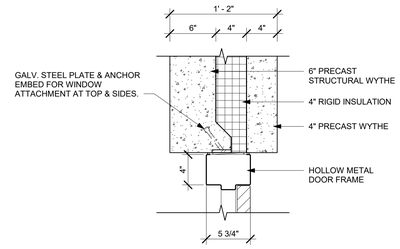
DOOR & HARDWARE SCHEDULE

DOOR NUMBER	ROOM NAME	DOOR INFORMATION: WIDTH	OVERALL WIDTH	HEIGHT	THICKNESS	# OF LEAFS	RATING	DOOR PANEL INFORMATION: ELEVATION ON	MATERIAL	FINISH	DOOR FRAME INFORMATION: ELEVATION ON	MATERIAL	FINISH	HARDWARE SET	FRAME DETAIL: HEAD	JAMB	SILL	REMARKS	DOOR NUMBER
LOWER LEVEL																			
109U	STAIR #1	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
FIRST FLOOR																			
101A	VEST.	3' - 0"	6' - 0"	7' - 0"		2		D3	AL	ANOD	F3	AL	ANOD						
101B	ENTRY	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
103A	FUEL OIL PUMP ROOM	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
103B	FUEL OIL PUMP ROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
104B	SERVICE YARD	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
104C	SERVICE YARD	24' - 0"	24' - 0"	10' - 0"		1		CS	AL	ANOD		AL	ANOD						
105A	RECEIVING	16' - 0"	16' - 0"	14' - 0"		1	-	CS	AL	ANOD		AL	ANOD					OVERHEAD COILING DOOR	
106	STAIR #1	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
106A	STAIR #1	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		VG	HM	PT	F2	HM	PT						
108A	FIRE PUMP ROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
108B	RECEIVING	3' - 6"	3' - 6"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
109	BOILER ROOM	16' - 0"	16' - 0"	14' - 0"		1	-	CS	AL	ANOD		AL	ANOD					OVERHEAD COILING DOOR	
109B	BOILER ROOM	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
110A	STAIR #2	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	VG	HM	PT	F2	HM	PT						
110B	STAIR #2	3' - 8"	3' - 8 1/4"	7' - 10 3/4"		1		G1	TG	-		AL	ANOD						
111	TOILET ROOM	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
112	CONTROL	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
113A	CHILLER PLANT ELECTRICAL ROOM	4' - 6"	9' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
113B	CHILLER PLANT ELECTRICAL ROOM	4' - 6"	9' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
113C	CHILLER PLANT ELECTRICAL ROOM	4' - 6"	9' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
113D	CHILLER PLANT ELECTRICAL ROOM	4' - 6"	9' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
114A	CHILLER PLANT	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
114B	CHILLER PLANT	16' - 0"	16' - 0"	14' - 0"	1 3/4"	1	-	CS	AL	ANOD		AL	ANOD					OVERHEAD COILING DOOR	
114C	CHILLER PLANT	3' - 6"	3' - 6"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
114D	CHILLER PLANT	3' - 0"	3' - 0"	7' - 0"				F	HM	PT	F2	HM	PT						
114E	CHILLER PLANT	16' - 0"	16' - 0"	14' - 0"	1 3/4"	1	-	CS	AL	ANOD		AL	ANOD					OVERHEAD COILING DOOR	
114F	CHILLER PLANT	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
114G	CHILLER PLANT	3' - 0"	3' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
115A	JANITOR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2		F	HM	PT	F3	HM	PT						
FIRST FLOOR MEZZANINE																			
116	BOILER ROOM MEZZANINE	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
SECOND FLOOR																			
109Q	CORRIDOR	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		VG	HM	PT	F2	HM	PT						
203	OFFICE	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
204	OFFICE	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
205	LOCKER / BREAK RM	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
205A	TOILET / SHOWER	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
205B	TOILET / CHANGING	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
206	MECHANICAL	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
207	MAINTENANCE WORKROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
208A	GENERATOR CONTROL	3' - 0"	6' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
208B	GENERATOR SWITCHGEAR	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
208C	GENERATOR ROOM A	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
209	CONTROL ROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
210	GENERATOR SWITCHGEAR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
211A	BATTERY ROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
211B	BATTERY ROOM	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
212A	15KV SWITCHGEAR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	T1	HM	PT					TRANSOM SHALL BE 16 GA. STEEL	
212B	15KV SWITCHGEAR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	T1	HM	PT					TRANSOM SHALL BE 16 GA. STEEL	
212C	15KV SWITCHGEAR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	T1	HM	PT					TRANSOM SHALL BE 16 GA. STEEL	
213A	FUEL OIL DAY TANKS B	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	45 MIN.	F	HM	PT	F3	HM	PT						
213B	FUEL OIL DAY TANKS B	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	45 MIN.	F	HM	PT	F2	HM	PT						
214A	MAINTENANCE STORAGE	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
214B	GENERATOR ROOM B	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
215A	CUP EMERGENCY ELECTRICAL ROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
215B	CUP EMERGENCY ELECTRICAL ROOM	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
216A	MSS SERVICE SWITCHGEAR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
216B	MSS SERVICE SWITCHGEAR	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
217	STAIR #2	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	90 MIN.	VG	HM	PT	F2	HM	PT						
218A	GENERATOR ROOM B	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
218B	GENERATOR ROOM A	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
218C	GENERATOR ROOM B	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
219	GENERATOR EXHAUST PLENUM 2	4' - 0"	4' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
220A	GENERATOR ROOM A	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
220B	GENERATOR SWITCHGEAR	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	T1	HM	PT					TRANSOM SHALL BE 16 GA. STEEL	
221	GENERATOR EXHAUST PLENUM 1	4' - 0"	4' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
222A	FUEL OIL DAY TANKS A	3' - 0"	6' - 0"	7' - 0"	1 3/4"	1	45 MIN.	F	HM	PT	F3	HM	PT						
222B	FUEL OIL DAY TANKS A	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
223	JANITOR / STORAGE	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
224	MECHANICAL	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2	-	F	HM	PT	F3	HM	PT						
225	MDF DATA	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
226	OFFICE	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1	-	F	HM	PT	F2	HM	PT						
229	MSS SERVICE SWITCHGEAR	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
ROOF																			
301	STAIR #1	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		VG	HM	PT	F2	HM	PT						
302A	EMERGENCY GENERATOR INTAKE MONITOR 1	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
302B	EMERGENCY GENERATOR INTAKE MONITOR 1	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
303	EMERGENCY GENERATOR INTAKE MONITOR 2	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						
304	VESTIBULE	3' - 0"	6' - 0"	7' - 0"	1 3/4"	2		VG	HM	PT	F3	HM	PT						
305	EQUIPMENT ROOM	3' - 0"	3' - 0"	7' - 0"	1 3/4"	1		F	HM	PT	F2	HM	PT						

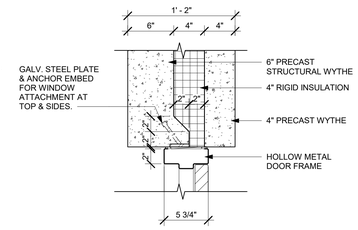


TYPICAL DOOR FRAME ELEVATION
1/4" = 1'-0"

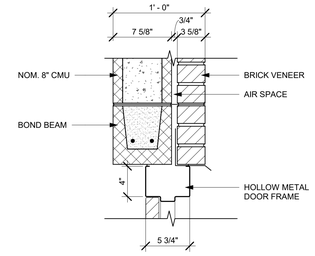
TYPICAL DOOR PANEL ELEVATION
1/4" = 1'-0"



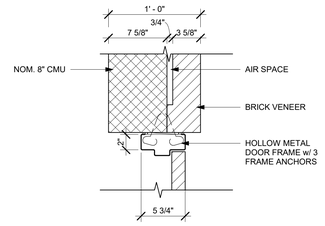
13 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



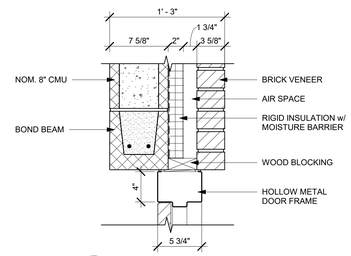
14 A701 **JAMB DETAIL**
1 1/2" = 1'-0"



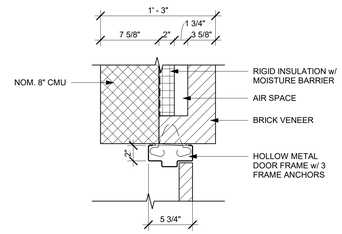
11 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



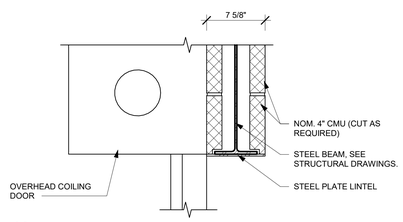
10 A701 **JAMB DETAIL**
1 1/2" = 1'-0"



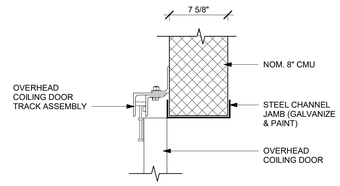
8 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



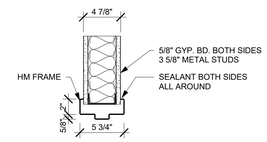
9 A701 **JAMB DETAIL**
1 1/2" = 1'-0"



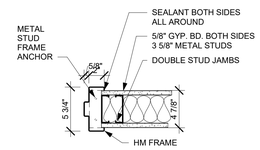
18 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



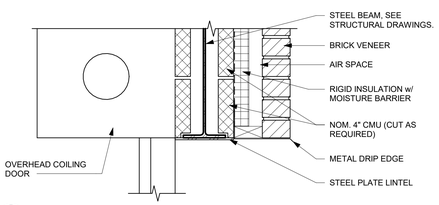
17 A701 **JAMB DETAIL**
1 1/2" = 1'-0"



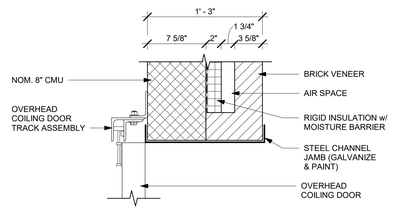
6 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



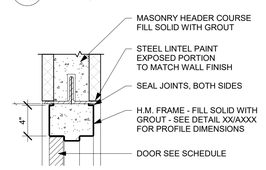
7 A701 **JAMB DETAIL**
1 1/2" = 1'-0"



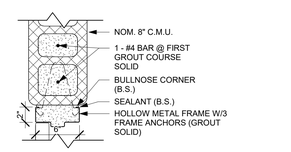
16 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



15 A701 **JAMB DETAIL**
1 1/2" = 1'-0"



5 A701 **HEAD DETAIL**
1 1/2" = 1'-0"



4 A701 **JAMB DETAIL**
1 1/2" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

VPS ARCHITECTURE
905 North Capitol Ave, Suite 100
Indianapolis, IN 46204
(317) 353-3281

CE Solutions structural engineers
8770 North St., Ste. 100, Fishers, IN 46038 | 317.818.1912 | cesolutionsinc.com

Cripe
Solutions by Design Since 1937
9339 Priority Way West Drive, Suite 100
Indianapolis, IN 46240
(317) 844-6777 | www.cripe.biz

100% Design Development Documents
February 10th, 2023

REVISIONS

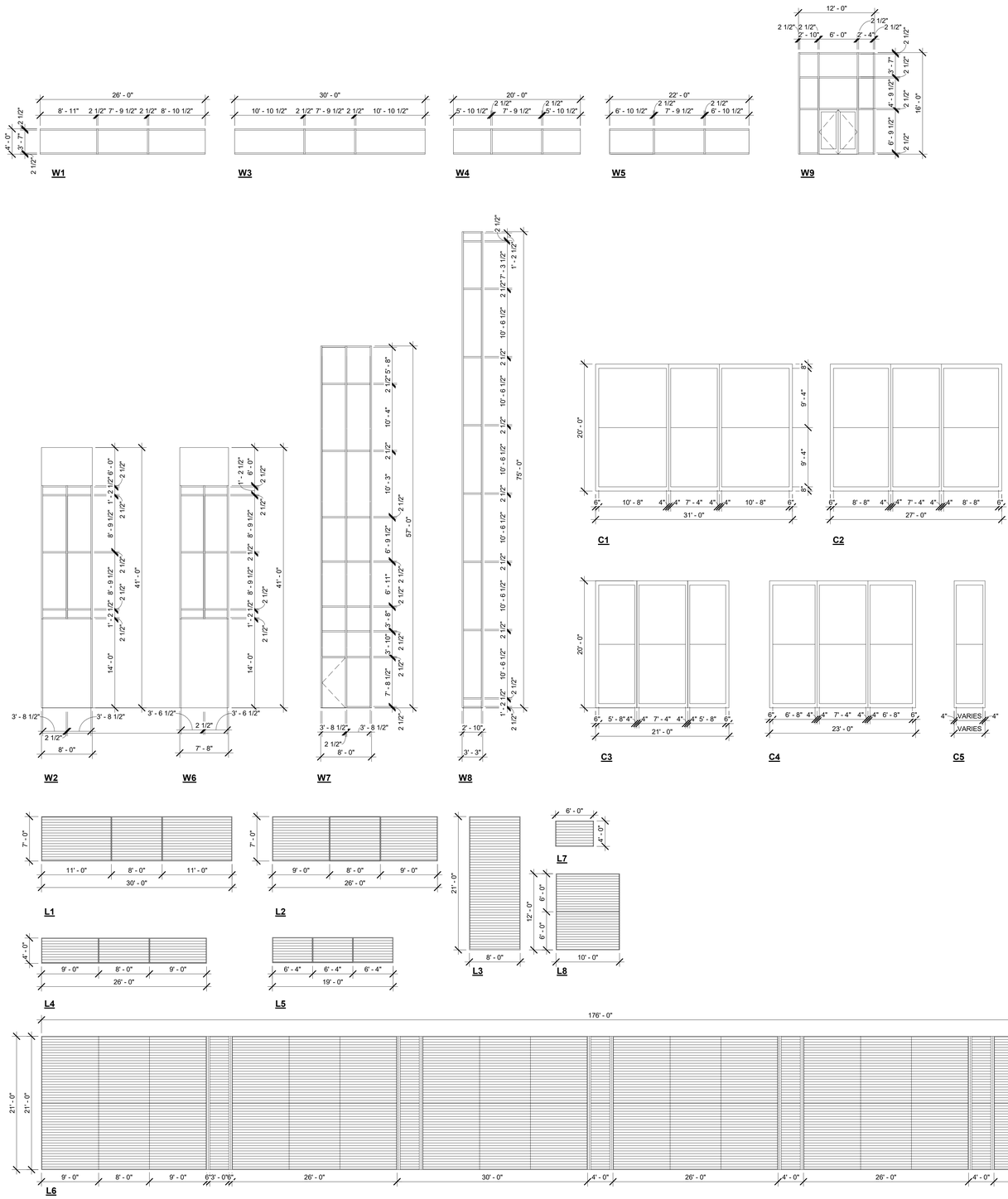
NO.	DATE	DESCRIPTION

DESIGNED BY: Designer
CHECKED BY: Checker
APPROVED BY: Approver
PROJECT NO.
CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
DOOR SCHEDULES AND DETAILS

SHEET NUMBER
A701

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:41:01 PM AESI Proj. No:



OPENING ELEVATION
1/8" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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(317) 844-6777 | www.cripe.biz

100% Design Development Documents
February 10th, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: Designer
CHECKED BY: Checker
APPROVED BY: Approver
PROJECT NO.

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

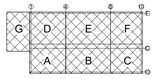
OPENING ELEVATIONS AND SCHEDULE

SHEET NUMBER

A702

ORIGINAL SHEET SIZE [8.30" X 42" (ARCH E1)]
2/9/2023 3:41:05 PM AESI Proj. No:
0 1/2" 1" 2"

ROOM FINISH SCHEDULE



ROOM NUMBER	ROOM NAME	FLOOR FINISHES: SEALED CONCRETE (SC01)	EPOXY SEALER (ES01)	LUXURY VINYL TILE (LVT01)	PORCELAIN FLOOR TILE (PFT01)	RUBBER SHEET FLOORING (RS02)	RUBBER STAIR TREADS (RST01)	WALK OFF CARPET TILE (WOC01)	BASE FINISH: 4" RESILIENT COVE BASE (RB01)	4" PORELAIN FLOOR TILE (PFT01)	NO BASE REQUIRED (NBR)	WALLS: PRECAST PANEL (PCP01)	CONCRETE MASONRY UNIT (CMU)	POURED CONCRETE (PC)	GYPSUM WALLBOARD (GYP BD)	MOISTURE RESISTANT GYPSUM BOARD (MRGB)	WALL FINISHES: PAINT (PT##)	TEXTURED STAINLESS STEEL PANELS (TSSPT01)	EPOXY PAINT (EPT01)	PORCELAIN FLOOR TILE (PFT02)	CEILING FINISHES: EXPOSED STRUCTURE, PAINT PT05	ACOUSTICAL CEILING PANEL SYSTEM (ACT01)	EPOXY PAINTED GYPSUM BOARD (EPGB01)	STAINLESS STEEL (SST)	COMMENTS	ROOM NUMBER
LOWER LEVEL																										
001	STAIR #1	SC01									NBR			PC			PT01				PT05					001
002	UTILITY TUNNEL	SC01									NBR			PC			PT01				PT05					002
FIRST FLOOR																										
101	VEST.							WOC01	RB01			PCP01	CMU				PT01						EPGB01			101
102	ENTRY	SC01							RB01				CMU				PT01				PT05					102
103	FUEL OIL PUMP ROOM	SC01							RB01			PCP01	CMU				PT01				PT05					103
104	SERVICE YARD	SC01									NBR		CMU						EPT01		PT05					104
105	RECEIVING	SC01							RB01			PCP01	CMU				PT01				PT05					105
106	STAIR #1	SC01				RS02	RST02		RB01			PCP01	CMU				PT01				PT05					106
108	FIRE PUMP ROOM	SC01							RB01			PCP01	CMU				PT01				PT05		EPGB01			108
109	BOILER ROOM																									109
110	STAIR #2	SC01							RB01			PCP01	CMU				PT01				PT05					110
111	TOILET ROOM				PFT01					PFT01			CMU						EPT01	PFT02		ACT01				111
112	CONTROL	SC01							RB01				CMU				PT01				PT05	ACT01				112
113	CHILLER PLANT ELECTRICAL ROOM		ES01						RB01			PCP01	CMU				PT01				PT05					113
114	CHILLER PLANT	SC01							RB01			PCP01	CMU				PT01				PT05					114
115	JANITOR	SC01							RB01				CMU				PT01				PT05					115
116	ELEVATOR					RS02					NBR							TSSP						SST	SEE SPECS - CEILING AND WALLS PROVIDED BY ELEVATOR VENDOR	116
FIRST FLOOR MEZZANINE																										
108M	FIRE PUMP ROOM MEZZAINE	SC01									NBR															108M
109M	BOILER ROOM MEZZANINE	SC01									NBR															109M
SECOND FLOOR																										
201	CORRIDOR	SC01							RB01			PCP01	CMU				PT01				PT05					201
203	OFFICE			LVT01					RB01			PCP01	CMU				PT01					ACT01				203
204	OFFICE			LVT01					RB01			PCP01	CMU				PT01					ACT01				204
205	LOCKER / BREAK RM			LVT01					RB01						GYP BD		PT01					ACT01				205
205A	TOILET / SHOWER				PFT01					PFT01						MRGB			EPT01	PFT02		ACT01	EPGB01		FIBERGLASS FACED TILE BACKER BOARD IN SHOWER AREA	205A
205B	TOILET / CHANGING				PFT01					PFT01						MRGB			EPT01	PFT02		ACT01				205B
206	MECHANICAL	SC01							RB01			PCP01	CMU				PT01				PT05					206
207	MAINTENANCE WORKROOM	SC01							RB01				CMU				PT01				PT05					207
208	GENERATOR CONTROL	SC01							RB01				CMU				PT01				PT05					208
209	CONTROL ROOM	SC01							RB01			PCP01	CMU				PT01				PT05					209
210	GENERATOR SWITCHGEAR		ES01						RB01				CMU				PT01				PT05					210
211	BATTERY ROOM	SC01							RB01				CMU				PT01				PT05					211
212	15KV SWITCHGEAR		ES01						RB01			PCP01	CMU				PT01				PT05					212
213	FUEL OIL DAY TANKS B	SC01							RB01				CMU				PT01								MEZZANINE	213
214	MAINTENANCE STORAGE	SC01							RB01				CMU				PT01								MEZZANINE	214
215	CUP EMERGENCY ELECTRICAL ROOM		ES01						RB01			PCP01	CMU				PT01				PT05					215
216	MSS SERVICE SWITCHGEAR		ES01						RB01				CMU		GYP BD		PT01				PT05					216
217	STAIR #2	SC01							RB01			PCP01	CMU				PT01				PT05					217
218	GENERATOR ROOM B	SC01							RB01				CMU				PT01				PT05					218
219	GENERATOR EXHAUST PLENUM 2	SC01											CMU													219
220	GENERATOR ROOM A	SC01							RB01				CMU				PT01				PT05					220
221	GENERATOR EXHAUST PLENUM 1	SC01											CMU													221
222	FUEL OIL DAY TANKS A	SC01							RB01				CMU				PT01				PT05					222
223	JANITOR / STORAGE	SC01							RB01				CMU				PT01				PT05					223
224	MECHANICAL	SC01							RB01			PCP01	CMU				PT01				PT05					224
225	MDF DATA		ES01						RB01			PCP01	CMU				PT01				PT05					225
226	OFFICE			LVT01					RB01			PCP01	CMU				PT01					ACT01				226
227	CORRIDOR	SC01							RB01				CMU				PT01				PT05					227
228	CORRIDOR	SC01							RB01			PCP01	CMU				PT01				PT05					228
229	MSS BATTERY ROOM	SC01							RB01			PCP01	CMU				PT01				PT05					229
SECOND FLOOR MEZZANINE																										
207M	MAINTENANCE WORKROOM AND CONTROL ROOM MEZZANINE	SC01									NBR															207M
214M	FUEL OIL DAY TANKS B MEZZANINE	SC01									NBR															214M
ROOF																										
301	STAIR #1					RS02	RST02		RB01			PCP01	CMU		GYP BD		PT01				PT05					301
302	EMERGENCY GENERATOR INTAKE MONITOR 1	SC01									NBR										PT05					302
303	EMERGENCY GENERATOR INTAKE MONITOR 2	SC01									NBR										PT05					303
304	VESTIBULE	SC01							RB01				CMU				PT01				PT05					304
305	EQUIPMENT ROOM	SC01							RB01				CMU				PT01				PT05					305

CASEWORK SPECIFICATIONS:

1. PLASTIC LAMINATE CASEWORK SHALL BE MANUFACTURED BY A CABINET MANUFACTURER APPROVED BY INDIANA UNIVERSITY HEALTH AND PROJECT ARCHITECT PRIOR TO CONSTRUCTION. UNITS SHALL BE OF THE SIZE AND ARRANGEMENT AS INDICATED ON THE DRAWINGS. CABINETS SHALL BE MADE FROM 3/4" HIGH DENSITY INDUSTRIAL MELAFACED PARTICLE BOARD. ALL EXTERIOR EXPOSED SURFACES SHALL BE COVERED WITH A HIGH PRESSURE PLASTIC LAMINATE FINISH (0.030" THICK VERTICAL GRADE MINIMUM). DOOR AND DRAWER EDGES SHALL HAVE A 3MM PVC EDGE HOT MELT GLUE APPLIED. THE INTERIOR OF THE CABINET AND THE SHELVES ARE TO BE AN OFF-WHITE MELAMINE FINISH. CABINETS SHALL BE BUILD WITH 170 DEGREE HINGES. ALL HARDWARE (HINGES, DRAWER SLIDES, ETC.) ARE TO BE "BLUM" OR APPROVED EQUAL. DOOR AND DRAWER PULLS SHALL HAVE 4" WIRE PULLS. EXPOSED SHELVING INSIDE BASE OR WALL UNIT (NO DOORS) SHALL BE 3/4" PLYWOOD WITH LAMINATE FINISH. CABINETS SHALL BE COMPLETE WITH ALL HARDWARE, SHELVING AND ACCESSORIES. FURNISH DETAILED SHOP DRAWINGS FOR ARCHITECT'S APPROVAL. CABINET LAMINATE AND EDGING SHALL BE SELECTED FROM MANUFACTURER'S RULL RANGE OF COLORS. INSTALL 3/8" DIAMETER ADHESIVE MOUNT CLEAR RUBBER BUMPERS AS REQUIRED WHERE WIRE PULLS, ETC. COME IN CONTACT WITH OTHER SURFACES. REFER TO MATERIAL FINISH LEGEND FOR CABINET LAMINATE COLORS.

2. PLASTIC LAMINATE COUNTERTOPS SHALL BE MANUFACTURED TO ANSI A161.2. EXPOSED SURFACES SHALL BE COVERED WITH HIGH PRESSURE PLASTIC LAMINATE, 0.050" THICK, GENERAL PURPOSE TYPE. SUBSTRATE TO BE SOLID 1-1/2" WATER RESISTANT DENSITY PARTICLE BOARD. COUNTER SHALL BE EDGED WITH 3MM PVC EDGING HOT MELT GLUE ATTACHED. ALL EXPOSED OUTSIDE CORNERS OF COUNTERTOP SHALL BE RADIUSED 2". FURNISH ALL COUNTERS WITH 4" HIGH BACKSPLASH AND RETURNS AT ENDS WITH WALLS TO MATCH COUNTER MATERIAL, UNLESS NOTED OTHERWISE. REFER TO MATERIAL FINISH LEGEND FOR COUNTERTOP LAMINATE COLORS

3. SOLID SURFACE COUNTERTOPS AND WINDOW STOOLS SHALL BE A NON-POROUS HOMOGENOUS BLEND OF POLYESTER OR ACRYLIC POLYMERS AND MINERAL FILLERS. PROVIDE SOLID SURFACE OVERLAY IN THICKNESS AS INDICATED ON DRAWINGS OR PER MANUFACTURER'S STANDARDS. SUBSTRATE TO BE WATER RESISTANT PLYWOOD. ALL EXPOSED OUTSIDE CORNERS OF COUNTERTOP TO BE RADIUSED 2" MINIMUM. EASE ALL EDGES, PROVIDE 1/4" ROUND EDGE AT COUNTER FRONT, TOP, AND BOTTOM. FURNISH ALL COUNTERS WITH 4" HIGH BACKSPLASH AND RETURNS AT ENDS WITH WALLS, UNLESS NOTED OTHERWISE. REFER TO MATERIAL FINISH LEGEND FOR COUNTERTOP SOLID SURFACE COLORS.

PAINT SPECIFICATIONS:

1. WORK INCLUDES SURFACE PREPARATION, PAINTING, AND FINISHING OF INTERIOR EXPOSED ITEMS AND SURFACES THROUGHOUT THE PROJECT, EXCEPT AS OTHERWISE INDICATED. DO NOT PAINT PRECAST PANELS. ITEMS WHEN FACTORY-FINISHING IS SPECIFIED, INCLUDING, BUT NOT LIMITED TO COUNTERTOPS, LOCKERS, ACOUSTICAL MATERIALS, FINISHED MECHANICAL AND ELECTRICAL EQUIPMENT, LIGHT FIXTURES, AND METAL SURFACES SHALL NOT REQUIRE FINISH PAINTING.

2. ALL PAINT PRODUCTS SHALL BE PREMIUM QUALITY LINES AS SUPPLIED BY SHERWIN-WILLIAMS, UNLESS NOTED OTHERWISE. APPLICATION SHALL BE DONE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR ENVIRONMENTAL CONDITIONS AND SURFACE PREPARATION.

3. PROVIDE THE FOLLOWING PAINT SYSTEMS FOR VARIOUS SUBSTRATES AS INDICATED.

GYPSUM BOARD

PRIME: 1 COAT; PROMAR ZERO VOC LATEX PRIMER
FINAL (TOP COAT): 2 COATS, EGGSHELL; PROMAR 200 ZERO VOC INTERIOR LATEX

BLOCK AND CONCRETE

INTERIOR BLOCK AND CONCRETE SURFACES SYSTEM:
PRIME: 1 COAT; SW CONFLEX BLOCK FILLER
FINAL (TOP COAT) 2 COATS, EGGSHELL; PROMAR 200 VOC INTERIOR LATEX

EXTERIOR BLOCK AND CONCRETE SURFACES SYSTEM:
PRIME: 1 COAT; SCOFIELD CURESEAL-S, MATTE FINISH (OR EQUAL)
FINAL (TOP COAT) 2 COATS, GLOSS; PRO INDUSTRIAL HIGH PERFORMANCE EPOXY

FERROUS METALS OR SHOP PRIMED GALVANIZED METALS OR PRE-PRIMED METALS

PRIME: 1 COAT FLAT, PROMAR 200, ZERO VOC INTERIOR LATEX PRIMER (OR EQUAL)
FINAL (TOP COAT) 2 COATS ENAMEL, SEMI-GLOSS; PROMAR 200 INTERIOR ALKYD SEMI-GLOSS

MATERIAL FINISH LEGEND

SEALED CONCRETE

SC01 — GENERAL
MANUFACTURER: EUCLID CHEMICAL
NAME: DIAMOND HARD LIQUID DENSIFIER AND SEALER
FINISH: GLOSS

EPOXY SEALER

ES01 — MANUFACTURER: SHERWIN WILLIAMS
NAME: RESUTILE 4638
TYPE: HS POLYURETHANE FLOOR ENAMEL
COLOR: INDUSTRIAL GREY
FINISH: GLOSS

LUXURY VINYL TILE

LVT01 — MANUFACTURER: GERFLOR
STYLE: CREATION 70 CONNECT
COLOR: GENTLEMAN TAUPE
NUMBER: 0089
SIZE: 19.4" x 19.4", IU HEALTH STOCK
THICKNESS: 2.5 mm
WEAR LAYER: 28 MILS
INSTALLATION: LENGTH OF TILE PERPENDICULAR TO DOOR OPENING

PORCELAIN FLOOR TILE

PFT01 — MANUFACTURER: FLORIDA TILE
STYLE: AVENTIS
COLOR: TITANIUM
NUMBER: FTIAT3RF12X24
SIZE: 12"X24"
THICKNESS: 9MM, RECTIFIED
INSTALLATION: TRADITIONAL

PFT02 — MANUFACTURER: FLORIDA TILE
STYLE: AVENTIS
COLOR: COTTON
NUMBER: FTIAT5RF12X24
SIZE: 12"X24"
THICKNESS: 9MM, RECTIFIED
INSTALLATION: TRADITIONAL

RUBBER SHEET

RS01 — TOILETS
MANUFACTURER: NORA
STYLE: ENVIRONCARE (WELDED SEAMS)
COLOR: SNOW SHOEING
NUMBER: 7035
SIZE: 48" WIDE SHEETS
THICKNESS: 3 mm

RS02 — STAIRS/ ELEVATOR
MANUFACTURER: NORA
STYLE: NORAMENT GRANO
COLOR: CAMPHOR
NUMBER: 5306
SIZE: 40" x 40"
THICKNESS: 3 mm

RUBBER STAIR TREADS

RST01 — STAIR TREADS
MANUFACTURER: NORA
STYLE: GRANO STAIRTREAD
COLOR: ANGELICA ROOT
NUMBER: 5302

WALK-OFF CARPET

WOC01 — VESTIBULE
MANUFACTURER: INTERFACE
STYLE: STEP REPEAT
STYLE NUMBER: SR899
COLOR: IRON
NUMBER: 104940
SIZE: 19.69" x 19.69"
BACKING: GLASBAC
INSTALLATION: MONOLITHIC

RESILIENT COVE BASE

RB01 — MANUFACTURER: TARKETT/ JOHNSONITE
STYLE: TRADITIONAL VINYL COVE
COLOR: MOON ROCK
NUMBER: #29
SIZE: 4" HIGH, ON ROLL, 1/8" THICK

RB02 — TOILETS
MANUFACTURER: NORA
STYLE: SANITARY BASE, THERMOPLASTIC RUBBER
NUMBER: 7035
HEIGHT: 6"

MATERIAL FINISH LEGEND

PLASTIC LAMINATE

PL01 — MANUFACTURER: ARBORITE
LOCATION: SHELVES ON STANDARDS/BRACKETS
NAME: CHAMBRAY GRIS
FINISH: CASHMERE
NUMBER: P-399 CA

PL02 — MANUFACTURER: WILSONART
LOCATION: CABINETS (VERTICAL SURFACES)
NAME: CUMBERLAND WALNUT
FINISH: ALIGNED WALNUT
NUMBER: 17016-67

SOLID SURFACE

SS01 — MANUFACTURER: CORIAN
LOCATION: ALL COUNTERTOPS
NAME: WHITE JASMINE
FINISH: MATTE

PAINT

PT01 — GENERAL MANUFACTURER: SHERWIN WILLIAMS
COLOR: SNOWBOUND
NUMBER: SW7004
FINISH: ACRYLIC LATEX, EGGSHELL

PT02 — DOOR AND WINDOW TRIM
MANUFACTURER: SHERWIN WILLIAMS
COLOR: DOVETAIL
NUMBER: SW7018
FINISH: ACRYLIC LATEX, SEMI-GLOSS

PT03 — GENERAL IN TOILET ROOMS
MANUFACTURER: SHERWIN WILLIAMS
COLOR: SNOWBOUND
NUMBER: SW7004
FINISH: EPOXY, EGGSHELL

PT04 — CEILINGS, UNDERSIDE OF BULKHEADS
MANUFACTURER: SHERWIN WILLIAMS
COLOR: STANDARD CEILING WHITE
NUMBER:
FINISH: ACRYLIC LATEX, FLAT

PT05 — EXPOSED CEILINGS
MANUFACTURER: SHERWIN WILLIAMS
TYPE: PRO INDUSTRIAL WATERBORNE ACRYLIC DRYFALL
COLOR: STANDARD CEILING WHITE
NUMBER:
FINISH: FLAT

TEXTURED STAINLESS STEEL PANELS (BY ELEVATOR VENDOR)

TSSTP01 — MANUFACTURER: ELEVATOR VENDOR
STYLE: TEXTURED METAL PANELS
COLOR: STAINLESS STEEL
NUMBER:

CEILING

ACT01 — GENERAL
MANUFACTURER: ARMSTRONG COMMERCIAL
NAME: ULTIMA
NUMBER: 1941
EDGE TYPE: BEVELED TEGULAR
SIZE: 24" x 24" x 7/8"
FINISH: WHITE
GRID: 15/16" TEGULAR GRID
GRID COLOR: WHITE

SSTC01 — ELEVATOR
MANUFACTURER: (BY ELEVATOR VENDOR)
MATERIAL: STAINLESS STEEL
SURFACE: SMOOTH

WINDOW ROLLER SHADE

WRS01 — MANUFACTURER: DRAPER OR MECHO
STYLE: MANUAL CHAIN OPERATION
SHADE CLOTH: PHIFER SHEERWEAVE 4000 SERIES
OPENNESS: 5% OPEN
COLOR: PEWTER
NUMBER: U63
FASCIA COLOR: CLEAR ANODIZED
LOCATION: ALL WINDOWS INDICATED ON PLAN

TOILET ACCESSORIES LEGEND

GRAB BARS
MANUFACTURER: BRADLEY
MODEL NUMBER:
812001-36, BACK OF TOILET - HORIZONTAL
812001-42, SIDE OF TOILET - HORIZONTAL
812001-18, SIDE OF TOILET - VERTICAL
ENTRY TO SHOWER - VERTICAL
SIDE OF SHOWER - HORIZONTAL
812001-24, CONTROL SIDE OF SHOWER - HORIZONTAL

FINISH: SATIN STAINLESS STEEL

MIRROR
MANUFACTURER: BRADLEY
MODEL NUMBER: 780-1830
FINISH: SATIN STAINLESS STEEL

COAT HOOK
MANUFACTURER: BRADLEY
MODEL NUMBER: 9114
FINISH: SATIN STAINLESS STEEL

SHOWER UNIT
MANUFACTURER: INPRO
MODEL NUMBER: 36"X36" ADA TRANSFER SHOWER BASE
FINISH: SOLID SURFACE, BRIGHT WHITE

SHOWER WALLS
MANUFACTURER: INPRO
MODEL NUMBER: PRISM DECORATIVE SHOWER WALL
FINISH: SOLID PATTERN, SOLID SURFACE,
COLOR: BRIGHT WHITE P9011

SHOWER CURTAIN
MANUFACTURER: GRAINGER
MODEL NUMBER: 4EEY7 COTTON DUCK
FINISH: WHITE

SHOWER CURTAIN ROD
MANUFACTURER: BRADLEY
MODEL NUMBER: 9531
FINISH: SATIN STAINLESS STEEL

SHOWER SEAT
MANUFACTURER: BRADLEY
MODEL NUMBER: 9569
FINISH: WHITE

SHOWER SHELF
MANUFACTURER: ASI
SERIES: 20692
SIZE: CUSTOM, 4" WIDE x 12" LONG
FINISH: SATIN STAINLES STEEL

LIQUID SOAP DISPENSER (BY VENDOR)
MANUFACTURER: BRADLEY
MODEL NUMBER: 6563
FINISH: SATIN STAINLESS STEEL

TOILET TISSUE DISPENSER (BY VENDOR)
MANUFACTURER: BRADLEY
MODEL NUMBER: 5402
FINISH: SATIN STAINLESS STEEL

TOWEL BAR
MANUFACTURER: BRADLEY
MODEL NUMBER: 9054
FINISH: SATIN STAINLESS STEEL

PAPER TOWEL DISPENSER (BY VENDOR)
MANUFACTURER: BRADLEY
MODEL NUMBER:250-15
FINISH: SATIN STAINLESS STEEL

UTILITY SHELF
MANUFACTURER: BRADLEY
MODEL NUMBER: 9984
FINISH: SATIN STAINLESS STEEL

WASTE RECEPTACLE
MANUFACTURER: BRADLEY
MODEL NUMBER: 377-37
FINISH: SATIN STAINLESS STEEL

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
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February 10th, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: Designer
CHECKED BY: Checker
APPROVED BY: Approver
PROJECT NO.

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: ROOM FINISH SCHEDULE

SHEET NUMBER: A703

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:41:10 PM AESI Proj. No:
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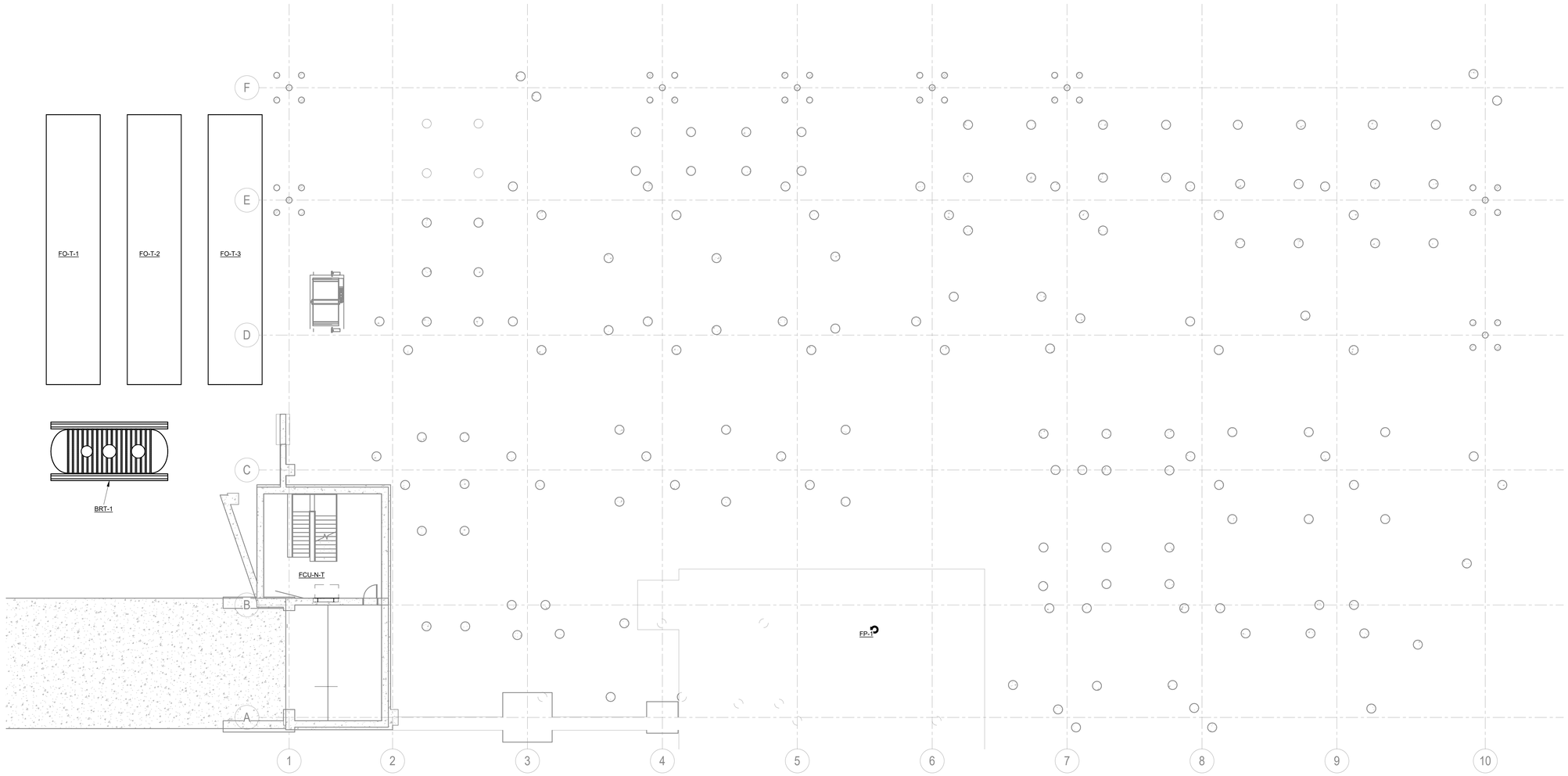

LOWER LEVEL EQUIPMENT PLAN- OVERALL

Scale: 3/32" = 1'-0"

OWNER

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

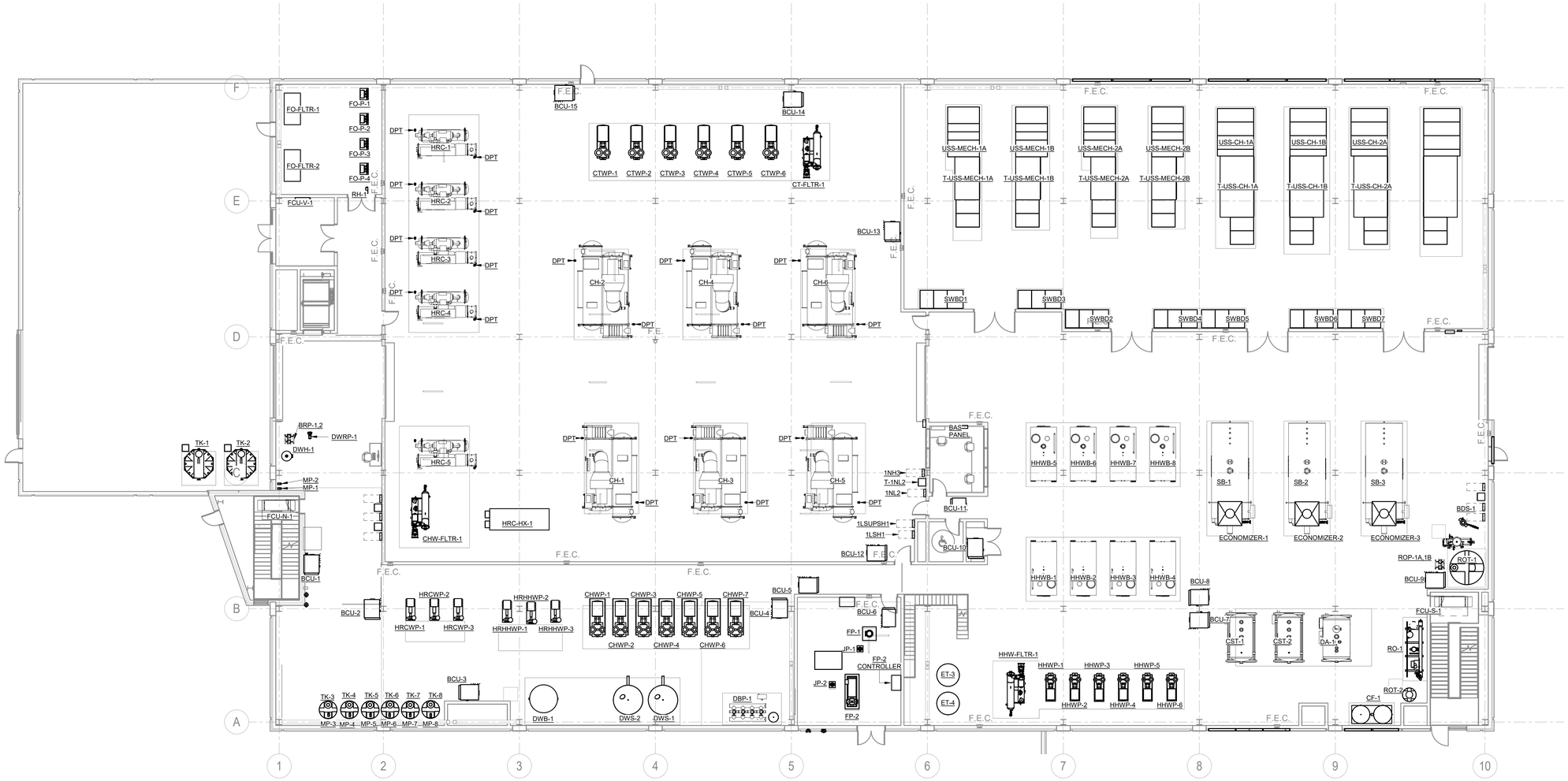
LOWER LEVEL EQUIPMENT PLAN

SHEET NUMBER

EQ301

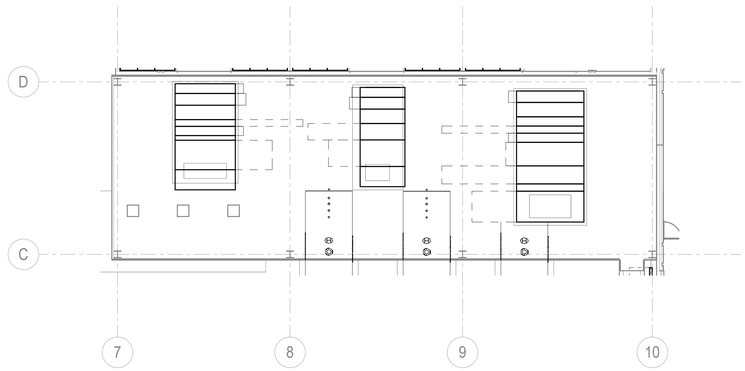
0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:39:14 PM AESI Proj. No: 21-154



FIRST FLOOR EQUIPMENT PLAN - OVERALL

Scale: 3/32" = 1'-0"



FIRST FLOOR MEZZANINE EQUIPMENT PLAN

Scale: 3/32" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:39:22 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

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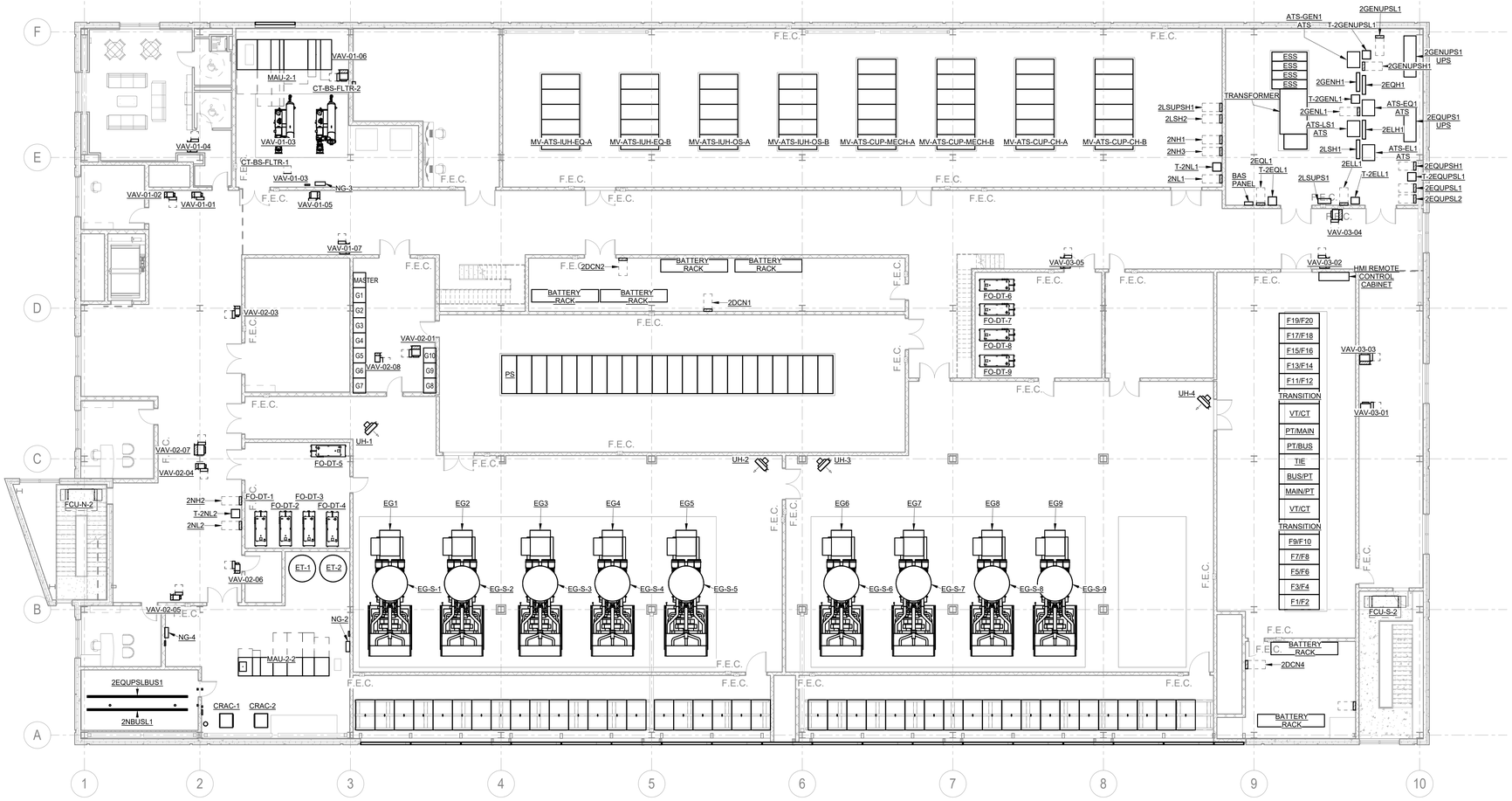
DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

FIRST FLOOR EQUIPMENT PLAN

SHEET NUMBER

EQ302



SECOND FLOOR EQUIPMENT PLAN - OVERALL

Scale: 3/32" = 1'-0"

OWNER

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DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

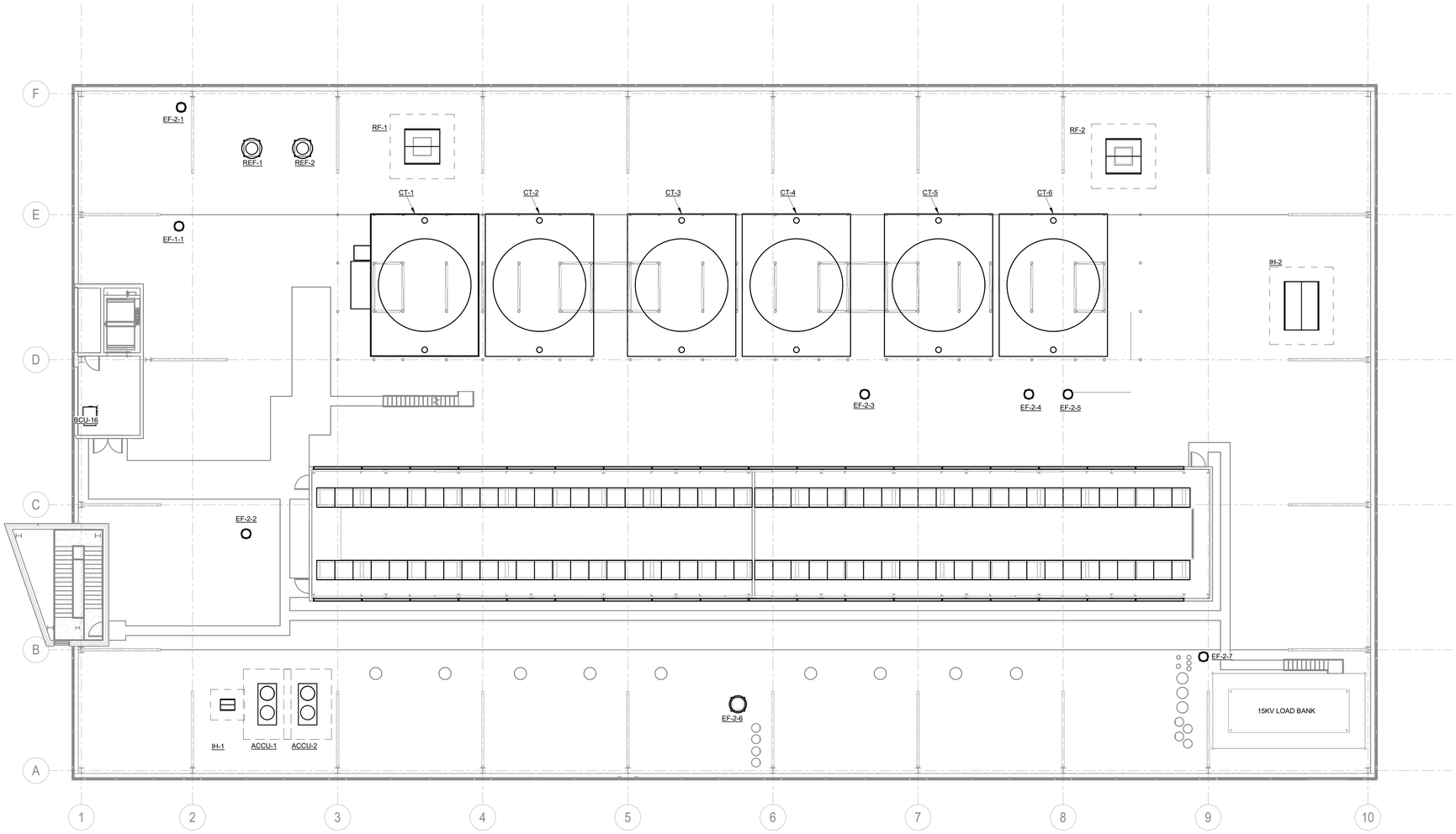
SECOND FLOOR EQUIPMENT PLAN

SHEET NUMBER

EQ303

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:39:26 PM AESI Proj. No: 21-154



ROOF EQUIPMENT PLAN - OVERALL

Scale: 3/32" = 1'-0"

OWNER

Indiana University Health
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

ROOF EQUIPMENT PLAN

SHEET NUMBER

EQ304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:39:27 PM AESI Proj. No: 21-154

NOTE: ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION ON THE DRAWINGS. ALL SYMBOLS NOT NECESSARILY USED ON THIS PROJECT.

VALVES & FITTINGS:

- GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- GLOBE VALVE
- BALANCING VALVE
- PLUG VALVE
- CONTROL VALVE
- SOLENOID VALVE
- NEEDLE VALVE
- THERMAL EXPANSION VALVE
- AUTOMATIC BALANCE VALVE
- BACK FLOW PREVENTER
- PRESSURE REDUCING, SELF CONTAINED VALVE
- PRESSURE REDUCING, PILOT OPERATED VALVE
- RELIEF, PILOT OPERATED VALVE
- ANGLE GLOBE VALVE
- PRESSURE SAFETY, ANGLE TYPE VALVE
- THREE WAY BALL VALVE
- THREE WAY GLOBE VALVE
- THREE WAY PLUG VALVE
- MOTORIZED VALVE
- MOTORIZED VALVE
- THREE WAY CONTROL VALVE
- PIPE TURN 90°
- LINE BREAK
- PIPE ELBOW UP (RISER)
- PIPE ELBOW DOWN
- PIPE TEE DOWN
- CAP OR PLUG
- REDUCER, CONCENTRIC
- REDUCER, ECCENTRIC
- Y-STRAINER
- FLEXIBLE CONNECTION
- FLANGES
- UNION
- PIPE GUIDE
- PIPE ANCHOR
- FILTER (INLINE)
- GAUGE
- THERMOMETER
- STEAM TRAP
- PRESSURE SENSOR
- PUMP

VALVES & FITTINGS:

- MATERIAL CHANGE
- AAV — AUTOMATIC AIR VENT
- DRAIN
- FLOW METER

GENERAL SYMBOLS:

- POINT OF CONNECTION
- POINT OF REMOVAL
- PLAN NOTE
- DEMOLITION NOTE
- REVISION
- DETAIL BUBBLE
- SECTION BUBBLE

DIFFUSERS & REGISTERS

SUPPLY DIFFUSER:

SHADING INDICATES BLANKED-OFF QUADRANT OF DIFFUSION PATTERN
SEE SCHEDULE FOR RUNOUT SIZE
DIFFUSER TYPE
DIFFUSER SIZE
SDA 750 — DIFFUSER CFM

SUPPLY DIFFUSER:

SHADING INDICATES BLANKED-OFF QUADRANT OF DIFFUSION PATTERN
SEE SCHEDULE FOR RUNOUT SIZE
DIFFUSER TYPE
DIFFUSER SIZE
SDA 750 — DIFFUSER CFM

RETURN/EXHAUST GRILLE:

SEE SCHEDULE FOR RUNOUT SIZE
GRILLE TYPE
GRILLE SIZE
RGA 750 — GRILLE CFM

RETURN/EXHAUST GRILLE:

SEE SCHEDULE FOR RUNOUT SIZE
GRILLE TYPE
GRILLE SIZE
RGA 750 — GRILLE CFM

LINEAR BAR & SLOT DIFFUSER:

ARROW INDICATES DIRECTION OF AIR FLOW
SEE SCHEDULE FOR RUNOUT SIZE
DIFFUSER TYPE
DIFFUSER SIZE
LDA 220 — DIFFUSER CFM

LINEAR BAR & SLOT DIFFUSER:

ARROW INDICATES DIRECTION OF AIR FLOW
SEE SCHEDULE FOR RUNOUT SIZE
DIFFUSER TYPE
DIFFUSER SIZE
LDA 220 — DIFFUSER CFM

TERMINAL BOXES

SINGLE-DUCT TERMINAL BOX WITH REHEAT COIL

SEE SCHEDULE FOR RUNOUT SIZE
TYPE OF TERMINAL BOX
VAV-1
CONTROL PANEL
MAINTAIN CODE REQUIRED CLEARANCE IN FRONT OF CONTROL PANEL

DUAL DUCT TERMINAL BOX:

SEE SCHEDULE FOR RUNOUT SIZE
TYPE OF TERMINAL BOX
VAV-1
CONTROL PANEL(S)
MAINTAIN CODE REQUIRED CLEARANCE IN FRONT OF CONTROL PANEL

DUCTWORK:

- SUPPLY ARROW
- RETURN/EXHAUST ARROW
- THERMOSTAT
- HUMIDISTAT
- SENSOR
- SUPPLY UP
- SUPPLY DOWN
- RETURN/EXHAUST UP
- RETURN/EXHAUST DOWN
- ROUND UP
- ROUND DOWN
- FLAT OVAL SUPPLY UP
- FLAT OVAL SUPPLY DOWN
- 16x12 — RECTANGULAR DUCT WIDTH x HEIGHT
- 16"ø — ROUND DUCT DIAMETER
- 16x12ø — FLAT OVAL DUCT WIDTH x HEIGHT
- EXISTING DUCT
- 90° MITERED ELBOW WITH TURNING VANES
- W, (r=w), r — ELBOW
- DUCT END CAP
- 15° MAX — DUCT TRANSITION - SLOPED BOTH SIDES
- 15° MAX — DUCT TRANSITION - FLAT ON ONE SIDE
- FLEXIBLE DUCT
- VOLUME DAMPER
- FD — FIRE DAMPER
- MOTORIZED DAMPER
- BDD — BACKDRAFT DAMPER
- AD — ACCESS DOOR
- FAN (OR PUMP)

DUCTWORK:

SINGLE LINE REPRESENTATION:

- SUPPLY UP
- SUPPLY DOWN
- RETURN/EXHAUST UP
- RETURN/EXHAUST DOWN
- ROUND UP
- ROUND DOWN
- FLAT OVAL SUPPLY UP
- FLAT OVAL SUPPLY DOWN
- 16x12 — RECTANGULAR DUCT WIDTH x HEIGHT
- 16"ø — ROUND DUCT DIAMETER
- 16x12ø — FLAT OVAL DUCT WIDTH x HEIGHT
- EXISTING DUCT
- DUCT TURN 90°
- DUCT END CAP
- DUCT TRANSITION - SLOPED ON BOTH SIDES
- DUCT TRANSITION - FLAT ON ONE SIDE
- FLEXIBLE DUCT
- VOLUME BALANCE DAMPER
- FD — FIRE DAMPER
- MOTORIZED DAMPER
- BDD — BACKDRAFT DAMPER

PIPING DESIGNATIONS:

- NEW PIPING
- EXISTING PIPING TO REMAIN
- EXISTING PIPING TO BE REMOVED
- PIPE SLOPES IN DIRECTION OF ARROW

FLOW/CONTROL SYMBOLS:

- AI — ANALOG INPUT
- AO — ANALOG OUTPUT
- DI — DIGITAL BINARY INPUT
- DO — DIGITAL BINARY OUTPUT
- CO2 — CARBON DIOXIDE SENSOR
- CS — CURRENT SENSOR
- ΔP — DIFFERENTIAL PRESSURE SENSOR
- SD — DUCT SMOKE DETECTOR
- ES — END SWITCH
- H — HUMIDITY SENSOR
- LL — LOW LIMIT TEMPERATURE SENSOR
- M — DAMPER MOTOR
- P — PRESSURE SENSOR
- T — TEMPERATURE SENSOR
- AIR FLOW MEASURING STATION
- AIR HANDLER FAN
- CONTROL VALVE
- HYDRONIC PUMP
- MS — MOTOR STARTER
- VFD — VARIABLE FREQUENCY DRIVE
- FM — FLOW METER

MECHANICAL ABBREVIATIONS:

AE	ANALYSIS ELEMENT
AFF	ABOVE FINISHED FLOOR
AH	(PARAMETER) ALARM HIGH
AHU	AIR HANDLING UNIT
AIT	ANALYSIS INDICATING TRANSMITTER
AL	(PARAMETER) ALARM LOW
AS	AIR SEPARATOR
ASD	ADJUSTABLE SPEED DRIVE (ALSO VFD)
AV	AUTOMATIC AIR VENT
BAS	BUILDING AUTOMATION SYSTEM (ALSO BMS)
BCU	BLOWER COIL UNIT
BFV	BUTTERFLY VALVE
BDD	BACK DRAFT DAMPER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM (ALSO BAS)
BOD	BOTTOM OF DUCT
BTU	BRITISH THERMAL UNIT
CA	COMPRESSED AIR
CBDV	CONTINUOUS BLOWDOWN VALVE
CH	CHILLER
CHM	CHEMICAL
CHWP	CHILLED WATER PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CR	PUMPED CONDENSATE RETURN
CRAC	COMPUTER ROOM AIR CONDITIONER
CO	CLEANOUT
COND	CONDUCTIVITY
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CPVC	CHLORINATED POLYVINYL CHLORIDE
CT	COOLING TOWER
CTF	COOLING TOWER FAN
CTP	COOLING TOWER PUMP
CTWR	COOLING TOWER WATER RETURN
CTWS	COOLING TOWER WATER SUPPLY
CU	COPPER
CS	CARBON STEEL
CV	CONTROL VALVE
CW	COMESTIC COLD WATER
DB	DRY BULB
DCV	DOUBLE CHECK VALVE
DDC	DIRECT DIGITAL CONTROL
DIA	DIAMETER
DN	DOWN
DPI	DIFFERENTIAL PRESSURE INDICATOR
DPS	DIFFERENTIAL PRESSURE SENSOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DT	DAY TANK
ECM	ELECTRONICALLY COMMUTATED MOTOR
EA	EXHAUST AIR
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EL	ELEVATION
ET	EXPANSION TANK
EX	EXHAUST
EXIST	EXISTING
EWT	ENTERING WATER TEMPERATURE
FCU	FAN COIL UNIT
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN
FE	FLOW ELEMENT
FEP	FLUORINATED ETHYLENE PROPYLENE
FLA	FULL LOAD AMPS
FLTR	FILTER
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOT	FUEL OIL TANK
FOTV	FUEL OIL TANK VENT
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
HE	HEAT EXCHANGER
HHW	HEATING HOT WATER
HHWP	HEATING HOT WATER PUMP
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HP	HORSEPOWER
HPS	HIGH PRESSURE STEAM
HPSR	HIGH PRESSURE STEAM RETURN
HRC	HEAT RECOVERY CHILLER
HRCWP	HEAT RECOVERY CHILLED WATER PUMP
HRCHWP	HEAT RECOVERY HEATING HOT WATER PUMP
HV	HAND VALVE
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
HWRP	HOT WATER RECIRCULATION PUMP
LCV	LEVEL CONTROL VALVE
LI	LEVEL INDICATOR
LPS	LOW PRESSURE STEAM
LPSR	LOW PRESSURE STEAM RETURN
LT	LEVEL TRANSMITTER
LSH	LEVEL SENSOR HIGH
LSL	LEVEL SENSOR LOW
LSLL	LEVEL SENSOR LOW LOW
LWT	LEAVING WATER TEMPERATURE
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPS
MFG	MANUFACTURER
MOCP	MAXIMUM OVER CIRCUIT PROTECTION
MUA	MAKE UP AIR UNIT
MOV	MOTOR OPERATED VALVE
N2	NITROGEN
NC	NORMALLY CLOSED
NG	NATURAL GAS
NO	NORMALLY OPEN
OA	OUTDOOR AIR
ORP	OXIDATION-REDUCTION POTENTIAL
PDS	PRESSURE DIFFERENTIAL SWITCH
PE	PRESSURE ELEMENT
PI	PRESSURE INDICATOR
PIT	PRESSURE INDICATING TRANSMITTER
PRV	PRESSURE REGULATING VALVE
PS	PRESSURE SWITCH
PSV	PRESSURE SAFETY VALVE
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	PRESSURE TRANSMITTER
PTSA	CHEMICAL TREATMENT DYE
PVC	POLYVINYL CHLORIDE
PVDF	POLYVINYLIDENE FLUORIDE
PWR	PURIFIED WATER RETURN
PWS	PURIFIED WATER SUPPLY
RA	RETURN AIR
REF	REFRIGERANT
RF	RETURN FAN
RG	RETURN GRILLE
RO	REVERSE OSMOSIS
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
SA	SUPPLY AIR
SC	SPEED CONTROLLER
SAN	SANITARY
SCW	SOFT COLD WATER
SD	SUPPLY DIFFUSER
SF	SUPPLY FAN
SFT	SOFT WATER
SRV	SAFETY RELIEF VALVE
SS	STAINLESS STEEL
SS FLTR	SIDE STREAM FILTER
STR	STRAINER
TCC	TEMPERATURE CONTROL CONTRACTOR
TCV	TEMPERATURE CONTROL VALVE
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TT	TEMPERATURE TRANSMITTER
TW	THERMOWELL
V	VENT
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE (ALSO ASD)
VTR	VENT THROUGH ROOF
WB	WET BULB
WH	WALL HYDRANT
XFMR	TRANSFORMER
XL	ACROSS THE LINE
ZS	LIMIT SWITCH

OWNER

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY	AESI
CHECKED BY	AESI
APPROVED BY	Approver
PROJECT NO.	21-154
CERTIFICATION	PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

MECHANICAL SYMBOLS AND ABBREVIATIONS

SHEET NUMBER

M001

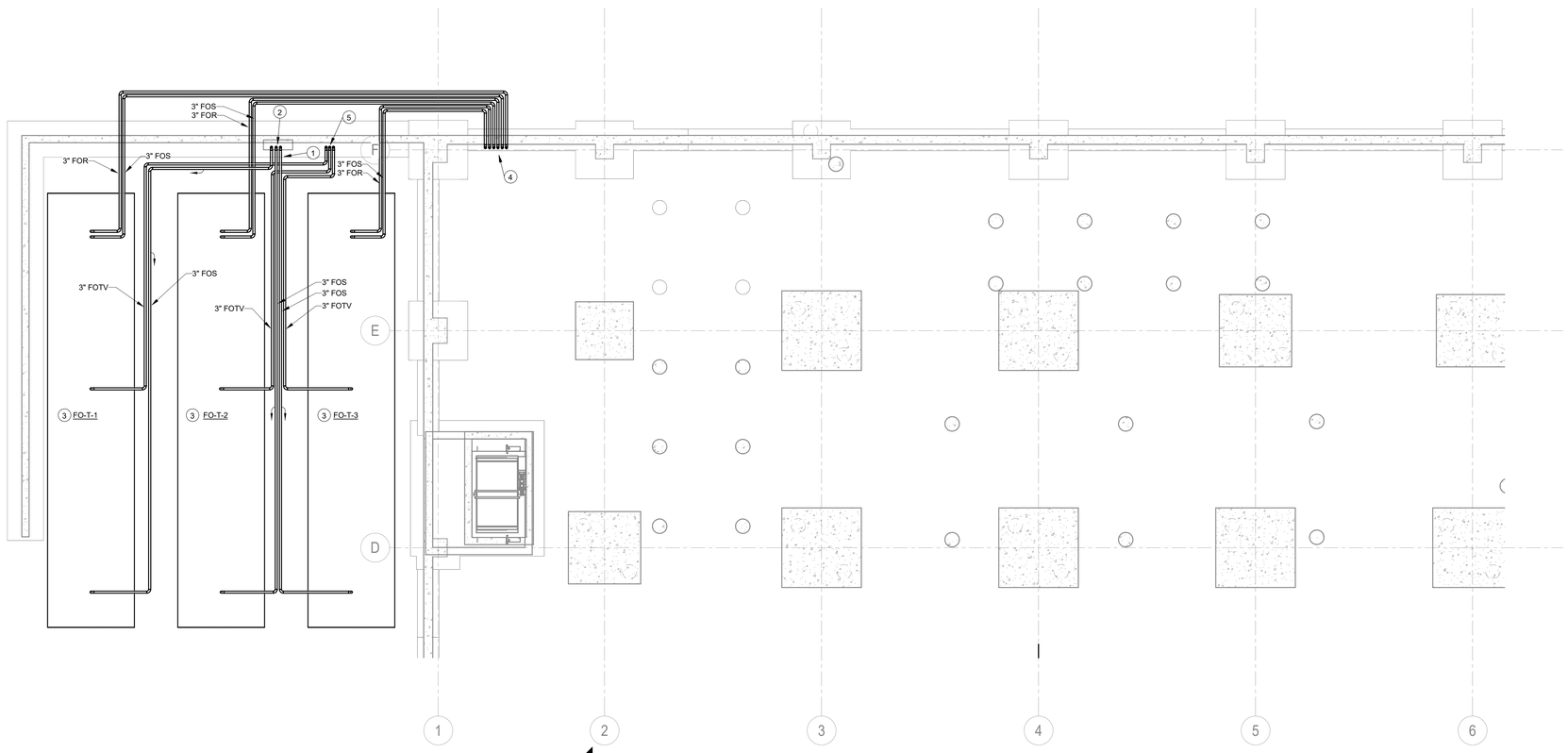
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:33:40 PM AESI Proj. No: 21-154

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. FILL LINES UP TO WALL MOUNTED TANK FILL STATION.
2. SLOPE FILL LINES TO TANKS. PROVIDE HIGH POINT AT RISE FROM REMOTE FILL STATION.
3. BURIED FUEL OIL TANKS. SEE STRUCTURAL AND CIVIL DRAWINGS FOR EXCAVATION AND DEADMAN INFORMATION.
4. FUEL OIL LINES UP. SEE M303 FOR CONTINUATION.
5. FUEL OIL TANK VENT LINES UP. SEE M310 FOR CONTINUATION.



1 **MECHANICAL SITE PLAN**
Scale: 1/8" = 1'-0"

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APPROVED BY **Approver**	
PROJECT NO. **21-154**	

SHEET TITLE

MECHANICAL SITE PLAN

SHEET NUMBER

M201

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:33:42 PM AESI Proj. No: 21-154
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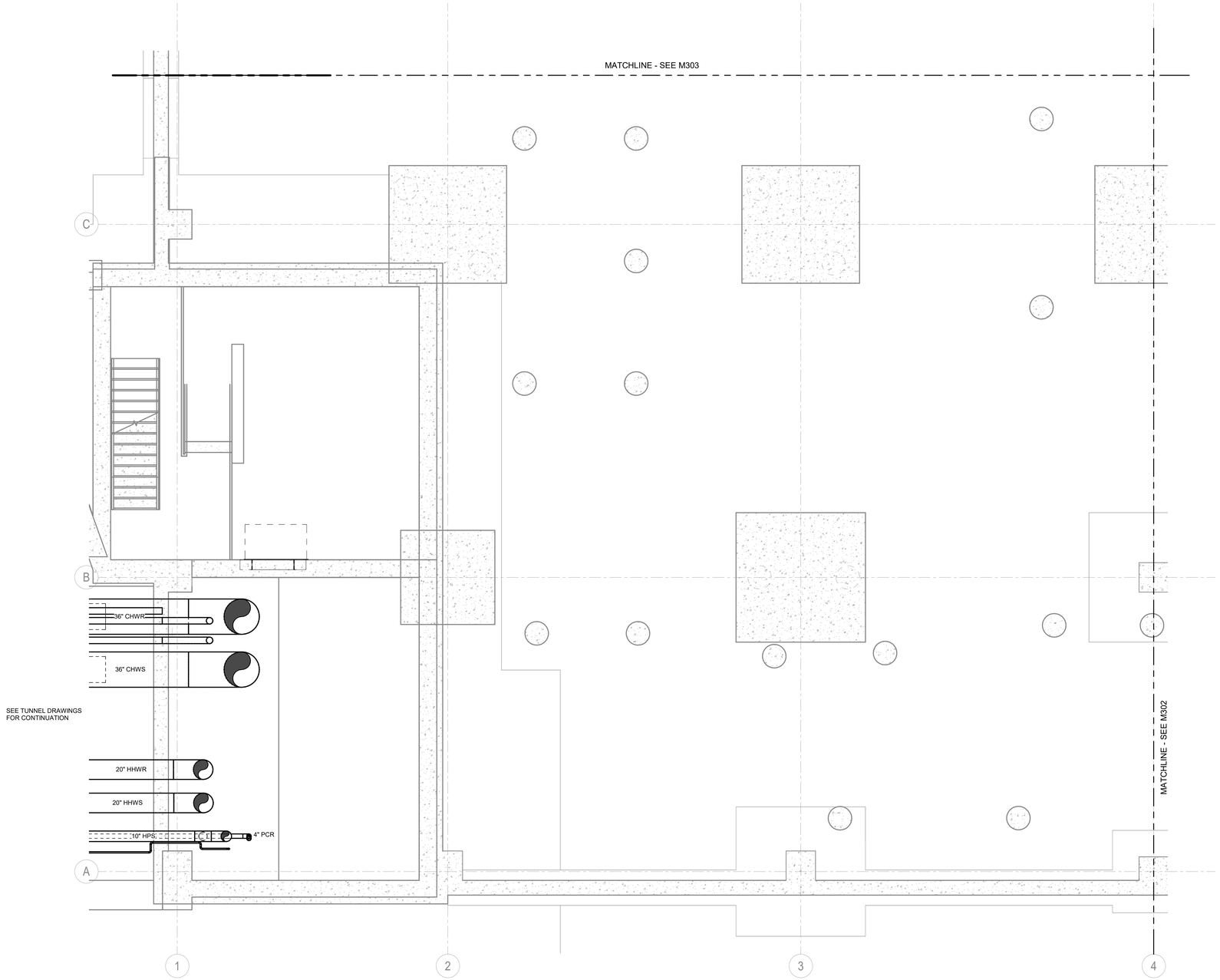

LOWER LEVEL PIPING PLAN- AREA A

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

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. ROUTE HHW PIPING TO FCU-B1 & FCU-B2. CONNECT PIPING PER MANUFACTURER INSTRUCTIONS. SEE DETAIL X PM SHEET M50X

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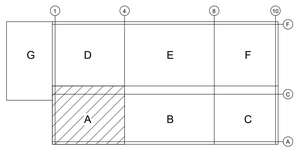
SHEET TITLE

LOWER LEVEL PIPING PLAN - AREA A

SHEET NUMBER

M301



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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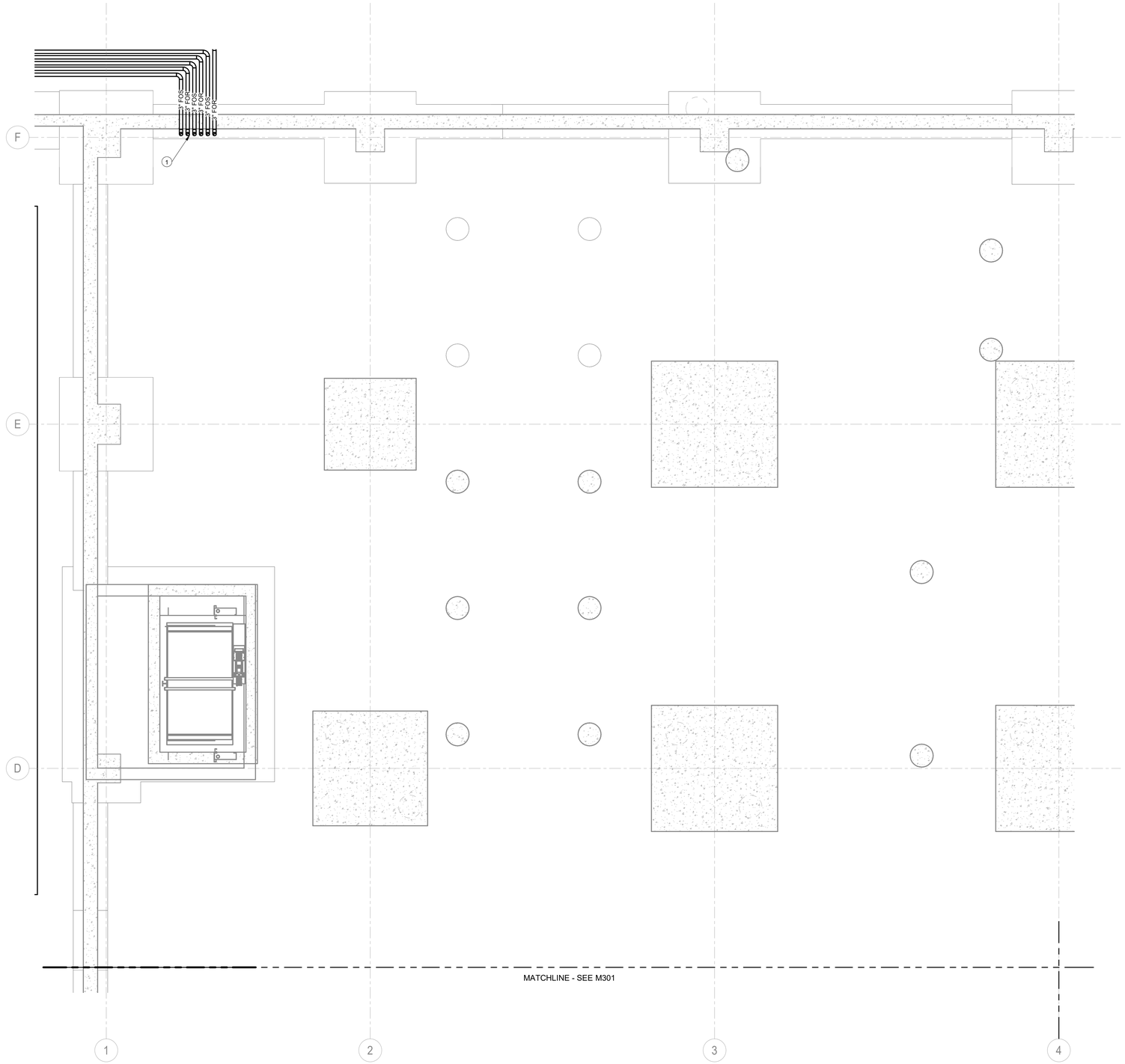


LOWER LEVEL PIPING PLAN- AREA D

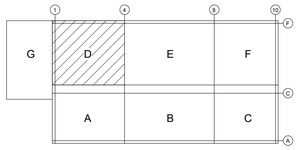
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. FUEL OIL PIPING FROM TANKS TO FUEL PUMP ROOM. SEE M201 SITE PLAN FOR CONNECTION TO TANKS, SEE M307 FOR ROOM ABOVE.



KEY PLAN
SCALE: NONE

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PROJECT NO. 21-154	

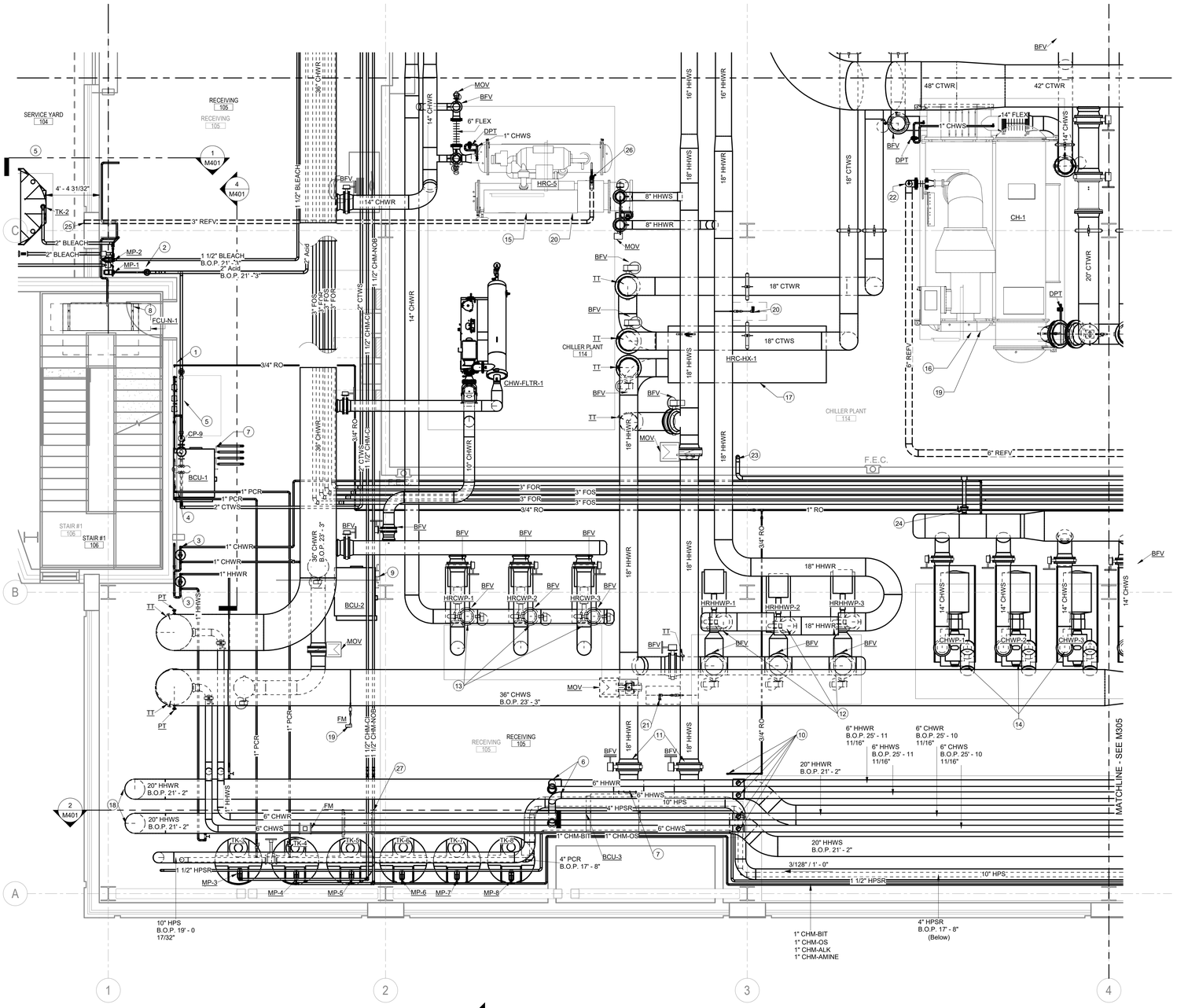
SHEET TITLE

LOWER LEVEL PIPING PLAN - AREA D

SHEET NUMBER

M303

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:33:45 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR PIPING PLAN - AREA A

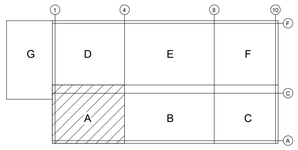
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. PIPE SIZE ON DRAWING FOR CHEMICAL TREATMENT PIPING IS SIZE OF PVC CONDUIT PIPING. SEE CHEMICAL TREATMENT P&ID FOR SIZE OF CHEMICAL TUBING.
3. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. RO WATER DOWN TO SINK. SEE ARCHITECTURAL PLANS FOR SINK LOCATION.
2. PROVIDE DOUBLE CHECK VALVE AND STATIC MIXER FOR ACID MIXING.
3. PROVIDE CORROSION COUPLING RACK AND CHEMICAL POT FEEDER.
4. PROVIDE CORROSION COUPLING RACK WITH CORROSION SENSOR.
5. PROVIDE TOWER WATER CORROSION COUPON RACK, AND ANALYZERS. SEE CHEMICAL TREATMENT P&ID FOR MORE INFORMATION.
6. 6" HHWS/R TO SERVE CUP LOADS. SEE M711 FOR BRANCH FLOW INFORMATION.
7. HHWS/R AND CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
8. HHWS/R AND CHWS/R PIPING CONNECTIONS TO FCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM FCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
9. CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
10. HHWS/R, CHWS/R, AND RO PIPING UP TO SECOND FLOOR. SEE SHEET M311 FOR CONTINUATION.
11. 18" HHWR BRANCH PIPING TO HEAT RECOVERY CHILLERS AT LOCATION INDICATED.
12. HEAT RECOVERY HEATING HOT WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING TO PUMP. SEE DETAIL 'X' ON SHEET M50X.
13. HEAT RECOVERY CHILLED WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO PUMP. SEE DETAIL 'X' ON SHEET M50X.
14. CHILLED WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO PUMP. SEE DETAIL 'X' ON SHEET M50X.
15. HEAT RECOVERY CHILLER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO CHILLER. SEE DETAILS '1' AND '3' ON SHEET M504. CONNECT HHW PIPING TO CHILLER. SEE DETAILS '2' AND '4' ON SHEET M504.
16. CENTRIFUGAL CHILLER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO CHILLER. SEE DETAILS '2' AND '3' ON SHEET M503. CONNECT CTW PIPING TO CHILLER. SEE DETAILS '1' AND '4' ON SHEET M503.
17. HEAT RECOVERY SYSTEM HEAT EXCHANGER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING AND CTW PIPING TO HEAT EXCHANGER. SEE DETAIL 'X' ON SHEET M50X.
18. HHW PIPING DOWN THROUGH FLOOR INTO TUNNEL AT LOCATION INDICATED. SEE SHEET M301 FOR CONTINUATION.
19. CHWS FLOW METER.
20. HHWR FLOW METER.
21. HHWS FLOW METER.
22. 6" REFRIGERANT RELIEF PIPING DOWN TO CHILLER.
23. 3" CHW EXPANSION TAK PIPE UP THROUGH FLOOR TO EXPANSION TANKS IN MECHANICAL 224.
24. 3" CHW EXPANSION TANK CONNECTON TO CHWS PIPING.
25. 3" REFRIGERANT SRV RELIEF PIPING THROUGH WALL. FLASHS ANS SEAL WALL PENETRATION.
26. 3" REFRIGERANT RELIEF PIPING DOWN TO HRC CHILLER.
27. HEATING HOT WATER FLOW METER IN 20" HHWS PIPE TO CAMPUS AT LOCATION INDICATED. MAINTAIN 10 PIPE DIAMTERS OF STRAIGHT PIPE ON BOTH SIDES OF PIPE.



KEY PLAN
SCALE: NONE

OWNER

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REVISIONS

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

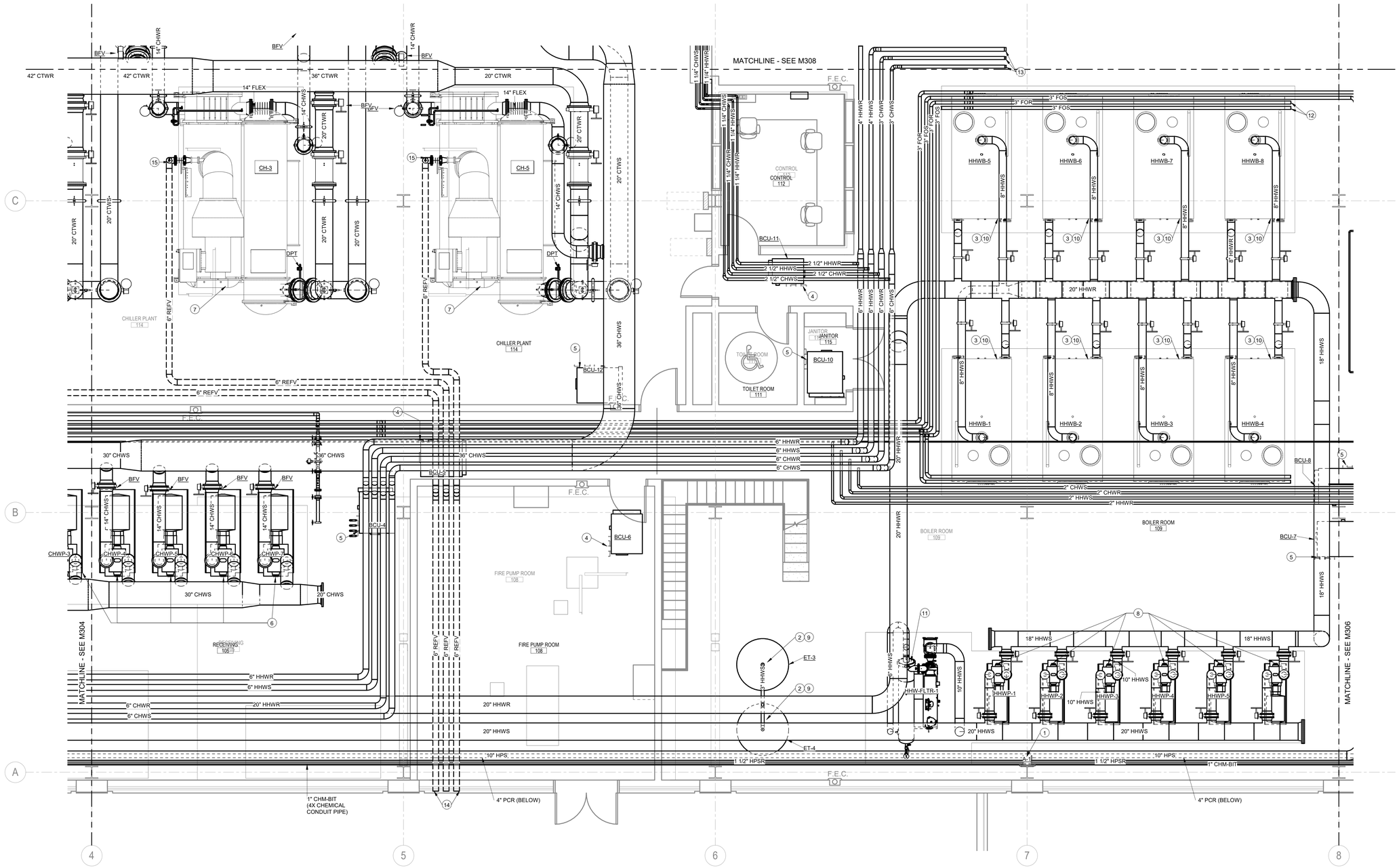
SHEET TITLE

FIRST FLOOR PIPING PLAN - AREA A

SHEET NUMBER

M304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:33:56 PM AESI Proj. No: 21-154



FIRST FLOOR PIPING PLAN - AREA B

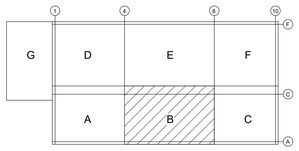
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR PAD CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. PROVIDE STEAM AND CONDENSATE ANCHOR ATTACHED TO COLUMN. SEE 2/M501 AND STRUCTURAL FOR MORE INFORMATION.
2. PROVIDE SAFETY RELIEF VALVE FOR EXPANSION TANKS. SEE SCHEDULE FOR MORE INFORMATION. ROUTE DISCHARGE TO FLOOR DRAIN.
3. PROVIDE CONDENSATE NEUTRALIZATION KITS FOR BOILER DRAINS. ROUTE DISCHARGE TO FLOOR DRAINS.
4. HHWS/R AND CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
5. CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
6. CHILLED WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO PUMP, SEE DETAIL 'X' ON SHEET M50X.
7. CENTRIFUGAL CHILLER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO CHILLER, SEE DETAILS '2' AND '3' ON SHEET M503. CONNECT CTW PIPING TO CHILLER, SEE DETAILS '1' AND '4' ON SHEET M503.
8. HEATING HOT WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING TO PUMP, SEE DETAIL 'X' ON SHEET M50X.
9. HEATING HOT WATER SYSTEM EXPANSION TANKS POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING TO TANKS, SEE DETAIL 'X' ON SHEET M50X.
10. CONDENSING, HEATING HOT WATER BOILER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING TO BOILER, SEE DETAIL 'X' ON SHEET M50X.
11. HEATING HOT FILTER SKID POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING TO FILTER SKID, SEE DETAIL 'X' ON SHEET M50X.
12. FUEL OIL PIPING ROUTED TO CONNECT TO HEATING HOT WATER BOILERS. FUEL OIL CONNECTION APPURTENANCES PROVIDED BY BOILER MANUFACTURER. SEE SHEET M312 FOR DETAIL.
13. HHWS/R AND CHWS/R PIPING CONTINUES ONTO EQUIPMENT MEZZANINE. SEE SHEET 'M402' FOR CONTINUATION.
14. 6" REFRIGERANT SRV RELIEF PIPING THROUGH WALL. FLASH AND SEAL PENETRATION.
15. 6" REFRIGERANT RELIEF PIPING DOWN TO CHILLER.



KEY PLAN
SCALE: NONE

OWNER

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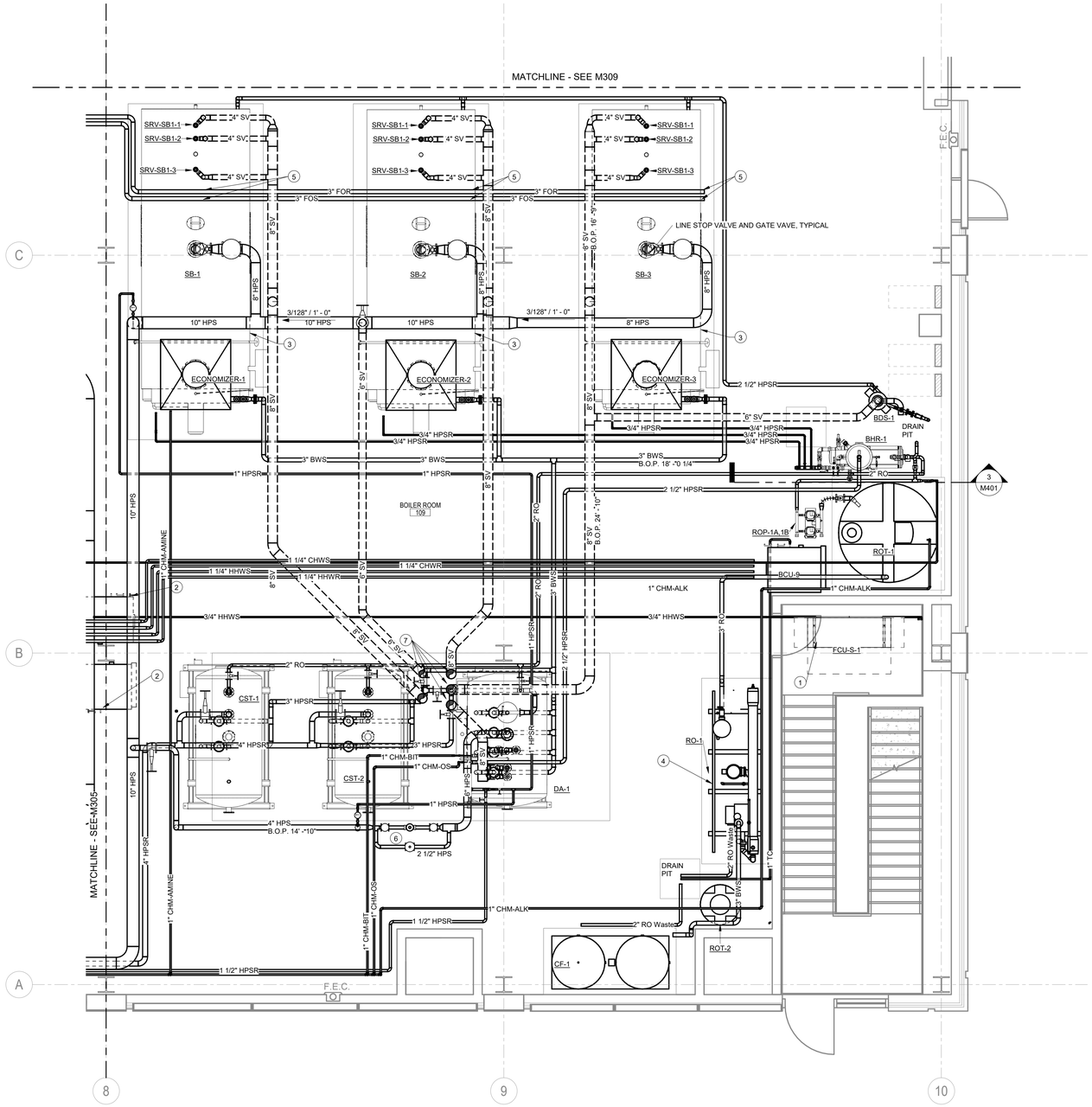
SHEET TITLE

FIRST FLOOR PIPING PLAN - AREA B

SHEET NUMBER

M305

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:08 PM AESI Proj No: 21-154



FIRST FLOOR PIPING PLAN - AREA C

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

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. PIPE SIZE ON DRAWING FOR CHEMICAL TREATMENT PIPING IS SIZE OF PVC CONDUIT PIPING. SEE CHEMICAL TREATMENT P&ID FOR SIZE OF CHEMICAL TUBING.
3. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR PAD CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. HHWS/R AND CHWS/R PIPING CONNECTIONS TO FCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM FCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
2. CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
3. STEAM BOILER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT STEAM AND FEEDWATER PIPING TO BOILER, SEE DETAIL 'X' ON SHEET M50X.
4. RO WATER FILTRATION SKID POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT HHW PIPING TO FILTER SKID, SEE DETAIL 'X' ON SHEET M50X.
5. FUEL OIL PIPING ROUTED TO CONNECT TO STEAM BOILERS. FUEL OIL CONNECTION APPURTENANCES PROVIDED BY BOILER MANUFACTURER. SEE SHEET M312 FOR DETAIL.
6. STEAM PRESSURE REDUCING STATION TO 10 PSIG.
7. STEAM VENTS UP TO SECOND FLOOR. SEE M313 FOR CONTINUATION.

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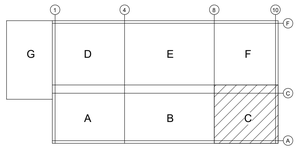
SHEET TITLE

FIRST FLOOR PIPING PLAN - AREA C

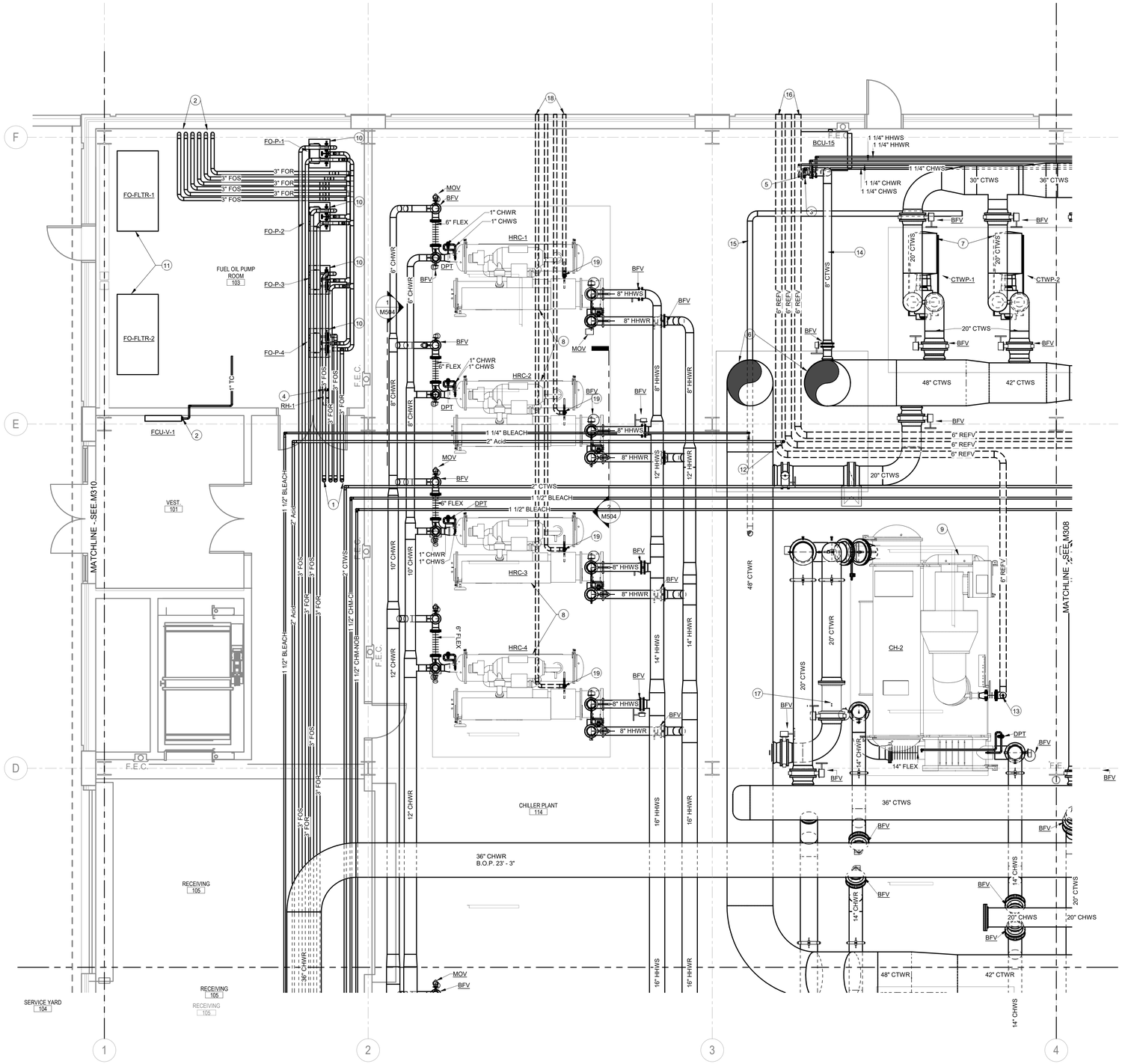
SHEET NUMBER

M306



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:19 PM AESI Proj. No: 21-154



FIRST FLOOR PIPING PLAN - AREA D

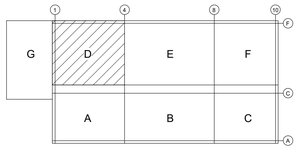
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. FUEL OIL TO GENERATOR DAY TANK ROOMS. SEE M311 FOR CONTINUATION ABOVE.
2. FUEL OIL 3" SUPPLY AND RETURN LINES FROM UNDERGOUND ROUTING FROM OUTSIDE BURIED TANKS. SEE SHEET M303 FOR CONTINUATION.
3. HHWS/R AND CHWS/R PIPING CONNECTIONS TO FCU. SEE DETAIL '2' ON H502. ROUTE CONDENSATE FROM FCU TO NEAREST DRAIN AS SHOWN. SEE DETAIL '2' ON H501.
4. HHWS/R PIPING CONNECTIONS TO REHEAT COIL. SEE DETAIL '2' ON H502.
5. MAKE-UP WATER CONNECTION. SEE P303 FOR CONTINUATION.
6. CTWS/R UP TO SECOND FLOOR. SEE M314 FOR CONTINUATION.
7. TOWER WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CTW PIPING TO PUMP, SEE DETAIL 'X' ON SHEET M50X.
8. HEAT RECOVERY CHILLER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO CHILLER, SEE DETAILS '1' AND '3' ON SHEET M504. CONNECT HHW PIPING TO CHILLER, SEE DETAILS '2' AND '4' ON SHEET M504.
9. CENTRIFUGAL CHILLER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO CHILLER, SEE DETAILS '2' AND '3' ON SHEET M503. CONNECT CTW PIPING TO CHILLER, SEE DETAILS '1' AND '4' ON SHEET M503.
10. FUEL OIL TRANSFER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT FUEL PIPING TO PUMP, SEE SHEET M712 FOR PIPING DETAILS.
11. FUEL OIL POLISHING FILTER SKID POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT FUEL PIPING TO PUMP, SEE SHEET M712 FOR PIPING DETAILS.
12. 2" ACID AND 1-1/4" BLEACH CHEMICAL TREATMENT PIPING UP THROUGH SECOND FLOOR CHASE. SEE SHEET 314 FOR CONTINUATION.
13. 6" REFRIGERANT RELIEF PIPING DOWN TO CHILLER.
14. 8" CTW MAKE-UP WATER.
15. 5" CTW BLOW DOWN PIPE.
16. 6" REFRIGERANT SRV RELIEF PIPING THROUGH WALL. FLASH AND SEAL WALL PENETRATION.
17. GRISWOLD QUICKSET BALANCING VALVE.
18. 3" REFRIGERANT SRV RELIEF PIPING THROUGH WALL. FLASHS ANS SEAL WALL PENETRATION.
19. 3" REFRIGERANT RELIEF PIPING DOWN TO HRC CHILLER.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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PROJECT

Central Utility Plant

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REVISIONS

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

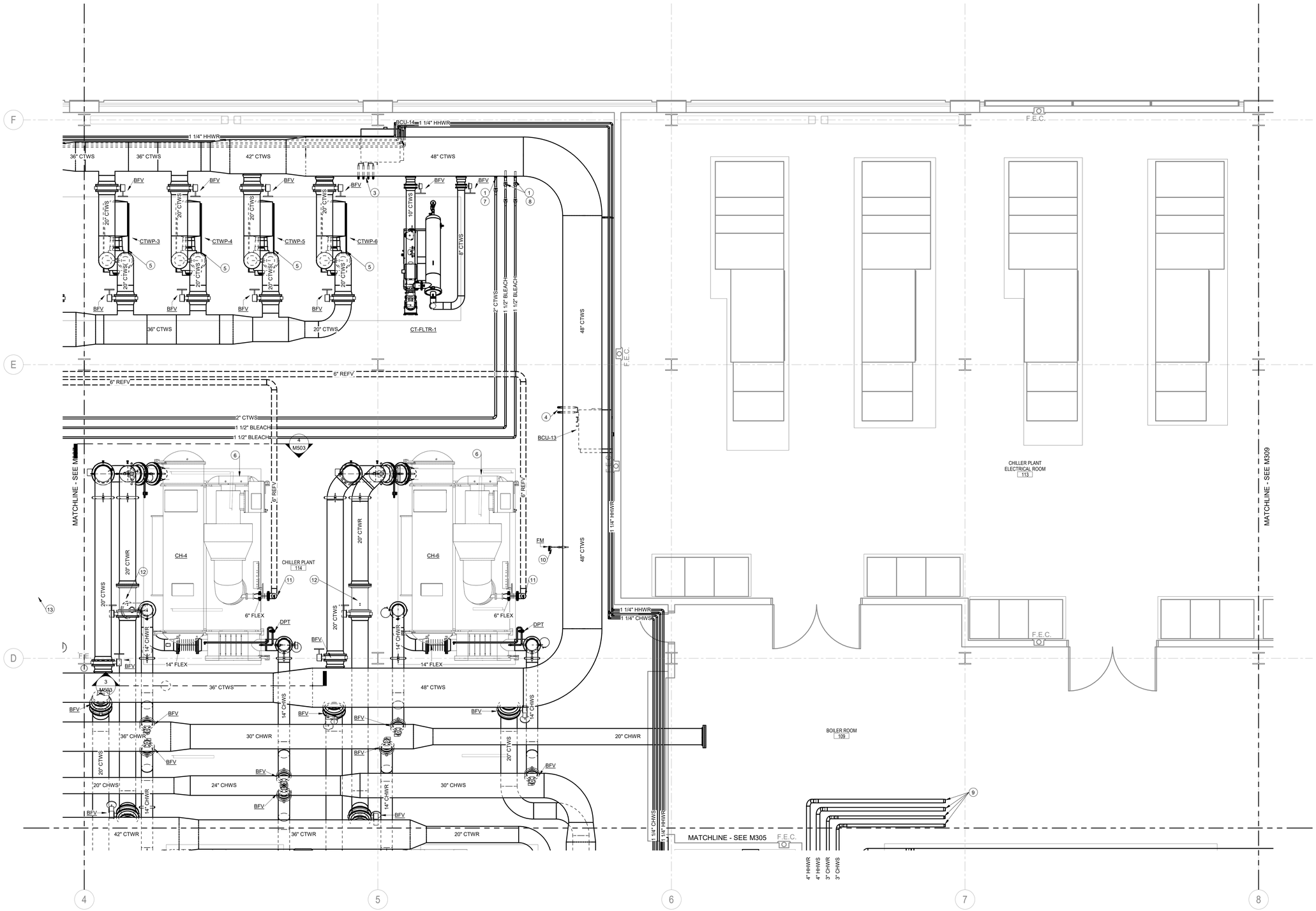
SHEET TITLE

FIRST FLOOR PIPING PLAN - AREA D

SHEET NUMBER

M307

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:31 PM AESI Proj. No: 21-154



GENERAL NOTES:

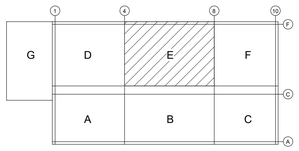
1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. PIPE SIZE ON DRAWING FOR CHEMICAL TREATMENT PIPING IS SIZE OF PVC CONDUIT PIPING. SEE CHEMICAL TREATMENT P&ID FOR SIZE OF CHEMICAL TUBING.

PLAN NOTES:

1. PROVIDE THREE (3) CHEMICAL INJECTION QUILL ASSEMBLY WITH CHECK VALVE AND ISOLATION VALVE. STOP CHEMICAL PIPING CONDUIT PIPING 2 FEET BEFORE INJECTION QUILL TO ALLOW FOR REMOVAL OF QUILL FOR MAINTENANCE.
2. EQUIPMENT MOUTNED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR PAD CONSTRUCTION AND LOCATION.
3. HHWS/R AND CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
4. CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
5. TOWER WATER PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CTW PIPING TO PUMP, SEE DETAIL 'X' ON SHEET M50X.
6. CENTRIFUGAL CHILLER POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT CHW PIPING TO CHILLER, SEE DETAILS '2' AND '3' ON SHEET M503. CONNECT CTW PIPING TO CHILLER, SEE DETAILS '1' AND '4' ON SHEET M503.
7. 2" CTW PIPING ROUTED TO CHECMICAL TREATMENT SKIDS.
8. 1-1/2" BLEACH CHEMICAL TREATMENT PIPING CONNECTED TO CTW AT LOCATION INDICATED. SEE SHEET M708 FOR DETAIL.
9. HHWS/R AND CHWS/R PIPING CONTINUES ONTO EQUIPMENT MEZZANINE. SEE SHEET 'M402' FOR CONTINUATION.
10. CTW FLOW METER.
11. 6" REFRIGERANT RELIEF PIPING DOW TO CHILLER
12. GRISWOLD QUICKSET BALANCING VALVE.

FIRST FLOOR PIPING PLAN - AREA E

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



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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340 W. 10th Street
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APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

FIRST FLOOR PIPING PLAN - AREA E

SHEET NUMBER

M308

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:39 PM AESI Proj. No: 21-154
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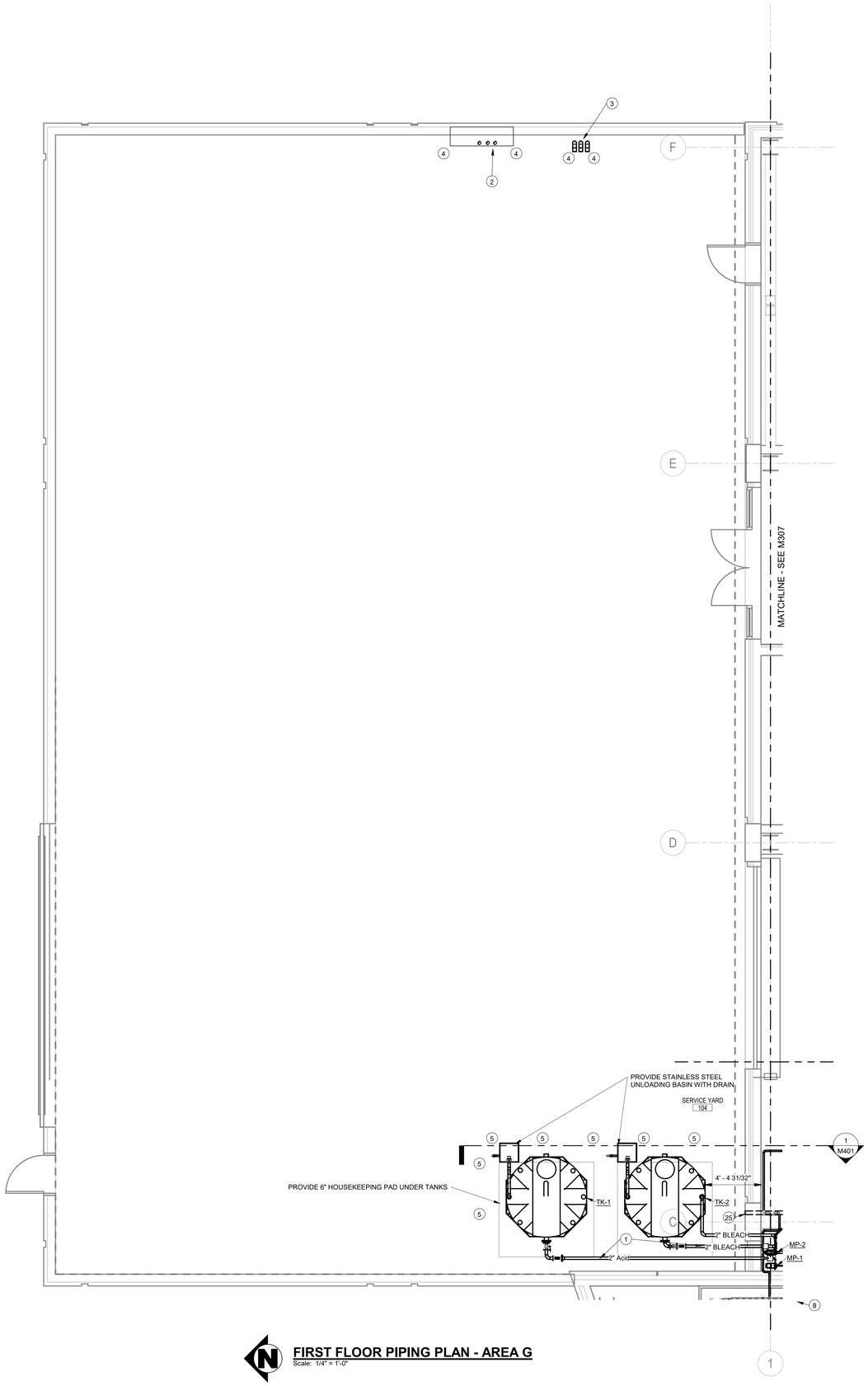


FIRST FLOOR PIPING PLAN - AREA G

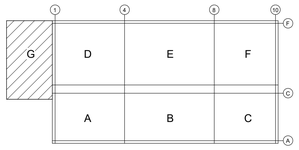
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR PAD CONSTRUCTION AND LOCAITON.

(#) PLAN NOTES:

1. ACID AND BLEACH PIPING TO BE HEAT TRACED AND INSULATED PER SPECIFICATIONS 230533 AND 230719. PIPING FLANGES TO HAVE CHEMICAL LEAK DETECTION SLEEVES PER SPECIFICATION 230293.18.
2. WALL MOUNTED TANK FILL STATION WITH LEVEL INDICATORS FOR ALL TANKS.
3. FUEL OIL TANK VENTS FROM BELOW. TERMINATE ABOVE FILL OPENING AT FILL STATION. PROVIDE TURN DOWN WITH INSECT SCREEN.
4. PROVIDE VEHICLE IMPACT PROTECTION FOR FILL STATION AND VENT LINES PER PROTECTIVE POST DETAIL ON SHEET C202.
5. PROVIDE VEHICLE IMPACT PROTECTION FOR FILL STATION TANKS PER PRTECTIVE POST DETAIL ON SHEET C202.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY	Approver
PROJECT NO.	21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

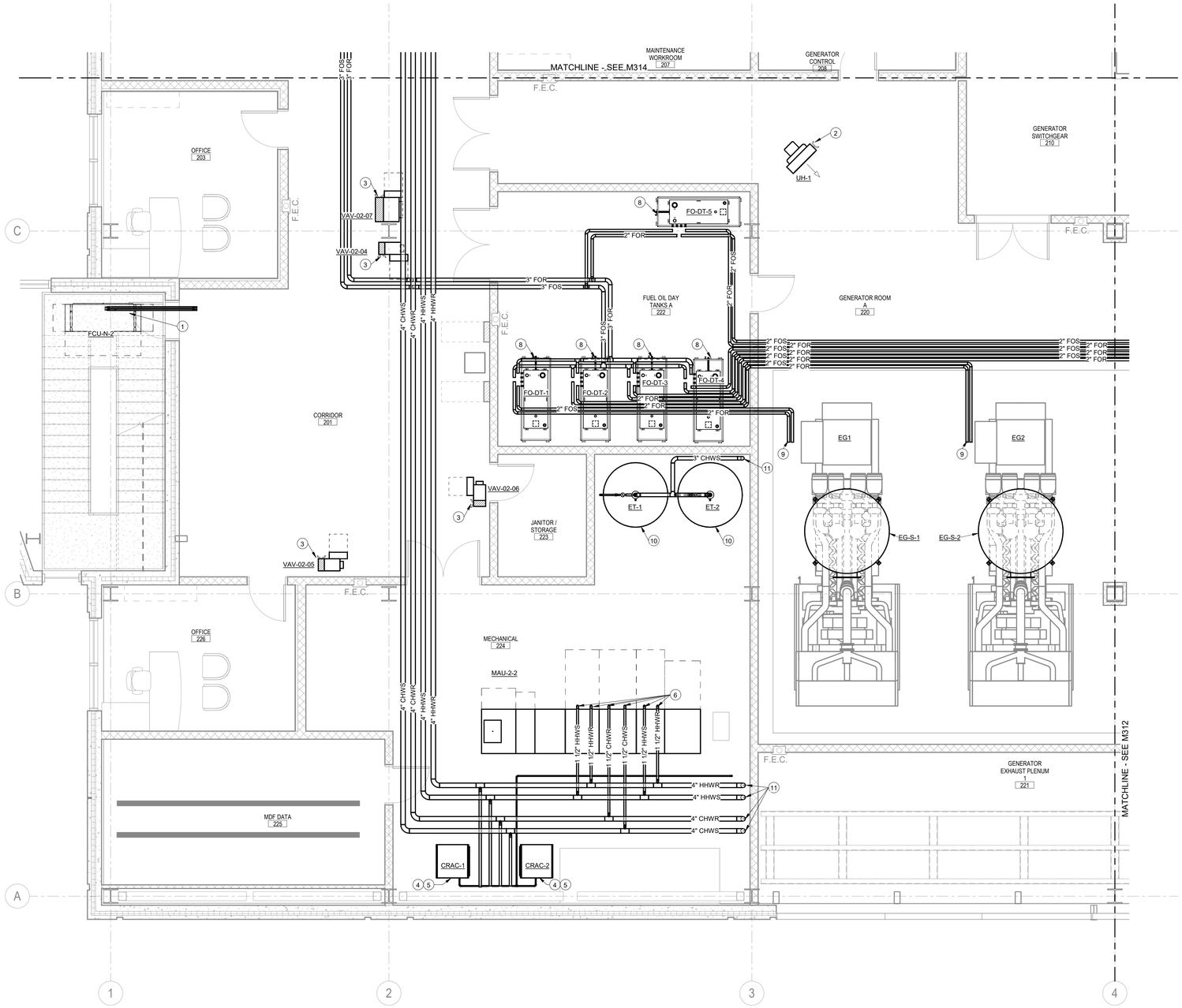
SHEET TITLE

FIRST FLOOR PIPING PLAN - AREA G

SHEET NUMBER

M310

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:45 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR PIPING PLAN - AREA A

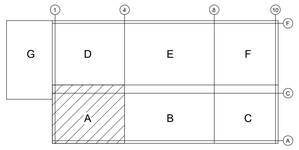
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR PAD CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. HHWS/R AND CHWS/R PIPING CONNECTIONS TO FCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM FCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
2. HHWS/R PIPING CONNECTIONS TO UNIT HEATER. SEE DETAIL '8' ON SHEET H501.
3. HHWS/R PIPING CONNECTIONS TO VAV BOX. SEE DETAIL '2' ON SHEET H502.
4. HHWS/R AND CHWS/R PIPING CONNECTIONS TO CRAC UNIT. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM CRAC UNIT TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
5. REFRIGERANT PIPING FROM CRAC UNIT UP TO ACCU LOCATED ON ROOF. CONNECT TO UNIT PER MANUFACTURER INSTRUCTIONS. SEE SHEET M317 FOR CONTINUATION.
6. HHWS/R AND CHWS/R PIPING CONNECTIONS TO MAU. SEE DETAIL '1' ON SHEET H501. ROUTE CONDENSATE FROM MAU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
7. HHWS/R AND CHWS/R PIPING UP FROM FIRST FLOOR. SEE SHEET M304 FOR CONTINUATION.
8. FUEL OIL DAYTANK PUMP POSITIONED ON EQUIPMENT PAD AS INDICATED. CONNECT FUEL PIPING TO PUMP, SEE SHEET M712 FOR PIPING DETAILS.
9. 10. FUEL OIL PIPING ROUTED TO GENERATOR FUEL PUMP CONNECTION. CONNECT TO GENERATOR PER MANUFACTURER INSTRUCTIONS, SEE SHEET M712 FOR PIPING DETAILS.
10. CHILLED WATER EXPANSION TANKS POSITIONED AS INDICATED.
11. 3" CHILLED WATER EXPANSION TANK PIPE DOWN TO FIRST FLOOR.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

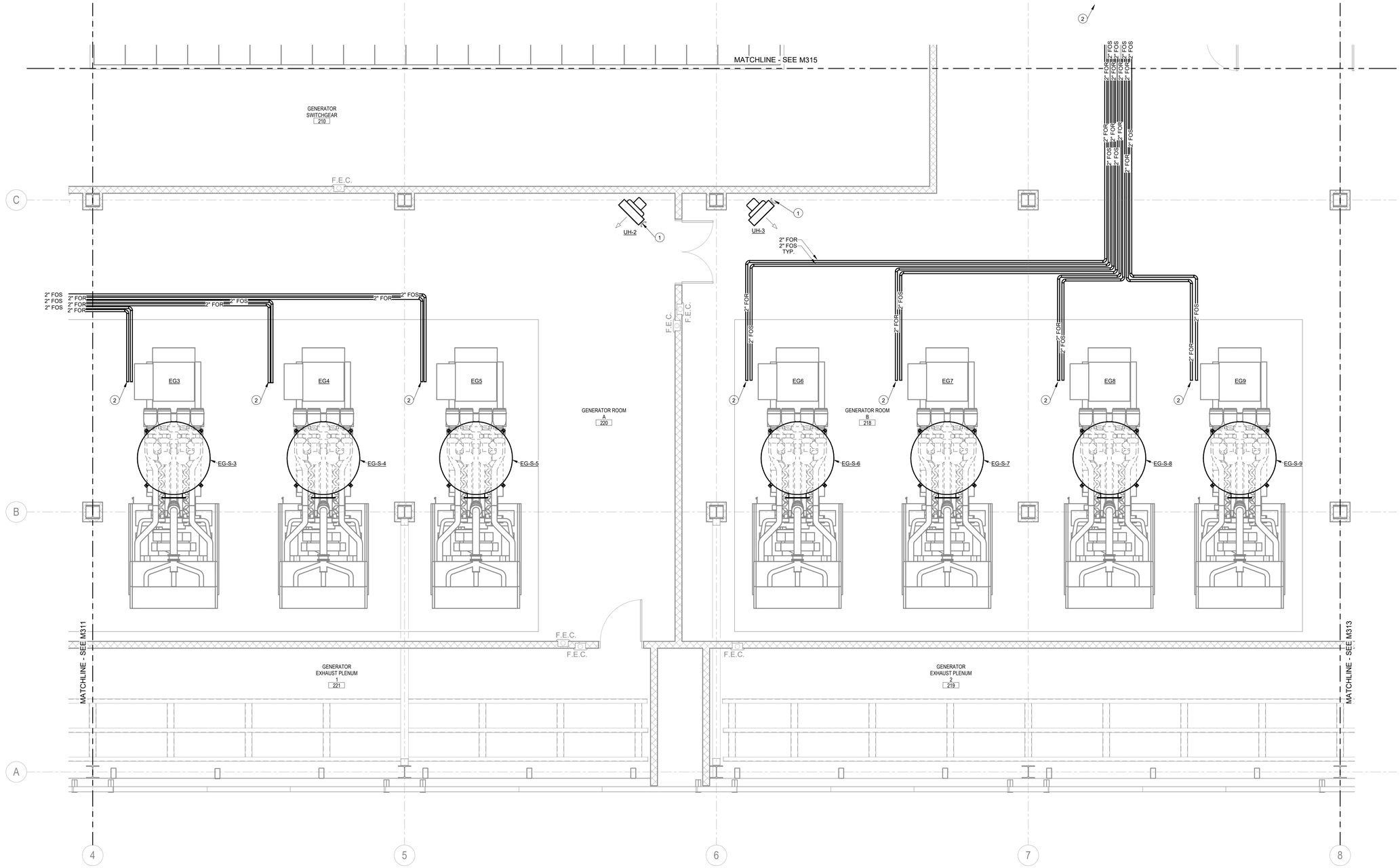
SHEET TITLE

SECOND FLOOR PIPING PLAN - AREA A

SHEET NUMBER

M311

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:54 PM AESI Proj. No: 21-154



SECOND FLOOR PIPING PLAN - AREA B

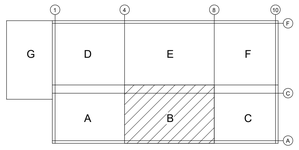
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. HHWS/R PIPING CONNECTIONS TO UNIT HEATER. SEE DETAIL '8' ON SHEET H501.
2. 2. FUEL OIL PIPING ROUTED TO GENERATOR FUEL PUMP CONNECTION. CONNECT TO GENERATOR PER MANUFACTURER INSTRUCTIONS, SEE SHEET M712 FOR PIPING DETAILS.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

SHEET TITLE

SECOND FLOOR PIPING PLAN - AREA B

SHEET NUMBER

M312

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:34:58 PM AESI Proj. No: 21-154
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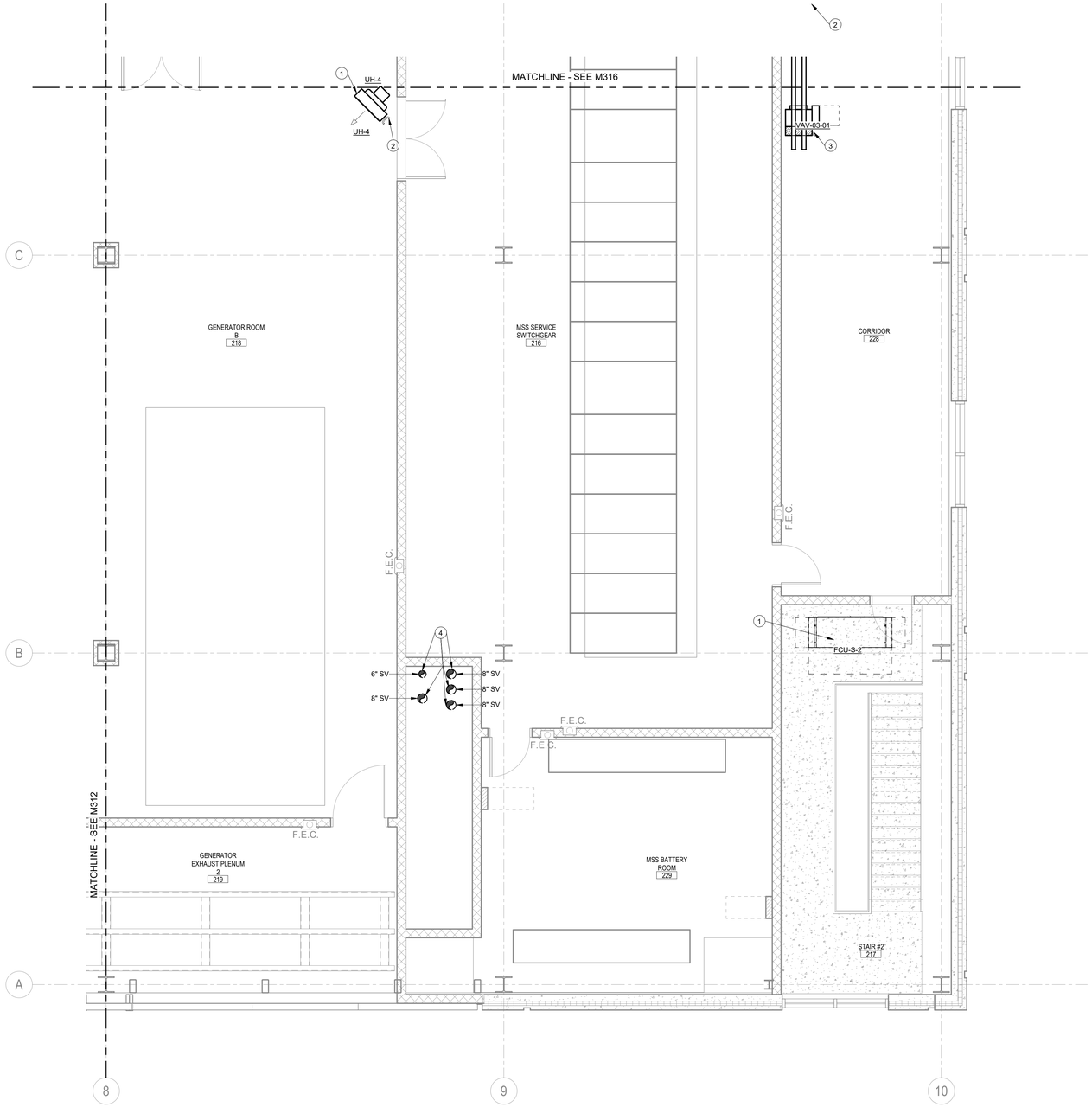


SECOND FLOOR PIPING PLAN - AREA C

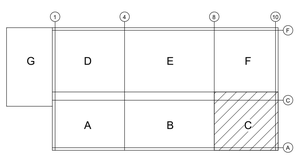
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. HHWS/R AND CHWS/R PIPING CONNECTIONS TO FCU. SEE DETAIL '2' ON SHEET H502. ROUTE CONDENSATE FROM BCU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
2. HHWS/R PIPING CONNECTIONS TO UNIT HEATER. SEE DETAIL '8' ON SHEET H501.
3. HHWS/R PIPING CONNECTIONS TO VAV BOX. SEE DETAIL '2' ON SHEET H502.
4. STEAM VENT UP TO ROOF. SEE SHEET M319 FOR CONTINUATION.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

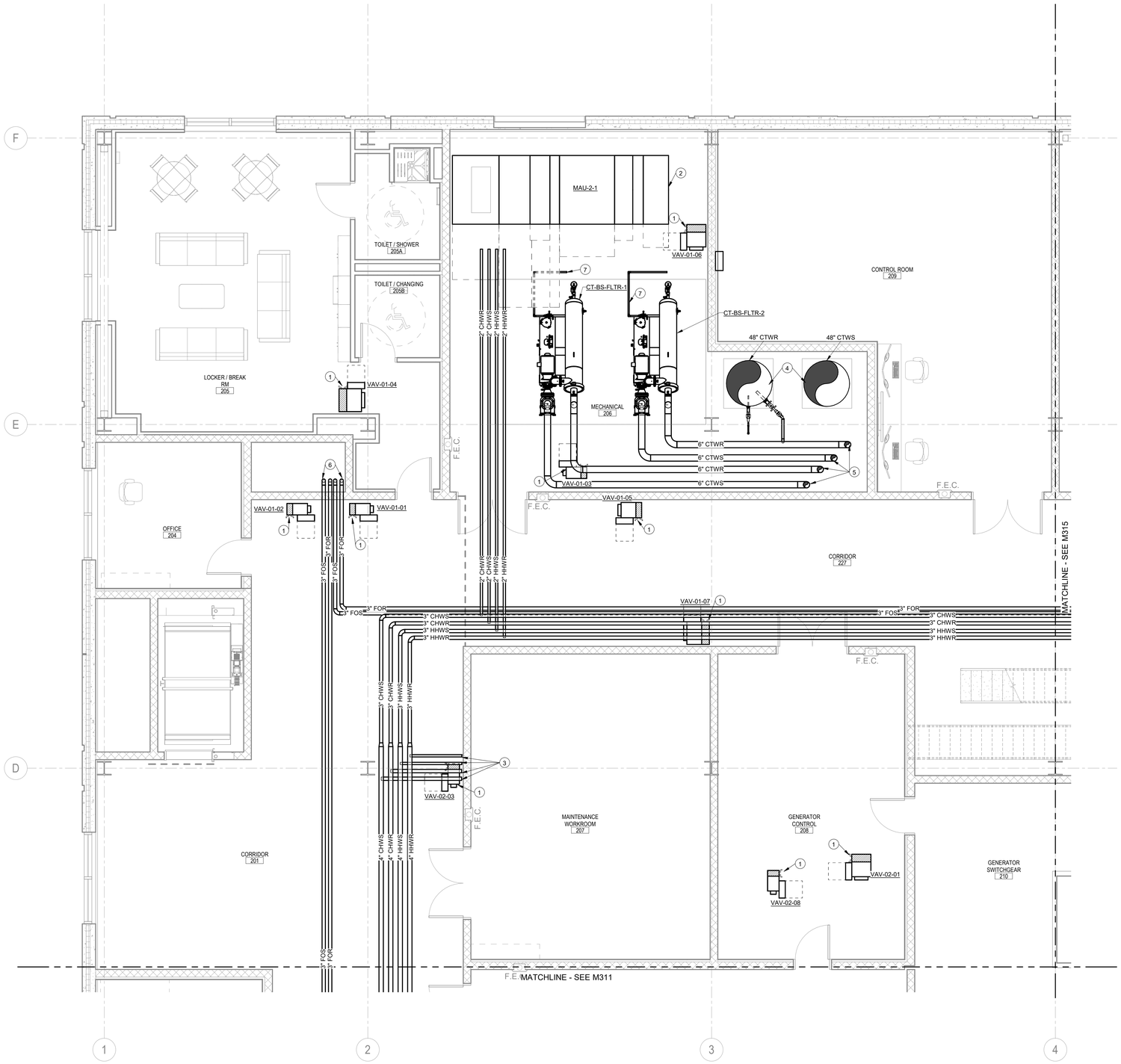
SHEET TITLE

SECOND FLOOR PIPING PLAN - AREA C

SHEET NUMBER

M313

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:00 PM AESI Proj. No: 21-154



SECOND FLOOR PIPING PLAN - AREA D

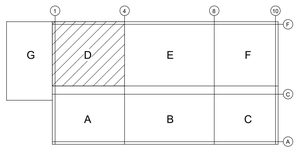
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PLANS. COORDINATE WITH STRUCTURAL PLANS FOR CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. HHWS/R PIPING CONNECTIONS TO VAV BOX. SEE DETAIL '2' ON SHEET H502.
2. HHWS/R AND CHWS/R PIPING CONNECTIONS TO MAU. SEE DETAIL '1' ON SHEET H501. ROUTE CONDENSATE FROM MAU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
3. HHWS/R AND CHWS/R PIPING CONTINUES ONTO EQUIPMENT MEZZANINE. SEE SHEET M402' FOR CONTINUATION.
4. CTWS/R UP TO ROOF. SEE SHEET M320 FOR CONTINUATION.
5. CHWS/R UP TO ROOF. SEE SHEET M320 FOR CONTINUATION.
6. FUEL OIL TO GENERATOR DAY TANK ROOMS. SEE M307 FOR CONTINUATION BELOW.
7. PROVIDE 1" DRAIN/BLOW DOWN PIPE FROM FILTER TO FLOOR DRAIN.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

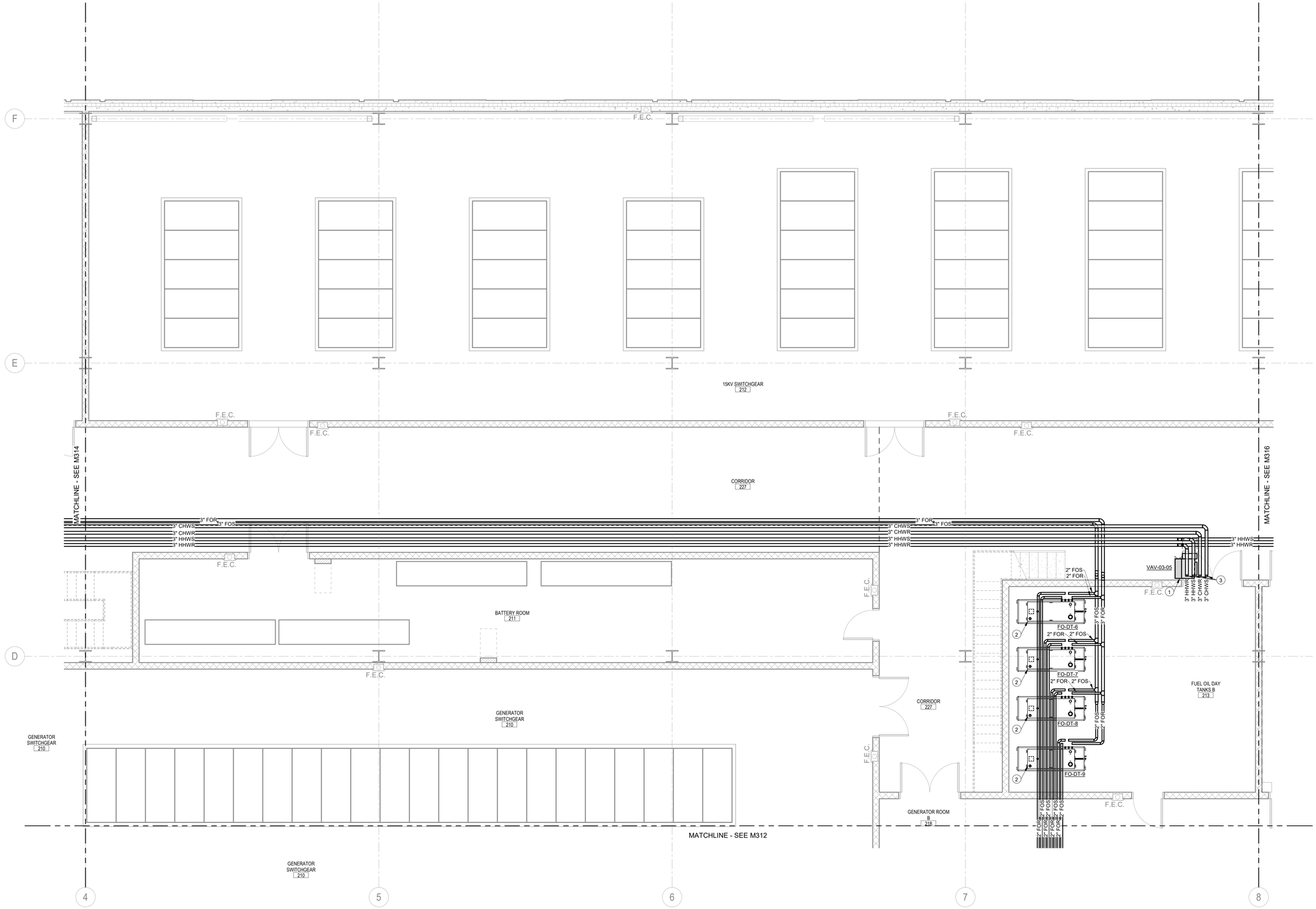
SHEET TITLE

SECOND FLOOR PIPING PLAN - AREA D

SHEET NUMBER

M314

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:04 PM AESI Proj. No: 21-154



SECOND FLOOR PIPING PLAN - AREA E

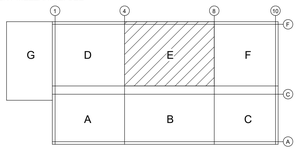
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL DRAWINGS FOR PAD CONSTRUCTION AND LOCATION.

PLAN NOTES:

1. HHWS/R PIPING CONNECTIONS TO VAV BOX. SEE DETAIL '2' ON SHEET H502.
2. FUEL OIL PIPING ROUTED TO GENERATOR FUEL PUMP CONNECTION. CONNECT TO GENERATOR PER MANUFACTURER INSTRUCTIONS. SEE SHEET M712 FOR PIPING DETAILS.
3. HHWS/R AND CHWS/R PIPING CONTINUES ONTO EQUIPMENT MEZZANINE. SEE SHEET 'M402' FOR CONTINUATION.



KEY PLAN
SCALE: NONE

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

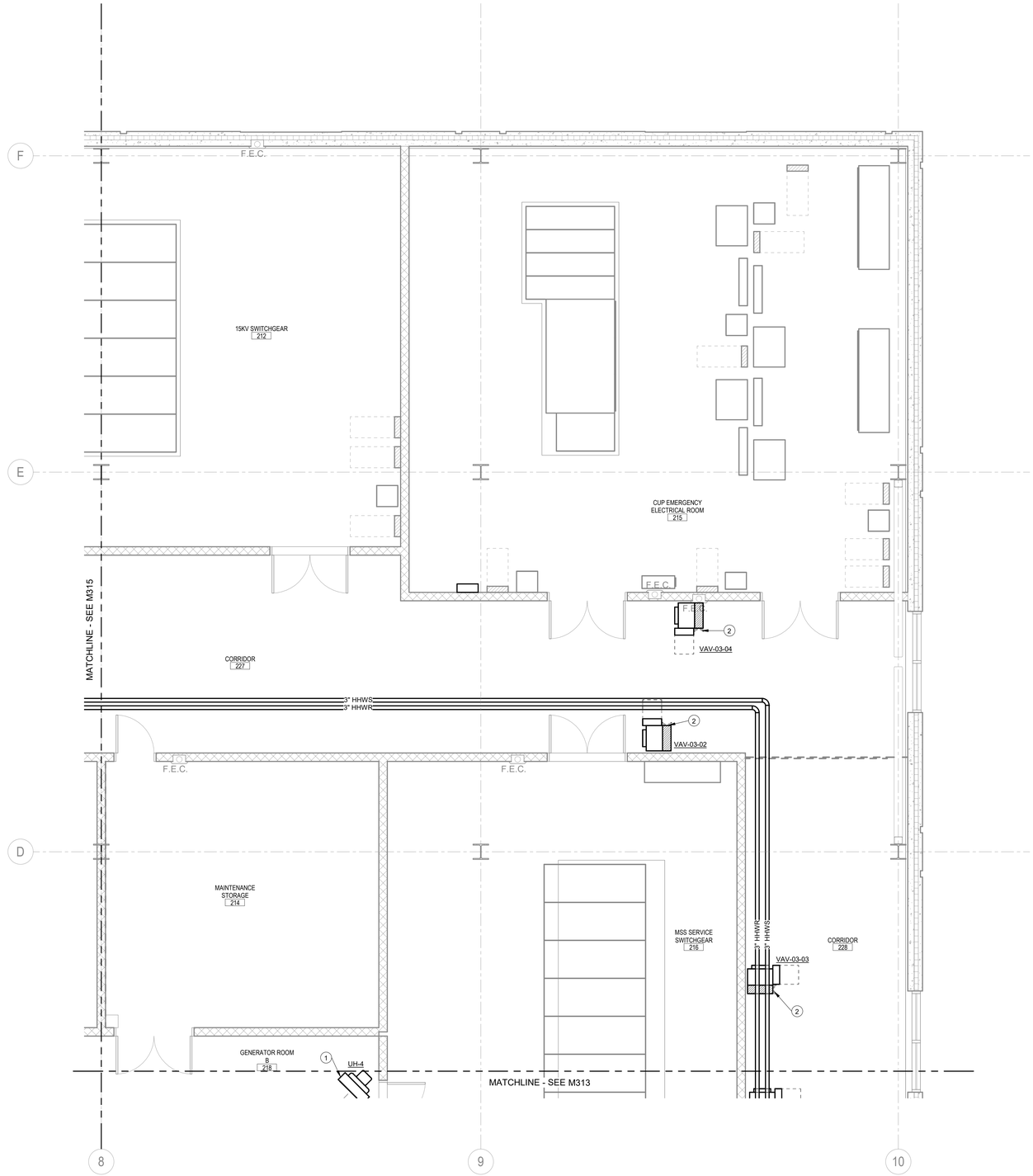
SHEET TITLE

SECOND FLOOR PIPING PLAN - AREA E

SHEET NUMBER

M315

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:11 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR PIPING PLAN - AREA F

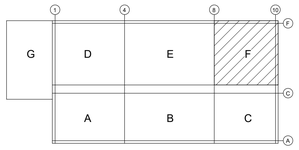
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
2. EQUIPMENT MOUNTED ON EQUIPMENT PADS. COORDINATE WITH STRUCTURAL PLANS FOR CONSTRUCTION AND LOCAITON.

PLAN NOTES:

1. HHWS/R PIPING CONNECTIONS TO UNIT HEATER. SEE DETAL '8' ON SHEET H501.
2. HHWS/R PIPING CONNECTIONS TO VAV BOX. SEE DETAIL '2' ON SHEET H502.



KEY PLAN
SCALE: NONE

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SHEET TITLE

SECOND FLOOR PIPING PLAN - AREA F

SHEET NUMBER

M316

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:13 PM AESI Proj. No: 21-154
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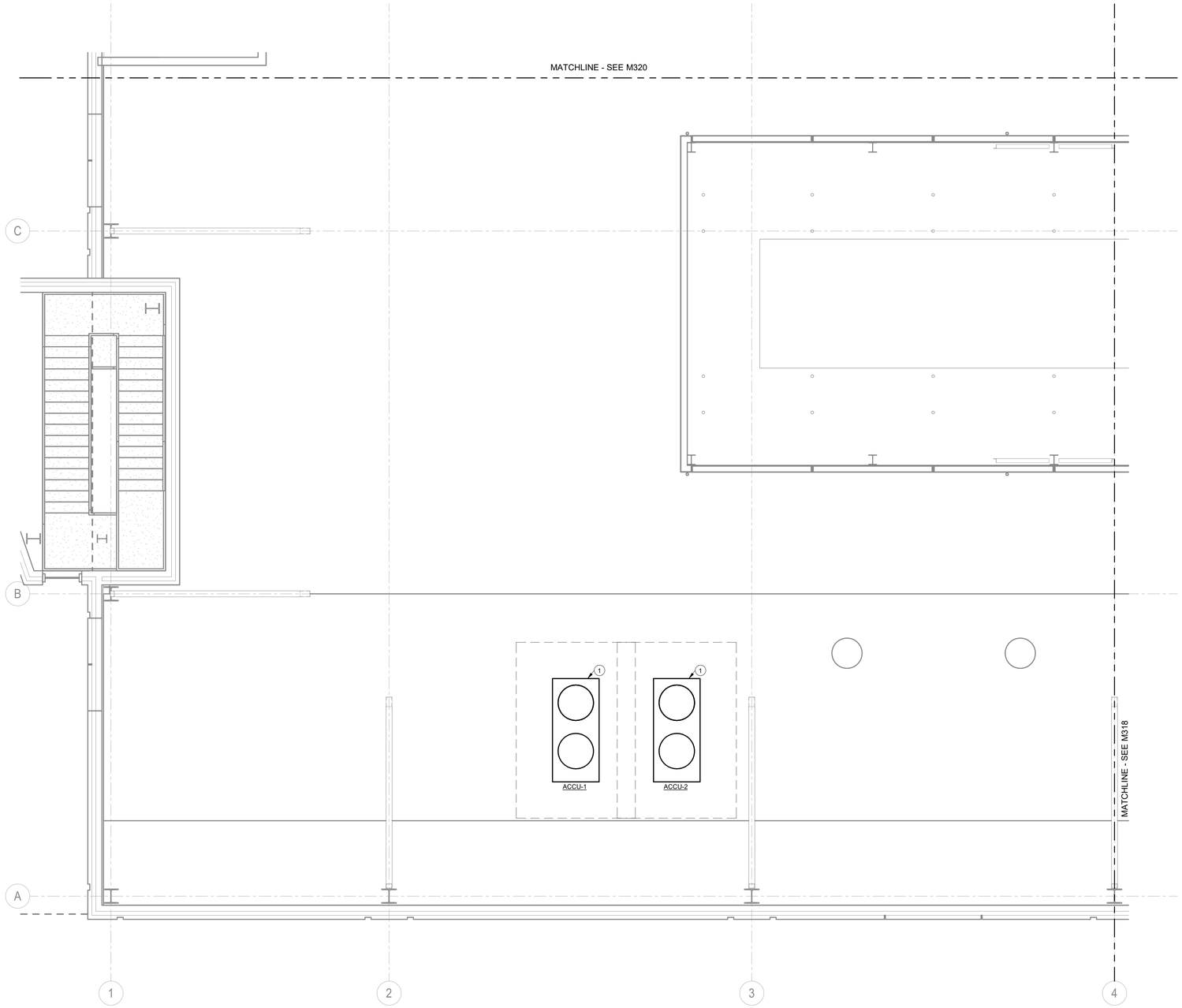


ROOF PIPING PLAN - AREA A

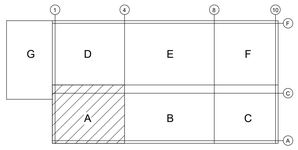
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE M001 FOR SYMBOLS AND ABBREVIATIONS.

(#) PLAN NOTES:

1. REFRIGERANT PIPING FROM ACCU DOWN TO CRAC UNIT LOCATED ON SECOND FLOOR. CONNECT TO UNIT PER MANUFACTURER INSTRUCTIONS. SEE SHEET M311 FOR CONTINUATION.



KEY PLAN
SCALE: NONE

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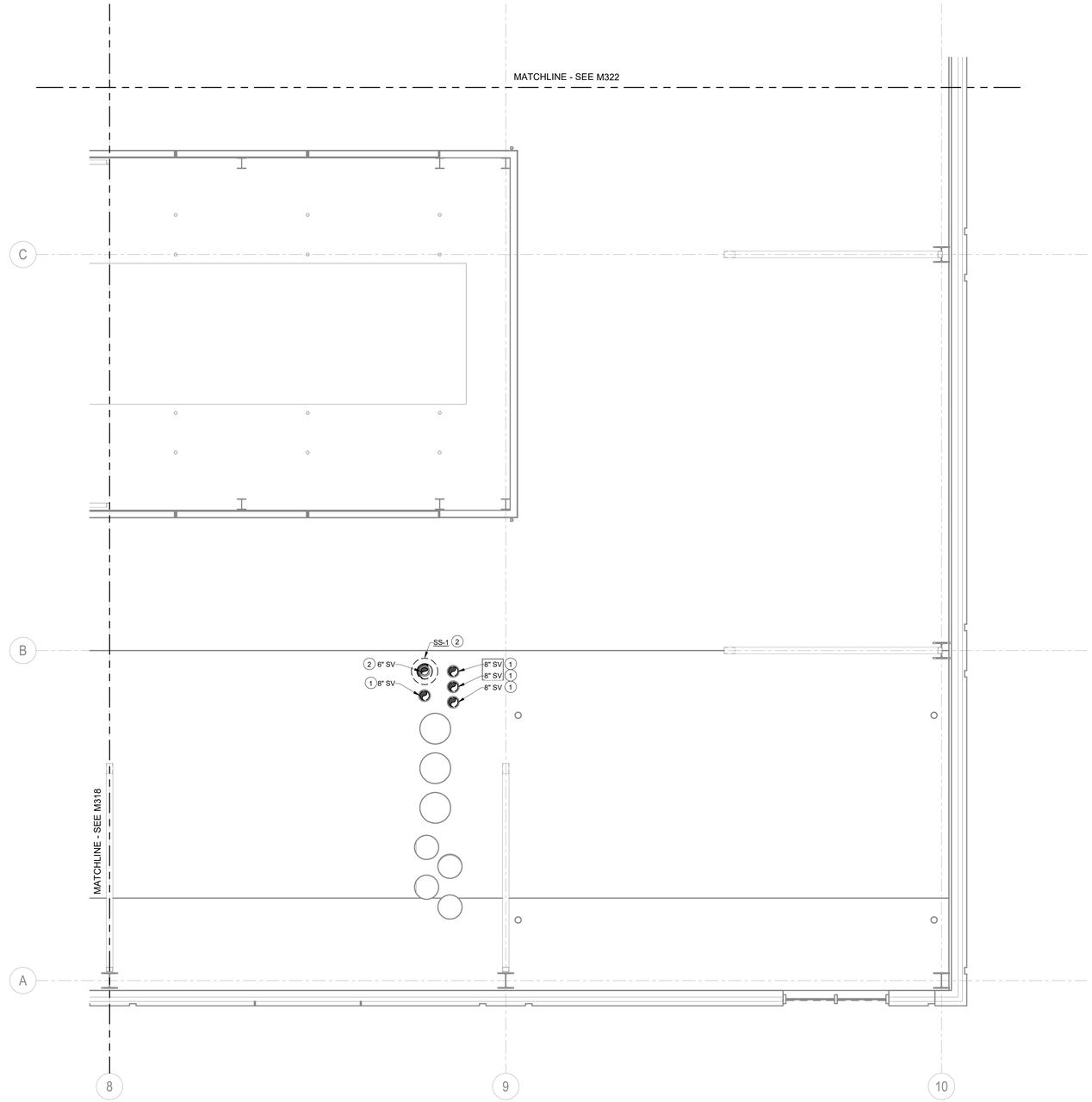
SHEET TITLE

ROOF PIPING PLAN - AREA A

SHEET NUMBER

M317

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:15 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF PIPING PLAN - AREA C

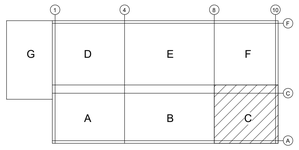
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. STEAM VENT PIPING UP THROUGH ROOF AT LOCATION INDICTED. SEE SHEET M313 FOR CONTINUATION FROM SECOND FLOOR. VENT PIPING SHALL TERMINATE APPROXIMATELY 23' ABOVE ROOF.
2. STEAM VENT SILENCER MOUNTED ON ROOF AT LOCATION INDICATED. STEAM VENT PIPING CONTINUES UP FROM SECOND FLOOR BELOW, SEE SHEET M313 FOR CONTINUATION. EXTEND 14" VENT OFF TOP OF SILENCER. 14" EXTENSION TO TERMINATE AT APPROXIMATELY 23' ABOVE ROOF.



KEY PLAN

SCALE: NONE

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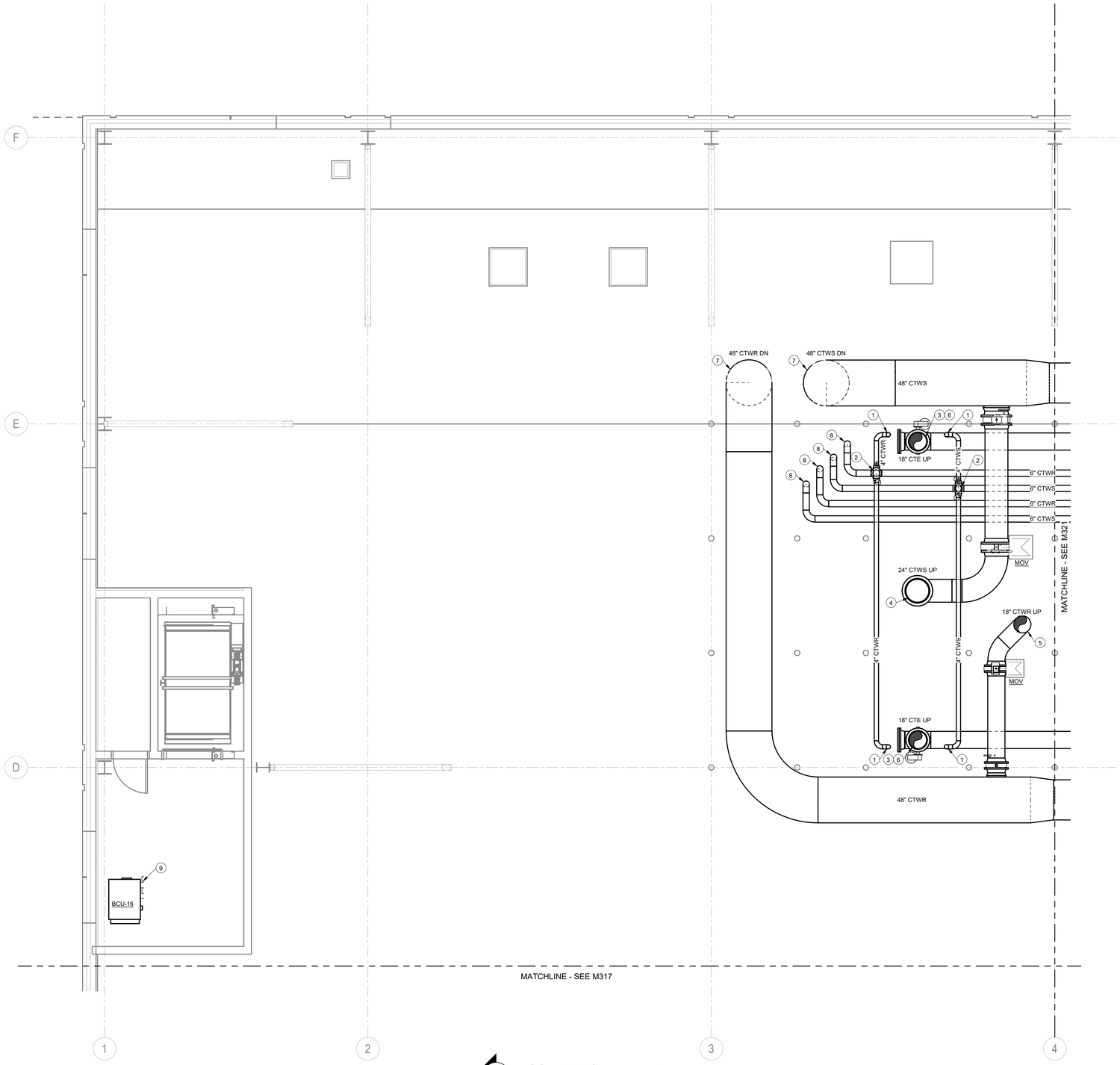
SHEET TITLE

ROOF PIPING PLAN - AREA C

SHEET NUMBER

M319

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:20 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF PIPING PLAN - AREA D

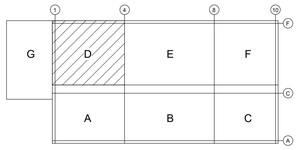
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. TOWER WATER BASIN SWEEP PIPING UP TO COOLING TOWER BASINS ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
2. BUTTERFLY ISOLATION VALVE AND MOTOR CONTROL VALVE IN VERTICAL PIPE.
3. BUTTERFLY ISOLATION VALVE IN VERTICAL PIPE.
4. COOLING TOWER SUPPLY PIPING DOWN FROM COOLING TOWER ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
5. COOLING TOWER RETURN PIPING UP TO COOLING TOWER ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
6. COOLING TOWER BASIN EQUALIZER PIPING DOWN FROM COOLING TOWER ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
7. 48" COOLING TOWER SUPPLY AND RETURN WATER PIPING DOWN THROUGH ROOF TO SECOND AND FIRST FLOORS BELOW. SEE SHEET M314 FOR CONTINUATION. FLASH AND SEAL ROOF PENETRATIONS.
8. 6" COOLING TOWER BASIN SWEEP PIPING DOWN THROUGH ROOF TO SECOND AND FIRST FLOORS BELOW. SEE SHEET M314 FOR CONTINUATION. FLASH AND SEAL ROOF PENETRATIONS.
9. HHWS/R AND CHWS/R PIPING CONNECTIONS TO BCU. SEE DETAIL 'Z' ON SHEET H502. ROUTE CONDENSATE FROM BCU DOWN TO FLOOR BELOW. SEE SHEET H314 FOR CONTINUATION. SEE DETAIL 'Z' ON SHEET H501.



KEY PLAN
SCALE: NONE

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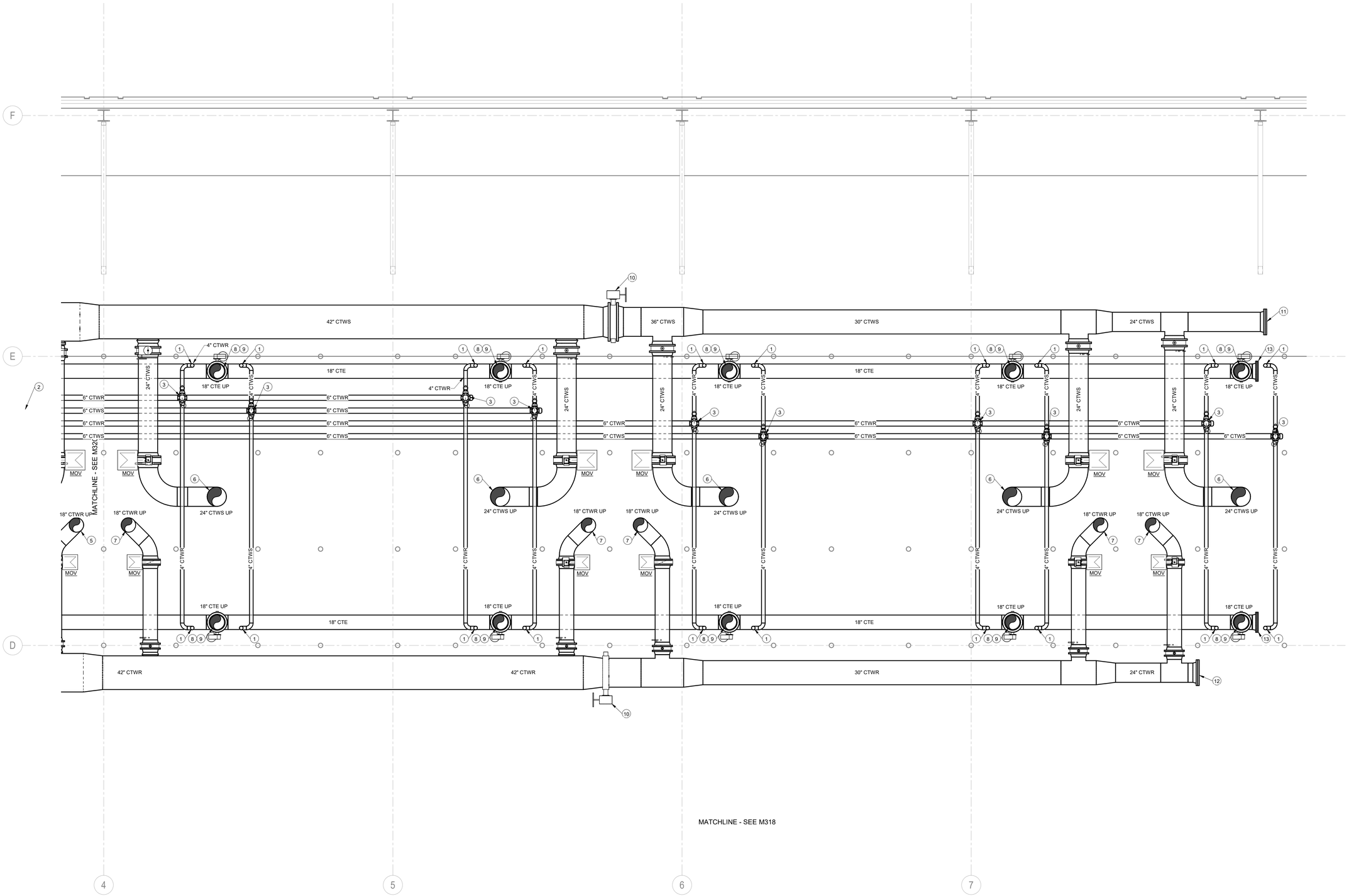
SHEET TITLE

ROOF PIPING PLAN - AREA D

SHEET NUMBER

M320

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:23 PM AESI Proj. No: 21-154



ROOF PIPING PLAN - AREA E

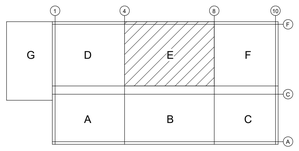
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. TOWER WATER BASIN SWEEP PIPING UP TO COOLING TOWER BASINS ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
2. COOLING TOWER SUPPLY PIPE CAPPED FOR FUTURE CONNECTION.
3. BUTTERFLY ISOLATION VALVE AND MOTOR CONTROL VALVE IN VERTICAL PIPE.
4. COOLING TOWER EQUALIZER PIPE CAPPED FOR FUTURE CONNECTION.
5. COOLING TOWER RETURN PIPE CAPPED OFF FOR FUTURE CONNECTION.
6. COOLING TOWER SUPPLY PIPING DOWN FROM COOLING TOWER ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
7. COOLING TOWER RETURN PIPING UP TO COOLING TOWER ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
8. COOLING TOWER BASIN EQUALIZER PIPING DOWN FROM COOLING TOWER ABOVE. REFER TO COOLING TOWER MANUFACTURER FOR PIPING CONNECTION DETAILS.
9. BUTTERFLY ISOLATION VALVE IN VERTICAL PIPE.
10. SEASONAL COOLING TOWER ISOLATION VALVES.
11. COOLING TOWER SUPPLY PIPE FLANGED OFF FOR FUTURE CONNECTION.
12. COOLING TOWER RETURN PIPE FLANGED OFF FOR FUTURE CONNECTION.
13. COOLING TOWER EQUALIZER PIPE FLANGED OFF FOR FUTURE CONNECTION.



KEY PLAN
SCALE: NONE

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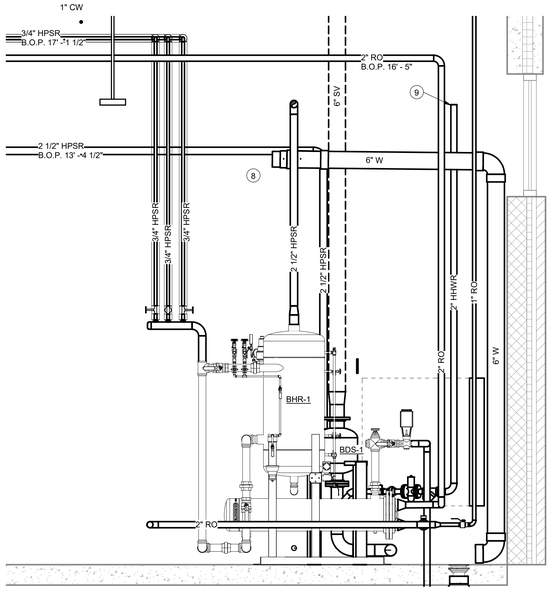
SHEET TITLE

ROOF PIPING PLAN - AREA E

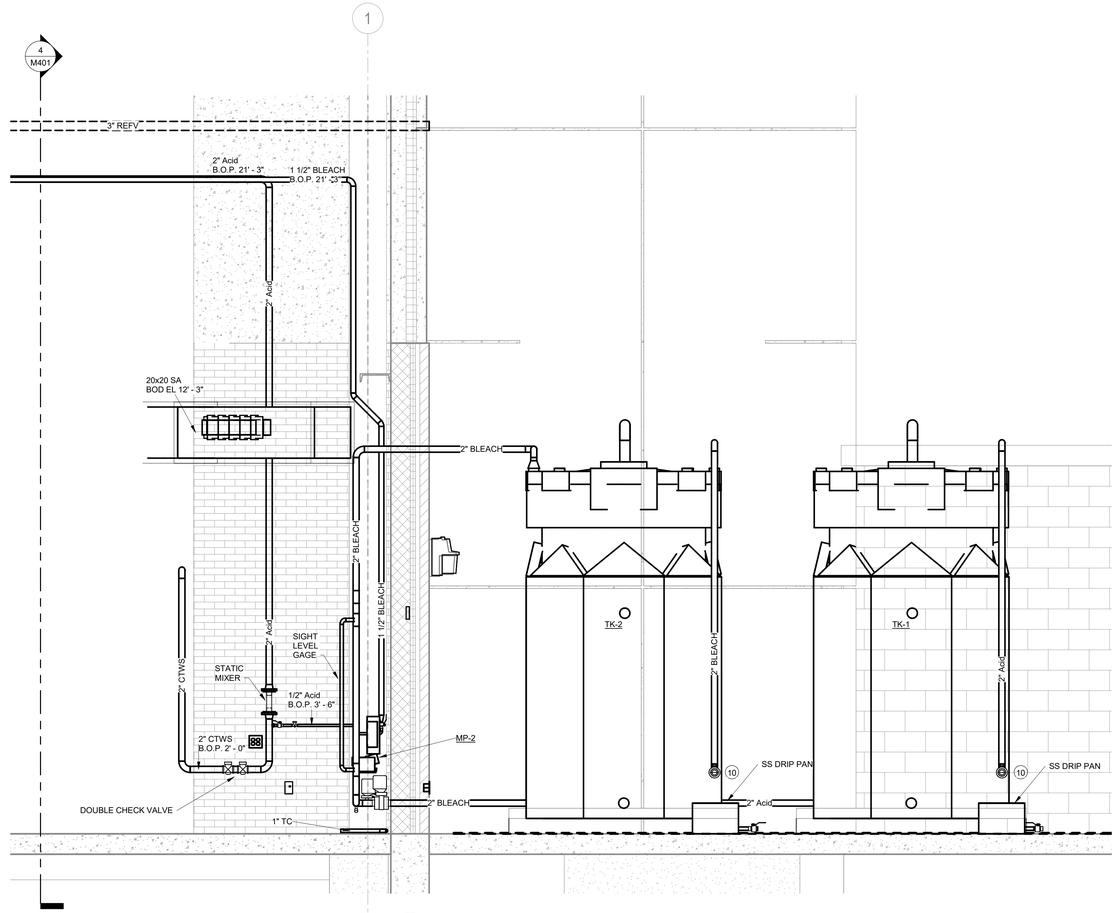
SHEET NUMBER

M321

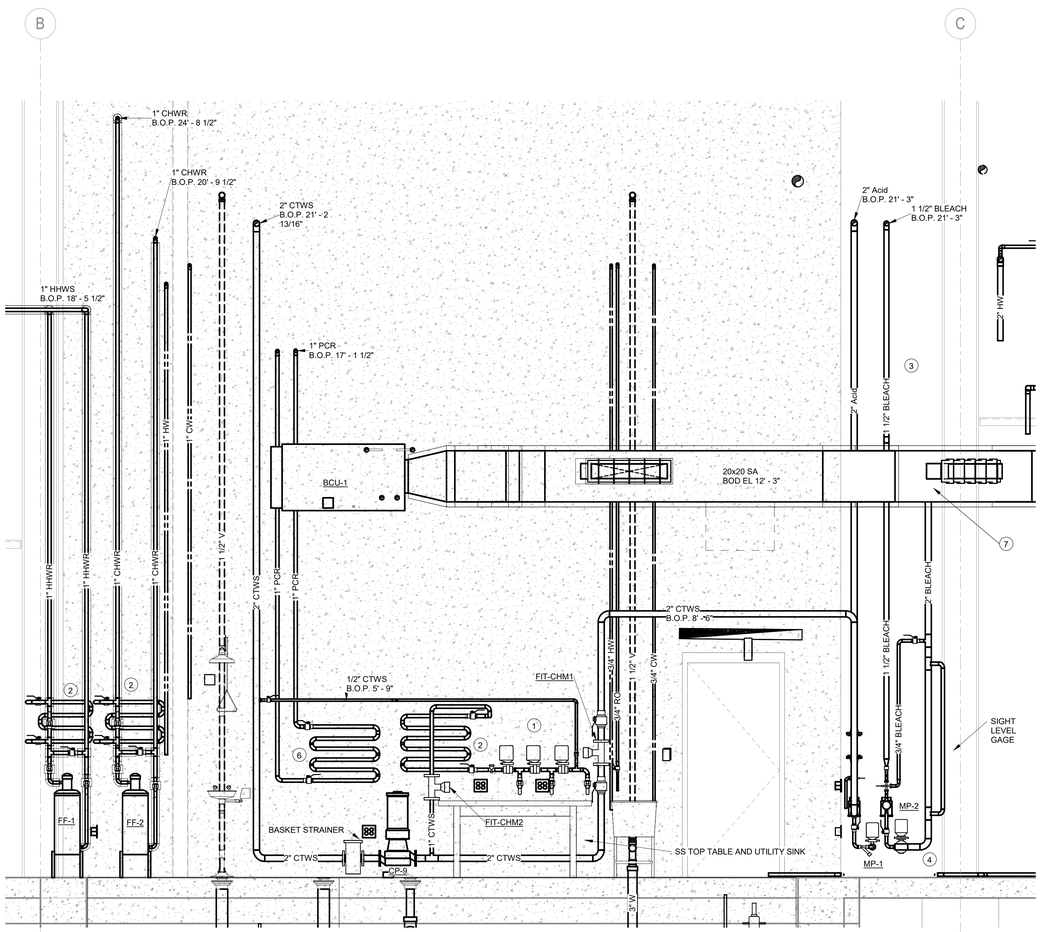
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:27 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



3 **FIRST FLOOR BOILER HEAT RECOVERY SECTION LOOKING EAST**
Scale: 1/2" = 1'-0"

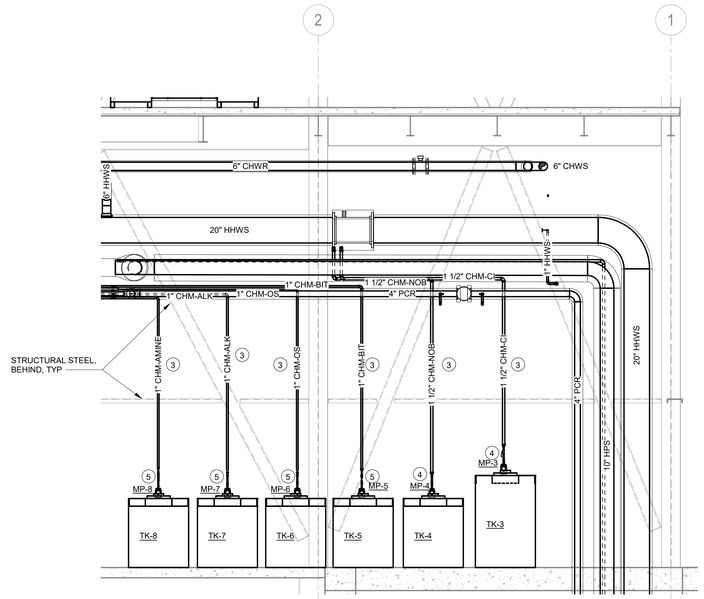


1 **FIRST FLOOR ACID MIXING AND TANKS SECTION LOOKING WEST**
Scale: 1/2" = 1'-0"



4 **FIRST FLOOR CHEMICAL TREATMENT SECTION LOOKING NORTH**
Scale: 1/2" = 1'-0"

CW24



2 **FIRST FLOOR CHEMICAL TREATMENT SECTION LOOKING WEST**
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. CHEMICAL TREATMENT ANALYZERS: COND, ORP, PH, PTSA.
2. CORROSION COUPON RACK.
3. PIPE SIZES NOTED ON DRAWING ARE FOR PVC CASING PIPE.
4. PIPE TO BE 1/2" FEP TUBINING IN 1-1/2" PVC CONDUITS USING SWEEPING ELBOWS.
5. PIPE TO BE 1/4" FEP TUBINING IN 1" PVC CONDUITS USING SWEEPING ELBOWS.
6. CORROSION COUPON RACK WITH CORROSION SENSOR.
7. BLEACH VENT BACK TO TOP OF BLEACH TANK.
8. WASTE DRAIN DOWN FROM COOLING TOWERS
9. CONNECT TO DOMESTIC WATER SERVICE
10. TANK LOADING LINE, VALVE, HOSE CONNECTION AND STAINLESS STEEL DRIP PAN.

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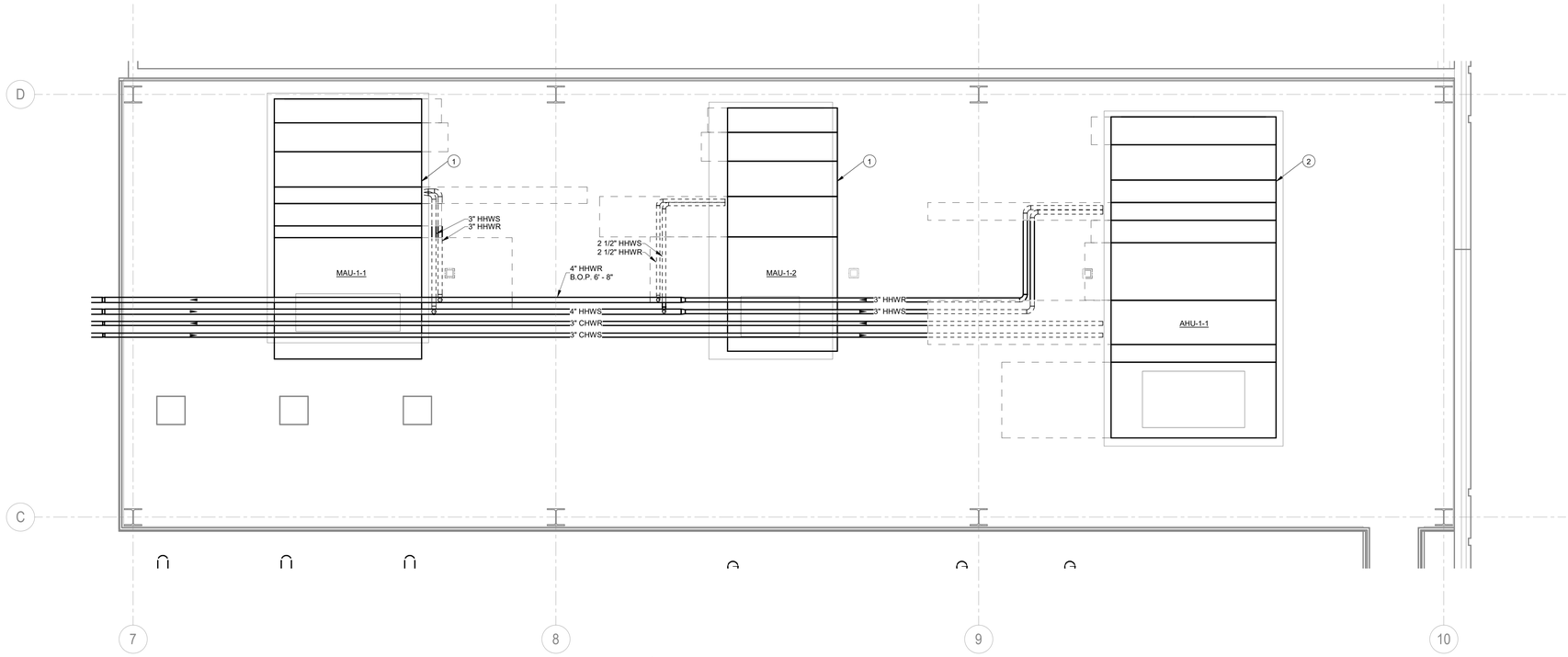
SHEET TITLE

ENLARGED MECHANICAL SECTIONS

SHEET NUMBER

M401

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 2:35:34 PM AESI Proj. No: 21-154



FIRST FLOOR MEZZANINE PIPING PLAN

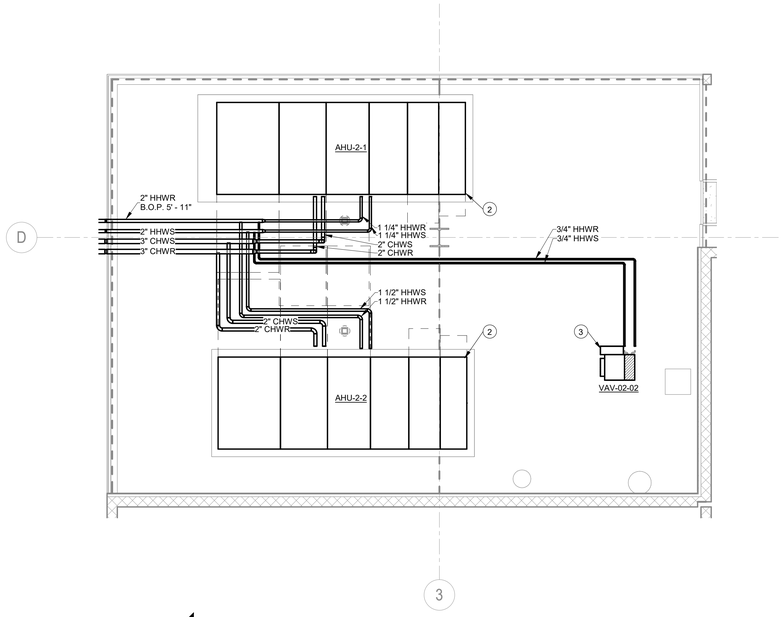
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. GENERAL NOTES FOR INDIVIDUAL SHEETS.
2. NEXT LINE OF NOTES HAVE NO SPACING BETWEEN LINES.

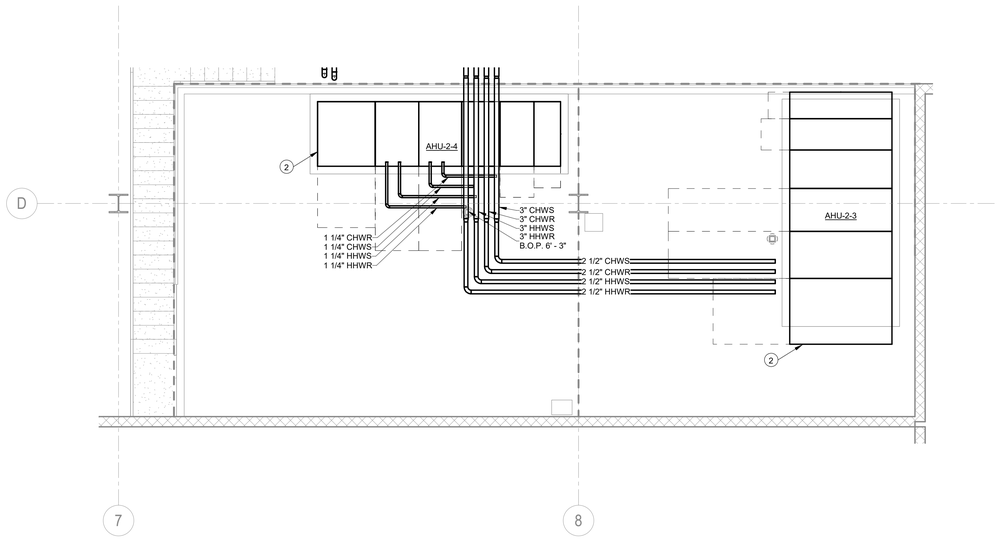
PLAN NOTES:

1. HHWS/R AND CHWS/R PIPING CONNECTIONS TO MAU. SEE DETAIL '1' ON SHEET H501. ROUTE CONDENSATE FROM MAU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
2. HHWS/R AND CHWS/R PIPING CONNECTIONS TO AHU. SEE DETAIL '1' ON SHEET H501. ROUTE CONDENSATE FROM AHU TO NEAREST FLOOR DRAIN AS SHOWN. SEE DETAIL '2' ON SHEET H501.
3. HHWS/R PIPING CONNECTIONS TO VAV BOX. SEE DETAIL '2' ON SHEET H502.



SECOND FLOOR MEZZANINE 1 PIPING PLAN

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



SECOND FLOOR MEZZANINE 2 PIPING PLAN

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

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APPROVED BY: Approver
PROJECT NO. 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

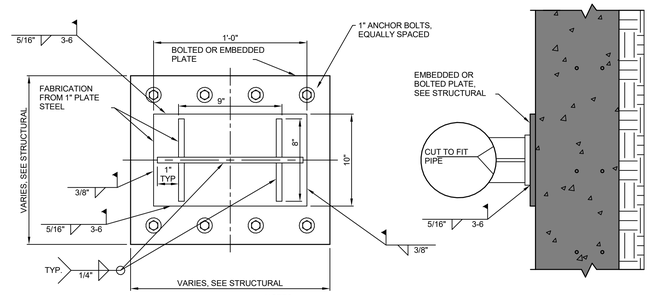
SHEET TITLE

MECHANICAL MEZZANINE PLANS

SHEET NUMBER

M402

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:37 PM AESI Proj. No: 21-154

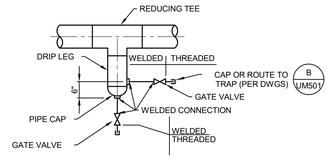


NOTES:

1. PAINT STRUCTURAL STEEL AND MISC. METAL PER PAINT SPECIFICATION.

2 STEAM ANCHOR DETAIL

Scale: 12" = 1'-0"



MAIN SIZE	DRIP LEG SIZE	DRIP LEG LENGTH	VALVE & DRAIN PIPE SIZES
2"	2"	10"	1"
3"	3"	10"	1"
4"	4"	10"	1"
6"	4"	10"	1"
8"	6"	12"	1 1/2"
10"	8"	15"	1 1/2"
12"	8"	18"	1 1/2"
14"	8"	21"	1 1/2"
16"	8"	24"	1 1/2"
18"	8"	27"	1 1/2"

3 STEAM DRIP LEG DETAIL

Scale: 12" = 1'-0"

OWNER

Indiana University Health
Medical Center Campus
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February 10, 2023

REVISIONS

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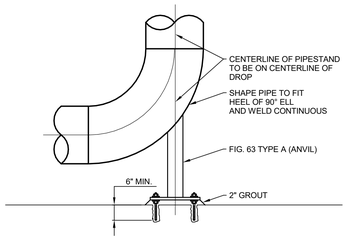
CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: MECHANICAL DETAILS

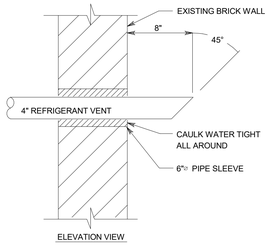
SHEET NUMBER: M501

0 1/2" 1" 2"

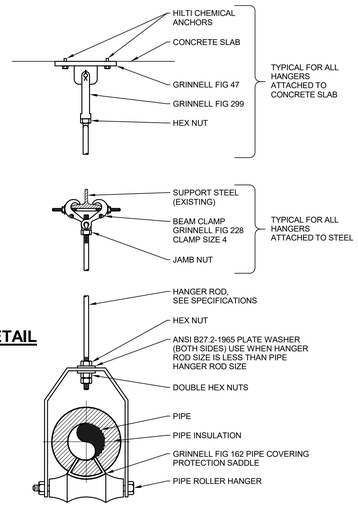
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:37 PM AESI Proj No: 21-154



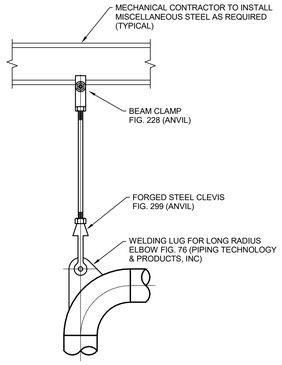
11 **PIPE STAND DETAIL**
Scale: NONE



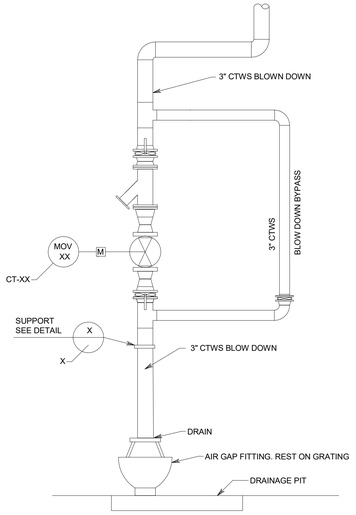
10 **REFRIGERANT VENT WALL PENETRATION DETAIL**
Scale: NONE



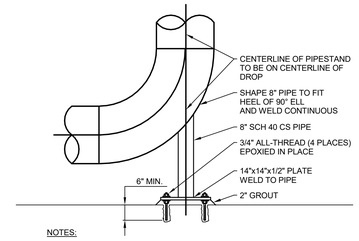
9 **TYPE 7 PIPE SUPPORT DETAIL**
Scale: NONE



6 **ELBOW HANGER DETAIL**
Scale: NONE



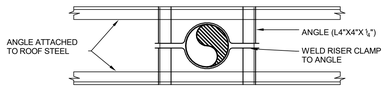
5 **TOWER WATER BLOWDOWN DETAIL**
Scale: NONE



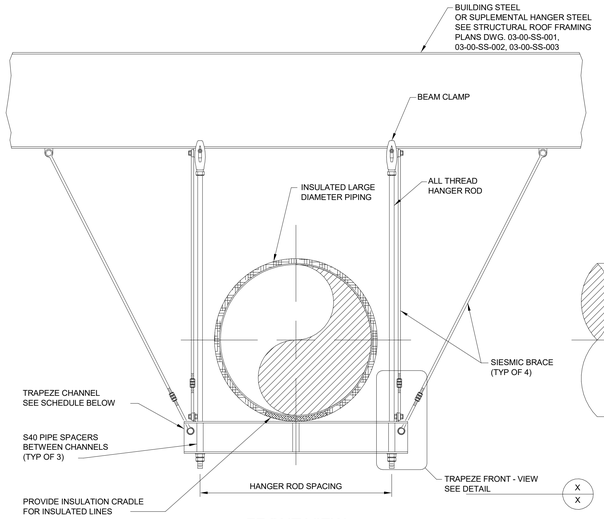
NOTES:

1. FOR PIPE STANDS ON SECTIONS OF PIPE OTHER THAN ELBOW, SHAPE 8" SCH 40 CS PIPE TO FIT SYSTEM PIPE OR COMPONENT.

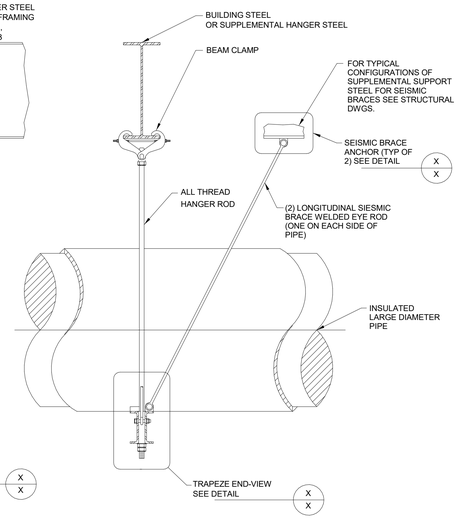
1 **FLOOR PIPE ELBOW SUPPORT DETAIL**
Scale: NONE



PLAN



FRONT VIEW

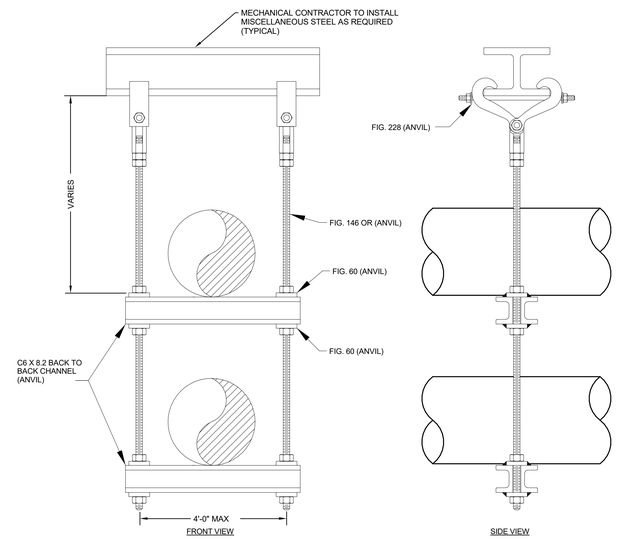


TRAPEZE HANGER DIMENSIONS					
PIPE SIZE	CHANNEL SIZE	PRIMARY HANGER RODS			SEISMIC ROD SIZE
		SIZE	SPACING	CHANNEL SPACERS	
48"	C10 X 15.3	1 1/2"	60"	2"	5/8"
42"	C10 X 15.3	1 1/2"	54"	2"	5/8"
36"	C10 X 15.3	1/2"	48"	2"	5/8"
30"	C6 X 8.2	1"	42"	2"	1/2"
24"	C6 X 8.2	1"	36"	2"	1/2"
EXPANSION TANKS	C4 X 5.4	1/2"	70"	1"	3/8"

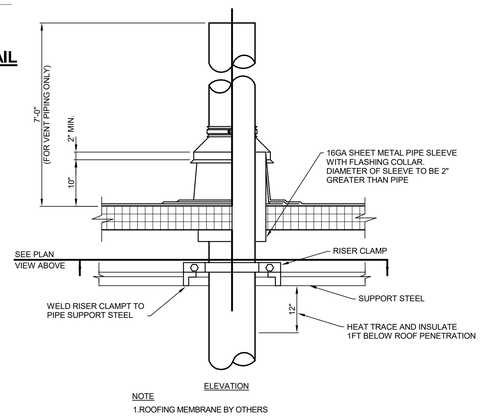
NOTES:

1. HANGER SYMBOLS USED ON PLANS
   - (A) - SIMPLE TRAPEZE HANGER WITH NO SEISMIC BRACING
   - (A) - TRAPEZE HANGER WITH TRANSVERSE BRACING ONLY
   - (A) - TRAPEZE HANGER WITH TRASVERSE AND LONGITUDINAL BRACING
2. CHANNEL SPACERS INDICATED IN SCHEDULE ARE S40 PIPE
3. ROOF STEEL SHOWN LEVEL ON THIS DWG ACTUALLY HAS GRADUAL SLOPE

12 **TRAPEZE HANGER DETAIL**
Scale: NONE

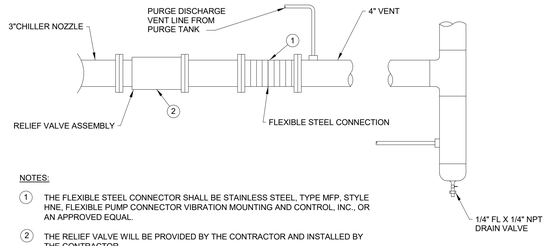


7 **H-3 & H-4 PIPE HANGER DETAIL**
Scale: NONE



NOTE
1.ROOFING MEMBRANE BY OTHERS

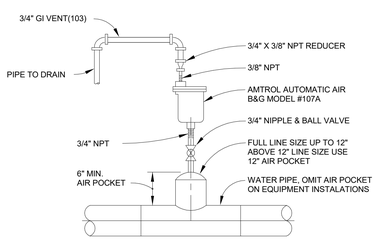
2 **ROOF PENETRATION COLD PIPE NO INSULATION DETAIL**
Scale: NONE



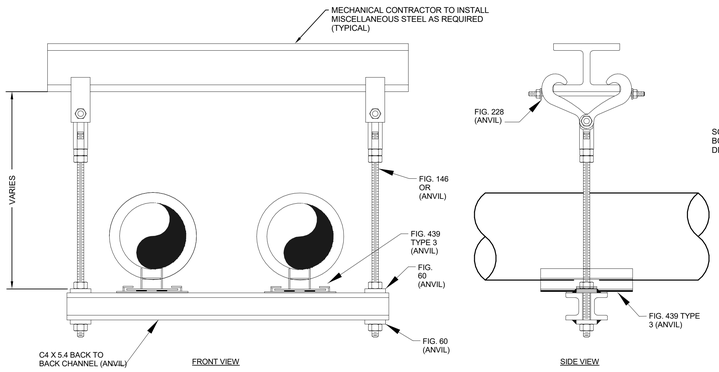
NOTES:

1. THE FLEXIBLE STEEL CONNECTOR SHALL BE STAINLESS STEEL, TYPE MFP, STYLE HNE, FLEXIBLE PUMP CONNECTOR VIBRATION MOUNTING AND CONTROL, INC., OR AN APPROVED EQUAL.
2. THE RELIEF VALVE WILL BE PROVIDED BY THE CONTRACTOR AND INSTALLED BY THE CONTRACTOR.

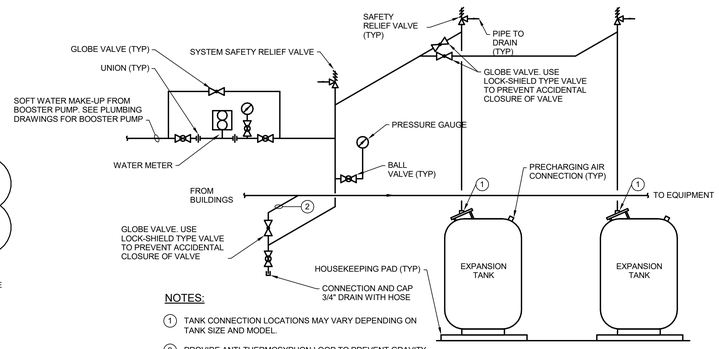
3 **REFRIGERANT RUPTURE DISK DETAIL**
Scale: NONE



13 **AUTOMATIC AIR VENT DETAIL**
Scale: NONE



8 **H-2 PIPE HANGER DETAIL**
Scale: NONE



NOTES:

1. TANK CONNECTION LOCATIONS MAY VARY DEPENDING ON TANK SIZE AND MODEL.
2. PROVIDE ANTI-THERMOSYPHON LOOP TO PREVENT GRAVITY HEATING OF TANK. 12" MIN. DROP.

4 **EXPANSION TANK PIPING DETAIL**
Scale: NONE

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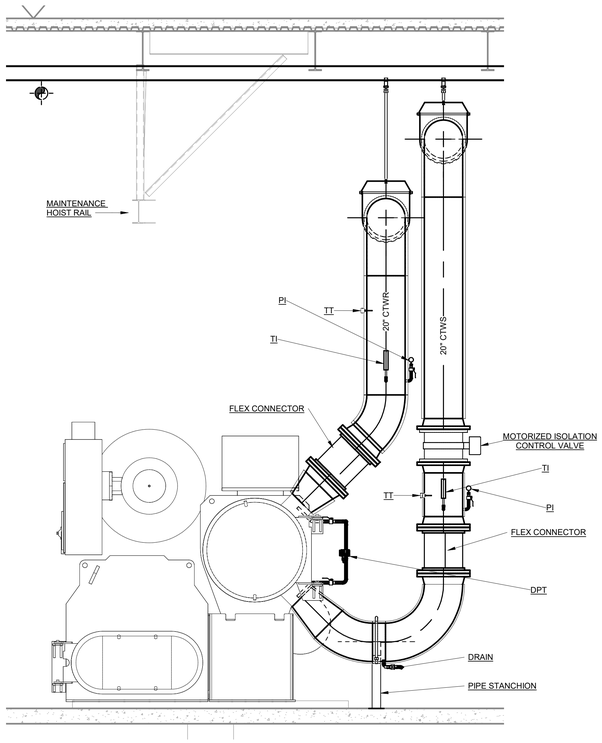
SHEET TITLE

MECHANICAL DETAILS

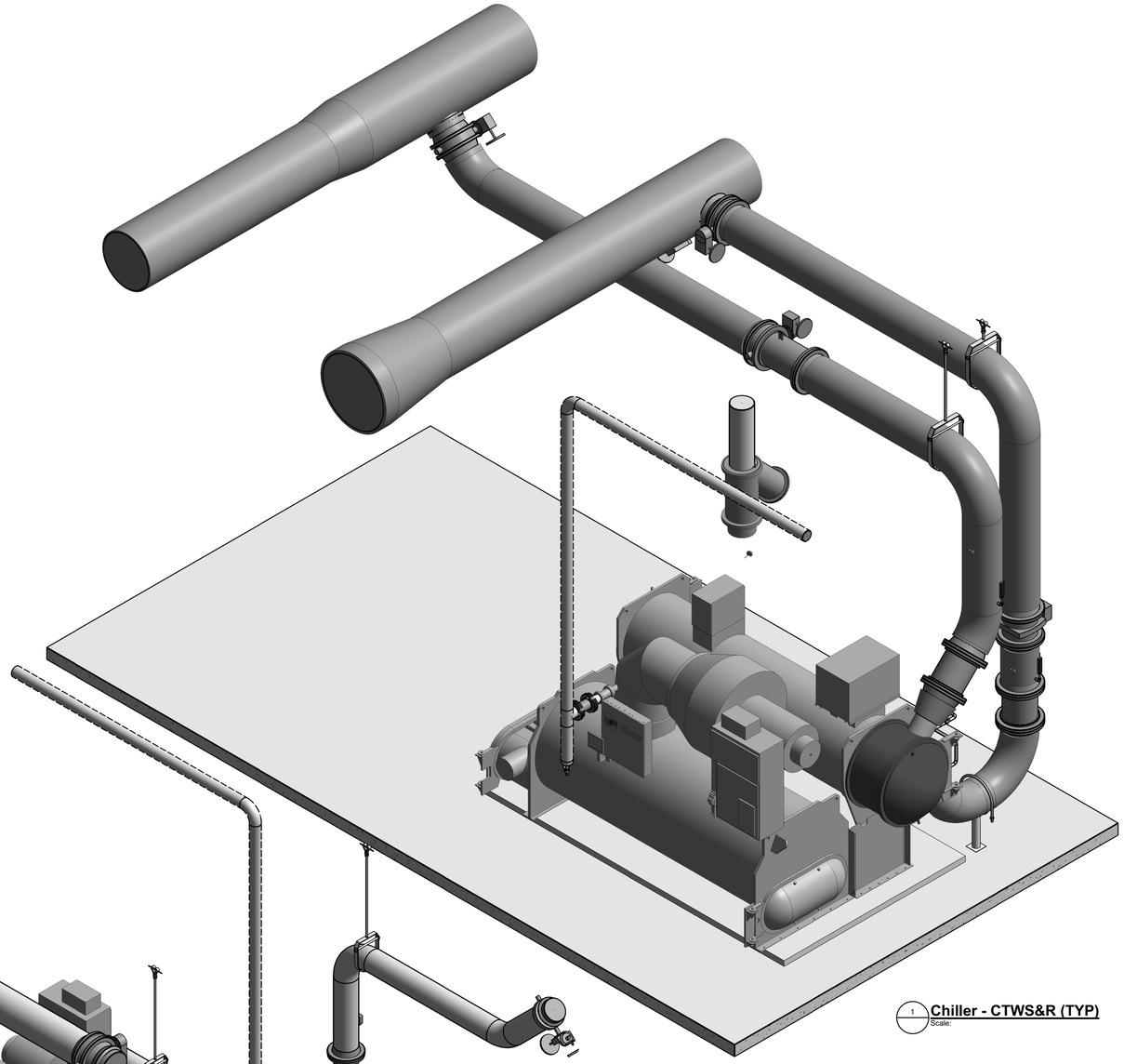
SHEET NUMBER

M502

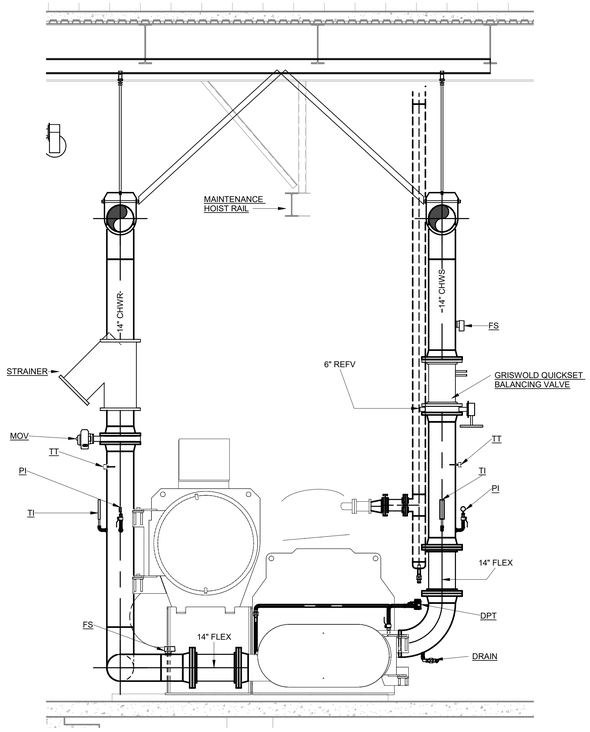
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:38 PM AESI Proj. No: 21-154



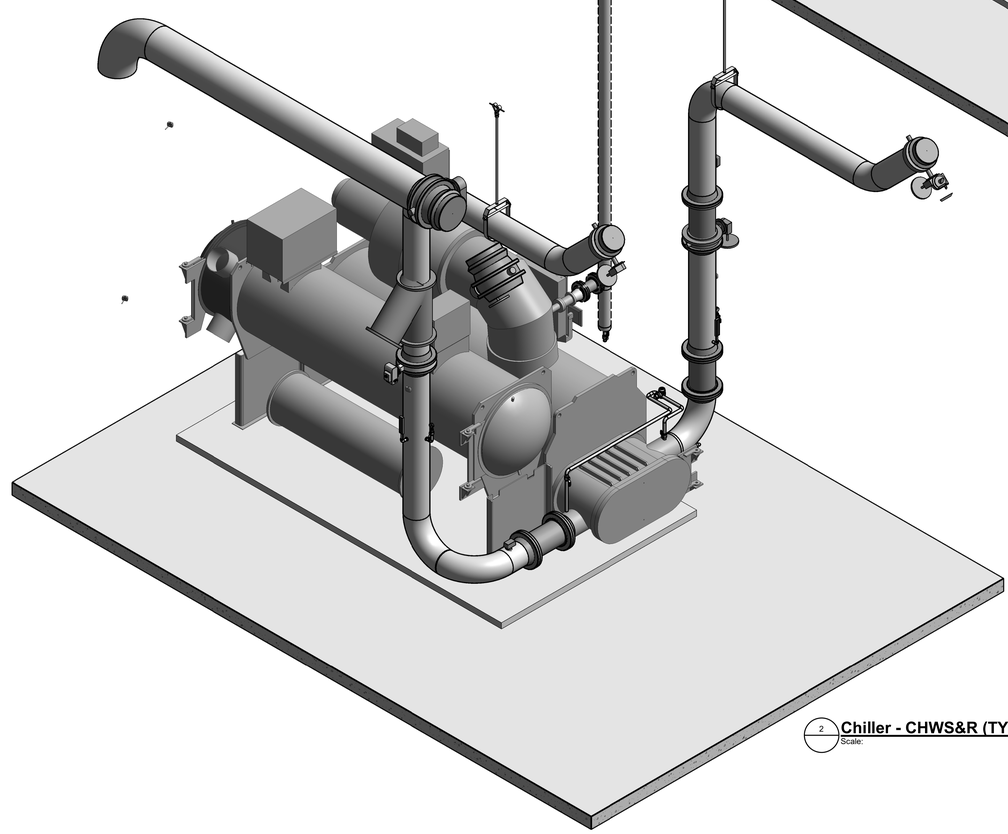
4 **Chiller - CTWS&R (TYP)**
Scale: 3/8" = 1'-0"



1 **Chiller - CTWS&R (TYP)**
Scale:



3 **Chiller CHWS&R (TYP)**
Scale: 3/8" = 1'-0"



2 **Chiller - CHWS&R (TYP)**
Scale:

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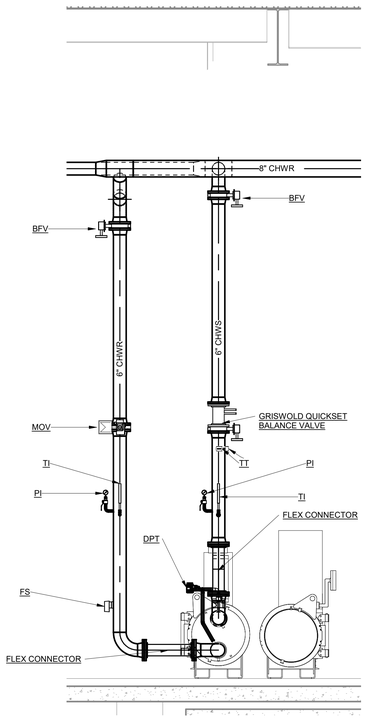
SHEET TITLE

MECHANICAL EQUIPMENT DETAILS

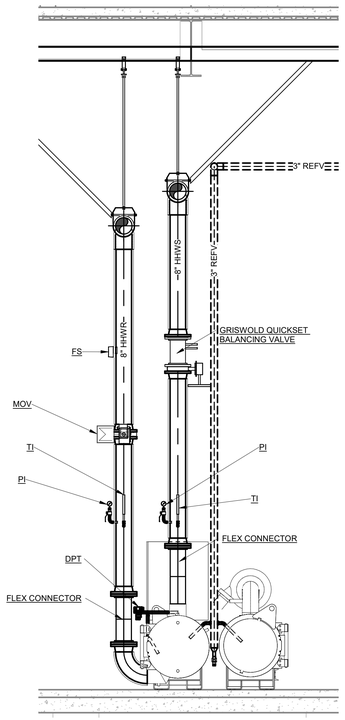
SHEET NUMBER

M503

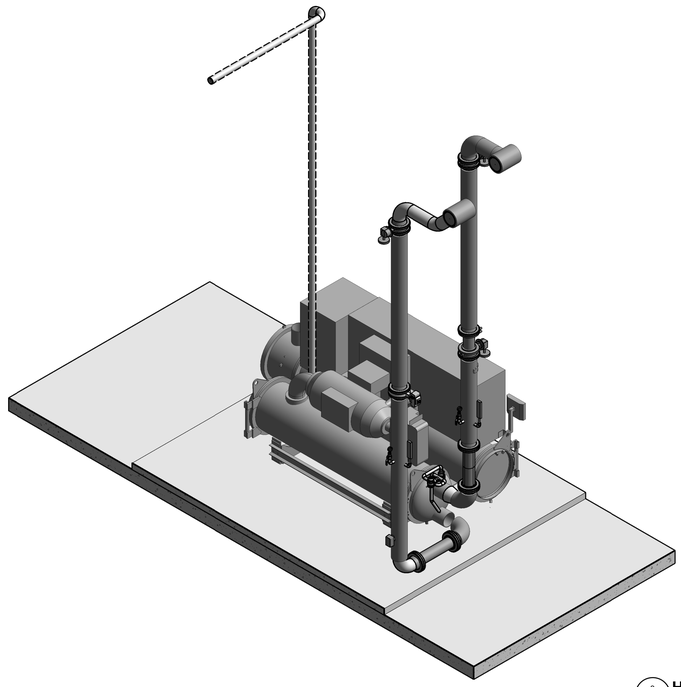
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:44 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



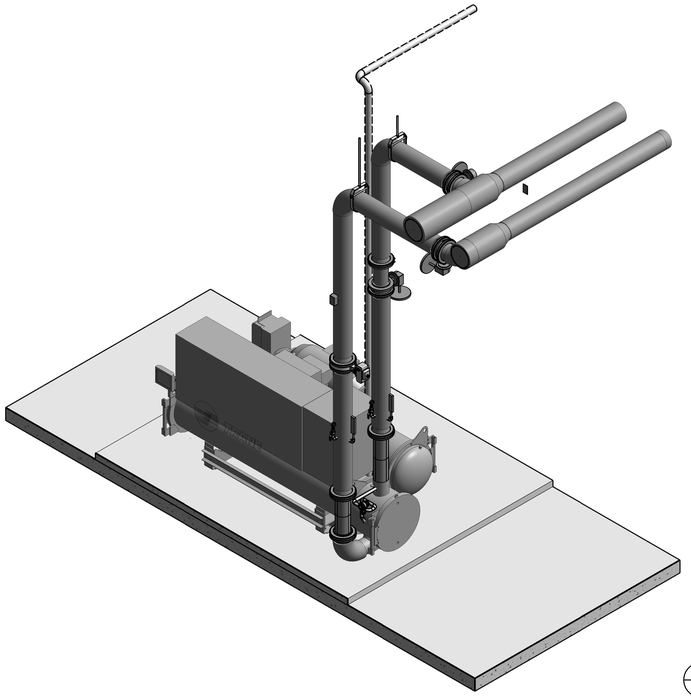
1 **HRC - CHWS&R (TYP)**
Scale: 3/8" = 1'-0"



2 **HRC - HHWS&R (TYP)**
Scale: 3/8" = 1'-0"



3 **HRC - CHWS&R (TYP)**
Scale:



4 **HRC - HHWS&R (TYP)**
Scale:

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:50 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

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SHEET TITLE

MECHANICAL EQUIPMENT DETAILS

SHEET NUMBER

M504

COOLING TOWER SCHEDULE

NOTES:
1. TWO (2) LADDERS WITH SAFETY CAGE TO ACCESS TOP OF TOWERS FROM COOLING TOWER ACCESS PLATFOMS.
2. SAFETY RAILING AROUND FAN DECK AT TOP OF TOWER.
3. FAN DECK EXTENSION PLATFORM.
4. INTERNAL ACCESS WALKWAY THROUGH CENTER OF TOWERS WITH ACCESS DOORS ON EACH END OF TOWER CELLS. INTERNAL FAN MAINTENANCE PLATFORM WITH INTERNAL ACCESS LADDER.
5. 18" BOTTOM FLANGED RETURN PIPING TO INTERNAL TOWER RETURN PIPE. INCLUDES PIPING THRU TOWER AND OVER TOP DECK TO DISTRIBUTION NOZZLES. INTERNAL PIPING SHALL BE SCH 40 HDPE.
6. 2" MOTORIZED FILL VALVE FOR EACH BASIN. LOW WATER AND HIGH WATER LEVEL ALARM FOR EACH COLLECTION BASIN.
7. TWO (2) 18" EQUALIZER PIPE CONNECTION(S) OUT BOTTOM OF TOWER BASINS.
8. PVC FILL WITH INTEGRAL LOUVERS.
9. FAN VELOCITY RECOVERY STACK.
10. LOW OIL LEVEL SWITCH FOR EACH GEAR DRIVE.
11. SOLID STATE FAN VIBRATION SWITCH AND TRANSMITTER FOR EACH FAN.
12. BASIN TEMPERATURE SENSOR FOR EACH BASIN.
13. BASE BID; 300 SERIES STAINLESS STEEL HOT WATER AND COLLECTION WATER BASIN WITH STAINLESS STEEL FRAME. STAINLESS STEEL INTERNAL WALKWAYS, LADDERS, HANDRAILS AND PLATFORMS. GALVANIZED STEEEL CASING, EXTERNAL FAN DECK PLATFORMS, LADDRS, AND HANDRAILS.
14. ALTERNATE BID-1 ; ALL 300 SERIES STAINLESS STEEL CONSTRUCTION ,HOT WATER AND COLLECTION WATER BASINS, STAINLESS STEEL FRAME, STAINLESS STEEL CASING, STAINLESS STEEL INTERNAL WALKWAYS, LADEERS, HAINRAILS AND PLATFORMS. GALVANIZED STEEL EXTERNAL FAN DECK HANDRAILS.
15. ALTERNATE BID-X ; PROVIDE FAN DECK LEVEL INTERCONNECTION PLATFORMS WITH HAINRAILS BETWEEN COOLING TOWER CELLS.
16. TOWER MANUFACTURER TO PROVIDE 60 kW TOWER BASIN HEATERS WITH REMOTE TEST AND MONITORING OF HEATING ELEMENTS.

			DESIGN CRITERIA						INLET		OUTLET		FAN(S)					FAN MOTOR(S)								FAN MOTOR(S)				FAN ELECTRICAL DATA				ELECTRIC BASIN HEATER								BASIN HEATER					BASIS OF DESIGN		MISCELLANEOUS					
UNIT TAG	LOCATION	TYPE	CAPACITY	HEAT REJECTION (BTU/HR)	EWB	FLOW	EWT	LWT	SIZE	LOCATION	SIZE	LOCATION	NO.	AIRFLOW	DRIVE TYPE	DIA	FAN SPEED RPM	NO. MOTORS	HP	BHP	RPM	VOLTS	PH	Hz	FLA	MCA	MOCP	MOTOR TYPE	DISC SW BY	STARTER TYPE	STARTER BY	NO OF HEATERS	KW PER HEATER	VOLTS	PH	HZ	DESIGN AIR TEMP	BASIN TEMP	FLA	MCA	MOCP	DISCONNECT SWITCH BY SECONDARY	CONTROL BY SECONDARY	MANUFACTURER	MODEL NO.	LENGTH	WIDTH	HEIGHT	SHIPPING WEIGHT	OPERATING WEIGHT	NOTES
CT-1	ROOF	CROSSFLOW	2,000	30,000,000	78.0 °F	6,000 GPM	95.0 °F	85.0 °F	18"	BOTTOM	24"	BOTTOM	1	552,900 CFM	GEAR	19"	202	1	125	110.1	1,800	480 V	3	60 Hz	151 A	0 A	0 A	TEFC	EC	VFD	EC	4	15	480 V	3	60 Hz	-20.0 °F	40.0 °F	78 A	0 A	0 A	EC	MFG	MARLEY	NC8422YAN1	22' - 4 3/4"	29' - 6"	27' - 0 1/16"	44,278 lb	103,800 lb	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
CT-2	ROOF	CROSSFLOW	2,000	30,000,000	78.0 °F	6,000 GPM	95.0 °F	85.0 °F	18"	BOTTOM	24"	BOTTOM	1	552,900 CFM	GEAR	19"	202	1	125	110.1	1,800	480 V	3	60 Hz	151 A	0 A	0 A	TEFC	EC	VFD	EC	4	15	480 V	3	60 Hz	-20.0 °F	40.0 °F	78 A	0 A	0 A	EC	MFG	MARLEY	NC8422YAN1	22' - 4 3/4"	29' - 6"	27' - 0 1/16"	44,278 lb	103,800 lb	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
CT-3	ROOF	CROSSFLOW	2,000	30,000,000	78.0 °F	6,000 GPM	95.0 °F	85.0 °F	18"	BOTTOM	24"	BOTTOM	1	552,900 CFM	GEAR	19"	202	1	125	110.1	1,800	480 V	3	60 Hz	151 A	0 A	0 A	TEFC	EC	VFD	EC	4	15	480 V	3	60 Hz	-20.0 °F	40.0 °F	78 A	0 A	0 A	EC	MFG	MARLEY	NC8422YAN1	22' - 4 3/4"	29' - 6"	27' - 0 1/16"	44,278 lb	103,800 lb	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
CT-4	ROOF	CROSSFLOW	2,000	30,000,000	78.0 °F	6,000 GPM	95.0 °F	85.0 °F	18"	BOTTOM	24"	BOTTOM	1	552,900 CFM	GEAR	19"	202	1	125	110.1	1,800	480 V	3	60 Hz	151 A	0 A	0 A	TEFC	EC	VFD	EC	4	15	480 V	3	60 Hz	-20.0 °F	40.0 °F	78 A	0 A	0 A	EC	MFG	MARLEY	NC8422YAN1	22' - 4 3/4"	29' - 6"	27' - 0 1/16"	44,278 lb	103,800 lb	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
CT-5	ROOF	CROSSFLOW	2,000	30,000,000	78.0 °F	6,000 GPM	95.0 °F	85.0 °F	18"	BOTTOM	24"	BOTTOM	1	552,900 CFM	GEAR	19"	202	1	125	110.1	1,800	480 V	3	60 Hz	151 A	0 A	0 A	TEFC	EC	VFD	EC	4	15	480 V	3	60 Hz	-20.0 °F	40.0 °F	78 A	0 A	0 A	EC	MFG	MARLEY	NC8422YAN1	22' - 4 3/4"	29' - 6"	27' - 0 1/16"	44,278 lb	103,800 lb	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16
CT-6	ROOF	CROSSFLOW	2,000	30,000,000	78.0 °F	6,000 GPM	95.0 °F	85.0 °F	18"	BOTTOM	24"	BOTTOM	1	552,900 CFM	GEAR	19"	202	1	125	110.1	1,800	480 V	3	60 Hz	151 A	0 A	0 A	TEFC	EC	VFD	EC	4	15	480 V	3	60 Hz	-20.0 °F	40.0 °F	78 A	0 A	0 A	EC	MFG	MARLEY	NC8422YAN1	22' - 4 3/4"	29' - 6"	27' - 0 1/16"	44,278 lb	103,800 lb	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

CHILLER SCHEDULE

NOTES:
1. UNIT MOUNTED 4160 V AUTO TRANSFORMER AND CONTROL PANEL.
2. SEISMIC VIBRATION ISOLATORS AT CHILLER SUPPORTS
3. TWP STAGE VSD MAGNETIC BEARING CENTRIFUGAL.
4. 150# ASME DESIGN, HINGED COVER MARINE WATER BOXES ON BOTH EVAPORATORS AND CONDENSERS. HINGED COVERS ON EVAPORATORS AND CONDENSERS OPPOSITE END OF MARINE WATER BOXES.
5. UNIT MOUNTED 460 V VFD AND CONTROL PANEL.

						EVAPORATOR						EVAPORATOR			CONDENSER							COMPRESSOR																BASIS OF DESIGN			
UNIT TAG	LOCATION	TOTAL POWER KW	COOLING NPLV.IP KW/TON	CHILLER HEATING COP.H KW/KW	HEATING AND COOLING COP.SHC KW/KW	TONS	FLUID	FOULING FACTOR HR-SQFT DEG F/BTU	NO. OF PASSES	FLOW	GPM MIN	EWT	LWT	WATER PRESS DROP	FLUID	FOULING FACTOR HR-SQFT DEG F/HR	NO OF PASSES	FLOW	GPM SECONDARY	EWT	LWT	WATER PRESS DROP	TYPE	QTY.	REFRIG.TYPE	REFRIGERANT CHARGE	NO. OF STAGES	MOTOR LRA	FLA	MCA	MOP	VOLTS	PH	Hz	DISC SW BY	STARTER BY	STARTER TYPE	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	OPERATING WEIGHT	NOTES
CH-1	CHILLER PLANT 114	1217	0.5066	N/A	N/A	2000	CHW	0.0004	2	3000 GPM	1122 GPM	58.0 °F	42.0 °F	9.06 FT	CTW	0.00025	2	6000 GPM	2316 GPM	85.0 °F	95.0 °F	22.9 FT	CENTRIFUGAL	1	R-12332D	2950.00 lb	2	994	194 A	242 A	390 A	4160 V	1	60 Hz	MFG	MFG	AUTO TRANSFORMER	Y	DAC	TRANE	CVHW	73,027 lb	1, 2, 4
CH-2	CHILLER PLANT 114	1217	0.5066	N/A	N/A	2000	CHW	0.0004	2	3000 GPM	1122 GPM	58.0 °F	42.0 °F	9.06 FT	CTW	0.00025	2	6000 GPM	2316 GPM	85.0 °F	95.0 °F	22.9 FT	CENTRIFUGAL	1	R-12332D	2950.00 lb	2	994	194 A	242 A	390 A	4160 V	1	60 Hz	MFG	MFG	AUTO TRANSFORMER	Y	DAC	TRANE	CVHW	73,027 lb	1, 2, 4
CH-3	CHILLER PLANT 114	1217	0.5066	N/A	N/A	2000	CHW	0.0004	2	3000 GPM	1122 GPM	58.0 °F	42.0 °F	9.06 FT	CTW	0.00025	2	6000 GPM	2316 GPM	85.0 °F	95.0 °F	22.9 FT	CENTRIFUGAL	1	R-12332D	2950.00 lb	2	994	194 A	242 A	390 A	4160 V	1	60 Hz	MFG	MFG	AUTO TRANSFORMER	Y	DAC	TRANE	CVHW	73,027 lb	1, 2, 4
CH-4	CHILLER PLANT 114	1217	0.5066	N/A	N/A	2000	CHW	0.0004	2	3000 GPM	1122 GPM	58.0 °F	42.0 °F	9.06 FT	CTW	0.00025	2	6000 GPM	2316 GPM	85.0 °F	95.0 °F	22.9 FT	CENTRIFUGAL	1	R-12332D	2950.00 lb	2	994	194 A	242 A	390 A	4160 V	1	60 Hz	MFG	MFG	AUTO TRANSFORMER	Y	DAC	TRANE	CVHW	73,027 lb	1, 2, 4
CH-5	CHILLER PLANT 114	1217	0.5066	N/A	N/A	2000	CHW	0.0004	2	3000 GPM	1122 GPM	58.0 °F	42.0 °F	9.06 FT	CTW	0.00025	2	6000 GPM	2316 GPM	85.0 °F	95.0 °F	22.9 FT	CENTRIFUGAL	1	R-12332D	2950.00 lb	2	994	194 A	242 A	390 A	4160 V	1	60 Hz	MFG	MFG	AUTO TRANSFORMER	Y	DAC	TRANE	CVHW	73,027 lb	1, 2, 4
CH-6	CHILLER PLANT 114	1217	0.5066	N/A	N/A	2000	CHW	0.0004	2	3000 GPM	1122 GPM	58.0 °F	42.0 °F	9.06 FT	CTW	0.00025	2	6000 GPM	2316 GPM	85.0 °F	95.0 °F	22.9 FT	CENTRIFUGAL	1	R-12332D	2950.00 lb	2	994	194 A	242 A	390 A	4160 V	1	60 Hz	MFG	MFG	AUTO TRANSFORMER	Y	DAC	TRANE	CVHW	73,027 lb	1, 2, 4
HRC-1	CHILLER PLANT 114	329.7	0.3790	4.18	N/A	300	CHW	0.0001	2	448 GPM	295 GPM	58.0 °F	42.0 °F	3.88 FT	CTW	0.00025	2	461 GPM	425 GPM	100.0 °F	120.0 °F	32.97 FT	VSD CENTRIFUGAL	1	R-5131	800.00 lb	2	1000	244 A	304 A	500 A	480 V	3	60 Hz	MFG	MFG	VFD	Y	DDC	TRANE	HDWA	16,564 lb	3, 4, 5
HRC-2	CHILLER PLANT 114	329.7	0.3790	4.18	N/A	300	CHW	0.0001	2	448 GPM	295 GPM	58.0 °F	42.0 °F	3.88 FT	CTW	0.00025	2	461 GPM	425 GPM	100.0 °F	120.0 °F	32.97 FT	VSD CENTRIFUGAL	1	R-5131	800.00 lb	2	1000	244 A	304 A	500 A	480 V	3	60 Hz	MFG	MFG	VFD	Y	DDC	TRANE	HDWA	16,564 lb	3, 4, 5
HRC-3	CHILLER PLANT 114	329.7	0.3790	4.18	N/A	300	CHW	0.0001	2	448 GPM	295 GPM	58.0 °F	42.0 °F	3.88 FT	CTW	0.00025	2	461 GPM	425 GPM	100.0 °F	120.0 °F	32.97 FT	VSD CENTRIFUGAL	1	R-5131	800.00 lb	2	1000	244 A	304 A	500 A	480 V	3	60 Hz	MFG	MFG	VFD	Y	DDC	TRANE	HDWA	16,564 lb	3, 4, 5
HRC-4	CHILLER PLANT 114	329.7	0.3790	4.18	N/A	300	CHW	0.0001	2	448 GPM	295 GPM	58.0 °F	42.0 °F	3.88 FT	CTW	0.00025	2	461 GPM	425 GPM	100.0 °F	120.0 °F	32.97 FT	VSD CENTRIFUGAL	1	R-5131	800.00 lb	2	1000	244 A	304 A	500 A	480 V	3	60 Hz	MFG	MFG	VFD	Y	DDC	TRANE	HDWA	16,564 lb	3, 4, 5
HRC-5	CHILLER PLANT 114	329.7	0.3790	4.18	N/A	300	CHW	0.0001	2	448 GPM	295 GPM	58.0 °F	42.0 °F	3.88 FT	CTW	0.00025	2	461 GPM	425 GPM	100.0 °F	120.0 °F	32.97 FT	VSD CENTRIFUGAL	1	R-5131	800.00 lb	2	1000	244 A	304 A	500 A	480 V	3	60 Hz	MFG	MFG	VFD	Y	DDC	TRANE	HDWA	16,564 lb	3, 4, 5

OWNER

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PROJECT

Central Utility Plant

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M601

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:52 PM AESI Proj. No: 21-154

CONTROL TYPE:

DDC DIRECT DIGITAL CONTROL
HOA HAND OFF AUTOMATIC
IC INTEGRAL CONTROLS
IL INTERLOCK WITH OTHER EQUIPMENT
PB PUSH BUTTON
RC RUNS CONSTANTLY
TC TIME CLOCK
WS WALL SWITCH
WSPL WALL SWITCH WITH PILOT LIGHT

PUMP SCHEDULE

NOTES:
1. WITH OSHA COUPLING GUARD
2. 304 SS SHAFT
3. 300 PSI WORKING PRESSURE
4. 175 PSI WORKING PRESSURE

		DESIGN CRITERIA											MOTOR DATA								ELECTRICAL				BASIS OF DESIGN		
UNIT TAG	LOCATION	TYPE	MINIMUM SHUTOFF HEAD FT.	NPSHR MAX	PUMP BASIN RPM	FLOW	TDH	FLUID	MIN. FLUID TEMP.	MAX. FLUID TEMP.	MIN. IMPELLER DIA.	MIN. EFFICIENCY	BHP	HP	RPM	VOLTS	PH	FLA	MCA	MOCP	STARTER BY	STARTER TYPE	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	NOTES
CHWP-1	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CHWP-2	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CHWP-3	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CHWP-4	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CHWP-5	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CHWP-6	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CHWP-7	RECEIVING 105	BASE MOUNTED	303	9.36	1781	3000 GPM	252 FT	CHILLED WATER	42.0 °F	60.0 °F	17.5	82.1%	232	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-8x10x17.5B	1, 2, 3
CTWP-1	CHILLER PLANT 114	BASE MOUNTED	164	38.7	1724	6000 GPM	116 FT	CONDENSER WATER	55.0 °F	95.0 °F	13	81.6%	215	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-10X12X13.5 A	1, 2, 4
CTWP-2	CHILLER PLANT 114	BASE MOUNTED	164	38.7	1724	6000 GPM	116 FT	CONDENSER WATER	55.0 °F	95.0 °F	13	81.6%	215	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-10X12X13.5 A	1, 2, 4
CTWP-3	CHILLER PLANT 114	BASE MOUNTED	164	38.7	1724	6000 GPM	116 FT	CONDENSER WATER	55.0 °F	95.0 °F	13	81.6%	215	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-10X12X13.5 A	1, 2, 4
CTWP-4	CHILLER PLANT 114	BASE MOUNTED	164	38.7	1724	6000 GPM	116 FT	CONDENSER WATER	55.0 °F	95.0 °F	13	81.6%	215	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-10X12X13.5 A	1, 2, 4
CTWP-5	CHILLER PLANT 114	BASE MOUNTED	164	38.7	1724	6000 GPM	116 FT	CONDENSER WATER	55.0 °F	95.0 °F	13	81.6%	215	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-10X12X13.5 A	1, 2, 4
CTWP-6	CHILLER PLANT 114	BASE MOUNTED	164	38.7	1724	6000 GPM	116 FT	CONDENSER WATER	55.0 °F	95.0 °F	13	81.6%	215	250	1800	480 V	3	280 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC-10X12X13.5 A	1, 2, 4
HHWP-1	BOILER ROOM 109	BASE MOUNTED	277	10.1	1685	1000 GPM	245 FT	HEATING HOT WATER	60.0 °F	130.0 °F	16.5	73.5	84.1	125	1800	480 V	3	156 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC 4X6X17.5A	
HHWP-2	BOILER ROOM 109	BASE MOUNTED	277	10.1	1685	1000 GPM	245 FT	HEATING HOT WATER	60.0 °F	130.0 °F	16.5	73.5	84.1	125	1800	480 V	3	156 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC 4X6X17.5A	
HHWP-3	BOILER ROOM 109	BASE MOUNTED	277	10.1	1685	1000 GPM	245 FT	HEATING HOT WATER	60.0 °F	130.0 °F	16.5	73.5	84.1	125	1800	480 V	3	156 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC 4X6X17.5A	
HHWP-4	BOILER ROOM 109	BASE MOUNTED	277	10.1	1685	1000 GPM	245 FT	HEATING HOT WATER	60.0 °F	130.0 °F	16.5	73.5	84.1	125	1800	480 V	3	156 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC 4X6X17.5A	
HHWP-5	BOILER ROOM 109	BASE MOUNTED	277	10.1	1685	1000 GPM	245 FT	HEATING HOT WATER	60.0 °F	130.0 °F	16.5	73.5	84.1	125	1800	480 V	3	156 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC 4X6X17.5A	
HHWP-6	BOILER ROOM 109	BASE MOUNTED	277	10.1	1685	1000 GPM	245 FT	HEATING HOT WATER	60.0 °F	130.0 °F	16.5	73.5	84.1	125	1800	480 V	3	156 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	VSC 4X6X17.5A	
HRCWP-1	RECEIVING 105	BASE MOUNTED	157	14.5	1656	1400 GPM	107 FT	CHILLED WATER	42.0 °F	60.0 °F	13	77.9%	48.5	60	1800	480 V	3	75.5 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	E1510-5GB	1, 2, 4
HRCWP-2	RECEIVING 105	BASE MOUNTED	157	14.5	1656	1400 GPM	107 FT	CHILLED WATER	42.0 °F	60.0 °F	13	77.9%	48.5	60	1800	480 V	3	75.5 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	E1510-5GB	1, 2, 4
HRCWP-3	RECEIVING 105	BASE MOUNTED	157	14.5	1656	1400 GPM	107 FT	CHILLED WATER	42.0 °F	60.0 °F	13	77.9%	48.5	60	1800	480 V	3	75.5 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	E1510-5GB	1, 2, 4
HRHHWP-1	RECEIVING 105	BASE MOUNTED	145	12.8	1727	1800 GPM	115 FT	HEATING HOT WATER	60.0 °F	130.0 °F	11.875	84.6%	61.3	75	1800	480 V	3	91 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	E-1510-6G	1, 2, 4
HRHHWP-2	RECEIVING 105	BASE MOUNTED	145	12.8	1727	1800 GPM	115 FT	HEATING HOT WATER	60.0 °F	130.0 °F	11.875	84.6%	61.3	75	1800	480 V	3	91 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	E-1510-6G	1, 2, 4
HRHHWP-3	RECEIVING 105	BASE MOUNTED	145	12.8	1727	1800 GPM	115 FT	HEATING HOT WATER	60.0 °F	130.0 °F	11.875	84.6%	61.3	75	1800	480 V	3	91 A	0 A	0 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	E-1510-6G	1, 2, 4

CHEMICAL TANK SCHEDULE

NOTES:
1. TANK TO BE HEAT TRACED AND INSULATED
2. INCLUDE INTERSITAL LEAK DETECTOR
3. TANK TO HAVE INTEGRAL PUMP SHELF
4. INCLUDE NOZZLE ON TOP FOR LEVEL INDICATION
5. INCLUDE CHEMICALLY COMPATABLE NOZZLE ON TOP INLET PIPING AND BOTTOM OUTLET PIPING
6. INCLUDED WITH RO CIP SKID. INCLUDES TANK STAND, AND INLET AND OUTLET VALVES AND PIPING/HOSES FOR CLEANING RO UNIT.

								BASIS OF DESIGN		
UNIT TAG	LOCATION	UNIT TYPE	SYSTEM SERVED	UNIT VOLUME GALLONS	MIN. WATER TEMP.	MAX. WATER TEMP.	PRESS. AT TANK	MANUFACTURER	MODEL NO.	NOTES
ROT-1	BOILER ROOM 109	SINGLE WALL HDPE	RO WATER	3000.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	ICT3000	4,5
ROT-2	BOILER ROOM 109	SINGLE WALL HDPE	RO WATER CIP	200.0 gal	60.0 °F	120.0 °F	14.6 psia	ASSMANN	IMT200	6
TK-1		DOUBLE WALL HDPE	ACID	1550.0 gal	60.0 °F	120.0 °F	14.6 psia	ASSMANN	IMT 1550	1,2,4,5
TK-2		DOUBLE WALL HDPE	BLEACH	1550.0 gal	60.0 °F	120.0 °F	14.6 psia	ASSMANN	IMT 1550	1,2,4,5
TK-3	RECEIVING 105	DOUBLE WALL HDPE	CSP-301	405.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	IMT405	2,3
TK-4	RECEIVING 105	DOUBLE WALL HDPE	7424 MB	250.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	IMT250	2,3
TK-5	RECEIVING 105	DOUBLE WALL HDPE	B104	250.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	IMT250	2,3
TK-6	RECEIVING 105	DOUBLE WALL HDPE	B172	250.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	IMT250	2,3
TK-7	RECEIVING 105	DOUBLE WALL HDPE	B-521-3	250.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	IMT250	2,3
TK-8	RECEIVING 105	DOUBLE WALL HDPE	B-140-8	250.0 gal	60.0 °F	100.0 °F	14.6 psia	ASSMANN	IMT250	2,3

CHEMICAL PUMP SCHEDULE

NOTES:
1. INCLUDE FOOT VALVE AND DISCHARGE VALVE ACCESSORIES
2. PROVIDE PUMP WITH AUTOGASSSING VALVE

		DESIGN CRITERIA								MOTOR DATA								ELECTRICAL				BASIS OF DESIGN		
UNIT TAG	LOCATION	TYPE	FLOW	TDH	FLUID	MIN. FLUID TEMP.	MAX. FLUID TEMP.	MIN. IMPELLER DIA.	MIN. EFFICIENCY	BHP	HP	RPM	VOLTS	PH	FLA	MCA	MOCP	STARTER BY	STARTER TYPE	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	NOTES
CP-9	RECEIVING 105	INLINE	4800 gal/h	67.19 lb/in²	TOWER WATER	60.0 °F	120.0 °F			7	10	3600	480 V	3	14 A	30 A	30 A	TCC	VFD	NO	DCC	BELL & GOSSETT	E80 1.5x1.5x7C	
MP-1	RECEIVING 105	Metering Pump	3.8 gal/h	102 lb/in²	ACID	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	GAMMALX-071 5	1
MP-2	RECEIVING 105	Metering Pump	3.8 gal/h	102 lb/in²	BLEACH	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	GAMMALX-071 5	1,2
MP-3	RECEIVING 105	Metering Pump	3.8 gal/h	102 lb/in²	CSP-301	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	GAMMALX-071 5	1
MP-4	RECEIVING 105	Metering Pump	3.8 gal/h	102 lb/in²	7424 MB	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	GAMMALX-071 5	1
MP-5	RECEIVING 105	Metering Pump	1.03 gal/h	102 lb/in²	B104	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	CONCEPT B-0704	1
MP-6	RECEIVING 105	Metering Pump	1.03 gal/h	102 lb/in²	B172	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	CONCEPT B-0704	1
MP-7	RECEIVING 105	Metering Pump	1.03 gal/h	102 lb/in²	B-521-3	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	CONCEPT B-0704	1
MP-8	RECEIVING 105	Metering Pump	0.79 gal/h	145 lb/in²	B-140-8	60.0 °F	100.0 °F				0.25		110 V	1	6 A	15 A	15 A	CHEM	PLUG	NO	DCC	PROMINENT	CONCEPT B-1003	1

FLOW METERS

NOTES:
1. PROVIDE FLOW STRAIGHTENER WITH FLOW METER

UNIT TAG	UNIT SERVICE	UNIT TYPE	TEMPERATURE MAX	PIPE SIZE - INLET	METER SIZE	UNIT MANUFACTURER	UNIT MODEL NO.	NOTES
			-459.7 °F		3"			
FIT-CHM1	TOWER WATER	FLOW SWITCH	-459.7 °F		2"			
FIT-CHM2	TOWER WATER	FLOW SWITCH	-459.7 °F		1"			
FM			-459.7 °F		6"			
FM-1			-459.7 °F		8"			
FM-2	CONDNESATE	VORTEX SHEDDING	210.0 °F		3"	ENDRESS+HAUSER		

HOT WATER BOILER SCHEDULE

NOTES:
1. PROVIDE BOILER WITH STOP AND CHECK VALVE, WATER SAFETY RELIEF VALVES,
2. PROVIDE BOILER WITH 2" INSULATED DOUBLE WALL POSITIVE PRESSURE SPECIAL GAS VENT LISTED FOR CONDENSING APPLICATIONS. INNER LINER TO BE 29-4C STAINLESS STEEL OUTER JACKET TO BE ALUMINZED STEEL.
3. PROVIDE ROOM COMBUSTION AIR MAKEUP UNIT INTERLOCK WITH BOILER COMBUSTION AIR FAN. BOILER PREVENTED FROM FIRING UNLESS ROOM COMBUSTION AIR MAKEUP UNIT IS OPERATIONAL.
4. PROVIDE BOILER WITH NATURAL GAS PRIMARY BURNER, PRIMARY NATURAL GAS TRAINS, GAS REGULATORS AND ASSOCIATED CONTROLS.
5. PROVIDE BOILER WITH DUAL FUEL FIRING CONTROLS AND EQUIPMENT. SECONDARY FUEL TO BE LOW SULPHER #2 FUEL OIL. PROVIDE #2 OIL TRAIN, BURNER MOUNTED OIL PUMP, SECONDARY PROPANE FUELED PILOT LIGHT, AND ALL CONTROLS AND APPERTANANCES FOR DUAL FUEL USE.
6. PROVIDE BOILER CONTROL SYSTEM WITH BACNET AND WEB BASED CONNECTIVITY. CONTROLS TO ALLOW FOR ADJUSTMENT AND MONITOR BOILER OPERATION, ALARMS, AND STATUS.

				GAS PRESSURE										ELECTRICAL DATE							BASIS OF DESIGN		WEIGHT		
UNIT TAG	LOCATION	TYPE	FUEL	MIN.	MAX.	INPUT MBH	OUTPUT MBH	MIN. TURN DOWN	GPM	EWT	LWT	MAX. WATER P.D.	WATER VOLUME	RELIEF VALVE SETTING	STARTER BY	EM. POWER	FLA	MCA	MOCP	VOLTS	PH	MANUFACTURER	MODEL NO.	SHIPPING	OPERATING	NOTES
HHWB-1	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-2	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-3	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-4	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-5	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-6	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-7	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6
HHWB-8	BOILER ROOM 109	CONDENSING	NG AND FUEL OIL	1.4 psi	7 psi	10000	9400	5:1	630 GPM	100.0 °F	130.0 °F	5 psi	950.0 gal	160 psi	MANUF	Y	23 A	29 A	52 A	460 V	3	CLEAVER BROOKS	SFC 10000	17041 lb	24960 lb	1,2,3,4,5,6

EXPANSION TANK SCHEDULE

NOTES:
1. SCHEDULE NOTES
2. SCHEDULE NOTES

							MAX. OPER. PRESS.						
											BASIS OF DESIGN		
UNIT TAG	LOCATION	SYSTEM SERVED	APPROX. SYSTEM VOLUME	MIN. WATER TEMP.	MAX. WATER TEMP.	PRESS. AT TANK	RELIEF VALVE	AT TANK	MIN. VOLUME	MIN. ACCEPT. VOLUME	MANUFACTURER	MODEL NO.	NOTES
ET-1	MECHANICAL 224	CHILLED WATER	350,000 gal	42.0 °F	110.0 °F	41 psi	0 psi	150 psi	660 gal	660 gal	BELL & GOSSETT	SERIES "B" MODEL NO. B-3500	
ET-2	MECHANICAL 224	CHILLED WATER	350,000 gal	42.0 °F	110.0 °F	0 psi	0 psi	150 psi	660 gal	660 gal	BELL & GOSSETT	SERIES "B" MODEL NO. B-3500	
ET-3	BOILER ROOM 109	HEATING HOT WATER	0 gal	60.0 °F	160.0 °F	0 psi	150 psi	0 psi	0 gal	0 gal	BELL & GOSSETT	SERIES "B" MODEL NO. B-5000	
ET-4	BOILER ROOM 109	HEATING HOT WATER	0 gal	60.0 °F	160.0 °F	0 psi	150 psi	0 psi	0 gal	0 gal	BELL & GOSSETT	SERIES "B" MODEL NO. B-5000	

STEAM BOILER SCHEDULE

NOTES:
1. PROVIDE BOILER WITH STOP AND CHECK VALVE, AND THREE STEAM SAFETY RELIEV VALVES SET AT 150 PSIG.
2. PROVIDE BOILER WITH 2" INSULATED DOUBLE WALL POSITIVE PRESSURE CHIMENY. INNER LINER TO BE 304 STAINLESS STEEL. OUTER JACKET TO BE GALVANIZED STEEL.
3. PROVIDE ROOM COMBUSTION AIR MAKEUP UNIT INTERLOCK WITH BOILER COMBUSTIN AIR FAN. BOILER TO BE PREVENTED FROM FIRING UNLESS ROOM COMBUSTION AIR MAKEUP UNIT IS OPERATIONAL
4. PROVIDE BOILER WITH DDC FEEDWATER CONTROL BALL VALVE AND CONTROLLER. PROVIDE BOILER SIGHT GLASS WATER COLUMN WITH TWO LOW WATER CUTOUTS, LEVEL CONTROLLER, HIGH WATER CUTOUT, TEST /DRAIN VALVE, AND PRESSURE GAUGE.
5. PROVIDE BOILER BLOW DOWN CONTROL SYSTEM . SYSTEM TO INCLUDE STOP VALVE, SURFACE BLOW DOWN CONTROL VALVE, CONDUCTIVITY SENSOR AND DDC CONTROLLER. BOTTOM BLOWDOWN TO INCLUDE STOP VALVE AND BOTTOM BLOW DOWN VALVE.
6. ROVIDE BOILER WITH NATURAL GAS PRIMARY BURNER, PRIMARY NATURAL GAS TRAINS, GAS REGULATORS AND ASSOCIATED CONTROLS.
7. PROVIDE BOILER WITH DUAL FUEL FIRING CONTROLS AND EQUIPMENT. SECONDARY FUEL TO BE LOW SULPHER #2 FUEL OIL. PROVIDE #2 OIL TRAIN, BURNER MOUNTED OIL PUMP, SECONDARY PROPANE FUELED PILOT LIGHT, AND ALL CONTROLS AND APPERTANANCES
8. PROVIDE BURNER WITH 10:1 PARELLEL POSITIONING PRIMARY NATURAL GAS CONTROLS WITH OXYGEN TRIM. FUEL OIL CONTROLS TO HAVE 8:1 TURNDOWN.
9. PROVIDE BOILER CONTROL SYSTEM WITH BACNET AND WEB BASED CONNECTIVITY. CONTROLS TO ALLOW FOR ADJUSTMENT AND MONITOR BOILER OPERATION, ALARMS, AND STATUS.

							GAS PRESSURE								ELECTRICAL DATE							BASIS OF DESIGN		WEIGHT		
UNIT TAG	LOCATION	TYPE	BHP	WORKING/ OPERATING PRESSURE	DESIGN PRESSURE	FUEL	MIN.	MAX.	INPUT MBH	OUTPUT MBH	MIN. TURN DOWN	WATER VOLUME	RELIEF VALVE SETTING	STARTER BY	EM. POWER	FLA	MCA	MOCP	VOLTS	PH	MANUFACTURER	MODEL NO.	SHIPPING	OPERATING	NOTES
SB-1	BOILER ROOM 109	TWO PASS WETBACK FIRE TUBE STEAM BOILER	700	125 psi	150 psi	NG AND FUEL OIL	95 in-wg	127 in-wg	27568	23433	10:1	0.0 gal	150 psi	MANUFACTURER	YES	76 A	0 A	0 A	480 V	3	CLEAVER BROOKS	CBDEX-2D-700	38500.00 lb	63550.00 lb	1,2,3,4,5,6,7,8,9
SB-2	BOILER ROOM 109	TWO PASS WETBACK FIRE TUBE STEAM BOILER	700	125 psi	150 psi	NG AND FUEL OIL	95 in-wg	127 in-wg	27568	23433	10:1	0.0 gal	150 psi	MANUFACTURER	YES	76 A	0 A	0 A	480 V	3	CLEAVER BROOKS	CBDEX-2D-700	38500.00 lb	63550.00 lb	1,2,3,4,5,6,7,8,9
SB-3	BOILER ROOM 109	TWO PASS WETBACK FIRE TUBE STEAM BOILER	700	125 psi	150 psi	NG AND FUEL OIL	95 in-wg	127 in-wg	27568	23433	10:1	0.0 gal	150 psi	MANUFACTURER	YES	76 A	0 A	0 A	480 V	3	CLEAVER BROOKS	CBDEX-2D-700	38500.00 lb	63550.00 lb	1,2,3,4,5,6,7,8,9

HEAT EXCHANGER SCHEDULE - WATER TO WATER

NOTES:
1. PROVIDE WITH INSULATION BLANKET.
2. PROVIDE WITH ASME SECTION VIII DIVISION 1U STAMP.
3. PROVIDE 304 SS PORT STRAINER FOR EACH INLET PORT.
4. PROVIDE 3041 SS DRAIN PAN AND ELASTOMERIC THERMAL BREAK ISOLATION PADS UNDER HEAT EXCHANGER.

				HOT SIDE					COLD SIDE							HEAT	BASIS OF DESIGN			
UNIT TAG	LOCATION	UNIT TYPE	PLATE THICKNESS	MEDIA	FLOW	TEMP. IN	TEMP. OUT	MAX. PRESS. DROP	MEDIA	FLOW	TEMP. IN	TEMP. OUT	MAX. PRESS. DROP	MIN. SURFACE AREA	NO. OF PLATES	TRANSFER (BTU/HR)	MANUFACTURER	MODEL	OPERATING WEIGHT	NOTES
HRC-HX-1	CHILLER PLANT 114	PLATE AND FRAME	0.02"	CONDENSED WATER	5400 GPM	98.0 °F	88.0 °F	11.5 ft/H2O	TOWER WATER	5400 GPM	85.0 °F	95.0 °F	11.5 ft/H2O	13901 ft²	617	26902	BELL & GOSSETT	AP201	46989.00 lb	

OWNER

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PROJECT

Central Utility Plant

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**
CHECKED BY **AESI**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

MECHANICAL SCHEDULES

SHEET NUMBER

M602

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 2:35:55 PM AESI Proj. No: 21-154

MISCELLANEOUS EQUIPMENT SCHEDULE

NOTES:
1. PROVIDE COMPLETE SYSTEM. USE PURGE VALVE WITHOUT BAGS IN BAG FILTER FIRST 60 DAYS AND THEN INSERT BAGS AND TURN OFF PURGE VALVE.

				MOTOR								ELECTRICAL DATA				BASIS OF DESIGN			
UNIT TAG	LOCATION	DESCRIPTION	CAPACITY	BHP	HP	RPM	VOLTS	PH	FLA	MCA	MOCP	STARTER BY	STARTER TYPE	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	DRY WEIGHT	NOTES
BAS PANEL	CONTROL 112				0	0	120 V	1	0 A	0 A	0 A							0.00 lb	
BAS PANEL	CONTROL ROOM 209				0	0	120 V	1	0 A	0 A	0 A							0.00 lb	
BAS PANEL	CUP EMERGENCY ELECTRICAL ROOM 215				0	0	120 V	1	0 A	0 A	0 A							0.00 lb	
CHW-FLTR-1	CHILLER PLANT 114	CHILLED WATER SIDE STREAM FILTER	1100 GPM	20	20	1750	460 V	3	26 A	33 A	40 A	E.C.	ACROSS THE LINE	NO	LOCAL WITH BMS ALARM	LAKOS	PACKAGED CENTRIFUGAL SEPARATOR. LAKOS MODEL #TBX-1100-SRV-TC SYSTEM WITH HTX-0500-TC SEPARATOR, AND SRV 816 WITH 74 MICRON FILTER BAG FILTER, AUTOMATIC PURGE VALVE AND DRY CONTACT DIFFERENTIAL PRESSURE SWITCH	2038.00 lb	1
CT-BS-FLTR-1	MECHANICAL 206	COOLING TOWER BASIN SWEEPER SYSTEM	610 GPM	15	15	1750	460 V	3	19 A	25 A	30 A	E.C.	ACROSS THE LINE	NO	LOCAL WITH BMS ALARM	LAKOS	PACKAGED CENTRIFUGAL SEPARATOR. LAKOS MODEL #eTBX-0610-SRV/ACP1 TC SYSTEM WITH eHTX-0260 SEPARATOR, SRV 833 WITH 74 MICRON FILTER BAG FILTER, AUTOMATIC PURGE VALVE AND DRY CONTACT DIFFERENTIAL PRESSURE SWITCH, AND MULTI-TOWER BASIN CLEANING KIT FOR THREE ONE CELL COOLING TOWERS	1553.00 lb	1
CT-BS-FLTR-2	MECHANICAL 206	COOLING TOWER BASIN SWEEPER SYSTEM	610 GPM	15	15	1750	460 V	3	19 A	24 A	30 A	E.C.	ACROSS THE LINE	NO	LOCAL WITH BMS ALARM	LAKOS	PACKAGED CENTRIFUGAL SEPARATOR. LAKOS MODEL #eTBX-0610-SRV/ACP1 TC SYSTEM WITH eHTX-0260 SEPARATOR, SRV 833 WITH 74 MICRON FILTER BAG FILTER, AUTOMATIC PURGE VALVE AND DRY CONTACT DIFFERENTIAL PRESSURE SWITCH, AND MULTI-TOWER BASIN CLEANING KIT FOR THREE ONE CELL COOLING TOWERS	1553.00 lb	1
CT-FLTR-1	CHILLER PLANT 114	COOLING TOWER SIDE STREAM FILTER	825 GPM	20	20	1250	460 V	3	26 A	33 A	40 A	E.C.	ACROSS THE LINE	NO	LOCAL WITH BMS ALARM	LAKOS	PACKAGED CENTRIFUGAL SEPARATOR. LAKOS MODEL #TBX-0825-SRV WITH HTX-0450 SEPARATOR, AND SRV 816 WITH 74 MICRON FILTER BAG FILTER, AUTOMATIC PURGE VALVE AND DRY CONTACT DIFFERENTIAL PRESSURE SWITCH	1973.00 lb	1
HHW-FLTR-1	BOILER ROOM 109	HEATING HOT WATER SIDE STREAM FILTER	825 GPM	20	20	1750	460 V	3	26 A	33 A	40 A	E.C.	ACROSS THE LINE	NO	LOCAL WITH BMS ALARM	LAKOS	PACKAGED CENTRIFUGAL SEPARATOR. LAKOS MODEL #TBX-0825-SRV WITH HTX-0450 SEPARATOR, AND SRV 816 WITH 74 MICRON FILTER BAG FILTER, AUTOMATIC PURGE VALVE AND DRY CONTACT DIFFERENTIAL PRESSURE SWITCH	1973.00 lb	1
REFRIGERANT MONITOR SYSTEM CONTROL PANEL	CHILLER PLANT 114				0	0	0 V	1	0 A	0 A	0 A							0.00 lb	

AIR VENT SCHEDULE

TAG NO.	LOCATION	SYSTEM SERVED	INLET SIZE (NPT)	VENT SIZE (NPT)	PRESSURE RATING (PSIG)	TEMP. RATING (DEG F)	DESCRIPTION	MFGR	MODEL #	NOTES
AV-1	TOP CHWR / R BRANCH DROP AT EACH CHILLER	CHILLED WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-2	HIGH POINTS IN CHW PUMP PIPING	CHILLED WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-3	HIGH POINTS IN CHWS / R PIPING	CHILLED WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-4	HIGH POINTS HX-1 CTWS / R	TOWER WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-5	HIGH POINTS BRANCH PIPING EACH CHILLER CTWS / R	TOWER WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-6	HIGH POINTS IN CHW PUMP PIPING	TOWER WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-7	HIGH POINT HX-1 HHWS & HHWR	HEATING HOT WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-8	HIGH POINT BRANCH PIPING EACH BOILER HHWS / R	HEATING HOT WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-9	HIGH POINTS IN HHW PUMP PIPING	HEATING HOT WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-10	HIGH POINTS IN HHWS / R PIPING	HEATING HOT WATER	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS
AV-11	HIGH POINTS IN SIDE STREAM FILTER PIPING	HHW, CHW, CTW	3/4"	1/4"	250	300	AUTOMATIC AIR VENT VALVE , CAST IRON BODY WITH STAINLESS STEEL FLOAT AND INTERNALS	HOFFMAN	792	MULTIPLE LOCATIONS

MISCELLANEOUS FUEL OIL EQUIPMENT SCHEDULE

NOTES:
1. NOTES
2. NOTES

					PUMP MOTOR									ELECTRICAL DATA				BASIS OF DESIGN			
UNIT TAG	SERVICE	SIZE	DESCRIPTION	PUMP/ACCESSORY DATA	QTY	HP	RPM	VOLTS	PH	Hz	FLA	MCA	MOCP	STARTER BY	STARTER TYPE	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	WEIGHT	NOTES
FO-DT-1	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-2	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-3	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-4	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-5	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-6	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-7	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-8	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-DT-9	FUEL OIL - GENERATORS	250 GALLON	DAY TANK WITH LEVEL CONTROLLER AND GENERATOR TRANSFER PUMP	PROVIDE WITH 225 GPH FUEL TRANSFER PUMP TO FEED GENERATOR	1	0.25	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	DT-260-S-R-UL	2.94 lb	
FO-FLTR-1	FUEL OIL	1200 GPH FUEL POLISHING SKID WITH WASTE WATER REMOVAL SYSTEM (WR-01)	FUEL POLISHING SKID, FILTERS FUEL FROM TANK AND REMOVES MOISTURE.	PROVIDE WITH 1200 GPH PUMP TO PULL FUEL FROM STORAGE TANK	1	0.75	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	PF-505	0.00 lb	
FO-FLTR-2	FUEL OIL	1200 GPH FUEL POLISHING SKID WITH WASTE WATER REMOVAL SYSTEM (WR-01)	FUEL POLISHING SKID, FILTERS FUEL FROM TANK AND REMOVES MOISTURE.	PROVIDE WITH 1200 GPH PUMP TO PULL FUEL FROM STORAGE TANK	1	0.75	1725	120 V	1	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	PF-505	0.00 lb	
FO-P-1	FUEL OIL	1000 GPH	SIZED FOR 5 GENERATORS. FEEDS ONE DAY TANK ROOM ON THE SECOND FLOOR.		1	2	1140	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	ATPSF-206	0.00 lb	
FO-P-2	FUEL OIL	1000 GPH	SIZED FOR 5 GENERATORS. FEEDS ONE DAY TANK ROOM ON THE SECOND FLOOR.		1	2	1140	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	ATPSF-206	0.00 lb	
FO-P-3	FUEL OIL	800 GPH	SIZED FOR 2 FIRING STEAM BOILERS. FEEDS TO BOILER ROOM.		1	0.75	1140	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	ATPSF-202	0.00 lb	
FO-P-4	FUEL OIL	800 GPH	SIZED FOR 8 FIRING HHW BOILERS. FEEDS TO BOILER ROOM.		1	0.75	1140	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	PREFERRED MFG	ATPSF-202	0.00 lb	
FO-T-1	FUEL OIL	50,000 GALLON	BURIED DOUBLE WALL STORAGE TANK	PROVIDE INTERSTITIAL LEAK MONITORING	1	0	0	0 V	1	0 Hz	0 A	0 A	0 A					HIGHLAND TANK	50000HGDW144	0.00 lb	
FO-T-2	FUEL OIL	50,000 GALLON	BURIED DOUBLE WALL STORAGE TANK	PROVIDE INTERSTITIAL LEAK MONITORING	1	0	0	0 V	1	0 Hz	0 A	0 A	0 A					HIGHLAND TANK	50000HGDW144	0.00 lb	
FO-T-3	FUEL OIL	50,000 GALLON	BURIED DOUBLE WALL STORAGE TANK	PROVIDE INTERSTITIAL LEAK MONITORING	1	0	0	0 V	1	0 Hz	0 A	0 A	0 A					HIGHLAND TANK	50000HGDW144	0.00 lb	

MISCELLANEOUS STEAM EQUIPMENT SCHEDULE

NOTES:
1. NOTES
2. NOTES

						PUMP MOTOR									ELECTRICAL DATA				BASIS OF DESIGN			
UNIT TAG	LOCATION	SERVICE	SIZE	DESCRIPTION	PUMP/ACCESSORY DATA	QTY	BHP	HP	RPM	VOLTS	PH	Hz	FLA	MCA	MOCP	STARTER BY	STARTER TYPE	EM POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	WEIGHT	NOTES
BDS-1	BOILER ROOM 109	BLOW DOWN SEPARATOR	18 GALLON VERTICAL BLOWDOWN SEPPARATOR TANK WITH TANGENTIAL INLET, VENT, DRAIN, TANK DISCHARGE COOLING WATER CONTROLS	ASME 75 PSIG RATED CARBON STEEL BLOW DOWN SEPARATOR TANK NOMINAL 16" D X 26" H WITH 6" ANSI 150# TOP VENT ,.4" ANSI 150# FLANGE BOTTOM DRAIN, 1-1/4" NPT TANGENTAL SIDE INLET WITH 316 SS WEAR PLATE. AND 1-1/2" ANGLE IRON SUPPORT LEGS	FLANGED DISCHARGE CONDENSATE COOLER ASSEMBLY TO INCLUDE THERMOMETER, 3/4" NPT COOLING WATER ADJSUTABLE CAPILARY TEMERATRUE CONTROL VALVE, 3/4" NPT COOLING WATER INLET CHECK VALVE AND STRAINER	0	0	0	0	0 V	1	0 Hz	0 A	0 A	0 A					CLEAVER BROOKS	BDS-A34B-150	9915.00 lb	
BHR-1	BOILER ROOM 109	BLOWDOWN HEAT RECOVERY	SIZE FOR 14 GPM MAX FLOW FOR THREE 700 HP BOILERS CONTINUOUS BLOWDOWN			1	0	0	0	0 V	1	0 Hz	0 A	0 A	0 A			NO		STICKLE STEAM SPECIALTIES	550-	640.00 lb	
CF-1	BOILER ROOM 109	DUPLEX CARBON FILTER SKID	65 GPM CONTINUOUS FLOW, DUPLEX SYSTEM WITH TWO 48"X60" TANKS	DUPLEX CARBON FILTER SKID WITH CONTROLS AND VALVES FOR REGENERATIONS	CONTROLS, SS EXTERNAL AND INTERNAL PIPING AND VALVES FOR REGENERATION	1	0	0	0	110 V	1	60 Hz	0 A	0 A	0 A			NO		MARLO	MFS-ACA-48		
CST-1	BOILER ROOM 109	CONDENSATE RETURN TANK AND PUMPS	1,200 GALLON HORIZONTAL ATMOSPHERIC STAINLESS STEEL FEED WATER TANK WITH TWO MULTI STAGE FEED WATER PUMPS WITH SIGHTGLASS, TANK MAKEUP WATER LEVEL CONTROLS, FEEDWATER PUMP SEQUENCING AND ALTERNATING CONTROLS, ALL PIPING, VENT, AND DRAIN CONNECTIONS	54" DIA. X 120" L 304 STAINLESS STEEL FEED WATER TANK ELEVATED ON STEEL ANGLE IRON FRAME WITH TWO BOILER FEED WATER PUMPS, STARTERS,PUMP CONTROLS, TANK LEVEL CONTROLS, TANLK LEVEL AND TEMPERATURE ALARMS AND SAFETIES. BOILER CONTROL PANEL CONTROL AND MONITORING OF TANK AND PUMP OPERATION	TWO B&G MODEL MULTI STAGE PUMPS EACH SIZED TO FEED DAEARATOR TANK FOR REDUNDANCY.	2	10	10	3550	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	CLEAVER BROOKS	SRG-1200-ADAC-1000	9915.00 lb	
CST-2	BOILER ROOM 109	CONDENSATE RETURN TANK AND PUMPS	1,200 GALLON HORIZONTAL ATMOSPHERIC STAINLESS STEEL FEED WATER TANK WITH TWO MULTI STAGE FEED WATER PUMPS WITH SIGHTGLASS, TANK MAKEUP WATER LEVEL CONTROLS, FEEDWATER PUMP SEQUENCING AND ALTERNATING CONTROLS, ALL PIPING, VENT, AND DRAIN CONNECTIONS	54" DIA. X 120" L 304 STAINLESS STEEL FEED WATER TANK ELEVATED ON STEEL ANGLE IRON FRAME WITH TWO BOILER FEED WATER PUMPS, STARTERS,PUMP CONTROLS, TANK LEVEL CONTROLS, TANLK LEVEL AND TEMPERATURE ALARMS AND SAFETIES. BOILER CONTROL PANEL CONTROL AND MONITORING OF TANK AND PUMP OPERATION	TWO B&G MODEL MULTI STAGE PUMPS EACH SIZED TO FEED DAEARATOR TANK FOR REDUNDANCY.	2	10	10	3550	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	CLEAVER BROOKS	SRG-1200-ADAC-1000	9915.00 lb	
DA-1	BOILER ROOM 109	DEAERATOR AND BOILER FEED WATER SYSTEM	1,100 GALLON HORIZONTAL ATMOSPHERIC STAINLESS STEEL FEED WATER TANK WITH THREE MULTI STAGE FEED WATER PUMPS, STEAM SPARGER FEED WATER HEATER WITH TEMPERATURE CONTROLS, SIGHTGLASS, TANK MAKEUP WATER LEVEL CONTROLS, FEEDWATER PUMP SEQUENCING AND ALTERNATING CONTROLS, ALL PIPING, VENT, AND DRAIN CONNECTIONS	54" DIA. X 120" L 304 STAINLESS STEEL FEED WATER TANK ELEVATED ON STEEL ANGLE IRON FRAME WITH THREE BOILER FEED WATER PUMPS, STARTERS,PUMP CONTROLS, TANK LEVEL CONTROLS,TANK TEMPERATURE CONTROLS, TANLK LEVEL AND TEMPERATURE ALARMS AND SAFETIES. BOILER CONTROL PANEL CONTROL AND MONITORING OF TANK AND PUMP OPERATION	FOUR B&G MODEL MULTI STAGE PUMPS EACH SIZED TO FEED ONE BOILER AND ONE EXTRA FOR REDUNDANCY.	4	15	15	3550	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	CLEAVER BROOKS	SM-45-1105-ADC-1000	9915.00 lb	
RO-1	BOILER ROOM 109	REVERSE OSMOSIS SYSTEM	50 GPM RO SYSTEM, 66 GMP INLET, 16 GPM REJECT WITH CLEANING SYSTEM	50 GPM OUTLET REVERSE OSMOSIS UNIT	20 HP FEED PUMP, 5 MICRON CARTRIDGE PRE-FILTER, RO MEMBRANES WITH HOUSING, CONCENTRATE AND RECYCLE FLOW CONTROL VALVES, PLC WITH CONTOL PANEL, CONDUCTIVITY MONITOR, INTEGRAL CIP SKID WITH 5 HP PUMP	1	20	20	1800	480 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	NO	HOA	MARLO	MRO-72K-8H		
ROP-1A,1B	BOILER ROOM 109	DUPLEX RO TRANSFER PUMP SKID	TWO (2) 50 GPM AT 50 PSIG TRANSFER PUMPS WITH MOTOR CONTROL PANEL AND DISCONNECT, SKID MOUNTED			2	3	3	1800	460 V	3	60 Hz	0 A	0 A	0 A	VENDOR	X/L	YES	HOA	MARLO	DTPS-50		

OWNER

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PROJECT

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO. 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M603

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:58 PM AESI Proj. No: 21-154

CHILLED WATER , HEATING HOT WATER, AND CONDENSER WATER CONTROL VALVE SCHEDULE

NOTES:

1. CONTROL VALVES SHOWN IN THIS TABLE SHALL BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR FOR INSTALLATION BY THE MECHANICAL CONTRACTOR.
2. SEE DRAWINGS..
3. PROVIDE FAIL...

TAG NO.	LOCATION	SERVICE	FLUID	FLOW GPM	CONNECTION SIZE (NPS)	END CONNECTION TYPE	INLET TEMPERATURE °F	VALVE TYPE	VALVE CV	VALVE FLOW CHARACTERISTIC	MATERIAL OF CONSTRUCTION	DESIGN PRESSURE	CLOSE OFF PRESSURE PSIG	CLOSE OFF DIFFERENTIAL PRESSURE (PSIG)	CONTROL TYPE	ACTUATOR TYPE	ACTUATOR	MFG.	MODEL #	NOTES
CH-1-MOV-01	CH-1 14" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-1-MOV-02	CH-1 20" TOWER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	TOWER WATER	6,000	20	CLASS 150 FLANGED	85	HIGH PERFORMANCE V-PORT SEGMENTED BALL	13,020	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-2-MOV-01	CH-2 12" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-2-MOV-02	CH-2 14" TOWER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	TOWER WATER	6,000	20	CLASS 150 FLANGED	85	HIGH PERFORMANCE V-PORT SEGMENTED BALL	13,020	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-3-MOV-01	CH-3 12" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-3-MOV-02	CH-3 14" TOWER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	TOWER WATER	6,000	20	CLASS 150 FLANGED	85	HIGH PERFORMANCE V-PORT SEGMENTED BALL	13,020	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-4-MOV-01	CH-4 12" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-4-MOV-02	CH-4 14" TOWER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	TOWER WATER	6,000	20	CLASS 150 FLANGED	85	HIGH PERFORMANCE V-PORT SEGMENTED BALL	13,020	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-5-MOV-01	CH-5 12" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-5-MOV-02	CH-5 14" TOWER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	TOWER WATER	6,000	20	CLASS 150 FLANGED	85	HIGH PERFORMANCE V-PORT SEGMENTED BALL	13,020	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-6-MOV-01	CH-6 12" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CH-6-MOV-02	CH-6 14" TOWER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	TOWER WATER	6,000	20	CLASS 150 FLANGED	85	HIGH PERFORMANCE V-PORT SEGMENTED BALL	13,020	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-1-MOV-01	HRC-1 6" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	540	6	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	1,260	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-1-MOV-02	HRC-1 8" CONDENSER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	HHW	1,080	8	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	2,030	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-2-MOV-01	HRC-1 6" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	540	6	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	1,260	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-2-MOV-02	HRC-1 8" CONDENSER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	HHW	1,080	8	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	2,030	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-3-MOV-01	HRC-1 6" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	540	6	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	1,260	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-3-MOV-02	HRC-1 8" CONDENSER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	HHW	1,080	8	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	2,030	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-4-MOV-01	HRC-1 6" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	540	6	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	1,260	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-4-MOV-02	HRC-1 8" CONDENSER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	HHW	1,080	8	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	2,030	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-5-MOV-01	HRC-1 6" CHILLED WATER INLET PIPING	CHILLER EVAPORATOR FLOW CONTROL	CHILLED WATER	540	6	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	1,260	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HRC-5-MOV-02	HRC-1 8" CONDENSER WATER INLET PIPING	CHILLER CONDENSER FLOW CONTROL VALVE	HHW	1,080	8	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	2,030	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HX-1-MOV-1	HX-1 1 8" CONDENSER WATER RETURN PIPING	HX-1 CONDENSER WATER FLOW CONTROL VALVE	HHW	5,400	16	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	8,510	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
HX-1-MOV-2	HX-1 1 8" TOWER WATER RETURN PIPING	HX-1 TOWER WATER FLOW CONTROL VALVE	TOWER WATER	5,400	16	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	8,510	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CT-1-MOV-01	CT-1 18" TOWER WATER INLET PIPING	COOLING TOWER FLOW CONTROL	TOWER WATER	6,000	18	CLASS 150 FLANGED	95	2-WAY MOTOR OPERATED BUTTERFLY	17,240	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CT-2-MOV-01	CT-2 18" TOWER WATER INLET PIPING	COOLING TOWER FLOW CONTROL	TOWER WATER	6,000	18	CLASS 150 FLANGED	95	2-WAY MOTOR OPERATED BUTTERFLY	17,240	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CT-3-MOV-01	CT-3 18" TOWER WATER INLET PIPING	COOLING TOWER FLOW CONTROL	TOWER WATER	6,000	18	CLASS 150 FLANGED	95	2-WAY MOTOR OPERATED BUTTERFLY	17,240	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CT-4-MOV-01	CT-4 18" TOWER WATER INLET PIPING	COOLING TOWER FLOW CONTROL	TOWER WATER	6,000	18	CLASS 150 FLANGED	95	2-WAY MOTOR OPERATED BUTTERFLY	17,240	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CT-5-MOV-01	CT-5 18" TOWER WATER INLET PIPING	COOLING TOWER FLOW CONTROL	TOWER WATER	6,000	18	CLASS 150 FLANGED	95	2-WAY MOTOR OPERATED BUTTERFLY	17,240	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CT-6-MOV-01	CT-6 18" TOWER WATER INLET PIPING	COOLING TOWER FLOW CONTROL	TOWER WATER	6,000	18	CLASS 150 FLANGED	95	2-WAY MOTOR OPERATED BUTTERFLY	17,240	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CHW-BP-MOV-01	14" CHW BYPASS PIPING	BYPASS FLOW CONTROL	CHILLED WATER	3,000	14	CLASS 150 FLANGED	58	HIGH PERFORMANCE V-PORT SEGMENTED BALL	6,440	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
CTW-BP-MOV-1	16" CHW BYPASS PIPING	BYPASS FLOW CONTROL	TOWER WATER	5,400	16	CLASS 150 FLANGED	110	HIGH PERFORMANCE V-PORT SEGMENTED BALL	8,510	EQUAL PERCENTAGE	316 SS METAL SEAT, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	275	175	175	PRO-PORTIONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M604

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:35:59 PM AESI Proj. No: 21-154

CHILLER AND BOILER CONTROL VALVE SCHEDULE (CONT.)

NOTES:

1. CONTROL VALVES SHOWN IN THIS TABLE SHALL BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR FOR INSTALLATION BY THE MECHANICAL CONTRACTOR.
2. SEE DRAWINGS...
3. PROVIDE FAIL...

CT-1- BS-MOV-01	6" BASIN SWEEPER CTW CONTROL VALVE	CT-1 TOWER WATER SUPPLY CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-1- BS-MOV-02	6" BASIN SWEEPER CTW CONTROL VALVE	CT-1 TOWER WATER RETURN CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-2- BS-MOV-01	6" BASIN SWEEPER CTW CONTROL VALVE	CT-2 TOWER WATER SUPPLY CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-2- BS-MOV-02	6" BASIN SWEEPER CTW CONTROL VALVE	CT-2 TOWER WATER RETURN CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATINGF	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-3- BS-MOV-01	6" BASIN SWEEPER CTW CONTROL VALVE	CT-3 TOWER WATER SUPPLY CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-3- BS-MOV-02	6" BASIN SWEEPER CTW CONTROL VALVE	CT-3 TOWER WATER RETURN CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-4- BS-MOV-01	6" BASIN SWEEPER CTW CONTROL VALVE	CT-4 TOWER WATER SUPPLY CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-4- BS-MOV-02	6" BASIN SWEEPER CTW CONTROL VALVE	CT-4 TOWER WATER RETURN CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-5- BS-MOV-01	6" BASIN SWEEPER CTW CONTROL VALVE	CT-5 TOWER WATER SUPPLY CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC MODULATING. NON-RETURN ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-5- BS-MOV-02	6" BASIN SWEEPER CTW CONTROL VALVE	CT-5 TOWER WATER RETURN CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-6- BS-MOV-01	6" BASIN SWEEPER CTW CONTROL VALVE	CT-6 TOWER WATER SUPPLY CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CT-6- BS-MOV-02	6" BASIN SWEEPER CTW CONTROL VALVE	CT-6 TOWER WATER RETURN CONTROL VALVE	TOWER WATER	1,300	6	CLASS 150 FLANGED	95	2 WAY PROPORTIONAL NON-SPRING RETURN	1,850	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	175	175	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-CHM-MOV-01	4" CTW BLOW DOWN CONTROL	COOLING TOWER WATER BLOWDOWN VALVE	TOWER WATER	80	4	CLASS 150 FLANGED	95	2 WAY MOTOR OPERATED BUTTERFLY	154	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	PRO-PORTI ONAL	ELECTRIC MODULATING NON-SPRING RETURN WITH POSITION FEEDBACK	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W TWO AUXILLARY SWITCHES AND BEACON INDICATOR	BRAY	NYL SERIES	
CUP-B-1-MOV-01	B-1 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	4-20 mA	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-1-MOV-01	B-1 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-2-MOV-01	B-2 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	4-20 mA	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-3-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-4-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-5-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-6-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-7-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-8-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-9-MOV-01	B-3 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	
CUP-B-10-MOV-01	B-4 8" HHWS OUTLET CONTROL VALVE	BOILER HEATING HOT WATER SUPPLY CONTROL VALVE	HEATING HOT WATER SUPPLY	634	8	CLASS 150 FLANGED	150	2-WAY MOTOR OPERATED BUTTERFLY	2,004	MODIFIED EQUAL PERCENTAGE	CAST IRON BODY, DUCTILE IRON NYLON COATED DISC, EPDM SEAT, 416 SS TRIM	250	150	150	ON / OFF FLOATING	ELECTRIC ON/OFF NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE/W POSITION FEEDBACK	BRAY	NYL SERIES	

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY AESI	
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

MECHANICAL SCHEDULES

SHEET NUMBER

M605

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
0 1/2" 1" 2"
2/10/2023 2:36:00 PM AESI Proj. No: 21-154

BALANCE VALVE SCHEDULE

NOTES:
1. PROVIDE...
2. FUTURE (NIC)

TAG NO.	LOCATION	SERVICE	FLUID	FLOW GPM	CONNECTION SIZE (NPS)	END CONNECTION TYPE	CV	MATERIALS OF CONSTRUCTION	DESIGN PRESSURE	WEIGHT (LBS)	MFG.	MODEL #	NOTES
BV-CH-1-A	CH-1	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1
BV-CH-1-B	CH-1	CHILLER CONDENSER FLOW	TOWER WATER	6,000	20	FLANGE	19,950	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	750	GRISWOLD	3QFY FLANGED END QUICKSET	1
BV-CH-2-A	CH-2	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1
BV-CH-2-B	CH-2	CHILLER CONDENSER FLOW	TOWER WATER	6,000	20	FLANGE	19,950	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	750	GRISWOLD	3QFY FLANGED END QUICKSET	1
BV-CH-3-A	CH-3	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1
BV-CH-3-B	CH-3	CHILLER CONDENSER FLOW	TOWER WATER	6,000	20	FLANGE	19,950	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	750	GRISWOLD	3QFY FLANGED END QUICKSET	1
BV-CH-4-A	CH-4	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1
BV-CH-4-B	CH-4	CHILLER CONDENSER FLOW	TOWER WATER	6,000	20	FLANGE	19,950	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	750	GRISWOLD	3QFY FLANGED END QUICKSET	1
BV-CH-5-A	CH-5	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1
BV-CH-5-B	CH-5	CHILLER CONDENSER FLOW	TOWER WATER	6,000	20	FLANGE	19,950	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	750	GRISWOLD	3QFY FLANGED END QUICKSET	1
BV-CH-6-A	CH-6	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1
BV-CH-6-B	CH-6	CHILLER CONDENSER FLOW	TOWER WATER	6,000	20	FLANGE	19,950	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	750	GRISWOLD	3QFY FLANGED END QUICKSET	1
BV-HRC-1-A	HRC-1	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	6	FLANGE	980	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER HANDLE OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	70.3	GRISWOLD	3QFR FLANGED END QUICKSET	1
BV-HRC-1-B	HRC-1	CHILLER CONDENSER FLOW	HHW	1,080	8	FLANGE	1,745	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	126.5	GRISWOLD	3QFS FLANGED END QUICKSET	1
BV-HRC-2-A	HRC-2	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	6	FLANGE	980	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER HANDLE OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	70.3	GRISWOLD	3QFR FLANGED END QUICKSET	1
BV-HRC-2-B	HRC-2	CHILLER CONDENSER FLOW	HHW	1,080	8	FLANGE	1,745	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	126.5	GRISWOLD	3QFS FLANGED END QUICKSET	1
BV-HRC-3-A	HRC-3	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	6	FLANGE	980	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER HANDLE OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	70.3	GRISWOLD	3QFR FLANGED END QUICKSET	1
BV-HRC-3-B	HRC-3	CHILLER CONDENSER FLOW	HHW	1,080	8	FLANGE	1,745	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	126.5	GRISWOLD	3QFS FLANGED END QUICKSET	1
BV-HRC-4-A	HRC-4	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	6	FLANGE	980	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER HANDLE OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	70.3	GRISWOLD	3QFR FLANGED END QUICKSET	1
BV-HRC-4-B	HRC-4	CHILLER CONDENSER FLOW	HHW	1,080	8	FLANGE	1,745	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	126.5	GRISWOLD	3QFS FLANGED END QUICKSET	1
BV-HRC-5-A	HRC-5	CHILLER EVAPORATOR FLOW	CHILLED WATER	3,000	6	FLANGE	980	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER HANDLE OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	70.3	GRISWOLD	3QFR FLANGED END QUICKSET	1
BV-HRC-5-B	HRC-5	CHILLER CONDENSER FLOW	HHW	1,080	8	FLANGE	1,745	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	126.5	GRISWOLD	3QFS FLANGED END QUICKSET	1
BV-HX-1A	HX-1	HX RETURN WATER FLOW	HHW	5,400	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-HX-1B	HX-1	HX RETURN WATER FLOW	CONDENSER WATER	5,400	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-CT-1A	CT-1	RETURN WATER FLOW	TOWER WATER	6,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-CT-2A	CT-2	RETURN WATER FLOW	TOWER WATER	3,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-CT-3A	CT-3	RETURN WATER FLOW	TOWER WATER	3,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-CT-4A	CT-4	RETURN WATER FLOW	TOWER WATER	3,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-CT-5A	CT-5	RETURN WATER FLOW	TOWER WATER	3,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-CT-6A	CT-6	RETURN WATER FLOW	TOWER WATER	3,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1

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PROJECT

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PROJECT NO. **21-154**	

SHEET TITLE

MECHANICAL SCHEDULES

SHEET NUMBER

M606

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:36:01 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

BALANCE VALVE SCHEDULE (CONT.)

NOTES:
1. PROVIDE...
2. FUTURE (NIC)

BV-BS-7A	TOWER WATER BASIN SWEEPER CT-1	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7B	TOWER WATER BASIN SWEEPER CT-1	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7C	TOWER WATER BASIN SWEEPER CT-2	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7D	TOWER WATER BASIN SWEEPER CT-2	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7E	TOWER WATER BASIN SWEEPER CT-3	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7F	TOWER WATER BASIN SWEEPER CT-3	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7G	TOWER WATER BASIN SWEEPER CT-4	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7H	TOWER WATER BASIN SWEEPER CT-4	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7I	TOWER WATER BASIN SWEEPER CT-5	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7J	TOWER WATER BASIN SWEEPER CT-5	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7K	TOWER WATER BASIN SWEEPER CT-6	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BS-7L	TOWER WATER BASIN SWEEPER CT-6	BASIN SWEEPER	TOWER WATER	310	4	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	43	GRISWOLD	3QFP FLANGED END QUICKSET	1
BV-BD-6A	TOWER WATER BLOW DOWN VALVE	BLOW DOWN	TOWER WATER	80	3	FLANGE	201	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 LEVER OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	30	GRISWOLD	3QFN FLANGED END QUICKSET	1
BV-BP-6A	TOWER WATER BYPASS VALVE	BYPASS	TOWER WATER	3,000	18	FLANGE	12,057	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	614.2	GRISWOLD	3QFX FLANGED END QUICKSET	1
BV-BP-6C	CHILLED WATER BYPASS VALVE	BYPASS	CHILLED WATER	3,000	14	FLANGE	6,225	CARBON STEEL BODY WITH CARBON STEEL PIEZO-RING AVERAING FLOW SENSOR, SS PRESSURE TAPS, CLASS 150 CS STEEL FLANGES, CLASSS 150 HAND WHEEL GEAR OPERATED LUG TYPE BUTTERFLY VALVE WITH RESILIANT SEAT	175	378.3	GRISWOLD	3QFV FLANGED END QUICKSET	1

STEAM AND CONDENSATE CONTROL VALVE SCHEDULE

NOTES:
1. CONTROL VALVES SHOWN IN THIS TABLE SHALL BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR FOR INSTALLATION BY THE MECHANICAL CONTRACTOR.
2. SEE DRAWINGS, SPECIFICATIONS, AND CONTROL SEQUENCES FOR ADDITIONAL CONTROL VALVE TYPES, LOCATIONS, AND FUNCTIONS. VALVES IN THIS SCHEDULE DO NOT CONSTITUTE ALL REQUIRED CONTROL VALVES.
3. PROVIDE FAIL OPEN SPRING ACTUATOR WITH TWO AUXILIARY SWITCHES AND MANUAL HAND WHEEL

UNIT TAG	LOCATION	SERVICE	FLUID	FLOW	END CONNECTION SIZE (NPS)	END CONNECTION TYPE	INLET TEMPERATURE	VALVE TYPE	VALVE CV	VALVE FLOW CHARACTERISTIC	MATERIAL OF CONSTRUCTION	DESIGN PRESSURE	CLOSE OFF PRESSURE	CLOSE OFF DIFFERENTIAL PRESSURE	CONTROL TYPE	ACTUATOR TYPE	ACTUATOR	BASIS OF DESIGN		NOTES
																		MANUFACTURER	MODEL NO.	
MOTORIZED ISOLATION CONTROL VALVE				0 GPM	0"	CLASS 150 FLANGED	-459.7 °F	HIGH PERFORMANCE V-PORT SEGMENTED BALL	0	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	0 psi	0 psig	0 psig	4-20 mA	ELECTRIC MODULATING NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
MOTORIZED ISOLATION CONTROL VALVE				0 GPM	0"	CLASS 150 FLANGED	-459.7 °F	HIGH PERFORMANCE V-PORT SEGMENTED BALL	0	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	0 psi	0 psig	0 psig	4-20 mA	ELECTRIC MODULATING NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	
MOTORIZED ISOLATION CONTROL VALVE				0 GPM	0"	CLASS 150 FLANGED	-459.7 °F	HIGH PERFORMANCE V-PORT SEGMENTED BALL	0	EQUAL PERCENTAGE	316 SS METAL SEAT, LEAK CLASS IV, INCONEL 625 SPRING, FILLED PTFE, CAST SS BODY, 316 SS SHAFT	0 psi	0 psig	0 psig	4-20 mA	ELECTRIC MODULATING NON-SPRING RETURN WITH TWO AUXILLARY SWITCHES	0-10V DC TO 90 DEG ROTARY 120 VOLT POWERED ACTUATOR, BUTTERFLY VALVE W/ TWO AUXILLARY SWITCHES AND BEACON INDICATOR	NELES	RE SERIES	

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M607

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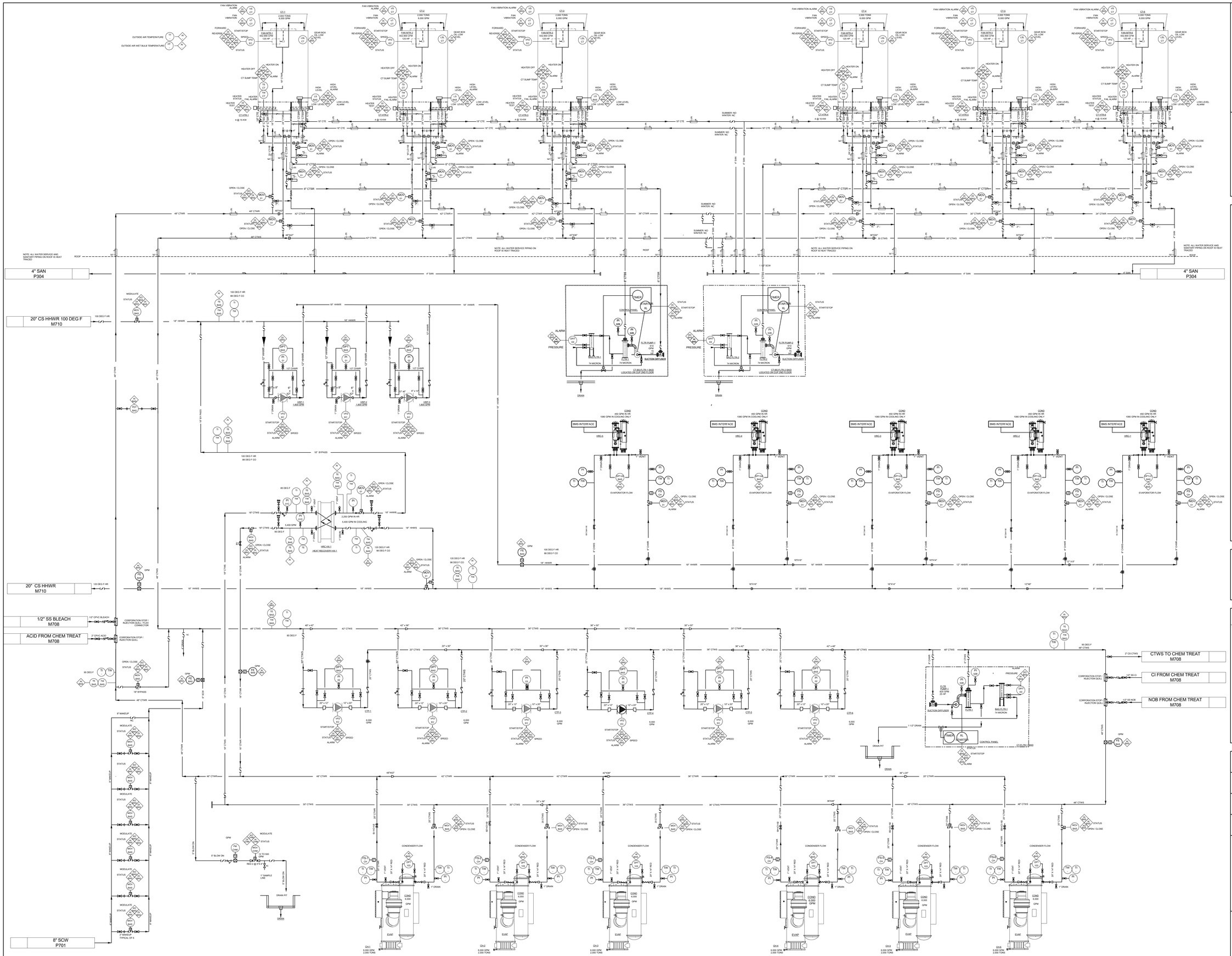
2/10/2023 2:36:02 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **COOLING TOWER SYSTEM - COOLING TOWER P&ID**
Scale: 6" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:36:03 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

OWNER

Indiana University Health
Medical Center Campus
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Central Utility Plant

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY	DS
CHECKED BY	AESI
APPROVED BY	Approver
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SHEET TITLE

COOLING TOWER SYSTEM - COOLING TOWER P&ID

SHEET NUMBER

M701

CENTRAL TOWER-WATER SYSTEM SEQUENCES

A. TOWER-WATER PLANT:

1. The central utility plant (CUP) tower-water system serves the new IU Health downtown campus. It is a variable primary system that is made up of six (6) 2,000 ton cross flow cooling towers, six 6,000 gpm variable speed cooling tower water pumps, two 600 gpm cooling tower basin sweeper systems, one 810 gpm centrifugal side stream filter system, one heat recovery chiller plate and frame heat exchanger, cooling tower blowdown system, make up water system and water treatment system. . The CUP tower water system operates year round.
2. Towers and associated pumps are enabled / disabled by the building BMS. The BMS controls and coordinates the staging of equipment and equipment operating speed to minimize total plant energy consumption. Advanced control algorithms, weather forecasts and historic data are used to predict and calculate energy usage and when and how equipment will operate to meet the campus load. The BMS control actions are based upon .
   a. Campus Chilled Water Load: Chilled water load as determined by the chilled water flow rate to the campus and chilled water supply / return temperature difference.
   b. Campus simultaneous heating hot water load and use of heat recovery chillers to meet chilled water and heating hot water demand.
   c. Individual Chiller Operating Power: Chiller amperage compared to chiller full load amperage maybe used as a surrogate for chilled water
   d. Cooling Tower Condenser Supply / Return Water Temperature
   e. Tower Water Pump Speed: Tower water supply/ return differential pressure.
   f. Tower Water number of Pumps: Number of Chillers running.
   g. Chiller Condenser Water Flow: Chiller condenser water supply / return differential pressure.
   h. Chiller Condenser Water: Number of Chillers running
   i. Heating hot water
   j. Building occupancy time of day schedule and equipment run time schedules
   k. Campus historical weather and space set point data and building equipment historical operating data.

B. COOLING TOWER

1. BMS commands Cooling Tower System to stand by whenever the CHW system is enabled. In stand by
2. When BMS commands HX-1 and / or lead 2,000 ton chiller compressor to run;
   a. The corresponding equipment condenser water isolation MOV is opened and a condenser water flow circuit is established.
   b. The lead cooling tower is enabled, and the BMS determines if the CTWS water temperature is too cold to run through the chiller.
      1. if the cooling tower water supply (CTWS) temperature is greater than 65 °F (adjustable), the lead cooling tower isolation MOV is opened.
      2. if the CTWS temperature is less than 60 °F (adjustable), the lead cooling tower MOV remains closed while the CTW bypass valve is modulated open. CTWR bypasses the cooling towers until the CTWS temperature rises to 85 °F (adjustable). When the CTWS rises to 85 °F, the CTW bypass is closed, and the lead cooling tower CTW isolation valve is opened.
   c. The lead cooling tower pump starts and runs after condenser / HX-1 isolation valve is proved open.
   d. The HX or chiller proof of flow switch closes and the BMS initiates the HX startup sequence, or the Chiller DDC initiates the chiller startup sequence.
3. BMS determines when an additional 2,000 ton chiller is to be added. When a 2,000 ton chiller is to be added:
   a. Open next chiller in succession condenser water isolation valve.
   b. Start next in succession CTW pump. All operating CTW pump VSD's modulate at the same speed to control CTWS/R differential pressure set point.
   c. Simultaneously open next in succession cooling tower inlet MOV.
   d. Chiller condenser water minimum flow permissive confirmed by chiller condenser water minimum flow switch.
      1. Chiller held offline until minimum flow established to chiller condenser. Flow required to be established within 1 minute (adjustable) of chiller condenser water valve opening.
      2. Chiller condenser water flow measured by flow differential pressure transducer across chiller condenser. BMS controls chiller condenser water flow by modulating condenser isolation control valve. BMS determines condenser flow rate based on chiller manufacturers allowable condenser flow limits, chiller and overall plant energy consumption
   e. BMS to monitor and log individual chiller condenser flow as measured at condenser differential pressure transmitters.
4. BMS determines when a 2,000 ton chiller is to be removed. When a 2,000 ton chiller is to be removed:
   a. Chiller DDC control stop sequence is initiated. When chiller DDC controls shut down sequence and timers confirm chiller ready for shut down:
      1. Close last chiller on condenser water isolation valve.
   b. Operating CTW pump VSD modulate to same speed to control pressure set point. BMS calculates CTW pump contribution to overall plant energy and determines if a CTW pump should be shut down.
      1. If a pump is to be removed, stop last CTW pump that was staged on. Pump off staging order is reverse of pump on staging.
   c. BMS calculates operating cooling tower energy contribution to overall plant energy use and determines if a cooling tower should be shut down. If a cooling tower is to be shut down, cooling tower off staging is reverse order of cooling tower on staging. close last cooling tower on inlet MOV.
5. BMS to monitor and log individual chiller condenser flow as measured at condenser differential pressure transmitter.

C. COOLING TOWER PUMP CONTROL:

1. There are six (6) parallel tower water variable distribution pumps located in the CUP CTWS piping (The pump and tower quantity has N+1 redundancy).
   a. Cooling tower pumps run whenever the 2,000 ton chillers operate or the heat recovery heat exchanger (HX-1) operates. At least one corresponding condenser water isolation valves for the 2,000 centrifugal chillers or the heat exchanger condenser water isolation valve must prove open for the cooling tower pumps to run.
   b. The BMS stages the pumps on / off and modulates their VFD speed to maintain a differential pressure of 14 psig (adjustable) between the CTWS and CTWR mains at the CTWS/R differential pressure transmitter located in the mechanical room on the second floor.
   c. The BMS controls all active CTWS distribution pumps to run at the same speed.
   d. The distribution pumps are designed for 6,000 gpm per pump (design flow rate of a 2,000 ton chiller). The BMS will calculate the apparent number of tower water pumps required based on cooling load, active 2,000 chillers, heat recovery heat exchanger status, and CTW pump energy consumption and overall plant energy consumption.
      1. When flow per cooling tower exceeds 5,000 gpm an additional pump will be started.
      2. When flow per cooling tower is less than 3,000 gpm a running pump will be stopped.
2. Pump VSD ramp rate will set to 10% / minute (adjustable).
3. BMS will monitor position of chiller condenser isolation valves and heat recovery heat exchanger HX-1 isolation control valves and prevent cooling tower pumps from running until isolation valves are opened.

D. DRUN TIME ALTERNATE TOWERS, AND PUMPS:

1. Operate towers and associated pumps on 14 day (adjustable) *lead-lag-standby* schedule, alternating based on adjustable 336 hour set point. When time elapses rotate *lead-lag-standby* designation, so *lag* becomes *lead*, *standby* becomes *lag* and *lead* becomes *standby*. Make provisions for future seventh and eight tower, and associated pumps.
2. Equipment staging
   a. Cooling towers and cooling tower pumps are staged on and off as scheduled once all safeties and prerequisites are met, and need is established.
3. Optimization: BMS will monitor and control CUP energy use at the equipment level and use advanced control algorithms to minimize over all plant energy use. KW metering, cooling tower and chilled water flow, outdoor air temperature, time of day, and previous occupancy / chiller load / outdoor and indoor temperature history and forecasts, rest schedules and predictive load calculations will be used to stage chillers, towers, and pumps on and off to minimize e energy use while maintaining system control.

E. COOLING TOWER MAKEUP WATER FILL

1. Cooling Tower Drain Valves
   a. Make Up Water: Tower water branch supply and return lines are provided with manual shut off isolation valves. Brach piping section also have manual drain valves. Branch valves can be closed, and pipe sections drained for tower maintenance or winter shutdown. For Summer operation, the drain valves are closed, and the branch isolation valves are opened.
2. Cooling Tower Makeup Water
   a. The water level in the cooling tower cold water basins is controlled by the BMS, individual cooling tower basin ultrasonic level sensors, and motorized make up water valves located in the chilled water pump room on the first floor of the CUP.
      1. The water level of each cooling tower basin is transmitted to the BMS by each cooling towers ultrasonic level sensor. The level for each sensor is preset to account for cooling tower sump level changes associated with transient cooling tower water traveling through the cooling tower fill.
      2. BMS level set points provided for cooling tower basin water level include;
         a. Low low level alarm low level condition to BMS
         b. Low level add makeup water; open makeup valve
         c. High level stop adding makeup water; close makeup valve
         d. High high level alarm high level condition to BMS
      3. If cooling tower is shut down for winter, monitor basin water level but do not use basin water level to operate cooling tower makeup valve. Only use non-winterized cooling towers to operate makeup valves.
   b. There is one 2" cooling tower makeup valve each cooling tower. The valves are manifolded into a common 6" header that injects makeup water into the 48" cooling tower supply main on the suction side of the cooling tower supply pumps. The BMS determines the number of makeup valves to operate on a call for makeup water. In general if a cooling tower is operating as determined by its 18" CTR inlet valve status as opened, the corresponding makeup water valve on the 6" header will be enabled and modulate open / closed tin response to makeup water level controls.

F. COOLING TOWER TEMPERATURE AND FLOW CONTROL OPTIMIZATION

1. The tower water design supply temperature is 85 °F and the return design water temperature is 95 °F.
2. Cooling towers are designed for 6,000 gpm flow. They are capable of running at flows as low as 50% design flow (3,000 gpm).
3. The cooling tower fans are outfitted with a VFD motor controls. The cooling tower fan speed is modulated to control the leaving tower water temperature.
   a. The normal summer CTWS temperature is 85 F.
   b. When temperatures are cooler, the CTWS temperature is reset to the cooling tower to entering air wet bulb temperature plus 5 °F. The cooling tower fan speed is modulated to control CTWS set point.
   c. In winter, the cooling tower fan will modulate, and stage on / off to maintain minimum CTWS above 60 F.
   d. The cooling tower fans can run in reverse in winter when needed for de-icing the fan / tower.
4. The chiller condenser are capable of variable flow from chiller minimum flow (about 3,000 gpm) to chiller design flow 6,000 gpm. The condenser flow to the active chillers is allowed to vary between 1.5 to 3 gpm / ton based on least total plant energy use. The condenser flow will be split equally across all active cooling towers and the cooling tower VFD fans will all operate at the same speed. Number of active cooling towers will prevent flow through any tower from being less than 3,000
5. The BMS controls shall analyze the combined chiller, chiller pump, cooling tower, and cooling tower pump energy use and calculate new set points for the chiller flow, and cooling tower supply water temperature resulting in the least energy to meet the campus building load.

G. COOLING-TOWER SUMP HEATER:

1. Energize sump heater if sump temperature falls below 40 deg F temperature set point.
2. Cooling tower supply basin water temperature is input to BMS.
3. Each electric heating element is monitored for on /off status and element failure status.
4. Close cooling tower supply and return motor operated valves, close cooling tower make up water solenoid valve, open cooling tower supply solenoid drain valve and cooling tower return solenoid drain valve if sump temperature falls below 35 deg F temperature set point.
5. Disable sump heater if sump water level is below sump low water level.

H. HEAT RECOVERY CONDENSER WATER SIDE STREAM CHW PUMPS

1. Three 1,800 gpm HRC condenser side pumps (N+1 quantity) circulate chilled water through the active heat recovery chillers in the HHW sidecar loop. Heat recovery heating hot water side stream pumps start and run when the HRC's run.
   a. The HRC HHWP Pumps stage on /off and the VSD indexes number of pumps and speed to correspond to the number of active HRC'ers.
   b. The HRC heating hot water pumps provide a constant flow per operational HRC.
      1. In heat recovery mode the BMS modulates each active HRC condenser isolation valve to maintain 450 gpm as measured by the HRC condenser differential pressure transmitter.
      2. In cooling only mode the BMS modulates each active HRC condenser isolation valve to maintain 1080 gpm as measured by the HRC condenser differential pressure transmitter.
2. In heat recovery mode, the condenser water from the heat recovery chillers flows back into the HHWR main and through the standby boilers. The lead boiler fires to provide supplemental heating as required to reach HHW set point.
3. In Cooling only mode a three way diverting valve in the HHWS pipe from the HRC's diverts flow through HX-1 to the suction side of the HRC condenser side stream pumps. Cooling tower water isolation valve in the HX-1 return pipe opens to provide cooling tower water to HX-1.

I. INDICATE ON THE OPERATOR'S WORKSTATION DISPLAY TERMINAL:

1. DDC system graphic.
2. DDC system status, on-off.
3. Low-level cooling-tower sump alarm.
4. Outdoor temperature.
5. Cooling (software) demand indication.
6. Time and time schedule.
7. Condenser-water pump(s) on-off status (enabled or disabled).
8. Condenser-water pump(s) on-off indication (operating or not operating).
9. Condenser-water flow indication.
10. Cooling-tower fan(s) on-off indication (operating or not operating).
11. Refrigeration machine on-off indication (operating or not operating).
12. Condenser-water sump (return) control-point temperature.
13. Condenser-water sump (return) temperature.
14. Condenser-water control-valve position.
15. Cooling-tower fan(s) on-off indication (operating or not operating).
16. Cooling Tower Fan Speed
17. Cooling Tower Fan direction Forward / Reverse
18. Cooling Tower Fan Vibration Alarm
19. Cooling Tower Supply Water Basin Temperature
20. Cooling Tower Supply Basin Water Level Status
21. Condenser-water supply temperature.
22. Cooling-tower sump temperature.
23. Cooling-tower sump heater element on-off indication (operating or not operating).
24. Cooling Tower Basin Heater element failure alarm
25. Cooling-tower sump drain indication.
26. Condenser-water pressure drop through chiller.
27. Condenser-water flow through chiller.
28. Chiller / HX-1 condenser-water supply and return temperature.

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REVISIONS

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DESIGNED BY **DS**	CERTIFICATION
CHECKED BY **AESI**	PRELIMINARY NOT FOR CONSTRUCTION
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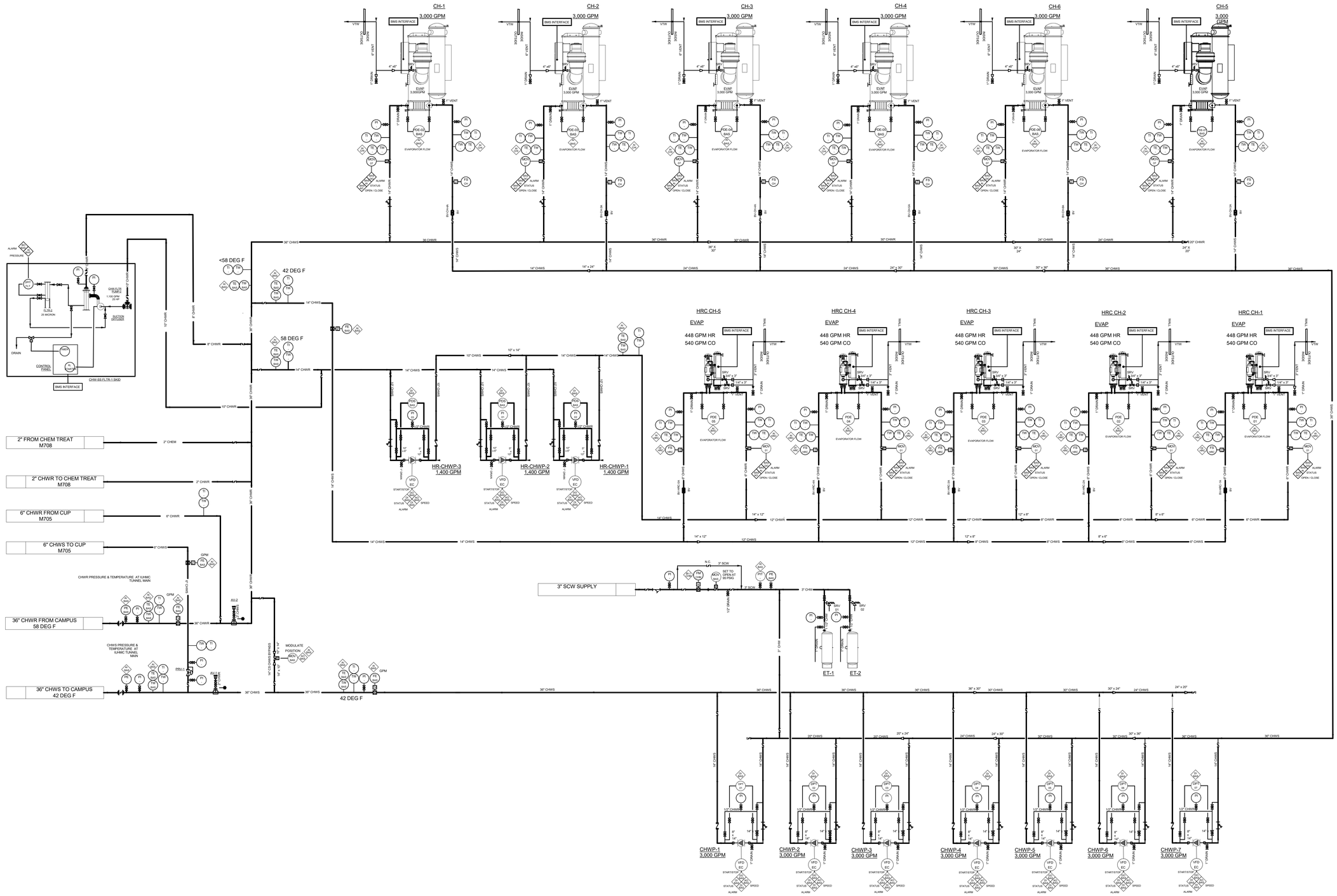
PROJECT NO. **21-154**	

SHEET TITLE

CENTRAL TOWER-WATER SYSTEM SEQUENCES

SHEET NUMBER

M702



1 **CHILLED WATER SYSTEM - CHILLED WATER P&ID**
Scale: none

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CHILLED WATER SYSTEM - CHILLED WATER P&ID

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M703

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CENTRAL CHILLED-WATER SYSTEM SEQUENCES

A. CHILLED WATER PLANT:

1. The central utility plant (CUP) chilled water system serves the new IU Health downtown campus. It is a variable primary chilled water system that is made up of five (5) 300 ton variable speed centrifugal heat recovery chillers, six (6) 2,000 ton constant speed water cooled centrifugal chillers, seven (7) 3,000 gpm variable speed primary CHW pumps, three 1,400 gpm variable speed heat recovery chiller chilled water sidecar pumps, three 1,800 gpm variable speed heat recovery condenser water sidecar pumps, six (6) 2,000 ton cross flow cooling towers, and six 6,000 gpm variable speed cooling tower water pumps. The CUP chilled water system operates year round.
2. The campus chilled water supply (CHWS) and chilled water return (CHWR) design temperatures are 42°F and 58°F respectively. The chilled water is piped from the CUP to the hospital and support buildings through 36" CHWS&R mains located in a tunnel beneath Senate Avenue.

B. HEAT RECOVERY CHILLERS:

1. There are five (5) 300 ton variable speed centrifugal heat recovery chillers arranged in parallel sidecar fashion up stream of the 2,000 ton centrifugal chillers.
2. he HRC's can run in heat recovery mode or cooling only mode. The BMS controls the HRC operational mode based on simultaneous heating and cooling need and total least energy usage. Preference is given to running and base loading the heat recovery chillers in Heat Recovery Mode.
3. Any time the CUP CHW system is energized the lead 2,000 ton centrifugal chiller enters standby mode. The lead 2,000 ton chiller chilled water isolation valve is opened to provide a CHW flow path from the CHWR to CHWS piping.
4. The heat recovery chillers are the first chillers to stage on and last to stage off. They are meant to run year round. They are required to run when total CHW load is less than 500 tons / 1,200 gpm since these loads / flows are the lower operating limit for a 2,000 ton centrifugal chiller.
5. The heat recovery chillers are nominal 400 ton VFD centrifugal chillers derated to 300 tons in heat recovery mode. They have limited operating range in heat recovery mode due to the high compressor lift (42°F chilled water to 120 °F heating hot water). In cooling only mode the HRC's can produce capacity near 400 tons each (lift 42°F chilled water to 98 °F condenser water).
   a. HRC capacity and load range is lift dependent and mapped into the BMS for both heat recovery and cooling only operating modes.
   b. In either mode the BMS will stage the HRC 's on /off and chiller DDC controls will monitor / control compressor speed to supply 42 ° F chilled water, unless HRC DDC control is overridden by BMS command for load limiting constraints or the chilled water rest schedule changes the CHWS set point.
6. In the heat recovery mode the HRC's are designed to cool the CHW from 58°F to 42°F while heating the HHWR from 100 °F to 120°F.
   a. Condenser water (HHWR) is pumped at 1.5 gpm / cooling ton through HRC's. Condenser water isolation valve is modulated to control HRC condenser flow rate to 450 gpm as measured at HRC condenser differential pressure transmitter.
   b. Condenser water may be bypassed through a plate and frame heat exchanger (HX-1) at variable flow rate that rejects excess heat to the cooling towers. HX-1 condenser water three way diverting valve is modulated to control HHWR to the HHWR main from HRC condenser as measured by flow meter HHWR-FM-2 to match HHWR flow rate to boilers as measured at HHWR-FM-1 flow meter-1.
7. In cooling only mode the chillers are designed to cool the CHW from 58°F to 42°F while heating the condenser water from 88 °F to 98°F.
   a. Condenser water is pumped through a plate and frame heat exchanger (HX-1) at an increased rate (3 gpm) that rejects heat to the cooling towers. Condenser water isolation valve is modulated to control HRC condenser flow rate to 1080 gpm as measured at HRC condenser differential pressure transmitter.
   b. Condenser water is bypassed through plate and frame heat exchanger (HX-1) at variable flow rates that rejects condenser heat to the cooling towers. HX-1 condenser water three way diverting valve is positioned to bypass all condenser water through HX-1.
8. BMS will calculate the cooling / heating loads and determine the number of HRC's to run and the mode in which they will run.
   a. Total cooling loads below 1,500 tons with simultaneous heating hot water loads will be met by running the HRC in heat recovery mode.
   b. HX-1 may be utilized when total cooling load exceeds simultaneous total heating load to fully /partially dump excess heat to the cooling towers.
9. When CUP total cooling load exceeds 1,500 tons, the larger 2,000 ton centrifugal chillers are staged on in combination with the heat recovery chillers.
   a. The BMS will command the operating HRC's to enter into load limiting to create a nominal 300 ton chilled water load for the 2,000 ton centrifugal chiller (minimum stable operating load). The HRC % load limit will be variable and calculated based on the current chilled water flow rate through the 2,000 ton chiller and differential water temperature deviation from set point (42 °F adjustable).
   b. If the HRC load falls below allowable minimum HRC capacity, active HRC'ers will be staged off sequentially until the HRC'ers are in a stable operating zone.
   c. The 2,000 ton chiller will start and run to maintain 42 °F discharge water unless
      1. The chilled water is already at 42 °F
      2. The flow through the 2,000 ton chiller is less than 1,200 gpm
      3. The total chilled water load is less than 900 tons.
      4. The 2,000 ton chiller load is less than 250 tons.
      5. The chiller minimum off timer has not timed out.
   d. The BMS will decrease / increase the HRC load limit as the total chilled water system load decreases / increases. The HRC's will exit load limiting whenever the total system load
      1. Increases above 1,800 tons
      2. Decreases below 900 tons and the 2,000 ton chiller is returned to standby mode.
   e. When the chilled water flow through the lead 2,000 ton chiller exceeds 3,200 gpm (adjustable) a second 2,000 ton chiller CHW and CTW isolation valves will open, and the lag 2,000 ton chiller will be staged on. After the second 2,000 ton chiller is online the subsequent 2,000 ton chillers will follow suit based on BMS energy optimization control algorithms.

C. HEAT RECOVERY CHILLER SIDE STREAM CHW PUMPS

1. Three 1,400 gpm HR CHW pumps (N+1 quantity) circulate chilled water through the active heat recovery chiller's evaporators in the HR CHW sidecar loop. Lead HRCW side stream pump starts and runs when the lead HRC runs.
   a. The BMS stages the HRC CHWP pumps on / off. BMS modulates the pump VSD's pump speed to meet HRC side stream loop flow set point.
   b. Based on HRC mode and CHW load the BMS determines the HRC side stream circulation flow rate and number of HR CHW pumps to run.
   c. The BMS indexes the VSD pump speed to correspond to the operational mode and number of active HRC's. When multiple HR CHW pumps run, they are run at the same speed.
   d. The heat recovery loop CHWR flow is measured and monitored by the BMS at CHWR-FM-02 downstream of the HR CHW pumps. The CHWR flow is used as HR CHW pump VSD control feedback. Pump VSD speed is modulated to maintain HRC side stream loop set point.
   e. The CHWR flow through the HRC's is stepped and varies with operational mode.
      1. In heat recovery mode the BMS modulates each active HRC CHW isolation valve to maintain 450 gpm as measured by the HRC chiller evaporator differential pressure transmitter.
      2. In cooling only mode the BMS modulates each active HRC CHW isolation valve to maintain 540 gpm as measured by the HRC chiller evaporator differential pressure transmitter
2. The HRC chilled water flows back into the 36" CHWR main up stream of the 2,000 ton centrifugal chillers.

D. CENTRIFUGAL CHILLERS

1. When the CHW system is enabled, the lead 2,000 ton chiller is placed in standby.
   a. The lead chiller CHW isolation valve is opened and CHWR is allowed to flow through the chiller. The chiller refrigeration circuit will be locked out.
   b. The BMS calculates total CHW system load based on system flow as measured at CHWS-FM-01 and supply/ return differential temperature. The BMS determines which chillers and how many chillers to run.
   c. The HRC are preferentially loaded. CHW from the HRC sidecar loop is sent to the lead 2,000 ton centrifugal chiller. When the total CHW system load exceeds the HRC capacity (900 tons to 1500 tons), and CHW system flow rate is greater than 1,200 gpm the 2,000 ton chiller refrigeration system is enabled. The chiller compressor may or may not run depending on the campus CHW and HHW simultaneous cooling and heating loads and the HRC operating status.
   d. When the centrifugal chiller refrigeration system is enabled and the chiller compressor is needed the 2,000 ton lead chiller
      1. Condenser water isolation valve will open
      2. Chilled water lead pump will start and run if it not already running.
      3. The chiller CTW flow switch will establish proof of chiller CTW flow.
      4. The chiller DDC controls will start the chiller in accordance with the chiller DDC startup sequence.
      5. The chiller compressor will be free to start and run according to the Chiller on board DDC controls.
2. When the BMS calculates that the total chilled water load has or will exceed the total heat recovery chiller capacity and the cooling load is increasing or expected to increase,
   a. The BMS will command the operating HRC's to enter into load limiting to create a nominal 300 ton chilled water load for the lead 2,000 ton centrifugal chiller (2,000 ton minimum stable operating load).
   b. The HRC % load limit will be variable and calculated based on the current chilled water flow rate through the lead 2,000 ton chiller and lead 2,000 ton chiller differential water temperature deviation from set point.
   c. The BMS will command the active HRC's VFD's to limit the HRC speed and power to the calculated set point. This will reduce the cooling and heating ability of the HRC's and create the 300 ton chilled water load for the lead 2,000 ton chiller.
   d. The HRC's operating envelope is highly dependent on the HRC required lift. If the HRC's cooling load falls below allowable minimum HRC capacity, active HRC's will be staged off sequentially, shifting load to the remaining active HRC's until the remaining active HRC's are in a stable operating zone.
   e. The 2,000 ton chiller will start and run to maintain 42 °F discharge water unless
      1. The chilled water is already at 42 °F
      2. The flow through the 2,000 ton chiller is less than 1,200 gpm
      3. The total chilled water load is less than 900 tons.
      4. The 2,000 ton chiller load is less than 250 tons.
      5. The 2,000 ton chiller compressor minimum off timer has not timed out.
   f. The BMS will decrease / increase the HRC load limit as the total chilled water system load decreases / increases. The HRC's will exit load limiting whenever the total system load
      1. Increases above 1,800 tons (2,000 ton chiller and HRC's both run based on load)
      2. Decreases below 900 tons and the 2,000 ton chiller is returned to standby mode.
   g. When the chilled water flow through the lead 2,000 ton chiller exceeds 3,200 gpm (adjustable) a second 2,000 ton chiller will be staged on. After the second 2,000 ton chiller is online the subsequent 2,000 ton chillers will be staged on / off by the BMS to maximize energy savings.
3. Add a Chiller when one is already running: Simultaneously do the following:
   a. Calculate chiller and campus chilled water load. When all operating chillers are loaded to 100% flow capacity or 75 % load for 15 minutes and weather forecast / BMS historical chilled water system load data indicates chilled water load are likely to increase in the next 30 minutes, bring next chiller in succession online.
   b. Unload any operating chillers to 40% load while maintaining operating chilled water pump(s) speed / flow rate(s).
      1. Allow chilled water supply temperature to float without chiller control action temporarily until next chiller brought online (5 minutes adjustable).
   c. Open next chiller condenser water isolation valve
   d. Open next cooling tower return water isolation valve.
   e. Start next cooling tower pump. Modulate VSD to establish condenser flow uniformly across all active 2,000 ton chillers.
   f. Open next chiller chilled water isolation valve.
   g. Start next chilled water pump. Modulate VSD to establish evaporator flow uniformly across all active 2,000 ton chillers.
   h. Modulate chilled water and tower water bypass valves when necessary.
   i. BMS returns control to chiller DDC discharge temperature controller.
   j. Chilled water and condenser water pumps modulate for pressure control in unison.
4. Remove Chiller: Simultaneously do the following:
   a. Calculate chiller and campus chilled water load. When all operating chillers are loaded to 40% capacity for 15 minutes and / or chilled water system flow drops to 40% design flow for 15 minutes and weather forecast / BMS historical chilled water system load data indicates chilled water load are likely to decrease in the next 30 minutes, remove a chiller in reverse order of adding chillers.
   b. Unload any operating chillers and allow chilled water temperature to float without chiller control action temporarily until chiller is offline and associated cooling towers, chilled water and cooling tower pumps are offline.
   c. Stop lag chiller per chiller shutdown sequence. Close chiller chilled water inlet isolation valve after manufacturer recommended time delay.
   d. BMS to determine required number of CHW pumps needed. Stop lag chilled water pump if needed, and modulate operating chilled water pumps to control chilled water supply / return main differential pressure set point.
   e. Close chiller condenser isolation valve.
   f. Stop cooling tower lag pump. Remaining pump VFD's modulate to control condenser water supply / return differential pressure.
   g. Determine if all operational cooling towers should remain operational (there may be energy savings by operating one more cooling than operating chiller. BMS to calculate projected hp and select equipment to operate.)
      1. If so split flow across all operating towers equally.
      2. If not, then close lag cooling tower inlet motor operated valve. Allow flow to distribute equally over operating cooling tower.

E. CHILLED WATER DISTRIBUTION PUMPS:

1. There are seven (7) parallel chilled water variable primary distribution pumps located in the CUP CHWS piping (The pump quantity has N+1 redundancy).
   a. The BMS stages the pumps on / off and modulates their VFD speed to maintain a differential pressure of 65 psig between the CHWS and CHWR mains at the CHWS/R differential pressure transmitter located in the utility tunnel chilled water piping mains at the hospital entrance.
   b. The lead CHW pump is always enabled. The BMS controls all active CHWS distribution pumps to run at the same speed.
   c. The distribution pumps are designed for 3,000 gpm per pump (design flow rate of a 2,000 ton chiller). The BMS will calculate the apparent number of chilled water pumps required based on system flow rate and cooling load.
      1. When flow per pump exceeds 2,000 gpm and the BMS determines energy saving can be had by running an additional pump an additional pump will be started.
      2. When minimum allowable flow per pump is less than 1,000 gpm a running pump will be stopped to protect the pumps.
2. Pump VSD ramp rate will set to 10% / minute (adjustable).
3. BMS will monitor IUHMC control valve positions and implement differential pressure rest based on IUHMC valve position.

F. CHILLED WATER DISTRIBUTION BYPASS VALVE:

1. The chilled water distribution bypass valve is located in the CUP between the CHWS/R 36" mains at the tunnel entrance.
2. The BMS will open and modulate the bypass valve to maintain minimum CHW flow to protect the operating chillers.
   a. Chillers
      1. The minimum CHW flow through a heat recovery chillers is 450 gpm.
      2. The minimum chilled water flow through a 2,000 ton is 1,200 gpm.
      3. The BMS will monitor the active chillers and the CHWS flow and modulate the bypass valve to maintain minimum flow per number of active chillers if the total CHWS flow is less than the calculated minimum flow.
3. The BMS will open and modulate the bypass valve to maintain minimum CHW flow to protect the operating distribution pumps.
   a. CHW Pumps
      1. The minimum CHW distribution pump flow is 932 gpm.
4. The BMS will monitor the number of active distribution pumps and the total CHWS flow and modulate the bypass valve to maintain the minimum CHW distribution pump flow based on the number of active chilled water pumps.
5. Chilled water pump pressure control PID loop and chilled water control bypass valve PID loops work in concert with each other. For stability, the chilled water pressure control loop time period is reset once per second and the chilled water bypass control valve loop time period is reset once per ten seconds.

G. CHW SYSTEM FLOW METERING

1. The chilled water is piped to / from the CUP to the hospital and support buildings through 36" CHWS&R mains located in a tunnel beneath Senate Avenue. A flow meter is installed in the 36" CHWS pipe in the CUP before the bypass valve. The flow signal is sent to the BMS.
2. A second flow meter is installed in the 36" CHWR in the tunnel after branch piping to SSB building upstream of the CUP CHW bypass valve. The flow signal is sent to the BMS.
3. Each chiller evaporator and condenser has a differential pressure transmitter calibrate for flow through the respective device. The flow signal is sent to the BMS.

H. CHILLER PLANT OPTIMIZATION

1. Chillers and associated pumps are enabled/ disabled by the building BMS. The BMS and chiller controllers' control and coordinate the staging of equipment and equipment operating speed to minimize total chilled water plant energy consumption. Advanced control algorithms, weather forecasts and historic data are used to predict and calculate energy usage and when and how equipment will operate to meet the campus load. The chiller staging controllers' actions are based upon .
   a. Campus Chilled Water Load: Chilled water load as determined by the chilled water flow rate to the campus and chilled water supply / return temperature difference,
   b. Campus simultaneous heating hot water load and use of heat recovery chillers to meet chilled water and heating hot water demand.
   c. Individual Chiller Operating Power: Chiller amperage compared to chiller full load amperage maybe used as a surrogate for chilled water
   d. Cooling Tower Condenser Supply / Return Water Temperature
   e. Tower Water Pump Speed: Tower water supply/ return differential pressure.
   f. Tower Water number of Pumps: Number of Chillers running.
   g. Chiller Condenser Water Flow: Chiller condenser water supply / return differential pressure.
   h. Chiller Condenser Water: Number of Chillers running
   i. Heating hot water
   j. Building occupancy time of day schedule and equipment run time schedules
   k. Campus historical weather and space set point data and building equipment historical operating data
2. Chilled-Water System Occupied Time Schedule:
   a. Chillers have a 24 hour per day, seven day per week, 365 day per year time of day schedule with four adjustable enabled / disabled time periods per day. Chillers have separate time of day schedules for weekends, holidays, and weekdays. Time of day schedules will:
      1. Enable startup, initiation, and control of chilled water and tower water system based on day type and occupied / unoccupied schedules.
3. Run Time Alternate Chillers and pumps:
   a. Operate chillers, and associated pumps on 14 day (adjustable) *lead-lag-next up* schedule, alternating based on adjustable 366 hour set point. When time elapses rotate *lead-lag-next up* designation, so *lag* becomes *lead*, *next up* becomes *lag* and *lead* becomes *last next up*. Provide control expansion provisions for future 7th and 8th centrifugal chiller and associated pumps.

I. INDICATE ON THE OPERATOR'S WORKSTATION DISPLAY TERMINAL:

1. DDC system graphic.
2. DDC system status, on-off.
3. Outdoor temperature.
4. Cooling (software) demand indication.
5. Time and time schedule.
6. Condenser-water flow indication.
7. Chilled-water pump(s) on-off status (enabled or disabled).
8. Chilled-water pump(s) on-off indication (operating or not operating).
9. Chilled-water flow indication.
10. Refrigeration machine on-off indication (operating or not operating).
11. Chilled-water supply temperature.
12. Chilled-water return temperature.
13. Chilled-water temperature control-point adjustment.
14. Chiller(s) on-off status (enabled or disabled).
15. Chiller(s) on-off indication (operating or not operating).
16. Chiller "failure-to-start" indication.
17. Expansion tank low-level alarm.
18. Condenser-water control-valve position.
19. Condenser-water supply temperature.
20. Chiller(s) power input (instantaneous).
21. Chilled-water pressure drop through chiller.
22. Chilled-water flow through chiller.
23. Condenser-water pressure drop through chiller.
24. Condenser-water flow through chiller.
25. Chiller condenser-water supply and return temperature.
26. Chiller chilled-water supply and return temperature.
27. System capacity in tons.

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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0 1/2" 1" 2"

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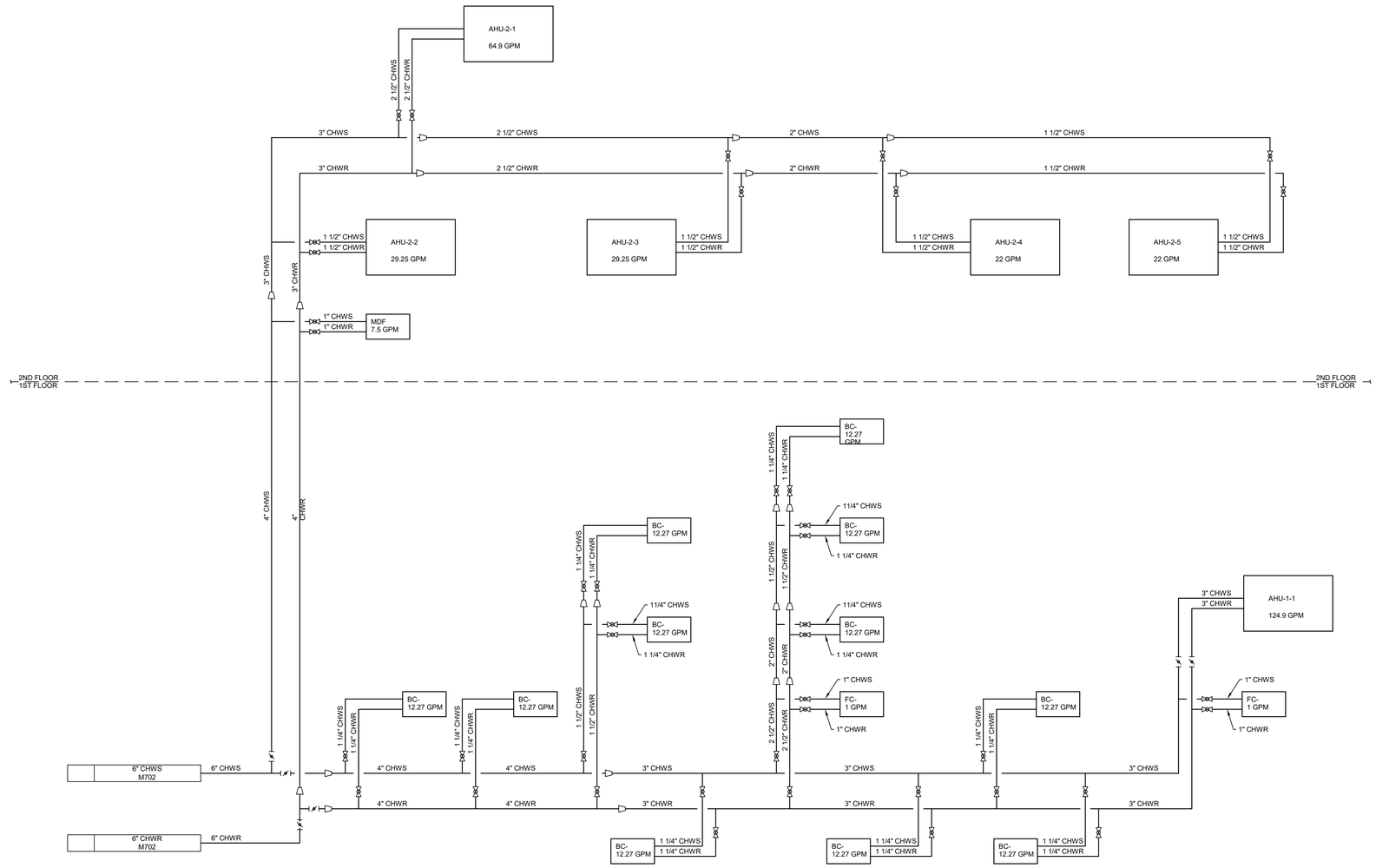
SHEET TITLE

CENTRAL CHILLED-WATER SYSTEM SEQUENCES

SHEET NUMBER

M704



1 **CUP CHILLED WATER FLOW DIAGRAM**
Scale: NONE

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CUP CHILLED WATER SYSTEM PI&D

SHEET NUMBER

M705

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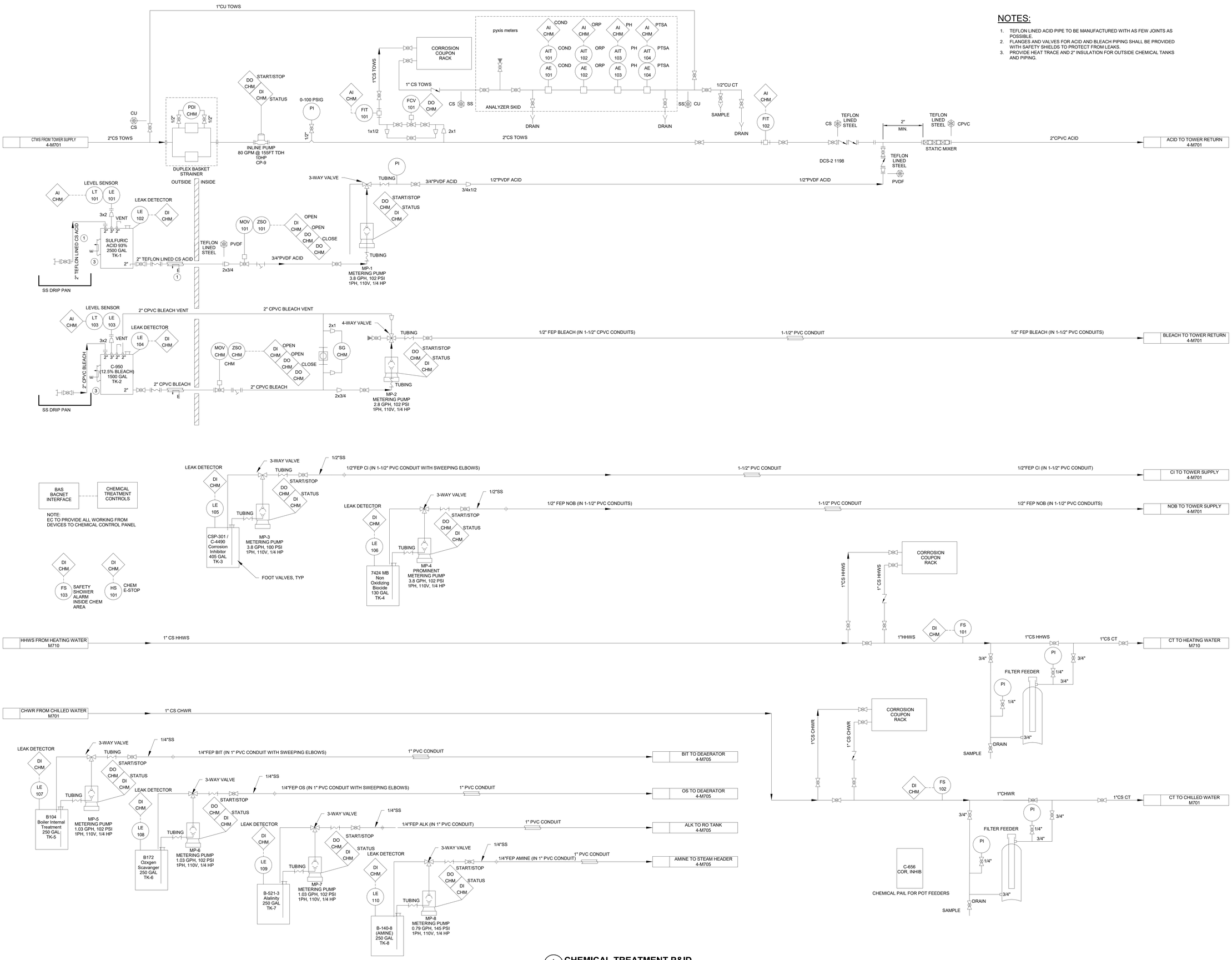
2/10/2023 2:36:05 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

NOTES:

1. TEFLON LINED ACID PIPE TO BE MANUFACTURED WITH AS FEW JOINTS AS POSSIBLE.
2. FLANGES AND VALVES FOR ACID AND BLEACH PIPING SHALL BE PROVIDED WITH SAFETY SHIELDS TO PROTECT FROM LEAKS.
3. PROVIDE HEAT TRACE AND 2" INSULATION FOR OUTSIDE CHEMICAL TANKS AND PIPING.



1 **CHEMICAL TREATMENT P&ID**
Scale: NONE

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SHEET TITLE

CHEMICAL TREATMENT P&ID

SHEET NUMBER

M708

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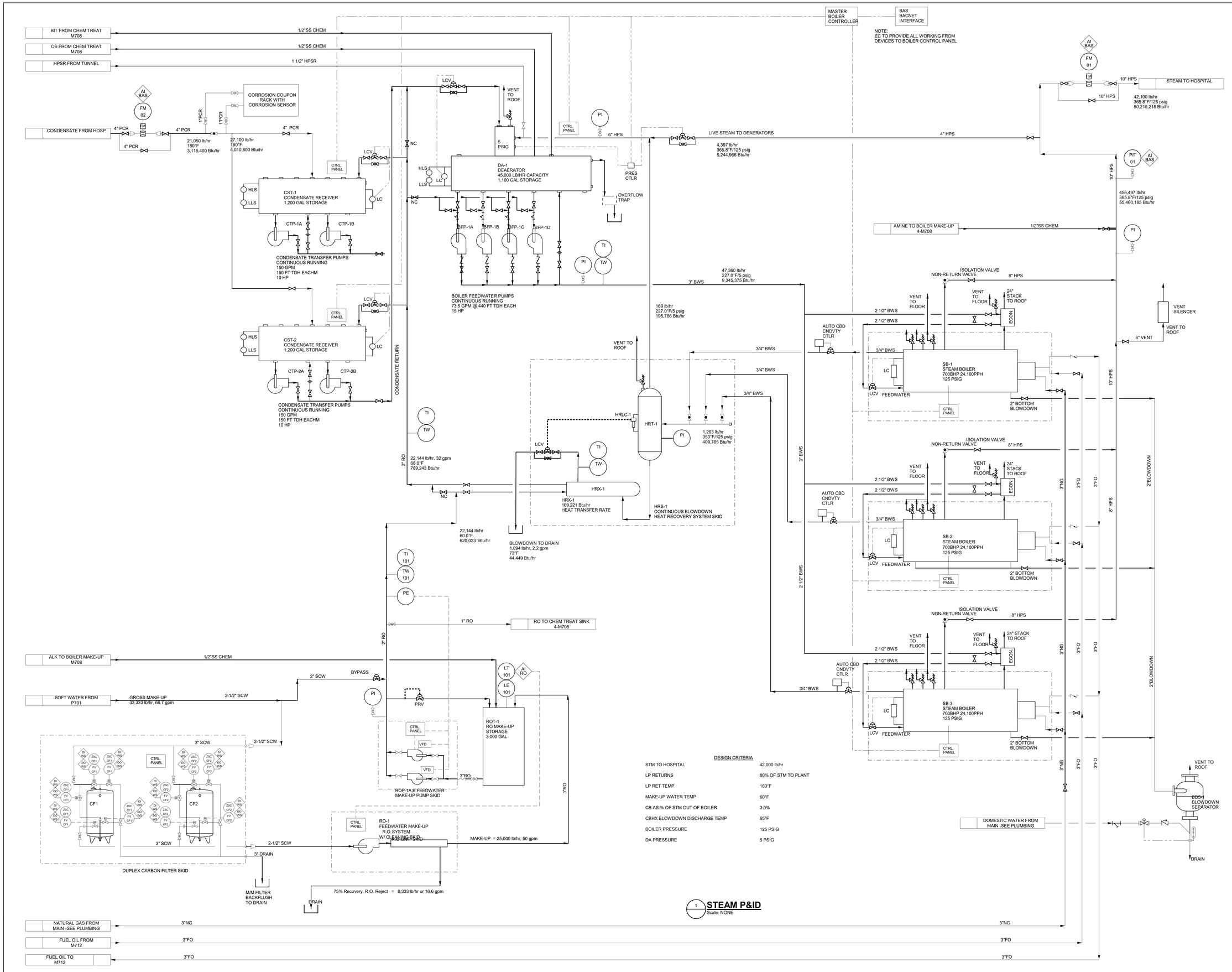

1 **STEAM P&ID**
Scale: NONE

DESIGN CRITERIA

STM TO HOSPITAL	42,000 lb/hr
LP RETURNS	80% OF STM TO PLANT
LP RET TEMP	180°F
MAKE-UP WATER TEMP	60°F
CB AS % OF STM OUT OF BOILER	3.0%
CBHX BLOWDOWN DISCHARGE TEMP	65°F
BOILER PRESSURE	125 PSIG
DA PRESSURE	5 PSIG

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SHEET TITLE

STEAM P&ID

SHEET NUMBER

M709

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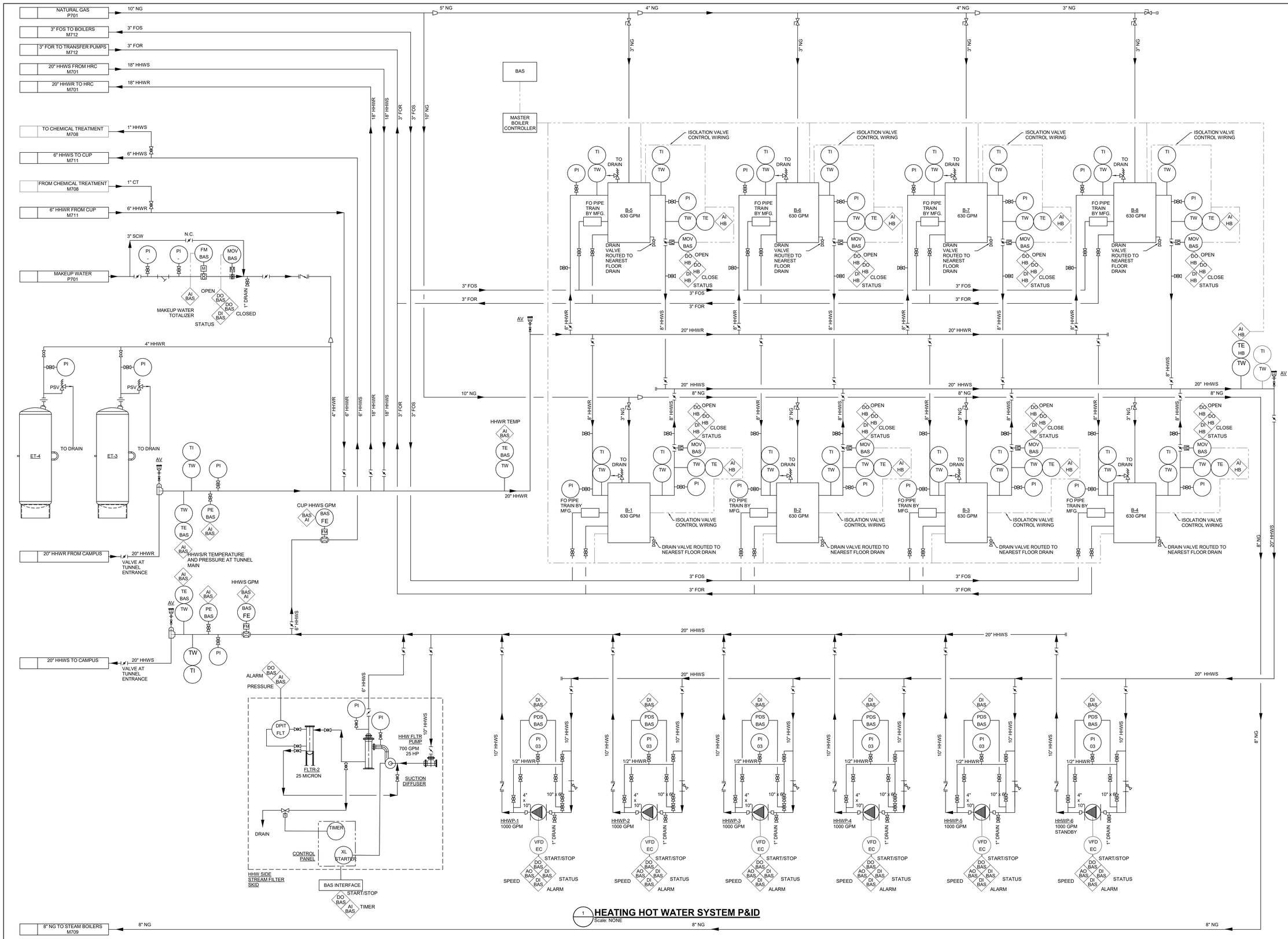

1 **HEATING HOT WATER SYSTEM P&ID**
Scale: NONE

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SHEET TITLE

HEATING HOT WATER SYSTEM P&ID

SHEET NUMBER

M710

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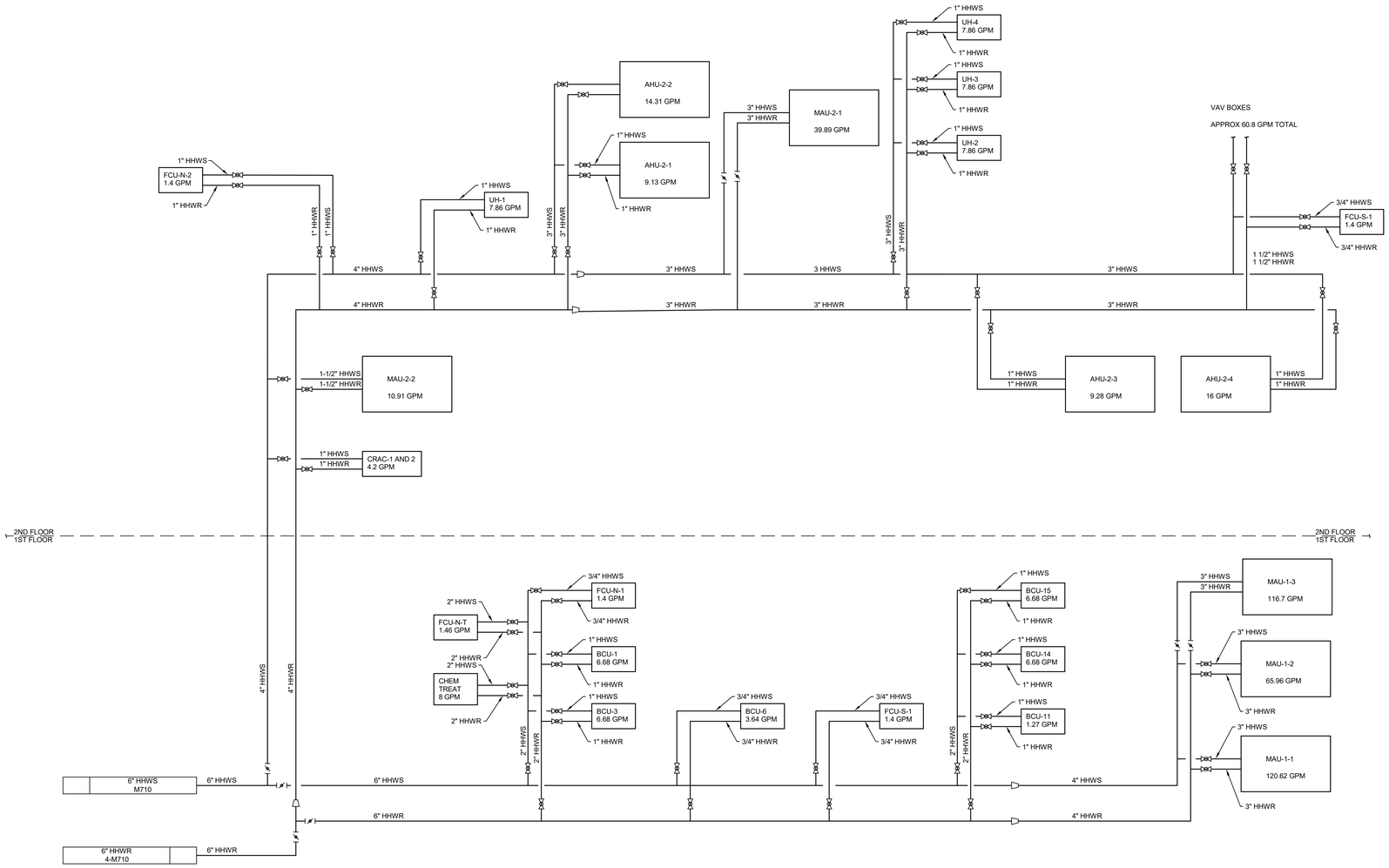

1 **CUP HEATING HOT WATER FLOW DIAGRAM**
Scale: 12" = 1'-0"

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SHEET TITLE

CUP HEATING HOT WATER SYSTEM P&ID

SHEET NUMBER

M711

0 1/2" 1" 2"

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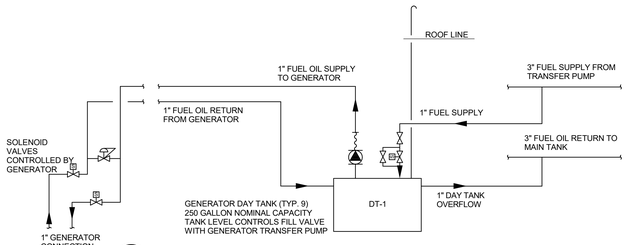
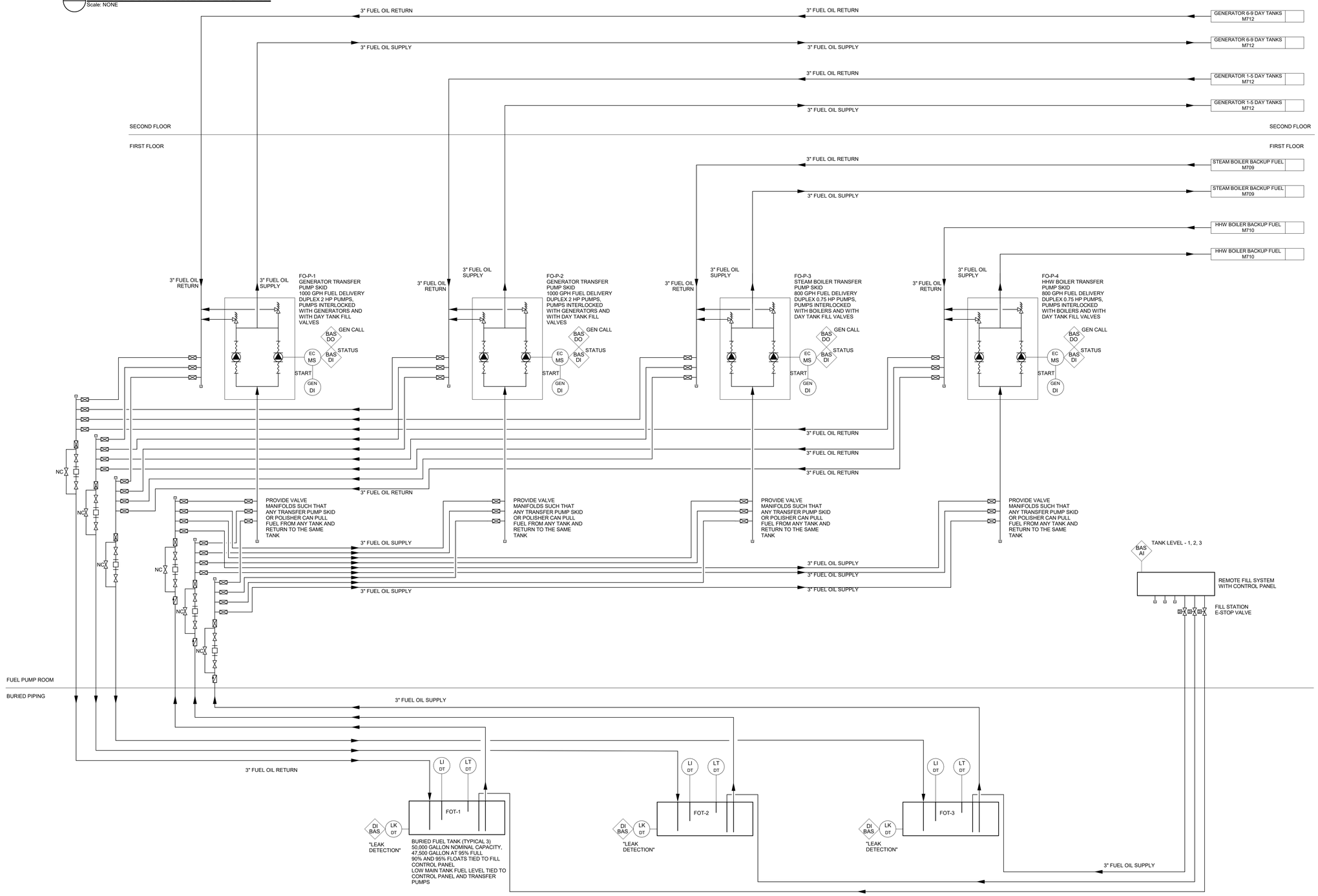


2 **TYPICAL DAY TANK ARRANGEMENT**
Scale: NONE



1 **GENERATOR FUEL OIL P&ID**
Scale: NONE

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SHEET TITLE

GENERATOR FUEL OIL P&ID

SHEET NUMBER

M712

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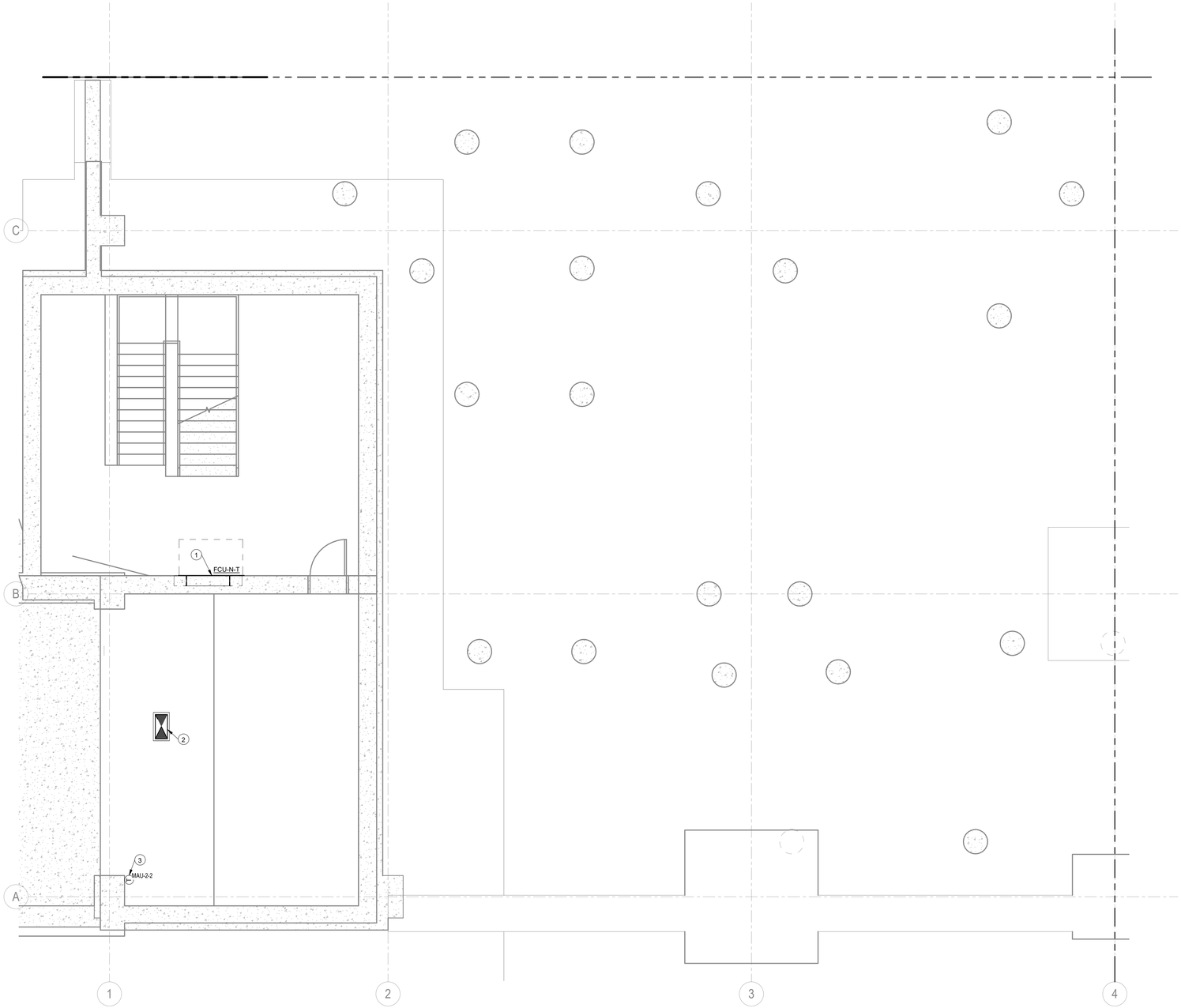


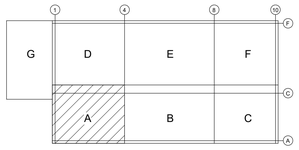
LOWER LEVEL HVAC PLAN- AREA A
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS

PLAN NOTES:

1. INSTALL HEATING ONLY FAN COIL UNIT IN LOCATION ON STAIRWELL SHOWN. MOUNT UNIT FLUSH WITH WALL. SEE DETAIL X ON SHEET M50X.
2. SUPPLY AIR DUCT FROM MUA-2-2 THROUGH FIRST FLOOR SLAB. SEE SHEET H304 FOR CONTINUATION. CONTRACTOR SHALL INSTALL FIRE DAMPER IN SLAB. SEE DETAIL 'X' ON SHEET M50X. DUCT IN TUNNEL IS OPEN ENDED.
3. MAU-2-2 COMBINATION THERMOSTAT/HUMIDISTAT MOUNTED ON TUNNEL WALL AT LOCATION SHOWN.



KEY PLAN
SCALE: NONE

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SHEET TITLE

LOWER LEVEL HVAC PLAN - AREA A

SHEET NUMBER

H301

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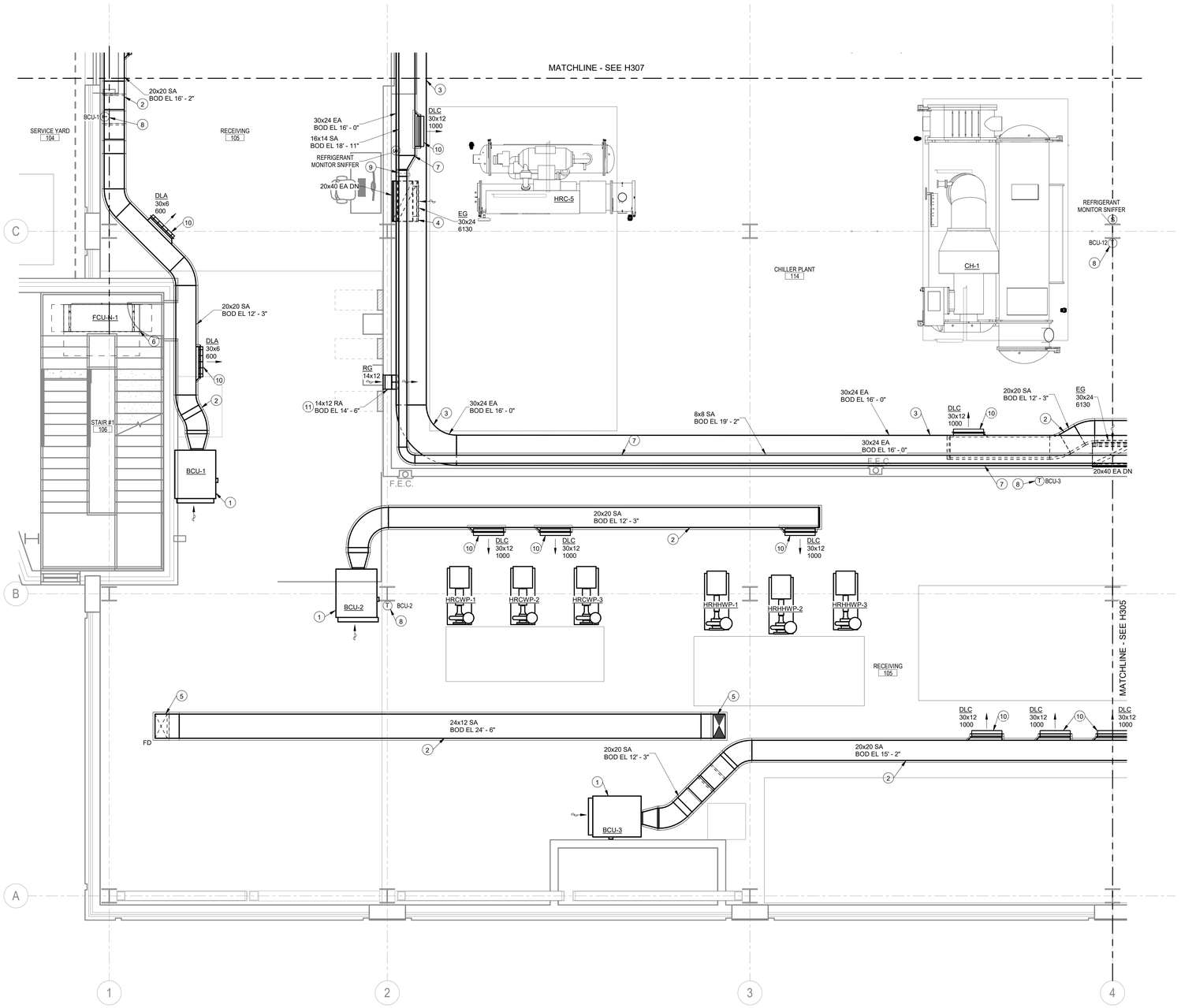


FIRST FLOOR HVAC PLAN - AREA A

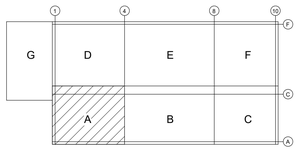
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. BLOWER COIL UNIT SUSPENDED FROM STRUCTURE AT LOCATION SHOWN. SEE STRUCTURAL SHEETS FOR MOUNTING DETAIL.
2. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. CHILLER ROOM EMERGENCY REFRIGERANT EXHAUST DUCT ROUTED AS SHOWN. PROVIDE CONTROL DAMPER AND BALANCING DAMPER IN VERTICAL SEGMENT OF DUCT. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
5. SUPPLY AIR DUCT FROM MUA-2-2. SEE SHEETS H301 AND H310 FOR CONTINUATION. CONTRACTOR SHALL POSITION FIRE DAMPER IN SLAB OF FIRST FLOOR WHERE DUCT PASSES INTO TUNNEL BELOW. SEE DETAIL '7' ON SHEET H501.
6. INSTALL SUSPENDED FAN COIL UNIT IN LOCATION SHOWN. INSTALL UNIT PER MANUFACTURER'S SPECIFICATIONS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING.
7. CHILLER ROOM MAKE UP AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
8. BLOWER COIL UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
9. BALANCE DAMPER FOR MAKE UP AIR TO FIRST FLOOR CONTROL ROOM. SEE SHEET H305 FOR DUCT CONTINUATION.
10. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
11. CHILLER ROOM TRANSFER AIR DUCT THROUGH WALL AS SHOWN. PROVIDE BACK DRAFT DAMPER MOUNTED AT WALL INTO CHILLER ROOM.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
9975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

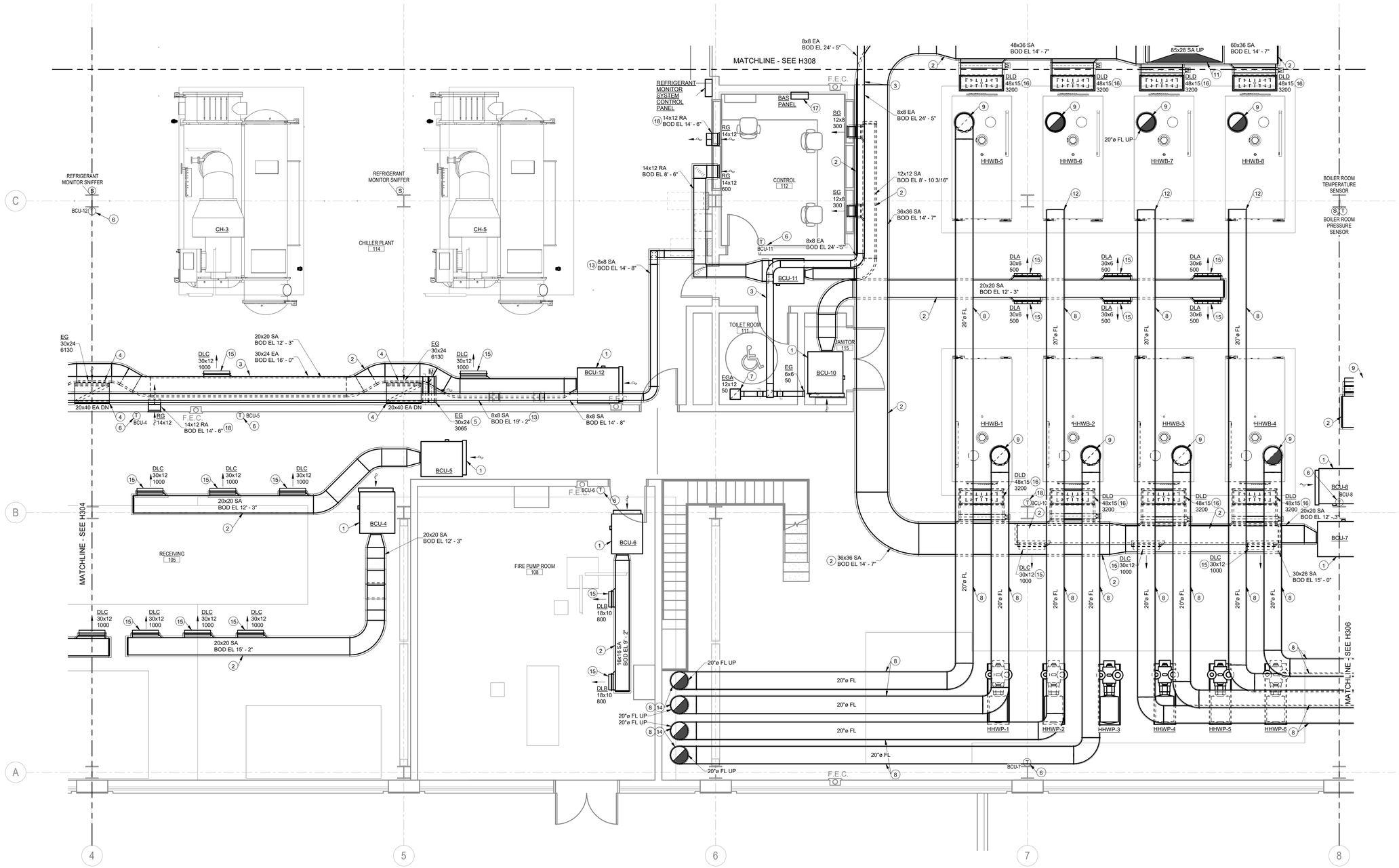
SHEET TITLE

FIRST FLOOR HVAC PLAN - AREA A

SHEET NUMBER

H304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:00:35 PM AESI Proj. No: 21-154



FIRST FLOOR HVAC PLAN - AREA B

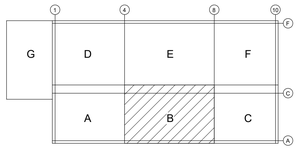
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMOBLS AND ABBREVIATIONS.

PLAN NOTES:

1. BLOWER COIL UNIT SUSPENDED FROM STRUCTURE AT LOCATION SHOWN. SEE STRUCTURAL SHEETS FOR DETAIL.
2. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. CHILLER ROOM EMERGENCY REFRIGERANT EXHAUST DUCT ROUTED AS SHOWN. PROVIDE CONTROL DAMPER AND BALANCING DAMPER IN VERTICAL SEGMENT OF DUCT. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
5. CHILLER ROOM GENERAL EXHAUST GRILLE. PROVIDE CONTROL DAMPER AND BALANCING DAMPER.
6. BLOWER COIL UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
7. EXHAUST GRILLE IN LAY-IN CEILING. COORDINATE WITH REFLECTED CEILING PLAN IN ARCHITECTURAL DRAWINGS.
8. 20" BOILER FLUE ROUTED AS SHOWN. BOILER FLUE SHALL SLOPE DOWNARD TOWARD BOILER OUTLET AT 1/4"/L.F. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. BOILER FLUES UP TO FLOOR ABOVE. SEE SHEET H311 FOR CONTINUATION.
9. CONNECT BOILER FLUE TO BOILER. REFER TO MANUFACTURER INSTRUCTIONS FOR CONNECTION DETAILS. PROVIDE CONDENSATE NEUTRALIZATION KITS FOR FLUE DRAINS AT EACH BOILER.
10. BOILER FLUE UP TO FLOOR ABOVE. SEE SHEET H311 FOR CONTINUATION.
11. SUPPLY AIR DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 1 ON SHEET H402 FOR CONTINUATION.
12. BOILER FLUE CONTINUES ON MEZZANIE. SEE DETAIL 1 ON SHEET H402 FOR CONTINUATION.
13. CHILLER ROOM MAKE UP AIR DUCT ROUTED AS SHOWN. CONNECT INTO RETURN AIR DUCT FOR FIRST FLOOR CONTROL ROOM AT LOCATION INDICATED. BALANCE DUCT TO PROVIDE 35 CFM OF MAKE UP AIR TO CONTROL ROOM. SEE SHEET H304 FOR BALANCE DAMPER LOCATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
14. PROVIDE DRAINS AND CONDENSATE NEUTRALIZATION KITS FOR FLUE DRAINS AT BOTTOM OF RISERS.
15. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL "J7" ON SHEET H501.
16. DRUM LOUVER DIFFUSER WITH INTEGRAL BALANCING DAMPER MOUNTED ON DUCT POINTED DOWNWARD TOWARD BOILER BURNER INTAKE. PROVIDE CONTROL DAMPER IN DUCT AND INTERLOCK TO OPEN WITH ASSOCIATED BOILER'S ACTIVATION. ANGLE DIFFUSER DOWN TOWARDS BURNER INTAKE WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT.
17. DESIGNATED LOCATION FOR BAS CONTROLS PANEL. COORDINATE EXACT LOCATION IN ROOM WITH OTHER DISCIPLINES. SEE ELECTRICAL SHEETS FOR POWER INFORMATION.
18. CHILLER ROOM TRANSFER AIR DUCT THROUGH WALL AS SHOWN. PROVIDE BACK DRAFT DAMPER MOUNTED AT WALL INTO CHILLER ROOM.



KEY PLAN
SCALE: NONE

OWNER

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REVISIONS

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

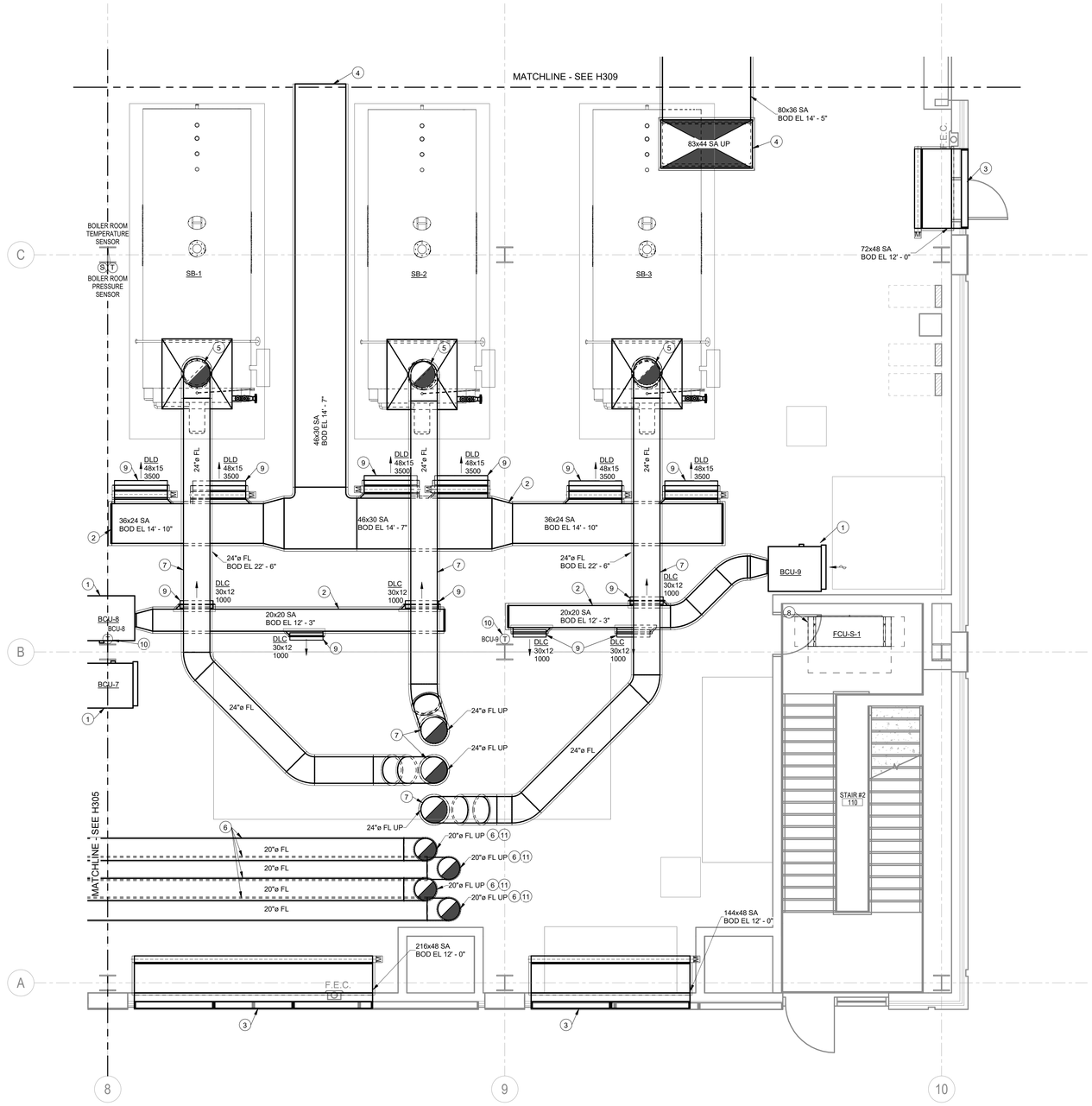
SHEET TITLE

FIRST FLOOR HVAC PLAN - AREA B

SHEET NUMBER

H305

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:00:44 PM AESI Proj. No: 21-154



FIRST FLOOR HVAC PLAN - AREA C

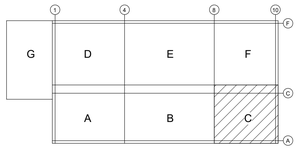
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMOBLS AND ABBREVIATIONS.

PLAN NOTES:

1. BLOWER COIL UNIT SUSPENDED FROM STRUCTURE AT LOCATION SHOWN. SEE STRUCTURAL SHEETS FOR DETAIL.
2. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EMERGENCY BOILER ROOM OUTDOOR AIR LOUVER LOCATED IN WALL AS SHOWN. SEE PLANS FOR SIZE. EXTEND PLENUM NO LESS THAN 36" FROM BACK OF LOUVER INTO BUILDING. SEE DETAIL "12' ON SHEET H501.
4. SUPPLY AIR DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 1 ON SHEET H402 FOR CONTINUATION.
5. CONNECT BOILER FLUE TO BOILER AND BOILER ECONOMIZER. REFER TO MANUFACTURER INSTRUCTIONS FOR CONNECTION DETAILS. ECOMIZER TO BE SUPPORTED BY BOILER USING MANUFACTURER'S PROVIDED ECONOMIZER SUPPORT STEEL.
6. 20" BOILER FLUE ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. BOILER FLUES UP TO FLOOR ABOVE. SEE SHEET H312 FOR CONTINUATION. PROVIDE DRAINS AND CONDENSATE NEUTRALIZATION KITS FOR FLUE DRAINS AT BOTTOM OF RISERS.
7. 24" BOILER FLUE ROUTED AS SHOWN. PROVIDE TEE WITH DRAIN PIPE TO FLOOR AT BOTTOM OF RISER. SEE SHEET H312 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEED SEISMIC ZONE C REQUIREMENTS.
8. INSTALL SUSPENDED FAN COIL UNIT IN LOCATION SHOWN. INSTALL UNIT PER MANUFACTURER'S SPECIFICATIONS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING.
9. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL "17' ON SHEET H501.
10. BLOWER COIL UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
11. PROVIDE DRAINS AND CONDENSATE NEUTRALIZATION KITS FOR FLUE DRAINS AT BOTTOM OF RISERS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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PROJECT

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

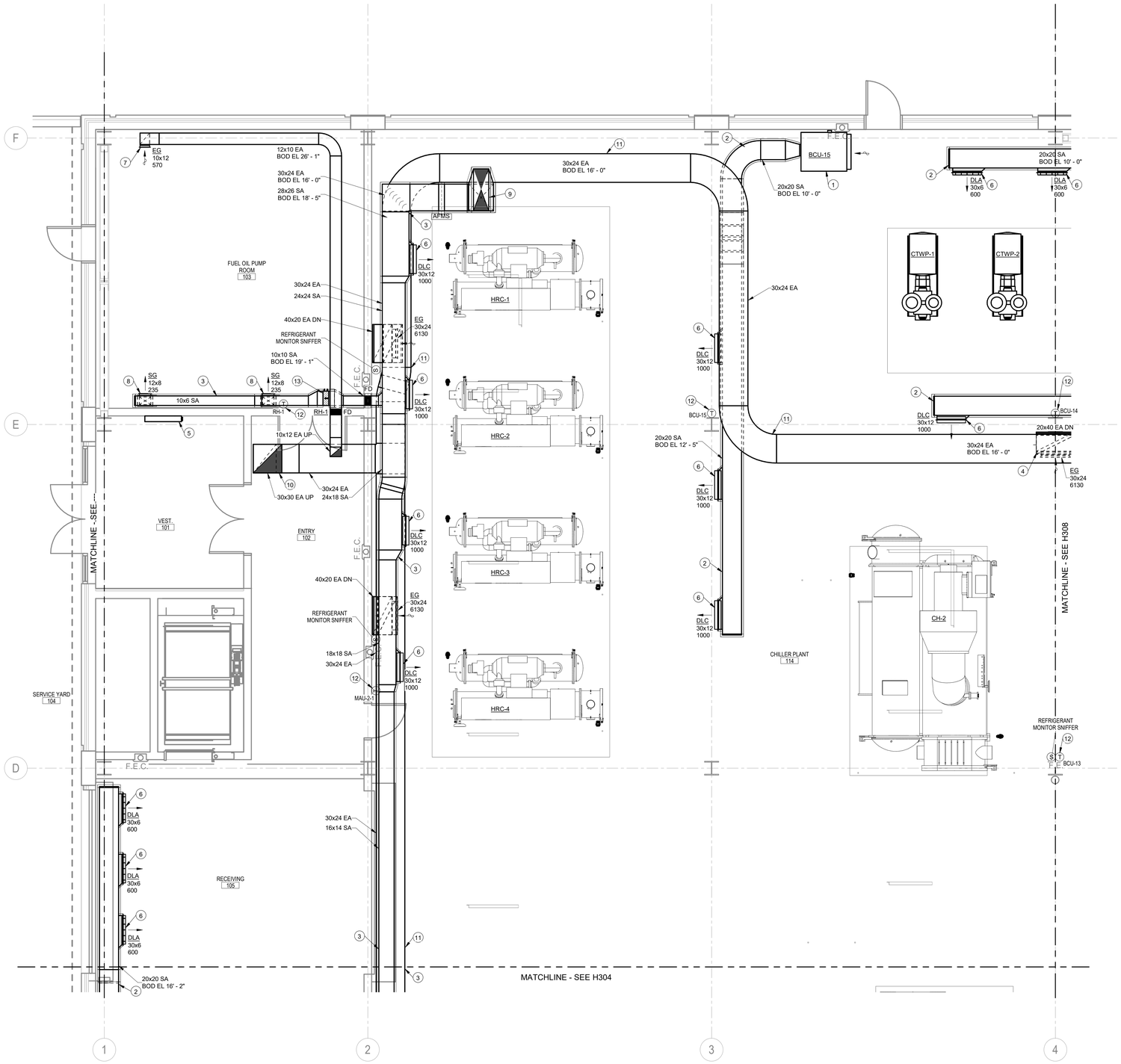
SHEET TITLE

FIRST FLOOR HVAC PLAN - AREA C

SHEET NUMBER

H306

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:00:49 PM AESI Proj. No: 21-154



FIRST FLOOR HVAC PLAN - AREA D

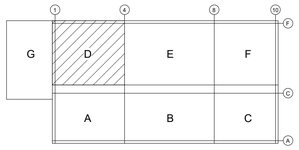
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMOBLS AND ABBREVIATIONS.

PLAN NOTES:

1. BLOWER COIL UNIT SUSPENDED FROM STRUCTURE AT LOCATION SHOWN. SEE STRUCTURAL SHEETS FOR DETAIL.
2. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. CHILLER ROOM MAKE UP AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. CHILLER ROOM EMERGENCY REFRIGERANT EXHAUST DUCT ROUTED AS SHOWN. PROVIDE CONTROL DAMPER AND BALANCING DAMPER IN VERTICAL SEGMENT OF DUCT. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
5. INSTALL VERTICAL WALL INSET FAN COIL UNIT IN LOCATION SHOWN. INSTALL UNIT PER MANUFACTURER'S SPECIFICATIONS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING.
6. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17" ON SHEET H501.
7. FUEL PUMP ROOM EXHAUST DUCT ROUTED AS SHOWN. PROVIDE VOLUME DAMPER IN VERTICAL DUCT. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
8. FUEL PUMP ROOM SUPPLY DUCT ROUTED AS SHOWN. PROVIDE VOLUME DAMPER IN VERTICAL DUCT. SUPPLY GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
9. CHILLER ROOM SUPPLY AIR FROM ABOVE. SEE H313 FOR CONTINUATION FROM MUA-2-1.
10. CHILLER ROOM EXHAUST AIR UP THROUGH CEILING. SEE H313 FOR CONTINUATION TO MAU-2-1 AND REF-1&2.
11. EXHAUST AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
12. BLOWER COIL UNIT, REHEAT COIL OR MAKE UP AIR UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
13. DUCT MOUNTED RE-HEAT COIL IN LOCATION INDICATED. SEE DETAILS '2' & '3' ON SHEET H502.
14. FUEL PUMP ROOM EXHAUST AIR UP THROUGH CEILING. SEE H313 FOR CONTINUATION TO EF-1-1.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
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PROJECT

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

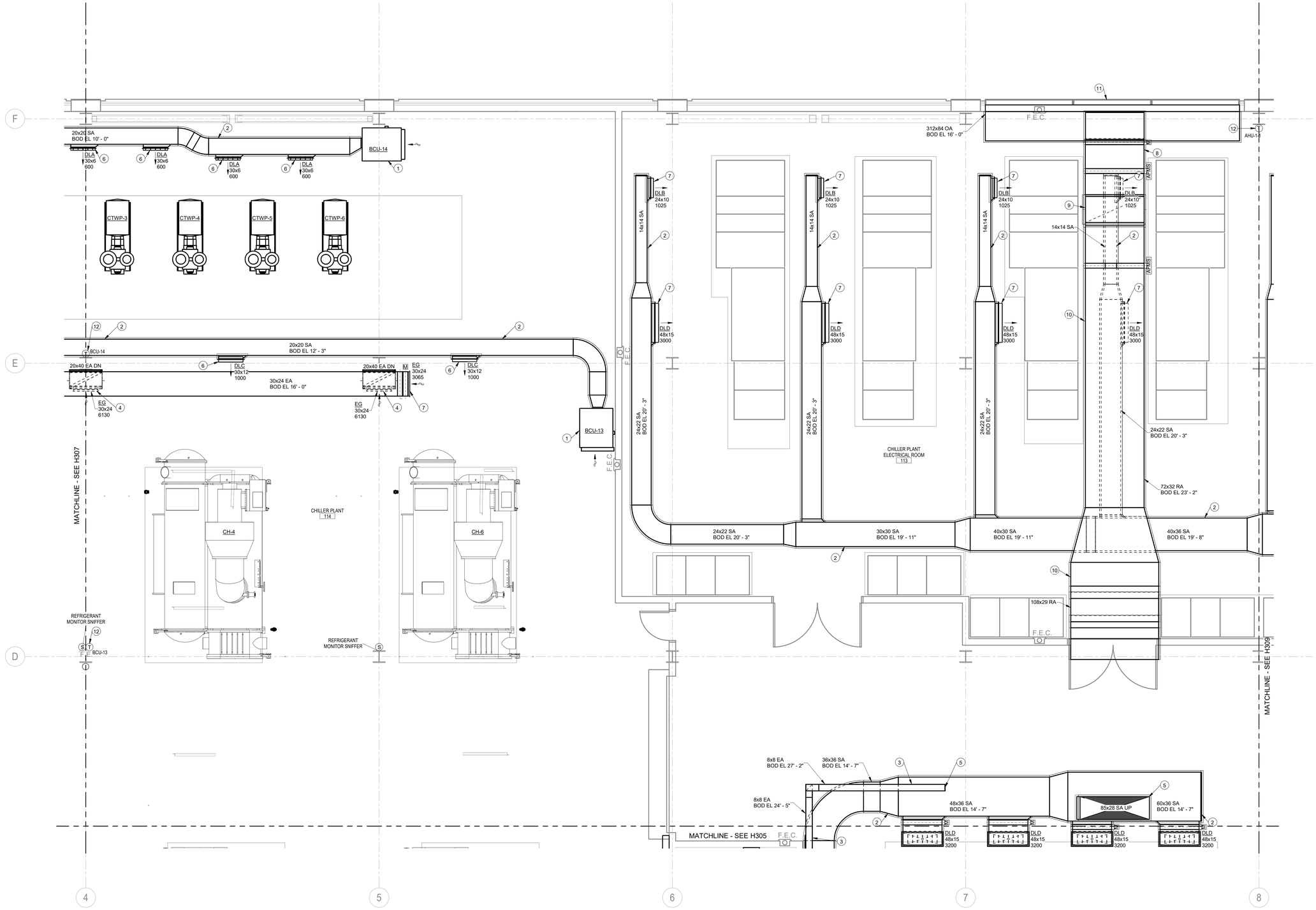
SHEET TITLE

FIRST FLOOR HVAC PLAN - AREA D

SHEET NUMBER

H307

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:00:55 PM AESI Proj. No.: 21-154



FIRST FLOOR HVAC PLAN - AREA E

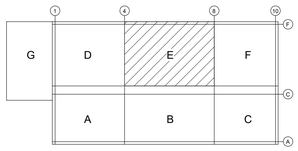
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. BLOWER COIL UNIT SUSPENDED FROM STRUCTURE AT LOCATION SHOWN. SEE STRUCTURAL SHEETS FOR DETAIL.
2. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. CHILLER ROOM EMERGENCY REFRIGERANT EXHAUST DUCT ROUTED AS SHOWN. PROVIDE CONTROL DAMPER AND BALANCING DAMPER IN VERTICAL SEGMENT OF DUCT. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
5. DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 1 ON SHEET H402 FOR CONTINUATION.
6. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
7. CHILLER ROOM GENERAL EXHAUST GRILLE. PROVIDE CONTROL DAMPER AND BALANCING DAMPER.
8. OUTDOOR AIR DUCT ROUTED AS SHOWN. MODULATING CONTROL DAMPER MOUNTED IN DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
9. OPEN RETURN DUCT WITH MODULATING CONTROL DAMPER MOUNTED ON TOP OF DUCT AT LOCATION INDICATED.
10. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
11. OUTDOOR AIR LOUVER LOCATED IN WALL AS SHOWN. SEE PLANS FOR SIZE. BOTTOM OF LOUVER SHALL BE AS NOTED ON PLANS. EXTEND PLENUM NO LESS THAN 36" FROM LOUVER INTO BUILDING. SEE DETAIL '12' ON SHEET H501.
12. BLOWER COIL UNIT OR AIR HANDLING UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMOBLS AND ABBREVIATIONS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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PROJECT

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DESIGNED BY: SRB	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

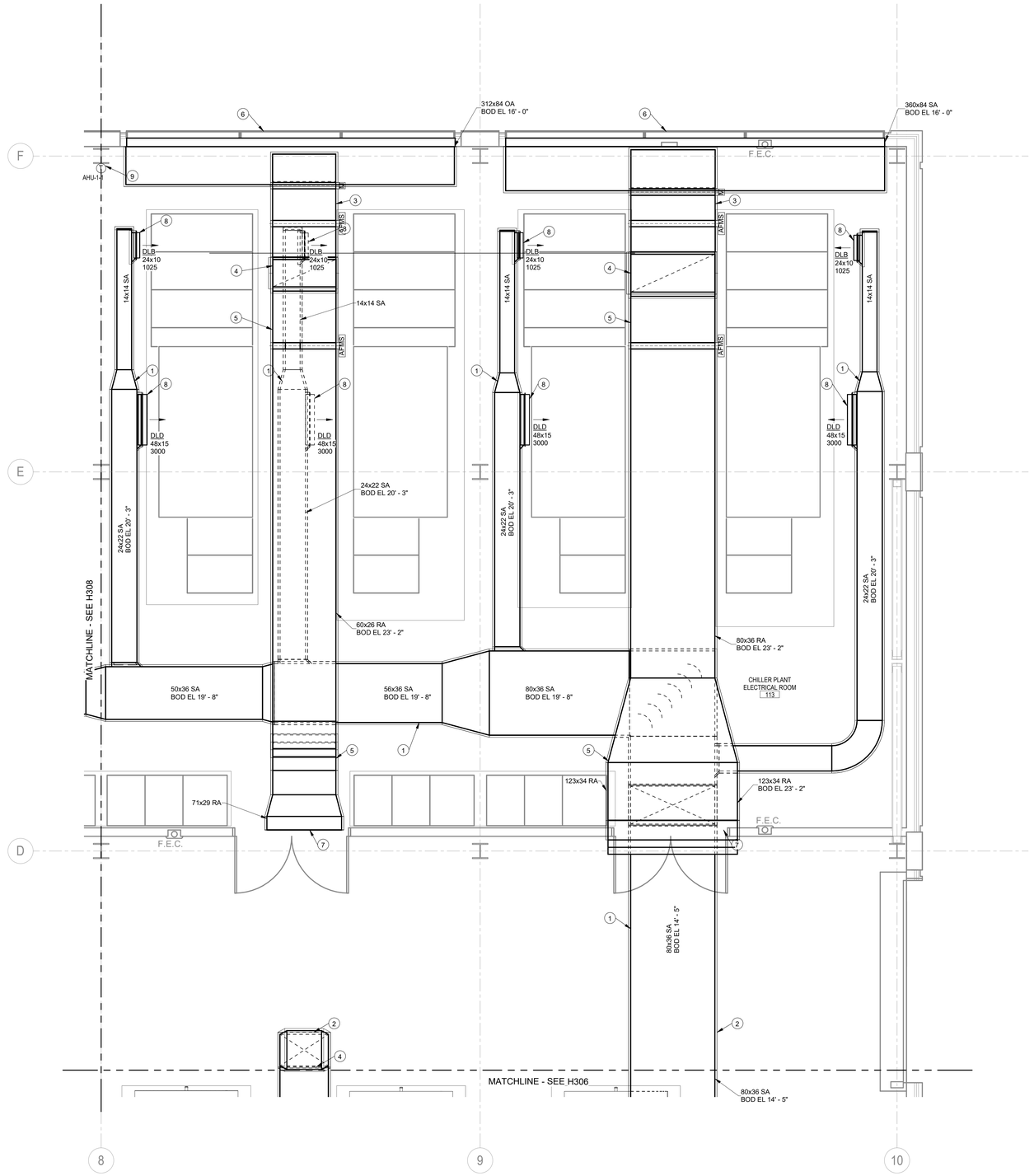
SHEET TITLE

FIRST FLOOR HVAC PLAN - AREA E

SHEET NUMBER

H308

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:00:59 PM AESI Proj. No: 21-154



FIRST FLOOR HVAC PLAN - AREA F

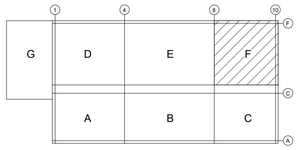
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMOBLS AND ABBREVIATIONS.

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. SUPPLY AIR DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 1 ON SHEET H402 FOR CONTINUATION.
3. OUTDOOR AIR DUCT ROUTED AS SHOWN. MODULATING CONTROL DAMPER MOUNTED IN DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. OPEN RETURN DUCT WITH MODULATING CONTROL DAMPER MOUNTED ON TOP OF DUCT AT LOCATION INDICATED.
5. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
6. OUTDOOR AIR LOUVER LOCATED IN WALL AS SHOWN. SEE PLANS FOR SIZE, BOTTOM OF LOUVER SHALL BE AS NOTED ON PLANS. EXTEND PLENUM NO LESS THAN 36" FROM LOUVER INTO BUILDING. SEE DETAIL '12' ON SHEET H501.
7. DUCTWORK CONTINUES ON MEZZANIE. SEE DETAIL 1 ON SHEET H402 FOR CONTINUATION.
8. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
9. AIR HANDLING UNIT, REHEAT COIL OR MAKE UP AIR UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.



KEY PLAN

SCALE: NONE

OWNER

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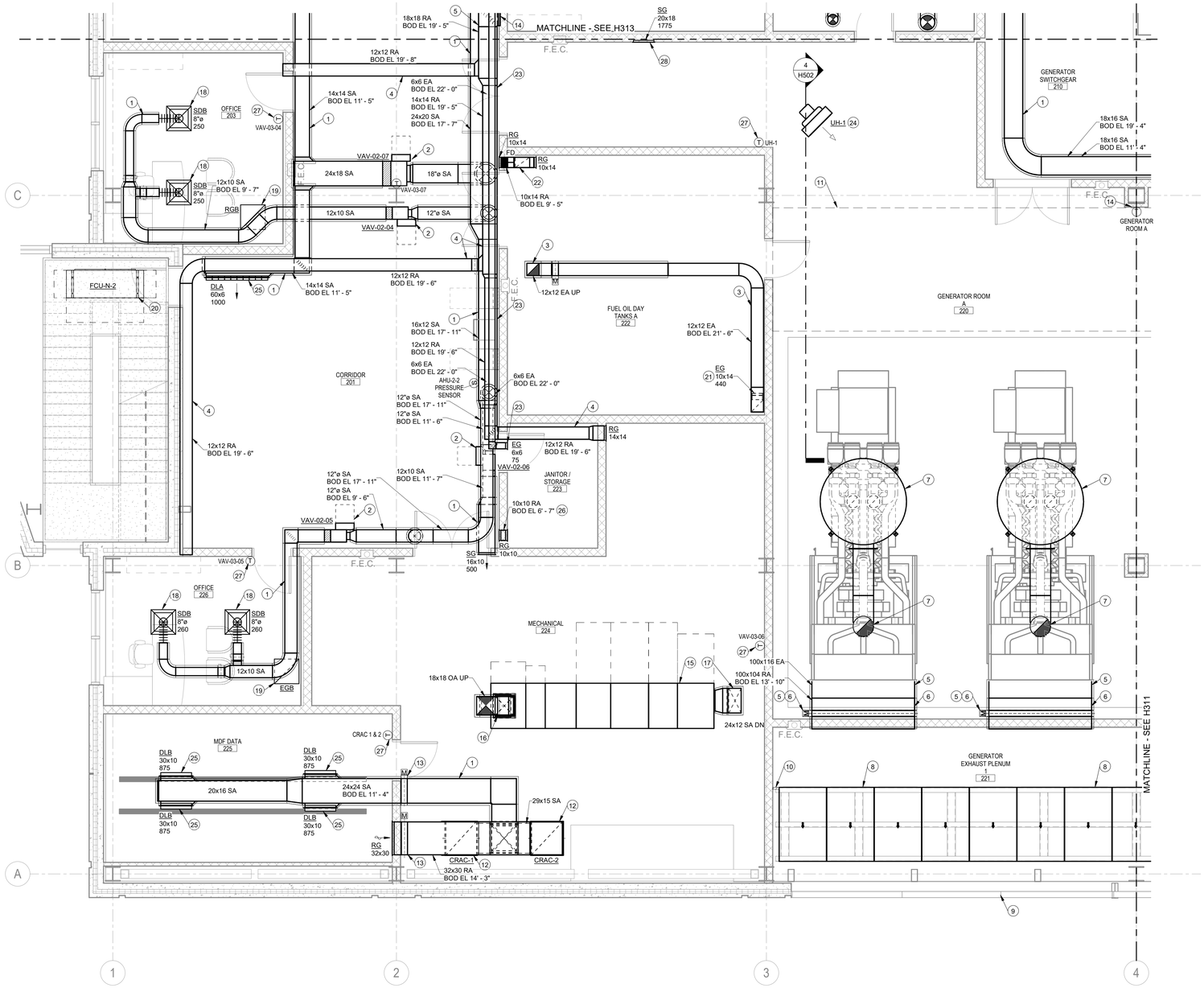
SHEET TITLE

FIRST FLOOR HVAC PLAN - AREA F

SHEET NUMBER

H309

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:03 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR HVAC PLAN - AREA A

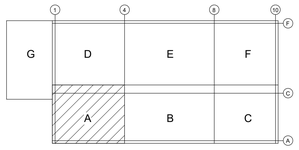
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. VAV BOX SUSPENDED IN SUPPLY AIR DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. EXHAUST AIR DUCT ROUTED THROUGH TO ROOF. SEE SHEET H316 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
5. CONTRACTOR SHALL CONNECT GENERATOR RADIATOR FANS THROUGH WALL WITH DUCTWORK AND FLEXIBLE CONNECTORS. ALIGN DUCTWORK TO BE CENTERED WITH GENERATOR RADIATOR FAN. COORDINATE WITH GENERATOR MANUFACTURER FOR APPROVED CONNECTION METHODS TO GENERATOR RADIATOR FAN. SPRING OPEN, MOTORIZED CONTROL DAMPER SHALL BE MOUNTED TO DUCTWORK AT WALL.
6. RETURN AIR DUCTWORK MOUNTED THROUGH WALL AT LOCATION INDICATED ABOVE GENERATOR RADIATOR FAN. MODULATING CONTROL DAMPER SHALL BE MOUNTED TO DUCTWORK AT WALL.
7. GENERATOR FLUE ROUTED UP THROUGH ROOF AS SHOWN. SEE SHEET H316 FOR CONTINUATION. GENERATOR FLUE TO CONNECT TO GENERATOR EXHAUST SILENCER AT LOCATION INDICATED. SEE STRUCTURAL DRAWINGS FOR GENERATOR SILENCER SUPPORTS.
8. GENERATOR RELIEF AIR PLENUM SOUND ATTENUATORS POSITIONED AS SHOWN. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
9. GENERATOR RADIATOR FAN DISCHARGE LOUVER ARRAY LOCATED IN WALL AS SHOWN. SEE DETAIL '13' ON SHEET H501. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
10. CONTRACTOR TO PROVIDE 2" THICK, BUILT UP AIR HANDLER CASING AROUND SOUND ATTENUATORS AND SOUND ATTENUATOR STRUCTURAL FRAMING. SEAL CASING PER EXHAUST AIR PLENUM PRESSURE RATING IN SPECIFICATIONS.
11. GENERATOR ROOM AIR INLET FROM AIR MONITORS ABOVE. SEE SHEET H316 FOR AIR MONITOR PLANS. SEE STRUCTURAL AND ARCHITECTURAL SHEETS FOR FLOOR FRAMING OPENING. COORDINATE WITH ALL DISCIPLINES TO KEEP OPENING FREE OF OBSTRUCTIONS.
12. BOTTOM DISCHARGE, TOP RETURN COMPUTER ROOM AIR CONDITIONER POSITIONED AS SHOWN. UNIT SHALL BE POSITIONED ON FLOOR STAND WITH FACTORY SUPPLIED SUPPLY AIR CONNECTIONS. SEE MECHANICAL SHEETS FOR PIPING CONNECTIONS.
13. SPRING CLOSE, MOTORIZED DAMPER FOR CRAC UNIT DUCTWORK SHALL BE MOUNTED AT MDF ROOM WALL.
14. GENERATOR ROOM THERMOSTAT MOUNTED ON COLUMN AT LOCATION SHOWN. MONITORS GENERATOR ROOM TEMPERATURE DURING GENERATOR OPERATION.
15. MAU-2-2 MOUNTED ON EQUIPMENT PAD AT LOCATION INDICATED. SEE STRUCTURAL SHEETS FOR EQUIPMENT PAD DETAILS. DASHED LINES INDICATED EQUIPMENT SERVICE CLEARENCES. COORDINATE WITH ALL DISCIPLINES TO KEEP SERVICE CLEARENCES FREE OF OBSTRUCTIONS. SEE MECHANICAL SHEETS FOR PIPE ROUTING. SEE ELECTRICAL SHEETS FOR ELECTRICAL CONNECTION DETAILS.
16. OUTDOOR AIR DUCT UP THROUGH ROOF. SEE H316 FOR CONTINUATION.
17. SUPPLY AIR DUCT DOWN THROUGH SLAB TO FIRST FLOOR AND UTILITY TUNNEL. SEE H304 FOR CONTINUATION.
18. DIFFUSER IN LAY-IN CEILING. SEE DETAILS '9' & '11' ON SHEET H501. COORDINATE WITH REFLECTED CEILING PLAN IN ARCHITECTURAL DRAWINGS.
19. RETURN GRILLE IN LAY-IN CEILING. SEE DETAIL '10' ON SHEET H501.COORDINATE WITH REFLECTED CEILING PLAN IN ARCHITECTURAL DRAWINGS.
20. INSTALL SUSPENDED FAN COIL UNIT IN LOCATION SHOWN. INSTALL UNIT PER MANUFACTURER'S SPECIFICATIONS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING.
21. FUEL TANK ROOM EXHAUST DUCT ROUTED AS SHOWN. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
22. FUEL TANK ROOM TRANSFER AIR DUCT ROUTED AS SHOWN. PROVIDE BACK DRAFT DAMPER MOUNTED AT WALL INTO FUEL TANK ROOM. TRANSFER GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
23. EXHAUST AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. BALANCE DAMPER FOR EXHAUST GRILLE MAY BE FOUND ON SHEET H313.
24. UNIT HEATER SUSPENDED AT LOCTION SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING. SEE DETAIL '8' ON SHEET H501.
25. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
26. TRANSFER AIR GRILLE LOCATED IN WALL AT LOCATION SHOWN.
27. FINNED TUBE RADIATOR, UH, CRAC UNIT OR VAV BOX THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
28. OUTDOOR AIR MAKE UP GRILLE TO GENERATOR ROOM. SEE MEZZANINE PLAN ON SHEET H401 FOR DUCT CONTINUATION.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

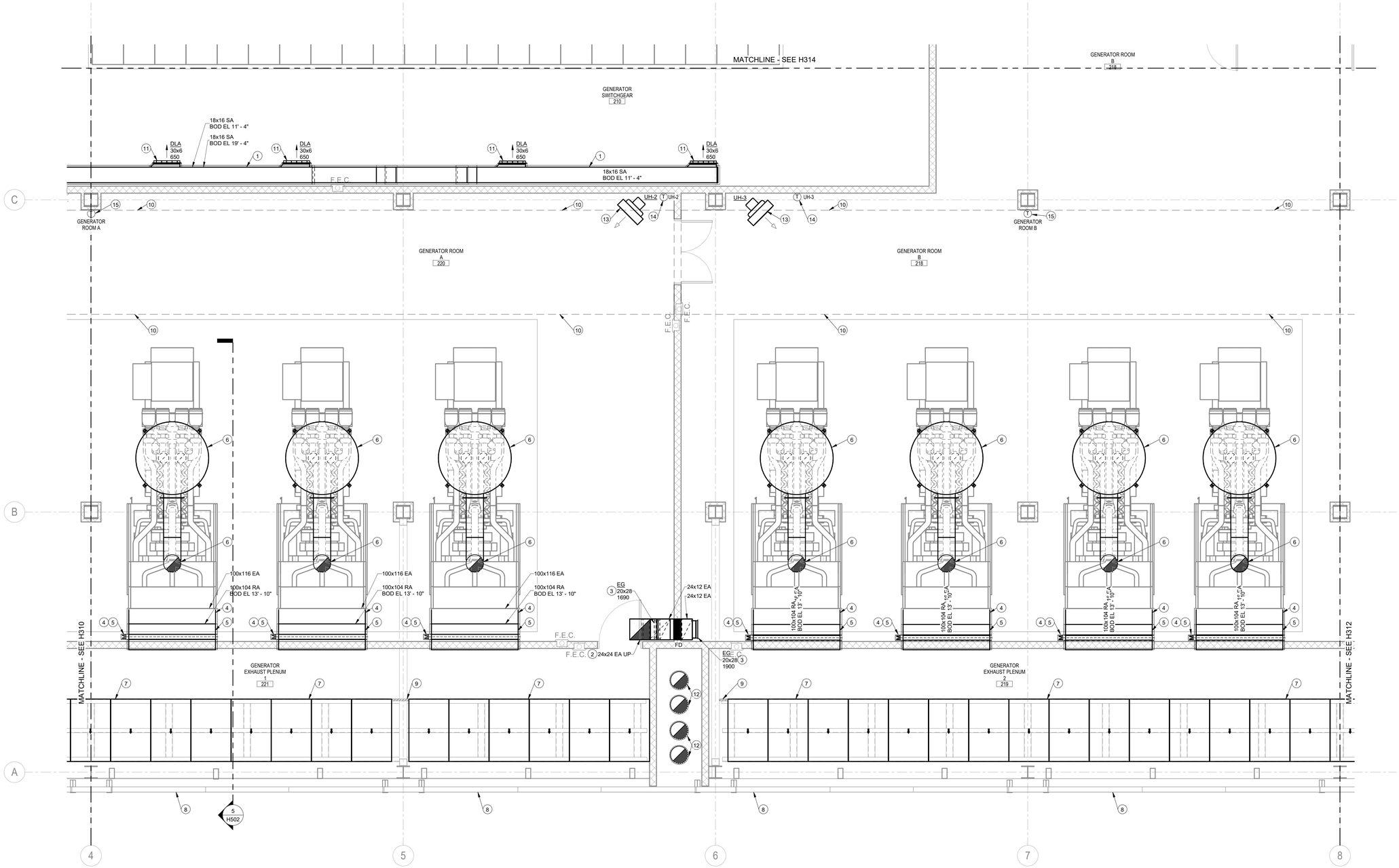
SHEET TITLE

SECOND FLOOR HVAC PLAN - AREA A

SHEET NUMBER

H310

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:09 PM AESI Proj. No: 21-154



SECOND FLOOR HVAC PLAN - AREA B

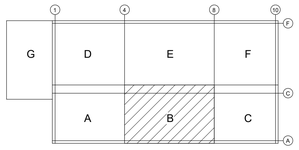
1 Scale: 1/4" = 1'-0"

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. EXHAUST AIR DUCT ROUTED AS SHOWN. EXHAUST AIR DUCT ROUTED THROUGH TO ROOF. SEE SHEET H318 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F. PROVIDE BALANCE DAMPER IN VERTICAL DUCT.
4. CONTRACTOR SHALL CONNECT GENERATOR RADIATOR FANS THROUGH WALL WITH DUCTWORK AND FLEXIBLE CONNECTORS. ALIGN DUCTWORK TO BE CENTERED WITH GENERATOR RADIATOR FAN. COORDINATE WITH GENERATOR MANUFACTURER FOR APPROVED CONNECTION METHODS TO GENERATOR RADIATOR FAN. SPRING OPEN, MOTORIZED CONTROL DAMPER SHALL BE MOUNTED TO DUCTWORK AT WALL.
5. RETURN AIR DUCTWORK MOUNTED THROUGH WALL AT LOCATION INDICATED ABOVE GENERATOR RADIATOR FAN. MODULATING CONTROL DAMPER SHALL BE MOUNTED TO DUCTWORK AT WALL.
6. GENERATOR FLUE ROUTED UP THROUGH ROOF AS SHOWN. SEE SHEET H317 FOR CONTINUATION. GENERATOR FLUE TO CONNECT TO GENERATOR EXHAUST SILENCER AT LOCATION INDICATED. SEE STRUCTURAL DRAWINGS FOR GENERATOR SILENCER SUPPORTS.
7. GENERATOR RELIEF AIR PLENUM SOUND ATTENUATORS POSITIONED AS SHOWN. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
8. GENERATOR RADIATOR FAN DISCHARGE LOUVER ARRAY LOCATED IN WALL AS SHOWN. SEE DETAIL '12' ON SHEET H501. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
9. CONTRACTOR TO PROVIDE 2" THICK, BUILT UP AIR HANDLER CASING AROUND SOUND ATTENUATORS AND SOUND ATTENUATOR STRUCTURAL FRAMING. SEAL CASING PER EXHAUST AIR PLENUM PRESSURE RATING IN SPECIFICATIONS.
10. GENERATOR ROOM AIR INLET FROM AIR MONITORS ABOVE. SEE SHEET H317 FOR AIR MONITOR PLANS. SEE STRUCTURAL AND ARCHITECTURAL SHEETS FOR FLOOR FRAMING OPENING. COORDINATE WITH ALL DISCIPLINES TO KEEP OPENING FREE OF OBSTRUCTIONS.
11. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
12. 20" BOILER FLUE ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. BOILER FLUES UP FROM FLOOR BELOW THROUGH TO ROOF. SEE SHEET H305 AND SHEET H317 FOR CONTINUATION.
13. UNIT HEATER SUSPENDED AT LOCTION SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING. SEE DETAIL 8 ON SHEET H502.
14. UH THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
15. GENERATOR ROOM THERMOSTAT MOUNTED ON COLUMN AT LOCATION SHOWN. MONITORS GENERATOR ROOM TEMPERATURE DURING GENERATOR OPERATION.

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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PROJECT

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION
CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

SECOND FLOOR HVAC PLAN - AREA B

SHEET NUMBER

H311

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:14 PM AESI Proj. No: 21-154
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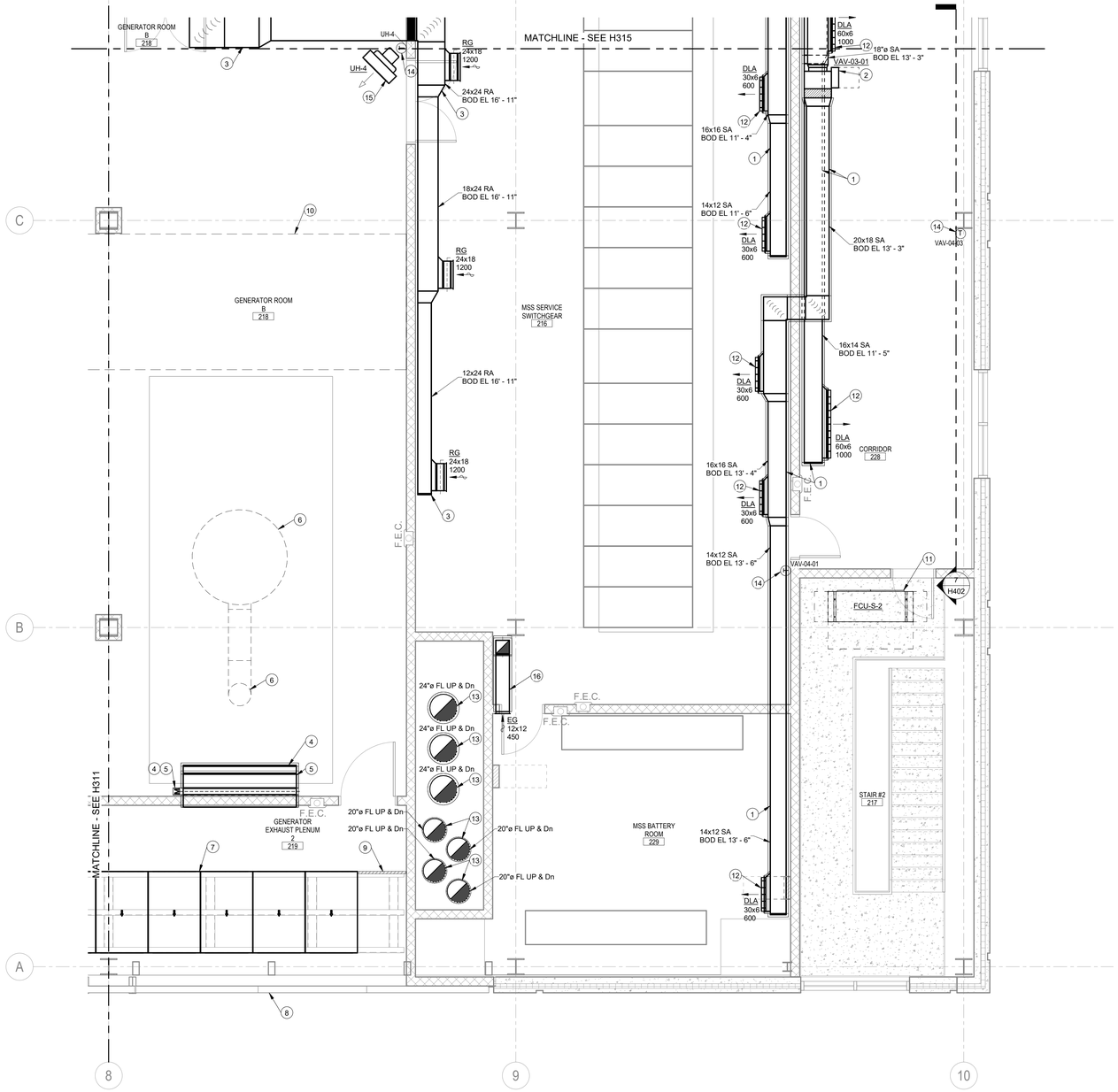


SECOND FLOOR HVAC PLAN - AREA C

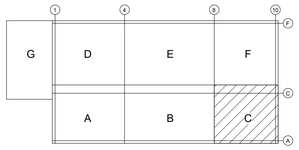
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. VAV BOX SUSPENDED IN SUPPLY AIR DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. CONTRACTOR SHALL PROVIDE EXHUAST AIR DUCT IDENTICAL TO GENERATOR RADIATOR FAN EXHAUST DUCTS THROUGH WALL FOR FUTURE CONNECTION. SPRING OPEN, MOTORIZED CONTROL DAMPER SHALL BE MOUNTED TO DUCTWORK AT WALL. DUCTWORK SHALL BE CAPPED FOR FUTURE USE.
5. RETURN AIR DUCTWORK MOUNTED THROUGH WALL AT LOCATION INDICATED ABOVE GENERATOR RADIATOR FAN. MODULATING CONTROL DAMPER SHALL BE MOUNTED TO DUCTWORK AT WALL. DUCTWORK SHALL BE CAPPED FOR FUTURE USE.
6. LOCATION OF FUTURE GENERATOR EXHAUST FLUE, SEE SHEET H318 FOR CONTINUATION. SEE STRUCTURAL DRAWINGS FOR FUTURE GENERATOR SILENCER SUPPORTS AND ROOF PENETRATION.
7. GENERATOR RELIEF AIR PLENUM SOUND ATTENUATORS POSITIONED AS SHOWN. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
8. GENERATOR RELIEF AIR LOUVER ARRAY LOCATED IN WALL AS SHOWN. SEE DETAIL '12' ON SHEET H501. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
9. CONTRACTOR TO PROVIDE 2" THICK, BUILT UP AIR HANDLER CASING AROUND SOUND ATTENUATORS AND SOUND ATTENUATOR STRUCTURAL FRAMING. SEAL CASING PER EXHAUST AIR PLENUM PRESSURE RATING IN SPECIFICATIONS.
10. GENERATOR ROOM AIR INLET FROM AIR MONITORS ABOVE. SEE SHEET H318 FOR AIR MONITOR PLANS. SEE STRUCTURAL AND ARCHITECTURAL SHEETS FOR FLOOR FRAMING OPENING. COORDINATE WITH ALL DISCIPLINES TO KEEP OPENING FREE OF OBSTRUCTIONS.
11. INSTALL SUSPENDED FAN COIL UNIT IN LOCATION SHOWN. INSTALL UNIT PER MANUFACTURER'S SPECIFICATIONS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING.
12. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
13. BOILER FLUES UP FROM FIRST FLOOR AND THROUGH ROOF. SEE SHEET H306 AND SHEET H318 FOR CONTINUATION.
14. UH OR VAV BOX THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
15. UNIT HEATER SUSPENDED AT LOCTION SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. SEE MECHANICAL DRAWINGS FOR PIPE ROUTING. SEE DETAIL '8' ON SHEET H502.
16. EXHAUST AIR DUCT ROUTED AS SHOWN. EXHAUST AIR DUCT ROUTED THROUGH TO ROOF. SEE SHEET H318 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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REVISIONS

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CHECKED BY AESI	
APPROVED BY Approver	
PROJECT NO. 21-154	

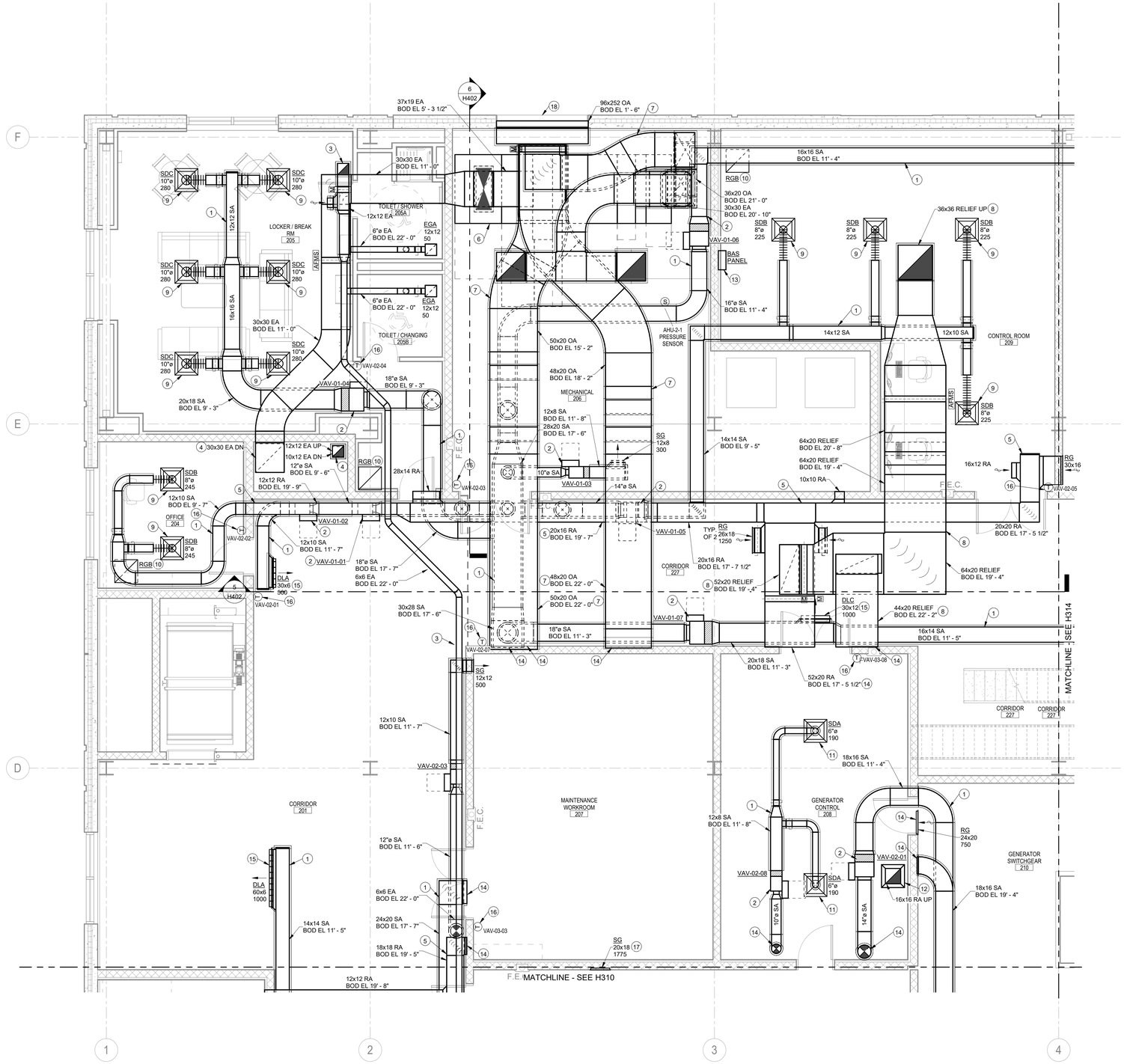
SHEET TITLE

SECOND FLOOR HVAC PLAN - AREA C

SHEET NUMBER

H312

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:19 PM AESI Proj. No: 21-154



SECOND FLOOR HVAC PLAN - AREA D

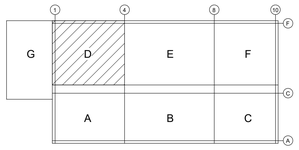
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. VAV BOX SUSPENDED IN SUPPLY AIR DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. EXHAUST AIR DUCT ROUTED THROUGH TO ROOF. SEE SHEET H319 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. EXHAUST AIR DUCT ROUTED FROM FIRST FLOOR THROUGH TO ROOF AS SHOWN. SEE SHEET H319 AND SHEET H307 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
5. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
6. MAU-2-1 MOUNTED ON EQUIPMENT PAD AT LOCATION INDICATED. SEE STRUCTURAL SHEETS FOR EQUIPMENT PAD DETAILS. SUPPLY AIR DUCT DISHARGES DOWNWARD THROUGH EQUIPMENT PAD. SEE SHEET H307 FOR CONTINUATION. DASHED LINES INDICATED EQUIPMENT SERVICE CLEARENCES, COORDINATE WITH ALL DISCIPLINES TO KEEP SERVICE CLEARENCES FREE OF OBSTRUCTIONS. SEE MECHANICAL SHEETS FOR PIPE ROUTING. SEE ELECTRICAL SHEETS FOR ELECTRICAL CONNECTION DETAILS.
7. OUTDOOR AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL INSTALL SIESMIC BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
8. RELEIF AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL INSTALL SIESMIC BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. DUCT IS ROUTED UP THROUGH ROOF AT LOCATION INDICATED. SEE SHEET H319 FOR CONTINUATION.
9. DIFFUSER IN LAY-IN CEILING. SEE DETAIL '9' ON SHEET H501. COORDINATE WITH REFLECTED CEILING PLAN IN ARCHITECTURAL DRAWINGS.
10. RETURN GRILLE IN LAY-IN CEILING. SEE DETAIL '10' ON SHEET H501.COORDINATE WITH REFLECTED CEILING PLAN IN ARCHITECTURAL DRAWINGS.
11. SUPPLY DIFFUSER FOR GENERATOR CONTROL ROOM SUSPENDED IN ROOM AT 10'-0" A.F.F. AT LOCATION INDICATED.
12. RETURN GRILLE FOR GENERATOR CONTROL ROOM SUSPENDED IN ROOM AT 10'-0" A.F.F. AT LOCATION INDICATED. RETURN DUCT CONTINUES UPWARD THROUGH CEILING INTO EQUIPMENT MEZZANINE. SEE SHEET H401 FOR CONTINUATION.
13. DESIGNATED LOCATION FOR BAS CONTROLS PANEL. COORDINATE EXACT LOCATION IN ROOM WITH OTHER DISCIPLINES. SEE ELECTRICAL SHEETS FOR POWER INFORMATION.
14. DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 2 ON SHEET H401 FOR CONTINUATION.
15. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL '17' ON SHEET H501.
16. FINNED TUBE RADIATOR OR VAV BOX THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
17. OUTDOOR AIR MAKE UP GRILLE TO GENERATOR ROOM. SEE MEZZANINE PLAN ON SHEET H401 FOR DUCT CONTINUATION.
18. OUTDOOR AIR LOUVER LOCATED IN WALL AS SHOWN. SEE PLANS FOR SIZE, BOTTOM OF LOUVER SHALL BE AS NOTED ON PLANS. EXTEND PLENUM NO LESS THAN 36" FROM LOUVER INTO BUILDING. SEE DETAIL '12' ON SHEET H501.



KEY PLAN
SCALE: NONE

OWNER

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

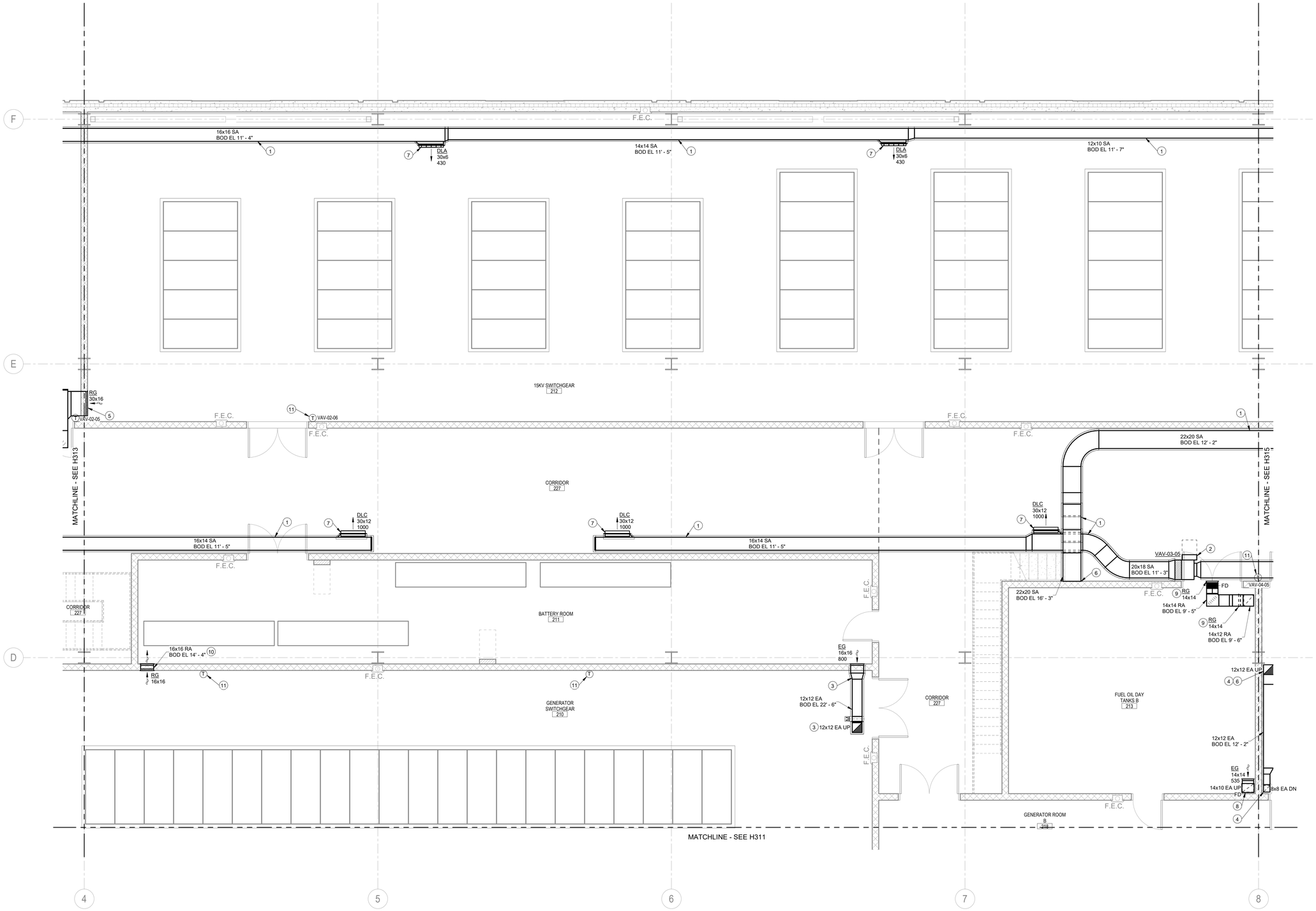
SHEET TITLE

SECOND FLOOR HVAC PLAN - AREA D

SHEET NUMBER

H313

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:25 PM AESI Proj. No: 21-154



SECOND FLOOR HVAC PLAN - AREA E

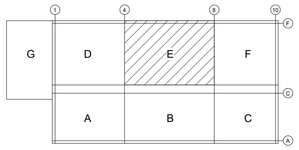
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. VAV BOX SUSPENDED IN SUPPLY AIR DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. EXHAUST AIR DUCT ROUTED THROUGH TO ROOF. SEE SHEET H320 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. EXHAUST AIR DUCT ROUTED FROM FIRST FLOOR THROUGH TO MEZZANINE AS SHOWN. SEE SHEET H401 AND SHEET H308 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
5. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
6. DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 3 ON SHEET H401 FOR CONTINUATION.
7. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL "17" ON SHEET H501.
8. FUEL TANK ROOM EXHAUST DUCT ROUTED AS SHOWN. EXHAUST GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F. A FIRE DAMPER SHALL BE POSITIONED IN THE VERTICAL RISER PASSING INTO THE EQUIPMENT MEZZANINE ABOVE. SEE SHEET H401 FOR CONTINUATION.
9. FUEL TANK ROOM TRANSFER AIR DUCT ROUTED AS SHOWN. PROVIDE BACK DRAFT DAMPER MOUNTED AT WALL INTO FUEL TANK ROOM. TRANSFER GRILLE SHALL BE MOUNTED WITH BOTTOM OF GRILLE LOCATED 1'-6" A.F.F.
10. TRANSFER AIR GRILLE LOCATED IN WALL AT LOCATION SHOWN.
11. VAV BOX THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

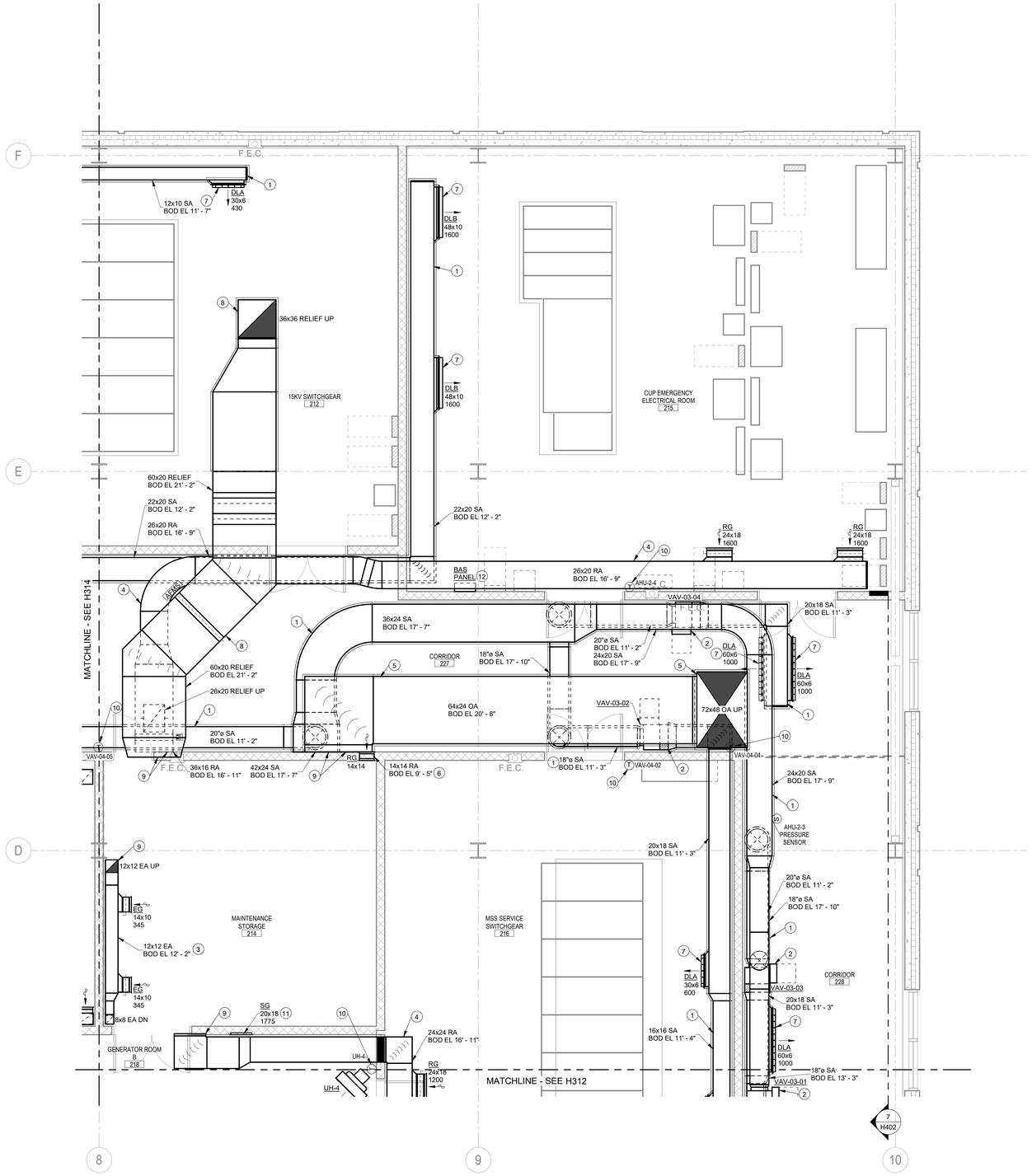
SHEET TITLE

SECOND FLOOR HVAC PLAN - AREA E

SHEET NUMBER

H314

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:29 PM AESI Proj. No: 21-154



SECOND FLOOR HVAC PLAN - AREA F

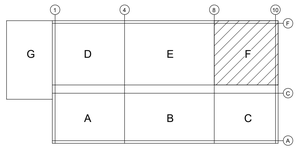
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. VAV BOX SUSPENDED IN SUPPLY AIR DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED FROM FIRST FLOOR THROUGH TO MEZZANINE AS SHOWN. SEE SHEET H401 AND SHEET H308 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
5. OUTDOOR AIR DUCT DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. DUCT ROUTED UP THROUGH ROOF, SEE H321 FOR CONTINUATION.
6. TRANSFER AIR GRILLE LOCATED IN WALL AT LOCATION SHOWN.
7. DRUM LOUVER DIFFUSER SIDE WALL MOUNTED ON DUCT WITH INTEGRAL BALANCING DAMPER. ANGLE DIFFUSER DOWN TOWARDS FLOOR WITH DIFFUSER INTREGRAL PITCH ADJUSTMENT. SEE DETAIL "17" ON SHEET H501.
8. RELEIF AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL INSTALL SIESMIC BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. DUCT IS ROUTED UP THROUGH ROOF AT LOCATION INDICATED. SEE SHEET H321 FOR CONTINUATION.
9. DUCT TO EQUIPMENT MEZZANINE. SEE DETAIL 3 ON SHEET H401 FOR CONTINUATION.
10. UH OR VAV BOX THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
11. OUTDOOR AIR MAKE UP GRILLE TO GENERATOR ROOM. SEE MEZZANINE PLAN ON SHEET H401 FOR DUCT CONTINUATION.
12. DESIGNATED LOCATION FOR BAS CONTROLS PANEL. COORDINATE EXACT LOCATION IN ROOM WITH OTHER DISCIPLINES. SEE ELECTRICAL SHEETS FOR POWER INFORMATION.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

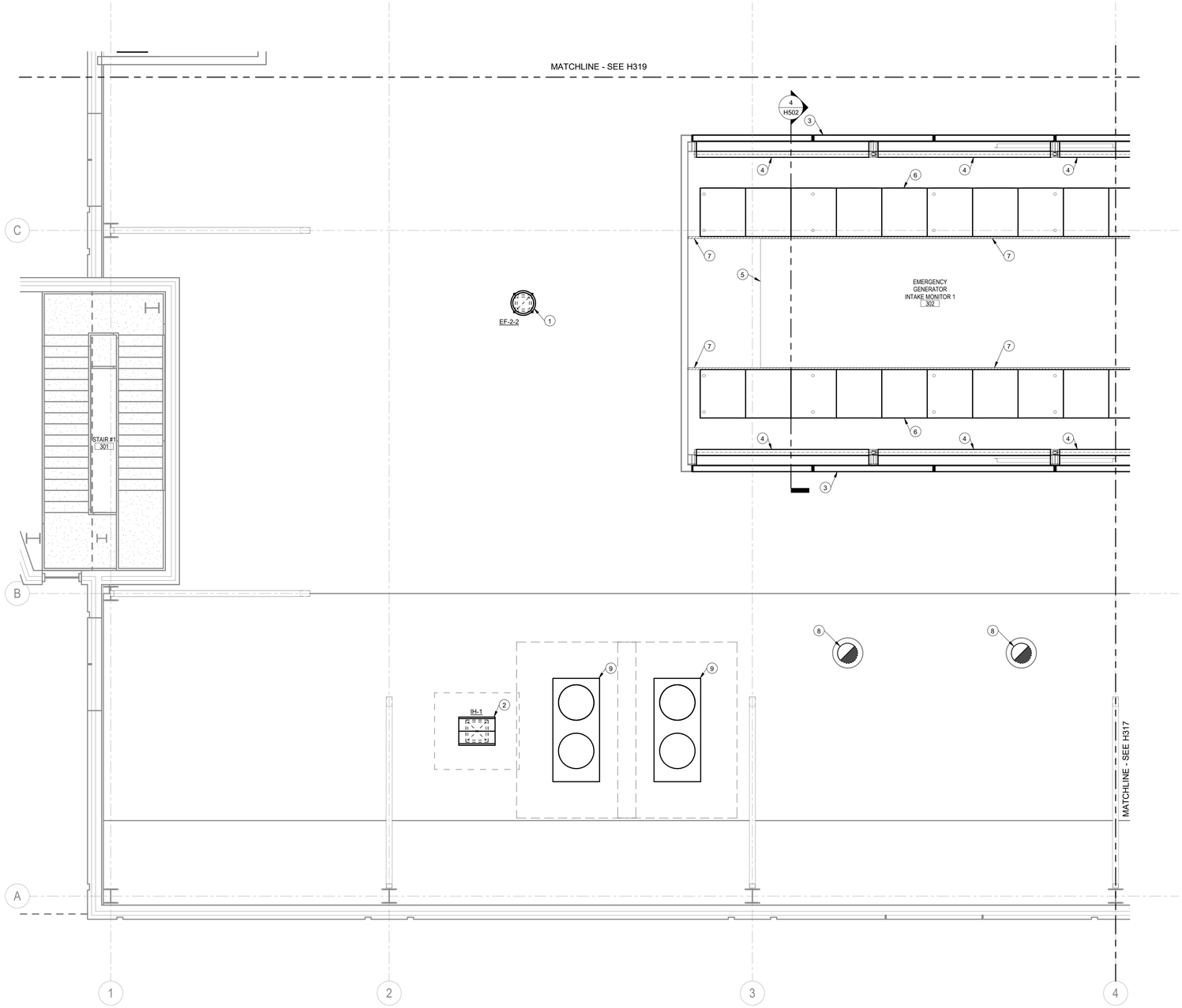
SHEET TITLE

SECOND FLOOR HVAC PLAN - AREA F

SHEET NUMBER

H315

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:34 PM AESI Proj No: 21-154



ROOF HVAC PLAN - AREA A

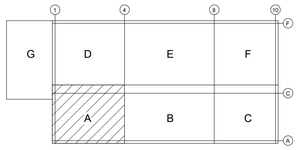
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. EXHAUST FAN MOUNTED ON ROOF AT LOCATION INDICATED. EXHAUST AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H310 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '3' ON SHEET H501.
2. OUTDOOR AIR INLET HOOD ON ROOF AT LOCATION INDICATED. OUTDOOR AIR DUCT TO SECOND FLOOR FROM ROOF. SEE SHEET H310 FOR CONTINUATION OF OUTDOOR AIR DUCT. SEE DETAIL '15' ON SHEET H501.
3. GENERATOR AIR MONITOR INLET LOUVER ARRAY LOCATED IN WALL AS SHOWN. BOTTOM OF LOUVERS SHALL BE AT 3'-0" ABOVE ROOFLINE. SEE DETAIL '12' ON SHEET H501. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
4. INSTALL CONTROL DAMPER ARRAY ON BACKSIDE OF LOUVER ARRAY. PROVIDE 10" DEEP PLENUM TO OFFSET DAMPERS FOR MAINTENANCE CLEARANCE FOR DAMPER ACTUATOR. SEAL LOUVERS NOT CONNECTED TO DAMPER PLENUM WEATHER TIGHT WITH LOUVER BLANK OFF PANEL. SEE DETAIL '12' ON SHEET H501.
5. GENERATOR ROOM AIR INLET. SEE SHEET H310 FOR CONTINUATION INTO GENERATOR ROOM BELOW. SEE STRUCTURAL AND ARCHITECTURAL SHEETS FOR FLOOR FRAMING OPENING. COORDINATE WITH ALL DISCIPLINES TO KEEP OPENING FREE OF OBSTRUCTIONS.
6. GENERATOR AIR INLET MONITOR SOUND ATTENUATORS POSITIONED AS SHOWN. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
7. CONTRACTOR TO PROVIDE 2" THICK, BUILT UP AIR HANDLER CASING AROUND SOUND ATTENUATORS AND SOUND ATTENUATOR STRUCTURAL FRAMING. SEAL CASING PER EXHAUST AIR PLENUM PRESSURE RATING IN SPECIFICATIONS.
8. GENERATOR FLUE ROUTED UP THROUGH ROOF AS SHOWN. SEE SHEET H310 FOR CONTINUATION FROM GENERATOR ROOM. SEE DETAIL 'X' ON SHEET H50X.
9. ROOF MOUNTED AIR COOLED CONDENSING UNIT FOR MDF ROOM CRAC UNIT. SEE ARCHITECTURAL SHEETS FOR MOUNTING DETAILS.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

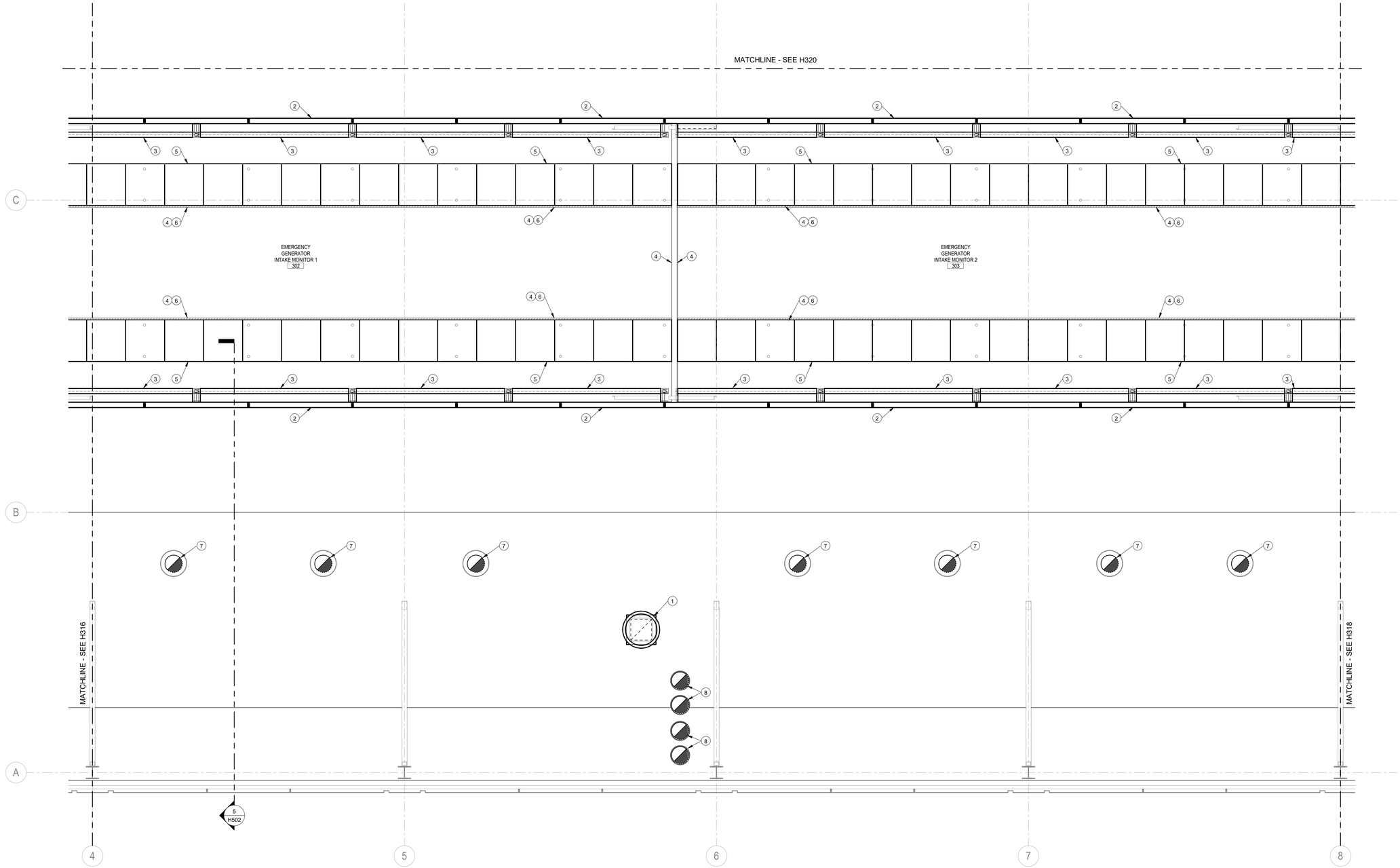
SHEET TITLE

ROOF HVAC PLAN - AREA A

SHEET NUMBER

H316

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:37 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF HVAC PLAN - AREA B

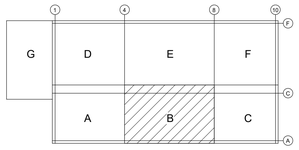
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. EXHAUST FAN MOUNTED ON ROOF AT LOCATION INDICATED. EXHAUST AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H310 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '3' ON SHEET H501.
2. GENERATOR AIR MONITOR INLET LOUVER ARRAY LOCATED IN WALL AS SHOWN. BOTTOM OF LOUVERS SHALL BE AT 3'-0" ABOVE ROOFLINE. SEE DETAIL '12' ON SHEET H501. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
3. INSTALL CONTROL DAMPER ARRAY ON BACKSIDE OF LOUVER ARRAY. PROVIDE 10" DEEP PLENUM TO OFFSET DAMPERS FOR MAINTENANCE CLEARANCE FOR DAMPER ACTUATOR. SEAL LOUVERS NOT CONNECTED TO DAMPER PLENUM WEATHER TIGHT WITH LOUVER BLANK OFF PANEL. SEE DETAIL '12' ON SHEET H501.
4. GENERATOR ROOM AIR INLET. SEE SHEET H310 FOR CONTINUATION INTO GENERATOR ROOM BELOW. SEE STRUCTURAL AND ARCHITECTURAL SHEETS FOR FLOOR FRAMING OPENING. COORDINATE WITH ALL DISCIPLINES TO KEEP OPENING FREE OF OBSTRUCTIONS.
5. GENERATOR AIR INLET MONITOR SOUND ATTENUATORS POSITIONED AS SHOWN. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
6. CONTRACTOR TO PROVIDE 2" THICK, BUILT UP AIR HANDLER CASING AROUND SOUND ATTENUATORS AND SOUND ATTENUATOR STRUCTURAL FRAMING. SEAL CASING PER EXHAUST AIR PLENUM PRESSURE RATING IN SPECIFICATIONS.
7. GENERATOR FLUE ROUTED UP THROUGH ROOF AS SHOWN. SEE SHEET H310 FOR CONTINUATION FROM GENERATOR ROOM. SEE DETAIL 'X' ON SHEET H50X.
8. 20" BOILER FLUE ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. BOILER FLUES UP FROM FLOOR BELOW THROUGH ROOF. SEE SHEET H311 FOR CONTINUATION.

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

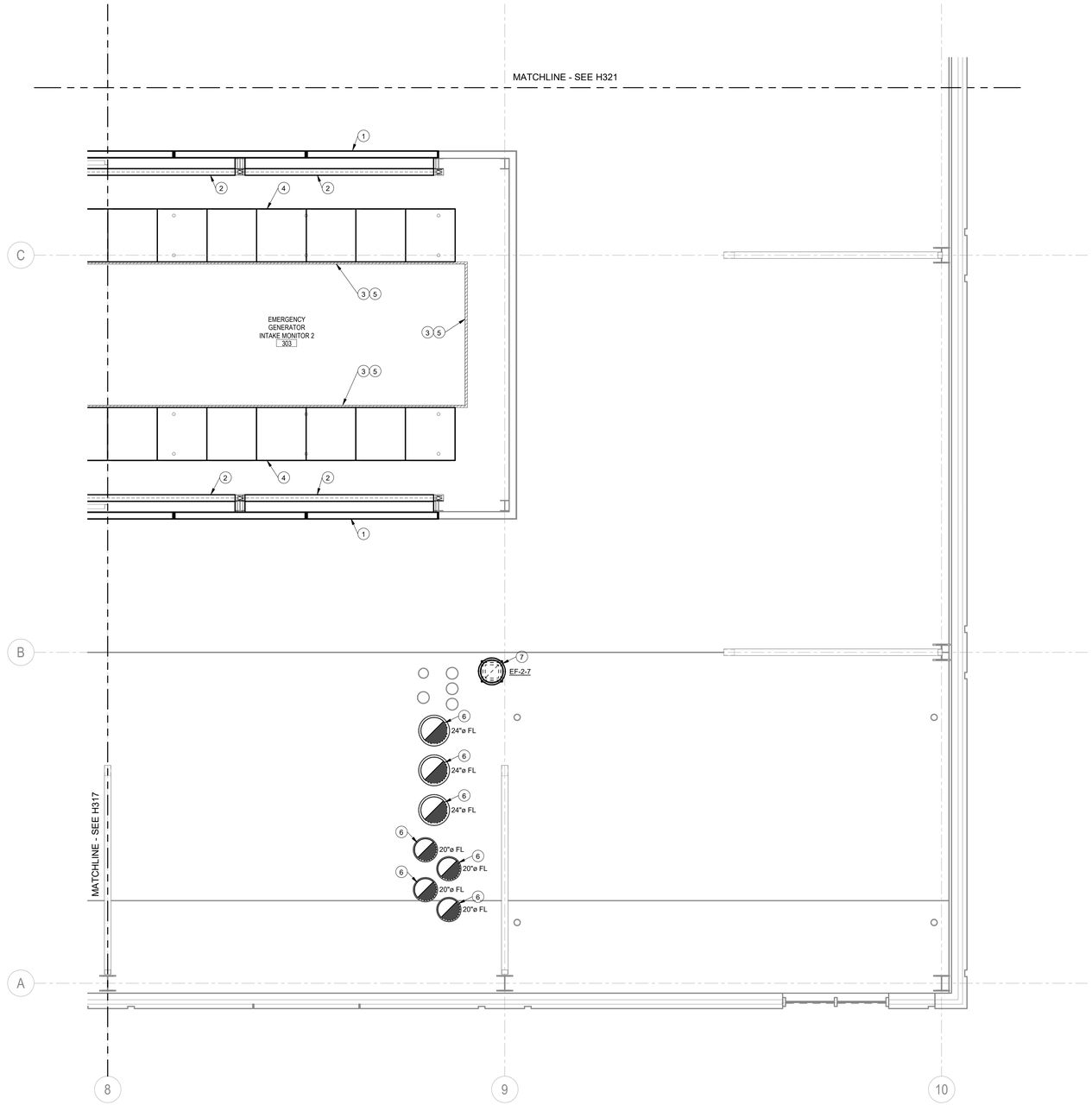
SHEET TITLE

ROOF HVAC PLAN - AREA B

SHEET NUMBER

H317

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:42 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF HVAC PLAN - AREA C

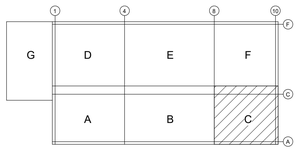
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. GENERATOR AIR MONITOR INLET LOUVER ARRAY LOCATED IN WALL AS SHOWN. BOTTOM OF LOUVERS SHALL BE AT 3'-0" ABOVE ROOFLINE. SEE DETAIL '12' ON SHEET H501. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
2. INSTALL CONTROL DAMPER ARRAY ON BACKSIDE OF LOUVER ARRAY. PROVIDE 10" DEEP PLENUM TO OFFSET DAMPERS FOR MAINTENANCE CLEARANCE FOR DAMPER ACTUATOR. SEAL LOUVERS NOT CONNECTED TO DAMPER PLENUM WEATHER TIGHT WITH LOUVER BLANK OFF PANEL. SEE DETAIL '12' ON SHEET H501.
3. GENERATOR ROOM AIR INLET. SEE SHEET H310 FOR CONTINUATION INTO GENERATOR ROOM BELOW. SEE STRUCTURAL AND ARCHITECTURAL SHEETS FOR FLOOR FRAMING OPENING. COORDINATE WITH ALL DISCIPLINES TO KEEP OPENING FREE OF OBSTRUCTIONS.
4. GENERATOR AIR INLET MONITOR SOUND ATTENUATORS POSITIONED AS SHOWN. SEE SCHEDULES FOR SIZE. SEE STRUCTURAL DRAWINGS FOR MOUNTING AND SUPPORT DETAILS.
5. CONTRACTOR TO PROVIDE 2" THICK, BUILT UP AIR HANDLER CASING AROUND SOUND ATTENUATORS AND SOUND ATTENUATOR STRUCTURAL FRAMING. SEAL CASING PER EXHAUST AIR PLENUM PRESSURE RATING IN SPECIFICATIONS.
6. BOILER FLUE ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. PROVIDE BOILER FLUE WITH LOW LOSS END CAP. BOILER FLUES UP FROM FLOOR BELOW THROUGH ROOF. SEE SHEET H312 FOR CONTINUATION.
7. EXHAUST FAN MOUNTED ON ROOF AT LOCATION INDICATED. EXHAUST AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H313 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '3' ON SHEET H501.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

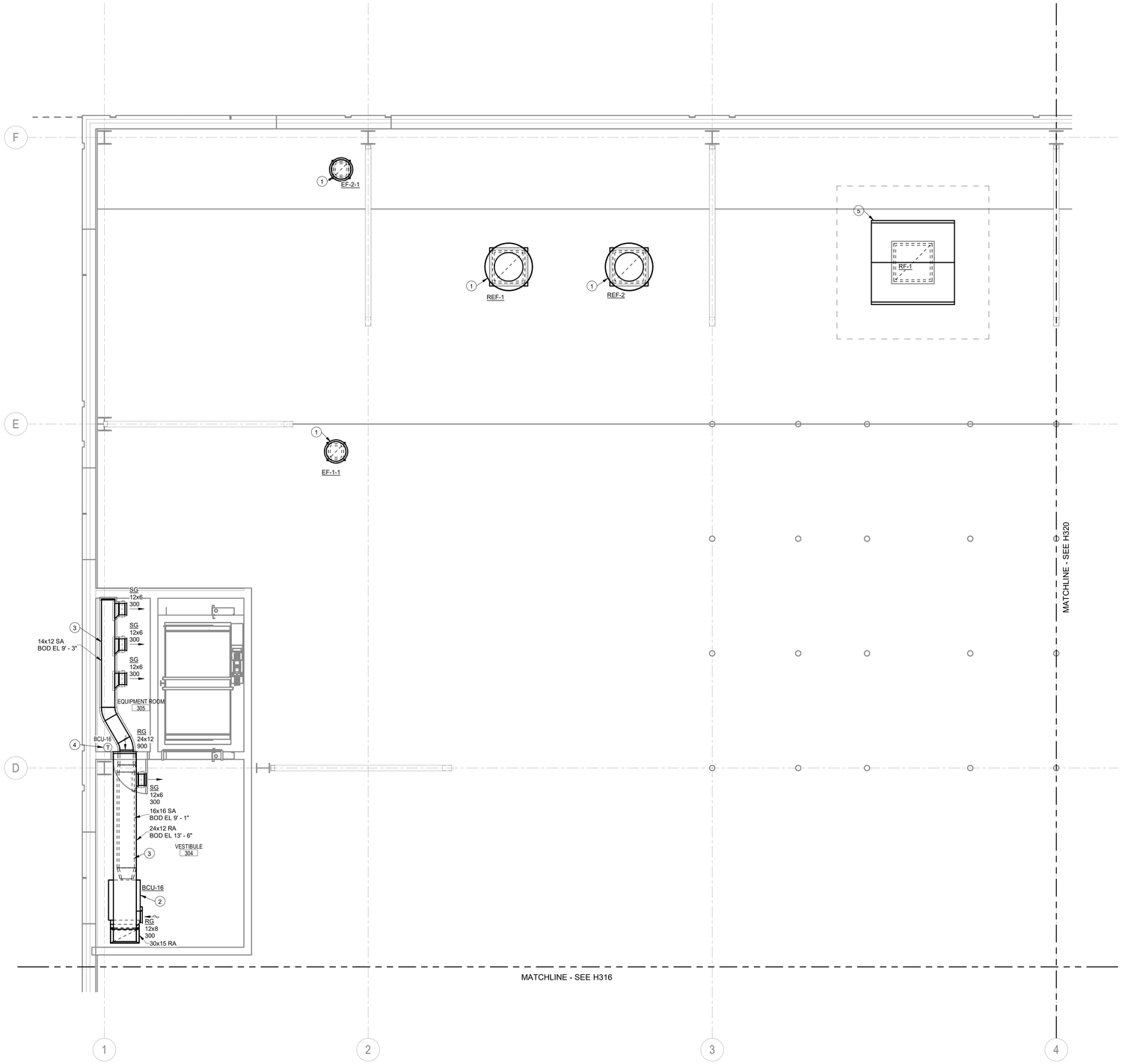
SHEET TITLE

ROOF HVAC PLAN - AREA C

SHEET NUMBER

H318

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:44 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF HVAC PLAN - AREA D

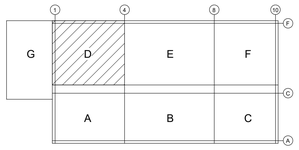
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. EXHAUST FAN MOUNTED ON ROOF AT LOCATION INDICATED. EXHAUST AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H313 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '3' ON SHEET H501.
2. BLOWER COIL UNIT SUSPENDED FROM STRUCTURE AT LOCATION SHOWN. SEE STRUCTURAL SHEETS FOR MOUNTING DETAIL.
3. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. BLOWER COIL UNIT THERMOSTAT MOUNTED ON WALL AT LOCATION SHOWN. COORDINATE WITH OTHER DISIPLINES.
5. RELEIF FAN MOUNTED ON ROOF AT LOCATION INDICATED. RELEIF AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H313 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '16' ON SHEET H501.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO.: 21-154	

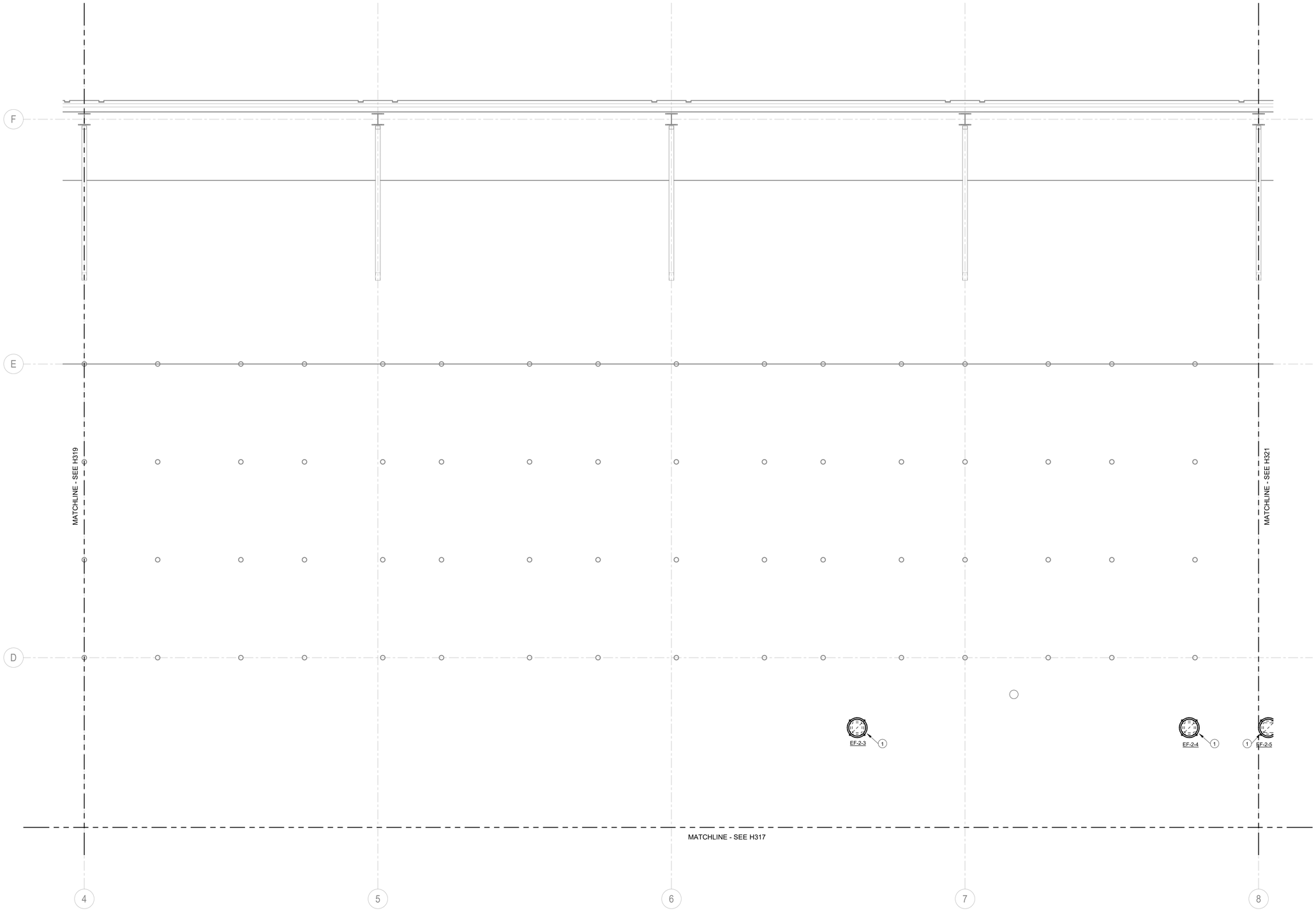
SHEET TITLE

ROOF HVAC PLAN - AREA D

SHEET NUMBER

H319

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:47 PM AESI Proj. No: 21-154



ROOF HVAC PLAN - AREA E

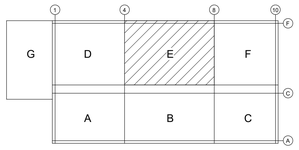
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. EXHAUST FAN MOUNTED ON ROOF AT LOCATION INDICATED. EXHAUST AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H313 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '3' ON SHEET H501.

GENERAL NOTES:

1. SEE M001 FOR SYMBOLS AND ABBREVIATIONS.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT

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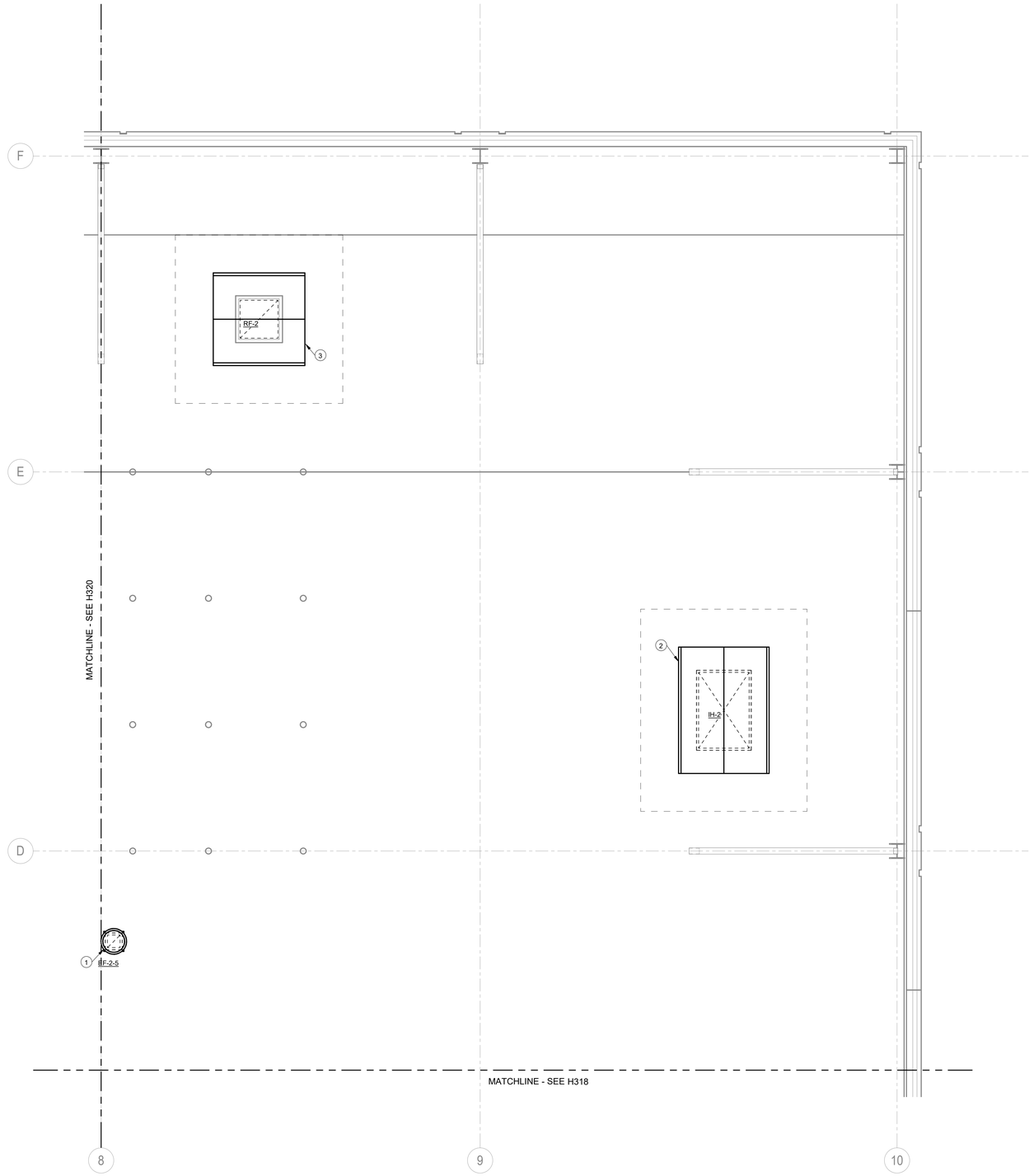
SHEET TITLE

ROOF HVAC PLAN - AREA E

SHEET NUMBER

H320

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:49 PM AESI Proj. No: 21-154



ROOF HVAC PLAN - AREA F

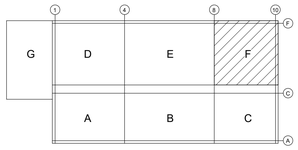
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.

PLAN NOTES:

1. EXHAUST FAN MOUNTED ON ROOF AT LOCATION INDICATED. EXHAUST AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H313 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '3' ON SHEET H501.
2. OUTDOOR AIR INLET HOOD ON ROOF AT LOCATION INDICATED. OUTDOOR AIR DUCT TO SECOND FLOOR FROM ROOF. SEE SHEET H310 FOR CONTINUATION OF OUTDOOR AIR DUCT. SEE DETAIL '15' ON SHEET H501.
3. RELEIF FAN MOUNTED ON ROOF AT LOCATION INDICATED. RELEIF AIR DUCT ROUTED FROM SECOND FLOOR TO ROOF. SEE SHEET H313 FOR CONTINUATION OF EXHAUST DUCT. SEE DETAIL '16' ON SHEET H501.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health

Medical Center Campus

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Indianapolis, IN, 46202

PROJECT

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

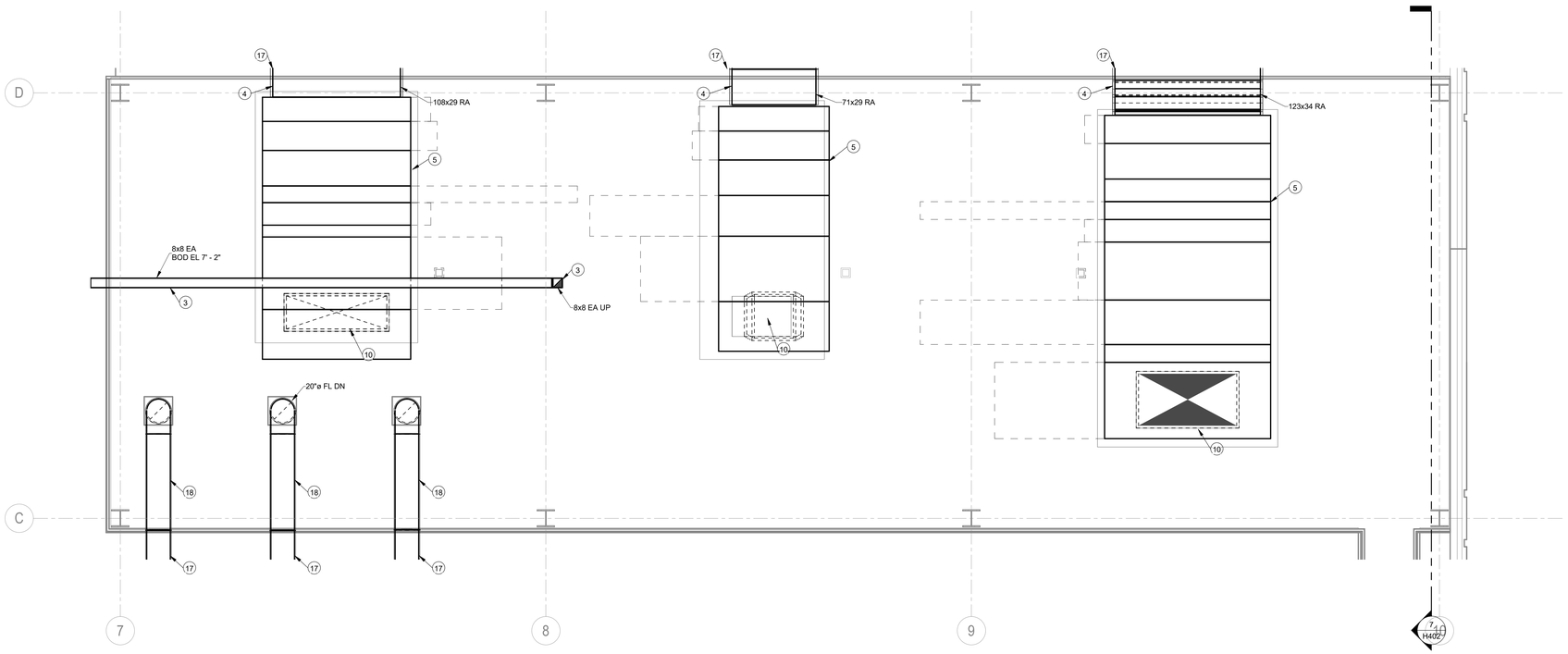
SHEET TITLE

ROOF HVAC PLAN - AREA F

SHEET NUMBER

H321

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:51 PM AESI Proj. No: 21-154



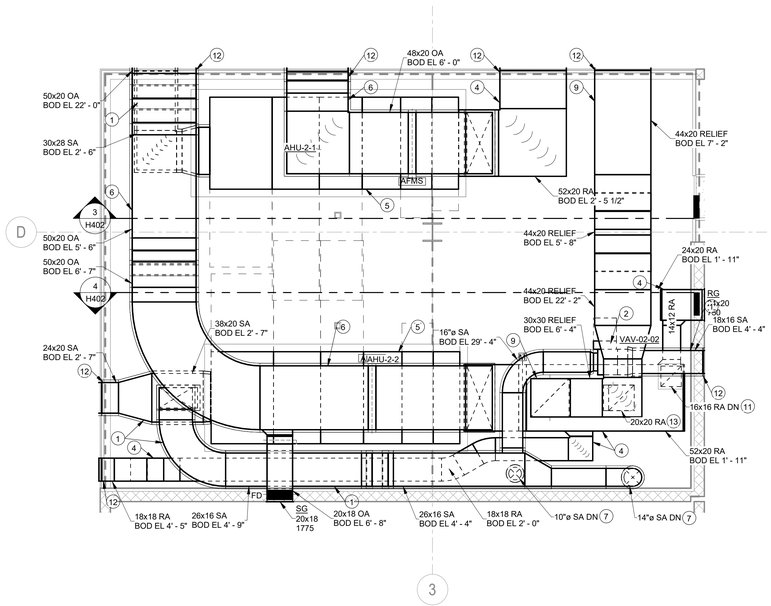
1 FIRST FLOOR MEZZANINE HVAC PLAN
Scale: 1/4" = 1'-0"

GENERAL NOTES:

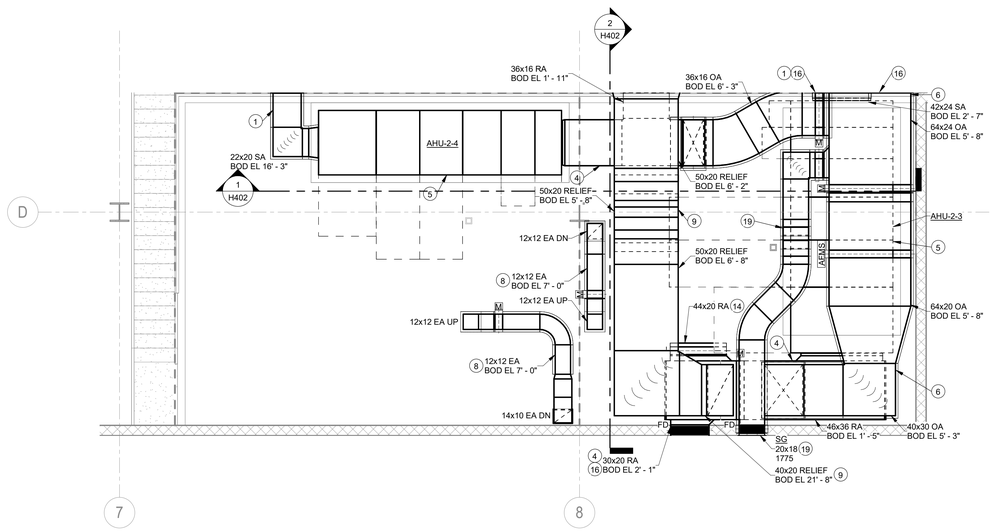
1. SEE SHEET M001 FOR SYMBOLS AND ABBREVIATIONS.
2. SEE ARCHITECTURAL SHEETS FOR MEZZANINE FINISHED FLOOR HEIGHTS.

PLAN NOTES:

1. SUPPLY AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
2. VAV BOX SUSPENDED IN SUPPLY AIR DUCT AT LOCATION INDICATED. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
3. EXHAUST AIR DUCT ROUTED AS SHOWN. EXHAUST AIR DUCT ROUTED THROUGH TO FLOOR ABOVE. SEE SHEET H314 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
4. RETURN AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
5. AIR HANDLING UNIT OR MAKE UP AIR UNIT MOUNTED ON EQUIPMENT PAD AT LOCATION INDICATED. SEE STRUCTURAL SHEETS FOR EQUIPMENT PAD DETAILS. DASHED LINES INDICATED EQUIPMENT SERVICE CLEARENCES, COORDINATE WITH ALL DISCIPLINES TO KEEP SERVICE CLEARENCES FREE OF OBSTRUCTIONS. SEE MECHANICAL SHEETS FOR PIPE ROUTING. SEE ELECTRICAL SHEETS FOR ELECTRICAL CONNECTION DETAILS.
6. OUTDOOR AIR DUCT UP THROUGH ROOF. SEE H316 FOR CONTINUATION.
7. SUPPLY AIR DUCT DOWN THROUGH SLAB TO FLOOR BELOW. SEE H313 FOR CONTINUATION.
8. EXHAUST AIR DUCT ROUTED FROM FLOOR BELOW THROUGH MEZZANINE TO ROOF AS SHOWN. SEE SHEET H320 AND SHEET H314 FOR CONTINUATION. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.
9. RELEIF AIR DUCT ROUTED AS SHOWN. CONTRACTOR SHALL INSTALL SIESMIC BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. DUCT IS ROUTED UP THROUGH ROOF AT LOCATION INDICATED. SEE SHEET H319 FOR CONTINUATION.
10. SUPPLY AIR DUCT DOWN THROUGH SLAB TO FLOOR BELOW. SEE H309 FOR CONTINUATION.
11. RETURN AIR DUCT DOWN THROUGH SLAB TO FLOOR BELOW. SEE H313 FOR CONTINUATION.
12. DUCT FROM EQUIPMENT MEZZANINE. SEE H313 FOR CONTINUATION.
13. OPEN RETURN DUCT WITH BALANCE DAMPER MOUNTED ON TOP OF DUCT AT LOCATION INDICATED. TAB CONTRACTOR SHALL SET BALANCE DAMPER TO 2000CFM.
14. OPEN RETURN DUCT WITH BALANCE DAMPER MOUNTED ON TOP OF DUCT AT LOCATION INDICATED. TAB CONTRACTOR SHALL SET BALANCE DAMPER TO 6000CFM.
15. DUCT FROM EQUIPMENT MEZZANINE. SEE H314 FOR CONTINUATION.
16. DUCT FROM EQUIPMENT MEZZANINE. SEE H315 FOR CONTINUATION.
17. DUCT FROM EQUIPMENT MEZZANINE. SEE H309 FOR CONTINUATION.
18. 20" BOILER FLUE ROUTED AS SHOWN. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS. BOILER FLUES UP TO FLOOR ABOVE. SEE SHEET H311 FOR CONTINUATION.
19. OUTDOOR AIR MAKE UP DUCT TO GENERATOR ROOM. CONTRACTOR SHALL PROVIDE SEISMIC SWAY BRACING AS REQUIRED TO MEET SEISMIC ZONE C REQUIREMENTS.



2 SECOND FLOOR MEZZANINE 1 HVAC PLAN
Scale: 1/4" = 1'-0"



3 SECOND FLOOR MEZZANINE 2 HVAC PLAN
Scale: 1/4" = 1'-0"

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PROJECT NO.: 21-154	

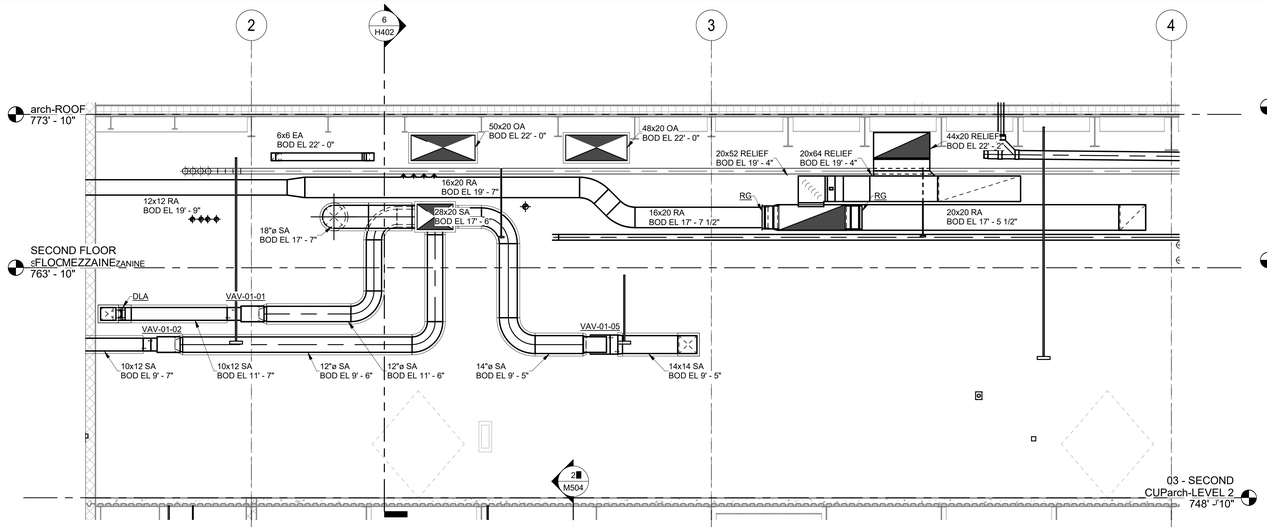
SHEET TITLE

HVAC MEZZANINE PLANS

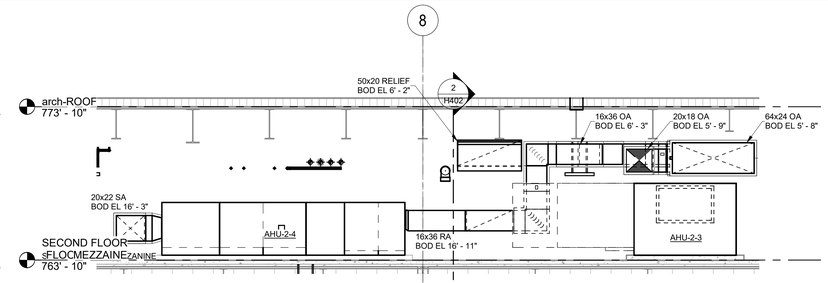
SHEET NUMBER

H401

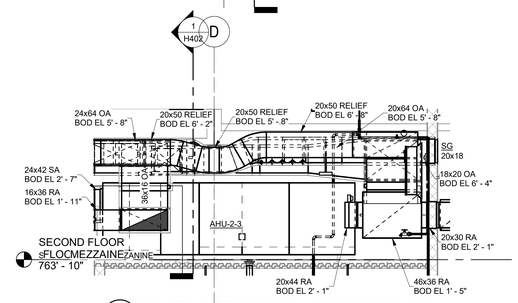
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:01:54 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



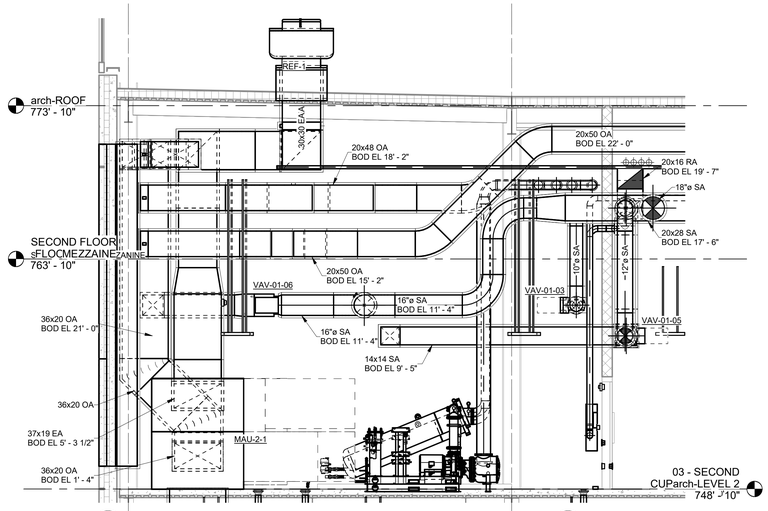
5 **NORTH CORRIDOR LOOKING EAST**
Scale: 1/4" = 1'-0"



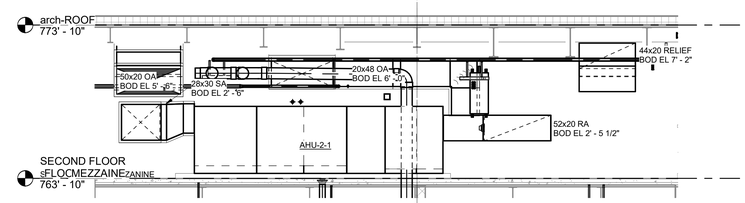
1 **SOUTH MEZZANINE LOOKING EAST**
Scale: 1/4" = 1'-0"



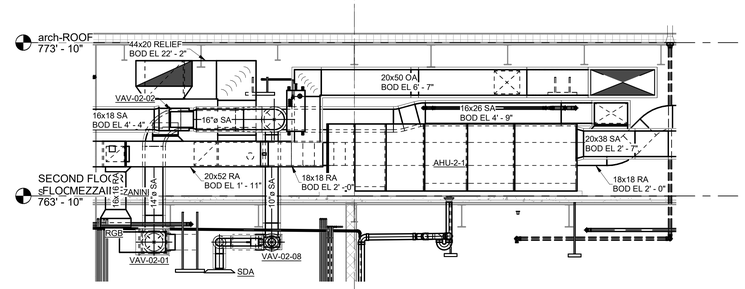
2 **SOUTH MEZZANINE LOOKING SOUTH**
Scale: 1/4" = 1'-0"



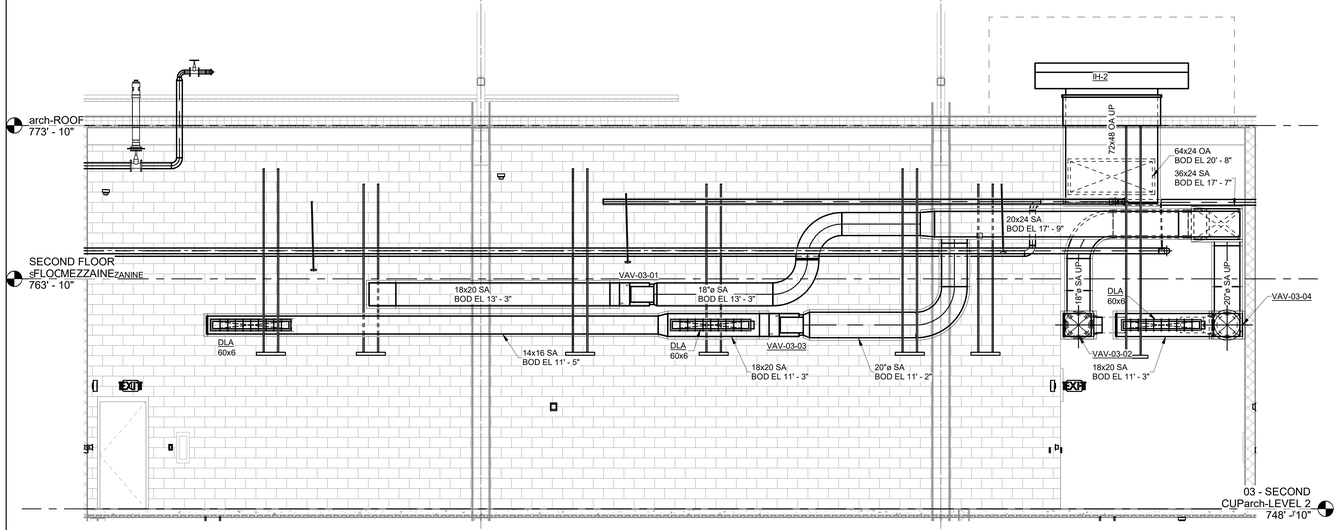
6 **MECHANICAL ROOM 204 LOOKING SOUTH**
Scale: 1/4" = 1'-0"



3 **NORTH MEZZANINE LOOKING EAST**
Scale: 1/4" = 1'-0"



4 **NORTH MEZZANINE LOOKING WEST**
Scale: 1/4" = 1'-0"



7 **SOUTH CORRIDOR SECTION**
Scale: 1/4" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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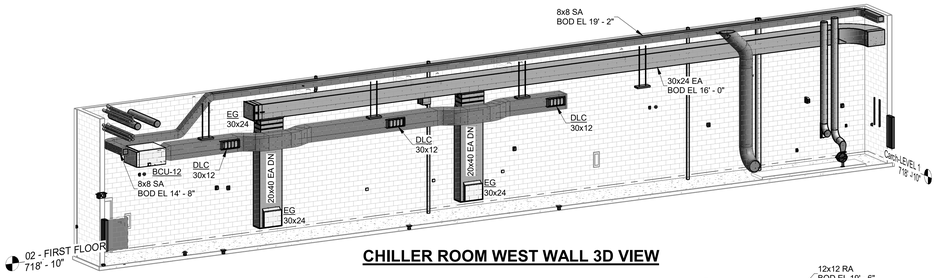
SHEET TITLE

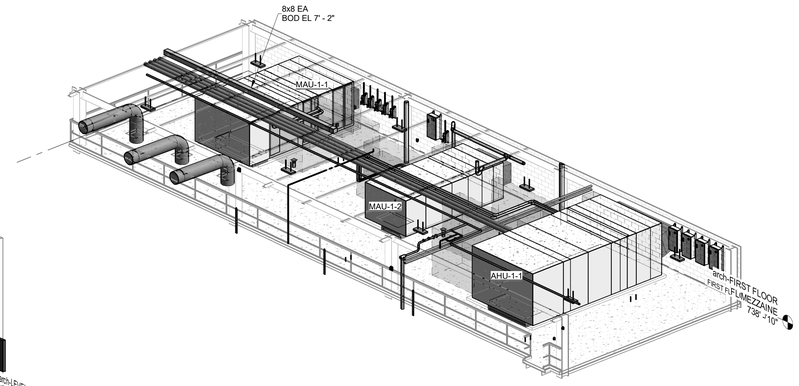
HVAC SECTIONS

SHEET NUMBER

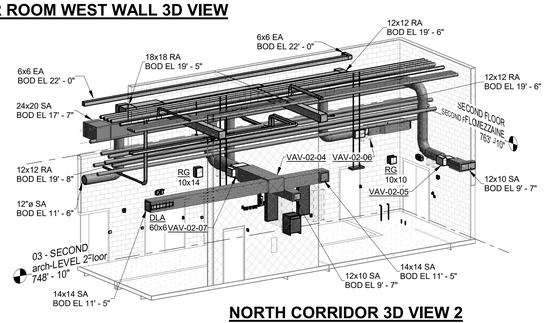
H402



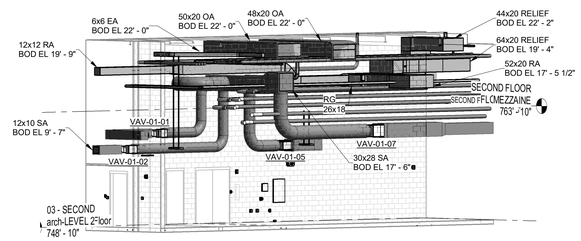
CHILLER ROOM WEST WALL 3D VIEW



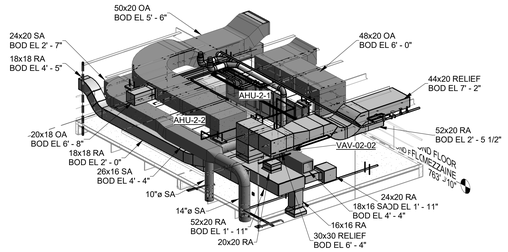
FIRST FLOOR MEZZANINE 3D VIEW



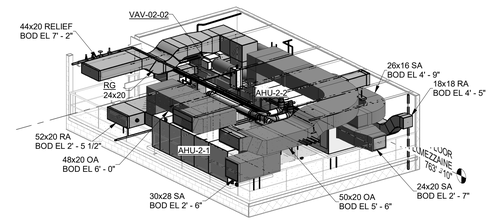
NORTH CORRIDOR 3D VIEW 2



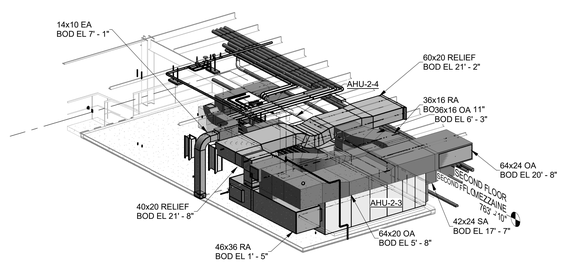
NORTH CORRIDOR 3D VIEW 1



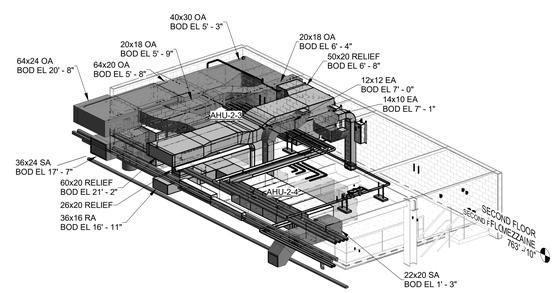
NORTH MEZZANINE 3D VIEW 2



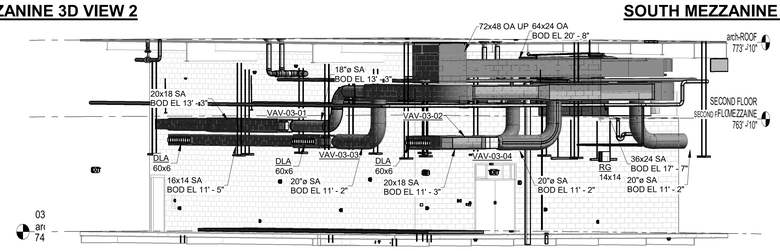
NORTH MEZZANINE 3D VIEW 1



SOUTH MEZZANINE 3D VIEW 2



SOUTH MEZZANINE 3D VIEW 1



SOUTH CORRIDOR 3D VIEW

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PROJECT NO. 21-154	

SHEET TITLE

HVAC 3D VIEWS

SHEET NUMBER

H403

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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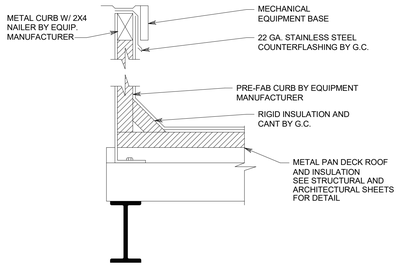
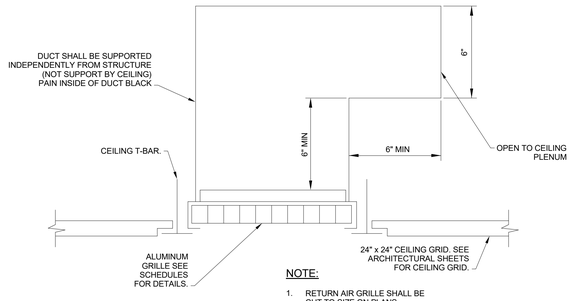


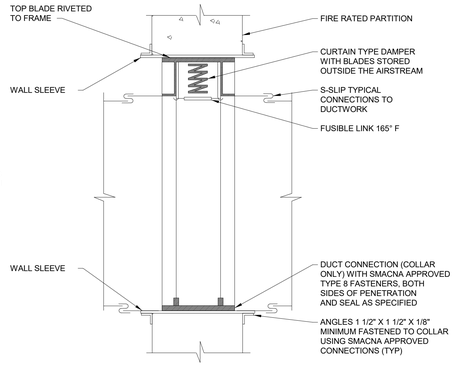
14 ROOF CURB DETAIL
Scale: NONE



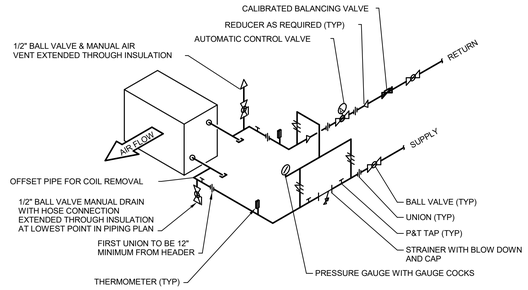
NOTE:

1. RETURN AIR GRILLE SHALL BE CUT TO SIZE ON PLANS

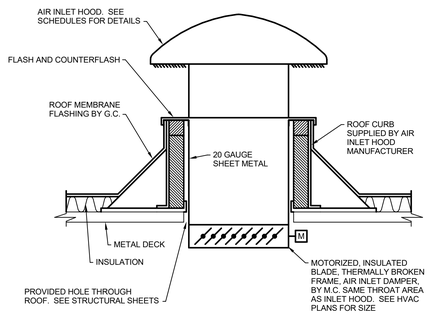
10 RETURN AIR GRILLE IN LAY-IN CEILING DETAIL
Scale: NONE



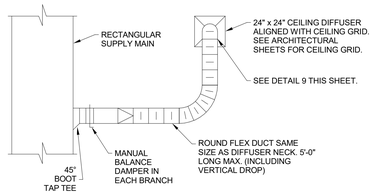
5 FIRE DAMPER INSTALLATION DETAIL
Scale: NONE



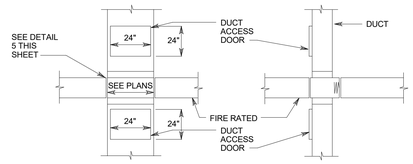
1 2 - WAY AHU WATER COIL PIPING DETAIL
Scale: NONE



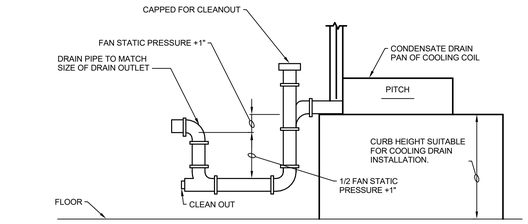
15 AIR INTAKE HOOD DETAIL
Scale: NON



11 SUPPLY DIFFUSER DETAIL
Scale: NONE

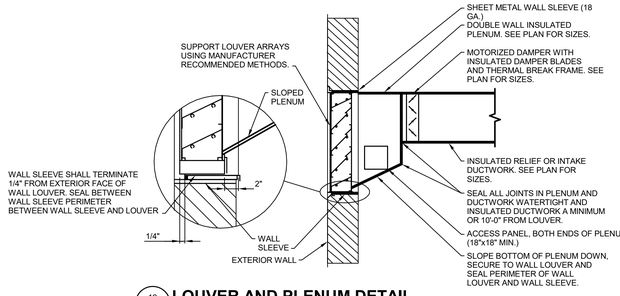


6 FIRE DAMPER ACCESS PANEL DETAIL
Scale: NONE

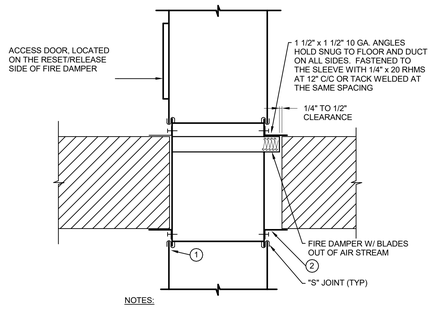


NOTE:
ARRANGE PIPING FOR EASY REMOVAL

2 DRAW - THRU UNITS COOLING DRAIN DETAIL
Scale: NONE



12 LOUVER AND PLENUM DETAIL
Scale: NONE

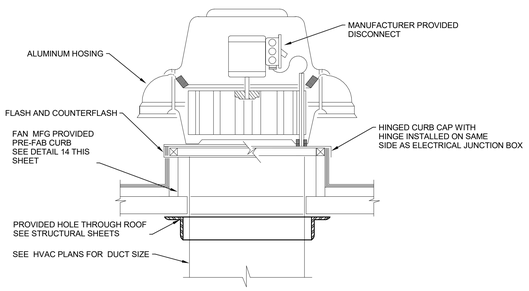


NOTES:

1. DAMPER SLEEVE MUST BE MINIMUM 26 GAGE UP TO MAXIMUM 10 GAGE STEEL. SLEEVE THICKNESS MUST BE EQUAL TO OR THICKER THAN THE DUCT CONNECTED TO IT. SLEEVE GAGE REQUIREMENTS ARE LISTED IN THE SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE FOR HVAC SYSTEMS AND IN NFPA 90A. SLEEVE MUST BE 14 GAGE MINIMUM WHEN DAMPER EXCEEDS 36" WIDE OR 24" HIGH. SLEEVE MUST NOT EXTEND MORE THAN 6" OUT OF THE WALL OR FLOOR.

2. GALVANIZED DAMPERS 50" X 60" OR 60" X 50" OR SMALLER REQUIRE MINIMUM OF 1 1/2" X 1 1/2" X 16 GAGE CONVENTIONAL MOUNTING ANGLES FASTENED TO THE DAMPER SLEEVE WITH NO. 10 (M5) BOLTS OR SCREWS, 3/16" RIVETS, TACK WELDS OR SPOT WELDS, SPACED A MAXIMUM OF 6" ON CENTER. MOUNTING ANGLES MUST OVERLAP THE WALL OR FLOOR A MINIMUM OF 1". DO NOT FASTEN ANGLES TOGETHER AT CORNERS OF THE DAMPER/SLEEVE ASSEMBLY.

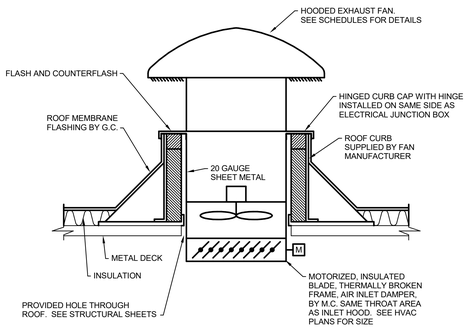
7 FIRE DAMPER HORIZONTAL INSTALLATION DETAIL
Scale: NONE



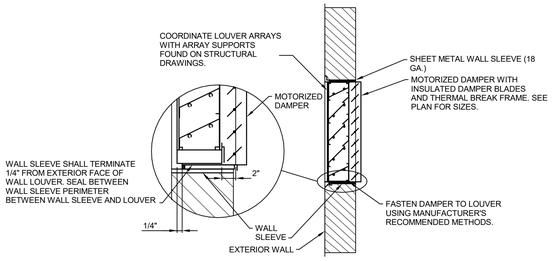
NOTES:

1. M.C. SHALL VERIFY ACTUAL SIZES OF ROOF CURB AND ROOF OPENING FOR THE PARTICULAR FAN MFG. SELECTED. COORDINATE THESE SIZES WITH ROOFING AND STRUCTURAL CONTRACTORS.
2. FAN TO BE INSTALLED LEVEL AND PLUMB.

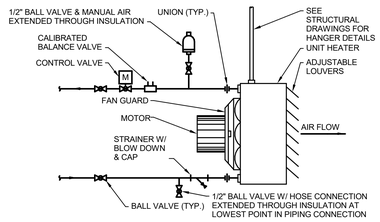
3 EXHAUST FAN MOUNTING DETAIL
Scale: NONE



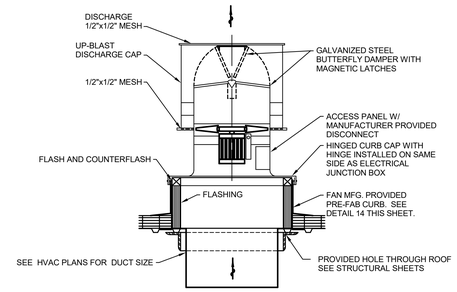
16 HOODED EXHAUST FAN DETAIL
Scale: NONE



13 LOUVER DETAIL
Scale: NONE



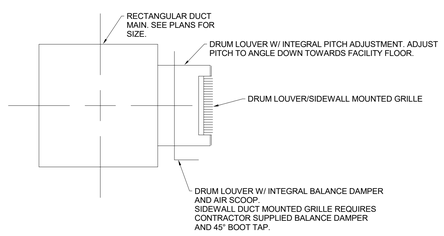
8 HOT WATER UNIT HEATER DETAIL
Scale: NONE



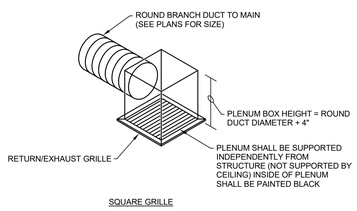
NOTES:

1. M.C. SHALL VERIFY ACTUAL SIZES OF ROOF CURB AND ROOF OPENING FOR THE PARTICULAR FAN MFG. SELECTED. COORDINATE THESE SIZES WITH ROOFING AND STRUCTURAL CONTRACTORS.
2. FAN TO BE INSTALLED LEVEL AND PLUMB.

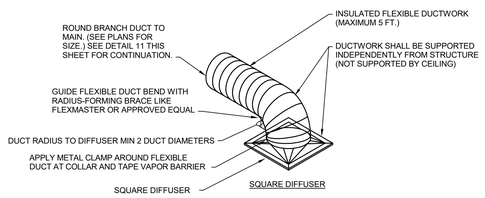
4 UP-BLAST PROPELLER EXHAUST FAN DETAIL
Scale: NONE



17 SIDE WALL DRUM LOUVER AND GRILLE DETAIL
Scale: NONE



SQUARE GRILLE



SQUARE DIFFUSER

9 GRILLE AND DIFFUSER IN CEILING INSULATION DETAIL
Scale: NONE

OWNER

Indiana University Health
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PROJECT

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION
CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

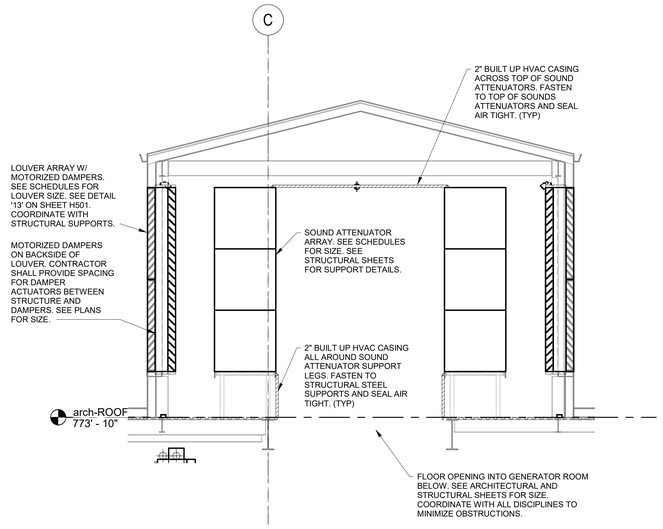
SHEET TITLE

HVAC DETAILS

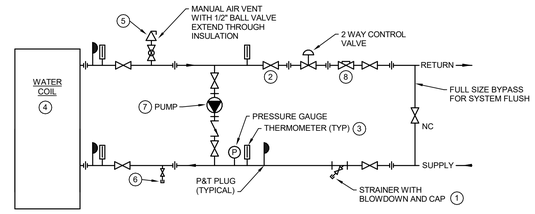
SHEET NUMBER

H501

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:02:24 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



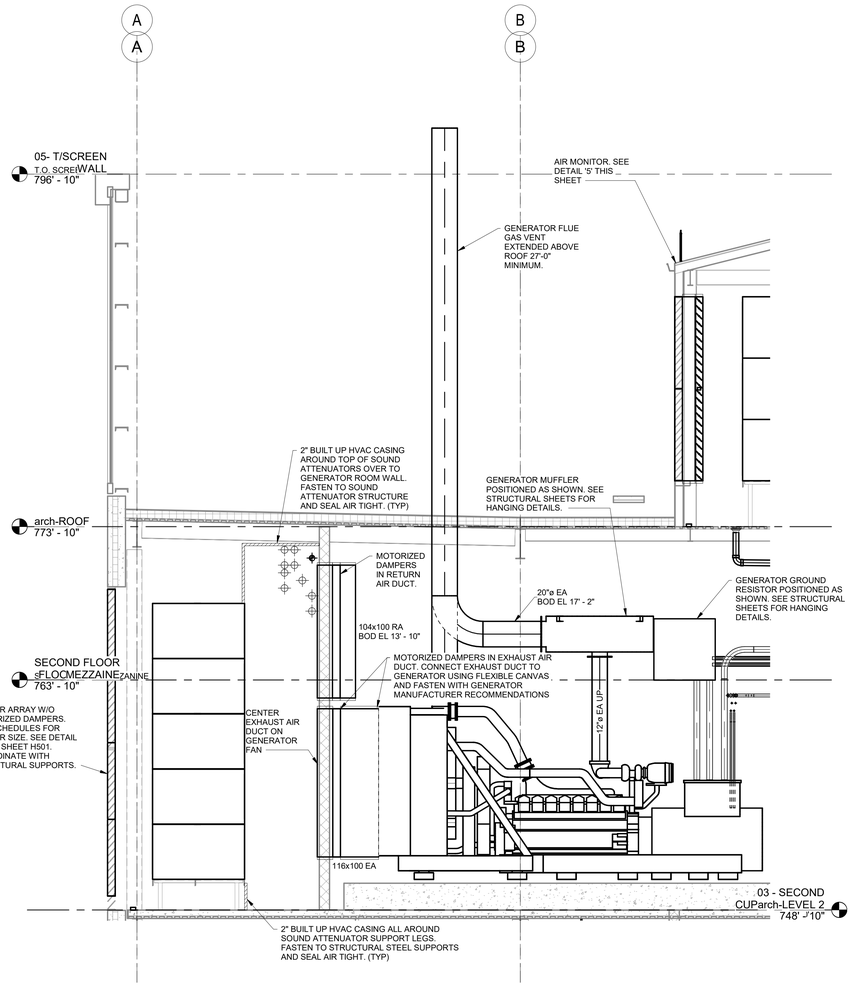
4 **AIR MONITOR DETAIL**
Scale: 1/4" = 1'-0"



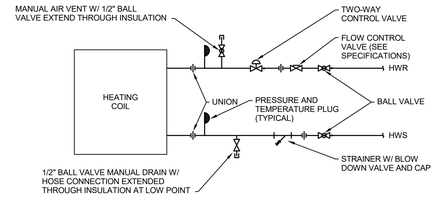
NOTES:

1. PROVIDE VALVED AND CAPPED BLOWDOWN WITH HOSE THREADS.
2. USE BALL VALVES FOR 2" PIPE SIZE AND SMALLER - USE BUTTERFLY VALVES FOR PIPE SIZE ABOVE 2" (TYPICAL).
3. PROVIDE SOLAR THERMOMETER INSTALLED AND ARRANGED FOR EASY VIEWING AND TO CAPTURE MAXIMUM LIGHT.
4. VERIFY NUMBER OF COILS AND PIPE SEPARATELY AS SHOWN.
5. INSTALL AIR VENT AT HIGHEST POINT IN PIPING CONNECTION.
6. 1/2" BALL VALVE MANUAL DRAIN W/ HOSE CONNECTION EXTENDED THROUGH INSULATION.
7. SEE INLINE PUMP DETAIL.
8. PROVIDE CALIBRATED BALANCING VALVE.

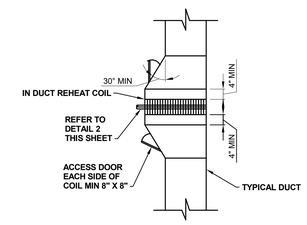
1 **PUMPED COIL DETAIL**
Scale: NONE



5 **GENERATOR ROOM DETAIL**
Scale: 1/4" = 1'-0"



2 **2-WAY VAV BOX, FAN COIL UNIT REHEAT COIL DETAIL**
Scale: NONE



3 **DUCT MOUNTED REHEAT COIL DETAIL**
Scale: NONE

OWNER

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

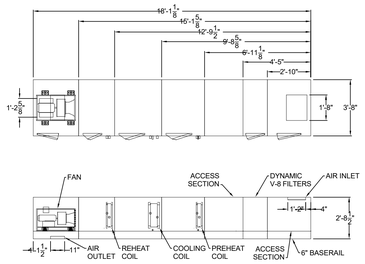
SHEET TITLE

HVAC DETAILS

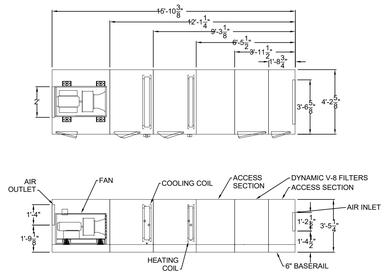
SHEET NUMBER

H502

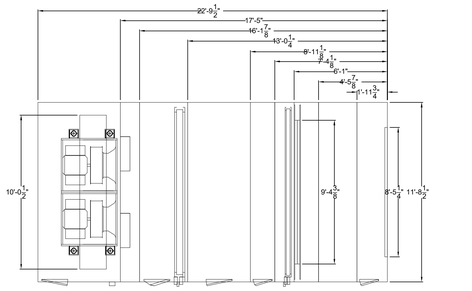
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 2:02:26 PM AESI Proj. No: 21-154

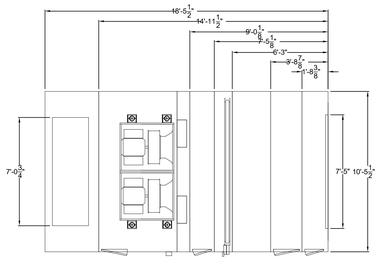


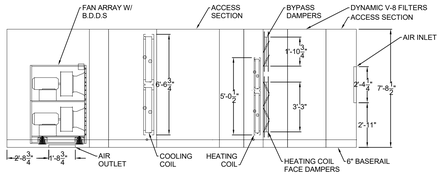
9 **MAU-2-2 DETAIL**
Scale: 1/4" = 1'-0"



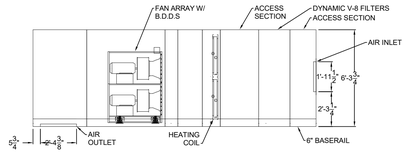
5 **AHU-2-4 DETAIL**
Scale: 1/4" = 1'-0"



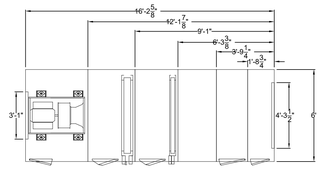


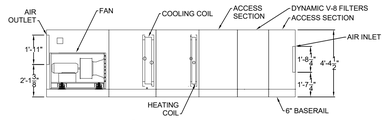


1 **AHU-1-1 DETAIL**
Scale: 1/4" = 1'-0"

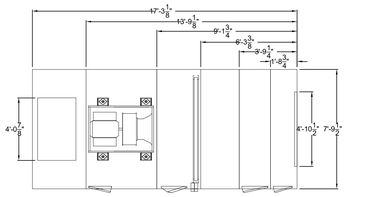


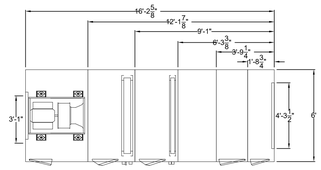
6 **MAU-1-1 DETAIL**
Scale: 1/4" = 1'-0"

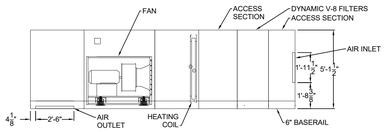




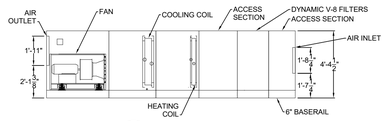
2 **AHU-2-1 DETAIL**
Scale: 1/4" = 1'-0"



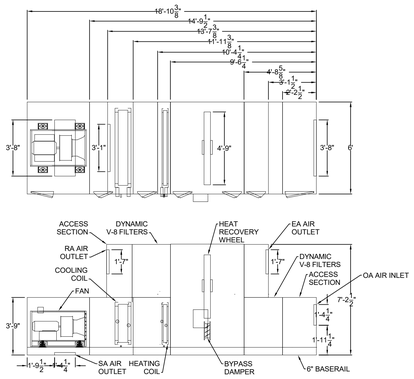




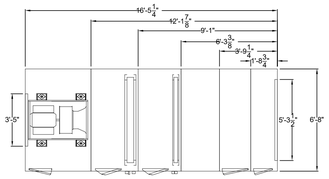
7 **MAU-1-2 DETAIL**
Scale: 1/4" = 1'-0"

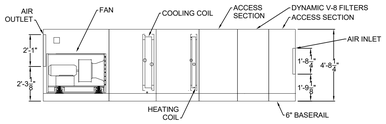


3 **AHU-2-2 DETAIL**
Scale: 1/4" = 1'-0"



8 **MAU-2-1 DETAIL**
Scale: 1/4" = 1'-0"





4 **AHU-2-3 DETAIL**
Scale: 1/4" = 1'-0"

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REVISIONS

NO.	DATE	DESCRIPTION

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

HVAC EQUIPMENT DETAILS

SHEET NUMBER

H503

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:02:26 PM AESI Proj. No: 21-154

BLOWER AND FAN COIL UNIT SCHEDULE

NOTES:
1. UNIT IS PROVIDED WITH HEATING COIL AND COOLING COIL.
2. UNIT IS PROVIDED ONLY WITH COOLING COIL.
3. UNIT IS PROVIDED WITH HEATING COIL ONLY
4. UNIT MOTOR SHALL BE ECM.
5. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR.
6. UNIT REQUIRES SUPPLY DUCT CONNECTION.
7. UNIT REQUIRES RETURN DUCT CONNECTION.

			FAN				COOLING COIL								HEATING COIL						MOTOR DATA							ELECTRICAL DATA		CABINET				BASIS OF DESIGN			
UNIT TAG	LOCATION	TYPE	CFM	ESP	TSP	DRIVE	MBH	EDB	EWB	EWT	LWT	GPM	ROWS	WATER P.D.	MBH	EWT	LWT	GPM	ROWS	WATER P.D.	HP	RPM	VOLTS	PH	FLA	MCA	MOCP	EM. POWER	CONTROL TYPE	DEPTH	LENGTH	HEIGHT	FILTER TYPE	MANUFACTURER	MODEL NO.	WEIGHT	NOTES
BCU-1	RECEIVING 105	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.423 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	104.43	130.0 °F	100.0 °F	6.68 GPM	2	0.93 ftH2O	1.5	1065	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	1,4,5,6
BCU-2	RECEIVING 105	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-3	RECEIVING 105	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.423 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	104.43	130.0 °F	100.0 °F	6.68 GPM	2	0.93 ftH2O	1.5	1065	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	1,4,5,6
BCU-4	RECEIVING 105	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-5	RECEIVING 105	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-6	FIRE PUMP ROOM 108	HORIZONTAL, EXPOSED	1600 CFM	0.500 in-wg	1.224 in-wg	DIRECT	55.95	85.0 °F	65.0 °F	42.0 °F	58.0 °F	7.23 GPM	4	3.12 ftH2O	56.83	130.0 °F	100.0 °F	3.64 GPM	2	0.97 ftH2O	1	1406	460 V	3	2.50 A	3.13 A	15 A	YES	DDC	46"	35.8"	18"	1" THROWAWAY	TRANE	BCHE054	223.00 lb	1,4,5,6
BCU-7	BOILER ROOM 109	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.00 A	4.00 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-8	BOILER ROOM 109	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-9	BOILER ROOM 109	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.00 A	4.00 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHD090	303.40 lb	2,4,5,6
BCU-10	JANITOR 115	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.423 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.00 A	4.00 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-11	BOILER ROOM 109	HORIZONTAL, EXPOSED	600 CFM	0.500 in-wg	1.074 in-wg	DIRECT	13.02	75.0 °F	62.0 °F	42.0 °F	58.0 °F	1.63 GPM	4	3.12 ftH2O	0	130.0 °F	100.0 °F	0 GPM	0	0 ftH2O	1	1340	460 V	3	2.50 A	3.13 A	15 A	YES	DDC	36.19"	28.69"	20.25"	1" THROWAWAY			0.00 lb	1,5,6
BCU-12	CHILLER PLANT 114	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-13	CHILLER PLANT 114	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	0	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	1.5	942	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	303.40 lb	2,4,5,6
BCU-14	CHILLER PLANT 114	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.109 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	104.43	130.0 °F	100.0 °F	6.68 GPM	2	0.93 ftH2O	1.5	1065	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	307.70 lb	1,4,5,6
BCU-15	CHILLER PLANT 114	HORIZONTAL, EXPOSED	3000 CFM	0.500 in-wg	1.432 in-wg	DIRECT	101.04	85.0 °F	65.0 °F	42.0 °F	58.0 °F	13.14 GPM	4	4.11 ftH2O	104.43	130.0 °F	100.0 °F	6.68 GPM	2	0.93 ftH2O	1.5	1065	460 V	3	3.30 A	4.13 A	15 A	YES	DDC	48"	40.65"	26"	1" THROWAWAY	TRANE	BCHE090	307.70 lb	2,4,5,6
BCU-16	VESTIBULE 304	HORIZONTAL, EXPOSED	1200 CFM	0.500 in-wg	1.159 in-wg	DIRECT	37.77	85.0 °F	65.0 °F	42.0 °F	58.0 °F	4.99 GPM	4	4.23 ftH2O	39.06	130.0 °F	100.0 °F	2.61 GPM	2	1 ftH2O	1	1611	460 V	3	2.50 A	3.13 A	15 A	YES	DDC	42"	33.1"	17"	1" THROWAWAY	TRANE	BCHE036	171.00 lb	1,4,5,6,7
FCU-N-1	STAIR #1 106	HORIZONTAL, EXPOSED	1000 CFM	0.050 in-wg	0.493 in-wg	DIRECT	16.87	76.0 °F	60.0 °F	42.0 °F	58.0 °F	2.1 GPM	3	1.38 ftH2O	20.93	130.0 °F	100.0 °F	1.4 GPM	1	10.79 ftH2O	0.25	1446	120 V	1	6.07 A	7.59 A	15 A	YES	THERMOSTAT	26"	75"	10"	1" THROWAWAY	TRANE	FCDB120	218.00 lb	1,4,5
FCU-N-2	STAIR #1 106	HORIZONTAL, EXPOSED	1000 CFM	0.050 in-wg	0.493 in-wg	DIRECT	16.87	76.0 °F	60.0 °F	42.0 °F	58.0 °F	2.1 GPM	3	1.38 ftH2O	20.93	130.0 °F	100.0 °F	1.4 GPM	1	10.79 ftH2O	0.25	1446	120 V	1	6.07 A	7.59 A	15 A	YES	THERMOSTAT	26"	75"	10"	1" THROWAWAY	TRANE	FCDB120	218.00 lb	1,4,5
FCU-N-T	Room 1	VERTICAL, CONCEALED	800 CFM	0.050 in-wg	0.400 in-wg	DIRECT	0	0.0 °F	0.0 °F	0.0 °F	0.0 °F	0 GPM	0	0 ftH2O	21.91	130.0 °F	100.0 °F	1.46 GPM	2	0.78 ftH2O	0.146	1306	120 V	1	3.88 A	4.85 A	15 A	YES	THERMOSTAT	10.38"	65.5"	57.5"	1" THROWAWAY	TRANE	FFHB080	139.00 lb	3,4,5
FCU-S-1	STAIR #2 110	HORIZONTAL, EXPOSED	1000 CFM	0.050 in-wg	0.493 in-wg	DIRECT	16.87	76.0 °F	60.0 °F	42.0 °F	58.0 °F	2.1 GPM	3	1.38 ftH2O	20.93	130.0 °F	100.0 °F	1.4 GPM	1	10.79 ftH2O	0.25	1446	120 V	1	6.07 A	7.59 A	15 A	YES	THERMOSTAT	26"	75"	10"	1" THROWAWAY	TRANE	FCDB120	218.00 lb	1,4,5
FCU-S-2	STAIR #2 217	HORIZONTAL, EXPOSED	1000 CFM	0.050 in-wg	0.493 in-wg	DIRECT	16.87	76.0 °F	60.0 °F	42.0 °F	58.0 °F	2.1 GPM	3	1.38 ftH2O	20.93	130.0 °F	100.0 °F	1.4 GPM	1	10.79 ftH2O	0.25	1446	120 V	1	6.07 A	7.59 A	15 A	YES	THERMOSTAT	26"	75"	10"	1" THROWAWAY	TRANE	FCDB120	218.00 lb	1,4,5

COMPUTER ROOM AIR CONDITIONING UNIT SCHEDULE

NOTES:
1. LOCKING DISCONNECT BY E.C.
2. MANUFACTURER TO PROVIDE REMOTE THERMOSTAT AND HUMIDISTAT, UNIT MOUNTED SMOKE DETECTOR, HIGH LIMIT TEMPERATURE SENSOR, LEAK POINT SENSOR AND LOW VOLTAGE TERMINAL PACK.
3.HUMIDIFIER SHALL BE RATED FOR USE WITH REVERSE OSMOSIS WATER

				AIRFLOW	CHILLED WATER COIL								HEATING WATER COIL					FAN							ELECTRICAL DATA					HUMIDIFIER		FILTERS			BASIS OF DESIGN			
UNIT TAG	LOCATION	AREA SERVED	TYPE	CFM	TOTAL MBH	SENSIBLE MBH	EDB	EWB	GPM	WATER P.D.	ROWS	FACE VELOCITY	TOTAL MBH	EDB	GPM	ROWS	FACE VELOCITY	TYPE	DRIVE	NO.	EXTERNAL SP	FAN RPM	VOLTS	PH	FLA	MCA	MOCP	EM POWER	CONTROL TYPE	TYPE	CAPACITY	TYPE	MERV RAITING	SIZE	MANUFACTURER	MODEL NO.	WEIGHT	NOTES
CRAC-1	MECHANICAL 224	MDF ROOM	BOTTOM DISCHARGE	3500 CFM	71	66.8	72.0 °F	58.7 °F	18.4 GPM	10 ftH2O	4	500 FPM	30.58	64.0 °F	2.1 GPM	1	500 FPM	ECM	DIRECT	1	0.200 in-wg	1800	480 V	3	21 A	23.4 A	30 A	YES	DDC	INFRARED	7.7	PLEATED	8	4 INCH	LIEBERT	PX018D21AD	850.00 lb	1, 2, 3
CRAC-2	MECHANICAL 224	MDF ROOM	BOTTOM DISCHARGE	3500 CFM	71	66.8	72.0 °F	58.7 °F	18.4 GPM	10 ftH2O	4	500 FPM	30.58	64.0 °F	2.1 GPM	1	500 FPM	ECM	DIRECT	1	0.200 in-wg	1800	480 V	3	21 A	23.4 A	30 A	YES	DDC	INFRARED	7.7	PLEATED	8	4 INCH	LIEBERT	PX018D21AD	850.00 lb	1, 2, 3

VAV BOX SCHEDULE

NOTES:
1. MANUFACTURER SHALL FURNISH UNIT WITH FLOW SENSOR AND DISCHARGE TEMPERATURE SENSOR. CONTROL CONTRACTOR SHALL PROVIDE DDC CONTROLLER AND DAMPER ACTURATOR.
2. PROVIDE DUCT TRANSITION AT UNIT WHERE INLET SIZE AND DUCT RUNOUT SIZE ARE DIFFERENT.
3. THE UNIT MAXIMUM S.P. IS THE DIFFERENCE BETWEEN THE UNIT INLET AND DISCHARGE INCLUDING REHEAT COIL.
4. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR

									HOT WATER REHEAT COIL											DISCHARGE SOUND POWER OCTAVE BAND CENTER FREQUENCY									BASIS OF DESIGN		
UNIT TAG	SYSTEM SERVED	AREA SERVED	UNIT TYPE	UNIT INLET SIZE	MAXIMUM CFM	MINIMUM CFM	MAXIMUM S.P. AT MAXIMUM CFM	INLET S.P.	EAT	LAT	EWT	LWT	GPM	MAXIMUM WATER P.D.	NOMINAL PIPE SIZE	HEATING CFM	MBH AT HEATING CFM	NC LEVEL AT INLET S.P.	MAXIMUM ROOM NC	125HZ	250HZ	500HZ	1000HZ	2000HZ	4000HZ	CONTROL TYPE	POWER 120V OR 24V W/ REMOTE XFMR	WEIGHT	MANUFACTURER	MODEL NO.	NOTES
VAV-01-01	AHU-2-1	NORTH CORRIDOR 228	DDC	7"	500 CFM	280 CFM	0.42 in-wg	0.750 in-wg	55.0 °F	87.0 °F	130.0 °F	94.8 °F	1 GPM	0.35 Feet	3/4"	500 CFM	17.36	20	35	70	62	51	48	43	40	DDC	24V W/ REMOTE	23.00 lb	PRICE	SDV-07	1, 2, 3, 4
VAV-01-02	AHU-2-1	OFFICE 204	DDC	7"	490 CFM	100 CFM	0.41 in-wg	0.750 in-wg	55.0 °F	95.7 °F	130.0 °F	107.9 °F	1.79 GPM	0.96 Feet	3/4"	440 CFM	19.43	20	35	76	71	63	57	52	49	DDC	24V W/ REMOTE	23.00 lb	PRICE	SDV-07	1, 2, 3, 4
VAV-01-03	AHU-2-1	MECHANICAL 206	DDC	6"	300 CFM	0 CFM	0.19 in-wg	0.750 in-wg	55.0 °F	85.6 °F	130.0 °F	98.9 °F	0.33 GPM	0.02 Feet	3/4"	150 CFM	4.98	20	35	72	67	57	52	46	43	DDC	24V W/ REMOTE	20.00 lb	PRICE	SDV-06	1, 2, 3, 4
VAV-01-04	AHU-2-1	LOCKER/BREAK 205	DDC	16"	1680 CFM	575 CFM	0.41 in-wg	0.750 in-wg	55.0 °F	96.3 °F	130.0 °F	100.5 °F	4 GPM	1.07 Feet	3/4"	1300 CFM	58.25	20	35	74	69	61	58	56	54	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-01-05	AHU-2-1	CONTROL 209	DDC	12"	900 CFM	300 CFM	0.38 in-wg	0.750 in-wg	55.0 °F	94.5 °F	130.0 °F	99.9 °F	2.14 GPM	0.75 Feet	3/4"	740 CFM	31.71	20	35	74	69	61	58	56	54	DDC	24V W/ REMOTE	38.00 lb	PRICE	SDV-12	1, 2, 3, 4
VAV-01-06	AHU-2-1	SWITCHGEAR 212	DDC	14"	1290 CFM	430 CFM	0.27 in-wg	0.750 in-wg	55.0 °F	88.6 °F	130.0 °F	100.9 °F	1.7 GPM	0.43 Feet	3/4"	670 CFM	24.42	20	35	61	53	50	47	44	41	DDC	24V W/ REMOTE	49.00 lb	PRICE	SDV-14	1, 2, 3, 4
VAV-01-07	AHU-2-1	NORTH CORRIDOR 228	DDC	16"	2000 CFM	0 CFM	0.53 in-wg	0.750 in-wg	55.0 °F	95.2 °F	130.0 °F	109.2 °F	8.5 GPM	4.05 Feet	3/4"	2000 CFM	87.23	20	35	74	67	65	59	57	56	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-02-01	AHU-2-2	GENERATOR SWITCHGEAR	DDC	14"	1300 CFM	430 CFM	0.27 in-wg	0.750 in-wg	55.0 °F	86.7 °F	130.0 °F	97.8 °F	1.41 GPM	0.31 Feet	3/4"	650 CFM	22.36	20	35	61	53	50	47	44	41	DDC	24V W/ REMOTE	49.00 lb	PRICE	SDV-14	1, 2, 3, 4
VAV-02-02	AHU-2-2	GENERATOR SWITCHGEAR	DDC	14"	1300 CFM	430 CFM	0.27 in-wg	0.750 in-wg	55.0 °F	86.7 °F	130.0 °F	97.8 °F	1.41 GPM	0.31 Feet	3/4"	650 CFM	22.36	20	35	61	53	50	47	44	41	DDC	24V W/ REMOTE	49.00 lb	PRICE	SDV-14	1, 2, 3, 4
VAV-02-03	AHU-2-2	MAINTENANCE WORKROOM 207	DDC	6"	500 CFM	100 CFM	0.38 in-wg	0.750 in-wg	55.0 °F	85.2 °F	130.0 °F	105.0 °F	0.67 GPM	0.09 Feet	3/4"	250 CFM	8.19	20	35	78	73	62	56	48	45	DDC	24V W/ REMOTE	20.00 lb	PRICE	SDV-06	1, 2, 3, 4
VAV-02-04	AHU-2-2	OFFICE 203	DDC	7"	490 CFM	100 CFM	0.42 in-wg	0.750 in-wg	55.0 °F	95.7 °F	130.0 °F	109.2 °F	2 GPM	1.16 Feet	3/4"	465 CFM	20.48	20	35	76	71	63	57	52	49	DDC	24V W/ REMOTE	23.00 lb	PRICE	SDV-07	1, 2, 3, 4
VAV-02-05	AHU-2-2	OFFICE 226	DDC	7"	520 CFM	100 CFM	0.45 in-wg	0.750 in-wg	55.0 °F	94.2 °F	130.0 °F	106.8 °F	1.75 GPM	0.92 Feet	3/4"	470 CFM	19.99	20	35	76	71	63	57	52	49	DDC	24V W/ REMOTE	23.00 lb	PRICE	SDV-07	1, 2, 3, 4
VAV-02-06	AHU-2-2	MECHANICAL 224	DDC	7"	500 CFM	0 CFM	0.30 in-wg	0.750 in-wg	55.0 °F	86.2 °F	130.0 °F	101.1 °F	0.6 GPM	0.1 Feet	3/4"	250 CFM	8.46	20	35	70	62	51	48	43	40	DDC	24V W/ REMOTE	23.00 lb	PRICE	SDV-07	1, 2, 3, 4
VAV-02-07	AHU-2-2	NORTH CORRIDOR 201	DDC	16"	2000 CFM	575 CFM	0.52 in-wg	0.750 in-wg	55.0 °F	95.2 °F	130.0 °F	109.2 °F	8.5 GPM	4.05 Feet	3/4"	2000 CFM	87.23	20	35	74	67	65	59	57	56	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-02-08	AHU-2-2	GENERATOR CONTROL ROOM	DDC	6"	380 CFM	80 CFM	0.36 in-wg	0.750 in-wg	55.0 °F	94.9 °F	130.0 °F	96.3 °F	0.5 GPM	0.08 Feet	3/4"	190 CFM	8.23	20	35	75	70	60	54	48	44	DDC	24V W/ REMOTE	20.00 lb	PRICE	SDV-06	1, 2, 3, 4
VAV-03-01	AHU-2-4	AES SERVICE SWITCHGEAR 216	DDC	16"	1800 CFM	0 CFM	0.31 in-wg	0.750 in-wg	55.0 °F	86.5 °F	130.0 °F	98.9 °F	2 GPM	0.61 Feet	3/4"	900 CFM	30.76	20	35	61	53	53	48	46	42	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-03-02	AHU-2-4	AES SERVICE SWITCHGEAR 216	DDC	16"	1800 CFM	575 CFM	0.31 in-wg	0.750 in-wg	55.0 °F	86.5 °F	130.0 °F	98.8 °F	2 GPM	0.61 Feet	3/4"	900 CFM	30.76	20	35	61	53	53	48	46	42	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-03-03	AHU-2-4	SOUTH CORRIDOR 228	DDC	16"	2000 CFM	575 CFM	0.53 in-wg	0.750 in-wg	55.0 °F	95.2 °F	130.0 °F	109.2 °F	8.5 GPM	4.05 Feet	3/4"	2000 CFM	87.23	20	35	74	67	65	59	57	56	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-03-04	AHU-2-4	SOUTH CORRIDOR 228	DDC	16"	2000 CFM	0 CFM	0.53 in-wg	0.750 in-wg	55.0 °F	95.2 °F	130.0 °F	109.2 °F	8.5 GPM	4.05 Feet	3/4"	2000 CFM	87.23	20	35	74	67	65	59	57	56	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4
VAV-03-05	AHU-2-4	SOUTH CORRIDOR 228	DDC	16"	2000 CFM	0 CFM	0.52 in-wg	0.750 in-wg	55.0 °F	85.7 °F	130.0 °F	91.5 °F	3.5 GPM	0.86 Feet	3/4"	2000 CFM	66.62	20	35	74	67	65	59	57	56	DDC	24V W/ REMOTE	55.00 lb	PRICE	SDV-16	1, 2, 3, 4

AHU ENTHALPY HEAT RECOVERY WHEEL SCHEDULE

NOTES:
1. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR.
2. ENTHALPY WHEEL SHALL BE EQUIPPED WITH VFD PROVIDED BY THE E.C.
3. ENTHALPY WHEEL SECTION OF THE AHU SHALL BE EQUIPED WITH SA AND EA BYPASS DAMPERS.
4. ENTHALPY WHEEL SHALL BE ALUMINUM WITH 4 ANGSTROM. CERAMIC MOLECULAR SIEVE.

			SUMMER DATA													WINTER DATA													MOTOR DATA								BASIS OF DESIGN		
			SUPPLY SIDE						EXHAUST SIDE							SUPPLY SIDE						EXHAUST SIDE																	
			ENTERING			LEAVING			ENTERING			LEAVING				ENTERING			LEAVING			ENTERING			LEAVING														
UNIT TAG	SYSTEM SERVED	LOCATION	CFM	DB	WB	CFM	DB	WB	CFM	DB	WB	CFM	DB	WB	RECOVERED MBH	CFM	DB	WB	CFM	DB	WB	CFM	DB	WB	CFM	DB	WB	RECOVERED MBH	HP	VOLTS	PH	FLA	MCA	MOCP	EM. POWER	WEIGHT	MANUFACTURER	MODEL NO.	NOTES
HRW-2-1	MAU-2-1		5906 CFM	95.0 °F	76.0 °F	5570 CFM	86.8 °F	67.5 °F	6140 CFM	85.0 °F	65.0 °F	6466 CFM	86.8 °F	67.5 °F	181.77	5906 CFM	-10.0 °F	-11.0 °F	5570 CFM	42.2 °F	25.8 °F	6140 CFM	55.0 °F	30.0 °F	6466 CFM	7.5 °F	1.3 °F	327.38	1	460 V	3	2 A	2 A	15 A	YES	1539.00 lb	TRANE	7000	1, 2, 3, 4

AHU HEATING OR COOLING COIL SCHEDULE

NOTES:
1. FACE VELOCITY IS BASED ON FINNED AREA ONLY AND NOT COIL CASING AREA.
2. ALL COILS TUBE THICKNESSES SHALL BE .025".
3. MANUFACTURER SHALL SELECT COILS WITH .00025 HR-SQFT-F/BTU FOULING FACTOR IN COIL SELECTIONS.
4. COIL SHALL BE EQUIPPED WITH FACE DAMPER AND BY PASS DAMPER OVER THE TOP OF THE COIL

		AIR SIDE									WATER SIDE					DIMENSIONAL			BASIS OF DESIGN	
UNIT TAG	SYSTEM SERVED	AIR FLOW	EDB	EWB	LDB	LWB	TOTAL LOAD (MBH)	SENSIBLE LOAD (MBH)	MAX. AIR PRESSURE DROP	MAX. AIR VELOCITY	GPM	EWT	LWT	MAX. WATER P.D.	MAX. VELOCITY	FACE AREA	NO. OF ROWS	FINS PER INCH	MANUFACTURER	NOTES
CC-AHU-1-1	AHU-1-1	32200 CFM	90.0 °F	65.0 °F	55.0 °F	52.9 °F	1143.69	1127.16	0.356 in-wg	491 FPM	142.36 GPM	42.0 °F	58.0 °F	6.5 FT	2.30 FPS	65.63 ft²	4	9.83	TRANE	1, 2, 3
CC-AHU-2-1	AHU-2-1	7000 CFM	82.0 °F	70.0 °F	55.0 °F	54.9 °F	340.43	209.02	0.613 in-wg	417 FPM	42.4 GPM	42.0 °F	58.0 °F	4.28 FT	2.53 FPS	16.81 ft²	6	11.16	TRANE	1, 2, 3
CC-AHU-2-2	AHU-2-2	7200 CFM	87.0 °F	72.0 °F	55.0 °F	54.9 °F	406.42	255	0.649 in-wg	428 FPM	50.62 GPM	42.0 °F	58.0 °F	5.9 FT	3.02 FPS	16.81 ft²	6	11.41	TRANE	1, 2, 3
CC-AHU-2-3	AHU-2-3	9600 CFM	84.0 °F	70.0 °F	55.0 °F	54.5 °F	466.14	307.63	0.685 in-wg	461 FPM	58.06 GPM	42.0 °F	58.0 °F	7.07 FT	3.16 FPS	20.81 ft²	6	10.58	TRANE	1, 2, 3
CC-AHU-2-4	AHU-2-4	3200 CFM	85.0 °F	60.0 °F	55.0 °F	47.7 °F	104.88	104.89	0.299 in-wg	401 FPM	13.06 GPM	42.0 °F	58.0 °F	7.65 FT	2.20 FPS	7.99 ft²	4	9.58	TRANE	1, 2, 3
CC-MAU-2-1	MAU-2-1	6600 CFM	83.0 °F	79.0 °F	55.0 °F	54.9 °F	522.05	188.34	0.815 in-wg	439 FPM	65.03 GPM	42.0 °F	58.0 °F	13.16 FT	4.81 FPS	13.65 ft²	6	13.41	TRANE	1, 2, 3
CC-MAU-2-2	MAU-2-2	1750 CFM	83.0 °F	79.0 °F	55.0 °F	54.9 °F	152.7	54.93	0.537 in-wg	388 FPM	19.02 GPM	42.0 °F	58.0 °F	5.21 FT	2.34 FPS	4.51 ft²	6	10.58	TRANE	1, 2, 3
HC-AHU-2-1	AHU-2-1	7000 CFM	47.0 °F	40.0 °F	65.0 °F	40.0 °F	136.65	136.65	0.124 in-wg	417 FPM	9.13 GPM	130.0 °F	100.0 °F	1 FT	1.06 FPS	16.81 ft²	2	7.83	TRANE	1, 2, 3
HC-AHU-2-2	AHU-2-2	7200 CFM	28.0 °F	20.0 °F	65.0 °F	20.0 °F	288.91	288.91	0.106 in-wg	428 FPM	19.31 GPM	130.0 °F	100.0 °F	2.38 FT	2.38 FPS	16.81 ft²	2	6.41	TRANE	1, 2, 3
HC-AHU-2-3	AHU-2-3	9600 CFM	42.0 °F	40.0 °F	65.0 °F	40.0 °F	239.46	239.46	0.173 in-wg	461 FPM	16 GPM	130.0 °F	100.0 °F	2.14 FT	1.74 FPS	20.81 ft²	2	10.67	TRANE	1, 2, 3
HC-AHU-2-4	AHU-2-4	3200 CFM	50.0 °F	40.0 °F	95.0 °F	40.0 °F	138.82	138.82	0.137 in-wg	401 FPM	9.28 GPM	130.0 °F	100.0 °F	2 FT	1.56 FPS	7.99 ft²	2	11.08	TRANE	1, 2, 3
HC-MAU-1-1	MAU-1-1	25600 CFM	-10.0 °F	-11.0 °F	55.0 °F	-11.0 °F	1804.61	1804.61	0.192 in-wg	522 FPM	120.7 GPM	130.0 °F	100.0 °F	7.83 FT	4.65 FPS	49.05 ft²	2	9.58	TRANE	1, 2, 3
HC-MAU-1-2	MAU-1-2	14000 CFM	-10.0 °F	-11.0 °F	55.0 °F	-11.0 °F	986.9	986.9	0.149 in-wg	468 FPM	65.96 GPM	130.0 °F	100.0 °F	6.25 FT	2.98 FPS	29.90 ft²	2	8.58	TRANE	1, 2, 3
HC-MAU-2-1	MAU-2-1	6000 CFM	-10.0 °F	0.0 °F	51.5 °F	0.0 °F	400	0	0.127 in-wg	439 FPM	26.73 GPM	130.0 °F	100.0 °F	2.22 FT	1.83 FPS	13.65 ft²	2	7.83	TRANE	1
HC-MAU-2-2	MAU-2-2	1750 CFM	40.0 °F	-11.0 °F	75.0 °F	-11.0 °F	66.43	66.43	0.101 in-wg	388 FPM	4.44 GPM	130.0 °F	100.0 °F	1.14 FT	1.17 FPS	4.51 ft²	2	7.67	TRANE	1, 2, 3
PHC-MAU-2-2	MAU-2-2	1750 CFM	-10.0 °F	-11.0 °F	42.4 °F	-11.0 °F	96.87	96.87	0.087 in-wg	388 FPM	6.47 GPM	130.0 °F	100.0 °F	1.91 FT	1.71 FPS	4.51 ft²	2	6	TRANE	1, 2, 3

AHU CASING SCHEDULE

NOTES:
1. UNIT SHALL BE MOUNTED ON G.C. PROVIDED EQUIPMENT PAD, SEE STRUCTURE SHEETS. COORDINATE EQUIPMENT PAD SIZES WITH G.C. MANUFACTURER TO PROVIDE 6" EQUIPMENT BASE RAIL.
2. UNIT OUTDOOR AIR AND RETURN AIR MIXING OCCUR REMOTELY FROM AHU CASING
3. UNIT RELEIF AIR OCCURS REMOTELY FROM AHU CASING.
4. UNIT ACCESS DOORS AND MAINTENANCE CLEARANCES SHALL ALL BE LOCATED ON ONE SIDE OF UNIT.
5. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR.
6. UNIT SHALL BE EQUIPPED WITH LIGHTS IN ACCESS SECTIONS WITH DOOR WINDOWS. WIRING TO MANUFACTURER PROVIDED LIGHTING CONNECTIONS BY E.C.
7. ACCESS DOORS OVER 18" WIDE SHALL HAVE WINDOWS. WINDOWS SHALL BE THEMALLY BROKEN, DUAL PANE.

			OVERALL	AIRFLOW			OVERALL	BASIS OF DESIGN		
UNIT TAG	LOCATION	SERVING	WEIGHT	MAX.	MIN.	OUTDOOR AIR FLOW MINIMUM	TOTAL S.P.	MANUFACTURER	MODEL NO.	NOTES
AHU-1-1		TRANSFORMER ROOM	10406.00 lb	32200 CFM	3230 CFM	0 CFM	3.540 in-wg	TRANE	CSAA066	1, 2, 3 ,4, 5, 6, 7
AHU-2-1		2ND FLOOR NE CORNER	2652.00 lb	7000 CFM	1400 CFM	860 CFM	3.406 in-wg	TRANE	CSAA017	1, 2, 3 ,4, 5, 6, 7
AHU-2-2		2ND FLOOR NW CORNER	2719.00 lb	7200 CFM	1440 CFM	865 CFM	3.437 in-wg	TRANE	CSAA017	1, 2, 3 ,4, 5, 6, 7
AHU-2-3		2ND FLOOR SOUTH END	3155.00 lb	9600 CFM	1920 CFM	1675 CFM	3.342 in-wg	TRANE	CSAA021	1, 2, 3 ,4, 5, 6, 7
AHU-2-4		LIFE SAFETY ROOM	1773.00 lb	3200 CFM	0 CFM	0 CFM	2.361 in-wg	TRANE	CSAA008	1, 2, 3 ,4, 5, 6, 7
MAU-1-1		HYDRONIC BOILERS	6171.00 lb	25600 CFM	1300 CFM	0 CFM	2.396 in-wg	TRANE	CSAA050	1, 4, 5, 6, 7
MAU-1-2		STEAM BOILERS	3563.00 lb	14000 CFM	1400 CFM	0 CFM	2.040 in-wg	TRANE	CSAA030	1, 4, 5, 6, 7
MAU-2-1	MECHANICAL 206	CHILLER ROOM	4154.00 lb	5570 CFM	5570 CFM	5570 CFM	3.546 in-wg	TRANE	CSAA014	1, 4, 5, 6, 7
MAU-2-2	MECHANICAL 224	TUNNEL	1651.00 lb	1750 CFM	1750 CFM	1750 CFM	2.871 in-wg	TRANE	CSAA004	1, 4, 5, 6, 7

AHU FILTER SCHEDULE

1. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR
2. FILTER MANUFACTURER SHALL PROVIDE FILTERS TO AHU MANUFACTURER FOR FACTORY INSTALATION.
3. FILTER MANUFACTURER AND AHU MANUFACTURER SHALL COORDINATE TO DETERMINE PRESSURE DROP FO AHU FAN FOR STATIC PRESSURE SIZING.

								QUANTITY					
UNIT TAG	SYSTEM SERVED	FILTER TYPE	FILTER SERVICE	AIR FLOW	CLEAN PRESSURE DROP	DIRTY PRESSURE DROP	THICKNESS	NO. HIGH	NO. WIDE	FACE VELOCITY	MERV RATING	MINIMUM ASHRAE 52.1 EFFICIENCY	NOTES
F-AHU-1-1	AHU-1-1	ACTIVE	FINAL FILTER	32200 CFM	0.300 in-wg	0.700 in-wg	1"	13	3	461 FPM	13	90	1, 2, 3
F-AHU-2-2	AHU-2-2	ACTIVE	FINAL FILTER	7000 CFM	0.300 in-wg	0.700 in-wg	1"	6	2	467 FPM	13	90	1, 2, 3
F-AHU-2-3	AHU-2-3	ACTIVE	FINAL FILTER	7200 CFM	0.300 in-wg	0.700 in-wg	1"	6	2	480 FPM	13	90	1, 2, 3
F-AHU-2-4	AHU-2-4	ACTIVE	FINAL FILTER	9600 CFM	0.300 in-wg	0.700 in-wg	1"	7	2	484 FPM	13	90	1, 2, 3
F-AHU-2-5	AHU-2-5	ACTIVE	FINAL FILTER	3200 CFM	0.300 in-wg	0.700 in-wg	1"	4	1	447 FPM	13	90	1, 2, 3
F-MAU-1-1	MAU-1-1	ACTIVE	FINAL FILTER	25600 CFM	0.300 in-wg	0.700 in-wg	1"	11	3	477 FPM	13	90	1, 2, 3
F-MAU-1-2	MAU-1-2	ACTIVE	FINAL FILTER	14000 CFM	0.300 in-wg	0.700 in-wg	1"	8	2	0 FPM	13	90	1, 2, 3
F-MAU-2-1	MAU-2-1	ACTIVE	FINAL FILTER	5570 CFM	0.300 in-wg	0.700 in-wg	1"	5	7	446 FPM	13	90	1, 2, 3
F-MAU-2-2	MAU-2-2	ACTIVE	FINAL FILTER	1750 CFM	0.300 in-wg	0.700 in-wg	1"	3	1	412 FPM	13	90	1, 2, 3

AHU FAN SCHEDULE

NOTES:
1. UNIT MANUFACTURER TO PROVIDE 1 VFD CONNECTION POINT PER FAN. EACH FAN SHALL BE EQUIPPED WITH A BACKDRAFT DAMPER.
2. ELECTRICAL CONTRACTOR TO PROVIDE VFD AND WIRING TO CONNECTION POINT.

	FAN											MOTOR							STARTER/CONTROLLER				BASIS OF DESIGN	
UNIT TAG	QUANTITY	TYPE	SERVICE	AIR FLOW DESIGN	EXTERNAL PRESSURE	INTERNAL S.P.	TOTAL S.P.	SPEED (RPM)	UNIT TOTAL BHP	DIAMETER	DRIVE	RPM	RATED HP PER FAN	FLA	MCA	MOCP	VOLTS	PH	TYPE	STARTER BY	EMERGENCY POWER	LOCATION	MANUFACTURER	NOTES
SF-AHU-1-1	4	PLENUM	SUPPLY	8050 CFM	1.000 in-wg	2.540 in-wg	3.540 in-wg	1871	30.303	22.25"	DIRECT	1800	10	12.5 A	15.63 A	25 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	1, 2
SF-AHU-2-1	1	PLENUM	SUPPLY	7000 CFM	1.750 in-wg	1.656 in-wg	3.406 in-wg	1711	5.73	22.25"	DIRECT	1800	7.5	9.8 A	12.25 A	20 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	2
SF-AHU-2-2	1	PLENUM	SUPPLY	7200 CFM	1.750 in-wg	1.687 in-wg	3.437 in-wg	1737	5.991	22.25"	DIRECT	1800	7.5	9.8 A	12.25 A	20 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	2
SF-AHU-2-3	1	PLENUM	SUPPLY	9600 CFM	1.500 in-wg	1.842 in-wg	3.342 in-wg	1610	7.733	24.5"	DIRECT	1800	10	12.5 A	15.63 A	25 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	2
SF-AHU-2-4	1	PLENUM	SUPPLY	3200 CFM	1.000 in-wg	1.361 in-wg	2.361 in-wg	1787	1.96	18.25"	DIRECT	1800	2	2.9 A	3.63 A	15 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	1, 2
SF-MAU-1-1	4	PLENUM	SUPPLY	6400 CFM	1.000 in-wg	1.396 in-wg	2.396 in-wg	1908	17.562	20"	DIRECT	1800	5	6.7 A	8.38 A	15 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	1, 2
SF-MAU-1-2	1	PLENUM	SUPPLY	14000 CFM	1.000 in-wg	1.040 in-wg	2.040 in-wg	1327	7.628	30"	DIRECT	1200	10	14.3 A	17.88 A	30 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	2
SF-MAU-2-1	1	PLENUM	SUPPLY	5570 CFM	1.000 in-wg	2.546 in-wg	3.546 in-wg	1605	5.005	22.25"	DIRECT	1800	7.5	9.8 A	12.25 A	20 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	1, 2
SF-MAU-2-2	1	PLENUM	SUPPLY	1750 CFM	1.000 in-wg	1.871 in-wg	2.871 in-wg	2708	1.324	13.5"	DIRECT	1800	1.5	2.2 A	2.75 A	15 A	460 V	3	VFD	E.C.	YES	SEE DRAWINGS	TRANE	2

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:02:31 PM AESI Proj. No.: 21-154
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AESI	
APPROVED BY	
Approver	
PROJECT NO.	
21-154	

SHEET TITLE

HVAC SCHEDULES

SHEET NUMBER

H601

SOUND ATTENUATORS

NOTES:

1. PERFORATED GALVANIZED LINER WITH FIBERGLASS FILL
2. UNITS ARRANGED IN ARRAY. SEE STRUCTURAL DRAWINGS FOR SUPPORT DETAILS.

UNIT TYPE TAG	LOCATION	SYSTEM SERVED	WIDTH	HEIGHT	LENGTH	CFM	VELOCITY FT/MIN	MAX. APD " W.C.	DYNAMIC INSERTION LOSS								GENERATED NOISE								BASIS OF DESIGN		WEIGHT	QTY	NOTES
									63HZ	125HZ	250HZ	500HZ	1000HZ	2000HZ	4000HZ	8000HZ	63HZ	125HZ	250HZ	500HZ	1000HZ	2000HZ	4000HZ	8000HZ	MANUFACTURER	MODEL NO.			
TYPE 1	GENERATOR EXHAUST PLENUM	GENERATOR EXHAUST	46"	43"	72"	7610 CFM	500 FPM	0.08 in-wg	7	12	20	32	30	23	16	13	29	20	15	35	42	31	23	11	PRICE	RM48/5D	299.00 lb	205	1,2
TYPE 2	ROOF MOUNTED AIR MONITORS	GENERATOR INLET	45"	48"	48"	5420 CFM	360 FPM	0.04 in-wg	9	15	27	42	36	26	17	14	49	31	18	39	44	36	25	20	PRICE	RM72/6D	424.00 lb	288	1,2

UNIT HEATER SCHEDULE

NOTES:
1. TEMPERATURE CONTROLS CONTRACTOR TO PROVIDE THERMOSTAT
2. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR

UNIT TAG	LOCATION	TYPE	MBH	EAT	LAT	CFM	EWT	LWT	GPM	WATER P.D.	FAN DIA.	MOTOR DATA								ELECTRICAL DATA			BASIS OF DESIGN		WEIGHT	NOTES
												HP	NO. OF SPEEDS	RPM	FLA	MCA	MOCP	VOLTS	PHASES	DISC. SW. BY	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.		
UH-1	GENERATOR ROOM A 220	HORIZONTAL PROPELLER	85	55.0 °F	85.0 °F	2600 CFM	130.0 °F	100.0 °F	7.86 GPM	0.6 Feet	24.38"	.333	1	1140	4.5 A	5.6 A	15 A	120 V	1	MANUFACTURER	NO	THERMOSTAT	TRANE	S-180	98.00 lb	1,2
UH-2	GENERATOR ROOM A 220	HORIZONTAL PROPELLER	85	55.0 °F	85.0 °F	2600 CFM	130.0 °F	100.0 °F	7.86 GPM	0.6 Feet	24.38"	.333	1	1140	4.5 A	5.6 A	15 A	120 V	1	MANUFACTURER	NO	THERMOSTAT	TRANE	S-180	98.00 lb	1,2
UH-3	GENERATOR ROOM B 218	HORIZONTAL PROPELLER	85	55.0 °F	85.0 °F	2600 CFM	130.0 °F	100.0 °F	7.86 GPM	0.6 Feet	24.38"	.333	1	1140	4.5 A	5.6 A	15 A	120 V	1	MANUFACTURER	NO	THERMOSTAT	TRANE	S-180	98.00 lb	1,2
UH-4	GENERATOR ROOM B 218	HORIZONTAL PROPELLER	85	55.0 °F	85.0 °F	2600 CFM	130.0 °F	100.0 °F	7.86 GPM	0.6 Feet	24.38"	.333	1	1140	4.5 A	5.6 A	15 A	120 V	1	MANUFACTURER	NO	THERMOSTAT	TRANE	S-180	98.00 lb	1,2

LOUVER SCHEDULE

NOTES:

1. LOUVER IS PART OF AN ARRAY.
2. PROVIDE BIRD SCREENS.
3. PAINTED FINISH. COLOR CHOSEN BY ARCHITECT.

LOUVER TAG	AREA SERVED	QUANTITY	ARRAY TOTAL CFM	LOUVER HEIGHT	LOUVER WIDTH	LOUVER MANUFACTURER	MAX FACE VELOCITY	LOUVER MODEL NO	NOTES
AML	AIR MONITOR	72	1314400 CFM	72 in	120 in	GREENHECK	515 FPM	ESD-635	1, 2, 3
CEL-A	CHILLER PLANT ELECTRIC ROOM	3	25,600 CFM	72 in	104 in	GREENHECK	210 FPM	ESD-635	1, 2, 3
CEL-B	CHILLER PLANT ELECTRIC ROOM	3	14,000 CFM	72 in	104 in	GREENHECK	135 FPM	ESD-635	1, 2, 3
CEL-C	CHILLER PLANT ELECTRIC ROOM	3	32,200 CFM	72 in	120 in	GREENHECK	260 FPM	ESD-635	1, 2, 3
MRL	MECHANICAL 206	3	19540 CFM	84 in	96 in	GREENHECK	200 FPM	ESD-635	1, 2, 3
BL	BOILER ROOM	6		60 in	72 in	GREENHECK		ESD-635	2, 3
GL	GENERATOR ROOMS	1	1227530 CFM	240 in	2110 in	GREENHECK	635 FPM	ESD-635	2, 3

INTAKE HOOD SCHEDULE

NOTES:
1. MANUFACTURER SHALL PROVIDE GAVANIZED BIRD SCREEN.
2. MANUFACTURER SHALL PROVIDE 24" TALL, INSULATED ROOF CURB.
3. MANUFACTURER SHALL PROVIDE WITH HINGED CURB CAP ADAPTER
4. MECHANICAL CONTRACTOR SHALL PROVIDE INSULATED BLADE, MOTORIZED CONTROL DAMPER. CONTROL CONTRACT SHALL PROVIDE DAMPER ACTUATOR.

UNIT TAG	DESCRIPTION	LOCATION	PERFORMANCE					BASIS OF DESIGN		WEIGHT	NOTES
			CFM	PRESSURE DROP	THROAT VELOCITY	MAX. VELOCITY	THROAT AREA	MANUFACTURER	MODEL NO.		
IH-1	HOODED AIR INTAKE	ROOF, AREA A	1750 CFM	0.045 in-wg	438 FPM	1200 FPM	4 ft²	GREENHECK	FGI-24X24	82.00 lb	1, 2, 3, 4
IH-2	HOODED AIR INTAKE	ROOF, AREA F	1750 CFM	0.063 in-wg	517 FPM	1200 FPM	24 ft²	GREENHECK	FGI-48X72	353.00 lb	1, 2, 3, 4

HVAC PUMPED COILS PUMP SCHEDULE

NOTES:
1. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR

UNIT TAG	LOCATION	DESIGN CRITERIA								MOTOR DATA								ELECTRICAL			BASIS OF DESIGN		NOTES
		TYPE	FLOW	TDH	FLUID	MIN. FLUID TEMP.	MAX. FLUID TEMP.	MIN. IMPELLER DIA	MIN. EFFICIENCY	BHP	HP	RPM	VOLTS	PH	FLA	MCA	MOCP	STARTER BY	STARTER TYPE	EM. POWER	CONTROL TYPE	MANUFACTURER	MODEL NO.	
P-1-1	1ST FLOOR MEZZANINE	INLINE	120 GPM	15 FT	HEATING HOT WATER	40.0 °F	130.0 °F	4.75	63.8%	0.703	1	1800	480 V	3	1 A	2 A	15 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	e-60 2x2x5.25	1
P-1-2	1ST FLOOR MEZZANINE	INLINE	66 GPM	15 FT	HEATING HOT WATER	40.0 °F	130.0 °F	5.4	64.2%	0.384	1	1800	480 V	3	1 A	1 A	15 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	e-60 2x2x5.25	1
P-2-1	MECHANICAL ROOM 206	INLINE	40 GPM	15 FT	HEATING HOT WATER	40.0 °F	130.0 °F	4.375	57.2%	0.268	0.33	1800	480 V	3	0 A	1 A	15 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	e-60 1.25x1.25x5.25	1
P-2-2	MECHANICAL ROOM 224	INLINE	8 GPM	10 FT	HEATING HOT WATER	40.0 °F	130.0 °F		31.3%	0.1	0.167	3300	120 V	1	2 A	3 A	15 A	E.C.	VFD	Y	DDC	BELL & GOSSETT	PL-36	1

EXHAUST FAN SCHEDULE

NOTE:
1. MECHANICAL CONTRACTOR SHALLPROVIDE INSULATED BLADE MOTORIZED CONTROL DAMPER. CONTROL CONTRACTOR SHALL PROVIDE DAMPER ACTUATOR. MANUFACTURER SHALL PROVIDE 24" CURB AND BIRD SCREEN.
2. MANUFACTURER SHALL PROVIDE WITH HINGED CURB CAP ADAPTER.
3. SPARK RESISTANT CLASS C FAN AND ROOF CURB.
4. FAN SHALL BE PROVIDED WITH PERFORMANCE BAFFLE TO MEET SELECTED FLOWRATE AND PRESSURE DROP.

UNIT TAG	AREA SERVED	FAN					NC LEVEL AT INLET S.P.	DISCHARGE SOUND POWER OCTAVE BAND CENTER FREQUENCY							MOTOR DATA						MOTOR	DISCONNECT						BASIS OF DESIGN		NOTES
		FAN TYPE	CFM	TOTAL EXTERNAL S.P.	RPM	DRIVE		125HZ	250HZ	500HZ	1000HZ	2000HZ	4000HZ	HP	VOLTS	PH	FLA	MCA	MOCP	EM. POWER	TYPE	PROVIDED BY	LOCATION	STARTER BY	STARTER TYPE	CONTROL TYPE	WEIGHT	MANUFACTURER	MODEL NO.	
EF-1-1	FUEL PUMP ROOM 103	ROOF MOUNTED DOWNBLAST	570 CFM	0.375 in-wg	1139	DIRECT	65	71	70	62	56	54	49	0.33	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA D	E.C.	VFD	DDC	67.00 lb	GREENHECK	G-099-A	1, 2, 3, 4
EF-2-1	LOCKER/BREAK 205	ROOF MOUNTED DOWNBLAST	485 CFM	0.250 in-wg	948	DIRECT	60	66	64	57	52	49	45	0.33	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA D	E.C.	VFD	DDC	67.00 lb	GREENHECK	G-099-A	1, 2, 4
EF-2-2	FUEL OIL DAY TANK A 222	ROOF MOUNTED DOWNBLAST	440 CFM	0.250 in-wg	907	DIRECT	59	65	62	56	51	49	44	0.33	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA A	E.C.	VFD	DDC	67.00 lb	GREENHECK	G-099-A	1, 2, 3, 4
EF-2-3	BATTERY ROOM 211	ROOF MOUNTED DOWNBLAST	800 CFM	0.100 in-wg	1152	DIRECT	68	71	73	63	60	60	51	0.25	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA E	E.C.	VFD	DDC	65.00 lb	GREENHECK	G-099-A	1, 2, 3, 4
EF-2-4	FUEL OIL DAY TANK B 213	ROOF MOUNTED DOWNBLAST	535 CFM	0.250 in-wg	996	DIRECT	62	68	66	59	54	51	46	0.25	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA E	E.C.	VFD	DDC	65.00 lb	GREENHECK	G-099-A	1, 2, 3, 4
EF-2-5	MAINTENANCE STORAGE ROOM 214	ROOF MOUNTED DOWNBLAST	790 CFM	0.375 in-wg	1356	DIRECT	70	74	74	66	61	60	54	0.25	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA F	E.C.	VFD	DDC	65.00 lb	GREENHECK	G-099-A	1, 2, 4
EF-2-6	GENERATOR ROOMS A AND B	ROOF MOUNTED DOWNBLAST	3590 CFM	0.250 in-wg	9	DIRECT	77	77	80	75	68	70	61	1	460 V	3	2.10 A	2.630 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA B	E.C.	VFD	DDC	124.00 lb	GREENHECK	G-180-B	1, 2, 4
EF-2-7	MSS BATTERY ROOM 229	ROOF MOUNTED DOWNBLAST	450 CFM	0.100 in-wg	745	DIRECT	56	62	58	53	49	45	39	0.25	460 V	3	1.10 A	1.375 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA C	E.C.	VFD	DDC	65.00 lb	GREENHECK	G-099-A	1, 2, 3, 4
REF-1	CHILLER PLANT 114	ROOF MOUNTED UPBLAST	6140 CFM	2.000 in-wg	932	DIRECT	85	84	88	83	77	75	73	7.5	460 V	3	11.00 A	13.250 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA D	E.C.	VFD	DCC	337.00 lb	GREENHECK	CUE-300HP-B	1, 2, 4
REF-2	CHILLER PLANT 114	ROOF MOUNTED UPBLAST	6140 CFM	2.000 in-wg	932	DIRECT	85	84	88	83	77	75	73	7.5	460 V	3	11.00 A	13.250 A	15 A	YES	LOCKING	MANUFACTURER	ROOF AREA D	E.C.	VFD	DCC	337.00 lb	GREENHECK	CUE-300HP-B	1, 2, 4

AIR COOLED CONDENSING UNIT SCHEDULE

NOTES:
1. UNIT SHALL BE SEISMIC CLASS C RATED WITH 1.5 COMPONENT FACTOR.
2. UNIT SHALL BE MOUNTED ON G.C. PROVIDED ROOF RAILS. MECHANICAL CONTRACTOR SHALL COORDINATE WITH G.C. FOR SIZING.
3. UNIT SHALL BE PROVIDED WITH MANUFACTURER MOUNTED, LOCKING DISCONNECT.

UNIT TAG	SYSTEM SERVED	LOCATION	COOLING		BTU PER HOUR	REFRIGERANT TYPE	ELECTRICAL		ELECTRICAL						BASIS OF DESIGN		WEIGHT	NOTES
			EDB	LOW AMBIENT POINT			MCA	FLA	MOCP	VOLTS	PHASES	STARTER BY	DISC. SWITCH BY	EM. POWER	MANUFACTURER	MODEL NO.		
ACCU-1	CRAC-1	ROOF AREA A	95.0 °F	-20.0 °F	58400.0 Btu/h	R-410a	1.8 A	1.4 A	15 A	460 V	3	MANUFACTURER	MANUFACTURER	YES	LIEBERT	MCS028	194.00 lb	1,2,3
ACCU-2	CRAC-2	ROOF AREA A	95.0 °F	-20.0 °F	58400.0 Btu/h	R-410a	1.8 A	1.4 A	15 A	460 V	3	MANUFACTURER	MANUFACTURER	YES	LIEBERT	MCS028	194.00 lb	1,2,3

SUPPLY GRILLE SCHEDULE

NOTES:
1. LOUVERED GRILLE, HORIZONTAL 45° BLADES, ALUMINUM, MANUFACTURERS STANDARD WHITE.
2. DRUM DIFFUSER SHALL INCLUDE FACTORY MOUNTED, OPPOSED BLADE DAMPER.
3. DRUM LOUVER EQUIPPED WITH INTEGRAL PITCH ROTATION MECHANISM.

TYPE TAG	NOMINAL FACE SIZE	BRANCH DUCT SIZE	NOMINAL AREA	MIN. CFM	MAX. CFM	MAX. NC LEVEL	MAX. CORE VELOCITY	MAX. VELOCITY PRESSURE	MAX. TOTAL PRESSURE	MANUFACTURER	MODEL NO.	NOTES
DLA	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	VARIES	15	650 FPM	0.026 in-wg	0.089 in-wg	PRICE	HCD	2, 3
DLB	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	VARIES	15	650 FPM	0.026 in-wg	0.089 in-wg	PRICE	HCD	2, 3
DLC	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	VARIES	15	650 FPM	0.026 in-wg	0.089 in-wg	PRICE	HCD	2, 3
DLD	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	VARIES	15	650 FPM	0.026 in-wg	0.089 in-wg	PRICE	HCD	2, 3
SG	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	VARIES	30	750 FPM	0.080 in-wg	0.130 in-wg	PRICE	610	1

SUPPLY DIFFUSER SCHEDULE

NOTES:
1. SQUARE CONE DIFFUSER, ALUMINUM, 1/2" FIBERGLASS WITH FOIL SCRIM VAPOR BARRIER INSULATED BACKPAN, MANUFACTURERS STANDARD WHITE.
2.. BORDER STYLE SHALL MATCH INSTLLATION LOCATION. SEE ARCHITECTURAL CEILING PLANS AND OTHER RELEVANT DRAWINGS.
3.. RADIUS OF DIFFUSION BASED ON TERMINAL HORIZONTAL VELOCITIES OF 150-100-50 FPM AT MAX CFM.

TYPE TAG	NOMINAL SIZE	NOMINAL ROUND NECK SIZE	BRANCH DUCT SIZE TO DIFFUSER	MINIMUM CFM	MAXIMUM CFM	MAX. NC LEVEL	THROW (FT) 150-100-50	MAX. NECK VELOCITY	MAX. VELOCITY PRESSURE	MAX. TOTAL PRESSURE	MANUFACTURER	MODEL NO.	TYPE	DESCRIPTION	NOTES
SDA	24"x24"	6	6	220 CFM	380 CFM	15	3-5-9	700 FPM	0.031 in-wg	0.103 in-wg	PRICE	SCD	CEILING	SQUARE CONE	1, 2, 3
SDB	24"x24"	8	8	320 CFM	500 CFM	15	4-6-11	700 FPM	0.031 in-wg	0.103 in-wg	PRICE	SCD	CEILING	SQUARE CONE	1, 2, 3
SDC	24"x24"	10	10	220 CFM	380 CFM	15	5-7-13	700 FPM	0.031 in-wg	0.103 in-wg	PRICE	SCD	CEILING	SQUARE CONE	1, 2, 3

RETURN AND EXHAUST GRILLE SCHEDULE

NOTES:
1. EGG CRATE GRILLE, 1/2"x1/2", 0° ALUMINUM CORE, MANUFACTURER'S STANDARD WHITE.
2. LOUVERED GRILLE, HORIZONTAL 45° BLADES, ALUMINUM, MANUFACTURER'S STANDARD WHITE.
3. BORDER STYLE SHALL MATCH INSTALLATION LOCATION. SEE ARCHITECTURAL CEILING PLANS AND OTHER RELEVANT DRAWINGS.

TYPE TAG	NOMINAL FACE SIZE	MIN. CORE AREA	BRANCH DUCT SIZE	MIN. CFM	MAX. CFM	MAX. NC LEVEL	MAX. CORE VELOCITY	MAX. VELOCITY PRESSURE	MAX. TOTAL PRESSURE	MANUFACTURER	MODEL NO.	NOTES
EG	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	<varies>	30	700 FPM	0.031 in-wg	0.130 in-wg	PRICE	630	2
EGA	12"x12"	0.88 Sq. Ft.	12"x12"	0 CFM	700	15	700 FPM	0.031 in-wg	0.046 in-wg	PRICE	80	1, 3
EGB	24"x24"	3.75 Sq. Ft.	24"x24"	0 CFM	1400 CFM	11	600 FPM	0.047 in-wg	0.024 in-wg	PRICE	80	1, 3
RG	SEE PLANS	SEE PLANS	SEE PLANS	0 CFM	<varies>	30	700 FPM	0.031 in-wg	0.130 in-wg	PRICE	630	2
RGB	24"x24"	3.75 Sq. Ft.	24"x24"	0 CFM	1400 CFM	11	700 FPM	0.031 in-wg	0.024 in-wg	PRICE	80	1, 3

OWNER

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(317) 844-6777 | www.cripe.biz

100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

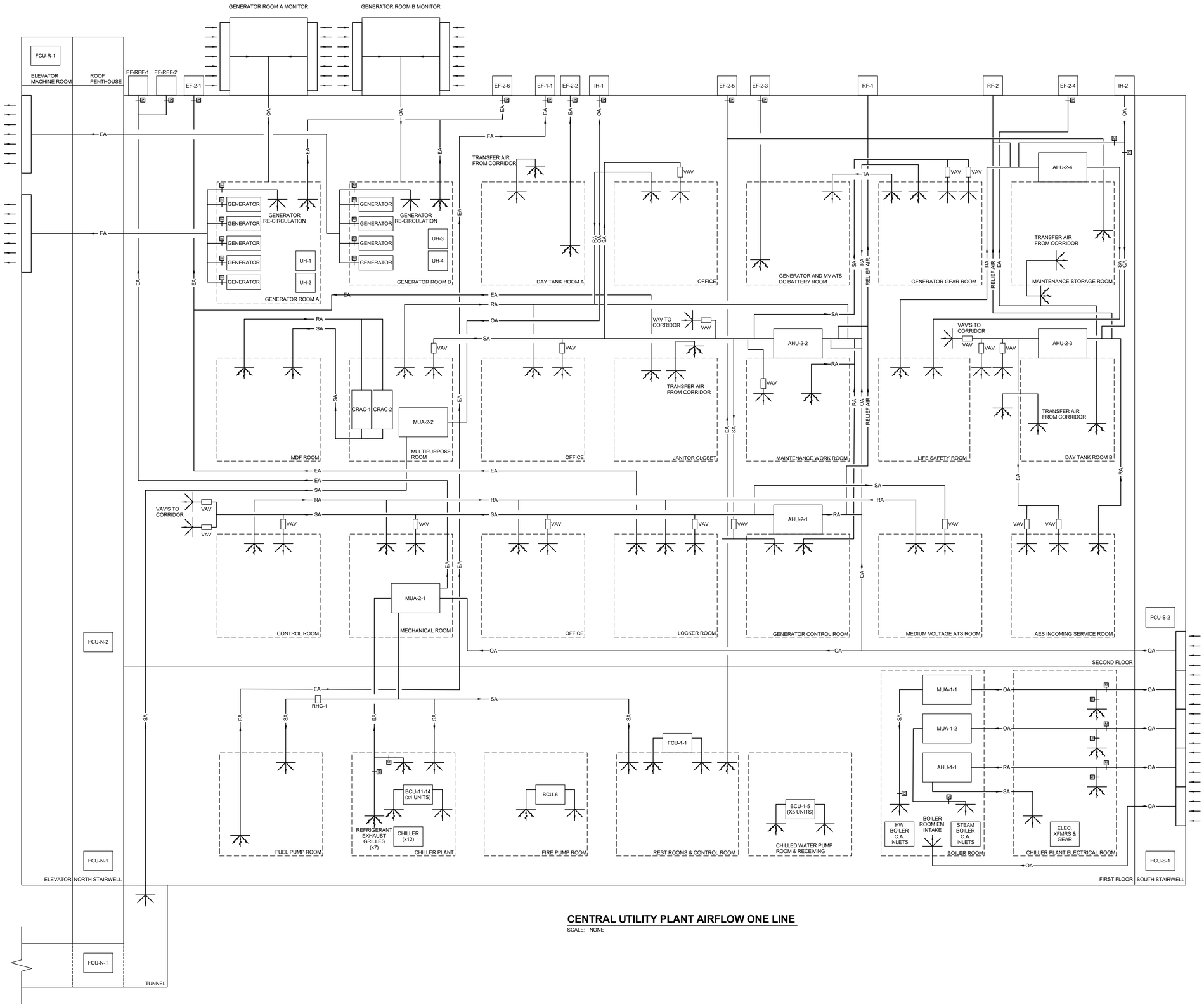
DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO. 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: HVAC SCHEDULES

SHEET NUMBER: H602

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 2:02:35 PM AESI Proj No: 21-154



CENTRAL UTILITY PLANT AIRFLOW ONE LINE

SCALE: NONE

OWNER

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PROJECT

Central Utility Plant

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY	AESI
CHECKED BY	AESI
APPROVED BY	Approver
PROJECT NO.	21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

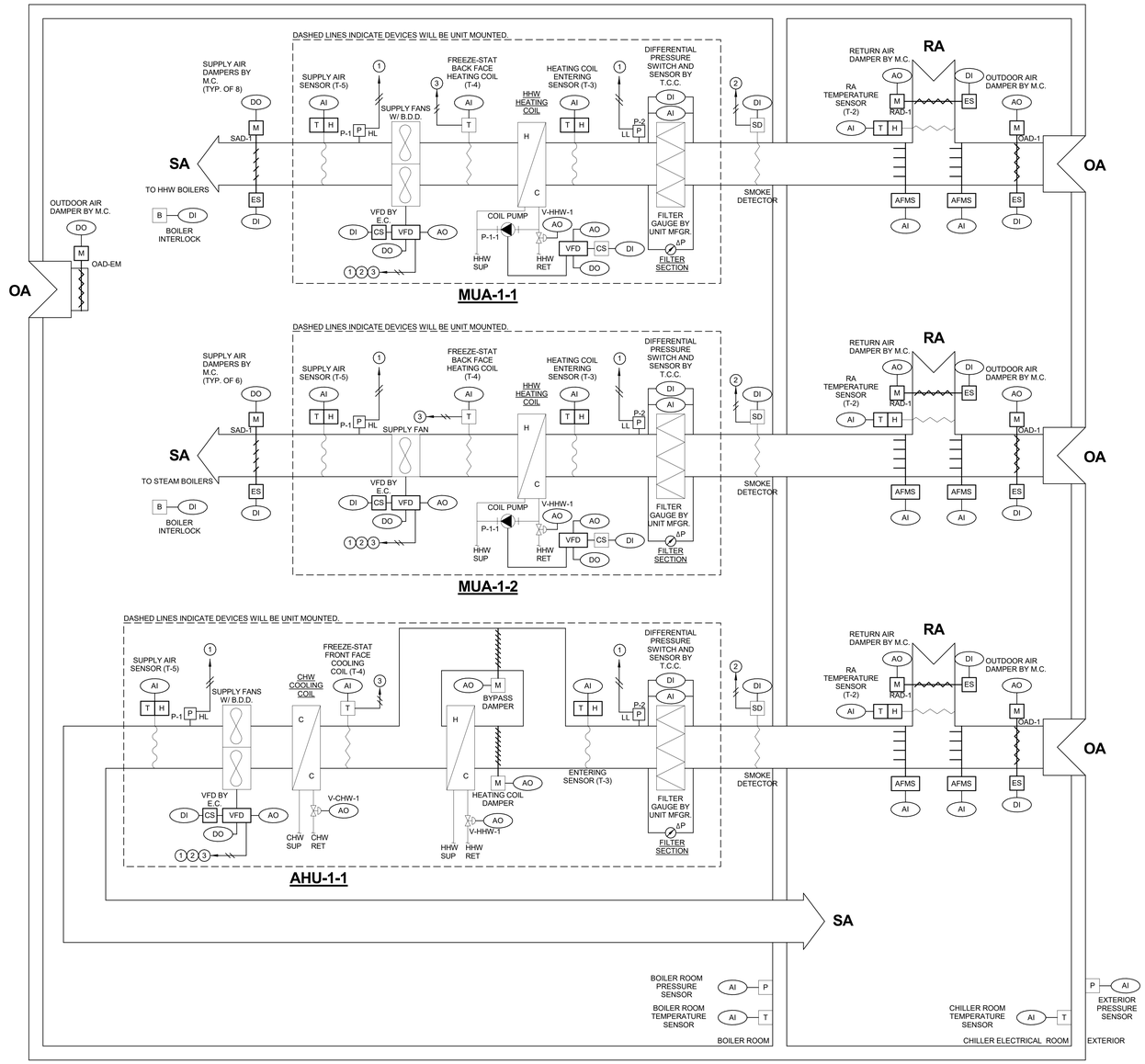
SHEET TITLE

HVAC ONE LINE DIAGRAMS

SHEET NUMBER

H701

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:02:35 PM AESI Proj. No: 21-154



BOILER ROOM HEATING WATER MAU-1-1 SEQUENCE OF OPERATIONS:

1. GENERAL:
   A. THE AIR HANDLER HAS 4 SUPPLY AIR FANS WITH BACKDRAFT DAMPERS FROM MANUFACTURER. E.C. TO PROVIDE ONE VFD PER FAN. T.C.C. TO OPERATE EACH VFD INDEPENDENTLY AND TO DE-ENERGIZE FANS AS NEEDED TO MAXIMIZE UNIT TURNDOWN CAPABILITIES.
   B. THE VFDS SHALL BE CONTROLLED BY THE BAS AND INTERLOCKED WITH THE HHW BOILER CONTROLLERS.
   C. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   D. ALL TEMPERATURES, AIRFLOWS AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   E. THE SUPPLY AIR FAN VARIABLE FREQUENCY DRIVES SHALL HAVE HAND-OFF-AUTO SWITCHES.
      a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
      b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   F. UNIT TO OPERATE AS A SINGLE ZONE VARIABLE VOLUME UNIT TO MAINTAIN POSITIVE SPACE PRESSURE IN THE BOILER ROOM.
2. SAFETY INTERLOCKS:
   A. ON COMMAND TO STOP THE AIR HANDLER, THE SUPPLY AIR FANS SHALL BE DE-ENERGIZED, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE AND THE RETURN AIR DAMPER (RAD-1) SHALL OPEN. THE CHILLED WATER CONTROL VALVE (V-CHW-1) AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL FULLY CLOSE. THE COIL PUMP (P-1-1)(UNLESS OTHERWISE NOTED) SHALL DE-ENERGIZE.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   B. WHENEVER THE FANS ARE STOPPED EITHER BY THE FIRE ALARM SYSTEM OR LOSS OF POWER, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE, THE RETURN AIR DAMPER (RAD-1) SHALL CLOSE AND THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN. THE CHILLED WATER CONTROLS VALVE (V-CHW-1) AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL FULLY CLOSE. THE COIL PUMP (P-1-1)(UNLESS OTHERWISE NOTED) SHALL DE-ENERGIZE. AN ALARM SHALL BE SENT TO THE BAS.
   C. SUPPLY HIGH STATIC (P-1) AND LOW STATIC (P-2) PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE OR 4" NEGATIVE SET POINTS ARE EXCEEDED, THE AIR HANDLER SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   D. FREEZE PROTECTION
      a. WHEN THE OUTSIDE AIR TEMPERATURE FALLS TO BELOW 38°F (ADJUSTABLE), HEATING COIL PUMP (P-1-1) SHALL BE ENERGIZED.
      b. WHEN THE OUTSIDE AIR TEMPERATURE RISES TO ABOVE 43°F, HEATING COIL PUMP SHALL BE DE-ENERGIZED.
      c. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-4) IS LESS THAN OR EQUAL TO 38°F:
         c.a. THE SUPPLY FAN SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZE STAT (T-4) AND FAN MOTOR VFD.
         c.b. THE AIR HANDLER SHALL STOP.
         c.c. CHILLED WATER VALVE (V-CHW-1) SHALL OPEN 50%, COIL PUMP (P-1-1) SHALL REMAIN ON, AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL MODULATE TO MAINTAIN SENSOR (T-4) AT 50°F (ADJ.).
         c.d. AN ALARM SHALL BE SENT TO THE BAS.
         c.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
      d. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   E. IF ANY FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BAS. THE REMAINING UNIT'S FANS SHALL CONTINUE TO RUN AS DESCRIBED BELOW.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   F. SMOKE DETECTION
      a. ON DETECTION OF SMOKE IN THE RETURN AIR DUCT, THE SMOKE DETECTOR SHALL SIGNAL THE FIRE ALARM SYSTEM.
      b. THE FIRE ALARM SYSTEM, THROUGH HARD WIRING, SHALL STOP THE SUPPLY AIR FAN AS DESCRIBED ABOVE.
3. NORMAL OPERATION MODE
   A. ON COMMAND TO START MAU-1-1, THE OUTSIDE AIR DAMPER (OAD-1) AND RETURN AIR DAMPER (RAD-1) SHALL FULLY OPEN. UPON PROOF OF ALL DAMPERS OPENING, AS DETERMINED BY END POSITION SWITCHES, THE RETURN AIR DAMPER SHALL FULLY CLOSE AND THE OUTDOOR AIR DAMPER SHALL REMAIN OPEN.
   B. UPON SIGNAL FROM HEATING HOT WATER BOILER CONTROL PANEL, THE SUPPLY AIR DAMPER ASSOCIATED WITH THE SIGNALLING BOILER SHALL FULLY OPEN. UPON PROOF OF DAMPER OPENING, AS DETERMINED BY END POSITION SWITCH, THE LEAD SUPPLY FAN SHALL CYCLE ON.
      a. IF ANY SUPPLY AIR DAMPER DOES NOT FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, AN ALARM SHALL BE SENT TO THE BAS.
      b. IF NO SUPPLY AIR DAMPER HAS BEEN PROVEN TO OPEN, THE UNIT SHALL SHUT DOWN AS DESCRIBED ABOVE.
      c. SUPPLY AIR DAMPERS SHALL FULLY CLOSE UPON SIGNAL FROM BOILER CONTROL PANEL OF ASSOCIATED BOILER DE-ENERGIZATION.
   C. MAU-1-1 FANS SHALL ENERGIZE, MODULATE AND DE-ENERGIZE IN RESPONSE TO BOILER ROOM PRESSURE SENSOR. MAU-1-1 FANS SHALL WORK IN CONJUNCTION WITH MAU-1-2 FAN TO MAINTAIN A POSITIVE DIFFERENTIAL PRESSURE IN THE BOILER ROOM OF +.05" W.C. (ADJ.) IN REFERENCE TO THE OUTDOOR PRESSURE.
   D. FILTERS:
      a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
      b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   E. HEATING MODE:
      a. HEATING MODE SHALL BE ENABLED WHENEVER:
         a.a. OUTSIDE AIR TEMPERATURE (T-1) IS LESS THAN 52°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVE (V-HHW-1) TO MAINTAIN DISCHARGE SETPOINT (T-5) AT 55°F (T-3)(ADJ.)
   F. IF AHU-1-1 OA DAMPER IS OPEN, MAU-1-1 RETURN AIR DAMPER (RAD-1) AND OUTDOOR AIR DAMPER (OAD-1) SHALL MODULATE PER COMBINED UNIT SEQUENCE FOUND ON THIS SHEET.

BOILER ROOM STEAM MAU-1-2 SEQUENCE OF OPERATIONS:

1. GENERAL:
   A. THE AIR HANDLER HAS 1 SUPPLY AIR FAN, E.C. TO PROVIDE ONE VFD FOR THE FAN.
   B. THE VFD SHALL BE CONTROLLED BY THE BAS AND INTERLOCKED WITH THE STEAM BOILER CONTROLLERS.
   C. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   D. ALL TEMPERATURES, AIRFLOWS AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   E. THE SUPPLY AIR FAN VARIABLE FREQUENCY DRIVE SHALL HAVE A HAND-OFF-AUTO SWITCH
      a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
      b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   F. UNIT TO OPERATE AS A SINGLE ZONE VARIABLE VOLUME UNIT TO MAINTAIN POSITIVE SPACE PRESSURE IN THE BOILER ROOM.
2. SAFETY INTERLOCKS:
   A. ON COMMAND TO STOP THE AIR HANDLER, THE SUPPLY AIR FANS SHALL BE DE-ENERGIZED, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE AND THE RETURN AIR DAMPER (RAD-1) SHALL OPEN. THE CHILLED WATER CONTROL VALVE (V-CHW-1) AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL FULLY CLOSE. THE COIL PUMP (P-1-2)(UNLESS OTHERWISE NOTED) SHALL DE-ENERGIZE.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   B. WHENEVER THE FANS ARE STOPPED EITHER BY THE FIRE ALARM SYSTEM OR LOSS OF POWER, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE, THE RETURN AIR DAMPER (RAD-1) SHALL CLOSE AND THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN. THE CHILLED WATER CONTROL VALVE (V-CHW-1) AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL FULLY CLOSE. THE COIL PUMP (P-1-2)(UNLESS OTHERWISE NOTED) SHALL DE-ENERGIZE. AN ALARM SHALL BE SENT TO THE BAS.
   C. SUPPLY HIGH STATIC (P-1) AND LOW STATIC (P-2) PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE OR 4" NEGATIVE SET POINTS ARE EXCEEDED, THE AIR HANDLER SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   D. FREEZE PROTECTION
      a. WHEN THE OUTSIDE AIR TEMPERATURE FALLS TO BELOW 38°F (ADJUSTABLE), HEATING COIL PUMP (P-1-2) SHALL BE ENERGIZED.
      b. WHEN THE OUTSIDE AIR TEMPERATURE RISES TO ABOVE 43°F, HEATING COIL PUMP SHALL BE DE-ENERGIZED.
      c. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-4) IS LESS THAN OR EQUAL TO 38°F:
         c.a. THE SUPPLY FAN SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZE STAT (T-4) AND FAN MOTOR VFD.
         c.b. THE AIR HANDLER SHALL STOP.
         c.c. CHILLED WATER VALVE (V-CHW-1) SHALL OPEN 50%, COIL PUMP (P-1-2) SHALL REMAIN ON, AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL MODULATE TO MAINTAIN SENSOR (T-4) AT 50°F (ADJ.).
         c.d. AN ALARM SHALL BE SENT TO THE BAS.
         c.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
      d. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   E. IF THE FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BAS.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   F. SMOKE DETECTION
      a. ON DETECTION OF SMOKE IN THE RETURN AIR DUCT, THE SMOKE DETECTOR SHALL SIGNAL THE FIRE ALARM SYSTEM.
      b. THE FIRE ALARM SYSTEM, THROUGH HARD WIRING, SHALL STOP THE SUPPLY AIR FAN AS DESCRIBED ABOVE.
3. NORMAL OPERATION MODE
   A. ON COMMAND TO START MAU-1-2, THE OUTSIDE AIR DAMPER (OAD-1) AND RETURN AIR DAMPER (RAD-1) SHALL FULLY OPEN. UPON PROOF OF ALL DAMPERS OPENING, AS DETERMINED BY END POSITION SWITCHES, THE RETURN AIR DAMPER SHALL FULLY CLOSE AND THE OUTDOOR AIR DAMPER SHALL REMAIN OPEN.
   B. UPON SIGNAL FROM STEAM BOILER CONTROL PANEL, THE SUPPLY AIR DAMPER ASSOCIATED WITH THE SIGNALLING BOILER SHALL FULLY OPEN. UPON PROOF OF DAMPER OPENING, AS DETERMINED BY END POSITION SWITCH, THE SUPPLY FAN SHALL CYCLE ON.
      a. IF ANY SUPPLY AIR DAMPER DOES NOT FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, AN ALARM SHALL BE SENT TO THE BAS.
      b. IF NO SUPPLY AIR DAMPER HAS BEEN PROVEN TO OPEN, THE UNIT SHALL SHUT DOWN AS DESCRIBED ABOVE.
      c. SUPPLY AIR DAMPERS SHALL FULLY CLOSE UPON SIGNAL FROM BOILER CONTROL PANEL OF ASSOCIATED BOILER DE-ENERGIZATION.
   C. MAU-1-2 FAN SHALL MODULATE IN RESPONSE TO BOILER ROOM PRESSURE SENSOR. MAU-1-2 FAN SHALL WORK IN CONJUNCTION WITH MAU-1-1 FANS TO MAINTAIN A POSITIVE DIFFERENTIAL PRESSURE IN THE BOILER ROOM OF +.05" W.C. (ADJ.) IN REFERENCE TO THE OUTDOOR PRESSURE.
   D. FILTERS:
      a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
      b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   E. HEATING MODE:
      a. HEATING MODE SHALL BE ENABLED WHENEVER:
         a.a. OUTSIDE AIR TEMPERATURE (T-1) IS LESS THAN 52°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVE (V-HHW-1) TO MAINTAIN DISCHARGE SETPOINT (T-5) AT 55°F (T-3)(ADJ.)
   F. IF AHU-1-1 OA DAMPER IS OPEN, MAU-1-2 RETURN AIR DAMPER (RAD-1) AND OUTDOOR AIR DAMPER (OAD-1) SHALL MODULATE PER COMBINED UNIT SEQUENCE FOUND ON THIS SHEET.

CHILLER ELECTRICAL ROOM AHU-1-1 SEQUENCE OF OPERATIONS:

1. GENERAL:
   A. THE AIR HANDLER HAS 4 SUPPLY AIR FANS WITH BACKDRAFT DAMPERS FROM MANUFACTURER. E.C. TO PROVIDE ONE VFD PER FAN. T.C.C. TO OPERATE EACH VFD INDEPENDENTLY AND TO DE-ENERGIZE FANS AS NEEDED TO MAXIMIZE UNIT TURNDOWN CAPABILITIES.
   B. THE VFDS SHALL BE CONTROLLED BY THE BAS.
   C. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   D. ALL TEMPERATURES, AIRFLOWS AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   E. THE SUPPLY AIR FAN VARIABLE FREQUENCY DRIVES SHALL HAVE A HAND-OFF-AUTO SWITCHES.
      a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
      b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   F. UNIT TO OPERATE AS A VARIABLE VOLUME UNIT TO MAINTAIN SPACE TEMPERATURE. IN THE CHILLER ELECTRICAL ROOM.
2. SAFETY INTERLOCKS:
   A. ON COMMAND TO STOP THE AIR HANDLER, THE SUPPLY AIR FANS SHALL BE DE-ENERGIZED, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE AND THE RETURN AIR DAMPER (RAD-1) SHALL OPEN. THE CHILLED WATER CONTROL VALVE (V-CHW-1) AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL FULLY CLOSE.
   B. WHENEVER THE FANS ARE STOPPED EITHER BY THE FIRE ALARM SYSTEM OR LOSS OF POWER, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE AND THE RETURN AIR DAMPER (RAD-1) SHALL OPEN. THE CHILLED WATER CONTROL VALVE (V-CHW-1) AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL FULLY CLOSE. AN ALARM SHALL BE SENT TO THE BAS.
   C. SUPPLY HIGH STATIC (P-1) AND LOW STATIC (P-2) PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE OR 4" NEGATIVE SET POINTS ARE EXCEEDED, THE AIR HANDLER SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
      a. THE EMERGENCY OUTDOOR AIR DAMPERS (OAD-EM) SHALL OPEN IF ROOM PRESSURE BEGINS TO DROP BELOW -.05 IN. W.C. RELATIVE TO THE OUTDOOR AIR PRESSURE AND AN ALARM SHALL BE SENT TO THE BAS.
   D. FREEZE PROTECTION
      a. WHEN THE COOLING COIL ENTERING AIR TEMPERATURE (T-4) FALLS TO BELOW 43°F (ADJ.), HEATING COIL DAMPERS SHALL FULLY OPEN AND BYPASS DAMPERS SHALL FULLY CLOSE. HEATING WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN TEMPERATURE (T-4) AT 50°F (ADJ.).
      b. WHEN THE COOLING COIL ENTERING AIR TEMPERATURE (T-4) RISES TO ABOVE 55°F (ADJ.), HEATING COIL DAMPERS SHALL FULLY CLOSE AND BYPASS DAMPERS SHALL FULLY OPEN.
      c. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-4) IS LESS THAN OR EQUAL TO 38°F:
         c.a. THE SUPPLY FAN SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZE STAT (T-5) AND FAN MOTOR VFD.
         c.b. THE AIR HANDLER SHALL STOP.
         c.d. AN ALARM SHALL BE SENT TO THE BAS.
         c.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
   E. IF ANY FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BAS. THE REMAINING UNIT'S FANS SHALL CONTINUE TO RUN AS DESCRIBED BELOW.
   F. SMOKE DETECTION
      a. ON DETECTION OF SMOKE IN THE RETURN AIR DUCT, THE SMOKE DETECTOR SHALL SIGNAL THE FIRE ALARM SYSTEM.
      b. THE FIRE ALARM SYSTEM, THROUGH HARD WIRING, SHALL STOP THE SUPPLY AIR FAN AS DESCRIBED ABOVE.
3. NORMAL OPERATION MODE
   A. ON COMMAND TO START AHU-1-1, THE SUPPLY FANS SHALL CYCLE ON AND RUN CONTINUOUSLY. THE RETURN AIR DAMPER (RAD-1) SHALL BE FULLY OPEN AND THE OUTDOOR AIR DAMPER (OAD-1) SHALL BE FULLY CLOSED, WITH BOTH DAMPER POSITIONS CONFIRMED BY END POSITION SWITCHES. SUPPLY FANS SHALL RAMP UP AND DOWN IN RESPONSE TO CHILLER ELECTRICAL ROOM TEMPERATURE SENSOR SET AT 85°F FOR COOLING AND 55°F FOR HEATING.
   B. FILTERS:
      a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
      b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   C. CHILLED WATER COOLING:
      a. COOLING MODE SHALL BE ENABLED WHENEVER:
         a.a. ROOM TEMPERATURE IS GREATER THAN 85°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN ROOM SETPOINT AT 85°F (ADJ.).
      c. ONCE THE CHILLED WATER CONTROL VALVE (V-CHW-1) IS FULLY OPEN, THE BAS SHALL MODULATE THE FAN SPEED TO MAINTAIN ROOM TEMPERATURE (ADJ.) AT 85°F (ADJ.) SETPOINT.
   D. ECONOMIZER MODE:
      a. THE ECONOMIZER CYCLE SHALL BE ENABLED PER THE COMBINED UNIT SEQUENCE FOUND ON THIS SHEET.

HVAC SETPOINTS - AHU-1

ROOM NAME	ROOM NO	SYSTEM SERVED	HEATING SETPOINT	COOLING SETPOINT

PLAN NOTES:

1. PRESSURE SWITCHES HARDWIRED TO VFD FOR HIGH STATIC LIMIT OR LOW STATIC LIMIT.
2. START/STOP INTERLOCK WITH THE FIRE ALARM SYSTEM.
3. FREEZE STAT HARDWIRED TO SUPPLY FAN VFD.

AI — T H GLOBAL OUTDOOR AIR SENSOR (T-1)

AI — P GLOBAL PRESSURE SENSOR

BOILER ROOM AND CHILLER ELECTRICAL ROOM AIR HANDLERS

SCALE: NONE

COMBINED UNIT SEQUENCE OF OPERATIONS:

1. COMBINED AHU ECONOMIZER MODE:
   A. SEQUNCE DESCRIBES JOINT OPERATION OF AHU-1-1, MAU-1-1 AND MAU-1-2 TO RECLAIM HEATED AIR FROM CHILLER ELECTRICAL ROOM FOR BOILER COMBUSTION UP AIR DURING ECONOMIZER OPERATIONS.
   B. AHU-1-1 ECONOMIZER MODE
      a. ECONOMIZER OPERATION SHALL BE ENABLED WHEN:
         a.a. OUTSIDE AIR TEMPERATURE (T-1) IS BELOW 55°F (ADJ.).
         a.b. SUPPLY FAN STATUS IS ON.
      b. THE OUTSIDE AIR DAMPER (OAD-1) SHALL MODULATE OPEN AND THE RETURN AIR DAMPER (RAD-1) SHALL MODULATE CLOSE TO MAINTAIN COOLING COIL ENTERING TEMPERATURE (T-5) ABOVE 46°F.
      c. AHU-1-1 SUPPLY FAN VFD SHALL MODULATE TO MAINTAIN ROOM TEMPERATURE BETWEEN HEATING AND COOLING SETPOINTS.
   C. MAU-1-1 AND MAU-1-2 ECONOMIZER MODE
      a. IF AHU-1-1 ECONOMIZER MODE IS ENABLED, AHU-1-1 OUTDOOR AIR AIRFLOW MEASURING STATION (AFMS) SHALL TRACK INCOMING OUTDOOR AIR. MAU-1-1 AND MAU-1-2 OUTDOOR AIR DAMPERS SHALL MODULATE CLOSED AND RETURN AIR DAMPERS SHALL MODULATE OPEN TO TRANSFER THE OUTDOOR AIR FROM THE CHILLER ELECTRIC ROOM INTO THE BOILER ROOM FOR COMBUSTION AIR.
      b. VOLUME OF OUTDOOR AIR MEASURED BY AHU-1-1 AFMS SHALL BE PROPORTIONALLY DISTRIBUTED TO MAU-1-1 AND MAU-1-2 BASED ON MAU-1-1 AND MAU-1-2 CURRENT SUPPLY AIRFLOW RATES OVER THEIR COMBINED SUPPLY AIRFLOW RATE.

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION
CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

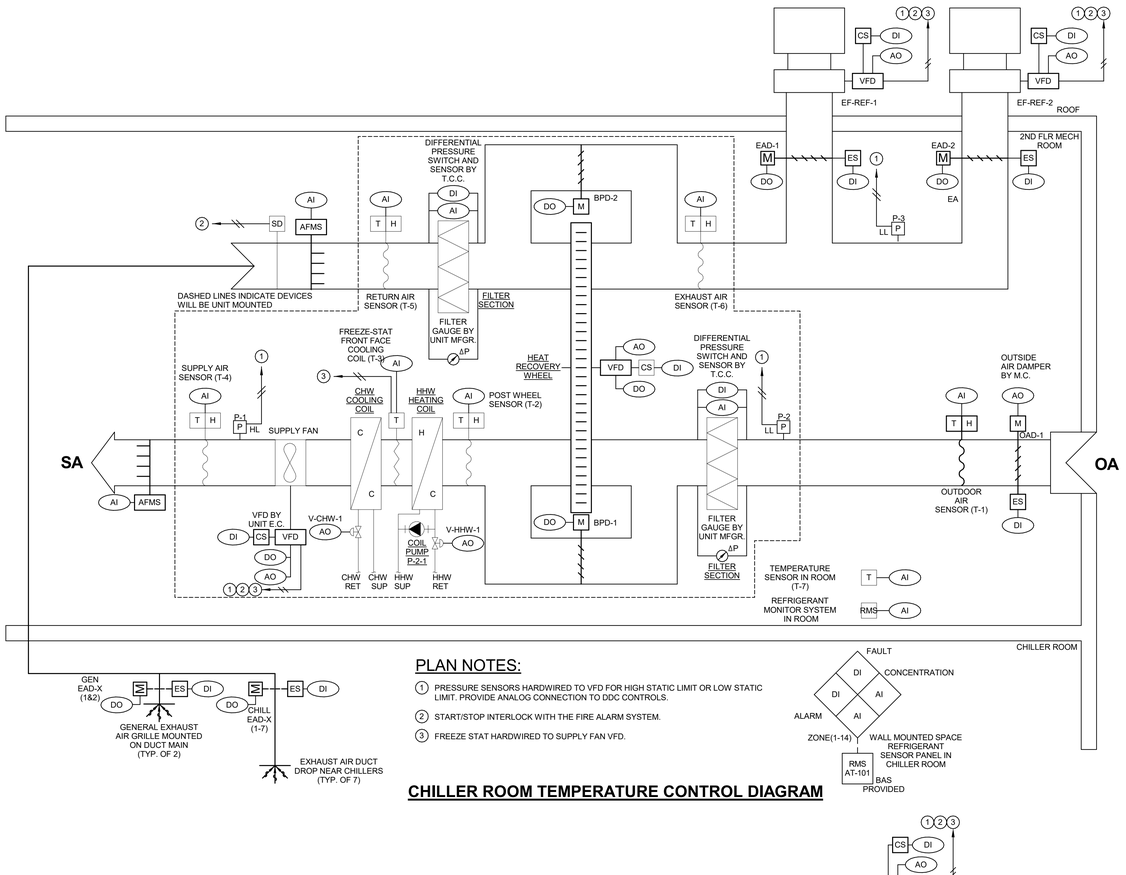
SHEET TITLE

HVAC DIAGRAMS

SHEET NUMBER

H702

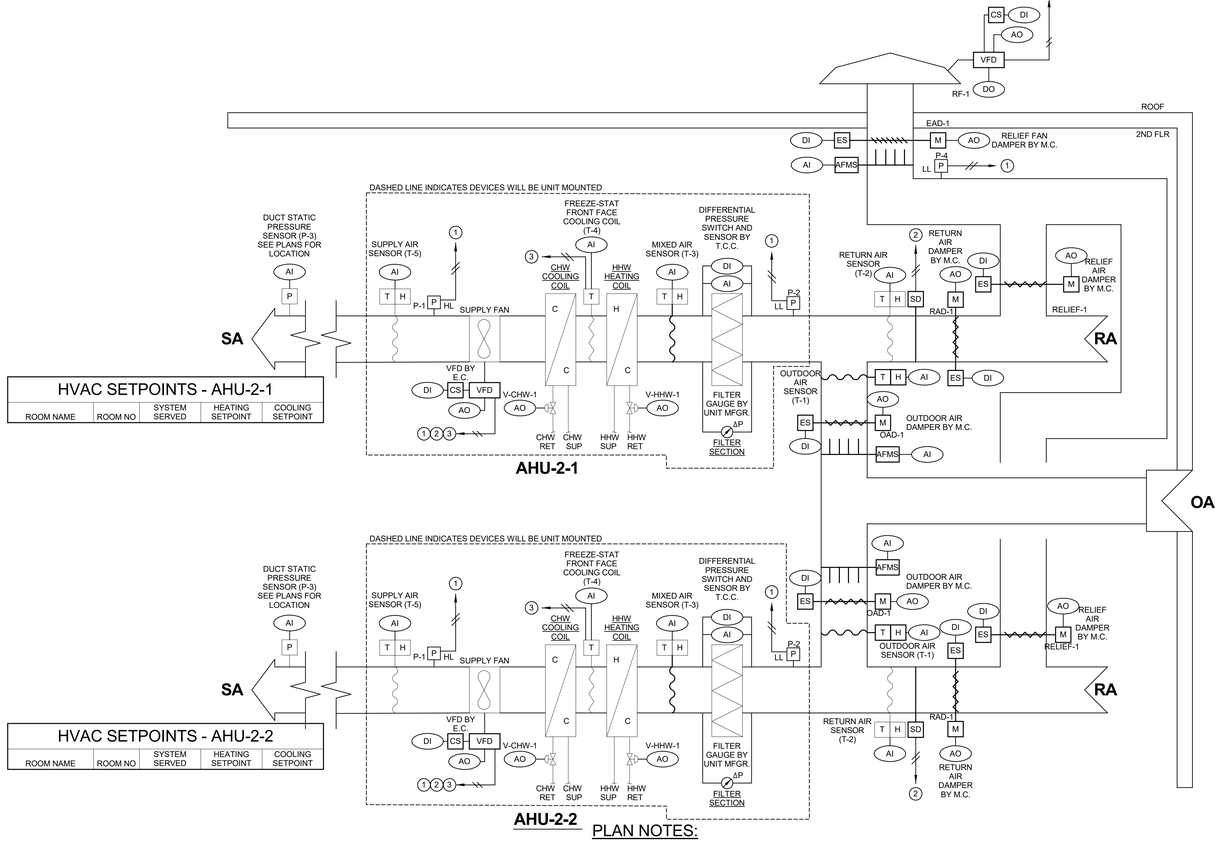
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 2:02:36 PM AESI Proj. No: 21-154



PLAN NOTES:

1. PRESSURE SENSORS HARDWIRED TO VFD FOR HIGH STATIC LIMIT OR LOW STATIC LIMIT. PROVIDE ANALOG CONNECTION TO DDC CONTROLS.
2. START/STOP INTERLOCK WITH THE FIRE ALARM SYSTEM.
3. FREEZE STAT HARDWIRED TO SUPPLY FAN VFD.

CHILLER ROOM TEMPERATURE CONTROL DIAGRAM



HVAC SETPOINTS - AHU-2-1

ROOM NAME	ROOM NO	SYSTEM SERVED	HEATING SETPOINT	COOLING SETPOINT

HVAC SETPOINTS - AHU-2-2

ROOM NAME	ROOM NO	SYSTEM SERVED	HEATING SETPOINT	COOLING SETPOINT

PLAN NOTES:

1. PRESSURE SWITCHES HARDWIRED TO VFD FOR HIGH STATIC LIMIT OR LOW STATIC LIMIT. PROVIDE PRESSURE SENSORS WITH ANALOG CONNECTION TO DDC CONTROLS AT SAME LOCATIONS.
2. START/STOP INTERLOCK WITH THE FIRE ALARM SYSTEM.
3. FREEZE STAT HARDWIRED TO SUPPLY FAN VFD.

NORTH MEZZANINE AHU TEMPERATURE CONTROL DIAGRAM

CHILLER ROOM MUA-2-1 AND REF-1 AND REF-2 SEQUENCE OF OPERATIONS:

1. GENERAL:
   - A. THE AIR HANDLER HAS ONE SUPPLY AIR FAN. E.C. TO PROVIDE ONE VFD FOR THE FAN. E.C. TO PROVIDE VFD FOR THE HEAT RECOVERY WHEEL.
   - B. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   - C. ALL TEMPERATURES, AIRFLOWS AND DAMPER POSTIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   - D. THE SUPPLY AIR FAN VFD SHALL HAVE A HAND-OFF-AUTO SWITCH.
     - a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
     - b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED BELOW.
   - E. UNIT TO OPERATE AS A CONSTANT VOLUME UNIT TO MAINTAIN MAKEUP AIR VOLUME AND SPACE TEMPERATURE. TAB CONTRACTOR SHALL SET VFD SPEED.
2. SAFETY INTERLOCKS:
   - A. ON COMMAND TO STOP THE AIR HANDLER, THE SUPPLY AIR FAN SHALL BE DE-ENERGIZED, AND THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE. THE HEAT RECOVERY WHEEL SHALL DE-ENERGIZE AND SUPPLY AND EXHAUST BYPASS DAMPERS SHALL OPEN. THE CHILLED WATER CONTROLS VALVE (V-CHW-1) AND HEATING WATER CONTROL VAVLE (V-HHW-1) SHALL FULLY CLOSE. THE COIL PUMP (P-2-1) (UNLESS OTHERWISE NOTED) SHALL DE-ENERGIZE.
   - B. WHENEVER THE SUPPLY FAN IS STOPPED EITHER BY THE BAS, THE FIRE ALARM SYSTEM OR LOSS OF POWER, THE OUTSIDE AIR DAMPER (OAD-1) SHALL CLOSE AND THE HEAT RECOVERY WHEEL SHALL DE-ENERGIZE. THE BYPASS DAMPERS SHALL OPEN. THE CHILLED WATER CONTROLS VALVE (V-CHW-1), HEATING WATER CONTROL VAVLE (V-HHW-1) AND COIL PUMP (P-2-1)(UNLESS OTHERWISE NOTED) SHALL DE-ENERGIZE. AN ALARM SHALL BE SENT TO THE BAS.
   - C. WHENEVER BOTH EXHAUST FANS ARE STOPPED EITHER BY THE BAS, THE FIRE ALARM SYSTEM OR LOSS OF POWER, MAU-2-1 SHALL SHUT DOWN AS DESCRIBED ABOVE AND THE EXHAUST AIR DAMPERS (EAD-1 AND EAD-2) SHALL FULLY CLOSE.
   - D. SUPPLY HIGH STATIC AND LOW STATIC PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE (P-1) OR 4" NEGATIVE (P-2) SET POINT IS EXCEEDED, THE AIR HANDLER SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   - E. EXHAUST LOW STATIC PRESSURE LIMIT: IF THE EXHAUST AIR STATIC PRESSURE OF 3" NEGATIVE (P-3) SET POINT IS EXCEEDED, THE EXHAUST FANS SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   - F. IF THE SUPPLY FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BAS.
   - G. IF EITHER EXHAUST AIR FAN (REF-1 OR REF-2) FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL DE-ENERGIZED. THE ASSOCIATED EXHAUST AIR DAMPER (EAD-1 OR EAD-2) SHALL FULLY CLOSE AND AN ALARM SHALL BE SENT TO THE BAS. THE REMAINING EXHAUST FAN SHALL RE-INDEX TO MAINTAIN CONSTANT FLOW FROM THE CHILLER ROOM, SEE EQUIPMENT SCHEDULES FOR FLOW RATE.
   - H. FREEZE PROTECTION
     - a. WHEN THE OUTSIDE AIR TEMPERATURE FALLS TO BELOW 38°F (ADJUSTABLE), HEATING COIL PUMP (P-2-1) SHALL BE ENERGIZED.
     - b. WHEN THE OUTSIDE AIR TEMPERATURE RISES TO ABOVE 43°F, HEATING COIL PUMP SHALL BE DE-ENERGIZED.
     - c. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-3) IS LESS THAN OR EQUAL TO 38°F:
       - c.a. THE SUPPLY FAN SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZE STAT (T-3) AND FAN MOTOR VFD.
       - c.b. THE AIR HANDLER SHALL STOP.
       - c.c. CHILLED WATER VALVE (V-CHW-1) SHALL OPEN 50%, COIL PUMP (P-2-1) SHALL REMAIN ON, AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL MODULATE TO MAINTAIN SENSOR (T-3) AT 50°F (ADJ.).
       - c.d. AN ALARM SHALL BE SENT TO THE BAS.
       - c.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
   - I. SMOKE DETECTION
     - a. ON DETECTION OF SMOKE IN THE RETURN AIR DUCT, THE SMOKE DETECTOR SHALL SIGNAL THE FIRE ALARM SYSTEM.
     - b. THE FIRE ALARM SYSTEM, THROUGH HARD WIRING, SHALL STOP THE SUPPLY AIR FAN AND THE EXHAUST AIR FANS REF-1 AND REF-2 AS DESCRIBED ABOVE.
3. NORMAL OPERATION MODE
   - A. ON COMMAND TO START MAU-2-1, THE OUTSIDE AIR DAMPER (OAD-1) AND EXHAUST AIR DAMPERS (EAD-1 AND EAD-2) SHALL FULLY OPEN. UPON PROOF OF ALL DAMPERS OPENING, AS DETERMINED BY END POSITION SWITCHES, THE SUPPLY FAN SHALL CYCLE ON AND SUPPLY A CONSTANT AIR VOLUME TO THE SPACE. SEE EQUIPMENT SCHEDULES FOR FLOWRATE. THE REFRIGERANT EXHAUST FANS SHALL CYCLE ON AND EXHAUST A CONSTANT AIR VOLUME FROM THE SPACE, SEE EQUIPMENT SCHEDULES FOR FLOWRATE. THE DESIGN SPEED SET POINT FOR SUPPLY FAN AND EXHAUST FANS SHALL BE DETERMINED IN ACCORDANCE WITH THE TESTING, ADJUSTING AND BALANCING (TAB) SPECIFICATIONS AND AIR FLOW MEASURING STATIONS (AFMS).
     - a. IF OUTDOOR AIR DAMPER DOES NOT FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, MAU-2-1 SHALL SHUT DOWN AS DESCRIBED ABOVE AND AN ALARM SHALL BE SENT TO THE BAS.
     - b. IF EITHER EXHAUST AIR DAMPER (EAD-1 OR EAD-2) DOES NOT FULLY OPEN, AS DETERMINED BY THE END POSITION SWITCH, THEN THE ASSOCIATED FAN SHALL NOT ENERGIZE. AN ALARM SHALL BE SENT TO THE BAS. THE REMAINING FAN WITH A FULLY OPEN DAMPER SHALL INDEX TO MAINTAIN SCHEDULED EXHAUST AIRFLOW.
     - c. IF NEITHER EXHAUST AIR DAMPER (EAD-1 AND EAD-2) FULLY OPEN, AS DETERMINED BY THE END POSITION SWITCH, THEN THE EXHAUST AIR FANS SHALL NOT ENERGIZE AND A STOP SIGNAL SHALL BE SENT TO MAU-2-1. AN ALARM SHALL BE SENT TO THE BAS.
   - B. FANS REF-1 AND REF-2 SHALL RUN IN PARALLEL TO MAINTAIN FLOWRATE FROM CHILLER ROOM.
   - C. THE EXHAUST AIR DAMPERS (GEN-EAD-1&2) IN THE CHILLER ROOM SHALL BE OPEN. ALL CHILLER EXHAUST AIR DAMPERS (CHILL-EAD-1 THROUGH 7) SHALL BE CLOSED.
   - D. FILTERS:
     - a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
     - b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   - E. CHILLED WATER COOLING:
     - a. COOLING MODE SHALL BE ENABLED WHENEVER:
       - a.a. POST-WHEEL SENSOR (T-2) IS GREATER THAN 58°F (ADJ.) AND POST WHEEL ENTHALPY IS ABOVE 28 BTU/LB (ADJ.).
       - a.b. THE SUPPLY FAN STATUS IS ON.
       - a.c. THE SPACE SETPOINT IS ABOVE 85°F (ADJ).
     - b. IF ROOM TEMPERATURE (T-7) DRIFTS ABOVE 85°F SETPOINT, THE BAS SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN COIL DISCHARGE SETPOINT AT 55°F (T-3)(ADJ.). ONCE SPACE SETPOINT IS BELOW 82°F, THE BAS SHALL FULLY CLOSE THE CHILLED WATER CONTROL VALVE.
   - F. HOT WATER HEATING:
     - a. HEATING MODE SHALL BE ENABLED WHENEVER:
       - a.a. POST-WHEEL SENSOR (T-2) IS LESS THAN 45°F (ADJ.).
       - a.b. THE SUPPLY FAN STATUS IS ON.
       - a.c. THE ROOM TEMPERATURE IS LESS THAN 55°F (ADJ.).
     - b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN DISCHARGE SETPOINT AT 60°F (T-3)(ADJ.) ONCE THE POST-WHEEL SENSOR (T-2) RISES ABOVE 48°F, THE BAS SHALL FULLY CLOSE THE HEATING WATER CONTROL VALVE.
   - G. ECONOMIZER CYCLE:
     - a. THE ECONOMIZER CYCLE SHALL BE ACTIVE WHEN:
       - a.a OUTSIDE AIR TEMPERATURE (T-1) IS BETWEEN 45°F(ADJ.) AND 58°F (ADJ.)
       - a.b. OUTSIDE AIR ENTHALPY IS BELOW 28 BTU/LB (ADJ.)
       - a.c. SUPPLY FAN STATUS IS ON.
     - b. THE HEATING WATER CONTROL VALVE (V-HHW-1) AND CHILLED WATER CONTROL VALVE (V-CHW-1) SHALL BE FULLY CLOSED. THE HEAT RECOVERY WHEEL SHALL BE DE-ENERGIZED AND SUPPLY AND EXHAUST BYPASS DAMPERS SHALL BE FULLY OPEN.
     - c. THE UNIT SHALL JUST ATTEMPT TO PROVIDE CONSTANT MAKE UP AIR TO THE SPACE. THE EXHAUST FANS (REF-1 AND REF-2) SHALL CONTINUE TO PROVIDE CONSTANT EXHAUST FROM THE SPACE. THE SPACE SETPOINT SHALL BE MAINTAINED BETWEEN 55°F AND 85°F.
     - d. IF SPACE TEMPERATURE (T-7) DRIFTS ABOVE OR BELOW SETPOINTS, UNIT SHALL RESUME HEAT RECOVERY, AS DESCRIBED BELOW, AND HEATING AND COOOLING, AS DESCRIBED ABOVE, TO MAINTAIN SPACE TEMPERATURE SETPOINTS.
   - H. HEAT RECOVERY WHEEL CONTROL:
     - a. HEAT WHEEL TO BE PROVIDED WITH INVERTER RATED MOTOR AND VFD CONTROLLER. PROGRAM IN MANUFACTURER RECOMMENDED WHEEL JOG TO GET WHEEL STARTED WHEN IT IS STOPPED.
     - b. THE DIFFERENCE IN ENTHALPY BETWEEN THE OA AND RA INPUTS IS MONITORED TO DETERMINE IF HEAT WHEEL SHALL OPERATE IN COOLING OR HEATING MODE.
     - c. CONTROL WHEEL SPEED TO MAINTAIN MIXED AIR TEMPERATURE OF 3 DEG BELOW SETPOINT IN HEATING MODE AND 3 DEG ABOVE SETPONT IN COOLING MODE. VARY SPEED OF HEAT WHEEL TO MAINTAIN ROOM TEMPERATURE SETPOINT AS 1ST STAGE OF HEATING OR COOLING BEFORE OPENING HEATING OR COOLING CONTROL VALVES AS DESCRIBED ABOVE.
     - d. IF OA ENTHALPY IS GREATER THAN RA ENTHALPY, THE WHEEL SHALL BE IN COOLING MODE AND SHALL RECEIVE A FULL 10VDC SIGNAL. DIFFERENCE IN ENTHALPY SHALL BE ADJUSTABLE BY 5%.
     - e. IF OA ENTHALPY IS LESS THAN RA ENTHALPY BY 0.5%, THE WHEEL SHALL OPERATE IN HEATING MODE. PROVIDE AN ANALOG SIGNAL FROM 0-6VDC BASED ON THE HEAT WHEEL OUTSIDE AIR DISCHARGE TEMPERATURE. IF HEAT WHEEL DISCHARGE TEMPERATURE IS ABOVE AHU SUPPLY AIR SETPOINT MINUS 3 DEG THE SIGNAL SHALL BE 0VDC. THIS SIGNAL SHALL MODULATE UP TO 6VDC AT A 5° (ADJ.) DIFFERENCE. DIFFERENCE IN ENTHALPY SHALL BE ADJUSTABLE BY 5% ABOVE OR BELOW.
     - f. FROST PROTECTION CYCLE SHALL BE INITIATED IF HEAT WHEEL DISCHARGE EA TEMPERATURE REACHES OR DROPS BELOW 5°F (ADJ). INITIAL FROST TEMPERATURE TO BE PROVIDED BY WHEEL MANUFACTURER. WHEEL SHALL CONTROL BASED ON EA TEMPERATURE TO PREVENT FROSTING UNTIL EA TEMPERATURE IS ABOVE SETPOINT.
     - g. THE HEAT WHEEL BY-PASS DAMPERS SHALL BE CLOSED WHEN THE HEAT WHEEL IS ON.
     - h. OPEN WHEEL BYPASS DAMPERS WHEN IT IS NOT IN USE.
4. REFRIGERANT MONITOR SYSTEM PURGE CYCLE
   - A. UPON SIGNAL FROM ROOM REFRIGERANT MONITOR SYSTEM (ZONE-X), THE CHILLER EXHAUST AIR DAMPER (CHILL EAD-X) ASSOCIATED WITH THE LEAK DETECTION SHALL FULLY OPEN. UPON CONFIRMATION OF OPEN CHILLER DAMPER STATUS, AS DETERMINED BY END POSITION SWITCH, BOTH GENERAL EXHAUST AIR DAMPERS (GEN-EAD-1&2) SHALL FULLY CLOSE. A VISUAL ALARM SHALL BE INDICATED IN THE ROOM NEAR THE CHILLERS, AND OUTSIDE OF EACH CHILLER ROOM DOOR. AN ALARM SHALL BE GENERATED AT BAS. IF MULTIPLE ZONES ACTIVATE UPON LEAK DETECTION ALARM, OPEN ALL DAMPERS ASSOCIATED WITH THOSE ZONES.
   - B. MAU-2-1 SHALL DEACTIVATE HEAT RECOVERY WHEEL AND OPEN BOTH WHEEL BYPASS DAMPERS.
   - C. MINIMUM RUN TIME OF EMERGENCY MODE SHALL BE 5 MINUTES. IF REFRIGERANT DETECTOR (ZONE X) IS NOT IN ALARM AFTER THAT TIME, VISUAL ALARMS SHALL BE CANCELED, GENERAL EXHAUST DAMPERS (GEN-EAD-1&2) SHALL RE-OPEN AND CHILLER EXHAUST AIR DAMPER (CHILL-EAD-X) SHALL FULLY CLOSE .

AHU-2-1, AHU-2-2 AND RF-1 SEQUENCE OF OPERATIONS:

1. GENERAL:
   - A. THE AIR HANDLERS HAVE ONE SUPPLY AIR FAN EACH, E.C. TO PROVIDE ONE VFD PER FAN.
   - B. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   - C. ALL TEMPERATURES, AIRFLOWS, AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   - D. THE SUPPLY AIR FAN VFD SHALL HAVE A HAND-OFF-AUTO SWITCH.
     - a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
     - b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   - E. AHUS TO OPERATE AS VARIABLE VOLUME UNITS TO MAINTAIN CONSTANT DUCT TEMPERATURE AND CONSTANT DUCT STATIC PRESSURE.
2. SAFETY INTERLOCKS:
   - A. WHENEVER EITHER AHU SUPPLY FAN IS STOPPED EITHER BY THE FIRE ALARM SYSTEM OR LOSS OF POWER, THE OUTDOOR AIR DAMPER (OAD-1) SHALL CLOSE, THE RELIEF AIR DAMPER (EAD-1) SHALL CLOSE, AND THE RETURN AIR DAMPER (RAD-1) SHALL OPEN. ALL VALVES SHALL FULLY CLOSE. AN ALARM SHALL BE SENT TO THE BAS.
   - B. SUPPLY HIGH STATIC AND LOW STATIC PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE (P-1) OR 4" NEGATIVE (P-2) SET POINT IS EXCEEDED, THE ASSOCIATED AIR HANDLER SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   - C. RELIEF LOW STATIC PRESSURE LIMIT: IF THE RELIEF AIR STATIC PRESSURE OF 3" NEGATIVE (P-3) SET POINT IS EXCEEDED, THE RELIEF FAN SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   - D. FREEZE PROTECTION
     - a. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-4) IS LESS THAN OR EQUAL TO 38°F:
       - a.a. THE SUPPLY FANS SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZESTAT (T-4) AND THE FAN MOTOR VFD.
       - a.b. THE AIR HANDLER SHALL STOP.
       - a.c. CHILLED WATER VALVE (V-CHW-1) SHALL OPEN 50% AND THE HEATING WATER CONTROL VALVE (V-HHW-1) SHALL MODULATE TO MAINTAIN SENSOR (T-4) AT 50°F(ADJ.).
       - a.d. AN ALARM SHALL BE SENT TO THE BAS.
       - a.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
   - E. IF A SUPPLY FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE ASSOCIATED AHU SHALL BE SHUT-DOWN AS DESCRIBED ABOVE AND AN ALARM SHALL BE SENT TO THE BAS.
   - F. IF THE RELIEF AIR FAN (RF-1) FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL BE DE-ENERGIZED, THE RELIEF AIR DAMPERS (EAD-1) SHALL REMAIN OPEN.
     - a. AN ALARM SHALL BE SENT TO THE BAS.
     - b. BOTH AHU-2-1 AND AHU-2-2 SHALL EXIT ECONOMIZER MODE.
     - c. THE OUTDOOR AIR DAMPERS (OAD-1) AND RETURN AIR DAMPERS (RAD-1) SHALL MODULATE TO MAINTAIN MINIMUM OUTDOOR AIR AND RELIEF AIR FLOWRATES AS DETERMINED BY AIRFLOW MEASURING STATIONS. SEE EQUIPMENT SCHEDULES FOR FLOWRATES.
   - G. SMOKE DETECTION
     - a. ON DETECTION OF SMOKE IN THE RETURN AIR DUCT, THE SMOKE DETECTOR SHALL SIGNAL THE FIRE ALARM SYSTEM.
     - b. THE FIRE ALARM SYSTEM THROUGH HARD WIRING SHALL STOP THE AHUS AND THE RELIEF AIR FAN (RF-1) AS DESCRIBED ABOVE.
3. UNIT SHUTDOWN
   - A. ON COMMAND FROM THE BAS TO STOP EITHER AIR HANDLER OR AN IN FIELD MANUAL FAN SHUTDOWN, THE SUPPLY AIR FAN SHALL BE DE-ENERGIZED, THE OUTDOOR AIR DAMPER (OAD-1) SHALL CLOSE, THE RELIEF AIR DAMPER (EAD-1) SHALL CLOSE, AND RETURN AIR DAMPER (RAD-1) SHALL OPEN. ALL VALVES SHALL FULLY CLOSE.
     - a. IF BOTH AHU-2-1 AND AHU-2-2 ARE COMMANDED TO STOP OR BOTH IN FIELD MANUAL FAN SHUTDOWNS ARE ACTIVATED, THE RELIEF FAN (RF-1) SHALL SHUTDOWN AS DESCRIBED BELOW.
   - B. ON COMMAND FROM THE BAS TO STOP THE RELIEF FAN OR AN IN FIELD MANUAL FAN SHUTDOWN, THE FAN SHALL BE DE-ENERGIZED, THE RELIEF AIR DAMPERS (EAD-1) SHALL REMAIN OPEN.
     - a. AN ALARM SHALL BE SENT TO THE BAS.
     - b. BOTH AHU-2-1 AND AHU-2-2 SHALL EXIT ECONOMIZER MODE.
     - c. THE OUTDOOR AIR DAMPERS (OAD-1) AND RETURN AIR DAMPERS (RAD-1) SHALL MODULATE TO MAINTAIN MINIMUM OUTDOOR AIR AND RELIEF AIR FLOWRATES AS DETERMINED BY AIRFLOW MEASURING STATIONS. SEE EQUIPMENT SCHEDULES FOR FLOWRATES.
4. NORMAL OPERATION MODE
   - A. ON COMMAND TO START EITHER OR BOTH AHU-2-1 OR AHU-2-2, THE OUTSIDE AIR DAMPER(S) (OAD-1) AND RELIEF AIR DAMPER(S) (EAD-1) SHALL FULLY OPEN. UPON PROOF OF ALL DAMPERS OPENING, AS DETERMINED BY END POSITION SWITCHES, THE SUPPLY FAN SHALL CYCLE ON AND RUN CONTINUOUSLY. THE OUTDOOR AIR DAMPER(S) (OAD-1), RETURN AIR DAMPER(S) (RAD-1) AND RELIEF AIR DAMPER(S) (EAD-1) SHALL INDEX TO MAINTAIN MINIMUM OUTDOOR AIR FLOW RATES IN ACCORDANCE WITH THE TESTING, ADJUSTING AND BALANCING (TAB) SPECIFICATIONS AND AS MEASURED BY THE AIR FLOW MEASURING STATIONS. SEE EQUIPMENT SCHEDULES FOR FLOWRATES. SUPPLY FAN SHALL RAMP UP AND DOWN IN RESPONSE TO DUCT PRESSURE SENSOR (P-3) SET AT .5" W.C. SEE PLANS FOR LOCATION OF DUCT PRESSURE SENSORS. THE RETURN AIR DAMPER (RAD-1), RELIEF AIR DAMPER (EAD-1) AND OUTDOOR AIR DAMPER (OAD-1) SHALL CONTINUE TO MODULATE TO MAINTAIN MINIMUM OUTDOOR AIR AS SUPPLY FAN SPEED UPDATES.
     - a. IF OUTDOOR AIR DAMPER (OAD-1) DOES NOT FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, A STOP SIGNAL SHALL BE SENT TO THE ASSOCIATED AHU. AN ALARM SHALL BE SENT TO THE BAS.
     - b. IF ONE OF THE RELIEF AIR DAMPERS (EAD-1) DOES NOT FULLY OPEN, AS DETERMINED BY THE END POSITION SWITCH, THEN A STOP SIGNAL SHALL BE SENT TO THE ASSOCIATED AHU. AN ALARM SHALL BE SENT TO THE BAS.
     - c. IF NEITHER RELIEF AIR DAMPER (EAD-1) FULLY OPENS, AS DETERMINED BY THE END POSITION SWITCH, THEN THE RELIEF AIR FAN SHALL NOT ENERGIZE AND A STOP SIGNAL SHALL BE SENT TO BOTH AHUS. AN ALARM SHALL BE SENT TO THE BAS.
   - B. RELIEF FAN RF-1 VFD SHALL MODULATE WITH AHU-2-1 AND AHU-2-2 SUPPLY FANS TO MAINTAIN VOLUMETRIC OFFSET FROM MIMIMUM OUTSIDE AIR AS DETERMINED BY AIRFLOW MEASURING STATION.
   - C. FILTERS:
     - a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
     - b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   - D. CHILLED WATER COOLING:
     - a. COOLING MODE SHALL BE ENABLED WHENEVER:
       - a.a. OUTDOOR AIR TEMPERATURE (T-1) IS GREATER THAN 58°F (ADJ.).
       - a.b. THE SUPPLY FAN STATUS IS ON.
       - a.c. OUTSIDE AIR ENTHALPY IS ABOVE 28 BTU/LB (ADJ.).
     - b. THE BAS SHALL MODULATE THE CHILLED WATER CONTROL VALVES (V-CHW-1) TO MAINTAIN COIL DISCHARGE SETPOINT (T-5) AT 55°F (ADJ.)
   - E. HOT WATER HEATING:
     - a. HEATING MODE SHALL BE ENABLED WHENEVER:
       - a.a. OUTDOOR AIR TEMPERATURE (T-1) IS LESS THAN 55°F (ADJ.).
       - a.b. THE SUPPLY FAN STATUS IS ON.
     - b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVES (V-HHW-1) TO MAINTAIN DISCHARGE SETPOINT (T-5) AT 55°F (ADJ.)
   - F. ECONOMIZER CYCLE:
     - a. THE ECONOMIZER CYCLE SHALL BE ACTIVE WHEN:
       - a.a OUTSIDE AIR TEMPERATURE (T-1) IS BETWEEN 45°F (ADJ.) AND 58°F (ADJ.).
       - a.b. OUTSIDE AIR ENTHALPY IS BELOW 28 BTU/LB (ADJ.)
       - a.c. SUPPLY FAN STATUS IS ON.
     - b. THE OUTSIDE AIR DAMPERS (OAD-1) SHALL FULLY OPEN, THE RETURN AIR DAMPERS (RAD-1) SHALL FULLY CLOSE AND THE RELIEF AIR DAMPERS (EAD-1) SHALL FULLY OPEN.
     - c. AHU SUPPLY FAN VFDS SHALL MODULATE TO MAINTAIN DUCT STATIC PRESSURE.
     - d. RELIEF FAN (RF-1) VFD SHALL MODULATE IN UNISON WITH THE AHU SUPPLY FANS AND MAINTAIN THE SAME OFFSET AS DURING MINIMUM OUTSIDE AIR MODE AS MEASURED BY THE AIR FLOW MEASURING STATION.

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY AESI	
APPROVED BY Approver	
PROJECT NO. 21-154	
SHEET TITLE HVAC DIAGRAMS	
SHEET NUMBER H703	

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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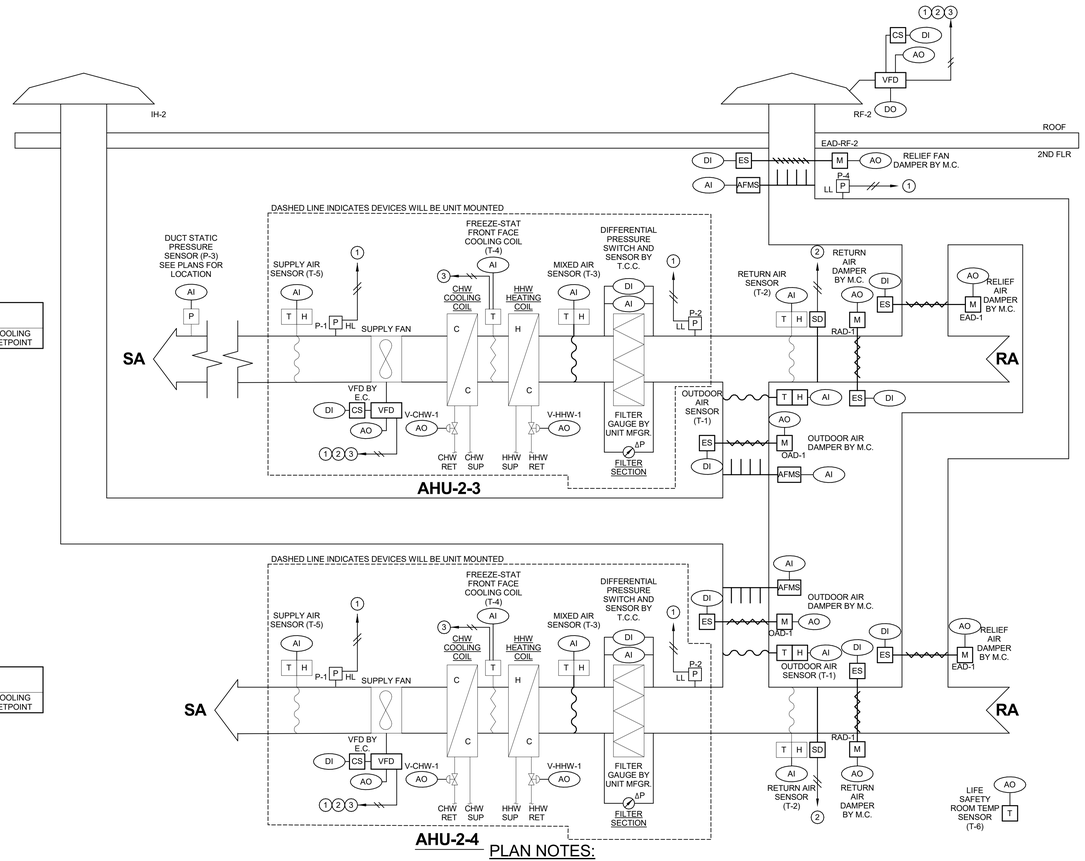


HVAC SETPOINTS - AHU-2-3

ROOM NAME	ROOM NO	SYSTEM SERVED	HEATING SETPOINT	COOLING SETPOINT

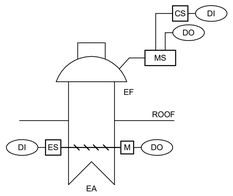
HVAC SETPOINTS - AHU-2-4

ROOM NAME	ROOM NO	SYSTEM SERVED	HEATING SETPOINT	COOLING SETPOINT

PLAN NOTES:

1. PRESSURE SWITCHES HARDWIRED TO VFD FOR HIGH STATIC LIMIT OR LOW STATIC LIMIT. PROVIDE PRESSURE SENSORS WITH ANALOG CONNECTION TO DDC CONTROLS AT SAME LOCATIONS.
2. START/STOP INTERLOCK WITH THE FIRE ALARM SYSTEM.
3. FREEZE STAT HARDWIRED TO SUPPLY FAN VFD.

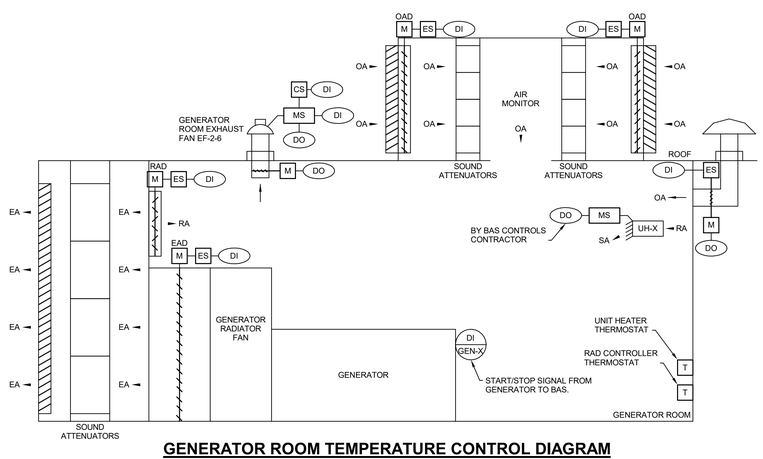
SOUTH MEZZANINE AHU TEMPERATURE CONTROL DIAGRAM



CONTINUOUS ROOM EXHAUST FAN SEQUENCE OF OPERATIONS:

1. NORMAL OPERATION
   A. UPON START SIGNAL FROM BAS, THE MOTORIZED DAMPER SHALL OPEN. UPON PROOF OF OPENING FROM THE END POSITION SWITCH, THE FAN SHALL ENERGIZE.
   B. FAN RUNS CONTINUOUSLY.
   C. UPON STOP SIGNAL FROM BAS, THE FAN SHALL DE-ENERGIZE AND THE MOTORIZED DAMPER SHALL CLOSE.
2. SAFETIES
   A. ON A FAN FAILURE AS DETERMINED BY CURRENT SENSOR, AN ALARM SHALL BE GENERATED AT THE BAS FRONT END. THE MOTORIZED DAMPER SHALL FULLY CLOSE UPON RECEIPT OF FAN FAILURE ALARM.

CONTINUOUS ROOM EXHAUST FAN CONTROL DIAGRAM



GENERATOR ROOM TEMPERATURE CONTROL DIAGRAM

AHU-2-3, AHU-2-4 AND RF-2 SEQUENCE OF OPERATIONS:

1. GENERAL:
   A. THE AIR HANDLERS HAVE ONE SUPPLY AIR FAN EACH, E.C. TO PROVIDE ONE VFD PER FAN.
   B. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   C. ALL TEMPERATURES, AIRFLOWS, AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   D. THE SUPPLY AIR FAN VFD SHALL HAVE A HAND-OFF-AUTO SWITCH.
      a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
      b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   F. AHU-2-3 TO OPERATE AS VARIABLE VOLUME UNIT TO MAINTAIN CONSTANT DUCT TEMPERATURE AND CONSTANT DUCT STATIC PRESSURE.
   G. AHU-2-4 TO OPERATE AS A SINGLE ZONE VARIABLE VOLUME UNIT TO MAINTAIN ROOM TEMPERATURE.
2. SAFETY INTERLOCKS:
   A. WHENEVER EITHER AHU SUPPLY FAN IS STOPPED EITHER BY THE FIRE ALARM SYSTEM OR LOSS OF POWER, THE OUTDOOR AIR DAMPER (OAD-1) SHALL CLOSE, THE RELIEF AIR DAMPER (EAD-1) SHALL CLOSE, AND THE RETURN AIR DAMPER (RAD-1) SHALL OPEN. ALL VALVES SHALL FULLY CLOSE. AN ALARM SHALL BE SENT TO THE BAS.
   B. SUPPLY HIGH STATIC AND LOW STATIC PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE (P-1) OR 4" NEGATIVE (P-2) SET POINT IS EXCEEDED, THE ASSOCIATED AIR HANDLER SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   C. RELIEF LOW STATIC PRESSURE LIMIT: IF THE RELIEF AIR STATIC PRESSURE OF 3" NEGATIVE (P-3) SET POINT IS EXCEEDED, THE RELIEF FAN SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   D. FREEZE PROTECTION
      a. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-4) IS LESS THAN OR EQUAL TO 38°F:
         a.a. THE SUPPLY FANS SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZESTAT (T-4) AND THE FAN MOTOR VFD.
         a.b. THE AIR HANDLER SHALL STOP.
         a.c. CHILLED WATER VALVE (V-CHW-1) SHALL OPEN 50% AND THE HEATING WATER CONTROL VALVE (V-HHW-1) SHALL MODULATE TO MAINTAIN SENSOR (T-4) AT 50°F (ADJ.).
         a.d. AN ALARM SHALL BE SENT TO THE BAS.
         a.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
   E. IF A SUPPLY FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE ASSOCIATED AHU SHALL BE SHUT-DOWN AS DESCRIBED ABOVE AND AN ALARM SHALL BE SENT TO THE BAS.
   F. IF THE RELIEF AIR FAN (RF-2) FAILS, AS DETERMINED BY CURRENT SENSOR, THE FAN SHALL BE DE-ENERGIZED, THE RELIEF AIR DAMPERS (EAD-1) SHALL REMAIN OPEN.
      a. AN ALARM SHALL BE SENT TO THE BAS.
      b. BOTH AHU-2-3 AND AHU-2-4 SHALL EXIT ECONOMIZER MODE.
      c. AHU-2-3'S OUTDOOR AIR DAMPER (OAD-1) AND RETURN AIR DAMPER (RAD-1) SHALL MODULATE TO MAINTAIN MINIMUM OUTDOOR AIR AND RELIEF AIR FLOWRATE AS DETERMINED BY AIRFLOW MEASURING STATIONS. SEE EQUIPMENT SCHEDULES FOR FLOWRATES.
   G. SMOKE DETECTION
      a. ON DETECTION OF SMOKE IN THE RETURN AIR DUCT, THE SMOKE DETECTOR SHALL SIGNAL THE FIRE ALARM SYSTEM.
      b. THE FIRE ALARM SYSTEM THROUGH HARD WIRING SHALL STOP THE AHUS AND THE RELIEF AIR FAN (RF-2) AS DESCRIBED ABOVE.
3. UNIT SHUTDOWN
   A. ON COMMAND FROM THE BAS TO STOP EITHER AIR HANDLER OR AN IN FIELD MANUAL FAN SHUTDOWN, THE SUPPLY AIR FAN SHALL BE DE-ENERGIZED, THE OUTDOOR AIR DAMPER (OAD-1) SHALL CLOSE, THE RELIEF AIR DAMPER (EAD-1) SHALL CLOSE, AND RETURN AIR DAMPER (RAD-1) SHALL OPEN. ALL VALVES SHALL FULLY CLOSE.
      a. IF BOTH AHU-2-3 AND AHU-2-4 ARE COMMANDED TO STOP OR BOTH IN FIELD MANUAL FAN SHUTDOWNS ARE ACTIVATED, THE RELIEF FAN (RF-2) SHALL SHUTDOWN AS DESCRIBED BELOW. IF AHU-2-3 IS COMMANDED OFF AND AHU-2-4 IS NOT IN ECONOMIZER MODE, RF-2 SHALL STILL SHUTDOWN AS DESCRIBED ABOVE.
   B. ON COMMAND FROM THE BAS TO STOP THE RELIEF FAN OR AN IN FIELD MANUAL FAN SHUTDOWN, THE FAN SHALL BE DE-ENERGIZED, THE RELIEF AIR DAMPERS (EAD-1) SHALL REMAIN OPEN.
      a. AN ALARM SHALL BE SENT TO THE BAS.
      b. BOTH AHU-2-3 AND AHU-2-4 SHALL EXIT ECONOMIZER MODE.
      c. AHU-2-3'S OUTDOOR AIR DAMPER (OAD-1) AND RETURN AIR DAMPER (RAD-1) SHALL MODULATE TO MAINTAIN MINIMUM OUTDOOR AIR AND RELIEF AIR FLOWRATE AS DETERMINED BY AIRFLOW MEASURING STATIONS. SEE EQUIPMENT SCHEDULES FOR FLOWRATES.
4. NORMAL OPERATION MODE
   A. ON COMMAND TO START AHU-2-3, THE OUTSIDE AIR DAMPER (OAD-1) AND RELIEF AIR DAMPER (EAD-1) SHALL FULLY OPEN. UPON PROOF OF ALL DAMPERS OPENING, AS DETERMINED BY END POSITION SWITCHES, THE SUPPLY FAN SHALL CYCLE ON AND RUN CONTINUOUSLY. THE OUTDOOR AIR DAMPER (OAD-1), RETURN AIR DAMPER (RAD-1) AND RELIEF AIR DAMPER (EAD-1) SHALL INDEX TO MAINTAIN MINIMUM OUTDOOR AIR FLOW RATE IN ACCORDANCE WITH THE TESTING, ADJUSTING AND BALANCING (TAB) SPECIFICATIONS AND AS MEASURED BY THE AIR FLOW MEASURING STATIONS. SEE EQUIPMENT SCHEDULES FOR FLOWRATES. SUPPLY FAN SHALL RAMP UP AND DOWN IN RESPONSE TO DUCT PRESSURE SENSOR (P-3) SET AT .5" W.C. SEE PLANS FOR LOCATION OF DUCT PRESSURE SENSOR. THE RETURN AIR DAMPER (RAD-1), RELIEF AIR DAMPER (EAD-1) AND OUTDOOR AIR DAMPER (OAD-1) SHALL CONTINUE TO MODULATE TO MAINTAIN MINIMUM OUTDOOR AIR AS SUPPLY FAN SPEED UPDATES.
      a. IF OUTDOOR AIR DAMPER (OAD-1) DOES NOT FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, A STOP SIGNAL SHALL BE SENT TO AHU-2-3. AN ALARM SHALL BE SENT TO THE BAS.
      b. IF THE RELIEF AIR DAMPER (EAD-1) DOES NOT FULLY OPEN, AS DETERMINED BY THE END POSITION SWITCH, THEN A STOP SIGNAL SHALL BE SENT TO AHU-2-3 AND THE RELIEF AIR FAN SHALL NOT ENERGIZE. AN ALARM SHALL BE SENT TO THE BAS.
   B. ON COMMAND TO START AHU-2-4, THE SUPPLY FAN SHALL CYCLE ON AND RUN CONTINUOUSLY. THE RETURN AIR DAMPER (RAD-1) SHALL BE FULLY OPEN, OUTDOOR AIR DAMPER (OAD-1) SHALL BE FULLY CLOSED, AND RELIEF AIR DAMPER (EAD-1) SHALL BE FULLY CLOSED WITH ALL DAMPER POSITIONS CONFIRMED BY END POSITION SWITCHES. SUPPLY FAN SHALL RAMP UP AND DOWN IN RESPONSE TO ROOM TEMPERATURE SENSOR (T-6) SET AT 85°F FOR COOLING AND 55°F FOR HEATING.
      a. IF RETURN AIR DAMPER (RAD-1) IS NOT CONFIRMED AS FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, A STOP SIGNAL SHALL BE SENT TO AHU-2-4. AN ALARM SHALL BE SENT TO THE BAS.
   C. RELIEF FAN RF-2 VFD SHALL MODULATE WITH AHU-2-3'S SUPPLY FAN TO MAINTAIN VOLUMETRIC OFFSET FROM MIMIMUM OUTSIDE AIR AS DETERMINED BY AIRFLOW MEASURING STATION.
   D. FILTERS:
      a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
      b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   E. AHU-2-3 CHILLED WATER COOLING:
      a. COOLING MODE SHALL BE ENABLED WHENEVER:
         b.a. OUTDOOR AIR TEMPERATURE (T-1) IS GREATER THAN 58°F (ADJ.).
         b.b. THE SUPPLY FAN STATUS IS ON.
         b.c. OUTSIDE AIR ENTHALPY IS ABOVE 28 BTU/LB (ADJ.).
      b. FOR AHU-2-3 THE BAS SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN COIL DISCHARGE SETPOINT (T-5) AT 55°F (ADJ.)
   F. AHU-2-4 CHILLED WATER COOLING:
      a. COOLING MODE SHALL BE ENABLED WHENEVER:
         a.a. ROOM TEMPERATURE (T-3)(ADJ.) IS GREATER THAN 85°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN ROOM SETPOINT AT 85°F (T-6)(ADJ.).
      c. ONCE THE CHILLED WATER CONTROL VALVE (V-CHW-1) IS FULLY OPEN, THE BAS SHALL MODULATE THE FAN SPEED TO MAINTAIN ROOM TEMPERATURE (T-6)(ADJ.) AT 85°F (ADJ.) SETPOINT.
   G. AHU-2-3 HOT WATER HEATING:
      a. HEATING MODE SHALL BE ENABLED WHENEVER:
         a.a. OUTDOOR AIR TEMPERATURE (T-1) IS LESS THAN 55°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVES (V-HHW-1) TO MAINTAIN DISCHARGE SETPOINT (T-5) AT 55°F (ADJ.)
   H. AHU-2-4 HOT WATER HEATING:
      a. HEATING MODE SHALL BE ENABLED WHENEVER:
         a.a. ROOM AIR TEMPERATURE (T-6) IS LESS THAN 55°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVE (V-HHW-1) TO MAINTAIN ROOM SETPOINT AT 55°F (T-6)(ADJ.).
      c. ONCE THE HEATING WATER CONTROL VALVE (V-HHW-1) IS FULLY OPEN, THE BAS SHALL MODULATE THE FAN SPEED TO MAINTAIN ROOM TEMPERATURE (T-6)(ADJ.) AT 55°F (ADJ.) SETPOINT.
   I. AHU-2-3 ECONOMIZER CYCLE:
      a. THE ECONOMIZER CYCLE SHALL BE ACTIVE WHEN:
         a.a. OUTSIDE AIR TEMPERATURE (T-1) IS BETWEEN 45°F (ADJ.) AND 58°F (ADJ.)
         a.b. OUTSIDE AIR ENTHALPY IS BELOW 28 BTU/LB (ADJ.)
         a.c. SUPPLY FAN STATUS IS ON.
      b. THE OUTSIDE AIR DAMPER (OAD-1) SHALL FULLY OPEN, THE RETURN AIR DAMPER (RAD-1) SHALL FULLY CLOSE AND THE RELIEF AIR DAMPER (EAD-1) SHALL FULLY OPEN.
      c. AHU SUPPLY FAN VFD SHALL MODULATE TO MAINTAIN DUCT STATIC PRESSURE.
      d. RELIEF FAN (RF-2) VFD SHALL MODULATE IN UNISON WITH THE AHU SUPPLY FAN AND MAINTAIN THE SAME OFFSET AS DURING MINIMUM OUTSIDE AIR MODE AS MEASURED BY THE AIR FLOW MEASURING STATION.
   J. AHU-2-4 ECONOMIZER CYCLE:
      a. THE ECONOMIZER CYCLE SHALL BE ACTIVE WHEN:
         a.a. OUTSIDE AIR TEMPERATURE (T-1) IS BETWEEN 55°F (ADJ.) AND 70°F (ADJ.)
         a.b. OUTSIDE AIR ENTHALPY IS BELOW 28 BTU/LB (ADJ.)
         a.c. SUPPLY FAN STATUS IS ON.
      b. THE OUTSIDE AIR DAMPER (OAD-1) SHALL FULLY OPEN, THE RETURN AIR DAMPER (RAD-1) SHALL FULLY CLOSE AND THE RELIEF AIR DAMPER (EAD-1) SHALL FULLY OPEN.
      c. AHU SUPPLY FAN VFD SHALL MODULATE TO MAINTAIN ROOM TEMPERATURE BETWEEN HEATING AND COOLING SETPOINTS.
      d. RELIEF FAN (RF-2) VFD SHALL MODULATE IN UNISON WITH THE AHU SUPPLY FAN AND MAINTAIN THE FLOWRATE AS MEASURED BY THE AIR FLOW MEASURING STATION.
      e. IF ROOM SETPOINT IS NOT SATISFIED BY ECONOMIZER OPERATION, THE UNIT SHALL EXIT ECONOMIZER MODE AND RETURN TO NORMAL OPERATION.

GENERATOR ROOM SEQUENCE OF OPERATIONS:

1. GENERAL
   A. THE AIR MONITOR OUTDOOR AIR DAMPERS (OAD), GENERATOR RETURN AIR DAMPERS (RAD) AND GENERATOR EXHAUST AIR DAMPERS (EAD) SHALL HAVE NORMALLY OPEN, SPRING RETURN ACTUATORS CAPABLE OF FULLY OPENING THE DAMPERS IN 5 SECONDS AND FULLY CLOSING THE DAMPERS IN 15 SECONDS.
2. NORMAL OPERATION (GENERATORS OFF)
   A. ALL AIR MONITOR OUTDOOR AIR DAMPERS (OAD), GENERATOR RETURN AIR DAMPERS (RAD) AND GENERATOR EXHAUST AIR DAMPERS (EAD) ARE TO BE CLOSED DURING NORMAL OPERATION WHEN GENERATORS ARE OFF.
      a.IF ANY DAMPER OPENS WITHOUT AN INITIATING SIGNAL, AS DETERMINED BY END POSITION SWITCH, THEN AN ALARM SHALL BE SENT TO THE BAS.
   B. UNIT HEATERS SHALL ENERGIZE WHEN THE GENERATOR ROOM UNIT HEATER THERMOSTATS TEMPERATURE FALLS BELOW 55°F AND MODULATE HEATING WATER VALVES OPEN TO MAINTAIN ROOM SETPOINT. UNIT HEATERS SHALL DE-ENERGIZE WHEN THE GENERATOR ROOM THERMOSTAT TEMPERATURE RISES ABOVE 55°F AND MODULATE HEATING WATER VALVES FULLY CLOSED.
   C. IN ROOM GENERAL EXHAUST AND IN ROOM GENERAL OUTDOOR AIR DAMPERS SHALL BOTH BE FULLY OPEN. GENERATOR ROOM EXHAUST FAN SHALL RUN CONTINUOUSLY.
      a. ON A FAN FAILURE, AS DETERMINED BY CURRENT SENSOR, AN ALARM SHALL BE SENT TO THE BAS.
      b. IN ROOM GENERAL EXHAUST AIR AND IN ROOM GENERAL OUTDOOR AIR DAMPERS SHALL FULLY CLOSE.
2. EMERGENCY OPERATION (GENERATORS ON)(MANUALLY STARTED)
   A. IN THE EVENT OF A MANUAL GENERATOR ACTIVATION, THE BAS SHALL REMAIN POWERED ON AND THE DAMPERS SHALL REMAIN POWERED ON.
   B. UPON GENERATOR START SIGNAL, THE AIR MONITOR OUTDOOR AIR DAMPERS (OAD), GENERATOR RETURN AIR DAMPERS (RAD) AND GENERATOR EXHAUST AIR DAMPERS (EAD) ASSOCIATED WITH THE ACTIVATED GENERATOR(S) ARE TO FULLY OPEN UPON GENERATOR START SIGNAL USING SPRING ACTUATORS.
   C. ONCE THE GENERATOR(S) ARE FULLY POWERED, THE GENERATOR RADIATOR FAN SHALL INDUCE AIRFLOW THROUGH THE ROOM. THE BAS SHALL MODULATE THE GENERATOR RADIATOR PLENUM RETURN AIR DAMPERS (IN UNISON IF MULTIPLE GENERATORS) TO MAINTAIN A SPACE TEMPERATURE OF 55°F AS DETERMINED BY THE GENERATOR ROOM THERMOSTAT. IF THE ROOM IS ABOVE 55°F, THEN THE GENERATOR RETURN AIR DAMPERS SHALL BE FULLY CLOSED.
      a. IF THE GENERATOR RETURN AIR DAMPERS ARE MODULATED FULLY OPEN AND THE SPACE TEMPERATURE BEGINS TO DROP BELOW 50°F, THE BAS SHALL CLOSE AIR MONITOR OUTDOOR AIR DAMPERS, ONE DAMPER ARRAY AT A TIME UNTIL THE ROOM IS ABOVE 55°F.
      b. ONCE THE ROOM TEMPERATURE REACHES 60°F (ADJ.), THE BAS SHALL RE-OPEN AIR MONITOR OUTDOOR AIR DAMPERS ONE AT A TIME. ONCE ALL OUTDOOR AIR DAMPERS ARE OPEN, THE BAS SHALL BEGIN TO MODULATE THE RETURN AIR DAMPER CLOSED TO MAINTAIN ROOM SETPOINT.
   D. UPON GENERATOR SHUTDOWN SIGNAL, THE BAS SHALL FULLY CLOSE THE AIR MONITOR OUTDOOR AIR DAMPERS. AFTER A 30 SECOND DELAY, THE BAS SHALL FULLY CLOSE THE GENERATOR RADIATOR PLENUM RETURN AIR DAMPERS AND GENERATOR RADIATOR DISCHARGE AIR DAMPERS. THE GENERATOR ROOM SHALL RESUME NORMAL OPERATION.
3. EMERGENCY OPERATION (GENERATORS ON)(POWER FAILURE)
   A. IN THE EVENT OF A POWER FAILURE TO THE FACILTIY, THE BAS SHALL REMAIN POWERED ON UPS BACKUP POWER AND ALL DAMPERS SHALL LOSE POWER.
   B. ALL THE AIR MONITOR OUTDOOR AIR DAMPERS (OAD), GENERATOR RETURN AIR DAMPERS (RAD) AND GENERATOR EXHAUST AIR DAMPERS (EAD) SHALL FULLY OPEN FROM THE SPRING ACTUATORS.
   C. ONCE THE GENERATORS HAVE RESTORED POWER TO THE FACILITY AND ALL THE DAMPERS, THE BAS SHALL OPERATE THE GENERATOR ROOM AS DESCRIBED ABOVE IN THE EMERGENCY OPERATION (MANUALLY STARTED) SEQUENCE.

HVAC SETPOINTS - UH UNITS

ROOM NAME	ROOM NO	SYSTEM SERVED	HEATING SETPOINT	COOLING SETPOINT

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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100% Design Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY AESI	
APPROVED BY Approver	
PROJECT NO. 21-154	

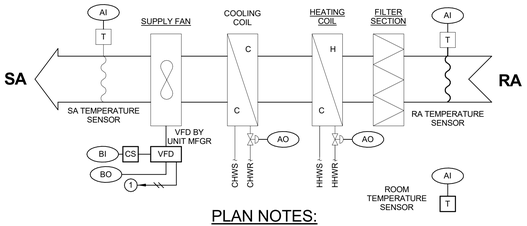
SHEET TITLE

HVAC DIAGRAMS

SHEET NUMBER

H704

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:02:38 PM AESI Proj. No: 21-154



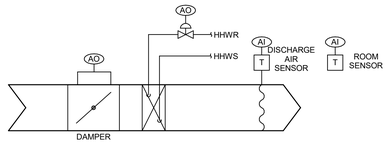
PLAN NOTES:

(1) START/STOP INTERLOCK WITH THE FIRE ALARM SYSTEM.

TYPICAL BLOWER COIL UNIT CONTROL DIAGRAM

PLANT TYPICAL BLOWER COIL/FAN COIL UNIT SEQUENCE OF OPERATIONS:

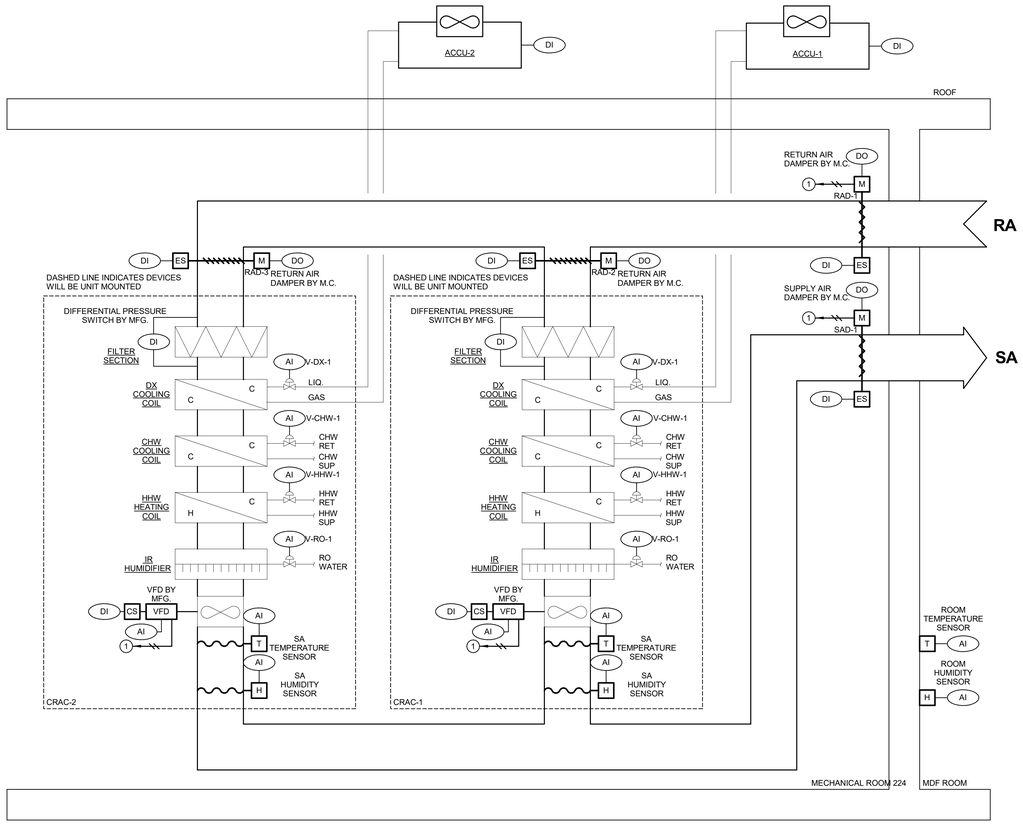
1. GENERAL:
   A. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   B. ALL TEMPERATURES SHALL BE DISPLAYED AT THE BAS CONSOLE.
   C. THE UNIT MOUNTED SUPPLY AIR FANS SHALL BE ECM CONTROLLED AND HAVE A HAND-OFF-AUTO SWITCH
      a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
      b. IN THE AUTOMATIC POSITION, THE BUILDING DDC SYSTEM SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   D. UNIT TO OPERATE AS A SINGLE ZONE, VARIABLE VOLUME UNIT TO MAINTAIN ROOM TEMPERATURE.
2. SAFETY INTERLOCKS:
   A. ON COMMAND TO STOP THE BLOWER COIL, THE SUPPLY AIR FAN SHALL BE DE-ENERGIZED.
   B. WHENEVER THE FAN IS STOPPED EITHER BY THE BAS, THE FIRE ALARM SYSTEM, REFRIGERANT MONITORING SYSTEM OR LOSS OF POWER, THE SUPPLY AIR FAN SHALL DE-ENERGIZE AND AN ALARM SENT TO THE BAS.
   C. IF THE FAN FAILS, THE FAN SHALL BE DE-ENERGIZED AND AN ALARM SHALL BE SENT TO THE BAS.
3. NORMAL OPERATION MODE
   A. ON COMMAND TO START, THE SUPPLY FAN SHALL CYCLE ON.
   B. CHILLED WATER COOLING:
      a. THE BAS SHALL MODULATE THE CONTROL VALVE TO MAINTAIN COIL SUPPLY AIR SETPOINT AT 55°F (ADJ.)
      b. THE BAS SHALL MODULATE ECM FAN SPEED TO MAINTAIN SPACE SETPOINT.
      c. THE COOLING MODE SHALL BE ENABLED WHENEVER:
         c.a. THE SUPPLY FAN STATUS IS ON.
         c.b. THE ROOM TEMPERATURE AS DETERMINED BY IN ROOM THERMOSTAT EXCEEDS 85°F (ADJ.)
   C. HOT WATER HEATING:
      a. THE BAS SHALL MODULATE THE CONTROL VALVE TO MAINTAIN COIL SUPPLY AIR SETPOINT AT 95°F (ADJ.)
      b. THE BAS SHALL MODULATE ECM FAN SPEED TO MAINTAIN SPACE SETPOINT.
      c. HEATING MODE SHALL BE ENABLED WHENEVER:
         c.a. THE SUPPLY FAN STATUS IS ON.
         c.b. THE ROOM TEMPERATURE AS DETERMINED BY IN ROOM THERMOSTAT DROPS BELOW 55°F (ADJ.)
   D. IF ROOM TEMPERATURE IS BETWEEN TEMPERATURE SETPOINTS, BLOW COIL UNIT SHALL SHUT DOWN AS DESCRIBED ABOVE.



VARIABLE VOLUME TERMINAL BOX WITH REHEAT CONTROL DIAGRAM

VAV BOX CONTROL SEQUENCE SEQUENCE OF OPERATIONS:

1. GENERAL
   A. ALL TERMINAL BOXES SHALL BE PRESSURE INDEPENDENT.
   B. THE ROOM TEMPERATURE SET POINT SHALL BE SET TO THE ROOM TEMPERATURE SET POINT SCHEDULE.
2. VARIABLE VOLUME REHEAT BOX CONTROL
   A. ON A CALL FOR COOLING FROM THE ROOM TEMPERATURE SENSOR, THE TERMINAL BOX DAMPER SHALL MODULATE ROOM AIRFLOW FROM MINIMUM TO MAXIMUM SCHEDULED AIRFLOWS TO MEET ROOM AIR TEMPERATURE COOLING SET POINT.
   B. WHEN THE ROOM AIR TEMPERATURE IS BETWEEN HEATING AND COOLING SET POINTS, THE TERMINAL BOX SHALL FLOW AT MINIMUM SCHEDULED AIRFLOW.
   C. ON A CALL FOR HEATING FROM THE ROOM TEMPERATURE SENSOR, THE TERMINAL BOX HEATING VALVE SHALL MODULATE OPEN TO MAINTAIN ROOM TEMPERATURE SETPOINT UNTIL DISCHARGE AIR TEMPERATURE REACHES SCHEDULED LEAVING AIR TEMPERATURE (LAT ON VAV BOX SCHEDULE) .
   D. ONCE DISCHARGE AIR TEMPERATURE REACHES SCHEDULED LEAVING AT TEMPERATURE, THE TERMINAL BOX DAMPER SHALL MODULATE FROM MINIMUM AIRFLOW TO MAINTAIN ROOM TEMPERATURE SET POINT.



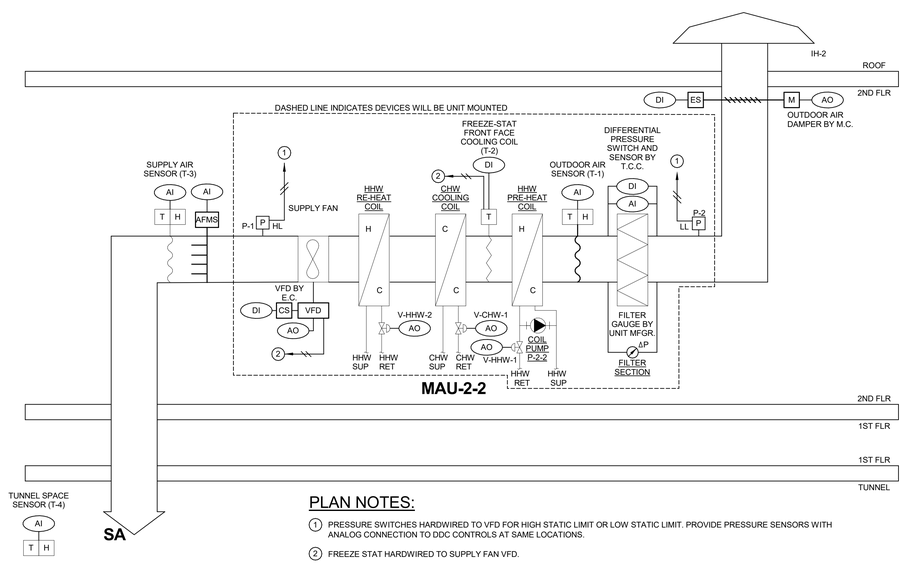
PLAN NOTES:

(1) START/STOP INTERLOCK WITH THE FIRE ALARM SYSTEM.

CRAC UNIT TEMPERATURE CONTROL DIAGRAM

COMPUTER ROOM AIR CONDITIONER SEQUENCE OF OPERATIONS:

1. GENERAL:
   A. EACH COMPUTER ROOM AIR CONDITIONER (CRAC UNIT) HAS ONE SUPPLY AIR FAN WITH A FACTORY INTEGRATED VFD.
   B. ALL OUTPUT CONTROLS SHALL BE PERFORMED BY THE UNIT INTEGRATED CONTROL SYSTEM. BAS SHALL PERFORM MONITORING ONLY.
   C. ALL TEMPERATURES, AIR FLOWS AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   D. CRAC UNITS TO OPERATE IN PARALLEL AS VARIABLE VOLUME UNITS TO MAINTAIN CONSTANT ROOM TEMPERATURE AND HUMIDITY.
2. SAFETY INTERLOCKS:
   A. ON COMMAND TO STOP ONE CRAC UNIT, THE UNITS SHALL PERFORM FACTORY CODED SHUTDOWN. SUPPLY AIR DAMPER (SAD-1) AND RETURN AIR DAMPER (RAD-1) SHALL REMAIN OPEN.
   B. UPON SIGNAL FROM THE MDF ROOM DEDICATED, GAS BASED FIRE ALARM SYSTEM, THE CRAC UNITS SUPPLY AIR FANS SHALL BE DE-ENERGIZED VIA HARDWIRE CONNECTION. THE CRAC UNITS SHALL PERFORM FACTORY CODED SHUTDOWN. THE SUPPLY AIR DAMPER (SAD-1) SHALL CLOSE IN 5 SECONDS AND THE RETURN AIR DAMPER (RAD-1) SHALL CLOSE IN 5 SECONDS. AN ALARM SHALL BE SENT TO THE BAS.
   C. WHENEVER EITHER FAN IS STOPPED BY LOSS OF POWER, THE SUPPLY AIR DAMPER (SAD-1) AND THE RETURN AIR DAMPER (RAD-1) SHALL REMAIN OPEN. AN ALARM SHALL BE SENT TO THE BAS.
3. NORMAL OPERATION MODE
   A. ON COMMAND TO START, THE CRAC UNITS SHALL PERFORM FACTORY CODED START UP. THE UNITS SHALL RUN CONTINUOUSLY TO MAINTAIN TEMPERATURE AND HUMIDITY SETPOINT.
   B. BOTH UNITS SHALL RUN IN PARALLEL. IF ONE UNIT FAN, DISCHARGE TEMPERATURE OR DISCHARGE HUMIDITY BEGINS TO FAIL, THE UNIT SHALL BE SHUTDOWN AND THE REMAINING UNIT SHALL CONTINUE TO MAINTAIN ROOM TEMPERATURE AND HUMIDITY SETPOINTS. THE RETURN AIR DAMPER ASSOCIATED WITH THE SHUTDOWN UNIT (RAD-2 OR RAD-3) SHALL FULLY CLOSE. AN ALARM SHALL BE GENERATED AT THE BAS.
   C. CHILLED WATER AND DX COOLING:
      a. COOLING MODE SHALL BE ENABLED WHENEVER:
         a.a. ROOM TEMPERATURE (T-1) IS GREATER THAN 72°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE CRAC UNIT INTERNAL CONTROLS SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN ROOM COOLING SETPOINT.
      c. IF THE CHILLED WATER COIL IS UNABLE TO MAINTAIN DISCHARGE TEMPERATURE REQUIRED TO MEET ROOM SETPOINT, THE CHILLED WATER VALVE (V-CHW-1) SHALL FULLY CLOSE. THE ROOF MOUNTED ACCU SHALL ENERGIZE AND THE DX COOLING VALVE (V-DX-1) SHALL MODULATE TO MAINTAIN ROOM COOLING SETPOINT.
         c.a. THE CHILLED WATER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN ROOM COOLING SETPOINT IN ADDITION TO DX COOLING IF THE DX COOLING VALVE (V-DX-1) IS FULLY OPENED.
   C. HOT WATER HEATING:
      a. HEATING MODE SHALL BE ENABLED WHENEVER:
         a.a. ROOM TEMPERATURE (T-1) IS LESS THAN 68°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE CRAC UNIT INTERNAL CONTROLS SHALL MODULATE THE HEATING WATER CONTROL VALVE (V-HHW-1) TO MAINTAIN ROOM HEATING SETPOINT.
   D. HUMIDIFICATION:
      a. THE CRAC UNIT HUMIDIFIERS SHALL BE ENABLED WHENEVER:
         a.a. ROOM HUMIDITY IS BELOW 35%RH.
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE CRAC UNIT INTERNAL CONTROLS SHALL MODULATE THE INFRARED HUMIDIFIER AND RO MAKE UP WATER VALVE (V-RO-1) TO MAINTAIN ROOM HUMIDITY SETPOINT.



PLAN NOTES:

(1) PRESSURE SWITCHES HARDWIRED TO VFD FOR HIGH STATIC LIMIT OR LOW STATIC LIMIT. PROVIDE PRESSURE SENSORS WITH ANALOG CONNECTION TO DDC CONTROLS AT SAME LOCATIONS.

(2) FREEZE STAT HARDWIRED TO SUPPLY FAN VFD.

TUNNEL MAKE UP AIR UNIT TEMPERATURE CONTROL DIAGRAM

MAU-2-2 TUNNEL VENTILATION SEQUENCE OF OPERATIONS:

1. GENERAL:
   A. THE AIR HANDLER HAS ONE SUPPLY AIR FAN, E.C. TO PROVIDE VFD FOR THE FAN.
   B. ALL SET POINTS SHALL BE ADJUSTABLE THROUGH THE BAS CONSOLE.
   C. ALL TEMPERATURES, AIRFLOWS, AND DAMPER POSITIONS SHALL BE DISPLAYED AT THE BAS CONSOLE.
   D. THE SUPPLY AIR FAN VFD SHALL HAVE A HAND-OFF-AUTO SWITCH.
      a. IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AT A CONSTANT SPEED. THE SPEED SHALL BE MANUALLY ADJUSTABLE AT THE VARIABLE FREQUENCY DRIVE CONTROL PAD. ALL TEMPERATURE AND FAN SYSTEM SAFETIES SHALL REMAIN FUNCTIONAL AS DESCRIBED BELOW.
      b. IN THE AUTOMATIC POSITION, THE BUILDING BAS SHALL CONTROL ALL FUNCTIONS AS DESCRIBED.
   E. UNIT TO OPERATE AS A SINGLE ZONE CONSTANT VOLUME UNIT TO MAINTAIN TUNNEL VENTILATION REQUIREMENT AND TEMPERATURE SETPOINTS.
2. SAFETY INTERLOCKS:
   A. WHENEVER THE AHU SUPPLY FAN IS STOPPED BY A LOSS OF POWER, THE INLET HOOD DAMPER SHALL CLOSE. AN ALARM SHALL BE SENT TO THE BAS.
   B. SUPPLY HIGH STATIC AND LOW STATIC PRESSURE LIMIT: IF THE SUPPLY AIR STATIC PRESSURE OF 4" WG POSITIVE (P-1) OR 4" NEGATIVE (P-2) SET POINT IS EXCEEDED, THE UNIT SHALL BE COMMANDED TO STOP AND AN ALARM SENT TO THE BAS CONSOLE.
   C. FREEZE PROTECTION
      a. WHEN THE OUTSIDE AIR TEMPERATURE FALLS TO BELOW 38°F (ADJUSTABLE), HEATING COIL PUMP (P-2-2) SHALL BE ENERGIZED.
      b. WHEN THE OUTSIDE AIR TEMPERATURE RISES TO ABOVE 43°F, HEATING COIL PUMP SHALL BE DE-ENERGIZED.
      c. PHYSICAL LOW LIMIT: IF THE FREEZESTAT TEMPERATURE (T-2) IS LESS THAN OR EQUAL TO 38°F:
         c.a. THE SUPPLY FAN SHALL STOP THROUGH A HARDWIRED INTERFACE BETWEEN THE FREEZE STAT (T-2) AND FAN MOTOR VFD.
         c.b. THE AIR HANDLER SHALL STOP.
         c.c. CHILLED WATER VALVE (V-CHW-1) SHALL OPEN 50%, COIL PUMP (P-2-2) SHALL REMAIN ON, AND HEATING WATER CONTROL VALVE (V-HHW-1) SHALL MODULATE TO MAINTAIN SENSOR (T-2) AT 50°F.
         c.d. AN ALARM SHALL BE SENT TO THE BAS.
         c.e. FREEZESTAT SHALL REQUIRE A MANUAL RESET.
   D. IF THE SUPPLY FAN FAILS, AS DETERMINED BY CURRENT SENSOR, THE AHU SHALL BE SHUT-DOWN AS DESCRIBED ABOVE AND AN ALARM SHALL BE SENT TO THE BAS.
3. UNIT SHUTDOWN
   A. ON COMMAND FROM THE BAS TO STOP THE AIR HANDLER OR AN IN FIELD MANUAL FAN SHUTDOWN, THE SUPPLY AIR FAN SHALL BE DE-ENERGIZED AND THE AIR INLET HOOD DAMPER SHALL CLOSE. ALL VALVES SHALL FULLY CLOSE AND THE HEATING COIL PUMP (P-2-2) SHALL BE DE-ENERGIZED.
4. NORMAL OPERATION MODE
   A. ON COMMAND TO START MAU-2-2, THE AIR INLET HOOD DAMPER SHALL FULLY OPEN, AS CONFIRMED BY END POSITION SWITCH.THE SUPPLY FAN SHALL CYCLE ON AND RUN CONTINUOUSLY. SUPPLY FAN SHALL PROVIDE CONSTANT AIR VOLUME TO UTILITY TUNNEL AS MEASURED BY AIR FLOW MEASURING STATION (AFMS).
      a. IF AIR INLET HOOD DAMPER IS NOT CONFIRMED AS FULLY OPEN, AS DETERMINED BY END POSITION SWITCH, A STOP SIGNAL SHALL BE SENT TO MAU-2-2. AN ALARM SHALL BE SENT TO THE BAS.
   B. FILTERS:
      a. FILTERS SHALL BE ACTIVE UNITS AND SEND FAILURE/FAULT ALARMS TO THE BAS.
      b. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR STATUS OF EACH FILTER BANK. AN ALARM SHALL BE ISSUED TO THE BAS WHEN THE FILTER PRESSURE EXCEEDS SETPOINT. SEE EQUIPMENT SCHEDULES FOR FINAL PRESSURE SETPOINT.
   C. CHILLED WATER COOLING:
      a. COOLING MODE SHALL BE ENABLED WHENEVER:
         a.a. TUNNEL TEMPERATURE (T-4)(ADJ.) IS GREATER THAN 85°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) TO MAINTAIN TUNNEL TEMPERATURE (T-4) (ADJ.) BELOW 85°F (ADJ.) SETPOINT.
   D. HOT WATER HEATING:
      a. HEATING MODE SHALL BE ENABLED WHENEVER:
         a.a. TUNNEL TEMPERATURE (T-4) IS LESS THAN 55°F (ADJ.).
         a.b. THE SUPPLY FAN STATUS IS ON.
      b. THE BAS SHALL MODULATE THE HEATING WATER CONTROL VALVES (V-HHW-1&2) TO MAINTAIN TUNNEL TEMPERATURE (T-4)(ADJ.) ABOVE 55°F (ADJ.) SETPOINT.
         LEAVING AIR TEMPERATURE.
   E. DE-HUMIDIFICATION MODE:
      a. IF TUNNEL SENSOR (T-4) DETECTS A HUMIDITY HIGHER THAN 60%RH (ADJ.) THE UNIT SHALL MODULATE THE CHILLED WATER CONTROL VALVE (V-CHW-1) AND RE-HEAT CONTROL VALVE (V-HHW-2) AS NEEDED TO DISCHARGE 50% RH AIR UNTIL TUNNEL RELATIVE HUMIDITY (T-4) HAS DROPPED BELOW 55%RH (ADJ.).

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Central Utility Plant

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY	AESI
CHECKED BY	AESI
APPROVED BY	Approver
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SHEET TITLE

HVAC DIAGRAMS

SHEET NUMBER

H705

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:02:38 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

NOTE: ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION ON THE DRAWINGS. ALL SYMBOLS NOT NECESSARILY USED ON THIS PROJECT.

GENERAL SYMBOLS:

- POINT OF CONNECTION
- PLAN NOTE
- REVISION
- DETAIL BUBBLE
- SECTION BUBBLE

VALVES & FITTINGS:

- GATE VALVE
- BALANCING VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- GLOBE VALVE
- CONTROL VALVE
- PRESSURE RELIEF, ANGLE TYPE VALVE
- REDUCED PRESSURE BACK FLOW PREVENTER
- INDICATED FLOW DIRECTION
- PIPE TURN 90°
- LINE BREAK
- PIPE ELBOW UP (RISER)
- PIPE ELBOW DOWN OR DROP
- PIPE TEE DOWN
- CAP OR PLUG
- REDUCER, CONCENTRIC
- REDUCER, ECCENTRIC
- FLANGES
- UNION
- METER
- FD FLOOR DRAIN
- CO FLOOR CLEANOUT
- GAUGE
- THERMOMETER
- STEAM TRAP
- PRESSURE SENSOR
- INLINE PUMP

PIPING DESIGNATIONS:

- NEW PIPING
- PIPE SLOPES IN DIRECTION OF ARROW
- CW DOMESTIC COLD WATER
- HW DOMESTIC HOT WATER
- HWR DOMESTIC HOT WATER RETURN
- 140°F DOMESTIC HOT WATER 140°F
- 140°F DOMESTIC HOT WATER 140°F RETURN
- W WASTE PIPING
- ST STORM PIPING
- SANITARY VENT
- D INDIRECT DRAIN
- AW ACID WASTE
- AV ACID VENT
- DI DEIONIZED WATER
- RODI REVERSE OSMOSIS DEIONIZED WATER
- LS LAWN SPRINKLER
- G GAS
- FOS FUEL OIL SUPPLY
- FOR FUEL OIL RETURN
- FOV FUEL OIL VENT
- VAC VACUUM
- CA COMPRESSED AIR
- PD PUMPED DISCHARGE
- BR BRINE WATER
- PIPE BELOW FLOOR
- SCW SOFT COLD WATER

PLUMBING ABBREVIATIONS:

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
AV	ACID VENT
AW	ACID WASTE
BDD	BACK DRAFT DAMPER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STEEL
BR	BRINE WATER
BRP	BRINE PUMP
BRT	BRINE TANK
BTU	BRITISH THERMAL UNIT
CA	COMPRESSED AIR
CO	CLEANOUT
CS	CUP SINK
CSS	CLINIC SERVICE SINK
CTRL	CONTROL
CW	DOMESTIC COLD WATER
D	CONDENSATE/DRAIN
DB	DRY BULB
DBP	DOMESTIC BOOSTER PUMP
DCV	DOUBLE CHECK VALVE
DD	DECK DRAIN
DET	DOMESTIC EXPANSION TANK
DIA	DIAMETER
DN	DOWN
DWH	DOMESTIC WATER HEATER
DWRP	DOMESTIC HOT WATER RECIRCULATION PUMP
DWS	DOMESTIC WATER SOFTER
EC	ELECTRICAL CONTRACTOR
ECO	EXTERIOR CLEANOUT
EW	EMERGENCY EYE/FACE WASH
EL	ELEVATION
ESEW	EMERGENCY SHOWER EYE/FACE WASH
ETMV	EMERGENCY THERMOSTATIC MIXING VALVE
EXIST	EXISTING
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FLA	FULL LOAD AMPS
FM	FLOW METER
FS	FLOOR SINK
GPR	GAS PRESSURE REGULATOR
HB	HOSE BIBB
HKSP	HOUSEKEEPING
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
IE	INVERT ELEVATION
L	LAVATORY
MB	MOP BASIN
MC	MECHANICAL CONTROLLER
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
ORD	OVERFLOW ROOF DRAIN
OS	OIL SEPARATOR
PC	PLUMBING CONTRACTOR
PIV	POST INDICATING VALVE
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	PRESSURE TANK
RD	ROOF DRAIN
RH	ROOF HYDRANT
RO	REVERSE OSMOSIS
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
SAN	SANITARY
SCW	SOFTENED COLD WATER
SH	SHOWER
SI	SEDIMENT INTERCEPTOR
SK	SINK
SP	SUMP PUMP
SS	STAINLESS STEEL
ST	STORM WATER
SVB	SHUT-OFF VALVE BOX
TD	TRENCH DRAIN
TMV	THEROSTATIC MIXING VALVE
TW	TEPID WATER
TYP	TYPICAL
UR	URINAL
US	UTILITY SINK
V	SANITARY VENT
VFD	VARIABLE FREQUENCY DRIVE
VTR	VENT THROUGH ROOF
W	WASTE
WC	WATER CLOSET
WH	WALL HYDRANT

GENERAL NOTES:

A. VERIFY CONDITIONS IN THE FIELD PRIOR TO BUILDING AND BEFORE BEGINNING WORK.

B. REVIEW THE WORK OF OTHER TRADES, COORDINATE AND -PLAN WORK WITH THE OTHER TRADES AND OWNER. ADJUST AS A RESULT OF COORDINATION.

C. STORE EQUIPMENT AND COMPONENTS IN A CLEAN, DRY LOCATION UNTIL READY FOR INSTALLATION. PROTECT FROM WEATHER, DIRT, WATER, AND CONSTRUCTION DEBRIS, ETC. AT ALL TIMES. ANY DAMAGED EQUIPMENT OR COMPONENTS SHALL BE RESTORED AS NEW OR REPLACED.

D. DRAWINGS SHOW THE INTENDED ARRANGEMENT AND ROUTING OF ALL PIPING, EQUIPMENT, AND APPURTENANCES. THEY SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT.

E. CLEAN ALL EQUIPMENT TO PRESENT A "LIKE NEW" CONDITION AT PROJECT COMPLETION.

F. OFFSET PIPING AROUND ELECTRICAL PANELS TO PROVIDE CLEARANCES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY EPW	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
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APPROVED BY Approver	
PROJECT NO. 21-154	

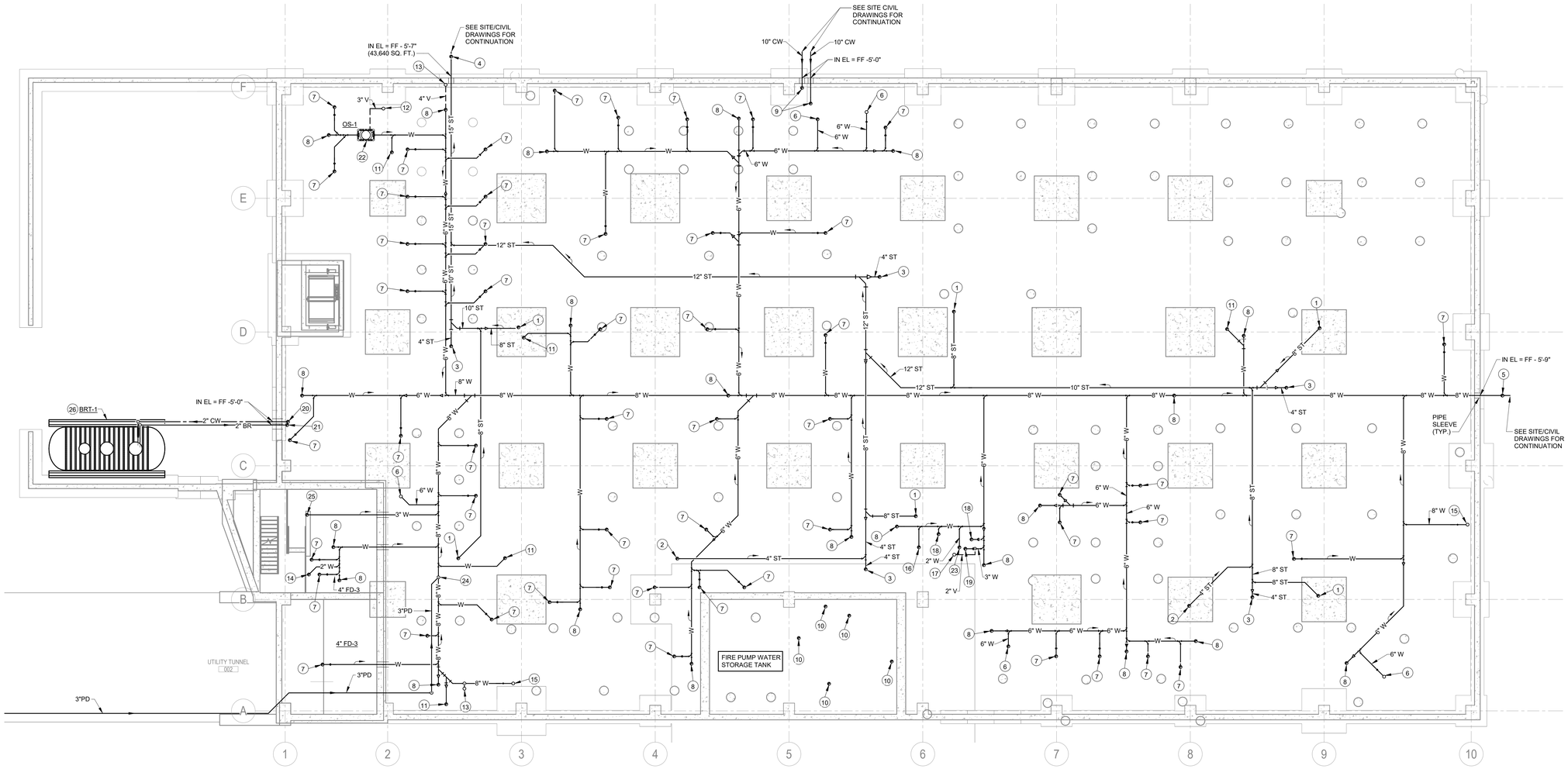
SHEET TITLE

PLUMBING SYMBOLS AND ABBREVIATIONS

SHEET NUMBER

P001

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 1:29:22 PM AESI Proj. No: 21-154



LOWER LEVEL PLUMBING PLAN

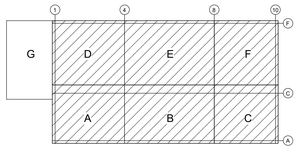
Scale: 3/32" = 1'-0"

GENERAL NOTES:

A. SEE SHEET P001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
B. ALL SANITARY WASTE PIPING TO BE 4" UNLESS OTHERWISE NOTED.

PLAN NOTES:

1. 8" ST FROM ABOVE.
2. 4" ST FROM ABOVE.
3. 4" ST UP TO FLOOR CLEANOUT (FCO).
4. 4" ST UP TO EXTERIOR CLEANOUT (ECO).
5. 4" W UP TO EXTERIOR CLEANOUT (ECO).
6. 6" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
7. 4" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
8. 4" W UP TO FLOOR CLEANOUT (FCO).
9. 10" INCOMING DOMESTIC COLD WATER UP.
10. 4" DRAIN FROM FLOOR DRAIN (FD) TO TERMINATE INTO FIRE PUMP WATER STORAGE TANK.
11. 4" W UP.
12. 3" V UP.
13. 4" V UP ALONG WALL ABOVE.
14. 2" W UP TO ESEW-1.
15. 8" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
16. 4" W UP IN CHASE ABOVE.
17. 2" V UP IN WALL ABOVE.
18. 2" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
19. 3" W WITH P-TRAP UP TO MOP BASIN (MB).
20. 2" CW FROM ABOVE.
21. 2" BRINE WATER UP.
22. INVERT ELEVATION OF 4" INLET AND OUTLET TO OS-1 IS -2'-0" BFF.
23. 2" W UP.
24. 3" PD TO CONNECT INTO THE TOP OF THE 8"W.
25. 3" W UP TO SS-1.
26. SEE DETAIL 1/P501.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
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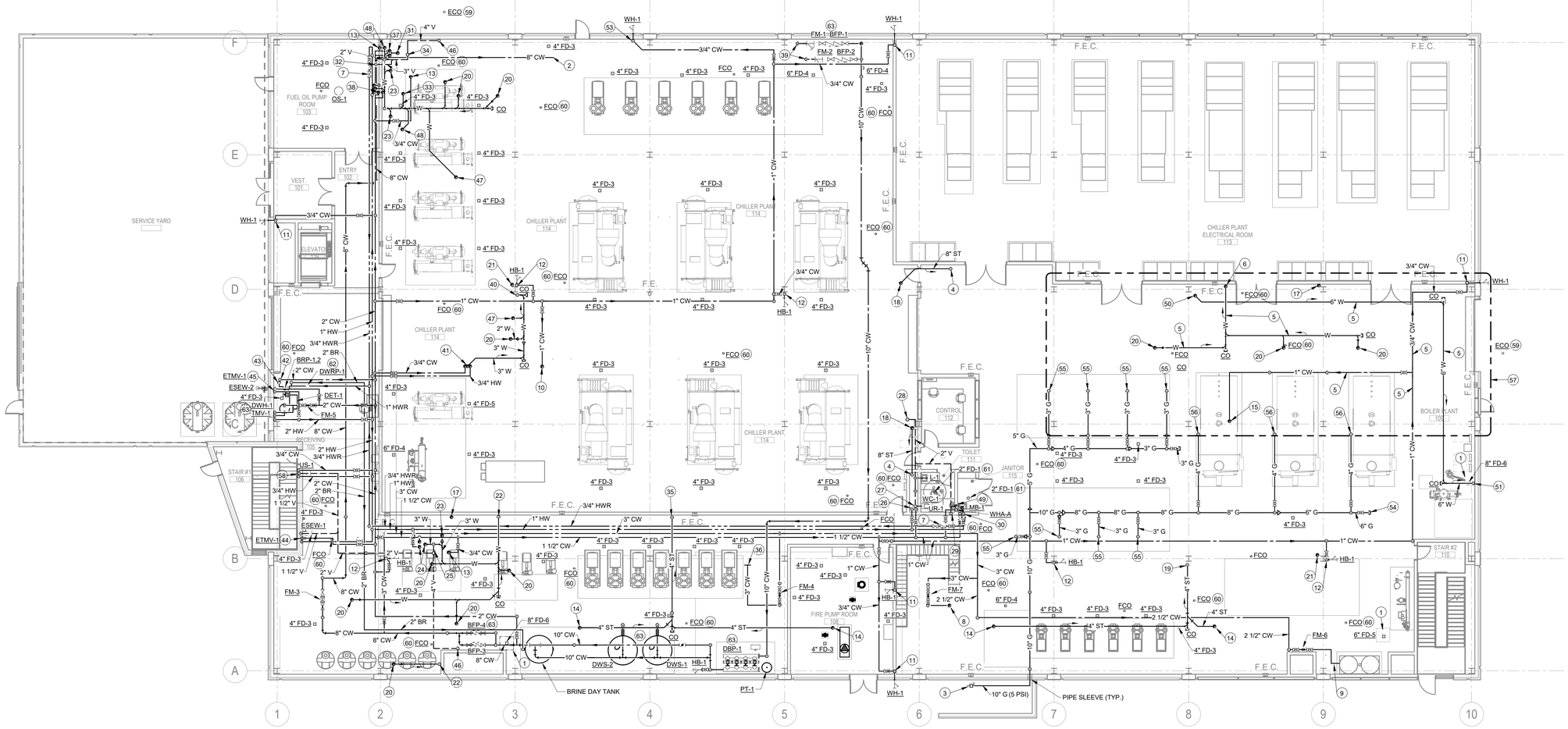
SHEET TITLE

LOWER LEVEL PLUMBING PLAN

SHEET NUMBER

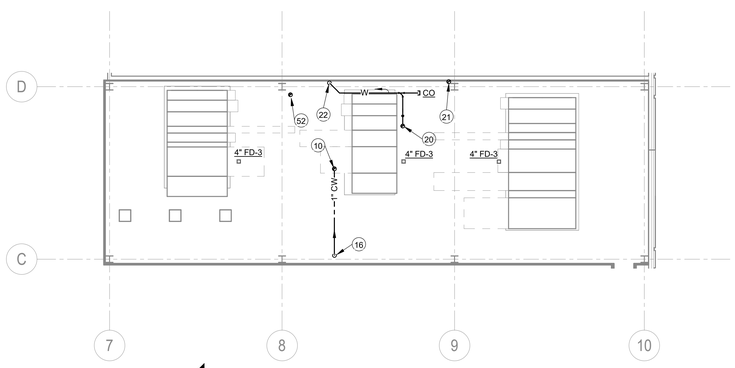
P302

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:27 PM AESI Proj No: 21-154
0 1/2" 1" 2"



FIRST FLOOR PLUMBING PLAN

Scale: 3/32" = 1'-0"



FIRST FLOOR MEZZANINE PLUMBING PLAN

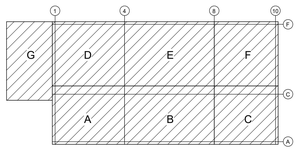
Scale: 3/32" = 1'-0"

GENERAL NOTES:

A. SEE SHEET P001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
B. ALL SANITARY WASTE PIPING TO BE 4" UNLESS OTHERWISE NOTED.

PLAN NOTES:

1. 3' X 3' X 2' CONCRETE DRAINAGE PIT WITH GRATE (BY OTHERS). FLOOR DRAIN (FD) AT BOTTOM OF PIT. SEE DRAINAGE PIT DETAIL 2/P501.
2. TO COOLING TOWER MAKE-UP. SEE SHEET M701.
3. INCOMING GAS SERVICE REDUCED TO 5 PSI. SEE SITE/CIVIL DRAWINGS FOR CONTINUATION. PC TO PROVIDE GAS PRESSURE REGULATOR IF GAS PRESSURE PROVIDED BY GAS COMPANY EXCEEDS 5 PSI. TOTAL GAS LOAD CONNECTED IS 165,728,000 BTUH WITH A FUTURE TOTAL CONNECTED GAS LOAD OF 205,728,000 BTUH. TOTAL DEVELOPED LENGTH IS 200 FT WITH FUTURE LENGTH OF 300 FT. SEE DETAIL 8/P501.
4. 8" ST DOWN. PROVIDE CLEANOUT AT BASE OF STORM RISER.
5. PIPE BELOW MEZZANINE.
6. 4" W FROM ABOVE AND DOWN ALONG WALL.
7. HOT WATER BALANCING VALVE STATION. SEE DETAIL 4/P501. BALANCE TO 2.0 GPM.
8. 3" CW TO HEATING HOT WATER MAKE-UP. SEE SHEET M710.
9. 2 1/2" CW TO CARBON FILTER SYSTEM FOR RO MAKE-UP. SEE SHEET M709.
10. 1" CW UP IN WALL ABOVE.
11. 3/4" CW DROP IN WALL.
12. 3/4" CW DROP ALONG COLUMN.
13. 3/4" CW UP IN WALL ABOVE.
14. 4" ST UP TO DECK DRAIN (DD).
15. 1" CW UP.
16. 1" CW FROM BELOW.
17. 8" ST UP AND DOWN ALONG WALL. PROVIDE CLEANOUT AT BASE OF STORM RISER.
18. 8" ST FROM ABOVE.
19. 4" ST DOWN ALONG COLUMN. PROVIDE CLEANOUT AT BASE OF STORM RISER.
20. 4" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
21. 8" ST UP AND DOWN ALONG COLUMN. PROVIDE CLEANOUT AT BASE OF STORM RISER.
22. 4" W DOWN ALONG WALL.
23. 2" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
24. 3" W WITH P-TRAP UP TO MOP BASIN (MB). 3/4" CW AND 3/4" HW UP IN WALL ABOVE. INSTALL SHUT-OFF VALVES AND CHECK VALVES ON WATER PIPES BEFORE UP IN WALL ABOVE.
25. 4" V UP IN WALL ABOVE.
26. 1 1/2" CW AND 3/4" HW DROP IN CHASE. PROVIDE WHA-A ON COLD WATER PIPE BEFORE WATER CLOSET CONNECTION.
27. 4" W DOWN. 2" V RISE.
28. 2" V UP.
29. 2" V FROM BELOW FLOOR IN WALL.
30. 3/4" CW AND 3/4" HW DROP IN WALL. INSTALL SHUT-OFF VALVES AND CHECK VALVES ON WATER PIPES BEFORE DROP IN WALL. 3" W DOWN FROM MOP BASIN (MB).
31. 2" W WITH P-TRAP UP TO SHOWER (SH) DRAIN.
32. 3" V FROM BELOW FLOOR RISE ALONG WALL..
33. 4" W UP IN CHASE ABOVE.
34. 4" V UP IN CHASE ABOVE.
35. 4" ST DOWN ALONG WALL. PROVIDE CLEANOUT AT BASE OF STORM RISER.
36. 3" CW TO CHILLED WATER MAKE-UP. SEE SHEET M703.
37. 1/2" CW AND 1/2" HW UP IN WALL ABOVE.
38. 2" CW AND 3/4" HW UP IN CHASE ABOVE.
39. INCOMING 10" DOMESTIC COLD WATER FROM BELOW.
40. 4" W DOWN ALONG COLUMN.
41. 3/4" CW AND 3/4" HW UP IN WALL ABOVE. 3" W FROM WALL ABOVE.
42. 2" CW DOWN BELOW FLOOR SLAB.
43. 2" BRINE WATER (BR) FROM BELOW FLOOR SLAB.
44. 1" CW AND 1" HW DROP TO ETMV-1. 1 1/4" TW TO ESEW-1. 2" DOWN AND 1 1/2" V RISE. SEE DETAIL 3/P501.
45. 1" CW AND 1" HW DROP ETMV-1. 1 1/4" TW TO ESEW-2.
46. 4" V FROM BELOW FLOOR SLAB ALONG WALL.
47. 4" W FROM ABOVE.
48. 2" W FROM ABOVE.
49. 3/4" CW DROP IN WALL. 1 1/2" V RISE. 2" W DOWN. PROVIDE WHA-A ON COLD WATER PIPE BEFORE URINAL CONNECTION.
50. 6" W COOLING TOWER DRAIN FROM ABOVE.
51. 6" W DROP ALONG WALL AND TO DRAINAGE PIT.
52. 6" W COOLING TOWER DRAIN FROM ABOVE AND DOWN.
53. 3/4" CW DROP ALONG WALL.
54. VALVE AND CAP 6" G (5 PSI) FOR FUTURE.
55. 3" G (5 PSI) DROP TO HEATING HOT WATER BOILER GAS TRAIN AND GAS PRESSURE REGULATOR (PROVIDED WITH BOILER). INSTALL DIRT LEG. GAS LOAD IS 10,000,000 BTUH. SEE DETAIL 8/P502.
56. 4" G (5 PSI) DROP TO STEAM BOILER GAS TRAIN AND GAS PRESSURE REGULATOR (PROVIDED WITH STEAM BOILER). INSTALL DIRT LEG. GAS LOAD IS 28,576,000 BTUH. SEE DETAIL 8/P502.
57. FIRST FLOOR MEZZANINE (ABOVE). SEE FIRST FLOOR MEZZANINE PLAN THIS SHEET.
58. 3/4" CW AND 3/4" HW DOWN IN WALL TO SS-1. 3" W DOWN, 1-1/2"V RISE.
59. SEE DETAIL 5/P501.
60. SEE DETAIL 6/P501.
61. SEE DETAIL 7/P501.
62. SEE DETAIL 9/P501.
63. SEE SHEET P701 FOR DETAIL AND DIAGRAM.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health
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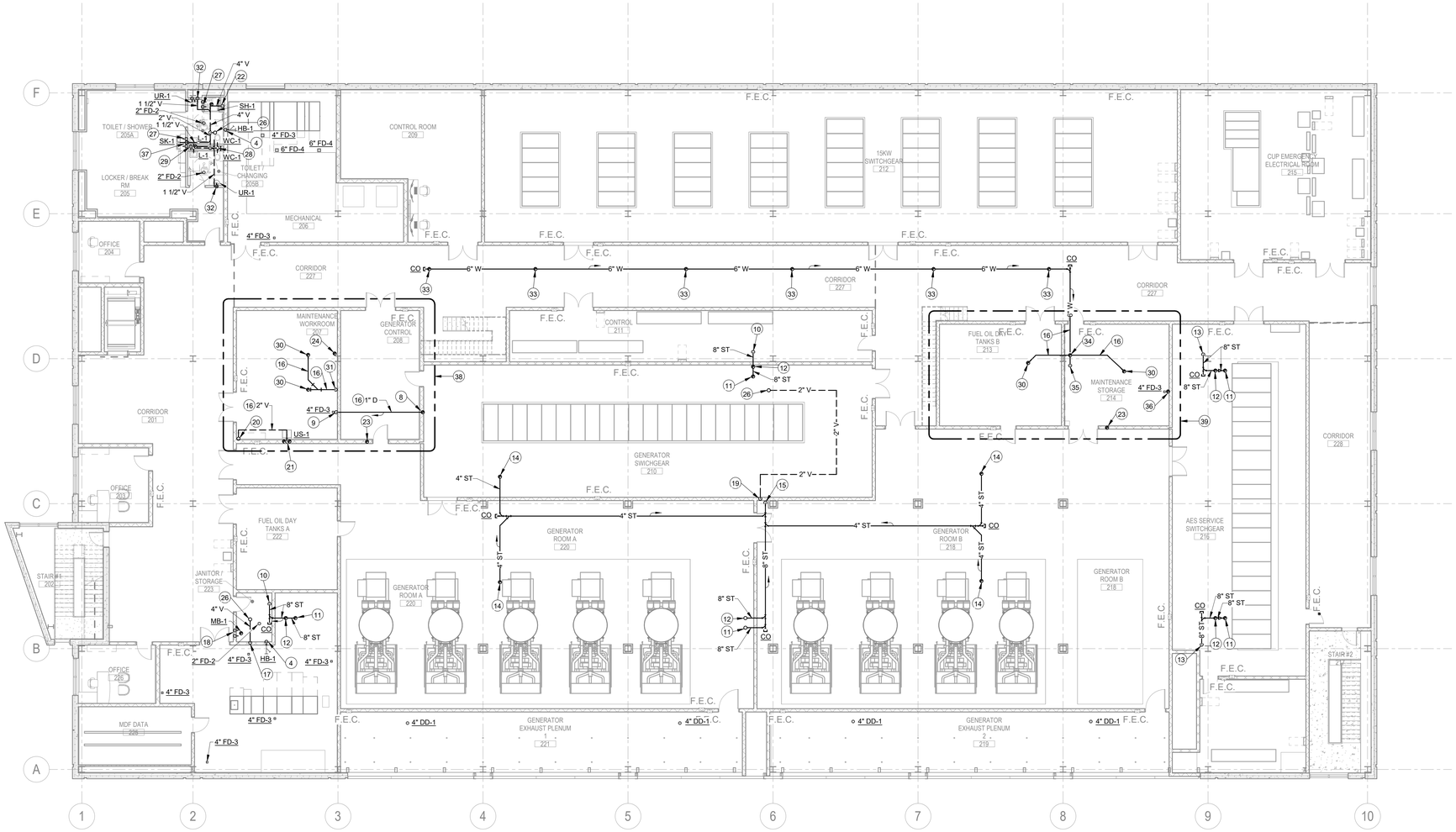
SHEET TITLE

FIRST FLOOR PLUMBING PLAN

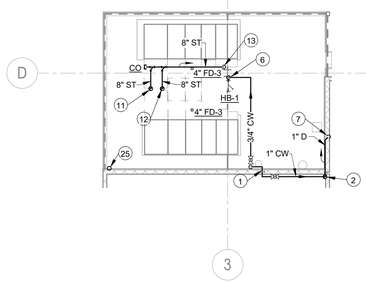
SHEET NUMBER

P303

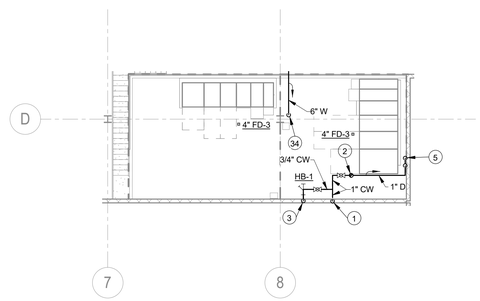
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:35 PM AESI Proj. No: 21-154



SECOND FLOOR PLUMBING PLAN
Scale: 3/32" = 1'-0"



SECOND FLOOR MEZZANINE 1 PLUMBING PLAN
Scale: 3/32" = 1'-0"



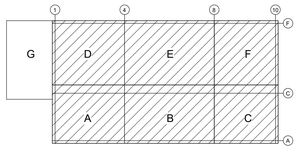
SECOND FLOOR MEZZANINE 2 PLUMBING PLAN
Scale: 3/32" = 1'-0"

GENERAL NOTES:

A. SEE SHEET P001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
B. ALL SANITARY WASTE PIPING TO BE 4" UNLESS OTHERWISE NOTED.

PLAN NOTES:

1. 1" CW FROM BELOW IN WALL.
2. 1" CW UP TO RH-1. 1" D FROM RH-1.
3. 3/4" CW DROP IN WALL TO HB-1.
4. 3/4" CW FROM BELOW IN WALL.
5. 1" DRAIN LINE FROM RH-1 DOWN ALONG WALL AND TERMINATE INTO FLOOR DRAIN (FD) BELOW WITH AIR GAP.
6. 3/4" CW DROP ALONG COLUMN.
7. 1" DRAIN LINE DOWN IN WALL.
8. 1" DRAIN LINE FROM ABOVE IN WALL.
9. 1" DRAIN LINE DROP ALONG WALL AND TERMINATE INTO FLOOR DRAIN (FD) WITH AIR GAP.
10. 8" ST DOWN ALONG WALL.
11. 6" ST UP TO ROOF DRAIN (RD).
12. 6" ST UP TO OVERFLOW ROOF DRAIN (ORD).
13. 8" ST DOWN ALONG COLUMN.
14. 4" ST UP TO DECK DRAIN (DD).
15. 8" ST DOWN.
16. PIPE BELOW MEZZANINE.
17. 4" V UP AND DOWN IN WALL.
18. 3/4" CW AND 3/4" HW FROM BELOW IN WALL. 3" W DOWN FROM MOP BASIN (MB).
19. 2" V FROM BELOW IN WALL.
20. 2" V UP IN CORNER.
21. 3/4" CW AND 3/4" HW FROM BELOW IN WALL. 3" W DOWN ALONG WALL. 2" V RISE.
22. 4" V FROM BELOW IN CHASE.
23. 1" CW UP AND DOWN IN WALL.
24. 8" ST UP AND DOWN ALONG COLUMN.
25. 2" V FROM BELOW IN CORNER. 4" V UP. 4"VTR.
26. 4"V UP. 4"VTR.
27. 1/2" CW AND 1/2" HW FROM BELOW IN WALL.
28. 4" W DOWN. 2" V RISE.
29. 2" CW AND 3/4" HW FROM BELOW IN CHASE. PROVIDE WHA-B ON COLD WATER PIPE BEFORE LAST WATER CLOSET CONNECTION.
30. 4" W WITH P-TRAP UP TO FLOOR DRAIN (FD).
31. 4" W DOWN ALONG WALL.
32. 3/4" CW FROM BELOW IN WALL. 1 1/2" RISE. 2" DOWN.
33. 4" W FROM COOLING TOWER DRAIN. SEE SHEET M701 FOR CONTINUATION.
34. 6" W DROP.
35. 6" W DOWN ALONG COLUMN.
36. 1" DRAIN LINE FROM ABOVE, ALONG WALL AND TERMINATE INTO FLOOR DRAIN (FD) WITH AIR GAP.
37. 1-1/2" V RISE AND 2" W DOWN IN WALL.
38. SECOND FLOOR MEZZANINE 1 (ABOVE). SEE SECOND FLOOR MEZZANINE 1 PLAN THIS SHEET.
39. SECOND FLOOR MEZZANINE 2 (ABOVE). SEE SECOND FLOOR MEZZANINE 2 PLAN THIS SHEET.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

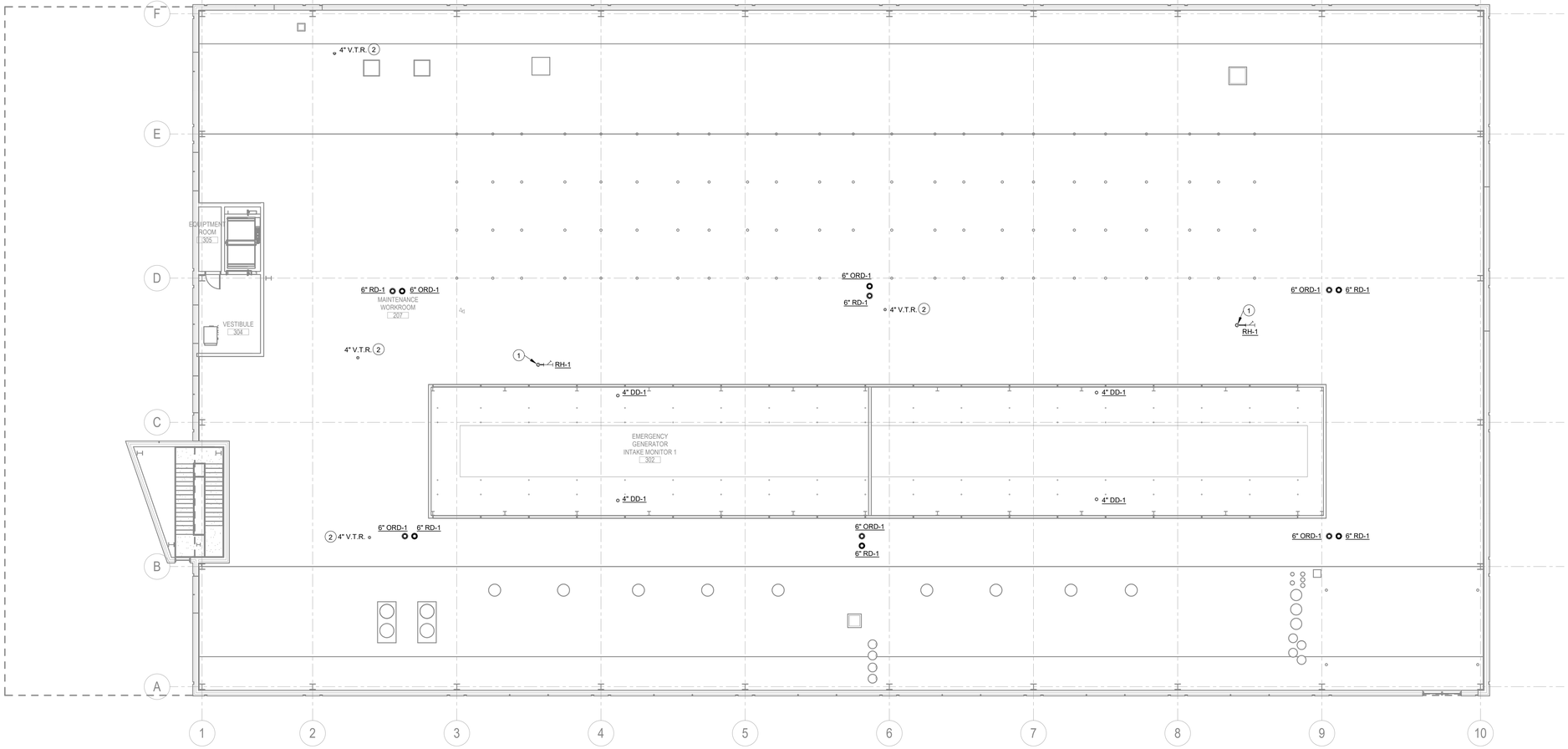
SHEET TITLE

SECOND FLOOR PLUMBING PLAN

SHEET NUMBER

P304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:40 PM AESI Proj. No: 21-154



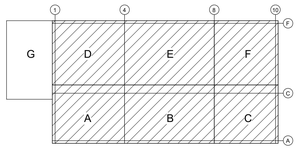
ROOF PLUMBING PLAN
Scale: 3/32" = 1'-0"

GENERAL NOTES:

A. SEE SHEET P001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.

(#) PLAN NOTES:

1. 1" CW FROM BELOW TO RH-1.
2. SEE DETAIL 10/P501.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

ROOF PLUMBING PLAN

SHEET NUMBER

P305

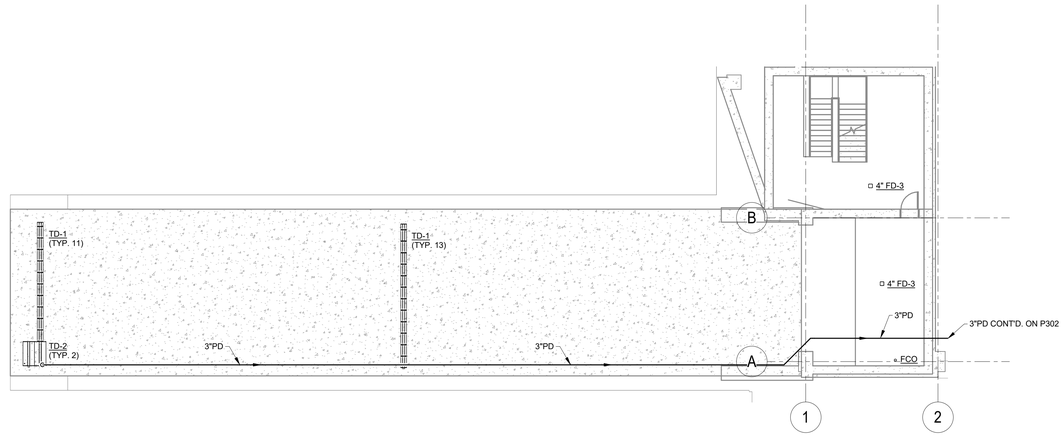
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:42 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

GENERAL NOTES:

A. SEE SHEET P001 FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL GENERAL NOTES.
B. ALL SANITARY WASTE PIPING TO BE 4" UNLESS OTHERWISE NOTED.

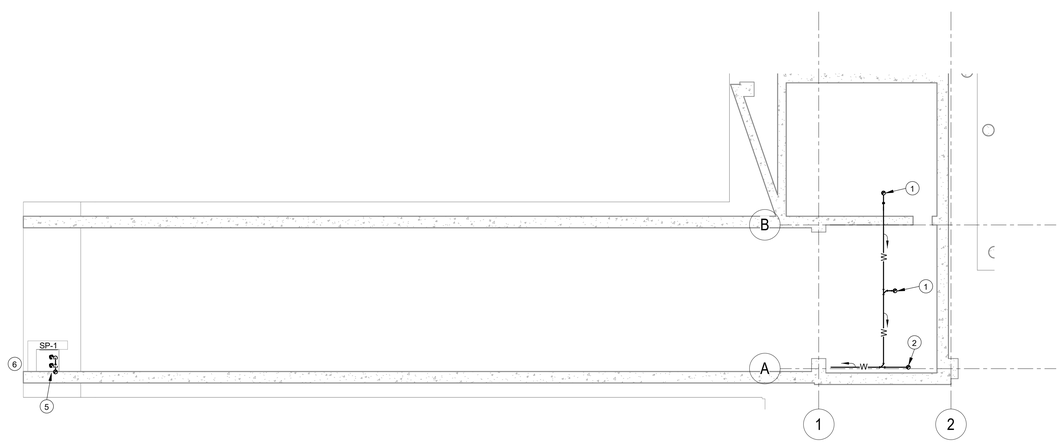
PLAN NOTES:

1. 4"W WITH P-TRAP UP TO FLOOR DRAIN (FD).
2. 4"W UP TO FLOOR CLEANOUT (FCO).
3. 4"W FROM BOTTOM OF CONCRETE TRENCH (BY OTHERS).
4. 6"W INTO PIT AT _____ BELOW TUNNEL FLOOR AT THIS POINT.
5. CONCRETE PIT (BY OTHERS).
6. SEE DETAIL 7/P502.



N

2 **TUNNEL PLUMBING FLOOR PLAN**
Scale: 3/32" = 1'-0"



N

1 **TUNNEL PLUMBING UNDERSLAB PLAN**
Scale: 3/32" = 1'-0"

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY EPW	CERTIFICATION
CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

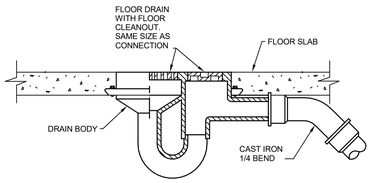
TUNNEL PLUMBING PLAN

SHEET NUMBER

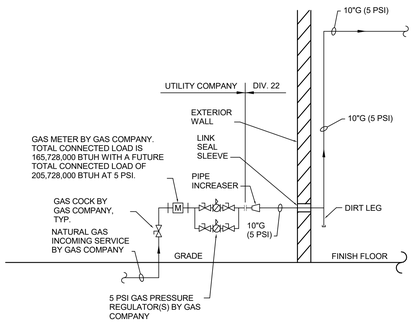
P306

0 1/2" 1" 2"

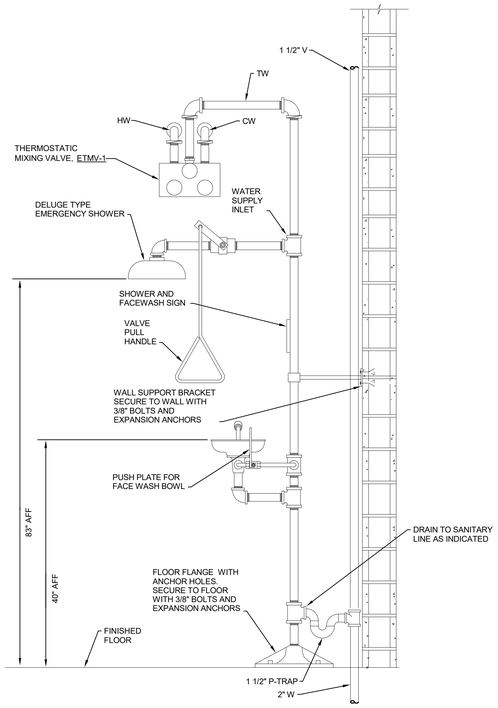
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:43 PM AESI Proj. No: 21-154



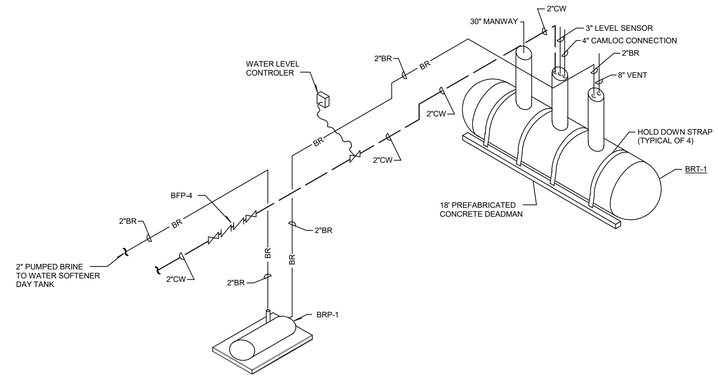
7 / P501 **FLOOR DRAIN DETAIL**
Scale: NONE



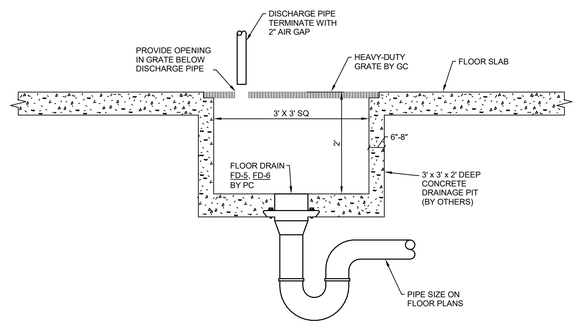
8 / P501 **GAS PIPING DIAGRAM**
Scale: NONE



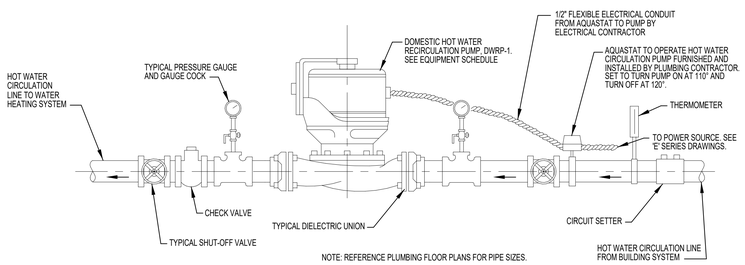
3 / P501 **EMERGENCY SHOWER EYE/FACE WASH ESEW-1 DETAIL**
Scale: NONE



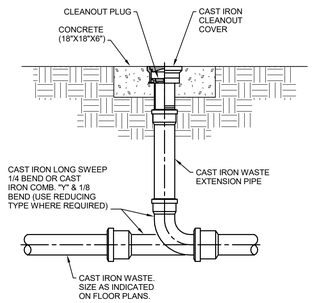
1 / P501 **BRINE TANK PIPING DETAILS**
Scale: NOT TO SCALE



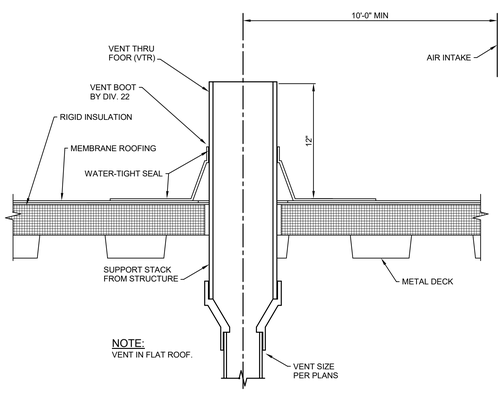
2 / P501 **DRAINAGE PIT DETAIL**
Scale: NONE



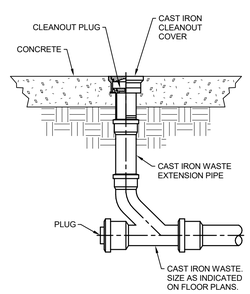
9 / P501 **HOT WATER RECIRCULATING PUMP DETAIL**
Scale: NONE



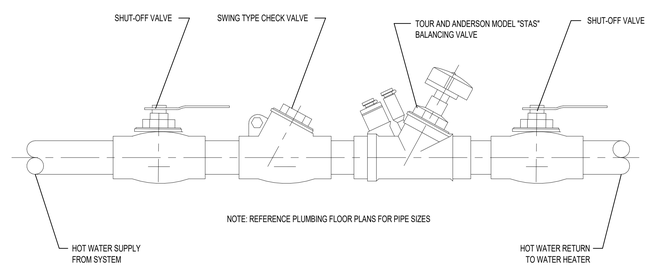
5 / P501 **EXTERIOR CLEANOUT DETAIL**
Scale: NONE



10 / P501 **PLUMBING VENT DETAIL**
Scale: NONE



6 / P501 **FLOOR CLEANOUT DETAIL**
Scale: NONE



4 / P501 **HOT WATER BALANCING VALVE STATION DETAIL**
Scale: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:43 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

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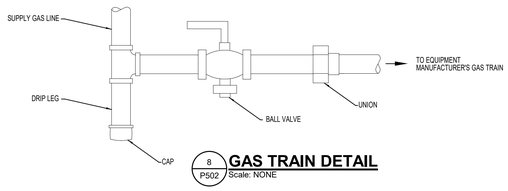
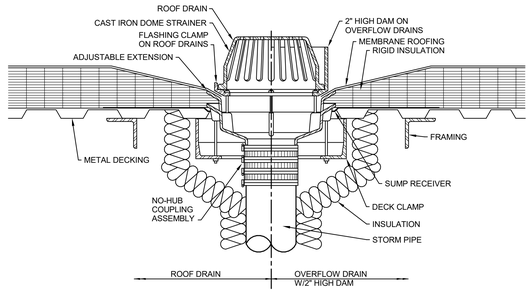
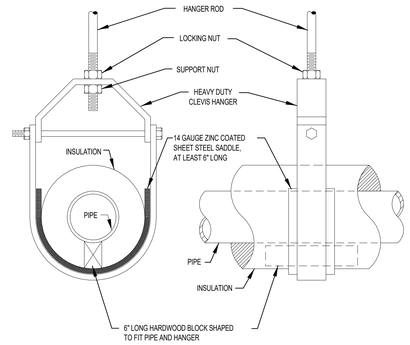
P501



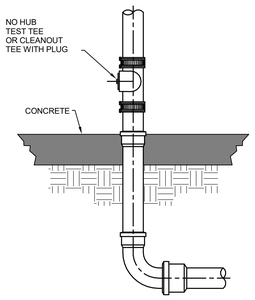
8 / P502 **GAS TRAIN DETAIL**
Scale: NONE



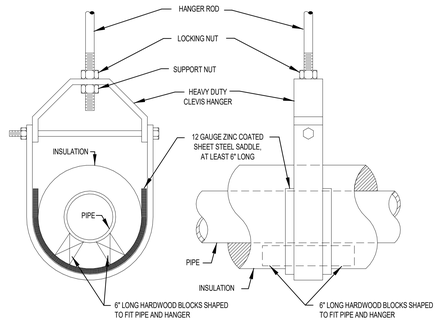
4 / P502 **ROOF DRAIN DETAIL**
Scale: NONE



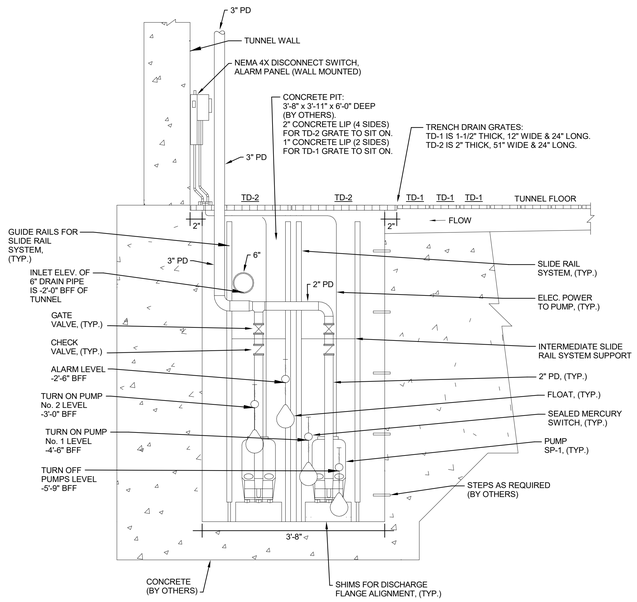
1 / P502 **PIPE HANGER (6 INCH & SMALLER) DETAIL**
Scale: NONE



5 / P502 **TYPICAL CLEANOUT FOR STORM RISER DETAIL**
Scale: NONE

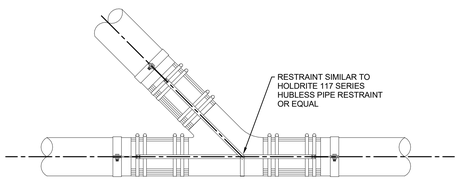


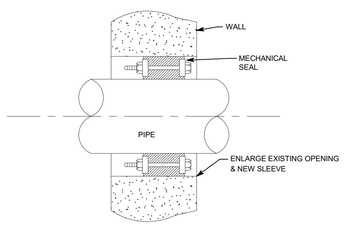
2 / P502 **PIPE HANGER (8 INCH & LARGER) DETAIL**
Scale: NONE



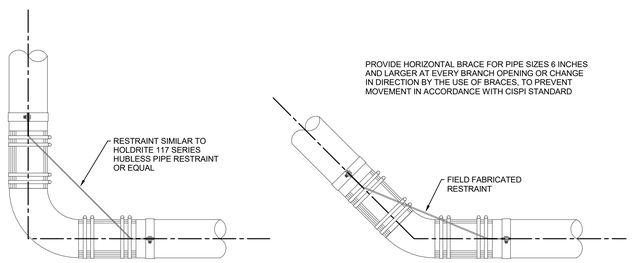
NOTE:
1. SEE FLOOR PLANS FOR TRENCH DRAIN LENGTHS AND NUMBER OF TD-1's THAT WILL BE REQUIRED.
2. THERE WILL BE (2) TD-2's.

7 / P502 **TUNNEL DUPLEX SUMP PUMP DETAIL**
Scale: 12" = 1'-0"





6 / P502 **WALL PENETRATION DETAIL**
Scale: NONE



3 / P502 **PIPE JOINT RESTRAINT (6 INCH & LARGER) DETAIL**
Scale: NONE

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DRAINAGE FIXTURE SCHEDULE

TAG NO.	LOCATION	IPS SIZE	STRAINER	MFR.	MODEL	REMARKS
FD-1	FINISHED AREAS ON GRADE	2"	NICKEL BRONZE, ROUND	J. R. SMITH	2041-A-NB	FLOOR DRAIN: C.I. BODY, 5" ADJUSTABLE NICKEL BRONZE STRAINER, INTEGRAL P-TRAP AND CLEANOUT. PROVIDE SURE SEAL TRAP SEAL IN DRAIN.
FD-2	FINISHED AREAS ABOVE GRADE	2"	NICKEL BRONZE, ROUND	J. R. SMITH	2005Y-A-NB	FLOOR DRAIN: C.I. BODY, 5" ADJUSTABLE NICKEL BRONZE STRAINER, PROVIDE DEEP SEAL P-TRAP WITH BOTTOM CLEANOUT. PROVIDE SURE SEAL TRAP SEAL IN DRAIN.
FD-3	MECHANICAL & PLUMBING EQUIPMENT & GENERAL BUILDING AREAS	4"	1/2 NICKEL BRONZE, SQUARE WITH DOME BOTTOM STRAINER	J. R. SMITH	2635Y-F-C-12-NB	FLOOR DRAIN: C.I. BODY, ACID RESISTANT INTERIOR COATING, SEDIMENT BUCKET AND 1/2 NICKEL BRONZE GRATE. PROVIDE WITH DEEP SEAL P-TRAP. PROVIDE SURE SEAL TRAP SEAL IN DRAIN.
FD-4	INCOMING DOMESTIC WATER FOR BFP-1 AND BFP-2, COOLING TOWER & HEATING HOT WATER SIDE STREAM FILTERS	6"	1/2 NICKEL BRONZE, SQUARE WITH DOME BOTTOM STRAINER	J. R. SMITH	2635Y-F-C-12-NB	FLOOR DRAIN: C.I. BODY, ACID RESISTANT INTERIOR COATING, SEDIMENT BUCKET AND 1/2 NICKEL BRONZE GRATE. PROVIDE WITH DEEP SEAL P-TRAP. PROVIDE SURE SEAL TRAP SEAL IN DRAIN.
FD-5	DRAINAGE PIT	6"	ROUND, LESS GRATE	J. R. SMITH	2143C	FLOOR DRAIN: C.I. BODY AND FLASHING COLLAR, ACID RESISTANT INTERIOR COATING, LESS GRATE. PROVIDE WITH DEEP SEAL P-TRAP.
FD-6	DRAINAGE PITS	8"	ROUND, LESS GRATE	J. R. SMITH	2143C	FLOOR DRAIN: C.I. BODY AND FLASHING COLLAR, ACID RESISTANT INTERIOR COATING, LESS GRATE. PROVIDE WITH DEEP SEAL P-TRAP.
TD-1	TUNNEL RAMP	N/A	12" WIDE, BLACK DUCTILE IRON	NEENAH FOUNDRY	R-4990-CX	TRENCH DRAIN GRATES AND FRAMES: HEAVY DUTY, UNBOLTED, TYPE A GRATES, TYPE B FRAMES, 24" LONG X 12" WIDE X 1-1/2" THICK.
TD-2	TUNNEL RAMP PIT	N/A	51" WIDE, BLACK DUCTILE IRON	NEENAH FOUNDRY	R-4990-OX	TRENCH DRAIN GRATES AND FRAMES: HEAVY DUTY, UNBOLTED, TYPE A GRATES, TYPE B FRAMES, 24" LONG X 51" WIDE X 2" THICK.
RD-1	ROOF	6"	C.I. DOME	J. R. SMITH	1015Y-R-C-CID	ROOF DRAIN: C.I. BODY, ADJUSTABLE EXTENSION SLEEVE, FLASHING CLAMP AND GRAVEL STOP, SUMP RECEIVER, UNDERDECK CLAMP, C.I. DOME.
ORD-1	ROOF	6"	C.I. DOME	J. R. SMITH	1045Y-R-C-CID	OVERFLOW ROOF DRAIN: C.I. BODY, ADJUSTABLE EXTENSION SLEEVE, FLASHING CLAMP AND 2" WATER DAM, SUMP RECEIVER, UNDERDECK CLAMP, C.I. DOME.
DD-1	ROOF	4"	C.I. ROUND	J. R. SMITH	1450Y-R-C-M	DECK DRAIN: C.I. BODY, FLASHING CLAMP WITH SEEPAGE OPENINGS, SUMP RECEIVER, UNDERDECK CLAMP, DUCTILE IRON GRATE.
FCO	FINISHED AREAS ON GRADE	4"	NICKEL BRONZE, ROUND	J. R. SMITH	4021S	FLOOR CLEANOUT: C.I. BODY, ROUND ADJUSTABLE SCORIATED SECURED NICKEL BRONZE TOP, BRONZE PLUG FLANGE WITH FLASHING CLAMP.
ECO	OUTSIDE AT GRADE	4"	C.I. ROUND	J. R. SMITH	4251S	EXTERIOR CLEANOUT: C.I. BODY, DOUBLE FLANGE HOUSING, HEAVY DUTY SECURED SCORIATED CAST IRON COVER, LIFTING DEVICE, GASKET SEAL, BRONZE PLUG.

WATER HAMMER ARRESTER SCHEDULE

MARK	IPS SIZE	FIXTURE UNIT RATING	PRESSURE RATING	J.R. SMITH MOD. NO.	WADE MOD. NO.	ZURN MOD. NO.	REMARKS
WHA-A	3/4"	1 TO 11	150 PSIG	5005	W-5	100	P.D.I. CERTIFIED
WHA-B	1"	12 TO 32	150 PSIG	5010	W-10	200	P.D.I. CERTIFIED
WHA-C	1"	33 TO 60	150 PSIG	5020	W-20	300	P.D.I. CERTIFIED
WHA-D	1"	61 TO 113	150 PSIG	5030	W-50	400	P.D.I. CERTIFIED
WHA-E	1"	114 TO 154	150 PSIG	5040	W-75	500	P.D.I. CERTIFIED

PLUMBING EQUIPMENT SCHEDULE

TAG NO.	DESCRIPTION	PIPE CONNECTIONS				PERFORMANCE				MFG.	MODEL #	NOTES
		WASTE	VENT	CW	HW	GPM	P.D.	AMPS/Hp	VOLTS/HZ/PH			
BFP-1 BFP-2	REDUCED PRESSURE ZONE ASSEMBLY BACKFLOW PREVENTERS	3"	N/A	8"	N/A	1000	12 PSIG	N/A	N/A	WATTS	8" LF909-OSY-S-FDA	MAIN SUPPLY: PROVIDE STRAINER AND AIR GAP DRAIN FITTING. INSTALL STRAINER UPSTREAM OF BFP AND DOWNSTREAM OF ISOLATION VALVE (TYPICAL). ROUTE DRAIN LINE FROM AIR GAP TO NEAREST FLOOR DRAIN.
BFP-3 BFP-4	REDUCED PRESSURE ZONE ASSEMBLY BACKFLOW PREVENTERS	3"	N/A	8"	N/A	800	13 PSIG	N/A	N/A	WATTS	6" LF909-OSY-S-FDA	HYDRONIC MAKE-UP: PROVIDE STRAINER AND AIR GAP DRAIN FITTING. INSTALL STRAINER UPSTREAM OF BFP AND DOWNSTREAM OF ISOLATION VALVE (TYPICAL). ROUTE DRAIN LINE FROM AIR GAP TO NEAREST DRAINAGE PIT/FLOOR DRAIN.
FM-1 FM-2	INCOMING DOMESTIC WATER FLOW METERS	N/A	N/A	6"	N/A	1000	N/A	N/A	N/A	ENDRESS + HAUSER	PROMAG	MAIN SUPPLIES, ELECTROMAGNETIC TYPE, CONNECT TO BMS AND SETUP TO RECORD HOURLY DATA.
FM-3	COOLING TOWER MAKE-UP WATER FLOW METER	N/A	N/A	4"	N/A	800	N/A	N/A	N/A	ENDRESS + HAUSER	PROMAG	COOLING TOWER MAKE-UP, ELECTROMAGNETIC TYPE, CONNECT TO BMS AND SETUP TO RECORD HOURLY DATA.
FM-4	CHILLED WATER MAKE-UP WATER FLOW METER	N/A	N/A	2"	N/A	30	N/A	N/A	N/A	ENDRESS + HAUSER	PROMAG	CHILLED WATER MAKE-UP, ELECTROMAGNETIC TYPE, CONNECT TO BMS AND SETUP TO RECORD HOURLY DATA.
FM-5	DOMESTIC HOT WATER MAKE-UP WATER FLOW METER	N/A	N/A	2"	N/A	30	N/A	N/A	N/A	ENDRESS + HAUSER	PROMAG	DOMESTIC HOT WATER MAKE-UP, ELECTROMAGNETIC TYPE, CONNECT TO BMS AND SETUP TO RECORD HOURLY DATA.
FM-6	RO MAKE-UP WATER FLOW METER	N/A	N/A	2 1/2"	N/A	70	N/A	N/A	N/A	ENDRESS + HAUSER	PROMAG	RO MAKE-UP, ELECTROMAGNETIC TYPE, CONNECT TO BMS AND SETUP TO RECORD HOURLY DATA.
FM-7	HEATING HOT WATER MAKE-UP WATER FLOW METER	N/A	N/A	3"	N/A	30	N/A	N/A	N/A	ENDRESS + HAUSER	PROMAG	HEATING HOT WATER MAKE-UP, ELECTROMAGNETIC TYPE, CONNECT TO BMS AND SETUP TO RECORD HOURLY DATA.
DWH-1	DOMESTIC WATER HEATER	FD	N/A	1 1/2"	1 1/2"	SEE NOTES	N/A	21.6 AMPS	480/60/3	BOCK	CE119-3D	DIGITAL ELECTRIC STORAGE WATER HEATER: 18.0 KW, 119 GALLON CAPACITY, GLASS LINED, UNIT CAPABLE OF HEATING 72 GPH FROM 40 DEG F TO 140 DEG F.
DET-1	DOMESTIC HOT WATER EXPANSION TANK	N/A	N/A	1"	N/A	N/A	N/A	N/A	N/A	AMTROL	ST-12C-DD	AMTROL THERM-X-TROL THERMAL EXPANSION TANK. ASME CONSTRUCTED, 6.4 GALLON TANK VOLUME AND NON-FERROUS MATERIALS.
TMV-1	THERMOSTATIC MIXING VALVE	N/A	N/A	1"	1" HW, 1 1/4" TW	28	5 PSIG	N/A	N/A	LAWLER	802 UNIT 86008	THERMOSTATIC MIXING VALVE, ALL BRONZE CONSTRUCTION WITH THERMOMETER, SHUT-OFF VALVES AND UNIONS. SET POINT OF 110 DEG F.
ETMV-1	EMERGENCY THERMOSTATIC MIXING VALVE	N/A	N/A	1"	1" HW, 1 1/4" TW	35	10 PSIG	N/A	N/A	LAWLER	911	EMERGENCY SAFETY SHOWER AND EYEWASH THERMOSTATIC MIXING VALVE, ROUGH CHROME PLATED FINISH WITH THERMOMETER, SHUT-OFF VALVES, CHECK VALVES AND UNIONS.
DWS-1 DWS-2	DOMESTIC WATER SOFTENERS	6"	N/A	8"	N/A	NORM: 700 GPM MAX: 1,000 GPM	NORM: 15 PSID MAX: 25 PSID	3 AMPS	120/60/1	NANCREDE ENGINEERING	NECO MHC-3600-8	DUPLEX WATER SOFTENER SYSTEM WITH BRINE DAY TANK WATER METER ON DEMAND REGENERATION UNIT, ELECTRONIC CONTROLS.
DBP-1	DOMESTIC WATER BOOSTER PUMP	N/A	N/A	10"	N/A	250 EACH	+55 PSI	15 HP EACH	460/60/3	TIGERFLOW	SERIES ES-3000-H-VFD MODEL QESH-15EB-C-S8-CC-P-VFD	QUADRAPLEX BOOSTER PUMP PACKAGE, VARIABLE SPEED DRIVE, SKID MOUNTED. PROVIDE WITH BAS INTERFACE CAPABILITY.
BRT-1	BRINE TANK	N/A	8"	1"	2" BRINE	N/A	N/A	N/A	N/A	NANCREDE ENGINEERING	NEDW1026	13,000 GALLON UNDERGROUND DOUBLE WALL BRINE TANK, 10' X 26'. WITH WATER LEVEL ULTRASONIC CONTROLLER, SALT LEVEL INDICATOR AND CONCENTRATOR MONITOR, INTERNAL FIBERGLASS LADDER, DUST BAG HOUSING, NSF 61 LABEL, 12" GRAVEL BED, H25 RATED TRAFFIC COVERS, AND CONCRETE ANCHOR SYSTEM
BRP-1 BRP-2	DUPLEX BRINE PUMPS	N/A	N/A	2" BRINE	N/A	25	30 PSIG	2 HP EACH	460/60/3	FINISH THOMPSON	DB15	POLYPROPYLENE MAG DRIVE PUMPS, DUPLEX BASE MOUNTED PUMPS WITH CONTROL PANEL.
PT-1	PRESSURE TANK	N/A	N/A	1"	N/A	N/A	N/A	N/A	N/A	TIGERFLOW	TF-185-E	185 GALLON, BLADDER TYPE EXPANSION TANK; REMOVABLE BUTYL BLADDER
SP-1	DUPLEX SUMP PUMPS	2" EACH	N/A	N/A	N/A	109	40' TDH	2 HP EACH	460/60/3	ZOELLER	4189	DOUBLE SEAL PUMPS, Z-RAIL SYSTEM, DUPLEX PUMPS CONTROL/ALARM PANEL, FLOAT TREE WITH FLOATS.
OS-1	OIL SEPARATOR	4"	3"	N/A	N/A	75	N/A	N/A	N/A	STRIEM	OS-75-4M-C24-HP-SR24	110 GALLON LIQUID CAPACITY; OIL: 93 GAL.; SAND: 11 GAL.; H2O RATED PICKABLE CAST IRON COVER, PROVIDE RISER HEIGHT AS REQUIRED TO BE FLUSH WITH FINISH FLOOR.
DWRP-1	DOMESTIC HOT WATER RECIRCULATION PUMP	N/A	N/A	N/A	1"	4	20' TDH	1.02 AMPS	115/60/1	BELL AND GOSSETT	ECOCIRC 20-18	STAINLESS STEEL CONSTRUCTION, PROVIDE STRAP ON AQUASTAT TO START AND STOP PUMP ON 10 DEGREE TEMPERATURE VARIATION IN RETURN MAIN.

PLUMBING FIXTURE SCHEDULE

TAG NO.	DESCRIPTION (LOCATION)	PIPE ROUGH-IN CONNECTIONS					PERFORMANCE	MFG.	MODEL #	MOUNTING HEIGHT	NOTES
		WASTE	VENT	CW	HW	TW	GPM				
WC-1	WATER CLOSET - ADA: (TOILET 111, TOILET/SHOWER 205A, TOILET/CHANGING 205B)	4"	2"	1"	N/A	N/A	1.28 (GPF)	AMERICAN STANDARD SLOAN	AFWALL MILLENNIUM FLOWISE 2257.101 ROYAL 111-1.28	16-1/2" AFF TO RIM	WATER CLOSET: ADA MOUNTING HEIGHT, WHITE ELONGATED VITREOUS CHINA BOWL, WALL MOUNTED, 1 1/2" TOP SPUD. FLUSH VALVE: CHROME PLATED BRASS, 1.28 GPF MANUAL FLUSH VALVE, CHROME ESCUTCHEON PLATE, VACUUM BREAKER, SWEAT SOLDER ADAPTER, WATERSENSE LISTED. SEAT: BEMIS 2155SSCT COMMERCIAL, ANTI-MICROBIAL SURFACE PLASTIC SEAT WITH SELF SUSTAINING/CHECK TYPE HINGES AND SS HARDWARE, WHITE. CARRIER: J.R. SMITH 100 SERIES.
UR-1	URINAL - ADA: (TOILET 111, TOILET/SHOWER 205A, TOILET/CHANGING 205B)	2"	1 1/2"	3/4"	N/A	N/A	1 GALLON EVERY 72 HOURS	SLOAN	HYB-1000	17" AFF TO LIP	URINAL: ADA MOUNTING HEIGHT, HYBRID URINAL WITH JETRINSE SOLUTION TECHNOLOGY, VITREOUS CHINA, WHITE. AUTOMATIC CLEANING FLUSH EVERY 72 HOURS. WATERFREE NORMAL OPERATION. 6V LITHIUM BATTERY POWERED. WATERSENSE LISTED. CARRIER: J.R. SMITH 600 SERIES.
L-1	LAVATORY - ADA: (TOILET 111, TOILET/SHOWER 205A, TOILER/CHANGING 205B)	2"	1 1/2"	1/2"	1/2"	N/A	0.35	AMERICAN STANDARD CHICAGO FAUCET	LUCERNE 0355.027 420-T45E39VPABCP	34" AFF TO RIM	LAVATORY: ADA MOUNTING HEIGHT, WALL-HUNG, VITREOUS CHINA, WHITE, 20 1/2" X 18 1/4", FAUCET HOLES ON 4" CENTERS. FAUCET: DECK MOUNTED, POLISHED CHROME, 4" CENTERS, MANUAL FAUCET, 0.35 GPM FLOW AERATOR, WATERSENSE LISTED. DRAIN: CHROME PLATED OFFSET GRID STRAINER, CHROME PLATED, 17 GA BRASS, P-TRAP TAIL PIECE, EXTENSION AND BOX ESCUTCHEON. SUPPLIES: CHICAGO FAUCET 1017 SOFT SUPPLY TUBES AND LOOSE KEY ANGLE STOP VALVES, CHROME PLATED. INSULATION: TRUBRO HOT WATER, COLD WATER AND DRAIN INSULATION KIT. CARRIER: J.R. SMITH 700 SERIES.
SH-1	SHOWER - ADA: (TOILET/SHOWER 205A)	2"	N/A	1/2"	1/2"	N/A	1.5 / 1.5	AQUATIC CHICAGO FAUCET	1363BFSCST SH-PB1-11-031	SHOWER VALVE 42" AFF. DIVERTER VALVE 54" AFF. SHOWER HEAD 75" AFF.	SHOWER: 36"W x 36"D x 75 1/8"H INTERIOR, ACRYLIC SURFACE, WHITE FINISH, CENTER DRAIN, L-SHAPED GRAB BAR, FOLD-UP SEAT, CURTAIN ROD AND CURTAIN, CENTER BRASS DRAIN, SOAP DISH, VINYL FLEXIBLE WATER DAM. SHOWER VALVE: PRESSURE BALANCED, BRASS BODY CONSTRUCTION WITH 1.5 GPM ADJUSTABLE FLOW SHOWER HEAD AND 1.5 GPM HAND SPRAY, 24" WALL MOUNTED SLIDE BAR, 59" STAINLESS STEEL HOSE AND PUASE CONTROL, INLINE VACUUM BREAKER, DIVERTER VALVE. WATERSENSE LISTED. DRAIN: BRASS TO FIT DRAIN OPENING, CHROME, STAINLESS-STEEL STRAINER, DEEP SEAL P-TRAP.
SK-1	SINK: (LOCKER/BREAK 205)	2"	1 1/2"	1/2"	1/2"	N/A	1.5	JUST CHICAGO FAUCET	DLN-1933-A-GR 201-AG8AE35-317VAB	UNDERMOUNT	SINK: 304 STAINLESS STEEL, 18 GA, DOUBLE BOWL, UNDERCOATED, DIMENSIONS - OVERALL 33" X 19" X 8", BOWLS 14" X 14" X 8", (3) HOLES - 4" CENTERS, CENTER DRAINS. FAUCET: DECK MOUNTED, 8" CENTER, CERAMIC CARTRIDGE, 8" SWING SPOUT, 4" WRIST BLADES, 1.5 GPM LAMINAR FLOW, CHROME PLATED, WATERSENSE LISTED. DRAIN: LK58 DRAIN FITTING, 2" PVC TAIL PIECE, PVC P-TRAP AND ARM AND ESCUTCHEON, CHROME PLATED. SUPPLIES: CHICAGO FAUCET 1017 SOFT SUPPLY TUBES AND LOOSE KEY ANGLE STOP VALVES, CHROME PLATED.
MB-1	MOP BASIN: (JANITOR 115 & JANITOR/STORAGE 223)	3"	1 1/2"	1/2"	1/2"	N/A	FULL	FIAT CHICAGO FAUCET	TSB3000 897-RCF	FLOOR MOUNTED	MOP BASIN: ONE PIECE PRECAST TERRAZZO, 24"X24"X12" HIGH WITH 6" DROP FRONT, SS CAPS ON ALL CURBS, SS WALL GUARDS, SS STRAINER, 3" WASTE PIPE, WALL MOUNTED MOP BRACKET, WALL MOUNTED HOSE BRACKET WITH HOSE, SILICONE SEALANT. FAUCET: CHROME PLATED, QUARTER TURN, LEVER HANDLES, BRACING ROD, INTEGRAL STOP VALVES, VACUUM BREAKER.
SS-1	SERVICE SINK: (MAINTENANCE WORKROOM 207)	3"	1 1/2"	1/2"	1/2"	N/A	FULL	AMERICAN STANDARD CHICAGO FAUCET	AKRON 7695.008 305-VBXKCCP	26-1/4" AFF TO RIM	SERVICE SINK: ENAMELED CAST IRON WITH SUPPLIED WALL HANGER AND RIM GUARD. FAUCET: 3" BRASS SPOUT, INTEGRAL CHECK STOPS, CERAMIC DISC VALVE CARTRIDGES, VACUUM BREAKER, CHROME PLATED. DRAIN: TRAP STANDARD 7708.030, 3" CAST IRON P-TRAP STANDARD TO WALL AND STRAINER. STOP VALVES: CHICAGO FAUCET 1017 STOPS AND SUPPLY TUBES, ESCUTCHEONS, CHROME PLATED.
HB-1	HOSE BIBB: (INDOOR)	N/A	N/A	3/4"	N/A	N/A	FULL	WOODFORD	26-BR	24" AFF	HOSE BIBB: 3/4" INLET, 3/4" HOSE CONNEECTION, ROUGH BRASS FINISH, STEEL WHEEL HANDLE, TWO INDEPENDENT CHECK VALVES, BACKFLOW PREVENTER.
WH-1	WALL HYDRANT: (OUTDOOR)	N/A	N/A	3/4"	N/A	N/A	FULL	WOODFORD	B67-CH	24" ABOVE EXT. GRADE	WALL HYDRANT: 3/4" INLET, 3/4" HOSE CONNECTION, CHROME FINISH, DOUBLE CHECK BACKFLOW PREVENTER, AUTOMATIC DRAINING, BRASS BODY, LOCKABLE COVER, FREEZELESS, REMOVABLE KEY, ANGLED HOSE CONNECTION, WALL CLAMP, .
RH-1	ROOF HYDRANT: (ROOF)	1"	N/A	1"	N/A	N/A	FULL	WOODFORD	RHY2-1-MS	30" ABOVE ROOF	ROOF HYDRANT: DUAL CHECK BACKFLOW PREVENTER, 3/4" HOSE CONNECTION, ASSE 1052 LISTED, 1" NPT FEMALE INLET CONNECTION, 1 1/4" U.S. MADE GALVANIZED PIPE CASING, 1/8" NPT DRAIN HOLE, UNDER DECK FLANGE, MOUNTING BOLTS, AUTOMATIC DRAINING WHEN SHUT OFF.
ESEW-1	EMERGENCY SHOWER EYE/FACE WASH: (RECEIVING 105)	2"	1 1/2"	1"	1"	1 1/4"	20 SHOWER HEAD; 3.2 FACE/EYE WASH	GUARDIAN	GBF1909	FLOOR MOUNTED	EMERGENCY SHOWER & FACE/EYE WASH: COMBINATION UNIT. SHOWER: ABS PLASTIC DRENCH SHOWER, STAY OPEN FULL PORT BALL VALVE WITH PULL ROD. FACE/EYE WASH: ABS PLASTIC BOWL RECEPTOR, STAINLESS STEEL PUSH FLAG, LAMINAR FLOW, FACE WASH. DRAIN (FACE/EYE WASH): 1 1/2" BRASS P-TRAP, CHROME PLATED. PIPING: 1 1/2" HOT DIPPED GALVANIZED. ETMV-1: PROVIDE ETMV-1 AT ESEW-1 LOCATION.
ESEW-2	EMERGENCY SHOWER EYE/FACE WASH: (SERVICE YARD - OUTDOOR)	N/A	N/A	1"	1"	1 1/4"	20 SHOWER HEAD; 3.2 FACE/EYE WASH	GUARDIAN	GFR35007-TL	FLOOR MOUNTED	EMERGENCY SHOWER & FACE/EYE WASH: COMBINATION UNIT, ELECTRIC HEAT-TRACED 120V, ALARM HORN, LIGHT AND REMOTE SENSING CAPABILITY. SHOWER: ABS PLASTIC DRENCH SHOWER, STAY OPEN FULL PORT BALL VALVE WITH PULL ROD. FACE/EYE WASH: STAINLESS STEEL PUSH FLAG, LAMINAR FLOW, FACE WASH. DRAIN (FACE/EYE WASH): NONE. PIPING: 1 1/2" HOT DIPPED GALVANIZED. ETMV-1: PROVIDE ETMV-1 AT ESEW-2 LOCATION. INSTALL ETMV-1 IN NON-FREEZING ENVIRONMENT (INSIDE BUILDING).

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:46 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

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APPROVED BY: Approver
PROJECT NO. 21-154

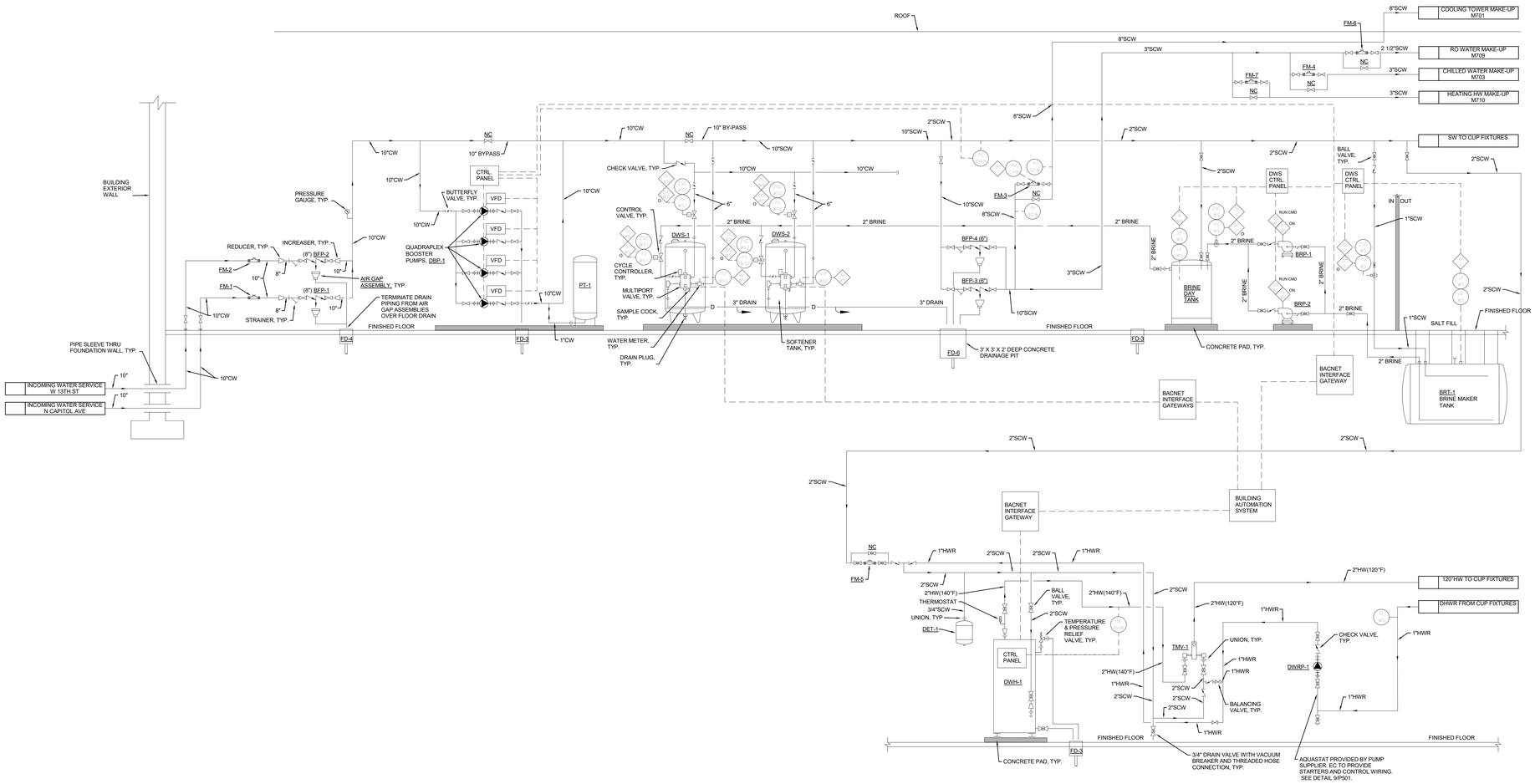
CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

PLUMBING SCHEDULES

SHEET NUMBER

P601



1 **DOMESTIC WATER DIAGRAM**
Scale: 12" = 1'-0"

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PROJECT NO. 21-154	

SHEET TITLE

PLUMBING DIAGRAMS

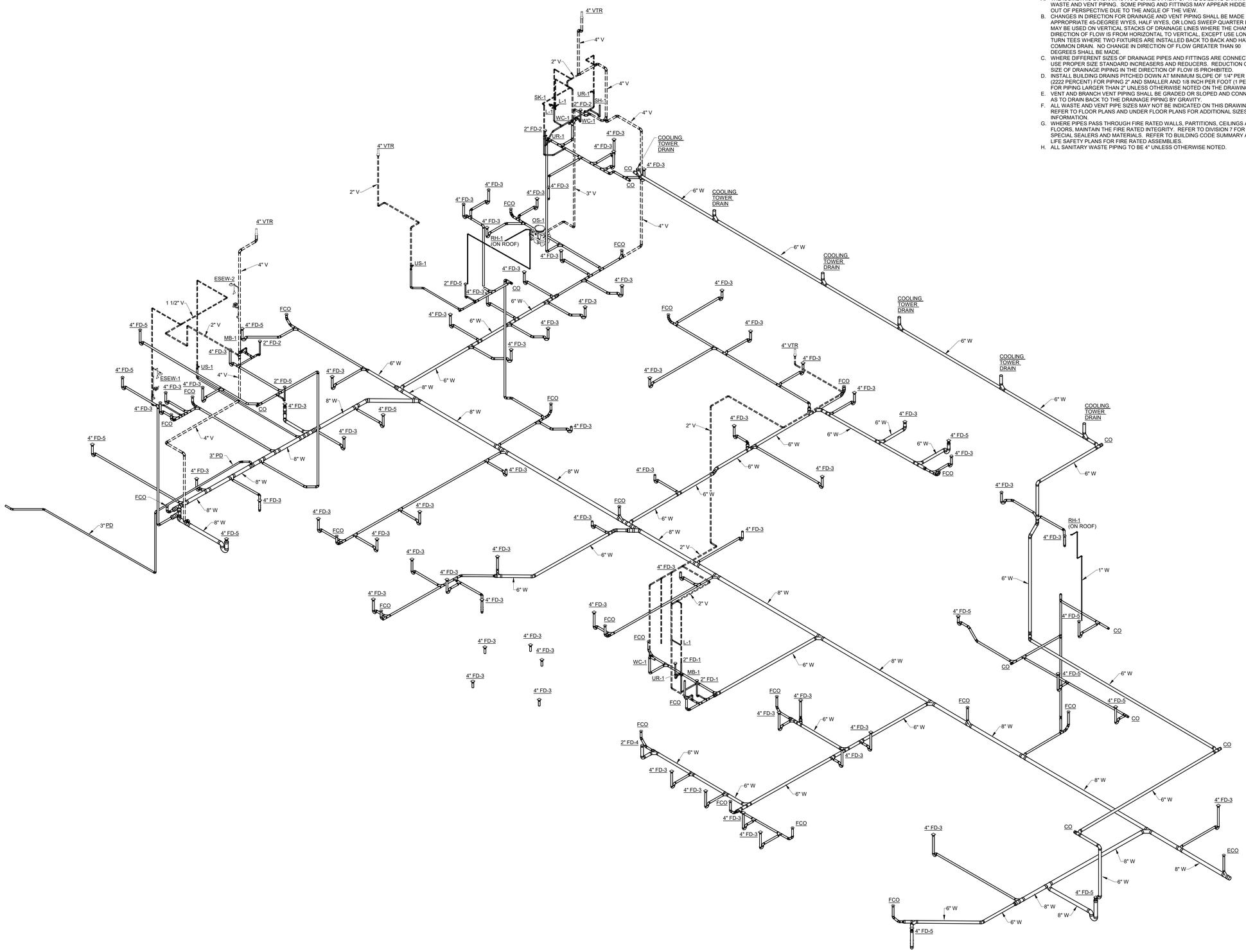
SHEET NUMBER

P701

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:46 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

GENERAL NOTES:

A. THE ISOMETRIC DIAGRAM IS A 3-D CAMERA VIEW OF THE BUILDING SANITARY, WASTE AND VENT PIPING. SOME PIPING AND FITTINGS MAY APPEAR HIDDEN OR OUT OF PERSPECTIVE DUE TO THE ANGLE OF THE VIEW.
B. CHANGES IN DIRECTION FOR DRAINAGE AND VENT PIPING SHALL BE MADE USING APPROPRIATE 45-DEGREE WYES, HALF WYES, OR LONG SWEEP QUARTER BENDS MAY BE USED ON VERTICAL STACKS OF DRAINAGE LINES WHERE THE CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL, EXCEPT USE LONG TURN TEES WHERE TWO FIXTURES ARE INSTALLED BACK TO BACK AND HAVE A COMMON DRAIN. NO CHANGE IN DIRECTION OF FLOW GREATER THAN 90 DEGREES SHALL BE MADE.
C. WHERE DIFFERENT SIZES OF DRAINAGE PIPES AND FITTINGS ARE CONNECTED, USE PROPER SIZE STANDARD INCREASERS AND REDUCERS. REDUCTION OF THE SIZE OF DRAINAGE PIPING IN THE DIRECTION OF FLOW IS PROHIBITED.
D. INSTALL BUILDING DRAINS PITCHED DOWN AT MINIMUM SLOPE OF 1/4" PER FOOT (2222 PERCENT) FOR PIPING 2" AND SMALLER AND 1/8 INCH PER FOOT (1 PERCENT) FOR PIPING LARGER THAN 2" UNLESS OTHERWISE NOTED ON THE DRAWINGS.
E. VENT AND BRANCH VENT PIPING SHALL BE GRADED OR SLOPED AND CONNECTED AS TO DRAIN BACK TO THE DRAINAGE PIPING BY GRAVITY.
F. ALL WASTE AND VENT PIPE SIZES MAY NOT BE INDICATED ON THIS DRAWING. REFER TO FLOOR PLANS AND UNDER FLOOR PLANS FOR ADDITIONAL SIZES AND INFORMATION.
G. WHERE PIPES PASS THROUGH FIRE RATED WALLS, PARTITIONS, CEILINGS AND FLOORS, MAINTAIN THE FIRE RATED INTEGRITY. REFER TO DIVISION 7 FOR SPECIAL SEALERS AND MATERIALS. REFER TO BUILDING CODE SUMMARY AND LIFE SAFETY PLANS FOR FIRE RATED ASSEMBLIES.
H. ALL SANITARY WASTE PIPING TO BE 4" UNLESS OTHERWISE NOTED.



1 **WASTE AND VENT ISOMETRIC**
Scale:

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APPROVED BY: ---	
PROJECT NO.: 21-154	

SHEET TITLE

PLUMBING WASTE & VENT ISOMETRIC

SHEET NUMBER

P801

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:29:50 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

NOTE: ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION ON THE DRAWINGS. ALL SYMBOLS NOT NECESSARILY USED ON THIS PROJECT.

GENERAL SYMBOLS:

- POINT OF CONNECTION
- POINT OF REMOVAL
- PLAN NOTE
- REVISION
- DETAIL BUBBLE
- SECTION BUBBLE

VALVES & FITTINGS:

- GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- GLOBE VALVE
- CONTROL VALVE
- 2 1/2" VALVE AND HOSE CONNECTION
- AIR VENT
- PRESSURE RELIEF VALVE
- PRESSURE REGULATING VALVE
- REDUCED PRESSURE BACK FLOW PREVENTER
- INDICATED FLOW DIRECTION
- PIPE TURN 90°
- LINE BREAK
- PIPE ELBOW UP (RISER)
- PIPE ELBOW DOWN
- PIPE TEE DOWN
- CAP OR PLUG
- REDUCER, CONCENTRIC
- REDUCER, ECCENTRIC
- FLANGES
- UNION
- METER
- FD FLOOR DRAIN
- GAUGE
- THERMOMETER
- PRESSURE SENSOR
- JOCKEY PUMP

DRAWING ABBREVIATIONS:

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AD	ACCESS DOOR
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STEEL
BTU	BRITISH THERMAL UNIT
CW	DOMESTIC COLD WATER
DCV	DOUBLE CHECK VALVE
DIA	DIAMETER
DN	DOWN
DCVA	DOUBLE CHECK VALVE ASSEMBLY
FD	FLOOR DRAIN
EL	ELEVATION
EXIST	EXISTING
FCO	FLOOR CLEANOUT
FLA	FULL LOAD AMPS
HKSP	HOUSEKEEPING
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RETURN
IE	INVERT ELEVATION
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NG	NITROGEN GENERATOR
PA	PRE-ACTION
PIV	POST INDICATING VALVE
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE

FIRE PROTECTION PIPING SYMBOLS

(WITHIN THE BUILDING)

- F — FIRE PROTECTION
- PA — PRE-ACTION
- FDP — FIRE DRY PIPE
- FPV — FIRE WATER STORAGE TANK VENT
- FIRE DEPARTMENT SIAMESE CONNECTION (FREE STANDING)
- FIRE DEPARTMENT SIAMESE CONNECTION (WALL MOUNTED)
- FS — FLOW SWITCH
- TS — ZONE CONTROL VALVE WITH TAMPER SWITCH
- SIGHT GLASS
- P — PRESSURE GAUGE
- PA — DOUBLE INTERLOCK PRE-ACTION VALVE
- FIRE PUMP TEST METER

HYDRANT FLOW TEST DATA

ADDRESS OF TEST: 15TH STREET AND MISSOURI STREET
LOCATION OF TEST: 2ND HYDRANT EAST OF MISSOURI STREET ON 15TH STREET
DATE OF TEST: JULY 29, 2021 AT 8:00 AM

FLOW HYDRANT NUMBER: 155	PRESSURE HYDRANT NUMBER: 154
FLOW HYDRANT MAIN SIZE (IN.): 8	PRESSURE HYRANT MAIN SIZE (IN.): 8
NOZZLES: 1	STATIC PRESSURE (PSI): 58
NOZZLE SIZE (IN.): 2.5	RESIDUAL PRESSURE (PSI): 56
FLOW RATE (GPM): 1090	ESTIMATED FLOW AT 20 PSI (GPM): 5,345

FIRE PROTECTION GENERAL NOTES:

1. THE CUP BUILDING WILL SUPPLY FIRE PROTECTION WATER TO THE CUP BUILDING, THE SOUTH SUPPORT BUILDING AND THE MEDICAL CENTER BUILDING. THE CONTRACTOR WILL BE REQUIRED TO DESIGN AND INSTALL THE FIRE PROTECTION SYSTEM FOR THE CUP BUILDING AND THE TUNNEL TO THE HAND-OFF POINTS FOR BOTH THE MEDICAL CENTER BUILDING AND THE SOUTH SUPPORT BUILDING.
2. THE ENTIRE CUP BUILDING WILL BE A FULLY SPRINKLED. FIRE PROTECTION CONTRACTOR SHALL DESIGN THE COMPLETE SYSTEM ACCORDING TO THE CRITERIA OUTLINED ON THE DRAWINGS, SPECIFICATIONS, FM, N.F.P.A. 13, 14, 20 AND 22. THE ENTIRE BUILDING SHALL BE PROTECTED BY A WET-PIPE OR A DRY-PIPE SPRINKLER SYSTEM. THE MDF ROOM WILL HAVE A CLEAN AGENT FIRE PROTECTION SYSTEM, IT WILL ALSO HAVE A SECONDARY DRY-PIPE SPRINKLER SYSTEM.
3. THE 10" FIRE PROTECTION SERVICE TO THE MEDICAL CENTER BUILDING SHALL HAVE THE CAPACITY OF 290 PSI @ 1000 GPM AT THE HAND-OFF POINT IN THE TUNNEL.
4. FIRE PROTECTION CONTRACTOR SHALL PREPARE ALL DRAWINGS AND APPLICATIONS REQUIRED TO OBTAIN APPROVAL OF THE SYSTEM BY OWNERS INSURANCE UNDERWRITER, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION. ALL DRAWINGS TO BE SUBMITTED DURING CONSTRUCTION.
5. FIRE PROTECTION CONTRACTOR SHALL SUBMIT DRAWINGS WITH ALL SPRINKLER HEAD LOCATIONS. ALL SPRINKLER HEADS TO BE LAID OUT NEATLY WITHIN THE CEILING SYSTEMS AND BE COORDINATED WITH ALL BULKHEADS, CEILINGS AND STRUCTURE. REFERENCE ARCHITECTURAL DRAWINGS FOR CEILING PLANS.
6. ALL PIPING, SIZES, ZONES AND SPRINKLER MAINS SHOWN ON DRAWINGS ARE FOR BIDDING AND DESIGN INTENT ONLY. FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR PROPER COVERAGE AND CAPACITY OF THE SPRINKLER SYSTEM.
7. ALL MATERIALS, WHERE APPLICABLE SHALL BE U.L. LISTED AND FACTORY MUTUAL APPROVED FOR THE USE IN AUTOMATIC SPRINKLER SYSTEMS.
8. DO NOT PLACE SPRINKLER HEAD WITHIN THE ELEVATOR OR THE ELEVATOR EQUIPMENT ROOM.
9. SPRINKLER PIPING SHALL NOT BE ROUTED THRU TECHNOLOGY ROOMS, USE SIDEWALL SPRINKLER HEADS WITH GUARDS TO SERVE THE ROOM.
10. SPRINKLER SYSTEM DESIGN SHALL BE APPOVED BY AUTHORITIES HAVING JURISDITION.
    a. MARGIN OF SAFETY FOR AVAILABLE WATER FLOW AND PRESSURE: 10 PERCENT, INCLUDING LOSSES THROUGH WATER SERVICE PIPING, VALVES AND BACKFLOW PREVENTERS.
    b. SPRINKLER OCCUPANCY HAZARD CLASSIFICATIONS:
       1) OFFICES, LOUNGES, SEPARATED DINING AREAS, TOILET ROOMS, COORIDORS: LIGHT HAZARD. DENSITY: 0.10 GPM SQ. FT. AREA: 1500 SQ. FT. HOSE DEMAND: 250 GPM. MAXIMUM PROTECTION AREA PER SPRINKLER HEAD: 196 SQ. FT. WITH FINISHED ACT CEILING TILES, 225 SQ. FT. WITH FINISHED GWB CEILINGS.
       5) MECHANICAL, ELECTRICAL, CLASSES I TO IV COMMODITIES STORAGE UP TO 200 SQ. FT., WORKSHOP AND UTILITY AREAS: ORDINARY HAZARD GROUP 2. DENSITY: 0.20 GPM SQ. FT. AREA: 2500 SQ. FT. HOSE DEMAND; 250 GPM. MAXIMUM PROTECTION AREA PER SPRINKLER HEAD: 130 SQ. FT.
       9) STORAGE AND RECEIVING AREAS: EXTRA HAZARD GROUP 2 AND NFPA 13 STORAGE CRITERIA. DENSITY: REFER TO PM DATA SHEET 8-9, AREA: 500 SQ. FT. HOSE DEMAND: 100 GPM. MAXIMUM PROTECTION AREA PER SPRINKLER HEAD: 11.2.
       10) FUEL OIL STORAGE: EXTRA HAZARD GROUP 2. DENSITY: 0.40 GPM SQ. FT. AREA: 2500 SQ. FT. HOSE DEMAND: 500 GPM. MAXIMUM PROTECTION AREA PER SPRINKLER HEAD: 100 SQ. FT.
       13) GENERATOR ROOMS: EXTRA HAZARD GROUP 1. DENSITY: 0.30 GPM SQ. FT. AREA: 2500 SQ. FT. HOSE DEMAND: 500 GPM. MAXIMUM PROTECTION AREA PER SPRINKLER HEAD: 100 SQ. FT.
11. MAXIMUM PROTECTION AREA PER SPRINKLER: ACCORDING TO UL LISTING.
12. ALL SYSTEMS SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF A FACILITY LOCATED IN A SEISMIC DESIGN CATEGORY C, RISK/OCCUPANCY CATEGORY IV AREA.
13. EACH DRY-PIPE SYSTEM SHALL BE EQUIPPED WITH A NITROGEN INJECTION POINTS AND NITROGEN MONITORING VENTS.
14. EACH PRE-ACTION SYSTEM SHALL HAVE A NITROGEN GENERATOR TO MAINTAIN A NITROGEN ATMOSPHERE WITHIN THE PIPING SYSTEM.

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APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

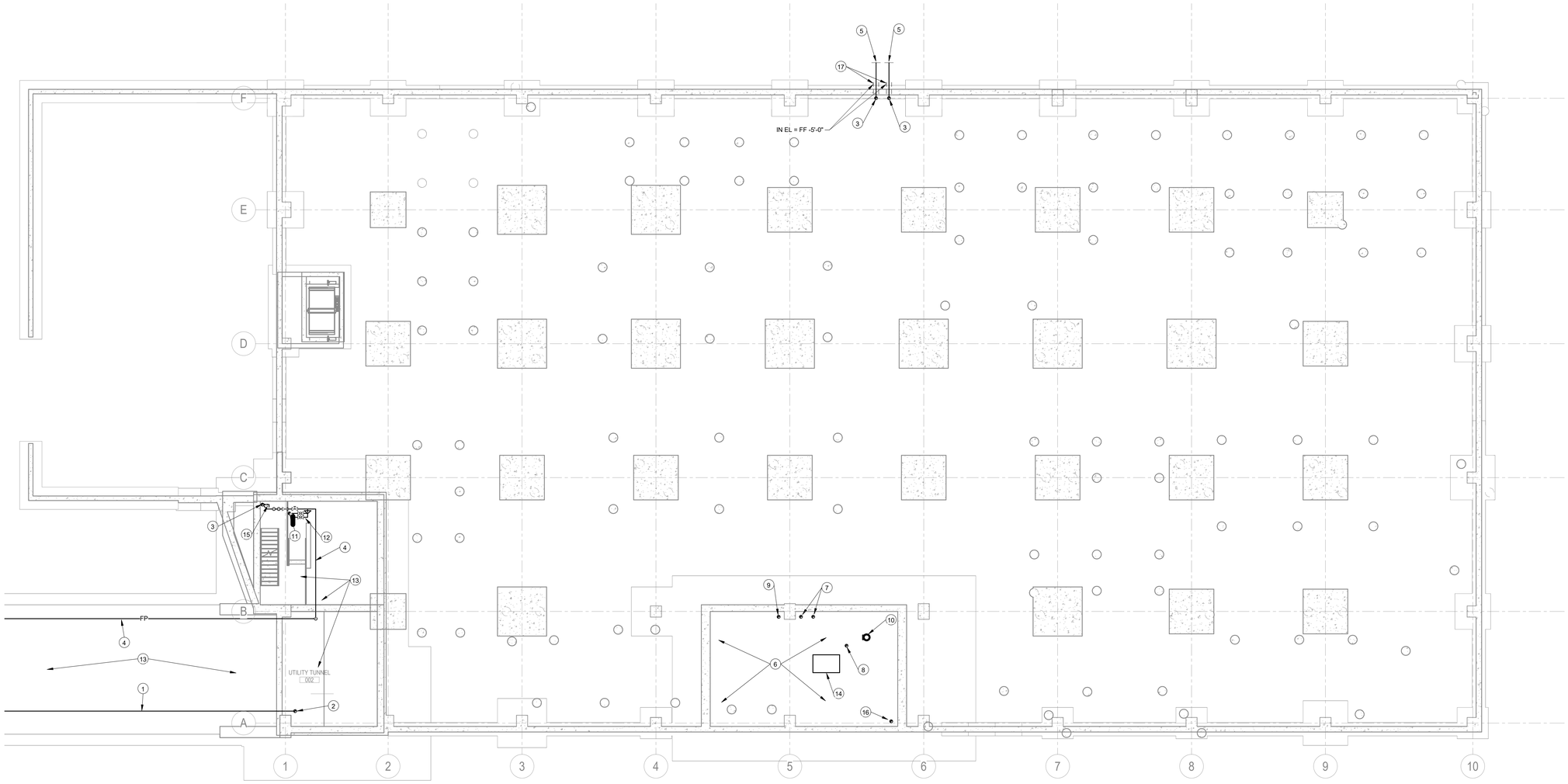
FIRE PROTECTION SYMBOLS AND ABBREVIATIONS

SHEET NUMBER

FP001

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:31:45 PM AESI Proj. No: 21-154



1 FP301 LOWER LEVEL FIRE PROTECTION PLAN

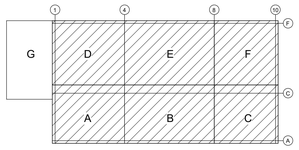
Scale: 3/32" = 1'-0"

GENERAL NOTES:

A. SEE DRAWING FP001 FOR ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. 10" FIRE PROTECTION PIPING IN TUNNEL. 10" FIRE PROTECTION SHALL BE INSTALLED TO THE SOUTH SUPPORT BUILDING AND TO THE HAND-OFF POINT IN THE TUNNEL TO SERVE THE MEDICAL CENTER BUILDING.
2. 10" FIRE PROTECTION PIPING UP.
3. FIRE PROTECTION PIPING UP.
4. FIRE PROTECTION SYSTEM SERVING THE TUNNEL. SEE TUNNEL DRAWINGS UT101.2 MECHANICAL - FIRE PROTECTION AND UT102.2 FIRE PROTECTION FOR HAND-OFF POINTS AT SOUTH SUPPORT BUILDING (SSB) AND THE MEDICAL CENTER BUILDING.
5. SEE SITE UTILITY DRAWINGS FOR CONTINUATION.
6. FIRE PROTECTION WATER STORAGE TANK. TANK SHALL BE 42'-0" LONG x 26'-5 3/4" WIDE x 9'-11" USABLE WATER DEPTH = 11,037 CUBIC FEET. 11,037 CUBIC FEET x 7.481 GALLONS PER CUBIC FOOT = 82,567 GALLONS OF USABLE WATER.
7. 10" WATER SUPPLY UP.
8. 10" FIRE PUMP WATER TEST RETURN TO TANK UP.
9. 6" TANK VENT UP.
10. FIRE PUMP (FP-1).
11. 2" FIRE RISER DRAIN DROP ROUTE THROUGH THE TUNNEL AND DROP AT TRENCH DRAIN, APPROXIMATELY 150'-0".
12. FLOOR CONTROL VALVE ASSEMBLY. SEE SPRINKLER SYSTEM FLOOR CONTROL VALVE DETAIL 2/FP501.
13. EARLY SUPPRESSION, FAST RESPONSE (ESFR) TYPE SPRINKER HEADS SHALL BE UTILIZED THROUGHOUT THE TUNNEL. SEE TUNNEL DRAWINGS UT101.2 MECHANICAL - FIRE PROTECTION AND UT102.2 FIRE PROTECTION FOR HAND-OFF POINTS AT SOUTH SUPPORT BUILDING (SSB) AND THE MEDICAL CENTER BUILDING.
14. TANK ACCESS WITH LADDER.
15. 2 1/2" VALVE AND HOSE CONNECTION ON THE INTERMEDIATE STAIR LANDING BETWEEN THE LOWER LEVEL AND FIRST FLOORS. FIRE DEPARTMENT HOSE CONNECTION AND VALVE (TYPICAL).
16. 8" TANK OVERFLOW UP.
17. PIPE SLEEVE THROUGH EXTERIOR FOUNDATION.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: MLP	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AES	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

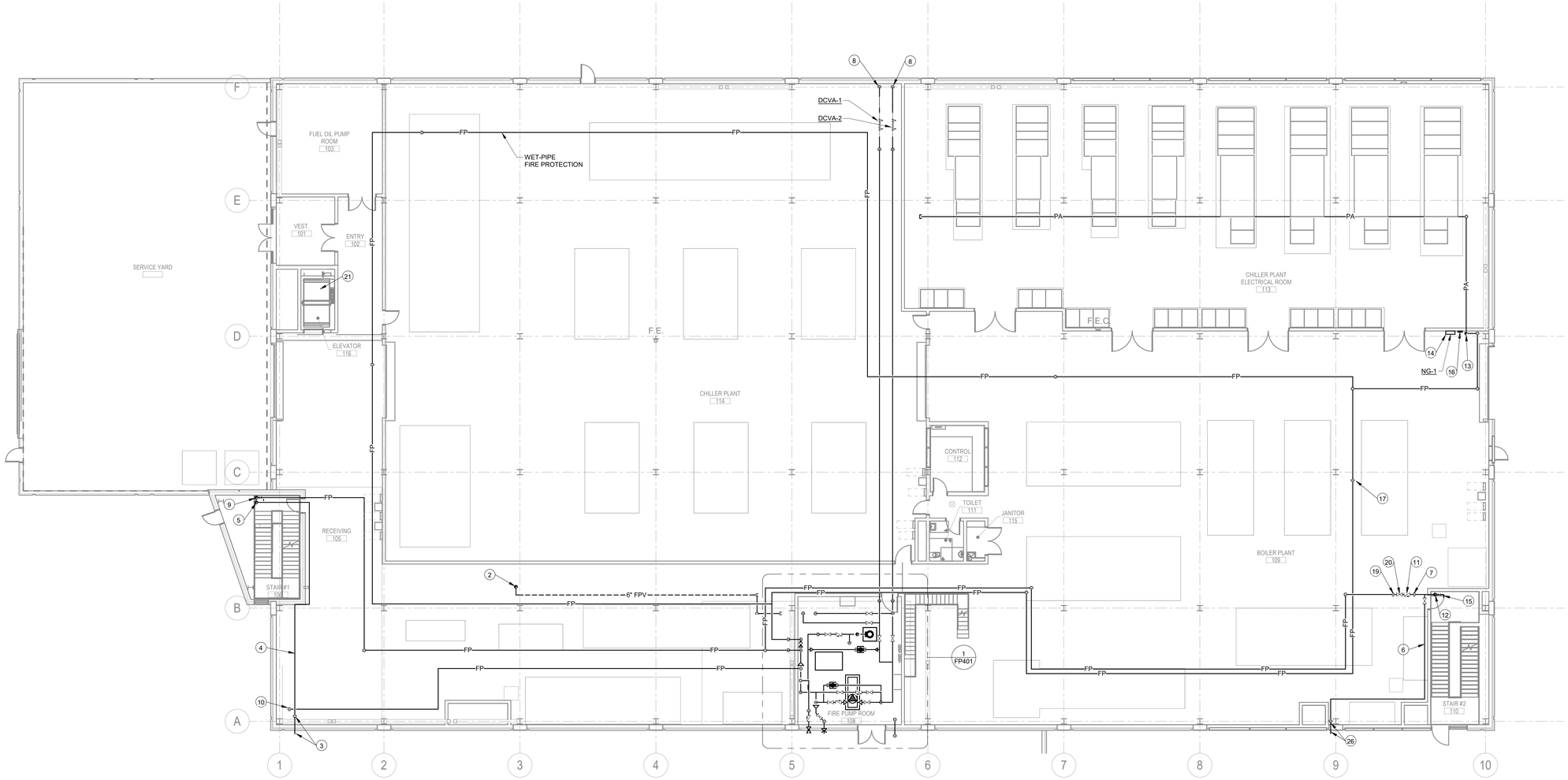
SHEET TITLE

LOWER LEVEL FIRE PROTECTION PLAN

SHEET NUMBER

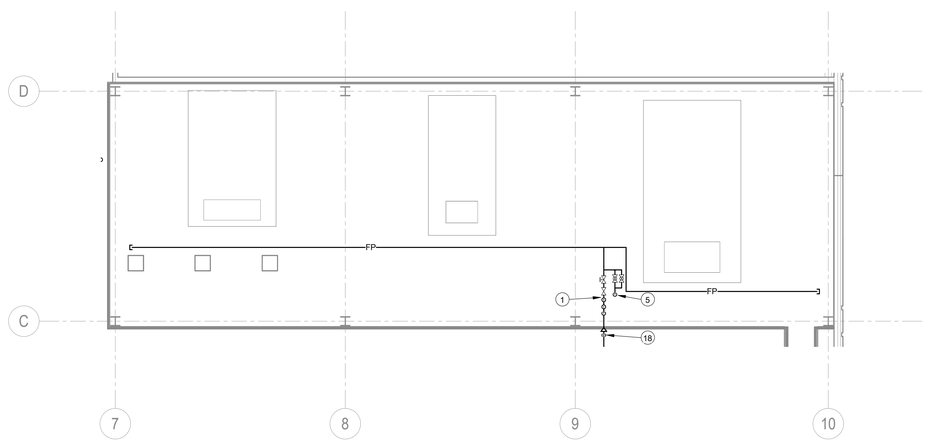
FP301

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:31:47 PM AESI Proj. No: 21-154



1 FIRST FLOOR FIRE PROTECTION PLAN

Scale: 3/32" = 1'-0"



2 FIRST FLOOR MEZZANINE FIRE PROTECTION PLAN

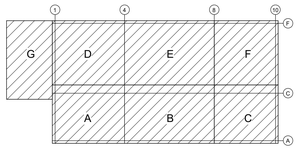
Scale: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE DRAWING FP001 FOR ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. FLOOR CONTROL VALVE ASSEMBLY. SEE SPRINKLER SYSTEM FLOOR CONTROL VALVE DETAIL 2/FP501.
2. 6" FIRE WATER STORAGE TANK VENT UP TO SECOND FLOOR.
3. 2" FIRE RISER DRAIN DOWN. 2" FIRE RISER DRAIN EXIT BUILDING AT 18" A.F.G. AND TURN DOWN AT 45 DEGREE.
4. 2" FIRE RISER DRAIN.
5. 2" FIRE RISER DRAIN UP.
6. STANDPIPE DRAIN.
7. PRESSURE GAUGE.
8. 10" FIRE PROTECTION SERVICE.
9. FIRE RISER DOWN TO LOWER LEVEL AND UP TO SECOND FLOOR. FIRE RISER SHALL HAVE A 2 1/2" VALVE AND HOSE CONNECTION ON THE INTERMEDIATE STAIR LANDING BETWEEN THE FIRST AND SECOND FLOORS. FIRE DEPARTMENT HOSE CONNECTION AND VALVE.
10. 10" FIRE PROTECTION DOWN INTO TUNNEL TO SERVE THE SOUTH SERVICE BUILDING AND THE HOSPITAL.
11. CHECK VALVE.
12. CLASS 1 MANUAL WET-STANDPIPE FIRE RISER UP. INSTALL DRAIN VALVE AT THE BASE OF THE RISER. FIRE RISER SHALL HAVE A 2 1/2" VALVE AND HOSE CONNECTION ON THE INTERMEDIATE STAIR LANDING BETWEEN THE FIRST AND SECOND FLOORS.
13. DOUBLE INTERLOCK PRE-ACTION SYSTEM RISER, SERVING THE CHILLER PLANT ELECTRICAL ROOM.
14. NITROGEN GENERATOR SERVING THE PRE-ACTION SYSTEM FOR THE CHILLER PLANT ELECTRICAL ROOM.
15. FIRE DEPARTMENT HOSE CONNECTION AND VALVE. HOSE CONNECTION LOCATED ON INTERMEDIATE FLOOR LANDING.
16. PRE-ACTION SYSTEM CONTROL PANEL.
17. FIRE PROTECTION UP TO MEZZANINE.
18. FIRE PROTECTION DOWN.
19. FLOW SWITCH.
20. GATE VALVE WITH TAMPER SWITCH.
21. THE ELEVATOR ENCLOSURE HAS A 2-HOUR FIRE RATING AND WILL NOT REQUIRE A SPRINKLER SYSTEM TO BE INSTALLED.



KEY PLAN

SCALE: NONE

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PROJECT NO. 21-154	

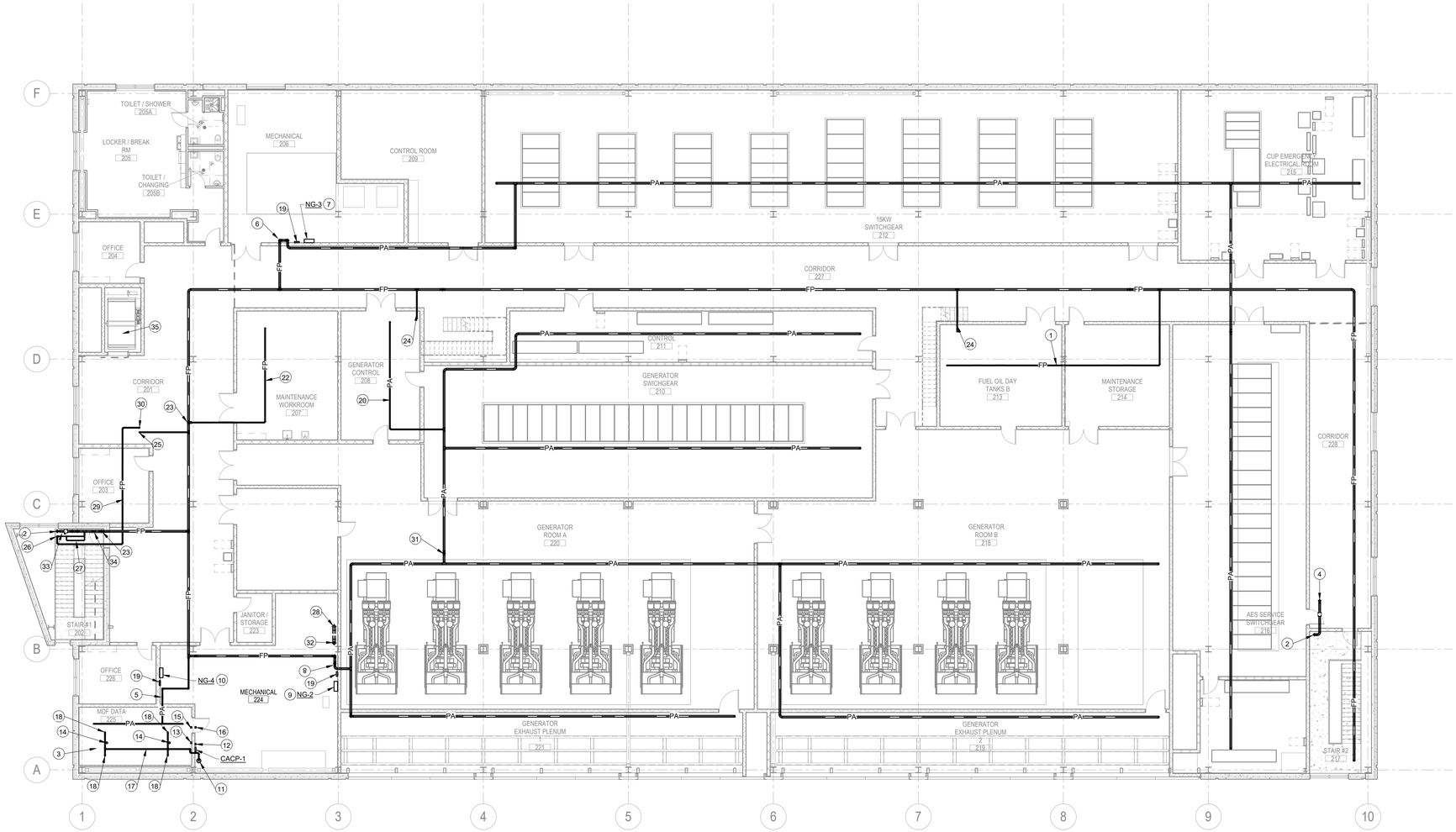
SHEET TITLE

FIRST FLOOR FIRE PROTECTION PLAN

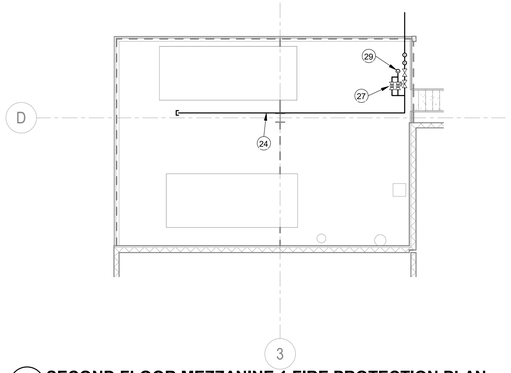
SHEET NUMBER

FP302

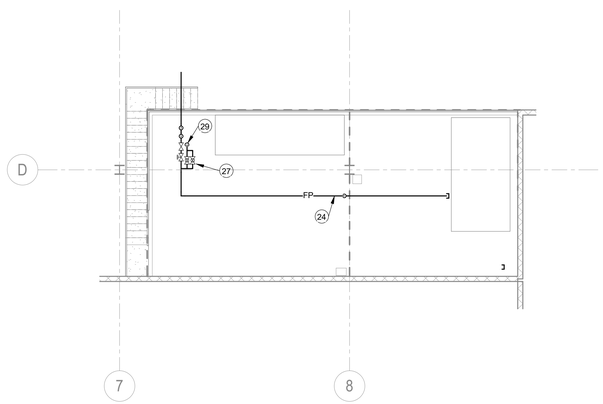
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:31:50 PM AESI Proj. No: 21-154



1 FP303 SECOND FLOOR FIRE PROTECTION PLAN
Scale: 3/32" = 1'-0"



2 FP303 SECOND FLOOR MEZZANINE 1 FIRE PROTECTION PLAN
Scale: 1/8" = 1'-0"



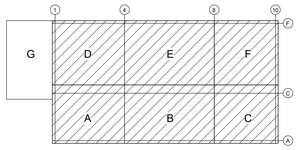
3 FP303 SECOND FLOOR MEZZANINE 2 FIRE PROTECTION PLAN
Scale: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE DRAWING FP001 FOR ADDTIONAL GENERAL NOTES.

PLAN NOTES CONTINUED:

1. WET-PIPE FIRE PROTECTION SYSTEM SERVING FUEL OIL DAY TANK ROOM AND MAINTENANCE STORAGE ROOM.
2. FIRE PROTECTION RISER UP AND DOWN. FIRE RISER SHALL HAVE A 2 1/2" VALVE AND HOSE CONNECTION ON THE INTERMEDIATE STAIR LANDINGS. FIRE DEPARTMENT HOSE CONNECTION AND VALVE.
3. MDF ROOM SHALL BE PROTECTED WITH A NOVEC-1230 CLEAN AGENT FIRE SUPPRESSION SYSTEM WITH SECONDARY DOUBLE INTERLOCK PRE-ACTION SYSTEM.
4. FIRE PROTECTION UP TO ROOF STANDPIPE HOSE CONNECTION.
5. DOUBLE INTERLOCK PRE-ACTION SYSTEM RISER, SERVING MDF DATA ROOM.
6. DOUBLE INTERLOCK PRE-ACTION SYSTEM RISER, SERVING SWITCHGEAR ROOM, CUP EMERGENCY ELECTRICAL ROOM AES SERVICE SWITCHGEAR ROOM.
7. NITROGEN GENERATOR SERVING THE PRE-ACTION SYSTEM FOR THE ELECTRICAL ROOMS.
8. DOUBLE INTERLOCK PRE-ACTION SYSTEM RISER, SERVING GENERATOR ROOM A, GENERATOR ROOM B AND GENERATOR SWITCHGEAR ROOM.
9. NITROGEN GENERATOR SERVING THE GENERATOR ROOMS.
10. NITROGEN GENERATOR SERVING THE PRE-ACTION SYSTEM FOR MDF ROOM.
11. 650# NOVEC CYLINDER, SECURED TO WALL.
12. NOVEC MANUAL RELEASE.
13. NOVEC DISABLE SWITCH.
14. NOVEC PHOTOELECTRIC SMOKE DETECTOR.
15. NOVEC HORN/STROBE.
16. NOVEC BELL.
17. NOVEC PIPING SYSTEM.
18. NOVEC DISCHARGE NOZZLE.
19. PRE-ACTION SYSTEM CONTROL PANEL.
20. PRE-ACTION SYSTEM SERVING THE GENERATOR CONTROL ROOM.
21. PRE-ACTION SYSTEM PIPING DROP.
22. WET-PIPE FIRE PROTECTION SYSTEM SERVING MAINTENANCE WORKROOM.
23. WET-PIPE FIRE PROTECTION SYSTEM DROP.
24. WET-PIPE FIRE PROTECTION SYSTEM SERVING THE MEZZANINE.
25. WET-PIPE FIRE PROTECTION UP TO ELEVATOR VESTIBULE.
26. 2" FIRE RISER DRAIN UP AND DOWN.
27. FLOOR CONTROL VALVE ASSEMBLY. SEE SPRINKLER SYSTEM FLOOR CONTROL VALVE DETAIL 2/FP501.
28. 6" FIRE WATER STORAGE TANK VENT DOWN.
29. 2" FIRE RISER DRAIN.
30. 2" FIRE RISER DRAIN UP.
31. PRE-ACTION FIRE PROTECTION SYSTEM UP TO EMERGENCY GENERATOR INTAKE MONITOR ROOM 302.
32. 6" FIRE WATER STORAGE TANK VENT UP THRU ROOF.
33. 2 1/2" VALVE AND HOSE CONNECTION ON THE INTERMEDIATE STAIR LANDING BETWEEN THE SECOND FLOOR AND THE ROOF. FIRE DEPARTMENT HOSE CONNECTION AND VALVE.
34. WET-PIPE FIRE PROTECTION SYSTEM UP TO SERVE THE UPPER LEVEL OF THE STAIRS.
35. THE ELEVATOR ENCLOSURE HAS A 2-HOUR FIRE RATING AND WILL NOT REQUIRE A SPRINKLER SYSTEM TO BE INSTALLED.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

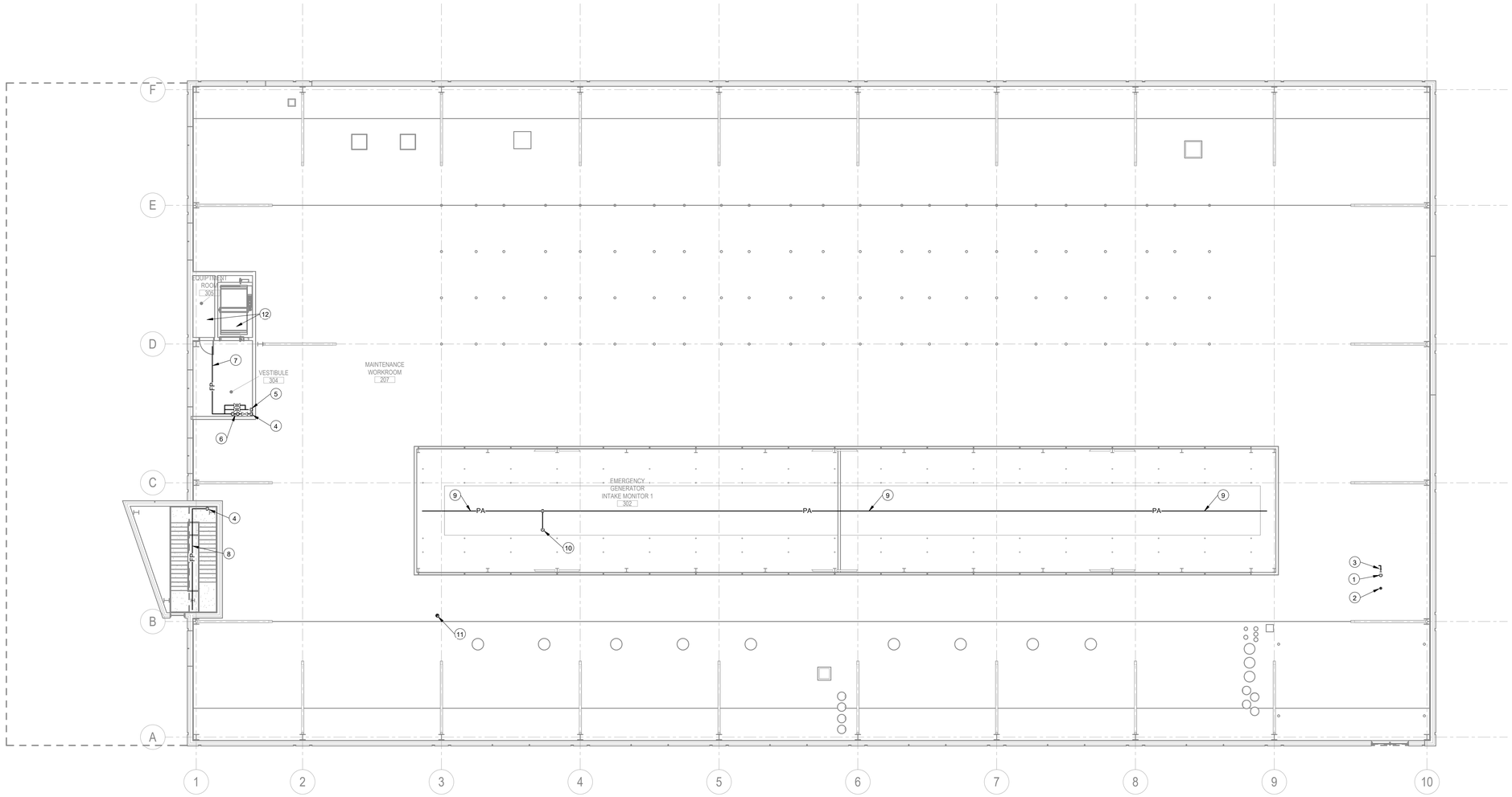
SHEET TITLE

SECOND FLOOR FIRE RPOTECTION PLAN

SHEET NUMBER

FP303

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:31:56 PM AESI Proj. No: 21-154



1 FP304 **ROOF FIRE PROTECTION PLAN**
Scale: 3/32" = 1'-0"

GENERAL NOTES:

A. SEE DRAWING FP001 FOR ADDTIONAL GENERAL NOTES.

PLAN NOTES:

1. 4" STANDPIPE DOWN.
2. POST INDICATING VALVE.
3. 2 1/2" HOSE CONNECTION AND VALVE.
4. FIRE PROTECTION DOWN.
5. FIRE PROTECTION DRAIN PIPING DOWN.
6. FLOOR CONTROL VALVE ASSEMBLY. SEE SPRINKLER SYSTEM FLOOR CONTROL VALVE DETAIL 1/FP501.
7. FIRE PROTECTION SERVING THE VESTIBULE.
8. FIRE PROTECTION SERVING THE TOP OF THE STAIR TOWER.
9. PRE-ACTION FIRE PROTECTION SYSTEM SERVING THE EMERGENCY GENERATOR INTAKE MONITOR SPACE.
10. PRE-ACTION FIRE PROTECTION SYSTEM DOWN.
11. 6" FIRE WATER STORAGE TANK VENT THRU ROOF. INSTALL INSECT SCREEN ON VENT OPENING.
12. THE ELEVATOR AND ELEVATOR EQUIPMENT ROOM ENCLOSURE HAS A 2-HOUR FIRE RATING AND WILL NOT REQUIRE A SPRINKLER SYSTEM TO BE INSTALLED.

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PROJECT NO. **21-154**	

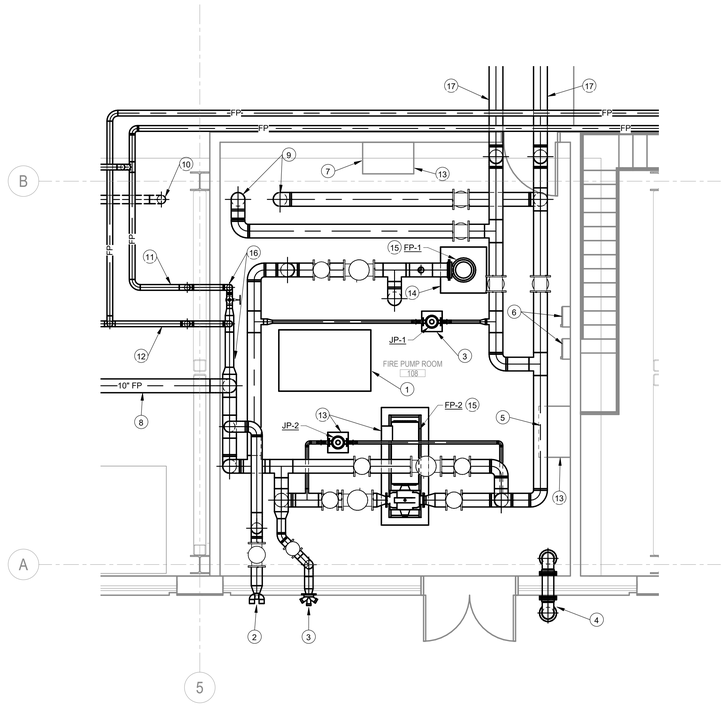
SHEET TITLE

ROOF FIRE PROTECTION PLAN

SHEET NUMBER

FP304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:31:57 PM AES\Proj No: 21-154
0 1/2" 1" 2"



1 / FP401 **01-First-FirePro-New - Callout 1**
Scale: 1/4" = 1'-0"

GENERAL NOTES:

A. SEE DRAWING FP001 FOR ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. FIRE WATER STORAGE TANK ACCESS DOOR.
2. WALL MOUNTED FIRE DEPARTMENT CONNECTION.
3. WALL MOUNTED FIRE PUMP TEST HEADER.
4. 8" FIRE PROTECTION WATER TANK VENT. TURN VENT DOWN AND TERMINATE 2'-6" ABOVE FINISHED GRADE WITH AN INSECT SCREEN.
5. FIRE PUMP (FP-2) CONTROL PANEL. SEE "E" SERIES DRAWINGS FOR INFORMATION ON CONTROL PANEL.
6. JOCKEY PUMP CONTROL PANELS. SEE "E" SERIES DRAWINGS FOR INFORMATION ON CONTROL PANEL.
7. FIRE PUMP (FP-1) CONTROL PANEL. SEE "E" SERIES DRAWINGS FOR INFORMATION ON CONTROL PANEL.
8. 10" FIRE PROTECTION TO SERVE THE SOUTH SERVICE BUILDING AND THE MEDICAL CENTER BUILDING.
9. 10" WATER DROP TO FIRE PROTECTION WATER STORAGE TANK.
10. 6" FIRE WATER STORAGE TANK VENT DOWN.
11. FIRE PROTECTION PIPING SERVING THE FIRST FLOOR.
12. FIRE PROTECTION PIPING SERVING ALL OTHER FLOORS AND THE STANDPIPE SYSTEM.
13. 4" HIGH CONCRETE HOUSE KEEPING PAD.
14. 2'-0" HIGH CONCRETE BASE.
15. SEE FIRE RISER PIPING DIAGRAM ON DRAWING FP701.
16. SEE FIRE RISER DIAGRAM 3/FP501.
17. 10" FIRE WATER SERVICE.

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PROJECT NO. **21-154**	

SHEET TITLE

ENLARGED FIRE PROTECTION PLANS

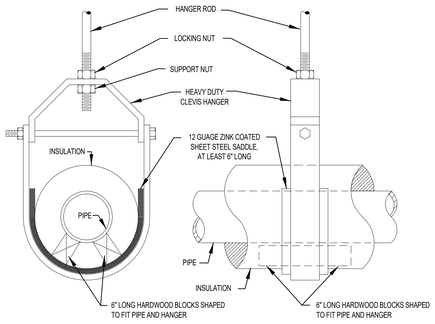
SHEET NUMBER

FP401

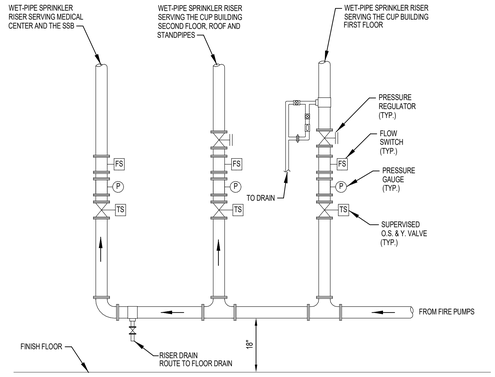
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 1:31:59 PM AESI Proj. No: 21-154

FIRE PROTECTION EQUIPMENT SCHEDULE

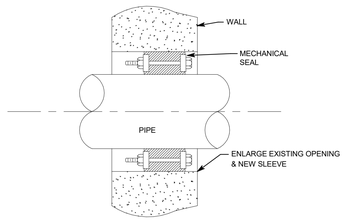
MARK	EQUIPMENT	LOCATION	CAPACITY	MANUFACTURER AND MODEL NUMBER	ELECTRICAL LOADS						REMARKS
					HP	WATTS	VOLTS	AMPS	PHASE	RPM	
FP-1	FIRE PUMP - VERTICAL TURBINE	FIRE PUMP ROOM - 108	1000 GPM AT 295 PSI	APEX PUMPING EQUIPMENT MODEL No. FP12CHC	250		460		3	1770	BRONZE FITTED VERTICAL TURBINE FIRE PUMP
FP-2	FIRE PUMP - HORIZONTAL SPLIT CASE	FIRE PUMP ROOM - 108	1000 GPM AT 245 PSI	ARMSTRONG MODEL No. HSC 6 x 5 x 12MF	350		460		3	3600	BRONZE FITTED SPLIT CASE PUMP WITH PACKING, STEEL BASE, COUPLING, GUARD
JP-1	JOCKEY PUMP	FIRE PUMP ROOM - 108	10 GPM AT 305 PSI	ARMSTRONG MODEL No. 4700-VMS-01:29B	3		460		3	3450	BRONZE FITTED SPLIT PUMP WITH MECHANICAL PACKING, S.S. SHAFT, O.D.P. CLOSE COUPLED MOTOR AND AROSS THE LINE CONTROLLER
JP-2	JOCKEY PUMP	FIRE PUMP ROOM - 108	10 GPM AT 305 PSI	ARMSTRONG MODEL No. 4700-VMS-01:29B	3		460		3	3450	BRONZE FITTED SPLIT PUMP WITH MECHANICAL PACKING, S.S. SHAFT, O.D.P. CLOSE COUPLED MOTOR AND AROSS THE LINE CONTROLLER
DCVA-1	DOUBLE CHECK VALVE ASSEMBLY	CHILLER PLANT ROOM - 114	1000 GPM @ 2.5 PSI DROP	WILKENS MODEL No. 10" - 350-FSC-OSY	–	–	–	–	–	–	INSTALL BACKFLOW PREVENTER AT 3'-0" A.F.F.
DCVA-2	DOUBLE CHECK VALVE ASSEMBLY	CHILLER PLANT ROOM - 114	1000 GPM @ 2.5 PSI DROP	WILKENS MODEL No. 10" - 350-FSC-OSY	–	–	–	–	–	–	INSTALL BACKFLOW PREVENTER AT 3'-0" A.F.F.
NG-1	NITROGEN GENERATOR	BOILER PLANT ROOM 109	–	ENGINEERED CORROSION SOLUTIONS MODEL No. PGEN -3(3E)	–	–	120	6	1	–	SERVING THE PRE-ACTION FIRE PROTECTION SYSTEM IN THE CHILLER PLAT ELECTRICAL ROOM 113
NG-2	NITROGEN GENERATOR	MECHANICAL ROOM 224	–	ENGINEERED CORROSION SOLUTIONS MODEL No. PGEN -5(5E)	–	–	120	6	1	–	SERVING THE PRE-ACTION FIRE PROTECTION SYSTEM IN GENERATOR CONTROL ROOM 208, GENERATOR SWITCHGEAR ROOM 210, CONTROL ROOM 211, GENERATOR ROOM A 220, GENERATOR ROOM B 218, GENERATOR EXHAUST PLENUM1 ROOM 221, AND GENERATOR EXHAUST PLENUM 2 ROOM 219
NG-3	NITROGEN GENERATOR	MECHANICAL ROOM 206	–	ENGINEERED CORROSION SOLUTIONS MODEL No. PGEN -3(3E)	–	–	120	6	1	–	SERVING THE PRE-ACTION FIRE PROTECTION SYSTEM IN 15KW SWITCHGEAR ROOM 212, CUP EMERGENCY ELECTRICAL ROOM 215, AND AES SERVICE SWITCHGEAR ROOM 216
NG-4	NITROGEN GENERATOR	MECHANICAL ROOM 224	–	ENGINEERED CORROSION SOLUTIONS MODEL No. PGEN -3(3E)	–	–	120	6	1	–	SERVING THE PRE-ACTION FIRE PROTECTION SYSTEM IN THE MDF DATA ROOM 225
CACP-1	CLEAN AGENT CONTROL PANEL	MECHANICAL ROOM 224	–	CHEETAH Xi 50 CONTROL PANEL	–	–	120	5.25	1	–	SERVING THE CLEAN AGENT FIRE PROTECTION SYSTEM IN THE MDF DATA ROOM 225



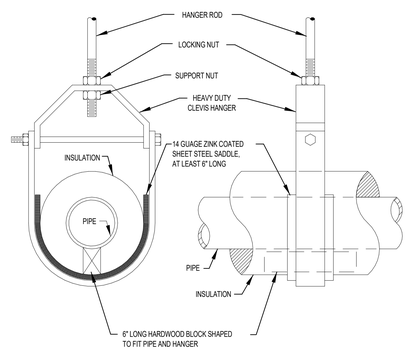
5 FP501 **FIRE PROTECTION PIPE HANGER 8 INCH AND LARGER DETAIL**
Scale: NONE



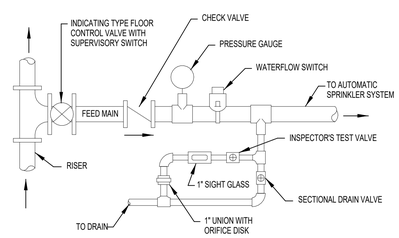
3 FP501 **FIRE RISER DIAGRAM**
Scale: None



6 FP501 **PIPE SLEEVE DETAIL**
Scale: NONE



4 FP501 **FIRE PROTECTION PIPE HANGER 6 INCH AND SMALLER DETAIL**
Scale: NONE



2 FP501 **SPRINKLER SYSTEM FLOOR CONTROL VALVE DETAIL**
Scale: None

OWNER

Indiana University Health
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PROJECT

Central Utility Plant

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY MLP	CERTIFICATION
CHECKED BY AES	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

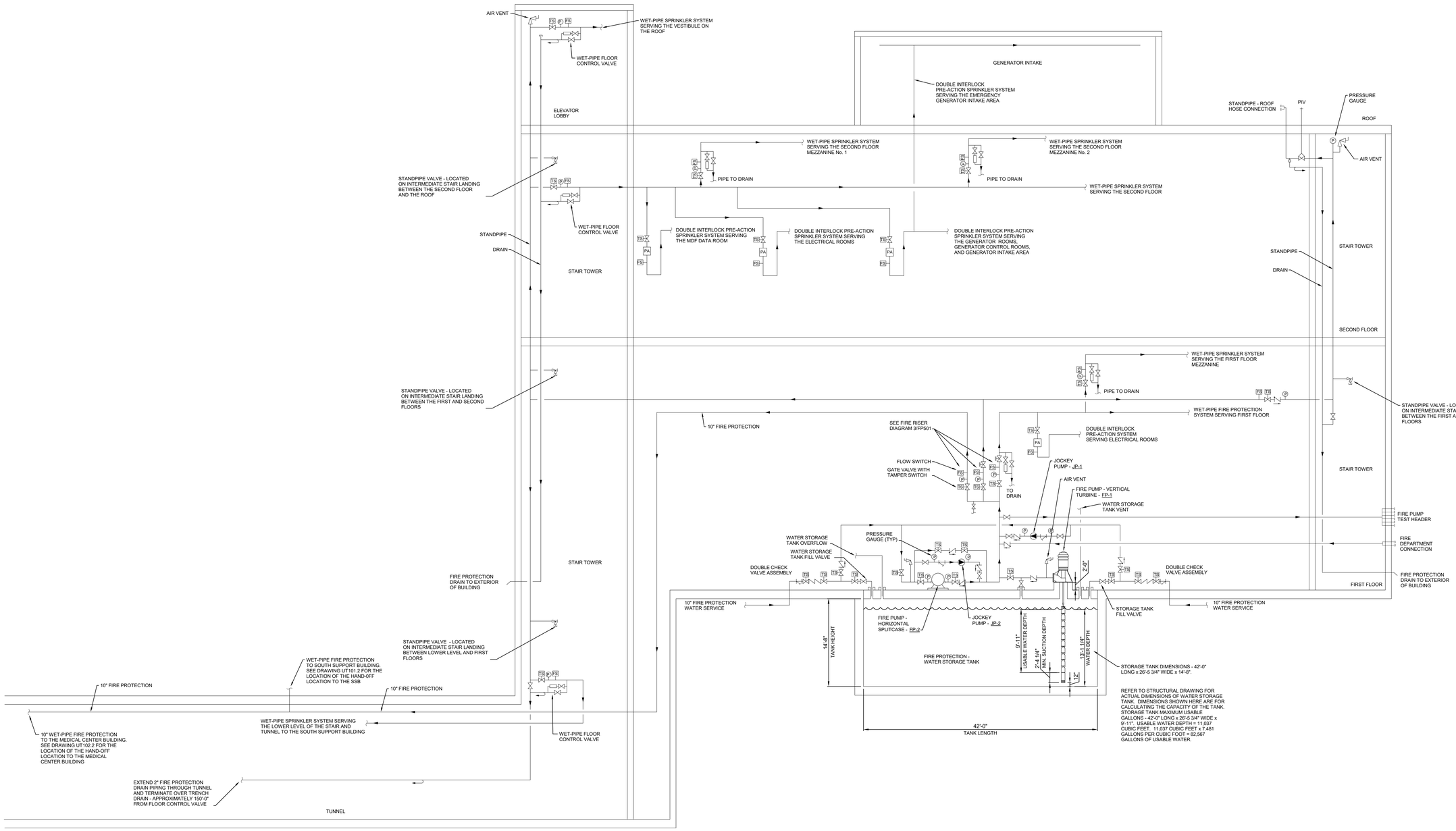
SHEET TITLE

FIRE PROTECTION SCHEDULES AND DETAILS

SHEET NUMBER

FP501

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:32:00 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 / FP701 **FIRE RISER PIPING DIAGRAM**
Scale: NONE

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

FIRE PROTECTION DIAGRAMS

SHEET NUMBER

FP701

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 1:32:00 PM AESI Proj No: 21-154
0 1/2" 1" 2"

NOTE: ALL SYMBOL DESCRIPTIONS ARE SUBJECT TO MODIFICATION ON THE DRAWINGS. ALL SYMBOLS NOT NECESSARILY USED ON THIS PROJECT.

RACEWAY SYMBOLS:

- CONDUIT
- CONDUIT CONCEALED UNDER FLOOR OR BELOW GRADE
- UNDERGROUND CONDUIT STUBBED OUT 5'-0" FROM BUILDING OR WALKWAY LINE, CAPPED AND MARKED
- (2) PHASE CONDUCTORS (2) NEUTRAL CONDUCTORS (1) GROUND
- B#5,7 — HOME RUN TO PANEL "B" FOR CIRCUITS #5 & 7 WITH NEUTRAL AND GROUND
- CONDUIT UP/DOWN
- JUNCTION BOX CONCEALED ABOVE ACCESSIBLE CEILING AREA

RECEPTACLE SYMBOLS:

- 20 AMP DUPLEX GROUNDING RECEPTACLE +20" AFF UNLESS OTHERWISE NOTED
- 20 AMP DUPLEX GROUNDING RECEPTACLE, EMERGENCY POWER
- 20 AMP DUPLEX GROUNDING RECEPTACLE, SPLIT WIRED
- 20 AMP DUPLEX GROUNDING RECEPTACLE, GROUND FAULT INTERRUPTING CIRCUIT
- 20 AMP DUPLEX GROUNDING RECEPTACLE, EMERGENCY POWER, GROUND FAULT INTERRUPTING CIRCUIT
- 20 AMP DOUBLE DUPLEX GROUNDING RECEPTACLE IN TWO GANG OUTLET BOX
- 20 AMP DOUBLE DUPLEX GROUNDING RECEPTACLE, EMERGENCY POWER
- 20 AMP DOUBLE DUPLEX GROUNDING RECEPTACLE, GROUND FAULT INTERRUPTING CIRCUIT
- 20 AMP DOUBLE DUPLEX GROUNDING RECEPTACLE, EMERGENCY POWER, GROUND FAULT INTERRUPTING CIRCUIT
- SPECIAL RECEPTACLE. SEE DRAWING FOR NEMA TYPE
- SPECIAL RECEPTACLE. SEE DRAWING FOR NEMA TYPE
- FLOOR DUPLEX RECEPTACLE OUTLET. SEE DRAWING FOR TYPE
- CEILING DUPLEX RECEPTACLE OUTLET. SEE DRAWING FOR TYPE
- SURFACE MULTI-OUTLET RACEWAY WITH RECEPTACLES 24" ON CENTER UNLESS OTHERWISE NOTED

LIGHTING CONTROL SYMBOLS:

- $ 3 a — 20 AMP POLE TOGGLE SWITCH 48" AFF. INSTALL MULTIPLE SWITCHES UNDER COMMON COVER PLATE. SUBSCRIPT AT SWITCH SYMBOL INDICATES THE FOLLOWING:
  TOP: 2 - DOUBLE POLE, 4 - FOUR WAY, M - MOMENTARY, 3 - THREE WAY, P - PILOT LIGHT, K - KEY OPERATED, D - DIMMER, LC - LIGHT CONTROLLER, BLANK - SINGLE POLE, LV - LOW-VOLTAGE PUSH BUTTON TYPE TOGGLE SWITCH
  BOTTOM: a,b,c,d, ETC. - IDENTIFICATION OF CONTROLLED DEVICE
- OCCUPANCY SENSOR SWITCH, CEILING MOUNTED
- OCCUPANCY SENSOR SWITCH, WALL MOUNTED
- DAYLIGHT SENSOR SWITCH, CEILING MOUNTED
- DAYLIGHT SENSOR SWITCH, WALL MOUNTED
- RC — LIGHTING ROOM CONTROLLER
- R — LIGHTING ISOLATED RELAY

POWER/MOTOR CONTROL SYMBOLS:

- PANELBOARD OR EQUIPMENT CABINET AS INDICATED
- MOTOR, NUMBER INDICATES HP
- $ T P — MANUAL MOTOR STARTER WITH THERMAL OVERLOADS AND PILOT LIGHT, 48" AFF
- X — SAFETY (DISCONNECT) SWITCH, INSTALL AT 60" AFF. "F" INDICATES FUSE SIZE, BLANK INDICATES NON-FUSED, "X" INDICATES AMPERAGE RATING
- COMBINATION STARTER: SEE SCHEDULE.

LIGHTING SYMBOLS:

- a/b, F# — LIGHTING FIXTURE, "a/b" INDICATES SWITCHING, "F#" INDICATES TYPE
- LIGHTING FIXTURE WITH LAMPS ON NORMAL AND EMERGENCY CIRCUIT, PROVIDE SEPARATE EMERGENCY LAMP BALLASTS AS SPECIFIED
- ALWAYS ON NIGHT LIGHT
- a F# — ROUND LIGHTING FIXTURE, "a" INDICATES SWITCHING, "F#" INDICATES TYPE
- a F# — WALL MOUNTED LIGHTING FIXTURE, "a" INDICATES SWITCHING, "F#" INDICATES TYPE
- SINGLE ARM LIGHTING STANDARD, POLE MOUNTED LUMINAIRE AND POLE SUPPORT BASE
- DOUBLE ARM LIGHTING STANDARD, POLE MOUNTED LUMINAIRE AND POLE SUPPORT BASE
- LIGHTING FIXTURE ON LIGHTING TRACK, CEILING MOUNTED
- SINGLE FACE EXIT SIGN. ARROW INDICATES DIRECTIONAL ARROW ON EXIT SIGN FACE
- EXIT SIGN, WALL MOUNTED 8'-0" AFF UNLESS OTHERWISE NOTED
- EMERGENCY BATTERY UNIT WITH TWO HEADS, WALL MOUNTED 8'-0" AFF UNLESS OTHERWISE NOTED

FIRE ALARM SYMBOLS:

- FACP — FIRE ALARM CONTROL PANEL
- FAAP — FIRE ALARM ANNUNCIATOR PANEL
- NAC — NOTIFICATION ALARM CIRCUIT
- F — FIRE ALARM MANUAL PULL STATION, 48" AFF
- F — FIRE ALARM MANUAL PULL STATION, AUDIO-VISUAL INDICATING DEVICE CENTERED ABOVE THE PULL STATION, 48" AFF AND +80" AFF LIGHT OUTPUT 75 cd UNLESS OTHERWISE NOTED
- V — FIRE ALARM VISUAL ONLY INDICATING DEVICE, +80" AFF LIGHT OUTPUT 75 cd UNLESS OTHERWISE NOTED
- CEILING AV, WALL AV — FIRE ALARM AUDIO/VISUAL INDICATING DEVICE, WALL MOUNT +80" AFF LIGHT OUTPUT 75 cd UNLESS OTHERWISE NOTED
- V, V — FIRE ALARM VISUAL ONLY INDICATING DEVICE, WALL MOUNT +80" AFF LIGHT OUTPUT 75 cd UNLESS OTHERWISE NOTED
- A, A — FIRE ALARM AUDIO HORN INDICATING DEVICE, WALL MOUNT +80" AFF
- BELL
- SD — AREA SMOKE DETECTOR
- HD — AREA HEAT DETECTOR
- FS — FLOW SWITCH, FIRE ALARM
- TS — TAMPER SWITCH, FIRE ALARM
- DS — DOOR SWITCH, FIRE ALARM
- AS — AIR DUCT SMOKE DETECTOR MOUNTED ON AIR DUCT
- LA — LOW AIR
- PS — PRESSURE SWITCH
- DOOR HOLD

TELECOMMUNICATION SYMBOLS:

- X — DATA OUTLET IN TWO GANG BOX WITH SINGLE GANG OPENING, "X" INDICATES NUMBER OF DATA JACKS
- X — FLOOR OUTLET, DATA OUTLET CONSISTS OF (2) DATA OUTLETS UNLESS OTHERWISE NOTED, EACH ALPHA CHARACTER "X" INDICATES NUMBER OF UNIQUE DATA JACKS
- AC-X — CEILING MOUNTED OUTLET, DATA OUTLET CONSISTS OF (2) DATA OUTLETS, UNLESS OTHERWISE NOTED, EACH ALPHA CHARACTER "X" INDICATES NUMBER OF UNIQUE DATA JACKS
- AP-X — CEILING MOUNTED WIRELESS ACCESS POINT OUTLET, DATA OUTLET CONSISTS OF (2) DATA OUTLETS, UNLESS OTHERWISE NOTED, EACH ALPHA CHARACTER "X" INDICATES NUMBER OF UNIQUE DATA JACKS
- SURFACE DATA/TELECOM RACEWAY
- S — CEILING MOUNTED SPEAKER
- S — PAGING HORN TYPE SPEAKER
- TV — TELEVISION/VIDEO OUTLET IN TWO GANG BOX WITH SINGLE GANG OPENING

SECURITY/ACCESS CONTROL SYMBOLS

- CR — CARD READER, WALL MOUNT +48" AFF
- KP — KEYPAD
- PB — PANIC BUTTON
- RX — REQUEST TO EXIT
- DS — DOOR STATUS
- ES — ELECTRIC STRIKE
- ML — MAG LOCK
- AA — AUDIBLE ALARM
- VI — VIDEO INTERCOM DOOR STATION
- VS — VIDEO INTERCOM MASTER STATION

DIAGRAM SYMBOLS:

- GROUND ROD (SINGLE LINE DIAGRAM)
- GROUND ROD (PLAN DRAWING)
- LIGHTNING ROD
- EXOTHERMIC WELDED CONNECTION.
- T — TRANSFORMER, 480V PRIMARY, 120/208 VOLT SECONDARY, 3 PHASE, 4 WIRE UNLESS OTHERWISE NOTED
- CURRENT & VOLTAGE TRANSFORMERS AS REQUIRED (REFER TO SPECIFICATIONS)
- AM — AMMETER, (REFER TO SPECIFICATIONS)
- VM — VOLTMETER, (REFER TO SPECIFICATIONS)
- FUSE
- 30A 3P — CIRCUIT BREAKER (C.B.)
- PUSHBUTTON, NORMALLY OPEN
- PUSHBUTTON, NORMALLY CLOSED
- LEVEL SWITCH, NORMALLY OPEN
- LEVEL SWITCH, NORMALLY CLOSED
- LIMIT SWITCH, NORMALLY OPEN
- LIMIT SWITCH, NORMALLY OPEN
- PRESSURE SWITCH, NORMALLY OPEN
- PRESSURE SWITCH, NORMALLY CLOSED
- FLOW SWITCH, NORMALLY OPEN
- FLOW SWITCH, NORMALLY CLOSED
- ON-DELAY TIMING CONTACT, NORMALLY OPEN
- ON-DELAY TIMING CONTACT, NORMALLY CLOSED
- OFF-DELAY TIMING CONTACT, NORMALLY OPEN
- OFF-DELAY TIMING CONTACT, NORMALLY CLOSED
- TEMPERATURE SWITCH, NORMALLY OPEN
- TEMPERATURE SWITCH, NORMALLY CLOSED
- RELAY CONTACT, NORMALLY OPEN
- RELAY CONTACT, NORMALLY CLOSED
- SOLENOID VALVE (WIRING DIAGRAM)
- R — PUSH-TO-TEST PILOT LIGHT
- XXXX X XXXX X — 2-POSITION SELECTOR SWITCH
- OFF HAND X AUTO X — 3-POSITION SELECTOR SWITCH
- TERMINAL BLOCK
- CONTROL TRANSFORMER
- CONTROL TRANSFORMER

GENERAL SYMBOLS:

- NEW
- EXISTING
- DEMOLITION
- FUTURE
- POINT OF CONNECTION
- POINT OF REMOVAL
- # — PLAN NOTE
- # — DEMOLITION NOTE
- X X — DETAIL OR SECTION MARKER

ELECTRICAL ABBREVIATIONS:

#/C	MULTI-CONDUCTOR CABLE
1/C	SINGLE CONDUCTOR CABLE
20AF	20 AMP FUSES
3P	3 POLE
A, AMP	AMPERE
ACCU	AIR COOLED CONDENSING UNIT
AFF	ABOVE FINISHED FLOOR. MOUNTING HEIGHTS FROM FINISHED FLOOR TO TOP OF BOX.
AHU	AIR HANDLING UNIT
CH	CABINET HEATER
E	EXISTING EQUIPMENT TO BE REUSED
EF	EXHAUST FAN
FCU	FAN COIL UNIT
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HP	HORSEPOWER
IG	ISOLATED GROUND
KVA	KILOVOLT AMPERES
KW	KILOWATT
NL	NIGHT LIGHT ON UNSWITCHED CIRCUIT
OL	OVERLOAD
PROVIDE	FURNISH, INSTALL AND CONNECT.
RTU	ROOF TOP UNIT
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VOLTS
WC	WATER COOLER
WG	WIRE GUARD
WP	WEATHERPROOF

GENERAL FIRE ALARM NOTES:

1. MANUAL PULL STATIONS AT EXIT DOORS SHALL BE INSTALLED WITHIN 5'-0" OF THE DOOR. OPERABLE PART OF EACH MANUAL PULL STATION SHALL BE INSTALLED BETWEEN 42" AND 48" ABOVE FINISHED FLOOR TO MEET ADA REQUIREMENTS.
2. FIRE RATED DOORS WITH HOLDS SHALL RELEASE UPON AN ALARM FROM SMOKE DETECTOR ON EITHER SIDE OF THE DOOR, OR OTHER ALARM INITIATION.
3. SMOKE DETECTOR SHALL BE INSTALLED 5'-0" OR LESS IN FRONT OF FACP AND CENTER OF THE DOORS WHICH CONTAIN HOLDERS.
4. SMOKE DETECTORS SHALL NOT BE INSTALLED WITHIN 3'-0" OF AN AIR DIFFUSER OR RETURN GRILL.
5. SMOKE DETECTORS IN ELEVATOR LOBBIES MUST BE INSTALLED WITHIN 21'-0" OF THE CENTERLINE OF THE ELEVATOR.
6. FIRE ALARM DESIGN SHALL CONTAIN NO MORE THAN 70% LOAD ON EACH PANEL AND LOOP LEAVING 30% AVAILABLE FOR FUTURE CAPACITY PER CIRCUIT.
7. CONTRACTOR MAY UTILIZE OPEN FIRE ALARM CABLING OR ARMORED FIRE ALARM CABLING WHEN INSTALLING CONDUCTORS ABOVE ACCESSIBLE CEILINGS AND BEHIND ACCESSIBLE CHASES. FIRE ALARM CABLING SHALL BE INSTALLED IN RACEWAY ABOVE INACCESSIBLE CEILINGS AND BEHIND INACCESSIBLE CHASES AND WALLS. IN ALL OPEN PUBLIC SPACES, FIRE ALARM CABLING SHALL BE INSTALLED IN RACEWAY (SURFACE RACEWAY) AND RACEWAY SHALL BE PAINTED TO MATCH WALLS/CEILING SURFACE ON WHICH THE RACEWAY IS INSTALLED.
8. OPEN FIRE ALARM CABLING NOT INSTALLED IN RACEWAY SHALL BE PLENUM RATED, NO EXCEPTION.
9. CONTRACTOR SHALL ADJUST DEVICE LOCATIONS BY UP TO 30" FROM WHAT IS SHOWN TO AVOID OBSTRUCTIONS.
10. CONTRACTOR SHALL PROVIDE "SURFACE MOUNT ADAPTER SKIRTS" FOR ALL SURFACE MOUNTED DEVICES. "SKIRTS" ARE NOT REQUIRED FOR SURFACE MOUNTED DEVICES INSTALLED IN MECHANICAL OR ELECTRICAL ROOMS.

GENERAL ELECTRICAL NOTES:

1. ALL WORK SHOWN IS NEW AND BY THE ELECTRICAL TRADES, UNLESS OTHERWISE NOTED.
2. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70-2020).
3. ALL FIRE ALARM WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF NATIONAL FIRE ALARM CODE (NFPA 72) AS ADOPTED BY THE STATE INCLUDING ALL AMENDMENTS.
4. THIS CONTRACTOR SHALL REVIEW THE COMPLETE SET OF DRAWINGS AND SPECIFICATIONS AND INCLUDE WORK FROM OTHER DIVISIONS THAT AFFECT HIS WORK IN HIS BID.
5. EACH CONTRACTOR SHALL FIELD VERIFY ALL EXISTING APPLICABLE CONDITIONS AND DIMENSIONS SHOWN ON THE DRAWINGS, AS PERTAINS TO THE INTENT OF THESE DRAWINGS. CONTRACTOR SHALL BRING TO THE ATTENTION OF THE ENGINEER AND DESIGNER ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF ANY WORK AFFECTED BY OR RELATED TO SUCH DISCREPANCY. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH OR CAUSED BY THAT CONTRACTOR'S FAILURE TO COMPLY WITH THIS REQUIREMENT.
6. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL CUTTING AND PATCHING REQUIRED FOR THE ELECTRICAL, SECURITY, AND FIRE ALARM INSTALLATION SHALL BE PERFORMED BY THE APPROPRIATE TRADE AND PAID FOR BY THIS CONTRACTOR. ALL CUTTING AND PATCHING SHALL BE IN ACCORDANCE WITH THE APPLICABLE ARCHITECTURAL DETAILS/NOTES.
7. ALL FIRESTOPPING SHALL BE PROVIDED UNDER DIVISION 26050 3.2, "FIRESTOPPING", AND BY DIVISION 7 SPECIFICATIONS.
8. VERIFY EXACT LOCATION OF OUTLETS ABOVE COUNTERS, IN CASEWORK OR EQUIPMENT PRIOR TO ROUGH IN.
9. COORDINATE INSTALLATION OF DEVICES AND WIRING WITH LIGHTING, HVAC, PIPING, AND STRUCTURAL MEMBERS.
10. GFCI CIRCUIT SHALL BE INSTALLED SUCH THAT GFCI RECEPTACLE SHALL ONLY TRIP ITSELF AND DOES NOT TRIP OR DISCONNECT POWER ON ANY OTHER RECEPTACLE.
11. LOW-VOLTAGE CONDUIT SHALL NOT CONTAIN MORE THAN 270° IN BENDS BETWEEN FLOOR BOXES, PROJECTOR BOXES, CAMERA BOXES, A/V EQUIPMENT RACKS, FIRE ALARM DEVICE BOXES, FIRE ALARM PANELS, SECURITY DEVICE BOXES, AND SECURITY PANELS. PROVIDE PULL BOXES IN RACEWAYS THAT CONTAIN MORE THAN 270° IN BENDS. PROVIDE A MINIMUM OF ONE (1) PULL BOX FOR EVERY 100 FEET OF RACEWAY.
12. CONTRACTOR SHALL PROVIDE MINIMUM 200 LB TENSION PULL STRING IN ALL EMPTY/FUTURE USE RACEWAYS.
13. ALL CONDUIT ROUTED IN AND THROUGH CONCRETE AND/OR BUILDING STRUCTURAL WALLS SHALL BE RIGID METAL CONDUIT, UNLESS OTHERWISE NOTED.
14. WHEN NEW WALL AND FLOOR FINISHES ARE SHOWN, REMOVE ALL COVERPLATES AND REINSTALL AFTER NEW FINISHES HAVE BEEN COMPLETED.
15. ALL CONDUIT AND DEVICES SHALL BE PROVIDED WITH OWNER APPROVED HANGERS CONFORMING TO STANDARDS OUTLINED. IN GENERAL ALL HANGERS SHALL BE ANCHORED FROM THE SIDE OF THE STRUCTURE AND NOT FROM THE BOTTOM.
16. TURN OVER ALL KEYS TO OWNER AT COMPLETION OF PROJECT.
17. FIRE STOP ALL WALL AND FLOOR PENETRATIONS WHETHER SURFACE IS RATED OR NOT.
18. DEVICE LOCATIONS AND RACEWAY ROUTING SHOWN IS DIAGRAMMATIC. CONTRACTOR SHALL VERIFY ALL CONDITIONS PRIOR TO STARTING CONSTRUCTION.

XXXX
- NUMBER 1,2,3, ETC.
- VOLTAGE L-208/120V H-480/277V
- CRITICALITY N-NORMAL POWER UPS - UNINTERUPABLE POWER SUPPLY
- FLOOR T-TUNNEL B-BASEMENT 1-FIRST FLOOR 2-SECOND FLOOR R-ROOF

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REVISIONS

NO.	DATE	DESCRIPTION

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

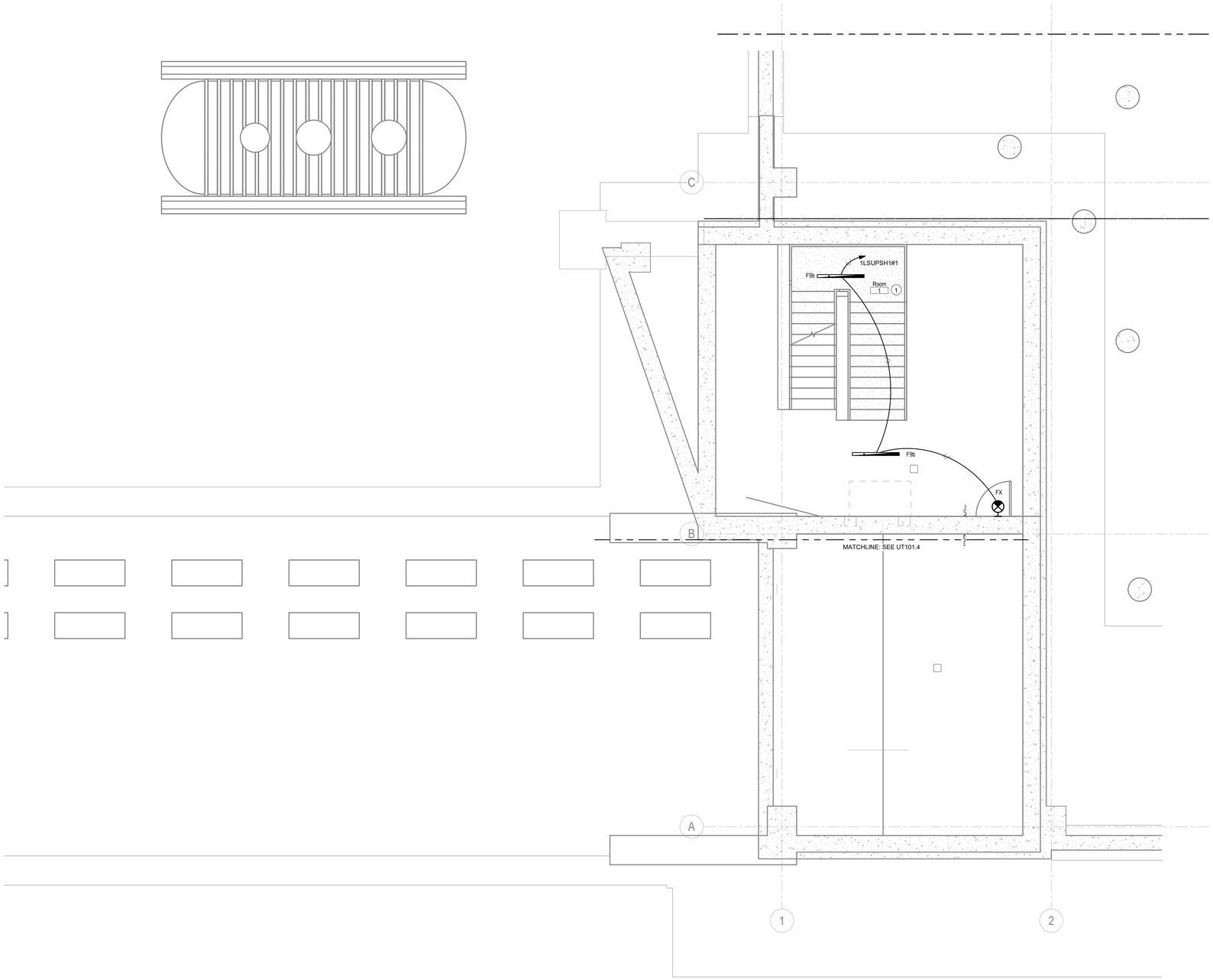
ELECTRICAL SYMBOLS AND ABBREVIATIONS

SHEET NUMBER

E001

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:19:47 PM AESI Proj. No: 21-154



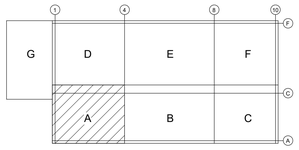
GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. SEE STAIRS #1 CROSS SHEET E501.

LOWER LEVEL LIGHTING PLAN- AREA A
Scale: 1/4" = 1'-0"



KEY PLAN
SCALE: NONE

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SHEET TITLE

LOWER LEVEL LIGHTING PLAN - AREA A

SHEET NUMBER

EL301

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:31 PM AESI Proj. No: 21-154

LOWER LEVEL PHOTOMETRIC PLAN AREA-A
Scale: 1/4" = 1'-0"

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SHEET TITLE

LOWER LEVEL PHOTOMETRIC PLAN - AREA A

SHEET NUMBER

EL301LT

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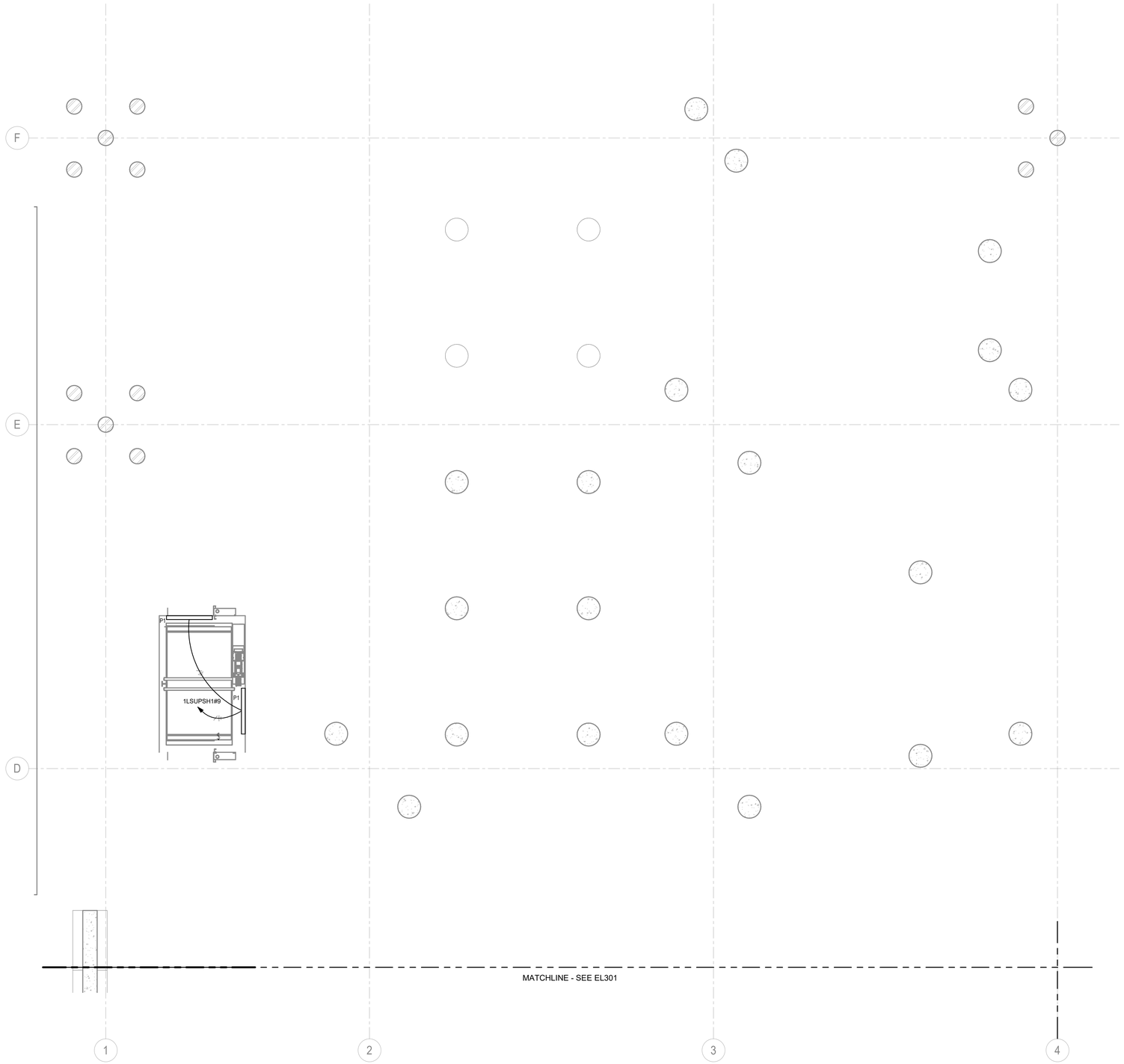


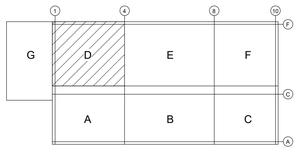
LOWER LEVEL LIGHTING PLAN- AREA D
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. GENERAL NOTES FOR INDIVIDUAL SHEETS.
2. NEXT LINE OF NOTES HAVE NO SPACING BETWEEN LINES.

(#) PLAN NOTES:

1. PLAN NOTES FOR INDIVIDUAL SHEETS.
2. NEXT LINE OF NOTES HAVE NO SPACING BETWEEN LINES.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
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PROJECT

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PROJECT NO. 21-154	

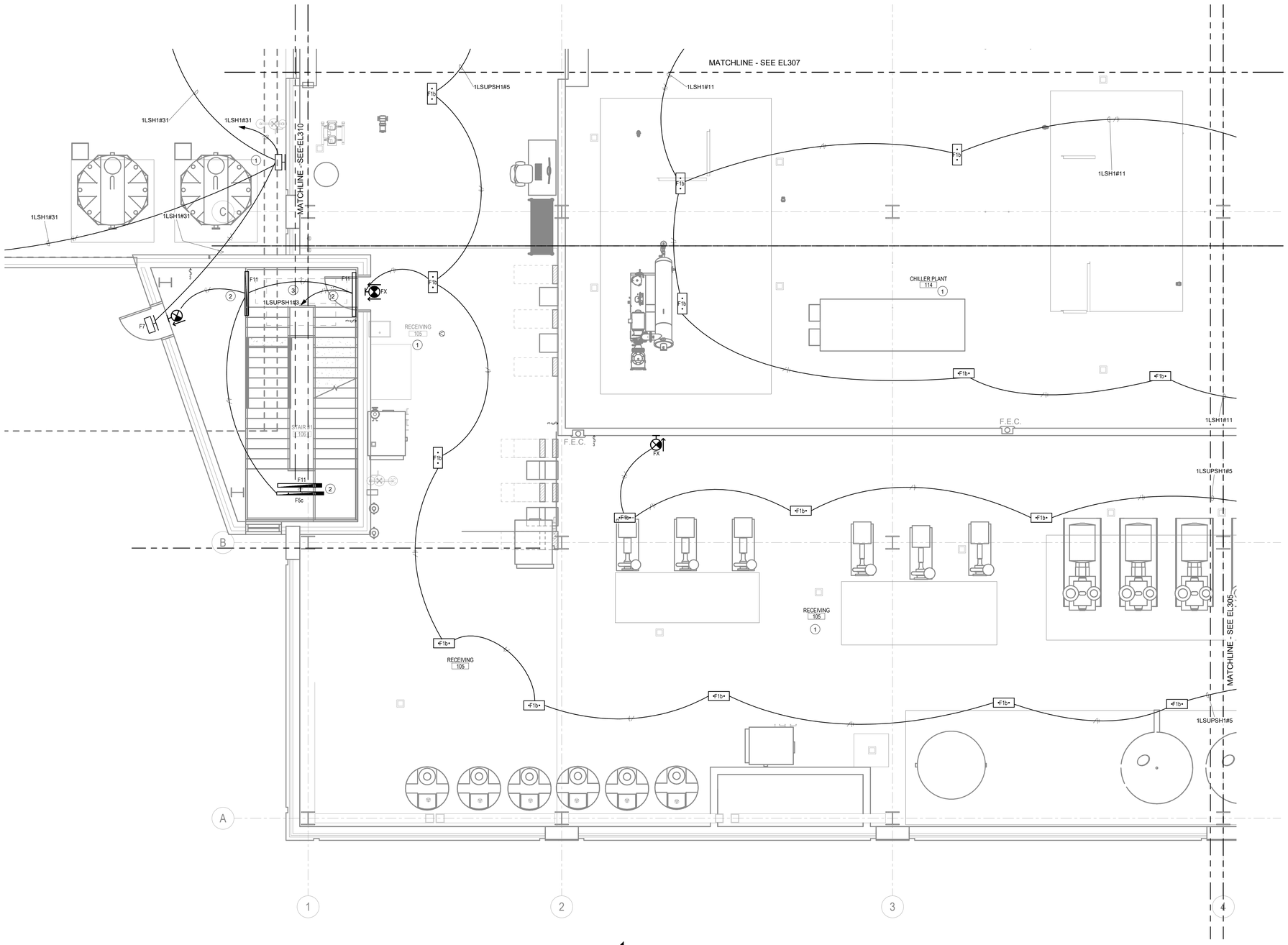
SHEET TITLE

LOWER LEVEL LIGHTING PLAN - AREA D

SHEET NUMBER

EL303

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:34 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR LIGHTING PLAN - AREA A

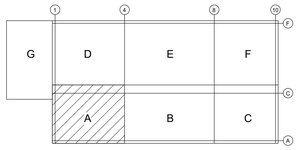
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 15'-0" AFF.
2. INSTALL LIGHT FIXTURE SHOWN THIS LOCATION ON TWO DIFFRENT LANDING.
3. SEE STAIRS #1 CROSS SHEET E501.



KEY PLAN
SCALE: NONE

OWNER

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SHEET TITLE

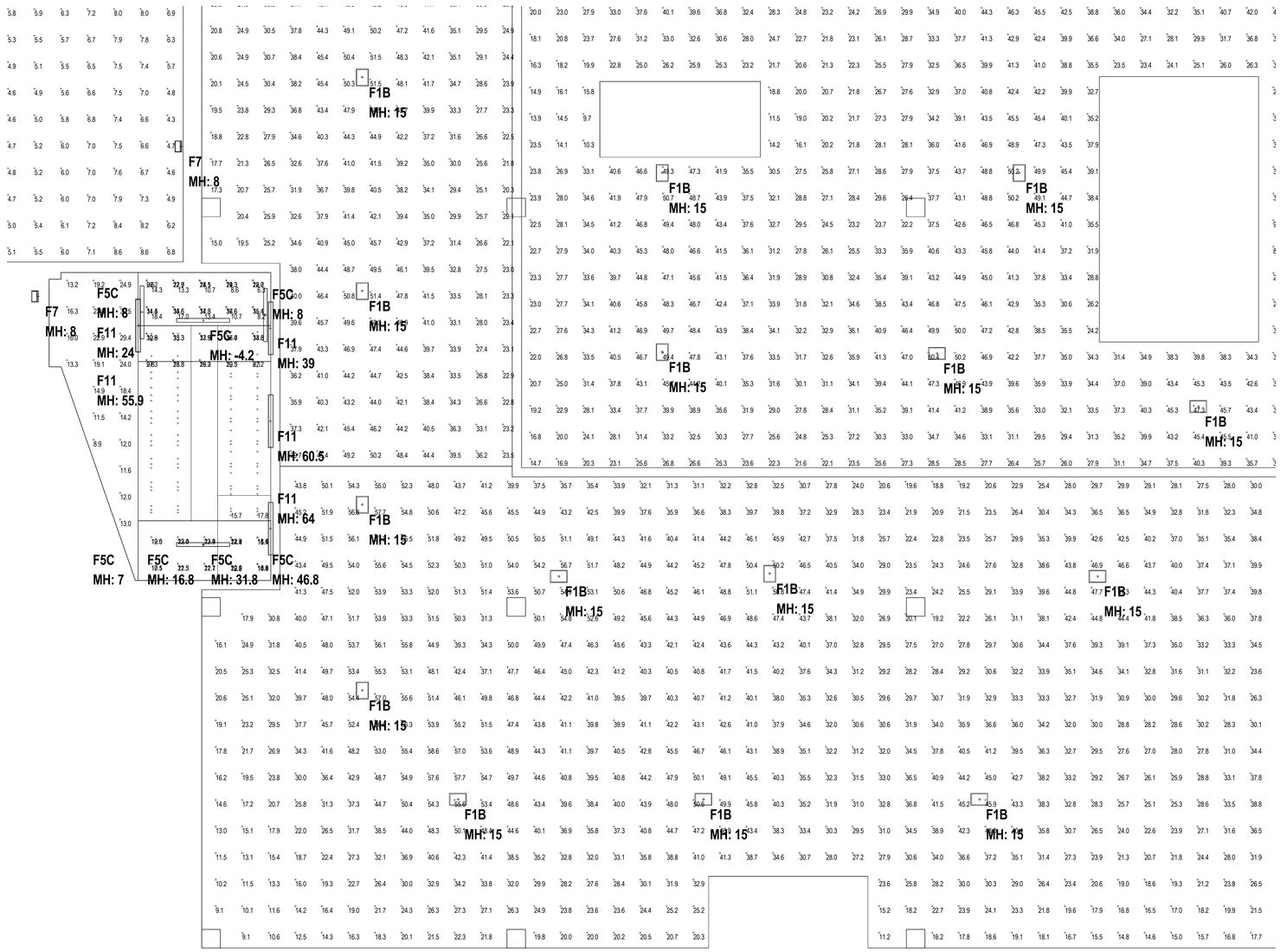
FIRST FLOOR LIGHTING PLAN - AREA A

SHEET NUMBER

EL304

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:39 PM AESI Proj No: 21-154



FISRT FLOOR PHOTOMETRIC PLAN AREA-A

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

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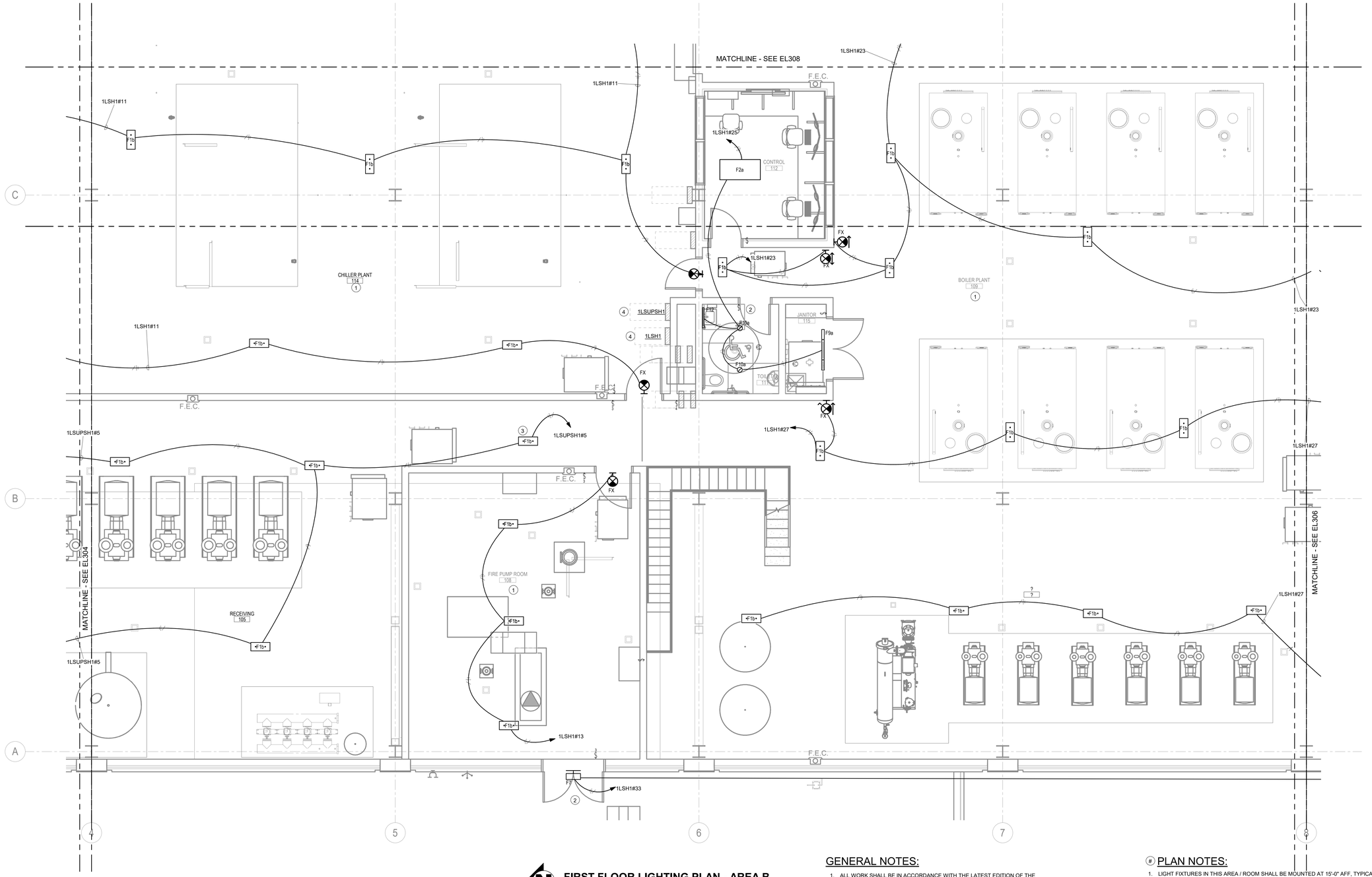
SHEET TITLE

FIRST FLOOR PHOTOMETRIC PLAN - AREA A

SHEET NUMBER

EL304LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:40 PM AESI Proj. No: 21-154



FIRST FLOOR LIGHTING PLAN - AREA B

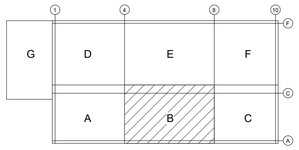
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 15'-0" AFF, TYPICAL.
2. COORDINATE SWITCH LOCATION WITH PLACEMENT OF DOOR.
3. LIGHT FIXTURE WILL BE HANGING OFF A PICCE OF UNISTRUT MOUNTED IN TRAPEZE.
4. SEE ONE LINE DIAGRAM AT SHEET EP708.



KEY PLAN
SCALE: NONE

OWNER

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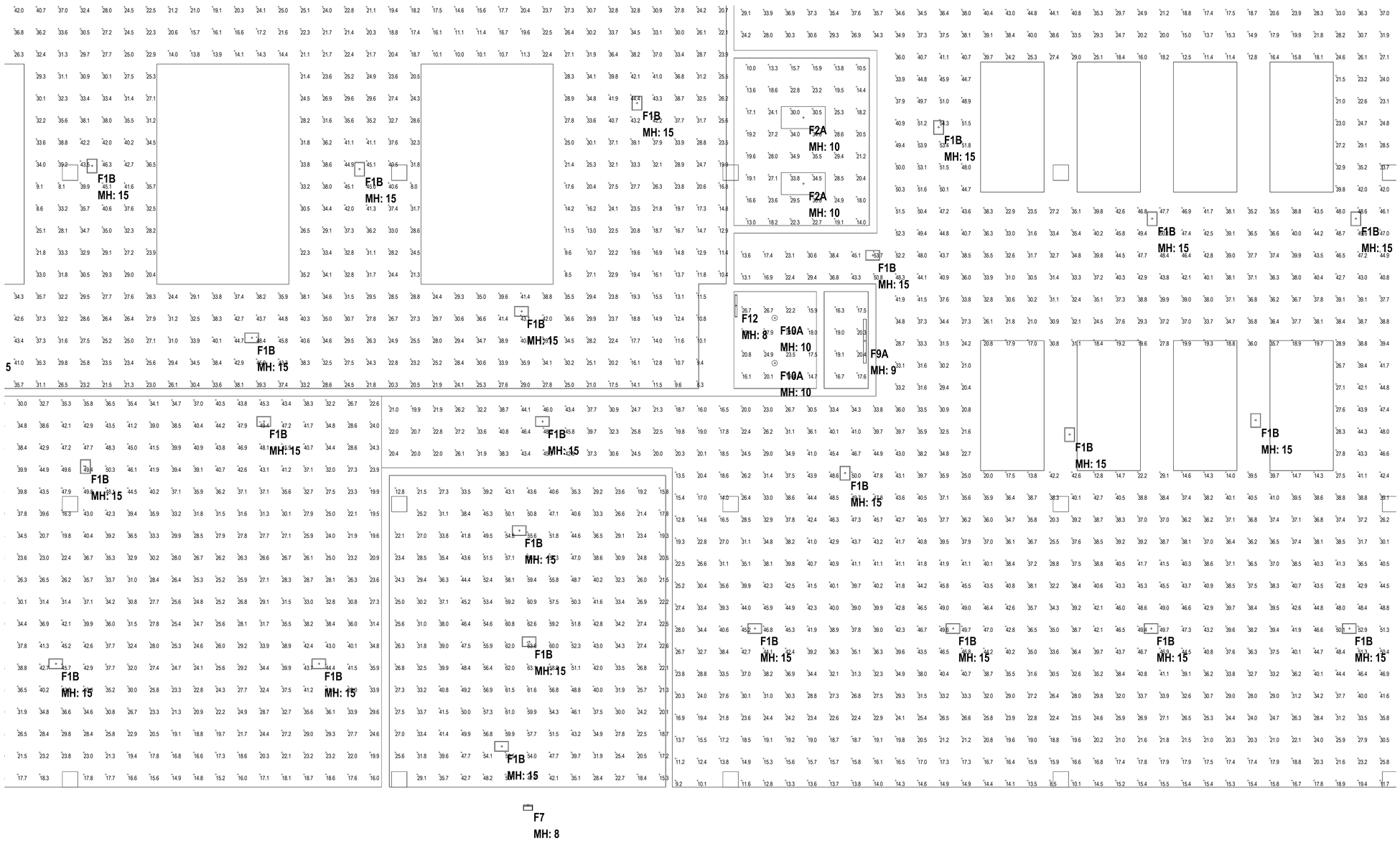
SHEET TITLE

FIRST FLOOR LIGHTING PLAN - AREA B

SHEET NUMBER

EL305

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:49 PM AESI Proj. No: 21-154



FISRT FLOOR PHOTOMETRIC PLAN AREA-B

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

OWNER

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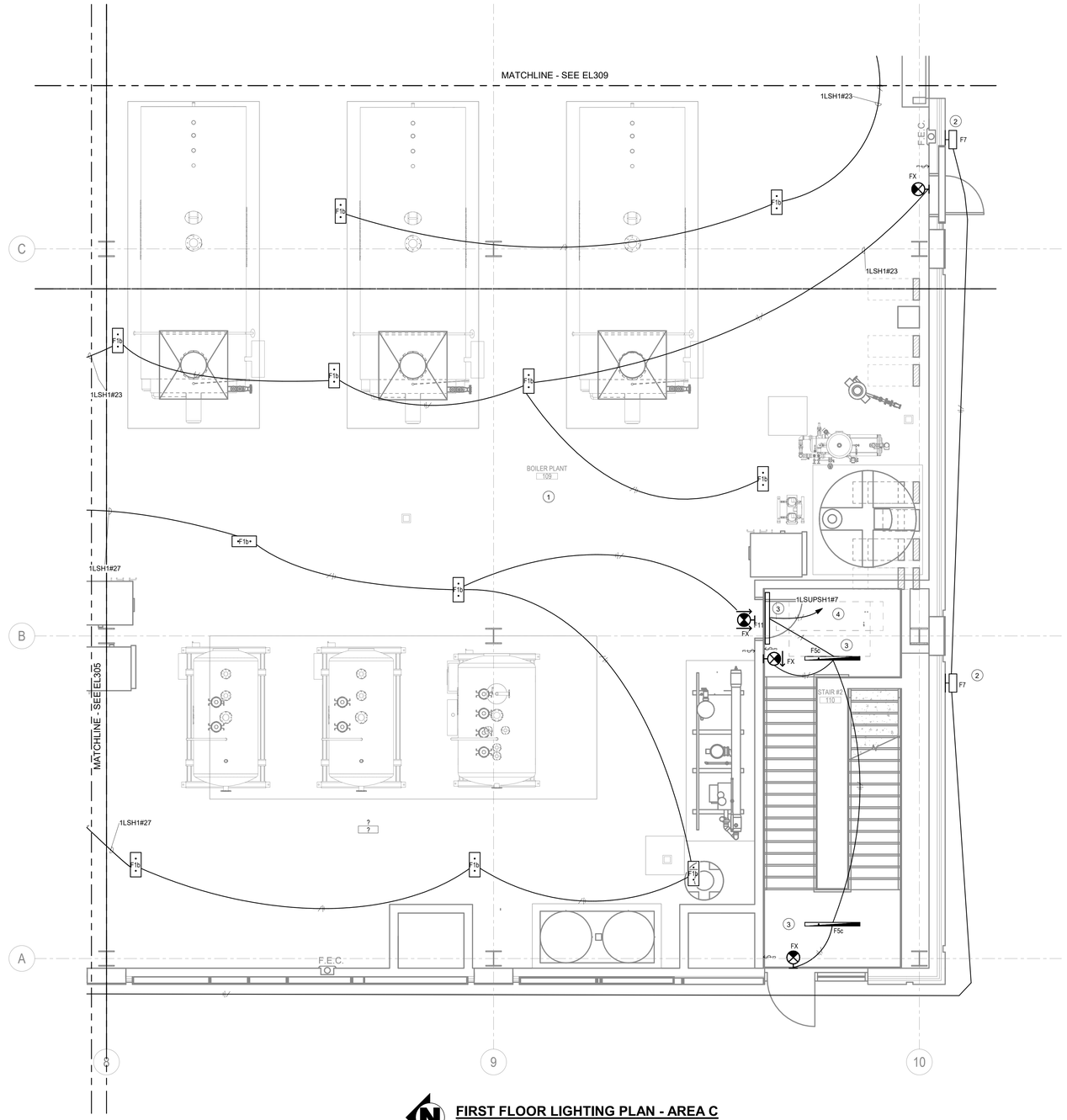
SHEET TITLE

FIRST FLOOR PHOTOMETRIC PLAN - AREA B

SHEET NUMBER

EL305LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:50 PM AESI Proj. No: 21-154



FIRST FLOOR LIGHTING PLAN - AREA C

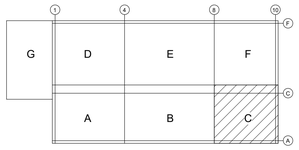
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 15'-0" AFF, TYPICAL..
2. LIGHT FIXTURE SHALL BE MOUNTED AT 9'-0" AFF.
3. INSTALL LIGHT FIXTURE SHOWN THIS LOCATION ON TWO DIFFRENT LANDING.
4. SEE STAIRS #2 CROSS SHEET E501.



KEY PLAN
SCALE: NONE

OWNER

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340 W. 10th Street
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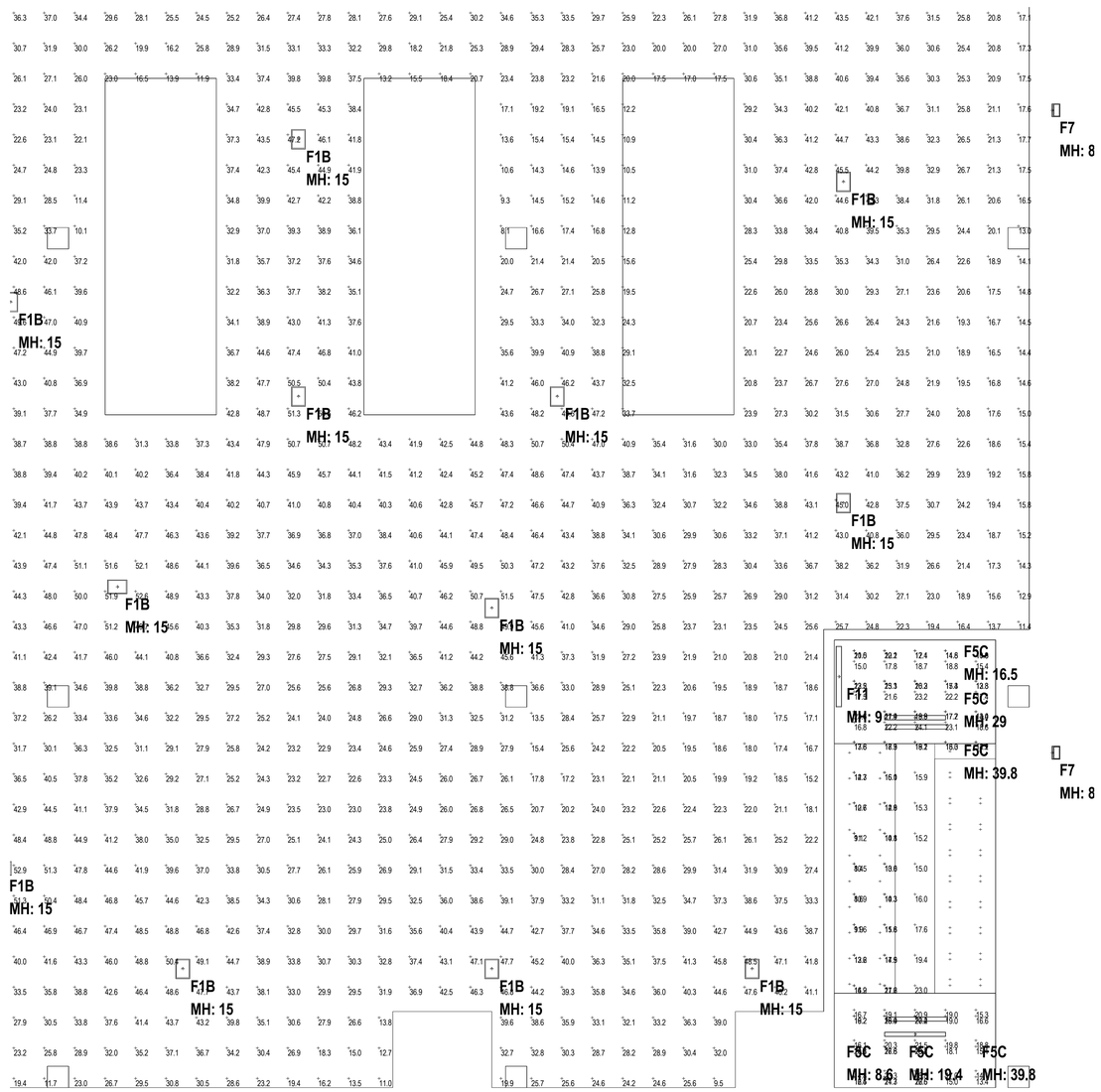
SHEET TITLE

FIRST FLOOR LIGHTING PLAN - AREA C

SHEET NUMBER

EL306

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:27:59 PM AESI Proj. No: 21-154



FISRT FLOOR PHOTOMETRIC PLAN AREA-C
Scale: 1/4" = 1'-0"

OWNER

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Medical Center Campus
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SHEET TITLE

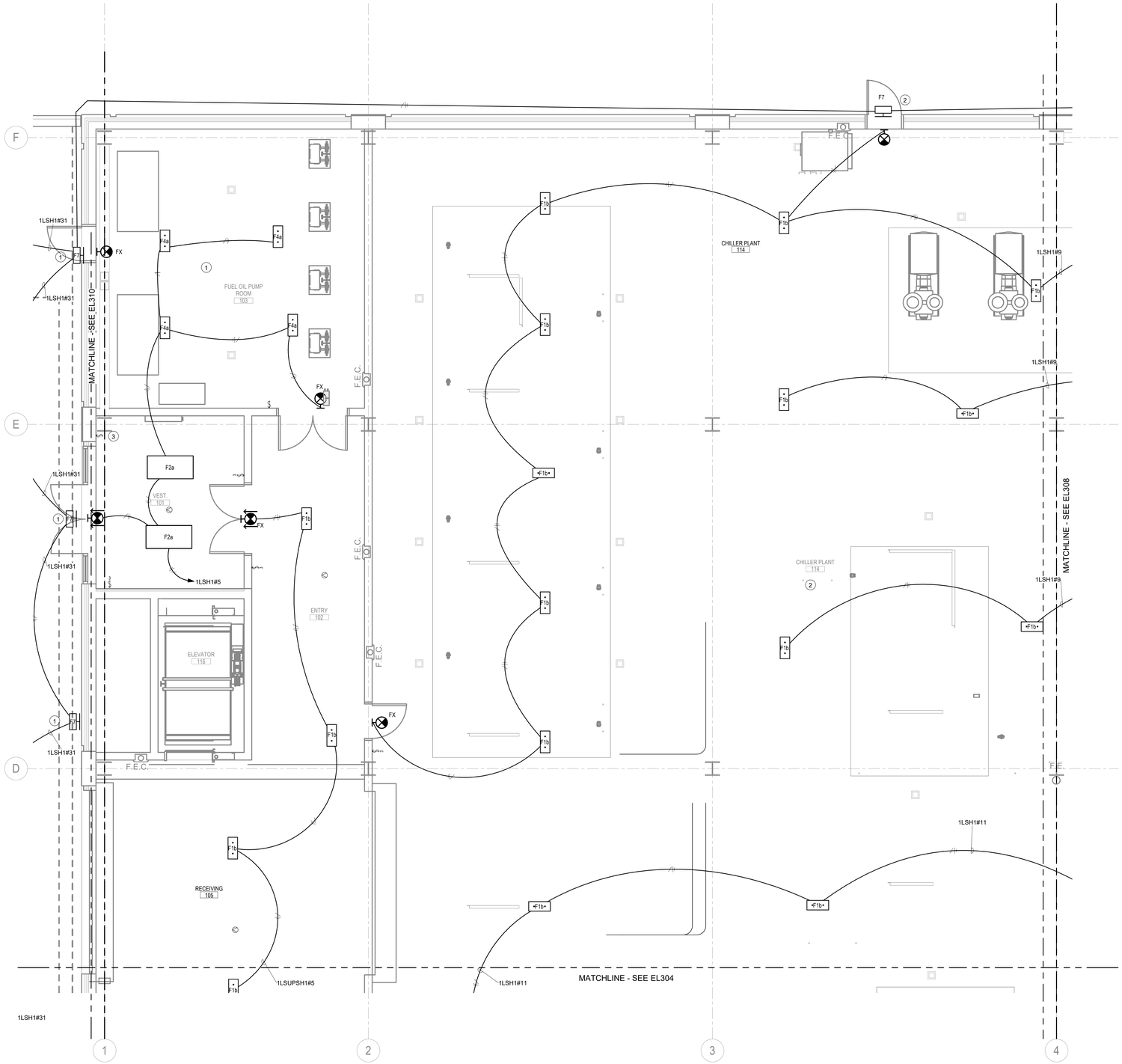
FIRST FLOOR PHOTOMETRIC PLAN - AREA C

SHEET NUMBER

EL306LT

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:00 PM AESI Proj. No: 21-154



FIRST FLOOR LIGHTING PLAN - AREA D

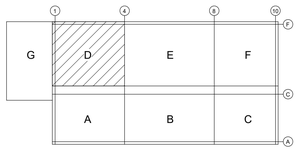
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURE SHALL BE MOUNTED AT 9'-0" AFF.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 15'-0" AFF.
3. ADD SWITCH SOR SERVICE YARD.



KEY PLAN

SCALE: NONE

OWNER

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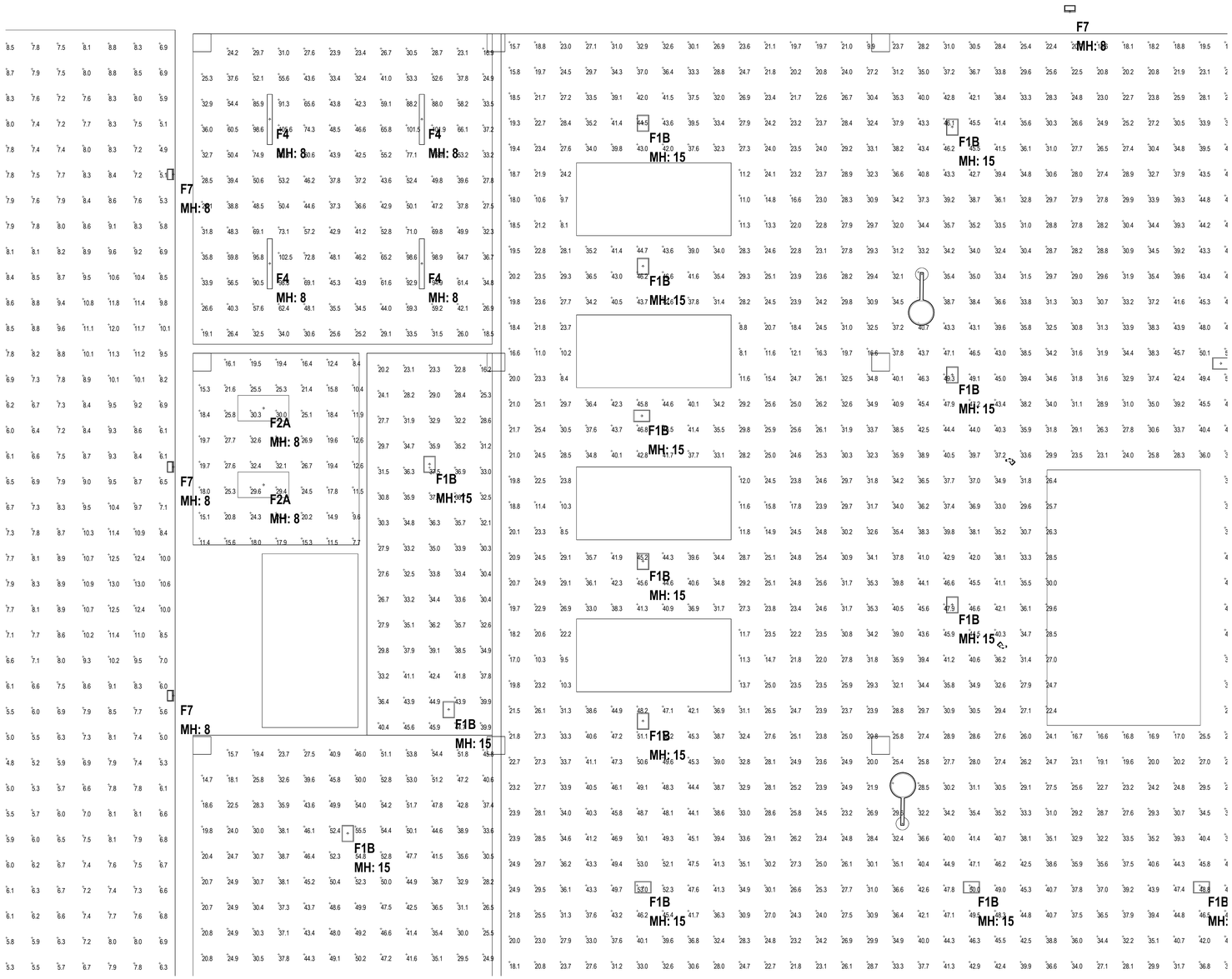
SHEET TITLE

FIRST FLOOR LIGHTING PLAN - AREA D

SHEET NUMBER

EL307

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:04 PM AESI Proj. No: 21-154



FISRT FLOOR PHOTOMETRIC PLAN AREA-D

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

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:05 PM AESI Proj No: 21-154

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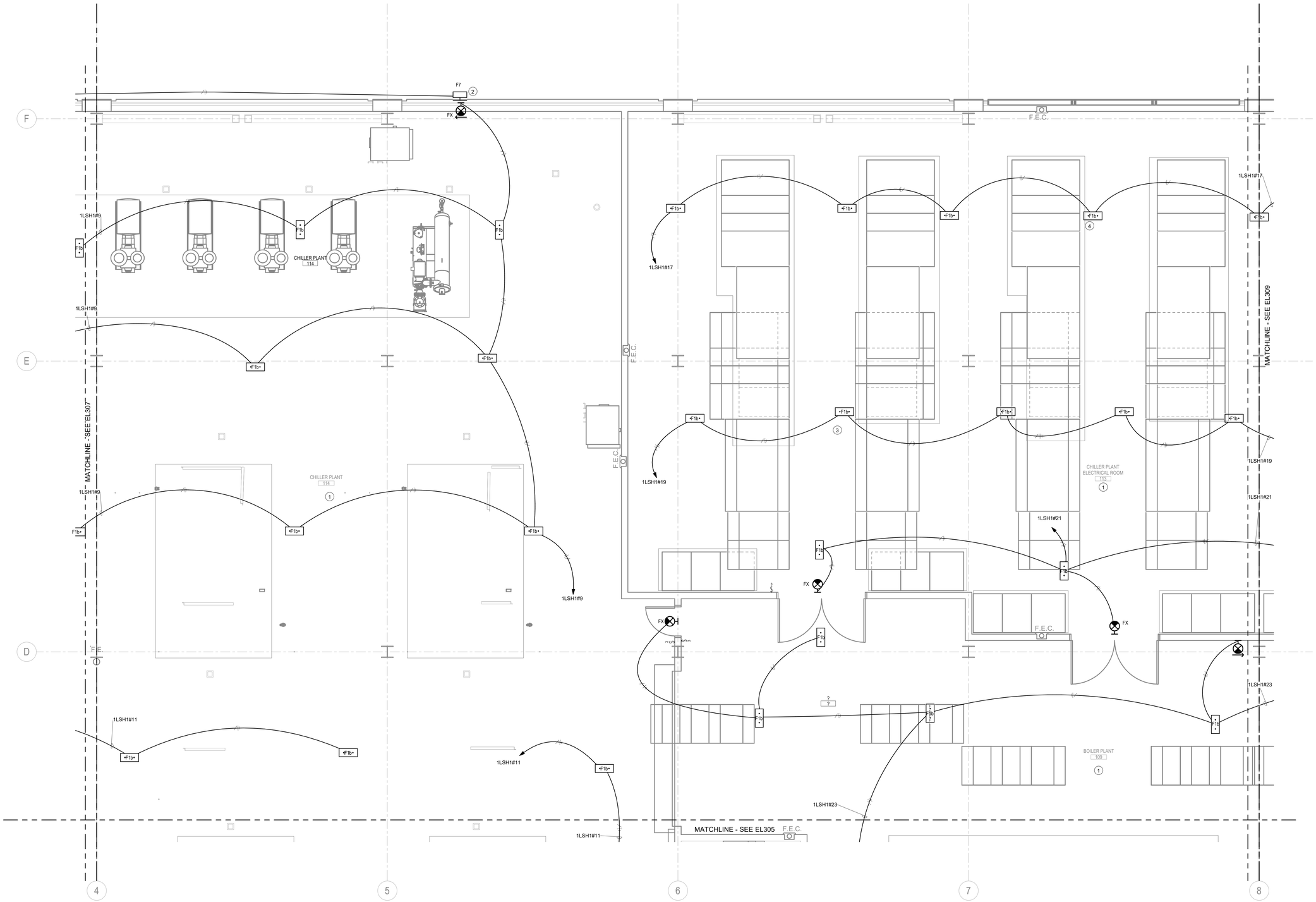
SHEET TITLE

FIRST FLOOR PHOTOMETRIC PLAN - AREA D

SHEET NUMBER

EL307LT



FIRST FLOOR LIGHTING PLAN - AREA E

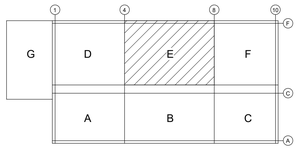
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 15'-0" AFF.
2. LIGHT FIXTURE SHALL BE MOUNTED AT 9'-0" AFF.
3. LIGHT FIXTURE WILL BE HANGING OFF A PICCE OF UNISTRUT MOUNTED IN TRAPEZE.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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NO.	DATE	DESCRIPTION

DESIGNED BY DAG	CERTIFICATION
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APPROVED BY SPE	
PROJECT NO. 21-154	

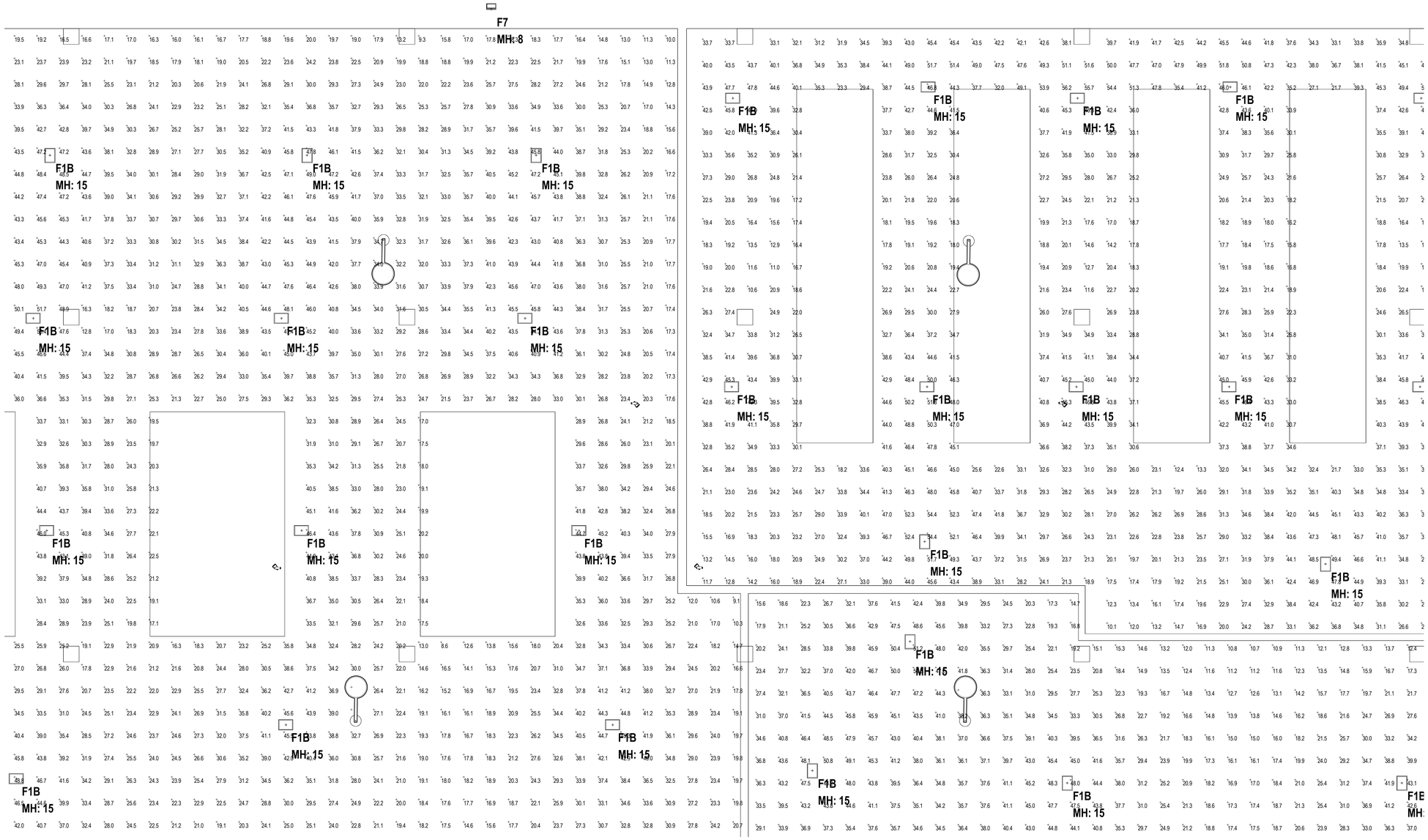
SHEET TITLE

FIRST FLOOR LIGHTING PLAN - AREA E

SHEET NUMBER

EL308

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:09 PM ASSI Proj. No: 21-154
0 1/2" 1" 2"



FISRT FLOOR PHOTOMETRIC PLAN AREA-E
Scale: 1/4" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:11 PM AESI Proj. No: 21-154

OWNER

Indiana University Health
Medical Center Campus
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Indianapolis, IN, 46202

PROJECT

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REVISIONS

NO.	DATE	DESCRIPTION

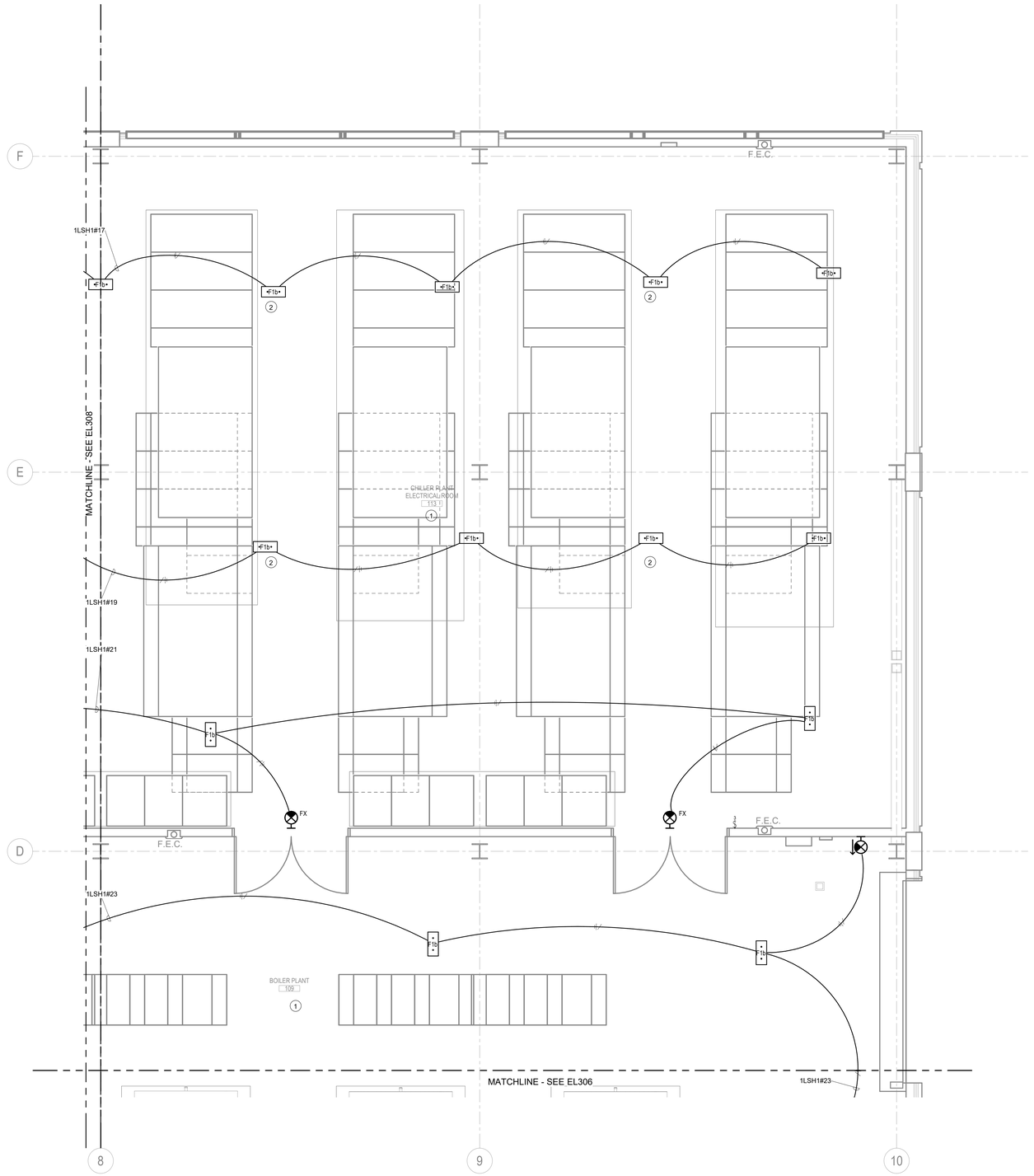
DESIGNED BY SPE	CERTIFICATION
CHECKED BY MB	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY SPE	
PROJECT NO. 21-154	

SHEET TITLE

FIRST FLOOR PHOTOMETRIC PLAN - AREA E

SHEET NUMBER

EL308LT



FIRST FLOOR LIGHTING PLAN - AREA F

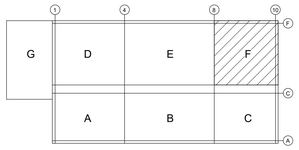
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 15'-0" AFF.
2. LIGHT FIXTURE WILL BE HANGING OFF A PICCE OF UNISTRUT MOUNTED IN TRAPEZE.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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340 W. 10th Street
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PROJECT

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APPROVED BY: SPE	
PROJECT NO.: 21-154	

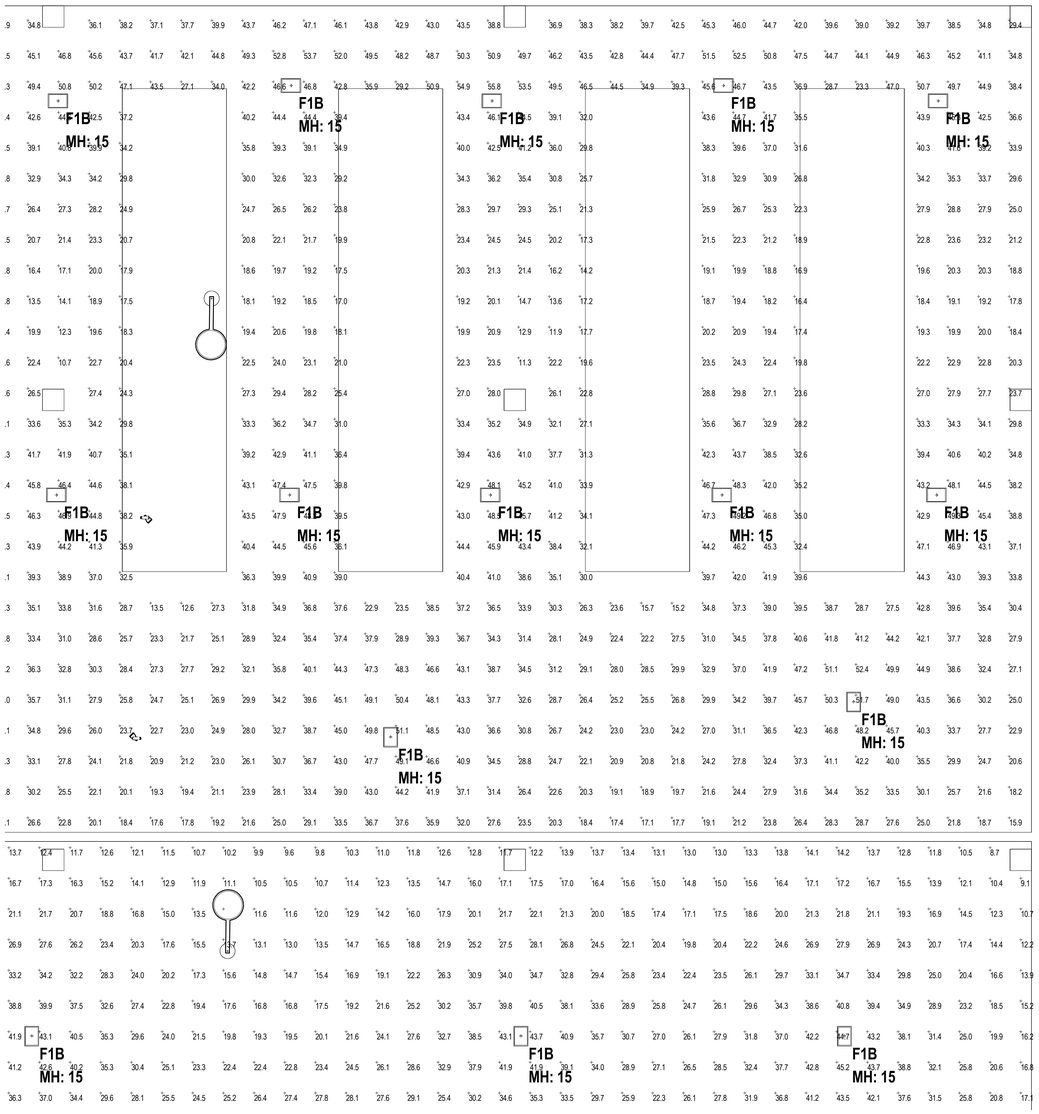
SHEET TITLE

FIRST FLOOR LIGHTING PLAN - AREA F

SHEET NUMBER

EL309

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:14 PM AESI Proj. No: 21-154



FISRT FLOOR PHOTOMETRIC PLAN AREA-F

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

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:15 PM AESI Proj. No: 21-154

OWNER

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NO.	DATE	DESCRIPTION

DESIGNED BY: SPE	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: MB	
APPROVED BY: SPE	
PROJECT NO.: 21-154	

SHEET TITLE

FIRST FLOOR PHOTOMETRIC PLAN - AREA F

SHEET NUMBER

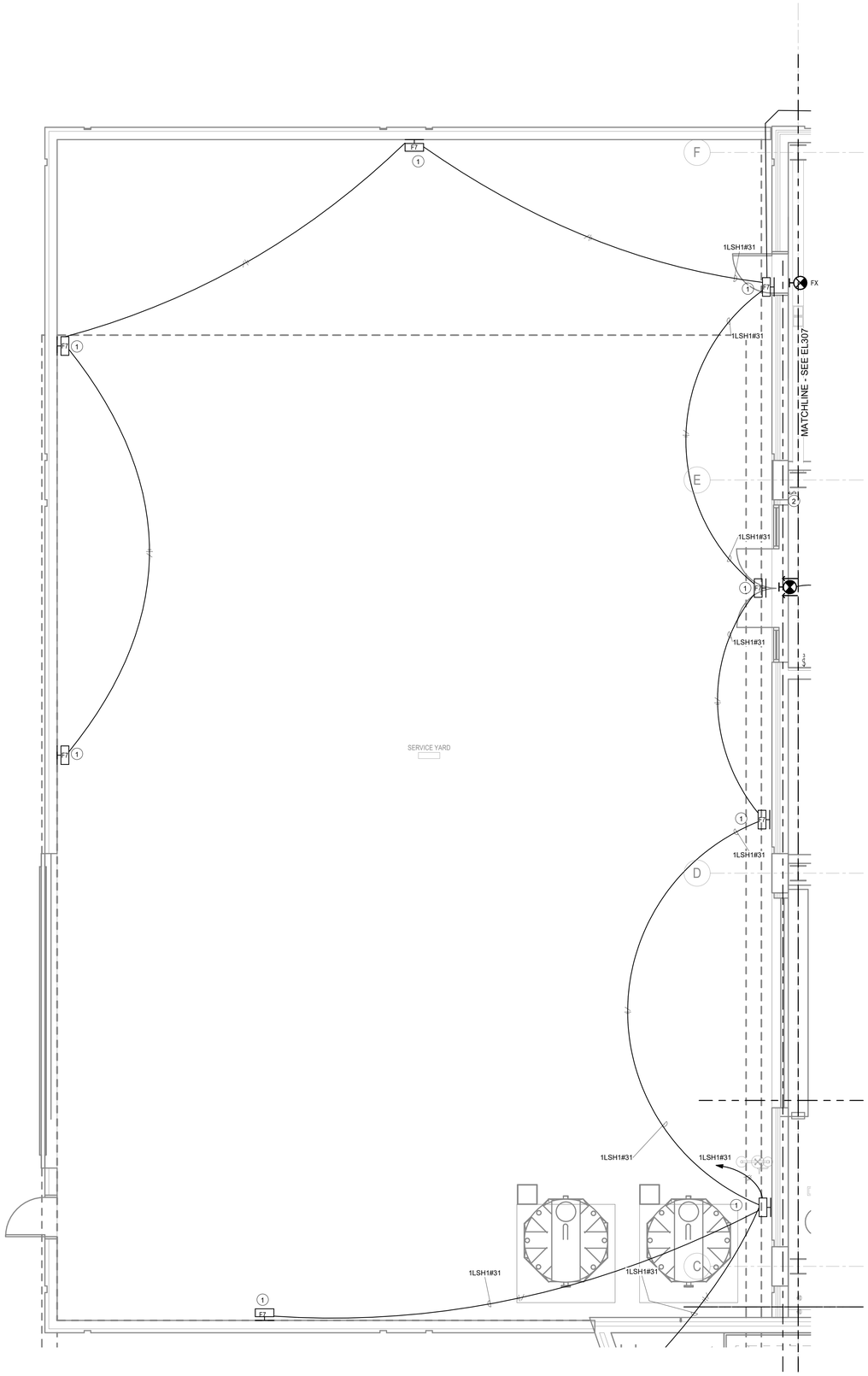
EL309LT

GENERAL NOTES:

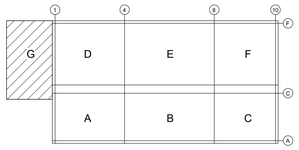
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURE SHALL BE MOUNTED AT 9'-0" AFF.
2. ADD SWITCH FOR SERVICE YARD.



FIRST FLOOR LIGHTING PLAN - AREA G
Scale: 1/4" = 1'-0"



KEY PLAN
SCALE: NONE

OWNER

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PROJECT

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APPROVED BY: SPE	
PROJECT NO.: 21-154	

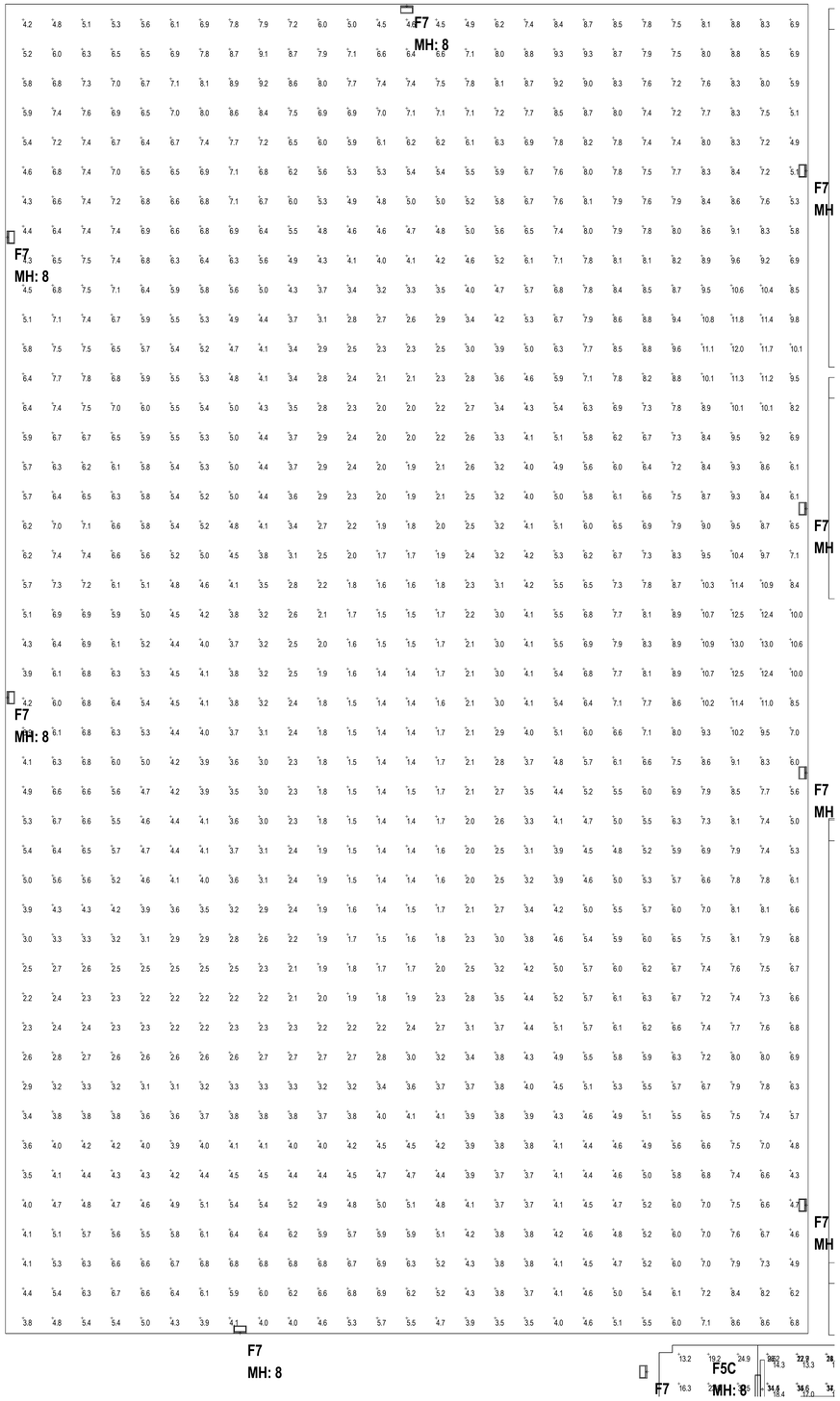
SHEET TITLE

FIRST FLOOR LIGHTING PLAN - AREA G

SHEET NUMBER

EL310

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:17 PM AESI Proj No: 21-154



FISRT FLOOR PHOTOMETRIC PLAN AREA-G
Scale: 1/4" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:18 PM AESI Proj. No: 21-154

OWNER

Indiana University Health
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PROJECT

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APPROVED BY SPE	
PROJECT NO. 21-154	

SHEET TITLE

FIRST FLOOR PHOTOMETRIC PLAN - AREA G

SHEET NUMBER

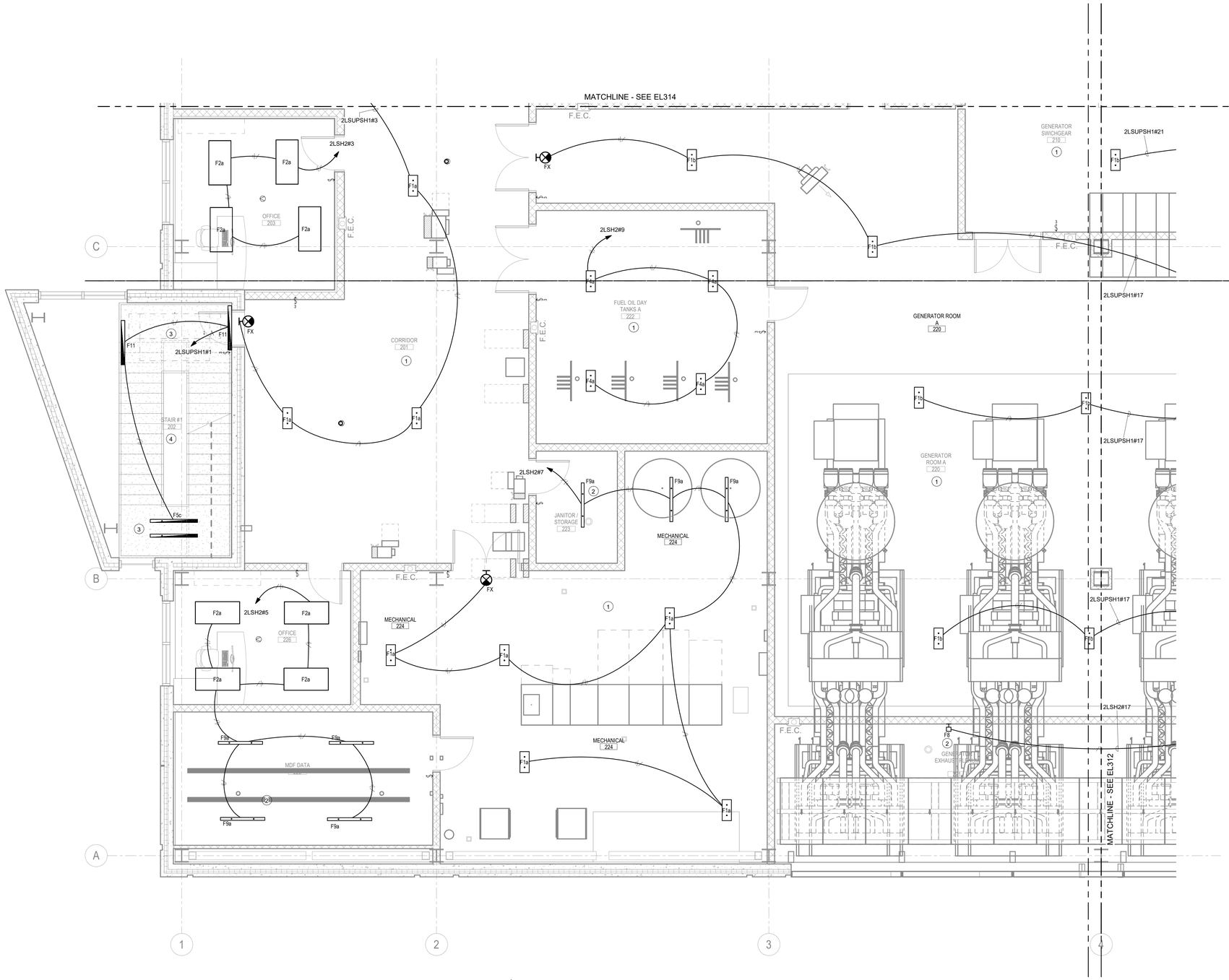
EL310LT

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

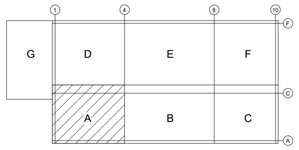
PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 10'-0" AFF.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 8'-0" AFF.
3. INSTALL LIGHT FIXTURE SHOWN THIS LOCATION ON TWO DIFFRENT LANDING.
4. SEE STAIRS #1 CROSS SHEET E501.



SECOND FLOOR LIGHTING PLAN - AREA A

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



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
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PROJECT

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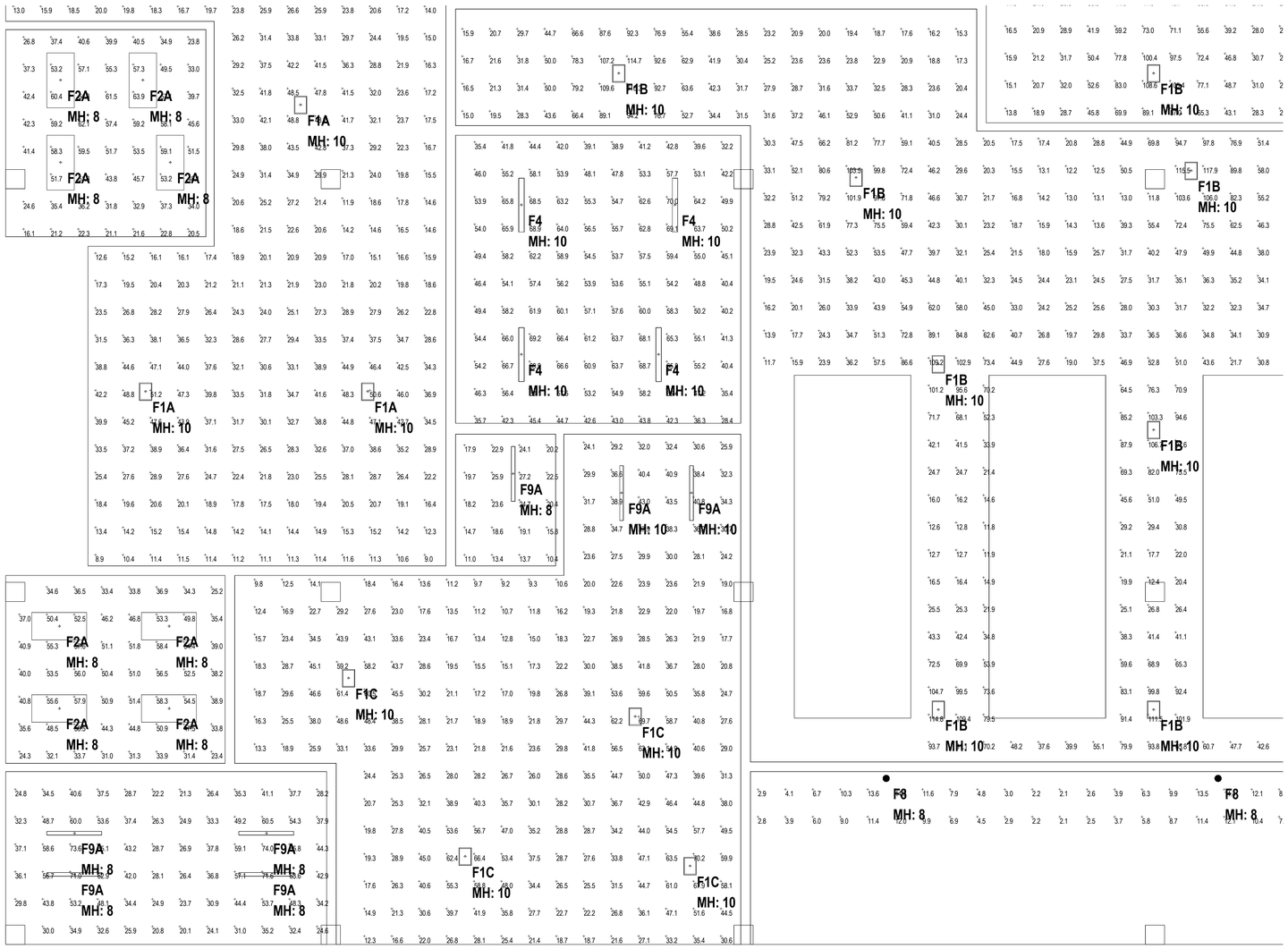
SHEET TITLE

SECOND FLOOR LIGHTING PLAN - AREA A

SHEET NUMBER

EL311

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:25 PM AESI Proj. No: 21-154



SECOND FLOOR PHOTOMETRIC PLAN AREA-A

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

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:27 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

OWNER

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Indianapolis, IN, 46202

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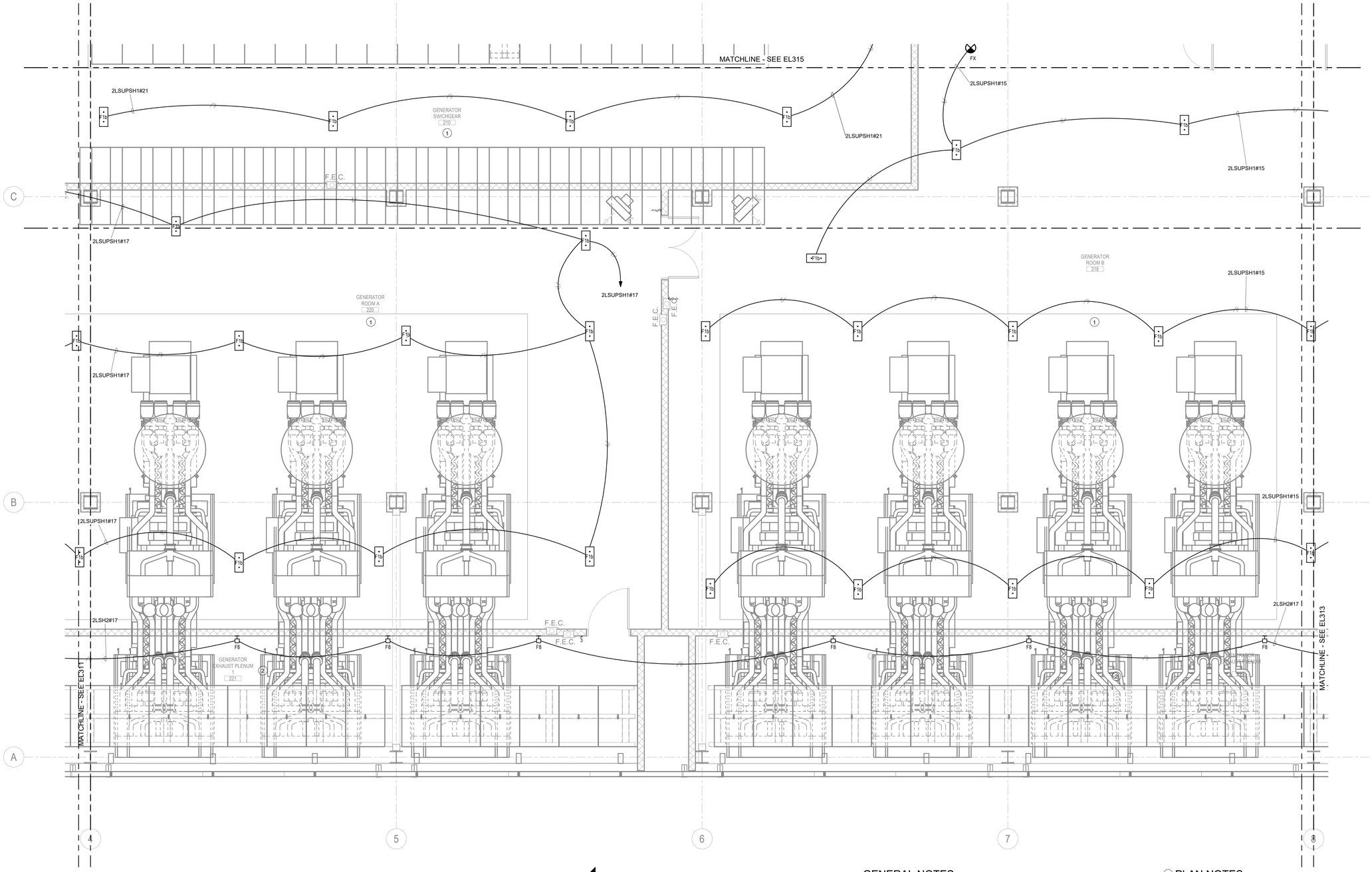
SHEET TITLE

SECOND FLOOR PHOTOMETRIC PLAN - AREA A

SHEET NUMBER

EL311LT



SECOND FLOOR LIGHTING PLAN - AREA B

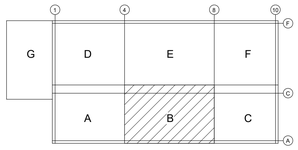
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 10'-0" AFF.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 8'-0" AFF.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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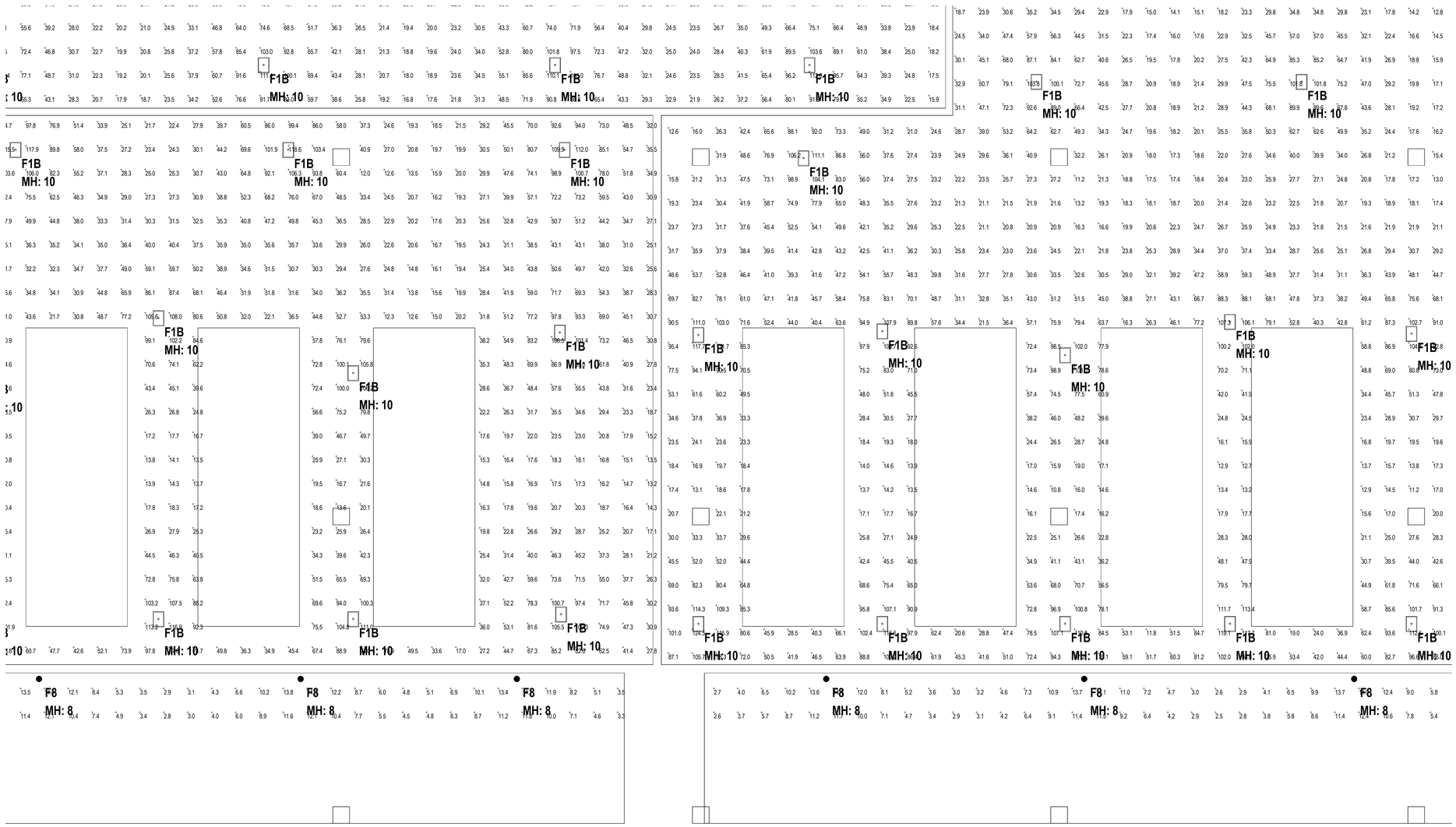
SHEET TITLE

SECOND FLOOR LIGHTING PLAN - AREA B

SHEET NUMBER

EL312

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:40 PM AESI Proj. No.: 21-154
0 1/2" 1" 2"



SECOND FLOOR PHOTOMETRIC PLAN AREA-B

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

OWNER

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Medical Center Campus
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PROJECT

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PROJECT NO. 21-154	

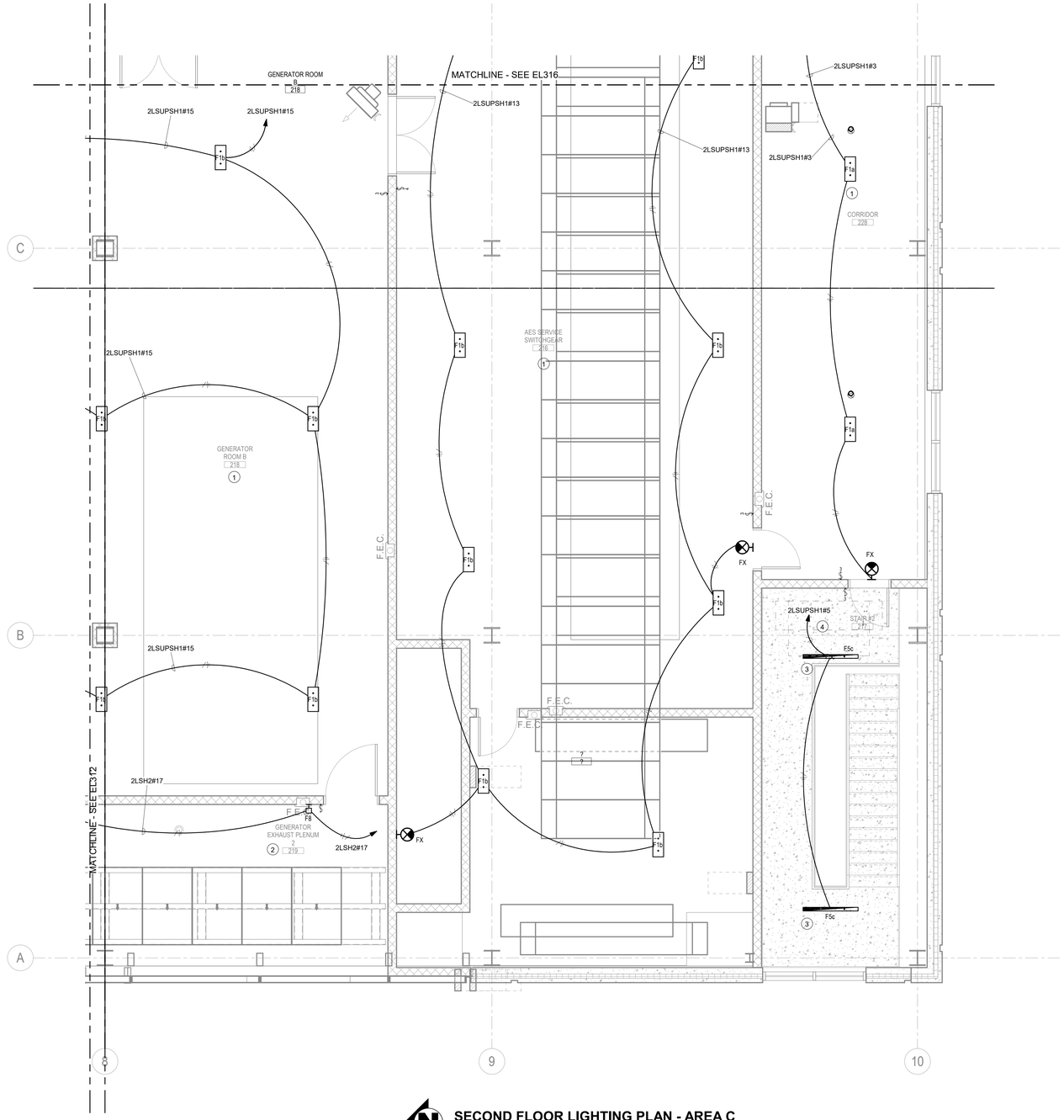
SHEET TITLE

SECOND FLOOR PHOTOMETRIC PLAN - AREA B

SHEET NUMBER

EL312LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:42 PM AESI Proj. No: 21-154



SECOND FLOOR LIGHTING PLAN - AREA C

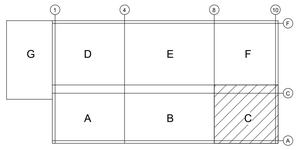
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 10'-0" AFF.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 8'-0" AFF.
3. INSTALL LIGHT FIXTURE SHOWN THIS LOCATION ON TWO DIFFRENT LANDING.
4. SEE STAIRS #2 CROSS SHEET E501.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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PROJECT NO. 21-154	

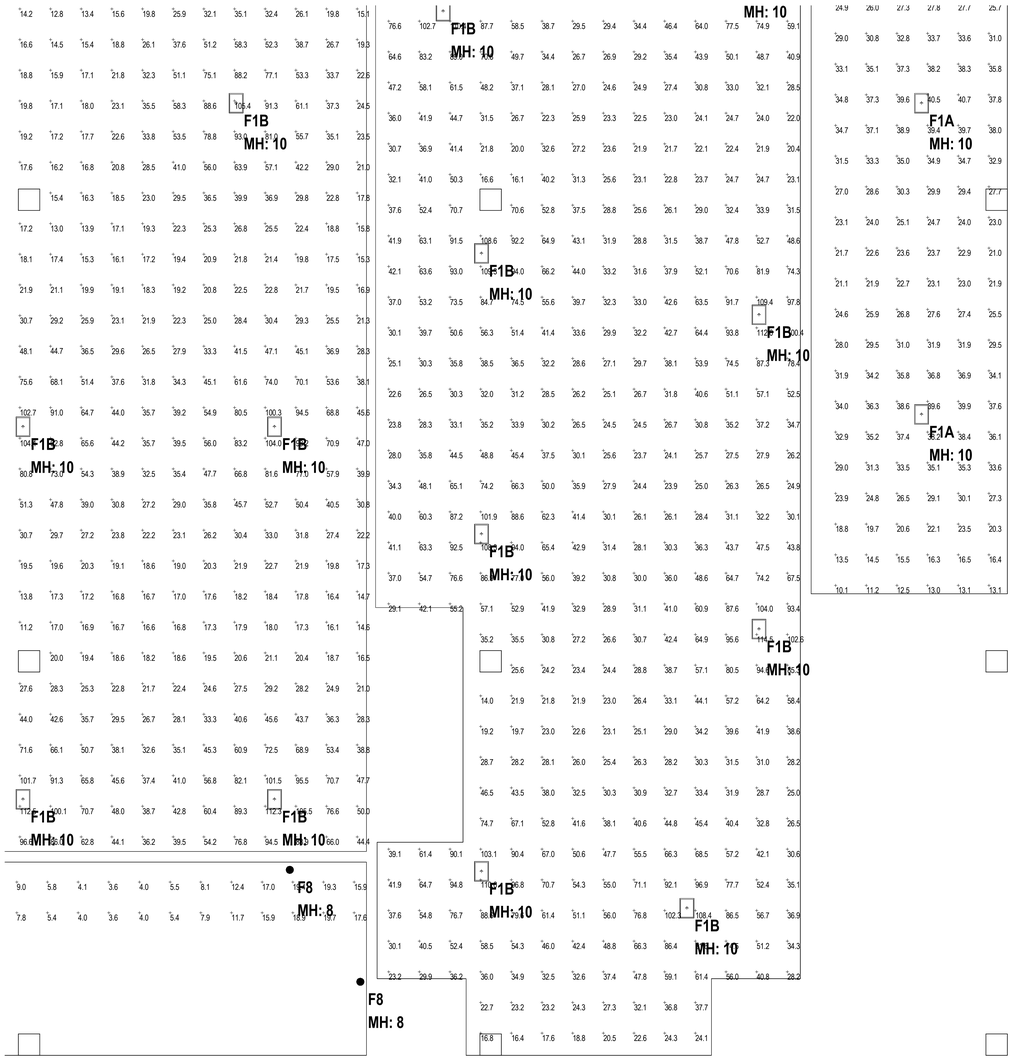
SHEET TITLE

SECOND FLOOR LIGHTING PLAN - AREA C

SHEET NUMBER

EL313

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:47 PM AESI Proj. No: 21-154



SECOND FLOOR PHOTOMETRIC PLAN AREA-C

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

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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PROJECT NO. 21-154	

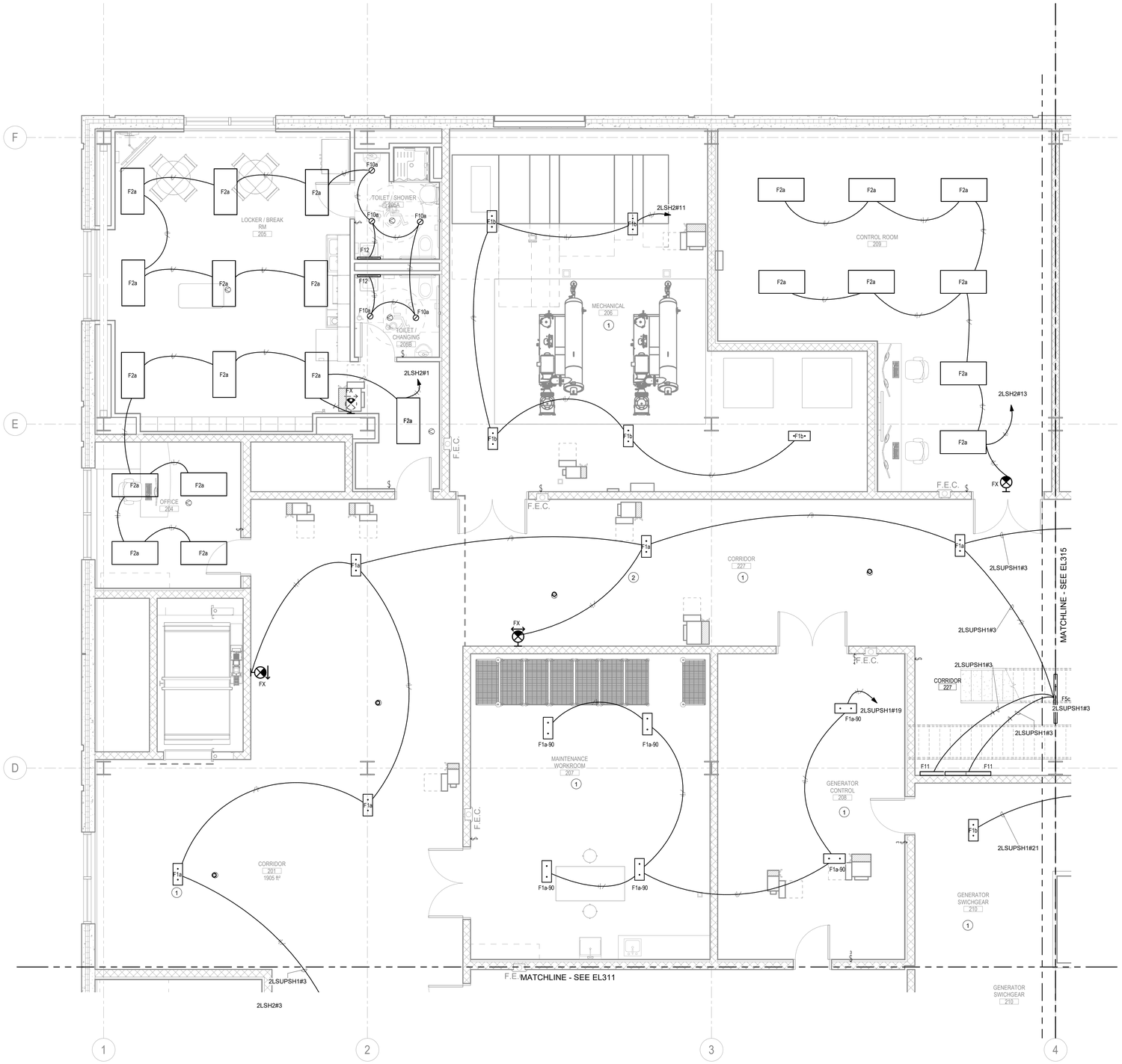
SHEET TITLE

SECOND FLOOR PHOTOMETRIC PLAN - AREA C

SHEET NUMBER

EL313LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:28:49 PM AESI Proj. No: 21-154



SECOND FLOOR LIGHTING PLAN - AREA D

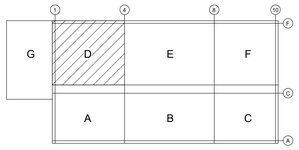
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.
11.

PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 10'-0" AFF.
2. LIGHT FIXTURE WILL BE HANGING OFF A PICCE OF UNISTRUT MOUNTED IN TRAPEZE



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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340 W. 10th Street
Indianapolis, IN, 46202

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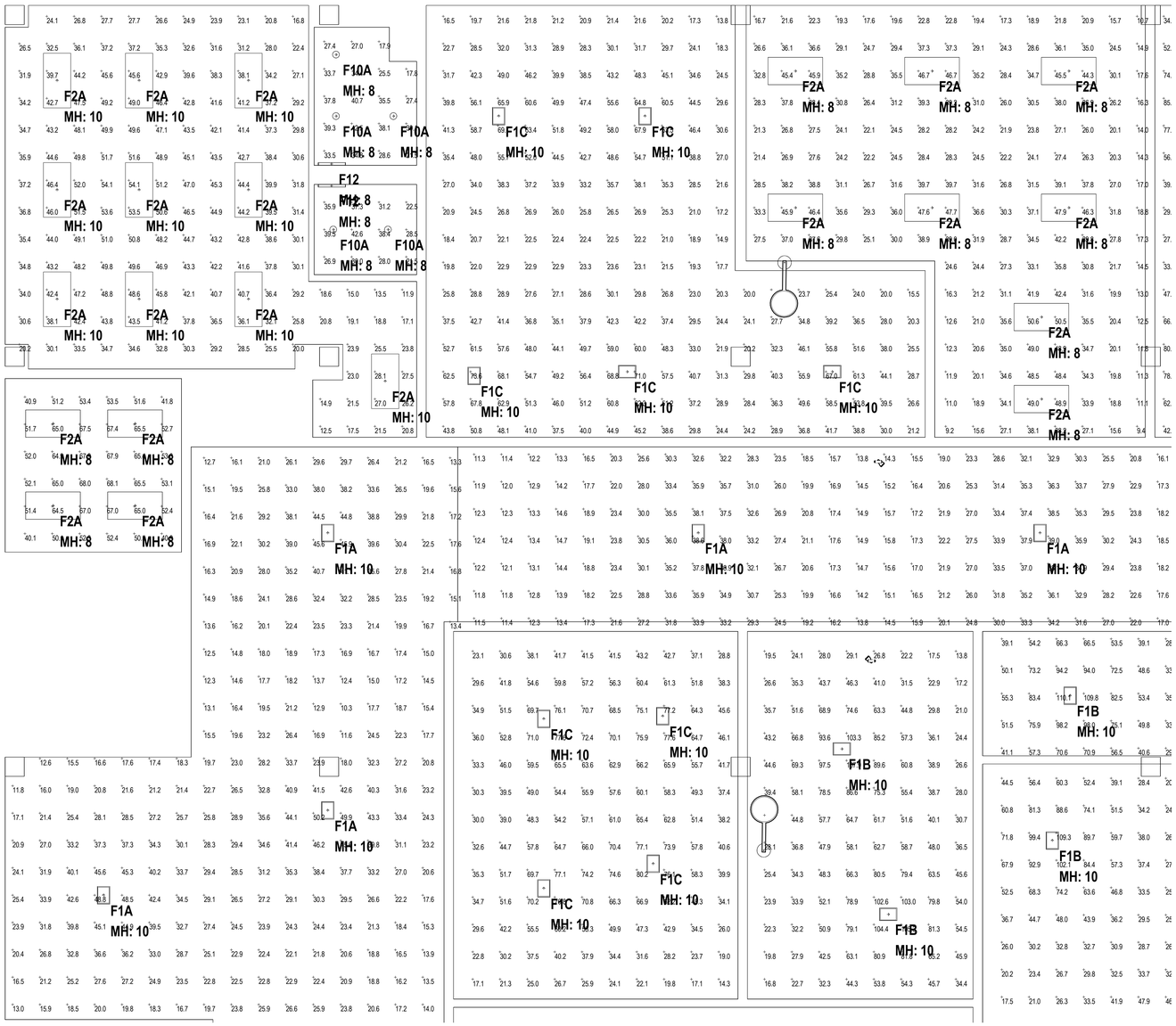
SHEET TITLE

SECOND FLOOR LIGHTING PLAN - AREA D

SHEET NUMBER

EL314

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:00 PM AESI Proj. No: 21-154



SECOND FLOOR PHOTOMETRIC PLAN AREA-D

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

OWNER

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APPROVED BY: SPE	
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SHEET TITLE

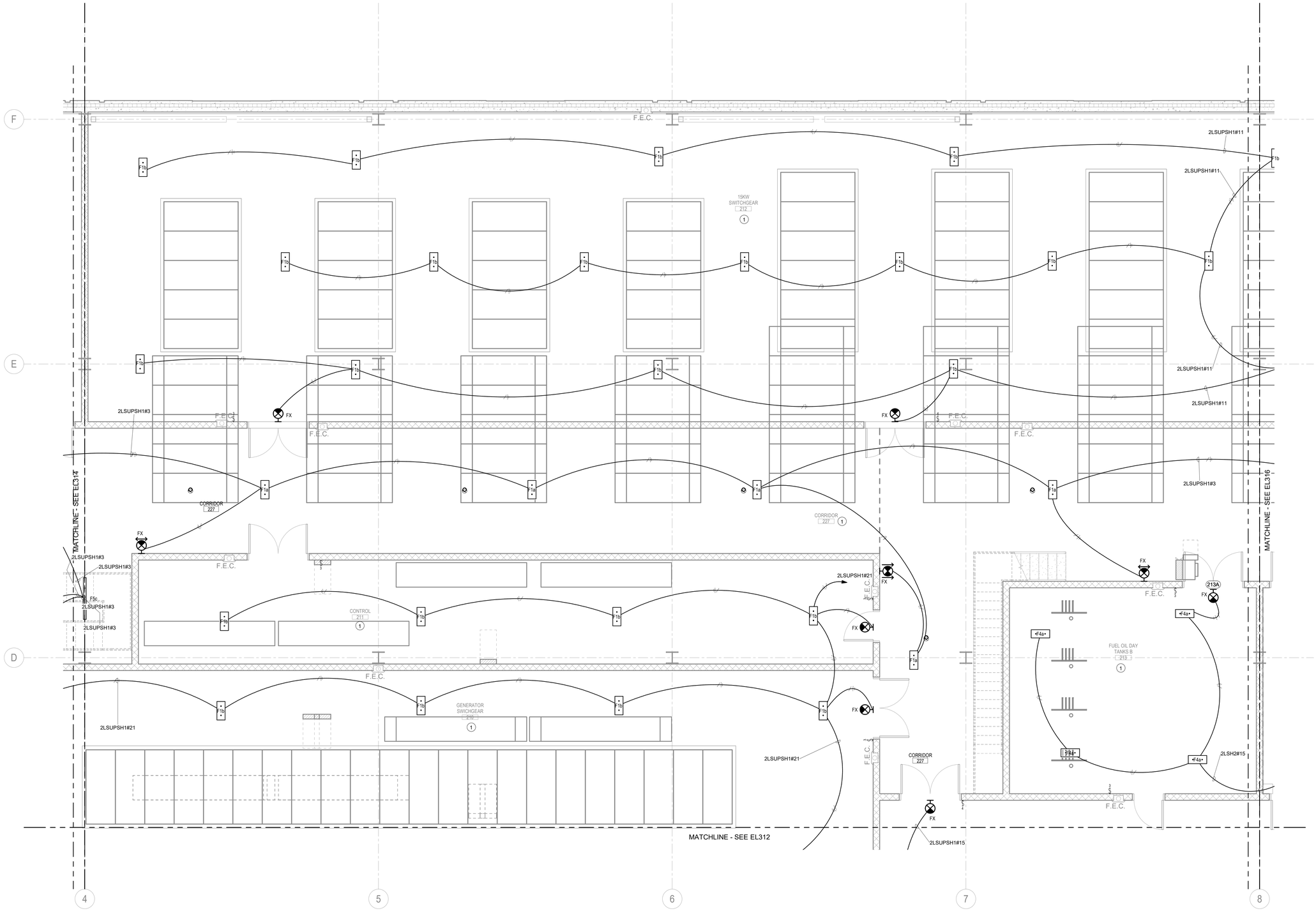
SECOND FLOOR PHOTOMETRIC PLAN - AREA D

SHEET NUMBER

EL314LT

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:00 PM AESI Proj No: 21-154



SECOND FLOOR LIGHTING PLAN - AREA E

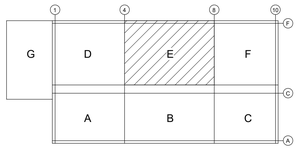
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE NOTED.
4. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
5. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
6. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
7. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
8. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
9. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.
10.

PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 10'-0" AFF.
2. NOT USED.
3. SEE HOMRUNS CONTINUE AT SHEET EL 316.
4. SEE HOMRUNS CONTINUE AT SHEET EL 314.
5. SEE HOMRUNS CONTINUE AT SHEET EL 312.



KEY PLAN
SCALE: NONE

OWNER

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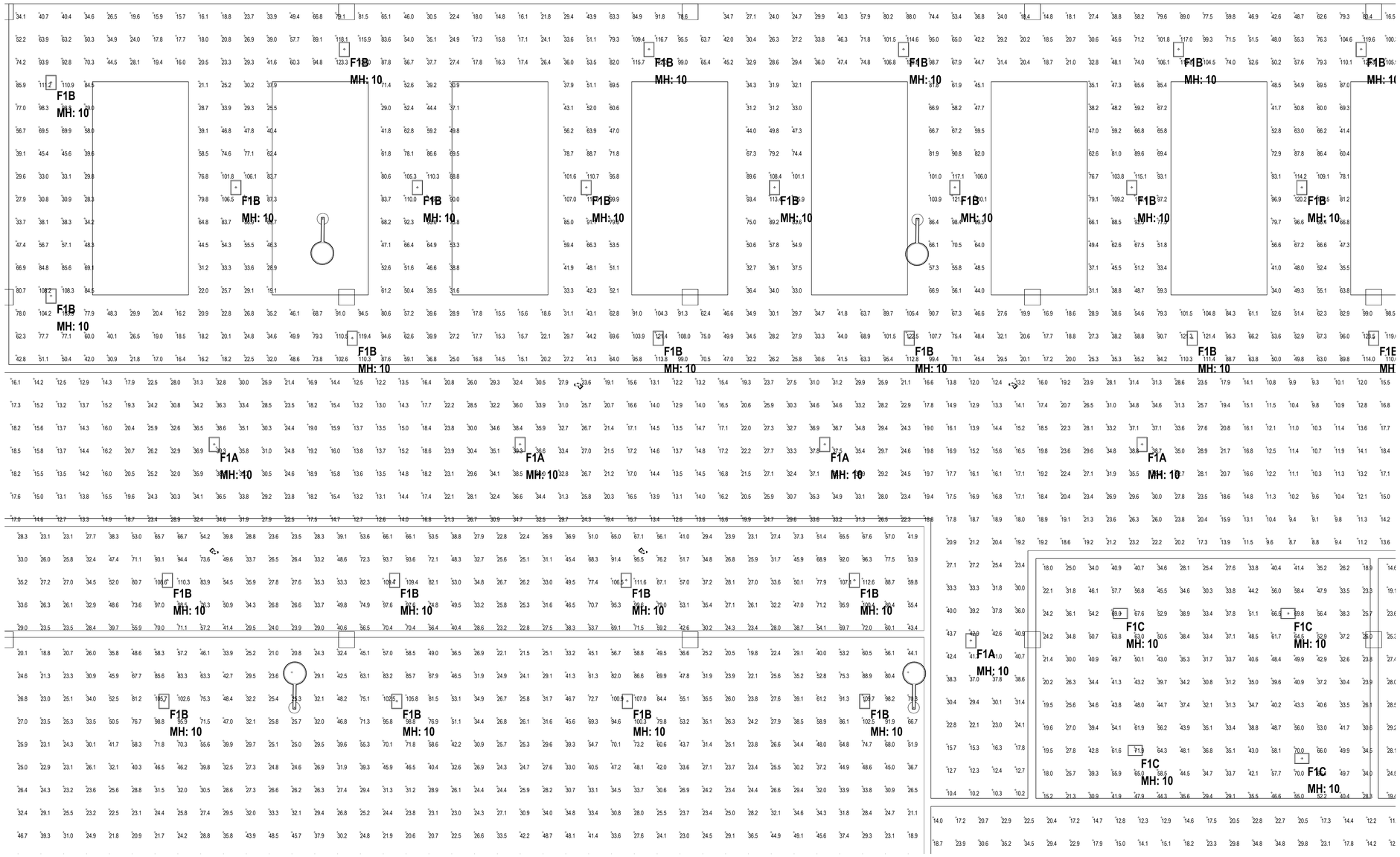
SHEET TITLE

SECOND FLOOR LIGHTING PLAN - AREA E

SHEET NUMBER

EL315

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:04 PM AESI Proj. No: 21-154



SECOND FLOOR PHOTOMETRIC PLAN AREA-E

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

OWNER

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Indianapolis, IN, 46202

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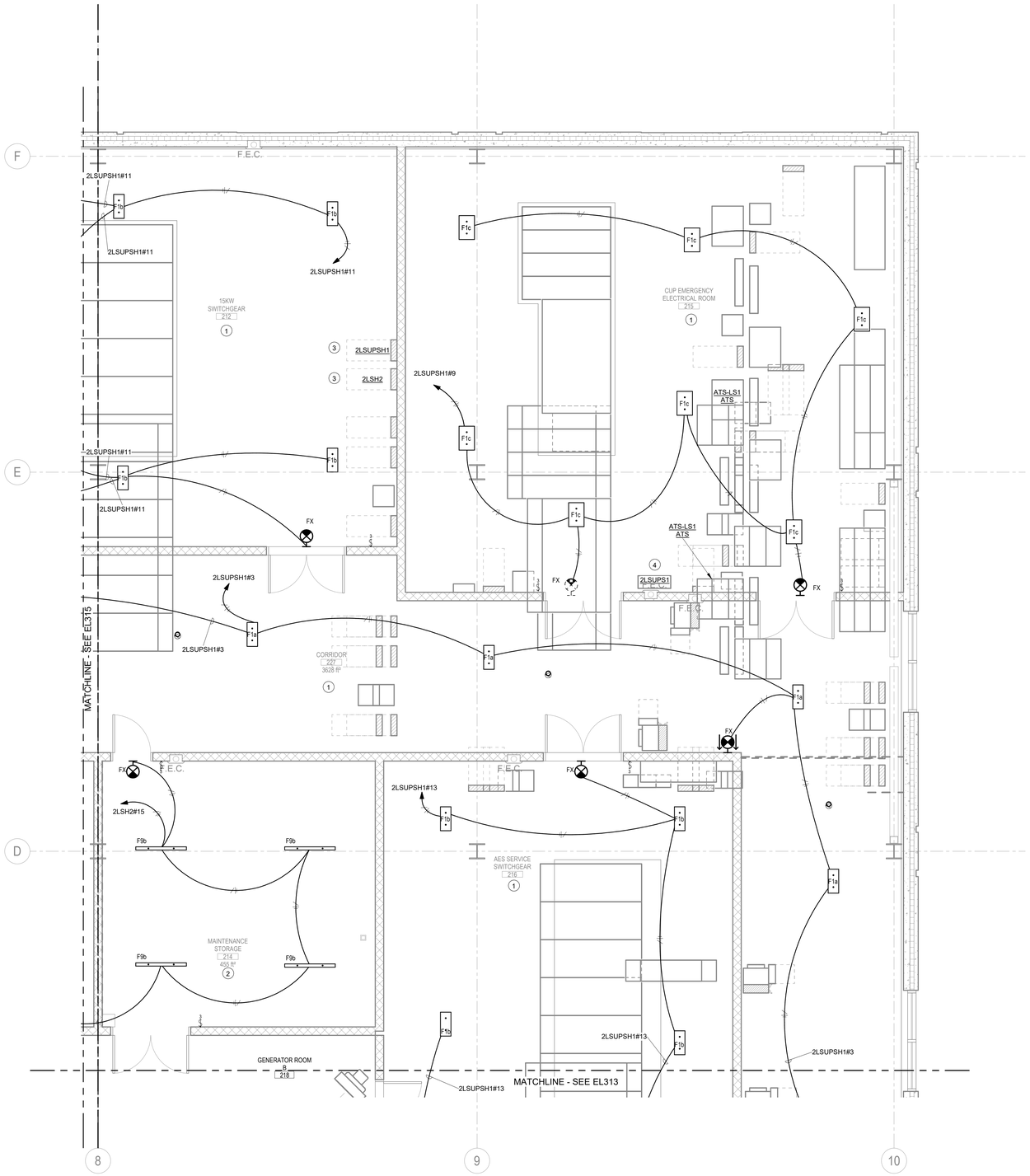
SHEET TITLE

SECOND FLOOR PHOTOMETRIC PLAN - AREA E

SHEET NUMBER

EL315LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:05 PM AESI Proj. No: 21-154



SECOND FLOOR LIGHTING PLAN - AREA F

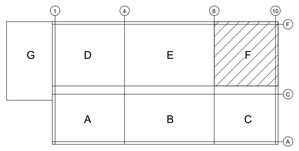
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 10'-0" AFF.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 8'-0" AFF.
3. SEE ONE LINE DIAGRAM AT SHEET EP708.
4. LIGHTING INVERTER WITH 480/277 V ,20KVA FOR EMERGENCY LIGHTING PANELS 1LSUPSH1 AND 2LSUPSH1.



KEY PLAN
SCALE: NONE

OWNER

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Medical Center Campus
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Indianapolis, IN, 46202

PROJECT

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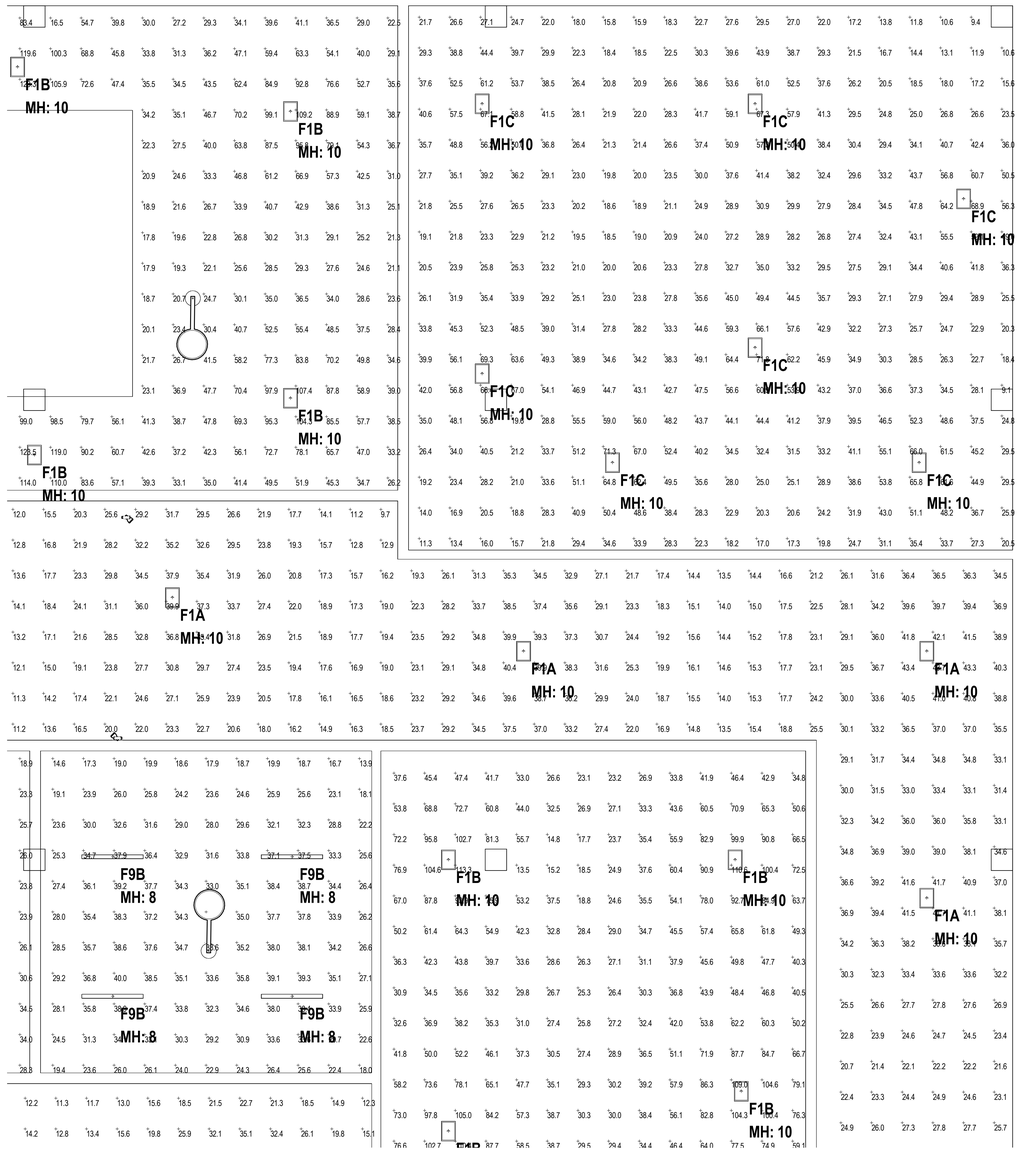
SHEET TITLE

SECOND FLOOR LIGHTING PLAN - AREA F

SHEET NUMBER

EL316

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:09 PM AESI Proj. No: 21-154



SECOND FLOOR PHOTOMETRIC PLAN AREA-F

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

OWNER

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Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

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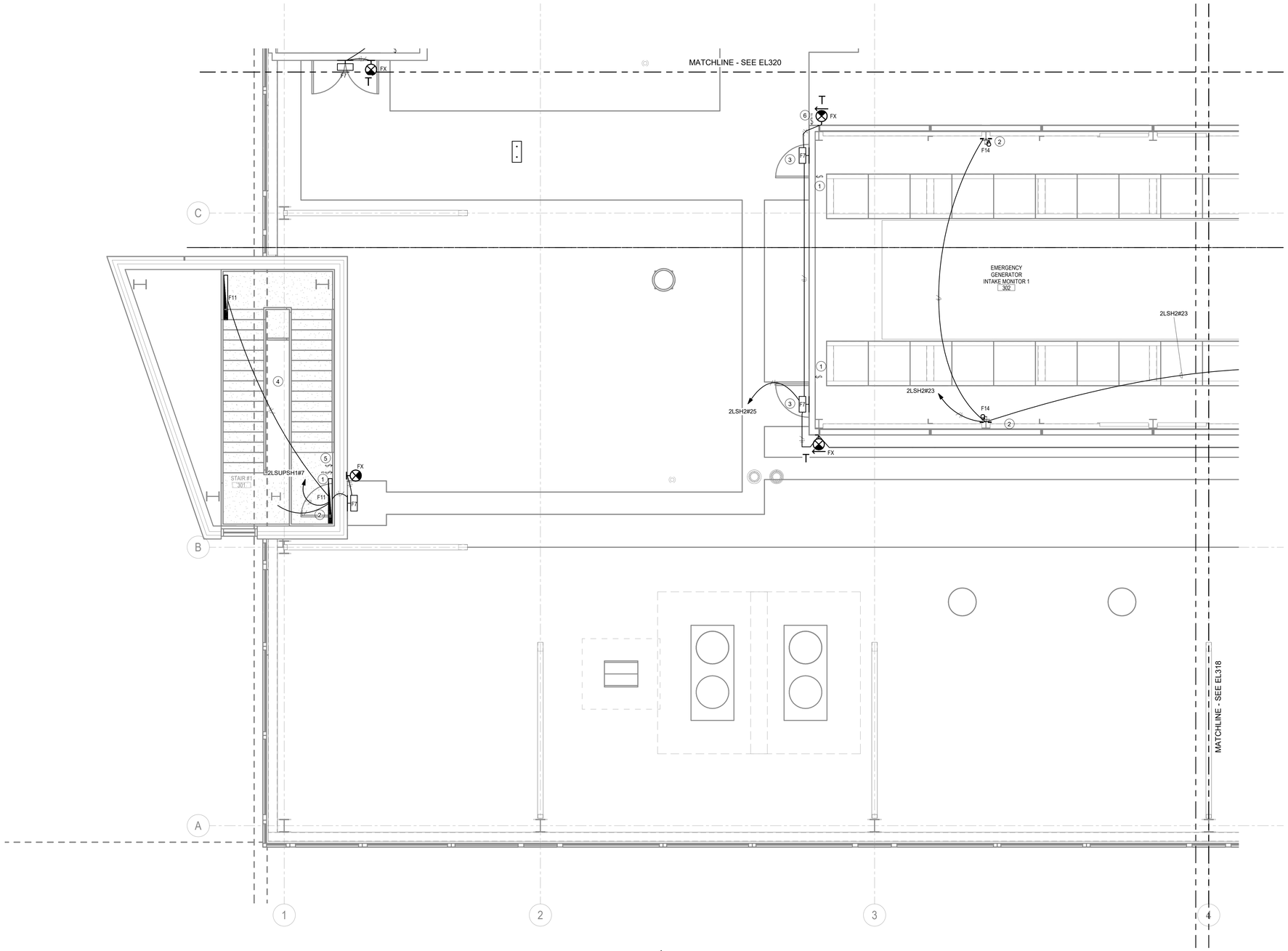
SHEET TITLE

SECOND FLOOR PHOTOMETRIC PLAN - AREA F

SHEET NUMBER

EL316LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:10 PM AESI Proj. No: 21-154



ROOF LIGHTING PLAN - AREA A

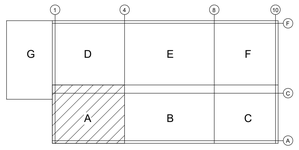
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

PLAN NOTES:

1. COORDINATE SWITCH LOCATION WITH PLACEMENT OF DOOR.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 16'-0" AFF.
3. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 9'-0" AFF.
4. SEE STAIRS #1 CROSS SHEET E501.
5. COORDINATE SWITCH LOCATION WITH PLACEMENT OF DOOR FOR OUT DOOR LIGHTING.
6. COORDINATE SWITCH LOCATION WITH PLACEMENT OF DOOR , AND PROVIDE 4 HOURS TIMER FOR POLE LIGHT FIXTURES.



KEY PLAN

SCALE: NONE

OWNER

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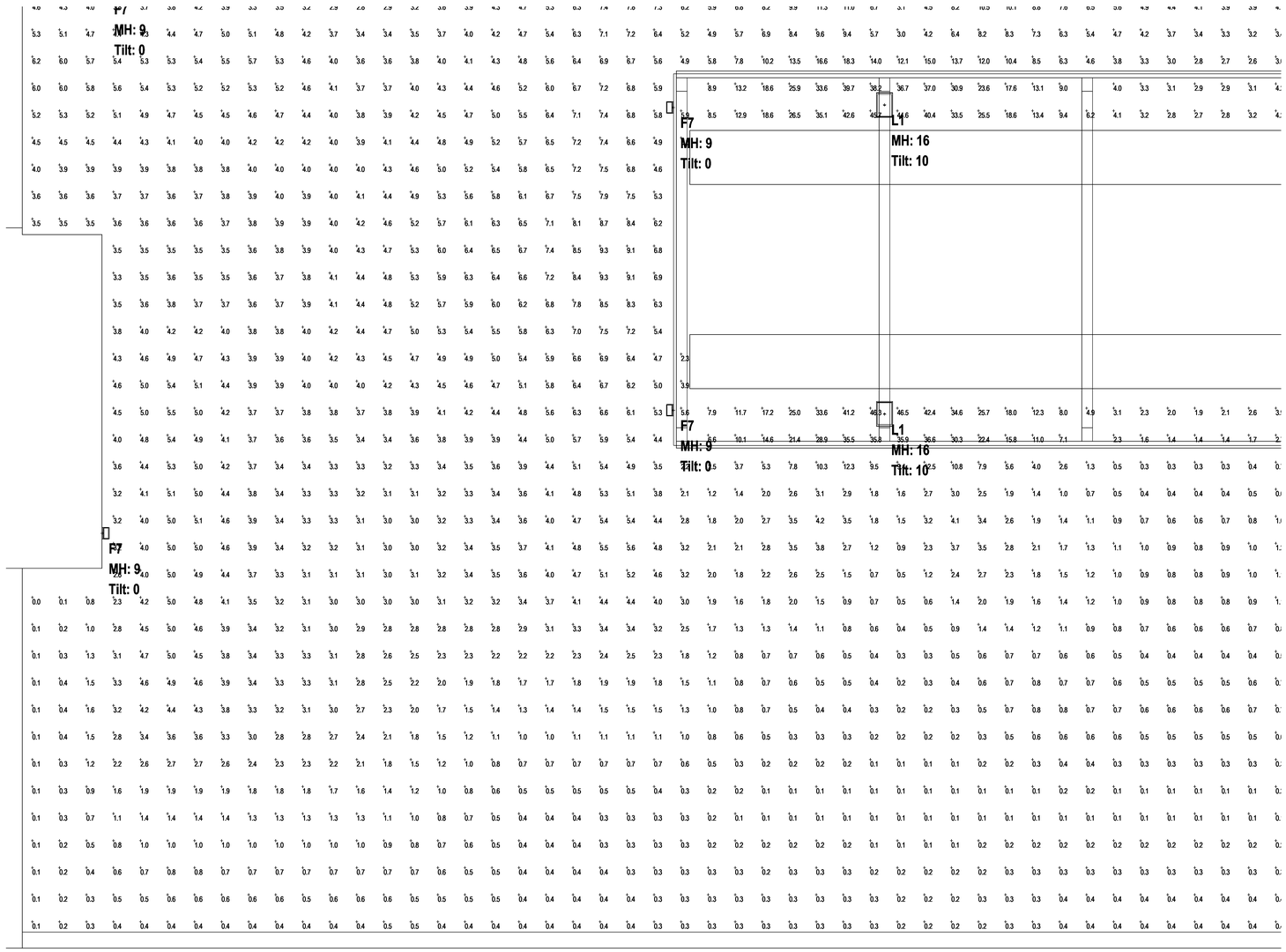
SHEET TITLE

ROOF LIGHTING PLAN - AREA A

SHEET NUMBER

EL317

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:29:14 PM AESI Proj. No: 21-154



ROOF PHOTOMETRIC PLAN AREA-A

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

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: SPE
CHECKED BY: MB
APPROVED BY: SPE
PROJECT NO. 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

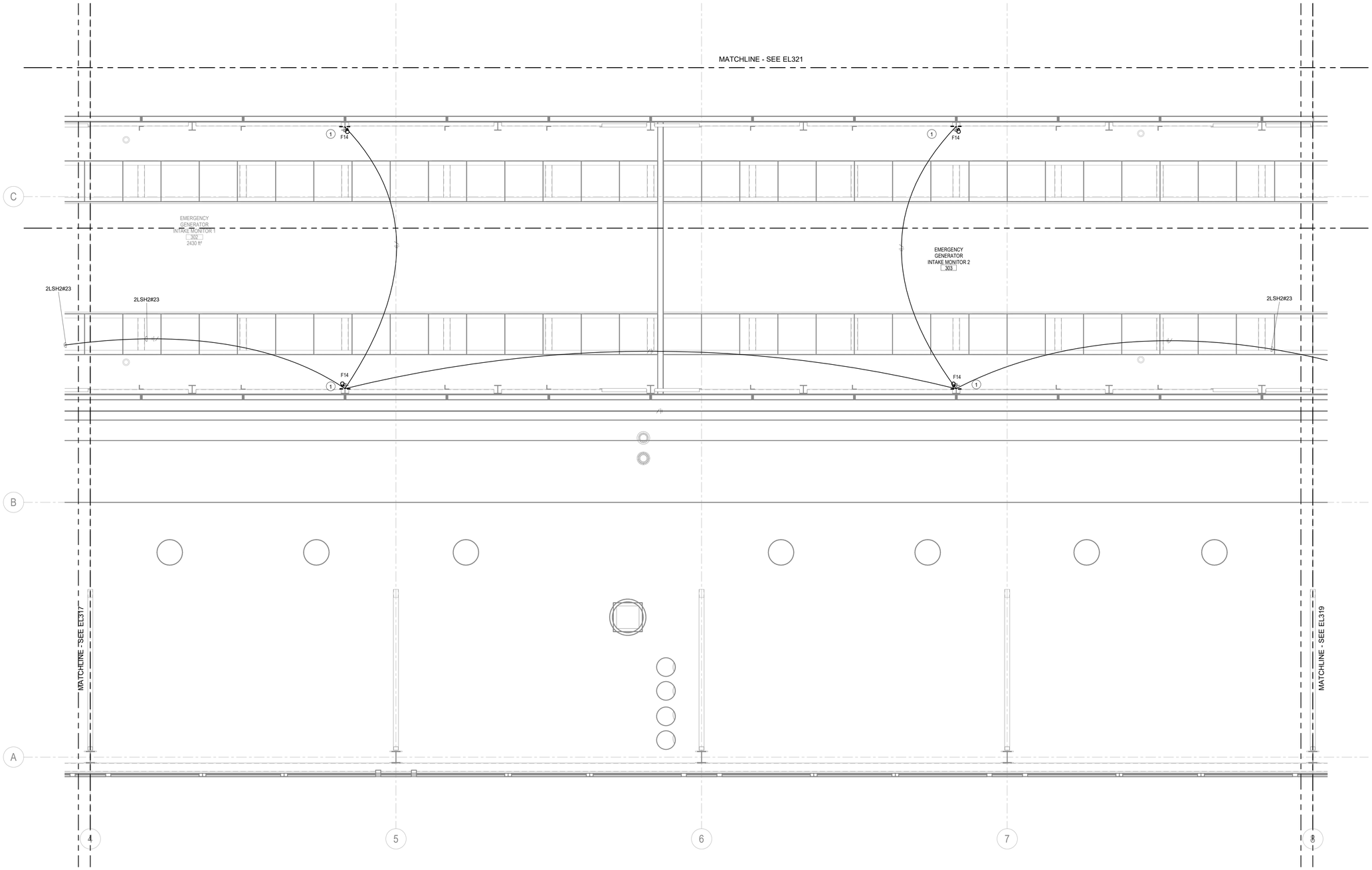
SHEET TITLE

ROOF PHOTOMETRIC PLAN - AREA A

SHEET NUMBER

EL317LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:30:02 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF LIGHTING PLAN - AREA B

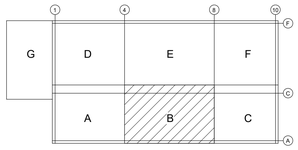
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULEEL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 16'-0" AFF.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
9975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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APPROVED BY SPE	
PROJECT NO. 21-154	

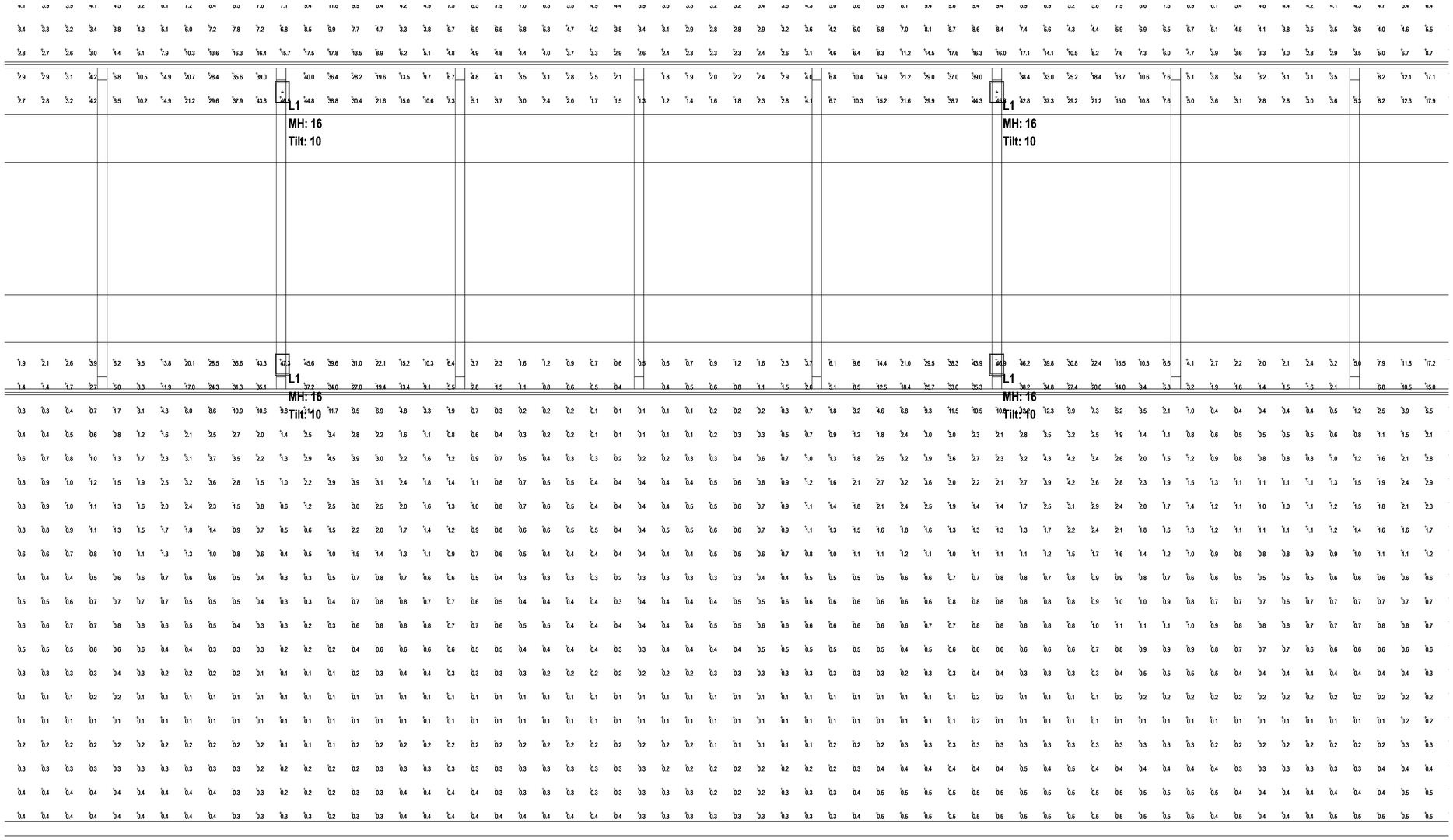
SHEET TITLE

ROOF LIGHTING PLAN - AREA B

SHEET NUMBER

EL318

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:30:07 PM AESI Proj. No: 21-154



ROOF PHOTOMETRIC PLAN AREA-B

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

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:31:36 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

OWNER

Indiana University Health
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340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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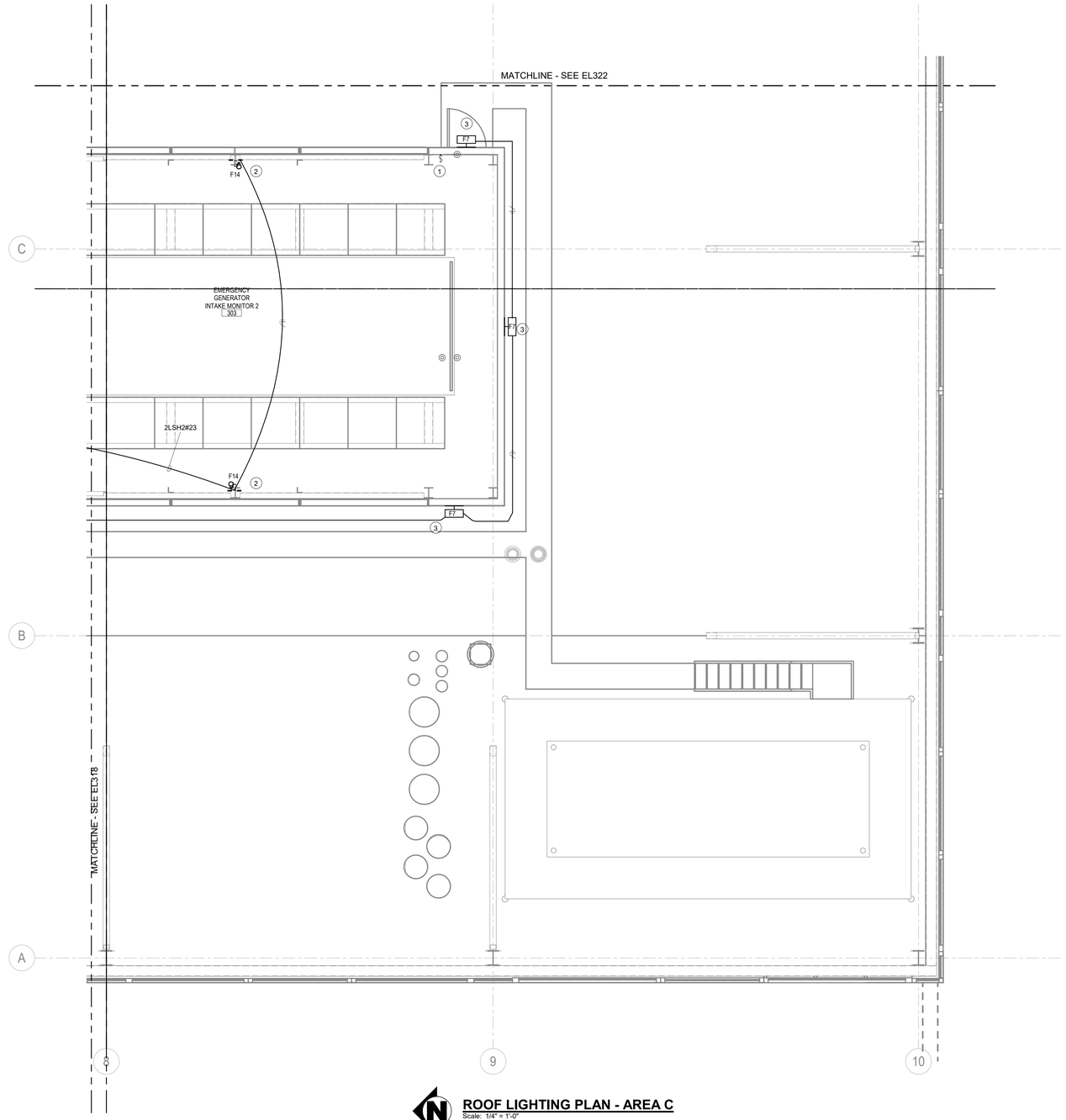
PROJECT NO. 21-154	

SHEET TITLE

ROOF PHOTOMETRIC PLAN - AREA B

SHEET NUMBER

EL318LT



ROOF LIGHTING PLAN - AREA C

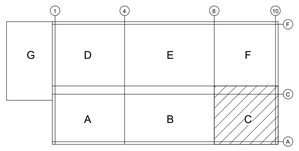
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

PLAN NOTES:

1. COORDINATE SWITCH LOCATION WITH PLACEMENT OF DOOR.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 16'-0" AFF.
3. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT9'-0" AFF.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health
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340 W. 10th Street
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PROJECT NO. 21-154	

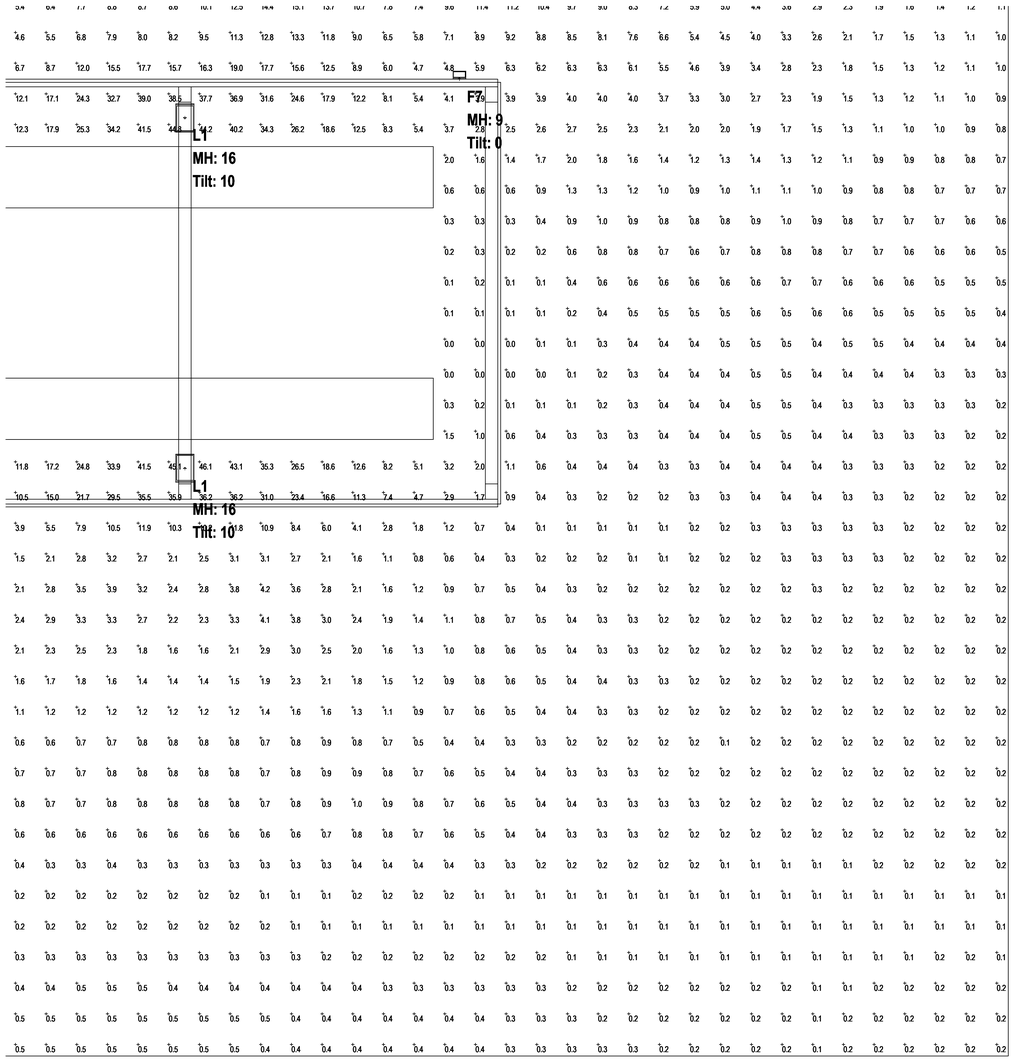
SHEET TITLE

ROOF LIGHTING PLAN - AREA C

SHEET NUMBER

EL319

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:31:40 PM AESI Proj. No: 21-154



ROOF PHOTOMETRIC PLAN AREA-C

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

OWNER

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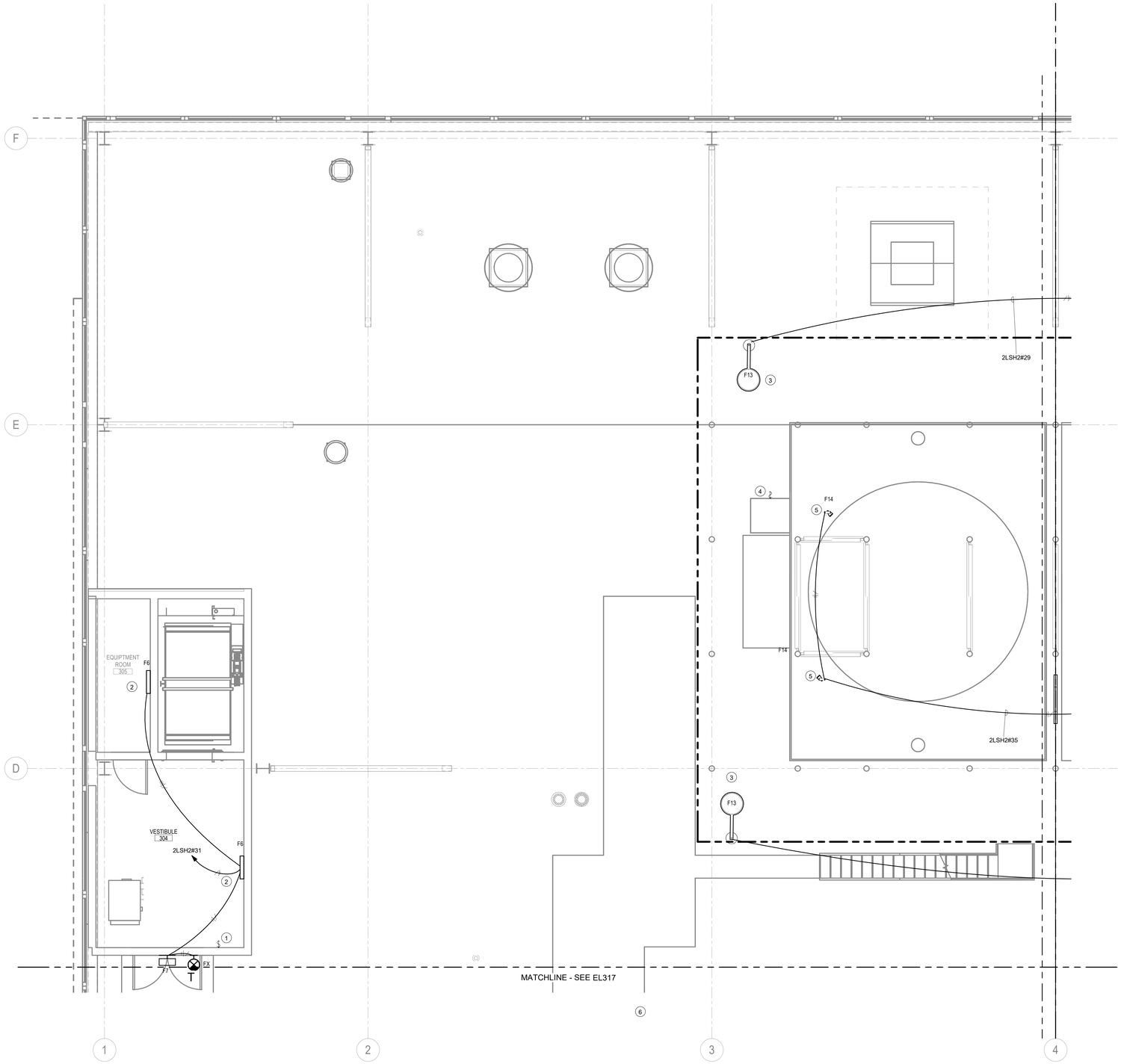
SHEET TITLE

ROOF PHOTOMETRIC PLAN - AREA C

SHEET NUMBER

EL319LT

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 12:32:13 PM AESI Proj. No: 21-154



ROOF LIGHTING PLAN - AREA D

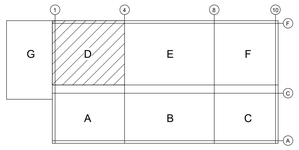
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

PLAN NOTES:

1. LIGHT SWITCH SHALL BE MOUNTED AT TOP OF PLATFORM NEAR STAIRS.
2. LIGHT FIXTURES IN THIS AREA / ROOM SHALL BE MOUNTED AT 8'-0" AFF.
3. POLE LIGHT FIXTURES IN THIS AREA SHALL BE MOUNTED AT 25'-0" OF COOLING TOWER, AND PIECE OF CONDUIT THAT FIXTURE MOUNTS ONLY FOR ONE FIXTURE PER CONDUIT.
4. LIGHT SWITCH FOR COOLING TOWER SHALL BE MOUNTED AT COOLING TOWER STAIR.
5. LIGHT FIXTURES IN THIS AREA SHALL BE MOUNTED AT 7'-6" STRUCTURE CRANE RAIL.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
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PROJECT NO. 21-154	

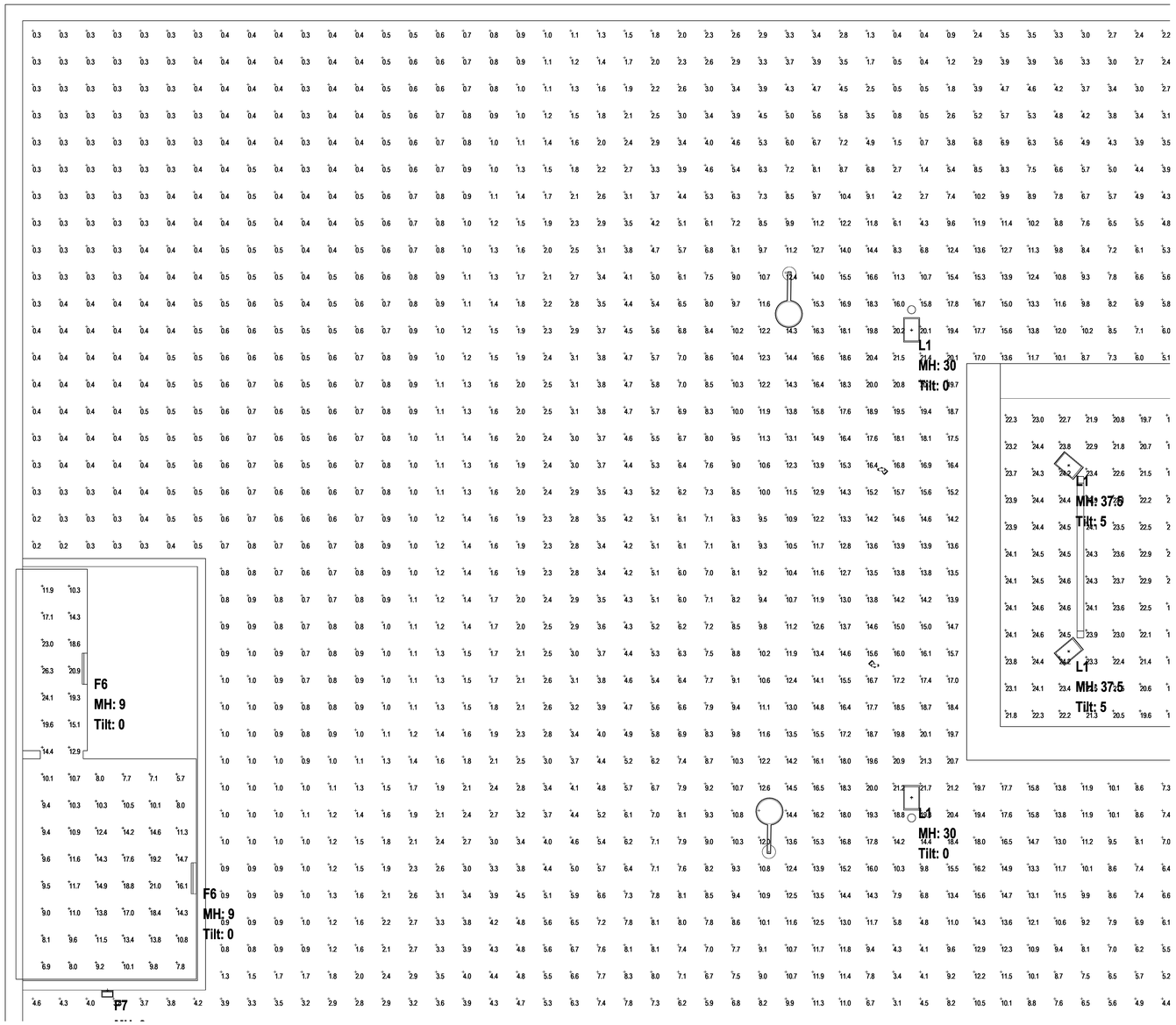
SHEET TITLE

ROOF LIGHTING PLAN - AREA D

SHEET NUMBER

EL320

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:16 PM AESI Proj. No: 21-154



ROOF PHOTOMETRIC PLAN AREA-D

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

OWNER

Indiana University Health
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340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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PROJECT NO. 21-154	

SHEET TITLE

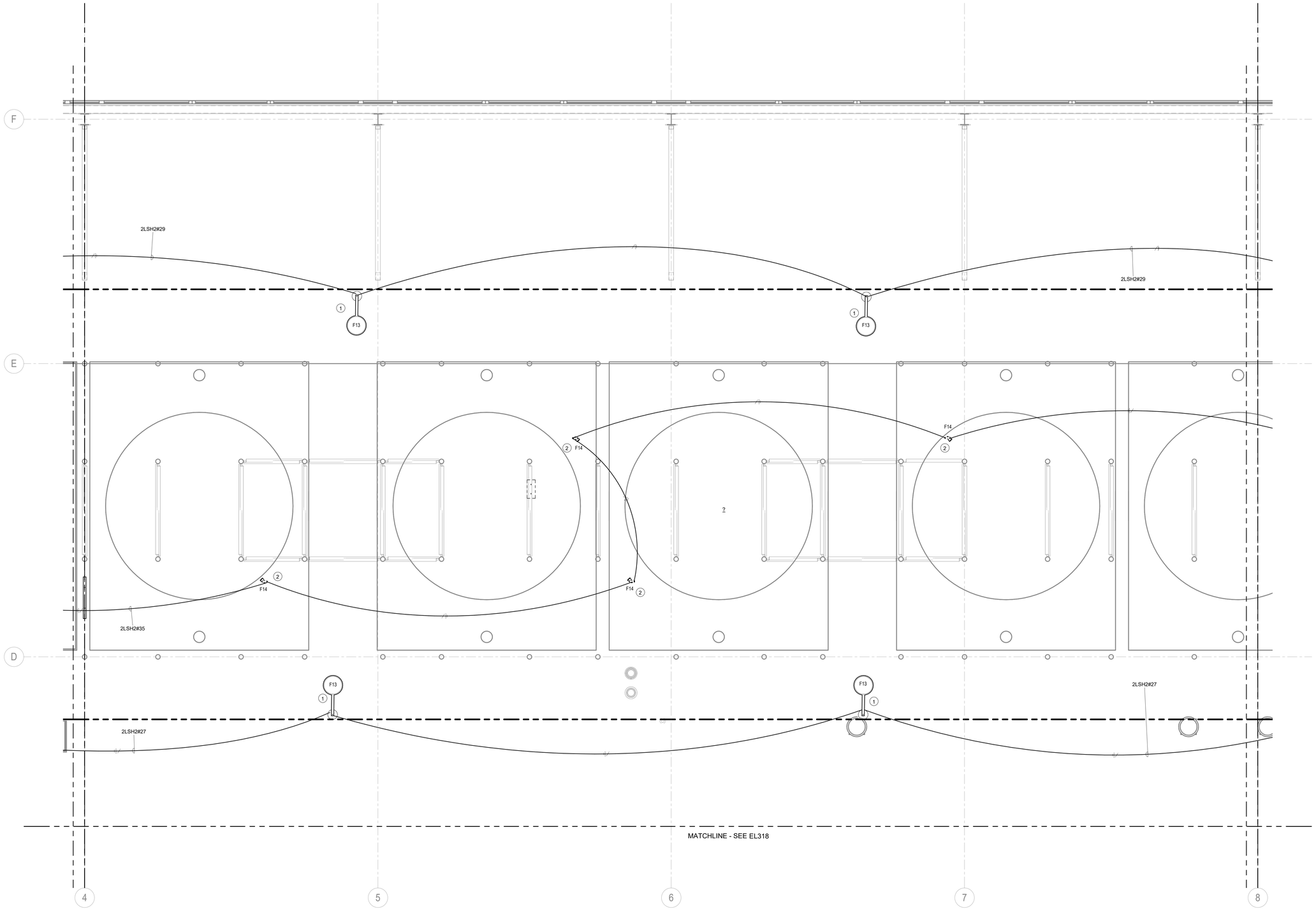
ROOF PHOTOMETRIC PLAN - AREA D

SHEET NUMBER

EL320LT

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:21 PM AESI Proj. No: 21-154



ROOF LIGHTING PLAN - AREA E

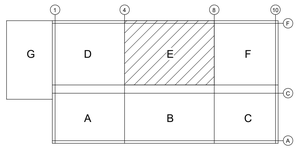
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. POLE LIGHT FIXTURES IN THIS AREA SHALL BE MOUNTED AT 25'-0" OF COOLING TOWER , AND PIECE OF CONDUIT THAT FIXTURE MOUNTS ONLY FOR ONE FIXTURE PER CONDUIT.
2. LIGHT FIXTURES IN THIS AREA SHALL BE MOUNTED AT 7'-6" STRUCTURE CRANE RAIL.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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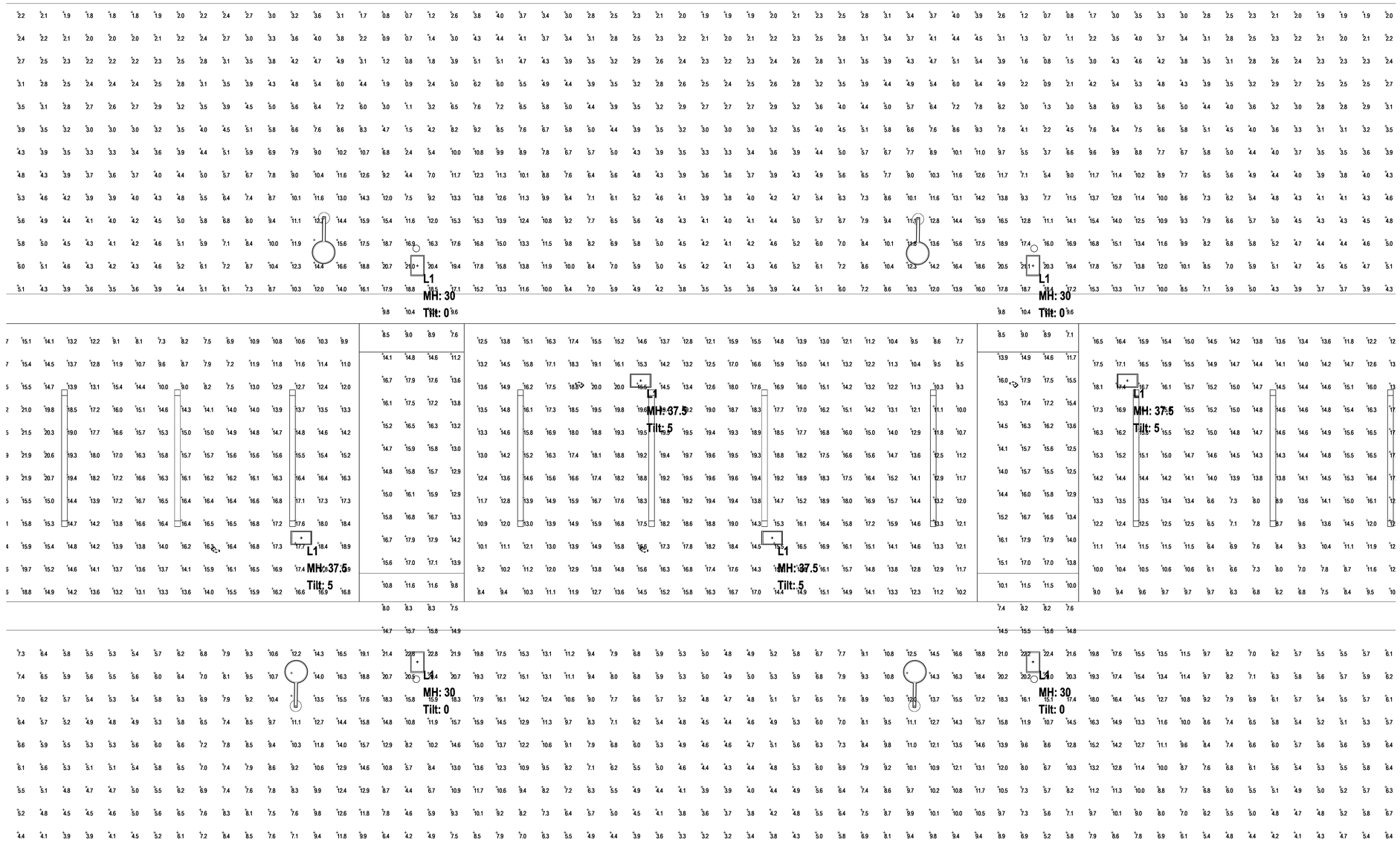
SHEET TITLE

ROOF LIGHTING PLAN - AREA E

SHEET NUMBER

EL321

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:23 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF PHOTOMETRIC PLAN AREA-E

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

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:28 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

OWNER

Indiana University Health
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PROJECT

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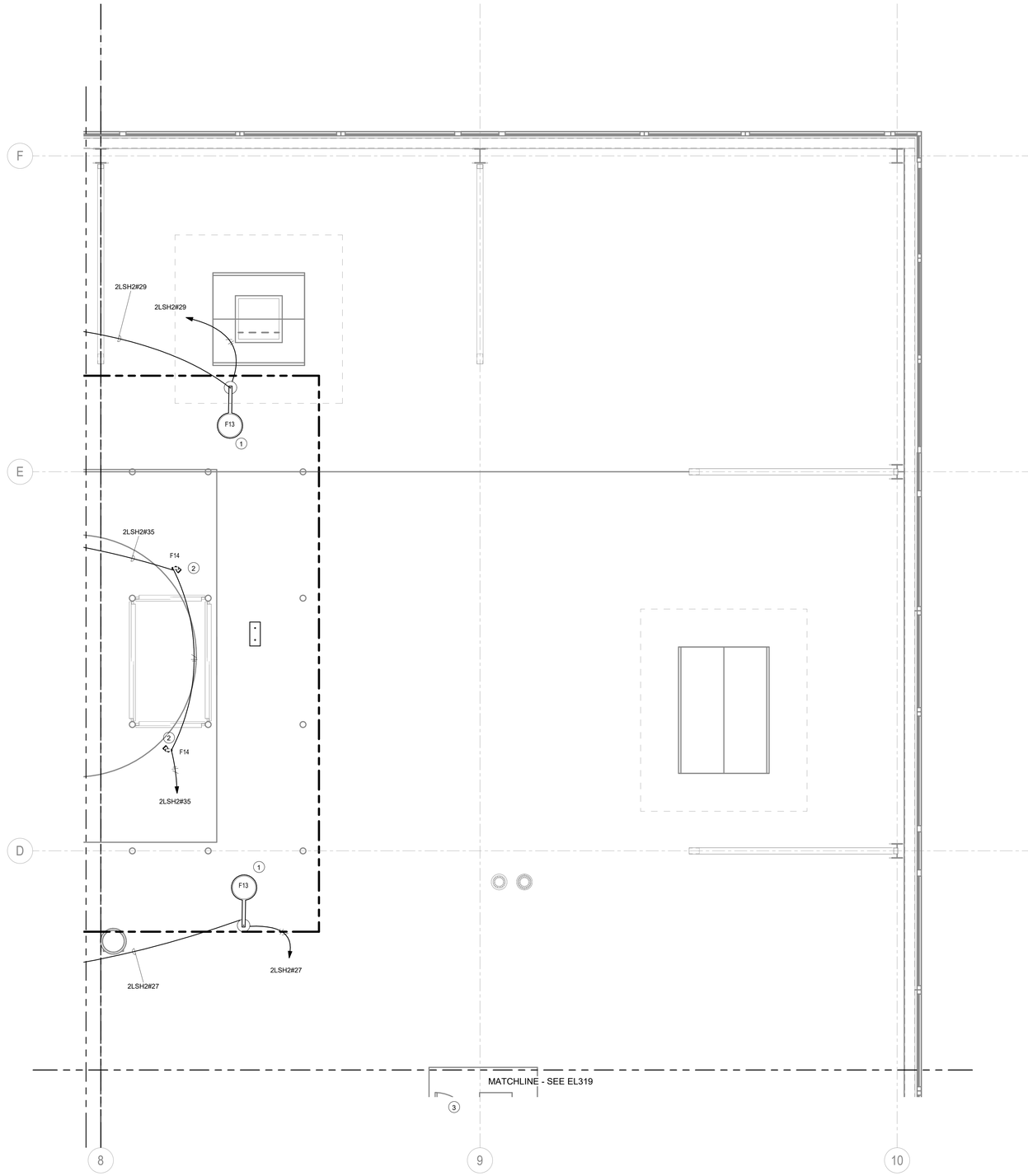
APPROVED BY SPE	
PROJECT NO. 21-154	

SHEET TITLE

ROOF PHOTOMETRIC PLAN - AREA E

SHEET NUMBER

EL321LT



ROOF LIGHTING PLAN - AREA F

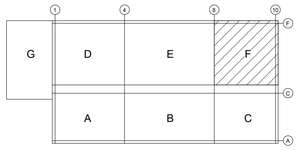
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE EL601.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.

(#) PLAN NOTES:

1. POLE LIGHT FIXTURES IN THIS AREA SHALL BE MOUNTED AT 25'-0" OF COOLING TOWER, AND PIECE OF CONDUIT THAT FIXTURE MOUNTS ONLY FOR ONE FIXTURE PER CONDUIT.
2. LIGHT FIXTURES IN THIS AREA SHALL BE MOUNTED AT 7'-6" STRUCTURE CRANE RAIL.



KEY PLAN

SCALE: NONE

OWNER

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SHEET TITLE

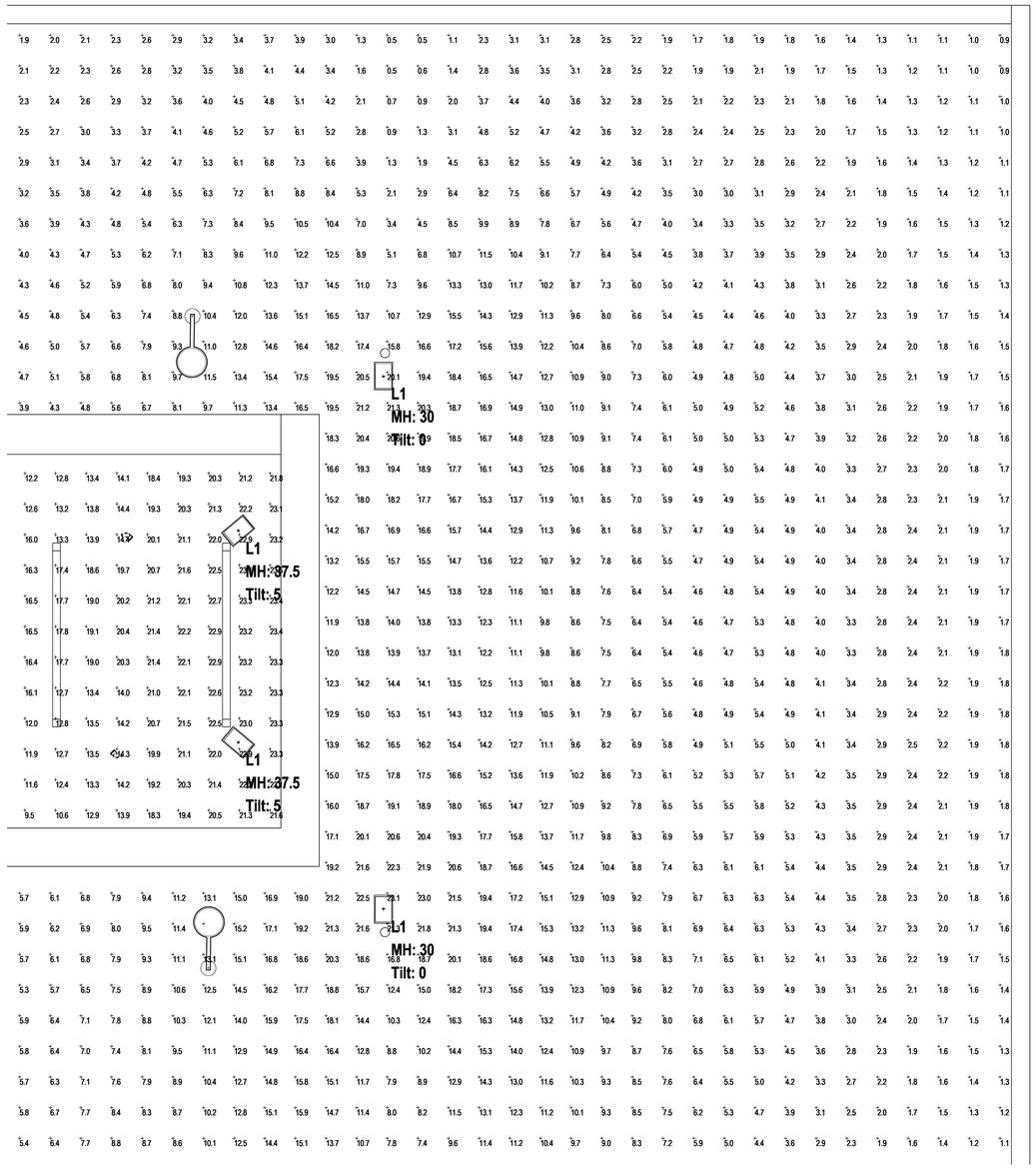
ROOF LIGHTING PLAN - AREA F

SHEET NUMBER

EL322

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:31 PM AESI Proj. No: 21-154



ROOF PHOTOMETRIC PLAN AREA-F

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

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY SPE	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY MB	
APPROVED BY SPE	
PROJECT NO. 21-154	

SHEET TITLE

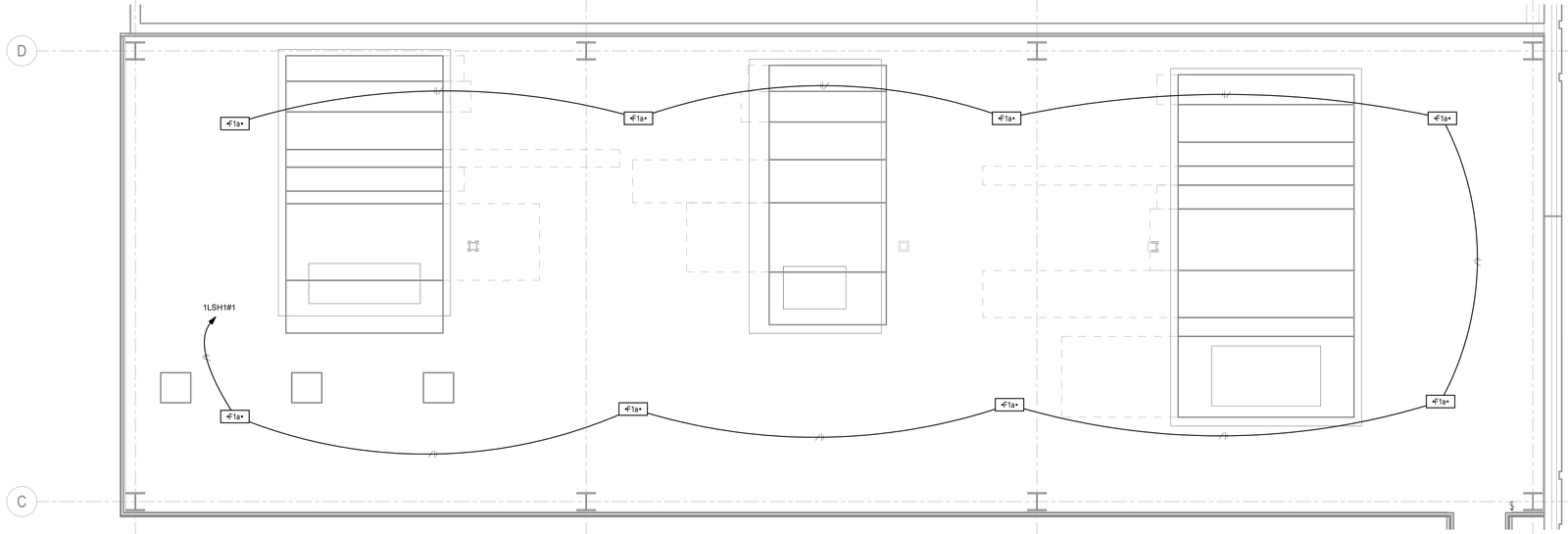
ROOF PHOTOMETRIC PLAN - AREA F

SHEET NUMBER

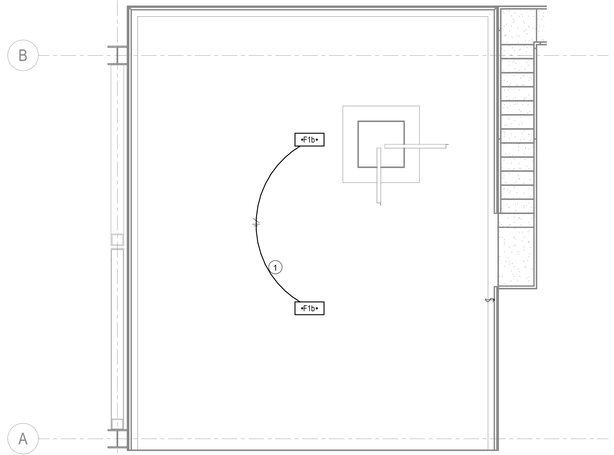
EL322LT

0 1/2" 1" 2"

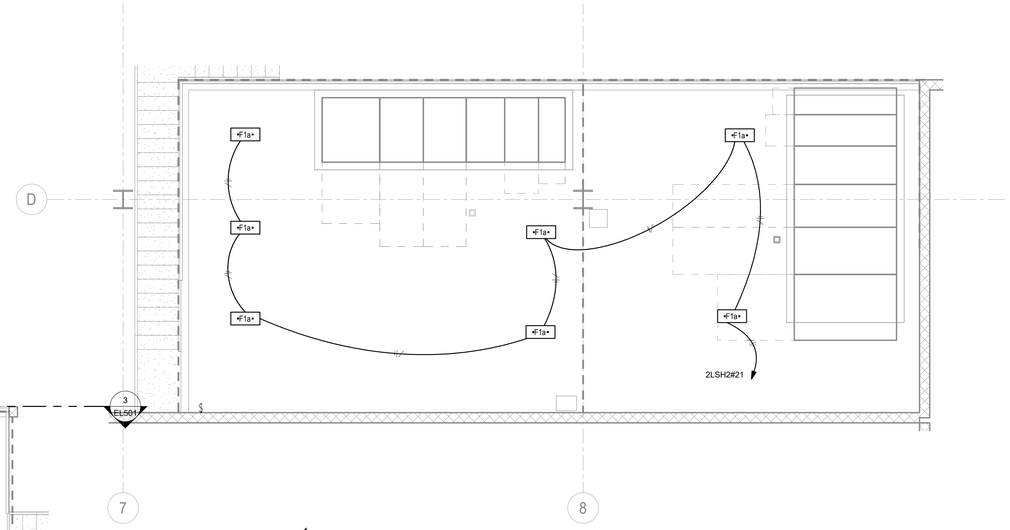
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:35 PM AESI Proj. No: 21-154



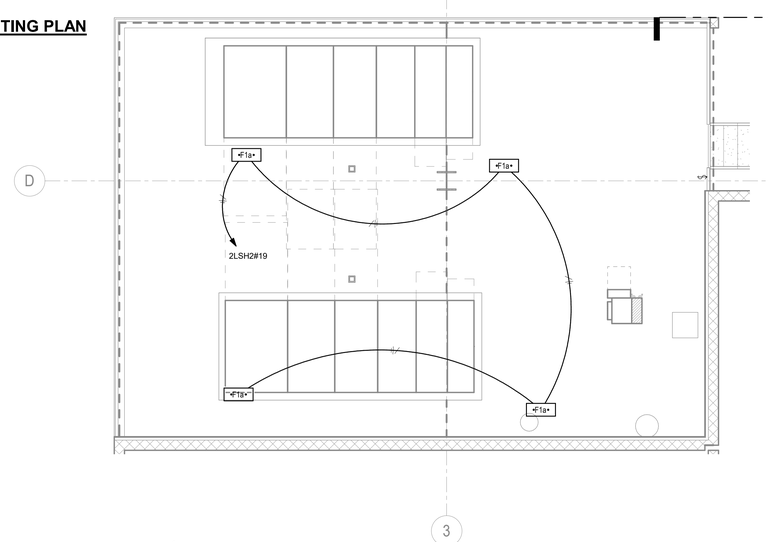
1 **FIRST FLOOR MEZZANINE 1 LIGHTING PLAN**
Scale: 1/4" = 1'-0"



FIRST FLOOR MEZZANINE 1 LIGHTING PLAN
Scale: 1/4" = 1'-0"



3 **SECOND FLOOR MEZZANINE 2 LIGHTING PLAN**
Scale: 1/4" = 1'-0"



2 **SECOND FLOOR MEZZANINE 1 LIGHTING PLAN**
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. CONNECT CIRCUIT TO LOWER LEVEL AT FIRE PUMP ROOM 108

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AS ADOPTED BY STATE INCLUDING ALL AMENDMENTS.
2. PROVIDE LIGHT FIXTURE AS SPECIFIED ON LIGHT FIXTURE SCHEDULE.
3. ALL LIGHTING CIRCUITS TO CONSIST OF (2) #12 AWG, #12 GND UNLESS OTHERWISE
4. NOTED.
5. ALL LIGHTING CIRCUITS EXCEEDING 75 FEET IN LENGTH SHALL CONSIST OF (2) #10 AWG, #10 GND UNLESS OTHERWISE NOTED.
6. PROVIDE ALL POWER PACKS AS REQUIRED LIGHTING CONTROL DEVICES AND POWER SUPPLIES FOR LOW VOLTAGE LIGHTING FIXTURES AS REQUIRED.
7. CEILING MOUNTED EXIT SIGN IN ROOMS WITH OPEN CEILINGS SHALL BE PENDANT MOUNTED, TOP OF FIXTURE SHALL ALIGN WITH BOTTOM OF PENDANT LIGHT FIXTURE.
8. ALL EXPOSED CONDUIT TO BE RIGID GALVANIZED STEEL (RGS).
9. SEAL ALL PENETRATIONS IN FULL HEIGHT WALLS.
10. PROVIDE ADDITIONAL TRAPEZE SUPPORTS FOR LIGHT FIXTURES AS REQUIRED UNDER DUCTWORK AND OTHER UTILITIES.
11.

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REVISIONS

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DESIGNED BY **DAG**	CERTIFICATION
CHECKED BY **MB**	PRELIMINARY NOT FOR CONSTRUCTION
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PROJECT NO. **21-154**	

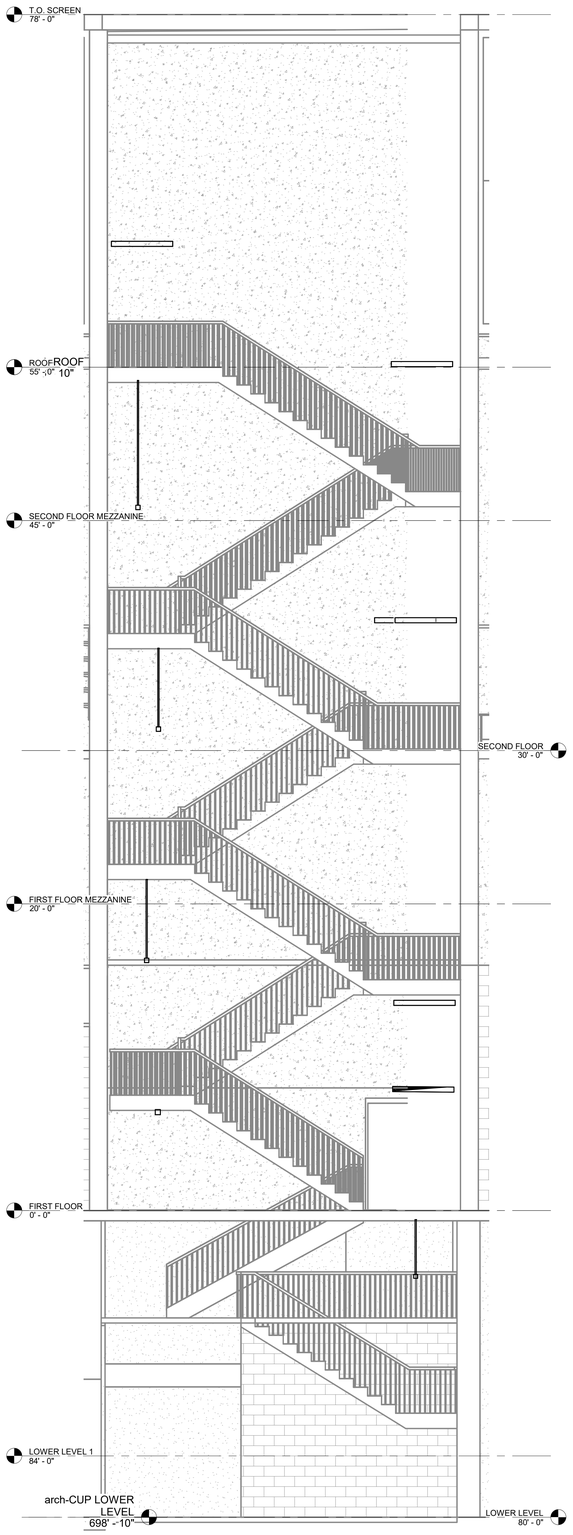
SHEET TITLE

LIGHTING MEZZAINE PLAN

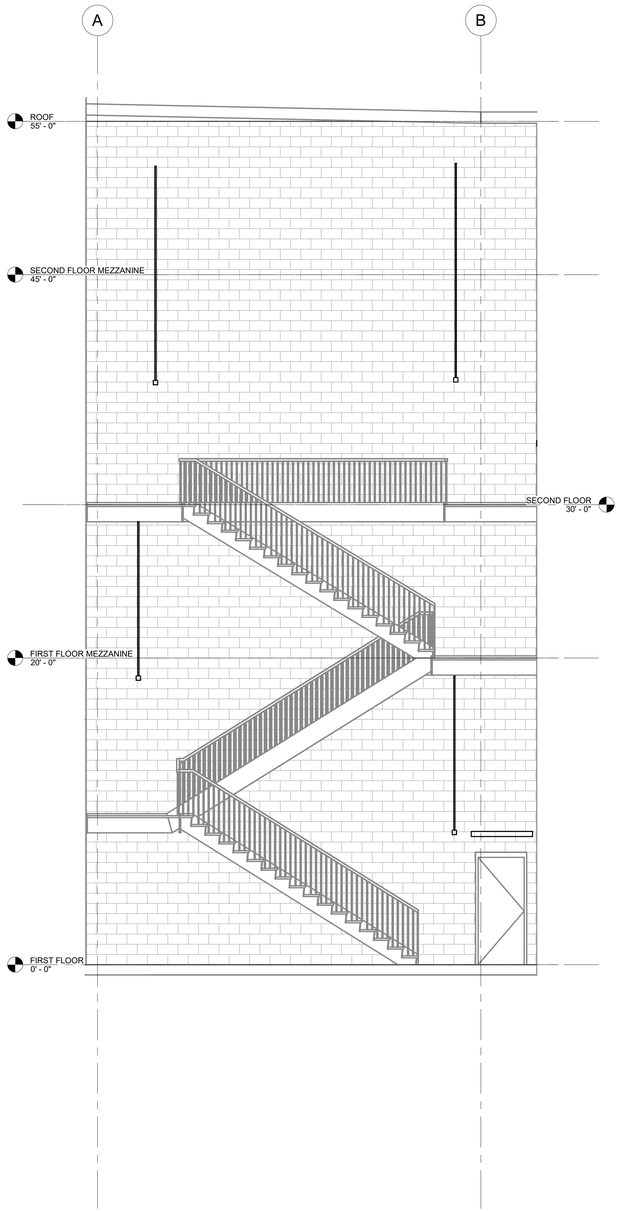
SHEET NUMBER

EL401

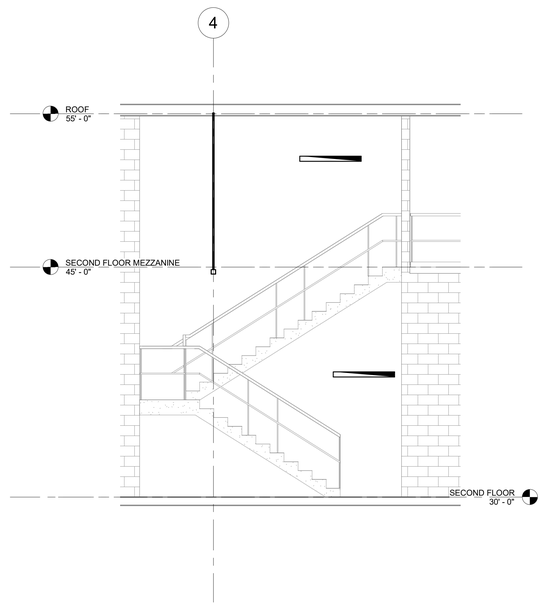
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:40 PM AESI Proj. No: 21-154



1 **STAIRS #1**
Scale: 1/4" = 1'-0"



2 **STAIRS #2**
Scale: 1/4" = 1'-0"



3 **CORRIDOR 227**
Scale: 1/4" = 1'-0"

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SHEET TITLE

LIGHTING DETAILS

SHEET NUMBER

EL501

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:41 PM AESI Proj. No: 21-154

LIGHTING FIXTURE SCHEDULE

NOTES:
1. ALL LUMENS AND WATTS IN LIGHT FIXTURE SCHEDULE ARE FOR ESL SPECTRUM LIGHT FIXTURES ONLY.
2. X

TYPE TAG	DESCRIPTION	MOUNTING	LAMPS			CRI	LAMPS		MANUFACTURERS	ROOMS #	NOTES
			TYPE	LUMENS	TEMPERATURE		WATTS	VOLTS			
F1a	LINEAR HIGH BAY - EXTRUDED ALUMINUM HOUSING, WIDE DISTRIBUTION, POLYCARDONATE LENS, 0-10V DIMMING	CABLE	LED	12100 lm	3500 K	80	72 W	277 V	1--COLUMBIA LIGHTING ECH1-835-L12-DW-ED-U-PM-ODS-F5C012 2-- LITHONIA LIGTHING CPHB-12000LM-SEF-GCL-WD-MVOLT-GZ10- 35K-80CRI-DWH 3--METALUX OHB-12-SE-W-UNV-L835-CD-X-U-X	201-224-227	1
F1a-90	LINEAR HIGH BAY - EXTRUDED ALUMINUM HOUSING, WIDE DISTRIBUTION, POLYCARDONATE LENS, 0-10V DIMMING	CABLE	LED	9100 lm	3500 K	90	53 W	277 V	1--COLUMBIA LIGHTING ECH1-935-L09-DW-ED-U-PM-ODS-F5C012 2--LITHONIA LIGHTING CPHB-9000LM-SEF-GCL-WD-MVOLT-GZ10-35K-90CRI-DWH 3--METALUX OHB-9-SE-W-UNV-L935-CD-X-U-X	207-208	1
F1b	LINEAR HIGH BAY - EXTRUDED ALUMINUM HOUSING, WIDE DISTRIBUTION, POLYCARDONATE LENS, 0-10V DIMMING	CABLE	LED	15101 lm	3500 K	80	94 W	277 V	1--COLUMBIA LIGHTING ECH1-835-L15-DW-ED-U-PM-ODS-F5C012 2--LITHONIA LIGHTING L CPHB-15000LM-SEF-GCL-WD-MVOLT-GZ10-35K-80CRI-DWH 3--METALUX OHB-15-SE-W-UNV-L835-CD-X-U-X	102-105-108-109-113 -114-210-211-212-22 0-226	1
F1c	LINEAR HIGH BAY - EXTRUDED ALUMINUM HOUSING, WIDE DISTRIBUTION, POLYCARDONATE LENS, 0-10V DIMMING	CABLE	LED	9100 lm	3500 K	80	53 W	277 V	1--COLUMBIA LIGHTING ECH1-835-L09-DW-ED-U-PM-ODS-F5C012 2--LITHONIA LIGHTING CPHB-9000LM-SEF-GCL-WD-MVOLT-GZ10-35K-80CRI-DWH 3--METALUX OHB-9-SE-W-UNV-L835-CD-X-U-X	215	1
F2a	2X4 TROFFER - DIE-FORMED CODE GAUGE COLD ROLLED STEEL HOUSING, ACRYLIC LENS, 0-10V DIMMING	LAY-IN GRID	LED	3492 lm	3500 K	90	27 W	277 V	1--COLUMBIA LIGHTING LCAT24-9-35-VW-G-R-ED-U 2--LITHONIA LIGHTING ENVX 2X4-HRG-3000LM-90CRI-35K-MIN1- ZT-MVOLT 3--METALUX 24-G-R-X-LD5-34-X-UNV-L935-X-CD-1--U-SK-24-WT	101-112-203-204-205 -209	1
F4a	LINEAR HAZARDOUS RATED-CLASS I(FLAMMABLE VAPORS, GASES & LIQUIDS)-DIV 2- GROUP D	CABLE	LED	8692 lm	3500 K	70	62 W	277 V	1--SPECGRADE LED ARIA-60-35K-120-V01-GR-PM-VDIM 2--LITHONIA LIGHTING HJHL42-040-50-35K-U-HJUB 3--METALUX 4-SRL-LD5-60SL-LW-UNV-L835-CD-1-SVPD2-U	103-222	1
F5c	LINEAR STAIRWELL - DIE-CAST STEEL, FROSTED ACRYLIC LENS, WIDE DISTRIBUTION. INTEGRAL OCCUPANCY SENSOR, UNOCCUPIED STATE DIM LUMINARE TO 50% OUTPUT, OCCUPIED STATE LUMINARIE RETURNS TO 100% OUTPUT, 0-10V DIMMING	PENDANT	LED	4556 lm	3500 K	80	40 W	277 V	1--COLUMBIA LIGHTING ESL4-35ML-FAW-EDU-NXOS 2--LITHONIA LIGHTING ESL-4-35-ML-FA-W-ED-NXOS 3--METALUX 4NWS3C3-UNV-HIGH-3500K	106-110-202-217-227	1
F6	LINEAR GENERATOR ROOM- 2" APETURE WALL MOUNTED, EXTRUDED ALUMINUM BODY, FLUSH FROSTED LENS, INTEGRAL OCCUPANCY SENSOR, UNOCCUPIED STATE DIM LUMINARE TO 50% OUTPUT, OCCUPIED STATE LUMINARIE RETURNS TO 100% OUTPUT, 0-10V DIMMING	WALL	LED	5037 lm	3500 K	80	60 W	277 V	1--COLUMBIA LIGHTING LXEM-2-35-HL-RFA-ED-U-XE45MB 2--LITHONIA LIGHTING CSVT-L48-5000LM-MVOLT-35K-80CRI 3--METALUX 2VT2-LD5-3-DR-W-UNV-L835-CD1-WL-U	304-305	1
F7	EXTERIOR WALLPACK - DIE-CAST ALUMINUM HOUSING, POWDER PAINT BLACK MATTE FINISH, FLOSTED ACYLIC DIFFUSER, ZERO UPLIGHT	WALL	LED	4012 lm	3000 K	<varies>	35 W	277 V	1--HUBBELL LIGHTING LNC3-24L3K-050-3-U-BLT LNC2-48L-35-4K7-4W-UNV 2--LITHONIA LIGHTING WDGE1 -P2-30K-80CRI-VW-MVOLT 3--METALUX McGRAW-IST-SA1-F-830-U-T4w-BK--X	EXTERIOR	1
F8	VAPOR TIGHT JELLY JAR - DIE-CAST ALUMINUM HOUSING WITH REMOVABLE CAST ALUMINUM GUARD, FROSTED GLASS GLOBE, WALL MOUNT TO SURFACE J-BOX	WALL	LED	2332 lm	3500 K	80	16 W	277 V	1--SPECGTADELED TAURUS-C TAUC-20-35K-120-V01-GRWM-VDIM-R1 2--LITHONIA LIGHTING AVP-20L2-U-MF-G-W-35 3--PHOENIX VA-W-17LED-WW--FGC	219-221	1
F9a	LINEAR UTILITY - CODE-GAUGE STEEL CONSTRUCTION, FROSTED ACRYLIC LENS, WIDE DISTRIBUTION, 0-10V DIMMING	CHAIN	LED	4613 lm	3500 K	80	40 W	277 V	1--COLUMBIA LIGHTING MPS4-35ML-CW-EDU CSHC 2--LITHONIA LIGHTING CLX-L48-4000LM-SEF-FDL-MVOLT-GZ10-35K-80CRI-WH 3--METALUX 4-SNLED-LD5-49SL-LN-UNV-X-L835-CD-1-U	115-223-224-225	1
F9b	LINEAR UTILITY - CODE-GAUGE STEEL CONSTRUCTION, FROSTED ACRYLIC LENS, WIDE DISTRIBUTION, 0-10V DIMMING	CHAIN	LED	5831 lm	3500 K	80	50 W	277 V	1--COLUMBIA LIGHITNG MPS4-35HL-CW-EDU-CSHC 2--LITHONIA LIGHTING CLX-L48-5000LM-SEF-FDL-MVOLT-GZ10-35K-80CRI-WH 3--METALUX 4-SNLED-LD5-46SL-LN-UNV-X-L835-CD-1-U	214-223	1
F9c	LINEAR UTILITY - CODE-GAUGE STEEL CONSTRUCTION, FROSTED ACRYLIC LENS, WIDE DISTRIBUTION, 0-10V DIMMING	CHAIN	LED	8045 lm	3500 K	80	67 W	277 V	1--COLUMBIA LIGHITNG MPS4-35XL-CW-EDU-CSHC 2--LITHONIA LIGHTING CLX-L48-7000LM-SEF-FDL-MVOLT-GZ10-35K-80CRI-WH 3--METALUX 4-SNLED-LD5-74HL-LN-UNV-X-L835-CD-1-U	225	1
F10a	6" RECESSED DOWNLIGHT - COLD-ROLLED STEEL HOUSING, WIDE DISTRIBUTION DIFFUSED LENS, WET LOCATION RATED, WHITE TRIM COLOR	RECESSED	LED	984 lm	3500 K	80	10 W	277 V	1--ALPHABET LIGHITNG NU6-RD-SW-13LM-35K-80-HE70-UNV-DIM10-NC-WH-WH 2--LITHONIA LIGHTING LDN6-35/10-L06WR-MVOLT-GZ10 3--HOLO COMMERCIAL HC6-10-D010-HM6-3040-835	111-205A-205B	1
F11	LINEAR STAIRWELL - 4" APETURE WALL MOUNTED, EXTRUDED ALUMINUM BODY, FLUSH FROSTED LENS, INTEGRAL OCCUPANCY SENSOR, UNOCCUPIED STATE DIM LUMINARE TO 50% OUTPUT, OCCUPIED STATE LUMINARIE RETURNS TO 100% OUTPUT, 0-10V DIMMING	SURFACE	LED	2882 lm	3500 K	80	19 W	277 V	1--FINELITE HP-4-WW-D-4-H-835-F-96LG-277-SC-FC-10%-FM-FE-SW-OBO 2--LITHONIA LIGHTING S4LS-LLP-4FT-MSL4-80CRI-35K-700LMF-MIN1-MVOLT-WHT-XT -APD 3--LUMENWERX V1A4S-D-ARO2-FH-SW--80-X-35K-X-UNV-D1-1-DRC-W	106-110-202-217-301 -227	1
F12	LINEAR HIGH PERFORMANCE- 2" APETURE WALL MOUNTED, EXTRUDED ALUMINUM BODY, FLUSH FROSTED LENS, INTEGRAL OCCUPANCY SENSOR, UNOCCUPIED STATE DIM LUMINARE TO 50% OUTPUT, OCCUPIED STATE LUMINARIE RETURNS TO 100% OUTPUT, 0-10V DIMMING	SURFACE	LED	2882 lm	3500 K	80	16 W	277 V	1--FINELITE HP-2-WM-ID-2FT-S-B-835 2--LITHONIA LIGHTING S2WID-LLP-MSL2-80CRI-35K-400LMF-I80CRI-I35KI-I400LMF-SC T-MIN10-FLL-MVOLT-WHTT 3--STARTEK-BEAM BEAMDI-2-500-750-WD-BW-35K-80-PW-ACW05-U-1C-DT1	205A-205B	1
F13	LED FLOOD LIGHTING WITH DIE-CASTHOUSING WITH HIDDEN VERTICAL HEAT FINES WITH BLACK COLOR	POLE	LED	22653 lm	3000 K	70	178 W	277 V	1-- BEACON VP-F-2-264L-175-3K7-W 2--LITHIONIA RSXF2LED-P4-30K-MFL-MVOLT-IS-DDBXD 3--COOPER- McGRAW-EDITION GLEON-SA3-D-830-U-T4W-ADJA-BK	EXTERIOR	1
F14	LED FLOOD LIGHTING WITH DIE-CASTHOUSING WITH HIDDEN VERTICAL HEAT FINES WITH BLACK COLOR	LAY-IN GRID	LED	22653 lm	3000 K	70	178 W	277 V	1-- BEACON VP-F-2-264L-175-3K7-W-T-TRUNNION 2--LITHIONIA RSXF2LED-P4-30K-MFL-MVOLT-IS-DDBXD 3--COOPER- McGRAW-EDITION GLEON-SA3-D-830-U-T4W-ADJA-BK	EXTERIOR-302-303	1
FX	EXIT SIGN - DIE-CAST ALUMINUM CONSTRUCTION, WHITE FINISH WITH RED LETTERS, UNIVERSAL MOUNTING	WALL/SURFACE/CEILING/PENDANT	LED	0 lm	0 K		4 W	277 V	1--DUAL-LITE SE*RW-I 2--LITHONIA LIGHTING LE-S-W-1-R 3--SURE-LITES CX-7-1-WH-SD-R	EXIT SIGN	1
P1	ELEVATOR LIGHT FIXTURE	SURFACE	LED	7643 lm	3500 K	80	62 W	277 V	1--COLUMBIA LIGHTING LXEM4-35-VL-RFA-ED-U 2--LITHONIA LIGHTING CSVT-L48-6000LM-MVOLT-35K-80CRI 3--LUMENWERX 4VT3-LD5-8-G-UNV-L835-CD1-U	ELEVATOR PIT	1

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SHEET TITLE

LIGHTING SCHEDULES

SHEET NUMBER

EL601

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:42 PM AESI Proj. No: 21-154

PANELBOARD SCHEDULE

Branch Panel...	1LSH1	**New/Exist:**	NEW	**Location:**	CHILLER PLANT 114	**Project Name:**	Central Utility Plant
SPD:	Yes	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480/277 Wye	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:		**Enclosure:**	Type 1	**Feeder:**	SEE SINGLE LINE DIAGRAM		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	LTG-BOILER PLANT MEZZ. (109)	1	20 A		Lighting	0.58	0.00					--		20 A	1	Spare	2
3	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	4
5	LTG- VEST. (101)	1	20 A		Lighting					0.31	0.00	--		20 A	1	Spare	6
7	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	8
9	LTG- CHILLER PLANT (114)	1	20 A		Lighting			1.61	0.00			--		20 A	1	Spare	10
11	LTG- CHILLER PLANT (114)	1	20 A		Lighting					1.41	0.00	--		20 A	1	Spare	12
13	LTG- FIRE PUMP ROOM (108)	1	20 A		Lighting	0.47	0.00					--		20 A	1	Spare	14
15	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	16
17	LTG- CHILLER PLANT ELECTRICAL RM...	1	20 A		Lighting					0.85	0.00	--		20 A	1	Spare	18
19	LTG- CHILLER PLANT ELECTRICAL RM...	1	20 A		Lighting	0.85	0.00					--		20 A	1	Spare	20
21	LTG- CHILLER PLANT ELECTRICAL RM...	1	20 A		Lighting			0.39	0.00			--		20 A	1	Spare	22
23	LTG- BOILER PLANT (109)	1	20 A		Lighting					1.53	0.00	--		20 A	1	Spare	24
25	LTG- CONTROL (112)	1	20 A		Lighting	0.10	0.00					--		20 A	1	Spare	26
27	LTG- BOILER PLANT (109)	1	20 A		Lighting			1.14	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	LTG- SERVICE YARD	1	20 A		Lighting	0.39	0.00					--		20 A	1	Spare	32
33	LTG- OUTSIDE	1	20 A		Lighting			0.11	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						2.39 kVA		**3.2 kVA**		**4.1 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)	9.73	1.00	9.73	Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	9.73		9.73		

PANELBOARD SCHEDULE

Branch Panel...	2LSH2	**New/Exist:**	NEW	**Location:**	15KW SWITCHGEAR 212	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480/277 Wye	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:		**Enclosure:**	Type 1	**Feeder:**	SEE SINGLE LINE DIAGRAM		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	LTG- LOCKER / BREAK RM (205)	1	20 A		Lighting	0.46	0.00					--		20 A	1	Spare	2
3	LTG- OFFICE (203)	1	20 A		Lighting			0.11	0.00			--		20 A	1	Spare	4
5	LTG- OFFICE (226)	1	20 A		Lighting					0.27	0.00	--		20 A	1	Spare	6
7	LTG- GANITOR / STORAGE (223)	1	20 A		Lighting	0.48	0.00					--		20 A	1	Spare	8
9	LTG- FUEL OIL DAY TANKS A (222)	1	20 A		Lighting			0.25	0.00			--		20 A	1	Spare	10
11	LTG- MECHANICAL (206)	1	20 A		Lighting					0.47	0.00	--		20 A	1	Spare	12
13	LTG- CONTROL ROOM (209)	1	20 A		Lighting	0.22	0.00					--		20 A	1	Spare	14
15	LTG- MAINTENANCE STORAGE (214)	1	20 A		Lighting			0.45	0.00			--		20 A	1	Spare	16
17	LTG-GENERATOR EXHAUST PLENUM 2...	1	20 A		Lighting					0.13	0.00	--		20 A	1	Spare	18
19	LTG- GENERATOR CONTROL . MEZZ (208)	1	20 A		Lighting	0.29	0.00					--		20 A	1	Spare	20
21	LTG- MAINTENANCE STRORAGE . MEZZ...	1	20 A		Lighting			0.50	0.00			--		20 A	1	Spare	22
23	LTG- INTAKE MONITORE RM (302)	1	20 A		Other					1.43	0.00	--		20 A	1	Spare	24
25	LTG- OUTSIDE EMERG. GENERATOR (302)	1	20 A		Lighting	0.18	0.00					--		20 A	1	Spare	26
27	LTG- POLE LIGHT- ROOF TOP	1	20 A		Lighting			0.71	0.00			--		20 A	1	Spare	28
29	LTG- POLE LIGHT- ROOF TOP	1	20 A		Lighting					0.71	0.00	--		20 A	1	Spare	30
31	LTG- VESTIBLUE (304)	1	20 A		Lighting	0.16	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	LTG- COOLING TOWER LIGHT	1	20 A		Other					1.43	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						1.80 kVA		**2.0 kVA**		**4.4 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)	5.40	1.00	5.40	Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)	2.85	0.80	2.28		
Total Load (KVA)	8.26		7.69		

PANELBOARD SCHEDULE

Branch Panel...	1LSUPSH1	**New/Exist:**	NEW	**Location:**	CHILLER PLANT 114	**Project Name:**	Central Utility Plant
SPD:	Yes	**Main:**	MLO	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480/277 Wye	**Amp:**	100 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:		**Enclosure:**	Type 1	**Feeder:**	SEE SINGLE LINE DIAGRAM		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	LTG- STAIR #1 (001)	1	20 A		Lighting	1.04	0.00					--		20 A	1	Spare	2
3	LTG- STAIR #1 (106)	1	20 A		Lighting			0.10	0.00			--		20 A	1	Spare	4
5	LTG- RECEIVING (105)	1	20 A		Lighting					1.70	0.00	--		20 A	1	Spare	6
7	LTG- STAIR #2 (110)	1	20 A		Lighting	0.11	0.00					--		20 A	1	Spare	8
9	LTG- ELEVATOR LIGHT	1	20 A		Lighting			0.12	0.00			--		20 A	1	Spare	10
11	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	12
13	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	14
15	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	16
17	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	20
21	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						1.15 kVA		**0.2 kVA**		**1.7 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)	3.07	1.00	3.07	Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	3.07		3.07		

PANELBOARD SCHEDULE

Branch Panel...	2LSUPSH1	**New/Exist:**	NEW	**Location:**	15KW SWITCHGEAR 212	**Project Name:**	Central Utility Plant
SPD:	Yes	**Main:**	MLO	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480/277 Wye	**Amp:**	100 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:		**Enclosure:**	Type 1	**Feeder:**	SEE SINGLE LINE DIAGRAM		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	LTG- STAIR #1 (202)	1	20 A		Lighting	0.08	0.00					--		20 A	1	Spare	2
3	LTG- CORRIDOR (227)	1	20 A		Lighting			1.48	0.00			--		20 A	1	Spare	4
5	LTG- STAIR #2 (217)	1	20 A		Lighting					0.08	0.00	--		20 A	1	Spare	6
7	LTG- STAIR #1 (301)	1	20 A		Lighting	0.12	0.00					--		20 A	1	Spare	8
9	LTG- CUP EMERGENCY ELECT. RM (215)	1	20 A		Lighting			0.38	0.00			--		20 A	1	Spare	10
11	LTG-15KW SWITCHGEAR (212)	1	20 A		Lighting					1.80	0.00	--		20 A	1	Spare	12
13	LTG- AES SERVICE SWITCHGEAR (216)	1	20 A		Lighting	0.95	0.00					--		20 A	1	Spare	14
15	LTG- GENERATOR ROOM B (218)	1	20 A		Lighting			1.51	0.00			--		20 A	1	Spare	16
17	LTG- GENERATOR ROOM A (220)	1	20 A		Lighting					1.32	0.00	--		20 A	1	Spare	18
19	LTG- GENERATOR CONTROL (208)	1	20 A		Lighting	0.32	0.00					--		20 A	1	Spare	20
21	LTG- CONTROL (211)	1	20 A		Lighting			1.23	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						1.47 kVA		**4.6 kVA**		**3.2 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)	9.26	1.00	9.26	Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	9.26		9.26		

ASHRAE STANDARD 90.1-2019 USING 9.6 SPACE BY SPACE METHOD

Key Plan Area	Rooms Name	Room #	Window Dimensions/ Top of Window Elevation	Primary Slide Lighted Area	Requires Day Light Control	Note for Lighting Control	# of Light Fixtures Day Lighting Control Required	Light Fixture For Day Light	Wattage Per Fixture For Day Light	Requires Occupancy Sensor	Note for Occupancy Sensor	Light Fixtures	Wattage Per Fixture	Total Light Fixtures in the Room	Total Wattage in the Room	Room Square footage (SF)	Lighting Power Density(LPD) (W/FT^2)	Total Wattage Allowed	Pass /Fail
D	Vestibiue	101	16' H X12'W / 16'	256	YES	9.4.1.1 a,d,e	2	F2a	27	YES	9.4.1.1 g	F2a	27	2	54	195	0.48	93.6	Pass
D	Entry	102	No Window	No Window	NO	9.4.1.1 a,d	-	-	-	NO	9.4.1.1 g	F1b	94	2	188	265	0.48	127.2	Pass
D	Fuel Pump Room	103	4' H X 20'-0"W / 16'	432	YES	9.4.1.1 a,e	-	-	-	NO	9.4.1.1 h	F4a	62	4	248	614	0.76	466.64	Pass
	Elevator Shaft	-	No Window	No Window	NO	9.4.1.1 a	-	-	-	NO	9.4.1.1 h	-	-	-	-	-	-	-	-
A	Receiving	105	No Window	No Window	NO	9.4.1.1 a	-	-	-	YES	9.4.1.1 h	F1b	94	6	564	1410	0.49	690.9	Pass
A	Stair # 1	106	No Window	No Window	NO	9.4.1.1 a,c,d	-	-	-	YES	9.4.1.1 g	F11 & F5c	19/40	2 & 2	118	329	0.49	161.21	Pass
A,B	Water Pump Room	107	4' H X 26' W / 16'	480	YES	9.4.1.1 a,b,e	-	-	-	NO	9.4.1.1 h	F1b	94	10	940	3634	0.76	2685.84	Pass
B	Fire Pump Room	108	4' H X 26' W / 16'	480	YES	9.4.1.1 a,b,e	1	F1b	94	NO	9.4.1.1 h	F1b	94	3 & 2	470	730	0.76	554.8	Pass
B,C,E,F	Boiler Plant Room	109	4' H X 26' W / 16'	480	YES	9.4.1.1 a,b,e	-	-	-	NO	9.4.1.1 h	F1b/F1a	94/72	28 & 8	3208	10221	0.76	7767.96	Pass
C	Stair # 2	110	4' H X 21'-9" W / 16' & 30' H X0'-6" W / 30'	446 & 270	YES	9.4.1.1 a,c,d,e	1	F5c	40	YES	9.4.1.1 g	F11 & F5c	19/40	1 & 2	118	295	0.49	144.55	Pass
B	Toilet	111	No Window	No Window	NO	9.4.1.1 a,d	-	-	-	YES	9.4.1.1 h	F10a/F12	10/16	2 &1	36	67	0.63	42.21	Pass
B	Control Room	112	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 a	F2a	27	1	27	188	0.76	142.88	Pass
E,F	Chiller Plant Electrical Room	113	4' H X 26' & 20'1 W / 16'	480 & 384	YES	9.4.1.1 a,b,e	2	F1b	94	NO	9.4.1.1 h	F1b	94	22	2068	6970	0.76	5297.2	Pass
A,D,E	Chiller Plant Room	114	4' H X 26' W / 16'	480	YES	9.4.1.1 a,b,e	1	F1b	94	NO	9.4.1.1 h	F1b	94	32	3008	12391	0.76	9417.16	Pass
B	Janitor Room	115	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	YES	9.4.1.1 h	F9a	40	1	40	36	0.38	13.68	Fail
D	Elevator Room	116	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	P1	62	2	124	102	0.65	66.3	-
A,D	Corridor Room	201	21' H X 8' W / 21'	192	NO	9.4.1.1 a,b,e	1	F1a	72	YES	9.4.1.1 g	F1a	72	6	432	1841	0.76	1399.16	Pass
A	Stair #1	202	No Window	No Window	NO	9.4.1.1 a,c,d	-	-	-	YES	9.4.1.1 g	F11 & F5c	19/40	2 & 2	118	337	0.49	165.13	Pass
A	Office	203	21' H X 8' W /21'	252	YES	9.4.1.1 a,c,d,e	4	F2a	27	YES	9.4.1.1 h	F2a	27	4	108	232	0.74	171.68	Pass
A,D	Office	204	21' H X 8' W /21'	252	YES	9.4.1.1 a,c,d,e	4	F2a	27	YES	9.4.1.1 h	F2a	27	4	108	214	0.74	158.36	Pass
D	locker/Break Room	205	21' H X 8' W /21'	252	YES	9.4.1.1 a,d,e	4	F2a	27	YES	9.4.1.1 h	F2a	27	9	243	701	0.74	518.74	Pass
D	Toilets Shower	205A	No Window	No Window	NO	9.4.1.1 a,d	-	-	-	YES	9.4.1.1 h	F10a/F12	10/16	3 &1	46	75	0.63	47.25	Pass
D	Toilets' Changing	205B	No Window	No Window	NO	9.4.1.1 a,d	-	-	-	YES	9.4.1.1 h	F10a/F12	10/16	2 &1	46	57	0.63	35.91	Pass
D	Mechanical Room	206	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	YES	9.4.1.1 h	F1b	94	5	470	739	0.76	561.64	Pass
A,D	Maintenance Work Rm	207	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	YES	9.4.1.1 h	F1a-90	53	4	212	561	0.76	426.36	Pass
A,D	Generator Control Room	208	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 a	F1a-90/F1a	53/72	2 & 4	394	444	0.76	337.44	Pass
D	Control Room	209	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 a	F2a	27	8	216	786	0.76	597.36	Pass
A,B,D,E	Generator Switchgear Room	210	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1b	94	9	846	2417	0.76	1836.92	Pass
A,D,E	Control Room	211	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1b	94	5	470	843	0.76	640.68	Pass
E,F	15Kw Switchgear Room	212	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1b	94	19	1786	4719	0.76	3586.44	Pass
A,E	Fuel Oil Day Tanks B Room	213	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F4a/F1a	62/72	4 & 4	536	617	0.76	468.92	Pass
F	Maintenance Storage Room	214	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F9b/F1a	50/72	4 & 2	344	455	0.63	286.65	Pass
F	Cup Emergency Electrical Room	215	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1c	33	7	371	1475	0.76	1121	Pass
C,F	AES Service Switchgear Room	216	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1b	94	10	940	2519	0.76	1914.44	Pass
C	Stair #2	217	25' H X 27' W / 27'	837	YES	9.4.1.1 a,c,d,e	2	F5c	40	NO	9.4.1.1 g	F5c	40	2	80	319	0.76	242.44	Pass
A,B,C	Generator Room B	218	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1b	72	18	1152	4641	0.76	3527.16	Pass
A,B,C	Generator Exhaust Plenum 2	219	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F8	16	4	64	1091	0.76	829.16	Pass
A,B	Generator Room A	220	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1b	72	14	1008	4259	0.76	3236.84	Pass
A	Generator Exhaust Plenum 1	221	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F8	16	4	64	1112	0.76	845.12	Pass
A	Fuel Oil Day Tanks A Room	222	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F4a	62	4	248	443	0.76	336.68	Pass
A	Janitor / Storage Room	223	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	YES	9.4.1.1 h	F9a	40	1	40	204	0.38	77.52	Pass
A	Mechanical Room	224	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F1a & F1a	72/40	5 & 2	388	824	0.43	354.32	Pass
A	MDF Data Room	225	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	F8a	50	4	200	321	0.74	237.54	Pass
A	Office	226	21' H X 8' W / 21'	252	YES	9.4.1.1 a,c,d,e	4	F2a	27	YES	9.4.1.1 h	F2a	27	4	108	229	0.74	169.46	Pass
D,E,F	Corridor	227	No Window	No Window	NO	9.4.1.1 a,c	-	-	-	YES	9.4.1.1 g	F1a,F5C,F11	72/40/19	13 & 1 & 2	1014	3220	0.41	1320.2	Pass
C,F	Corridor	228	21'H X 8' W / 21'	252	YES	9.4.1.1 a,c,e	2	F1a	72	YES	9.4.1.1 g	F1a	72	3	216	941	0.41	385.81	Pass
A,B	Emergency Generator Intake Monitor 1	302	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	P1	62	4	248	2263	0.76	1719.88	Pass
B,C	Emergency Generator Intake Monitor 2	303	No Window	No Window	NO	9.4.1.1 a,b	-	-	-	NO	9.4.1.1 h	P1	62	4	248	2239	0.76	1702.04	Pass
A	Stair #1	001	No Window	No Window	NO	9.4.1.1 a,c,d	-	-	-	YES	9.4.1.1 g	F9b	50	2	100	227	0.49	111.23	Pass
A	Utility Tunnel	002	No Window	No Window	NO	9.4.1.1 a,b,d	-	-	-	YES	9.4.1.1 g	F9b & F9c	50/67	2 &14	1038	3697	0.41	1515.77	PASS
														Total Wattage=	25093			Total Wattage=	58572.18

9.4.1.1 Interior Lighting Controls:
For each space in the building, all of lighting control functions indicated in Table 9.6.1, for the appropriate space type in first column, and as described below, shall be implemented.
9.4.1.1 a Local Control: There shall be one or more manual lighting controls in space that controls all of lighting in the space. Each control device shall control an area (1) no larger than 2500 ft^2 if the space is <= 10000 ft^2 and (2) no larger than 10000 ft^2 otherwise.
9.4.1.1 b Restricted to manual ON: None of lighting shall be automatically turned on.
9.4.1.1 c Restricted to partial automatic ON: No more than 50% of the lighting power for the general lighting shall be allowed to be automatically turned on, and none of the remaining lighting shall be automatically turned on.
9.4.1.1 d Bilevel lighting control: The general lighting in space shall be controlled so as to provide at least one intermediate step in lighting power or continuous dimming in addition to full ON and full OFF. At least one intermediate step shall be between 30% and 70% (inclusive) of full lighting power.
9.4.1.1 e Automatic daylight responsive controls for sidelighting: In any space where the combined input power of all general lighting completely or partially within the primary sidelighted areas is 150 W or greater, the general lighting in primary sidelighted areas shall be controlled by photocontrols.
9.4.1.1 g Automatic partial OFF (full OFF complies): The general lighting power in the space shall be automatically reduced by atleast 50% within 20 minutes of all occupants leaving the space.
9.4.1.1 h Automatic full OFF: All lighting, including lighting connected to emergency circuits, shall be automatically shut off within 20 minutes of all occupants leaving the space. A control device meeting the requirement shall controll no more than 5000 ft^2.

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:32:43 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

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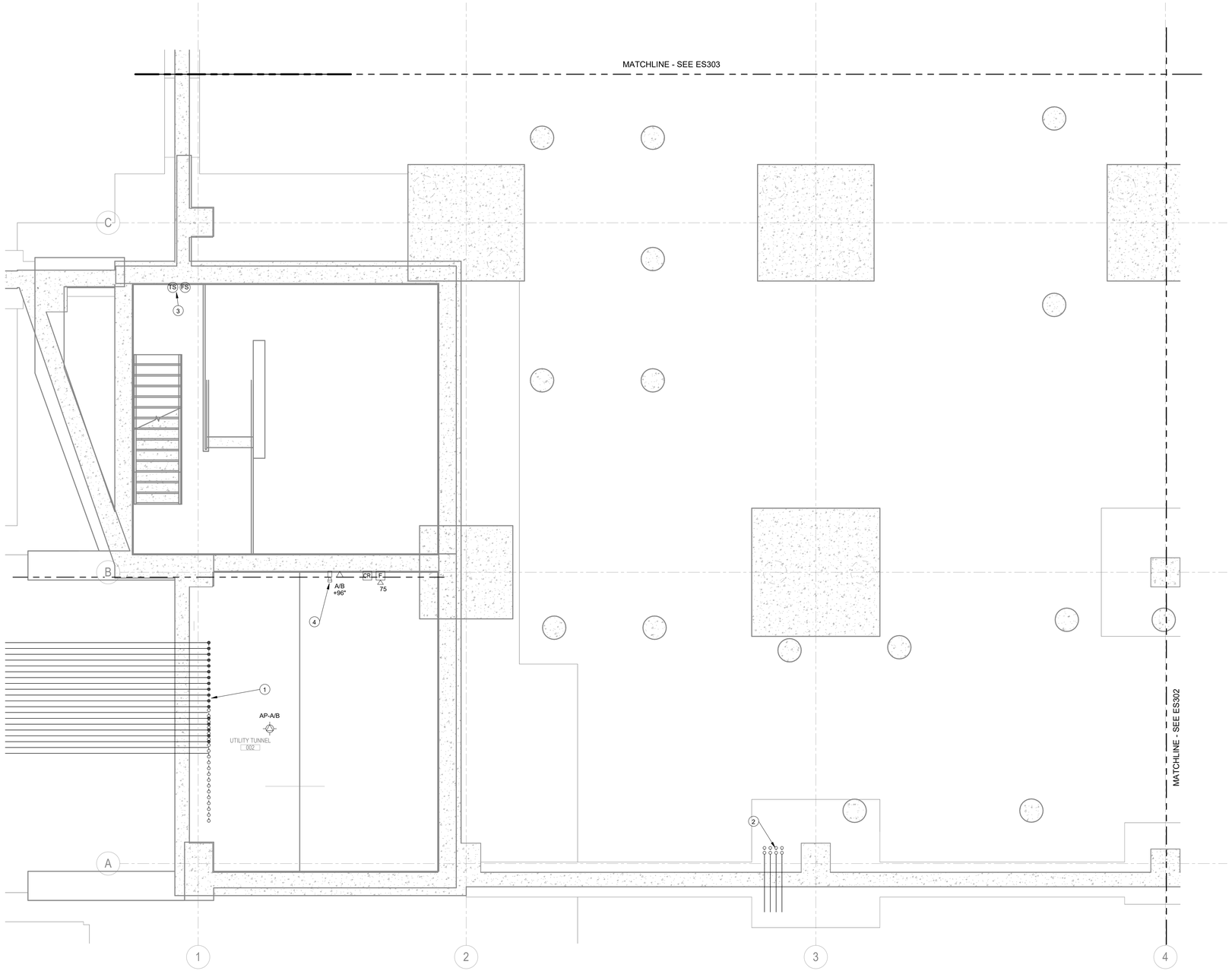
PROJECT NO. **21-154**	

SHEET TITLE

LIGHTING PANEL

SHEET NUMBER

EL602



LOWER LEVEL SYSTEMS PLAN- AREA A

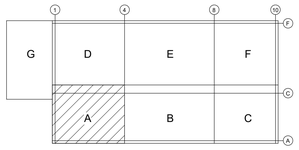
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. SEE DRAWINGS UT101.3 AND UT102.3 FOR ADDITIONAL TUNNEL DRAWINGS.
3. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
4. COORDINATE CARD READER INSTALLATION WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLY.
5. ROUTE ALL CABLING FOR LOW VOLTAGE SYSTEMS TO THE FIRST FLOOR OF THE CUP IN CONDUIT. ALL CABLING CAN THEN BE TRANSITIONED TO J-HOOKS WITH THE EXCEPTION OF FIRE ALARM CABLING.

PLAN NOTES:

1. (16) 4" CONDUITS UP TO MDF ROOM. CONDUITS ARE FROM THE AAHC AND SSB BUILDINGS.
2. (8) 4" CONDUITS UP TO MDF ROOM. CONDUITS ARE FROM IUH SITE DUCTBANK.
3. TUNNEL SPRINKLER RISER TAMPER AND FLOW SWITCHES.
4. INSTALL CAMERA AT 96" AFF. CAMERA SHALL BE TYPE "B" AS NOTED IN THE 282300 SPECIFICATION.



KEY PLAN

SCALE: NONE

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SHEET TITLE

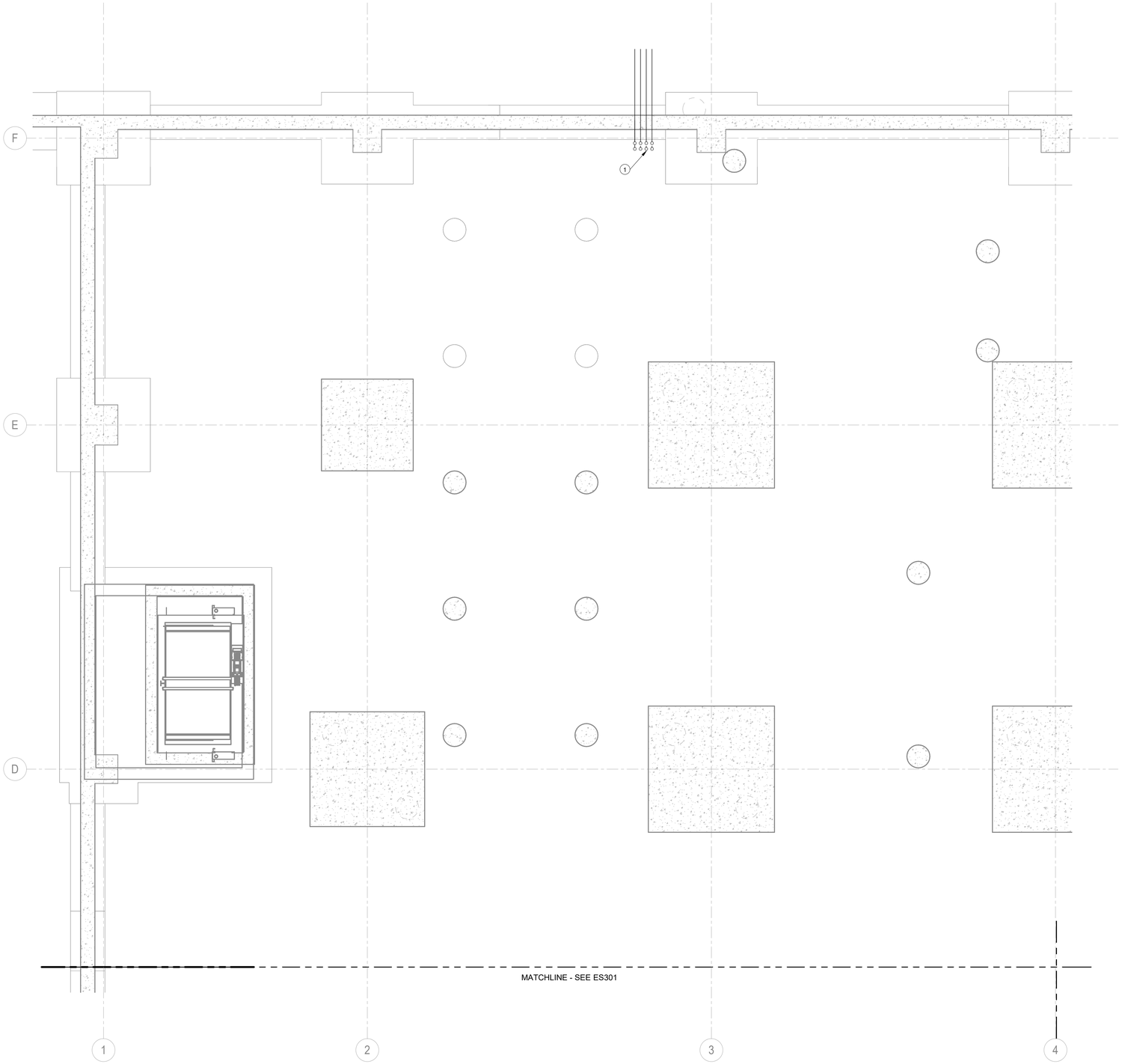
LOWER LEVEL SYSTEMS PLAN - AREA A

SHEET NUMBER

ES301

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:10 PM AESI Proj. No: 21-154



LOWER LEVEL SYSTEMS PLAN- AREA D

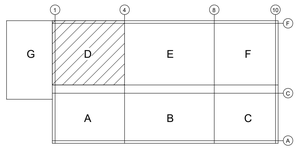
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.

(#) PLAN NOTES:

1. (8) 4" CONDUITS UP TO 2ND FLOOR MDF ROOM. CONDUITS ARE FROM THE VENDOR SITE DUCTBANK. SEE DRAWING ES307 FOR CONDUIT CONTINUATION TO 2ND FLOOR MDF ROOM AND SITE PLAN DRAWING FOR CONTINUATION TO THE SITE VENDOR DUCTBANK.



KEY PLAN
SCALE: NONE

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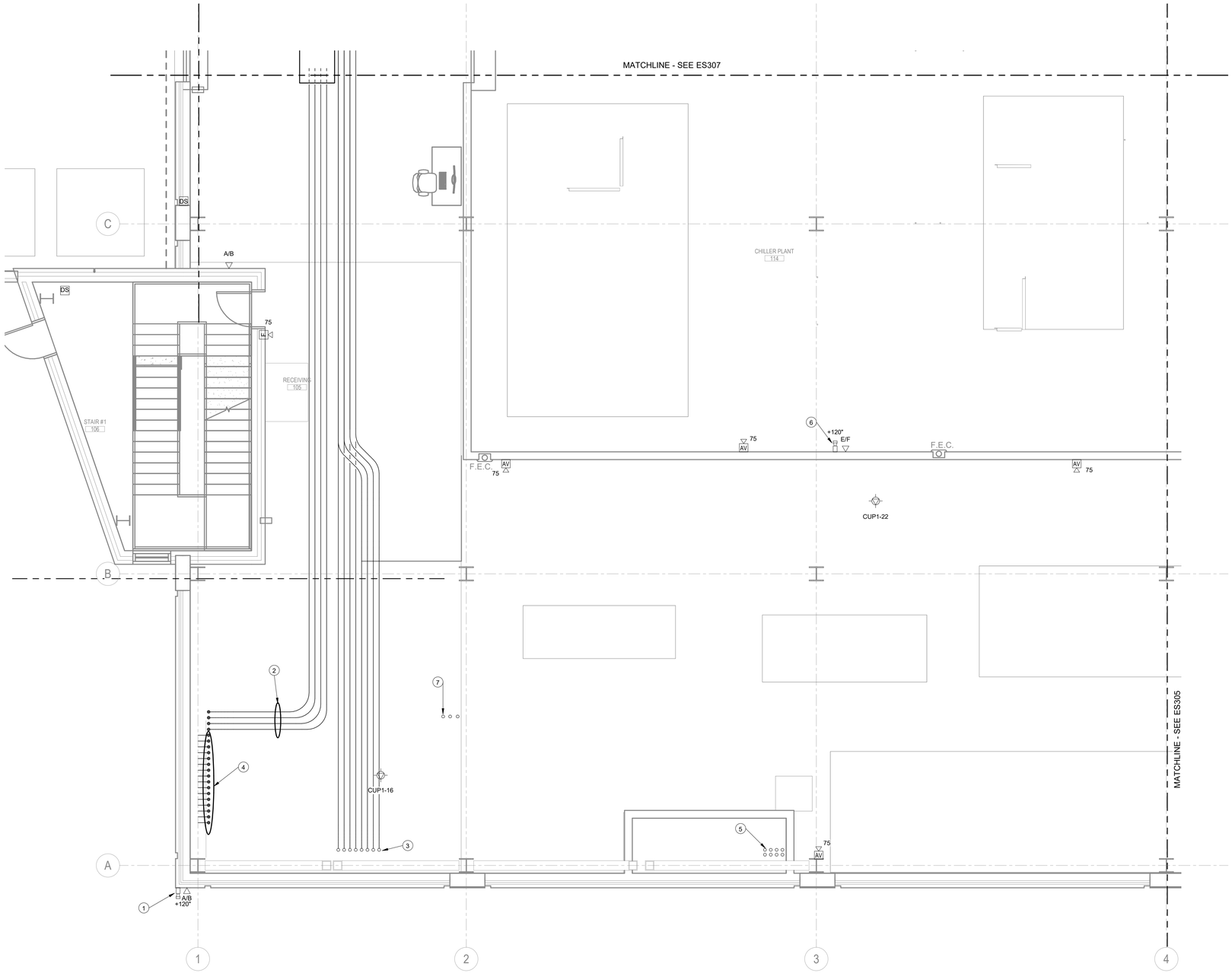
SHEET TITLE

LOWER LEVEL SYSTEMS PLAN - AREA D

SHEET NUMBER

ES303

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:10 PM AESI Proj. No: 21-154



FIRST FLOOR SYSTEMS PLAN - AREA A

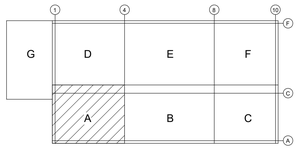
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. ALL LOW VOLTAGE CABLING ON THE FIRST FLOOR SHALL BE ROUTED IN J-HOOKS WITH THE EXCEPTION OF FIRE ALARM CABLING, WHICH SHALL BE INSTALLED IN CONDUIT.

PLAN NOTES:

1. MULTI-SENSOR PoE CAMERA (4 SENSORS). CAMERA SHALL BE TYPE "C" AS NOTED IN 282300 SPECIFICATION. PENDENT MOUNTED TO SIDE OF BUILDING. DATA JACK SHALL BE IN WEATHER PROOF ENCLOSURE.
2. (4) 4" COMMUNICATION CONDUITS. (1) CONDUIT WILL BE UTILIZED FOR THE FIRE ALARM COMMUNICATION NETWORK CABLING ROUTED THROUGH THE TUNNEL TO THE SSB FIRE ALARM PANEL. (3) CONDUITS WILL BE SPARES FOR ADDITIONAL FUTURE COMMUNICATIONS SYSTEMS.
3. (8) 4" C UP TO MDF ROOM. CONDUITS ARE FROM THE SITE VENDOR DUCTBANK. SEE DRAWING ES311 FOR CONTINUATION IN 2ND FLOOR MDF ROOM.
4. (16) 4" IIS CONDUITS UP TO MDF ROOM FROM THE TUNNEL. SEE DRAWING ES301 FOR CONTINUATION TO TUNNEL AND DRAWING ES311 FOR CONTINUATION IN 2ND FLOOR MDF ROOM.
5. (8) 4" C UP TO MDF ROOM. CONDUITS ARE FROM THE SITE IUH DUCTBANK. SEE DRAWING ES311 FOR CONTINUATION IN 2ND FLOOR MDF ROOM AND DRAWING ES301 TO SITE IUH DUCTBANK.
6. CAMERA SHALL BE TYPE "A" AS NOTED IN 282300 SPECIFICATION.
7. (3)4" SLEEVES IN CEILING UP TO MDF ROOM.



KEY PLAN

SCALE: NONE

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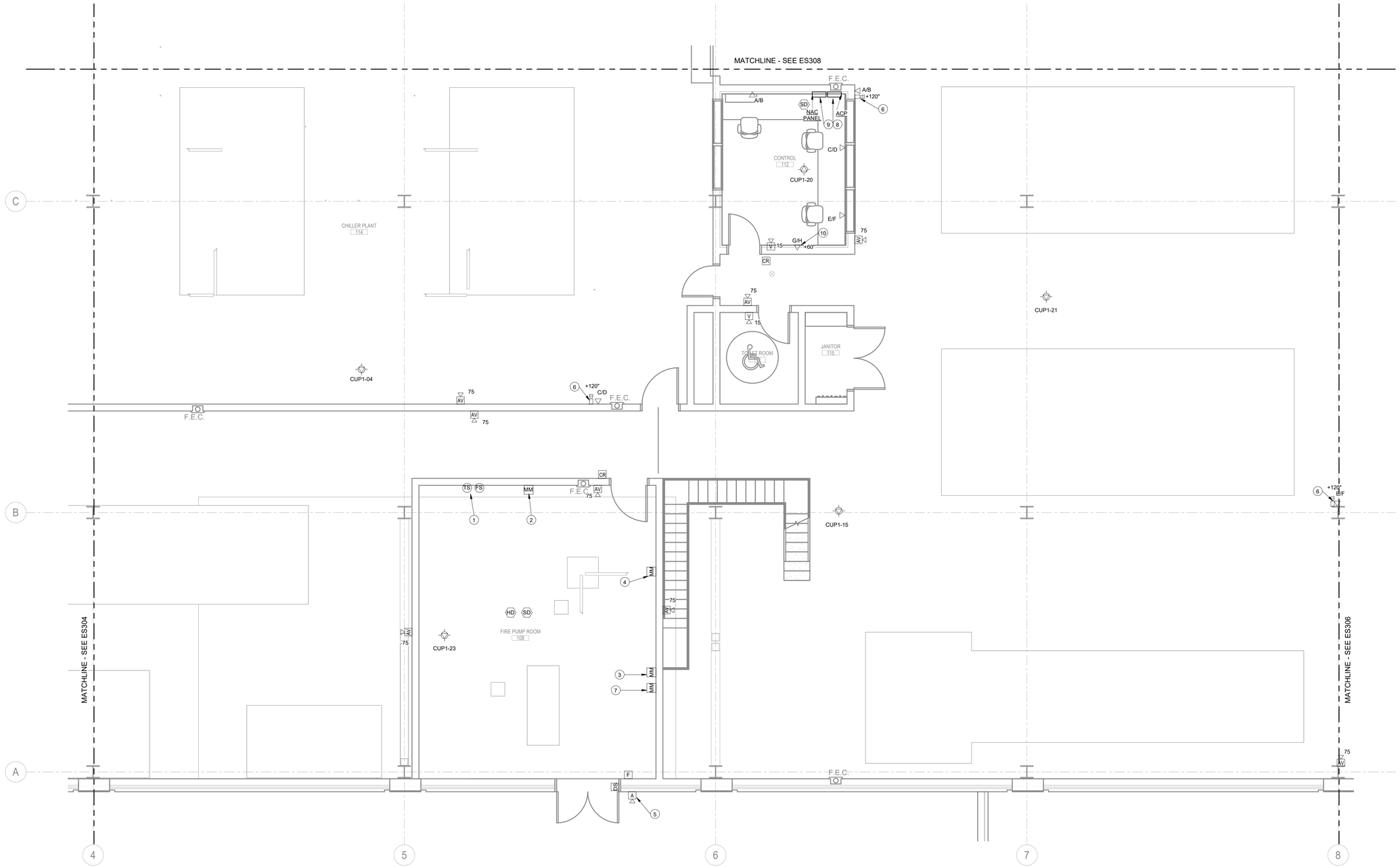
SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA A

SHEET NUMBER

ES304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:11 PM AESI Proj. No: 21-154



FIRST FLOOR SYSTEMS PLAN - AREA B

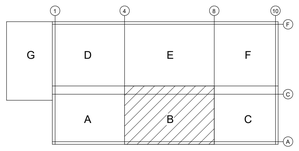
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG. CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. (3) FLOW AND (16) TAMPER SWITCHES FOR FIRE PROTECTION ZONES.
2. FP-1 FIRE PUMP MONITORING POINTS. SEE POINTS TO BE MONITORED ON DRAWING ES701.
3. FP-2 FIRE PUMP MONITORING POINTS. SEE POINTS TO BE MONITORED ON DRAWING ES701.
4. JOCKEY PUMP JP-1 MONITORING POINTS. SEE POINTS TO BE MONITORED ON DRAWING ES701.
5. ALARM BELL.
6. CAMERA SHALL BE TYPE "A" AS NOTED IN 282300 SPECIFICATION.
7. JOCKEY PUMP JP-2 MONITORING POINTS. SEE POINTS TO BE MONITORED ON DRAWING ES701.
8. ACCESS CONTROL PANEL CONNECTED TO MAIN SECURITY PANEL IN THE 2ND FLOOR CONTROL ROOM.
9. NAC PANEL FOR FIRE ALARM SYSTEM.
10. MONITOR BY OTHERS. COORDINATE DATA OUTLET AND HDMI CABLE CONDUIT WITH ARCHITECTURAL PLAN.



KEY PLAN

SCALE: NONE

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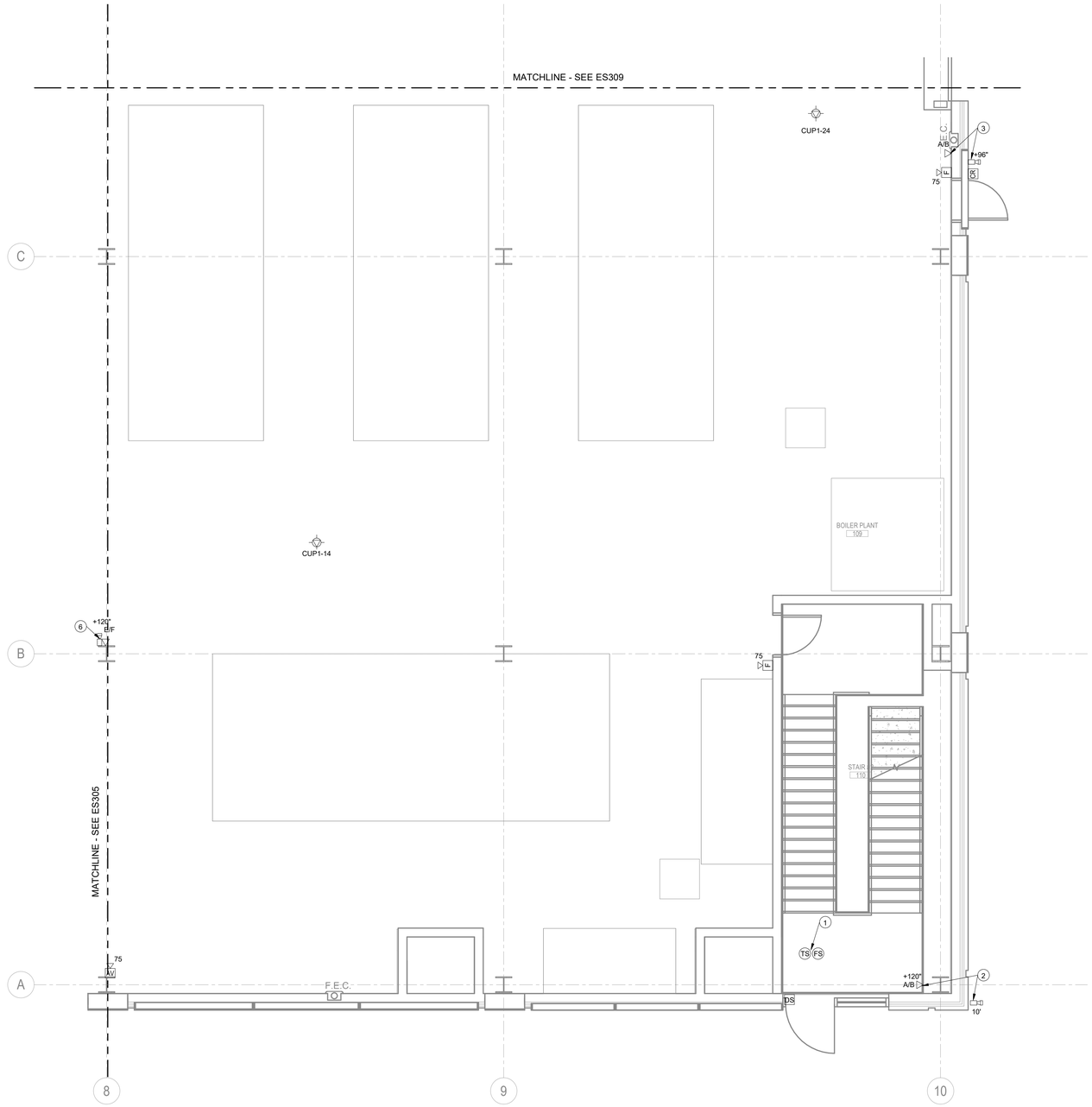
SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA B

SHEET NUMBER

ES305

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:11 PM AESI Proj. No: 21-154



FIRST FLOOR SYSTEMS PLAN - AREA C

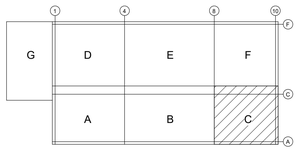
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. TAMPER AND FLOW SWITCH FOR SPRINKLER RISER.
2. MULTI-SENSOR PoE CAMERA (4 SENSORS). CAMERA SHALL BE TYPE "C" AS NOTED IN 282300 SPECIFICATION. PENDENT MOUNTED TO SIDE OF BUILDING. DATA JACK LOCATED INSIDE BUILDING. INSTALL 1" CONDUIT THROUGH WALL TO A 4 SQUARE BACK BOX ON EXTERIOR FOR PATCH CORD TO BE INSTALLED FOR CAMERA. SEAL CONDUIT TO MAKE WEATHERPROOF.
3. CAMERA SHALL BE TYPE "B" AS NOTED IN 282300 SPECIFICATION. DATA JACK TO BE LOCATED INSIDE BUILDING. INSTALL 1" CONDUIT THROUGH WALL TO A 4 SQUARE BACK BOX ON EXTERIOR FOR PATCH CORD TO BE INSTALLED FOR CAMERA. SEAL CONDUIT TO MAKE WEATHERPROOF.



KEY PLAN

SCALE: NONE

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SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA C

SHEET NUMBER

ES306

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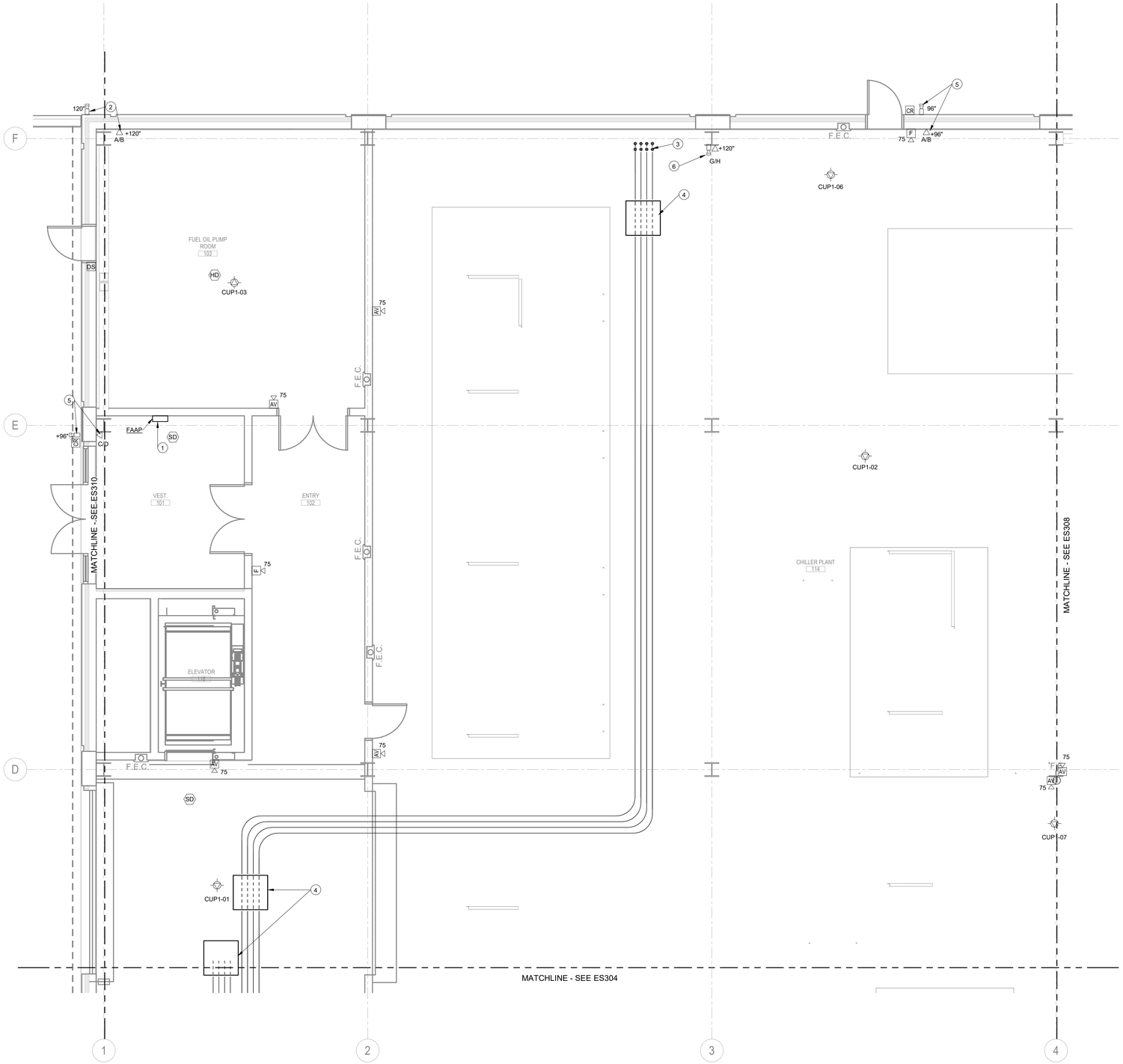


FIRST FLOOR SYSTEMS PLAN - AREA D

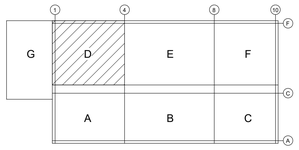
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.

PLAN NOTES:

1. FIRE ALARM ANNUNCIATOR PANEL.
2. MULTI-SENSOR PoE CAMERA (4 SENSORS). CAMERA SHALL BE A TYPE "C" AS NOTED IN 282300 SPECIFICATION. PENDENT MOUNT TO SIDE OF BUILDING. DATA JACK LOCATED INSIDE BUILDING. INSTALL 1" CONDUIT THROUGH WALL TO A 4 SQUARE BACK BOX ON EXTERIOR FOR PATCH CORD TO BE INSTALLED FOR CAMERA. SEAL CONDUIT TO MAKE WEATHERPROOF.
3. (6) 4" CONDUITS TO THE SITE VENDOR DUCTBANK. SEE SITE PLAN FOR CONTINUATION OF CONDUITS TO VENDOR DUCTBANK.
4. 36"X36"X16" PULL BOX.
5. CAMERA SHALL BE TYPE "B" AS NOTED IN 282300 SPECIFICATION. DATA JACK LOCATED INSIDE BUILDING. INSTALL 1" CONDUIT THROUGH WALL TO A 4 SQUARE BACK BOX ON EXTERIOR FOR PATCH CORD TO BE INSTALLED FOR CAMERA. SEAL CONDUIT TO MAKE WEATHERPROOF.
6. CAMERA SHALL BE TYPE "A" AS NOTED IN 282300 SPECIFICATION.



KEY PLAN
SCALE: NONE

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SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA D

SHEET NUMBER

ES307

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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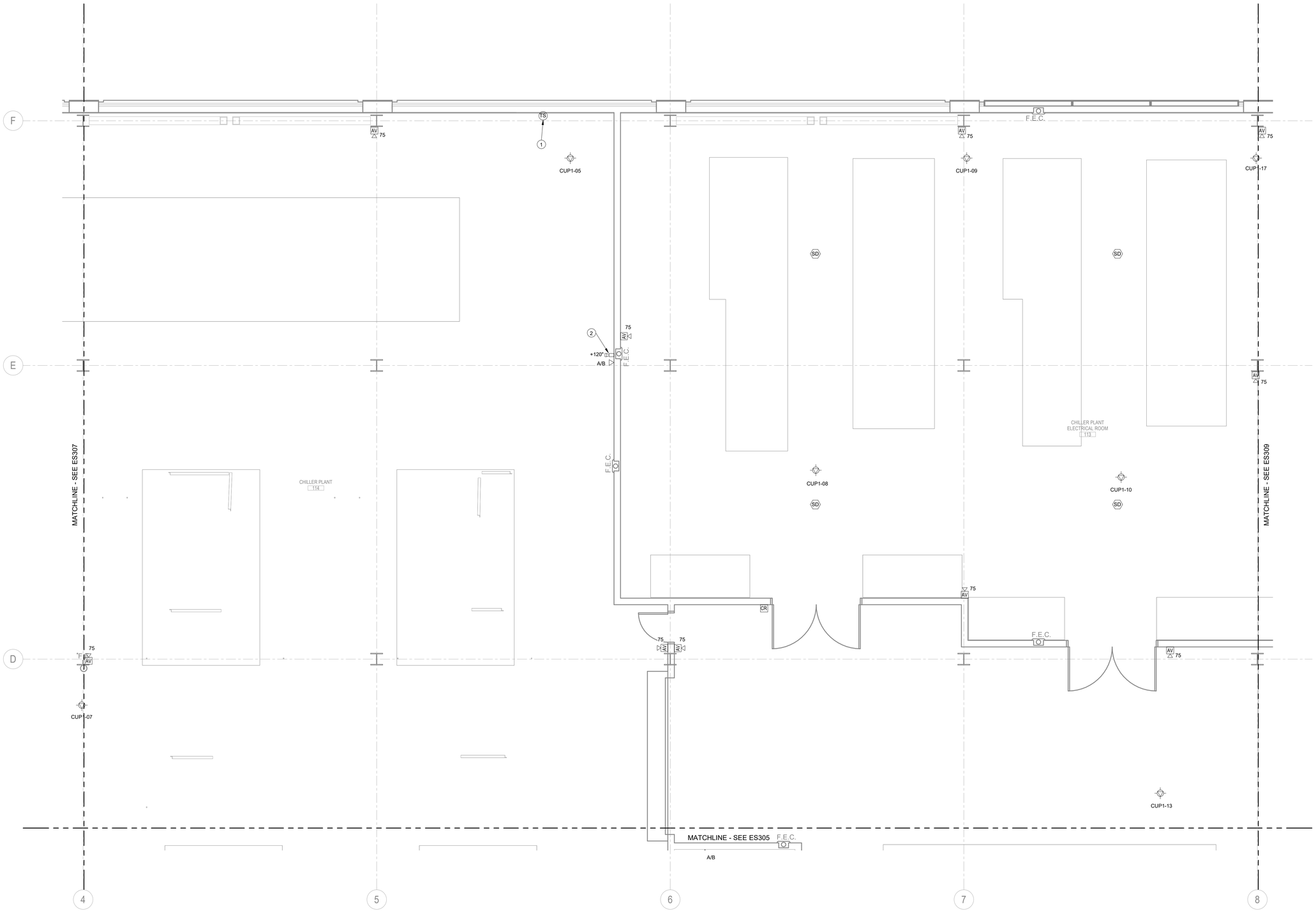


FIRST FLOOR SYSTEMS PLAN - AREA E

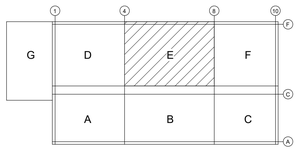
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

(#) PLAN NOTES:

1. (2) VALVE TAMPER SWITCHES FOR FIRE PROTECTION BACK FLOW PREVENTERS.
2. CAMERA SHALL BE TYPE "A" AS NOTED IN 282300 SPECIFICATION.



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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0 1/2" 1" 2"

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NO.	DATE	DESCRIPTION

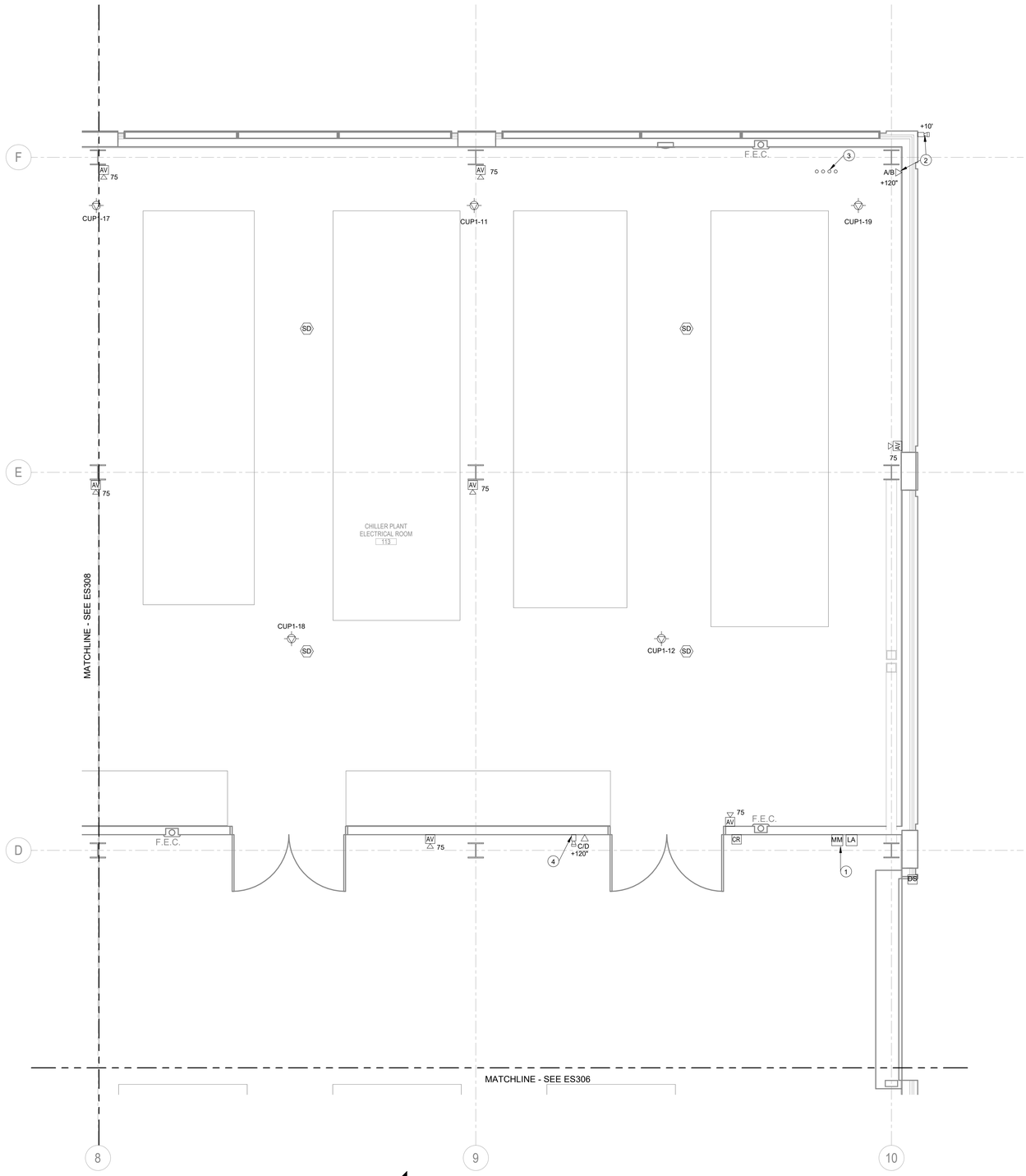
DESIGNED BY: ML	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: KH	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA E

SHEET NUMBER

ES308



FIRST FLOOR SYSTEMS PLAN - AREA F

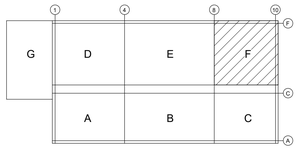
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. FIRE ALARM MONITORING POINTS FOR THE ELECTRIC ROOM PRE-ACTION SYSTEM. MONITORING POINTS INCLUDE LOW AIR, TROUBLE AND ALARM SIGNAL.
2. MULTI-SENSOR PoE CAMERA (4 SENSOR). CAMERA SHALL BE A TYPE "C" AS NOTED IN 282300 SPECIFICATION. PENDENT MOUNT TO SIDE OF BUILDING. DATA JACK INSIDE BUILDING. INSTALL 1" CONDUIT THROUGH WALL TO A 4 SQUARE BACK BOX ON EXTERIOR FOR PATCH CORD TO BE INSTALLED FOR CAMERA. SEAL CONDUIT TO MAKE WEATHERPROOF.
3. (4) 4" CONDUITS ROUTED TO JCI BUILDING FROM 2ND FLOOR MDF ROOM. SEE CONDUIT CONTINUATION TO 2ND FLOOR ON DRAWING ES316 AND ON SITE PLAN DRAWING FOR DUCTBANK TO JCI BUILDING.
4. CAMERA SHALL BE TYPE "A" AS NOTED IN 282300 SPECIFICATION.



KEY PLAN

SCALE: NONE

OWNER

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PROJECT

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PROJECT NO. 21-154	

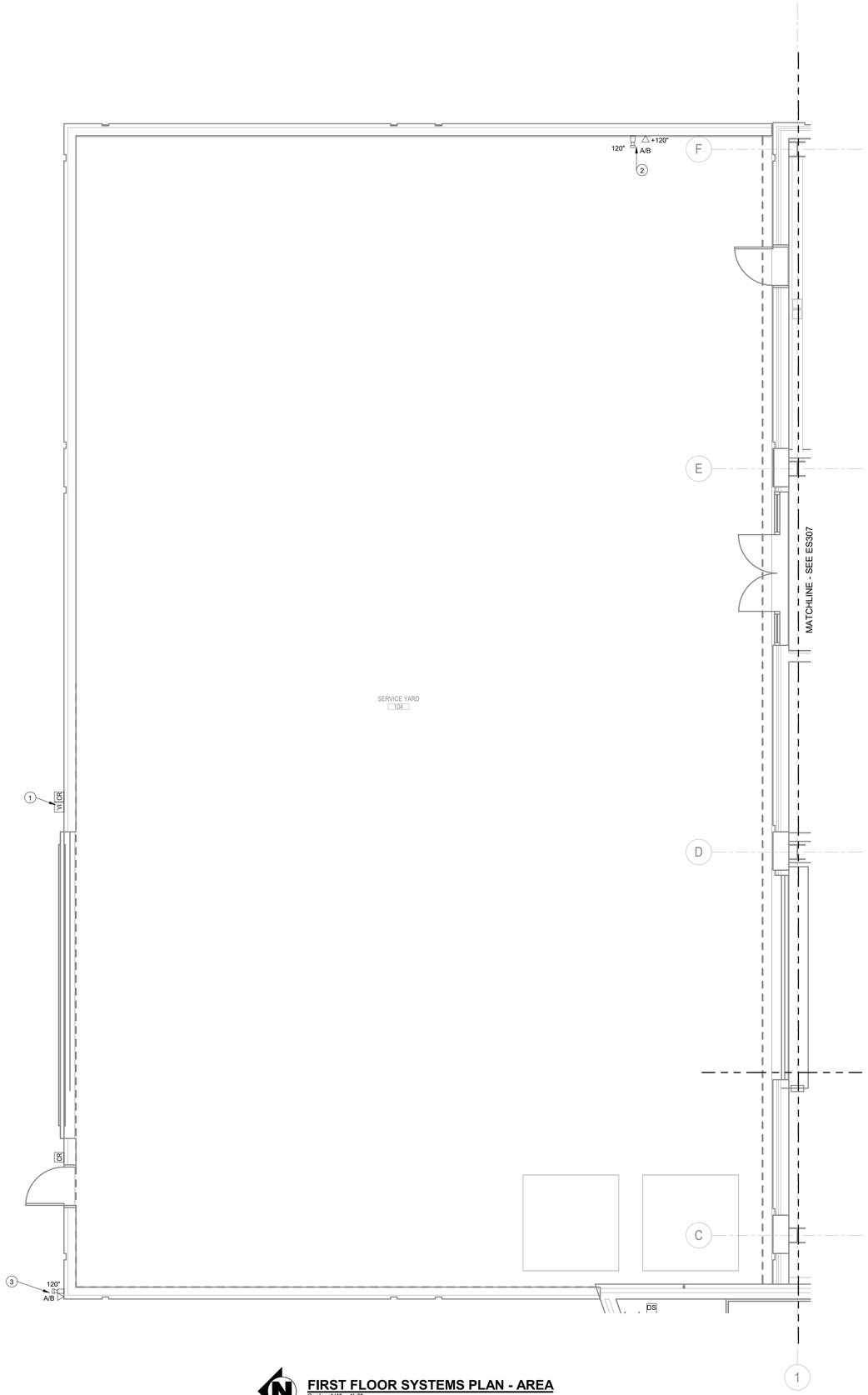
SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA F

SHEET NUMBER

ES309

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:18 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



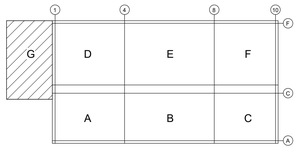
FIRST FLOOR SYSTEMS PLAN - AREA
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A WESCO UTG20 CABLE. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. VIDEO INTERCOM STATION CONNECTED TO A BASE STATION IN THE CONTROL ROOMS.
2. CAMERA SHALL BE TYPE "A" AS NOTED IN 282300 SPECIFICATION. INSTALL DATA JACK IN WEATHER PROOF ENCLOSURE.
3. CAMERA SHALL BE MULTISENSOR (4 SENSORS) TYPE "C" AS NOTED IN 282300 SPECIFICATION. PENDENT MOUNT TO SIDE OF FENCE. INSTALL DATA JACK IN WEATHER PROOF ENCLOSURE.



KEY PLAN
SCALE: NONE

OWNER

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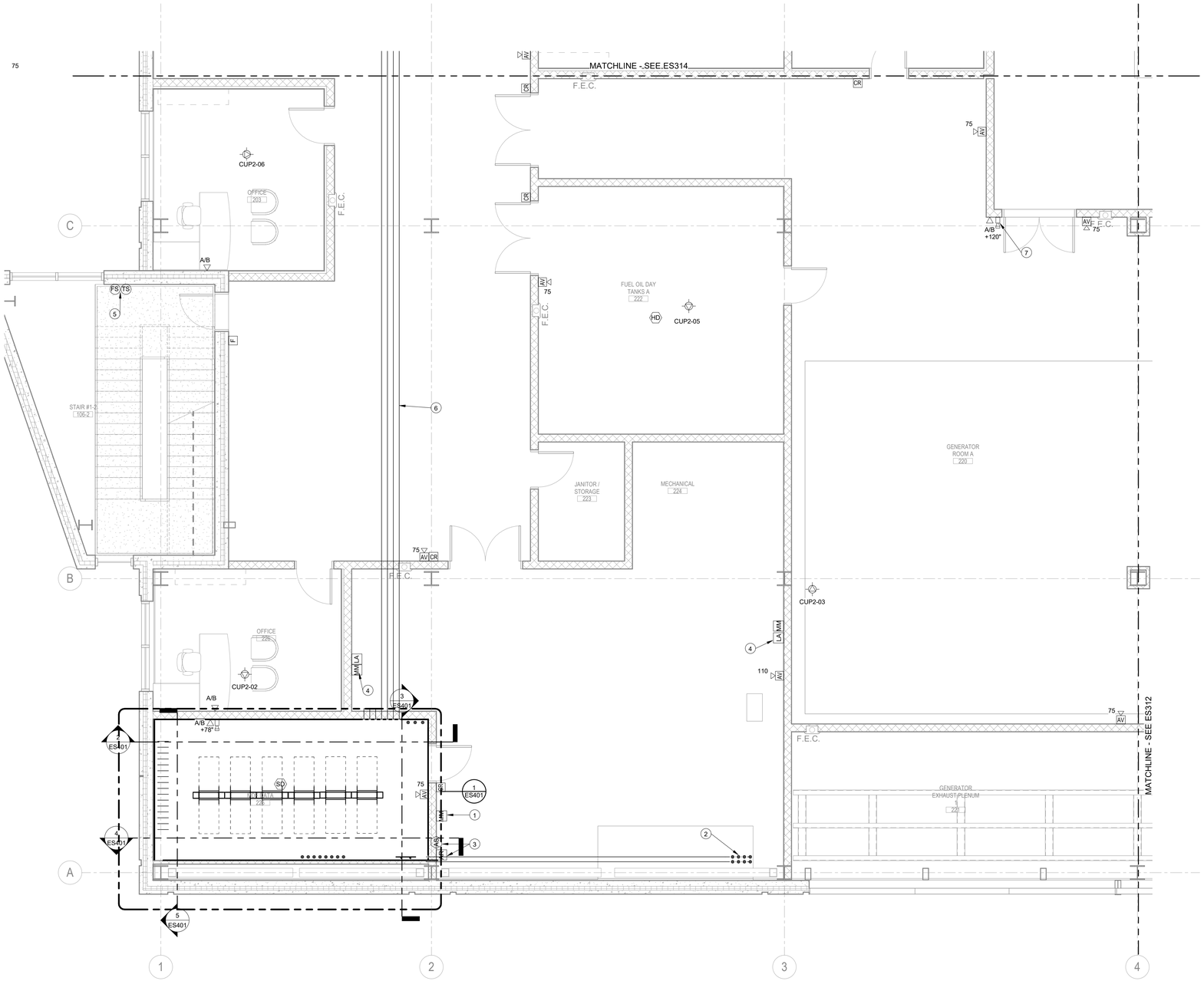
SHEET TITLE

FIRST FLOOR SYSTEMS PLAN - AREA G

SHEET NUMBER

ES310

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:19 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR SYSTEMS PLAN - AREA A

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

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. ALL LOW VOLTAGE CABLING ON THE SECOND FLOOR CAN BE ROUTED IN J-HOOKS WITH THE EXCEPTION OF FIRE ALARM CABLING, WHICH SHALL BE INSTALLED IN CONDUIT.

PLAN NOTES:

1. FIRE ALARM MONITORING POINTS FOR THE MDF ROOM FIRE SUPPRESSION SYSTEM (NOVEC 1200).
2. (8) 4" C FROM THE IUH DUCTBANK SYSTEM. SEE SITE PLAN FOR ROUTING OF CONDUITS TO SENATE AVE.
3. (2) DUCT DETECTORS AND (2) RELAY SHUTDOWNS FOR (2) MDF CRAC UNITS. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATIONS.
4. PRE-ACTION SYSTEM MONITORING POINTS - LOW AIR, TROUBLE, AND ALARM.
5. TAMPER AND FLOW SWITCH FOR SPRINKLER RISER.
6. (4) 4" C ROUTED TO JCI BLDG.
7. CAMERA SHALL BE A TYPE "A" AS NOTED IN 282300 SPECIFICATION.

OWNER

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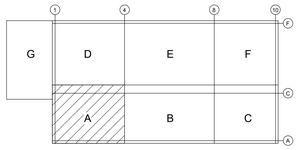
SHEET TITLE

SECOND FLOOR SYSTEMS PLAN - AREA A

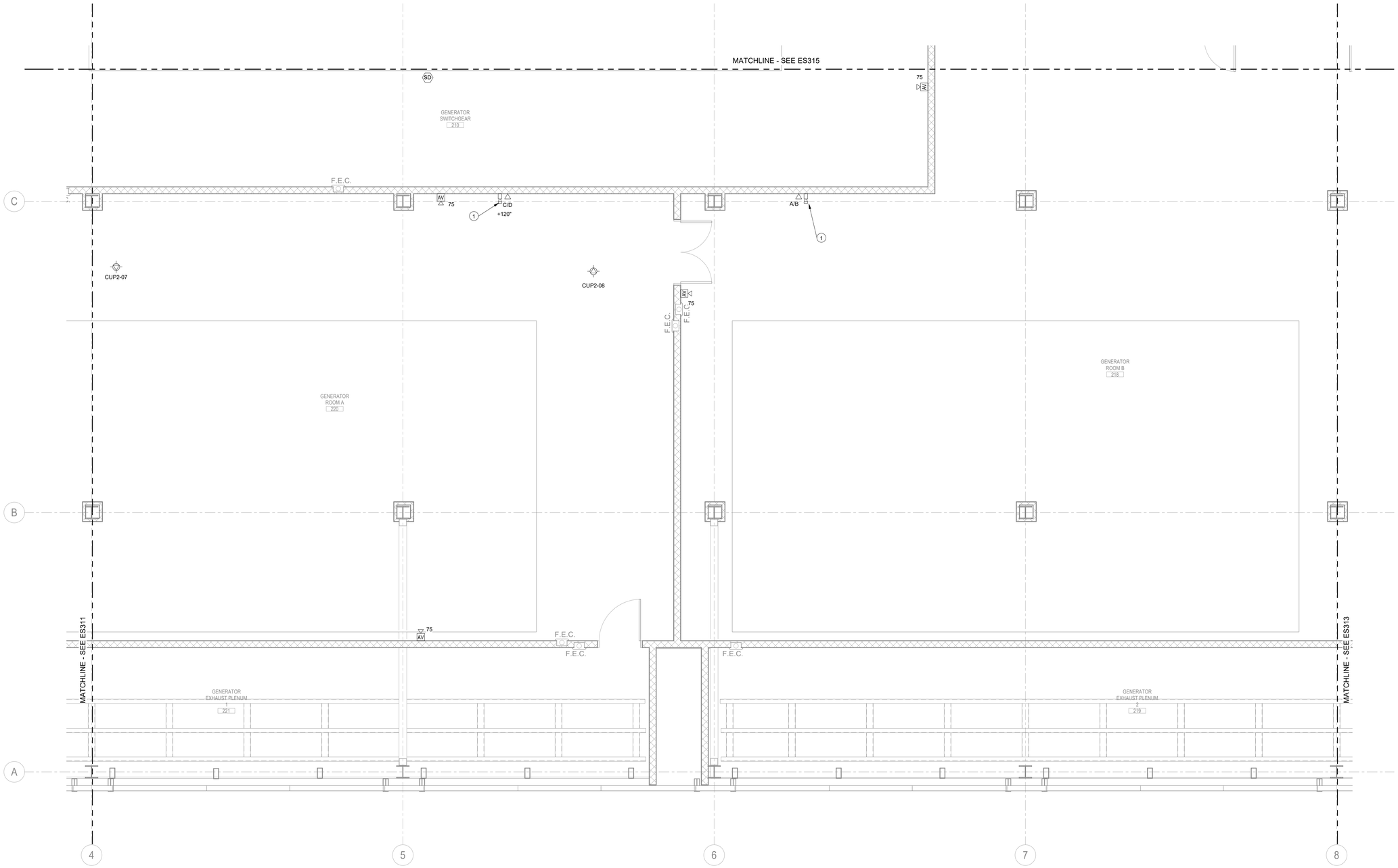
SHEET NUMBER

ES311



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:21 PM AESI Proj. No: 21-154



SECOND FLOOR SYSTEMS PLAN - AREA B

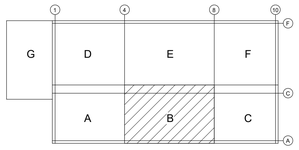
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. CAMERA SHALL BE A TYPE "A" AS NOTED IN 282300 SPECIFICATION.



KEY PLAN

SCALE: NONE

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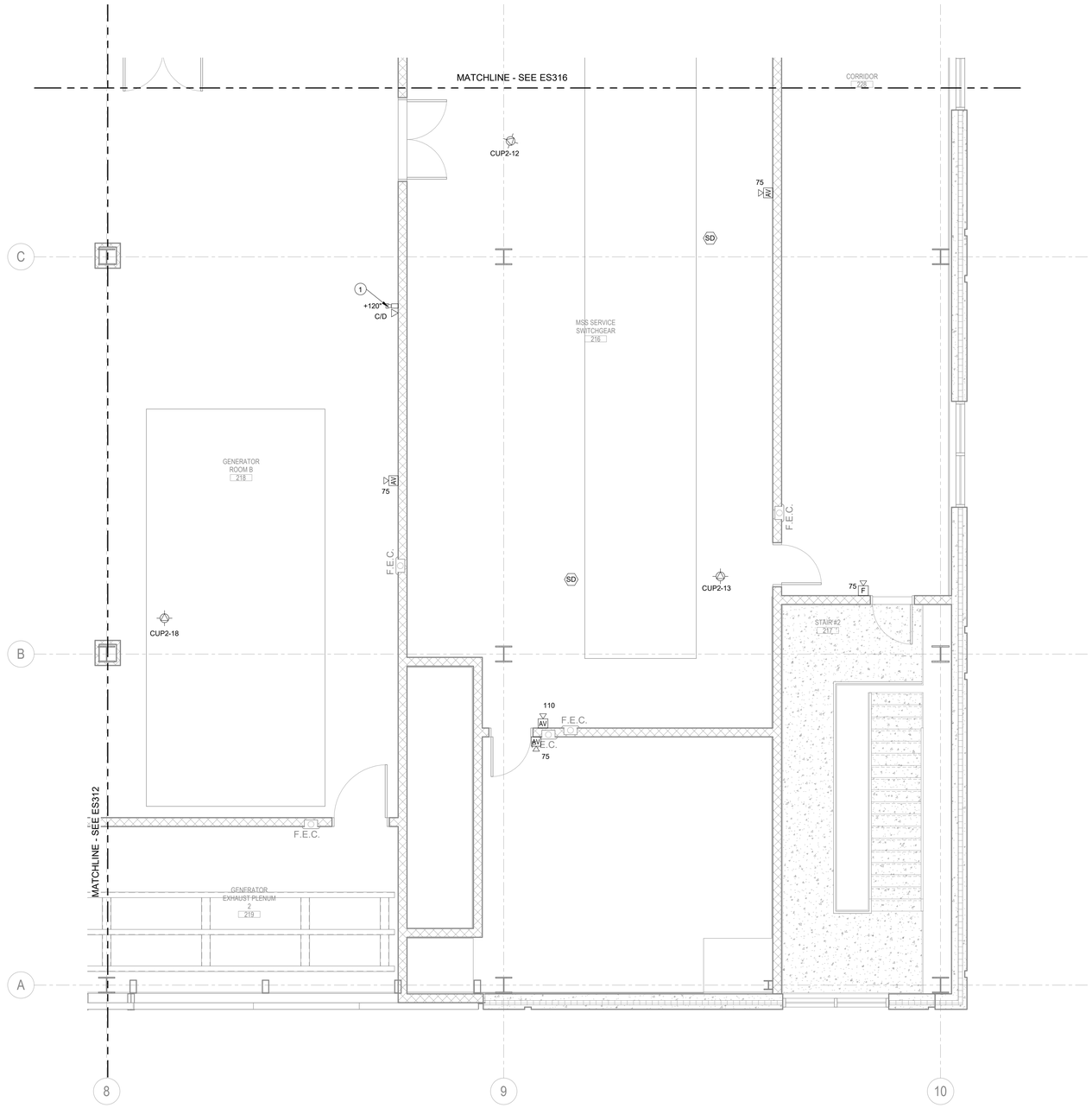
SHEET TITLE

SECOND FLOOR SYSTEMS PLAN - AREA B

SHEET NUMBER

ES312

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:23 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR SYSTEMS PLAN - AREA C

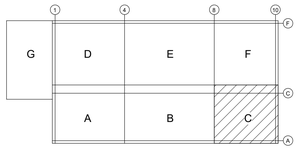
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

(#) PLAN NOTES:

1. CAMERA SHALL BE A TYPE "A" AS NOTED IN 282300 SPECIFICATION.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO.: 21-154	

SHEET TITLE

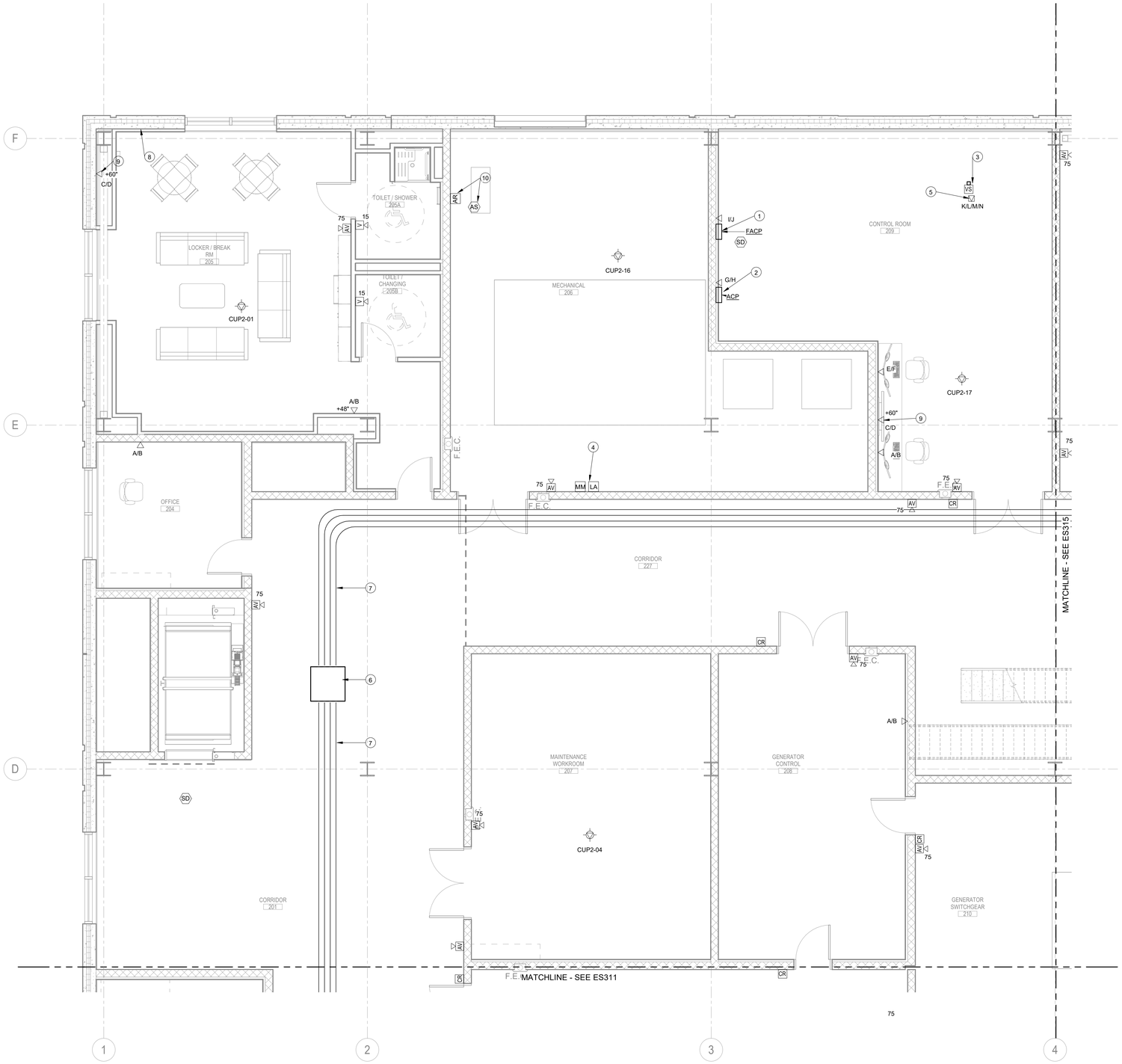
SECOND FLOOR SYSTEMS PLAN - AREA C

SHEET NUMBER

ES313

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:24 PM AESI Proj. No: 21-154



SECOND FLOOR SYSTEMS PLAN - AREA D

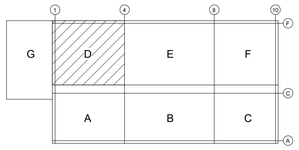
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.

PLAN NOTES:

1. FIRE ALARM CONTROL PANEL. TELECOM JACK FOR DACT. ALL CABLING SHALL BE IN CONDUIT TO THE FACP.
2. ACCESS CONTROL SECURITY PANEL. ALL CABLING SHALL BE IN CONDUIT FROM PANEL TO ABOVE CEILING.
3. VIDEO INTERCOM BASE STATION THAT WILL SIT ON CONTROL WORKSTATION DESK. INTERCOM WILL COMMUNICATE WITH GATE INTERCOM.
4. PRE-ACTION SYSTEM MONITORING POINTS - LOW AIR, TROUBLE, AND ALARM.
5. BAS COMPUTER DATA JACK IN FLOOR BOX BELOW CONTROL WORK STATION. SEE ELECTRICAL DRAWINGS FOR FLOOR BOX DETAIL.
6. 36"x36"x12" PULL BOX.
7. (4) 4" C ROUTED TO JCI BLDG.
8. INSTALL 1-1/2" CONDUIT FROM SHELF AT 48" AFF TO THE BACK OF THE MONITOR ON ADJACENT NORTH WALL. INSTALL SINGLE GANG BOX ON EACH END OF CONDUIT WITH GROMMETTED COVERPLATE THAT WILL ALLOW A HDMI CONNECTOR THROUGH THE GROMMETTED HOLE.
9. MONITOR BY OTHERS. COORDINATE DATA OUTLET AND HDMI CABLE CONDUIT WITH ARCHITECTURAL PLAN.
10. DUCT DETECTOR AND FIRE ALARM SHUTDOWN RELAY FOR MAU-2-1. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.



KEY PLAN
SCALE: NONE

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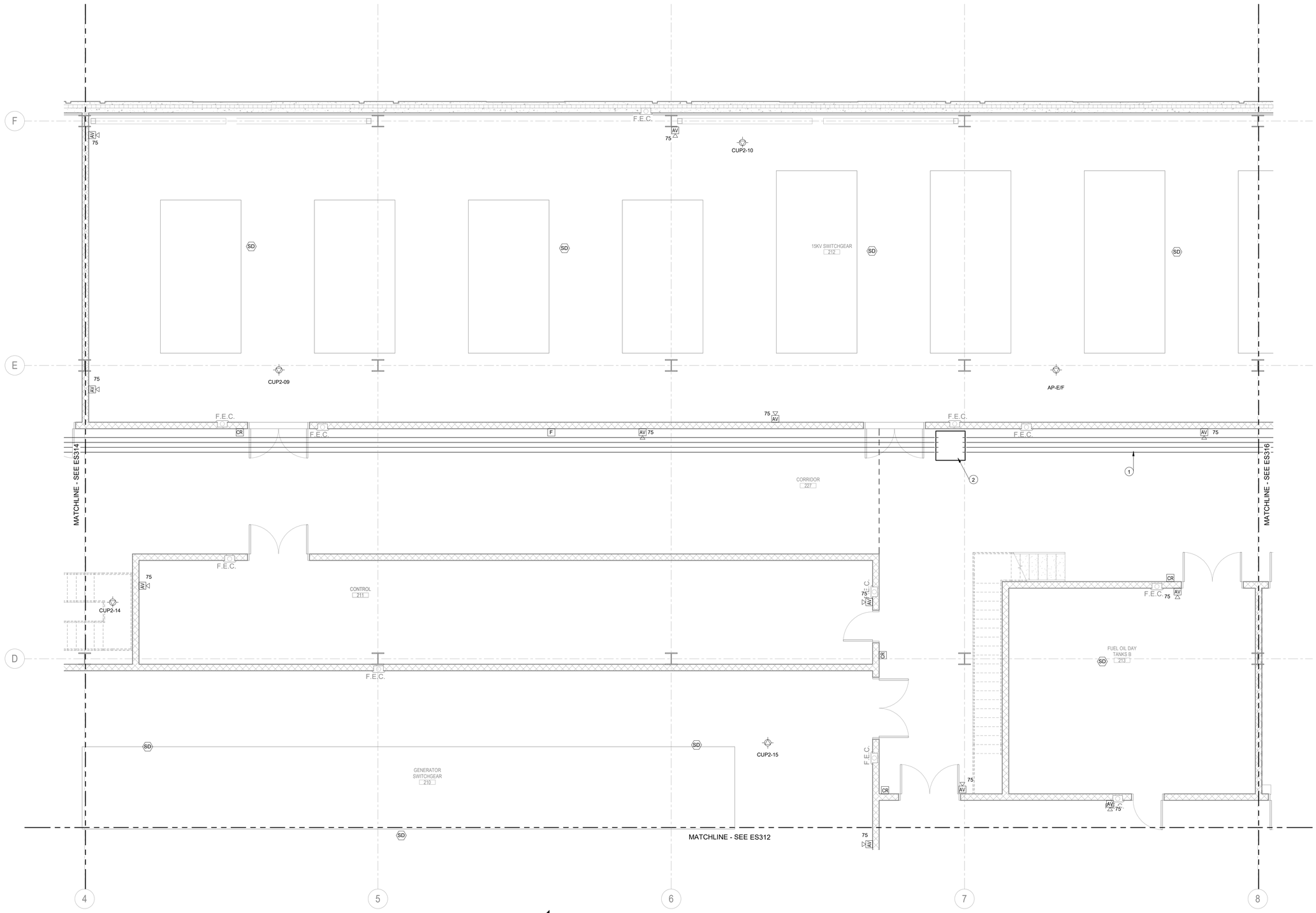
SHEET TITLE

SECOND FLOOR SYSTEMS PLAN - AREA D

SHEET NUMBER

ES314

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:27 PM AESI Proj. No: 21-154



SECOND FLOOR SYSTEMS PLAN - AREA E

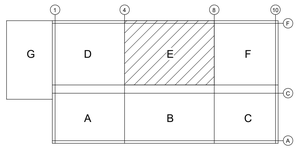
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. (4) 4" C ROUTED TO JCI BLDG.
2. 36"x36"x12" PULL BOX.
3. FIRE ALARM DEVICE ON MEZZANINE LEVEL. SEE ES402 FOR EXACT LOCATION.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

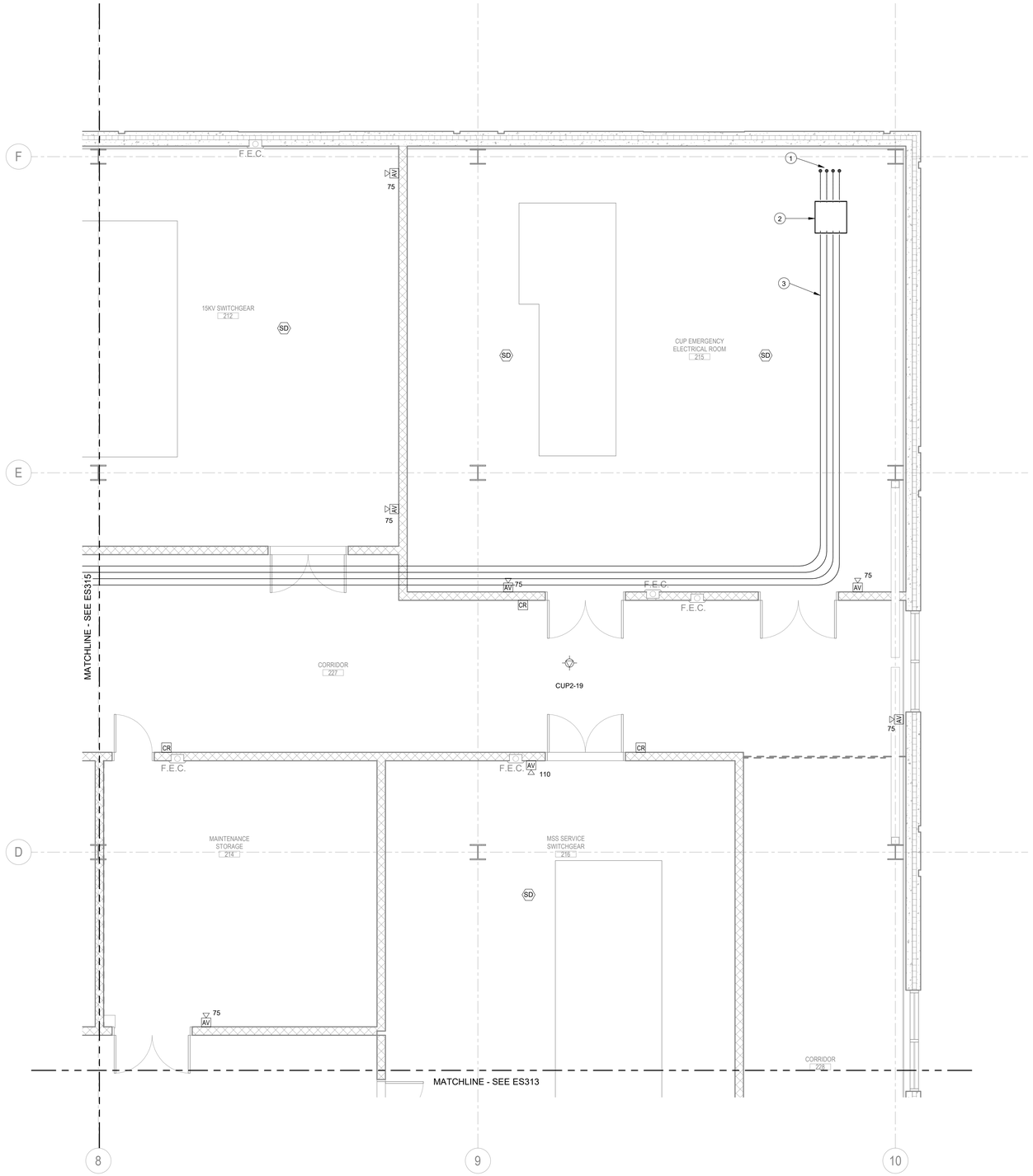
SHEET TITLE

SECOND FLOOR SYSTEMS PLAN - AREA E

SHEET NUMBER

ES315

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:29 PM AESI Proj. No: 21-154



SECOND FLOOR SYSTEMS PLAN - AREA F

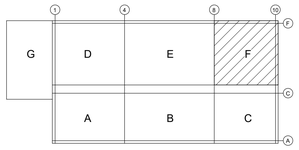
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

PLAN NOTES:

1. (4) 4" C ROUTED FROM 2ND FLOOR MDF ROOM TO JCI BLDG. SEE DRAWING ES307 FOR CONTINUATION OF CONDUITS TO 1ST FLOOR.
2. 36"x36"x12" PULL BOX.
3. (4) 4" C ROUTED TO 2ND FLOOR MDF ROOM.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY ML	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY KH	
APPROVED BY Approver	
PROJECT NO. 21-154	

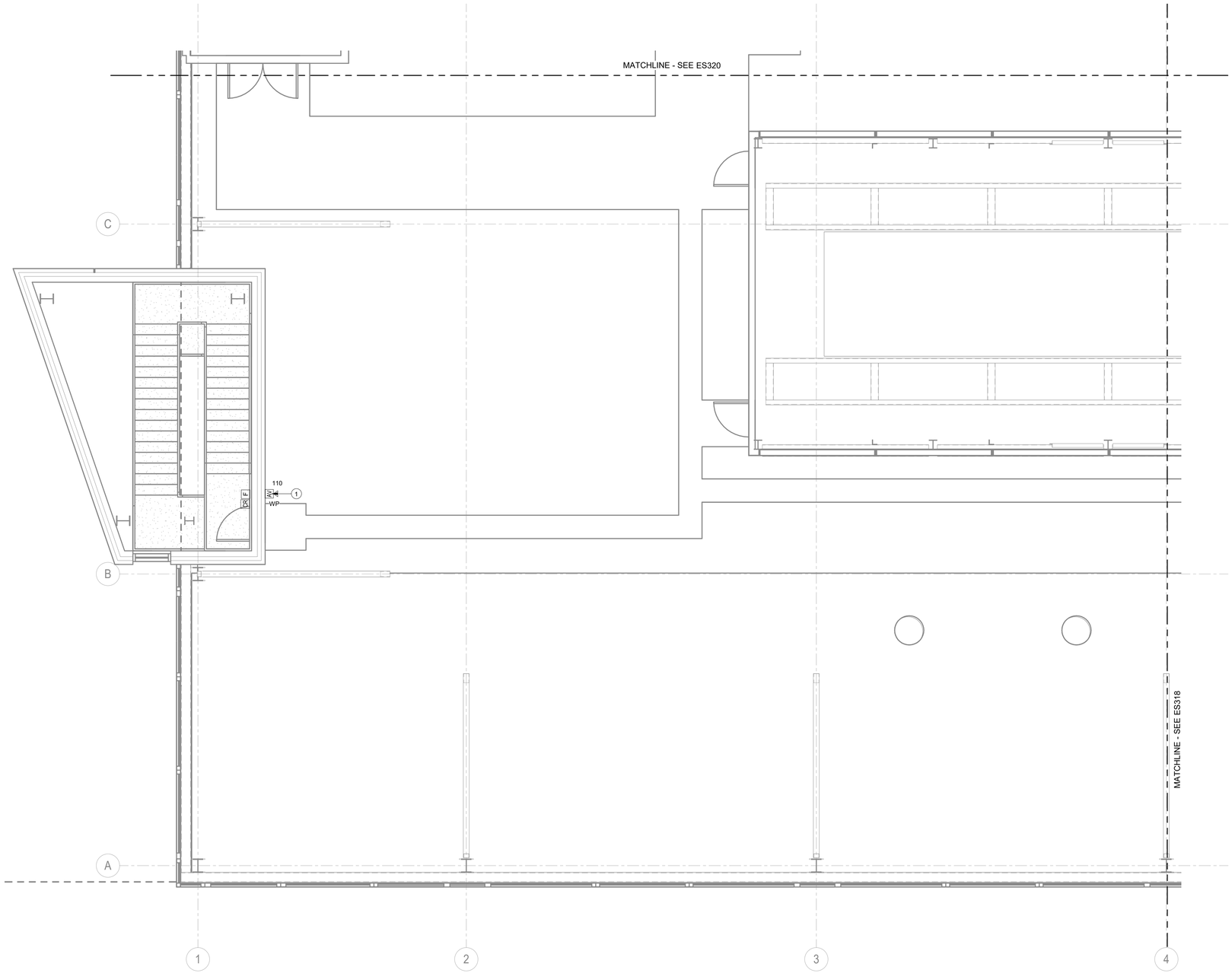
SHEET TITLE

SECOND FLOOR SYSTEMS PLAN - AREA F

SHEET NUMBER

ES316

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:30 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF SYSTEMS PLAN - AREA A

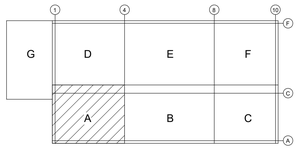
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. CAMERAS SHALL BE INSTALLED AT 10' AFF OR GRADE UNLESS OTHERWISE NOTED.
3. COORDINATE CARD READER INSTALLATIONS WITH ARCHITECTURAL DOOR SCHEDULE AND POWER PLANS FOR DOOR POWER SUPPLIES.
4. ALL LOW VOLTAGE CABLING ON THE ROOF FLOOR SHALL BE ROUTED IN CONDUIT DOWN TO THE 2ND FLOOR.

(#) PLAN NOTES:

1. WEATHER PROOF NOTIFICATION DEVICE.



KEY PLAN

SCALE: NONE

OWNER

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SHEET TITLE

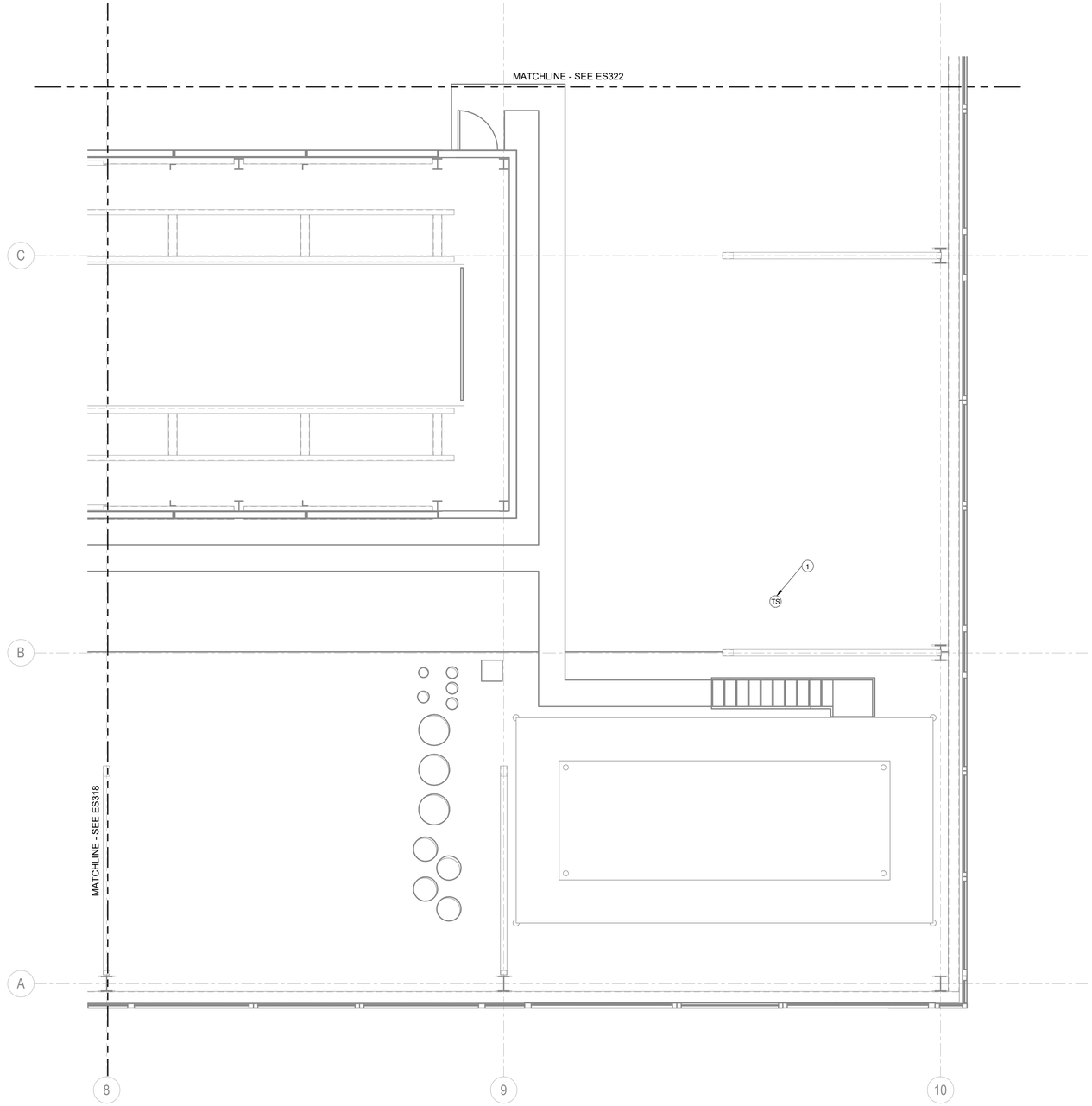
ROOF SYSTEMS PLAN - AREA A

SHEET NUMBER

ES317

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:31 PM AESI Proj. No: 21-154



ROOF SYSTEMS PLAN - AREA C

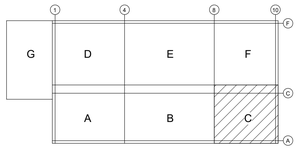
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE E001 FOR ADDITIONAL GENERAL NOTES.

(#) PLAN NOTES:

1. TAMPER SWITCH FOR ROOF PIV. COORDINATE LOCATION WITH FIRE PROTECTION DRAWINGS.



KEY PLAN

SCALE: NONE

OWNER

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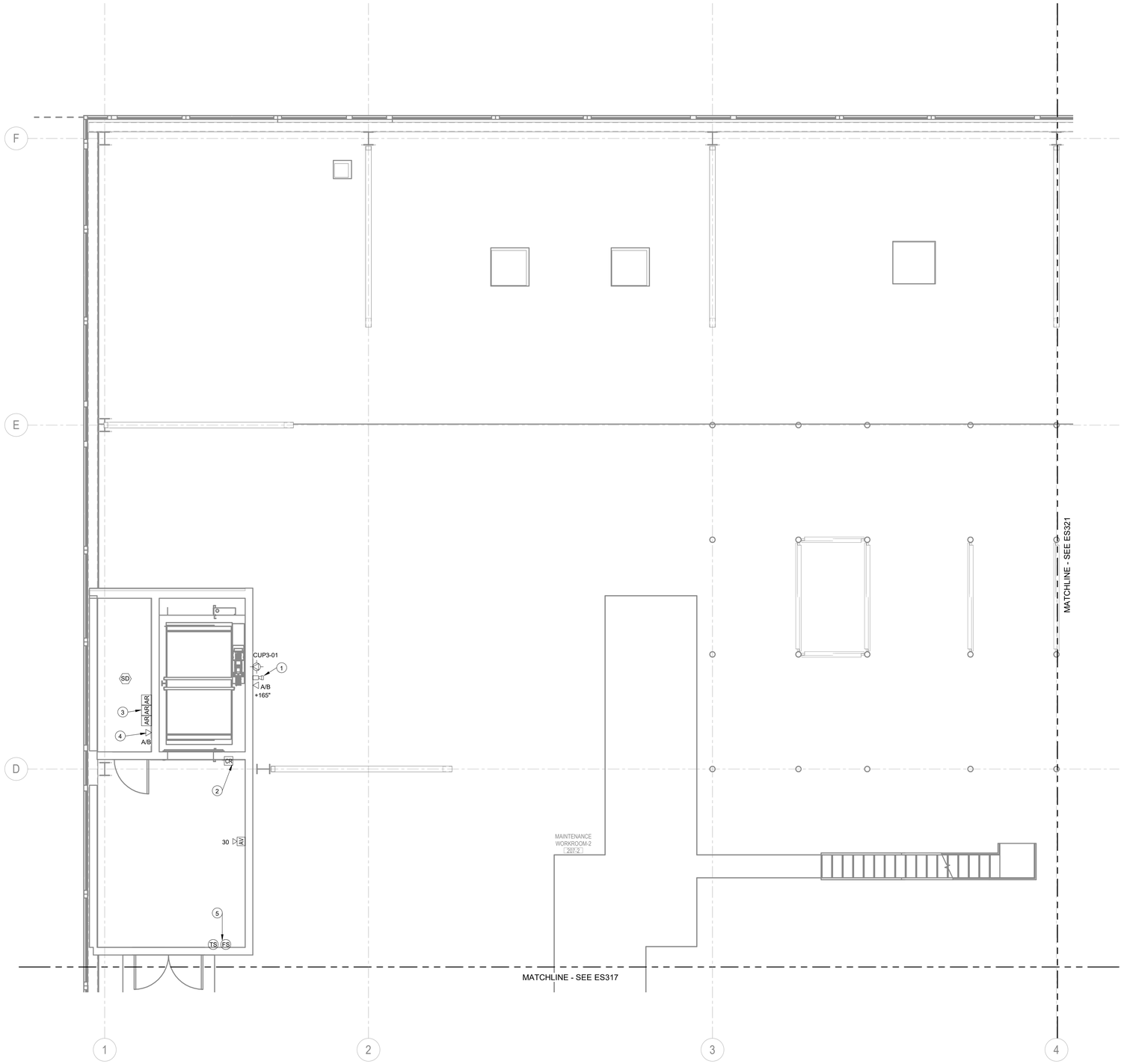
SHEET TITLE

ROOF SYSTEMS PLAN - AREA C

SHEET NUMBER

ES319

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:33 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF SYSTEMS PLAN - AREA D

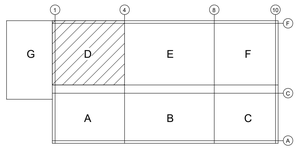
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.
2. THE CONTRACTOR SHALL VERIFY ROUTING OF DATA CABLE TO DEVICES FROM THE 2ND FLOOR MDF ROOM. FOR ALL CABLE LENGTHS GREATER THAN 90 METERS UTILIZE A UTG CABLE PER DIV 27 SPECIFICATIONS. AREAS OF POSSIBLE LENGTHS OVER 90 METERS ARE COLUMN B6 - B10 SOUTH TO COLUMN A10 - F10.

(#) PLAN NOTES:

1. CAMERA MOUNTED AT TOP OF ELEVATOR SHAFT TO VIEW COOLING TOWERS. CAMERA SHALL BE A TYPE "A" AS NOTED IN 282300 SPECIFICATION. INSTALL DATA JACKS IN WEATHER PROOF ENCLOSURE.
2. CARD READER IN ELEVATOR CAR TO ALLOW ROOF ACCESS.
3. PRIMARY, SECONDARY AND FIREMAN'S HAT ELEVATOR FIRE RELAYS LOCATED NEAR OR IN ELEVATOR CONTROLLER.
4. ELEVATOR PHONE OUTLET.
5. FLOW AND TAMPER SWITCHES FOR SPRINKLER SYSTEM.



KEY PLAN
SCALE: NONE

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SHEET TITLE

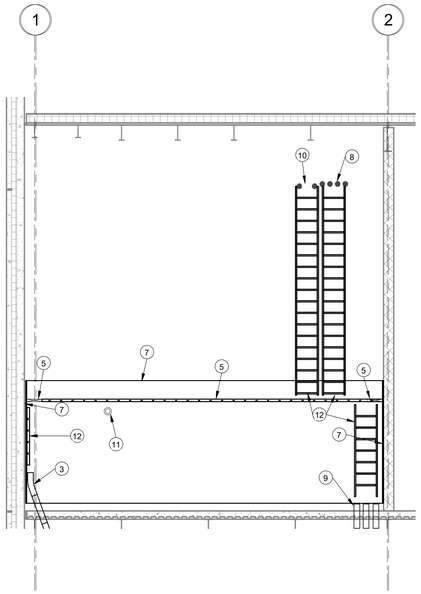
ROOF SYSTEMS PLAN - AREA D

SHEET NUMBER

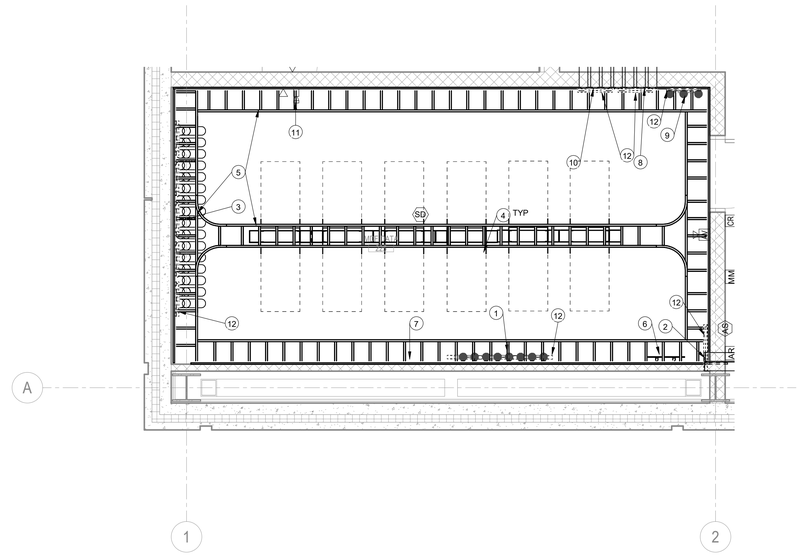
ES320

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:34 PM AESI Proj. No: 21-154



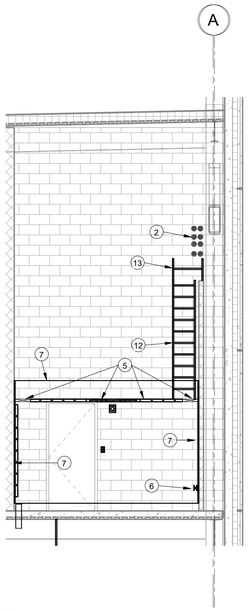
2 **EAST ELEVATION - MDF 225**
Scale: 1/4" = 1'-0"



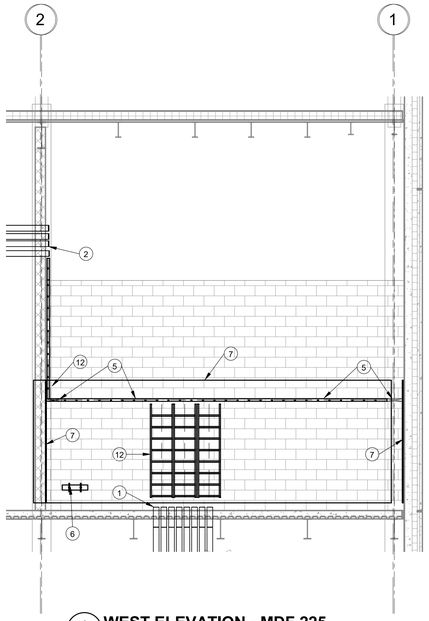
1 **ENLARGED SYSTEMS PLAN - MDF 225**
Scale: 3/8" = 1'-0"

PLAN NOTES:

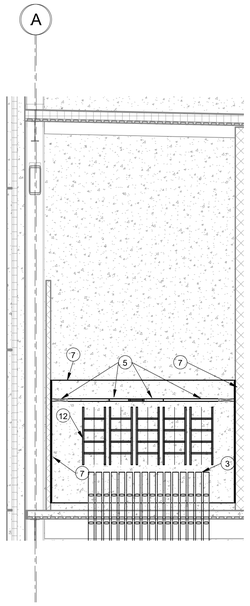
1. (8) 4" C FROM THE VENDOR DUCTBANK SYSTEM.
2. (8) 4" C FROM THE IUH DUCTBANK SYSTEM.
3. (16) 4" C FROM THE TUNNEL.
4. (2) 4 POST RACKS AND (4) 2 POST RACKS TO BE INSTALLED FOR ELECTRONICS.
5. 2"X12" RUNWAY CABLE TRAY.
6. TMGB TELECOM GROUNDING BUS. SEE ES501 FOR GROUNDING DETAILS.
7. MDF ROOM WRAPPED IN PLYWOOD FROM 6" AFF TO 8'6" AFF.
8. (4) 4" C FROM JCI BUILDING.
9. (3) 4"SLEEVES FOR 1ST FLOOR DATA CABLING.
10. (3) 4" SLEEVES FOR 2ND FLOOR AND ROOF DATA CABLING.
11. PoE CAMERA WITH VIEW AT THE ENTRY DOOR. CAMERA SHALL BE A TYPE "B" AS NOTED IN 282300 SPECIFICATION.
12. 2"x18" RUNWAY CABLE TRAY.
13. 2"x24" RUNWAY CABLE TRAY.



3 **SOUTH ELEVATION - MDF 225**
Scale: 1/4" = 1'-0"



4 **WEST ELEVATION - MDF 225**
Scale: 1/4" = 1'-0"



5 **NORTH ELEVATION - MDF 225**
Scale: 1/4" = 1'-0"

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DESIGNED BY **ML**	CERTIFICATION PRELIMINARY NOT FOR CONSTRUCTION
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APPROVED BY **Approver**	
PROJECT NO. **21-154**	

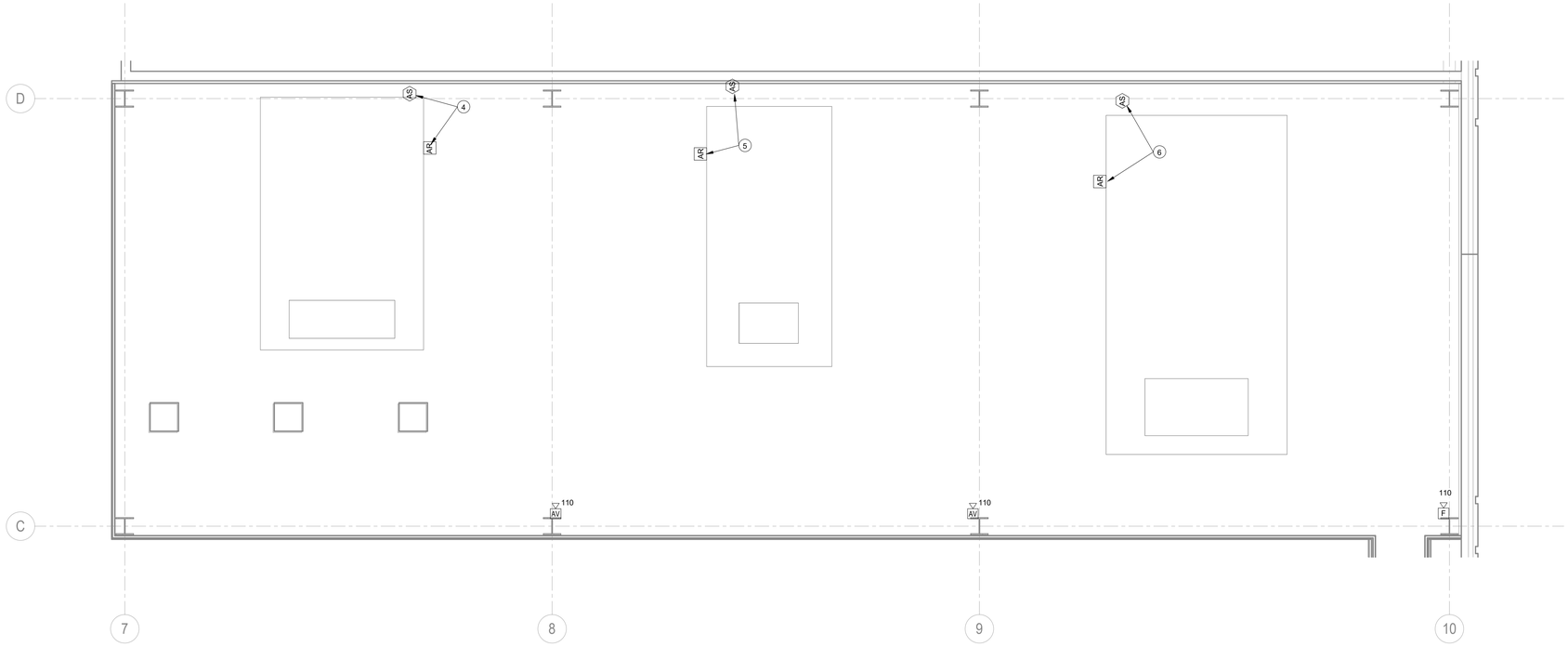
SHEET TITLE

ENLARGED SYSTEMS PLANS

SHEET NUMBER

ES401

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:38:40 PM AESI Proj No: 21-154



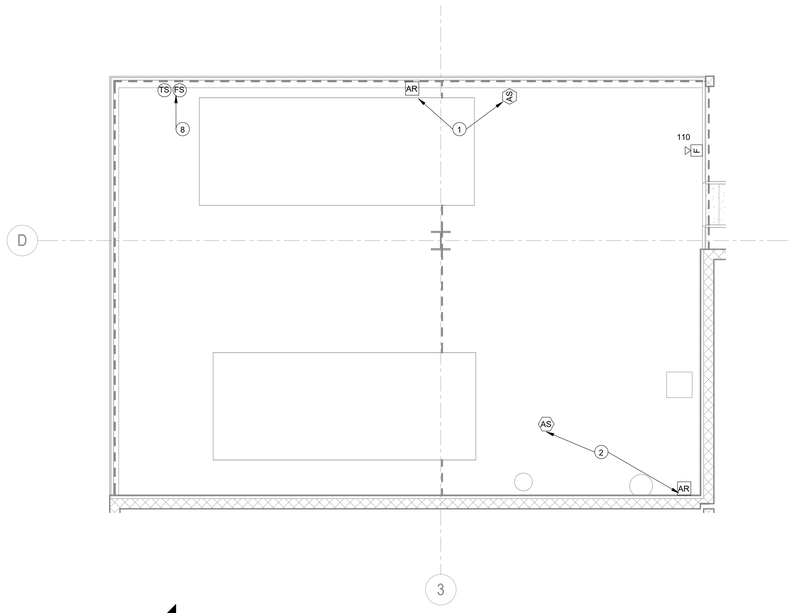
1 FIRST FLOOR MEZZANINE SYSTEMS PLAN
Scale: 1/4" = 1'-0"

GENERAL NOTES:

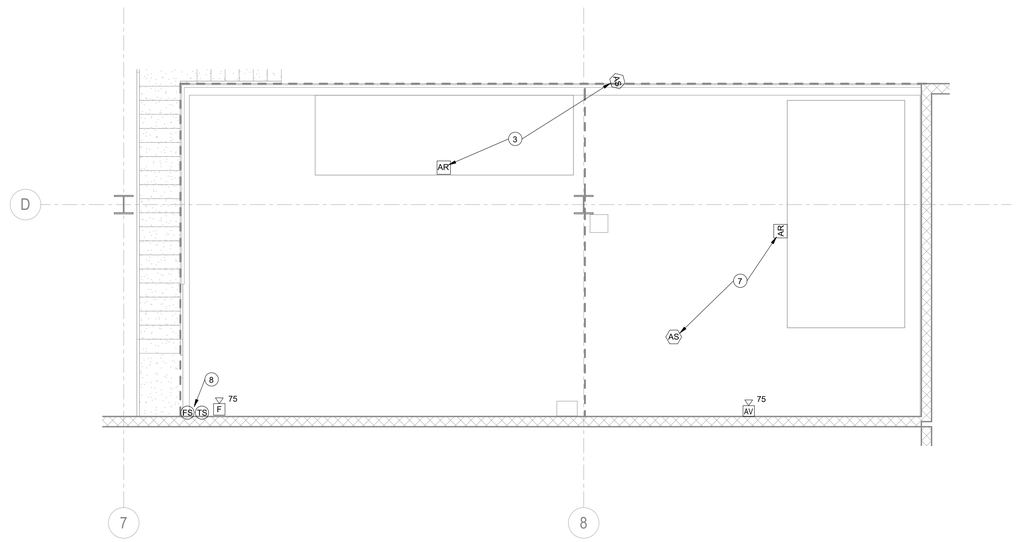
1. SEE DRAWING E001 FOR ADDITIONAL GENERAL NOTES.

PLAN NOTES:

1. DUCT DETECTOR AND AHU-2-1 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
2. DUCT DETECTOR AND AHU-2-2 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
3. DUCT DETECTOR AND AHU-2-3 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
4. DUCT DETECTOR AND MAU-1-1 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
5. DUCT DETECTOR AND MAU-1-2 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
6. DUCT DETECTOR AND AHU-1-1-1 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
7. DUCT DETECTOR AND AHU-2-4 FIRE ALARM SHUTDOWN RELAY. SEE MECHANICAL HVAC DRAWINGS FOR EXACT DUCT DETECTOR LOCATION.
8. TAMPER AND FLOW SWITCH FOR SPRINKLER ON MEZZANINE.



2 SECOND FLOOR MEZZANINE 1 SYSTEMS PLAN
Scale: 1/4" = 1'-0"



3 SECOND FLOOR MEZZANINE 2 SYSTEMS PLAN
Scale: 1/4" = 1'-0"

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PROJECT NO.: 21-154	

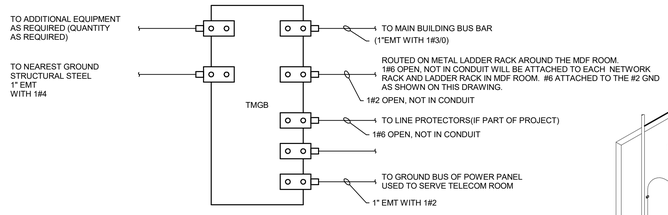
SHEET TITLE

MEZZANINE SYSTEMS PLANS

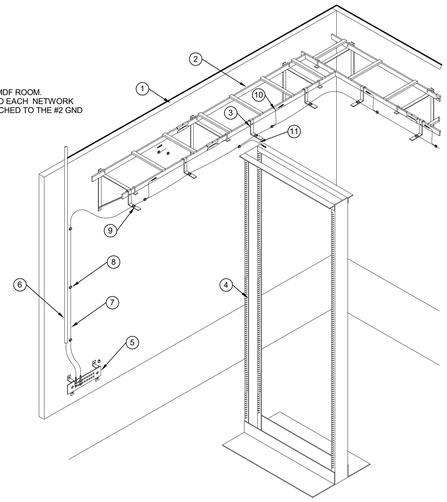
SHEET NUMBER

ES402

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:43 PM AESI Proj. No: 21-154



2 **TELECOM GROUNDING DETAIL**
Scale: NONE



TELECOM ROOM GROUNDING DETAIL NOTES:

1 TYP. SECTIONS OF 3/4" FIRE RATED PLYWOOD TERMINAL BOARDS MOUNTED TO WALLS

2 TYP. SECTIONS OF 12" LADDER CABLE TRAY MOUNTED TO PLYWOOD TERMINAL BOARD WITH SHELF BRACKETS

3 TYP. CABLE RUNWAY "L" BRACKET, ATTACHED TO CABLE TRAY

4 TYP. DATA EQUIPMENT FRAME

5 TYP. TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (TMGB) 1/4" X 4" X 20" COMPRISED OF 1/4" AND 3/8" STUD HOLES WITH BUSBAR INSULATORS. CPI 40153-020.

6 TYP. 1" EMT CONDUIT WITH BONDING CONDUCTOR FOR TELECOMMUNICATIONS (BCT) FROM BUILDING MAIN ELECTRICAL SERVICE GROUND CONNECTION POINT. ATTACH TO "TMGB" USING TWO HOLE (5/8" SPACING) LONG BARREL COMPRESSION LUGS WITH TWO INDENTS

7 TYP. #2 "THHN" GREEN COMMON BONDING NETWORK CONDUCTOR (CBN). CONNECT TO "TMGB" USING TWO HOLE (5/8" SPACING) LONG BARREL COMPRESSION LUGS WITH TWO INDENTS.

8 TYP. ATTACH "CBN" TO TERMINAL BOARD USING NYLON CABLE TIE MOUNT WITH #10 SCREW AND CABLE TIE.

9 ATTACH "CBN" TO "L" BRACKETS USING NYLON CABLE TIE MOUNT WITH 10/24 BOLT AND CABLE TIE.

10 TYP. #6 "THHN" GREEN BONDING JUMPER FROM "CBN" TO CABLE TRAY. ATTACH TO CABLE TRAY USING TWO HOLE (5/8" SPACING) LONG BARREL COMPRESSION LUGS WITH TWO INDENTS MOUNTED TO SIDE OF TRAY USING 1/4-20 BOLTS. SCRAPE PAINT FROM SIDE OF TRAY PRIOR TO INSTALLATION. ATTACH TO "CBN" USING "HTAP" CABLE SPLICE WITH CLEAR PLASTIC COVERS.

11 TYP. #6 "THHN" GREEN BONDING JUMPER FROM "CBN" TO EQUIPMENT FRAME. ATTACH TO FRAME USING TWO HOLE (5/8" SPACING) LONG BARREL COMPRESSION LUGS WITH TWO INDENTS MOUNTED TO EQUIPMENT FRAME USING 1/4-20 BOLTS. ATTACH TO "CBN" USING "HTAP" CABLE SPLICE WITH CLEAR PLASTIC COVER.

1 **MDF GROUNDING**
Scale: NONE

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SHEET TITLE

SYSTEMS DETAILS

SHEET NUMBER

ES501

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:43 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

DATA DEVICE SCHEDULE

ROOM NO.	JACK I.D.	DATA QTY.	TV QTY.	VOICE QTY.	DISTRIBUTED FROM	NOTES
	CUP1-23	2	0	0	MDF 225	WAP
	CUP2-17	2	0	0	MDF 225	WAP
	CUP2-01	2	0	0	MDF 225	WAP
	A/B	2	0	0	MDF 225	CAMERA
	A/B	2	0	0	MDF 225	CAMERA
	A/B	2	0	0	MDF 225	CAMERA
	CUP2-04	2	0	0	MDF 225	WAP
	A/B	2	0	0	MDF 225	CAMERA
	AP-A/B	2	0	0	MDF 225	WAP
	AP-C/D	2	0	0	MDF 225	WAP
	AP-E/F	2	0	0	MDF 225	WAP
	AP-A/B	2	0	0	MDF 225	WAP
	AP-A/B	2	0	0	MDF 225	WAP
	A/B	2	0	0	MDF 225	ELEVATOR PHONE
	AC-A	2	0	0	MDF 225	CAMERA
	C/D	2	0	0	MDF 225	MONITOR
101	C/D	2	0	0	MDF 225	CAMERA
103	A/B	2	0	0	MDF 225	CAMERA
103	CUP1-03	2	0	0	MDF 225	WAP
104	A/B	2	0	0	MDF 225	CAMERA
105	CUP1-01	2	0	0	MDF 225	WAP
105	CUP1-22	2	0	0	MDF 225	WAP
105						
105	A/B	2	0	0	MDF 225	
105	CUP1-16	2	0	0	MDF 225	WAP
105						
109	CUP1-14	2	0	0	MDF 225	WAP
109	CUP1-15	2	0	0	MDF 225	WAP
109	A/B	2	0	0	MDF 225	CAMERA
109	C/D	2	0	0	MDF 225	CAMERA
109	A/B	2	0	0	MDF 225	CAMERA
109	E/F	2	0	0	MDF 225	CAMERA
109	CUP1-13	2	0	0	MDF 225	WAP
109	CUP1-24	2	0	0	MDF 225	WAP
109	CUP1-21	2	0	0	MDF 225	WAP
110	A/B	2	0	0	MDF 225	CAMERA
112	A/B	2	0	0	MDF 225	
112	G/H	2	0	0	MDF 225	MONITOR
112	CUP1-20	2	0	0	MDF 225	WAP
112	C/D	2	0	0	MDF 225	
112	E/F	2	0	0	MDF 225	
113	CUP1-08	2	0	0	MDF 225	WAP
113	CUP1-12	2	0	0	MDF 225	WAP
113	A/B	2	0	0	MDF 225	CAMERA
113	CUP1-09	2	0	0	MDF 225	WAP
113	CUP1-17	2	0	0	MDF 225	WAP
113	CUP1-11	2	0	0	MDF 225	WAP
113	CUP1-19	2	0	0	MDF 225	WAP
113	CUP1-18	2	0	0	MDF 225	WAP
113	CUP1-10	2	0	0	MDF 225	WAP
114	CUP1-06	2	0	0	MDF 225	WAP
114	CUP1-05	2	0	0	MDF 225	WAP
114	CUP1-02	2	0	0	MDF 225	WAP
114	CUP1-07	2	0	0	MDF 225	WAP
114	E/F	2	0	0	MDF 225	CAMERA
114	C/D	2	0	0	MDF 225	CAMERA
114	A/B	2	0	0	MDF 225	CAMERA
114	G/H	2	0	0	MDF 225	CAMERA
114						
114	CUP1-04	2	0	0	MDF 225	WAP
114	A/B	2	0	0	MDF 225	
201						
203	CUP2-06	2	0	0	MDF 225	WAP
203	A/B	2	0	0	MDF 225	
204	A/B	2	0	0	MDF 225	
205	A/B	2	0	0	MDF 225	WALL PHONE
206	CUP2-16	2	0	0	MDF 225	WAP
207-2	CUP3-01	2	0	0	MDF 225	WAP
208	A/B	2	0	0	MDF 225	
209	I/J	2	0	0	MDF 225	FIRE ALARM PANEL
209	G/H	2	0	0	MDF 225	SECURITY PANEL
209	K/L/M/N	4	0	0	MDF 225	
209	C/D	2	0	0	MDF 225	TV
209	A/B	2	0	0	MDF 225	
209	E/F	2	0	0	MDF 225	
210	CUP2-15	2	0	0	MDF 225	WAP
212	AP-E/F	2	0	0	MDF 225	WAP
212	CUP2-10	2	0	0	MDF 225	WAP
212	CUP2-09	2	0	0	MDF 225	WAP
215						
216	CUP2-12	2	0	0	MDF 225	WAP
216	CUP2-13	2	0	0	MDF 225	WAP
218	CUP2-18	2	0	0	MDF 225	WAP
218	A/B	2	0	0	MDF 225	CAMERA
218	C/D	2	0	0	MDF 225	CAMERA
220	CUP2-03	2	0	0	MDF 225	WAP
220	CUP2-08	2	0	0	MDF 225	WAP
220	CUP2-07	2	0	0	MDF 225	WAP
220	A/B	2	0	0	MDF 225	CAMERA
220	C/D	2	0	0	MDF 225	CAMERA
222	CUP2-05	2	0	0	MDF 225	WAP
225						
225						
225						
225						
225						
225						
225	A/B	2	0	0	MDF 225	CAMERA
225						
225						
225						
225						
226	A/B	2	0	0	MDF 225	
226	CUP2-02	2	0	0	MDF 225	WAP
227	CUP2-14	2	0	0	MDF 225	WAP
227	CUP2-19	2	0	0	MDF 225	WAP
227						

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REVISIONS

NO.	DATE	DESCRIPTION

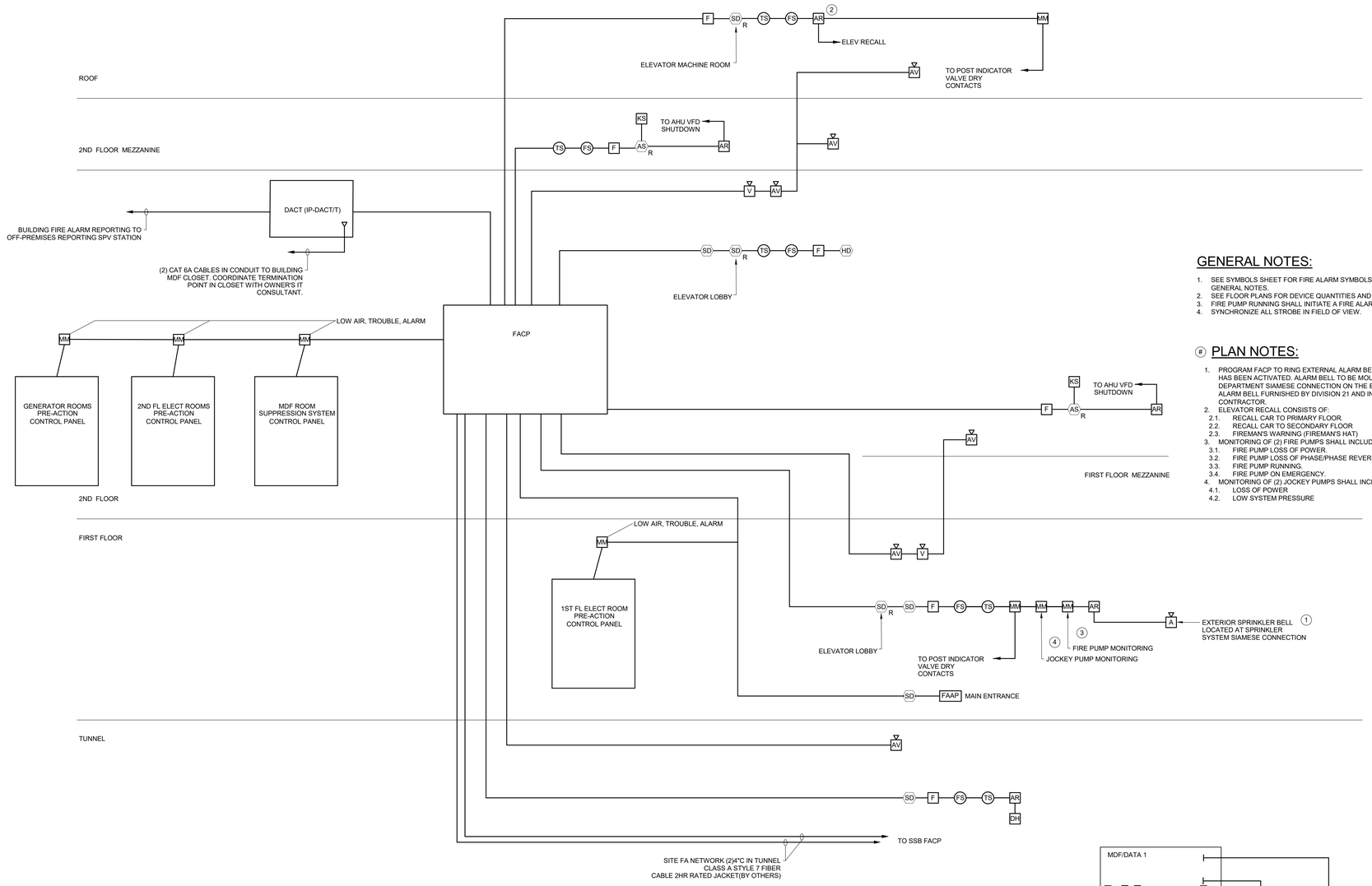
DESIGNED BY **ML**
CHECKED BY **KH**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION
PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
SYSTEMS SCHEDULES

SHEET NUMBER
ES601

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:44 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



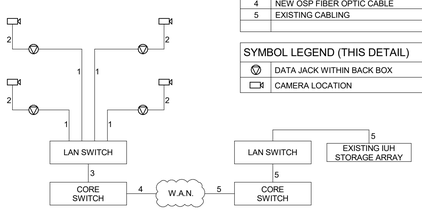
1 FIRE ALARM RISER
Scale: NONE

GENERAL NOTES:

1. SEE SYMBOLS SHEET FOR FIRE ALARM SYMBOLS AND ABBREVIATIONS AND GENERAL NOTES.
2. SEE FLOOR PLANS FOR DEVICE QUANTITIES AND LOCATIONS.
3. FIRE PUMP RUNNING SHALL INITIATE A FIRE ALARM SIGNAL.
4. SYNCHRONIZE ALL STROBE IN FIELD OF VIEW.

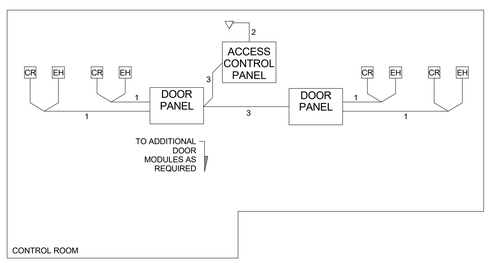
PLAN NOTES:

1. PROGRAM FACP TO RING EXTERNAL ALARM BELL WHEN ANY FLOW SWITCH HAS BEEN ACTIVATED. ALARM BELL TO BE MOUNTED ABOVE FIRE DEPARTMENT SIAMESE CONNECTION ON THE EXTERIOR OF THE BUILDING. ALARM BELL FURNISHED BY DIVISION 21 AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
2. ELEVATOR RECALL CONSISTS OF:
   - 2.1. RECALL CAR TO PRIMARY FLOOR.
   - 2.2. RECALL CAR TO SECONDARY FLOOR
   - 2.3. FIREMAN'S WARNING (FIREMAN'S HAT)
3. MONITORING OF (2) FIRE PUMPS SHALL INCLUDE:
   - 3.1. FIRE PUMP LOSS OF POWER.
   - 3.2. FIRE PUMP LOSS OF PHASE/PHASE REVERSAL.
   - 3.3. FIRE PUMP RUNNING.
   - 3.4. FIRE PUMP ON EMERGENCY.
4. MONITORING OF (2) JOCKEY PUMPS SHALL INCLUDE
   - 4.1. LOSS OF POWER
   - 4.2. LOW SYSTEM PRESSURE



CABLING LEGEND (THIS DETAIL)	
1	NEW CAT 6A PLENUM UTP CABLE (BY DIVISION 27)
2	NEW CAT 6A PATCH CABLE (BY DIVISION 27)
3	NEW FIBER CABLING (BY OWNER)
4	NEW OSP FIBER OPTIC CABLE
5	EXISTING CABLING

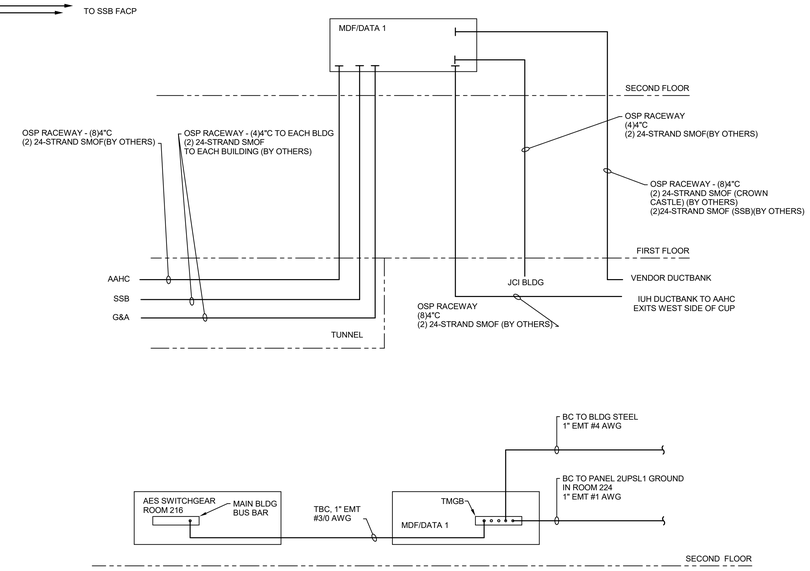
SYMBOL LEGEND (THIS DETAIL)	
V	DATA JACK WITHIN BACK BOX
	CAMERA LOCATION



CABLING LEGEND (THIS DETAIL)	
1	NEW COMPOSITE CABLING
2	NEW CAT 6A PATCH CABLE
3	NEW RS-485 CABLE

SYMBOL LEGEND (THIS DETAIL)	
▽	DATA LOCATION
CR	CARD READER
EH	ELECTRONIC LOCKING HARDWARE

3 SECURITY SYSTEM FUNCTIONAL DIAGRAM
Scale: NONE



2 MDF RISER DISTRIBUTION DIAGRAM
Scale: NONE

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DESIGNED BY: ML	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: KH	
APPROVED BY: Approver	
PROJECT NO. 21-154	

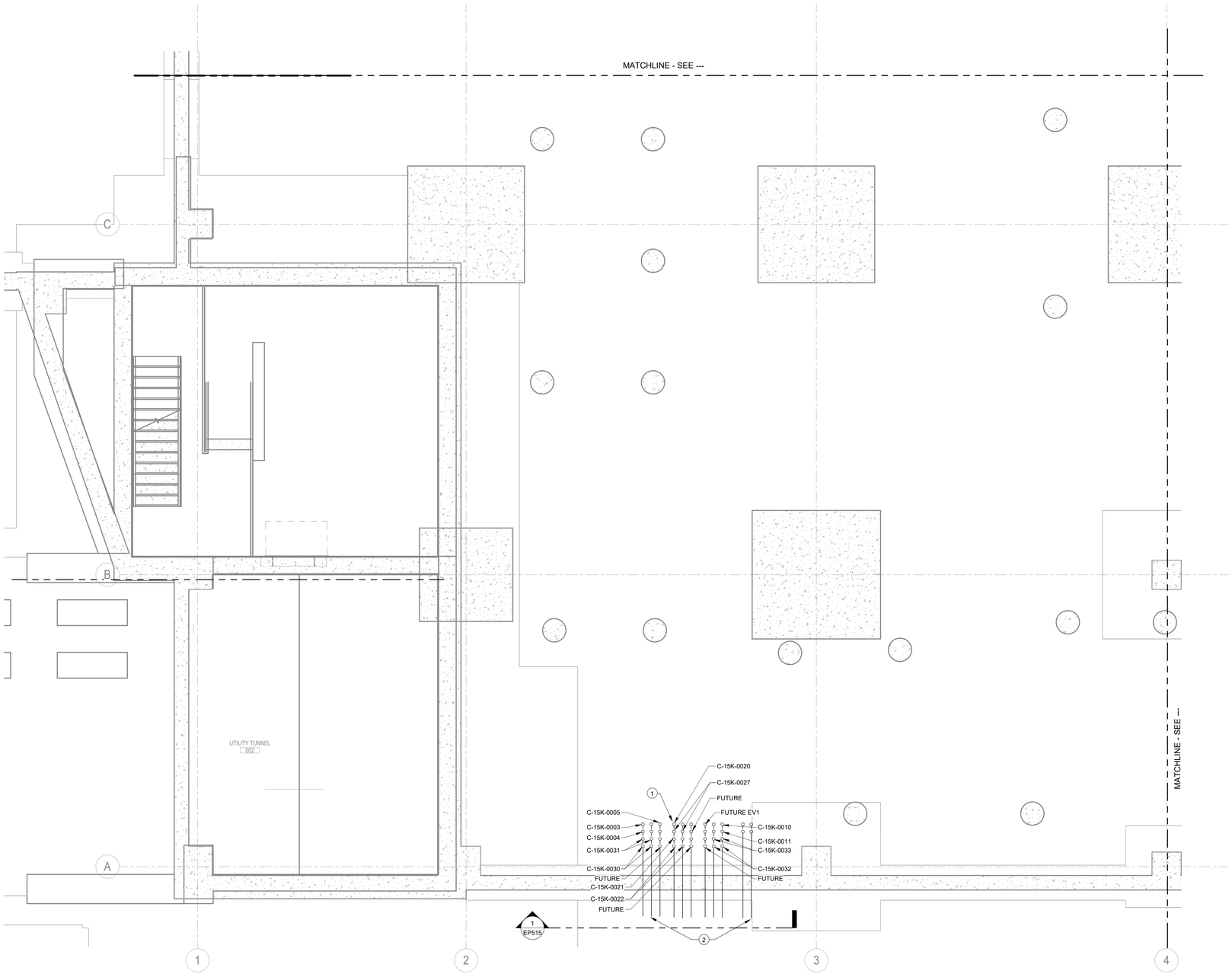
SHEET TITLE

SYSTEMS DIAGRAMS

SHEET NUMBER

ES701

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 12:36:44 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



LOWER LEVEL 13,200V POWER PLAN- AREA A

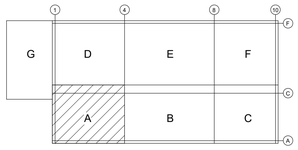
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP606 FOR SCHEDULES.
3. SEE DRAWING SERIES EP701 FOR DIAGRAMS.

(#) PLAN NOTES:

1. UP TO DRAWING EP304..
2. SEE DRAWING EP515 FOR SECTION.



KEY PLAN
SCALE: NONE

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APPROVED BY: Approver	
PROJECT NO. 21-154	

SHEET TITLE

LOWER LEVEL 13,200V POWER PLAN - AREA A

SHEET NUMBER

EP301

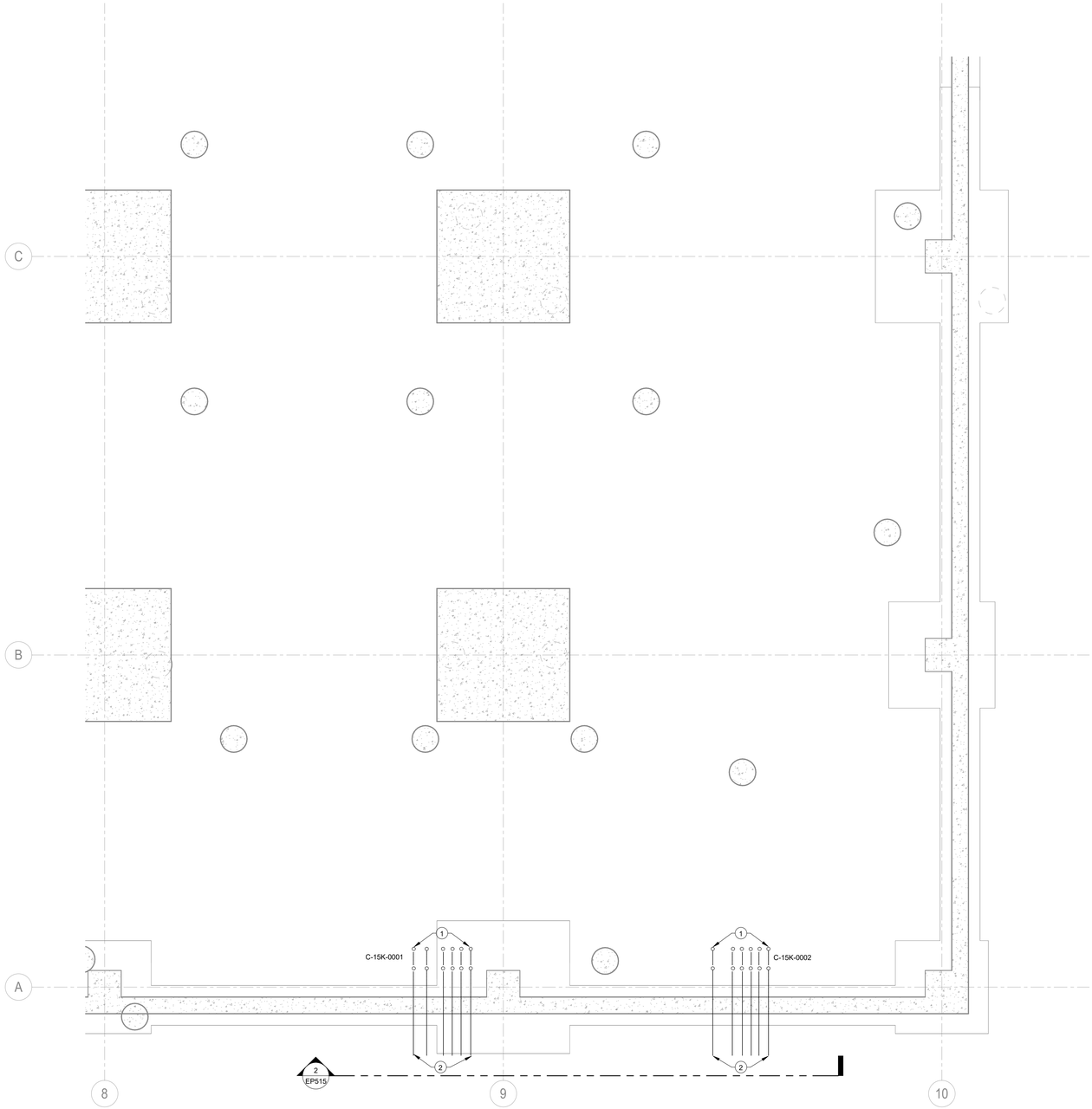
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:55:11 PM AESI Proj. No: 21-154

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP606 FOR SCHEDULES.
3. SEE DRAWING SERIES EP701 FOR DIAGRAMS.

PLAN NOTES:

1. UP TO DRAWING EP306.
2. SEE DRAWING EP515 FOR SECTION.



LOWER LEVEL 13,200V POWER PLAN- AREA C

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

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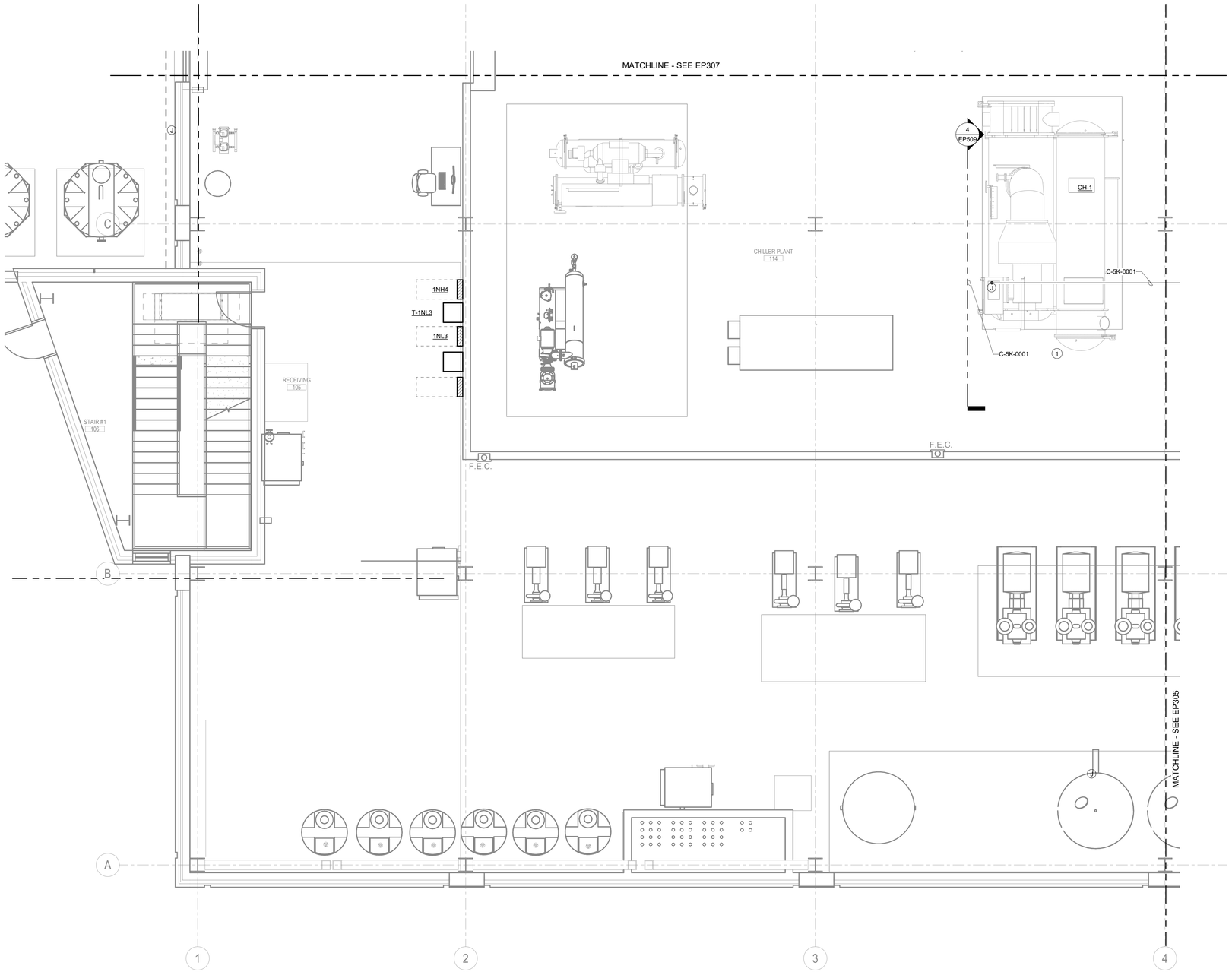
SHEET TITLE

LOWER LEVEL 13,200V POWER PLAN - AREA C

SHEET NUMBER

EP303

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:12 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR 13,200V POWER PLAN - AREA A

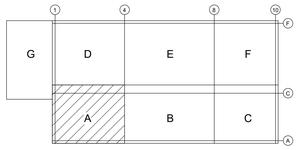
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP509 AND EP510 FOR DETAILS.
3. SEE DRAWING SERIES EP606 FOR SCHEDULES.
4. SEE DRAWING SERIES EP706 FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION FOR CH-4. SEE MEDIUM VOLTAGE CABLE SCHEDULE ON E606 FOR DETAILS.



KEY PLAN
SCALE: NONE

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SHEET TITLE

FIRST FLOOR 13,200V POWER PLAN - AREA A

SHEET NUMBER

EP304

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:16 PM AESI Proj. No: 21-154
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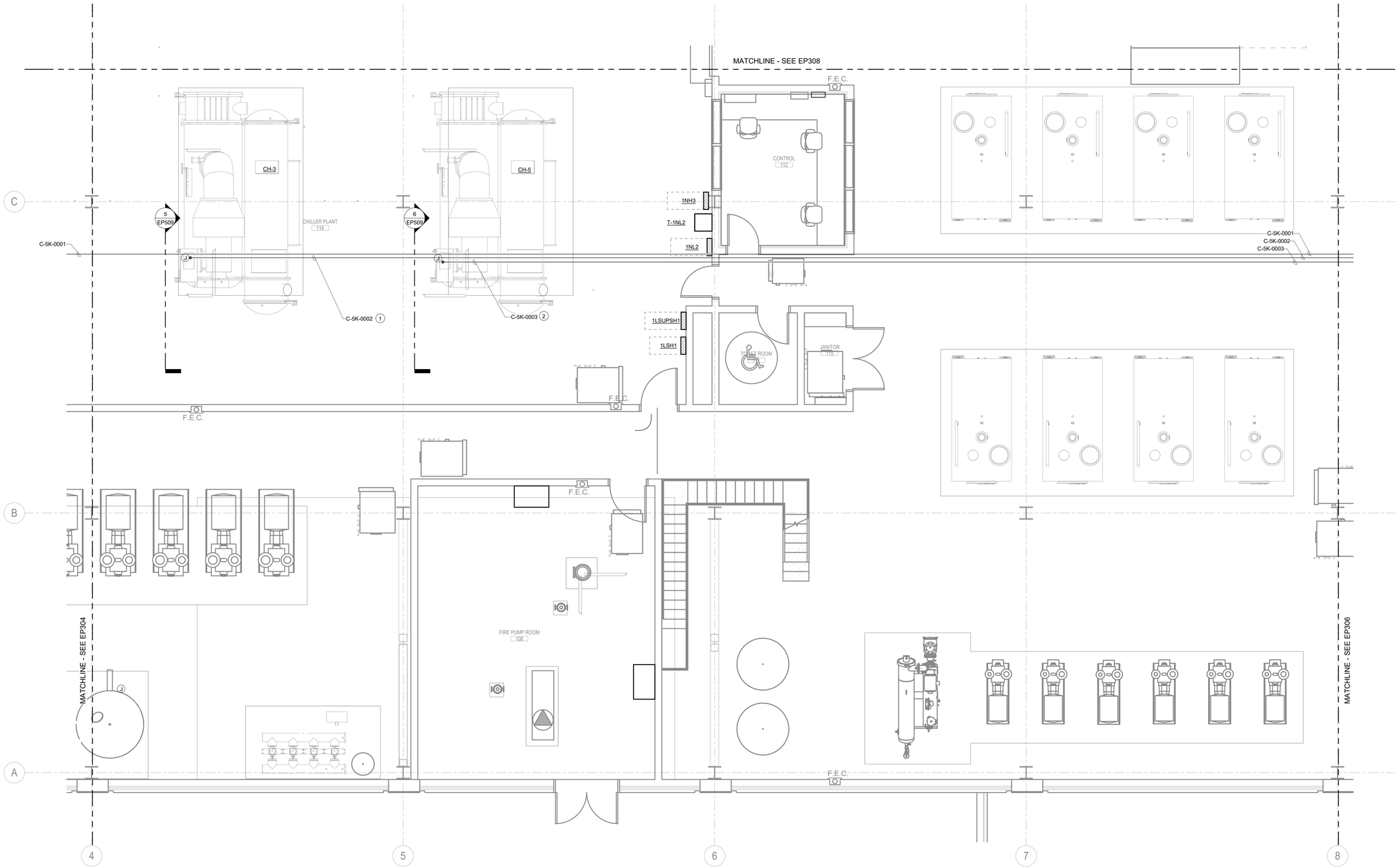


FIRST FLOOR 13,200V POWER PLAN - AREA B

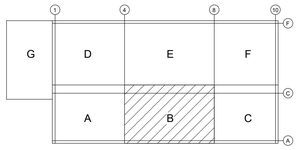
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP509 FOR DETAILS.
3. SEE DRAWING SERIES EP606 FOR SCHEDULES.
4. SEE DRAWING SERIES EP706 FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION FOR CH-5. SEE MEDIUM VOLTAGE CABLE SCHEDULE ON E606 FOR DETAILS.
2. PROVIDE ELECTRICAL CONNECTION FOR CH-6. SEE MEDIUM VOLTAGE CABLE SCHEDULE ON E606 FOR DETAILS.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

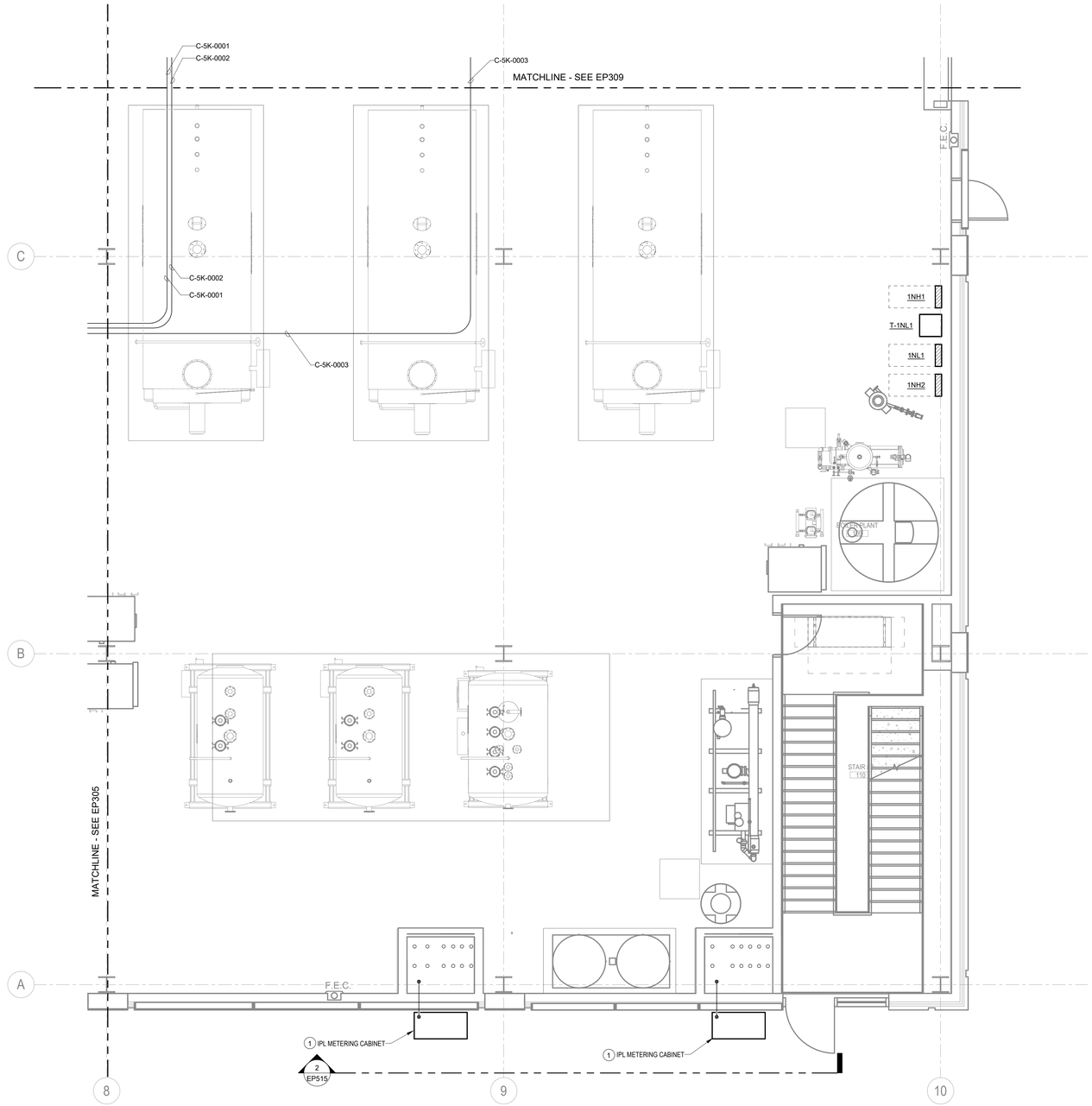
SHEET TITLE

FIRST FLOOR 13,200V POWER PLAN - AREA B

SHEET NUMBER

EP305

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:23 PM AESI Proj. No: 21-154



FIRST FLOOR 13,200V POWER PLAN - AREA C

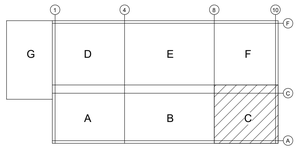
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP510 FOR DETAILS.
3. SEE DRAWING SERIES EP606 FOR SCHEDULES.
4. SEE DRAWING SERIES EP701 AND EP702 FOR DIAGRAMS.

PLAN NOTES:

1. INSTALL UTILITY FURNISHED METERING CABINET. COORDINATE LOCATION WITH UTILITY. PROVIDE 2"C TO POWER CHASE FOR CT CABLING.



KEY PLAN
SCALE: NONE

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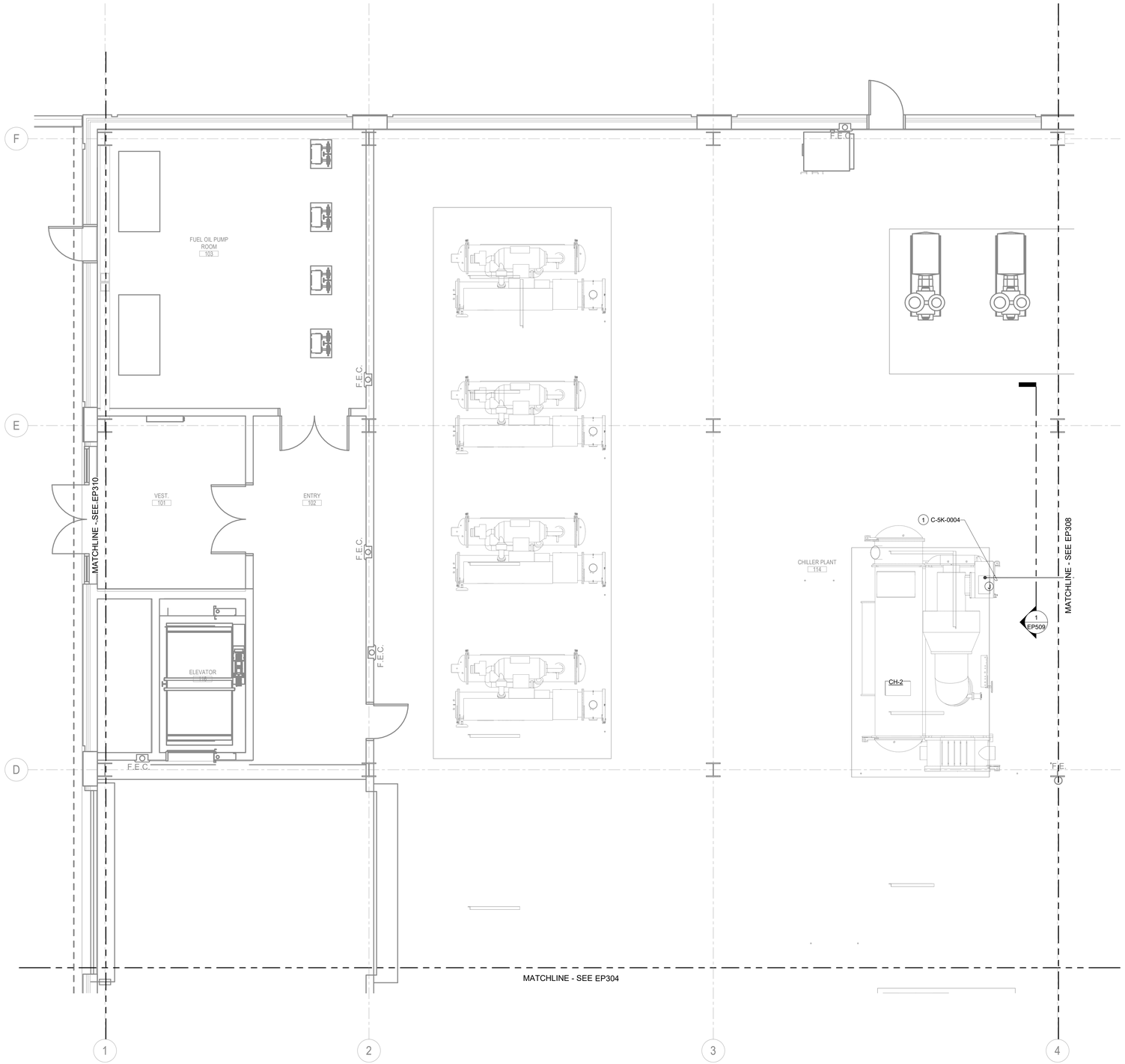
SHEET TITLE

FIRST FLOOR 13,200V POWER PLAN - AREA C

SHEET NUMBER

EP306

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:55:32 PM AESI Proj. No: 21-154



FIRST FLOOR 13,200V POWER PLAN - AREA D

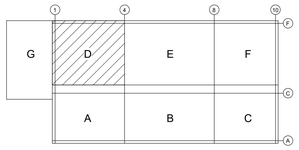
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP509 FOR DETAILS.
3. SEE DRAWING SERIES EP606 FOR SCHEDULES.
4. SEE DRAWING SERIES EP707 FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION FOR CH-1. SEE MEDIUM VOLTAGE CABLE SCHEDULE ON E606 FOR DETAILS.



KEY PLAN
SCALE: NONE

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PROJECT NO.: 21-154	

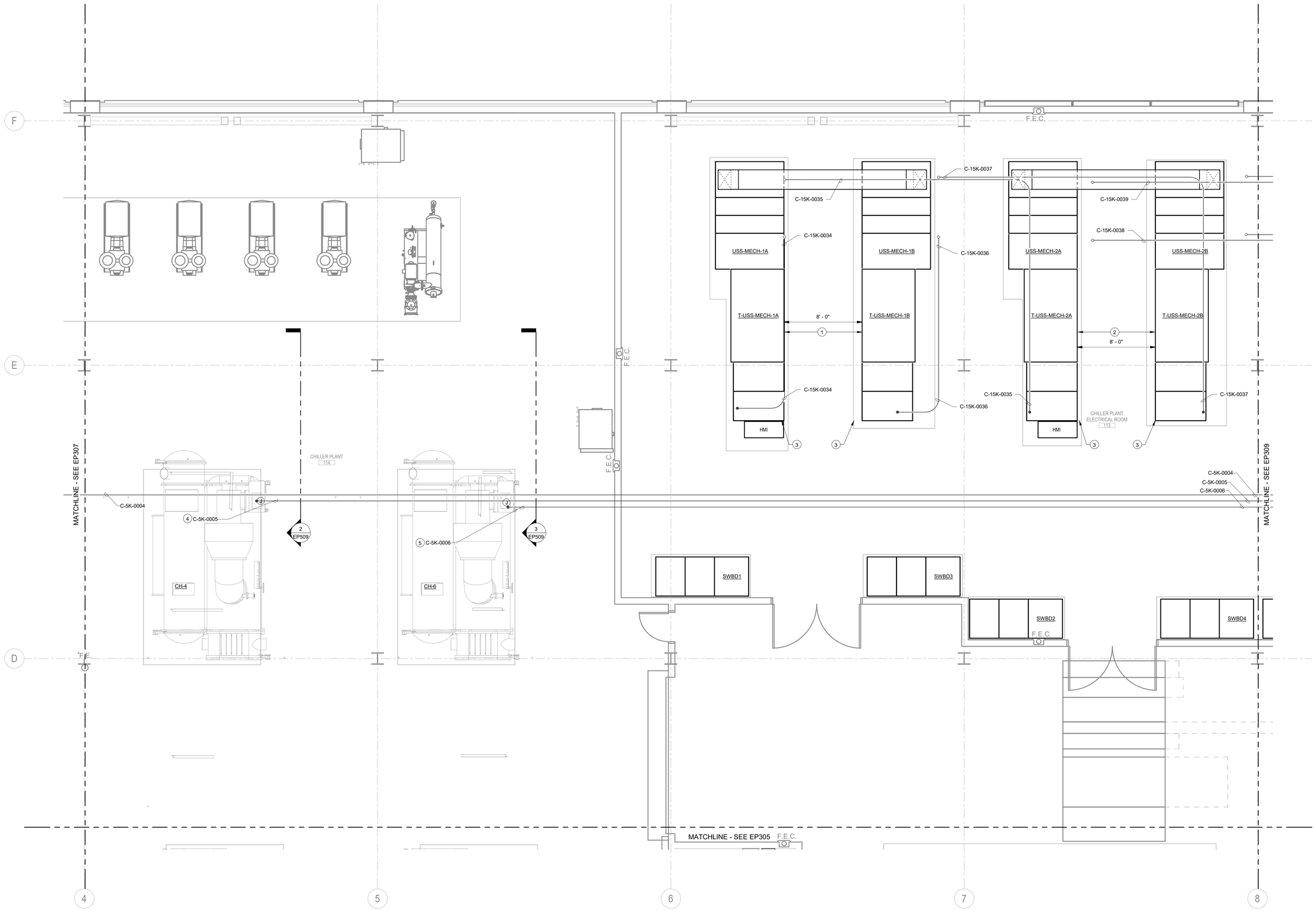
SHEET TITLE

FIRST FLOOR 13,200V POWER PLAN - AREA D

SHEET NUMBER

EP307

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:35 PM AESI Proj. No: 21-154



FIRST FLOOR 13,200V POWER PLAN - AREA E

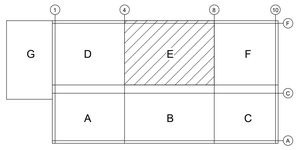
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP509 FOR DETAILS.
3. SEE DRAWING SERIES EP606 FOR SCHEDULES.
4. SEE DRAWING SERIES EP707 FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE UNIT SUBSTATION USS-MECH-1. SEE EP504 AND EP704 FOR DETAILS.
2. PROVIDE UNIT SUBSTATION USS-MECH-2. SEE EP504 AND EP705 FOR DETAILS.
3. PROVIDE 4" HOUSEKEEPING PAD. SEE STRUCTURAL DRAWINGS FOR DETAILS.
4. PROVIDE ELECTRICAL CONNECTION FOR CH-4. SEE MEDIUM VOLTAGE CABLE SCHEDULE ON E606 FOR DETAILS.
5. PROVIDE ELECTRICAL CONNECTION FOR CH-6. SEE MEDIUM VOLTAGE CABLE SCHEDULE ON E606 FOR DETAILS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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340 W. 10th Street
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PROJECT

Central Utility Plant

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DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

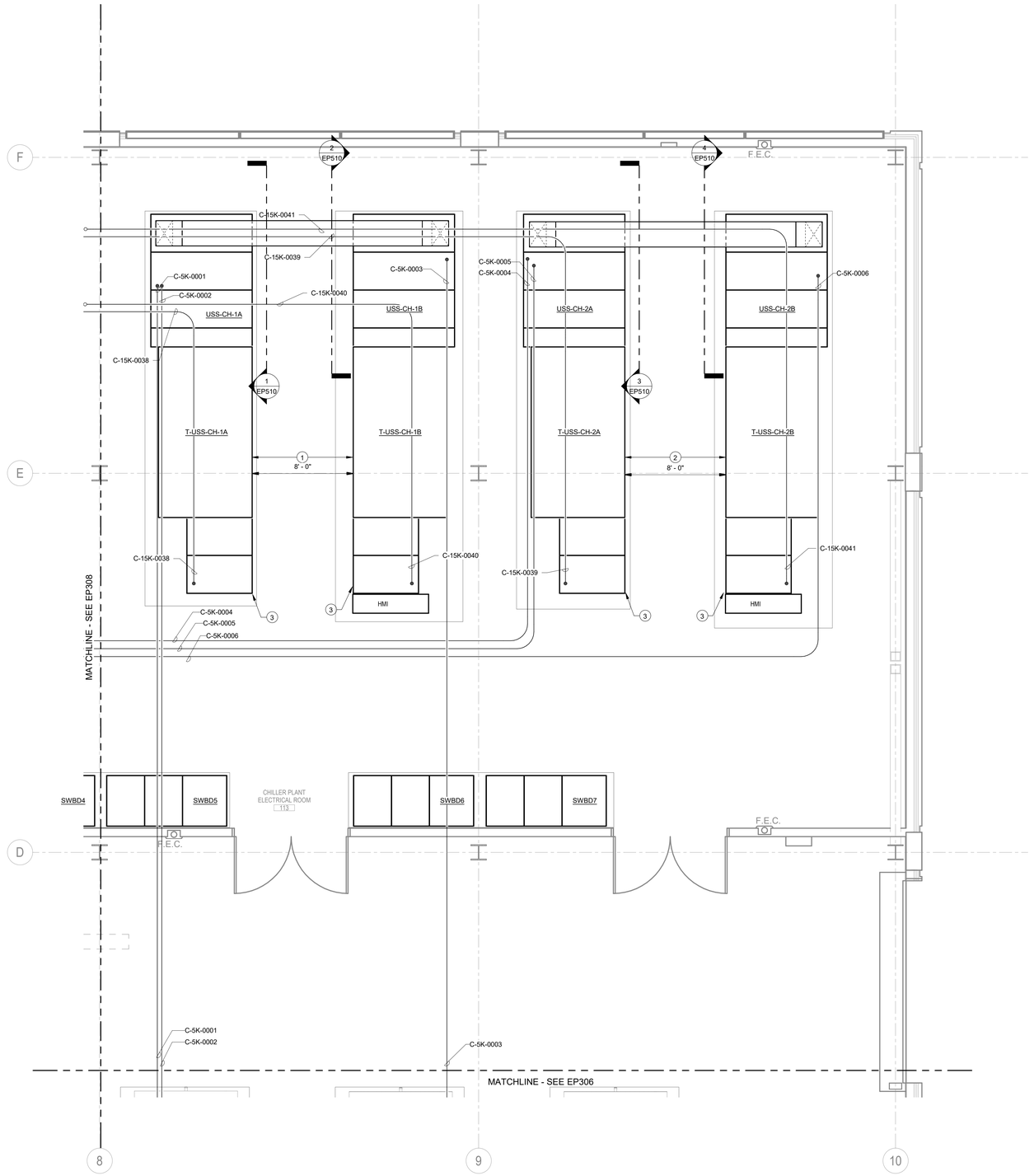
SHEET TITLE

FIRST FLOOR 13,200V POWER PLAN - AREA E

SHEET NUMBER

EP308

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:39 PM AESI Proj. No: 21-154



FIRST FLOOR 13,200V POWER PLAN - AREA F

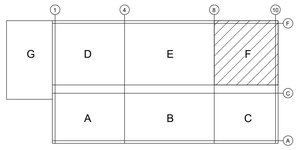
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP510 FOR DETAILS.
3. SEE DRAWING SERIES EP606 FOR SCHEDULES.
4. SEE DRAWING SERIES EP706 AND EP707 FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE UNIT SUBSTATION USS-CH-1. SEE EP503 AND EP706 FOR DETAILS.
2. PROVIDE UNIT SUBSTATION USS-CH-2. SEE EP503 AND EP707 FOR DETAILS.
3. PROVIDE 4" HOUSEKEEPING PAD. SEE STRUCTURAL DRAWINGS FOR DETAILS.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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PROJECT NO.: 21-154	

SHEET TITLE

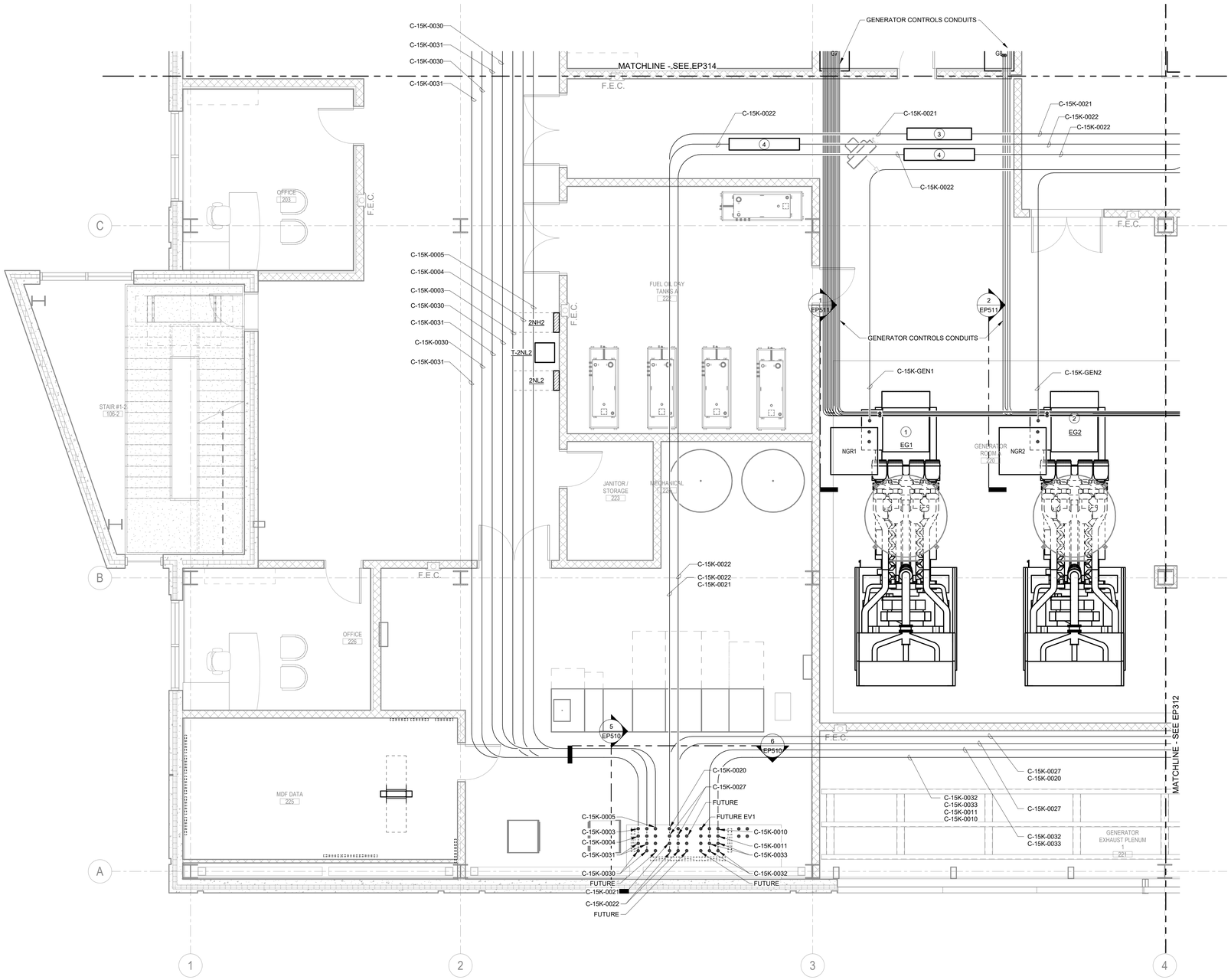
FIRST FLOOR 13,200V POWER PLAN - AREA F

SHEET NUMBER

EP309

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:41 PM AESI Proj. No: 21-154

0 1/2" 1" 2"



SECOND FLOOR 13,200V POWER PLAN - AREA A

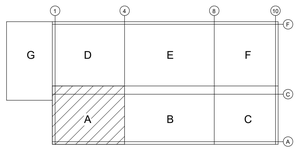
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. INSTALL EG-1. PROVIDE ELECTRICAL CONNECTION FOR EG-1. PROVIDE CONTROLS CONNECTIONS FOR EG-1. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR1.
2. INSTALL EG-2. PROVIDE ELECTRICAL CONNECTION FOR EG-2. PROVIDE CONTROLS CONNECTIONS FOR EG-2. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR2.
3. PROVIDE MEDIUM VOLTAGE PULL BOX. 5'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
4. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-0" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.



KEY PLAN
SCALE: NONE

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PROJECT NO.: 21-154	

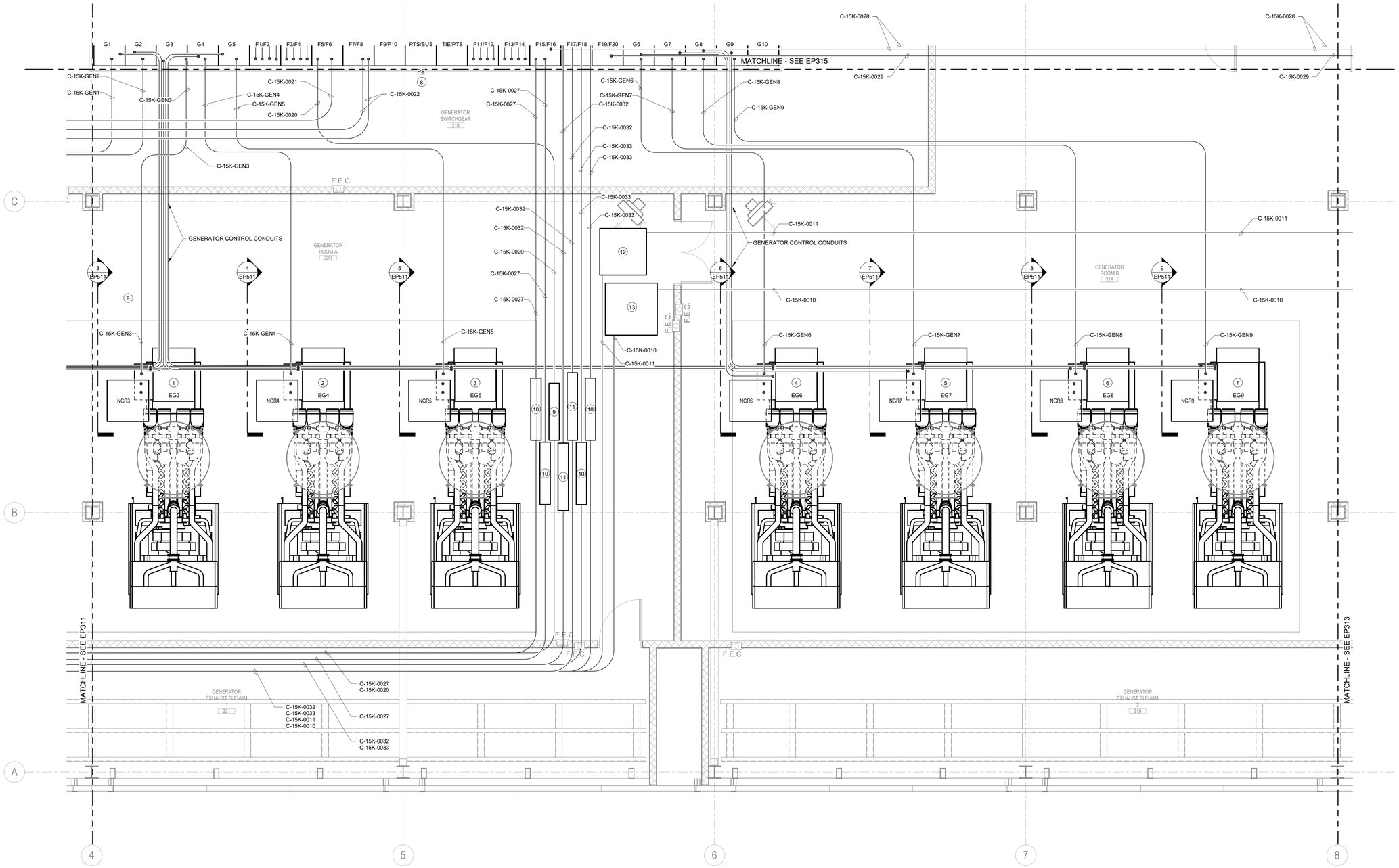
SHEET TITLE

SECOND FLOOR 13,200V POWER PLAN - AREA A

SHEET NUMBER

EP311

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:56:56 PM AESI Proj. No: 21-154



SECOND FLOOR 13,200V POWER PLAN - AREA B

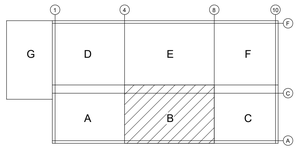
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. INSTALL EG-3. PROVIDE ELECTRICAL CONNECTION FOR EG-3. PROVIDE CONTROLS CONNECTIONS FOR EG-3. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR3.
2. INSTALL EG-4. PROVIDE ELECTRICAL CONNECTION FOR EG-4. PROVIDE CONTROLS CONNECTIONS FOR EG-4. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR4.
3. INSTALL EG-5. PROVIDE ELECTRICAL CONNECTION FOR EG-5. PROVIDE CONTROLS CONNECTIONS FOR EG-5. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR5.
4. INSTALL EG-6. PROVIDE ELECTRICAL CONNECTION FOR EG-6. PROVIDE CONTROLS CONNECTIONS FOR EG-6. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR6.
5. INSTALL EG-7. PROVIDE ELECTRICAL CONNECTION FOR EG-7. PROVIDE CONTROLS CONNECTIONS FOR EG-7. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR7.
6. INSTALL EG-8. PROVIDE ELECTRICAL CONNECTION FOR EG-8. PROVIDE CONTROLS CONNECTIONS FOR EG-8. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR8.
7. INSTALL EG-9. PROVIDE ELECTRICAL CONNECTION FOR EG-9. PROVIDE CONTROLS CONNECTIONS FOR EG-9. (2) 1"C, (20)TWISTED SHIELDED PAIR EACH AND (1)2"C, (4)#10 & (1)#10GND FOR CTS. INSTALL NGR9.
8. SEE EP315 FOR NOTES ON SWITCHGEAR PS.
9. PROVIDE MEDIUM VOLTAGE PULL BOX. 5'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
10. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-0" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
11. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
12. PROVIDE MEDIUM VOLTAGE PULL BOX. 4'-6" X 4'-6"" X 2'-0", NEMA 1, BOLTED COVER FACING DOWN.
13. PROVIDE MEDIUM VOLTAGE PULL BOX. 5'-0" X 5'-0" X 2'-0", NEMA 1, BOLTED COVER FACING DOWN.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

SECOND FLOOR 13,200V POWER PLAN - AREA B

SHEET NUMBER

EP312

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:00 PM AESI Proj. No: 21-154
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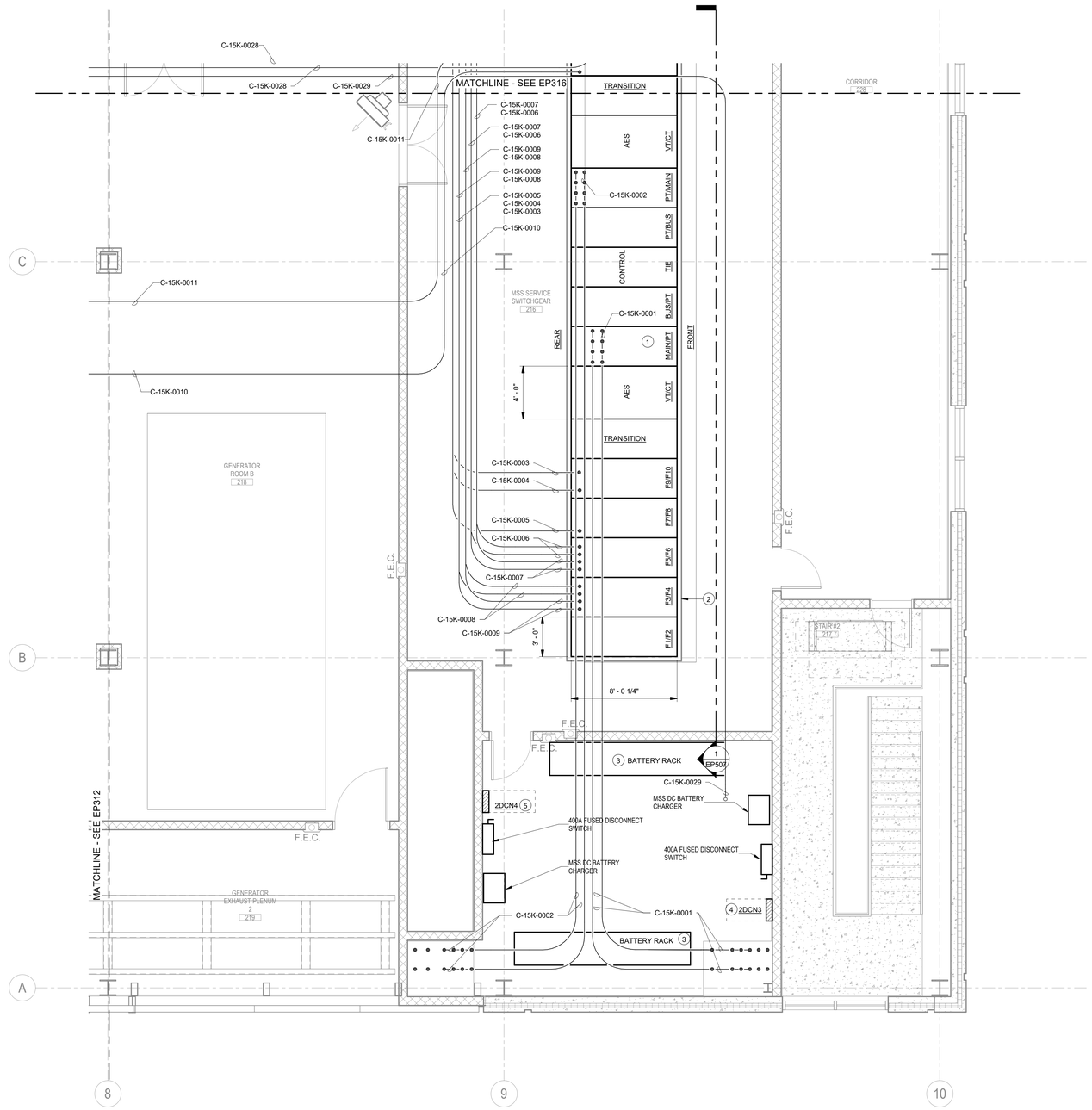


SECOND FLOOR 13,200V POWER PLAN - AREA C

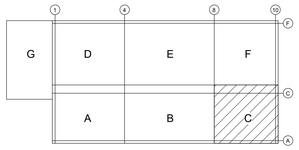
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. INSTALL MAIN SERVICE SWITCHGEAR MSS. SEE EP502 AND EP702 FOR DETAILS.
2. PROVIDE 4" HOUSEKEEPING PAD. SEE STRUCTURAL DRAWINGS FOR DETAILS.
3. PROVIDE DC BATTERY SYSTEM FOR SWITCHGEAR POWER. SEE DETAILS ON EP708.
4. PROVIDE DC PANELBOARD 2DCN3.
5. PROVIDE DC PANELBOARD 2DCN4.



KEY PLAN
SCALE: NONE

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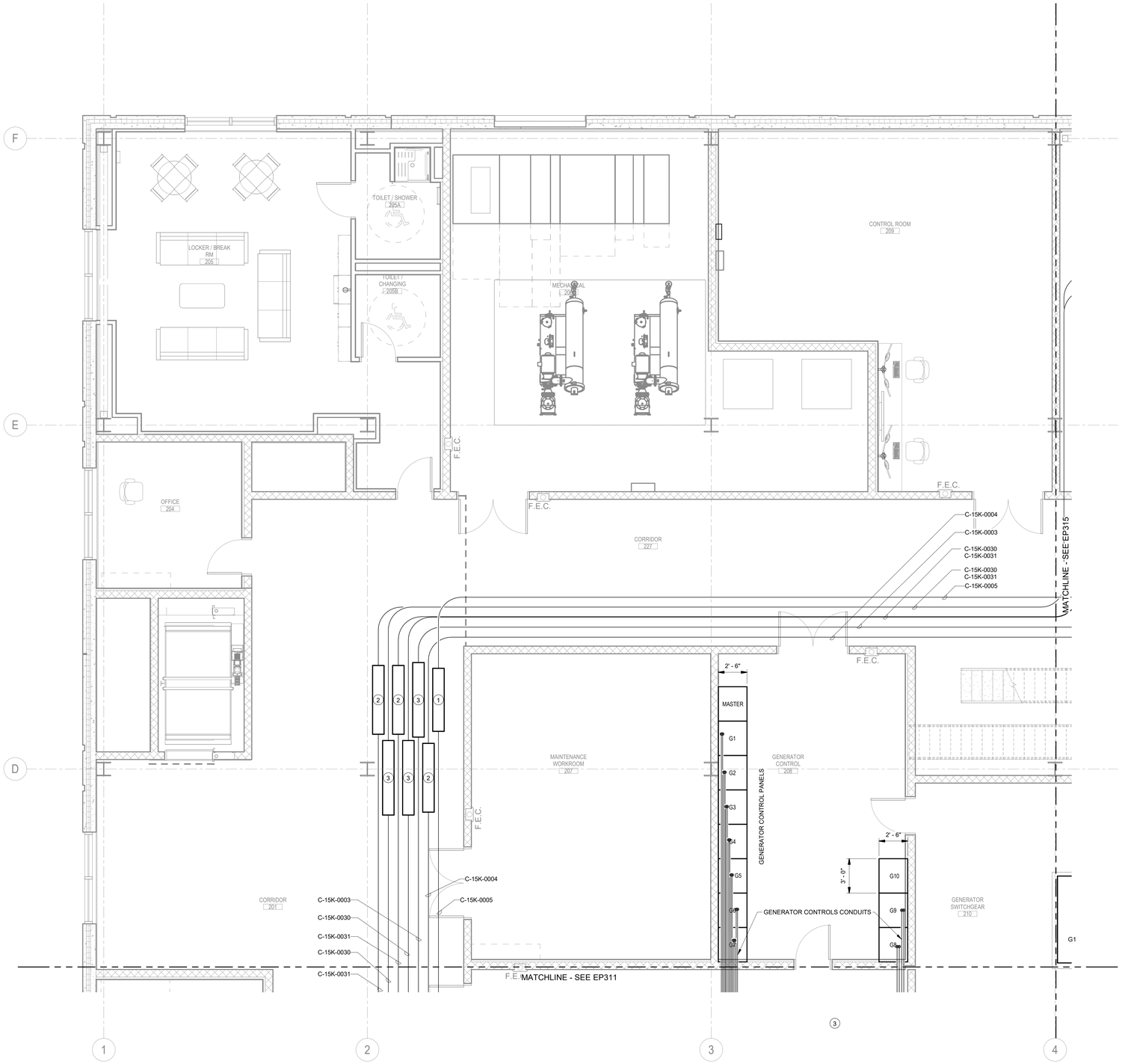
SHEET TITLE

SECOND FLOOR 13,200V POWER PLAN - AREA C

SHEET NUMBER

EP313

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:34 PM AESI Proj. No: 21-154



SECOND FLOOR 13,200V POWER PLAN - AREA D

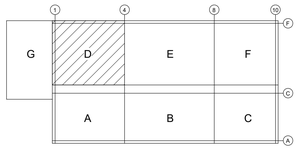
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE MEDIUM VOLTAGE PULL BOX. 5'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
2. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-0" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
3. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.



KEY PLAN
SCALE: NONE

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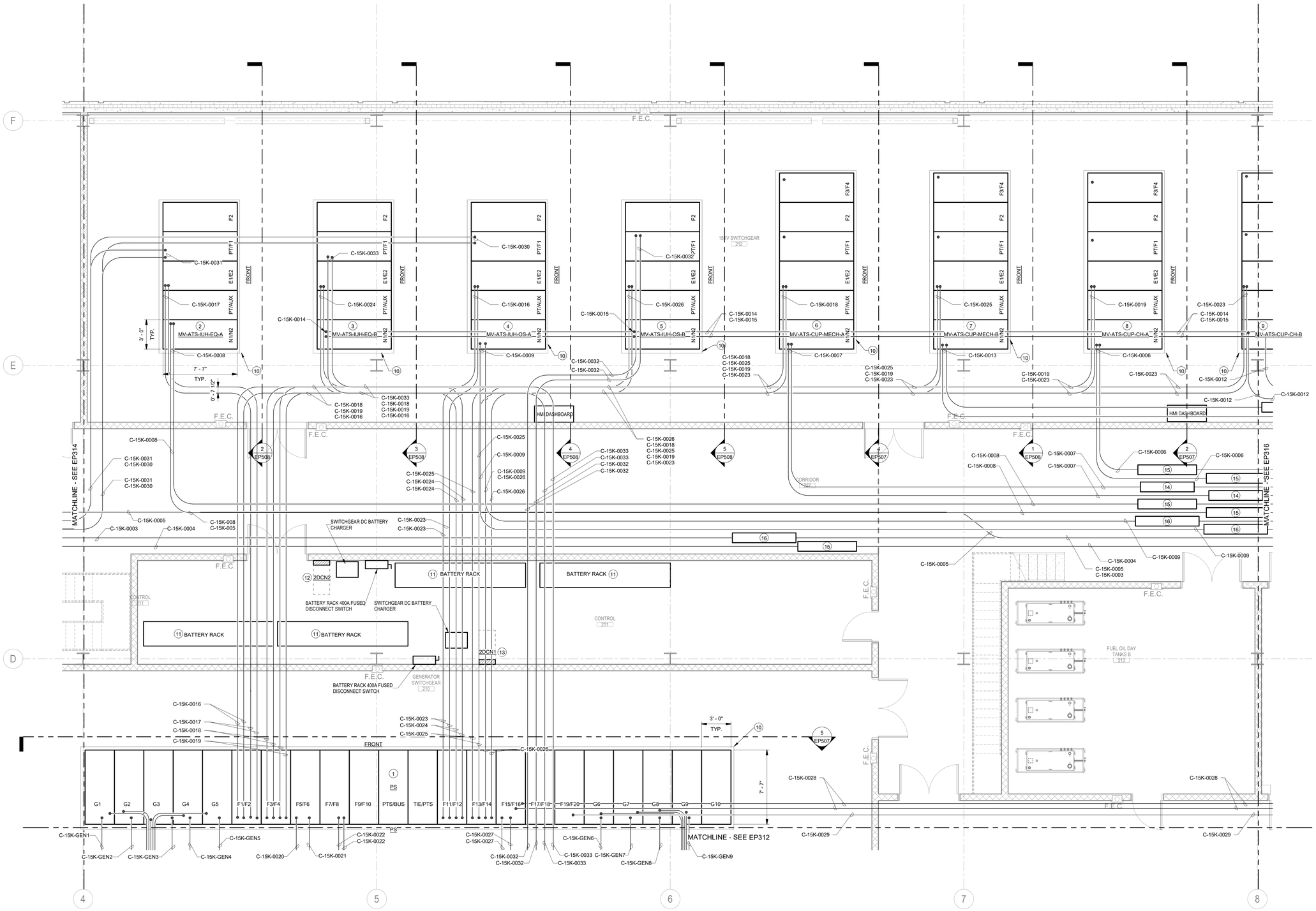
SHEET TITLE

SECOND FLOOR 13,200V POWER PLAN - AREA D

SHEET NUMBER

EP314

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:09 PM AESI Proj. No: 21-154



SECOND FLOOR 13,200V POWER PLAN - AREA E

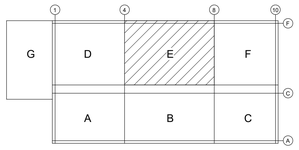
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. INSTALL PRIMARY SWITCHGEAR PS. SEE EP505 AND EP704 FOR DETAILS.
2. INSTALL MEDIUM VOLTAGE ATS MV-ATS-IUH-EQ-A. SEE EP505 AND EP703 FOR DETAILS.
3. INSTALL MEDIUM VOLTAGE ATS MV-ATS-IUH-EQ-B. SEE EP505 AND EP703 FOR DETAILS.
4. INSTALL MEDIUM VOLTAGE ATS MV-ATS-IUH-OS-A. SEE EP505 AND EP703 FOR DETAILS.
5. INSTALL MEDIUM VOLTAGE ATS MV-ATS-IUH-OS-B. SEE EP505 AND EP703 FOR DETAILS.
6. INSTALL MEDIUM VOLTAGE ATS MV-ATS-IUH-MECH-A. SEE EP505 AND EP703 FOR DETAILS.
7. INSTALL MEDIUM VOLTAGE ATS MV-ATS-CUP-MECH-B. SEE EP505 AND EP703 FOR DETAILS.
8. INSTALL MEDIUM VOLTAGE ATS MV-ATS-CUP-CH-A. SEE EP505 AND EP703 FOR DETAILS
9. INSTALL MEDIUM VOLTAGE ATS MV-ATS-CUP-CH-B. SEE EP505 AND EP703 FOR DETAILS.
10. PROVIDE 4" HOUSEKEEPING PAD. SEE STRUCTURAL DRAWINGS FOR DETAILS.
11. INSTALL DC BATTERY SYSTEM FOR SWITCHGEAR POWER. SEE DETAILS ON EP703.
12. PROVIDE DC PANELBOARD 2DCN1.
13. PROVIDE DC PANELBOARD 2DCN2.
14. PROVIDE MEDIUM VOLTAGE PULL BOX. 5'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
15. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-0" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
16. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.



KEY PLAN
SCALE: NONE

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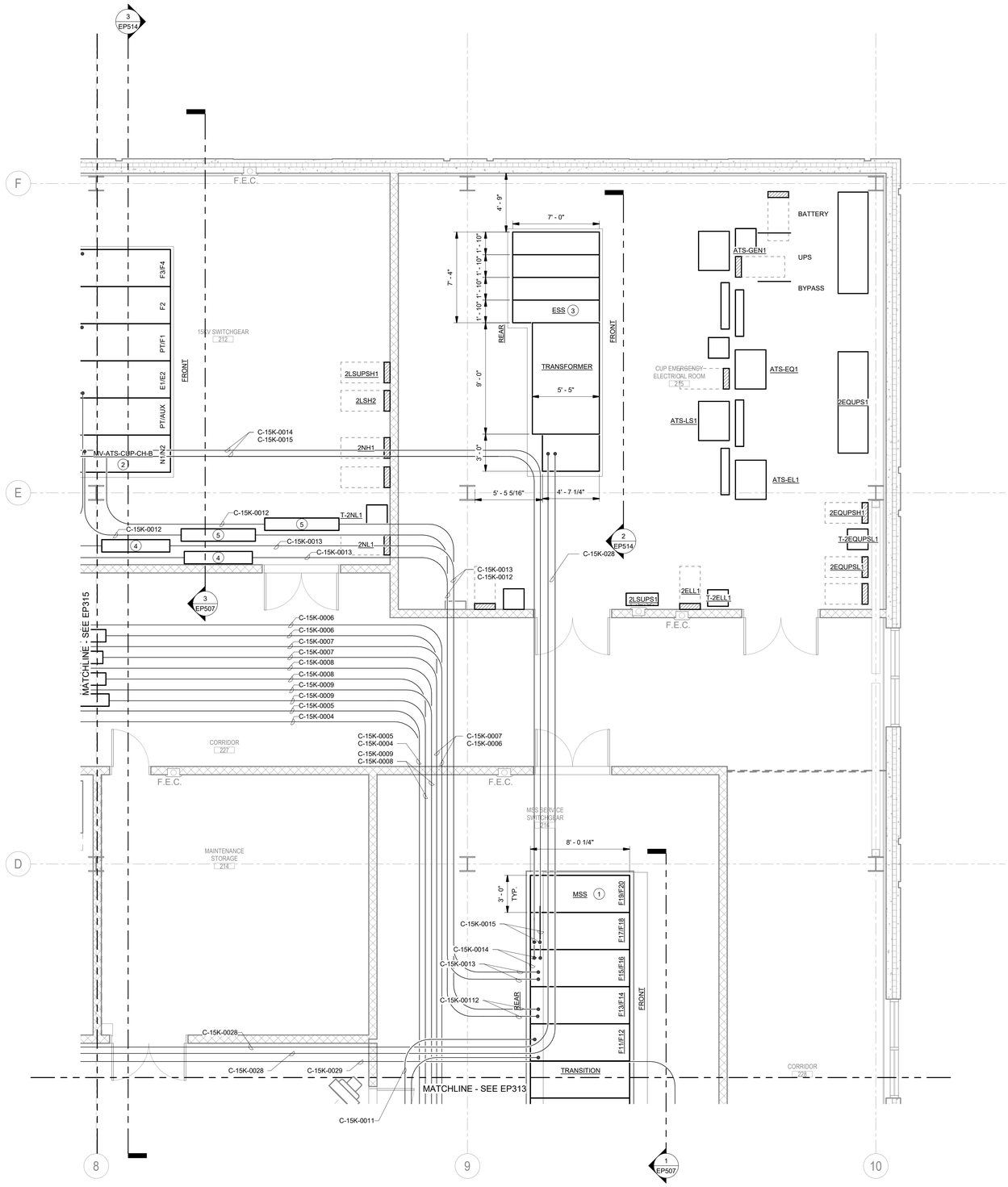
SHEET TITLE

SECOND FLOOR 13,200V POWER PLAN - AREA E

SHEET NUMBER

EP315

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:18 PM AESI Proj. No: 21-154



SECOND FLOOR 13,200V POWER PLAN - AREA F

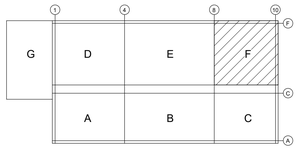
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. SEE DRAWING EP313 FOR CONTINUATION ON MSS.
2. SEE DRAWING EP315 FOR CONTINUATION ON MC-ATS-CUP-CH-B.
3. INSTALL EMERGENCY SERVICE SWITCHGEAR ESS. SEE EP504 AND EP708 FOR DETAILS.
4. PROVIDE MEDIUM VOLTAGE PULL BOX. 5'-6" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.
5. PROVIDE MEDIUM VOLTAGE PULL BOX. 6'-0" X 1'-0" X 1'-0", NEMA 1, BOLTED COVER FACING DOWN.



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
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DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

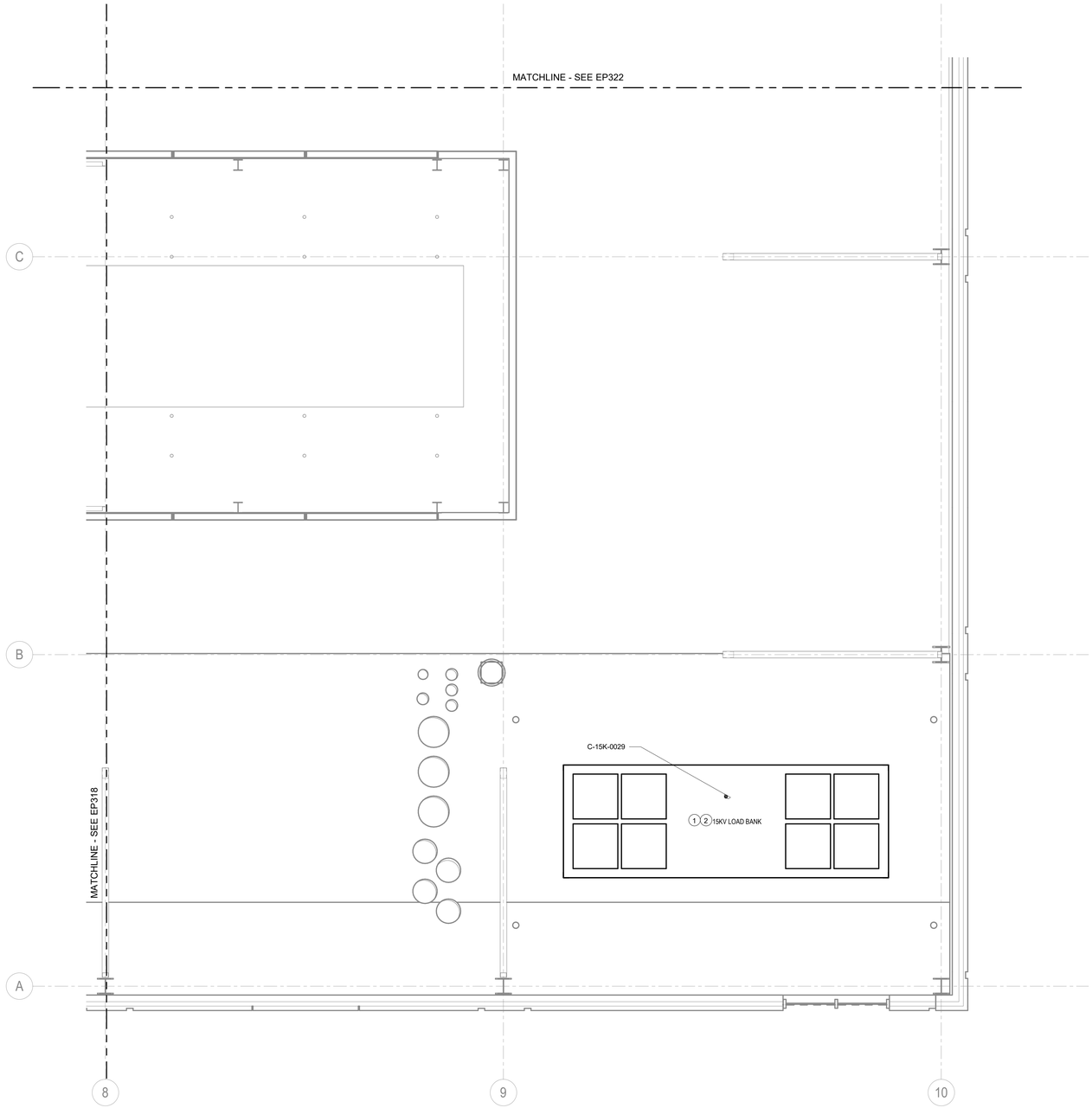
SHEET TITLE

SECOND FLOOR 13,200V POWER PLAN - AREA F

SHEET NUMBER

EP316

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:21 PM AESI Proj. No: 21-154



ROOF 13,200V POWER PLAN - AREA C

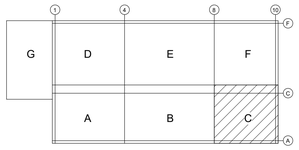
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. INSTALL 15KV LOAD BANK. PROVIDE MEDIUM VOLTAGE CABLE AND TERMINATIONS AT LOAD BANK. COORDINATE EXACT TERMINATION POINT WITH LOAD BANK SUBMITTALS.
2. 3MW, 13.2KV LOAD BANK, TRANSFORMER-LESS TYPE WITH 480V CONTROL/FAN PANEL.



KEY PLAN
SCALE: NONE

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SHEET TITLE

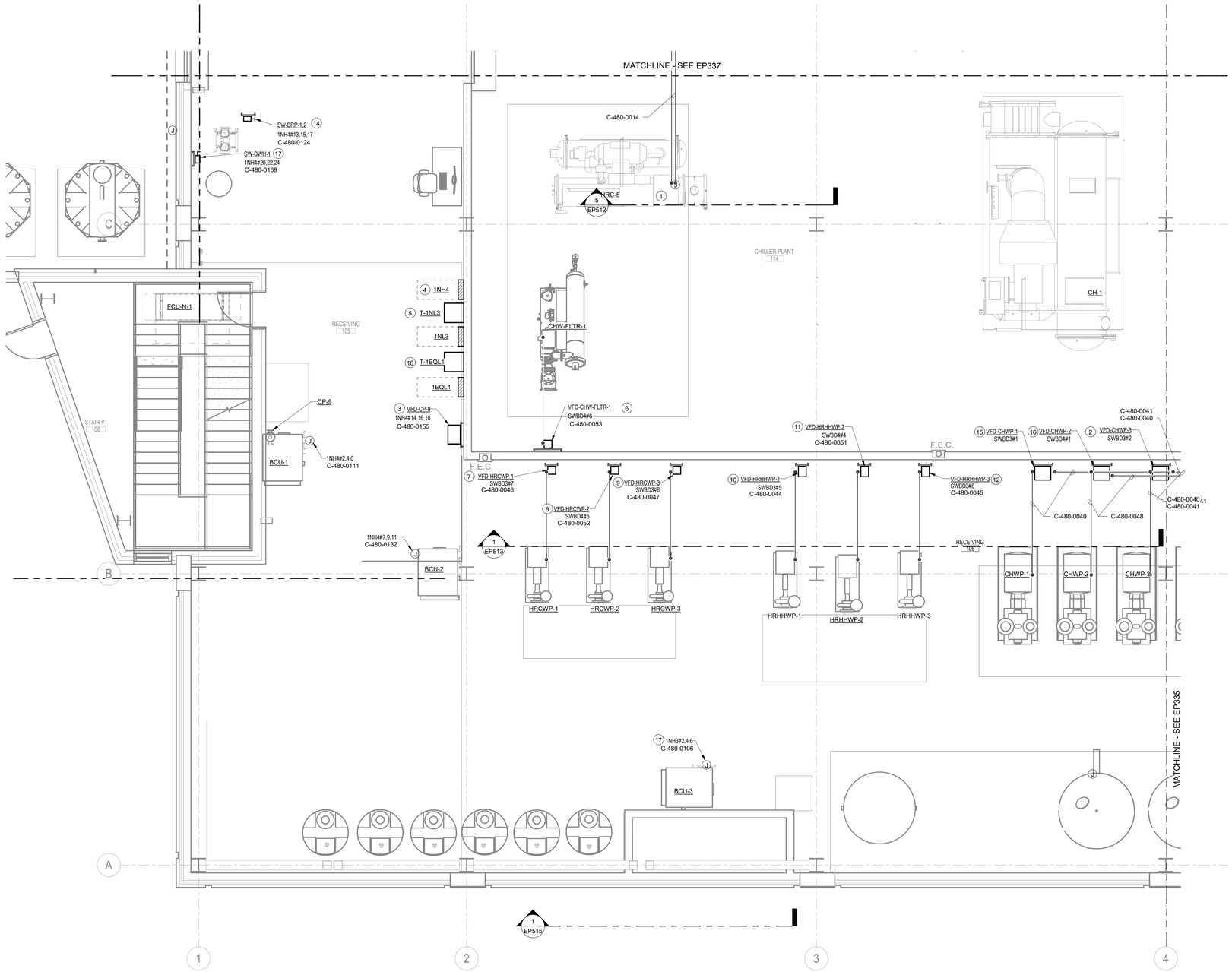
ROOF 13,200V POWER PLAN - AREA C

SHEET NUMBER

EP319

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:27 PM AESI Proj. No: 21-154



FIRST FLOOR 480V POWER PLAN - AREA A

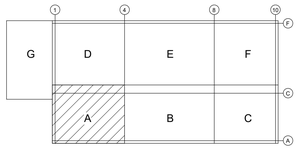
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION FOR HRC-5.
2. PROVIDE VFD-CHWP-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
3. PROVIDE VFD-CP-9. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
4. PROVIDE 1NH4. SEE SCHEDULE ON EP602 FOR DETAILS.
5. PROVIDE T-1NL3. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 1NL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
6. PROVIDE VFD-CHW-SS-FLTR-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
7. PROVIDE VFD-HRCWP-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
8. PROVIDE VFD-HRCWP-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
9. PROVIDE VFD-HRCWP-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
10. PROVIDE VFD-HRHHWP-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
11. PROVIDE VFD-HRHHWP-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
12. PROVIDE VFD-HRHHWP-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
13. PROVIDE ELECTRICAL CONNECTION FOR DBP-2 SKID CONTROL PANEL.
14. PROVIDE SW-BRP-1,2. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK +54"AFF.
15. PROVIDE VFD-CHWP-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
16. PROVIDE VFD-CHWP-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
17. PROVIDE SW-DWH-1. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK +54"AFF.
18. PROVIDE T-1EQL1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 1EQL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.



KEY PLAN
SCALE: NONE

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

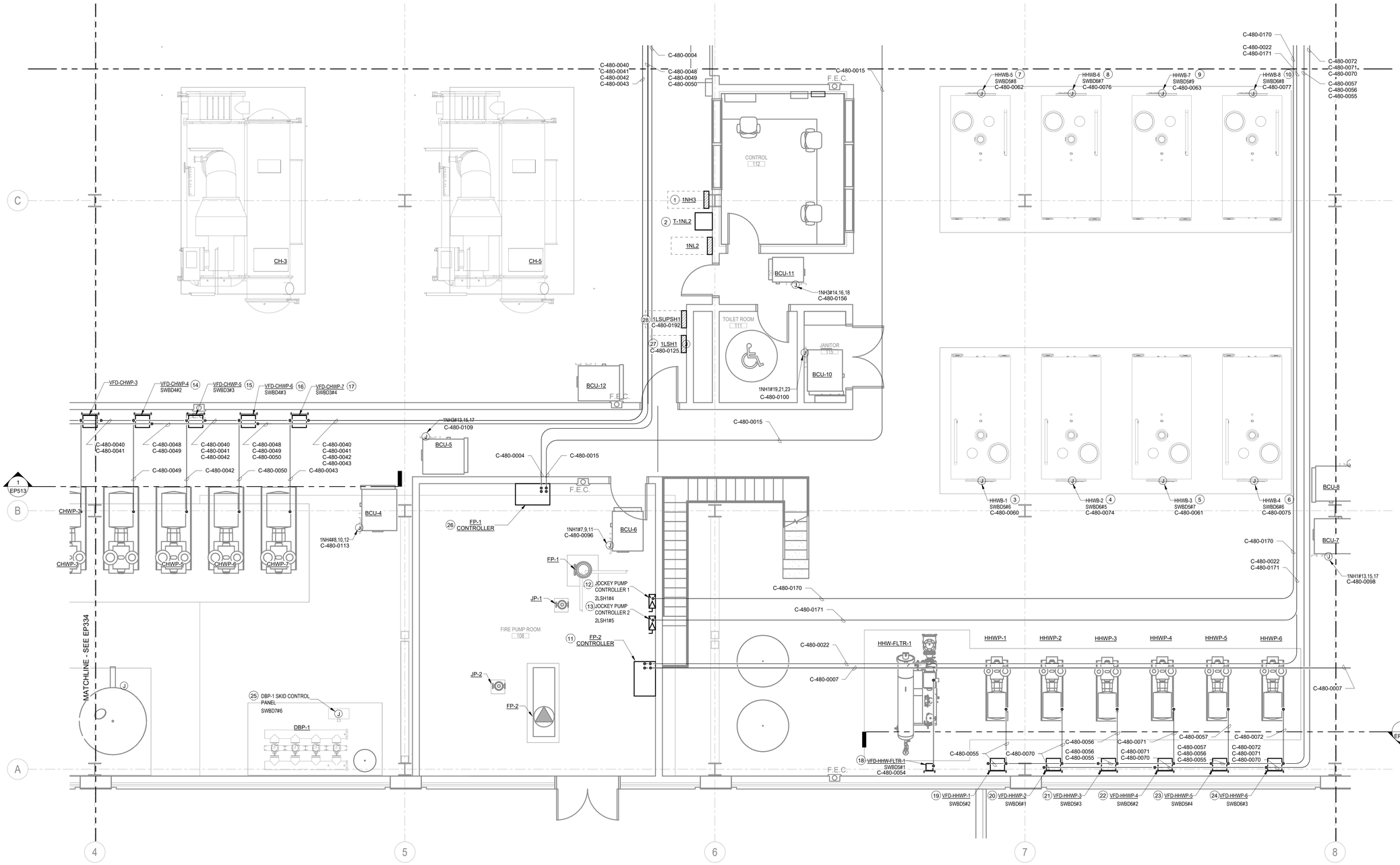
SHEET TITLE

FIRST FLOOR 480V POWER PLAN - AREA A

SHEET NUMBER

EP334

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:40 PM AESI Proj. No: 21-154



FIRST FLOOR 480V POWER PLAN - AREA B

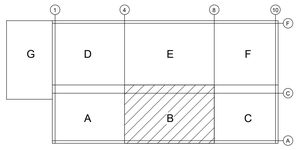
Scale: 1/4" = 1'-0"

PLAN NOTES:

1. PROVIDE 1NH3. SEE SCHEDULE ON EP602 FOR DETAILS.
2. PROVIDE T-1NL2. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 1NL2. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
3. PROVIDE ELECTRICAL CONNECTION FOR HHWB-1.
4. PROVIDE ELECTRICAL CONNECTION FOR HHWB-2.
5. PROVIDE ELECTRICAL CONNECTION FOR HHWB-3.
6. PROVIDE ELECTRICAL CONNECTION FOR HHWB-4.
7. PROVIDE ELECTRICAL CONNECTION FOR HHWB-5.
8. PROVIDE ELECTRICAL CONNECTION FOR HHWB-6.
9. PROVIDE ELECTRICAL CONNECTION FOR HHWB-7.
10. PROVIDE ELECTRICAL CONNECTION FOR HHWB-8.
11. PROVIDE FP-2 CONTROL PANEL/ATS. SEE MECHANICAL DRAWINGS FOR DETAILS.
12. PROVIDE JP-1 CONTROL PANEL/ATS. SEE MECHANICAL DRAWINGS FOR DETAILS.
13. PROVIDE JP-2 CONTROL PANEL/ATS. SEE MECHANICAL DRAWINGS FOR DETAILS.
14. PROVIDE VFD-CHWP-4. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
15. PROVIDE VFD-CHWP-5. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
16. PROVIDE VFD-CHWP-6. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
17. PROVIDE VFD-CHWP-7. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
18. PROVIDE VFD-HHW-FLTR-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
19. PROVIDE VFD-HHWP-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
20. PROVIDE VFD-HHWP-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
21. PROVIDE VFD-HHWP-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
22. PROVIDE VFD-HHWP-4. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
23. PROVIDE VFD-HHWP-5. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
24. PROVIDE VFD-HHWP-6. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
25. PROVIDE ELECTRICAL CONNECTION FOR DBP-1 SKID CONTROL PANEL.
26. PROVIDE FP-1 CONTROL PANEL/ATS. SEE MECHANICAL DRAWINGS FOR DETAILS.
27. PROVIDE 1LSH1. SEE SCHEDULE ON EL602.
28. PROVIDE 1LSUPSH1. SEE SCHEDULE ON EL602.

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.



KEY PLAN
SCALE: NONE

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

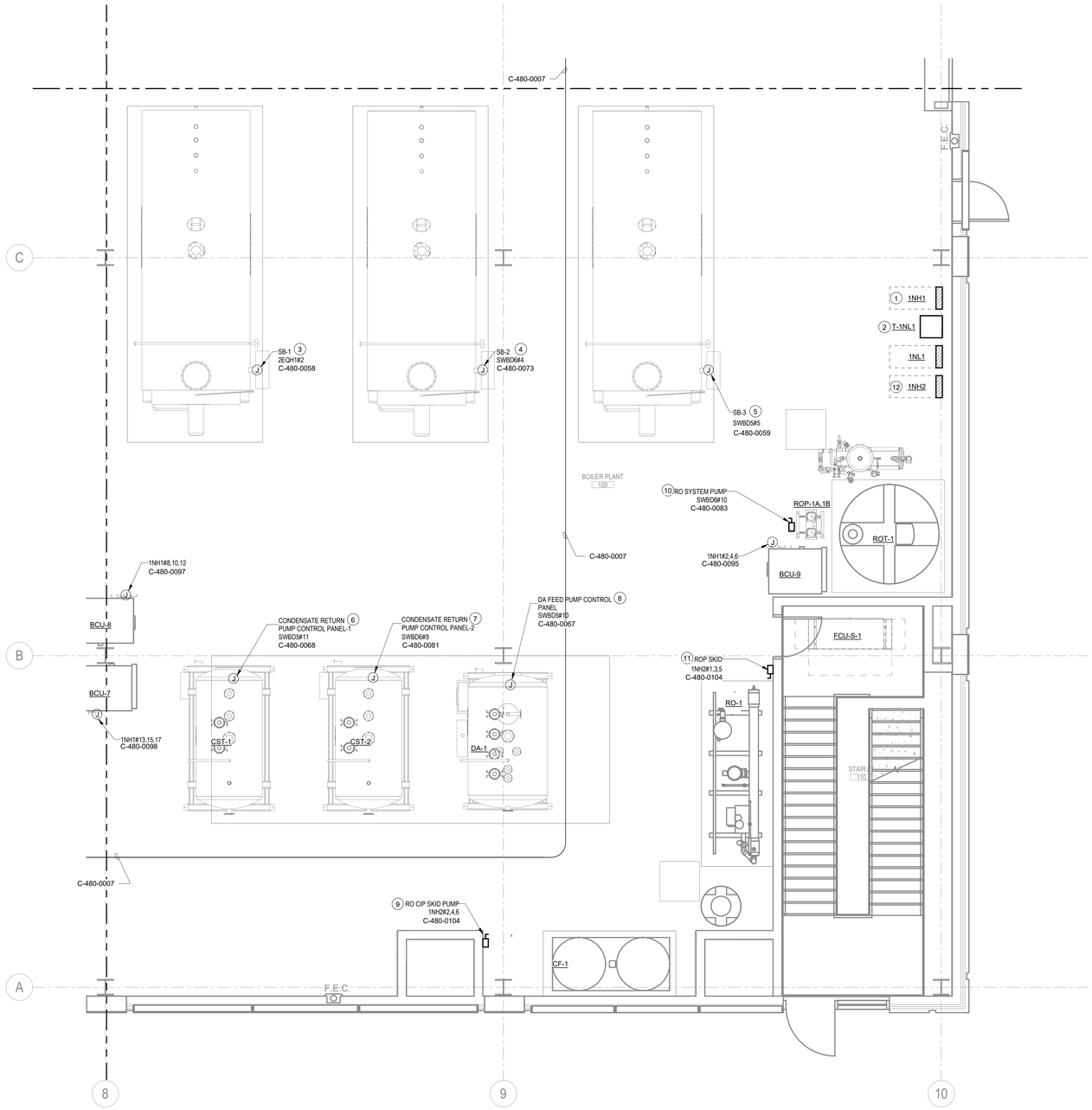
SHEET TITLE

FIRST FLOOR 480V POWER PLAN - AREA B

SHEET NUMBER

EP335

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:49 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR 480V POWER PLAN - AREA C

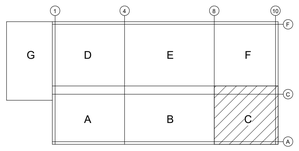
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE 1NH1. SEE SCHEDULE ON EP602 FOR DETAILS.
2. PROVIDE T-1NL1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 1NL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
3. PROVIDE ELECTRICAL CONNECTION FOR SB-1.
4. PROVIDE ELECTRICAL CONNECTION FOR SB-2.
5. PROVIDE ELECTRICAL CONNECTION FOR SB-3.
6. PROVIDE ELECTRICAL CONNECTION FOR CONDENSATE RETURN PUMP CONTROL PANEL 1.
7. PROVIDE ELECTRICAL CONNECTION FOR CONDENSATE RETURN PUMP CONTROL PANEL 2.
8. PROVIDE ELECTRICAL CONNECTION FOR DA FEED PUMP CONTROL PANEL.
9. PROVIDE SW-RO-CIP-PUMP SKID. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK AT +54"AFF.
10. PROVIDE SW-RO-SYSTEM PUMP. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK AT +54"AFF.
11. PROVIDE SW-ROP SKID. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK AT +54"AFF.
12. PROVIDE 1NH2. SEE SCHEDULE ON EP602 FOR DETAILS.



KEY PLAN

SCALE: NONE

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PROJECT NO.: 21-154	

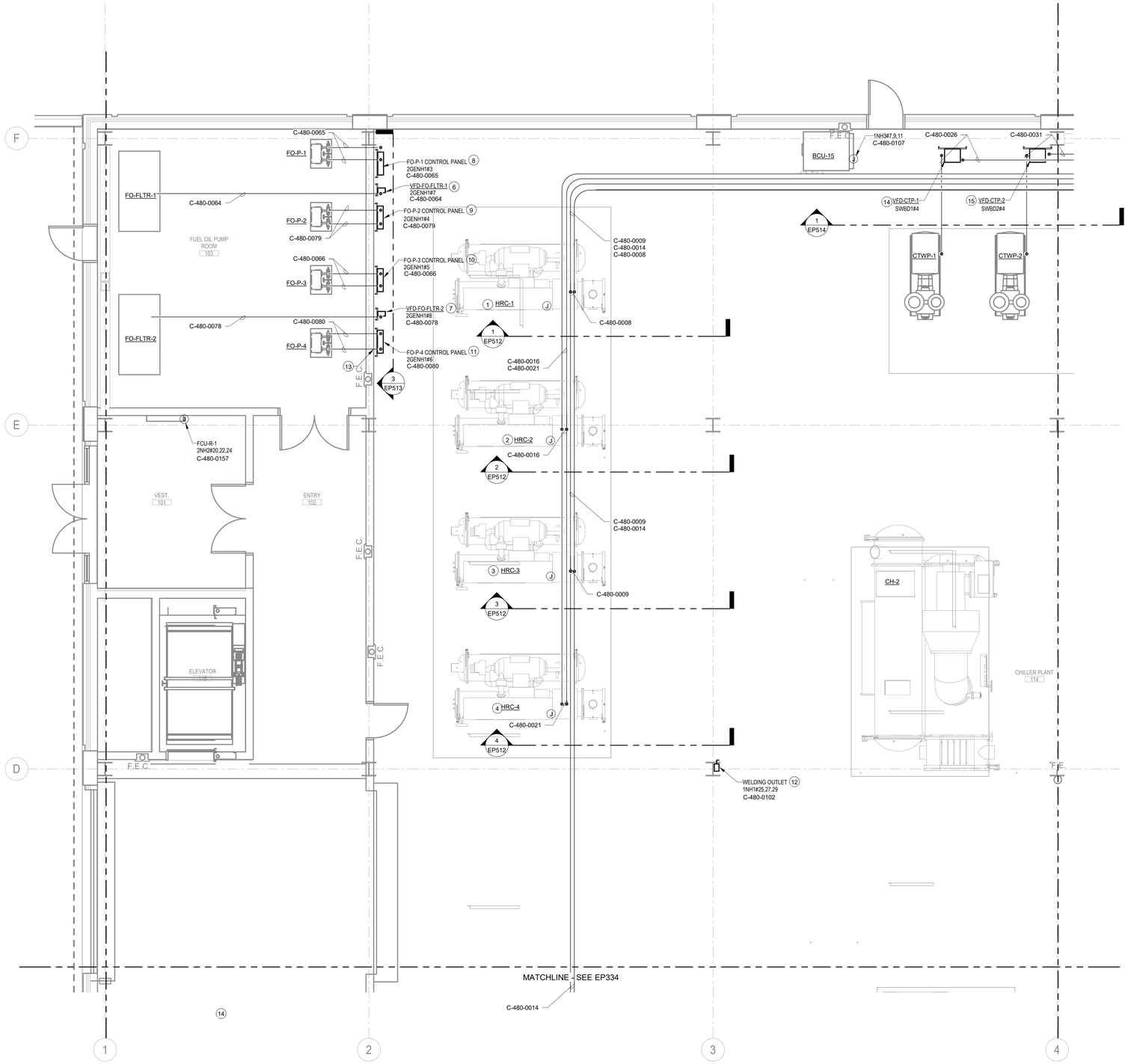
SHEET TITLE

FIRST FLOOR 480V POWER PLAN - AREA C

SHEET NUMBER

EP336

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:57:58 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR 480V POWER PLAN - AREA D

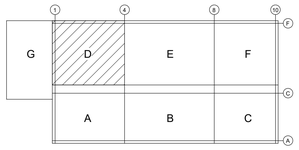
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION FOR HRC-1.
2. PROVIDE ELECTRICAL CONNECTION FOR HRC-2.
3. PROVIDE ELECTRICAL CONNECTION FOR HRC-3.
4. PROVIDE ELECTRICAL CONNECTION FOR HRC-4.
5. NOT USED.
6. PROVIDE VFD-FO-FILTER-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
7. PROVIDE VFD-FO-FILTER-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
8. PROVIDE ELECTRICAL CONNECTION FOR FO-P-1-CONTROL PANEL.
9. PROVIDE ELECTRICAL CONNECTION FOR FO-P-2-CONTROL PANEL.
10. PROVIDE ELECTRICAL CONNECTION FOR FO-P-3-CONTROL PANEL.
11. PROVIDE ELECTRICAL CONNECTION FOR FO-P-4-CONTROL PANEL.
12. PROVIDE WELDING OUTLET. MOUNT TO COLUMN AT +54"AFF.
13. PROVIDE CONDUIT SEAL OFF WITHIN 1'-0" OF PENETRATION THROUGH WALL TO FUEL OIL PUMP ROOM 103. TYPICAL FOR ALL CONDUIT PENETRATIONS.
14. PROVIDE VFD-CTP-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
15. PROVIDE VFD-CTP-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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PROJECT NO.: 21-154	

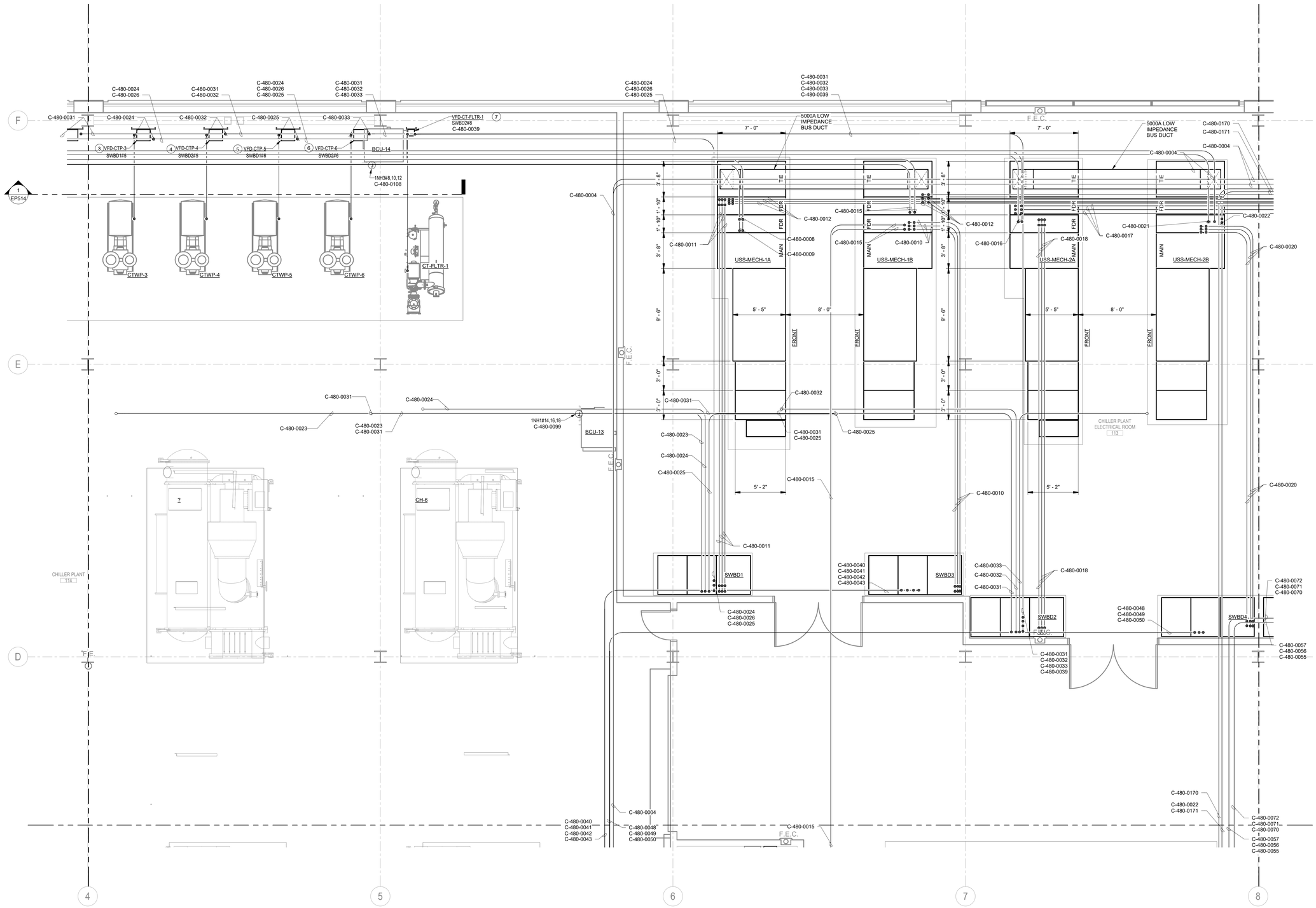
SHEET TITLE

FIRST FLOOR 480V POWER PLAN - AREA D

SHEET NUMBER

EP337

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:03 PM AESI Proj No: 21-154



FIRST FLOOR 480V POWER PLAN - AREA E

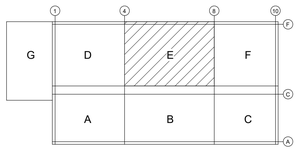
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. NONE.
2. NONE.
3. PROVIDE VFD-CTP-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
4. PROVIDE VFD-CTP-4. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
5. PROVIDE VFD-CTP-5. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
6. PROVIDE VFD-CTP-6. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
7. PROVIDE VFD-CTP-FILTER. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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REVISIONS

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PROJECT NO. 21-154	

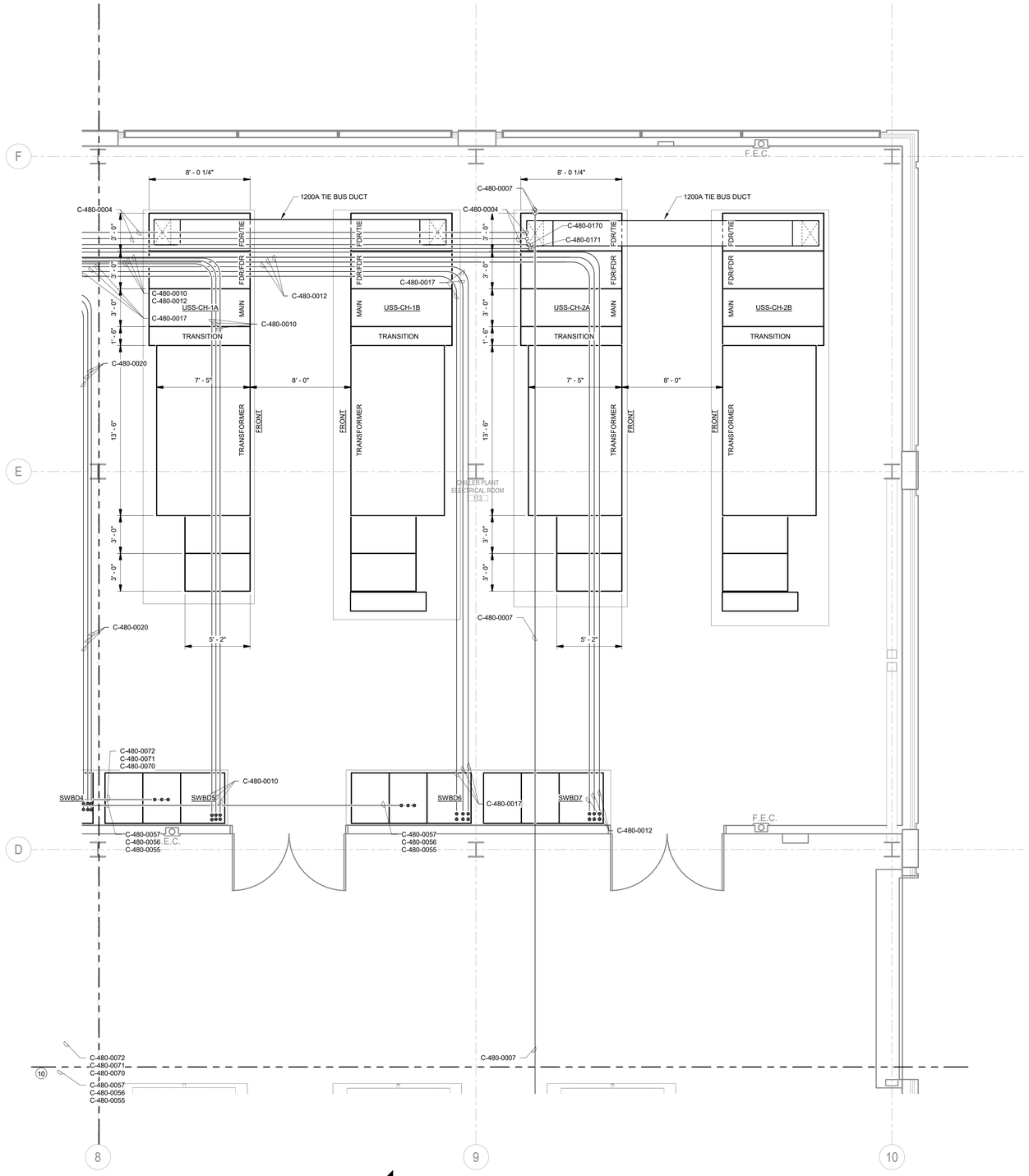
SHEET TITLE

FIRST FLOOR 480V POWER PLAN - AREA E

SHEET NUMBER

EP338

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:08 PM AESI Proj. No: 21-154



FIRST FLOOR 480V POWER PLAN - AREA F

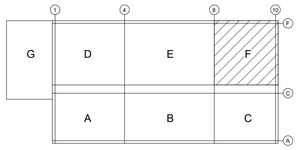
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. NOT USED.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

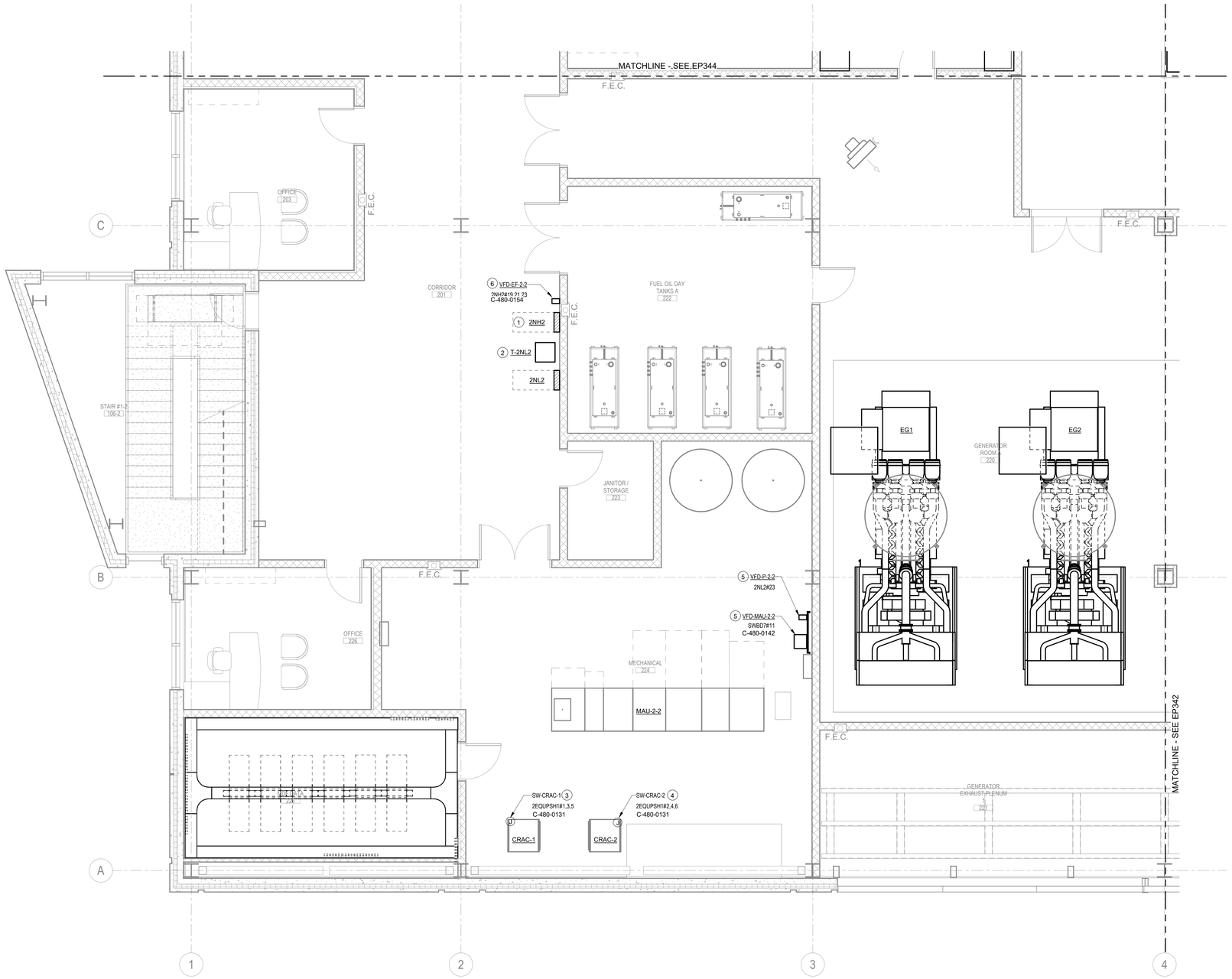
SHEET TITLE

FIRST FLOOR 480V POWER PLAN - AREA F

SHEET NUMBER

EP339

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:11 PM AESI Proj. No: 21-154



SECOND FLOOR 480V POWER PLAN - AREA A

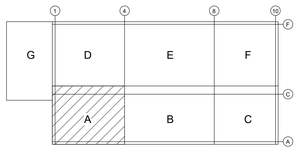
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE 2NH2. SEE SCHEDULE ON EP602 FOR DETAILS.
2. PROVIDE T-2NL2. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 2NL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
3. PROVIDE SW-CRAC-1. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK +54"AFF.
4. PROVIDE SW-CRAC-2. 30A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK +54"AFF.
5. PROVIDE VFD-MAU-2-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
6. PROVIDE VFD-EF-2-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
7. PROVIDE UH-1 SWITCH. 120V, 1 POLE, MOTOR RATED, LOCKING, NEMA 1.
8. PROVIDE VFD-EF-2-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
9. PROVIDE VFD-P-2-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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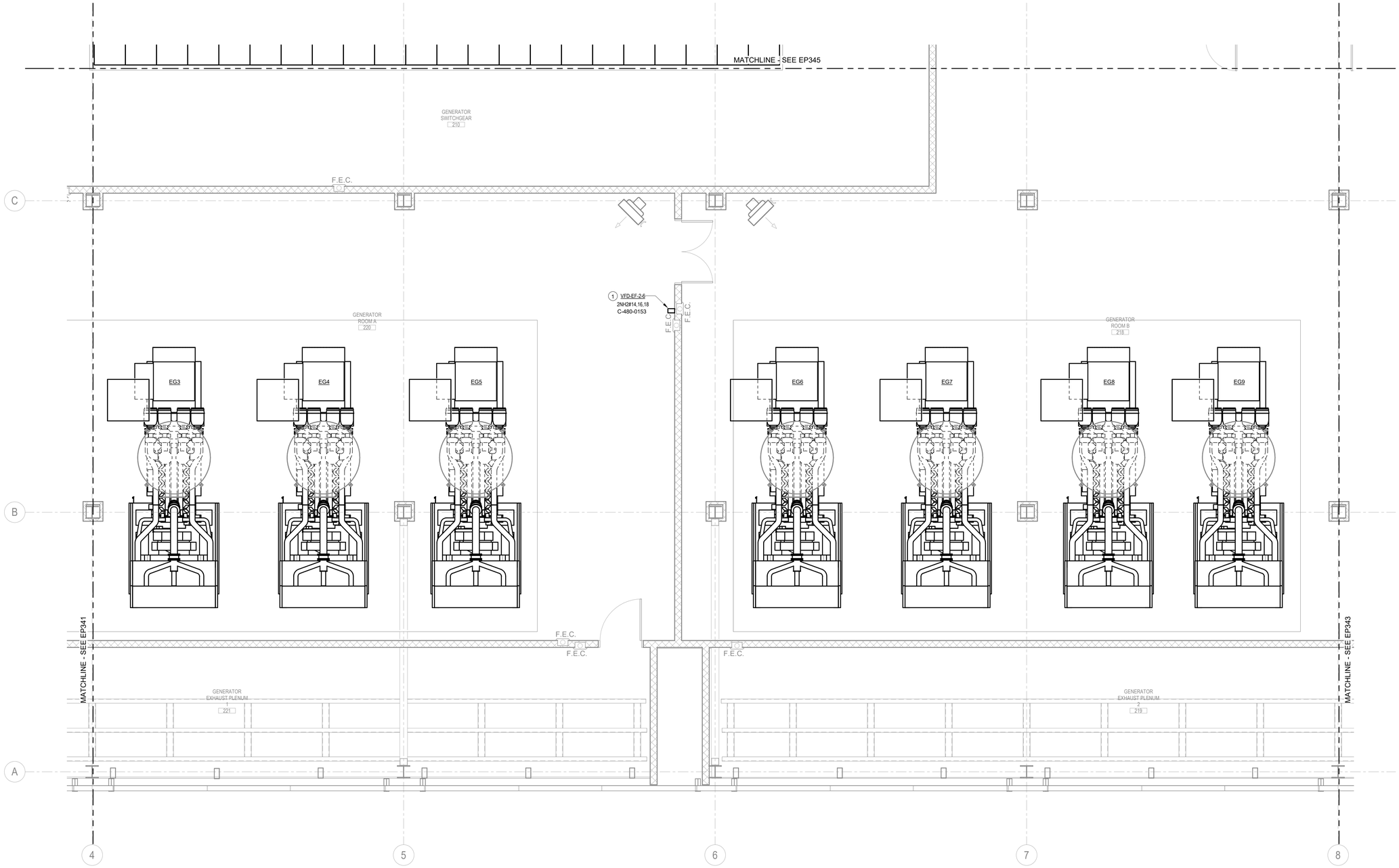
SHEET TITLE

SECOND FLOOR 480V POWER PLAN - AREA A

SHEET NUMBER

EP341

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:23 PM AESI Proj. No: 21-154



SECOND FLOOR 480V POWER PLAN - AREA B

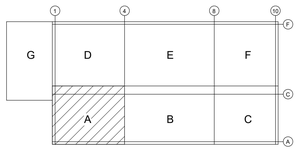
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE VFD-EF-2-6. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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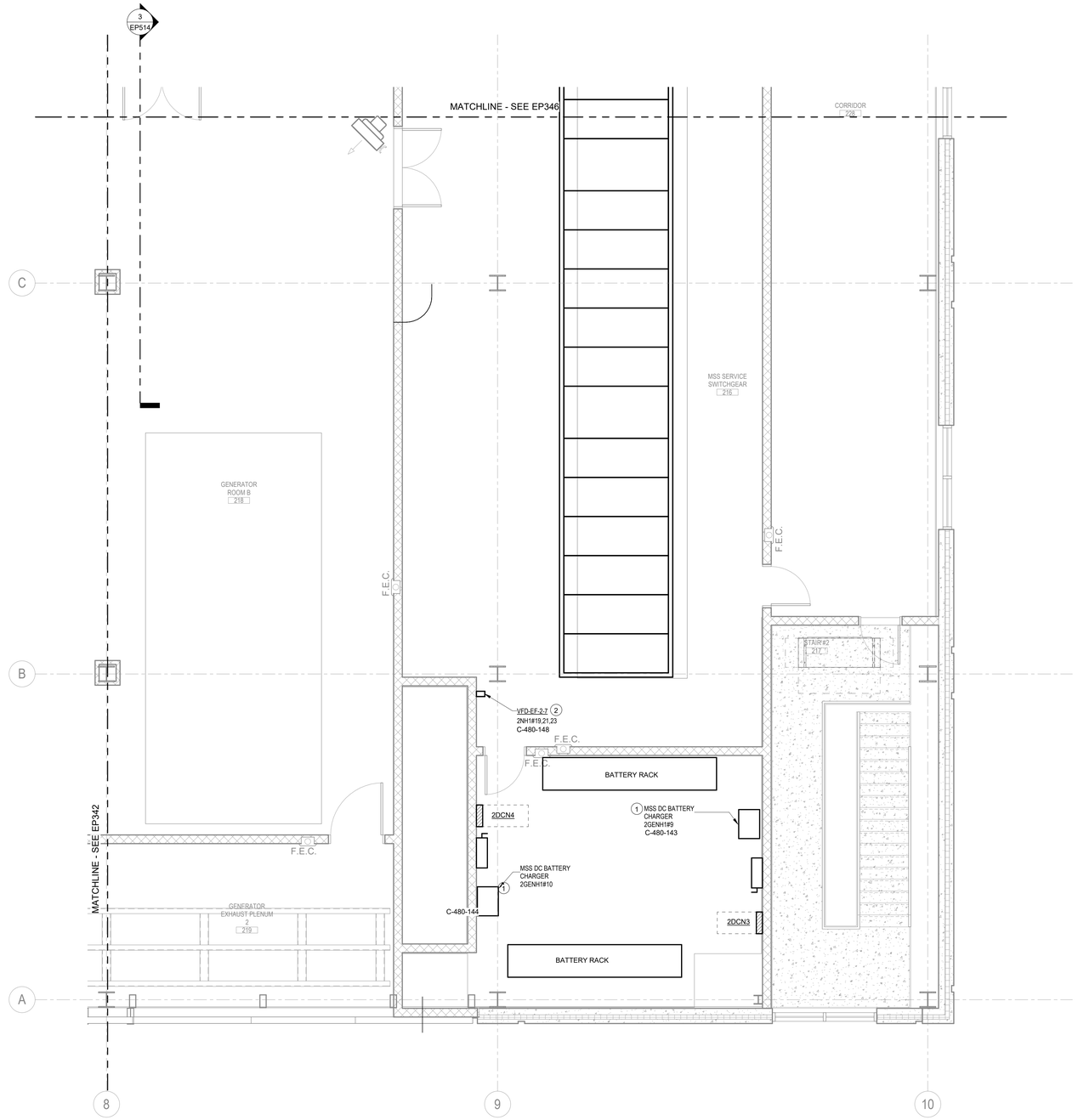
SHEET TITLE

SECOND FLOOR 480V POWER PLAN - AREA B

SHEET NUMBER

EP342

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:27 PM AESI Proj. No: 21-154



SECOND FLOOR 480V POWER PLAN - AREA C

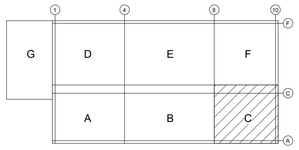
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE (2) DC BATTERY CHARGERS FOR MSS.
2. PROVIDE VFD-EF-2-7. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:29 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

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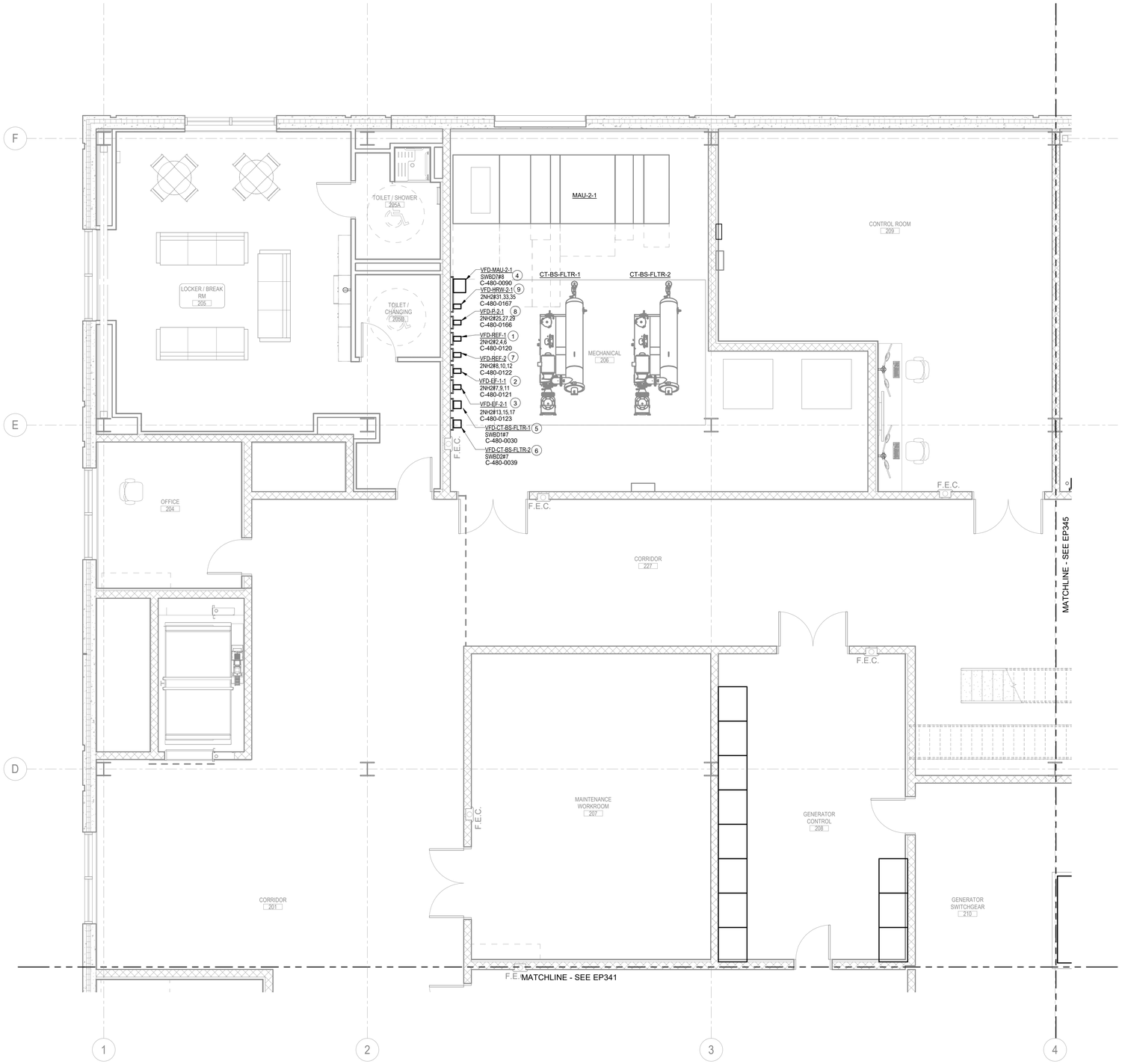
SHEET TITLE

SECOND FLOOR 480V POWER PLAN - AREA C

SHEET NUMBER

EP343



SECOND FLOOR 480V POWER PLAN - AREA D

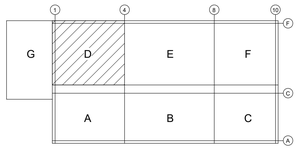
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE VFD-REF-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
2. PROVIDE VFD-EF-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
3. PROVIDE VFD-EF-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
4. PROVIDE MAU-2-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
5. PROVIDE VFD-CT-BASIN-SWPR-FLTR-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
6. PROVIDE VFD-CT-BASIN-SWPR-FLTR-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
7. PROVIDE VFD-REF-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
8. PROVIDE VFD-P-2-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
9. PROVIDE VFD-HRW-2-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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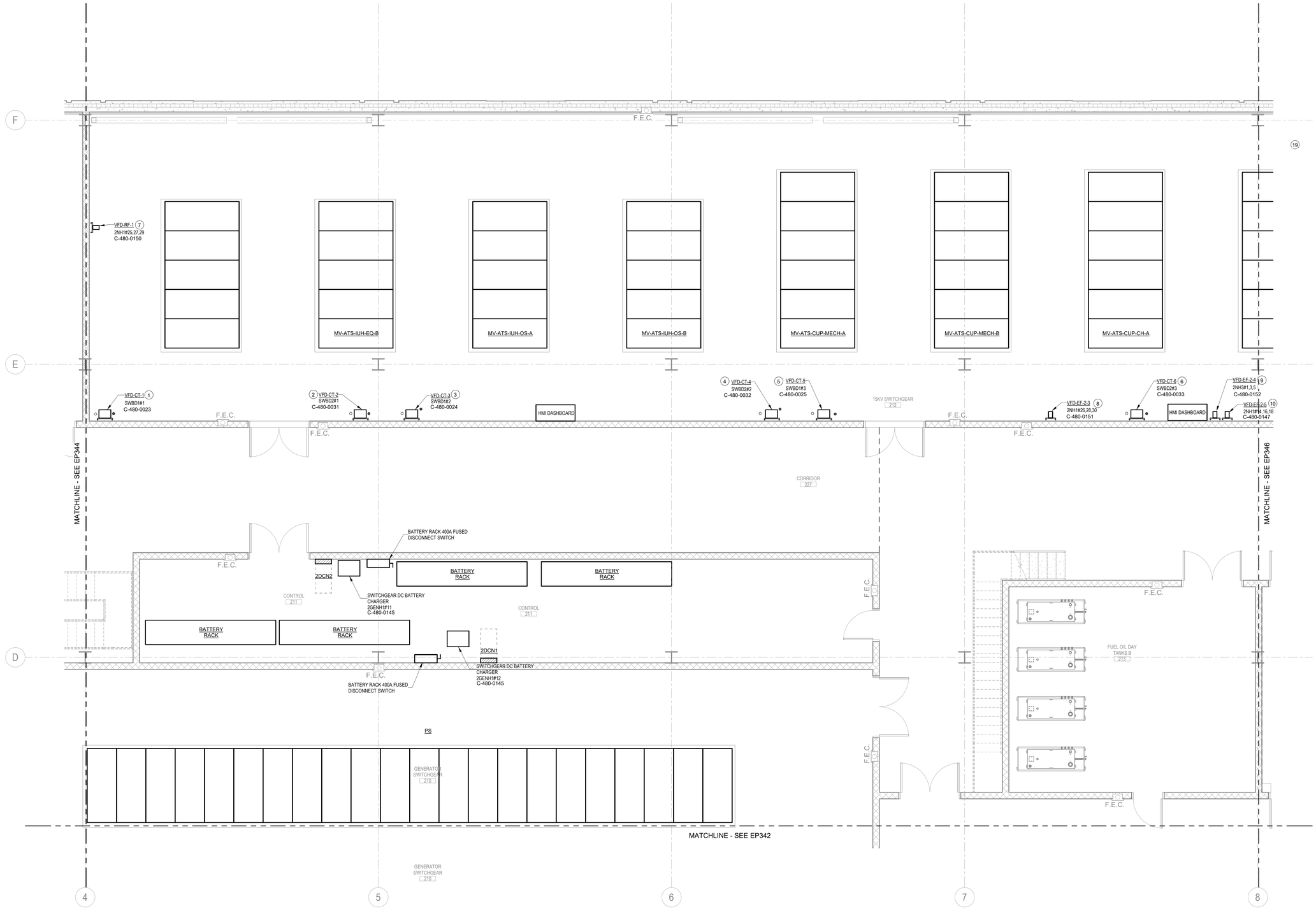
SHEET TITLE

SECOND FLOOR 480V POWER PLAN - AREA D

SHEET NUMBER

EP344

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:34 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR 480V POWER PLAN - AREA E

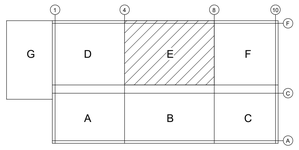
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE VFD-CT-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
2. PROVIDE VFD-CT-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
3. PROVIDE VFD-CT-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
4. PROVIDE VFD-CT-4. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
5. PROVIDE VFD-CT-5. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
6. PROVIDE VFD-CT-6. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
7. PROVIDE VFD-RF-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
8. PROVIDE VFD-EF-2-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
9. PROVIDE VFD-EF-2-4. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
10. PROVIDE VFD-EF-2-5. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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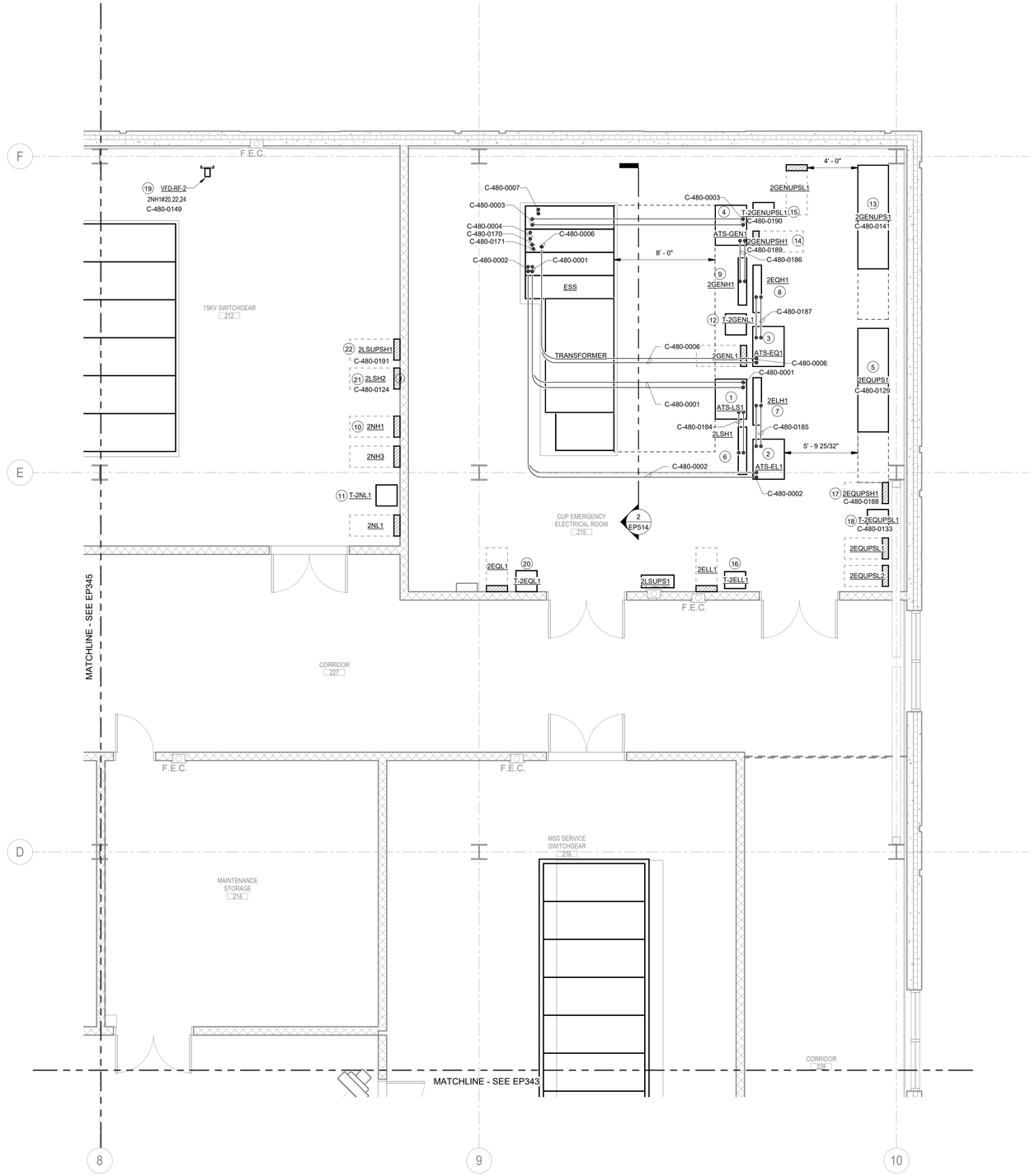
SHEET TITLE

SECOND FLOOR 480V POWER PLAN - AREA E

SHEET NUMBER

EP345

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:42 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR 480V POWER PLAN - AREA F

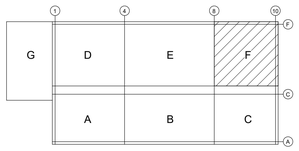
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ATS-LS1. SEE SCHEDULE ON EP601 FOR DETAILS.
2. PROVIDE ATS-EL1. SEE SCHEDULE ON EP601 FOR DETAILS.
3. PROVIDE ATS-EQ1. SEE SCHEDULE ON EP601 FOR DETAILS.
4. PROVIDE ATS-GEN1. SEE SCHEDULE ON EP601 FOR DETAILS.
5. PROVIDE 2EQUPS1. SEE SCHEDULE ON EP601.
6. PROVIDE 2LSH1. SEE SCHEDULE ON EP605.
7. PROVIDE 2ELH1. SEE SCHEDULE ON EP604.
8. PROVIDE 2EQH1. SEE SCHEDULE ON EP604.
9. PROVIDE 2GENH1. SEE SCHEDULE ON EP605.
10. PROVIDE 2NH1. SEE SCHEDULE ON EP602.
11. PROVIDE TRANSFORMER T-2LN1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 2LNL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
12. PROVIDE TRANSFORMER T-GENL1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 2GENL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
13. PROVIDE 2GENUPS1. SEE SCHEDULE ON EP601.
14. PROVIDE 2GENUPSH1. SEE SCHEDULE ON EP605.
15. PROVIDE TRANSFORMER T-2GENUPSL1. 480V/208-120V, 75KVA.
16. PROVIDE T-2ELL1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 2ELL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
17. PROVIDE 2EQUPSH1. SEE SCHEDULE ON EP604.
18. PROVIDE TRANSFORMER T-2EQUPSL1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 2EQUPSL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
19. PROVIDE VFD-RF-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STAINLESS STEEL STRUT RACK AT +54"AFF.
20. PROVIDE T-2EQL1. 480V/208-120V, 75KVA. PROVIDE CIRCUIT TO 2EQL1. COPPER: (1)2"C, (4)#4/0 & (1)#4GND. ALLUMINUM: (1)2-1/2"C, (4)300KCMIL & (1)#4GND.
21. PROVIDE 2LSH2. SEE SCHEDULE ON EL602.
22. PROVIDE 2LSUPSH1. SEE SCHEDULE ON EL602.



KEY PLAN
SCALE: NONE

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

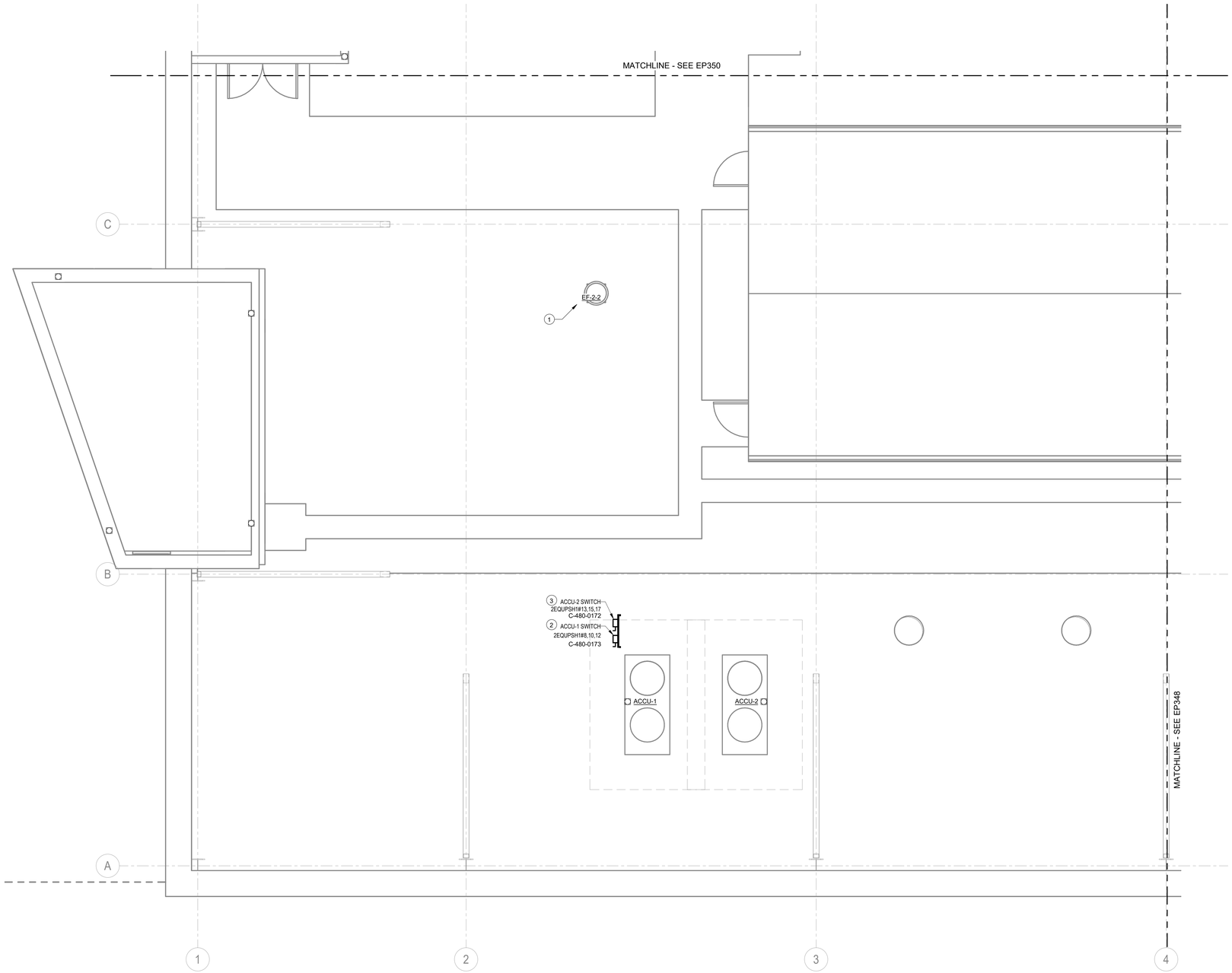
SHEET TITLE

SECOND FLOOR 480V POWER PLAN - AREA F

SHEET NUMBER

EP346

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:45 PM AESI Proj. No: 21-154



ROOF 480V POWER PLAN - AREA A

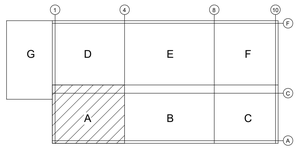
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION TO EF-2-2. VFD-EF-2-2 IS LOCATED IN CORRIDOR 201.
2. PROVIDE ACCU-1 SWITCH. 480V, 30A, 3 POLE, HEAVY DUTY, NEMA 4X. MOUNT ON STRUT RACK AT +54"AFF.
3. PROVIDE ACCU-2 SWITCH. 480V, 30A, 3 POLE, HEAVY DUTY, NEMA 4X. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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PROJECT NO.: 21-154	

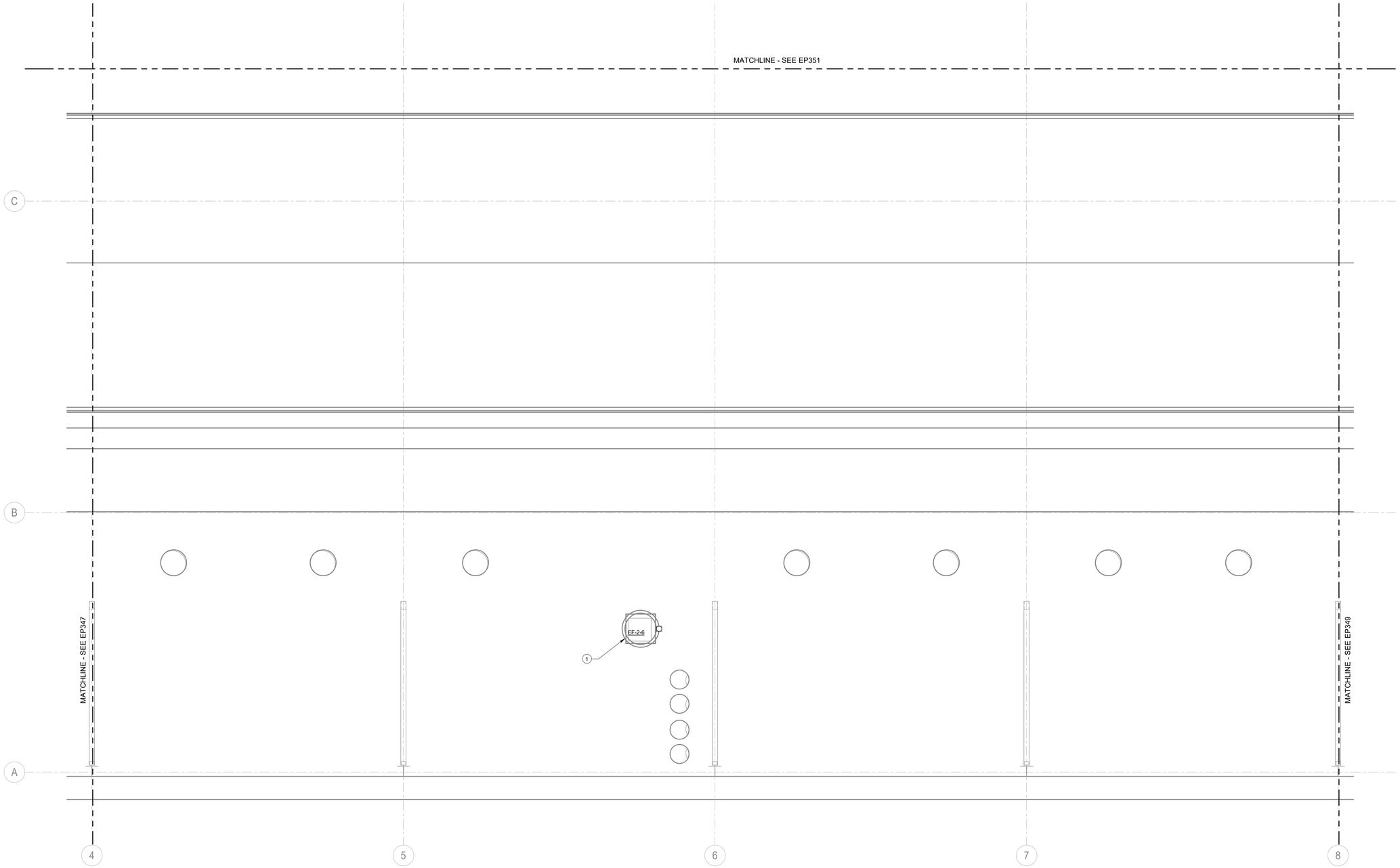
SHEET TITLE

ROOF 480V POWER PLAN - AREA A

SHEET NUMBER

EP347

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:47 PM AESI Proj. No: 21-154



ROOF 480V POWER PLAN - AREA B

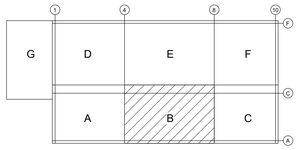
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRICAL CONNECTION TO EF-2-6. VFD-EF-2-6 IS LOCATED IN GENERATOR ROOM 220.



KEY PLAN
SCALE: NONE

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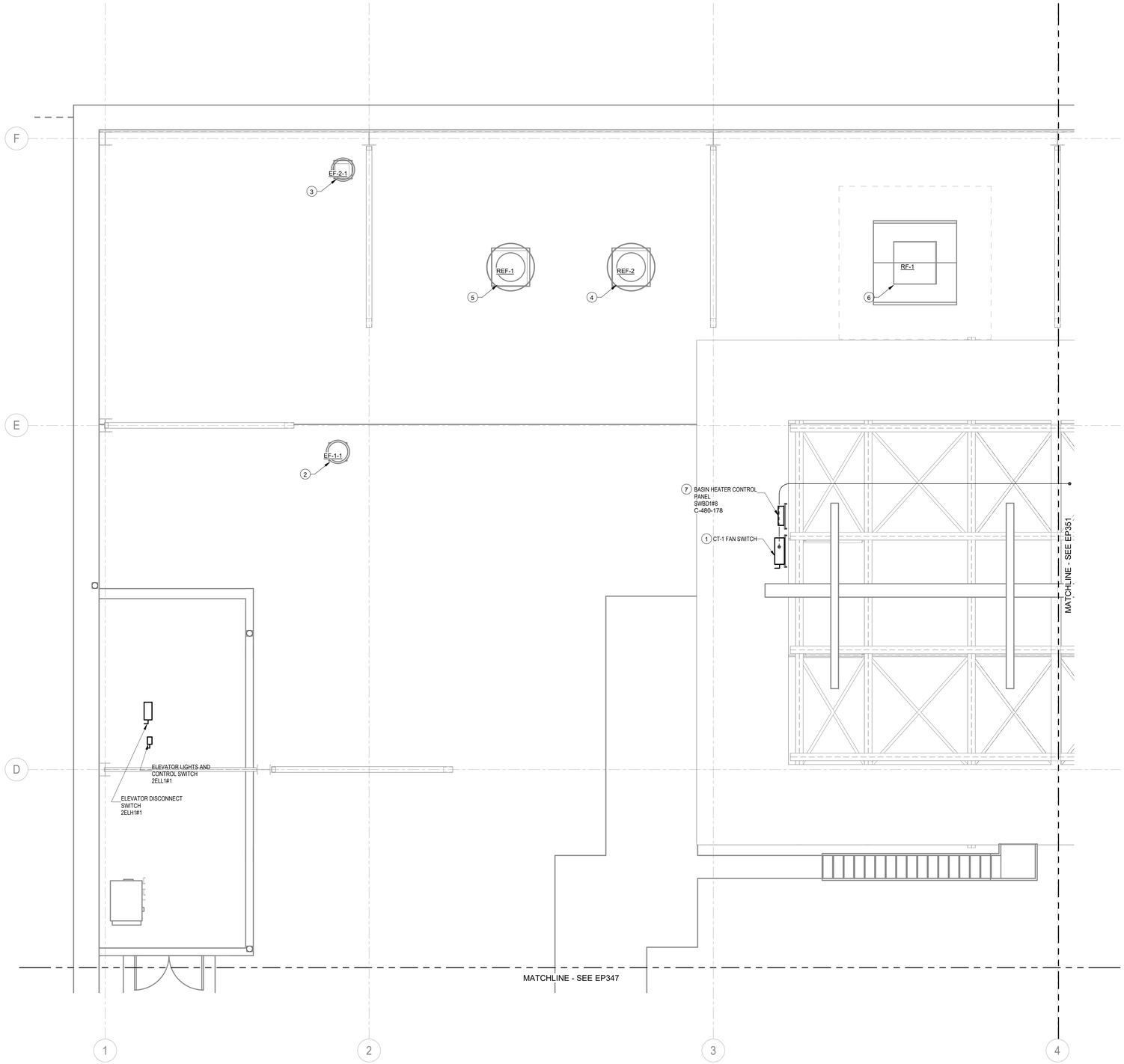
SHEET TITLE

ROOF 480V POWER PLAN - AREA B

SHEET NUMBER

EP348

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:48 PM AESI Proj No: 21-154
0 1/2" 1" 2"



ROOF 480V POWER PLAN - AREA D

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

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE CT-1 FAN DISCONNECT SWITCH. 400A, 3 POLE, NON FUSED, NEMA 4X, HEAVY DUTY DISCONNECT. MOUNT ON STRUT RACK AT +54"AFF.
2. PROVIDE ELECTRICAL CONNECTION TO EF-1-1. VFD-EF-1-1 IS LOCATED IN MECHANICAL 206.
3. PROVIDE ELECTRICAL CONNECTION TO EF-2-1. VFD-EF-2-1 IS LOCATED IN MECHANICAL 206.
4. PROVIDE ELECTRICAL CONNECTION TO REF-1. VFD-REF-1 IS LOCATED IN MECHANICAL 206.
5. PROVIDE ELECTRICAL CONNECTION TO REF-2. VFD-REF-2 IS LOCATED IN MECHANICAL 206.
6. PROVIDE ELECTRICAL CONNECTION TO RF-1. VFD-RF-1 IS LOCATED IN 15KV SWITCHGEAR 212.
7. INSTALL BASIN HEATER CONTROL PANEL. MOUNT ON STRUT RACK AT +54"AFF.

OWNER

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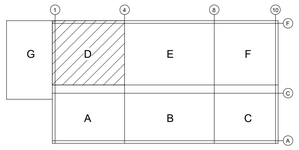
PROJECT NO.: 21-154	

SHEET TITLE

ROOF 480V POWER PLAN - AREA D

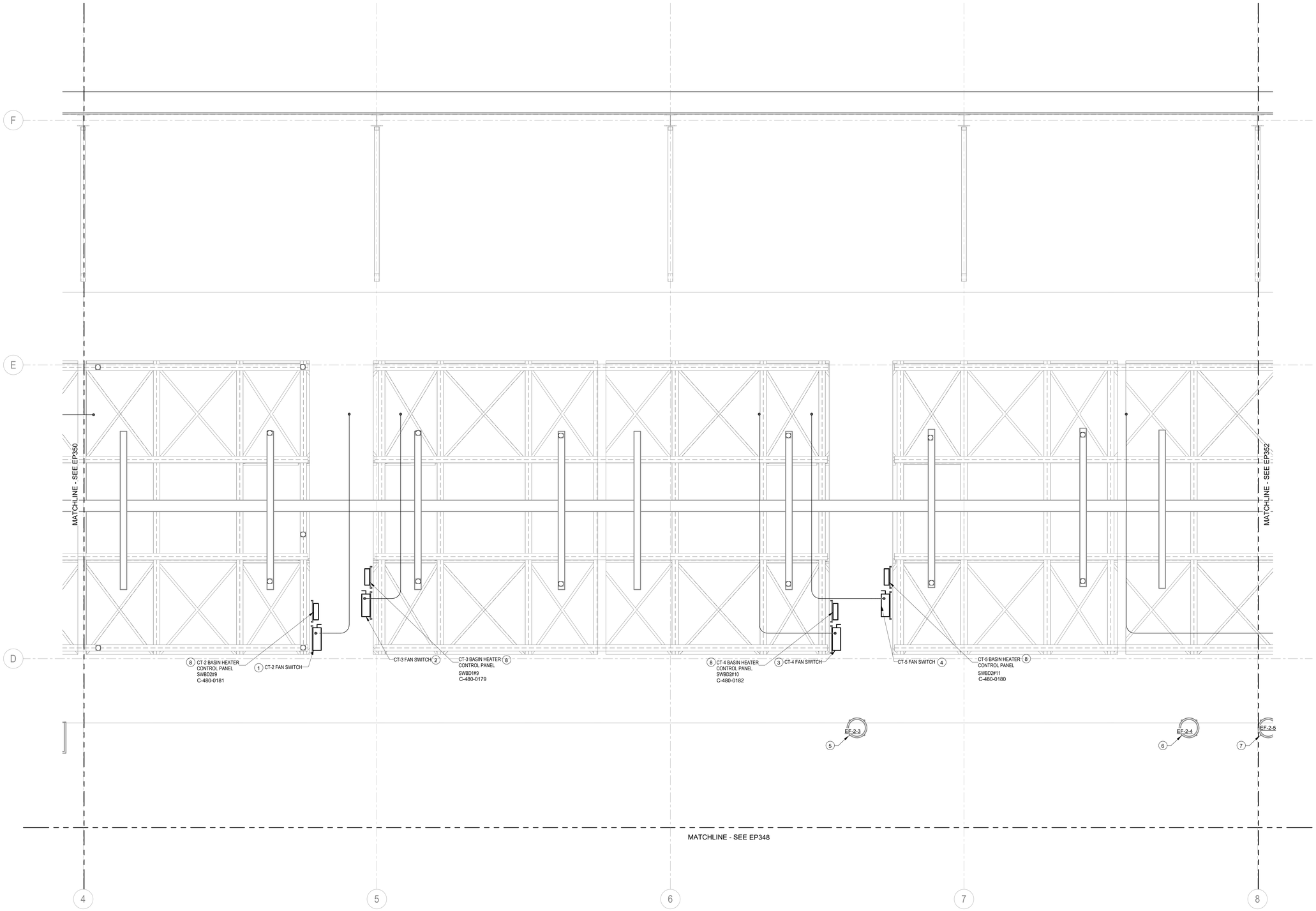
SHEET NUMBER

EP350



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:52 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF 480V POWER PLAN - AREA E

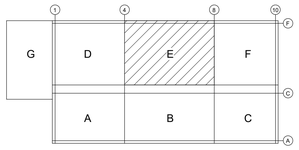
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE CT-2 FAN DISCONNECT SWITCH. 400A, 3 POLE, NON FUSED, NEMA 4X, HEAVY DUTY DISCONNECT. MOUNT ON STRUT RACK AT +54"AFF.
2. PROVIDE CT-3 FAN DISCONNECT SWITCH. 400A, 3 POLE, NON FUSED, NEMA 4X, HEAVY DUTY DISCONNECT. MOUNT ON STRUT RACK AT +54"AFF.
3. PROVIDE CT-4 FAN DISCONNECT SWITCH. 400A, 3 POLE, NON FUSED, NEMA 4X, HEAVY DUTY DISCONNECT. MOUNT ON STRUT RACK AT +54"AFF.
4. PROVIDE CT-5 FAN DISCONNECT SWITCH. 400A, 3 POLE, NON FUSED, NEMA 4X, HEAVY DUTY DISCONNECT. MOUNT ON STRUT RACK AT +54"AFF.
5. PROVIDE ELECTRICAL CONNECTION TO EF-2-3. VFD-EF-2-3 IS LOCATED IN 15KV SWITCHGEAR 212.
6. PROVIDE ELECTRICAL CONNECTION TO EF-2-4. VFD-EF-2-4 IS LOCATED IN 15KV SWITCHGEAR 212.
7. PROVIDE ELECTRICAL CONNECTION TO EF-2-5. VFD-EF-2-5 IS LOCATED IN 15KV SWITCHGEAR 212.
8. INSTALL BASIN HEATER CONTROL PANEL. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

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PROJECT NO.: 21-154	

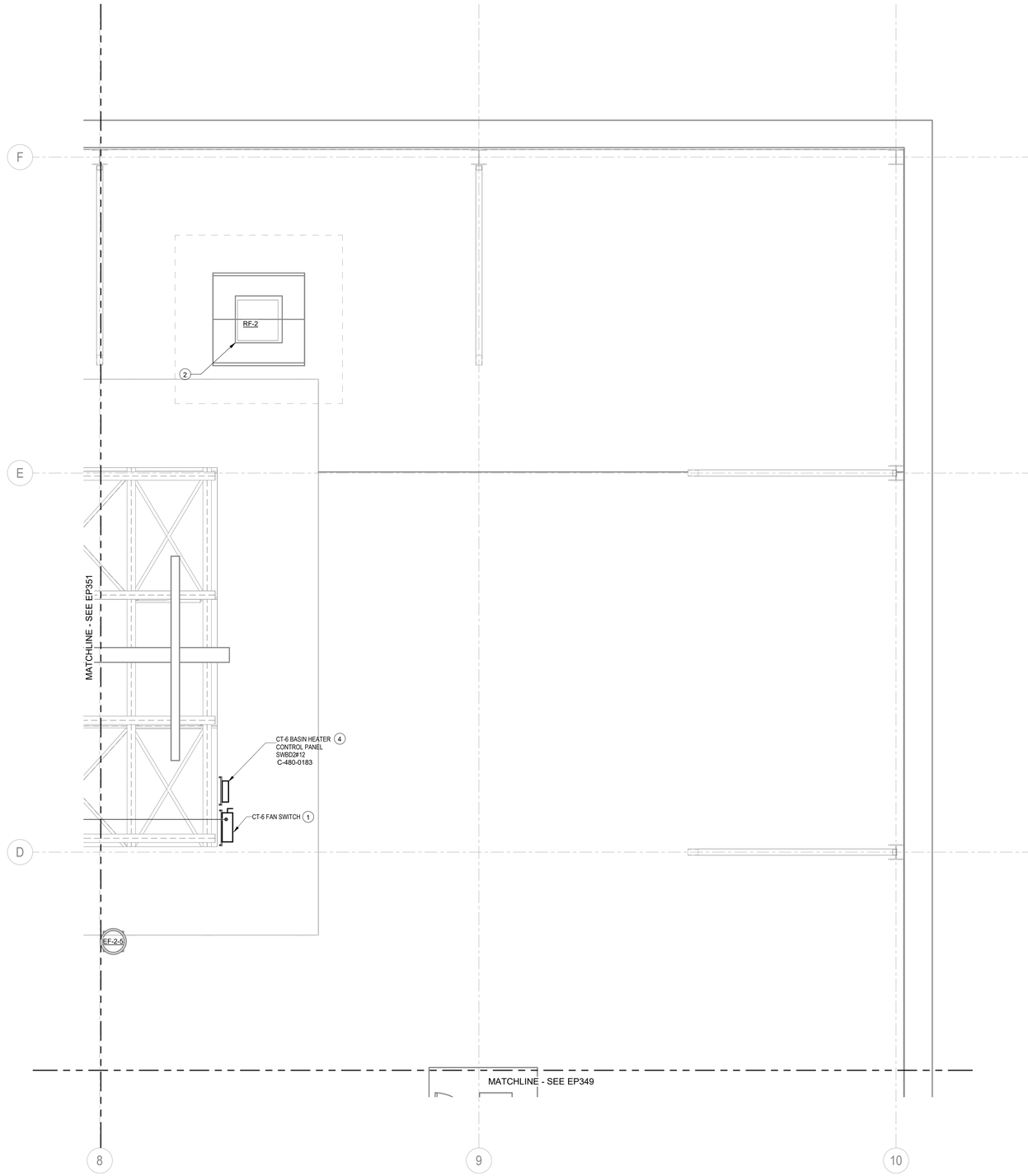
SHEET TITLE

ROOF 480V POWER PLAN - AREA E

SHEET NUMBER

EP351

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:54 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF 480V POWER PLAN - AREA F

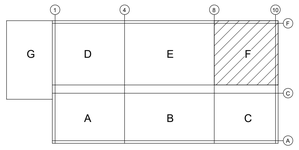
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE CT-1 FAN DISCONNECT SWITCH. 400A, 3 POLE, NON FUSED, NEMA 4X, HEAVY DUTY DISCONNECT. MOUNT ON STRUT RACK AT +54"AFF.
2. PROVIDE ELECTRICAL CONNECTION TO RF-2. VFD-RF-2 IS LOCATED IN 15KV SWITCHGEAR 212.
3. PROVIDE ELECTRICAL CONNECTION TO EF-2-5. VFD-EF-2-5 IS LOCATED IN 15KV SWITCHGEAR 212.
4. INSTALL BASIN HEATER CONTROL PANEL. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

OWNER

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SHEET TITLE

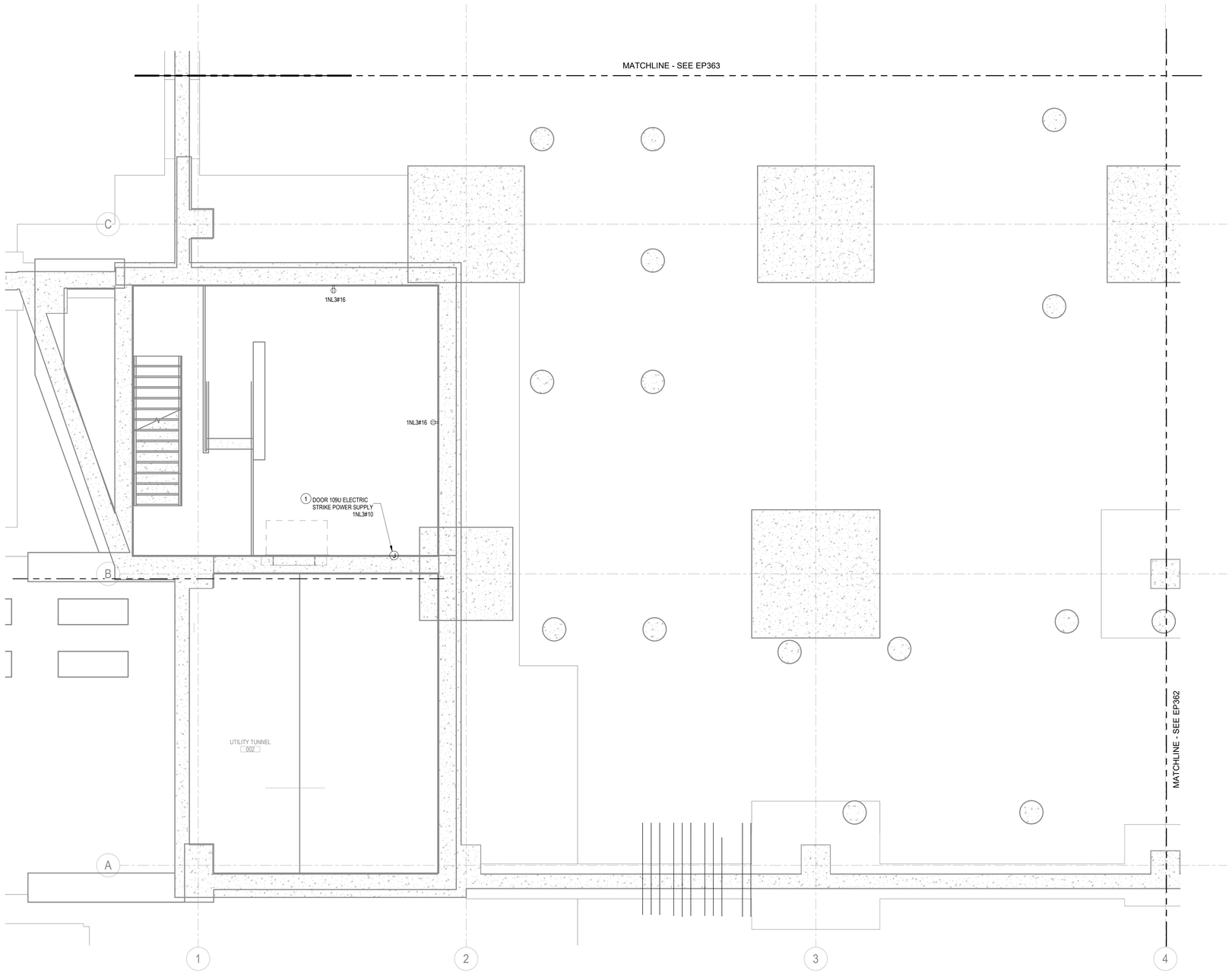
ROOF 480V POWER PLAN - AREA F

SHEET NUMBER

EP352

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:55 PM AESI Proj. No: 21-154

0 1/2" 1" 2"



LOWER LEVEL 208V POWER PLAN- AREA A

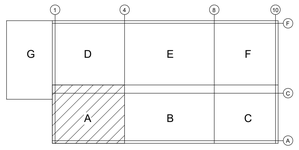
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.



KEY PLAN
SCALE: NONE

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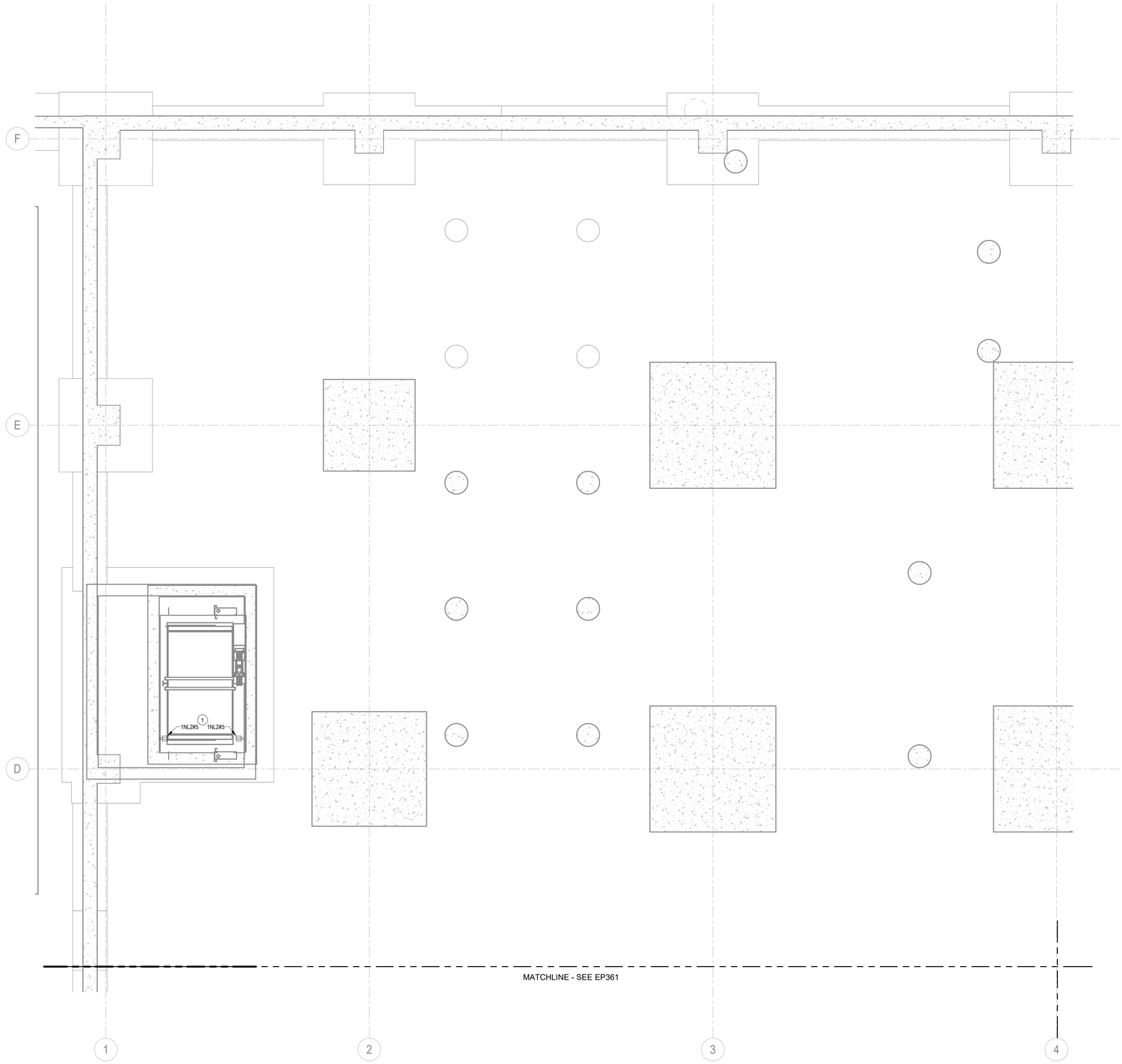
SHEET TITLE

LOWER LEVEL 208V POWER PLAN - AREA A

SHEET NUMBER

EP361

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:56 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



LOWER LEVEL 208V POWER PLAN- AREA D

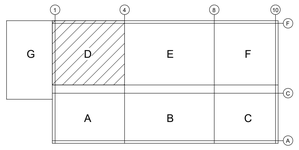
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE RECEPTACLE IN SURFACE MOUNTED BOX IN ELEVATOR PIT. MOUNT RECEPTACLE -16" TO LOWER LEVEL 1.



KEY PLAN
SCALE: NONE

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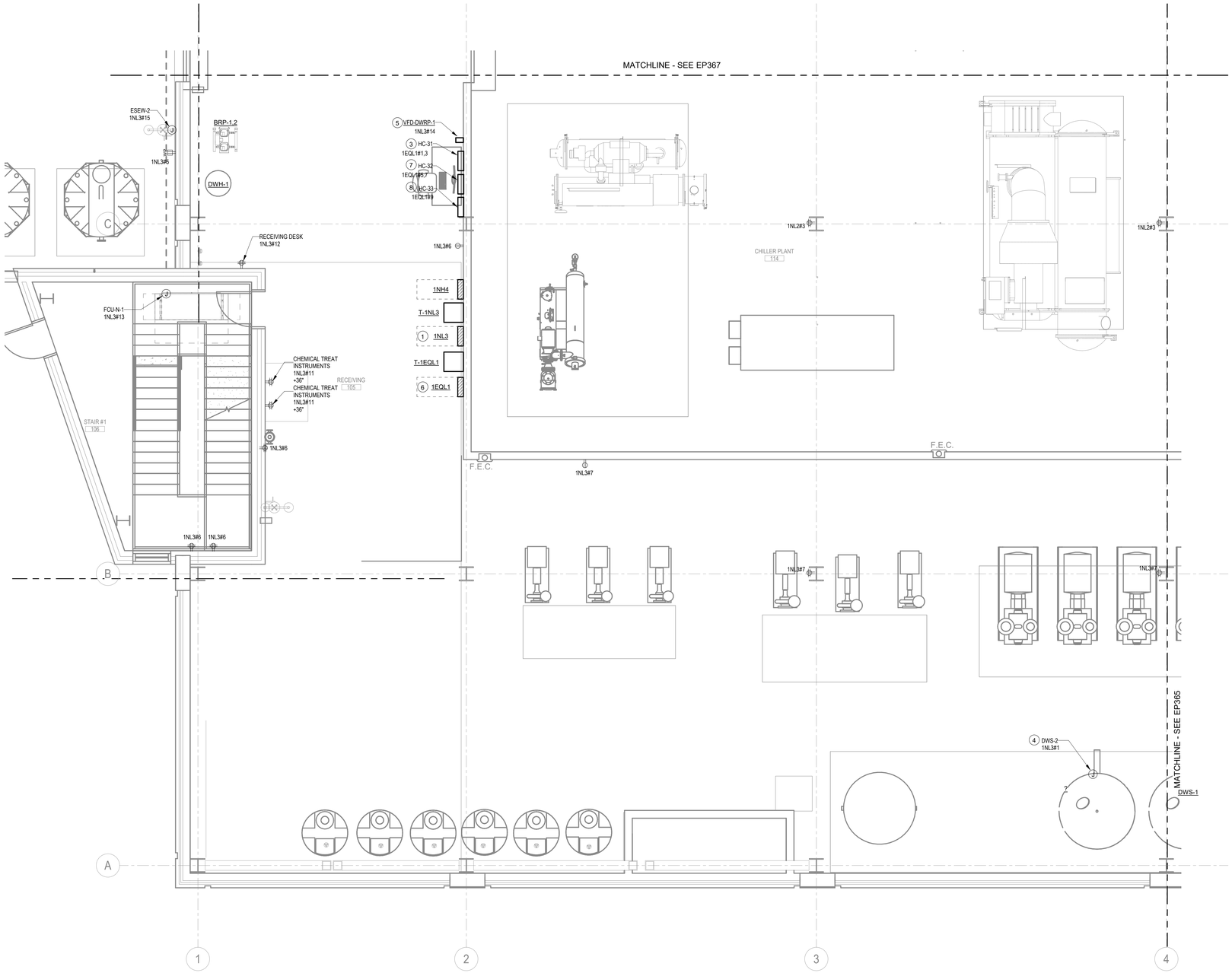
SHEET TITLE

LOWER LEVEL 208V POWER PLAN - AREA D

SHEET NUMBER

EP363

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:58:59 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR 208V POWER PLAN - AREA A

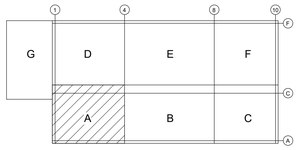
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE 1NL3. SEE SCHEDULE ON EP602 FOR DETAILS.
2. NOT USED.
3. PROVIDE HEAT TRACE CONTROLLER HC-31. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON WALL +54"AFF.
4. PROVIDE ELECTRICAL CONNECTIONS FOR DWS-2.
5. PROVIDE VFD-DWRP-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON WALL AT +54"AFF.
6. PROVIDE 1EQL1. SEE SCHEDULE ON EP606 FOR DETAILS.
7. PROVIDE HEAT TRACE CONTROLLER HC-32. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON WALL +54"AFF.
8. PROVIDE HEAT TRACE CONTROLLER HC-33. 3/4"C, (2)#10, (1)#10GND. MOUNT ON WALL +54"AFF.



KEY PLAN
SCALE: NONE

OWNER

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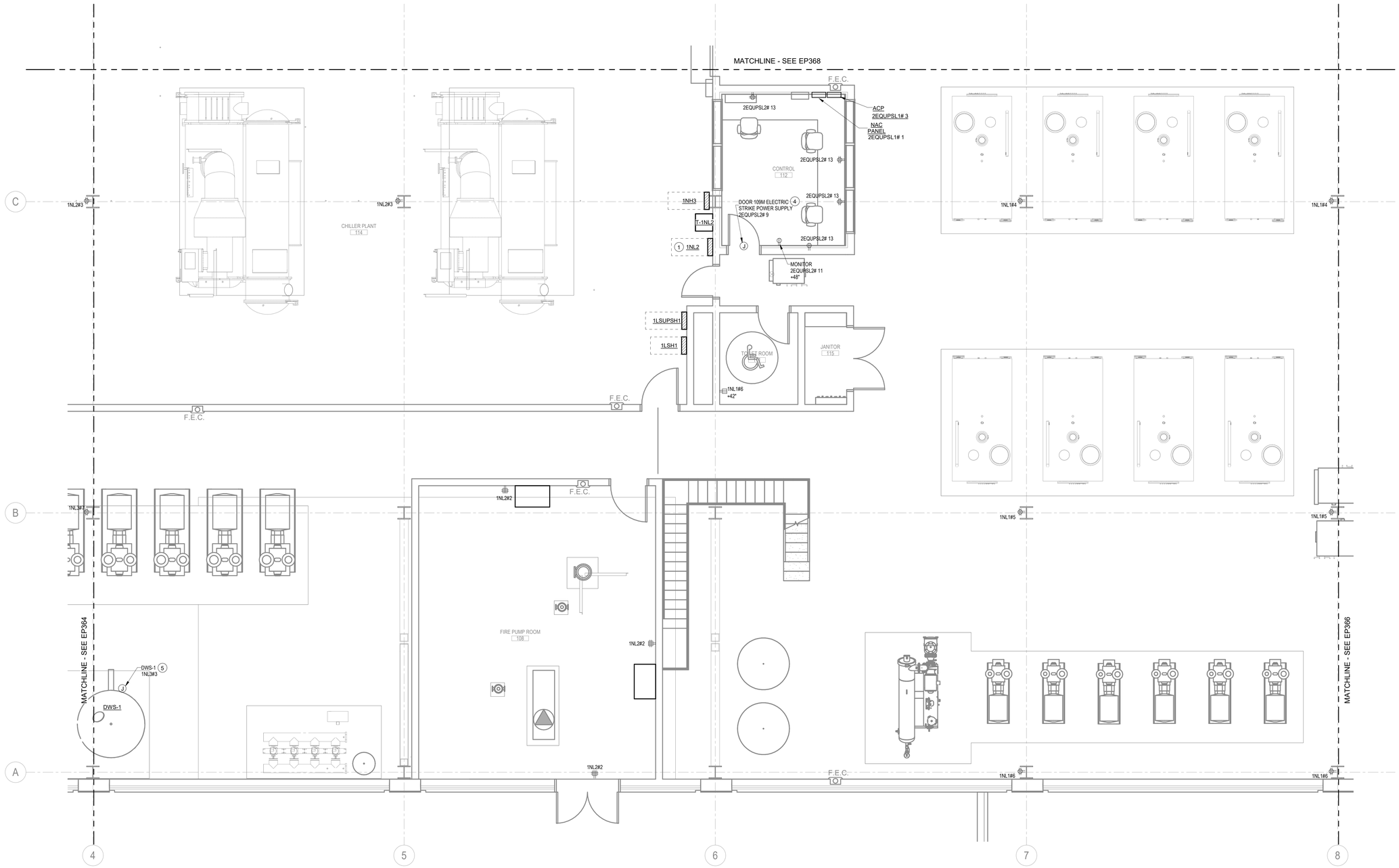
SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA A

SHEET NUMBER

EP364

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:03 PM AESI Proj. No: 21-154



FIRST FLOOR 208V POWER PLAN - AREA B

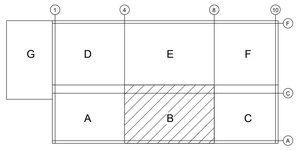
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE 1NL2. SEE SCHEDULE ON EP603 FOR DETAILS.
2. NOT USED.
3. NOT USED.
4. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.
5. PROVIDE ELECTRICAL CONNECTIONS FOR DWS-1.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO.: 21-154	

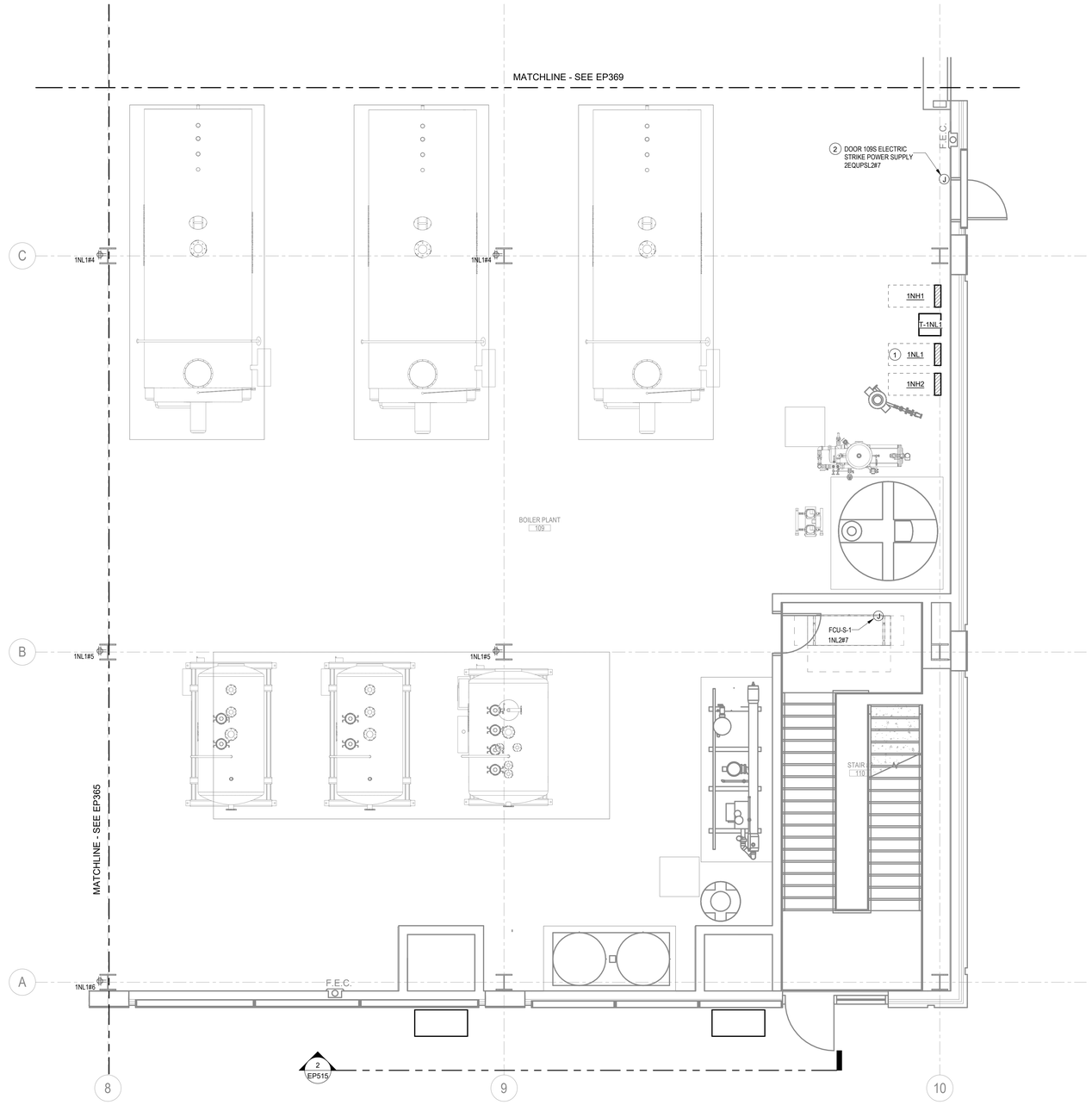
SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA B

SHEET NUMBER

EP365

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:10 PM AESI Proj. No: 21-154



FIRST FLOOR 208V POWER PLAN - AREA C

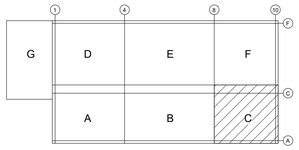
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE 1NL1. SEE SCHEDULE ON EP603 FOR DETAILS.
2. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO. 21-154	

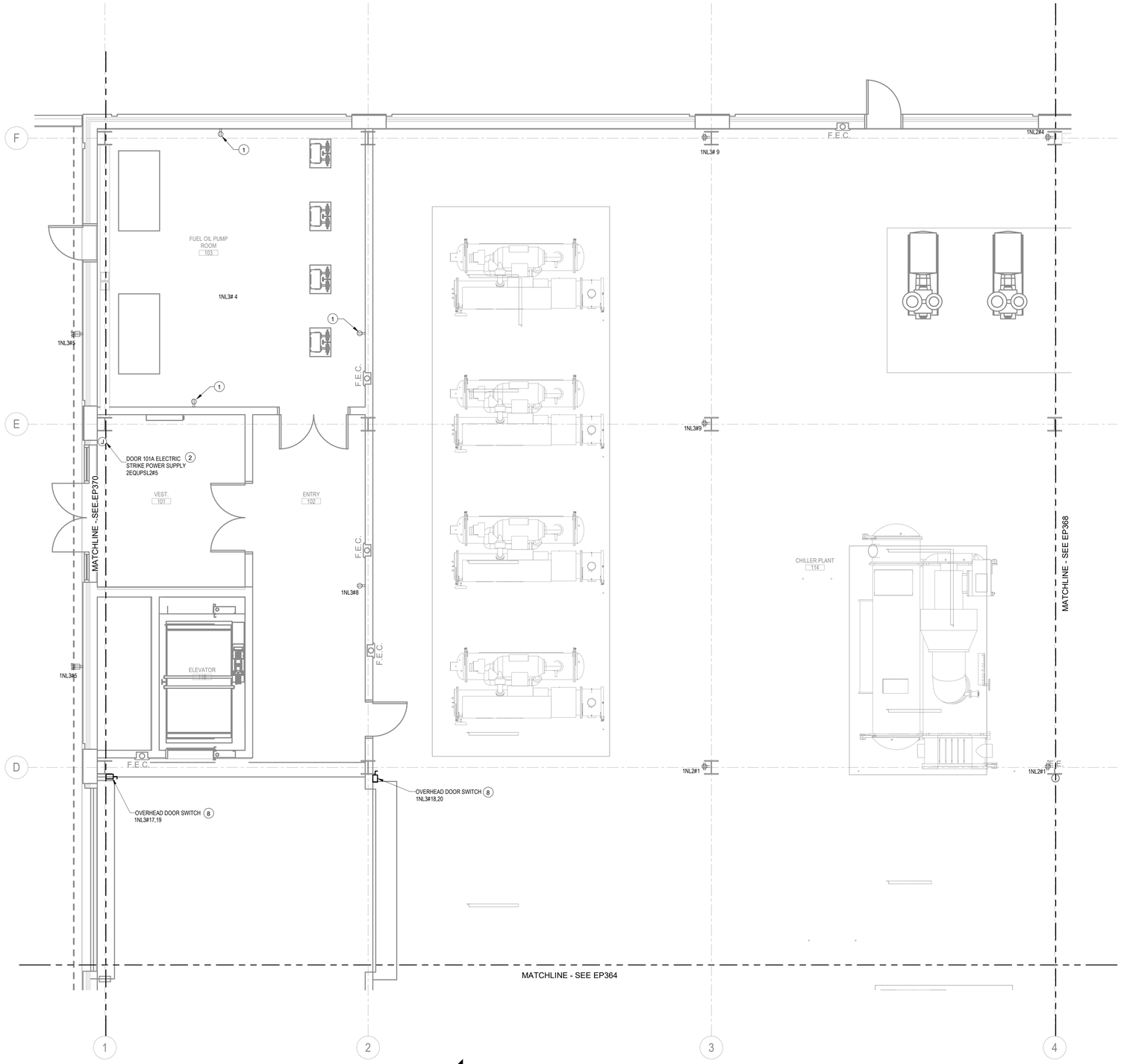
SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA C

SHEET NUMBER

EP366

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:19 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR 208V POWER PLAN - AREA D

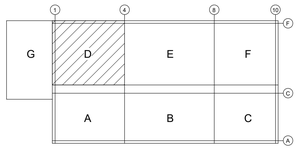
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE CLASS 1 DIV 1 RATED RECEPTACLE ASSEMBLY.
2. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.
3. PROVIDE POWER FOR OVERHEAD DOOR OPERATOR. PROVIDE 208V, 2 POLE, 30A DISCONNECT SWITCH AT +54"AFF. WIRE DOOR PER MANUFACTURER'S REQUIREMENTS. MOUNT DOOR CONTROLS NEXT TO DISCONNECT SWITCH.



KEY PLAN
SCALE: NONE

OWNER

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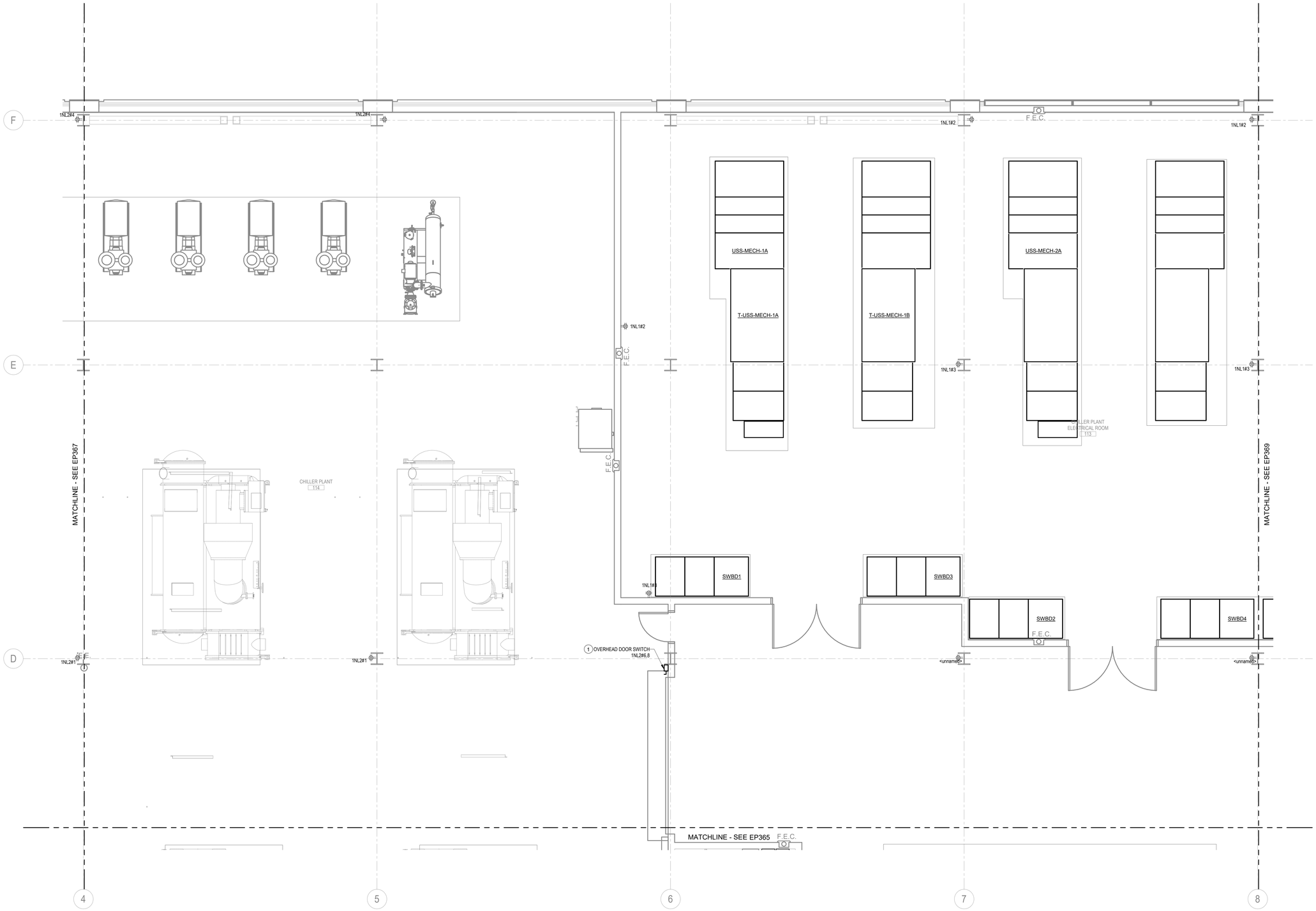
SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA D

SHEET NUMBER

EP367

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:23 PM AESI Proj. No: 21-154



FIRST FLOOR 208V POWER PLAN - AREA E

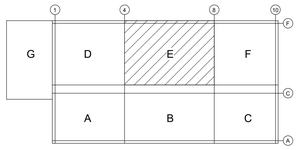
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE POWER FOR OVERHEAD DOOR OPERATOR. PROVIDE 208V, 2 POLE, 30A DISCONNECT SWITCH AT +54"AFF. WIRE DOOR PER MANUFACTURER'S REQUIREMENTS. MOUNT DOOR CONTROLS NEXT TO DISCONNECT SWITCH.



KEY PLAN
SCALE: NONE

OWNER

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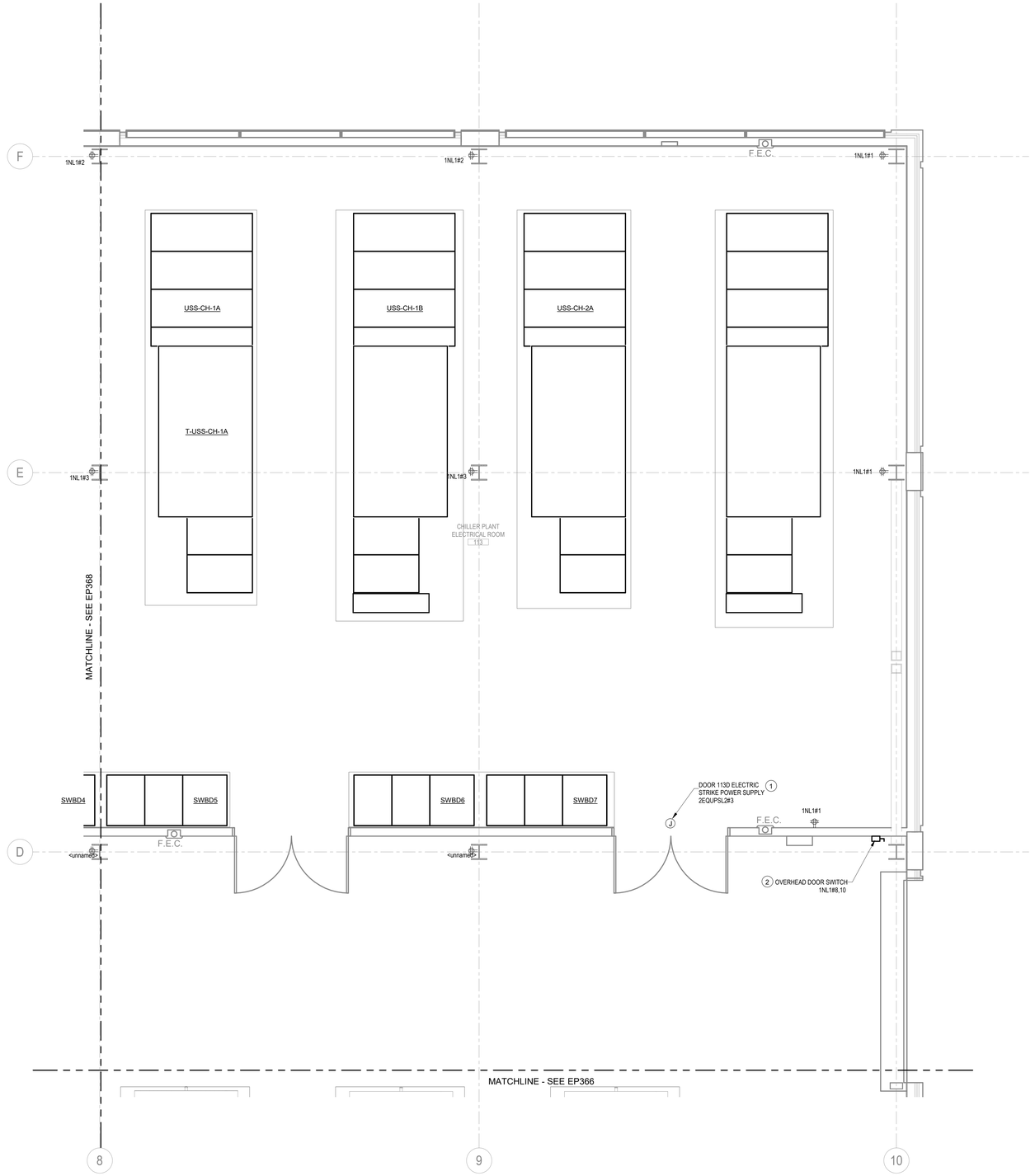
SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA E

SHEET NUMBER

EP368

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:49:26 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR 208V POWER PLAN - AREA F

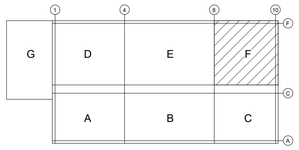
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.
2. PROVIDE POWER FOR OVERHEAD DOOR OPERATOR. PROVIDE 208V, 2 POLE, 30A DISCONNECT SWITCH AT +54"AFF. WIRE DOOR PER MANUFACTURER'S REQUIREMENTS. MOUNT DOOR CONTROLS NEXT TO DISCONNECT SWITCH.



KEY PLAN

SCALE: NONE

OWNER

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SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA F

SHEET NUMBER

EP369

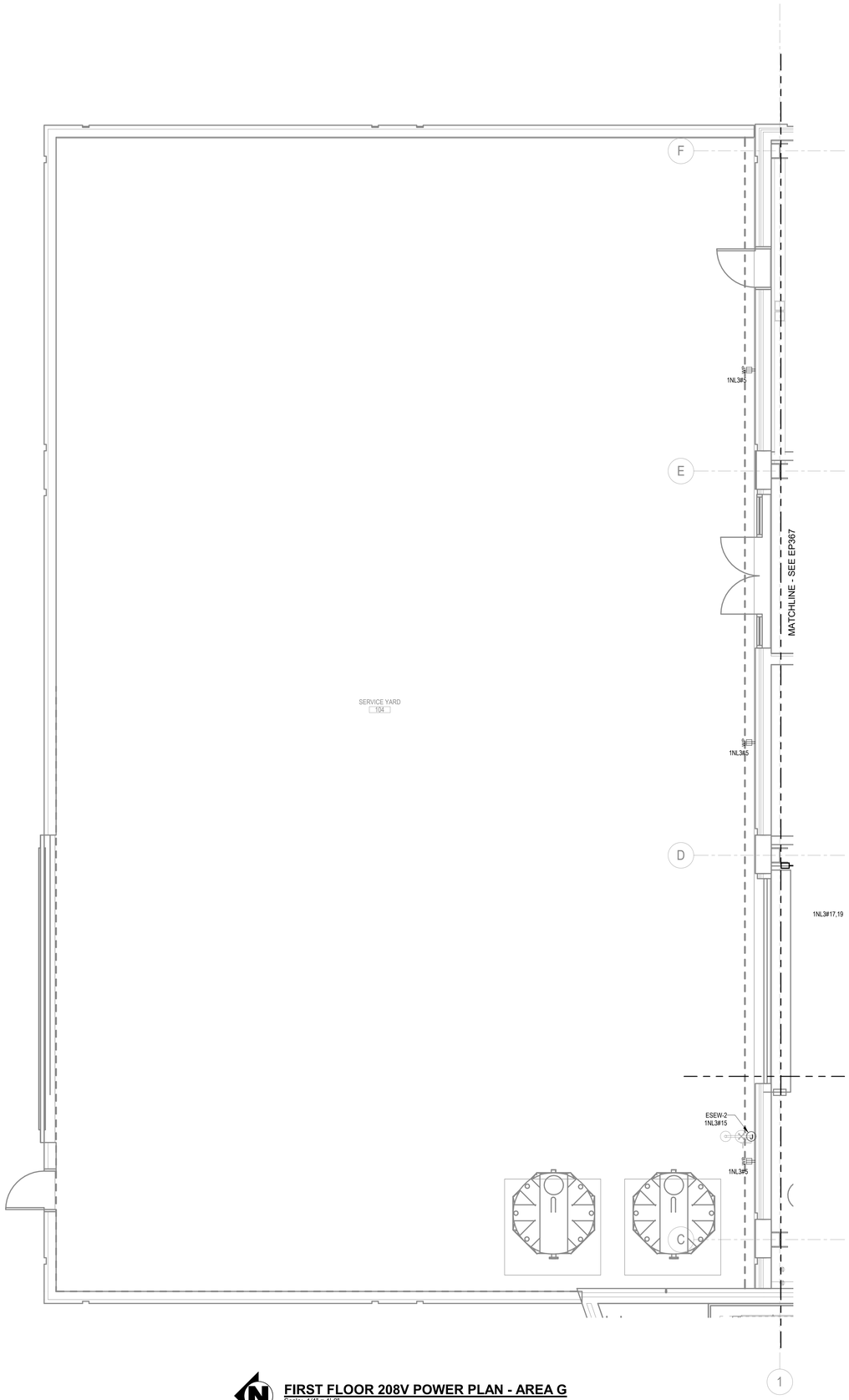
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:29 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

GENERAL NOTES:

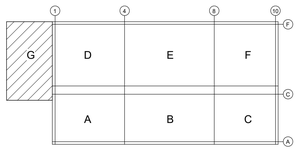
1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. NOT USED.



FIRST FLOOR 208V POWER PLAN - AREA G
Scale: 1/4" = 1'-0"



KEY PLAN
SCALE: NONE

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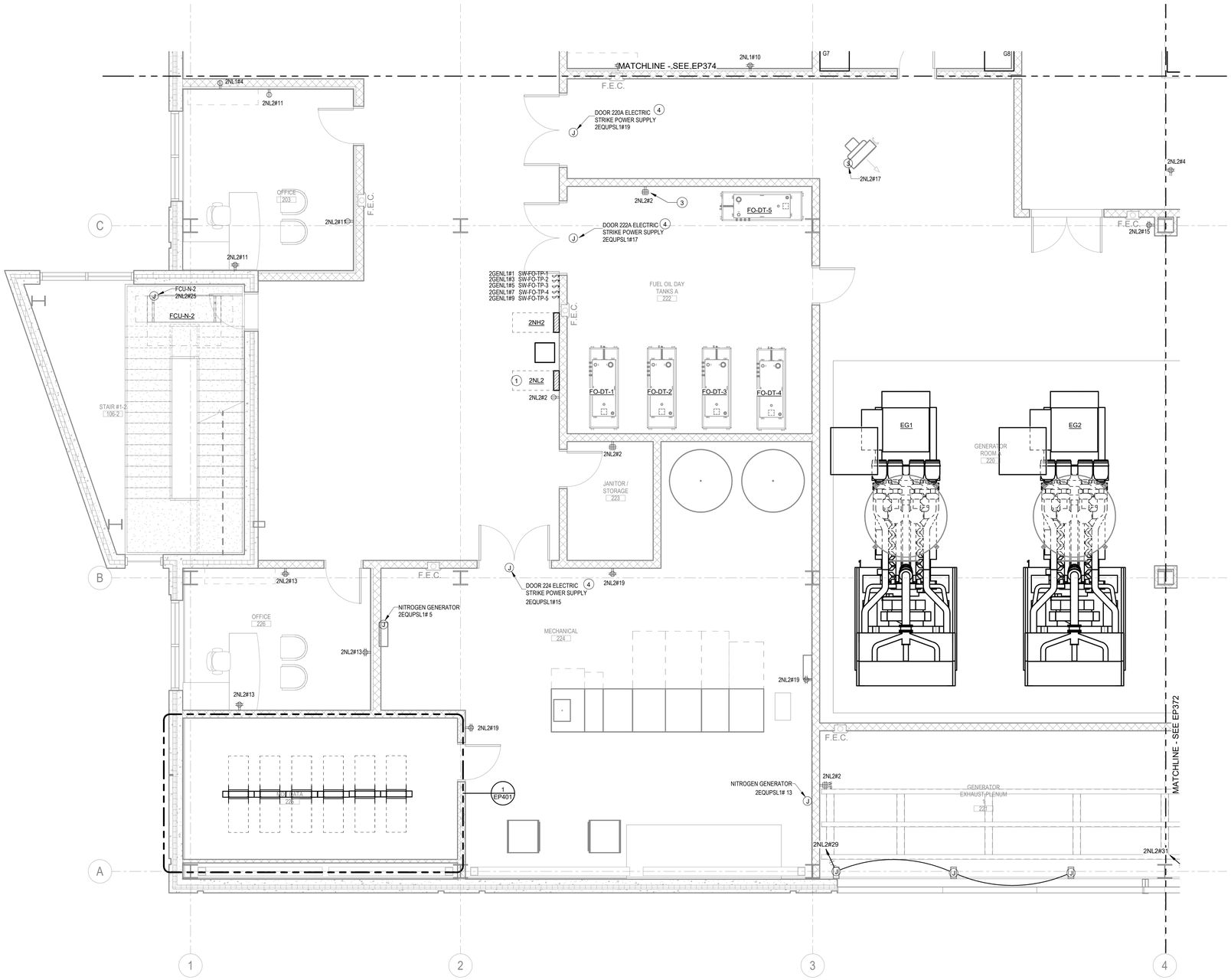
SHEET TITLE

FIRST FLOOR 208V POWER PLAN - AREA G

SHEET NUMBER

EP370

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 2:59:31 PM AESI Proj. No: 21-154



SECOND FLOOR 208V POWER PLAN - AREA A

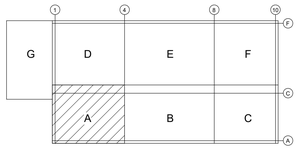
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE 2NL2. SEE SCHEDULE ON EP603 FOR DETAILS.
2. PROVIDE 120V, 1 POLE, LOCKABLE, MOTOR RATED SWITCH FOR UH-1.
3. PROVIDE CLASS 1 DIV. I RATED RECEPTACLE ASSEMBLY.
4. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.



KEY PLAN
SCALE: NONE

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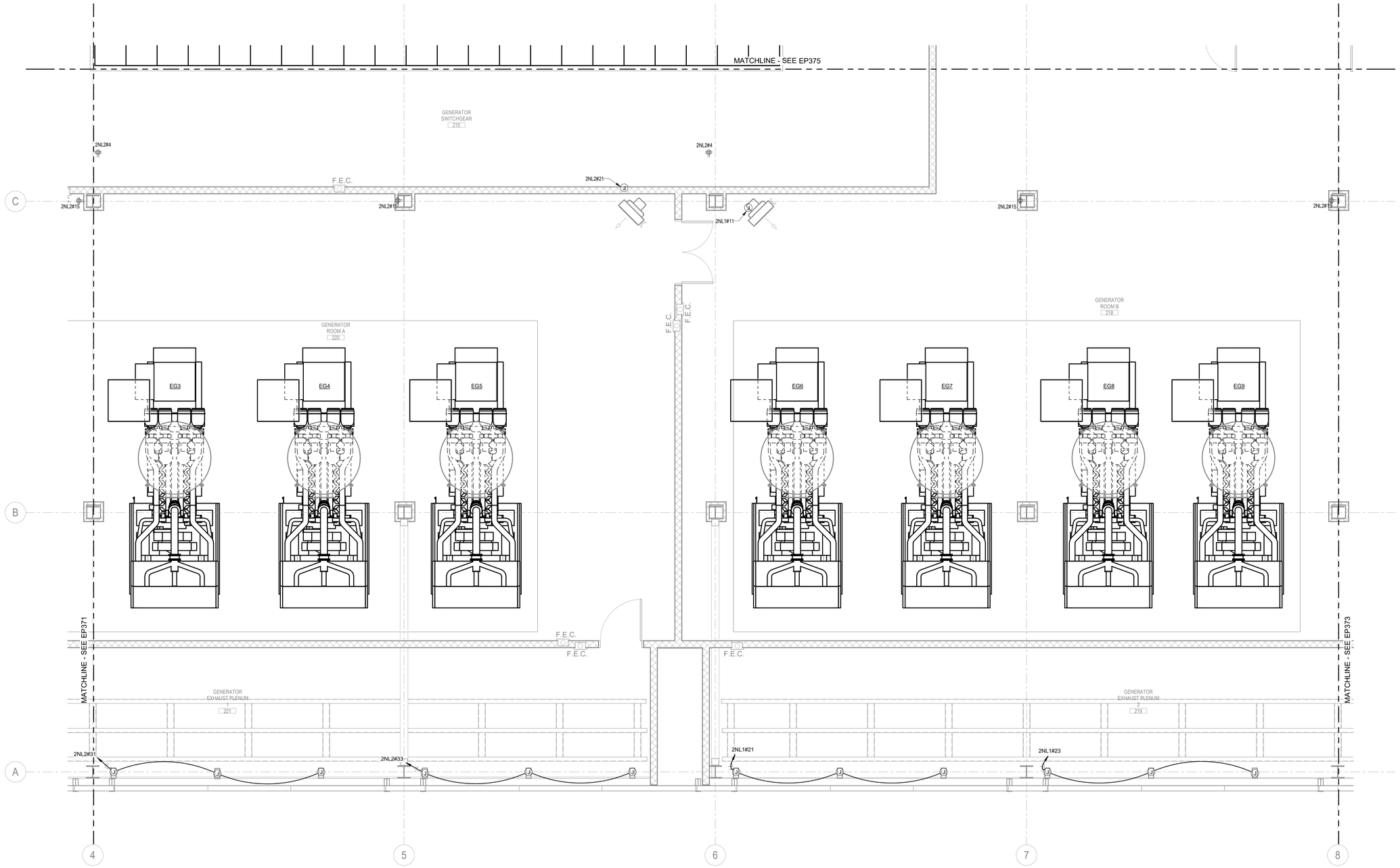
SHEET TITLE

SECOND FLOOR 208V POWER PLAN - AREA A

SHEET NUMBER

EP371

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:40 PM AESI Proj. No: 21-154



SECOND FLOOR 208V POWER PLAN - AREA B

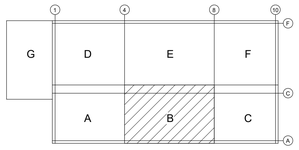
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. NOT USED.



KEY PLAN
SCALE: NONE

OWNER

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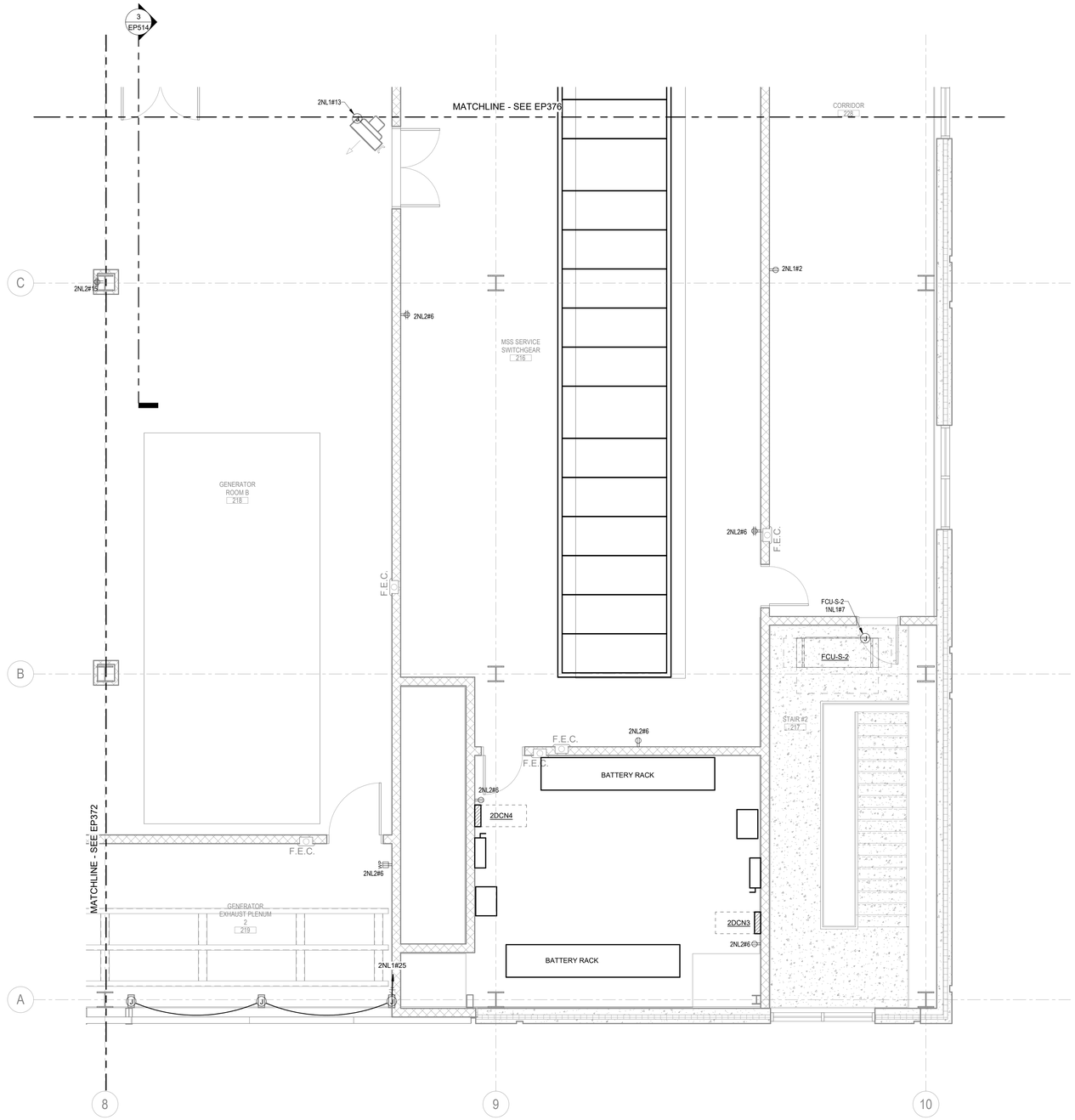
SHEET TITLE

SECOND FLOOR 208V POWER PLAN - AREA B

SHEET NUMBER

EP372

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:43 PM AESI Proj. No: 21-154



SECOND FLOOR 208V POWER PLAN - AREA C

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

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE 120V, 1 POLE, LOCKABLE, MOTOR RATED SWITCH FOR UH-4.

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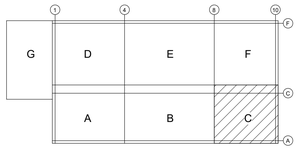
SHEET TITLE

SECOND FLOOR 208V POWER PLAN - AREA C

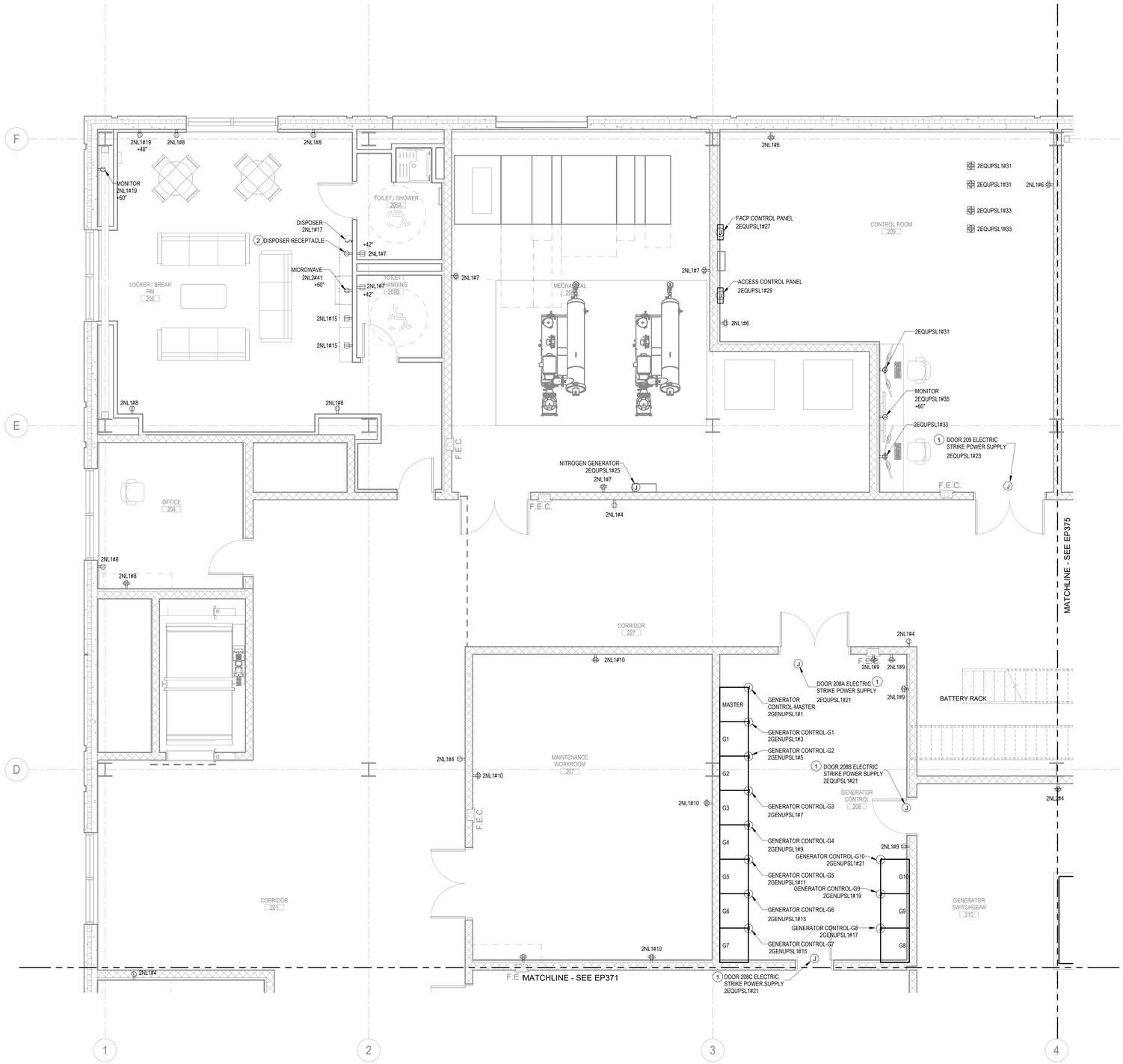
SHEET NUMBER

EP373



KEY PLAN
SCALE: NONE

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:46 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR 208V POWER PLAN - AREA D

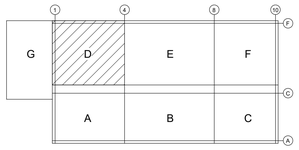
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.
2. PROVIDE SWITCHED RECEPTACLE AND SWITCH FOR DISPOSER. LOCATE RECEPTACLE IN CASEWORK.



KEY PLAN

SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
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DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

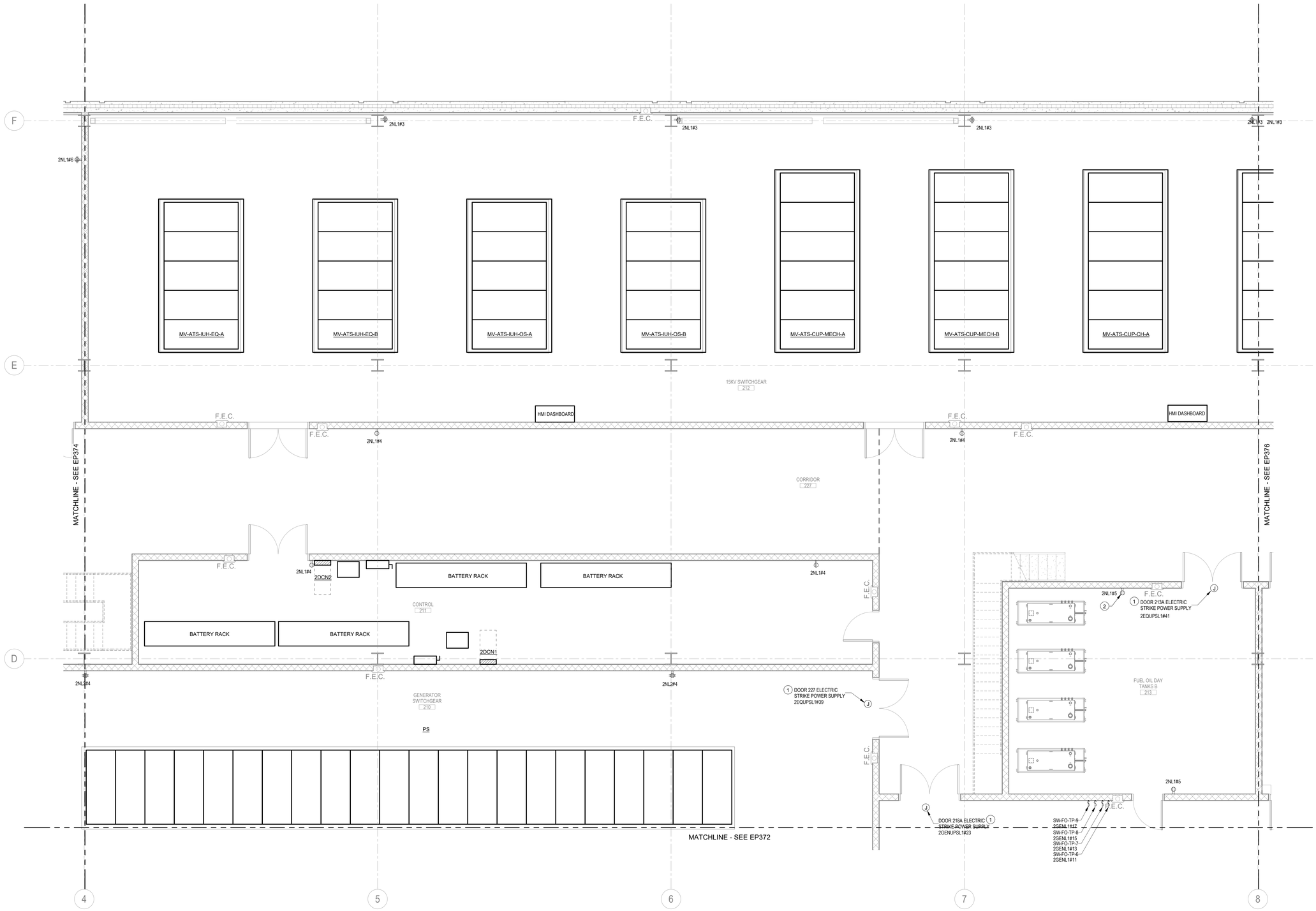
SHEET TITLE

SECOND FLOOR 208V POWER PLAN - AREA D

SHEET NUMBER

EP374

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:51 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR 208V POWER PLAN - AREA E

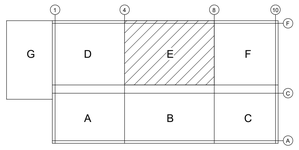
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.
2. PROVIDE CLASS 1 DIV. I RATED RECEPTACLE ASSEMBLY.



KEY PLAN
SCALE: NONE

OWNER

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Medical Center Campus
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Indianapolis, IN, 46202

PROJECT

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

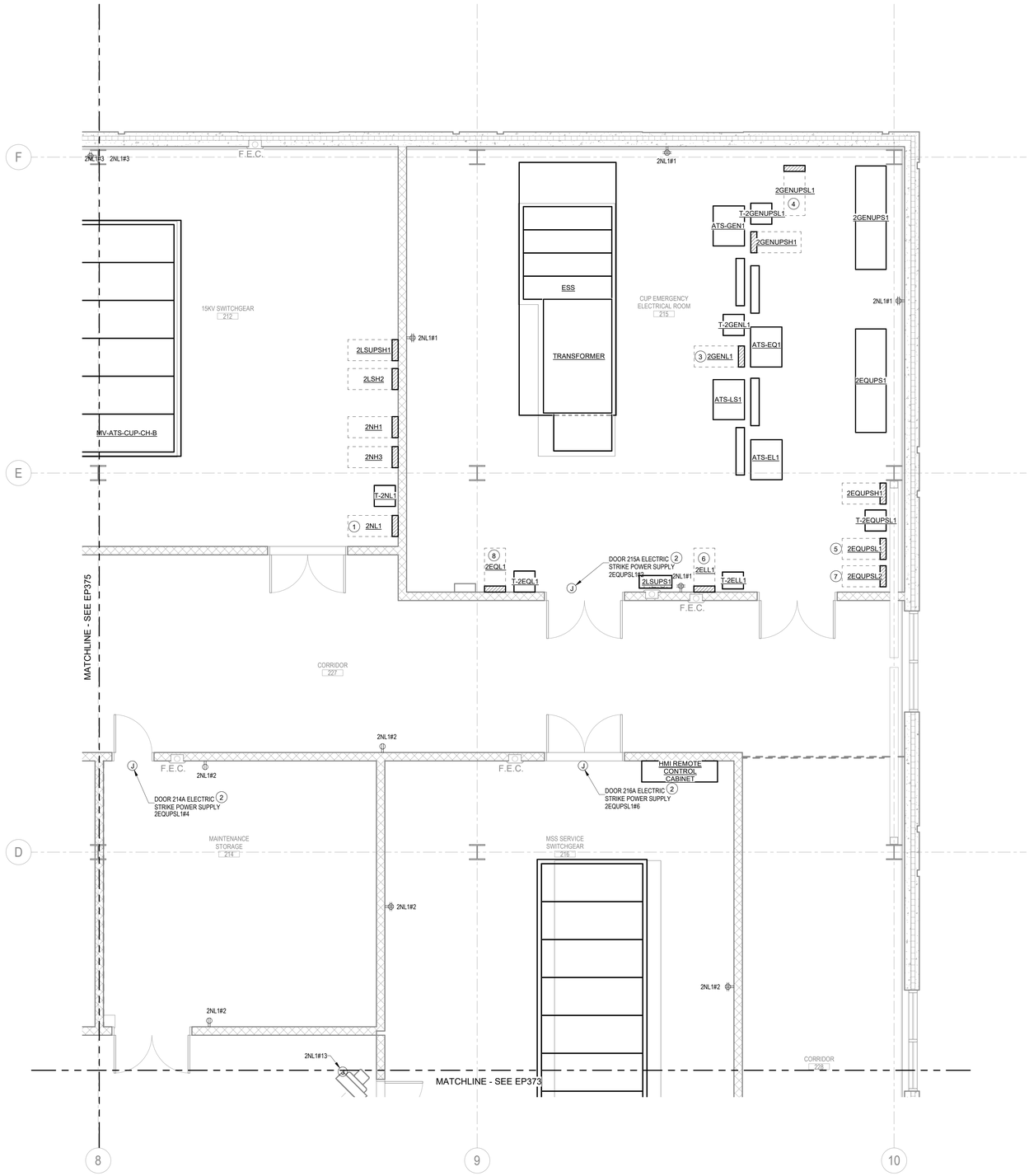
SHEET TITLE

SECOND FLOOR 208V POWER PLAN - AREA E

SHEET NUMBER

EP375

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 2:59:58 PM AESI Proj. No: 21-154



SECOND FLOOR 208V POWER PLAN - AREA F

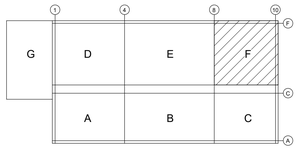
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE 2NL1. SEE SCHEDULE ON EP603 FOR DETAILS.
2. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.
3. PROVIDE 2GENL1. SEE SCHEDULE ON EP605 FOR DETAILS.
4. PROVIDE 2GENUPSL1. SEE SCHEDULE ON EP605 FOR DETAILS.
5. PROVIDE 2EQUPSL1. SEE SCHEDULE ON EP604 FOR DETAILS.
6. PROVIDE 2ELL1. SEE SCHEDULE ON EP604 FOR DETAILS.
7. PROVIDE 2GENUPSL2. SEE SCHEDULE ON EP605 FOR DETAILS.
8. PROVIDE 2EQL1. SEE SCHEDULE ON EP604 FOR DETAILS.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

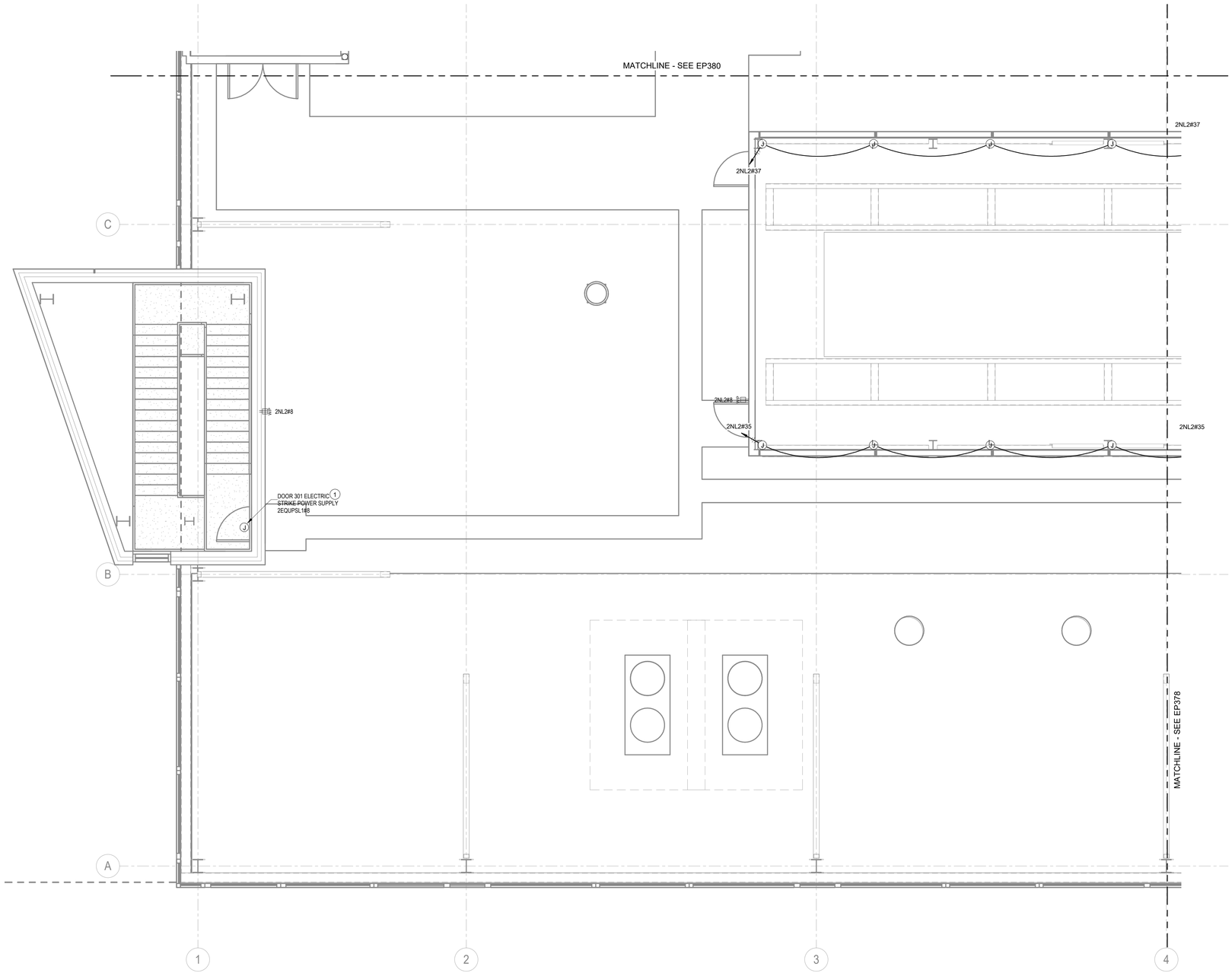
SHEET TITLE

SECOND FLOOR 208V POWER PLAN - AREA F

SHEET NUMBER

EP376

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:01 PM AESI Proj. No: 21-154



ROOF 208V POWER PLAN - AREA A

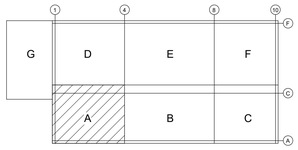
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.



KEY PLAN

SCALE: NONE

OWNER

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PROJECT NO. 21-154	

SHEET TITLE

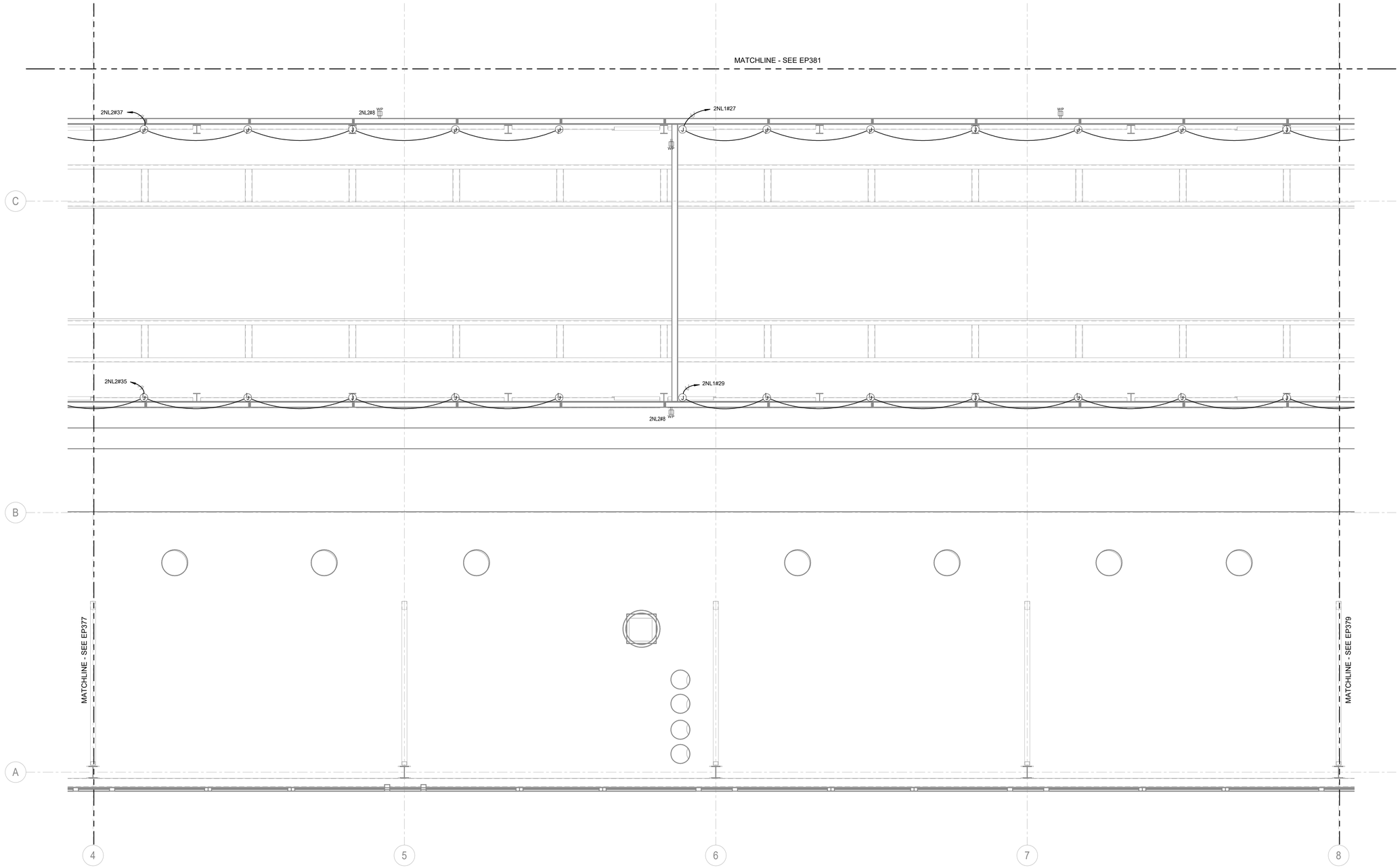
ROOF 208V POWER PLAN - AREA A

SHEET NUMBER

EP377

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:03 PM AESI Proj. No: 21-154

0 1/2" 1" 2"



ROOF 208V POWER PLAN - AREA B

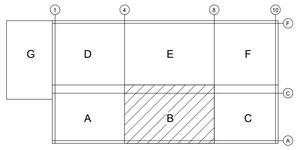
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. NOT USED.



KEY PLAN
SCALE: NONE

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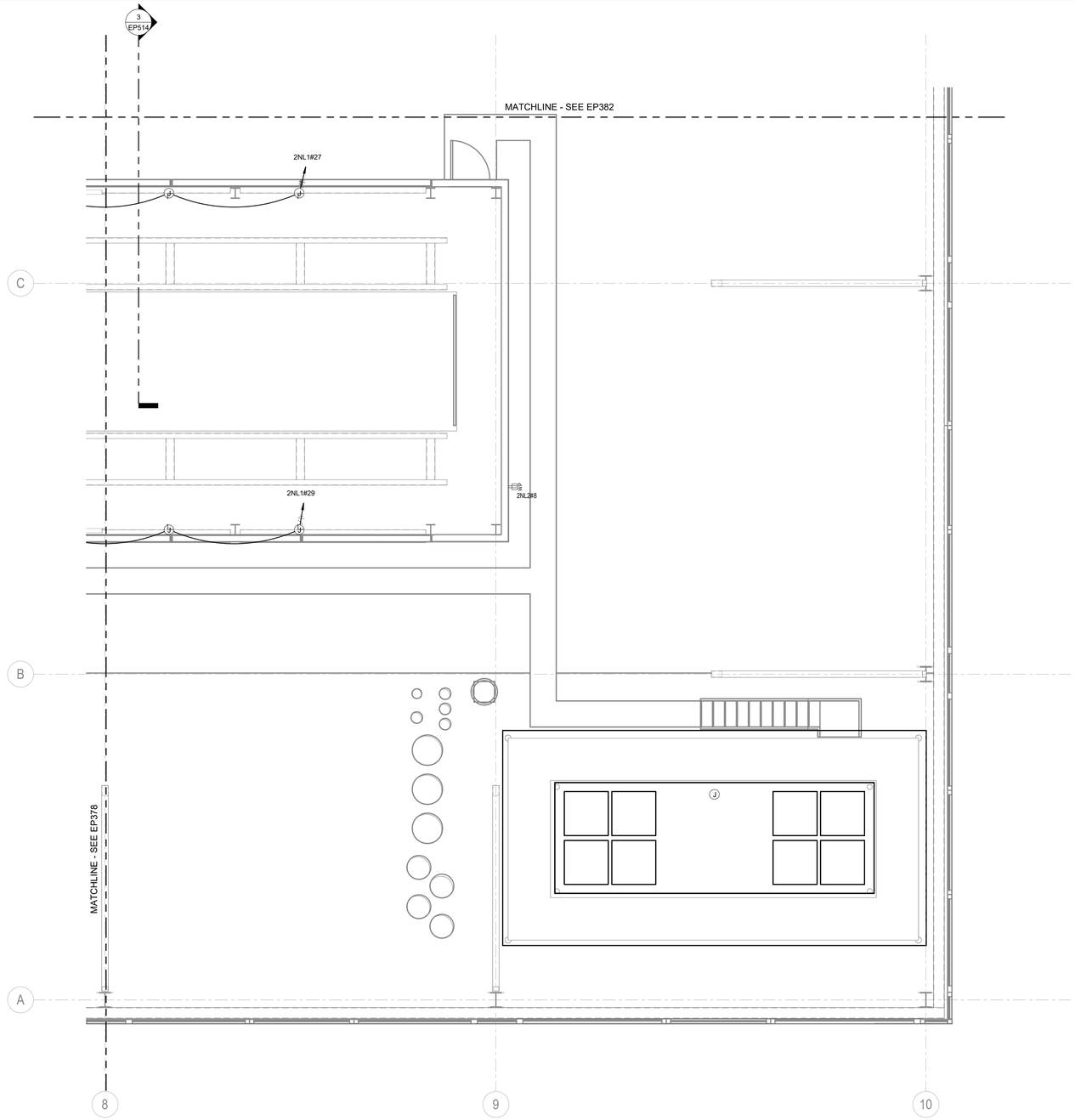
SHEET TITLE

ROOF 208V POWER PLAN - AREA B

SHEET NUMBER

EP378

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:06 PM AESI Proj No: 21-154
0 1/2" 1" 2"



ROOF 208V POWER PLAN - AREA C

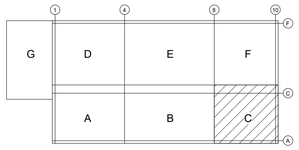
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. NOT USED.



KEY PLAN
SCALE: NONE

OWNER

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PROJECT NO.: 21-154	

SHEET TITLE

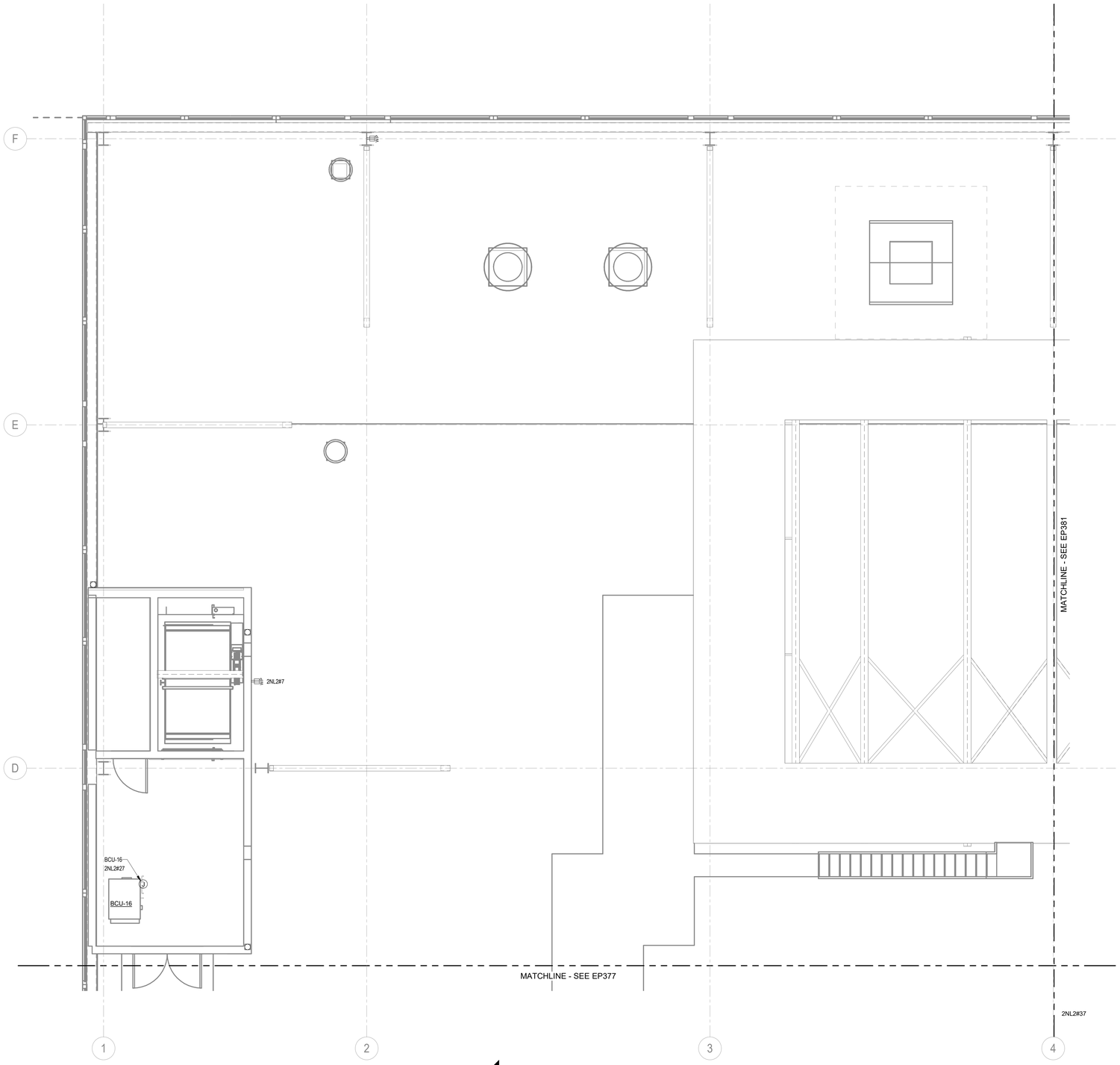
ROOF 208V POWER PLAN - AREA C

SHEET NUMBER

EP379

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:08 PM AESI Proj. No: 21-154

0 1/2" 1" 2"



ROOF 208V POWER PLAN - AREA D

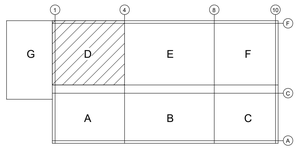
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. PROVIDE HEAT TRACE CONTROLLER, HC-1. SEE SCHEDULE ON EP608 AND SPECIFICATIONS FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



KEY PLAN
SCALE: NONE

OWNER

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

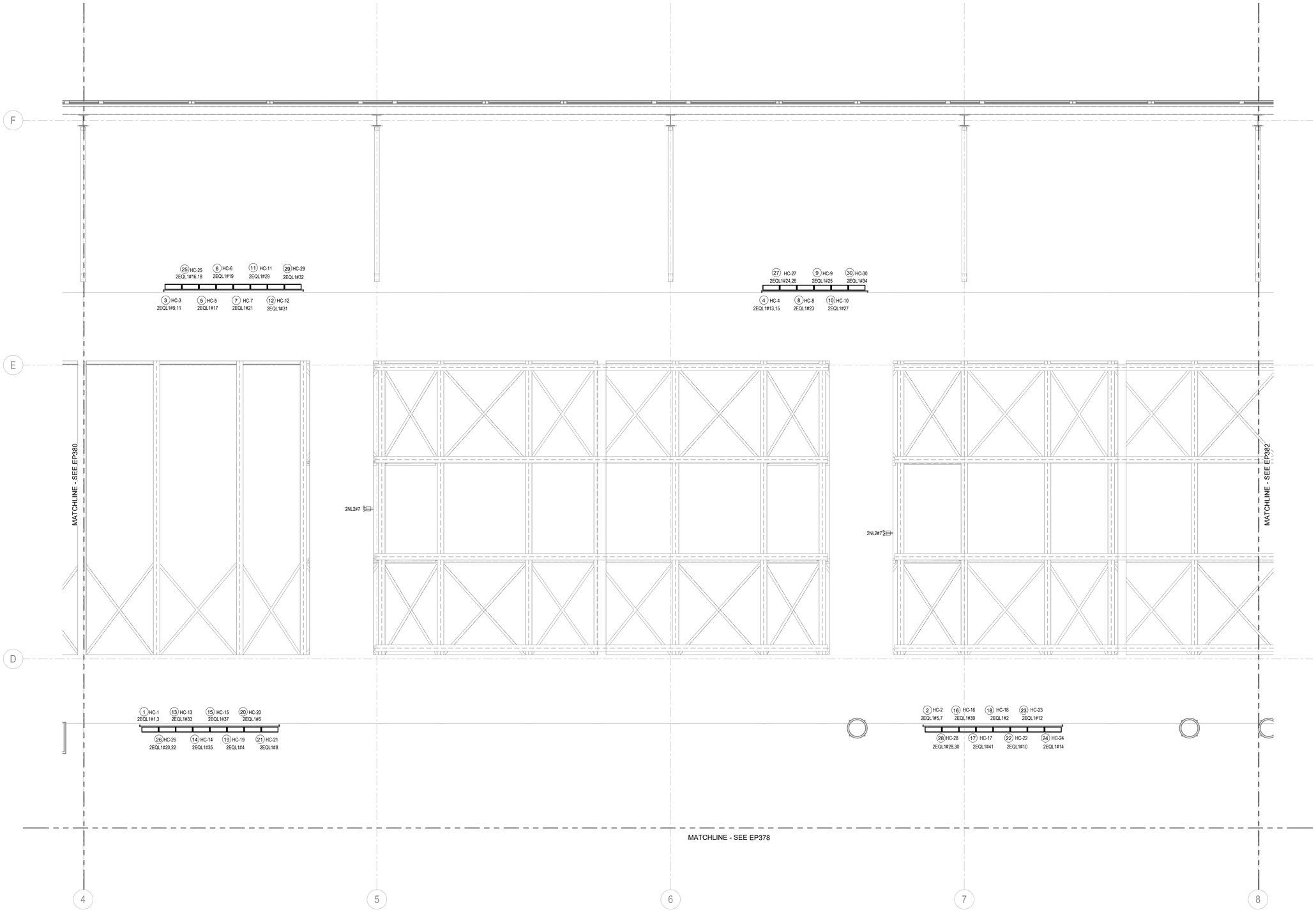
SHEET TITLE

ROOF 208V POWER PLAN - AREA D

SHEET NUMBER

EP380

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:10 PM AESI Proj. No: 21-154



ROOF 208V POWER PLAN - AREA E

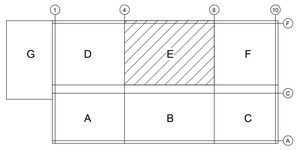
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE HEAT TRACE CONTROLLER HC-1. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
2. PROVIDE HEAT TRACE CONTROLLER HC-2. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
3. PROVIDE HEAT TRACE CONTROLLER HC-3. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
4. PROVIDE HEAT TRACE CONTROLLER HC-4. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
5. PROVIDE HEAT TRACE CONTROLLER HC-5. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
6. PROVIDE HEAT TRACE CONTROLLER HC-6. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
7. PROVIDE HEAT TRACE CONTROLLER HC-7. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
8. PROVIDE HEAT TRACE CONTROLLER HC-8. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
9. PROVIDE HEAT TRACE CONTROLLER HC-9. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
10. PROVIDE HEAT TRACE CONTROLLER HC-10. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
11. PROVIDE HEAT TRACE CONTROLLER HC-11. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
12. PROVIDE HEAT TRACE CONTROLLER HC-12. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
13. PROVIDE HEAT TRACE CONTROLLER HC-13. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
14. PROVIDE HEAT TRACE CONTROLLER HC-14. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
15. PROVIDE HEAT TRACE CONTROLLER HC-15. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
16. PROVIDE HEAT TRACE CONTROLLER HC-16. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
17. PROVIDE HEAT TRACE CONTROLLER HC-17. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
18. PROVIDE HEAT TRACE CONTROLLER HC-18. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
19. PROVIDE HEAT TRACE CONTROLLER HC-19. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
20. PROVIDE HEAT TRACE CONTROLLER HC-20. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
21. PROVIDE HEAT TRACE CONTROLLER HC-21. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
22. PROVIDE HEAT TRACE CONTROLLER HC-22. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
23. PROVIDE HEAT TRACE CONTROLLER HC-23. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
24. PROVIDE HEAT TRACE CONTROLLER HC-24. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
25. PROVIDE HEAT TRACE CONTROLLER HC-25. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
26. PROVIDE HEAT TRACE CONTROLLER HC-26. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
27. PROVIDE HEAT TRACE CONTROLLER HC-27. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
28. PROVIDE HEAT TRACE CONTROLLER HC-28. 3/4"C, (3)#10 (2 PHASE + NEUTRAL), (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
29. PROVIDE HEAT TRACE CONTROLLER HC-29. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.
30. PROVIDE HEAT TRACE CONTROLLER HC-30. 3/4"C, (2)#10, (1)#10GND. MOUNT ON STRUT RACK +54"AFF.



KEY PLAN
SCALE: NONE

OWNER

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DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

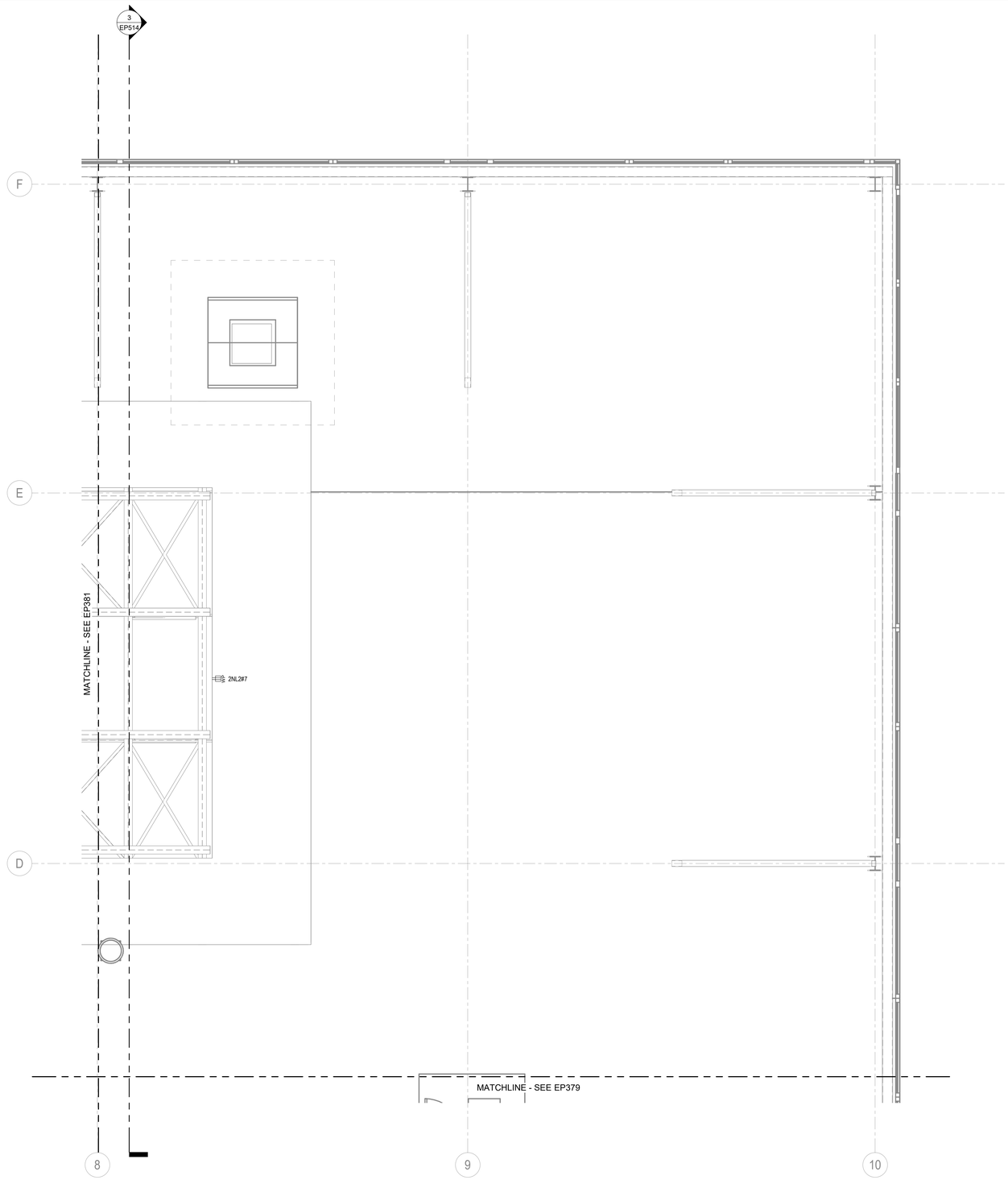
SHEET TITLE

ROOF 208V POWER PLAN - AREA E

SHEET NUMBER

EP381

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:13 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



ROOF 208V POWER PLAN - AREA F

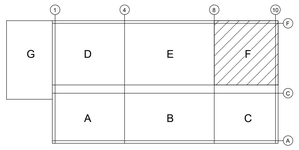
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. SEE DRAWING E001 FOR SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

(#) PLAN NOTES:

1. NOT USED.



KEY PLAN
SCALE: NONE

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PROJECT NO.: 21-154	

SHEET TITLE

ROOF 208V POWER PLAN - AREA F

SHEET NUMBER

EP382

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:15 PM AESI Proj. No: 21-154
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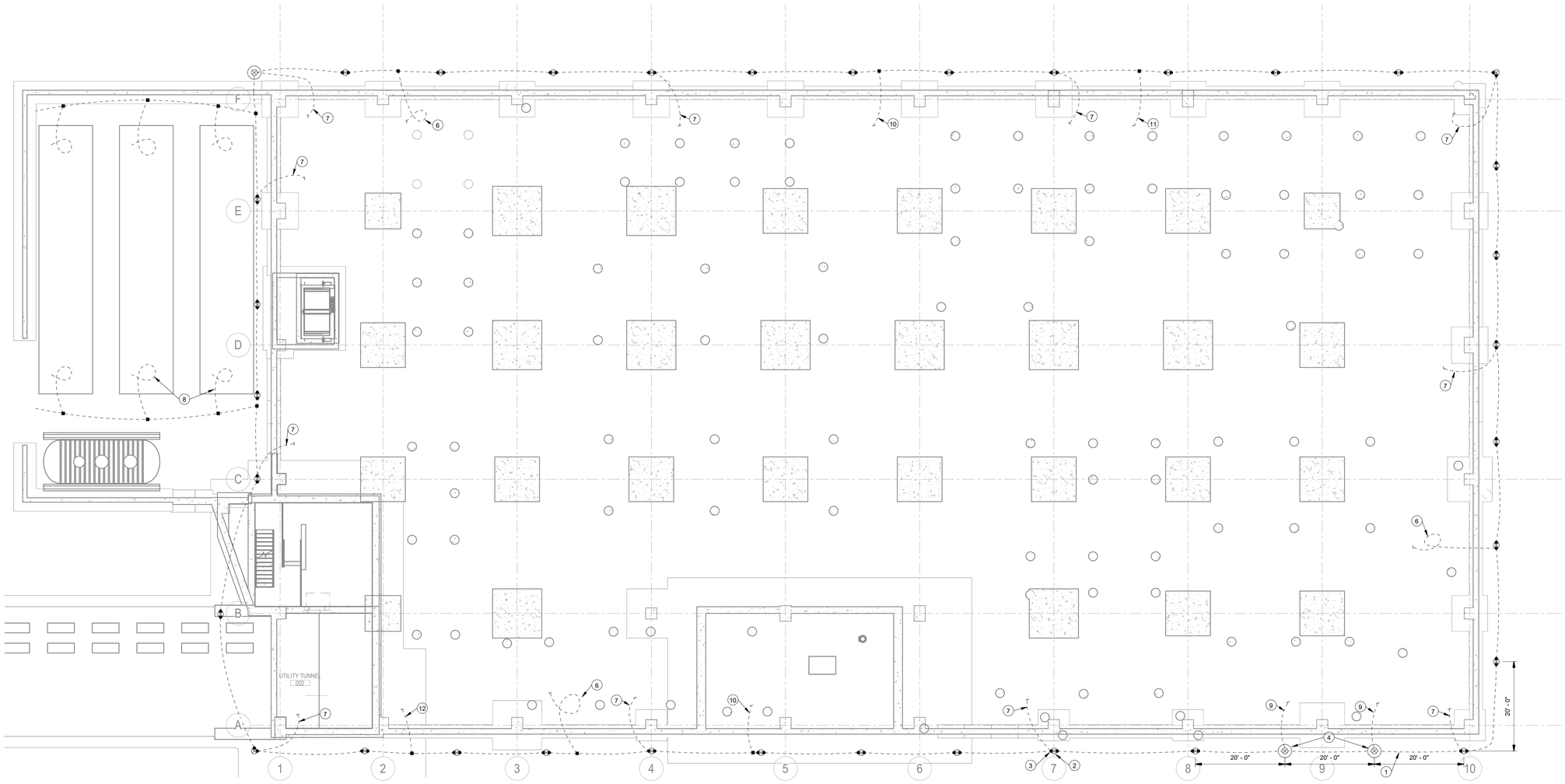

LOWER LEVEL GROUNDING ELECTRODE SYSTEM PLAN- OVERALL

Scale: 3/32" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE ALL MATERIAL AND LABOR NECESSARY TO INSTALL GROUNDING ELECTRODE SYSTEM AS INDICATED. THE GROUNDING RING CABLE SHALL BE INSTALLED MINIMUM OF 36" BELOW FINISHED GRADE. WHERE GROUNDING RING CABLE RUNS THROUGH CONCRETE PAD, CONTRACTOR SHALL LAY CABLE ON PAD REBAR AND MESH AND CONNECT CABLES TO CHANNEL STEEL LEVELING RAILS IN THE PAD AS INDICATED. INSTALLATION OF THE GROUNDING RING CABLE THROUGH CONCRETE FOUNDATION / PAD SHALL BE COORDINATED WITH THE FORMING AND CONCRETE POUR.
2. REFER TO DRAWING EP501 FOR GROUNDING DETAILS.
3. PROVIDE EXOTHERMIC WELD CONNECTIONS TO THE GROUNDING ELECTRODE SYSTEM UNLESS OTHERWISE NOTED FOR BURIED CONNECTIONS. BURNDY HYGROUND COMPRESSION CONNECTORS ARE ACCEPTABLE.
4. PROVIDE 1" PVC SCHEDULE 40 CONDUIT SLEEVE FOR ALL SLAB, FOUNDATION AND WALL PENETRATIONS.
5. PROVIDE A GROUNDING ELECTRODE SYSTEM CONNECTION TO WATER PIPES AND METAL PIPES PER THE NEC AT THE FIRST ACCESSIBLE POINT OF BUILDING ENTRY
6. PROVIDE A CLEAN AREA, REMOVE PAINT AND RUST DOWN TO BARE METAL BEFORE BONDING TO ALL METAL AND STEEL STRUCTURES.
7. PROVIDE A GROUNDING ELECTRODE SYSTEM CONNECTION TO EQUIPMENT WHERE SHOWN.
8. INSTALL ALL GROUNDING ELECTRODE SYSTEM CONDUCTORS WITH SLACK AND USE LARGE RADIUS BENDS TO AVOID DAMAGE.
9. INSTALLATION OF GROUND TO EQUIPMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
10. ALL GROUNDING ELECTRODE SYSTEM CONDUCTOR WHIPS SHALL BE MINIMUM 3'-0" LONG ABOVE FINISHED FLOOR OR FINISHED GRADE UNLESS OTHERWISE NOTED.
11. BOND LIGHTNING PROTECTION SYSTEM DOWN CONDUCTOR TO GROUNDING ELECTRODE SYSTEM RING WHERE SHOWN. LIGHTNING PROTECTION SYSTEM MAIN CONDUCTOR ABOVE GRADE IS ALUMINUM, TRANSITION TO COPPER BELOW GRADE.

PLAN NOTES:

1. PROVIDE #4/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR, DIRECT BURIED FOR GROUNDING ELECTRODE RING, CONNECT TO GROUNDING RODS, AND OTHER GROUNDING ELECTRODE SYSTEMS VIA EXOTHERMIC WELDS.
2. PROVIDE 10'-0" x 3/4" DIA. GROUNDING ROD. DRIVE INTO THE GROUND OUTSIDE FOUNDATION PERIMETER AND 3'-0" MINIMUM BELOW FINISHED GRADE.
3. EXOTHERMIC WELD CONNECTION. TYPICAL FOR GROUNDING RING TO GROUND ROD.
4. PROVIDE GROUND TEST WELL AT THIS LOCATION. CONNECTIONS TO GROUND ROD SHALL BE MECHANICAL ONLY TO SUPPORT TESTING.
5. PROVIDE #4/0 BARE COPPER GROUNDING CONDUCTOR AND CONNECT TO FOUNDATION STEEL REBAR. EXTEND 3'-0" OF GROUND CABLE ABOVE FINISHED FLOOR AND CONNECT TO BUILDING COLUMN STEEL VIA EXOTHERMIC WELD. SEE COLUMN GROUNDING DETAIL '2' ON DRAWING EP501.
6. PROVIDE #4/0 BARE COPPER GROUNDING CONDUCTOR AND CONNECT TO SLAB ON GRADE STEEL REBAR. CONNECT TO FOUNDATION STEEL.
7. PROVIDE #4/0 BARE COPPER LIGHTNING PROTECTION DOWN CONDUCTOR. EXOTHERMIC WELD TO GROUND ELECTRODE.
8. PROVIDE #3/0 BARE COPPER GROUNDING CONDUCTOR. TAP TO FUEL TANK GROUNDING POINT. PROVIDE TANK CONNECTION PER MANUFACTURER RECOMMENDATION.
9. PROVIDE #4/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR TO 2ND FLOOR MAIN GROUNDING BUS BAR.
10. PROVIDE #4/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR TO SERVICE ENTRANCE WATER LINES.
11. PROVIDE #4/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR TO 1ST FLOOR SUBSTATION ELECTRICAL ROOM AND CONNECT TO GROUNDING BUS BAR.
12. PROVIDE #4/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR TO 2ND FLOOR MDF ROOM AND CONNECT TO GROUNDING BUS BAR.

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PROJECT NO.: 21-154	

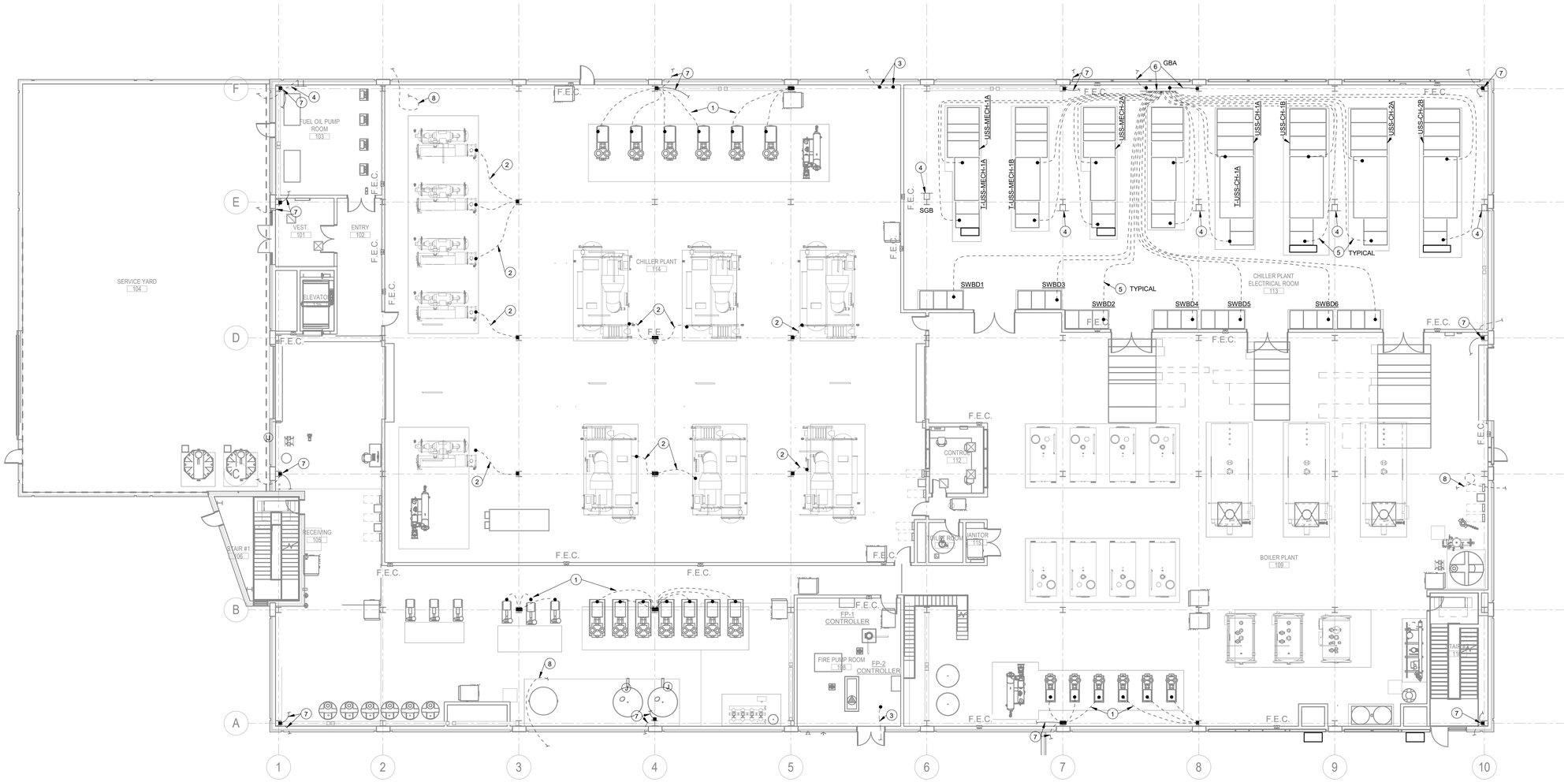
SHEET TITLE

LOWER LEVEL GROUNDING PLAN - OVERALL

SHEET NUMBER

EP391

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:18 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



FIRST FLOOR GROUNDING PLAN - OVERALL

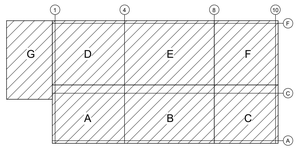
Scale: 3/32" = 1'-0"

GENERAL NOTES:

1. GROUNDING CONDUCTOR ROUTED UNDER SLAB TO EQUIPMENT CONNECTION POINT. USE 1" SLEEVE THROUGH SLAB.
2. SEE SHEET EP391 FOR GENERAL NOTES.

PLAN NOTES:

1. #2 BARE COPPER GROUNDING CONDUCTOR CONNECTION TO PUMP FRAME. CONNECTION PER MANUFACTURER REQUIREMENTS. EXOTHERMIC WELD TO STEEL COLUMN. MECHANICAL CONNECTION AT THE PUMP FRAME.
2. #1/0 BARE COPPER GROUNDING CONDUCTOR, PROVIDE CONNECTION TO CHILLER FRAME PER MANUFACTURER REQUIREMENTS. EXOTHERMIC WELD TO STEEL COLUMN.
3. #4/0 BARE COPPER GROUNDING CONDUCTOR CONNECTION TO INCOMING WATER PIPE. EXOTHERMIC WELD TO GROUNDING ELECTRODE RING. CONNECTION TO PIPE SHALL BE MECHANICAL AND ABOVE SLAB FOR VISUAL INSPECTION. SEE SHEET EP391 FOR CONTINUATION.
4. PROVIDE 24"L x 4"W x 1/2"D SAFETY GROUND BAR WITH STANDOFFS FOR MOUNTING. EXOTHERMIC WELD BAR WHIP TO STEEL COLUMN.
5. #3/0 BARE COPPER GROUNDING CONDUCTOR CONNECTION SUBSTATIONS AND SWITCHBOARD GROUND BUS. USE MECHANICAL CONNECTION AT GEAR AND GROUND BAR.
6. BARE COPPER GROUND BAR, GBA, 96"L x 4"W x 1/2"D WITH STANDOFFS FOR WALL MOUNTING. EXOTHERMIC WELD BAR WHIP TO STEEL COLUMN. PROVIDE #4/0 BARE COPPER CONDUCTOR TO GROUNDING ELECTRODE RING. AND EXOTHERMIC WELD. SEE SHEET EP391 FOR CONTINUATION.
7. LIGHTNING PROTECTION SYSTEM DOWN CONDUCTOR. ALUMINUM #4/0 FROM ROOF. PROVIDE BI-METAL CONNECTOR, CONNECTED TO STEEL COLUMN. TRANSITION TO COPPER #4/0 TO BELOW GRADE AND CONNECTION TO GROUNDING ELECTRODE. SEE SHEET EP391 FOR CONTINUATION.
8. PROVIDE CONCRETE ENCLOSED ELECTRODE. PROVIDE 20 FEET OF 1/2"Ø ROD OR 20 FEET OF #4 AWG COPPER CONNECTED TO SLAB STEEL REBAR AND MESH. PLACE SO 3' OF CONCRETE MINIMUM COVER AROUND ELECTRODE.



KEY PLAN

SCALE: NONE

OWNER

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PROJECT NO.: 21-154	

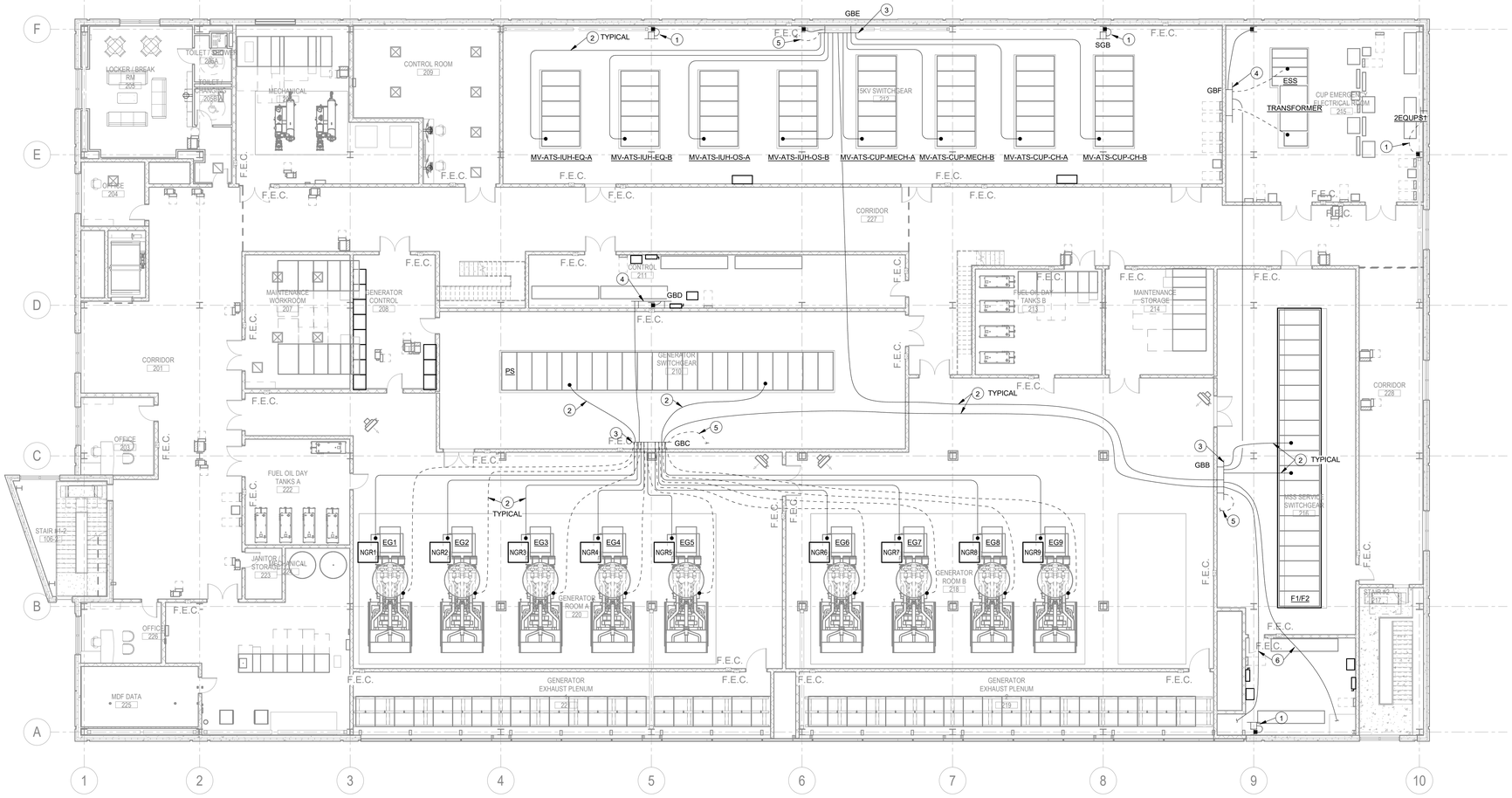
SHEET TITLE

FIRST FLOOR GROUNDING PLAN - OVERALL

SHEET NUMBER

EP392

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:00:40 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



SECOND FLOOR GROUNDING PLAN - OVERALL

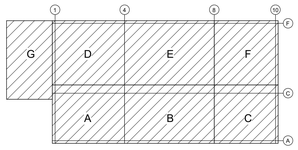
Scale: 3/32" = 1'-0"

GENERAL NOTES:

1. GROUNDING CONDUCTOR ROUTED UNDER SLAB TO EQUIPMENT CONNECTION POINT. USE 1" SLEEVE THROUGH SLAB.
2. SEE SHEET EP391 FOR GENERAL NOTES.

PLAN NOTES:

1. PROVIDE 24"L x 4"W x1/2"D SAFETY GROUNDING BAR WITH STANDOFFS FOR MOUNTING. EXOTHERMIC WELD BAR WHIP TO STEEL COLUMN. FOR SWITCHGEAR MAINTENANCE GROUNDING.
2. #3/0 COPPER GROUNDING CONDUCTOR CONNECTION TO SWITCHGEAR AND GENERATOR EQUIPMENT. MECHANICAL CONNECTION AT GEAR. MECHANICAL CONNECTION TO GROUND BAR. ROUTE IN 1"C. SLEEVE WHERE REQUIRED.
3. PROVIDE 96"L x 4"W x 1/2"D GROUNDING BAR WITH STAND OFFS FOR MOUNTING. EXOTHERMIC WELD BAR WHIP TO STEEL COLUMN.
4. PROVIDE 48"L x 4"W x 1/2"D GROUND BAR WITH STAND OFFS FOR MOUNTING. EXOTHERMIC WELD BAR WHIP TO STEEL COLUMN.
5. PROVIDE CONCRETE ENCASED ELECTRODE. PROVIDE 20 FEET OF 1/2" DIAMETER ROD OR 20 FEET OF #4 AWG COPPER CONNECTED TO SLAB STEEL REBAR AND MESH. PLACE SO 3" OF CONCRETE MINIMUM COVER AROUND ELECTRODE.
6. PROVIDE #4/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR. ROUTE BELOW GRADE AND CONNECT TO GROUNDING ELECTRODE ROD. SEE SHEET EP391 FOR CONTINUATION.



KEY PLAN

SCALE: NONE

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SHEET TITLE

SECOND FLOOR GROUNDING PLAN - OVERALL

SHEET NUMBER

EP393

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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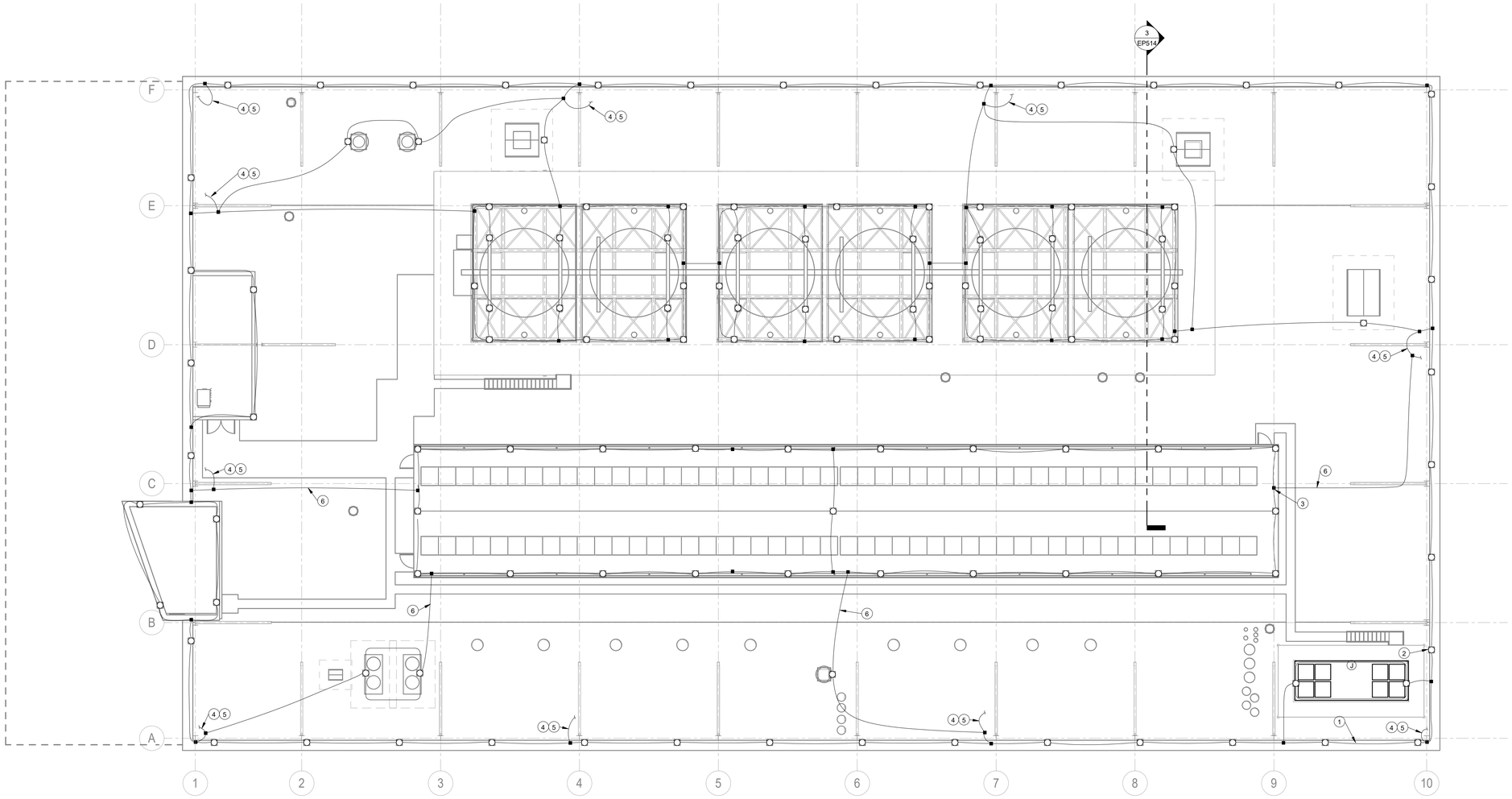


ROOF LIGHTNING PROTECTION PLAN - OVERALL

Scale: 3/32" = 1'-0"

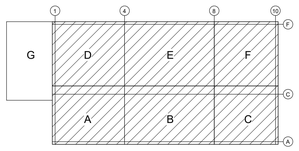
LIGHTNING PROTECTION SYSTEM - 2020 NFPA 780, TABLE 4.1.1.1.2			
CLASS II MATERIAL REQUIREMENTS			
TYPE OF CONDUCTOR	PARAMETER	COPPER	ALUMINUM
AIR TERMINAL, SOLID	DIAMETER	1/2"	5/8"
MAIN CONDUCTOR CABLE	SIZE EACH STRAND	15 AWG	13 AWG
	WEIGHT PER LENGTH	375 LB / 1000 FT	190 LB / 1000 FT
	CROSS SECTION AREA	115,000 CIR....	192,000 CIR....
BONDING CONDUCTOR CABLE	SIZE EACH STRAND	17 AWG	14 AWG
	CROSS SECTION AREA	26,240 CIR. MILS	41,100 CIR. MILS
NOTES			
1. BASIS OF DESIGN IS CLASS II ALUMINUM MATERIAL.			
2. ALTERNATE IS CLASS II COPPER MATERIAL.			

GENERAL NOTES:

1. LIGHTNING PROTECTION. CONTRACTOR SHALL PROVIDE A MASTER LABELED SYSTEM. SEE SPECIFICATION 264113.
2. SEE SHEET EP391 FOR GENERAL NOTES.
3. LIGHTNING RODS AND CONNECTION CONDUCTOR WILL BE PLACED ON TOP OF SCREEN WALL.

PLAN NOTES:

1. MAIN LIGHTNING PROTECTION CONDUCTOR. TYPICAL FOR ALL CONDUCTORS ON THIS DRAWING. SEE SCHEDULE ON THIS SHEET.
2. 24" SOLID 5/8"Ø AIR TERMINAL. TYPICAL FOR ALL AIR TERMINALS ON THE THIS DRAWING.
3. EXOTHERMIC WELD. TYPICAL FOR ALL CONNECTIONS ON THIS DRAWING.
4. DOWN CONDUCTOR. SEE DRAWING EP391 FOR CONNECTION TO GROUNDING ELECTRODE SYSTEM.
5. PROVIDE A THRU-ROOF CONNECTOR. CONNECT TO STRUCTURAL STEEL COLUMN BELOW ROOF.
6. ROUTE CABLE UNDER ROOF WALKPADS. PROVIDE CABLE PROTECTION UNDER WALK PADS.



KEY PLAN

SCALE: NONE

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SHEET TITLE

LIGHTNING PROTECTION PLAN

SHEET NUMBER

EP394

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:15 PM AESI Proj. No: 21-154
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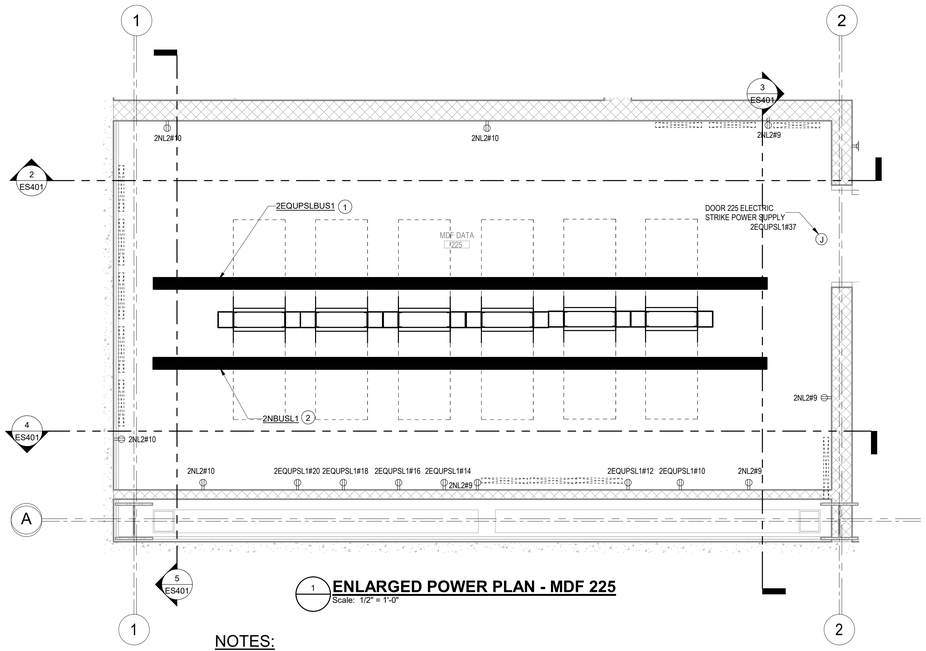

1 ENLARGED POWER PLAN - MDF 225

Scale: 1/2" = 1'-0"

NOTES:

1. PROVIDE MDF BUSWAY 2UPSBUS1. 100A, 208V, 3 PHASE, 4 WRE. STARLINE 100T OR OWNER APPROVED EQUIVALENT. MOUNT AT +10'-0" AFF. PROVIDE END FEED UNIT WITH METERING AND ANGLED DISPLAY COVER. PROVIDE (6) CBDC-X-L630C-4 (30A, 2P, 208V, L630C, 15FT SO CORD & STRAIN RELIEF).
2. PROVIDE MDF BUSWAY 2NBUS1. 100A, 208V, 3 PHASE, 4 WRE. STARLINE 100T OR OWNER APPROVED EQUIVALENT. MOUNT AT +10'-0" AFF. PROVIDE END FEED UNIT WITH METERING AND ANGLED DISPLAY COVER. PROVIDE (6) CBDC-X-L630C-4 (30A, 2P, 208V, L630C, 15FT SO CORD & STRAIN RELIEF).
3. PROVIDE ELECTRIC STRIKE POWER SUPPLY IN NEMA 1 BOX. MOUNT 12" ABOVE DOOR. PROVIDE POWER SUPPLY OF SAME MANUFACTURER AS ELECTRIC STRIKE. SEE DOOR HARDWARE SCHEDULE IN ARCHITECTURAL DRAWINGS FOR DETAILS.

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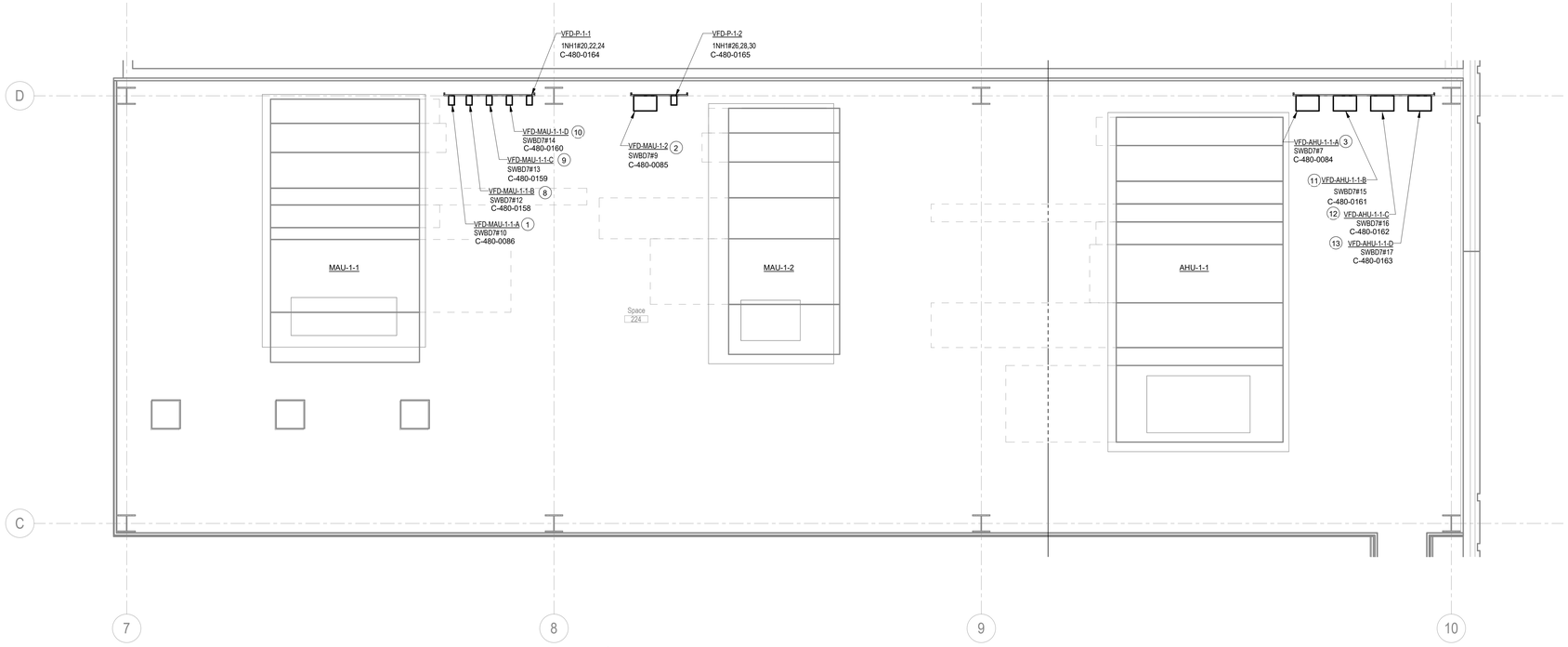
SHEET TITLE

ENLARGED POWER PLANS

SHEET NUMBER

EP401

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 3:01:18 PM AESI Proj. No: 21-154



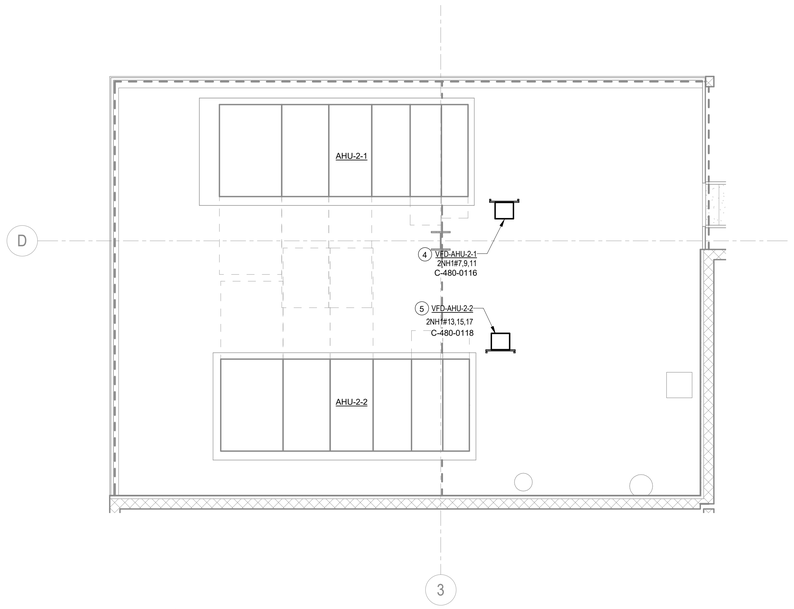
1 FIRST FLOOR MEZZANINE 480V POWER PLAN
Scale: 1/4" = 1'-0"

GENERAL NOTES:

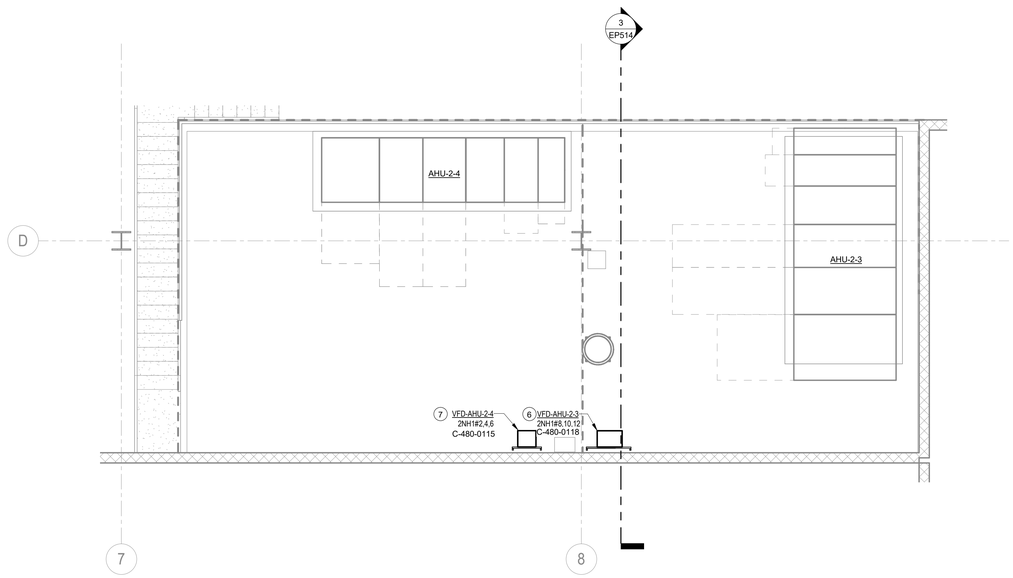
1. SEE DRAWING E001 FOR SYMBOLS, ABREVIATIONS, AND GENERAL NOTES.
2. SEE DRAWING SERIES EP5## FOR DETAILS.
3. SEE DRAWING SERIES EP6## FOR SCHEDULES.
4. SEE DRAWING SERIES EP7## FOR DIAGRAMS.

PLAN NOTES:

1. PROVIDE VFD-MAU-1-1-A. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
2. PROVIDE VFD-MAU-1-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
3. PROVIDE VFD-AHU-1-1-A. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
4. PROVIDE SW-AHU-2-1. 60A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK AT +54" AFF ON AHU MEZZANINE.
5. PROVIDE SW-AHU-2-2. 60A, 480V, 3 PHASES, HEAVY DUTY. MOUNT ON STRUT RACK AT +54" AFF ON AHU MEZZANINE.
6. PROVIDE VFD-AHU-2-3. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
7. PROVIDE VFD-AHU-2-4. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
8. PROVIDE VFD-MAU-1-1-B. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
9. PROVIDE VFD-MAU-1-1-C. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
10. PROVIDE VFD-MAU-1-1-D. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
11. PROVIDE VFD-AHU-1-1-B. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
12. PROVIDE VFD-AHU-1-1-C. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
13. PROVIDE VFD-AHU-1-1-D. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
14. PROVIDE VFD-P-1-1. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.
15. PROVIDE VFD-P-1-2. SEE SCHEDULE ON EP601 FOR DETAILS. MOUNT ON STRUT RACK AT +54"AFF.



2 SECOND FLOOR MEZZANINE 1 480V POWER PLAN
Scale: 1/4" = 1'-0"



3 SECOND FLOOR MEZZANINE 2 480V POWER PLAN
Scale: 1/4" = 1'-0"

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DESIGNED BY AESI	CERTIFICATION
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PROJECT NO. 21-154	

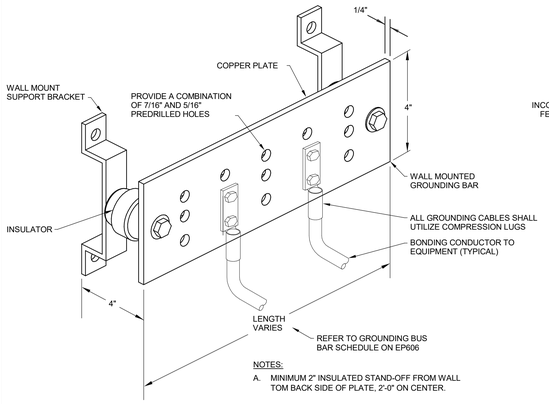
SHEET TITLE

MEZZANINE 480V POWER PLANS

SHEET NUMBER

EP403

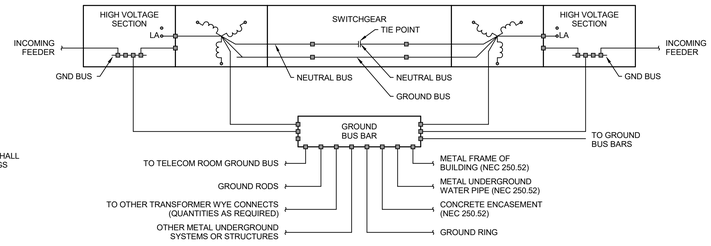
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:22 PM AESI Proj. No: 21-154



NOTES:

A. MINIMUM 2" INSULATED STAND-OFF FROM WALL TOM BACK SIDE OF PLATE, 2'-0" ON CENTER.

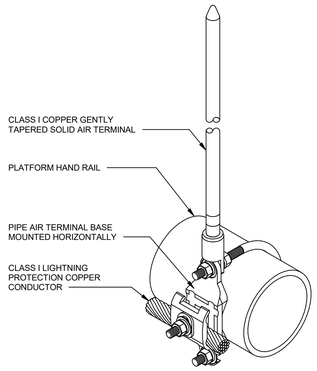
10 GROUNDING BUS BAR
Scale: NONE



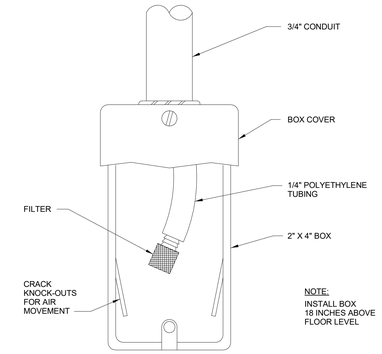
NOTES:

A. SEE GROUND BUS BAR SCHEDULE ON SHEET EP608.

9 SUBSTATION AND MAIN BUILDING BUS BAR GROUNDING
Scale: NONE



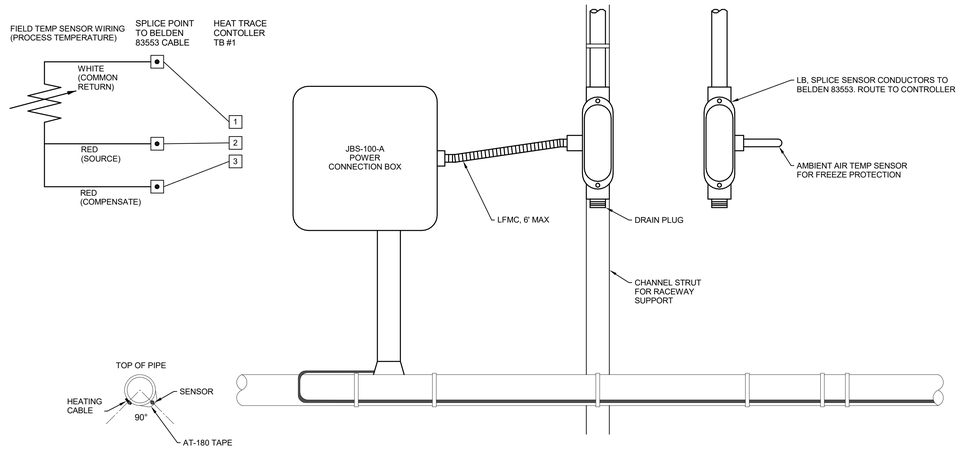
5 AIR TERMINAL PIPE MOUNTED
Scale: NONE



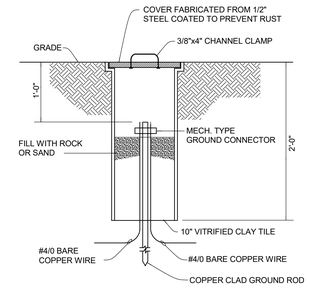
NOTE:
INSTALL BOX 18 INCHES ABOVE FLOOR LEVEL

NOTE:
REFER TO DRAWING CJ6.H302 FOR SENSING POINT LOCATIONS.

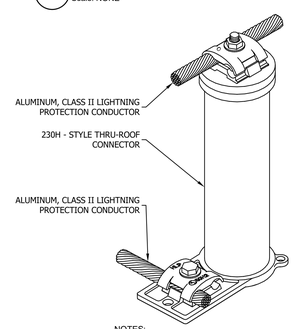
1 REFRIGERANT MONITOR SENSE POINT
Scale: NONE



12 HEAT TRACE RTD AND JUNCTION BOX DETAIL
Scale: NONE



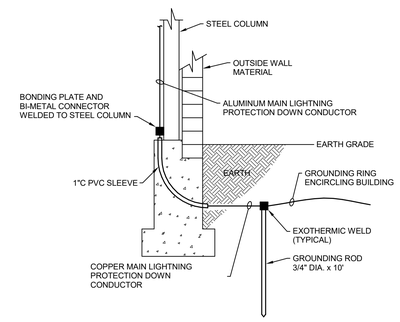
6 GROUNDING TEST WELL DETAIL
Scale: NONE



NOTES:

A. PROVIDE ROOF BOOT AND SEAL.
B. PROVIDE ROOF PENETRATION.

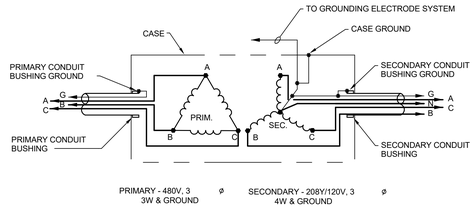
7 LIGHTNING PROTECTION THRU-ROOF DETAIL
Scale: NONE



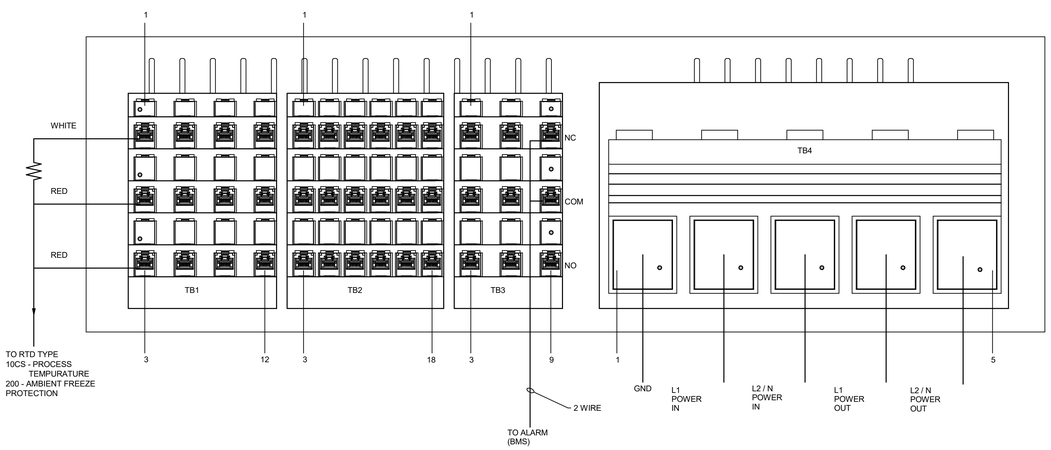
LIGHTNING DOWN CONDUCTOR DETAIL NOTES:

1. ALL CONNECTIONS BETWEEN LIGHTNING CONDUCTOR AND STRUCTURAL MEMBERS ARE TO BE MADE WITH EXOTHERMIC WELD.
2. LEAVE FIVE (5) FEET MINIMUM OF CABLE EXPOSED OUTSIDE OF PIER WALL FOR CONNECTION TO GROUND ELECTRODE SYSTEM.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF CONDUCTOR SLEEVE WITH FOUNDATION AND STRUCTURAL WORK.
4. PROTECT EXPOSED CABLE ENDS DURING CONSTRUCTION WITH TWO (2) FEET MINIMUM OF DURABLE HEAT SHRINK TUBING. CUT OFF TUBING AFTER CONSTRUCTION IS COMPLETE.
5. LEAVE THREE (3) FEET MINIMUM EXPOSED CABLE ABOVE PIER FOR LATER CONNECTION TO STEEL COLUMNS. PROTECT EXPOSED CABLE AS INDICATED IN NOTE #4. AFTER PLACEMENT OF STEEL NEATLY TRAIN CABLE INTO STEEL COLUMN FLANGE INTERIOR, CUT OFF EXCESS CABLE AND EXOTHERMIC WELD TO STEEL COLUMN.
6. TOUCH-UP STEEL COLUMN SURFACE AFTER EXOTHERMIC WELD TO MATCH PRIOR FINISH.
7. CONNECT LIGHTNING PROTECTION DOWN CONDUCTOR TO GROUNDING ROD/RING WITH EXOTHERMIC WELD.

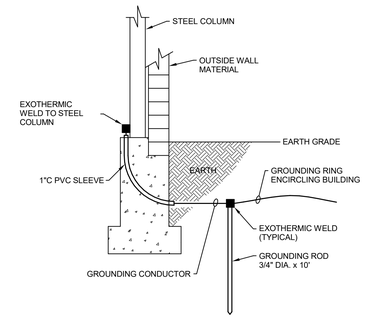
2 LIGHTNING DOWN CONDUCTOR DETAIL
Scale: NONE



3 TRANSFORMER CONNECTION DIAGRAM
Scale: NONE



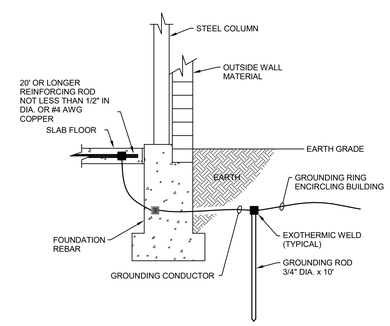
11 HEAT TRACE CONTROLLER BOTTOM SIDE TERMINAL BLOCKS
Scale: NONE



STEEL COLUMN GROUNDING DETAIL NOTES:

1. ALL CONNECTIONS BETWEEN GROUNDING CONDUCTOR AND STRUCTURAL MEMBERS ARE TO BE MADE WITH EXOTHERMIC WELD.
2. LEAVE FIVE (5) FEET MINIMUM OF CABLE EXPOSED OUTSIDE OF PIER WALL FOR CONNECTION TO GROUND ELECTRODE SYSTEM.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF CONDUCTOR SLEEVE WITH FOUNDATION AND STRUCTURAL WORK.
4. PROTECT EXPOSED CABLE ENDS DURING CONSTRUCTION WITH TWO (2) FEET MINIMUM OF DURABLE HEAT SHRINK TUBING. CUT OFF TUBING AFTER CONSTRUCTION IS COMPLETE.
5. LEAVE THREE (3) FEET MINIMUM EXPOSED CABLE ABOVE PIER FOR LATER CONNECTION TO STEEL COLUMNS. PROTECT EXPOSED CABLE AS INDICATED IN NOTE #4. AFTER PLACEMENT OF STEEL NEATLY TRAIN CABLE INTO STEEL COLUMN FLANGE INTERIOR, CUT OFF EXCESS CABLE AND EXOTHERMIC WELD TO STEEL COLUMN.
6. TOUCH-UP STEEL COLUMN SURFACE AFTER EXOTHERMIC WELD TO MATCH PRIOR FINISH.

8 STEEL COLUMN GROUNDING DETAIL
Scale: NONE



CONCRETE ENCASED ELECTRODE DETAIL NOTES:

1. ALL CONNECTIONS BETWEEN GROUNDING ELECTRODE CONDUCTOR AND STRUCTURAL MEMBERS ARE TO BE MADE WITH EXOTHERMIC WELD.
2. LEAVE FIVE (5) FEET MINIMUM OF CABLE EXPOSED OUTSIDE OF PIER WALL FOR CONNECTION TO GROUND ELECTRODE SYSTEM.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF CONDUCTOR WITH FOUNDATION AND STRUCTURAL WORK.
4. PROTECT EXPOSED CABLE ENDS DURING CONSTRUCTION WITH TWO (2) FEET MINIMUM OF DURABLE HEAT SHRINK TUBING. CUT OFF TUBING AFTER CONSTRUCTION IS COMPLETE.

4 CONCRETE ENCASED ELECTRODE GROUNDING DETAIL
Scale: NONE

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CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

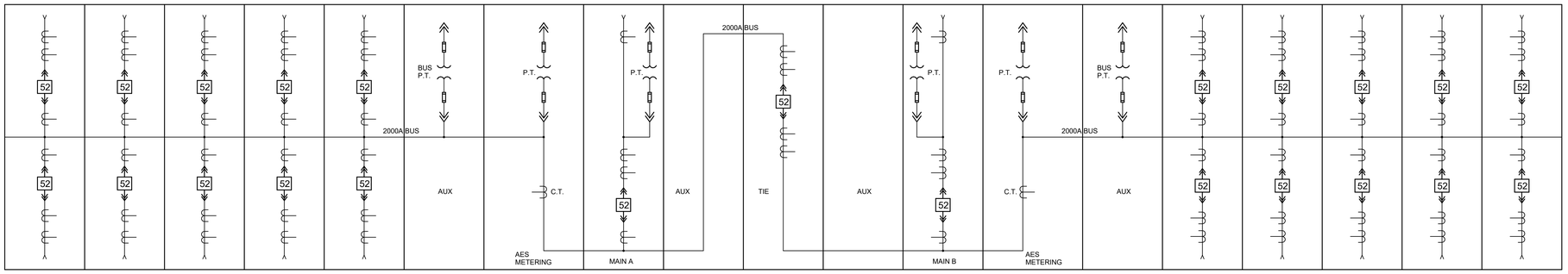
SHEET TITLE

POWER DETAILS

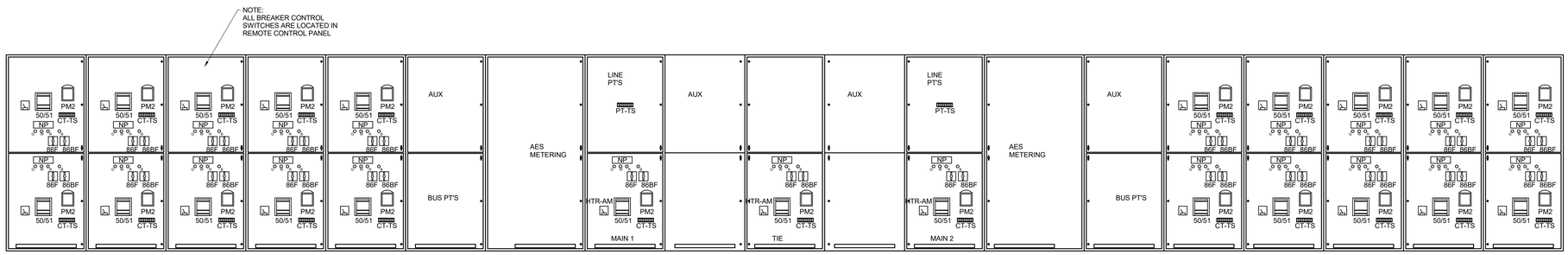
SHEET NUMBER

EP501

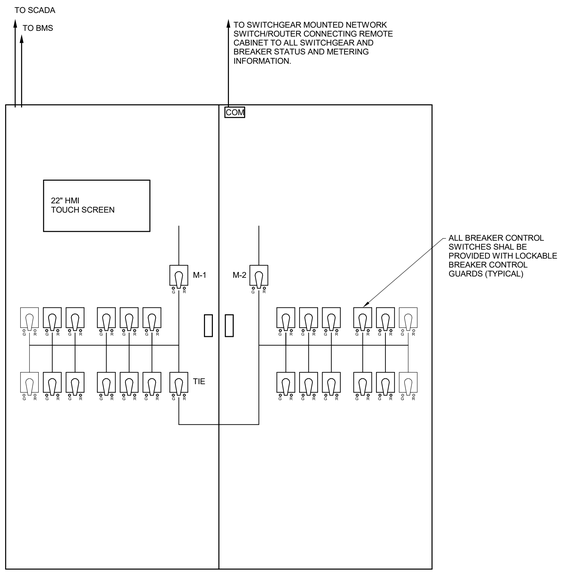
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:23 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **15KV MAIN SERVICE SWITCHGEAR BUS DIAGRAM**
Scale: NONE



2 **15KV MAIN SERVICE SWITCHGEAR ELEVATION**
Scale: NONE



3 **MAIN SERVICE SWITCHGEAR REMOTE HMI/OIT CONTROL CABINET**
Scale: NONE

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SHEET TITLE

SUBSTATION DETAILS - MSS DIAGRAM AND ELEVATION

SHEET NUMBER

EP502

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:23 PM AESI Proj. No: 21-154
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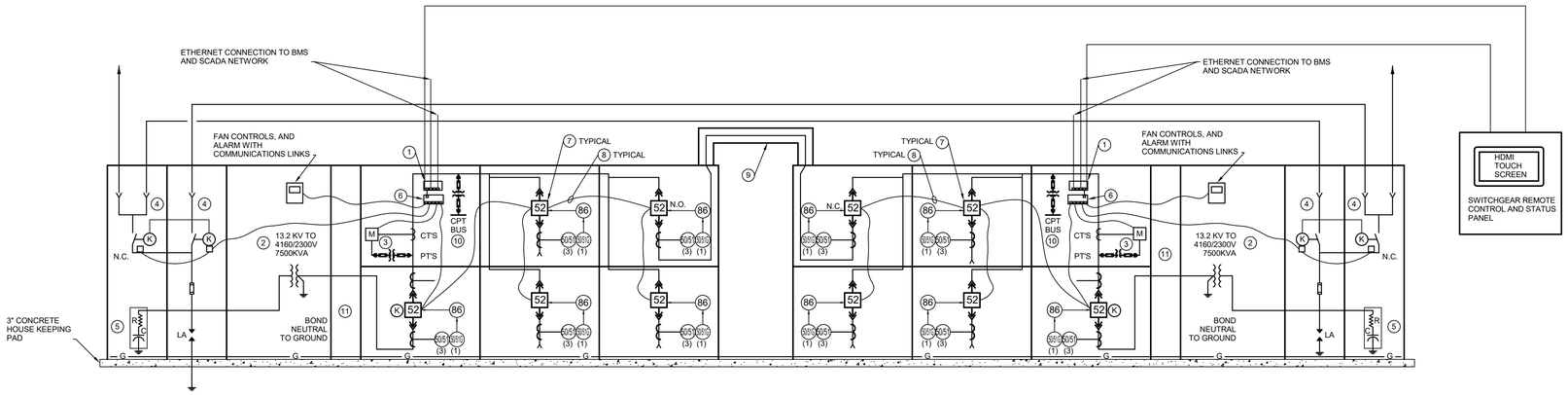

1 SUBSTATION DETAILS - CUP - USS-CH-1 / CH-2

Scale: NONE

DETAIL NOTES:

1. ETHERNET ROUTER WITH (2) FIBER AND (4) COPPER PORTS FOR NETWORK CONNECTIONS TO SCADA SYSTEM.
2. TRANSFORMER SHALL BE CAST COIL DESIGN.
3. MICROPROCESSOR BASED POWER METERING WITH ETHERNET COMMUNICATION INTERFACE TO SUBSTATION GATEWAY.
4. PROVIDE KIRK-KEY INTERLOCK SCHEME FOR PRIMARY SELECTIVE, TO PREVENT PARALLELING SERVICES. FOR SECONDARY MAIN BREAKER OPEN BEFORE SWITCH OPERATION.
5. PROVIDE R/C SNUBBER TO PROTECT AGAINST SWITCHING INDUCED TRANSIENTS.
6. SUBSTATION COMMUNICATIONS GATEWAY.
7. BREAKER PROTECTIVE RELAY UNIT WITH DIGITAL COMMUNICATIONS TO SUBSTATION GATEWAY.
8. COMMUNICATIONS LINK. THE MANUFACTURER SHALL WIRE NETWORK TO ALL COMMUNICATION CAPABLE DEVICES WITHIN THE SUBSTATION TO A CENTRAL GATEWAY IN SWITCHGEAR SECTION.
9. 1200A, 3-PHASE SEGMENTED BUS WITH GROUND.
10. CONTROL POWER TRANSFORMER FOR SUBSTATION, WITH CABLED CONNECTION AND ALTERNATOR CONTROL BETWEEN SUBSTATIONS.
11. TRANSITION SECTION.

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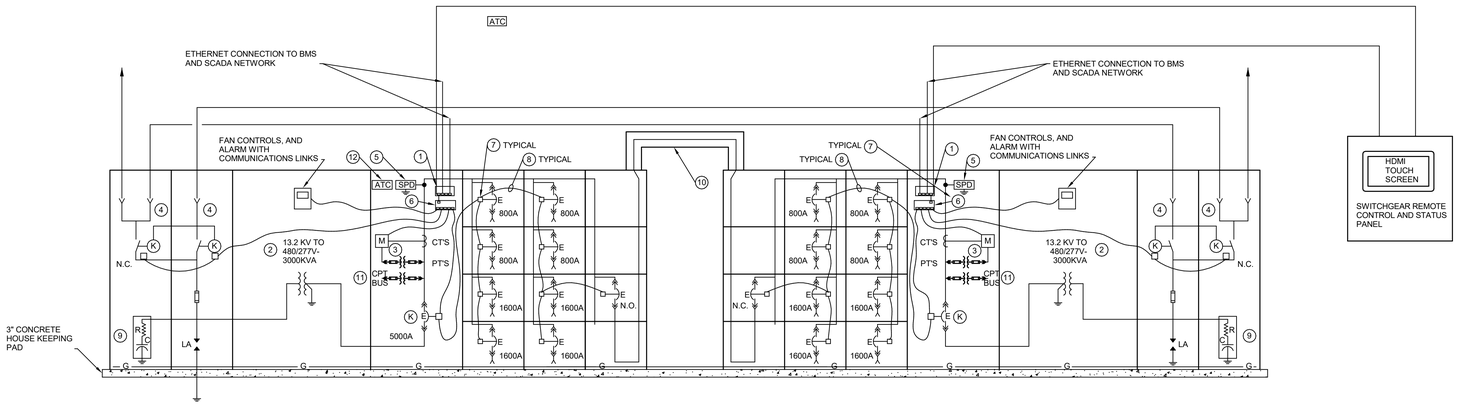
SHEET TITLE

SUBSTATION DETAILS - USS-CH-1 / CH-2

SHEET NUMBER

EP503

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:24 PM AESI Proj. No: 21-154

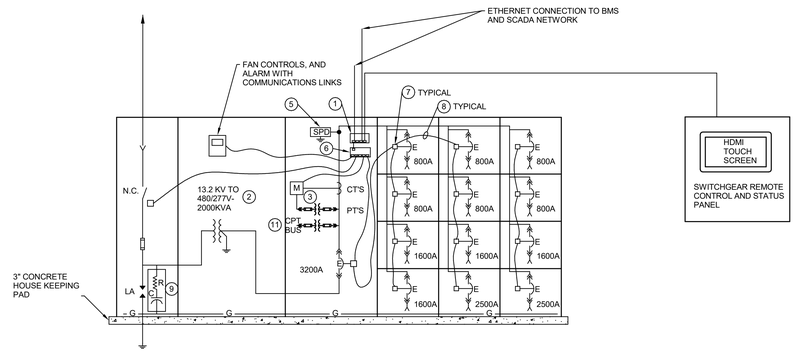


1 CUP SUBSTATION DETAIL USS-MECH-1/USS-MECH-2

Scale: NONE

DETAIL NOTES:

1. ETHERNET ROUTER WITH (2) FIBER AND (4) COPPER PORTS FOR NETWORK CONNECTIONS TO SCADA SYSTEM.
2. TRANSFORMER SHALL BE CAST COIL DESIGN.
3. MICROPROCESSOR BASED POWER METERING WITH ETHERNET COMMUNICATION INTERFACE TO SUBSTATION GATEWAY.
4. PROVIDE KIRK-KEY INTERLOCK SCHEME FOR PRIMARY SELECTIVE, TO PREVENT PARALLELING SERVICES. FOR SECONDARY MAIN BREAKER OPEN BEFORE SWITCH OPERATION.
5. PROVIDE FACTORY INSTALLED (SPD) SURGE PROTECTION DEVICE.
6. SUBSTATION COMMUNICATIONS GATEWAY.
7. BREAKER TRIP UNIT WITH DIGITAL COMMUNICATIONS TO SUBSTATION GATEWAY.
8. COMMUNICATIONS LINK. THE MANUFACTURER SHALL WIRE NETWORK TO ALL COMMUNICATION CAPABLE DEVICES WITHIN THE SUBSTATIOM TO A CENTRAL GATEWAY IN SWITCHGEAR SECTION.
9. PROVIDE R/C SNUBBER TO PROTECT AGAINST SWITCHING INDUCED TRANSIENTS.
10. 500A 3-PHASE, 4-WIRE, LOW IMPEDANCE BUS DUCT WITH GROUND.
11. CONTROL POWER TRANSFORMER FOR SUBSTATION, WITH CABLED CONNECTION AND ALTERNATOR CONTROL BETWEEN SUBSTATIONS.
12. AUTOMATIC TRANSFER CONTROL WITH AUTO / MANUAL SELECTOR SWITCH AND SYNC CONTROL. INCLUDES CONTACTS FOR INHIBIT CONTROL FROM PS MASTER CONTROLLER.



2 EMERGENCY SUBSTATION DETAIL CUP-ESS

Scale: NONE

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PROJECT NO. **21-154**	

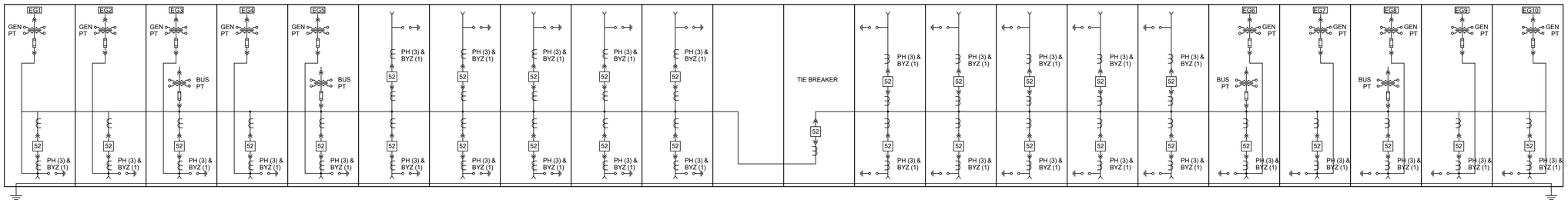
SHEET TITLE

SUBSTATION DETAILS - USS-MECH1/MECH2 AND ESS

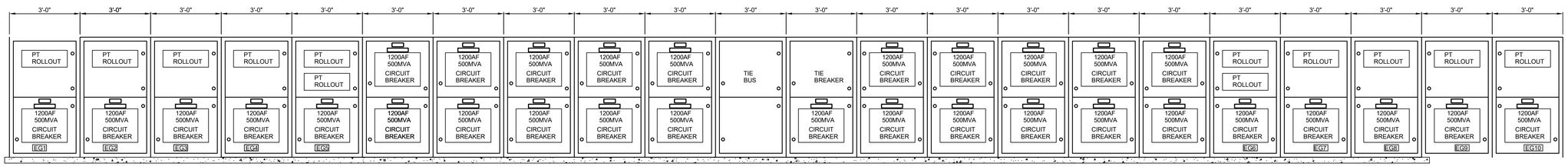
SHEET NUMBER

EP504

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:24 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

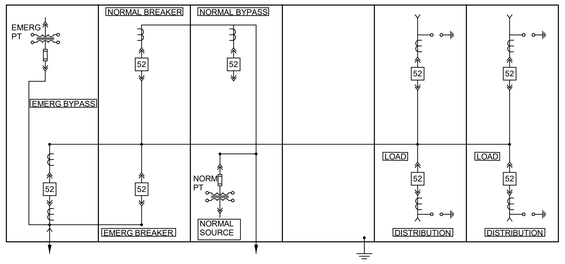


1 PARALLELING SWITCHGEAR BUS DIAGRAM
Scale: NONE

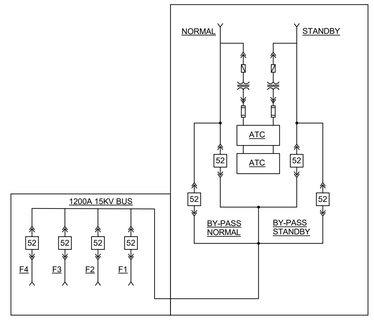


PARALLELING SWITCHGEAR IS TOP ENTRY

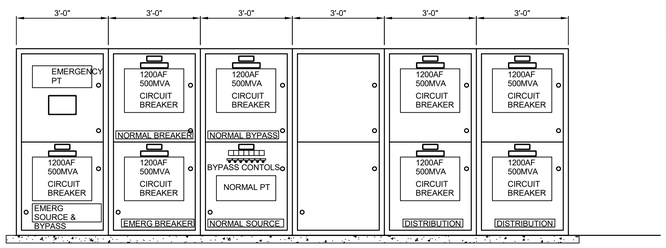
2 PARALLELING SWITCHGEAR ELEVATION
Scale: NONE



MV AUTOMATIC TRANSFER SWITCH BUS DIAGRAM

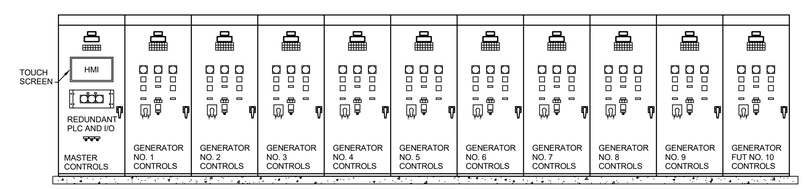


MV AUTOMATIC TRANSFER SWITCH ONE-LINE

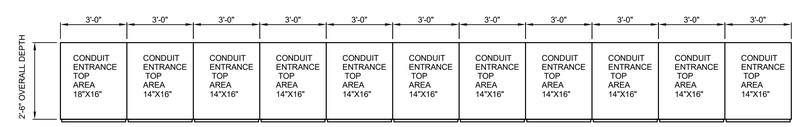


MV AUTOMATIC TRANSFER SWITCH ELEVATION MV-ATS ARE TOP ENTRY

3 TYPICAL MV-ATS DETAILS
Scale: NONE



ELEVATION VIEW



PLAN VIEW

4 PS GENERATOR MASTER CONTROLS
Scale: NONE

OWNER

Indiana University Health
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION
CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

SUBSTATION DETAILS - PS DIAGRAM AND ELEVATION

SHEET NUMBER

EP505

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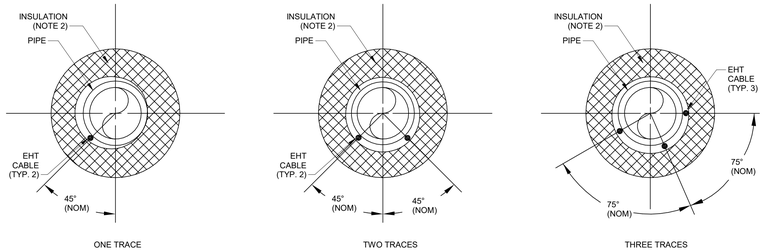
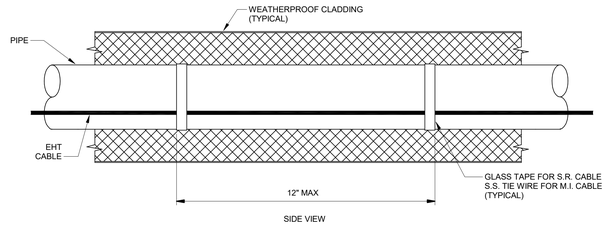
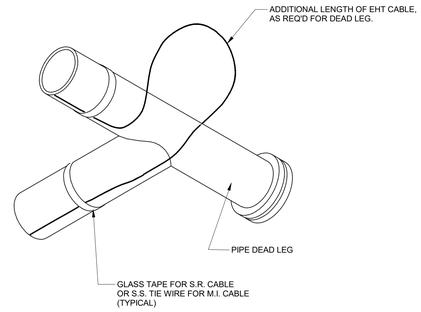
2/10/2023 3:01:25 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



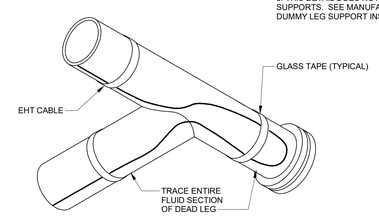
NOTES:
1. THESE DETAILS SHOW THE GENERAL INSTALLATION METHOD.
2. SEE HEAT TRACE SCHEDULE SHEET EP608 AND SPECIFICATION. FOR INSULATION TYPE AND THICKNESS SEE MECHANICAL DRAWINGS.



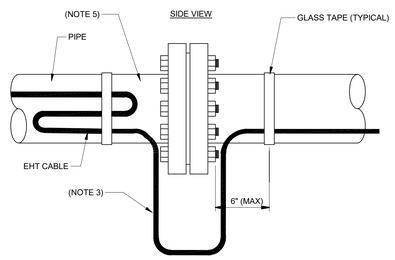
5 ELECTRICAL POWER HEAT TRACE DETAILS
Scale: 1/4" = 1'-0"



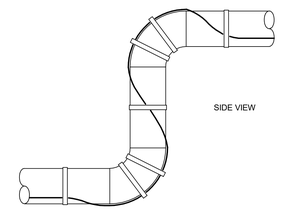
NOTES:
1. THESE DETAILS SHOW THE GENERAL INSTALLATION METHOD.
2. SEE MANUFACTURERS DETAILS FOR MINIMUM BEND RADIUS AND SPACING.
3. THIS DETAIL DOES NOT APPLY TO DUMMY LEG SUPPORTS. SEE MANUFACTURER'S DETAILS FOR DUMMY LEG SUPPORT INSTALLATIONS.



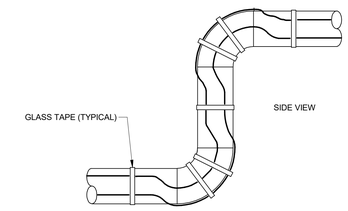
1 ELECTRICAL POWER HEAT TRACE DEAD LEG DETAILS
Scale: NONE



NOTES:
1. THESE DETAILS SHOW THE GENERAL INSTALLATION METHOD.
2. SEE MANUFACTURERS DETAILS FOR MINIMUM BEND RADIUS AND SPACING.
3. SEE MANUFACTURER'S FLANGE ADDER CHART.
4. FOR PIPES WITH MORE THAN ONE PASS OF EHT CABLE, APPLY THE FULL FLANGE ADDER FOR EACH PASS OF EHT CABLE ON EACH FLANGE PAIR.
5. FOR SOME APPLICATION IT MAY BE PHYSICALLY IMPOSSIBLE TO INSTALL ALL PHYSICALLY IMPOSSIBLE TO INSTALL ALL OF THE RECOMMENDED EHT CABLE ON THE FLANGE PAIR. IN THIS CASE, USE UP THE REMAINING EHT CABLE ON THE PIPE TO EITHER SIDE OF THE FLANGED PAIR.

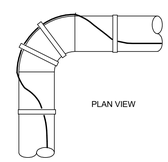


INSTALLATION OF SINGLE PASS OF EHT CABLE ON VERTICAL ELBOW

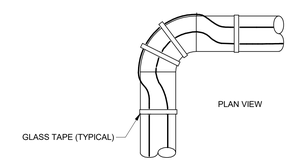


INSTALLATION OF MULTI-PASS OF EHT CABLE ON VERTICAL ELBOW

NOTES:
1. THESE DETAILS SHOW THE GENERAL INSTALLATION METHOD

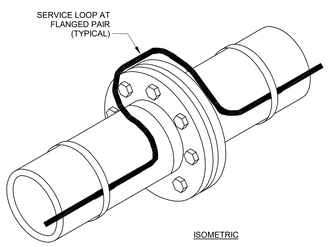


INSTALLATION OF SINGLE PASS OF EHT CABLE ON HORIZONTAL ELBOW

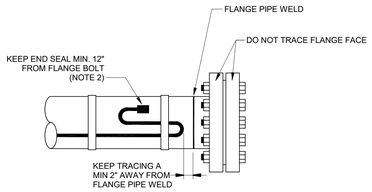


INSTALLATION OF MULTI-PASS OF EHT CABLE ON HORIZONTAL ELBOW

2 ELECTRICAL POWER MULTIPLE TRACE DETAILS
Scale: NONE

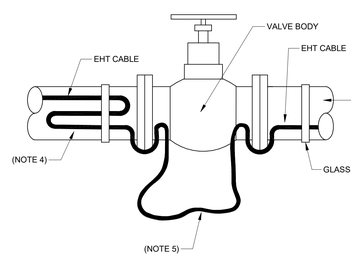


ISOMETRIC

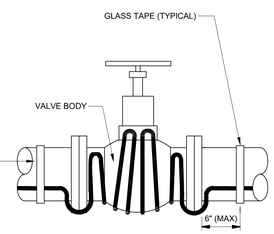


BLIND FLANGE DEAD END

6 ELECTRICAL POWER HEAT TRACE FLANGE DETAILS
Scale: 1/4" = 1'-0"



SIDE VIEW



SIDE VIEW

NOTES:
1. THESE DETAILS SHOW THE GENERAL INSTALLATION METHOD. THE EHT CABLE INSTALLATION WILL LOOK DIFFERENT FOR DIFFERENT VALVE SHAPES AND EHT LENGTHS.
2. SEE MANUFACTURERS DETAILS FOR MINIMUM BEND RADIUS AND SPACING.
3. FOR PIPES WITH MORE THAN ONE PASS OF EHT CABLE, APPLY THE FULL VALVE ADDER FOR EACH PASS OF EHT CABLE ON EACH VALVE
4. FOR SOME APPLICATIONS IT MAY BE PHYSICALLY IMPOSSIBLE TO INSTALL ALL OF THE RECOMMENDED EHT CABLE ON THE VALVE. IN THIS CASE, USE UP THE REMAINING EHT ON EITHER SIDE OF THE VALVE.
5. SEE MANUFACTURER'S INSTALLATION SHEETS FOR THE ADDER CHART FOR VALVES.

4 ELECTRICAL POWER HEAT TRACE VALVE DETAILS
Scale: NONE

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REVISIONS

NO.	DATE	DESCRIPTION

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APPROVED BY Approver	
PROJECT NO. 21-154	

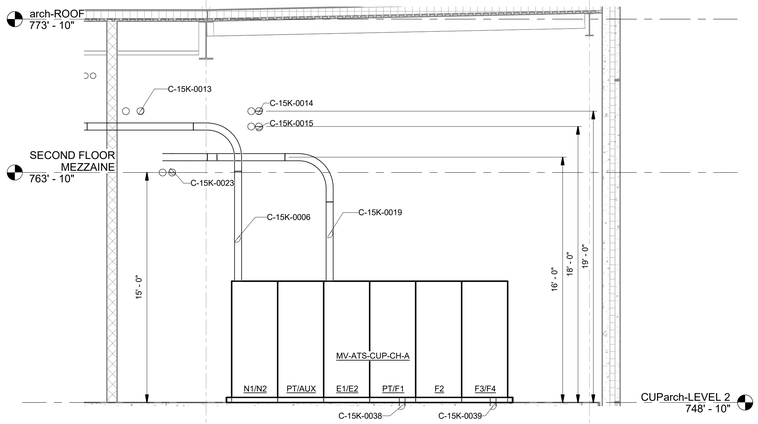
SHEET TITLE

ELECTRICAL DETAILS

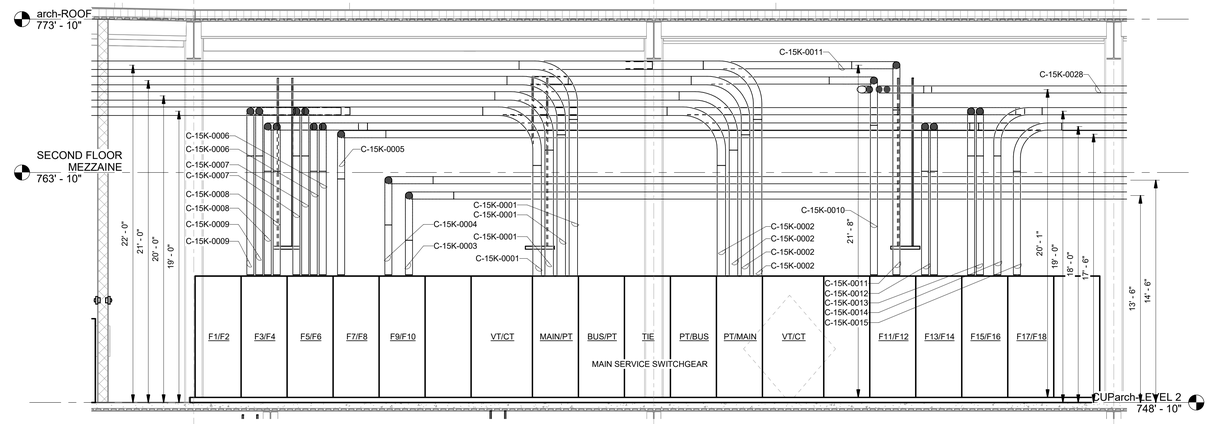
SHEET NUMBER

EP506

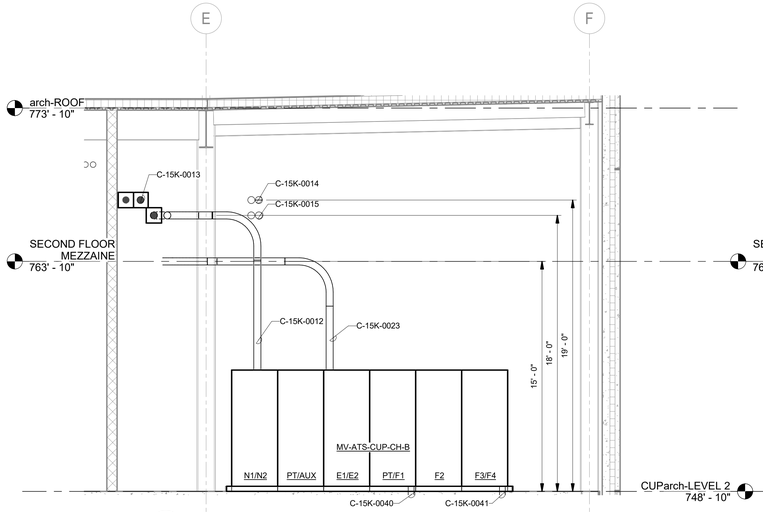
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:26 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



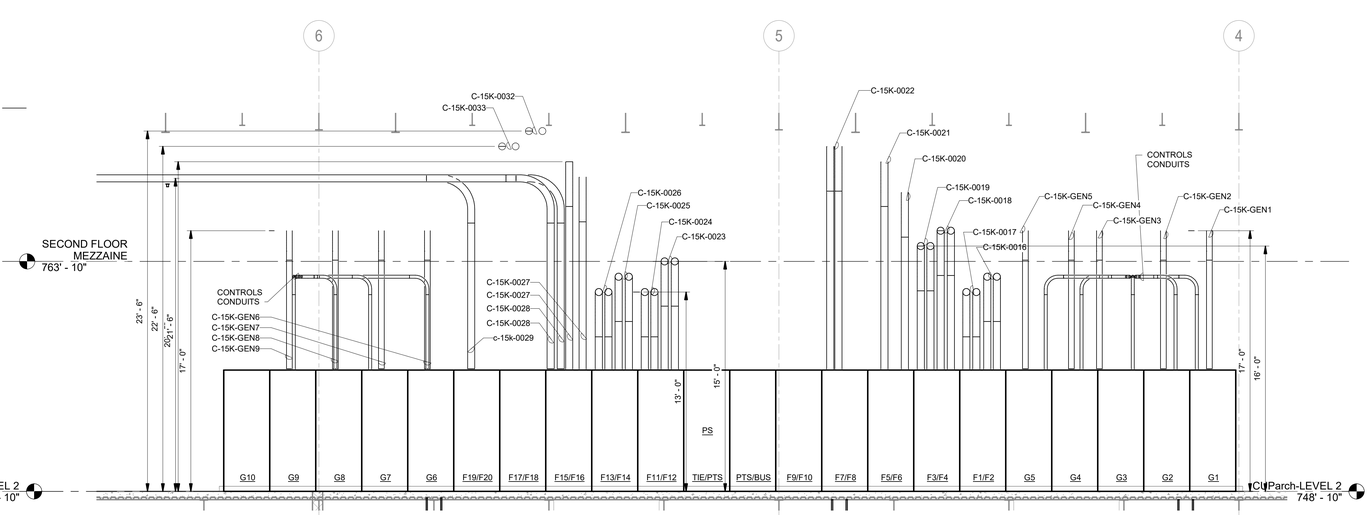
2 **MV-ATS-CUP-CH-A CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



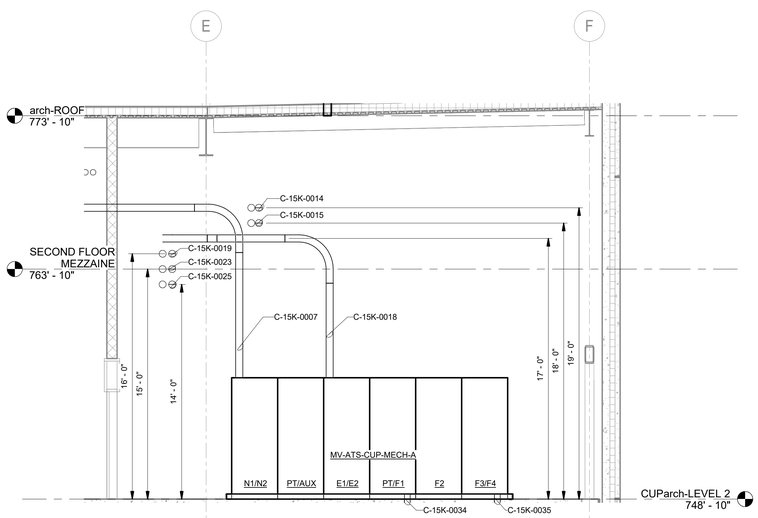
1 **MSS CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



3 **MV-ATS-CUP-CH-B CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



5 **PS GENERATOR CABLE AND CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



4 **MV-ATS-CUP-MECH-A CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

ORIGINAL SHEET SIZE (8.30" X 42" (ARCH E1)
2/10/2023 3:01:34 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

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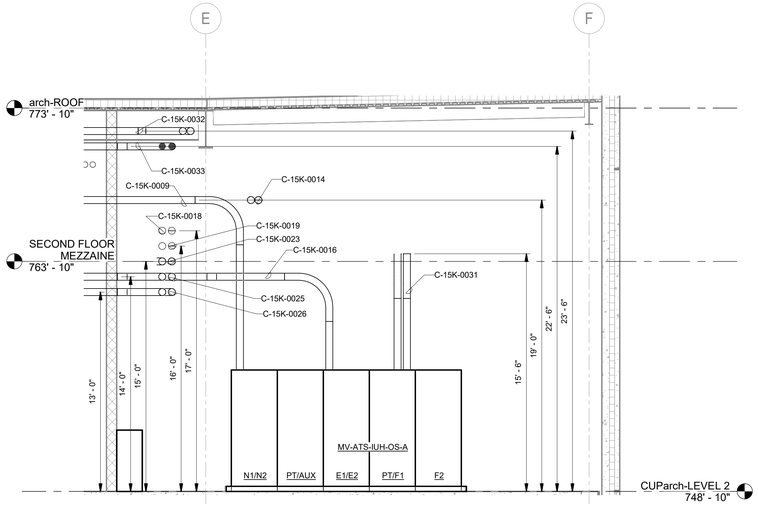
PROJECT NO. **21-154**	

SHEET TITLE

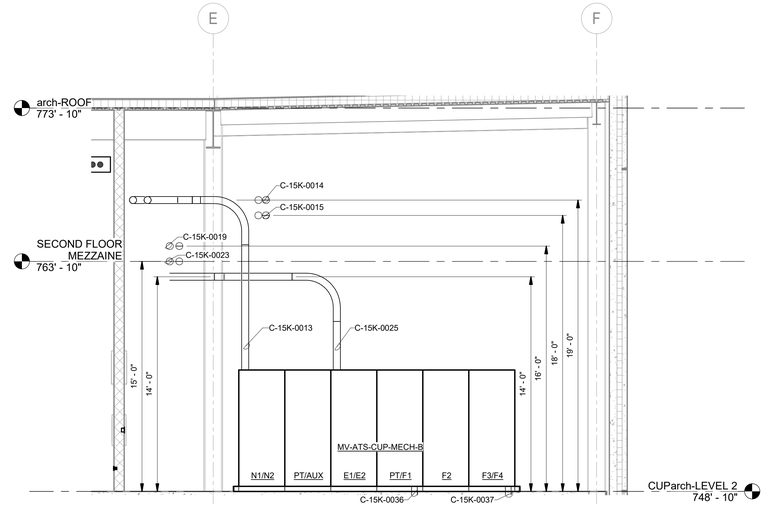
ELECTRICAL DETAILS

SHEET NUMBER

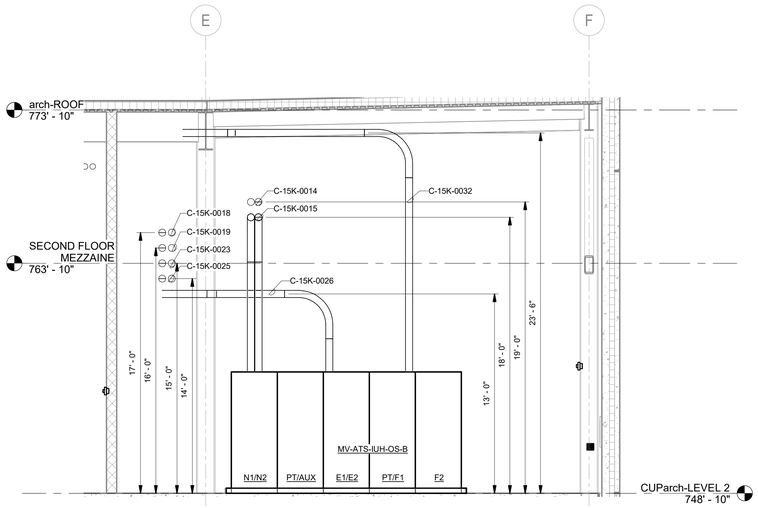
EP507



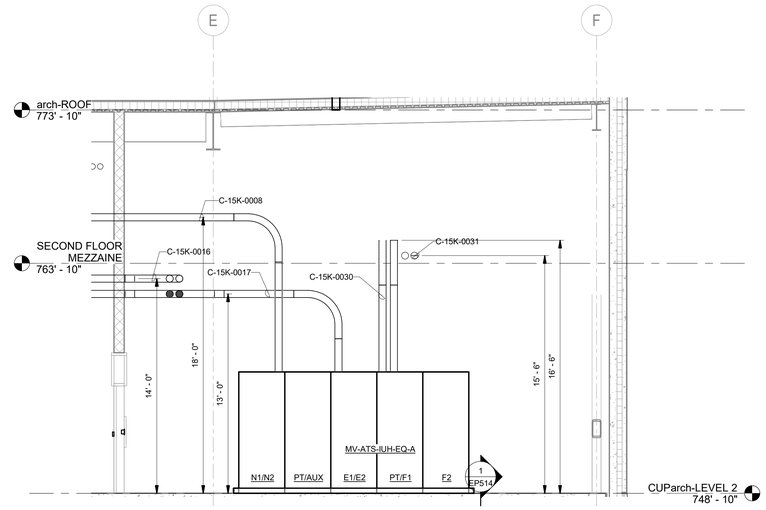
4 **MV-ATS-IUH-OS-A CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



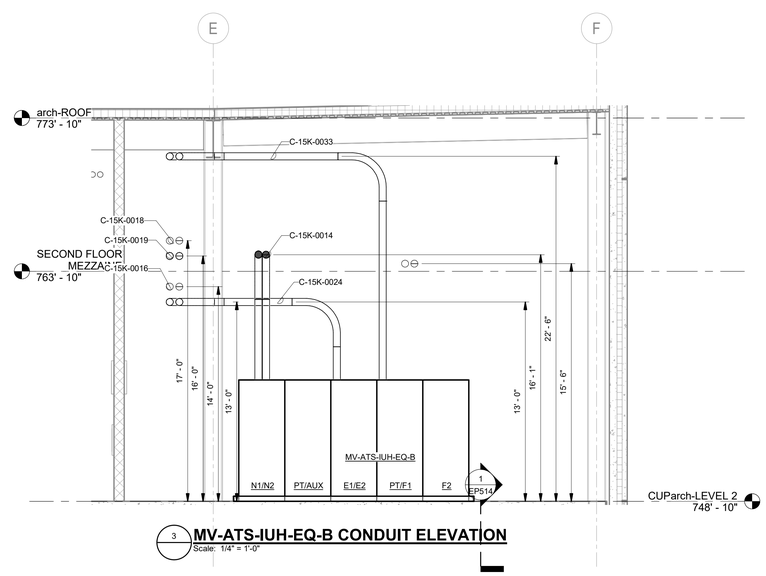
1 **MV-ATS-CUP-MECH-B CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



5 **MV-ATS-IUH-OS-B CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



2 **MV-ATS-IUH-EQ-A CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



3 **MV-ATS-IUH-EQ-B CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

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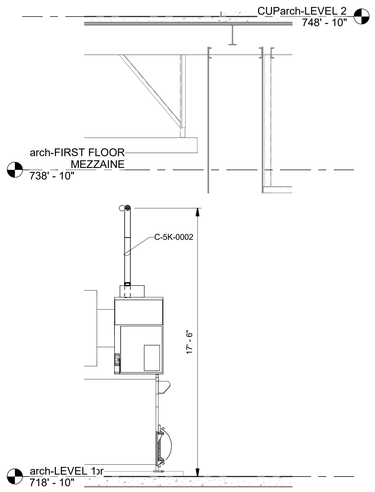
SHEET TITLE

ELECTRICAL DETAILS

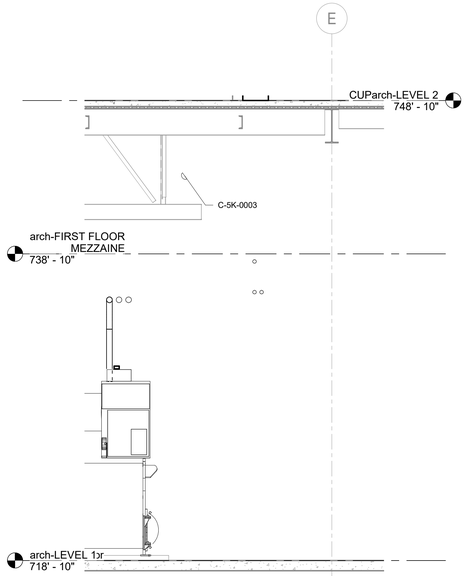
SHEET NUMBER

EP508

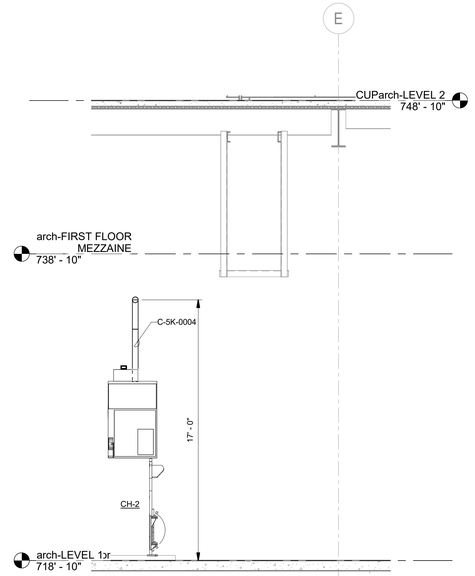
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:40 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



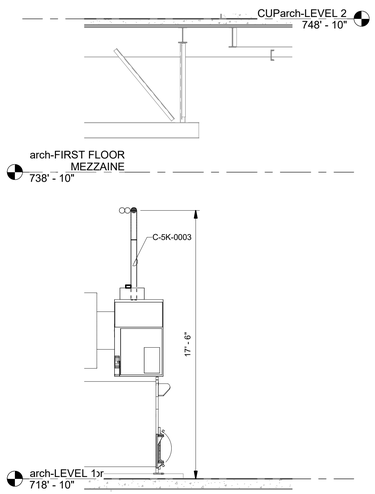
5 **CH-5 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



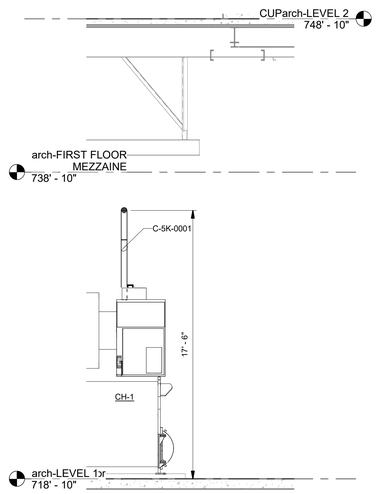
3 **CH-3 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



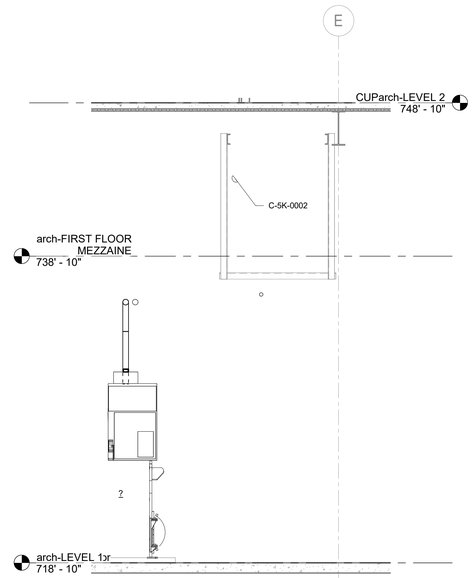
1 **CH-1 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



6 **CH-6 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



4 **CH-4 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



2 **CH-2 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

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PROJECT NO. **21-154**	

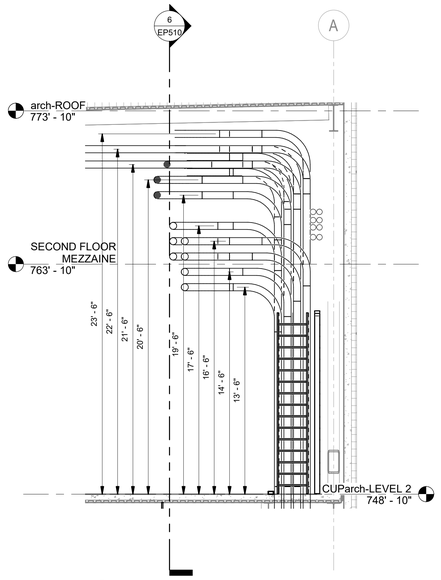
SHEET TITLE

ELECTRICAL DETAILS

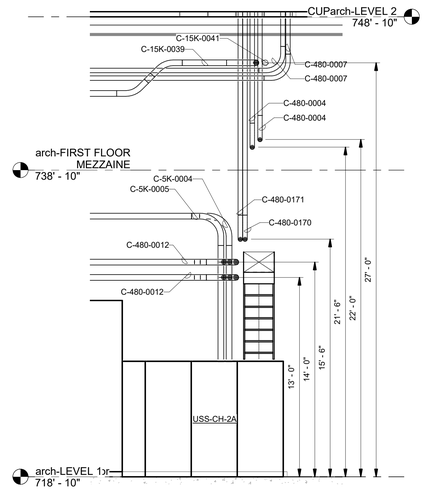
SHEET NUMBER

EP509

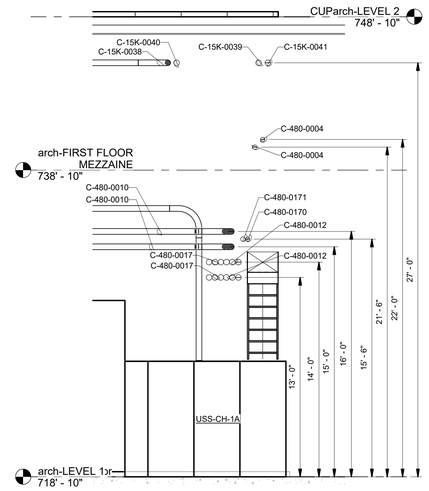
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:46 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



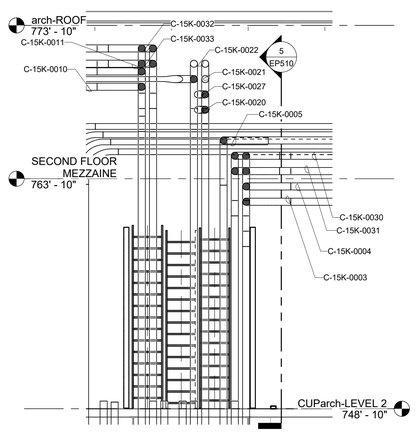
5 **UTILITY CHASE ENTRY ELEVATION 1**
Scale: 1/4" = 1'-0"



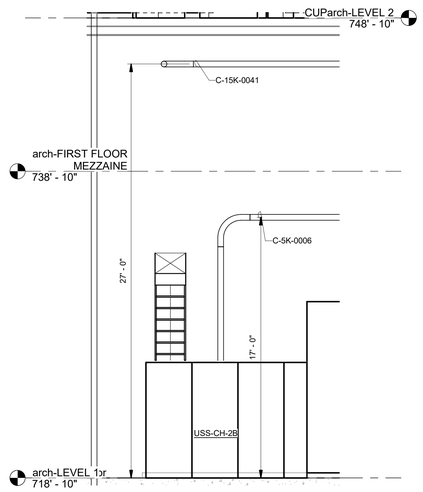
3 **USS-CH-2A CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



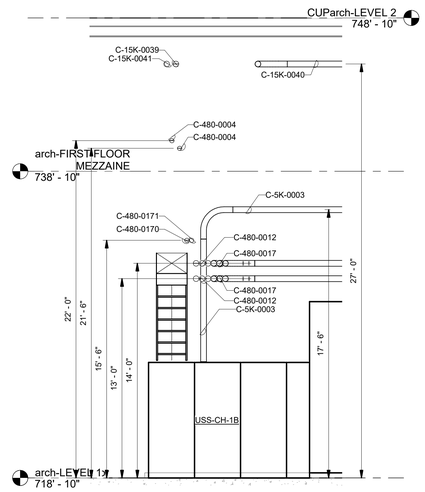
1 **USS-CH-1A CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



6 **UTILITY CHASE ENTRY ELEVATION 2**
Scale: 1/4" = 1'-0"



4 **USS-CH-2B CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



2 **USS-CH-1B CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

OWNER

Indiana University Health
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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**	CERTIFICATION
CHECKED BY **AESI**	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY **Approver**	
PROJECT NO. **21-154**	

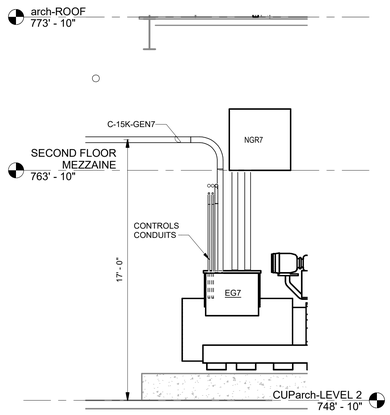
SHEET TITLE

ELECTRICAL DETAILS

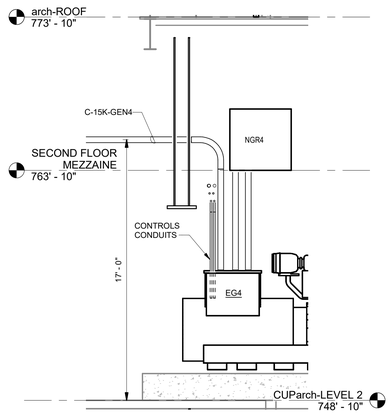
SHEET NUMBER

EP510

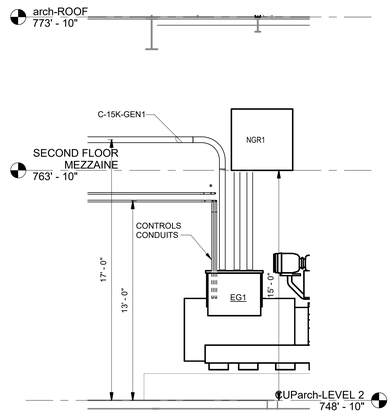
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:01:52 PM AESI Proj No: 21-154
0 1/2" 1" 2"



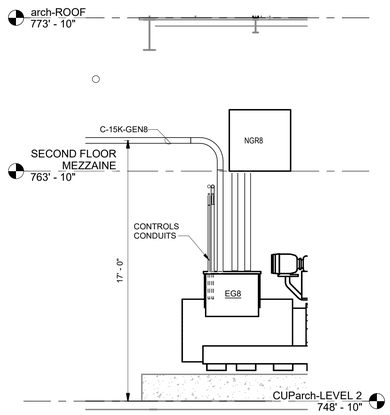
7 **G7 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



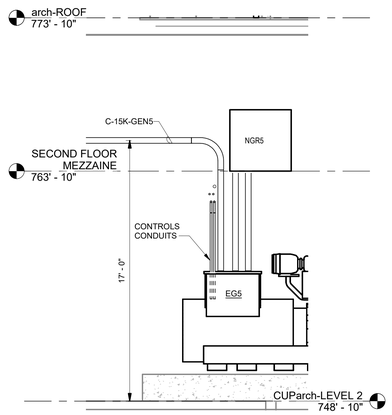
4 **G4 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



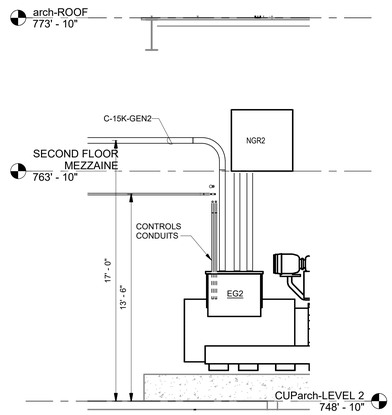
1 **G1 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



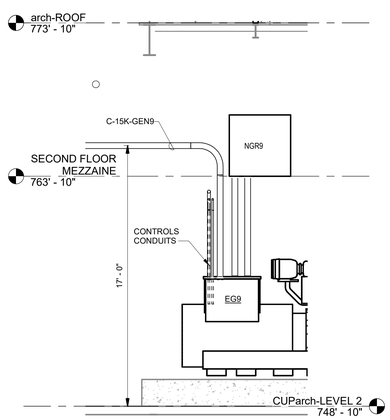
8 **G8 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



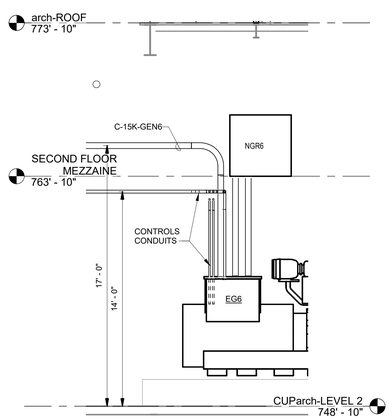
5 **G5 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



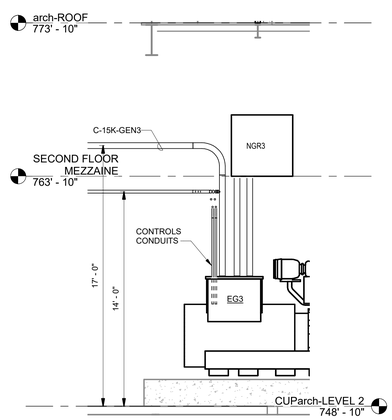
2 **G2 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



9 **G9 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



6 **G6 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



3 **G3 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

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PROJECT NO. **21-154**	

SHEET TITLE

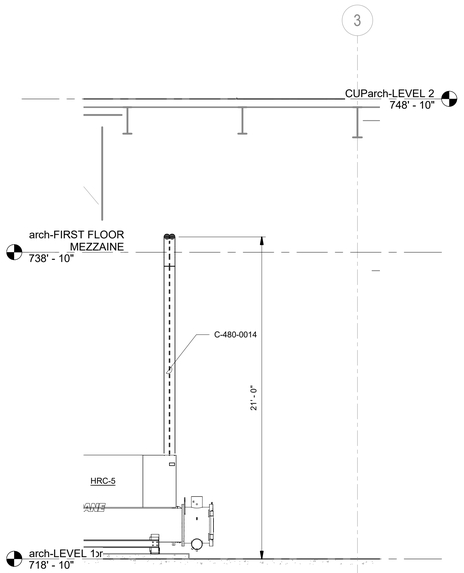
ELECTRICAL DETAILS

SHEET NUMBER

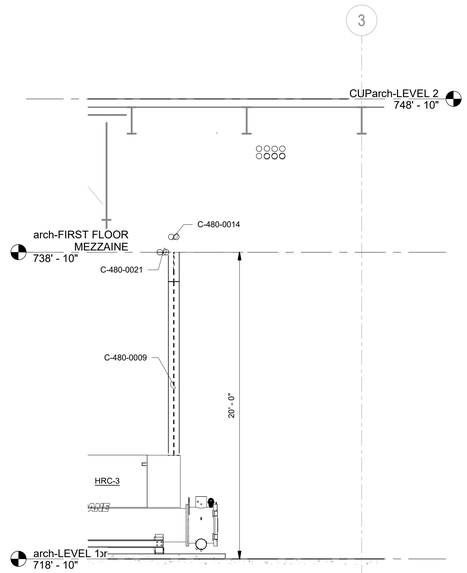
EP511

0 1/2" 1" 2"

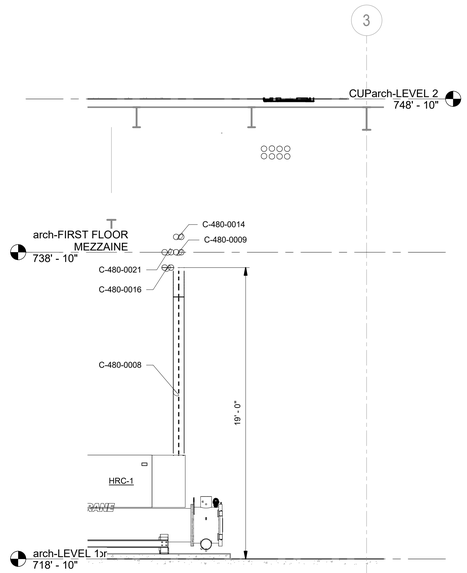
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:00 PM AESI Proj. No: 21-154



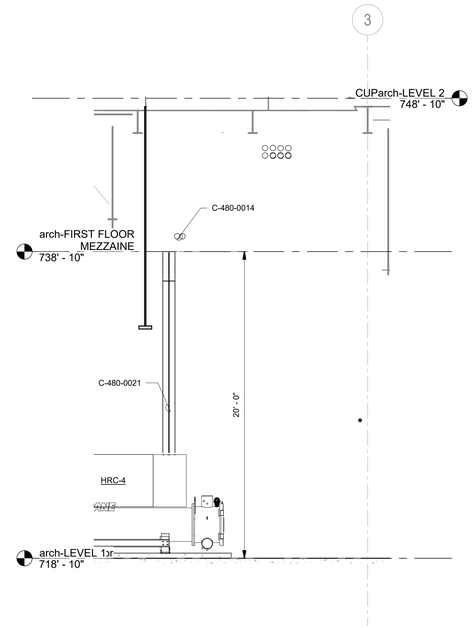
5 **HRC-5 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



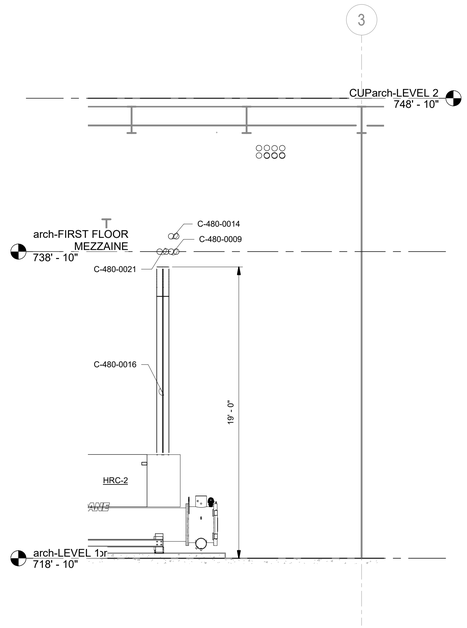
3 **HRC-3 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



1 **HRC-1 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



4 **HRC-4 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



2 **HRC-2 CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

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PROJECT NO. **21-154**	

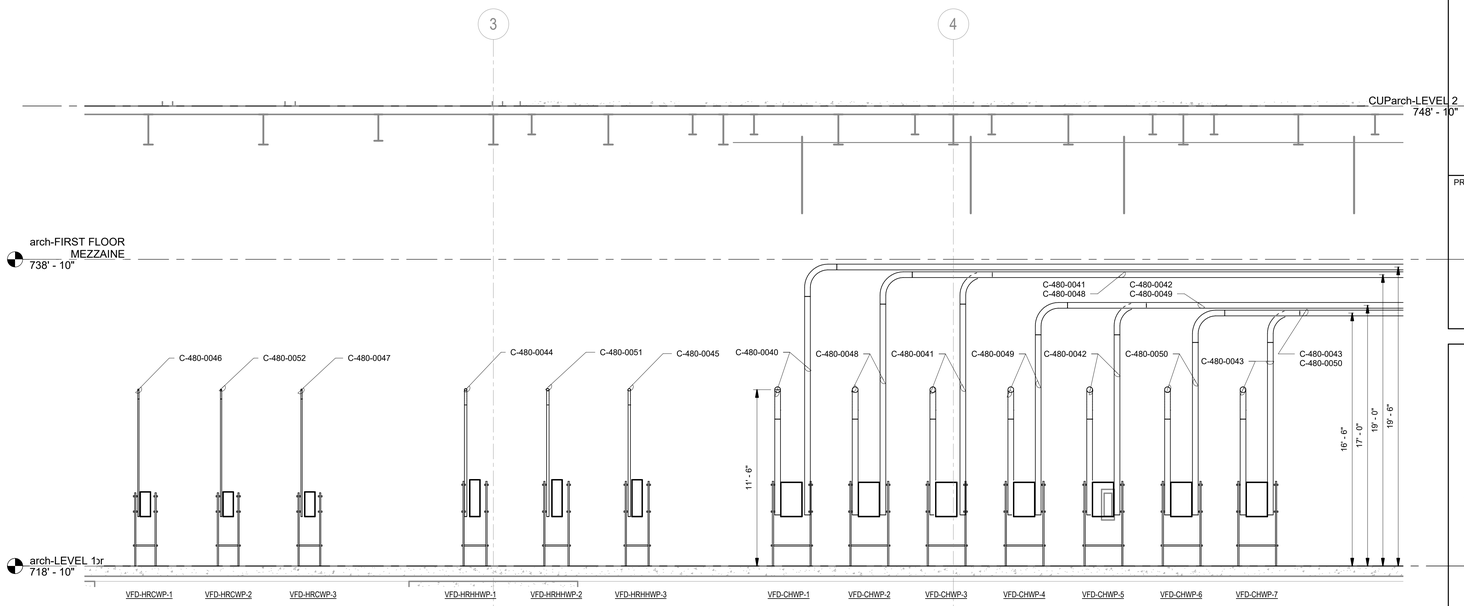
SHEET TITLE

ELECTRICAL DETAILS

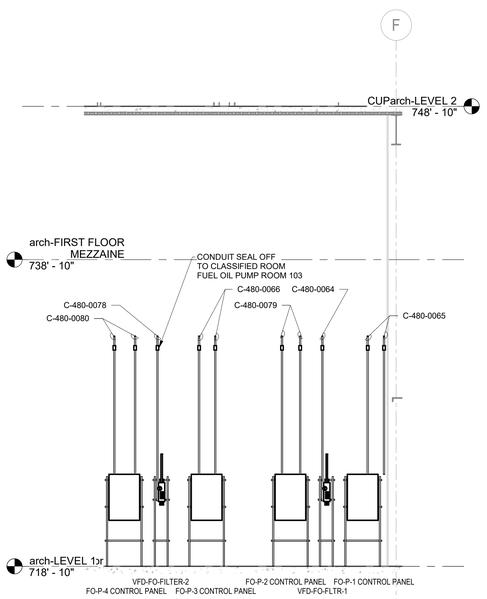
SHEET NUMBER

EP512

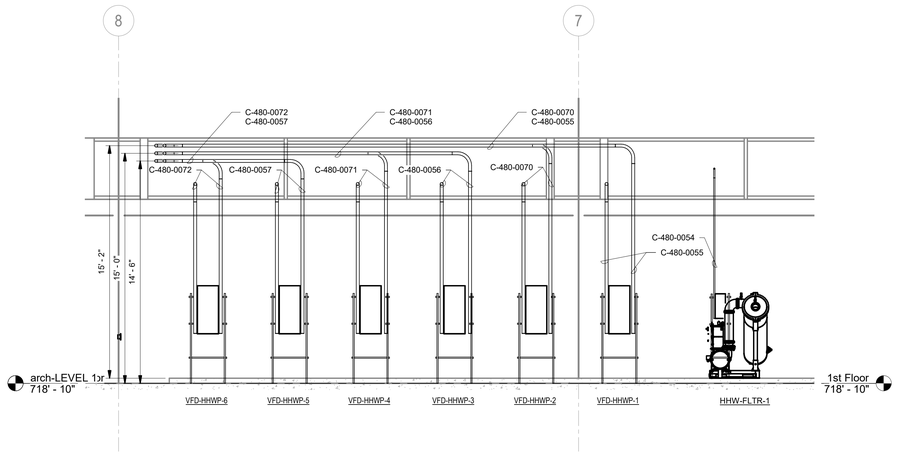
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:07 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **IUH LOOP PUMP VFD ELEVATION**
Scale: 1/4" = 1'-0"



3 **FUEL OIL CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



2 **HHW PUMP CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"

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PROJECT NO. **21-154**	

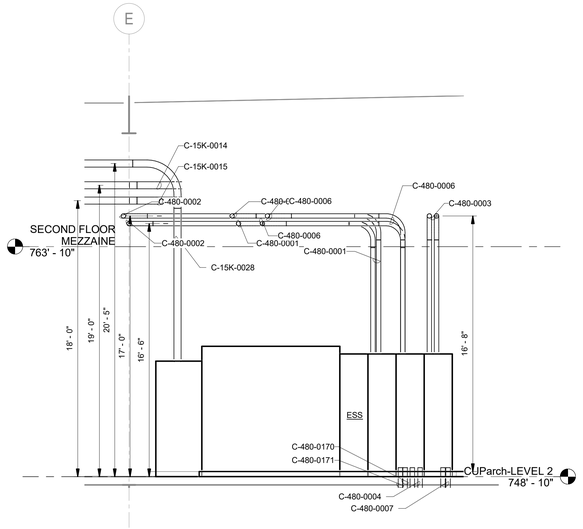
SHEET TITLE

ELECTRICAL DETAILS

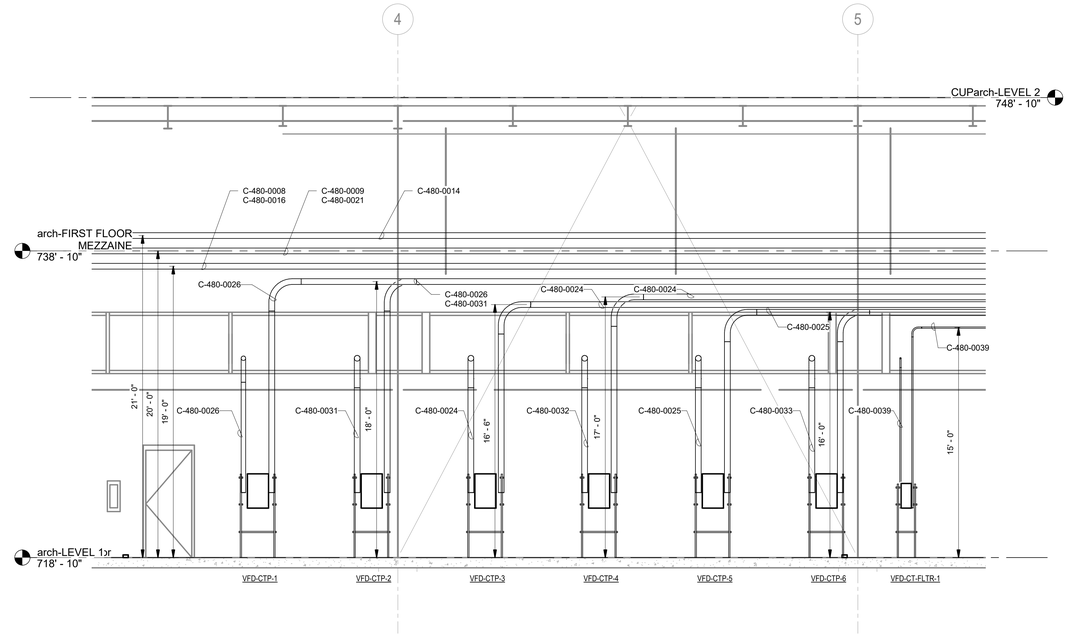
SHEET NUMBER

EP513

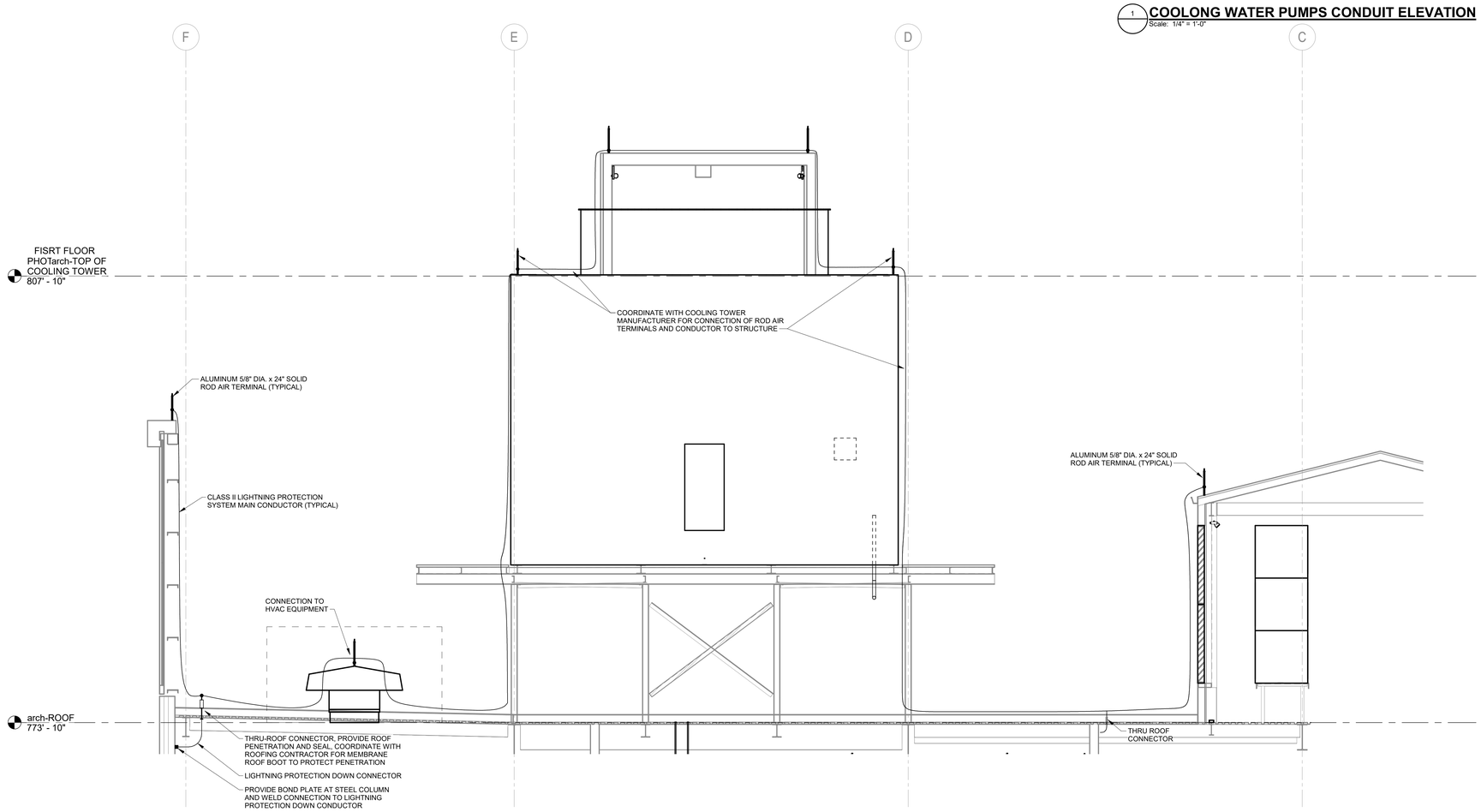
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:12 PM AESI Proj No: 21-154
0 1/2" 1" 2"



2 **ESS CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



1 **COOLONG WATER PUMPS CONDUIT ELEVATION**
Scale: 1/4" = 1'-0"



3 **COOLING TOWER SECTION - LIGHTNING PROTECTION**
Scale: 1/4" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:15 PM AESI Proj No: 21-154
0 1/2" 1" 2"

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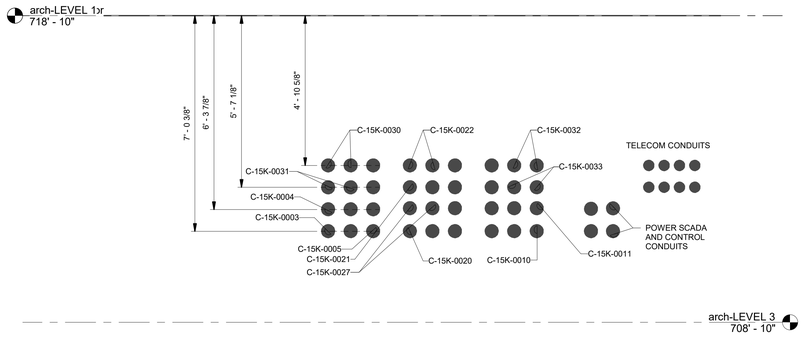
PROJECT NO. **21-154**	

SHEET TITLE

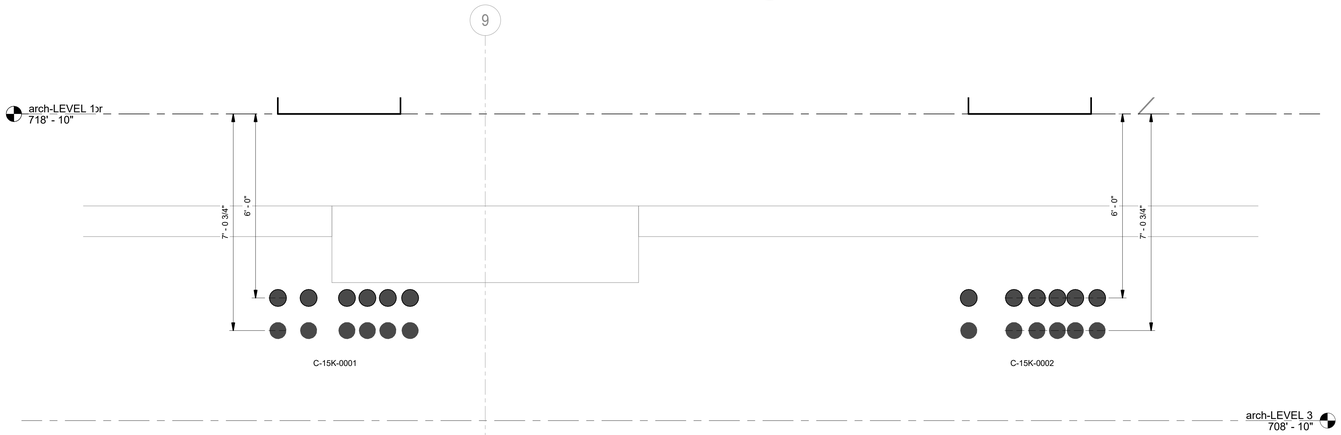
ELECTRICAL DETAILS

SHEET NUMBER

EP514



1 **DUCTBANK ELEVATION LEAVING THE CUP**
Scale: 1/2" = 1'-0"



2 **UTILITY DUCTBANK ELEVATION ENTERING CUP**
Scale: 1/2" = 1'-0"

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APPROVED BY **Approver**	
PROJECT NO. **21-154**	

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

EP515

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:18 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

AUTOMATIC TRANSFER SWITCH SCHEDULE

NOTES:
1. NOT USED

UNIT TAG	LOCATION	VOLTS	AMPS	PHASES	POLES	WIRES	AIC RATING	EQUIPMENT SERVED	NOTES
ATS-LS1	CUP EMERGENCY ELECTRICAL ROOM 215	480 V	800 A	3	4	4	65	2HLS1	
ATS-EL1	CUP EMERGENCY ELECTRICAL ROOM 215	480 V	800 A	3	4	4	65	2HEL1	
ATS-EQ1	CUP EMERGENCY ELECTRICAL ROOM 215	480 V	800 A	3	4	4	65	2HEQ1	
ATS-GEN1	CUP EMERGENCY ELECTRICAL ROOM 215	480 V	800 A	3	4	4	65	2GEN1	

480V UPS SCHEDULE

Panel Name	Location	KW	PHASES	PRIMARY VOLTAGE	SECONDARY VOLTAGE	BATTERY RUN TIME	UNIT MOUNTING	NOTES
2EQUPS1	CUP EMERGENCY ELECTRICAL ROOM 215	160 kW	3	480 V	480 V	30MIN	FLOOR	
2GENUPS1	CUP EMERGENCY ELECTRICAL ROOM 215	160 kW	3	480 V	480 V	30MIN	FLOOR	

CUP SWITCHGEAR AND SUBSTATION SCHEDULE

SWITCHGEAR	SUBSTATION	PRIMARY VOLTAGE	XFMR SIZE AA (KVA)	XFMR SIZE FA (KVA)	SECONDARY VOLTAGE	BUS AMPS	CONTROL POWER	TRANSFER CONTROL AUTO / MANUAL	SINGLE / DOUBLE ENDED	COMMUNICATION TCP/IP ETHERNET
MSS		13,200			13,200	2,000	125VDC	AUTO	DOUBLE	X
PS		13,200			13,200	2,000	125VDC	AUTO	DOUBLE	X
	ESS-CUP	13,200	2000	2660	480/277	3,200	CPT	-	SINGLE	X
	USS-CH1	13,200	7500	9975	4,160	1,200	CPT	MANUAL	DOUBLE	X
	USS-CH2	13,200	7500	9975	4,160	1,200	CPT	MANUAL	DOUBLE	X
	USS-Mech1	13,200	3000	3990	480/277	5,000	CPT	AUTO	DOUBLE	X
	USS-Mech2	13,200	3000	3990	480/277	5,000	CPT	AUTO	DOUBLE	X

CUP MV-ATS SCHEDULE

SWITCHGEAR	PRIMARY VOLTAGE	NORMAL SOURCE	EMERGENCY SOURCE	BUS AMPS	CONTROL POWER	BYPASS	TRANSFER CONTROL AUTOMATIC	COMMUNICATION TCP/IP ETHERNET
MV-ATS-IUH-OS-A	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-IUH-OS-B	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-IUH-EQ-A	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-IUH-EQ-B	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-CUP-MECH-A	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-CUP-MECH-B	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-CUP-CH-A	13,200	MSS	PS	1,200	125VDC	X	X	X
MV-ATS-CUP-CH-B	13,200	MSS	PS	1,200	125VDC	X	X	X

VARIABLE FREQUENCY DRIVE SCHEDULE

NOTES:
1. SCHEDULE NOTES
2. SCHEDULE NOTES

UNIT TAG	LOCATION	EQUIPMENT SERVED	MOTOR DATA HP	FLA	VOLTS	PH	CONTROLLER DATA CIRCUIT BREAKER FRAME	TRIP	NEMA SIZE	NEMA ENCLOSURE	NOTES
VFD-AHU-1-1-A	Space 224	AHU-1-1-A	10	14 A	480 V	3	30 A	30 A	1	1	
VFD-AHU-1-1-B	Space 224	AHU-1-1-B	10	14 A	480 V	3	30 A	30 A	1	1	
VFD-AHU-1-1-C	Space 224	AHU-1-1-C	10	14 A	480 V	3	30 A	30 A	1	1	
VFD-AHU-1-1-D	Space 224	AHU-1-1-D	10	14 A	480 V	3	30 A	30 A	1	1	
VFD-AHU-2-1		AHU-2-1	7.5	11 A	480 V	3	25 A	25 A	1	1	
VFD-AHU-2-2		AHU-2-2	7.5	11 A	480 V	3	25 A	25 A	1	1	
VFD-AHU-2-3		AHU-2-3	10	14 A	480 V	3	30 A	30 A	X	X	
VFD-AHU-2-4		AHU-2-4	2	3 A	480 V	3	20 A	20 A	1	1	
VFD-CHW-FLTR-1	CHILLER PLANT 114	CHW-FLTR-1	25	34 A	480 V	3	45 A	45 A	2	1	
VFD-CHWP-1	RECEIVING 105	CHWP-1	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CHWP-2	RECEIVING 105	CHWP-2	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CHWP-3	RECEIVING 105	CHWP-3	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CHWP-4	RECEIVING 105	CHWP-4	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CHWP-5	RECEIVING 105	CHWP-5	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CHWP-6	RECEIVING 105	CHWP-6	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CHWP-7	RECEIVING 105	CHWP-7	250	303 A	480 V	3	400 A	400 A	5	1	
VFD-CP-9	RECEIVING 105	CP-9	10	14 A	480 V	3	30 A	30 A	2	1	
VFD-CT-1	15KV SWITCHGEAR 212	CT-1	125	156 A	480 V	3	225 A	225 A	5	4X	
VFD-CT-2	15KV SWITCHGEAR 212	CT-2	125	156 A	480 V	3	225 A	225 A	5	4X	
VFD-CT-3	15KV SWITCHGEAR 212	CT-3	125	156 A	480 V	3	225 A	225 A	5	4X	
VFD-CT-4	15KV SWITCHGEAR 212	CT-4	125	156 A	480 V	3	225 A	225 A	5	4X	
VFD-CT-5	15KV SWITCHGEAR 212	CT-5	125	156 A	480 V	3	225 A	225 A	5	4X	
VFD-CT-6	15KV SWITCHGEAR 212	CT-6	125	156 A	480 V	3	225 A	225 A	5	4X	
VFD-CT-BS-FLTR-1	MECHANICAL 206	CT-BS-FLTR-1	20	27 A	480 V	3	35 A	35 A	2	1	
VFD-CT-BS-FLTR-2	MECHANICAL 206	CT-BS-FLTR-2	20	27 A	480 V	3	35 A	35 A	2	1	
VFD-CT-FLTR-1	CHILLER PLANT 114	CT-FLTR-1	25	34 A	480 V	3	45 A	45 A	2	1	
VFD-CTP-1	CHILLER PLANT 114	CTP-1	250	302 A	480 V	3	600 A	600 A	6	1	
VFD-CTP-2	CHILLER PLANT 114	CTP-2	250	302 A	480 V	3	400 A	400 A	6	1	
VFD-CTP-3	CHILLER PLANT 114	CTP-3	250	302 A	480 V	3	400 A	400 A	6	1	
VFD-CTP-4	CHILLER PLANT 114	CTP-4	250	302 A	480 V	3	400 A	400 A	6	1	
VFD-CTP-5	CHILLER PLANT 114	CTP-5	250	302 A	480 V	3	400 A	400 A	6	1	
VFD-CTP-6	CHILLER PLANT 114	CTP-6	250	302 A	480 V	3	400 A	400 A	6	1	
VFD-DWRP-1	RECEIVING 105	DWRP-1	0.5	1 A	120 V	1	20 A	20 A	0	1	
VFD-EF-1-1	MECHANICAL 206	EF-1-1	0.25	1 A	480 V	3	20 A	20 A	1	1	
VFD-EF-2-1	MECHANICAL 206	EF-2-1	0.25	1 A	480 V	3	20 A	20 A	1	1	
VFD-EF-2-2	CORRIDOR 201	EF-2-2	0.25	1 A	480 V	3	20 A	20 A	X	1	
VFD-EF-2-3	15KV SWITCHGEAR 212	EF-2-3	0.25	1 A	480 V	3	20 A	20 A	1	1	
VFD-EF-2-4	15KV SWITCHGEAR 212	EF-2-4	0.25	1 A	480 V	3	20 A	20 A	1	1	
VFD-EF-2-5	15KV SWITCHGEAR 212	EF-2-4	0.25	1 A	480 V	3	20 A	20 A	1	1	
VFD-EF-2-6	GENERATOR ROOM A 220	EF-2-6	1	2 A	480 V	3	20 A	20 A	X	1	
VFD-EF-2-7	MSS SERVICE SWITCHGEAR 216	EF-2-7	1.5	3 A	480 V	3	20 A	20 A	X	1	
VFD-FO-FLTR-1	CHILLER PLANT 114	FO-FLTR-1	0.5	1 A	480 V	3	15 A	15 A	0	1	
VFD-FO-FLTR-2	CHILLER PLANT 114	FO-FLTR-2	0.5	1 A	480 V	3	15 A	15 A	0	1	
VFD-HHW-FLTR-1	BOILER PLANT 109	HHW-FLTR-1	25	34 A	480 V	3	45 A	45 A	2	1	
VFD-HHWP-1	BOILER PLANT 109	HHWP-1	125	156 A	480 V	3	200 A	200 A	5	1	
VFD-HHWP-2	BOILER PLANT 109	HHWP-2	125	156 A	480 V	3	200 A	200 A	5	1	
VFD-HHWP-3	BOILER PLANT 109	HHWP-3	125	156 A	480 V	3	200 A	200 A	5	1	
VFD-HHWP-4	BOILER PLANT 109	HHWP-4	125	156 A	480 V	3	200 A	200 A	5	1	
VFD-HHWP-5	BOILER PLANT 109	HHWP-5	125	156 A	480 V	3	200 A	200 A	5	1	
VFD-HHWP-6	BOILER PLANT 109	HHWP-6	125	156 A	480 V	3	200 A	200 A	5	1	
VFD-HRCWP-1	RECEIVING 105	HRCWP-1	15	21 A	480 V	3	30 A	30 A	3	1	
VFD-HRCWP-2	RECEIVING 105	HRCWP-2	15	21 A	480 V	3	30 A	30 A	3	1	
VFD-HRCWP-3	RECEIVING 105	HRCWP-3	15	21 A	480 V	3	30 A	30 A	3	1	
VFD-HRHHWP-1	RECEIVING 105	HRHHWP-1	60	77 A	480 V	3	125 A	125 A	4	1	
VFD-HRHHWP-2	RECEIVING 105	HRHHWP-2	60	77 A	480 V	3	125 A	125 A	4	1	
VFD-HRHHWP-3	RECEIVING 105	HRHHWP-3	60	77 A	480 V	3	125 A	125 A	4	1	
VFD-HRW-2-1	MECHANICAL 206	HRW-2-1	0.5	1 A	480 V	3	20 A	20 A	0	1	
VFD-MAU-1-1-A	Space 224	MAU-1-1-A	5	8 A	480 V	3	20 A	20 A	1	1	
VFD-MAU-1-1-B	Space 224	MAU-1-1-B	5	8 A	480 V	3	20 A	20 A	1	1	
VFD-MAU-1-1-C	Space 224	MAU-1-1-C	5	8 A	480 V	3	20 A	20 A	1	1	
VFD-MAU-1-1-D	Space 224	MAU-1-1-D	5	8 A	480 V	3	20 A	20 A	1	1	
VFD-MAU-1-2	Space 224	MAU-1-2	10	14 A	480 V	3	30 A	30 A	1	1	
VFD-MAU-2-1	MECHANICAL 206	MAU-2-1	7.5	11 A	480 V	3	20 A	20 A	X	1	
VFD-MAU-2-2	MECHANICAL 224	MAU-2-2	2	3 A	480 V	3	20 A	20 A	X	1	
VFD-P-1-1	Space 224	P-1-1	0.75	2 A	480 V	3	20 A	20 A	0	1	
VFD-P-1-2	Space 224	P-1-2	0.75	2 A	480 V	3	20 A	20 A	0	1	
VFD-P-2-1	MECHANICAL 206	P-2-1	0.333	1 A	480 V	3	20 A	20 A	0	1	
VFD-P-2-2	MECHANICAL 224	P-2-2	0.33	7 A	120 V	1	20 A	20 A	0	1	
VFD-REF-1	MECHANICAL 206	REF-1	7.5	11 A	480 V	3	20 A	20 A	1	1	
VFD-REF-2	MECHANICAL 206	REF-2	7.5	11 A	480 V	3	20 A	20 A	1	1	
VFD-RF-1	15KV SWITCHGEAR 212	RF-1	5	8 A	480 V	3	20 A	20 A	1	1	
VFD-RF-2	15KV SWITCHGEAR 212	RF-2	5	8 A	480 V	3	20 A	20 A	1	1	

Updated 1/10/2023 - IUH Loads from 9/27/2022 WSP email - CUP Schedules - SSB Updated - Assumption Plaza Garage and CIH are removed from scope.

Normal Power Analysis																	
IUHMC / SSB / Plaza Garage / CUP Normal Power																	
MVA (Demand)																2026	2040
Normal Power System	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	>>>>	10	12	14	Sub Total MVA		
IUHMC Normal	10748VA															10.748	2.73
IUHMC Equipment	4815 KVA															4.815	1.2
CUP	18826 KVA (Based on Schedules, will update with profile load)															9.413	4.18
SSB	3000 KVA															3	
Plaza Garage	0 KVA															0	
CIH	0 KVA															0	
Normal Power Total																27.98	36.09
																1,223.8 Amps	(1,578.6 Amps)
																@ 13.2KV	@ 13.2KV

Updated 1/10/2023 - IUH Loads from 9/27/2022 WSP email - CUP Schedules - SSB from BOD.

Emergency and Stanby Power Analysis																	
IUHMC / SSB / Plaza Garage / CUP Emergency and Standby Power																	
MVA																2026	2040
Standby Power System	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	>>>	21	Sub Total MVA	
CUP Chiller Plant and Mechanical	18826 KVA (Based on 2026 max profile load, see note 1)															9.413	4.18
CUP Fire Pump	414 KVA															0.414	
IUHMC Equipment	4815KVA									1204 KVA						4.815	1.2
IUHMC Optional Standby	3075 KVA							920 KVA								3.075	0.92
CUP Emergency	1036 KVA	125 KVA														1.036	0.12
SSB Emergency	500 KVA															0.5	
Parking Garage Emergency	0 KVA															0	
Standby Power Sub Total																19.25	6.42

IUHMC Building Essential System																	
MVA																2026	2040
Essential Generator System	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5		7	Sub Total MVA	
Life Safety	1069.4 KVA															1.069	
Critical	2731.5 KVA															2.732	
IT Equipment	1424.8KVA															1.425	
Imaging Equipment	617.8...															0.618	
Elevator Service	855.1 KVA															0.855	
Essential Equipment	974.3 KVA															0.974	
Future IUHMC Expansion	1840 KVA																1.84
IUHMC Essential Power																7.673	1.84

Notes	1	CUP...	Total...	26.93	35.19
	2	Assump...	Total...	21.5408	28.1488

Generator Loading (DD Documents) Updated 1/10/2023

Emergency...			Bus 1 (5 Generators)					Bus 2 (4 Generators + Space for 10th Gen)										
Load Priority	Load Description	Building / Load Served	P1	P2	P3	P4a	P4b	P6	P8	P1	P2	P3	P4	P5	P7	P8	P9	P10	ATS / MV-ATS	Associated Substations
Essential			Load (KVA) / Priority Assignment														N+1	Future		
P1	Life Safety 1	IUHMC - Essential Fdr A	534.7																ATS	ESS01 & ESS02
P1	Critical 1		682.8																ATS	
P1	Critical 6		682.8																ATS	
P2	Critical 3 (IT Equip)		712.4																ATS	
P2	Critical 8 (Imaging)		308.9																ATS	
P2	Equipment 1			243.6															ATS	Inhibit control
P3	Equipment 4			243.6															ATS	Inhibit control
P3A	Elevator 1				213.8														ATS	Inhibit control
P3B	Elevator 4				213.8														ATS	Inhibit control
P1	Life Safety 2	IUHMC - Essential Fdr B								534.7									ATS	ESS01 & ESS02
P1	Critical 2									682.8									ATS	
P1	Critical 5									682.8									ATS	
P2	Critical 4 (IT Equip)									712.4									ATS	
P2	Critical 7 (Imaging)									308.9									ATS	
P2	Equipment 2										243.6								ATS	Inhibit control
P3	Equipment 3										243.6								ATS	Inhibit control
P3A	Elevator 2											213.8							ATS	Inhibit control
P3B	Elevator 3											213.8							ATS	Inhibit control
P1	Emergency LS	CUP								40									ATS	ESS-CUP
P2	Equipment									279.8	279.8								ATS	Inhibit control
P3	Elevator											33.2							ATS	Inhibit control
P1	Fire Pump									414									FPC	
P1	Emergency LS	SSB	42																ATS	ESS-SSB
P2	Equipment		142	142															ATS	Inhibit control
P3	Elevator				180														ATS	Inhit control
P1	Emergency LS	Plaza Parking Garage	0																ATS	ESS- PG
P2	Equipment			0															ATS	Inhibit control
P3	Elevator				0														ATS	Inhibit control
Optional...																				
P4	Sub EQ Fdr A	IUHMC - Mech / Ventilation				2407.5													MV-ATS	USS-EQ1 & USS-EQ2
P4	Sub EQ Fdr B	IUHMC - Mech / Ventilation											2407.5						MV-ATS	USS-EQ1 & USS-EQ2
P8	Sub 1A / 2A	CUP Chillers							3000										MV-ATS	USS-CH1 & USS-CH2
P8	Sub 1B / 2B	CUP Chillers														3000			MV-ATS	USS-CH1 & USS-CH2
P6	Sub OS Fdr A	IUHMC - Normal / Optional						1537.5											MV-ATS	USS-OS1 & USS-OS2 & USS-OS3
P7	Sub OS Fdr B	IUHMC - Normal / Optional													1537.5				MV-ATS	USS-OS1 & USS-OS2 & USS-OS3
P4	Sub 3A / 4A	CUP Mech Systems					3022.9												MV-ATS	USS-Mech1 & USS-Mech2
P5	Sub 3B / 4B	CUP Mech Systems												886.2					MV-ATS	USS-Mech1 & USS-Mech2
Priority by...																				
		Incoming Priortity Loading (KVA)	3105.6							3655.4										
		Incremental Loading (KVA)	3105.6							3655.4									Side A - 1 Gen ...	
1st G On Bus	3MW Units	Power Generation Available (KVA	3750							3750									Side B - 1 Gen -...	
		Incoming Priortity Loading (KVA)		629.2							767									
		Incremental Loading (KVA)		3734.8							4422.4								Side A - 2 Gen ...	
2nd G On...	3MW Units	Power Generation Available (KVA		7500							7500								Side B - 2 Gen -...	
		Incoming Priortity Loading (KVA)			607.6							460.8								
		Incremental Loading (KVA)			4342.4							4883.2							Side A - 3 Gen ...	
3rd G On Bus	3MW Units	Power Generation Available (KVA			11250							11250							Side B - 3 Gen -...	
		Incoming Priortity Loading (KVA)				2407.5	3022.9						2407.5	886.2	1537.5					
		Incremental Loading (KVA)				6749.9	9772.8						7290.7	8176.9	9714.4				Side A - 4 Gen ...	
4th G On Bus	3MW Units	Power Generation Available (KVA				15000	15000						15000	15000	15000				Side B - 4 Gen -...	
		Incoming Priortity Loading (KVA)						1537.5												
		Incremental Loading (KVA)						11310.3											Side A - 5 Gen ...	
5th G On Bus	3MW Units	Power Generation Available (KVA						18750												
		Incoming Priortity Loading (KVA)							3800							3800	-			
		Incremental Loading (KVA)							15110.3							13514.4	**28624.7**		8 Gen = each...	
Tie 1/2 Close	(9 Gens On E Bus)	Power Generation Available (KVA							-							-	**33750**		9 Gen = each...	

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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100% Desgin Development Documents
February 10, 2023

REVISIONS
NO. DATE DESCRIPTION

DESIGNED BY **AESI**
CHECKED BY **AESI**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION
PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
POWER SCHEDULES

SHEET NUMBER
EP601

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:21 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

PANELBOARD SCHEDULE

Branch Panel...	1NH4	**New/Exist:**	NEW	**Location:**	RECEIVING 105	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	SWBD7	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1					Motor; Heating; Receptacle;...	3.65	1.14										2
3	T-1NL3	3	125 A					2.56	1.14			Motor		20 A	3	BCU-1	4
5										3.88	1.14						6
7						1.14	1.14										8
9	BCU-2	3	20 A		Motor			1.14	1.14			Motor		20 A	3	BCU-4	10
11										1.14	1.14						12
13						1.88	3.88										14
15	BRP-1,2	3	20 A		Motor			1.88	3.88			Motor		30 A	3	VFD-CP-9	16
17										1.88	3.88						18
19						1.88	0.00										20
21	SP-1 IN TUNNEL	3	20 A		Motor			1.88	0.00			Heating		30 A	3	DWH-1	22
23										1.88	0.00						24
25						0.00	0.00										26
27	Spare	3	20 A		--			0.00	0.00			--		30 A	3	Spare	28
29										0.00	0.00						30
31						0.00	0.00										32
33	Spare	3	20 A		--			0.00	0.00			--		30 A	3	Spare	34
35										0.00	0.00						36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						14.73 kVA		**13.6 kVA**		**15.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	6.44	NEC	6.44	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)	0.08	1.00	0.08	Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	36.80	1.08	39.70		
Other Load (KVA)					
Total Load (KVA)	43.31		46.22		

PANELBOARD SCHEDULE

Branch Panel...	1NH1	**New/Exist:**	NEW	**Location:**	BOILER PLANT 109	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	SWBD5	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1					Motor; Receptacle; Spare	3.75	1.14										2
3	T-1NL1	3	125 A					3.56	1.14			Motor		20 A	3	BCU-9	4
5										1.98	1.14						6
7						1.14	1.14										8
9	BCU-6	3	20 A		Motor			1.14	1.14			Motor		20 A	3	BCU-8	10
11										1.14	1.14						12
13						1.14	1.14										14
15	BCU-7	3	20 A		Motor			1.14	1.14			Motor		20 A	3	BCU-13	16
17										1.14	1.14						18
19						1.14	0.00										20
21	BCU-10	3	20 A		Motor			1.14	0.00			Motor		20 A	3	P-1-1	22
23										1.14	0.00						24
25						16.63	0.00										26
27	Welding Outlet CHILLER PLANT 114	3	20 A		Other			16.63	0.00			Motor		20 A	3	P-1-2	28
29										16.63	0.00						30
31						0.00	0.00										32
33	Spare	3	20 A		--			0.00	0.00			--		20 A	3	Spare	34
35										0.00	0.00						36
37						0.00	0.00										38
39	Spare	3	20 A		--			0.00	0.00			--		20 A	3	Spare	40
41										0.00	0.00						42
						27.24 kVA		**27.1 kVA**		**25.5 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	7.56	NEC	7.56	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	22.33	1.04	23.19		
Other Load (KVA)	49.88	0.80	39.91		
Total Load (KVA)	79.78		70.66		

PANELBOARD SCHEDULE

Branch Panel...	2NH1	**New/Exist:**	NEW	**Location:**	15KV SWITCHGEAR 212	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	SWBD7	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1					Other; Motor; Receptacle; Spare	7.91	0.00										2
3	T-2NL1	3	125 A					7.14	0.00			Motor		20 A	3	AHU-2-4	4
5										3.49	0.00						6
7						0.00	0.00										8
9	VFD-AHU-2-1	3	25 A		Motor			0.00	0.00			Motor		20 A	3	VFD-AHU-2-3	10
11										0.00	0.00						12
13						0.00	0.17										14
15	AHU-2-2	3	15 A		Motor			0.00	0.17			Motor		20 A	3	VEF-EF-2-5	16
17										0.00	0.17						18
19						0.00	2.10										20
21	VFD-EF-2-7	3	20 A		Motor			0.00	2.10			Motor		20 A	3	VFD-RF-2	22
23										0.00	2.10						24
25						2.10	0.17										26
27	VFD-RF-1	3	20 A		Motor			2.10	0.17			Motor		20 A	3	EF-2-3	28
29										2.10	0.17						30
31						0.00	0.00										32
33	Spare	3	20 A		--			0.00	0.00			--		15 A	3	Spare	34
35										0.00	0.00						36
37						0.00	0.00										38
39	Spare	3	25 A		--			0.00	0.00			--		20 A	3	Spare	40
41										0.00	0.00						42
						12.45 kVA		**11.7 kVA**		**8.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	14.50	NEC	12.25	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	17.67	1.09	19.24		
Other Load (KVA)	0.00	Not Computed	0.00		
Total Load (KVA)	32.17		31.49		

PANELBOARD SCHEDULE

Branch Panel...	1NH2	**New/Exist:**	NEW	**Location:**	BOILER PLANT 109	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	SWBD6	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1						0.94	2.11										2
3	ROP SKID	3	15 A		Motor			0.94	2.11			Motor		15 A	3	RO CIP SKID PUMP	4
5										0.94	2.11						6
7						0.67	0.00										8
9	LOAD BANK FANS	3	20 A		Motor			0.67	0.00			--		20 A	3	Spare	10
11										0.67	0.00						12
13						0.00	0.00					--		20 A	1	Spare	14
15	Spare	3	15 A		--			0.00	0.00			--		20 A	1	Spare	16
17										0.00	0.00	--		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	20
21	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						3.72 kVA		**3.7 kVA**		**3.7 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	11.15	1.14	12.72		
Other Load (KVA)					
Total Load (KVA)	11.15		12.72		

PANELBOARD SCHEDULE

Branch Panel...	2NH2	**New/Exist:**	NEW	**Location:**	CORRIDOR 201	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	SWBD7	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1					Other; Motor; Receptacle; Spare	7.33	3.05										2
3	T-2NL2	3	125 A					6.38	3.05			Motor		20 A	3	VFD-REF-1	4
5										5.03	3.05						6
7						0.17	3.05										8
9	EF-1-1	3	20 A		Motor			0.17	3.05			Motor		20 A	3	VFD-REF-2	10
11										0.17	3.05						12
13						0.17	0.00										14
15	EF-2-1	3	20 A		Motor			0.17	0.00			Motor		20 A	3	EF-2-6	16
17										0.17	0.00						18
19						0.17	0.69										20
21	FVD-EF-2-2	3	20 A		Motor			0.17	0.69			Motor		20 A	3	FCU-R-1	22
23										0.17	0.69						24
25						3.05	0.00										26
27	VFD-P-2-1	3	20 A		Motor			3.05	0.00			--		20 A	3	Spare	28
29										3.05	0.00						30
31						13.58	0.00										32
33	HRW-2-1	3	20 A		Motor			13.58	0.00			--		20 A	3	Spare	34
35										13.58	0.00						36
37						0.00	0.00										38
39	Spare	3	125 A		--			0.00	0.00			--		20 A	3	Spare	40
41										0.00	0.00						42
						31.23 kVA		**30.3 kVA**		**28.9 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	13.24	NEC	11.62	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	77.22	1.13	87.40		
Other Load (KVA)					
Total Load (KVA)	90.46		99.02		

PANELBOARD SCHEDULE

Branch Panel...	1NH3	**New/Exist:**	NEW	**Location:**	CHILLER PLANT 114	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	SWBD7	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1					Motor; Receptacle; Spare	3.39	1.14										2
3	T-1NL2	3	125 A					1.80	1.14			Motor		20 A	3	BCU-3	4
5										0.86	1.14						6
7						1.14	1.14										8
9	BCU-15	3	20 A		Motor			1.14	1.14			Motor		20 A	3	BCU-14	10
11										1.14	1.14						12
13						1.14	1.14										14
15	BCU-5	3	20 A		Motor			1.14	1.14			Motor		20 A	3	BCU-11	16
17										1.14	1.14						18
19						0.00	0.00										20
21	Spare	3	20 A		--			0.00	0.00			--		20 A	3	Spare	22
23										0.00	0.00						24
25						0.00	0.00										26
27	Spare	3	20 A		--			0.00	0.00			--		20 A	3	Spare	28
29										0.00	0.00						30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						9.11 kVA		**7.5 kVA**		**6.6 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	4.32	NEC	4.32	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	18.90	1.05	19.76		
Other Load (KVA)					
Total Load (KVA)	23.22		24.08		

OWNER

Indiana University Health
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Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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100% Desgin Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**
CHECKED BY **AESI**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

POWER SCHEDULES

SHEET NUMBER

EP602

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 3:02:23 PM AESI Proj. No: 21-154

PANELBOARD SCHEDULE

Branch Panel...	2NL1	**New/Exist:**	NEW	**Location:**	15KV SWITCHGEAR 212	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-2NL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2NL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	Receptacle CUP EMERGENCY...	1	20 A		Receptacle	1.44	1.44					Receptacle		20 A	1	Receptacle AES SERVICE SWITCHGEAR...	2
3	Receptacle 15KW SWITCHGEAR 212	1	20 A		Receptacle			1.44	1.44			Receptacle		20 A	1	Receptacle CORRIDOR 227	4
5	Receptacle Room 213, 224	1	20 A		Receptacle					0.36	1.08	Receptacle		20 A	1	Receptacle CONTROL ROOM 209	6
7	Receptacle TOILET / SHOWER 205A	1	20 A		Receptacle	1.44	1.26					Receptacle		20 A	1	Receptacle OFFICE 204	8
9	Receptacle GENERATOR CONTROL 208	1	20 A		Receptacle			1.26	1.44			Receptacle		20 A	1	Receptacle MAINTENANCE WORKROOM...	10
11	UH-3 Space 224	1	20 A		Motor					0.67	0.00	--		20 A	1	Spare	12
13	UH-4	1	20 A		Motor	0.67	0.00					--		20 A	1	Spare	14
15	Receptacle LOCKER / BREAK RM 205	1	20 A		Receptacle			0.36	0.00			--		20 A	1	Spare	16
17	Other LOCKER / BREAK RM 205	1	20 A		Other;...					0.18	0.00	--		20 A	1	Spare	18
19	MONITOR LOCKER / BREAK RM 205	1	20 A		Receptacle	1.00	0.00					--		20 A	1	Spare	20
21	DAMPER ACT. COL. 6-7	1	20 A		Motor			0.30	0.00			--		20 A	1	Spare	22
23	DAMPER ACT. COL. 7-8	1	20 A		Motor					0.30	0.00	--		20 A	1	Spare	24
25	DAMPER ACT. COL. 8-9	1	20 A		Motor	0.30	0.00					--		20 A	1	Spare	26
27	DAMPER ACT. MONITOR SOUTH WEST	1	20 A		Motor			0.90	0.00			--		20 A	1	Spare	28
29	DAMPER ACT. MONITOR SOUTH EAST	1	20 A		Motor					0.90	0.00	--		20 A	1	Spare	30
31	REceptacle Mezzanine 1st floor	1	20 A		Receptacle	0.36	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						7.91 kVA		**7.1 kVA**		**3.5 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	14.50	NEC	12.25	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	4.04	1.04	4.21		
Other Load (KVA)	0.00	Not Computed	0.00		
Total Load (KVA)	18.54		16.46		

PANELBOARD SCHEDULE

Branch Panel...	2NL2	**New/Exist:**	NEW	**Location:**	CORRIDOR 201	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-2NL2	**Enclosure:**	Type 1	**Feeder:**	SEE T-2NL2 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1						0.00	1.26					Receptacle		20 A	1	Receptacle JANITOR / STORAGE 223	2
3	2NBUSL1	3	100 A		Other			0.00	1.44			Receptacle		20 A	1	Receptacle GENERATOR SWICHGEAR 210	4
5										0.00	1.44	Receptacle		20 A	1	Receptacle GENERATOR EXHAUST...	6
7	Receptacle ROOF	1	20 A		Receptacle	0.90	1.08					Receptacle		20 A	1	Receptacle ROOF	8
9	RECEPT MDF DATA 225	1	20 A		Receptacle			0.72	0.90			Receptacle		20 A	1	RECEPT MDF DATA 225	10
11	Receptacle OFFICE 203	1	20 A		Receptacle					0.72	0.00						12
13	Receptacle OFFICE 226	1	20 A		Receptacle	1.08	0.00					--		100 A	3	Spare	14
15	Receptacle GENERATOR ROOM A 220	1	20 A		Receptacle			1.44	0.00								16
17	UH-1 GENERATOR ROOM A 220	1	20 A		Motor					0.67	0.00	--		20 A	1	Spare	18
19	Receptacle MECHANICAL 224	1	20 A		Receptacle	1.08	0.00					--		20 A	1	Spare	20
21	UH-2	1	20 A		Motor			0.67	0.00			--		20 A	1	Spare	22
23	VFD-P-2-2	1	20 A		Motor					0.00	0.00	--		20 A	1	Spare	24
25	FCU-N-2	1	20 A		Motor	0.73	0.00					--		20 A	1	Spare	26
27	BCU-16	1	20 A		Motor			0.73	0.00			--		20 A	1	Spare	28
29	DAMPER ACT. COL. 3-4	1	20 A		Motor					0.30	0.00	--		20 A	1	Spare	30
31	DAMPER ACT. COL. 4-5	1	20 A		Motor	0.30	0.00					--		20 A	1	Spare	32
33	DAMPER ACT. COL. 5-6	1	20 A		Motor			0.30	0.00			--		20 A	1	Spare	34
35	DAMPER ACT. MONITOR NORTH EAST	1	20 A		Motor					0.90	0.00	--		20 A	1	Spare	36
37	DAMPER ACT. MONITOR NORTH WEST	1	20 A		Motor	0.90	0.00					--		20 A	1	Spare	38
39	Receptacle Mezzanine	1	20 A		Receptacle			0.18	0.00			--		20 A	1	Spare	40
41	Receptacle LOCKER / BREAK RM 205	1	20 A		Receptacle					1.00	0.00	--		20 A	1	Spare	42
						7.33 kVA		**6.4 kVA**		**5.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	13.24	NEC	11.62	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	5.50	1.03	5.68		
Other Load (KVA)					
Total Load (KVA)	18.74		17.30		

PANELBOARD SCHEDULE

Branch Panel...	1NL1	**New/Exist:**	NEW	**Location:**	BOILER PLANT 109	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-1NL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-1NL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	Receptacle CHILLER PLANT ELECTRICAL...	1	20 A		Receptacle	1.08	1.44					Receptacle		20 A	1	Receptacle CHILLER PLANT ELECTRICAL...	2
3	Receptacle CHILLER PLANT ELECTRICAL...	1	20 A		Receptacle			1.44	1.08			Receptacle		20 A	1	Receptacle BOILER PLANT 109	4
5	Receptacle BOILER PLANT 109	1	20 A		Receptacle					1.08	0.90	Receptacle		20 A	1	Receptacle BOILER PLANT 109	6
7	FCU-S-2	1	20 A		Motor	0.73	0.50					Motor		20 A	2	OVERHEAD DOOR	8
9	Receptacle MEZZ	1	20 A		Receptacle			0.54	0.50								10
11	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	12
13	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	14
15	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	16
17	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	20
21	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						3.75 kVA		**3.6 kVA**		**2.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	7.56	NEC	7.56	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	1.73	1.14	1.98		
Other Load (KVA)					
Total Load (KVA)	9.29		9.54		

PANELBOARD SCHEDULE

Branch Panel...	1NL2	**New/Exist:**	NEW	**Location:**	CHILLER PLANT 114	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-1NL2	**Enclosure:**	Type 1	**Feeder:**	SEE T-1NL2 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	Receptacle CHILLER PLANT 114	1	20 A		Receptacle	1.08	1.08					Receptacle		20 A	1	Receptacle FIRE PUMP ROOM 108	2
3	Receptacle CHILLER PLANT 114	1	20 A		Receptacle			1.08	0.72			Receptacle		20 A	1	Receptacle CHILLER PLANT 114	4
5	Receptacle	1	20 A		Receptacle					0.36	0.50	Motor		20 A	2	Motor CHILLER PLANT 114	6
7	FCU-S-1	1	20 A		Motor	0.73	0.50										8
9	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	10
11	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	12
13	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	14
15	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	16
17	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	20
21	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00							42
						3.39 kVA		**1.8 kVA**		**0.9 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	4.32	NEC	4.32	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	1.73	1.14	1.98		
Other Load (KVA)					
Total Load (KVA)	6.05		6.30		

PANELBOARD SCHEDULE

Branch Panel...	1NL3	**New/Exist:**	NEW	**Location:**	RECEIVING 105	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-1NL3	**Enclosure:**	Type 1	**Feeder:**	SEE T-1NL3 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	DWS-2	1	20 A		Motor	0.36	0.36					Receptacle		20 A	1	Receptacle UTILITY TUNNEL 002	2
3	DWS-1	1	20 A		Motor			0.36	0.54			Receptacle		20 A	1	Receptacle FUEL OIL PUMP ROOM 103	4
5	Receptacle Space 229	1	20 A		Receptacle					0.54	1.26	Receptacle		20 A	1	Receptacle RECEIVING 105	6
7	Receptacle WATER PUMP ROOM 107	1	20 A		Receptacle	0.90	0.18					Receptacle		20 A	1	Receptacle ENTRY 102	8
9	Receptacle CHILLER PLANT 114	1	20 A		Receptacle			0.72	0.50			Receptacle		20 A	1	DOOR 109U ELECTRIC STRIKE PS	10
11	CHEM. TREAT INST. RECEIVING 105	1	20 A		Receptacle					0.72	0.36	Receptacle		20 A	1	DESK RECEIVING 105	12
13	FCU-N-1	1	20 A		Motor	0.73	0.13					Motor		20 A	1	DWRP-1	14
15	ESEW-2 HEAT TRACE	1	20 A		Heating			0.08	0.36			Receptacle		20 A	1	Receptacle STAIR #1 001	16
17	OVERHEAD DOOR	2	20 A		Motor					0.50	0.50	Motor		20 A	2	OVERHEAD DOOR	18
19						0.50	0.50										20
21	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						3.65 kVA		**2.6 kVA**		**3.9 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	6.44	NEC	6.44	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)	0.08	1.00	0.08	Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	3.57	1.07	3.82		
Other Load (KVA)					
Total Load (KVA)	10.09		10.34		

OWNER

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PROJECT

Central Utility Plant

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100% Desgin Development Documents
February 10, 2023

REVISIONS
NO. DATE DESCRIPTION

DESIGNED BY: **AESI**	CERTIFICATION
CHECKED BY: **AESI**	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY: **Approver**	
PROJECT NO.: **21-154**	

SHEET TITLE

POWER SCHEDULES

SHEET NUMBER

EP603

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:25 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

SWITCHBOARD SCHEDULE

Panel Name:	2EQH1	**New/Exi...**	NEW	**Location:**	CUP EMERGENCY ELECTRIC...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	800A LSI	**Mounting:**	FLOOR	**Project Number:**	Project Number
Voltage:	480Y/277V	**Amp:**	800 A	**Kaic...**	65	**Date:**	February 10, 2023
Feed From:	ATS-EQ1	**Enclosu...**	NEMA 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Frame	Trip	Trip...	Basis of Design	Lights	Receptacles	Heating	Power	Motor
1	2EQUPS1	3	200 A	200 A				17 kVA			42 kVA
2	SB-1	3	90 A	90 A							54 kVA
3	Spare	3	200 A	200 A							
4	Spare	3	90 A	90 A							
5	T-2EQL1	3	125 A	125 A					0 VA		
6	T-1EQL1	3	400 A	20 A					0 VA		
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Sub-Total in KVA:								**17 kVA**	**0 VA**		**96 kVA**

	Connected KVA	Demand Factor	Demand Kva	Trip Type	Trip Unit Description	Note:
Lighting Load (KVA)					Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	17	79	14	LI	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)	0	Not Computed	0	LSI	Molded Case with Electronic Trip Unit (LSI)	
Motor Load (KVA)	96	114	109	LSIG	Molded Case with Electronic Trip Unit (LSIG)	
Other Load (KVA)	0	Not Computed	0			
Total Load (KVA)	113	109	123			

SWITCHBOARD SCHEDULE

Panel Name:	2ELH1	**New/Exi...**	NEW	**Location:**	CUP EMERGENCY ELECTRIC...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	800A LSI	**Mounting:**	FLOOR	**Project Number:**	Project Number
Voltage:	480Y/277V	**Amp:**	800 A	**Kaic...**	65	**Date:**	February 10, 2023
Feed From:	ATS-EL1	**Enclosu...**	NEMA 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Frame	Trip	Trip...	Basis of Design	Lights	Receptacles	Heating	Power	Motor
1	ELEVATOR	3	150 A	150 A							
2	T-2ELL1	3	40 A	40 A							
3	Spare	3	150 A	150 A							
4	Spare	3	40 A	40 A							
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Sub-Total in KVA:											

	Connected KVA	Demand Factor	Demand Kva	Trip Type	Trip Unit Description	Note:
Lighting Load (KVA)					Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)				LI	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				LSI	Molded Case with Electronic Trip Unit (LSI)	
Motor Load (KVA)				LSIG	Molded Case with Electronic Trip Unit (LSIG)	
Other Load (KVA)	0	Not Computed	0			
Total Load (KVA)	0	100	0			

PANELBOARD SCHEDULE

Branch Panel...	2EQUPSH1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	2EQUPS1	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1						6.49	6.49										2
3	CRAC-1	3	30 A		Motor			6.49	6.49			Motor		30 A	3	CRAC-2	4
5										6.49	6.49						6
7					Other; Receptacle; Spare	6.38	0.50										8
9	T-2EQUPSL1	3	125 A					5.94	0.50			Motor		20 A	3	ACCU-1	10
11										4.86	0.50						12
13						0.50	0.00										14
15	ACCU-2	3	20 A		Motor			0.50	0.00			--		20 A	3	Spare	16
17										0.50	0.00						18
19						0.00	0.00										20
21	Spare	3	20 A		--			0.00	0.00			--		30 A	3	Spare	22
23										0.00	0.00						24
25						0.00	0.00					--		20 A	1	Spare	26
27	Spare	3	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29										0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						20.35 kVA		**19.9 kVA**		**18.8 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	17.18	NEC	13.59	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)	41.90	1.12	46.76		
Other Load (KVA)	0.00	Not Computed	0.00		
Total Load (KVA)	59.08		60.35		

PANELBOARD SCHEDULE

Branch Panel...	2EQL1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-2EQL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2EQL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1						0.00	0.00										2
3	HC-1	2	30 A		Heating			0.00	0.00			Heating		30 A	1	HC-18	4
5										0.00	0.00	Heating		30 A	1	HC-19	6
7	HC-2	2	30 A		Heating	0.00	0.00					Heating		30 A	1	HC-20	8
9								0.00	0.00			Heating		30 A	1	HC-21	10
11	HC-3	2	30 A		Heating					0.00	0.00	Heating		30 A	1	HC-22	12
13						0.00	0.00					Heating		30 A	1	HC-23	14
15	HC-4	2	30 A		Heating			0.00	0.00			Heating		30 A	2	HC-24	16
17	HC-5	1	30 A		Heating					0.00	0.00					HC-25	18
19	HC-6	1	30 A		Heating	0.00	0.00					Heating		30 A	2	HC-26	20
21	HC-7	1	30 A		Heating			0.00	0.00								22
23	HC-8	1	30 A		Heating					0.00	0.00	Heating		30 A	2	HC-27	24
25	HC-9	1	30 A		Heating	0.00	0.00										26
27	HC-10	1	30 A		Heating			0.00	0.00			Heating		30 A	2	HC-28	28
29	HC-11	1	30 A		Heating					0.00	0.00						30
31	HC-12	1	30 A		Heating	0.00	0.00					Heating		30 A	1	HC-29	32
33	HC-13	1	30 A		Heating			0.00	0.00			Heating		30 A	1	HC-30	34
35	HC-14	1	30 A		Heating					0.00	0.00	--		20 A	1	Spare	36
37	HC-15	1	30 A		Heating	0.00	0.00					--		20 A	1	Spare	38
39	HC-16	1	30 A		Heating			0.00	0.00			--		20 A	1	Spare	40
41	HC-17	1	30 A		Heating					0.00	0.00	--		20 A	1	Spare	42
						0.00 kVA		**0.0 kVA**		**0.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)	0.00	Not Computed	0.00	Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	0.00		0.00		

PANELBOARD SCHEDULE

Branch Panel...	2EQUPSL1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	225 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-2EQUPSL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2EQUPSL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	NAC PANEL CONTROL 112	1	20 A		Other	0.00	0.50					Receptacle		20 A	1	DOOR 215A ELECTRIC STRIKE PS	2
3	ACCESS CONTROL PANEL CONTROL 112	1	20 A		Other			0.00	0.50			Receptacle		20 A	1	DOOR 214A ELECTRIC STRIKE PS	4
5	NITROGEN GENERATOR Space 224	1	20 A		Receptacle					0.50	0.50	Receptacle		20 A	1	DOOR 216A ELECTRIC STRIKE PS	6
7						0.00	0.50					Receptacle		20 A	1	DOOR 301 ELECTRIC STRIKE PS	8
9	2EQUPSBUSL1	3	100 A		Other			0.00	0.18			Receptacle		20 A	1	DATA RACK 1	10
11										0.00	0.18	Receptacle		20 A	1	DATA RACK 2	12
13	NITROGEN GENERATOR MECHANICAL...	1	20 A		Receptacle	0.50	0.18					Receptacle		20 A	1	DATA RACK 3	14
15	DOOR 224 ELECTRIC STRIKE PS	1	20 A		Receptacle			0.50	0.18			Receptacle		20 A	1	DATA RACK 4	16
17	DOOR 222A ELECTRIC STRIKE PS	1	20 A		Receptacle					0.50	0.18	Receptacle		20 A	1	DATA RACK 5	18
19	DOOR 220A ELECTRIC STRIKE PS	1	20 A		Receptacle	0.50	0.18					Receptacle		20 A	1	DATA RACK 6	20
21	DOOR 208C ELECTRIC STRIKE PS	1	20 A		Receptacle			1.50	0.00			--		20 A	1	Spare	22
23	DOOR 209 ELECTRIC STRIKE PS	1	20 A		Receptacle					0.50	0.00	--		20 A	1	Spare	24
25	NITROGEN GENERATOR MECHANICAL...	1	20 A		Receptacle	0.50	0.00					--		20 A	1	Spare	26
27	FACP 209 CONTROL ROOM	1	20 A		Receptacle			0.50	0.00			--		20 A	1	Spare	28
29	SECURITY PANEL 209 CONTROL ROOM	1	20 A		Receptacle					0.50	0.00	--		20 A	1	Spare	30
31	Receptacle CONTROL ROOM 209	1	20 A		Receptacle	1.08	0.00					--		20 A	1	Spare	32
33	Receptacle CONTROL ROOM 209	1	20 A		Receptacle			1.08	0.00			--		20 A	1	Spare	34
35	MONITOR CONTROL ROOM 209	1	20 A		Receptacle					0.50	0.00	--		20 A	1	Spare	36
37	DOOR 225 ELECTRIC STRIKE PS	1	20 A		Receptacle	0.50	0.00					--		20 A	1	Spare	38
39	DOOR 227 ELECTRIC STRIKE PS	1	20 A		Receptacle			0.50	0.00			--		20 A	1	Spare	40
41	DOOR 213A ELECTRIC STRIKE PS	1	20 A		Receptacle					0.50	0.00	--		20 A	1	Spare	42
						6.38 kVA		**5.9 kVA**		**4.9 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	17.18	NEC	13.59	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)	0.00	Not Computed	0.00		
Total Load (KVA)	17.18		13.59		

PANELBOARD SCHEDULE

Branch Panel...	2ELL1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	100 A	**Kaic Rating:**	42	**Date**	February 10, 2023
Feed From:	T-2ELL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2ELL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	ELEVATOR LIGHTS AND CONTROLS	1	20 A		Other	0.00	0.00					--		20 A	1	Spare	2
3	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	4
5	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	6
7	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	8
9	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	10
11	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	12
13	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	14
15	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	16
17	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	20
21	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	22
23	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	26
27	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	28
29	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	32
33	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	34
35	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00					--		20 A	1	Spare	38
39	Spare	1	20 A		--			0.00	0.00			--		20 A	1	Spare	40
41	Spare	1	20 A		--					0.00	0.00	--		20 A	1	Spare	42
						0.00 kVA		**0.0 kVA**		**0.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)	0.00	Not Computed	0.00		
Total Load (KVA)	0.00		0.00		

OWNER

Indiana University Health
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Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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100% Desgin Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**	CERTIFICATION PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY **AESI**	
APPROVED BY **Approver**	
PROJECT NO. **21-154**	

SHEET TITLE

POWER SCHEDULES

SHEET NUMBER

EP604

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 3:02:27 PM AESI Proj. No: 21-154

PANELBOARD SCHEDULE

Branch Panel...	2GENUPSH1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	480Y/277V	**Amp:**	200 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	2GENUPS1	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)	B (KVA)	C (KVA)	Load...	Type	Rating	Pole	Load Name	Ckt
1						2.00	0.00							2
3	T-2GENUPSL1	3	125 A		Receptacle; Spare		2.00	0.00	--		125 A	3	Spare	4
5								2.00	0.00					6
7						0.00	0.00							8
9	Spare	3	20 A		--		0.00	0.00	--		20 A	3	Spare	10
11								0.00	0.00					12
13	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	14
15	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	16
17	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	20
21	Spare	1	20 A		--		0.00	0.00	--		20 A	1	Spare	22
23	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	26
27	Spare	1	20 A		--		0.00	0.00	--		20 A	1	Spare	28
29	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	32
33	Spare	1	20 A		--		0.00	0.00	--		20 A	1	Spare	34
35	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	38
39	Spare	1	20 A		--		0.00	0.00	--		20 A	1	Spare	40
41	Spare	1	20 A		--			0.00	0.00	--	20 A	1	Spare	42
						2.00 kVA	**2.0 kVA**	**2.0 kVA**						

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	6.00	NEC	6.00	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	6.00		6.00		

PANELBOARD SCHEDULE

Branch Panel...	2EQUPSL2	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	400 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	2EQUPSL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2EQUPSL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)	B (KVA)	C (KVA)	Load...	Type	Rating	Pole	Load Name	Ckt
1							0.00							2
3	DOOR 113D ELECTRIC STRIKE PS	1	20 A		Receptacle		0.50	0.00			20 A	1	Spare	4
5	DOOR 109S ELECTRIC STRIKE PS	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	6
7	DOOR 109S POWER SUPPLY	1	20 A		Receptacle	0.50	0.00				20 A	1	Spare	8
9	DOOR 109M ELECTRIC STRIKE PS	1	20 A		Receptacle		0.50	0.00			20 A	1	Spare	10
11	MONITOR CONTROL 112	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	12
13	Receptacle CONTROL 112	1	20 A		Receptacle	1.44	0.00				20 A	1	Spare	14
15	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	16
17	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	20
21	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	22
23	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	26
27	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	28
29	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	32
33	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	34
35	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	38
39	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	40
41	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	42
						1.94 kVA	**1.0 kVA**	**1.0 kVA**						

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	3.94	NEC	3.94	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	3.94		3.94		

PANELBOARD SCHEDULE

Branch Panel...	2GENUPSL1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	225 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-2GENUPSL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2GENUPSL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)	B (KVA)	C (KVA)	Load...	Type	Rating	Pole	Load Name	Ckt
1	MASTER GENERATOR CONTROL 208	1	20 A		Receptacle	0.50	0.00		--		20 A	1	Spare	2
3	GENERATOR CONTROL-G1 208	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	4
5	GENERATOR CONTROL-G2 208	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	6
7	GENERATOR CONTROL-G3 208	1	20 A		Receptacle	0.50	0.00		--		20 A	1	Spare	8
9	GENERATOR CONTROL-G4 208	1	20 A		Receptacle		0.50	0.00			20 A	1	Spare	10
11	GENERATOR CONTROL-G5 208	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	12
13	GENERATOR CONTROL-G6 208	1	20 A		Receptacle	0.50	0.00		--		20 A	1	Spare	14
15	GENERATOR CONTROL-G7 208	1	20 A		Receptacle		0.50	0.00			20 A	1	Spare	16
17	GENERATOR CONTROL-G8 208	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	18
19	GENERATOR CONTROL-G9 208	1	20 A		Receptacle	0.50	0.00		--		20 A	1	Spare	20
21	GENERATOR CONTROL-G10 208	1	20 A		Receptacle		0.50	0.00			20 A	1	Spare	22
23	D00R 218A ELECTRIC STRIKE PS	1	20 A		Receptacle			0.50	0.00		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	26
27	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	28
29	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	32
33	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	34
35	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00		--		20 A	1	Spare	38
39	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	40
41	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	42
						2.00 kVA	**2.0 kVA**	**2.0 kVA**						

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	6.00	NEC	6.00	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	6.00		6.00		

SWITCHBOARD SCHEDULE

Panel Name:	2GENH1	**New/Exi...**	NEW	**Location:**	CUP EMERGENCY ELECTRIC...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	800A LSI	**Mounting:**	FLOOR	**Project Number:**	Project Number
Voltage:	480Y/277V	**Amp:**	800 A	**Kaic...**	65	**Date:**	February 10, 2023
Feed From:	ATS-GEN1	**Enclosu...**	NEMA1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Frame	Trip	Trip...	Basis of Design	Lights	Receptacles	Heating	Power	Motor
1	2GENUPSH1	3	200 A	200 A				6 kVA			
2	T-2GENL1	3	125 A	125 A							
3	FO-P-1 CONTROL PANEL	3	15 A	15 A						3 kVA	
4	FO-P-2 CONTROL PANEL	3	15 A	15 A						3 kVA	
5	FO-P-3 CONTROL PANEL	3	15 A	15 A						2 kVA	
6	FO-P-4 CONTROL PANEL	3	15 A	15 A						2 kVA	
7	VFD-FO-FLTR-1	3	15 A	15 A							1 kVA
8	VFD-FO-FLTR-2	3	15 A	15 A							1 kVA
9	MSS BATTERY CHARGER	3	60 A	60 A							
10	MSS BATERY CHARGER	3	60 A	60 A							
11	PS/MV-ATS BATTERY CHARGER	3	60 A	60 A							
12	PS/MV-ATS BATTERY CHARGER	3	60 A	60 A							
13	Spare	3	200 A	200 A							
14	Spare	3	125 A	125 A							
15	Spare	3	15 A	15 A							
16	Spare	3	15 A	15 A							
17	Spare	3	60 A	60 A							
18	Spare	3	60 A	60 A							
19											
20											
Sub-Total in KVA:								**6 kVA**		**11 kVA**	**3 kVA**

	Connected KVA	Demand Factor	Demand Kva	Trip Type	Trip Unit Description	Note:
Lighting Load (KVA)					Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)	6	100	6	LI	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				LSI	Molded Case with Electronic Trip Unit (LSI)	
Motor Load (KVA)	3	113	3	LSIG	Molded Case with Electronic Trip Unit (LSIG)	
Other Load (KVA)	6	80	5			
Total Load (KVA)	26	96	25			

SWITCHBOARD SCHEDULE

Panel Name:	2LSH1	**New/Exi...**	NEW	**Location:**	CUP EMERGENCY ELECTRIC...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	800A LSI	**Mounting:**	FLOOR	**Project Number:**	Project Number
Voltage:	480Y/277V	**Amp:**	800 A	**Kaic...**	62	**Date:**	February 10, 2023
Feed From:	ATS-LS1	**Enclosu...**	NEMA 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Frame	Trip	Trip...	Basis of Design	Lights	Receptacles	Heating	Power	Motor
1	1LSH1	3	225 A	225 A			10 kVA				
2	2LSH2	3	225 A	225 A			0 kVA				
3	2LSUPSH1	3	30 A	30 A							
4	JP-1 CONTROLLER	3	20 A	20 A							4 kVA
5	JP-2 CONTROLLER	3	20 A	20 A							4 kVA
6	Spare	3	225 A	20 A							
7	Spare	3	400 A	30 A							
8	Spare	3	400 A	20 A							
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Sub-Total in KVA:							**10 kVA**				**8 kVA**

	Connected KVA	Demand Factor	Demand Kva	Trip Type	Trip Unit Description	Note:
Lighting Load (KVA)	10	100	10		Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)				LI	Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				LSI	Molded Case with Electronic Trip Unit (LSI)	
Motor Load (KVA)	8	113	9	LSIG	Molded Case with Electronic Trip Unit (LSIG)	
Other Load (KVA)						
Total Load (KVA)	18	106	19			

PANELBOARD SCHEDULE

Branch Panel...	2GENL1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	225 A	**Kaic Rating:**	65	**Date**	February 10, 2023
Feed From:	T-2GENL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2GENL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)	B (KVA)	C (KVA)	Load...	Type	Rating	Pole	Load Name	Ckt
1	FO-DT-1 CORRIDOR 201	1	20 A		Other	0.70	0.00				20 A	1	Spare	2
3	FO-DT-2 CORRIDOR 201	1	20 A		Other		0.70	0.00			20 A	1	Spare	4
5	FO-DT-3 CORRIDOR 201	1	20 A		Other			0.70	0.00		20 A	1	Spare	6
7	FO-DT-4 CORRIDOR 201	1	20 A		Other	0.70	0.00				20 A	1	Spare	8
9	FO-DT-5 CORRIDOR 201	1	20 A		Other		0.70	0.00			20 A	1	Spare	10
11	FO-DT-6 GENERATOR ROOM B 218	1	20 A		Other			0.70	0.00		20 A	1	Spare	12
13	FO-DT-7 GENERATOR ROOM B 218	1	20 A		Other	0.70	0.00				20 A	1	Spare	14
15	FO-DT-8 GENERATOR ROOM B 218	1	20 A		Other		0.70	0.00			20 A	1	Spare	16
17	FO-DT-9 GENERATOR ROOM B 218	1	20 A		Other			0.70	0.00		20 A	1	Spare	18
19	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	20
21	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	22
23	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	24
25	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	26
27	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	28
29	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	30
31	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	32
33	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	34
35	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	36
37	Spare	1	20 A		--	0.00	0.00				20 A	1	Spare	38
39	Spare	1	20 A		--		0.00	0.00			20 A	1	Spare	40
41	Spare	1	20 A		--			0.00	0.00		20 A	1	Spare	42
						2.09 kVA	**2.1 kVA**	**2.1 kVA**						

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)				Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)	6.26	0.80	5.01		
Total Load (KVA)	6.26		5.01		

OWNER

Indiana University Health
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PROJECT

Central Utility Plant

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100% Desgin Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**
CHECKED BY **AESI**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

POWER SCHEDULES

SHEET NUMBER

EP605

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:29 PM AESI Proj. No: 21-154

PANELBOARD SCHEDULE

Branch Panel...	1EQL1	**New/Exist:**	NEW	**Location:**	RECEIVING 105	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-1EQL1	**Enclosure:**	Type 1	**Feeder:**	SEE CABLE SCHEDULE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	HC-31	2	20 A		Heating	0.00											2
3								0.00									4
5	HC-32	2	20 A		Heating					0.00							6
7						0.00											8
9	Heating RECEIVING 105	1	20 A		Heating			0.00									10
11																	12
13																	14
15																	16
17																	18
19																	20
21																	22
23																	24
25																	26
27																	28
29																	30
31																	32
33																	34
35																	36
37																	38
39																	40
41																	42
						0.00 kVA		**0.0 kVA**		**0.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)	0.00	Not Computed	0.00	Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	0.00		0.00		

PANELBOARD SCHEDULE

Branch Panel...	2EQL1	**New/Exist:**	NEW	**Location:**	CUP EMERGENCY ELECTRICAL...	**Project Name:**	Central Utility Plant
SPD:	YES	**Main:**	MCB	**Mounting:**	Surface	**Project No.**	Project Number
Voltage	208Y/120V	**Amp:**	200 A	**Kaic Rating:**	22	**Date**	February 10, 2023
Feed From:	T-2EQL1	**Enclosure:**	Type 1	**Feeder:**	SEE T-2EQL1 PLAN NOTE		Applied Engineering Services (317) 810-4141

Ckt	Load Name	Pole	Rating	Type	Load...	A (KVA)		B (KVA)		C (KVA)		Load...	Type	Rating	Pole	Load Name	Ckt
1	HC-1	2	30 A		Heating	0.00	0.00					Heating		30 A	1	HC-18	2
3								0.00	0.00			Heating		30 A	1	HC-19	4
5	HC-2	2	30 A		Heating					0.00	0.00	Heating		30 A	1	HC-20	6
7						0.00	0.00					Heating		30 A	1	HC-21	8
9	HC-3	2	30 A		Heating			0.00	0.00			Heating		30 A	1	HC-22	10
11										0.00	0.00	Heating		30 A	1	HC-23	12
13	HC-4	2	30 A		Heating	0.00	0.00					Heating		30 A	1	HC-24	14
15								0.00	0.00			Heating		30 A	2	HC-25	16
17	HC-5	1	30 A		Heating					0.00	0.00						18
19	HC-6	1	30 A		Heating	0.00	0.00					Heating		30 A	2	HC-26	20
21	HC-7	1	30 A		Heating			0.00	0.00								22
23	HC-8	1	30 A		Heating					0.00	0.00	Heating		30 A	2	HC-27	24
25	HC-9	1	30 A		Heating	0.00	0.00										26
27	HC-10	1	30 A		Heating			0.00	0.00			Heating		30 A	2	HC-28	28
29	HC-11	1	30 A		Heating					0.00	0.00						30
31	HC-12	1	30 A		Heating	0.00	0.00					Heating		30 A	1	HC-29	32
33	HC-13	1	30 A		Heating			0.00	0.00			Heating		30 A	1	HC-30	34
35	HC-14	1	30 A		Heating					0.00	0.00	--		20 A	1	Spare	36
37	HC-15	1	30 A		Heating	0.00	0.00					--		20 A	1	Spare	38
39	HC-16	1	30 A		Heating			0.00	0.00			--		20 A	1	Spare	40
41	HC-17	1	30 A		Heating					0.00	0.00	--		20 A	1	Spare	42
						0.00 kVA		**0.0 kVA**		**0.0 kVA**							

	Connected KVA	Demand Factor	Demand KVA	Trip Unit Description	Notes:
Lighting Load (KVA)				Molded Case with Fixed Trip Unit	
Receptacle Load (KVA)		NEC		Molded Case with Electronic Trip Unit (LI)	
Heating Load (KVA)	0.00	Not Computed	0.00	Molded Case with Electronic Trip iUnit (LSI)	
Motor Load (KVA)					
Other Load (KVA)					
Total Load (KVA)	0.00		0.00		

OWNER

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100% Desgin Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: **AESI**
CHECKED BY: **AESI**
APPROVED BY: **Approver**
PROJECT NO.: **21-154**

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

EP606

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:30 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

Equipment ID	Load Description	Copper Cable and Conduit	Projectd CT Size Load (Amps)	Tag	Location in Building
MAIN SERVICE SWITCHGEAR (MSS)					
MSS-FDR-1 - Spare (Future Cap Bank)	(Future Cap Bank)		1200		
MSS-FDR-2 - Spare			1200		
MSS-FDR-3 - MV-ATS-IUH-OS-A	Normal Power to MV-ATS-IUH-OS-A	(2)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0009*	IUH
MSS-FDR-4 - MV-ATS-IUH-EQ-A	Normal Power to MV-ATS-IUH-EQ-A	(2)4"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0008*	IUH
MSS-FDR-5 - MV-ATS-CUP-MECH-A	Normal Power to MV-ATS-CUP-MECH-A	(1)5"C, (3)250KCMIL, MV105 W (1) #1/0 GND EACH	1200	*C-15K-0007*	CUP 2ND FLOOR
MSS-FDR-6 - MV-ATS-CUP-CH-A	Normal Power to MV-ATS-CUP-CH-A	(2)5"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0006*	CUP 2ND FLOOR
MSS-FDR-7 - EV1	Normal Power to EV1	(1)5"C, (3)250KCMIL, MV105 W (1) #3/0 GND	1200	*C-15K-0005*	EV
MSS-FDR-8 - SPARE	Spare		1200		PG
MSS-FDR-9 - PG-A	Normal Power to PG-A	(1)5"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0004*	
MSS-FDR-10 - MSSB-A	Normal Power to SSB-A	(3)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0003*	SSB
MSS-MAIN A - Bus A	UTILITY FEED Handoff in Manhole to SS MAIN A - BUS A	(4)6"C, (3)750KCMIL, MV105 W (1) #4/0 GND EACH	2000	*C-15K-0001*	CUP 2ND FLOOR
MSS-TIE BUS A - B	Tie		2000		
MSS-Main B - Bus B	UTILITY FEED Handoff in Manhole to SS MAIN B - BUS B	(4)6"C, (3)750KCMIL, MV105 W (1) #4/0 GND EACH	2000	*C-15K-0002*	CUP 2ND FLOOR
MSS-FDR-11 - MSSB-B	Normal Power to SSB-B	(1)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0010*	SSB
MSS-FDR-12 - PG-B	Normal Power to PG-B	(1)5"C, (3)350KCMIL, MV105 W (1) #3/0 GND	1200	*C-15K-0011*	PG
MSS-FDR-13 - SPARE (Future EV1)	Spare		1200		
MSS-FDR-14 - MV-ATS-CUP-CH-B	Normal Power to MV-ATS-CUP-CH-B	(2)5"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0012*	CUP 2ND FLOOR
MSS-FDR-15 - MV-ATS-CUP-MECH-B	Normal Power to MV-ATS-CUP-MECH-B	(1)5"C, (3)250KCMIL, MV105 W (1) #1/0 GND EACH	1200	*C-15K-0013*	CUP 2ND FLOOR
MSS-FDR-16 - MV-ATS-IUH-EQ-B	Normal Power to MV-ATS-IUH-EQ-B	(2)4"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0014*	IUH
MSS-FDR-17 - MV-ATS-IUH-OS-B	Normal Power to MV-ATS-IUH-OS-B	(2)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0015*	IUH
MSS-FDR-18 - Spare (Future Cap Bank)	(Future Cap Bank)	(3)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200		
PARALLELING SWITCHGEAR (PS)					
PS-GEN-1	Generator 1	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN1*	CUP 2ND FLOOR
PS-GEN-2	Generator 2	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN2*	CUP 2ND FLOOR
PS-GEN-3	Generator 3	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN3*	CUP 2ND FLOOR
PS-GEN-4	Generator 4	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN4*	CUP 2ND FLOOR
PS-GEN-5	Generator 5	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN5*	CUP 2ND FLOOR
PS-FDR-1 - MV-ATS-IUH-OS-A	Emergency Power to MV-ATS-IUH-OS-A	(2)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0016*	IUH
PS-FDR-2 - MV-ATS-IUH-EQ-A	Emergency Power to MV-ATS-IUH-EQ-A	(2)4"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0017*	IUH
PS-FDR-3 - MV-ATS-CUP-MECH-A	Emergency Power to MV-ATS-CUP-MECH-A	(1)5"C, (3)250KCMIL, MV105 W (1) #1/0 GND EACH	1200	*C-15K-0018*	CUP 2ND FLOOR
PS-FDR-4 - MV-ATS-CUP-CH-A	Emergency Power to MV-ATS-CUP-CH-A	(2)5"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0019*	CUP 2ND FLOOR
PS-FDR-5 - SSB-A	Emergency Power to SSB-A	(1)5"C, (3)250KCMIL, MV105 W/ (1) #1 GND	400	*C-15K-0020*	SSB
PS-FDR-6 - PG-A	Emergency Power to PG-A	(1)5"C, (3)250KCMIL, MV105 W/ (1) #1 GND	400	*C-15K-0021*	PG
PS-FDR-7 - SPARE	Spare		1200		
PS-FDR-8 - IUH LIFE SAFETY SUB A	Emergency Power to IUH-ESS-A	(2)5"C, (3)350KCMIL, MV105 W/ (1) #1 GND EACH	1200	*C-15K-0022*	IUH
PS-FDR-9 - SPARE	Spare		400		
PS-FDR-10 - SPARE	Spare		1200		
PS-TIE BUS A - B			2000		
PS-FDR-11 - MV-ATS-CUP-CH-B	Emergency Power to MV-ATS-CUP-CH-B	(2)5"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0023*	CUP 2ND FLOOR
PS-FDR-12 - MV-ATS-CUP-MECH-B	Emergency Power to MV-ATS-CUP-MECH-B	(1)5"C, (3)250KCMIL, MV105 W (1) #1/0 GND EACH	1200	*C-15K-0024*	CUP 2ND FLOOR
PS-FDR-13 - MV-ATS-IUH-EQ-B	Emergency Power to MV-ATS-IUH-EQ-B	(2)4"C, (3)350KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0025*	IUH
PS-FDR-14 - MV-ATS-IUH-OS-B	Emergency Power to MV-ATS-IUH-OS-B	(2)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	1200	*C-15K-0026*	IUH
PS-FDR-15 - IUH LIFE SAFETY SUB B	Emergency Power to IUH-ESS-B	(2)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND EACH	1200	*C-15K-0027*	IUH
PS-FDR-16 - CUP LIFE SAFETY SUB	Emergency Power to CUP-ESS	(2)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND EACH	1200	*C-15K-0028*	CUP 2ND FLOOR
PS-FDR-17 - SPARE	Spare		1200		
PS-FDR-18 - SPARE	Spare		400		
PS-FDR-19 - CUP LOAD BANK	Load Bank	(1)4"C, (3)500KCMIL, MV105 W/ (1) #1 GND	400	*C-15K-0029*	CUP ROOF
PS-FDR-20 - SPARE	Spare		400		
PS-GEN-6	Generator 6	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN6*	CUP 2ND FLOOR
PS-GEN-7	Generator 7	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN7*	CUP 2ND FLOOR
PS-GEN-8	Generator 8	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN8*	CUP 2ND FLOOR
PS-GEN-9	Generator 9	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400	*C-15K-GEN9*	CUP 2ND FLOOR
PS-GEN-10 (Future)	Generator 10 (Future)	(1)4"C, (3)#2/0, MV105 W (1) #4 GND	400		
MV-ATS-IUH-OS-A					
MV-ATS-IUH-OS-A - FDR-1	ATS Power to MV-NORM-PRIMARY-A	(2)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	800	*C-15K-0030*	IUH
MV-ATS-IUH-OS-A - FDR-2	Spare		800		
MV-ATS-IUH-EQ-1					
MV-ATS-IUH-EQ-A - FDR-1	ATS Power to MV-EQUIP-PRIMARY-A	(2)5"C, (3)350KCMIL, MV105 W/ (1) #1 GND EACH	800	*C-15K-0031*	IUH
MV-ATS-IUH-EQ-A - FDR-2	Spare		800		
MV-ATS-IUH-OS-B					
MV-ATS-IUH-OS-B - FDR-1	ATS Power to MV-NORM-PRIMARY-B	(2)5"C, (3)500KCMIL, MV105 W (1) #3/0 GND EACH	800	*C-15K-0032*	IUH
MV-ATS-IUH-OS-B - FDR-2	Spare		800		
MV-ATS-IUH-EQ-B					
MV-ATS-IUH-EQ-B - FDR-1	ATS Power to MV-EQUIP-PRIMARY-B	(2)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND EACH	800	*C-15K-0033*	IUH
MV-ATS-IUH-EQ-B - FDR-2	Spare		800		
MV-ATS-CUP-MECH-A					
MV-ATS-CUP-MECH-A - FDR-1	ATS Power to USS-MECH1 Main A	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0034*	CUP 1ST FLOOR
MV-ATS-CUP-MECH-A - FDR-2	Spare		600		CUP 1ST FLOOR
MV-ATS-CUP-MECH-A - FDR-3	ATS Power to USS-MECH2 Main A	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0035*	
MV-ATS-CUP-MECH-A - FDR-4	Spare		600		
MV-ATS-CUP-MECH-B					
MV-ATS-CUP-MECH-B - FDR-1	ATS Power to USS-MECH1 Main B	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0036*	CUP 1ST FLOOR
MV-ATS-CUP-MECH-B - FDR-2	Spare		600		CUP 1ST FLOOR
MV-ATS-CUP-MECH-B - FDR-3	ATS Power to USS-MECH2 Main B	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0037*	
MV-ATS-CUP-MECH-B - FDR-4	Spare		600		
MV-ATS-CUP-CH-A					
MV-ATS-CUP-CH-A - FDR-1	ATS Power to USS-CH1 Main A	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0038*	CUP 1ST FLOOR
MV-ATS-CUP-CH-A - FDR-2	Spare		600		CUP 1ST FLOOR
MV-ATS-CUP-CH-A - FDR-3	ATS Power to USS-CH2 Main A	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0039*	
MV-ATS-CUP-CH-A - FDR-4	Spare		600		
MV-ATS-CUP-CH-B					
MV-ATS-CUP-CH-B - FDR-1	ATS Power to USS-CH1 Main B	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0040*	CUP 1ST FLOOR
MV-ATS-CUP-CH-B - FDR-2	Spare		600		CUP 1ST FLOOR
MV-ATS-CUP-CH-B - FDR-3	ATS Power to USS-CH2 Main B	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	600	*C-15K-0041*	
MV-ATS-CUP-CH-B - FDR-4	Spare		600		
USS-CH-1					
USS-CH1 - FDR-1	CH#1	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	400	*C-5K-0001*	CUP 1ST FLOOR
USS-CH1 - FDR-2	CH#3	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	400	*C-5K-0002*	CUP 1ST FLOOR
USS-CH1 - FDR-3	CH#5	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	400	*C-5K-0003*	CUP 1ST FLOOR
USS-CH1 - FDR-4	Spare		400		
USS-CH-2					
USS-CH1 - FDR-1	CH#2	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	400	*C-5K-0004*	CUP 1ST FLOOR
USS-CH1 - FDR-2	CH#4	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	400	*C-5K-0005*	CUP 1ST FLOOR
USS-CH1 - FDR-3	CH#6	(1)4"C, (3)350KCMIL, MV105 W/ (1) #1 GND	400	*C-5K-0006*	CUP 1ST FLOOR
USS-CH1 - FDR-4	Spare		400		

C-5K-

OWNER

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PROJECT

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100% Desgin Development Documents
February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**
CHECKED BY **AESI**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION
PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
POWER SCHEDULES

SHEET NUMBER
EP607

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:31 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

Equipment ID	Load Description	Cable	Projectd CT Size Load (Amps)	Tag	Location in Building
1NH1					
1NH1#1,3,5 - Transformer for 1NL1	T-1NL1	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0094*	BOILER PLANT 109
1NH1#2,4,6 - Blower Coil Unit 9	BCU-9	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0095*	BOILER PLANT 109
1NH1#7,9,11 - Blower Coil Unit 6	BCU-6	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0096*	FIRE PUMP ROOM 108
1NH1#8,10,12 - Blower Coil Unit 8	BCU-8	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0097*	BOILER PLANT 109
1NH1#13,15,17 - Blower Coil Unit 7	BCU-7	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0098*	BOILER PLANT 109
1NH1#14,16,18 - Blower Coil Unit 13	BCU-13	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0099*	CHILLER PLANT 114
1NH1#19,21,23 - Blower Coil Unit 10	BCU-10	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0100*	CHILLER PLANT 114
1NH1#20,22,24 - Spare	Spare	(1) 3/4"C, (3) #12, W (1) #12 GND	15	*C-480-0101*	BOILER PLANT 109
1NH1#25,27,29 - Welding Outlet	Welding Outlet	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0102*	CHILLER PLANT 114
1NH1#26,28,30, - Blower Coil Pump 1-1	P-1-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0164*	MEZZANINE
1NH1#31,33,35, - Blower Coil Pump 1-2	P-1-2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0165*	MEZZANINE
1NH2					
1NH2#1,3,5 - Reverse Osmosis Pump Skid	RO-1	(1) 3/4"C, (3) #12, W (1) #12 GND	15	*C-480-0103*	BOILER PLANT 109
1NH2#2,4,6 - Reverse Osmosis Clean In Place	RO CIP SKID	(1) 3/4"C, (3) #12, W (1) #12 GND	15	*C-480-0104*	BOILER PLANT 109
1NH3					
1NH3#1,3,5 - Transformer for 1NL2	T-1NL2	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0105*	CHILLER PLANT 114
1NH3#2,4,6 - Blower Coil Unit 3	BCU-3	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0106*	RECEIVING 105
1NH3#7,9,11 - Blower Coil Unit 15	BCU-15	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0107*	CHILLER PLANT 114
1NH3#8,10,12 - Blower Coil Unit 14	BCU-14	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0108*	CHILLER PLANT 114
1NH3#13,15,17 - Blower Coil Unit 5	BCU-5	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0109*	RECEIVING 105
1NH3#14,16,18 - Blower Coil Unit 11	BCU-11	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0156*	BOILER PLANT 109
1NH4					
1NH4#1,3,5 - Transformer for 1NL3	T-1NL3	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0110*	RECEIVING 105
1NH4#2,4,6 - Blower Coil Unit 1	BCU-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0111*	RECEIVING 105
1NH4#7,9,11 - Blower Coil Unit 2	BCU-2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0112*	RECEIVING 105
1NH4#8,10,12 - Blower Coil Unit 4	BCU-4	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0113*	RECEIVING 105
1NH4#13,15,17 - Brine Pumps	BRP-1,2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0124*	RECEIVING 105
1NH4#14,16,18 - Tower Water Return Pump	CP-9	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0155*	RECEIVING 105
1NH4#19,21,23 - Sump Pump 1	SP-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-168*	RECEIVING 105
1NH4#20,22,24 - Domestic Water Heater 1	DWH-1	(1) 3/4"C, (3) #10, W (1) #10 GND	30	*C-480-169*	RECEIVING 105
2NH1					
2NH1#1,3,5 - Transformer for 2NL1	T-2NL1	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0114*	15KW SWITCHGEAR 212
2NH1#2,4,6 - Air Handling Unit 2-4	AHU-2-4	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0115*	MEZZANINE 2XX
2NH1#7,9,11 - Air Handling Unit 2-1	AHU-2-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0116*	MEZZANINE 2XX
2NH1#8,10,12 - Air Handling Unit 2-5	AHU-2-5	(1) 3/4"C, (3) #12, W (1) #12 GND	15	*C-480-0117*	MEZZANINE 2XX
2NH1#13,15,17 - Air Handling Unit 2-2	AHU-2-2	(1) 3/4"C, (3) #12, W (1) #12 GND	15	*C-480-0118*	MEZZANINE 2XX
2NH1#14,16,18 - Exhaust Fan 2-5	EF-2-5	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0147*	15KV SWITCHGEAR 212
2NH1#19,21,23 - Exhaust Fan 2-7	EF-2-7	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0148*	MSS SWITCHGEAR 216
2NH1#20,22,24 - Return Fan 2	RF-2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0149*	15KW SWITCHGEAR 212
2NH1#25,27,29 - Return Fan 1	RF-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0150*	15KW SWITCHGEAR 212
2NH1#26,28,30 - Exhaust Fan 2-3	EF-2-3	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0151*	15KW SWITCHGEAR 212
2NH1#31,33,35 - Exhaust Fan 2-4	EF-2-4	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0152*	15KW SWITCHGEAR 212
2NH2					
2NH2#1,3,5 - Transformer for 2NL2	T-2NL2	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0119*	15KW SWITCHGEAR 212
2NH2#2,4,6 - Rooftop Exhaust Fan 1	REF-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0120*	MECHANICAL 224
2NH2#7,9,11 - Exhaust Fan 1-1	EF-1-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0121*	MECHANICAL 206
2NH2#8,10,12 - Rooftop Exhaust Fan 2	REF-2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0122*	MECHANICAL 206
2NH2#13,15,17 - Exhaust Fan 2-1	EF-2-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0123*	MECHANICAL 206
2NH2#14,16,18 - Exhaust Fan 2-6	EF-2-6	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0153*	MECHANICAL 206
2NH2#19,21,23 - Exhaust Fan 2-2	EF-2-2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0154*	MECHANICAL 206
2NH2#20,22,24 - Fan Coil Unit 1-1	FCU-1-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0157*	VEST. 101
2NH2#25,27,29 - Exhaust Coil Pump	P-2-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0166*	MECHANICAL 206
2NH2#26,28,30 - Heat Recovery Wheel 2-1	HRW-2-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0167*	MECHANICAL 206
2EQUPSH1					
2EQUPSH1#1,3,5 - Computer Room A/C 1	CRAC-1	(1) 3/4"C, (3) #10, W (1) #10 GND	30	*C-480-0131*	MECHANICAL 224
2EQUPSH1#2,4,6 - Computer Room A/C 2	CRAC-2	(1) 3/4"C, (3) #10, W (1) #10 GND	30	*C-480-0132*	MECHANICAL 224
2EQUPSH1#7,9,11 - T-2EQUPSL1	T-2EQUPSL1	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0133*	15KW SWITCHGEAR 212
2EQUPSH1#8,10,12 - Air Conditioning Condenser Unit 1	ACCU-1	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0172*	ROOF
2EQUPSH1#13,15,17 - Air Conditioning Condenser Unit 2	ACCU-2	(1) 3/4"C, (3) #12, W (1) #12 GND	20	*C-480-0173*	ROOF
2GENUPSH1					
2EQUPSH1#7,9,11 - T-2GENUPSL1	T-2GENUPSL1	(1) 1-1/2"C, (3) #1, W (1) #6 GND	125	*C-480-0190*	CUP EMERGENCY ELECTRICAL ROOM 215

Equipment ID	Load Description	Copper Cable and Condiut	Aluminum Cable and Condiut	Projectd CT Size Load (Amps)	Tag	Location in Building
CUP-ESS						
CUP-ESS-FDR-1 - ATS LIFE SAFETY	E Power to Life Safety ATS	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0001*	CUP EMERGENCY ELECTRICAL ROOM 215
CUP-ESS-FDR-2 - ATS ELEVATOR	E Power to Elevator ATS	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0002*	CUP EMERGENCY ELECTRICAL ROOM 215
CUP-ESS-FDR-3 - Spare	Spare			1600		
CUP-ESS-FDR-4 - Spare	Spare			1600		
CUP-ESS-FDR-5 - GEN EQUIPMENT	E Power to Generator Equipment...	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0003*	CUP EMERGENCY ELECTRICAL ROOM 215
CUP-ESS-FDR-6 - Spare	Spare			1600		
CUP-ESS-FDR-7 - Spare	Spare			1600		
CUP-ESS-FDR-8 - Fire Pump 1 Emergency	Emergency Feeder to FP-1	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	2500	*C-480-0004*	FIRE PUMP ROOM 108
CUP-ESS-FDR-9 - Spare	Spare			800		
CUP-ESS-FDR-10 - Spare	Spare			400		
CUP-ESS-FDR-11 - ATS EQUIPMENT	E Power to Equipment ATS	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0006*	CUP EMERGENCY ELECTRICAL ROOM 215
CUP-ESS-FDR-12 - Fire Pump 2 Emergency	Emergency Feeder to FP-2	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	2500	*C-480-0007*	FIRE PUMP ROOM 108
USS-MECH1						
USS-MECH1-FDR-1 - Heat Recovery Chiller 1	HRC-1	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0008*	CHILLER PLANT 114
USS-MECH1-FDR-2 - Heat Recovery Chiller 3	HRC-3	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0009*	CHILLER PLANT 114
USS-MECH1-FDR-3 - Switchboard 5	SWBD-5	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	1600	*C-480-0010*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH1-FDR-4 - Switchboard 1	SWBD-1	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	1600	*C-480-0011*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH1-FDR-5 - Automatic Transfer Switch - Elevator	ATS-EL	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0176*	CUP EMERGENCY ELECTRICAL ROOM 215
USS-MECH1-FDR-6 - Spare	Spare			1600		
USS-MECH1-FDR-7 - Spare	Spare			1600		
USS-MECH1-FDR-8 - Spare	Spare			1600		
USS-MECH1-FDR-9 - Spare	Spare			1600		
USS-MECH1-FDR-10 - Switchboard 7	SWBD-7	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	800	*C-480-0012*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH1-FDR-11 - Automatic Transfer Switch - Generator	ATS-GEN	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0177*	CUP EMERGENCY ELECTRICAL ROOM 215
USS-MECH1-FDR-12 - Spare	Spare			800		
USS-MECH1-FDR-13 - Switchboard 3	SWBD-3	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	1600	*C-480-0013*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH1-FDR-14 - Heat Recovery Chiller 5	HRC-5	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0014*	CHILLER PLANT 114
USS-MECH1-FDR-15 - Spare	Spare			800		
USS-MECH1-FDR-16 - Fire Pump 1 Normal	FP-1 Controller	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	2500	*C-480-0015*	FIRE PUMP ROOM 108
USS-MECH2						
USS-MECH2-FDR-1 - Heat Recovery Chiller 2	HRC-2	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0016*	CHILLER PLANT 114
USS-MECH2-FDR-2 - Spare	Spare			800		
USS-MECH2-FDR-3 - Switchboard 6	SWBD-6	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	1600	*C-480-0017*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH2-FDR-4 - Switchboard 2	SWBD-2	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	1600	*C-480-0018*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH2-FDR-5 - Automatic Transfer Switch - Life Safety	ATS-LS	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0174*	CUP EMERGENCY ELECTRICAL ROOM 215
USS-MECH2-FDR-6 - Spare	Spare			1600		
USS-MECH2-FDR-7 - Spare	Spare			1600		
USS-MECH2-FDR-8 - Spare	Spare			1600		
USS-MECH2-FDR-9 - Spare	Spare			1600		
USS-MECH2-FDR-10 - Automatic Transfer Switch - Equipment	ATS-EQ	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0175*	CUP EMERGENCY ELECTRICAL ROOM 215
USS-MECH2-FDR-11 - Spare	Spare			800		
USS-MECH2-FDR-12 - Spare	Spare			1600		
USS-MECH2-FDR-13 - Switchboard 4	SWBD-4	(5) 4"C, (4)500KCMIL, W/ (1) #4/0 GND EACH	(5) 4"C, (4)600KCMIL, W/ (1) #350KCMIL GND EACH	1600	*C-480-0020*	CHILLER PLANT ELECTRICAL ROOM 113
USS-MECH2-FDR-14 - Heat Recovery Chiller 4	HRC-4	(2) 4"C, (4)600KCMIL, W (1) #1/0 GND EACH	(2) 4"C, (4)750KCMIL, W (1) #1/0 GND EACH	800	*C-480-0021*	CHILLER PLANT 114
USS-MECH2-FDR-15 - Spare	Spare			800		
USS-MECH2-FDR-16 - Fire Pump 2 normal	FP-2 Controller	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	(7) 3/C 500KCMIL, W/ (1) 350KCMIL GND	2500	*C-480-0022*	FIRE PUMP ROOM 108
SWBD-1						
SWBD-1-FDR-1 - VFD for Cooling Tower Fan 1	VFD-CT-1	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0023*	CHILLER PLANT 114
SWBD-1-FDR-2 - VFD for Cooling Tower Fan 3	VFD-CT-3	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0024*	CHILLER PLANT 114
SWBD-1-FDR-3 - VFD for Cooling Tower Fan 5	VFD-CT-5	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0025*	CHILLER PLANT 114
SWBD-1-FDR-4 - VFD for Cooling Tower Pump 1	VFD-CTP-1	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0026*	CHILLER PLANT 114
SWBD-1-FDR-5 - VFD for Cooling Tower Pump 3	VFD-CTP-3	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0027*	CHILLER PLANT 114
SWBD-1-FDR-6 - VFD for Cooling Tower Pump 5	VFD-CTP-5	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0028*	CHILLER PLANT 114
SWBD-1-FDR-7 - VFD for Tower Basin Sweeper	VFD-CT-BASIN-SWP-FLTR-1			35	*C-480-0030*	MECHANICAL 206
SWBD-1-FDR-8 - CT-1 Basin Heaters	CT-HTR-1	(1) 1-1/2"C, (3) #1, W (1) #8 GND		100	*C-480-0178*	COOLING TOWER 1 MEZZ
SWBD-1-FDR-9 - CT-3 Basin Heaters	CT-HTR-2	(1) 1-1/2"C, (3) #1, W (1) #8 GND		100	*C-480-0179*	COOLING TOWER 1 MEZZ
SWBD-1-FDR-10 - CT-5 Basin Heaters	CT-HTR-3	(1) 1-1/2"C, (3) #1, W (1) #8 GND		100	*C-480-0180*	COOLING TOWER 1 MEZZ
SWBD-2						
SWBD-2-FDR-1 - VFD for Cooling Tower Fan 2	VFD-CT-2	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0031*	CHILLER PLANT 114
SWBD-2-FDR-2 - VFD for Cooling Tower Fan 4	VFD-CT-4	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0032*	CHILLER PLANT 114
SWBD-2-FDR-3 - VFD for Cooling Tower Fan 6	VFD-CT-6	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0033*	CHILLER PLANT 114
SWBD-2-FDR-4 - VFD for Cooling Tower Pump 2	VFD-CTP-2	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0034*	CHILLER PLANT 114
SWBD-2-FDR-5 - VFD for Cooling Tower Pump 4	VFD-CTP-4	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0035*	CHILLER PLANT 114
SWBD-2-FDR-6 - VFD for Cooling Tower Pump 6	VFD-CTP-6	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0036*	CHILLER PLANT 114
SWBD-2-FDR-7 - VFD for Tower Basin Sweeper	VFD-CT-BASIN-SWP-FLTR-2	(1) 3/4"C, (3) #8, W (1) #10 GND		35	*C-480-0038*	MECHANICAL 206
SWBD-2-FDR-8 - VFD for Cooling Tower Filter	VFD-CC-SS-FLTR-1	(1) 3/4"C, (3) #6, W (1) #10 GND		45	*C-480-0039*	CHILLER PLANT 114
SWBD-2-FDR-9 - CT-2 Basin Heaters	CT-HTR-2	(1) 1-1/2"C, (3) #1, W (1) #8 GND		100	*C-480-0181*	COOLING TOWER 1 MEZZ
SWBD-2-FDR-10 - CT-4 Basin Heaters	CT-HTR-4	(1) 1-1/2"C, (3) #1, W (1) #8 GND		100	*C-480-0182*	COOLING TOWER 1 MEZZ
SWBD-2-FDR-11 - CT-6 Basin Heaters	CT-HTR-6	(1) 1-1/2"C, (3) #1, W (1) #8 GND		100	*C-480-0183*	COOLING TOWER 1 MEZZ
SWBD-3						
SWBD-3-FDR-1 - VFD for Chilled Water Pump 1	VFD-CHWP-1	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0040*	RECEIVING 105
SWBD-3-FDR-2 - VFD for Chilled Water Pump 3	VFD-CHWP-3	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0041*	RECEIVING 105
SWBD-3-FDR-3 - VFD for Chilled Water Pump 5	VFD-CHWP-5	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0042*	RECEIVING 105
SWBD-3-FDR-4 - VFD for Chilled Water Pump 7	VFD-CHWP-7	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0043*	RECEIVING 105
SWBD-3-FDR-5 - VFD for Hosp. Recirc. Heating Hot Water Pump 1	VFD-HRHHWP-1	(1) 1-1/2"C, (3) #1, W (1) #6 GND		125	*C-480-0044*	RECEIVING 105
SWBD-3-FDR-6 - VFD for Hosp. Recirc. Heating Hot Water Pump 1	VFD-HRHHWP-3	(1) 1-1/2"C, (3) #1, W (1) #6 GND		125	*C-480-0045*	RECEIVING 105
SWBD-3-FDR-7 - VFD for Hosp. Recirc. Chilled Water Pump 1	VFD-HRCWP-1	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0046*	RECEIVING 105
SWBD-3-FDR-8 - VFD for Hosp. Recirc. Chilled Water Pump 3	VFD-HRCWP-3	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0047*	RECEIVING 105
SWBD-4						
SWBD-4-FDR-1 - VFD for Chilled Water Pump 2	VFD-CHWP-2	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0048*	RECEIVING 105
SWBD-4-FDR-2 - VFD for Chilled Water Pump 4	VFD-CHWP-4	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0049*	RECEIVING 105
SWBD-4-FDR-3 - VFD for Chilled Water Pump 6	VFD-CHWP-6	(1) 4"C, (3) 600KCMIL, W (1) #3 GND	(1) 4"C, (3)750KCMIL, W/ (1) #3 GND	400	*C-480-0050*	RECEIVING 105
SWBD-4-FDR-4 - VFD for Hosp. Recirc. Heating Hot Water Pump 2	VFD-HRHHWP-2	(1) 1-1/2"C, (3) #1, W (1) #6 GND		125	*C-480-0051*	RECEIVING 105
SWBD-4-FDR-5 - VFD for Hosp. Recirc. Chilled Water Pump 2	VFD-HRCWP-2	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0052*	RECEIVING 105
SWBD-4-FDR-6 - VFD for Chiulled Water Filter	FVD-CHW-SS-FLTR-1	(1) 3/4"C, (3) #6, W (1) #10 GND		45	*C-480-0053*	MECHANICAL 206
SWBD-5						
SWBD-5-FDR-1 - VFD for Heating Hot Water Filter 1	VFD-HHW-FLTR-1	(1) 3/4"C, (3) #6, W (1) #10 GND		45	*C-480-0054*	BOILER PLANT 109
SWBD-5-FDR-2 - VFD for Heating Hot Water Pump 1	VFD-HHWP-1	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0055*	BOILER PLANT 109
SWBD-5-FDR-3 - VFD for Heating Hot Water Pump 3	VFD-HHWP-3	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0056*	BOILER PLANT 109
SWBD-5-FDR-4 - VFD for Heating Hot Water Pump 5	VFD-HHWP-5	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0057*	BOILER PLANT 109
SWBD-5-FDR-5 - Spare	Spare					
SWBD-5-FDR-6 - Steam Boiler 3	SB-3	(1) 1-1/4C, (3) #2, W (1) #8 GND		90	*C-480-0059*	BOILER PLANT 109
SWBD-5-FDR-7 - Heating Hot Water Boiler 1	HHWB-1	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0060*	BOILER PLANT 109
SWBD-5-FDR-8 - Heating Hot Water Boiler 3	HHWB-3	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0061*	BOILER PLANT 109
SWBD-5-FDR-9 - Heating Hot Water Boiler 5	HHWB-5	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0062*	BOILER PLANT 109
SWBD-5-FDR-10 - Heating Hot Water Boiler 7	HHWB-7	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0063*	BOILER PLANT 109
SWBD-5-FDR-11 - Fuel Oil Filter	VFD-FO-FLTR-1	(1) 3/4"C, (3) #12, W (1) #12 GND		15	*C-480-0064*	FUEL OIL ROOM 103
SWBD-5-FDR-12 - Fuel Oil Pump Skid 1	FO-P-1	(1) 3/4"C, (3) #12, W (1) #12 GND		15	*C-480-0065*	FUEL OIL ROOM 103
SWBD-5-FDR-13 - Fuel Oil Pump Skid 3	FO-P-3	(1) 3/4"C, (3) #12, W (1) #12 GND		15	*C-480-0066*	FUEL OIL ROOM 103
SWBD-5-FDR-14 - DA Pump	DA-1	(1) 1-1/2"C, (3) #1, W (1) #6 GND		125	*C-480-0067*	BOILER PLANT 109
SWBD-5-FDR-15 - Condensate Return Pump	CST-1	(1) 3/4"C, (3) #8, W (1) #10 GND		40	*C-480-0068*	BOILER PLANT 109
SWBD-5-FDR-16 - Panel 1NH1	1NH1	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0069*	BOILER PLANT 109
SWBD-6						
SWBD-6-FDR-1 - VFD for Heating Hot Water Pump 2	VFD-HHWP-2	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0070*	BOILER PLANT 109
SWBD-6-FDR-2 - VFD for Heating Hot Water Pump 4	VFD-HHWP-4	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0071*	BOILER PLANT 109
SWBD-6-FDR-3 - VFD for Heating Hot Water Pump 6	VFD-HHWP-6	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0072*	BOILER PLANT 109
SWBD-6-FDR-4 - Steam Boiler 2	SB-2	(1) 1-1/4C, (3) #2, W (1) #8 GND		90	*C-480-0073*	BOILER PLANT 109
SWBD-6-FDR-5 - Heating Hot Water Boiler 2	HHWB-2	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0074*	BOILER PLANT 109
SWBD-6-FDR-6 - Heating Hot Water Boiler 4	HHWB-4	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0075*	BOILER PLANT 109
SWBD-6-FDR-7 - Heating Hot Water Boiler 6	HHWB-6	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0076*	BOILER PLANT 109
SWBD-6-FDR-8 - Heating Hot Water Boiler 8	HHWB-8	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0077*	BOILER PLANT 109
SWBD-6-FDR-9 - Fuel Oil Filter	VFD-FO-FLTR-2	(1) 3/4"C, (3) #12, W (1) #12 GND		15	*C-480-0078*	FUEL OIL ROOM 103
SWBD-6-FDR-10 - Fuel Oil Pump Skid 2	FO-P-2	(1) 3/4"C, (3) #12, W (1) #12 GND		15	*C-480-0079*	FUEL OIL ROOM 103
SWBD-6-FDR-11 - Fuel Oil Pump Skid 4	FO-P-4	(1) 3/4"C, (3) #12, W (1) #12 GND		15	*C-480-0080*	FUEL OIL ROOM 103
SWBD-6-FDR-12 - Condensate Return Pump	CST-2	(1) 3/4"C, (3) #8, W (1) #10 GND		40	*C-480-0081*	BOILER PLANT 109
SWBD-6-FDR-13 - Panel 1NH2	1NH2	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0082*	BOILER PLANT 109
SWBD-6-FDR-14 - RO System Pump	ROP-1A, 1B	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0083*	BOILER PLANT 109
SWBD-7						
SWBD-7-FDR-1 - VFD for AHU-1-1-A	AHU-1-1-A	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0084*	MEZZANINE 1XX
SWBD-7-FDR-2 - VFD for MAU-1-2	MAU-1-2	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0085*	MEZZANINE 1XX
SWBD-7-FDR-3 - VFD for MAU-1-1 Motor A	MAU-1-1-A	(1) 3/4"C, (3) #12, W (1) #12 GND		20	*C-480-0086*	MEZZANINE 1XX
SWBD-7-FDR-4 - Panel 1NH3	1NH3	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0087*	CHILLER PLANT 114
SWBD-7-FDR-5 - Panel 1NH4	1NH4	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0088*	RECEIVING 105
SWBD-7-FDR-6 - Panel 2NH1	2NH1	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0089*	15KW SWITCHGEAR 212
SWBD-7-FDR-7 - VFD for MAU-2-1	MAU-2-1	(1) 1"C, (3) #4, W (1) #8 GND		70	*C-480-0090*	MEZZANINE 2XX
SWBD-7-FDR-8 - Panel 2NH2	2NH2	(1) 2"C, (3) #4/0, W (1) #4 GND	(1) 2-1/2"C, 300KCMIL, W (1) #4 GND	225	*C-480-0091*	CORRIDOR 201
SWBD-7-FDR-9 - Domestic Booster Pump 1	DBP-1	(1) 2"C, (3) #3/0, W (1) #6 GND	(1) 2-1/2"C, (3) #250KCMIL, W (1) #6 GND	200	*C-480-0092*	RECEIVING 105
SWBD-7-FDR-10 - Spare	Spare					
SWBD-7-FDR-11 - VFD for MAU-2-2	MAU-2-2	(1) 3/4"C, (3) #12, W (1) #12 GND		20	*C-480-0142*	MECHANICAL 224
SWBD-7-FDR-12 - VFD for MAU-1-1 Motor B	MAU-1-1-B	(1) 3/4"C, (3) #12, W (1) #12 GND		20	*C-480-0158*	MEZZANINE 1XX
SWBD-7-FDR-13 - VFD for MAU-1-1 Motor C	MAU-1-1-C	(1) 3/4"C, (3) #12, W (1) #12 GND		20	*C-480-0159*	MEZZANINE 1XX
SWBD-7-FDR-14 - VFD for MAU-1-1 Motor D	MAU-1-1-D	(1) 3/4"C, (3) #12, W (1) #12 GND		20	*C-480-0160*	MEZZANINE 1XX
SWBD-7-FDR-15 - VFD for AHU-1-1-B	AHU-1-1-B	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0161*	MEZZANINE 1XX
SWBD-7-FDR-16 - VFD for AHU-1-1-C	AHU-1-1-C	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0162*	MEZZANINE 1XX
SWBD-7-FDR-17 - VFD for AHU-1-1-D	AHU-1-1-D	(1) 3/4"C, (3) #10, W (1) #10 GND		30	*C-480-0163*	MEZZANINE 1XX

OWNER

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February 10, 2023

REVISIONS

NO. DATE DESCRIPTION

DESIGNED BY: AESI
CHECKED BY: AESI
APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

POWER SCHEDULES

SHEET NUMBER

EP608

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:32 PM AESI Proj. No: 21-154

HEAT TRACE CIRCUIT	LINE DESCRIPTION	LINE SIZE	INSULATION THICKNESS	DUTY	DRAWING REFERENCE	ESTIMATED PIPE LENGTH	TEMP F	ESTIMATED VALVES TO WRAP	ESTIMATED FLANGES TO WRAP	HEAT TAPE MODEL #	VOLTS	AMPS	HEAT TAPE POWER CONNECTOR	HEAT TAPE END CONNECTOR	HEAT TAPE TEE CONNECTOR	HEAT TRACE CONTROLLER
1	MAIN CTWR - (TOWERS CT-1, CT-2, CT-3)	48"	2"	FREEZE PROTECTION	M701	113	AMB	5	2	15QTVR2-CT	208	30	1	1	0	HC1
2	MAIN CTWR - (TOWERS CT-4, CT-5, CT-6)	36"	2"	FREEZE PROTECTION	M701	83	AMB	5	2	15QTVR2-CT	208	30	1	1	0	HC2
3	MAIN CTWS - (TOWERS CT-1, CT-2, CT-3)	48"	2"	FREEZE PROTECTION	M701	113	AMB	5	2	15QTVR2-CT	208	30	1	1	0	HC3
4	MAIN CTWS - (TOWERS CT-4, CT-5, CT-6)	36"	2"	FREEZE PROTECTION	M701	96	AMB	5	2	15QTVR2-CT	208	30	1	1	0	HC4
5	CTWR - CT1	18"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC5
6	CTWS - CT1	24"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC5
7	CTWR - CT2	18"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC6
8	CTWS - CT2	24"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC6
9	CTWR - CT3	18"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC7
10	CTWS - CT3	24"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC7
11	CTWR - CT4	18"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC8
12	CTWS - CT4	24"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC8
13	CTWR - CT5	18"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC9
14	CTWS - CT5	24"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC9
15	CTWR - CT6	18"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC10
16	CTWS - CT6	24"	2"	FREEZE PROTECTION	M701	6	AMB	1	1	10QTVR1-CT	120	30	1	1	0	HC10
17	CTSS (TOWERS CT-1, CT-2, CT-3)	6"	2"	FREEZE PROTECTION	M701	74	AMB	3	0	5QTVR1-CT	120	30	1	1	0	HC11
18	CTSR (TOWERS CT-1, CT-2, CT-3)	6"	2"	FREEZE PROTECTION	M701	65	AMB	3	0	5QTVR1-CT	120	30	1	1	0	HC11
19	CTSS (TOWERS CT-4, CT-5, CT-6)	6"	2"	FREEZE PROTECTION	M701	153	AMB	3	0	5QTVR1-CT	120	30	1	1	0	HC12
20	CTSR (TOWERS CT-4, CT-5, CT-6)	6"	2"	FREEZE PROTECTION	M701	144	AMB	3	0	5QTVR1-CT	120	30	1	1	0	HC12
21	CTSS - CT1	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC13
22	CTSR - CT1	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC13
23	CTSS - CT2	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC14
24	CTSR - CT2	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC14
25	CTSS - CT3	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC15
26	CTSR - CT3	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC15
27	CTSS - CT4	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC16
28	CTSR - CT4	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC16
29	CTSS - CT5	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC17
30	CTSR - CT5	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC17
31	CTSS - CT6	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC18
32	CTSR - CT6	6"	2"	FREEZE PROTECTION	M701	38	AMB	1	4	5QTVR1-CT	120	30	1	2	1	HC18
33	CT-1 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	61	AMB	6	1	3BTV1-CR	120	30	1	6	6	HC19
34	CT-2 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	61	AMB	6	1	3BTV1-CR	120	30	1	6	6	HC20
35	CT-3 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	61	AMB	6	1	3BTV1-CR	120	30	1	6	6	HC21
36	CT-4 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	61	AMB	6	1	3BTV1-CR	120	30	1	6	6	HC22
37	CT-5 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	61	AMB	6	1	3BTV1-CR	120	30	1	6	6	HC23
38	CT-6 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	61	AMB	6	1	3BTV1-CR	120	30	1	6	6	HC24
39	CTE-1 (TOWERS CT-1, CT-2, CT-3)	18"	2"	FREEZE PROTECTION	M701	94	AMB	4	1	15QTVR2-CT	208	30	1	1	0	HC25
40	CTE-2 (TOWERS CT-1, CT-2, CT-3)	18"	2"	FREEZE PROTECTION	M701	94	AMB	4	1	15QTVR2-CT	208	30	1	1	0	HC26
41	CTE-1 (TOWERS CT-4, CT-5, CT-6)	18"	2"	FREEZE PROTECTION	M701	94	AMB	4	1	15QTVR2-CT	208	30	1	1	0	HC27
42	CTE-2 (TOWERS CT-4, CT-5, CT-6)	18"	2"	FREEZE PROTECTION	M701	94	AMB	4	1	15QTVR2-CT	208	30	1	1	0	HC28
43	CTE-1 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	3	AMB	1	0	3BTV1-CR	120	30	1	6	6	HC29
44	CTE-2 SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	3	AMB	1	0	3BTV1-CR	120	30	1	6	6	HC29
45	MAIN CTWR SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	20	AMB	2	0	3BTV1-CR	120	30	1	6	6	HC30
45	MAIN CTWS SANITARY DRAIN	4"	2"	FREEZE PROTECTION	M701	20	AMB	2	0	3BTV1-CR	120	30	1	6	6	HC30
46	2500 GAL SULFURIC ACID TANK TK-1	2500 GAL...	BLANKET	FREEZE PROTECTION	M708	TANK	AMB	0	0	BLANKET	208	30	**1**	**1**	0	HC31
47	SULFURIC ACID LINE	2"	2"	FREEZE PROTECTION	M708	18	AMB	2	1	3BTV1-CR	120	20	1	1	0	HC31
48	1500 GAL BLEACH TANK TK-2	1500 GAL...	BLANKET	FREEZE PROTECTION	M708	TANK	AMB	0	0	BLANKET	208	30	**1**	**1**	0	HC32
49	BLEACH LINE	2"	2"	FREEZE PROTECTION	M708	8	AMB	2	1	3BTV1-CR	120	20	1	1	0	HC32
50	EYE WASH STATION, COURTYARD	1.25"	2"	FREEZE PROTECTION		68	AMB	0	1	3BTV1-CR	120	20	1	1	0	HC33

NOTES:

JBS-100A	HEAT TRACE POWER CONNECTOR
E-100-L-A	HEAT TRACE "LIGHTED" END CONNECTOR (USED WITH FREEZE PROTECTION, LIGHT ON WHEN HEAT TAPE ON).
T-100	HEAT TRACE TEE CONNECTOR
GT	GLASS TAPE USED TO SECURE TRACE TO PIPE

OWNER

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**
CHECKED BY **AESI**
APPROVED BY **Approver**
PROJECT NO. **21-154**

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

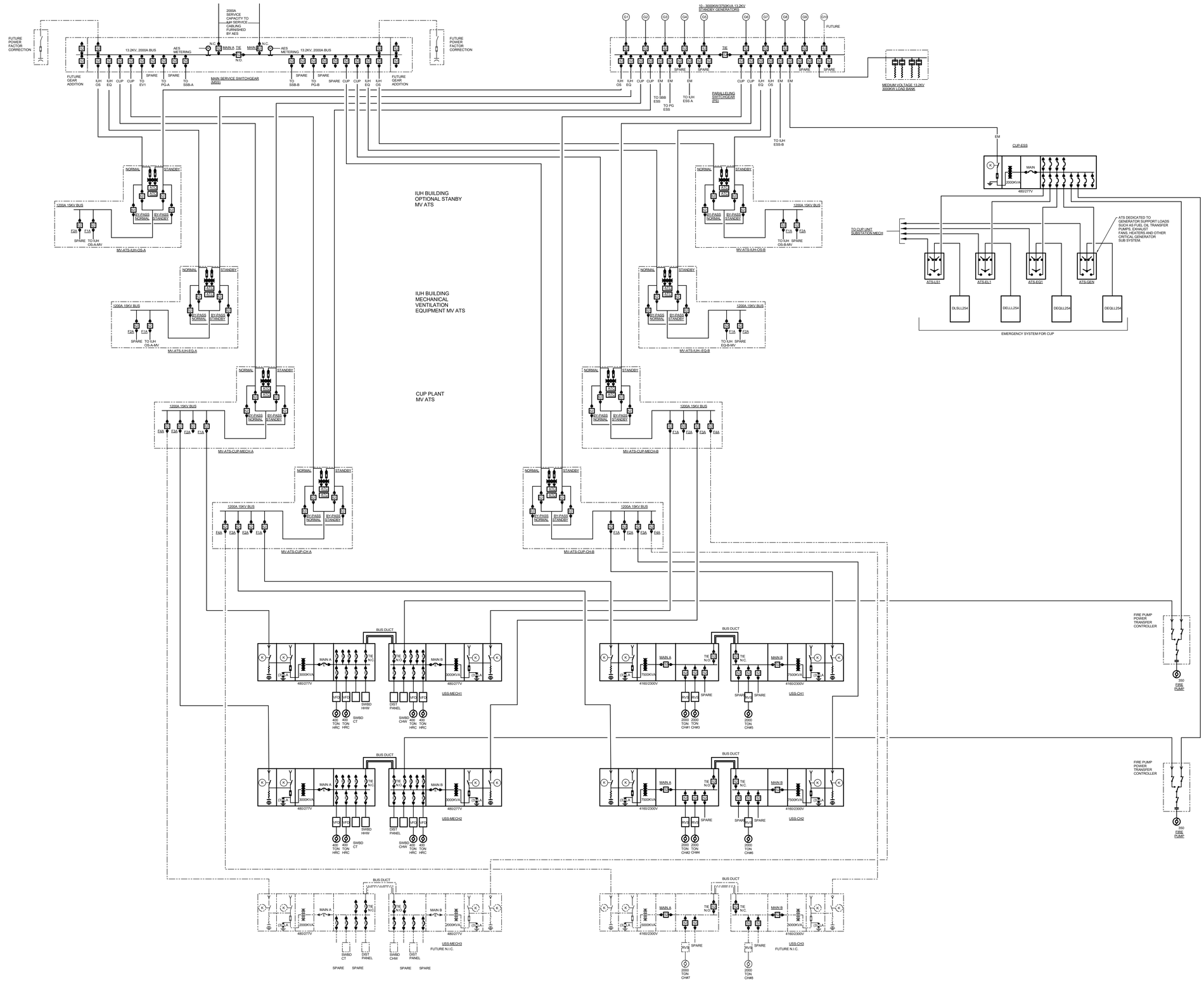
SHEET TITLE

POWER SCHEDULES

SHEET NUMBER

EP609

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
2/10/2023 3:02:33 PM AESI Proj. No: 21-154



1 **PRIMARY ONE LINE DIAGRAM**
Scale: NONE

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REVISIONS

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DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

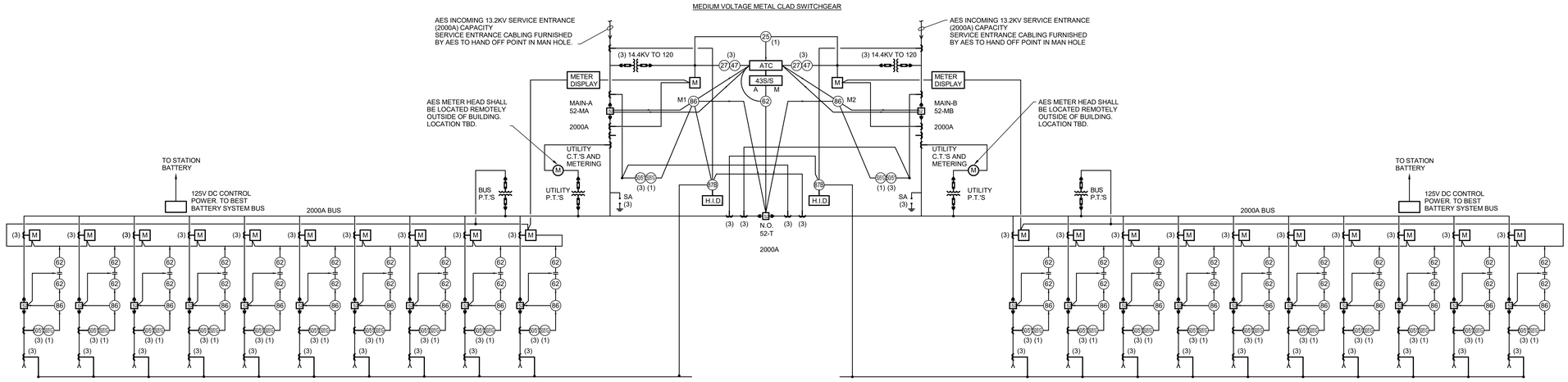
SHEET TITLE

PRIMARY ONE LINE DIAGRAM

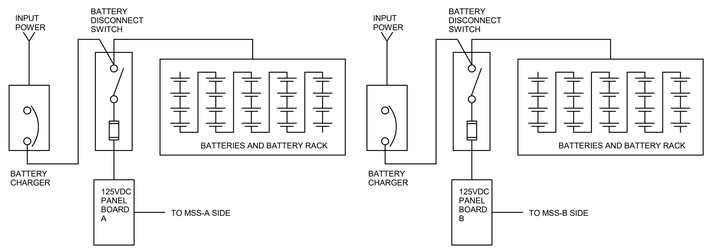
SHEET NUMBER

EP701

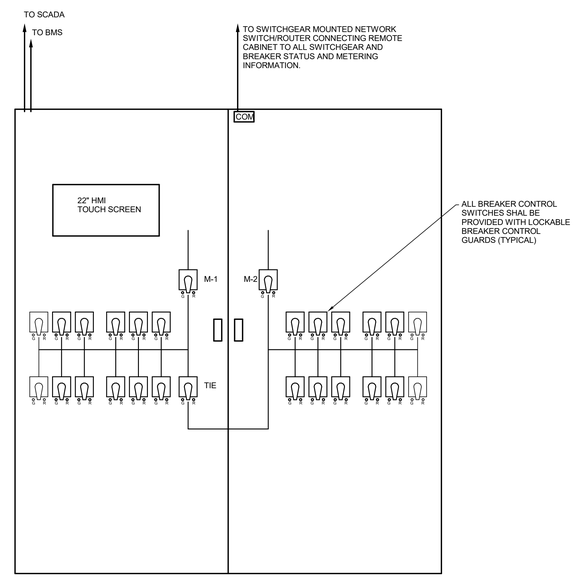
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:33 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 MSS SINGLE LINE DIAGRAM
Scale: NONE



2 REDUNDANT 125V DC BATTERY SYSTEM FOR MSS
Scale: NONE



3 REMOTE CONTROL PANEL WITH HMI/OIT MSS
Scale: NONE

LEGEND

M	MICROPROCESSOR METERING DEVICE
ATC	AUTOMATIC TRANSFER CONTROLLER
43S/S (A M)	AUTO / MANUAL TRANSFER SELECTOR
25	SYNC CHECK RELAY
27	UNDER VOLTAGE RELAY
47	PHASE SEQUENCE RELAY
50/51	PHASE OVERCURRENT RELAY
50G/51G	GROUND OVERCURRENT RELAY
62	TIME DELAY OR OPENING RELAY
86	LOCK-OUT RELAY
87B	MAIN BUS DIFFERENTIAL RELAY
H.I.D	HIGH IMPEDANCE DIFFERENTIAL PROTECTION
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	FUSE FOR PT'S - PRIMARY AND SECONDARY
	MEDIUM VOLTAGE BREAKER

4 MV SINGLE LINE DIAGRAM LEGEND
Scale: NONE

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PROJECT NO.: 21-154	

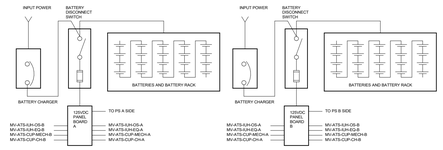
SHEET TITLE

MSS SINGLE LINE DIAGRAM

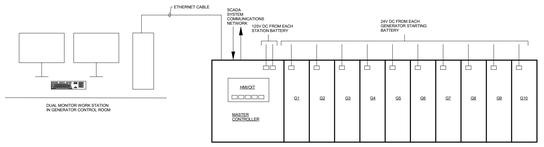
SHEET NUMBER

EP702

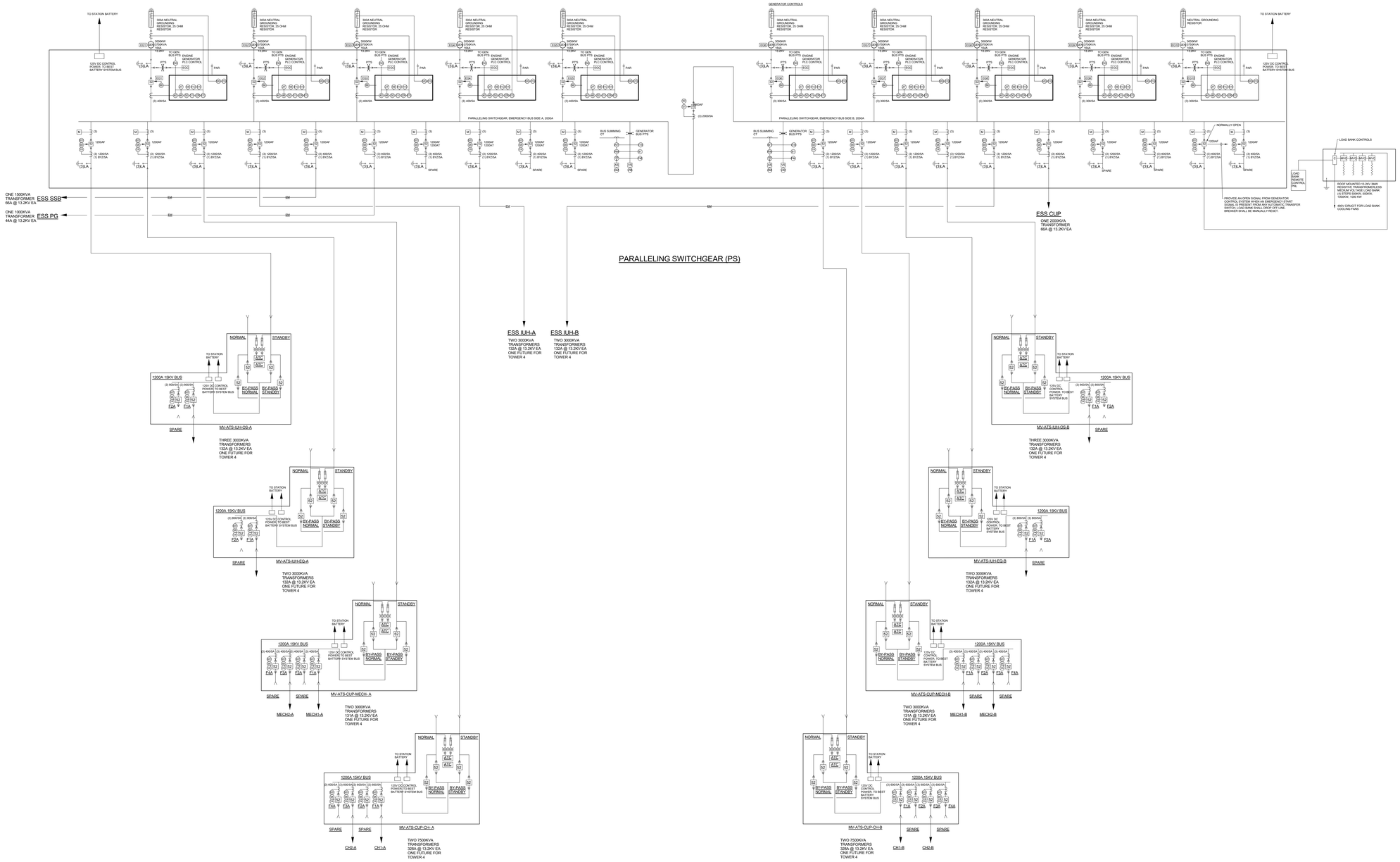
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:34 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



REDUNDANT 125V DC BATTERY SYSTEM FOR PS AND MV-ATS



MASTER CONTROLLER AND SCADA SYSTEM



PARALLELING SWITCHGEAR (PS)

1 **CENTRAL STANDBY/EMERGENCY ONE LINE DIAGRAM**
Scale: NONE

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PROJECT NO. **21-154**	

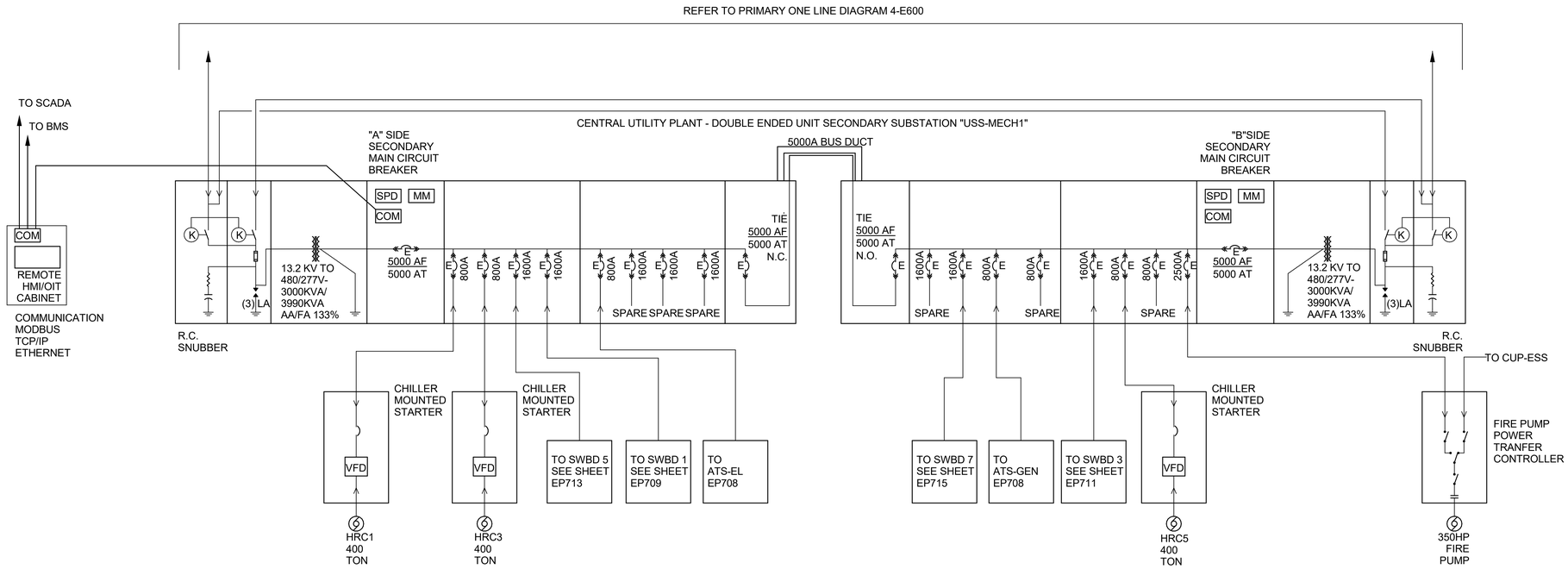
SHEET TITLE

PS ONE LINE DIAGRAM

SHEET NUMBER

EP703

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:34 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **USS-MECH1 SINGLE LINE DIAGRAM**
Scale: NONE

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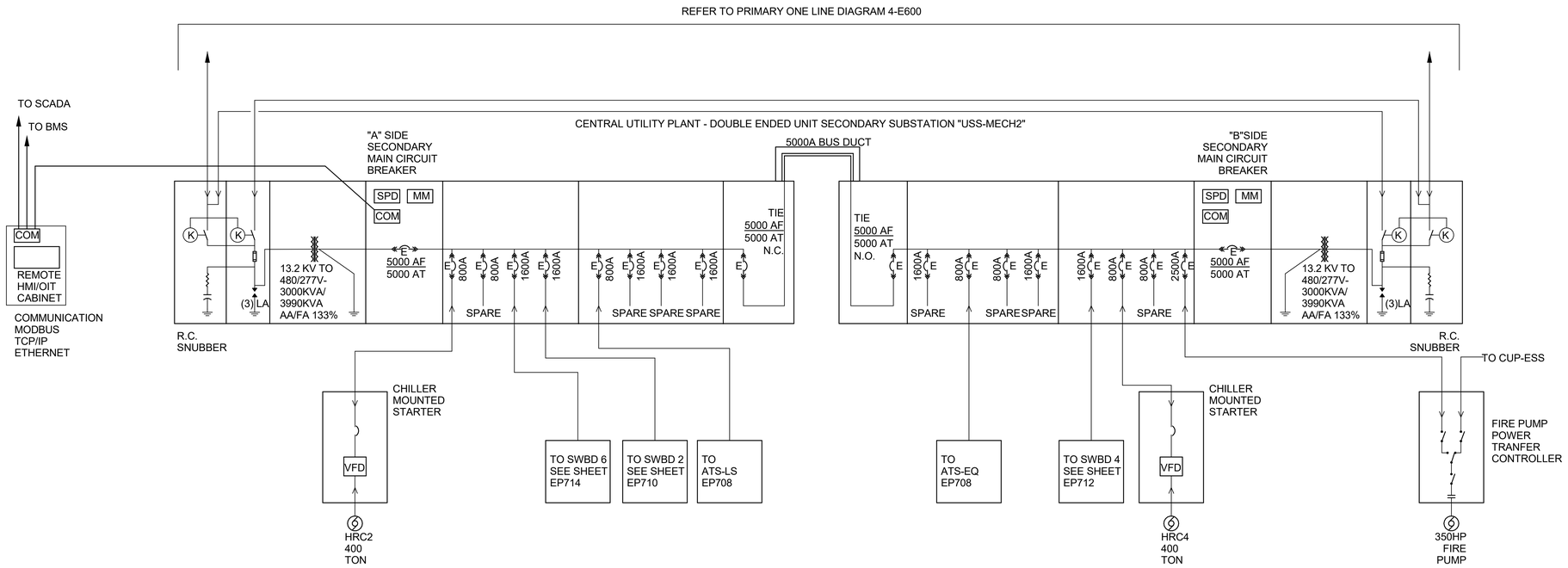
SHEET TITLE

USS-MECH1 SINGLE LINE DIAGRAM

SHEET NUMBER

EP704

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:34 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **USS-MECH2 SINGLE LINE DIAGRAM**
Scale: NONE

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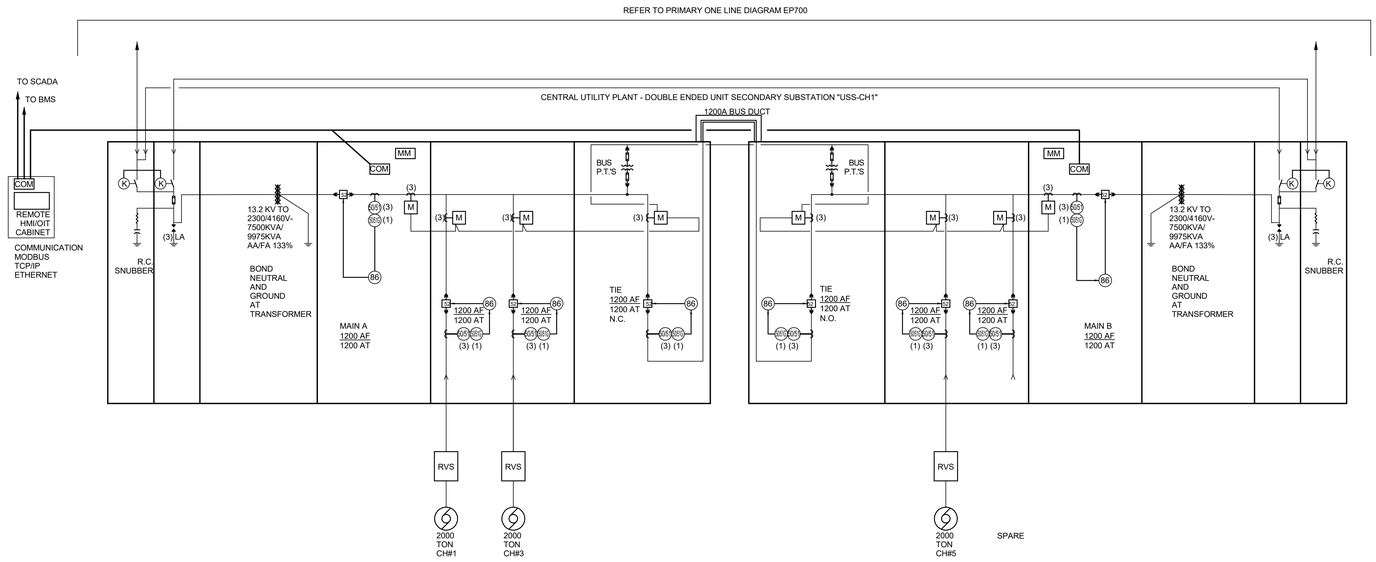
SHEET TITLE

USS-MECH2 SINGLE LINE DIAGRAM

SHEET NUMBER

EP705

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:35 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **USS-CH1 SINGLE LINE DIAGRAM**
Scale: NONE

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SHEET TITLE

USS-CH1 SINGLE LINE DIAGRAM

SHEET NUMBER

EP706

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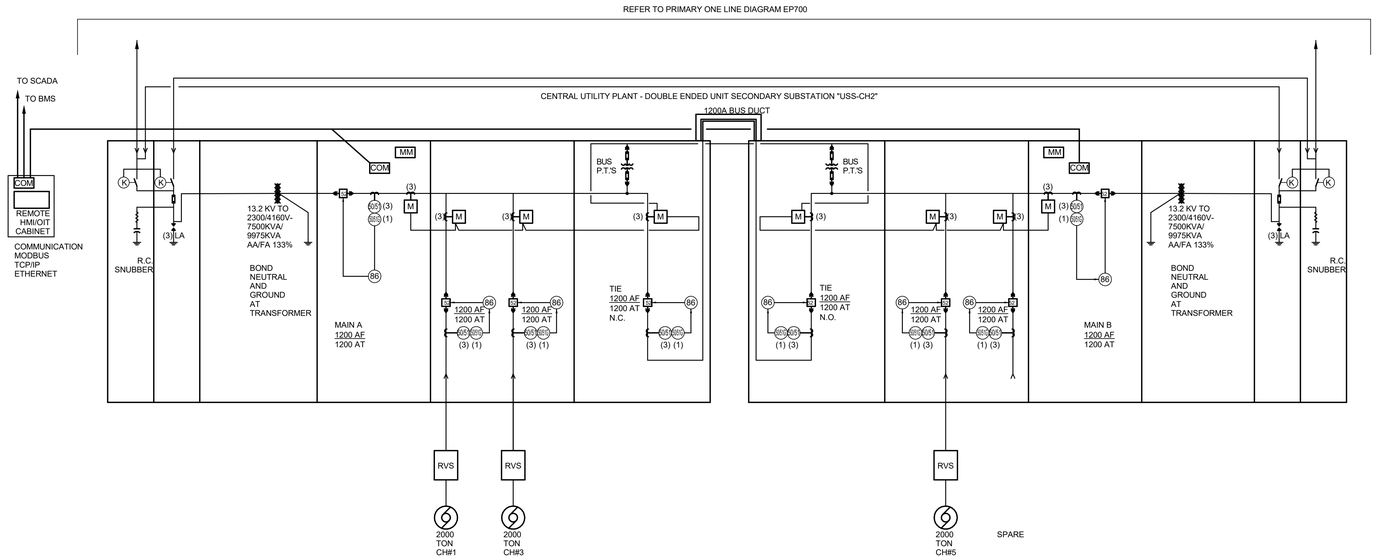
2/10/2023 3:02:35 PM AESI Proj. No: 21-154



USS-CH2 SINGLE LINE DIAGRAM

Scale: NONE

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SHEET TITLE

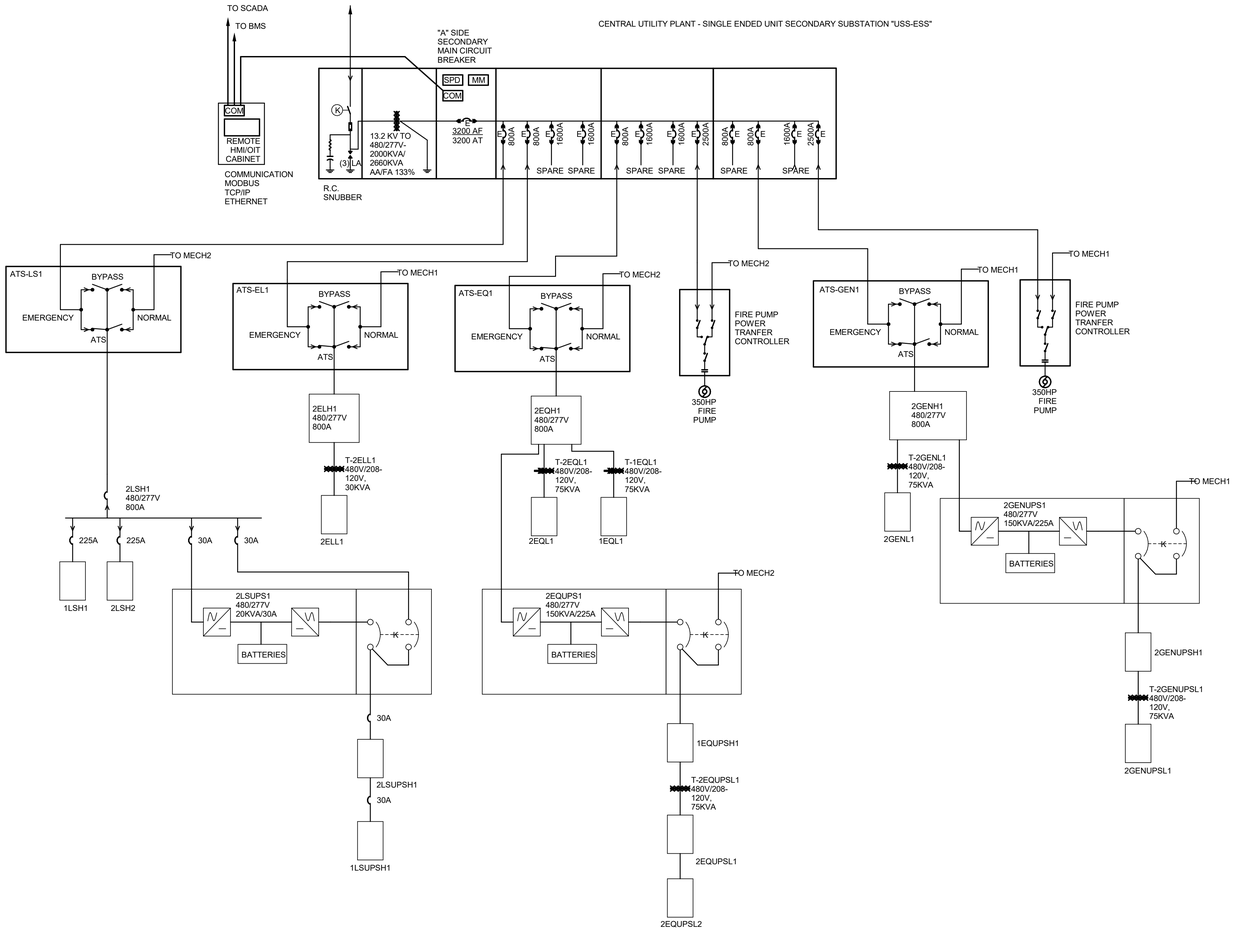
USS-CH2 SINGLE LINE DIAGRAM

SHEET NUMBER

EP707

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:35 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

REFER TO PRIMARY ONE LINE DIAGRAM EP701



1 **USS-CUP-ESS SINGLE LINE DIAGRAM**
Scale: 1/4" = 1'-0"

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SHEET TITLE

USS-CUP-ESS SINGLE LINE DIAGRAM

SHEET NUMBER

EP708

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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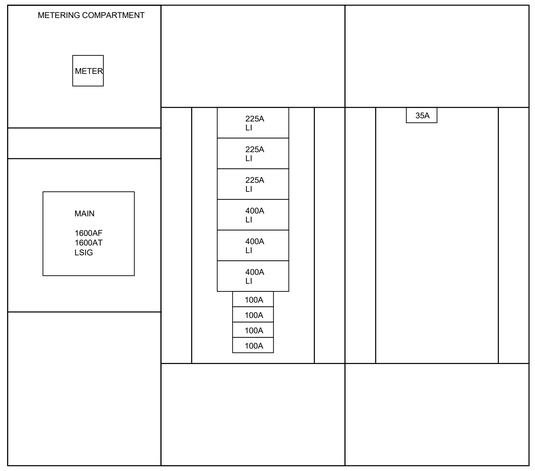
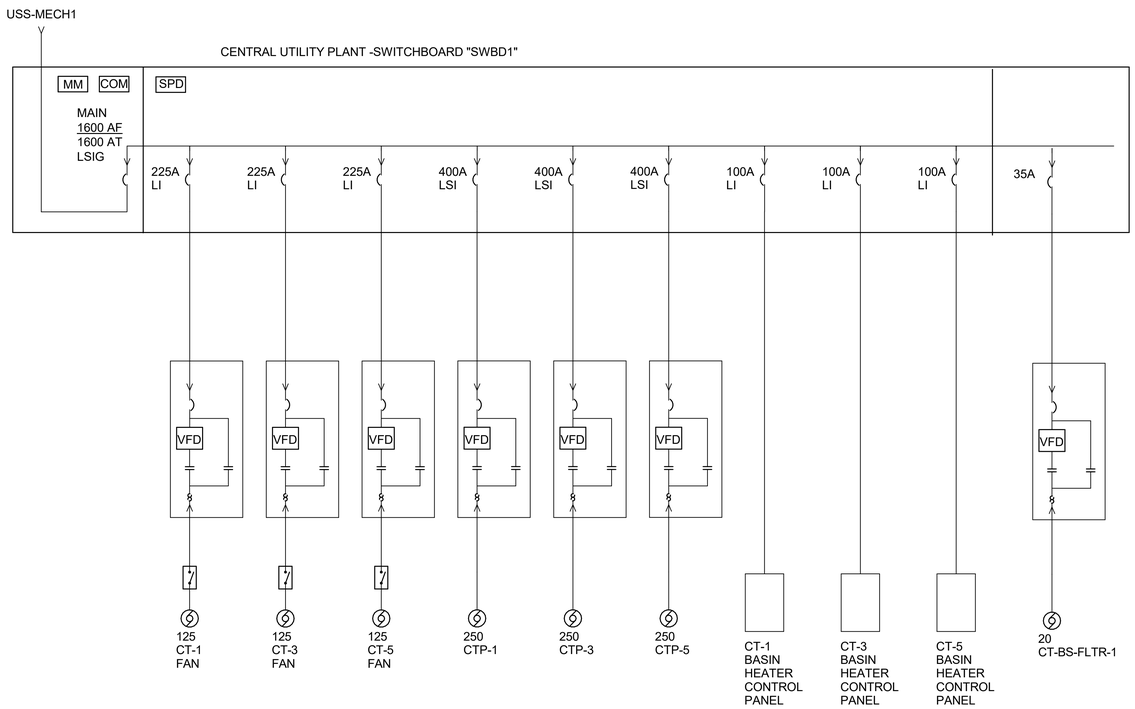


1 **SWBD1 ELEVATION**
Scale: NONE



2 **SWBD1 SINGLE LINE DIAGRAM**
Scale: NONE

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SHEET TITLE

SWBD1 SINGLE LINE DIAGRAM

SHEET NUMBER

EP709

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:36 PM AESI Proj. No: 21-154
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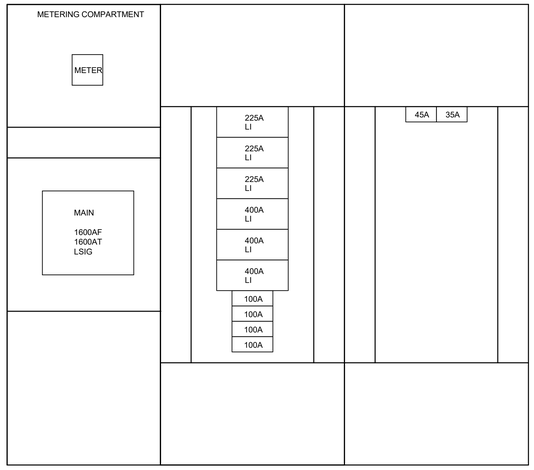
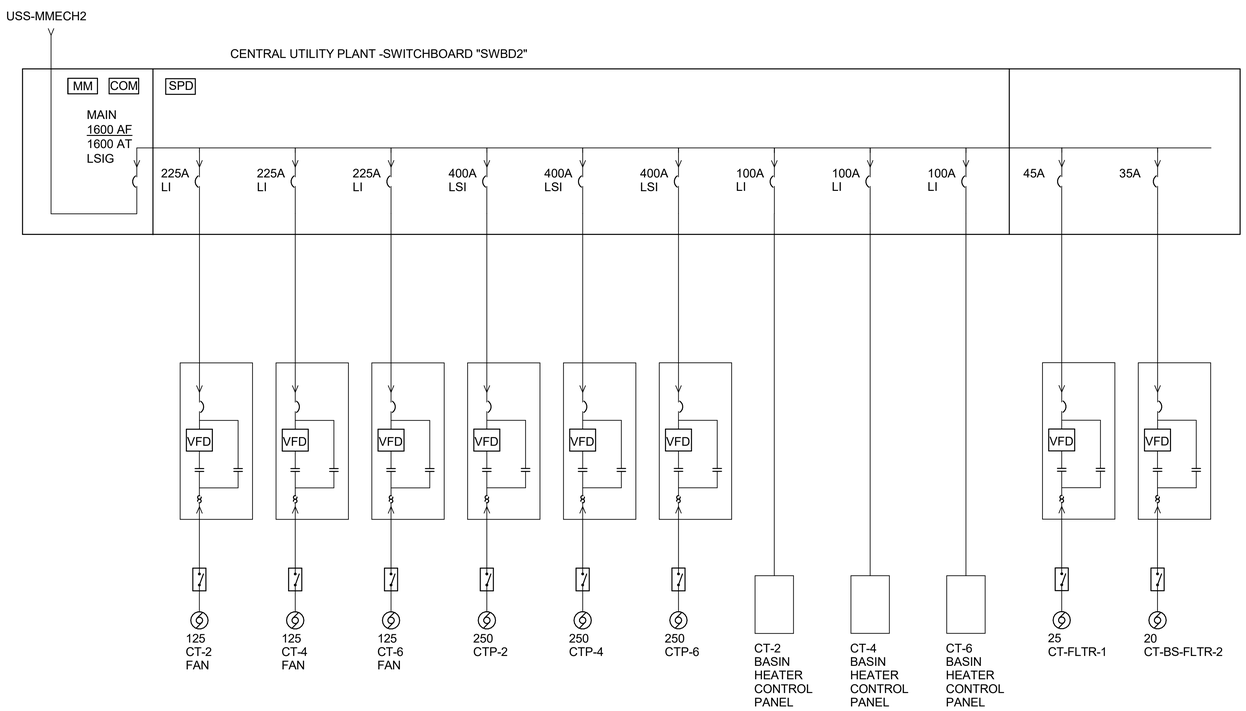


1 **SWBD2 ELEVATION**
Scale: NONE



2 **SWBD2 SINGLE LINE DIAGRAM**
Scale: NONE

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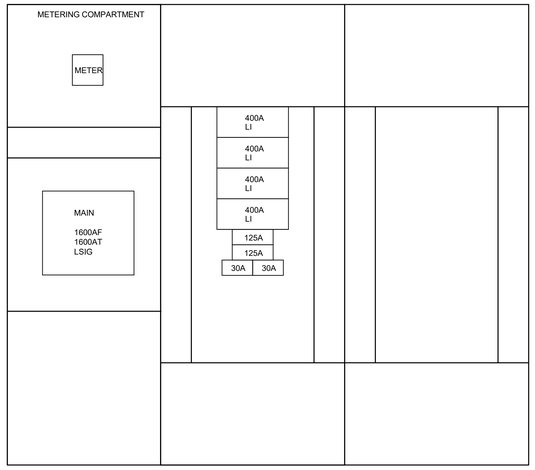
SHEET TITLE

SWBD2 SINGLE LINE DIAGRAM

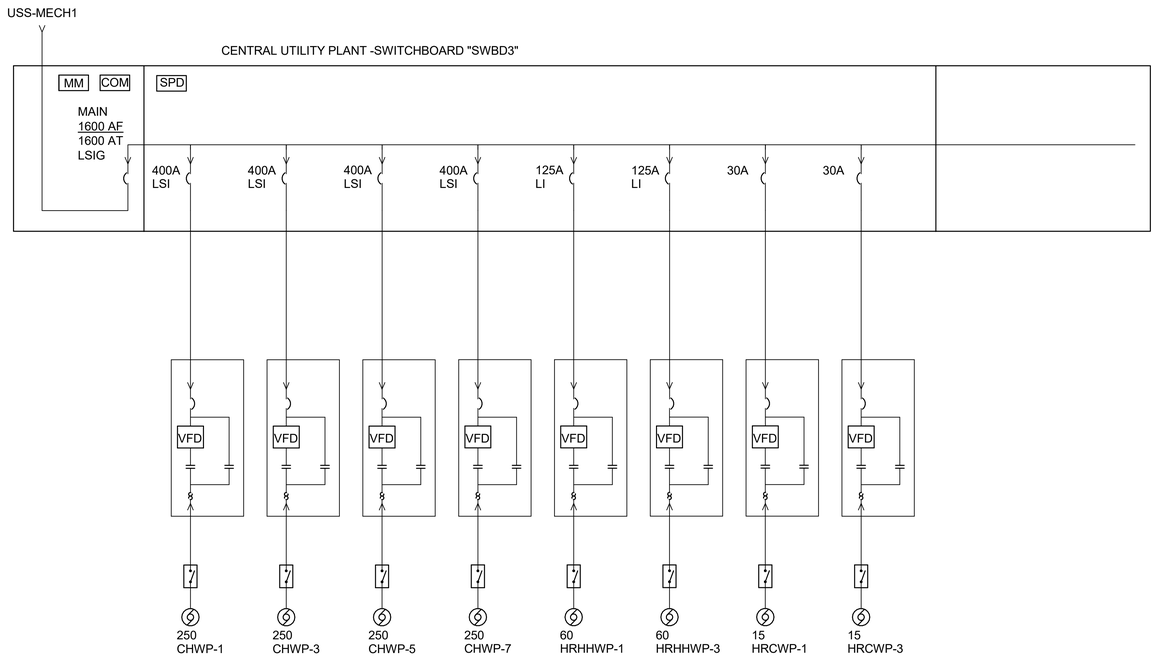
SHEET NUMBER

EP710

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:36 PM AESI Proj No: 21-154
0 1/2" 1" 2"



1 **SWBD3 ELEVATION**
Scale: NONE



2 **SWBD3 SINGLE LINE DIAGRAM**
Scale: NONE

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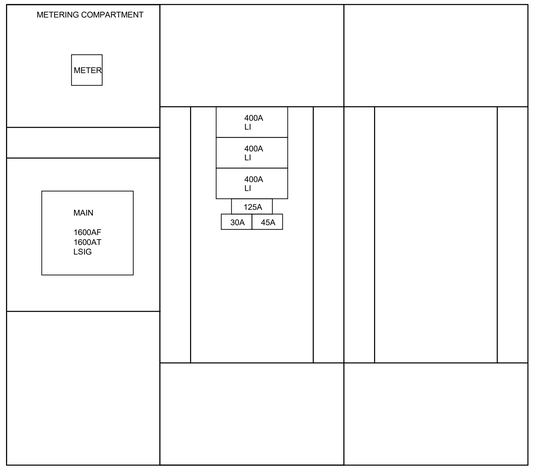
SHEET TITLE

SWBD3 SINGLE LINE DIAGRAM

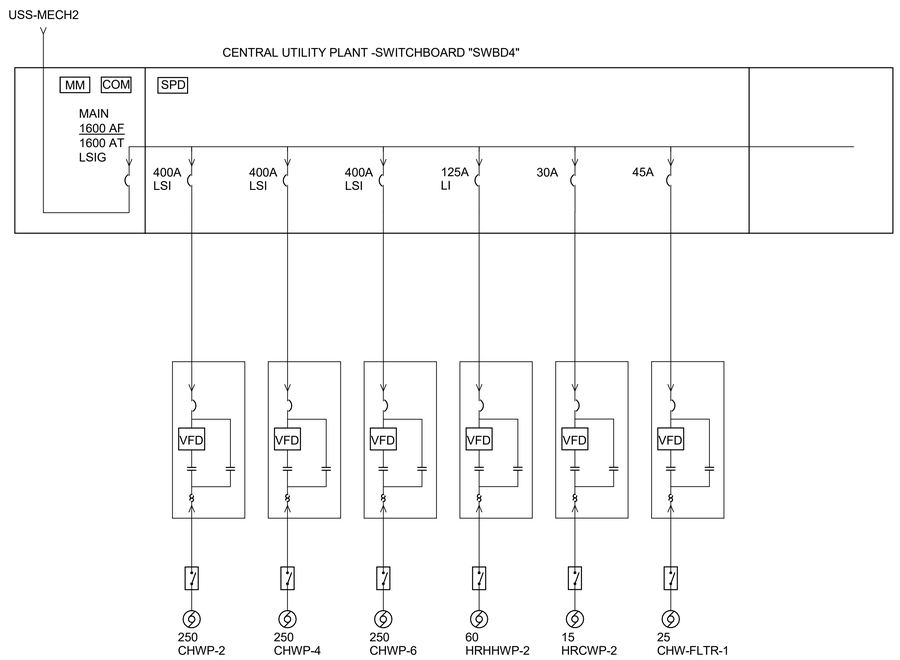
SHEET NUMBER

EP711

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:36 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **SWBD4 ELEVATION**
Scale: NONE



2 **SWBD4 SINGLE LINE DIAGRAM**
Scale: NONE

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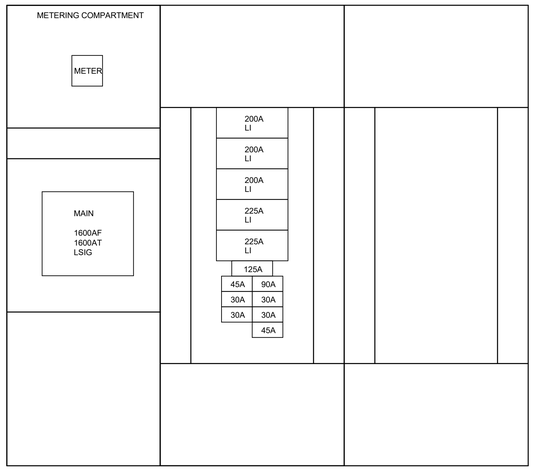
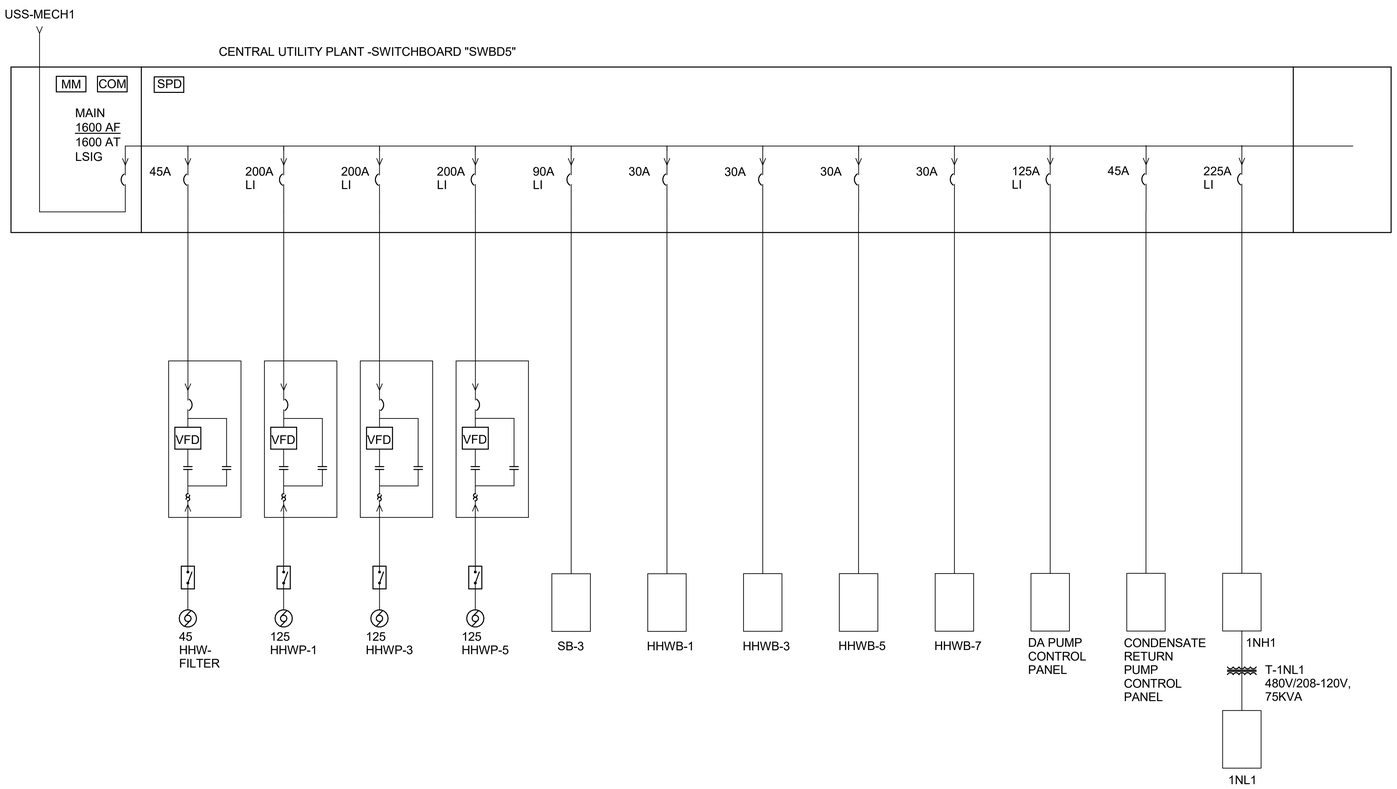
SHEET TITLE
SWBD4 SINGLE LINE DIAGRAM

SHEET NUMBER
EP712

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:37 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **SWBD5 ELEVATION**
Scale: NONE



2 **SWBD5 SINGLE LINE DIAGRAM**
Scale: NONE

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY **AESI**	CERTIFICATION PRELIMINARY NOT FOR CONSTRUCTION
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PROJECT NO. **21-154**	

SHEET TITLE

SWBD5 SINGLE LINE DIAGRAM

SHEET NUMBER

EP713

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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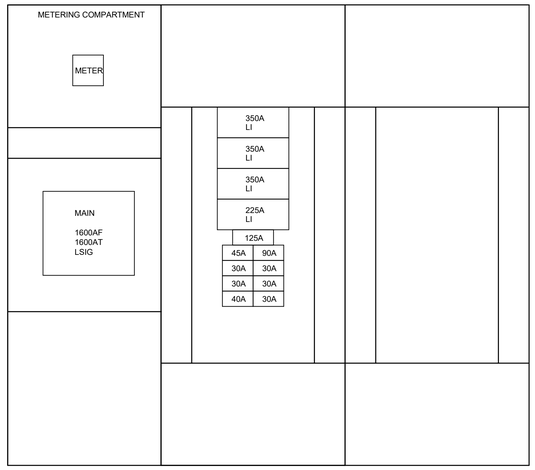
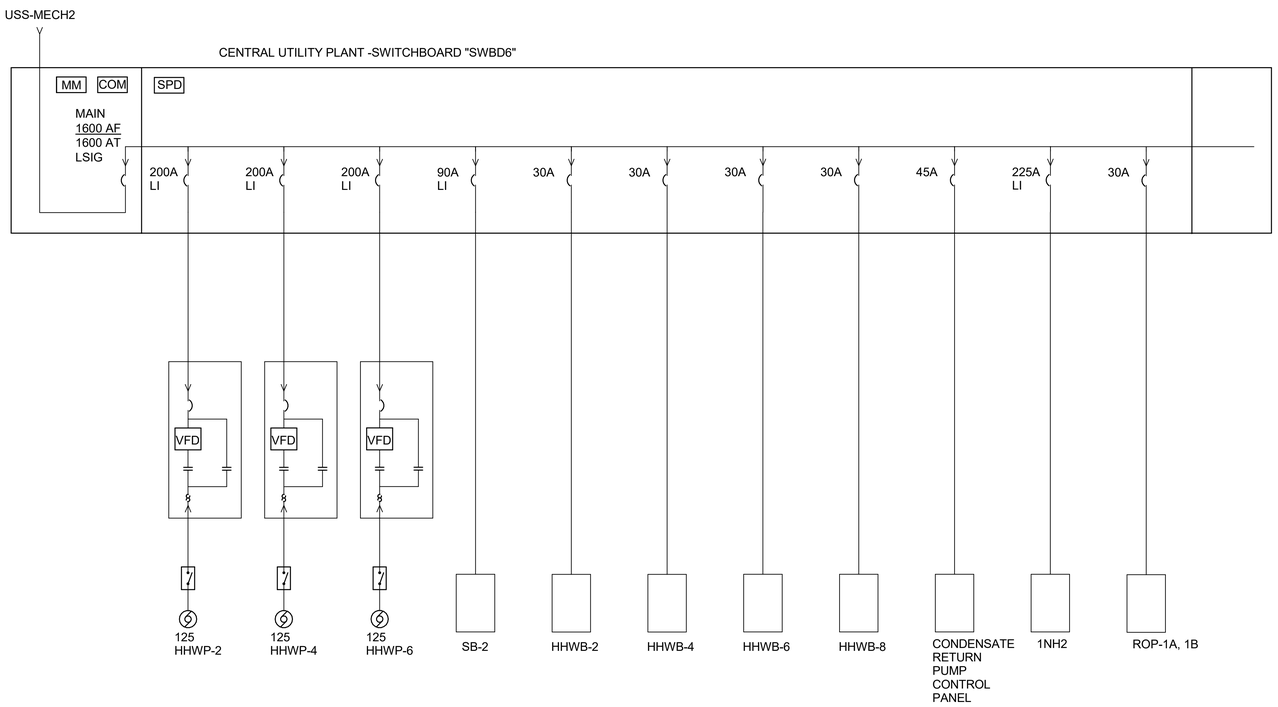


1 **SWBD6 ELEVATION**
Scale: NONE



2 **SWBD6 SINGLE LINE DIAGRAM**
Scale: NONE

OWNER

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PROJECT

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SHEET TITLE

SWBD6 SINGLE LINE DIAGRAM

SHEET NUMBER

EP714

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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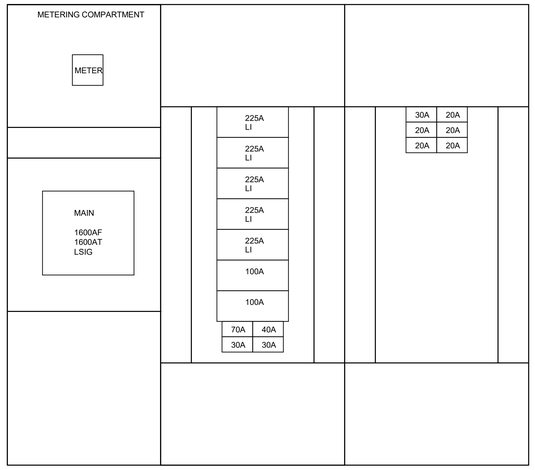
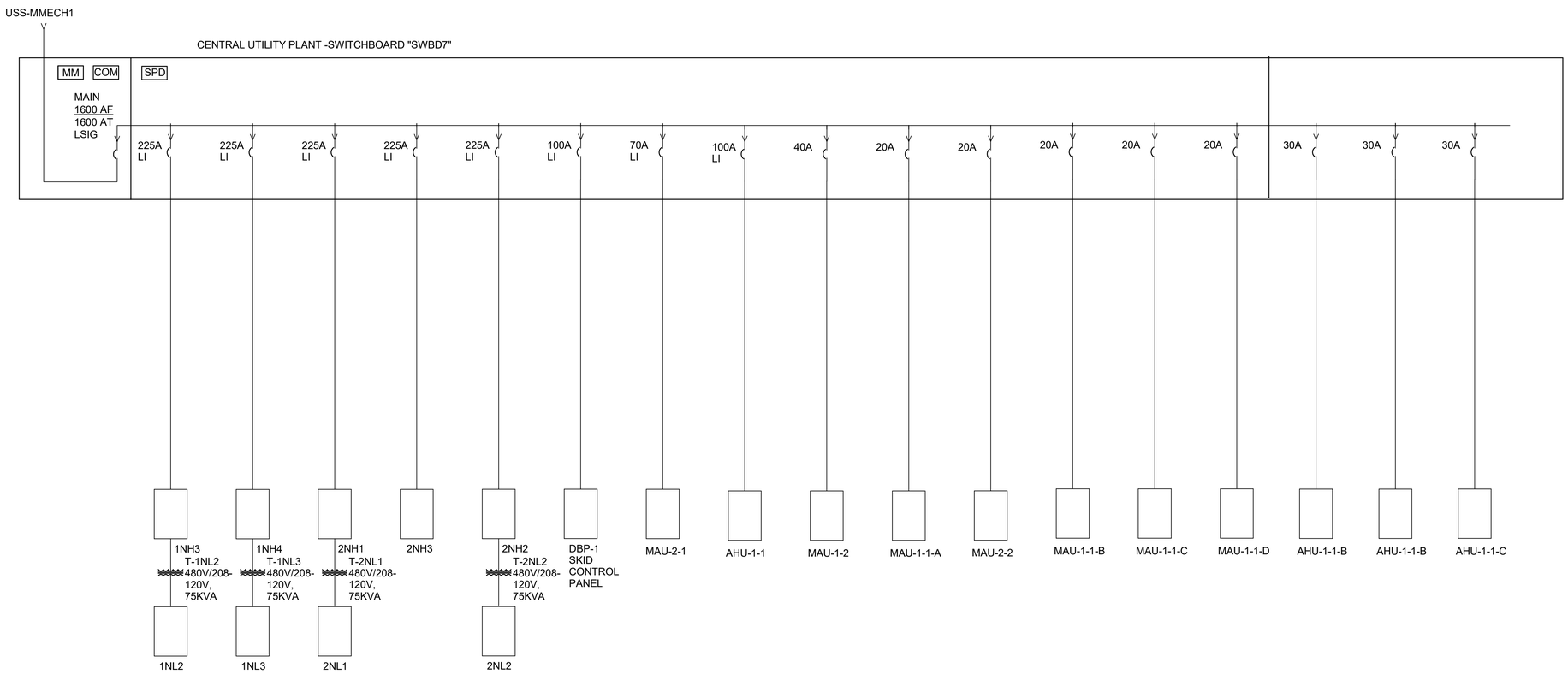


1 **SWBD7 ELEVATION**
Scale: NONE



2 **SWBD7 SINGLE LINE DIAGRAM**
Scale: NONE

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PROJECT NO. **21-154**

CERTIFICATION
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SHEET TITLE

SWBD7 SINGLE LINE DIAGRAM

SHEET NUMBER

EP715

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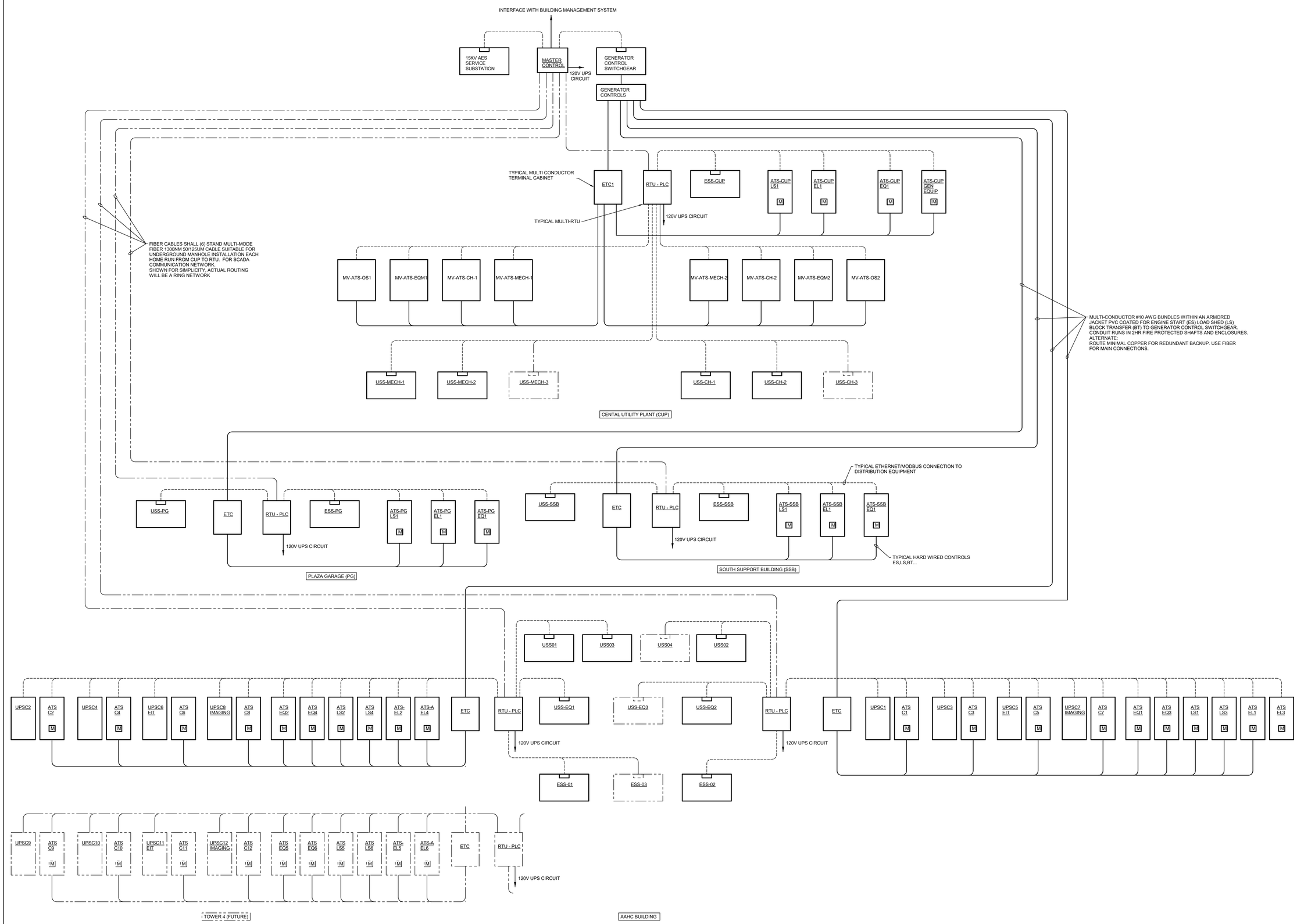

1 **ELECTRICAL SCADA SYSTEM SCHEMATIC DIAGRAM**
Scale: NONE

OWNER

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SHEET TITLE

ELECTRICAL SCADA SYSTEM SCHEMATIC DIAGRAM

SHEET NUMBER

EP716

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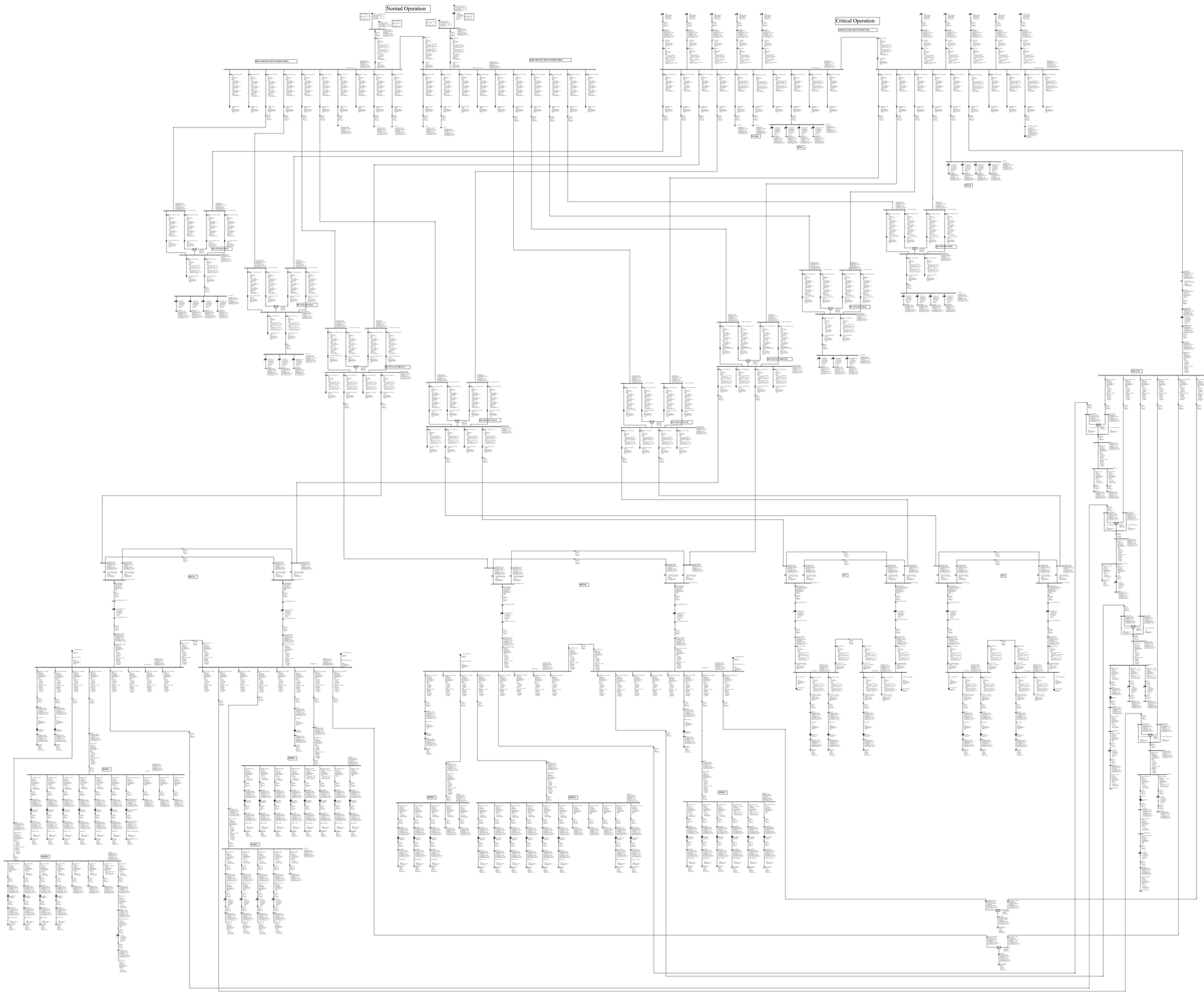

1 **ARC FLASH ONELINE - OVERALL**
Scale: NONE

NOTES:

1. PROTECTIVE DEVICE SETTINGS PROVIDED WITH SPECIFICATIONS.

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:40 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

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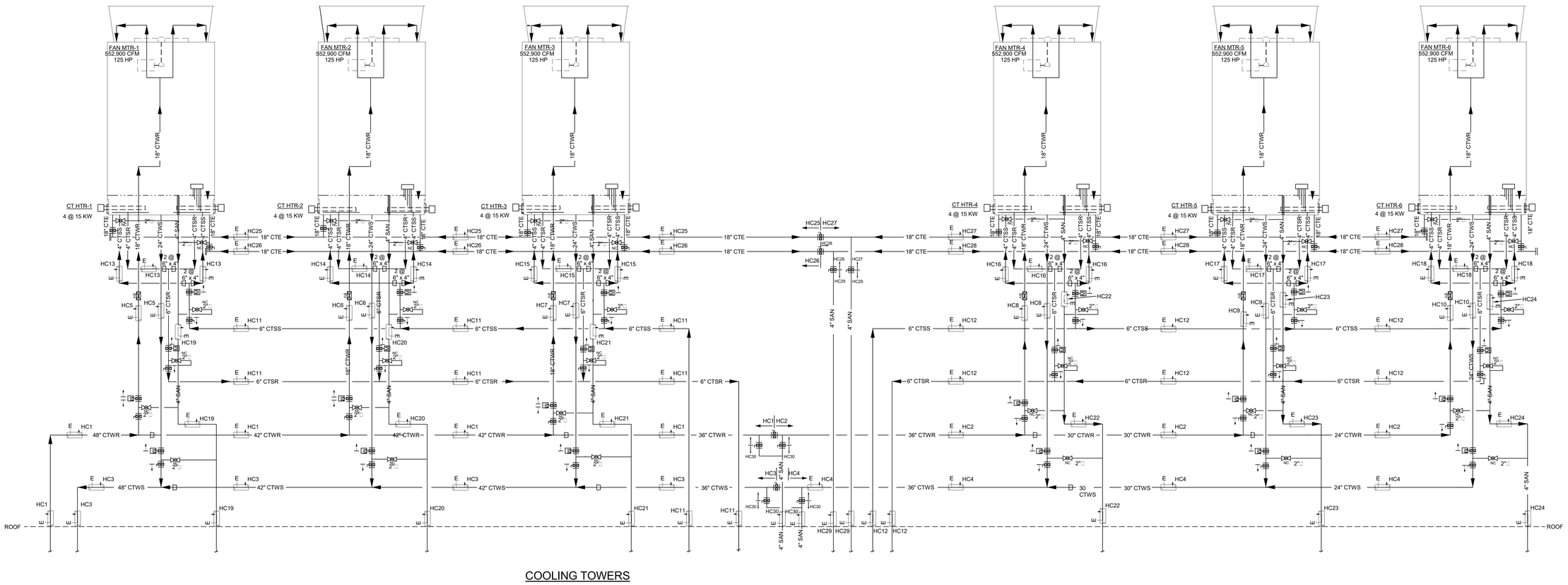
PROJECT NO. **21-154**	

SHEET TITLE

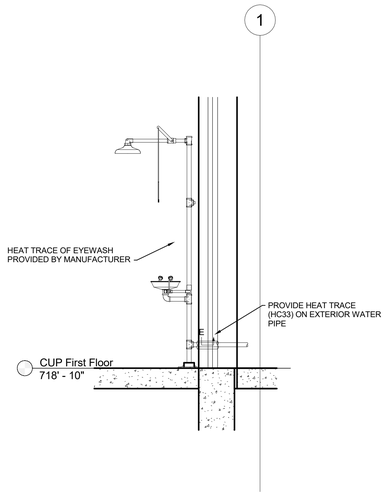
ONELINE DIAGRAM FOR ARC FLASH - OVERALL

SHEET NUMBER

EP717

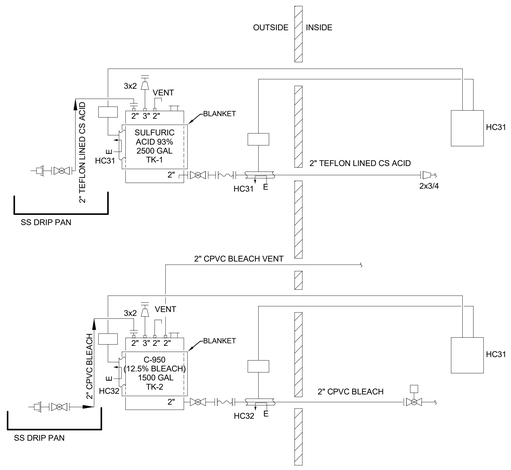


COOLING TOWERS



2 **EYEWASH HEAT TRACE DETAIL**
Scale: NONE

1 **HEAT TRACE SCHEMATIC**
Scale: NONE



CHEMICAL TREATMENT

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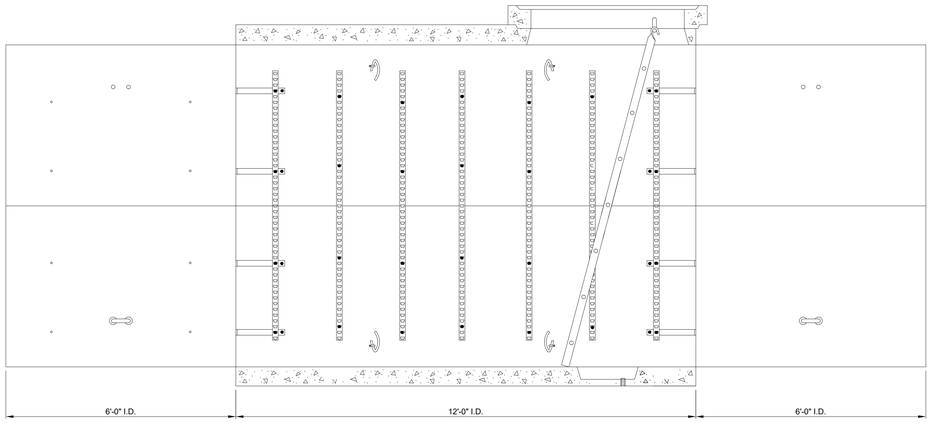
SHEET TITLE

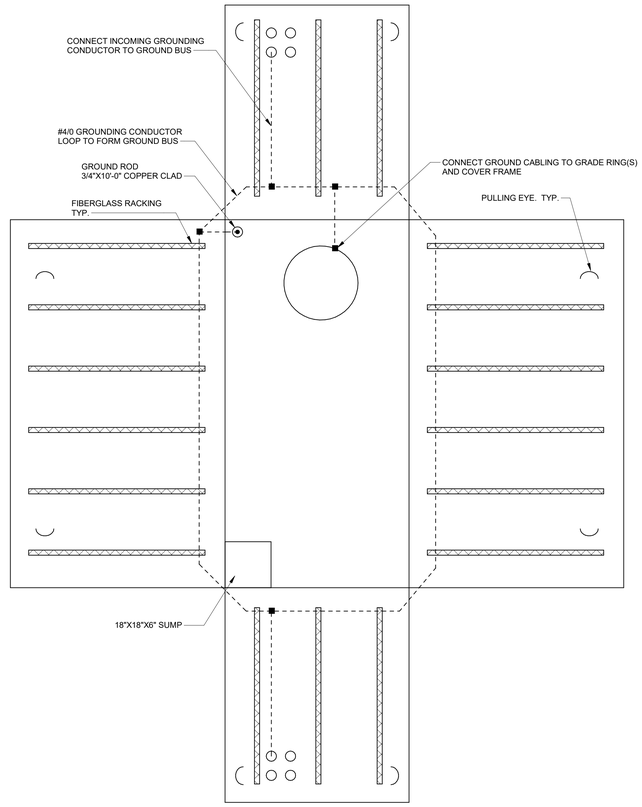
HEAT TRACE SCHEMATIC

SHEET NUMBER

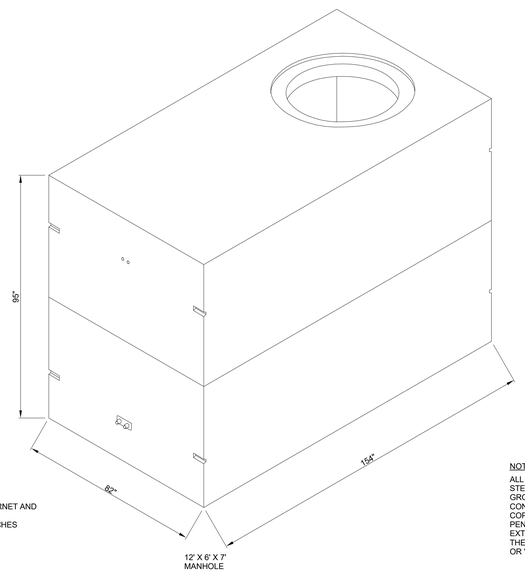
EP718

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 3:02:40 PM AESI Proj. No: 21-154





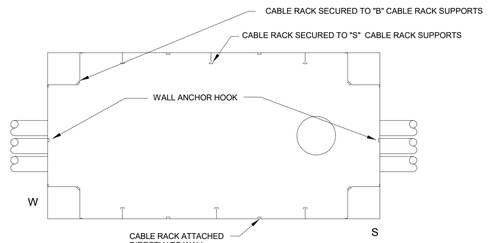
1 **TYPICAL ELECTRICAL MANHOLE DETAIL**
Scale: NONE



DIMENSIONS

		LENGTH	WIDTH	HEIGHT
		IN.	IN.	IN.
	INSIDE	144	72	84
	OUTSIDE	154	82	95
RECOMMENDED	HOLE SIZE	178	94	-

	THICKNESS		WEIGHT
	IN.		LBS.
WALL	5	TOP	16,111
ROOF	6	BOTTOM	14,178
FLOOR	5	TOTAL	30,289

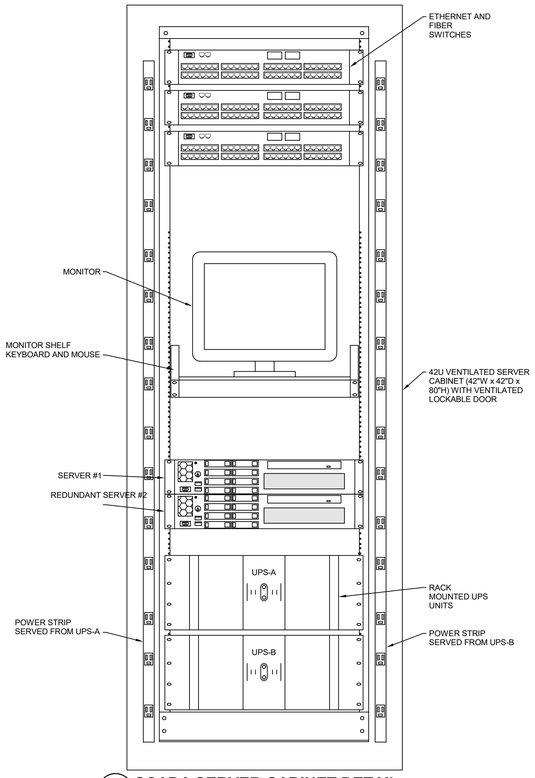


O.D. 154" X 82"X 95"
I.D. 12' X 6' X 7'

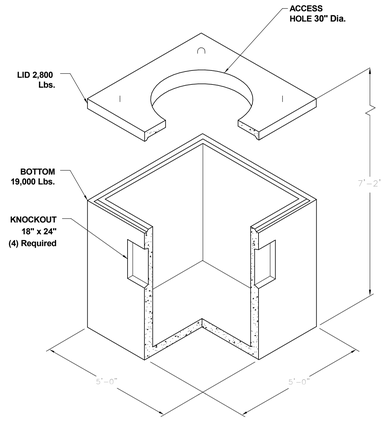
NOTES:

ALL MATERIALS USED IN THE MANHOLE SHALL BE RESISTANT TO CORROSION AND ALL STEEL SHALL BE GALVANIZED OR ZINC COATED. MANHOLES SHALL BE PROVIDED WITH A GROUND ROD SLEEVE TO ACCOMMODATE A 3/4" COPPER GROUND ROD. THE CONTRACTOR SHALL BOND ALL METALLIC APPARATUS IN THE MANHOLE WITH A #4 COPPER SOLID GROUND CONDUCTOR. CONTRACTOR SHALL WATERPROOF ALL PENETRATIONS AND JOINTS ON THE MANHOLE TO PREVENT WATER PENETRATION. EXTENSION RINGS FOR MANHOLE OPENING SHALL BE FURNISHED AND INSTALLED WITH THE MANHOLE TO BRING THE COVER UP TO GRADE. COVER SHALL READ "ELECTRICAL" OR "TELECOM" AS NEEDED AND BE H-20 RATED.

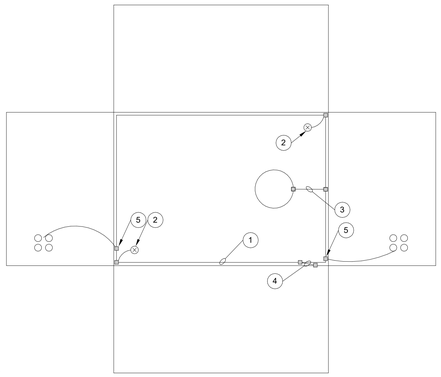
3 **TYPICAL ELECTRICAL MANHOLE**
Scale: NONE



6 **SCADA SERVER CABINET DETAIL**
Scale: NONE



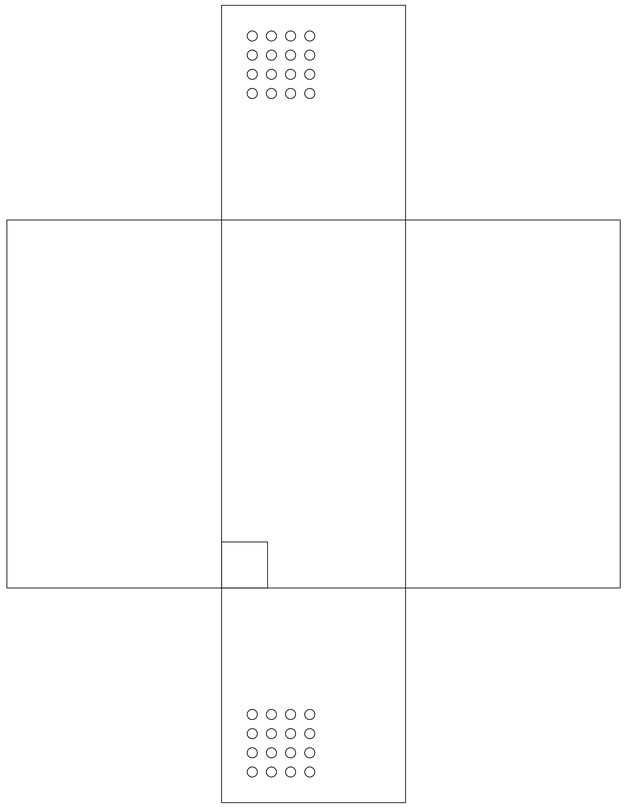
5 **SCADA MANHOLE DETAIL**
Scale: NONE



NOTES:

1. PROVIDE #4/0 AWG BARE COPPER GROUND LOOP.
2. PROVIDE 3/4" x 10'-0" COPPER CLAD GROUND ROD. CONNECT TO GROUND LOOP VIA EXOTHERMIC WELD. COORDINATE GROUND AND SLEEVE LOCATION WITH MANHOILE MANUFACTURER.
3. PROVIDE #4 AWG SOLID BARE COPPER FROM MANHOLE COVER RING TO GROUND LOOP. CONNECT TO RING BY DRILLING AND TAPPING TO ACCEPT A 1/4"-20 THREAD SCREW. PROVIDE A SINGLE-HOLE COMPRESSION LUG ON THE WIRE. PROVIDE EXOTHERMIC WELD AT GROUND LOOP.
4. PROVIDE #4 AWG SOLID BARE COPPER FROM MANHOLE REBAR GROUNDING TAB TO GROUNDING LOOP. FIELD VERIFY QUANTITY. COORDINATE LOCATIONS WITH MANHOLE MANUFACTURER.
5. PROVIDE CONNECTION OF #4/0AWG BARE COPPER GROUNDING CONDUCTOR RUN WITH DUCTBANK TO MANHOLE GROUND LOOP WITH EXOTHERMIC WELD.

4 **TYPICAL ELECTRICAL MANHOLE GROUNDING DETAIL**
Scale: NONE



2 **MH-1 CABLE ROUTING DETAIL**
Scale: NONE

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PROJECT NO. **21-154**	

SHEET TITLE

ELECTRICAL SITE DETAILS

SHEET NUMBER

UE501

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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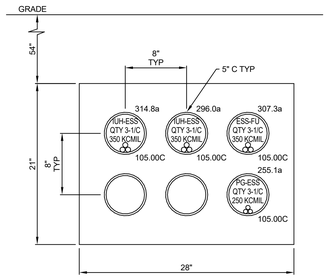
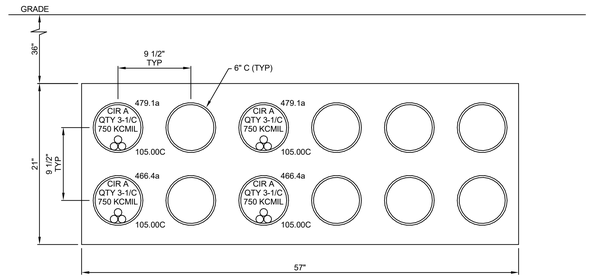
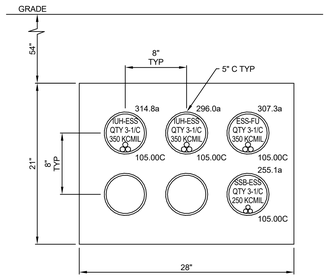
0 1/2" 1" 2"



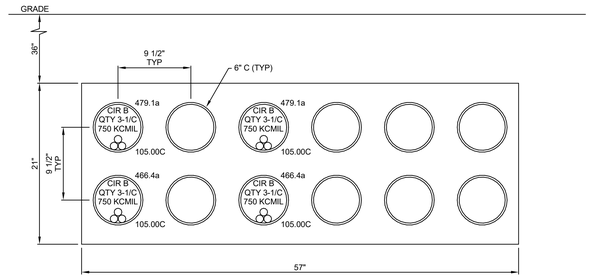
5 **EMERGENCY A DUCT BANK**
Scale: NONE



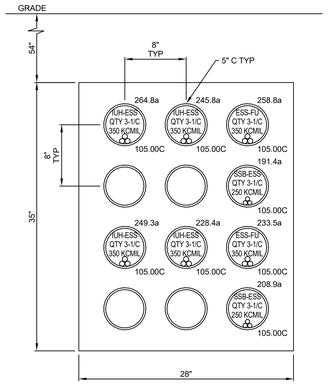
1 **AES UTILITY CIR A SERVICE**
Scale: NONE



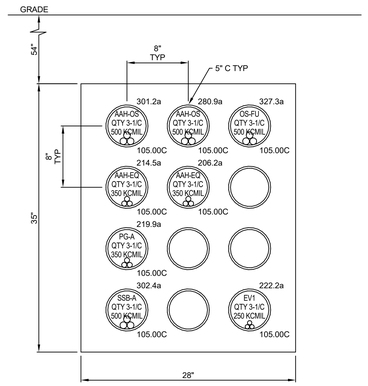
6 **EMERGENCY B DUCT BANK**
Scale: NONE



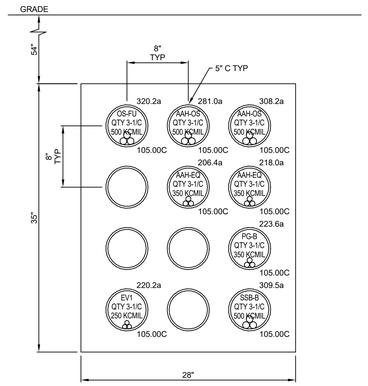
2 **AES UTILITY CIR B SERVICE**
Scale: NONE



7 **EMERGENCY DUCT BANKS A AND B COMBINED**
Scale: NONE



3 **NORMAL A DUCT BANK**
Scale: NONE



4 **NORMAL B DUCT BANK**
Scale: NONE

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REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY: AESI	CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION
CHECKED BY: AESI	
APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

ELECTRICAL SITE DETAILS

SHEET NUMBER

UE502

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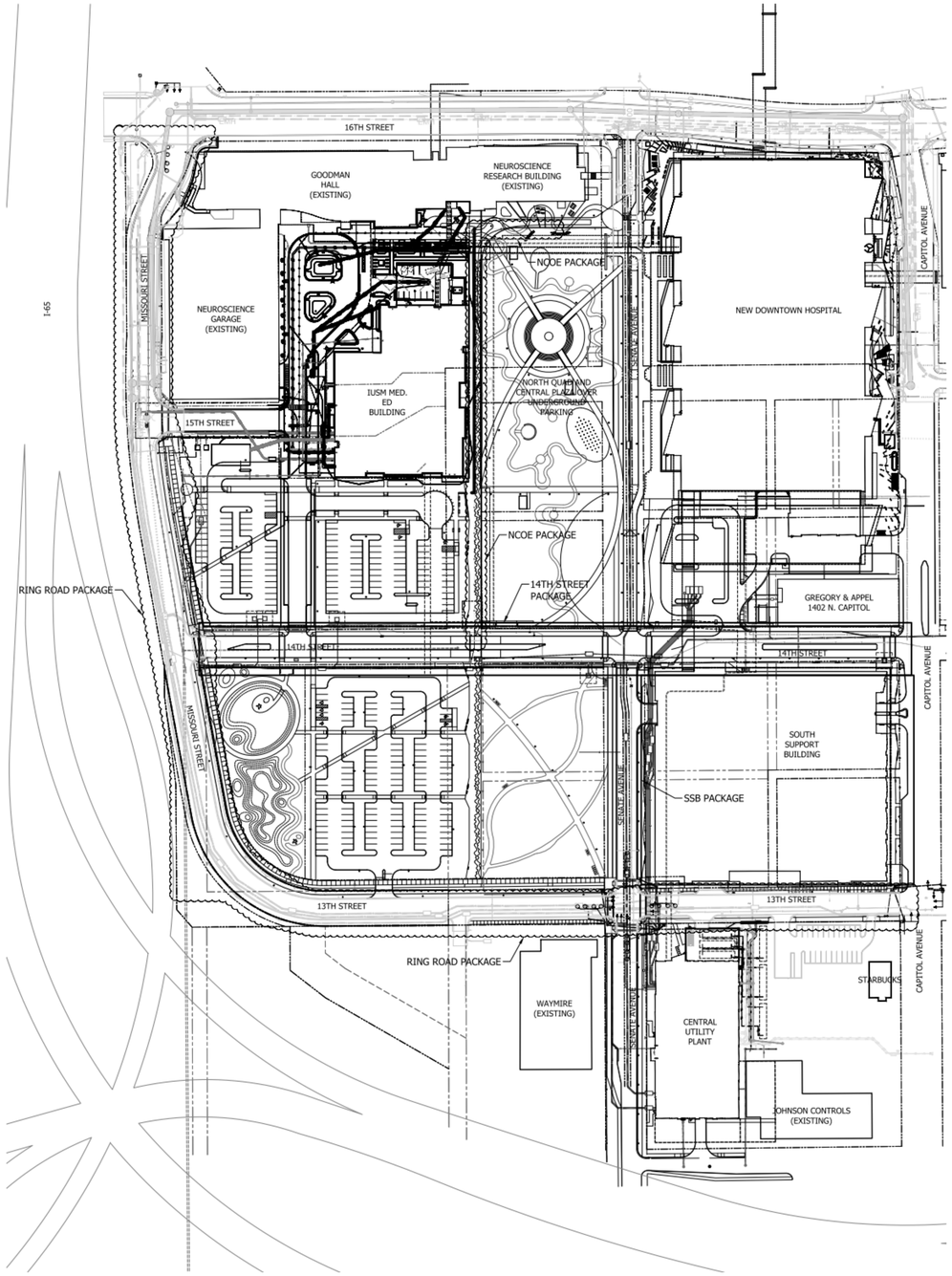
2/10/2023 3:02:41 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



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DIMSCALE..1 LTSCALE....20
PLOTTED BY..JMowery
DATE.....Jan 13,2023 - 1:05pm

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2/10/2023 11:51:12 AM AESI Proj. No: 21-154

0 1/2" 1" 2"

HEALTH

VS ENGINEERING

50% DETAILED DESIGN SET

CERTIFIED BY:

JOHN C. ZANT, JR. , P.E.

01/13/2023

DATE

IU HEALTH

NEW DOWNTOWN HOSPITAL

OVERALL CAMPUS PACKAGE

INDIANAPOLIS, INDIANA

KEY MAP

DESIGNED: JFM	DRAWN: JFM
CHECKED: JZ	CHECKED: JZ
HORIZONTAL SCALE	
1" = 100'	
VERTICAL SCALE	
N/A	

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

OVERALL SITE LAYOUT

PROJECT NUMBER 2104729

SHEET C100

OWNER

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY AESI	CERTIFICATION
CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

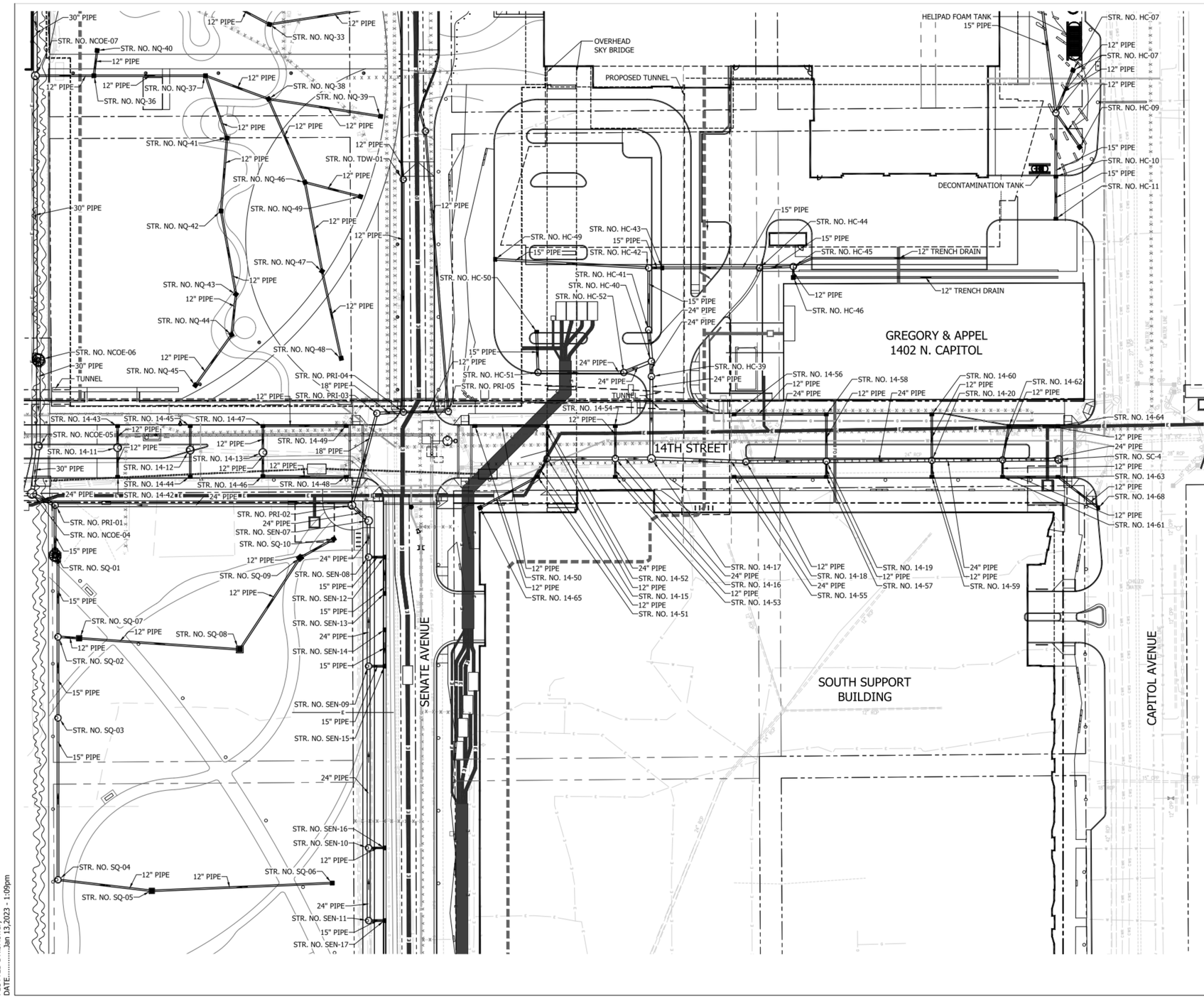
OVERALL SITE LAYOUT

SHEET NUMBER

C100

SITE DRAWINGS PROVIDED FOR REFERENCE TO SCALE DISTANCE FOR MV CABLING BETWEEN CUP AND AAHC DEMARK POINT

FOR REFERENCE ONLY



LEGEND

- PROPOSED MANHOLE
- PROPOSED INLET
- PROPOSED PIPE
- PIPE TO BE REMOVED

STORM SEWER LOCATIONS

ECO	ECO PARK
HC	HOSPITAL SURROUNDS
NPK	NORTH PARKING LOT
NQ	NORTH QUAD
PC	PRIVATE CONNECTION
RRD	RING ROAD (EXISTING)
SEN	SENATE SYSTEM
SPK	SOUTH PARKING LOT
SQ	SOUTH QUAD
SSB	SOUTH SERVICE BUILDING

NOTES

1. ALL RRD STRUCTURES INSTALLED BY PREVIOUS IU HEALTH CONTRACTOR.
2. ALL NCOE STRUCTURES TO BE INSTALLED BY IU HEALTH CONTRACTOR.
3. NON-STORM UTILITIES IDENTIFIED FOR REFERENCE PURPOSES ONLY. SEE UTILITY SHEETS FOR ADDITIONAL INFORMATION.
4. PROPERTY LINES NOT CALLED OUT FOR PLAN CLARITY PURPOSES. SEE SHEETS C101-C106 FOR PROPERTY LINE INFORMATION.

Indiana811 Know what's below. Dig before you dig.

HEALTH

VS ENGINEERING

50% DETAILED DESIGN SET

CERTIFIED BY:

JOHN C. ZANT, JR. , P.E.

01/13/2023

DATE

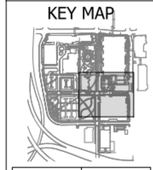
IU HEALTH

NEW DOWNTOWN HOSPITAL

OVERALL CAMPUS PACKAGE

INDIANAPOLIS, INDIANA

KEY MAP



DESIGNED: JFM	DRAWN: JFM
CHECKED: JZ	CHECKED: JZ
HORIZONTAL SCALE	
1" = 30'	
VERTICAL SCALE	
N/A	

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

STORM SEWER LAYOUT

PROJECT NUMBER 2104729

SHEET C703

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

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CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

SSB TO AAHC DEMARK MANHOLES

SHEET NUMBER

C703

SITE DRAWINGS PROVIDED FOR REFERENCE TO SCALE DISTANCE FOR MV CABLING BETWEEN CUP AND AAHC DEMARK POINT

FOR REFERENCE ONLY

DIRECTORY....C:\ProjectWise\VS Engineering\2104729 - IU Health AAHC\CAD\02 VS Engineering\02 Sheet Files\
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PLOTTED BY...JNowery
DATE.....Jan 13,2023 - 1:09pm

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2/10/2023 11:51:13 AM AESI Proj No: 21-154

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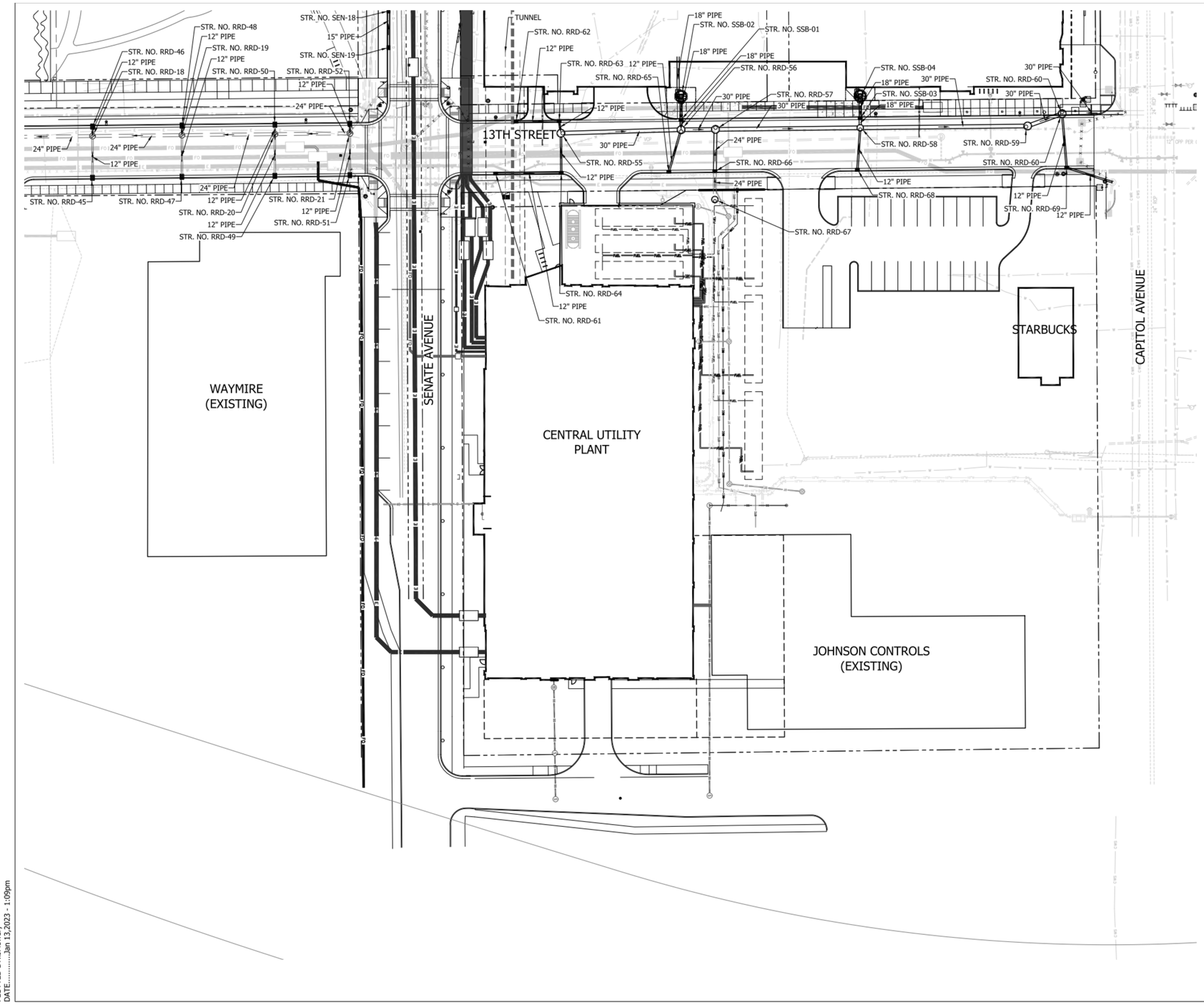

LEGEND

- PROPOSED MANHOLE
- PROPOSED INLET
- PROPOSED PIPE
- PIPE TO BE REMOVED

STORM SEWER LOCATIONS

ECO	ECO PARK
HC	HOSPITAL SURROUNDS
NPK	NORTH PARKING LOT
NQ	NORTH QUAD
PC	PRIVATE CONNECTION
RRD	RING ROAD (EXISTING)
SEN	SENATE SYSTEM
SPK	SOUTH PARKING LOT
SQ	SOUTH QUAD
SSB	SOUTH SERVICE BUILDING

NOTES

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SITE DRAWINGS PROVIDED FOR REFERENCE TO SCALE DISTANCE FOR MV CABLING BETWEEN CUP AND AAHC DEMARK POINT

FOR REFERENCE ONLY

DIRECTORY....C:\ProjectWise\VS Engineering\2104729 - IU Health AAHC\CAD\02 VS Engineering\02 Sheet Files\
FILE.....2104729-Campus Storm Layout.dwg
DIMSCALE..1 LTSCALE....20
PLOTTED BY..JNowery
DATE.....Jan 13,2023 - 1:09pm

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/10/2023 11:51:13 AM AESI Proj. No: 21-154

0 1/2" 1" 2"

HEALTH

VS ENGINEERING

50% DETAILED DESIGN SET

CERTIFIED BY:

JOHN C. ZANT, JR. , P.E.

01/13/2023

DATE

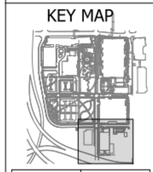
IU HEALTH

NEW DOWNTOWN HOSPITAL

OVERALL CAMPUS PACKAGE

INDIANAPOLIS, INDIANA

KEY MAP



DESIGNED: JFM	DRAWN: JFM
CHECKED: JZ	CHECKED: JZ
HORIZONTAL SCALE	
1" = 30'	
VERTICAL SCALE	
N/A	

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

STORM SEWER LAYOUT

PROJECT NUMBER 2104729

SHEET C705

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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5975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
Tel: 317.810.4141 • Fax: 317.810.4140 • www.applied-e-s.com

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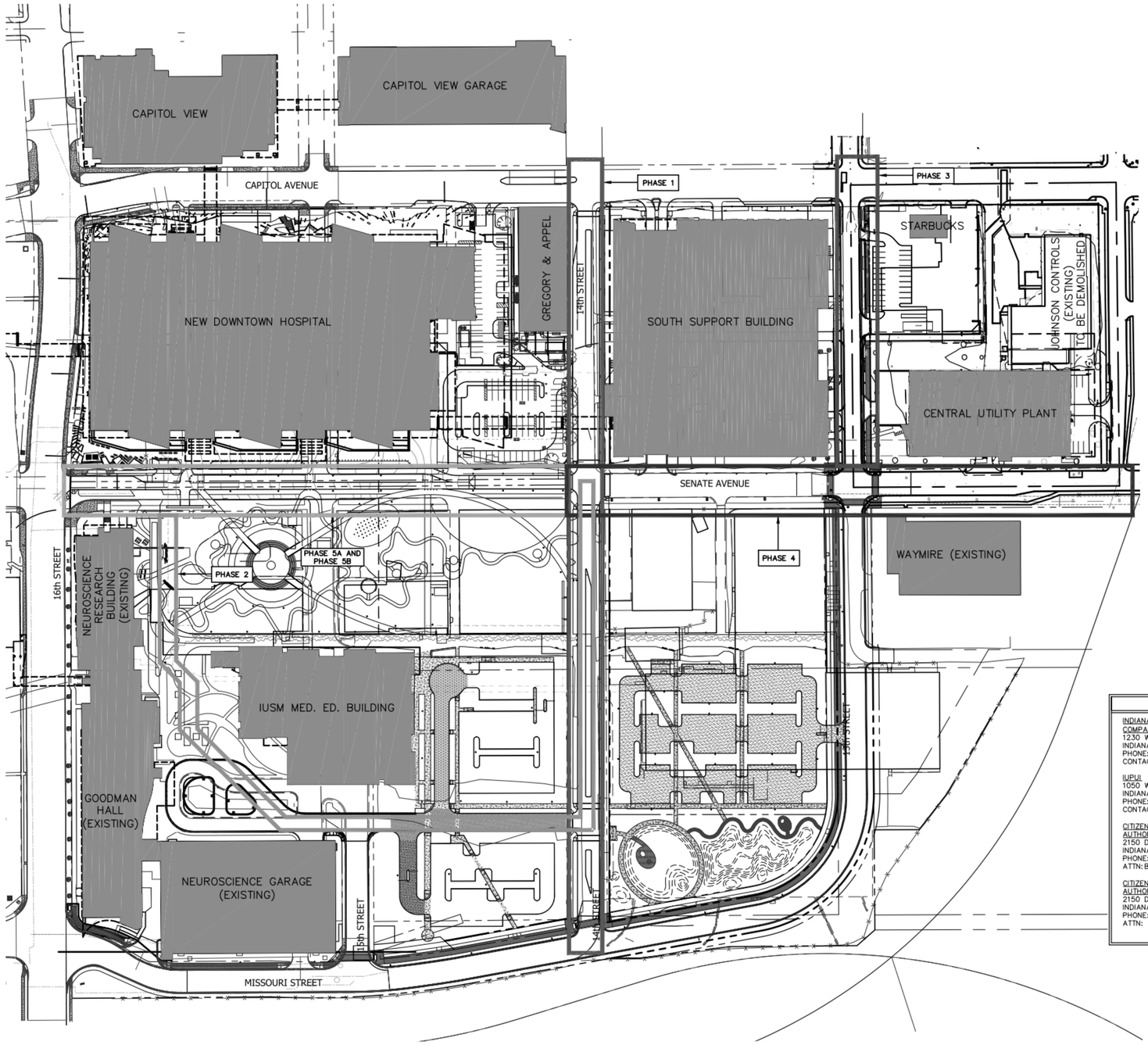
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

CUP TO SSB

SHEET NUMBER

C705



PHASING LEGEND:

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 4
- PHASE 5A AND 5B

NOTES:

1. THE CONSTRUCTION SEQUENCING SHOWN IS AFTER THE COMPLETION OF ENABLING UTILITIES, RING ROAD, AND NCOE STORM CONSTRUCTION.
2. CONSTRUCTION SEQUENCING OUTLINES THE VARIOUS PUBLIC UTILITIES AND NOT INDIVIDUAL BUILDING SERVICE CONNECTIONS.
3. CONSTRUCTION SEQUENCING IS NOT ALL INCLUSIVE.
4. PHASE 1 INCLUDES ALL PUBLIC UTILITIES ALONG 14TH STREET FROM CAPITOL TO MISSIOURI. PHASE 1 MUST BE COMPLETED PRIOR TO WATER SERVICE CONNECTION FROM THE AAHC.
5. PHASE 2 INCLUDES CHILLED WATER AND STEAM LINES REQUIRED FOR THE IU SCHOOL OF MEDICINE. PHASE 2 MUST BE COMPLETED PRIOR TO WATER SERVICE CONNECTION FROM THE CUP.
6. PHASE 1 AND PHASE 2 WORK CAN OCCUR CONCURRENTLY. HOWEVER, THE RELOCATION OF THE WATER MAIN IN 14TH STREET (PHASE 1) MUST BE COMPLETED PRIOR TO THE INSTALLATION OF THE STEAM LINE IN 14TH STREET (PHASE 2).
7. PHASE 3 INCLUDES ALL PUBLIC UTILITIES ALONG 13TH STREET FROM CAPITOL TO SENATE. PHASE 3 MUST BE COMPLETED PRIOR TO WATER SERVICE CONNECTION FROM THE CUP.
8. PHASE 4 INCLUDES ALL PUBLIC UTILITIES ALONG SENATE FROM 14TH TO 12TH STREET.
9. DEMOLITION OF THE PEOPLE MOVER IS REQUIRED IN ORDER TO COMPLETE PHASE 4 WORK.
10. PHASE 4 MUST BE CONSTRUCTED IN ORDER TO PROVIDE POWER TO THE CUP.
11. PHASE 5A INCLUDES THE DEMOLITION OF THE PUBLIC UTILITIES IN SENATE TO FACILIATE THE PLAZA GARAGE CONSTRUCTION. PHASES 1 – 4 MUST BE COMPLETED PRIOR TO THE START OF PHASE 5A. FRESENIUS MUST BE DEMOLISHED PRIOR TO STARTING PHASE 5A.
12. PHASE 5B INCLUDES THE INSTALLATION OF THE PRIMARY ELECTRICAL FEED FROM THE SUBSTATION TO THE CUP. PHASE 5B REQUIRES THE COMPLETION OF THE PLAZA GARAGE PRIOR TO START OF CONSTRUCTION.

UTILITIES

INDIANAPOLIS POWER AND LIGHT COMPANY / AES INDIANA
1230 W. MORRIS ST.
INDIANAPOLIS, IN 46221
PHONE: 317–261–8617
CONTACT: JANET SNODGRASS

IUPUI
1050 WISHARD BLVD. SUITE 4000
INDIANAPOLIS, IN 46202
PHONE: 317–274–7106
CONTACT: RYAN SCHAFER

CITIZENS ENERGY GROUP /CWA AUTHORITY, INC. – WATER
2150 DR. MARTIN LUTHER KING JR. ST.
INDIANAPOLIS, IN 46202
PHONE: 317–927–4351
ATTN: BRAD HOSTETLER

CITIZENS ENERGY GROUP /CWA AUTHORITY, INC. – SANITARY
2150 DR. MARTIN LUTHER KING JR. ST.
INDIANAPOLIS, IN 46202
PHONE: 317–927–4351
ATTN: BRAD HOSTETLER

CITIZENS ENERGY GROUP – GAS
2150 DR. MARTIN LUTHER KING JR. ST.
INDIANAPOLIS, IN 46202
PHONE: 317–927–4684
ATTN: RICH MILLER

CITIZENS ENERGY GROUP – THERMAL
266 KENTUCKY AVE.
INDIANAPOLIS, IN 46255
PHONE: 317–308–9910
ATTN: PHILIP SEARCY

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AMERICAN STRUCTUREPOINT INC.
9925 River Road, Suite 200, Indianapolis, Indiana 46240
t: 317.577.8080 www.structurepoint.com

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CERTIFIED BY:

KAITLYN M. CURRIE, P.E.

12/14/2022

DATE

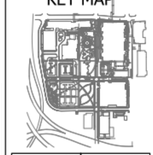
IU HEALTH

NEW DOWNTOWN HOSPITAL

OVERALL CAMPUS PACKAGE

INDIANAPOLIS, INDIANA

KEY MAP



DESIGNED: JPJ	DRAWN: MDY
CHECKED: KMC	CHECKED: JPJ
HORIZONTAL SCALE	
1" = 80'	
VERTICAL SCALE	

REVISION SCHEDULE

NO.	DESCRIPTION	DATE

PROPOSED UTILITIES SEQUENCING

PROJECT NUMBER: 2104729

SHEET: C500

OWNER

Indiana University Health
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PROJECT

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APPROVED BY: Approver	
PROJECT NO.: 21-154	

SHEET TITLE

CUP SITE DEMARK POINTS

SHEET NUMBER

C706

DIRECTORY....C:\ProjectWise\VS Engineering\2104729 - IU Health AAHC\CAD\06 AS\
FILE.....2104729-MH-AAHC-C-Campus Utility Sheets-zz.dwg
DIMSCALE...20 LTSCALE....1
PLOTTED BY..mgriffith
DATE.....Jan 11,2023 - 12:58pm

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2/10/2023 11:51:14 AM AESI Proj. No: 21-154

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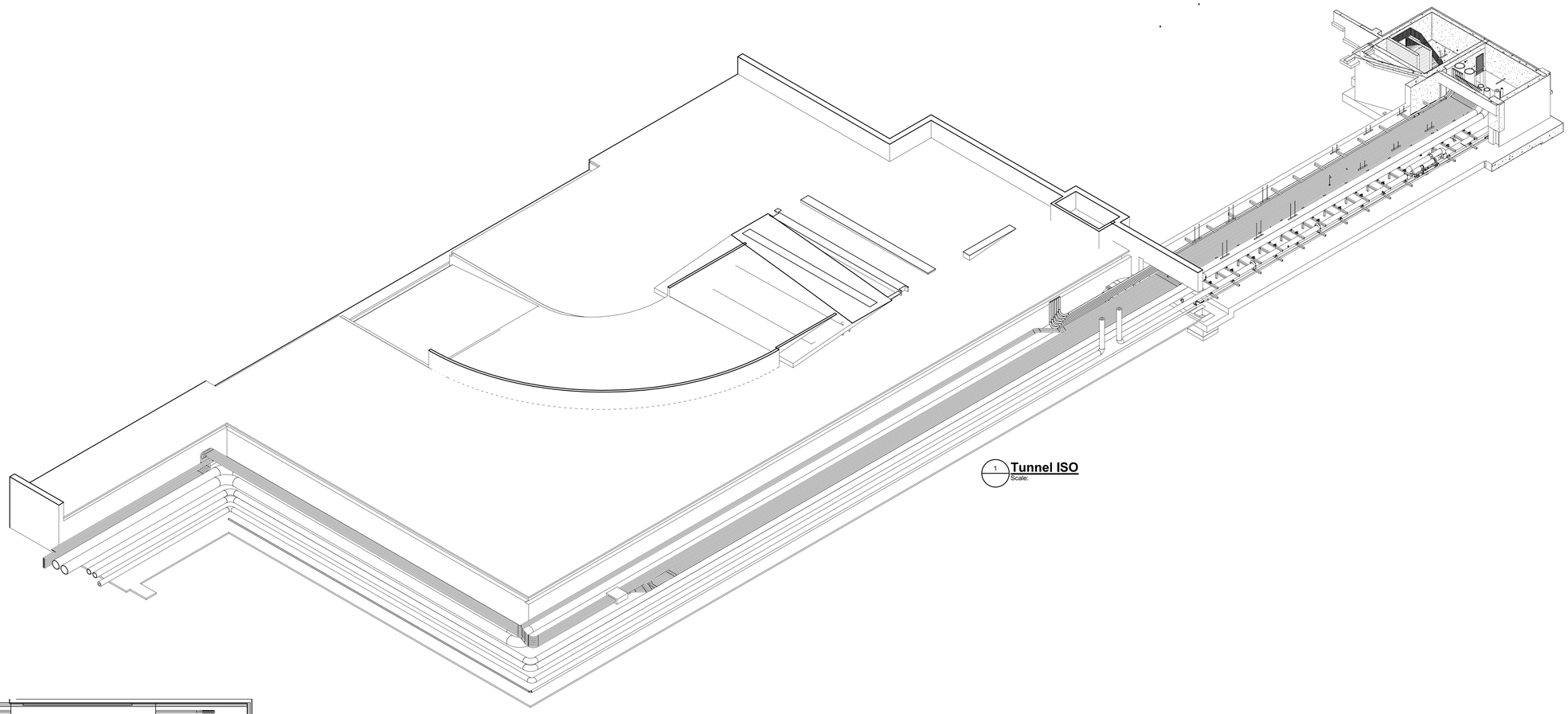

1 **Tunnel ISO**
Scale:

2 **UTILITY TUNNEL OVERALL PLAN**
Scale: 1/16" = 1'-0"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:37 PM AESI Proj. No: 21-154

0 1/2" 1" 2"

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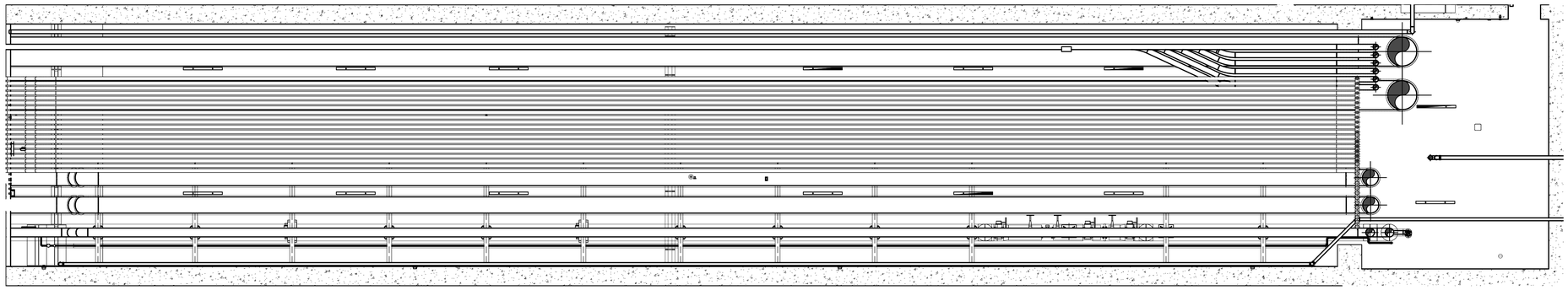
PROJECT NO. **21-154**	

SHEET TITLE

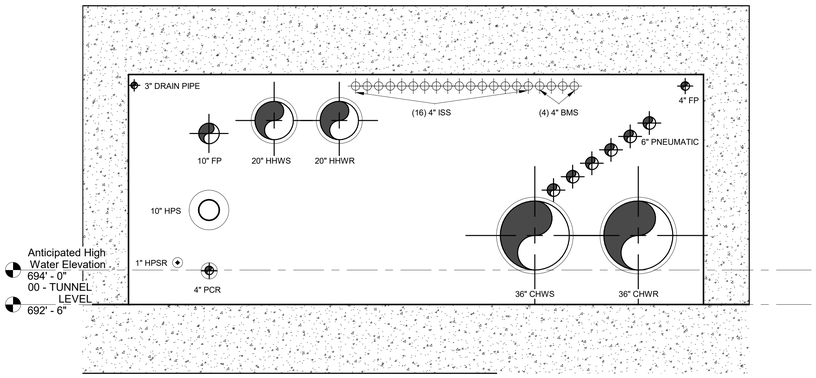
UTILITY TUNNEL

SHEET NUMBER

UT100



1 **UTILITY TUNNEL CUP OVERALL**
Scale: 3/16" = 1'-0"



2 **UTILITY TUNNEL CUP UTILITY LAYOUT**
Scale: 3/8" = 1'-0"

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Indianapolis, IN, 46202

PROJECT

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PROJECT NO. **21-154**

CERTIFICATION
PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE
UTILITY TUNNEL - CUP

SHEET NUMBER
UT101

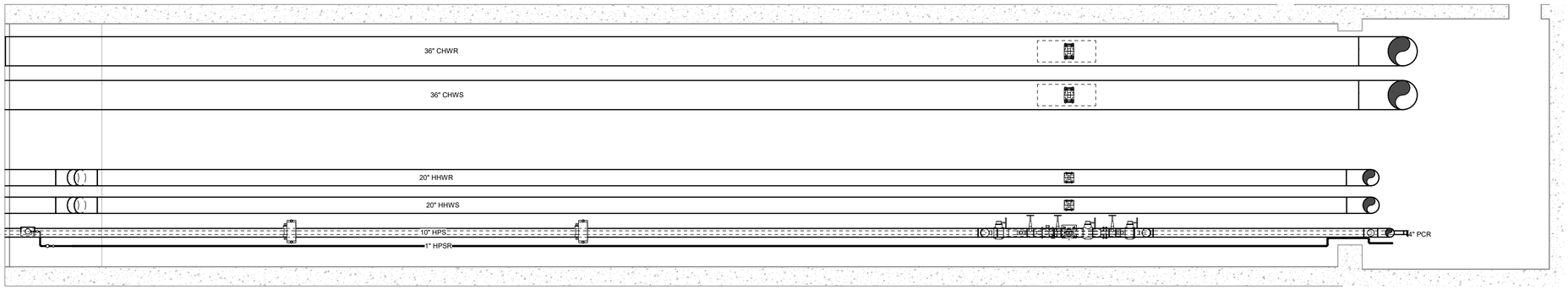
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:38 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

GENERAL NOTES:

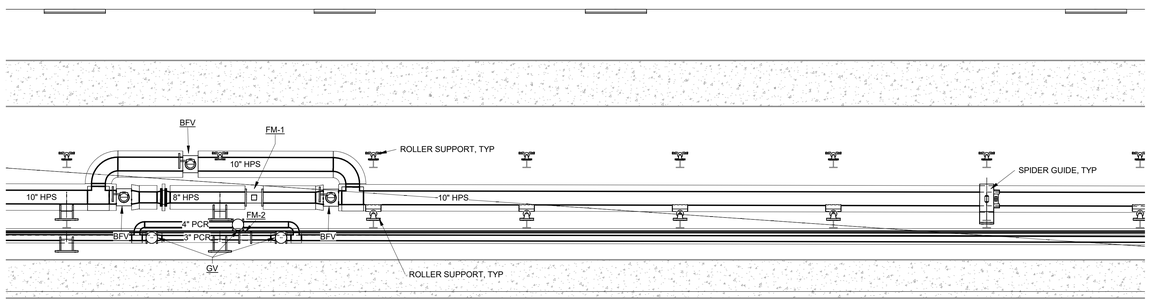
1. REFER TO STRUCTURAL DRAWINGS FOR STRUCTURE DESIGN.
2. DOOR SHOWN FOR REFRENCE - SCOPE HAS NOT BEEN DETERMINED YET.

MECHANICAL PLAN NOTES:

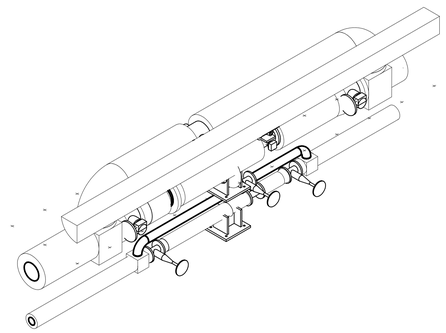
1. TBD



1 **UTILITY TUNNEL CUP MECHANICAL - HVAC PLAN**
Scale: 3/16" = 1'-0"



3 **STEAM AND PCR ASSEMBLY**
Scale: 1/4" = 1'-0"



2 **STEAM IN TUNNEL**
Scale:

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

Applied Engineering Services
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APPROVED BY **Approver**	
PROJECT NO. **21-154**	

SHEET TITLE

MECHANICAL

SHEET NUMBER

UT101.1

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:39 PM AESI Proj. No: 21-154
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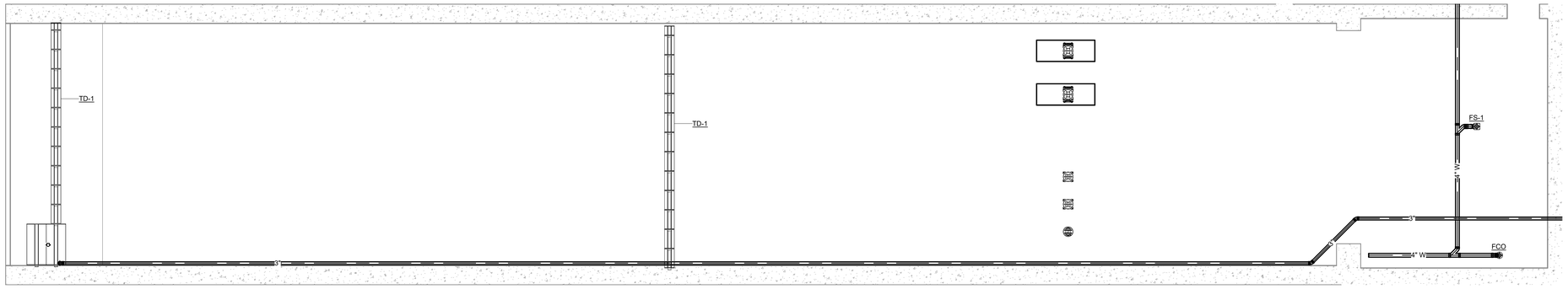
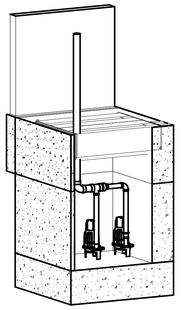
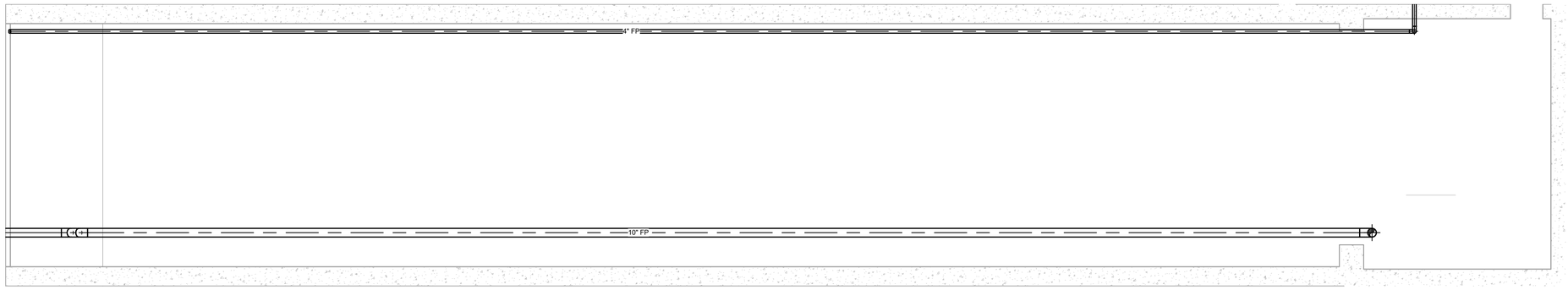


1 **UTILITY TUNNEL CUP FIRE PLUMBING PLAN**
Scale: 3/16" = 1'-0"



3 **UTILITY TUNNEL SUMP PUMPS**
Scale:



2 **UTILITY TUNNEL CUP FIRE PLUMBING PLAN**
Scale: 3/16" = 1'-0"

GENERAL NOTES:

1. REFER TO STRUCTURAL DRAWINGS FOR STRUCTURE DESIGN.
2. DOOR SHOWN FOR REFRENCE - SCOPE HAS NOT BEEN DETERMINED YET.

PLUMBING PLAN NOTES:

1. TBD

FIRE PROTECTION PLAN NOTES:

1. TBD

OWNER

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Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

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February 10, 2023

REVISIONS

NO.	DATE	DESCRIPTION

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CHECKED BY AESI	PRELIMINARY NOT FOR CONSTRUCTION
APPROVED BY Approver	
PROJECT NO. 21-154	

SHEET TITLE

PLUMBING - FIRE PROTECTION

SHEET NUMBER

UT101.2

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:40 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

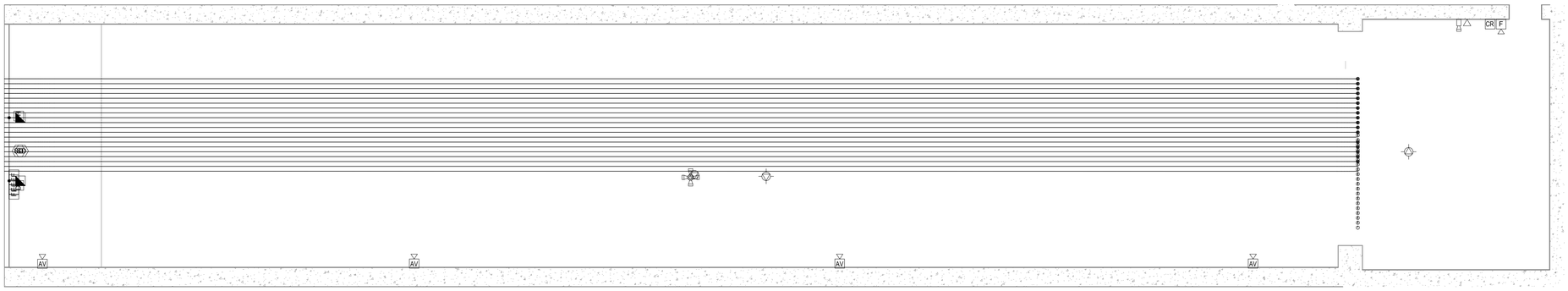
1 **POWER PLAN**
Scale: 3/16" = 1'-0"

GENERAL NOTES:

1. REFER TO STRUCTURAL DRAWINGS FOR STRUCTURE DESIGN.
2. DOOR SHOWN FOR REFRENCE - SCOPE HAS NOT BEEN DETERMINED YET.

POWER PLAN NOTES:

1. PROVIDE RECEPTACLE. MOUNT ON PIPE SUPPORT AT 1'-6" ABOVE GRADE.
2. PROVIDE SP-1 SWITCH. 30A, 3 PHASE, HEAVY DUTY, NEMA 4X. MOUNT AT 4'-0" AFF ON WALL. CONNECT TO PUMP CONTROL PANEL. SEE MECHANICAL DRAWING FOR PUMP DETAILS.



2 **SYSTEMS PLAN**
Scale: 3/16" = 1'-0"

SYSTEMS PLAN NOTES:

1. TBD

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Indiana University Health
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APPROVED BY: Approver
PROJECT NO.: 21-154

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: POWER - SYSTEMS

SHEET NUMBER: UT101.3

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:40 PM AESI Proj. No: 21-154
0 1/2" 1" 2"

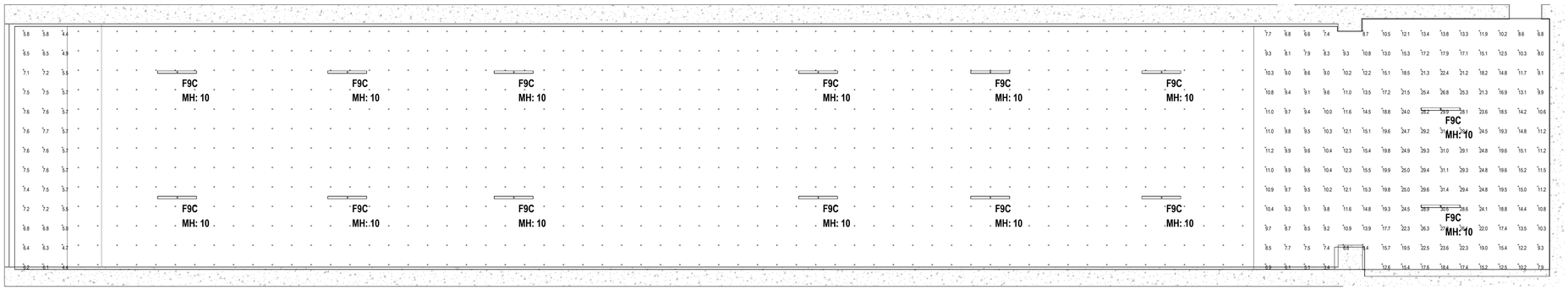
GENERAL NOTES:

1. REFER TO STRUCTURAL DRAWINGS FOR STRUCTURE DESIGN.
2. DOOR SHOWN FOR REFRENCE - SCOPE HAS NOT BEEN DETERMINED YET.

LIGHTING PLAN NOTES:

1. TBD

1 **LIGHTING PLAN**
Scale: 3/16" = 1'-0"



2 **PHOTOMETRIC PLAN**
Scale: 3/16" = 1'-0"

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CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE: LIGHTING

SHEET NUMBER: UT101.4

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
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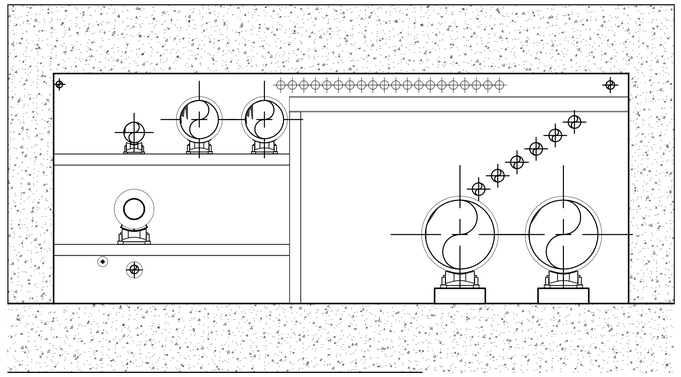
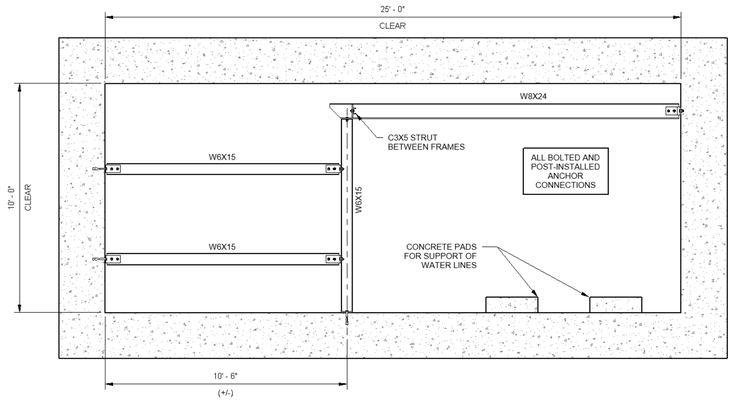
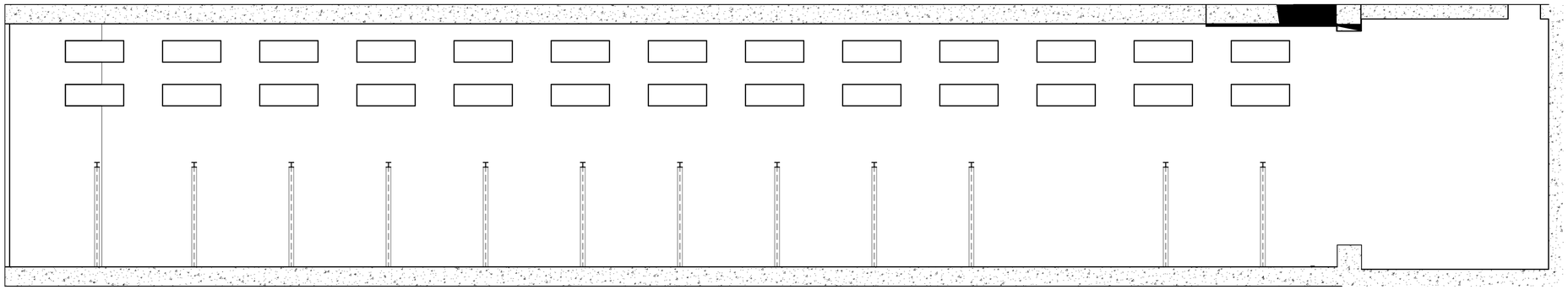


1 **UTILITY TUNNEL CUP PIPING SUPPORT**
Scale: 3/8" = 1'-0"





2 **UTILITY TUNNEL CUP PIPING SUPPORT PLAN**
Scale: 3/16" = 1'-0"

TYPICAL FOR ALL SUPPORTS

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PROJECT NO. **21-154**	

SHEET TITLE

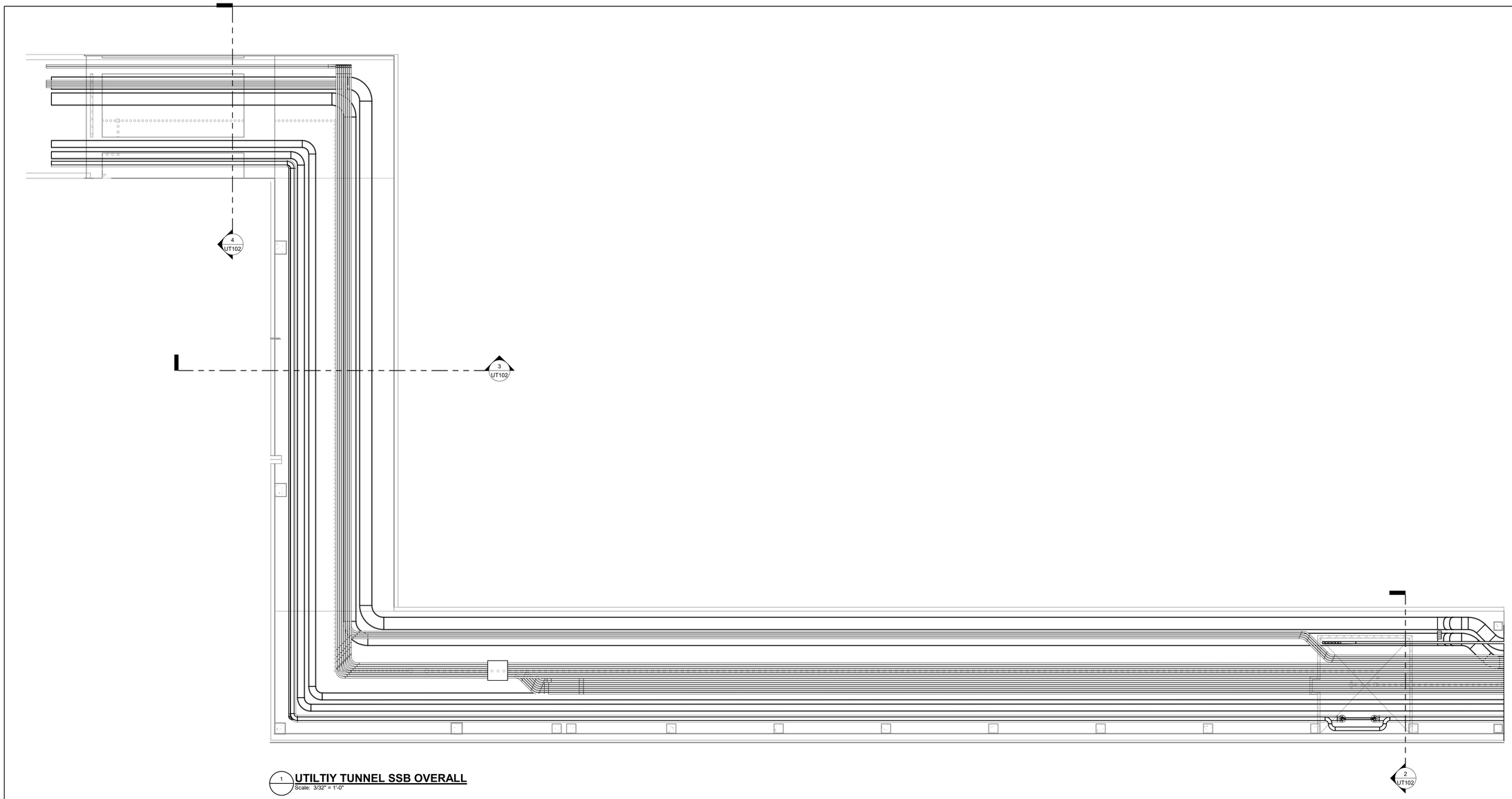
UTILITY SUPPORT DETAILS

SHEET NUMBER

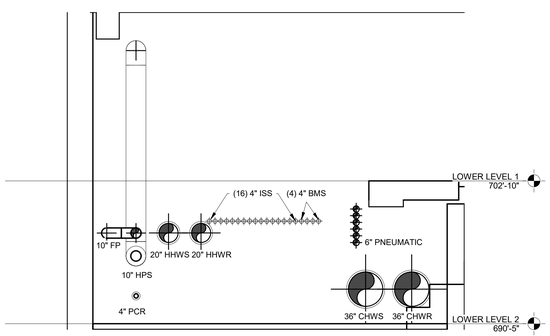
UT101.5

0 1/2" 1" 2"

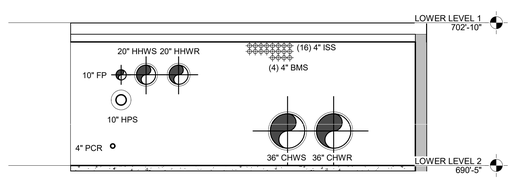
ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/8/2023 3:42:41 PM AESI Proj. No: 21-154



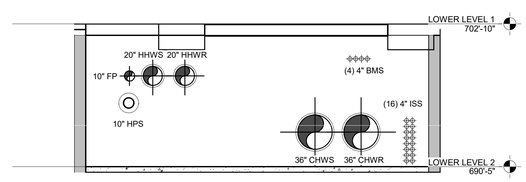
1 **UTILTIY TUNNEL SSB OVERALL**
Scale: 3/32" = 1'-0"



2 **UTILITY TUNNEL SSB LAYOUT 1**
Scale: 3/16" = 1'-0"



3 **UTILITY TUNNEL SSB LAYOUT 2**
Scale: 3/16" = 1'-0"



4 **UTILITY TUNNEL SSB LAYOUT 3**
Scale: 3/16" = 1'-0"

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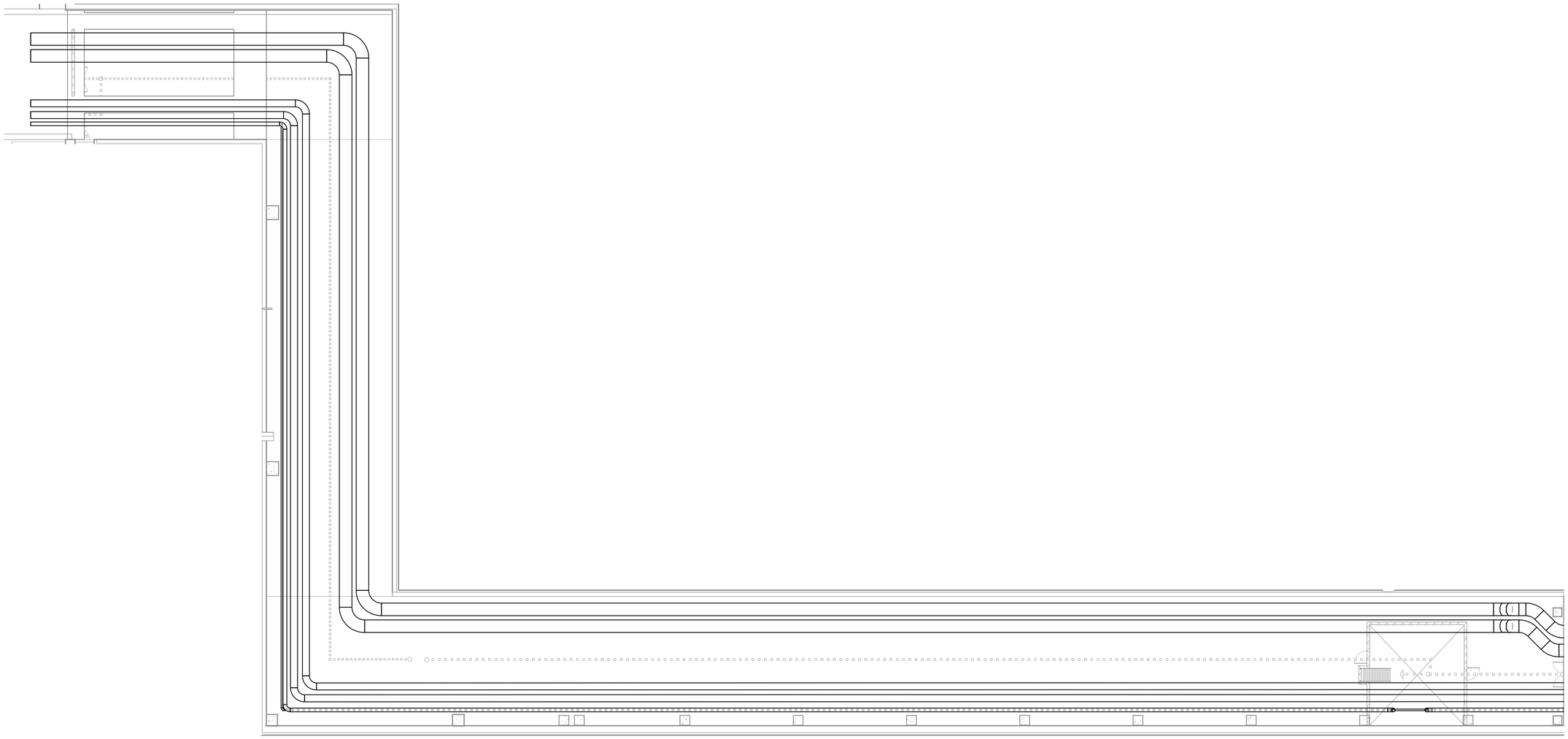
SHEET TITLE

UTILITY TUNNEL - SSB

SHEET NUMBER

UT102

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:43 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **UTILITY TUNNEL SSB MECHANICAL PLAN**
Scale: 3/32" = 1'-0"

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SHEET TITLE

SSB - MECHANICAL

SHEET NUMBER

UT102.1

0 1/2" 1" 2"

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:43 PM AESI Proj. No: 21-154

1 **UTILITY TUNNEL SSB FIRE PROTECTION PLAN**
Scale: 3/32" = 1'-0"

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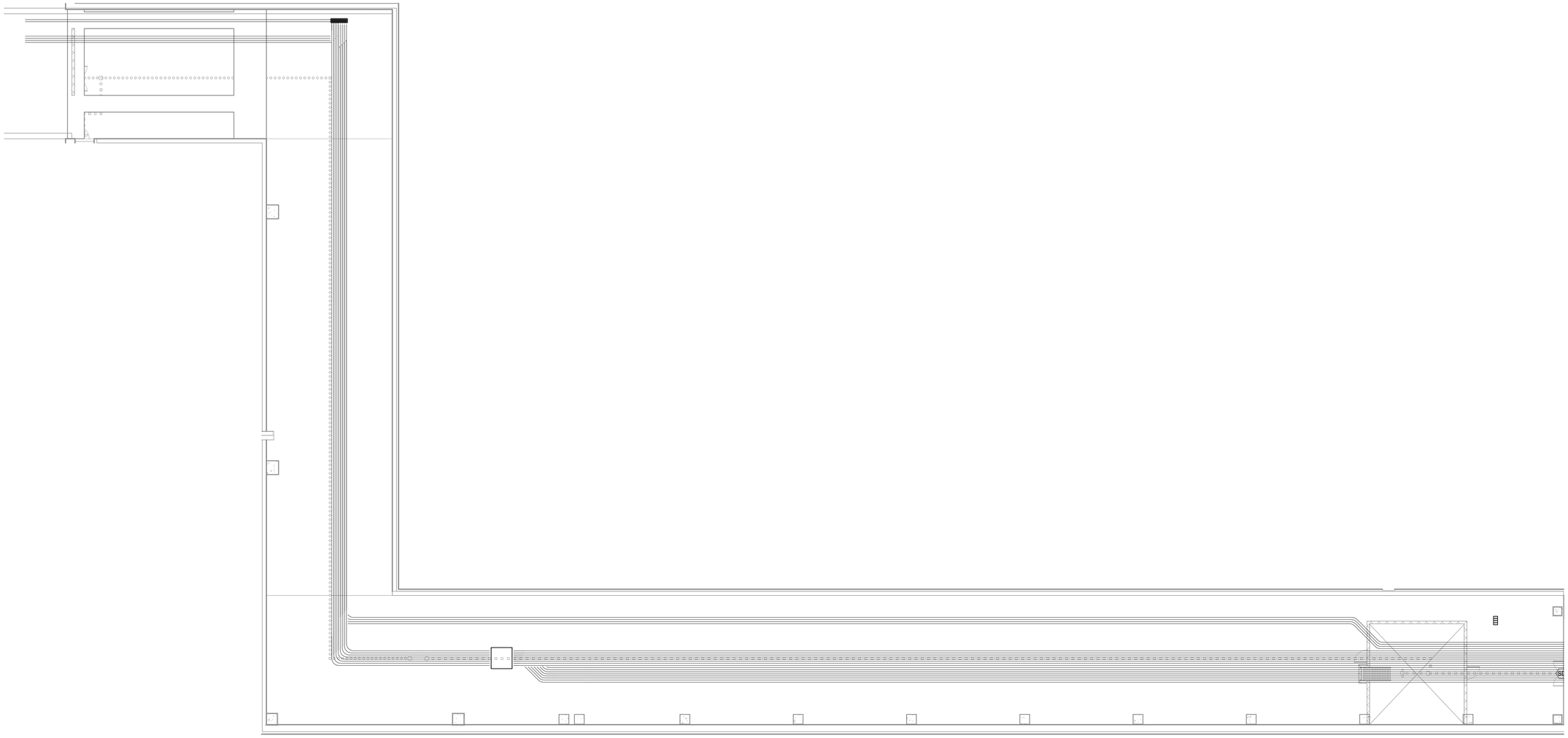
SHEET TITLE

SSB - FIRE PROTECTION

SHEET NUMBER

UT102.2

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:43 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



1 **UTILITY TUNNELSSB SYSTEMS PLAN**
Scale: 3/32" = 1'-0"

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CERTIFICATION
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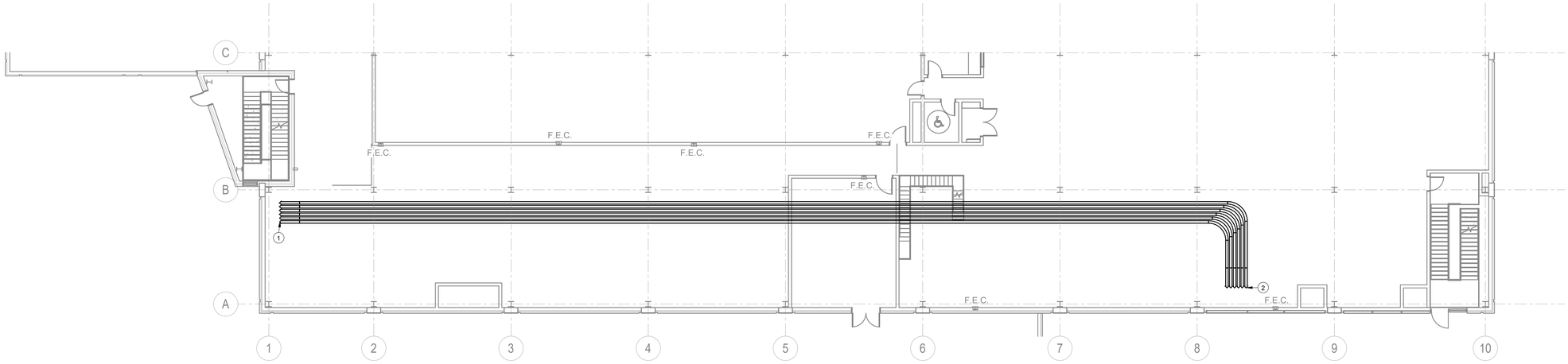
SHEET TITLE
SSB - SYSTEMS

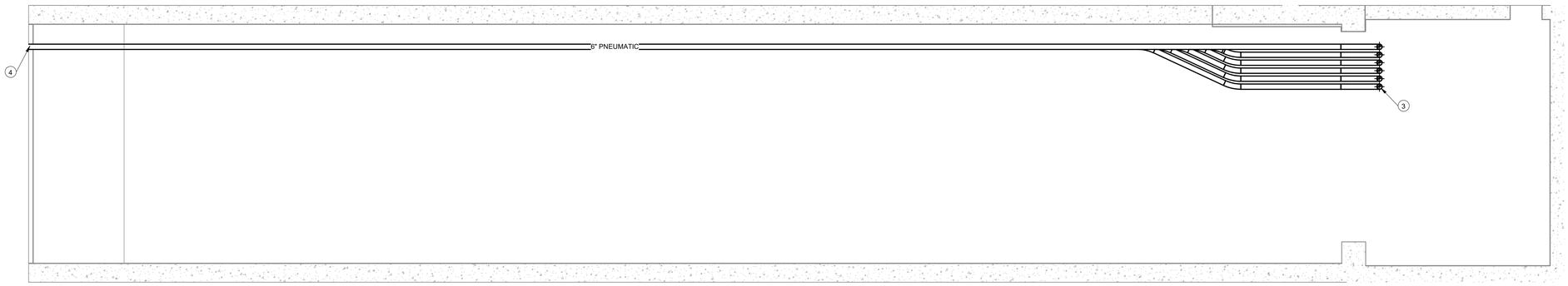
SHEET NUMBER
UT102.3

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:44 PM AESI Proj. No: 21-154
0 1/2" 1" 2"



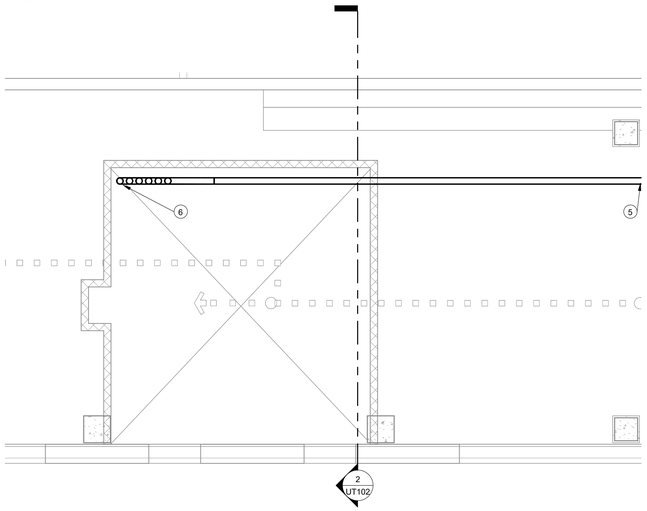
1 FIRST FLOOR PNEUMATIC TUBE PLAN -

Scale: 3/32" = 1'-0"



2 UTILITY TUNNEL CUP PNEUMATIC TUBE PLAN

Scale: 3/16" = 1'-0"



3 UTILITY TUNNEL SSB PNEUMATIC TUBE PLAN

Scale: 3/16" = 1'-0"

GENERAL NOTES:

1. COORDINATE WITH STRUCTURAL PLANS FOR UTILITY TUNNEL CONSTRUCTION.
2. SSB STRUCTURAL SHOWN FOR REFERENCE. COORDINATE WITH SSB STRUCTURAL PLANS FOR UTILITIY TUNNEL CONSTRUCTION
3. SSB ARCHITECTURAL SHOWN FOR REFERENCE.
4. PNEUMATIC TUBES SHOWN FOR REFERENCE. COORDINATE WITH PNEUMATIC TUBE PLANS BY ST. ONGE.

PLAN NOTES:

1. PNEUMATIC TUBES DOWN TO UTILITY TUNNEL.
2. PNEUMATIC TUBES DOWN AND OUT WEST WALL OF BUILDING.
3. PNEUMATIC TUBES UP TO CUP FIRST FLOOR.
4. HAND OFF TO SSB STRUCTURAL.
5. HAND OFF TO CUP STRUCTURAL.
6. PNEUMATIC TUBES UP INTO SSB.

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SHEET TITLE

PNEUMATIC TUBES

SHEET NUMBER

UT103

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
2/9/2023 3:42:44 PM AESI Proj. No: 21-154
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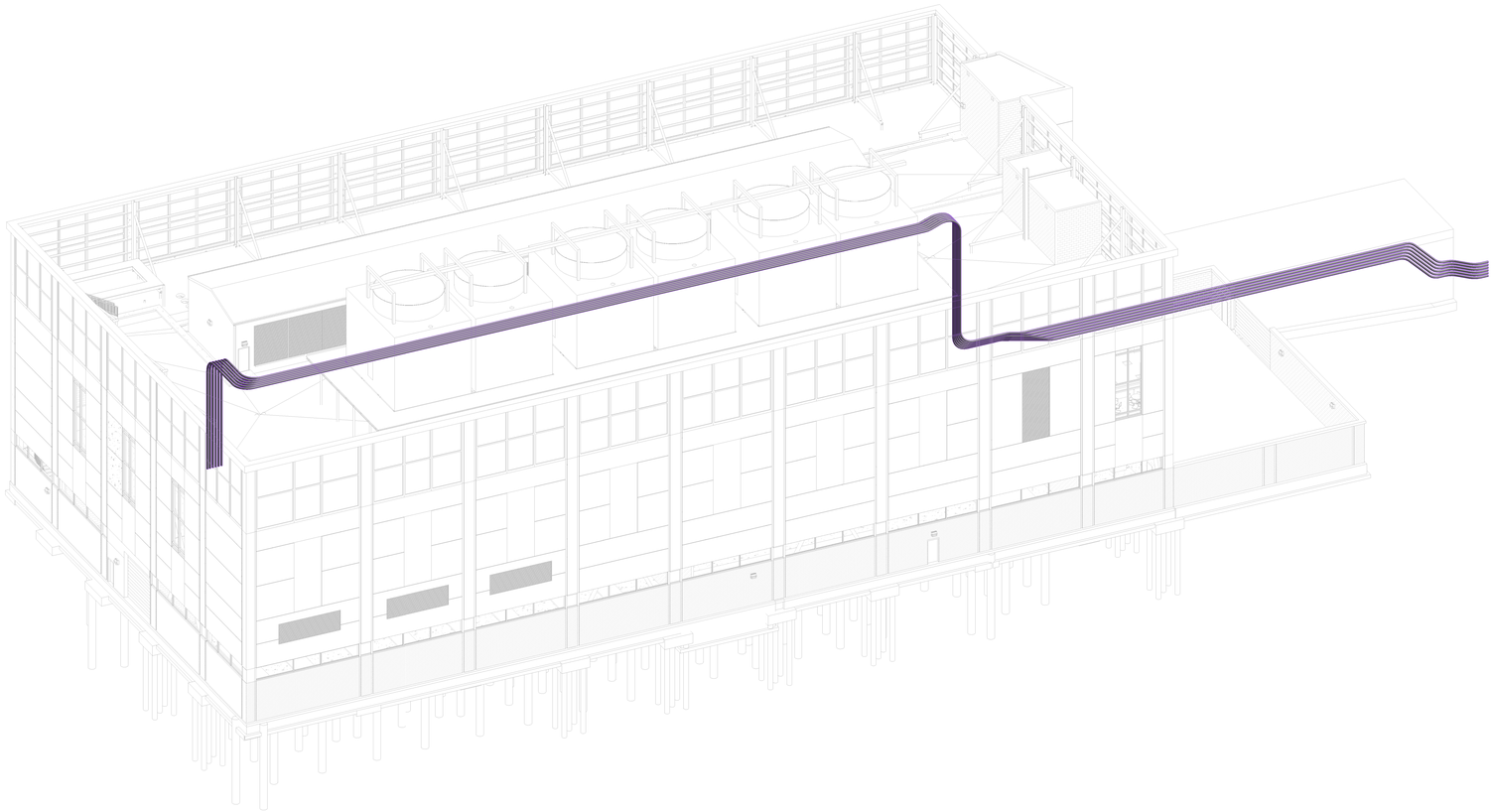

PNEUMATIC TUBE SHEET LIST	
Sheet Number	Sheet Name
PT000	PNEUMATIC TUBE COVER SHEET
PT100	PNEUMATIC TUBE RISER DIAGRAM
PT200	PNEUMATIC TUBE PLANS - LOWER LEVEL
PT201	PNEUMATIC TUBE PLANS - FIRST FLOOR
PT300	PNEUMATIC TUBE EQUIPMENT
PT301	PNEUMATIC TUBE MISC. PARTS
PT302	PNEUMATIC TUBE WALL & FLOOR PENETRATIONS

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PROJECT NO.

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

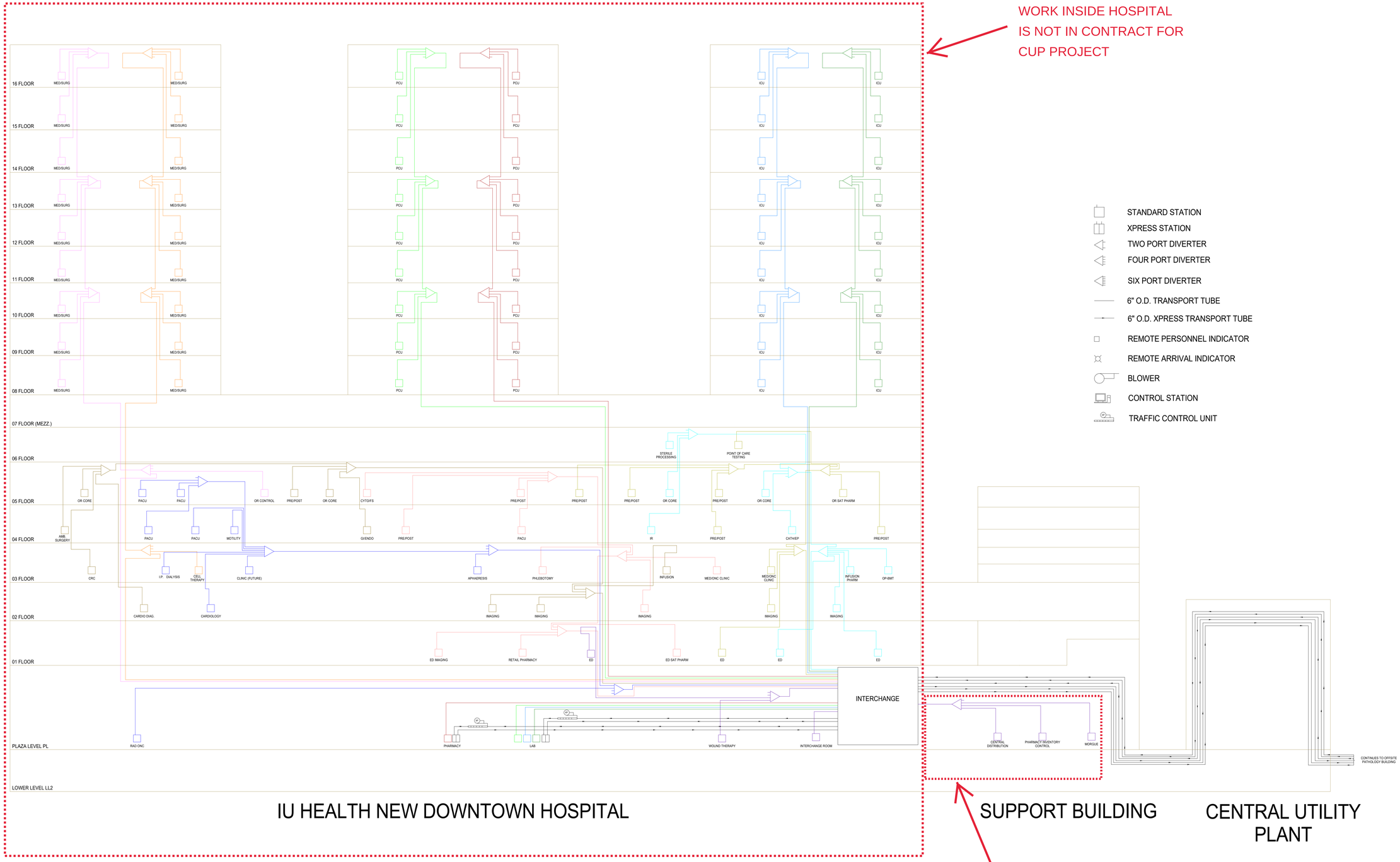
SHEET TITLE

PNEUMATIC TUBE COVER SHEET

SHEET NUMBER

PT000

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
1/19/2023 3:43:11 PM AESI Proj. No:
0 1/2" 1" 2"



STANDARD STATION
XPRESS STATION
TWO PORT DIVERTER
FOUR PORT DIVERTER
SIX PORT DIVERTER
6" O.D. TRANSPORT TUBE
6" O.D. XPRESS TRANSPORT TUBE
REMOTE PERSONNEL INDICATOR
REMOTE ARRIVAL INDICATOR
BLOWER
CONTROL STATION
TRAFFIC CONTROL UNIT

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2022-05-04

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PROJECT NO.	

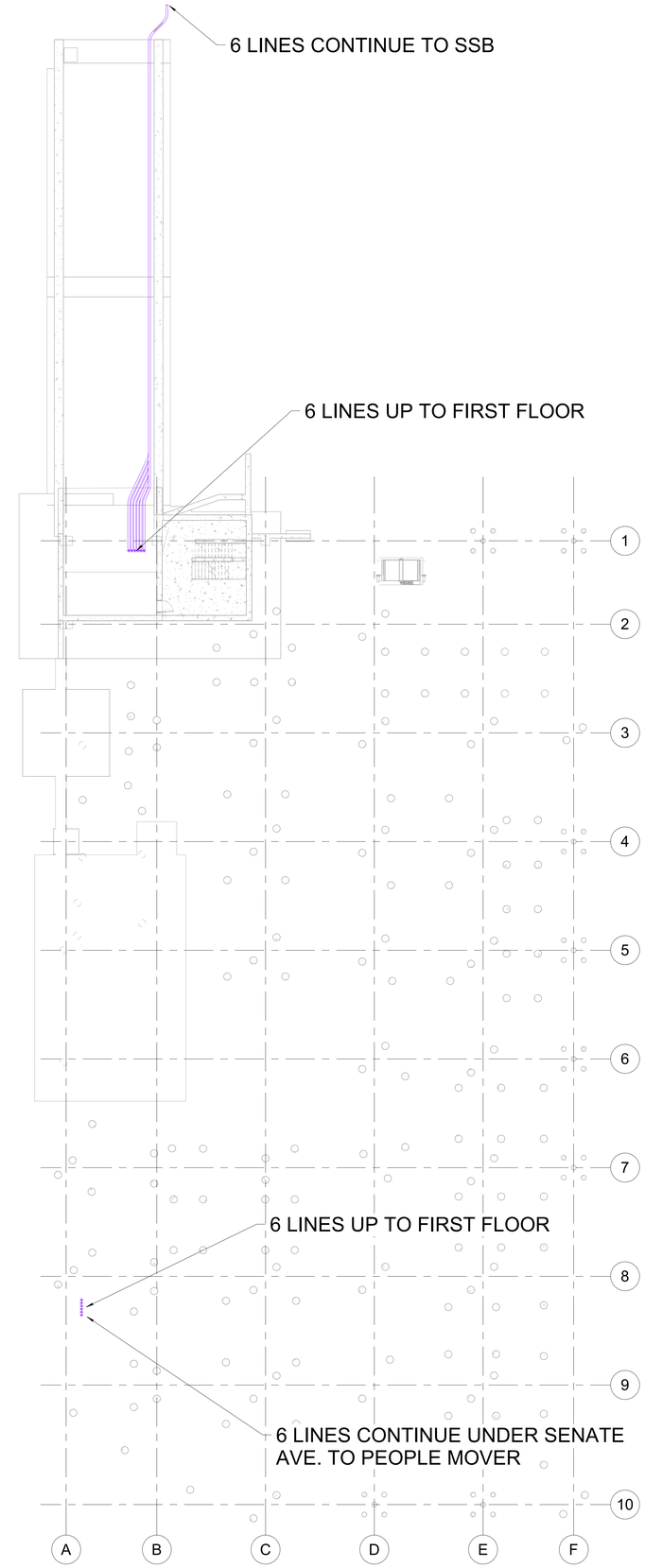
SHEET TITLE

PNEUMATIC TUBE RISER DIAGRAM

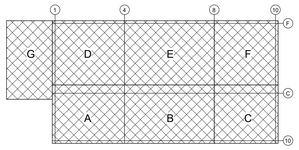
SHEET NUMBER

PT100

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
1/19/2023 3:43:11 PM AESI Proj. No:
0 1/2" 1" 2"



1 LOWER LEVEL
1/16" = 1'-0"



KEY PLAN
SCALE: NONE

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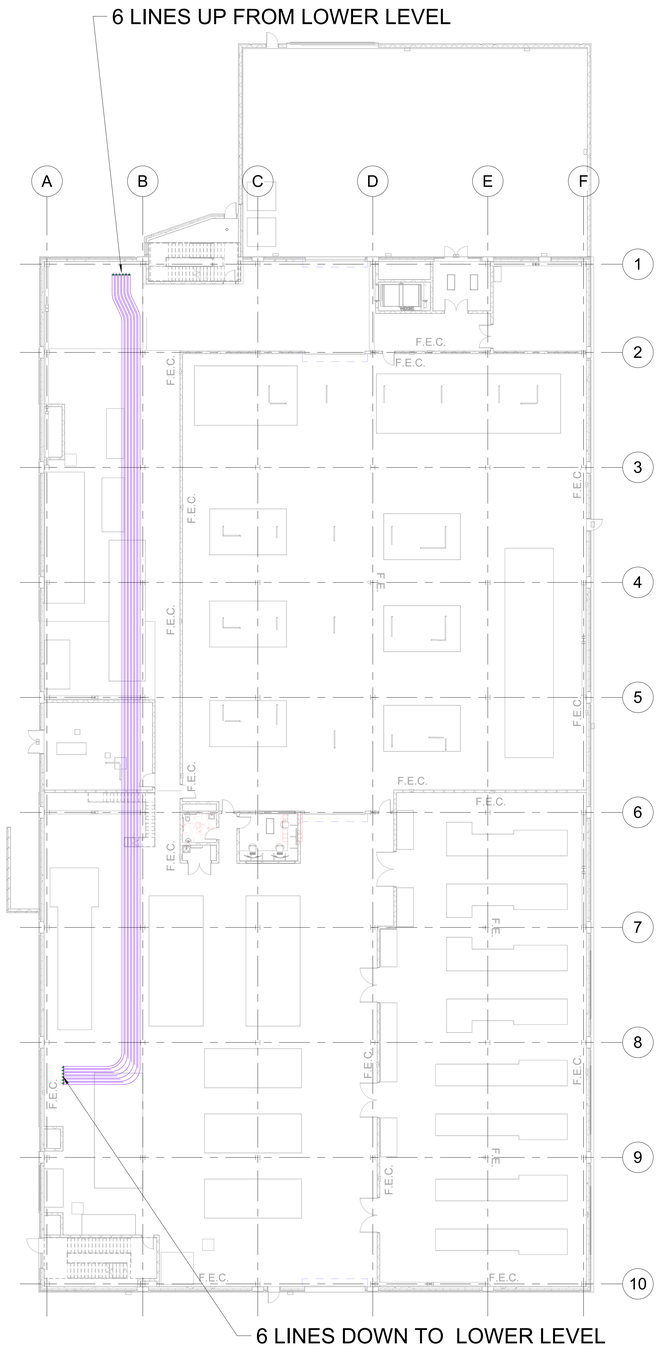
SHEET TITLE

PNEUMATIC TUBE PLANS - LOWER LEVEL

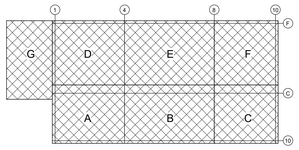
SHEET NUMBER

PT200

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
1/19/2023 3:43:12 PM AESI Proj. No:
0 1/2" 1" 2"



1 FIRST FLOOR
1/16" = 1'-0"



KEY PLAN
SCALE: NONE

OWNER

Indiana University Health
Medical Center Campus
340 W. 10th Street
Indianapolis, IN, 46202

PROJECT

Central Utility Plant

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9975 Castle Creek Parkway N Drive, Suite 300 • Indianapolis, Indiana 46250
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REVISIONS

NO.	DATE	DESCRIPTION

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APPROVED BY Approver	
PROJECT NO.	

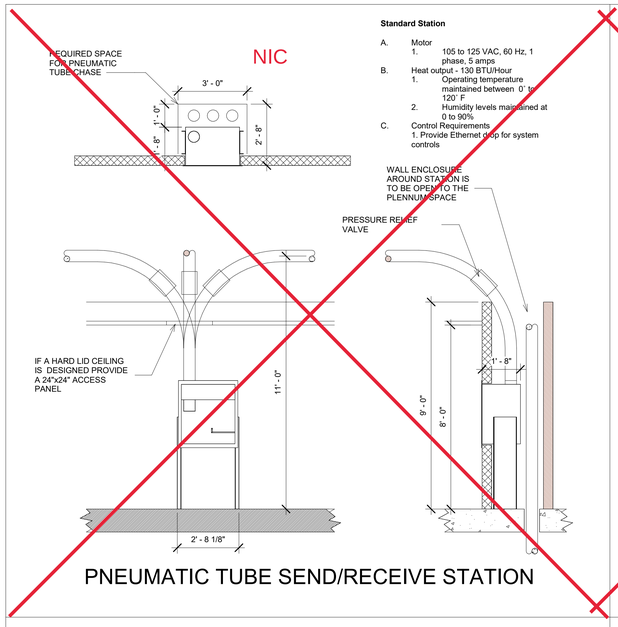
SHEET TITLE

PNEUMATIC TUBE PLANS - FIRST FLOOR

SHEET NUMBER

PT201

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
1/19/2023 3:43:13 PM AESI Proj. No:
0 1/2" 1" 2"



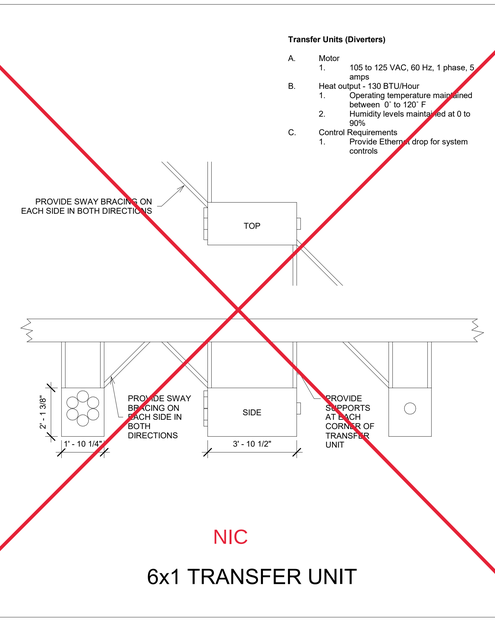
Standard Station

A. Motor
1. 105 to 125 VAC, 60 Hz, 1 phase, 5 amps

B. Heat output - 130 BTU/Hour
1. Operating temperature maintained between 0° to 120° F
2. Humidity levels maintained at 0 to 90%

C. Control Requirements
1. Provide Ethernet drop for system controls

PNEUMATIC TUBE SEND/RECEIVE STATION



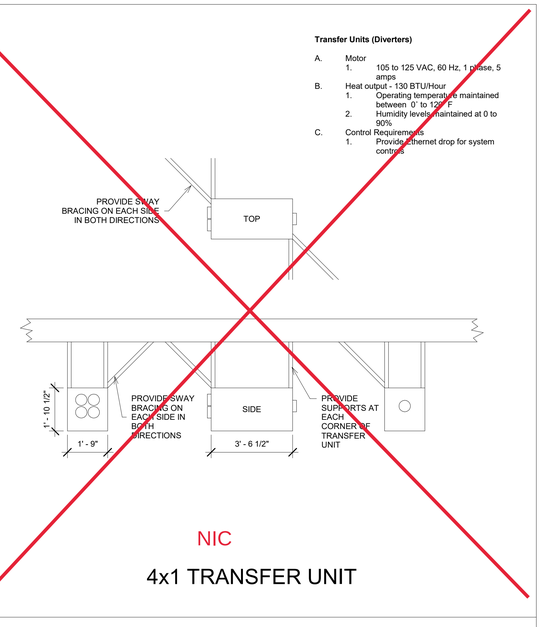
Transfer Units (Diverters)

A. Motor
1. 105 to 125 VAC, 60 Hz, 1 phase, 5 amps

B. Heat output - 130 BTU/Hour
1. Operating temperature maintained between 0° to 120° F
2. Humidity levels maintained at 0 to 90%

C. Control Requirements
1. Provide Ethernet drop for system controls

6x1 TRANSFER UNIT



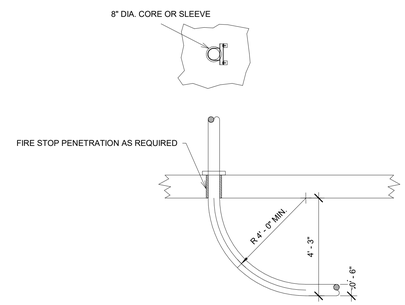
Transfer Units (Diverters)

A. Motor
1. 105 to 125 VAC, 60 Hz, 1 phase, 5 amps

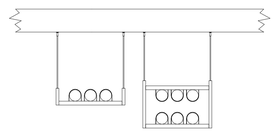
B. Heat output - 130 BTU/Hour
1. Operating temperature maintained between 0° to 120° F
2. Humidity levels maintained at 0 to 90%

C. Control Requirements
1. Provide Ethernet drop for system controls

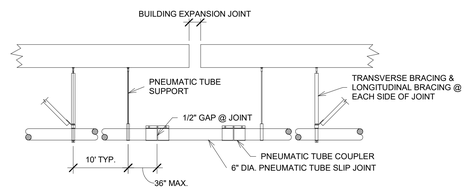
4x1 TRANSFER UNIT



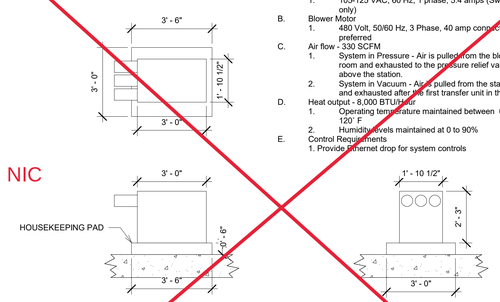
FLOOR PENETRATION DETAIL



OPTIONAL TUBE SUPPORT DETAIL



PNEUMATIC TUBE EXPANSION JOINT DETAIL



Blowers (6 inch system)

A. Shifter Valve Motor
1. 105-125 VAC, 60 Hz, 1 phase, 5.4 amps (Swisslog only)

B. Blower Motor
1. 480 Volt, 50/60 Hz, 3 Phase, 40 amp connection is preferred

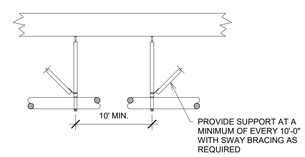
C. Air flow - 330 SCFM
1. System in Pressure - Air is pulled from the blower room and exhausted to the pressure relief valve above the station.
2. System in Vacuum - Air is pulled from the station and exhausted after the first transfer unit in the zone.

D. Heat output - 8,000 BTU/Hour
1. Operating temperature maintained between 0° to 120° F
2. Humidity levels maintained at 0 to 90%

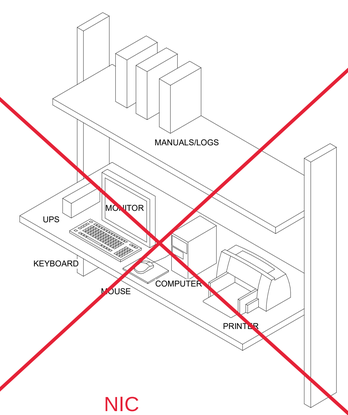
E. Control Requirements
1. Provide Ethernet drop for system controls

POWER SUPPLY	FREQUENCY	PHASED POWER	CURRENT	FULL LOAD CURRENT
200-230	50/60	3 PHASE	10	28
460	50/60	3 PHASE	10	12.5

PNEUMATIC TUBE BLOWER



PNEUMATIC TUBE SUPPORT DETAIL



COMMUNICATION CONTROL PANEL

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
1/19/2023 3:43:13 PM AESI Proj. No:

0 1/2" 1" 2"

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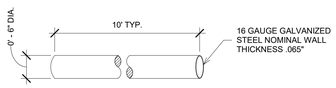
SHEET TITLE

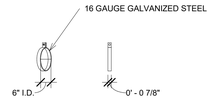
PNEUMATIC TUBE EQUIPMENT

SHEET NUMBER

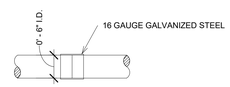
PT300



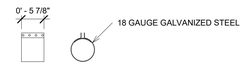
1 TYPICAL TUBING (STRAIGHT END)



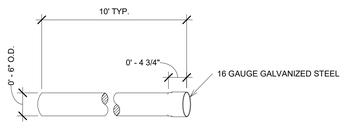
2 TYPICAL TUBE HANGER



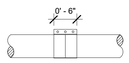
3 TYPICAL SOLID SLEEVE



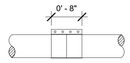
4 TYPICAL CLAMP SLEEVE



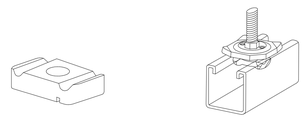
5 TYPICAL TUBING (ONE END EXPANDED)



6 COMPRESSION COUPLING

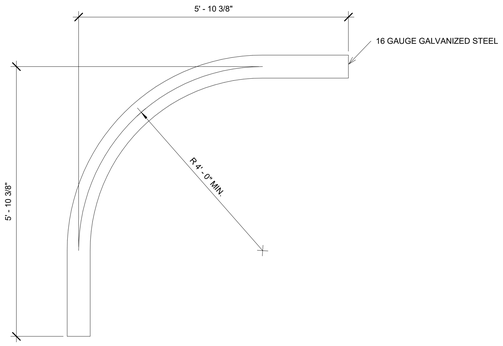


7 COMPRESSION COUPLING

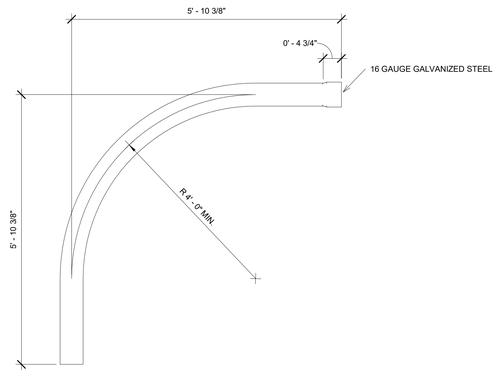


CHANNEL NUT

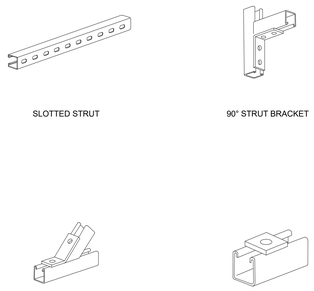
SADDLE NUT ASSEMBLY



8 90° LONG RADIUS BEND (STRAIGHT END)



9 90° LONG RADIUS BEND (ONE END EXPANDED)



SLOTTED STRUT

90° STRUT BRACKET

45° STRUT BRACKET

SQUARE WASHER PLATE

10 TYPICAL UNISTRUT HANGING COMPONENTS

OWNER

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PROJECT NO.	

SHEET TITLE

PNEUMATIC TUBE MISC. PARTS

SHEET NUMBER

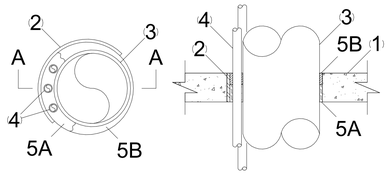
PT301

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1) 0 1/2" 1" 2"
1/19/2023 3:43:13 PM AESI Proj. No:

System No. C-AJ-8081

F Rating - 2 Hr

T Rating - 1 Hr



TOP VIEW SECTION A-A

1. Floor or Wall Asse1. Floor or Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete floor or
min 3-1/2 in. (89 mm) reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*.
Max diameter of opening is 8 in. (203 mm).
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Metallic Sleeve — (Optional) Nom 8 in. (203 mm) diam (or smaller) Schedule 40 (or heavier) steel sleeve cast or grouted into floor or wall
assembly, flush with floor or wall surfaces or extending a max of 3 in. (76 mm) above floor or beyond both surfaces of wall.

2A. Sheet Metal Sleeve — (Optional, Not Shown) - Max 6 in. (152 mm) diam, min No. 26 ga galv steel provided with a No. 26 ga galv steel square
flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than
the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. (102 mm) below the bottom of the floor and a max of 1 in. (25
mm) above the top surface of the concrete floor.

2B. Sheet Metal Sleeve — (Optional, Not Shown) - Max 8 in. (203 mm) diam, min No. 24 ga galv steel provided with a No. 24 ga galv steel square
flange spot welded to the sleeve at approx mid-height, or flush with bottom of sleeve in floors, and sized to be a min of 2 in. (51 mm) larger than
the sleeve diam. The sleeve is to be cast in place and may extend a max of 4 in. (102 mm) below the bottom of the floor and a max of 1 in. (25
mm) above the top surface of the concrete floor.

3. Steel Tube — Nom 6 in. (152 mm) diam (or smaller) No. 16 ga steel tube installed eccentrically within the opening. The annular space between
the tube and the periphery of the opening shall be min 1/4 in. (6 mm) to max 1-3/4 in. (45 mm). Tube to be rigidly supported on both sides of floor
or wall assembly.

4. Cables — Max four 3/8 in. (10 mm) diam two pair No. 22 AWG foil shielded plenum rated communication cables with polyvinyl chloride (PVC)
insulation and jacket. Min separation between cables and periphery of opening shall be 1/4 in. (6 mm). Separation between cables and tube shall
be min 0 in. (point contact) to max 1 in. (25 mm). Cables to be rigidly supported on both sides of floor or wall assembly.

5. Firestop System — The firestop system shall consist of the following:

A. Packing Material — Min 1-1/2 in. (38 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a
permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of
fill material.

B. Fill, Void or Cavity Material* - Sealant — Min 1 in. (25 mm) thickness of fill material applied within the annulus, flush with top surface of floor
or with both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

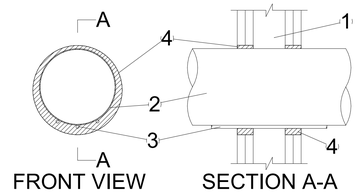
*Bearing the UL Classification Mark
mbly

1 TYPICAL FLOOR PENETRATION DETAIL

System No. W-L-8023

F Ratings -1&2 Hr (See Item 1)

T Rating - 0 Hr



FRONT VIEW SECTION A-A

1. Wall Assembly — The 1 or 2 hr fire rated board/stud wall assembly shall be constructed of the materials and in the manner specified in the
individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following
construction features.

A. Studs — Wall framing shall consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm)
lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.

B. Gypsum Board* — One or two layers of nom 5/8 in. (16 mm) thick gypsum board as specified in the individual Wall and Partition Design. Max
diam of opening is 7 in. (178 mm).
The hourly F Rating of the firestop system is equal to the hourly rating of the wall assembly.

2. Steel Tube — Nom 6 in. (152 mm) diam (or smaller) No. 16 ga steel tube installed eccentrically within the opening. The tube may be installed at
an angle not greater than 45 degrees from perpendicular. The annular space between the tube and the periphery of the opening shall be min 1/4
in. (6 mm) to max 3/4 in. (19 mm). Tube to be rigidly supported on both sides of wall assembly.

3. Cables — Max three 3/8 in (10 mm) diam two pair No. 22 AWG foil shielded communication cables with polyvinyl chloride (PVC) insulation and
jacket. The cables may be installed at an angle not greater than 45 degrees from perpendicular in line with steel tube (Item 2). Min separation
between cables and periphery of opening shall be 1/4 in. (6 mm). Separation between cables and tube shall be min 0 in. (point contact) to max 1
in. (25 mm). Cables to be rigidly supported on both sides of wall assembly.

4. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus for 1 hr rated walls. Min 1-1/4 in. (32
mm) thickness of fill material applied within annulus for 2 hr rated walls. Fill material applied flush with both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

*Bearing the UL Classification Mark

2 TYPICAL WALL PENETRATION DETAIL

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APPROVED BY: Approver
PROJECT NO.

CERTIFICATION: PRELIMINARY NOT FOR CONSTRUCTION

SHEET TITLE

PNEUMATIC TUBE WALL & FLOOR PENETRATIONS

SHEET NUMBER

PT302

ORIGINAL SHEET SIZE IS 30" X 42" (ARCH E1)
11/9/2023 3:43:13 PM AESI Proj. No:
0 1/2" 1" 2"