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NEW PASSENGER TERMINAL BUILDING

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DULUTH, MINNESOTA 55811

FAA AIP NO. _____
RS&H PROJ. NO. 213-1882-091

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VOLUME 2 OF 2



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DUCTWORK SYMBOLS & STANDARDS

WHERE DUCTWORK IS SHOWN SINGLE LINE, FOLLOWING SHALL APPLY FOR ACTUAL DUCT CONSTR.

SINGLE LINE	ACTUAL CONSTRUCTION
ELBOW	DOUBLE THICKNESS TURNING VANES ROUND ELBOW W/ TURNING BLADES IF W > 18" — R = 3W/4
TAP TAKE-OFF	ADJUSTABLE TAP DAMPER — SUPPLY / RETURN
RISE OR DROP	ELEVATION — OFFSET IN VERTICAL PLANE SHALL BE MADE WITH SMOOTH FITTINGS. ARROW IN DIRECTION OF AIRFLOW. — RISE / DOWN
HORIZONTAL OFFSET	OFFSET IN HORIZONTAL PLANE SHALL BE MADE WITH SMOOTH FITTINGS.
PLENUM OVER DIFFUSER — CONN. TO LINEAR DIFFUSER PLENUM	PLENUM OVER DIFFUSER — CONICAL FITTINGS — REGULATION OF VOLUME DAMPER SHALL BE ACCESSIBLE THROUGH THE FACE OF DIFFUSER
FLD — FIRE RATED WALL — FIRE DAMPER	ACCESS DOOR IN DUCT — FLD MOUNTING TYPE DEPENDS ON AIR VELOCITIES AND DUCT SIZE – SEE SPECIFICATIONS. RATING EQUAL TO PARTITION UNLESS NOTED OTHERWISE. (2HR MIN.)
HTG. COIL — HEATING COIL	COIL WITH FLANGED CONNECTION ALL AROUND — DIRECTION OF FLOW — ACCESS DOORS — NOTE: INSTALL ELECTRIC DUCT HEATERS 2'-0" MIN FROM ANY FANS, ELBOWS, OR "T" FITTINGS.
VD	VOLUME DAMPER
ALD	AUTOMATIC LOUVER DAMPER (MOTORIZED DAMPER)
BDD	BDD – BACKDFAFT DAMPER — (T) THERMOSTAT
FLEXIBLE CONNECTION	TRANSITION
SUPPLY	RETURN OR EXHAUST — SOLID CROSS INDICATES UP OR TOWARD. DASHED CROSS INDICATES DOWN OR AWAY.

GRILLE, REGISTER AND DIFFUSER SYMBOLS:

SQUARE CEILING SUPPLY DIFFUSER OR REGISTER — CEILING RETURN OR EXHAUST GRILLE OR REGISTER — SIDEWALL SUPPLY REGISTER — SIDEWALL RETURN OR EXHAUST GRILLE OR REGISTER

ROUND CEILING SUPPLY DIFFUSER OR REGISTER — A/B/300 — TYPE (SEE SCHEDULE) / ø NECK SIZE OR WIDTH X HEIGHT OR SLOT X LENGTH / CFM

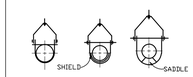
CONTINUOUS FIN TUBE RADIATION

MECHANICAL DRAWING LIST

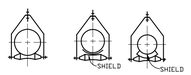
SHEET No.	DESCRIPTION	ISSUED FOR DESIGN DEVELOPMENT 11-30-09	ISSUED FOR 60% CD 02-11-10
M001	MECHANICAL LEGEND		●
M002	MECHANICAL SYMBOLS		●
M110	ENLARGED FIRST FLOOR MECHANICAL PLAN – AREA A		●
M111	ENLARGED FIRST FLOOR MECHANICAL PLAN – AREA B		●
M112	ENLARGED SECOND FLOOR MECHANICAL PLAN – AREA A		●
M113	ENLARGED SECOND FLOOR MECHANICAL PLAN – AREA B		●
M114	ENLARGED THIRD FLOOR MECHANICAL PLAN – AREA A		●
M115	ENLARGED THIRD FLOOR MECHANICAL PLAN – AREA B		●
M116	ENLARGED MECHANICAL ROOF PLAN – AREA A		
M117	ENLARGED MECHANICAL ROOF PLAN – AREA B		
M201	TUG TUNNEL MECHANICAL PLAN		●
M301	HEATING HOT WATER FLOW DIAGRAM		●
M302	CHILLED WATER FLOW DIAGRAM		●
M303	AIRSIDE RADIANT SLAB FLOW DIAGRAM & DETAILS		
M401	MECHANICAL EQUIPMENT SCHEDULES I		●
M402	MECHANICAL EQUIPMENT SCHEDULES II		●
M501	MECHANICAL DETAILS I		●
M502	MECHANICAL DETAILS II		●
M503	MECHANICAL DETAILS III		●

● DENOTES DRAWING CHANGED FOR THIS ISSUE.
○ DENOTES DRAWING NOT CHANGED FOR THIS ISSUE.
▲ DENOTES 1 OR MORE SKETCHES ISSUED FOR THIS ISSUE

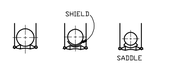
PIPE HANGER & SUPPORT SCHEDULE



#1 #2 #3 CLEVIS HANGERS (FOR 6" PIPE BELOW)



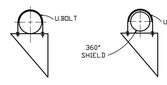
#4 #5 #6 CLEVIS ROLLER HANGERS (FOR 8" PIPE BELLOW)



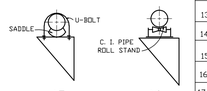
#7 #8 #9 TWO ROD RIGID HANGERS (FOR 8" PIPE AND ABOVE)



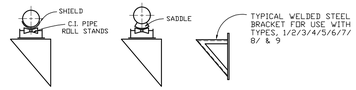
#10 #11 #12 TWO ROD RIGID HANGERS (FOR 8" PIPE AND ABOVE)



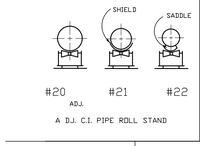
#13 #14



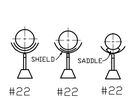
#15 #16



#17 #18 #19 WELDED STEEL BRACKETS



#20 #21 #22 ADJ. A D.J. C.I. PIPE ROLL STAND



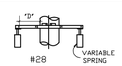
#22 #22 #22 ADJ. STANCHION SUPPORTS



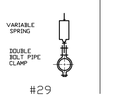
#26 BASE PIPE STANCHION SUPPORT (SIZE PER SPECIFICATIONS)



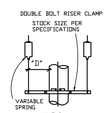
#27 SINGLE BOLT RISER CLAMP SEE SPECIFICATIONS FOR SAFE SIZES



#28 SPRING WITH DOUBLE BOLT RISER CLAMP SEE SPECIFICATIONS FOR SAFE SIZES



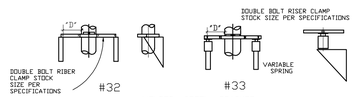
#29 SINGLE ROD SPRING



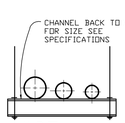
#30 DOUBLE SPRING



#31 TRAPEZE SPRING



#32 #33 WELDED STEEL BRACKET



#37 MULTI TWO ROD RIGID HANGER GANG HANGER

FIG NO.	LESS THAN 1/4" MOVEMENT EXCEPT AS NOTED: NON. INSUL.	CH.W. LINES	HOT LINES	MORE THAN 1/4" MOVEMENT EXCEPT AS NOTED: NON. INSUL.	CH.W. LINES	HOT LINES
	OVERHEAD SUPPORTS (HORIZONTAL PIPING)					
1						
2		✳				
3			✳			
4				✳		
5					✳	
6						✳
7				✳		
8					✳	
9						✳
10	✳					
11		✳				
12			✳			
	WALL SUPPORTS (HORIZONTAL PIPING)					
13	✳					
14		✳				
15			✳			
16				✳		
17					✳	
18						✳
19	✳	✳	✳	✳	✳	✳
	FLOOR SUPPORTS (HORIZONTAL PIPING)					
20				✳		
21					✳	
22						✳
23	✳					
24		✳				
25			✳			
	FLOOR SUPPORTS (VERTICAL PIPING)					
26	✳	✳	✳			
27	✳	✳	✳			
28				✳	✳	✳
	OVERHEAD SUPPORTS (VERTICAL & HORIZ. PIPING)					
29				✳ ●	✳ ●	✳ ●
30				✳ ●	✳ ●	✳ ●
31				✳ ●	✳ ●	✳ ●
	WALL SUPPORTS (VERTICAL PIPING)					
32	✳	✳	✳			
33				✳ ●	✳ ●	✳ ●
	ANCHORS (VERTICAL & HORIZONTAL PIPING)					
34	APPLIES TO ALL PIPES TO STOP MOVEMENT					
35						
	GANG HANGERS (VERTICAL PIPING)					
36	✳	✳	✳			
	GANG HANGERS (HORIZONTAL PIPING)					
37	✳	✳	✳	TO BE INDIVIDUALLY SUPPORTED		
	GUIDES (VERTICAL & HORIZONTAL PIPING)					
38					✳	
39						✳
40				✳		
41					✳	
42						✳



#34 SINGLE BOLT RISER CLAMP

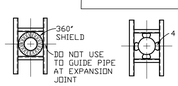


#35 STRUCT. STEEL FRAME TO SUIT

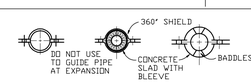
ANCHORS



#36 MULTI- J HOOK PLATE GANG HANGER



#38 #39 OPEN BAY-NO SLEEVE IN FLOOR. STEEL FRAME



#40 #41 #42 SINGLE BOLT RISER CLAMS

G U I D E S

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02-11-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

MECHANICAL LEGEND

SHEET NUMBER

M001

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Drawing: H:\2882.00 Duluth Airport\A.0 CADD\Civil 3d\Projects\2882_M001.dwg Plotted on: 2/12/2010 3:02 PM Plotted by: Tolye, Todd

HVAC PIPE SYMBOLS

- ANGLE VALVE
- AUTO. VENT PIPE DISCHARGE TO DRAIN
- BLIND FLANGE
- BASKET TYPE STRAINER
- DUPLEX BASKET TYPE STRAINER
- CAP
- COUPLING TYPE FLEXIBLE CONNECTION
- MOTOR OPERATED VALVE (AUTOMATIC)
- DRAIN VALVE PIPE TO FLOOR DRAIN
- EXPANSION JOINT
- FLEXIBLE CONNECTION
- FLOAT OPERATED VALVE
- FLOW IN THE DIRECTION OF THE ARROW
- FMD — FLOW MEASURING DEVICE
- FS — FLOW SWITCH
- GAUGE COCK
- GATE VALVE
- GLOBE VALVE
- HOSE END DRAIN VALVE (3/4")
- MANUAL BUTTERFLY VALVE
- MANUAL AIR VENT VALVE
- MOTOR OPERATED BUTTERFLY VALVE
- NEEDLE VALVE
- ORIFICE
- PIPE ANCHOR
- PIPE ANCHOR OR SUPPORT
- PIPE GUIDE
- PLUG VALVE OR COCK
- PRESSURE GAUGE ASSEMBLY
- PRESSURE GAUGE ASSEMBLY W/ SNUBBER
- PRESSURE REDUCING VALVE
- PIPE REDUCER OR INCREASER
- RELIEF OR SAFETY VALVE
- SOLENOID OPERATED VALVE
- SWING CHECK VALVE
- THERMOMETER
- PETE'S PLUG
- THREE-WAY CONTROL VALVE
- UNION
- Y-TYPE STRAINER WITH CLEANOUT PLUG
- TWO-WAY CONTROL VALVE
- BEAM PENETRATION
- GRISWOLD VALVE
- BUTTERFLY VALVE
- BALANCING VALVE
- FOR — BALANCING VALVE
- —V— VENT LINE
- CD — CONDENSATE DRAIN
- FOS — FUEL OIL SUPPLY
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- HHWS — HOT WATER SUPPLY
- HHWR — HOT WATER RETURN
- G — GAS

HVAC DUCT SYMBOLS

- HINGED ACCESS DOOR IN EQUIPMENT OR DUCT
- CEILING DIFFUSER WITH TAG NO. AND AIR QUANTITY. SEE SCHEDULE FOR SIZE BLANK OFF
- COLUMN NUMBER OR LETTER
- DETAIL OR SECTION- REMOTE LOCATION
- DETAIL OR SECTION- DRAWING
- DIRECTION OF AIR FLOW
- DUCT ELBOW TURNED DOWN
- DUCT ELBOW TURNED UP
- RETURN AIR OPENING THRU PARTITION ABOVE CEILING
- DUCT INCLINED DOWN WITH RESPECT TO AIRFLOW
- DUCT INCLINED UP WITH RESPECT TO AIRFLOW
- DUCT-SIZE IN "N" FIRST DIMENSION IS SIDE SHOWN
- DUCT-SIZE TRANSITION
- FIRE DAMPER W/ ACCESS PANEL
- VOLUME DAMPER
- MOTOR OPERATED DAMPER
- FLEXIBLE DUCT CONNECTION
- FLEXIBLE DUCT
- LINED DUCT- DIMENSION SHOWN IS CLEAR INSIDE
- SQUARE TURNED ELBOW WITH TURNING VANES
- SMOKE DAMPER W/ACCESS PANEL
- COMBINATION FIRE/SMOKE DAMPER W/ACCESS PANEL
- DUCT SOUND ATTENUATOR
- BRANCH TAKEOFF WITH VOLUME DAMPER
- SUPPLY DUCT RISER OR SECTION
- EXHAUST OR RETURN DUCT RISER OR SECTION
- SUPPLY REGISTER (WALL)
- RETURN REGISTER (WALL)
- RETURN GRILLE (CEILING)
- UNDERCUT DOOR MAXIMUM
- DUCT-MOUNTED HEATING COIL
- BEAM PENETRATION
- FINNED TUBE RADIATOR

CONTROL SYMBOLS

C	COMMON
CCP	CENTRAL CONTROL PANEL
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FS	FLOW SWITCH
LLR	LOW LIMIT RELAY
LP	LOCAL PANEL
OPER	OPERATION
PI	PRESSURE INDICATOR
RC	RECEIVER CONTROLLER
SAV	SOLENOID AIR VALVE
SPT	STATIC PRESSURE TRANSMITTER
TC	TIME CLOCK
TI	TEMPERATURE INDICATOR
TT	TEMPERATURE TRANSMITTER
VIB	VIBRATION
VPT	VELOCITY PRESSURE TRANSMITTER

- CA — COMPRESSED AIR PIPING
- DAMPER END SWITCH
- DEVICE WITH AVERAGING SENSING DEVICE
- DP — DIFFERENTIAL PRESSURE SWITCH CONTROLLER
- ELECTRIC CONTACT (N.C.)
- ELECTRIC CONTACT (N.O.)
- ELECTRIC PNEUMATIC VALVE (EP)
- IMMERSION OR INSERTION STATUS
- INDICATION POINT
- MOTOR OPERATOR FOR DAMPER OR VALVE
- OPPOSED DAMPER BLADE
- PARALLEL DAMPER BLADE
- PLOT UNIT RUN STATUS
- PRESSURE ELECTRIC SWITCH (PE)
- RECEIVER CONTROLLER
- ROOM THERMOSTAT
- PNEUMATIC ELECTRIC SWITCH
- 3 POSITION SWITCH & HAND OFF AUTO
- 3-WAY AIR VALVE
- T — THERMOSTAT
- DD — DUCT SMOKE DETECTOR
- H — HUMIDISTAT

HVAC ABBREVIATIONS

ACCU	AIR COOLED CONDENSING UNIT
AC	AIR CONDITIONING
AD	ACCESS DOOR
AH	AIR HANDLING SYSTEM
AL	ACOUSTICAL LINING
APPROX.	APPROXIMATE
AVG	AVERAGE
ABV	ABOVE
AS	AIR SEPARATOR
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
B	BOILER
BOD	BOTTOM OF DUCT
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CA	COMPRESSOR AIR
CC	COOLING COIL
CCW	COUNTER CLOCKWISE
CD	CONDENSATE DRAIN
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CH	CHEMICAL TREATMENT TANK
CI	CAST IRON
CL	CENTER LINE
CLG	CEILING
C.O.	CLEAN OUT
CO	CARBON MONOXIDE
COT	COMPRESSION TANK
CONC	CONCRETE
COND. DR.	CONDENSATE DRAIN (COIL. PAN DRAIN)
CONN.	CONNECTION
CR	CEILING REGISTER
CT	COOLING TOWER
CW	CLOCKWISE
CY	CYCLE
DB	DRY BULB TEMPERATURE
DD	DUCT SMOKE DETECTOR
DFN	DEFLECTION
DG	DOOR GRILLE
DIA	DIAMETER
DIFF	DIFFUSER
DX	DIRECT EXPANSION
DN	DOWN
DWG.	DRAWING
EF	EXHAUST FAN
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ED	EXHAUST DISCHARGE
EE	ELECTRICAL ROOM EXHAUST
EFF	EFFICIENCY
EH	EXHAUST HEAD
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC.	ELECTRIC
ELEV.	ELEVATOR
EOAT	ENTERING OUTSIDE AIR TEMPERATURE
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
F	FILTER
FA	FREE AREA
FD	FIRE DAMPER
F/SD	FIRE SMOKE DAMPER
FHE	FUME HOOD EXHAUST
FL	FLOOR
FLEX.	FLEXIBLE
FMD	FLOW MEASURING DEVICE
FO	FILTER ON OUTSIDE AIR
FP	FAN POWER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FR	FILTER ON RETURN AIR
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT
FTR	FINNED TUBE RADIATOR
FLGD	FLANGED
GA	GAGE OR GAUGE
GC	GENERAL CONTRACTOR
GD	GRAVITY DAMPER
GE	GENERAL EXHAUST
GR	GRILLE
GALV	GALVANIZED
H	HORIZONTAL
HC	HEATING COIL
HP	HORSEPOWER
HTG	HEATING
HU	HUMIDIFIER
HVAC	HEATING VENTILATION & AIR CONDITIONING
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IAC	INSTRUMENTS AIR COMPRESSOR
IN	INCH
INSUL	INSULATION
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
KWH	KILOWATT HOUR
LD	LINED DUCT
LN	LINEAR
LOV	INTAKE OR EXHAUST LOUVER
LWT	LEAVING WATER TEMPERATURE
MACH	MACHINE
MAT	MIXED AIR TEMPERATURE
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MD	MOTORIZED DAMPER
MIN	MINIMUM
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
NC	NOISE CRITERIA
N.C.	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
NK	NECK
N.O.	NORMALLY OPEN
NR	NO REQUIREMENT
NRO	NET ROOF OPENING
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DAMPER
OSD	OPEN SITE DRAIN
OV	OUTLET VELOCITY
PFR	PREFILTER ON RETURN AIR
1 PH	SINGLE PHASE
3 PH	THREE PHASE
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSIG	POUND PER SQUARE INCH
PNEU.	PNEUMATIC
R	REFRIGERATION
RA	RETURN AIR
REF	RECIRCULATION/EXHAUST FAN
REG	REGISTER
REQ'D	REQUIRED
RET	RETURN
RM	ROOM
RP	REFRIGERANT PUMPOUT UNIT
RPM	REVOLUTIONS PER MINUTE
RV	PRESSURE RELIEF VALVE
S	SUPPLY FAN
SA	SUPPLY AIR
SD	SMOKE DAMPER
SF	SQUARE FEET
SHT	SHEET
SM	SHEET METAL
SP	STATIC PRESSURE
SPD	SPLITTER DAMPER
SPEC	SPECIFICATION
ST	SOUND ATTENUATOR
STD	STANDARD
SUP	SUPPLY
SOL	SOLENOID
SCRD	SCREWED
SS	STAINLESS STEEL
T	TEMPERATURE DIFFERENCE
TD	
TE	TOILET EXHAUST
TEMP	TEMPERATURE
TR	TON OF REFRIGERATION
TS	TOP SPEED
T.S.P.	TOTAL STATIC PRESSURE
TYP	TYPICAL
TCP	TEMPERATURE CONTROL PANEL
TH	TOP HORIZONTAL
UG	UNDERGROUND
UB	UP BLAST
V	VENTILATION FAN
VA	VALVE
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VOL	VOLUME
VTR	VENT THRU ROOF
W	WATT
W/	WITH
WB	WET BULB TEMPERATURE
WE	WALL EXHAUST
WC	WATER COLUMN
WM	WATER METER
WMS	WIRE MESH SCREEN
Z	ZONE

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REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: XX

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SHEET TITLE

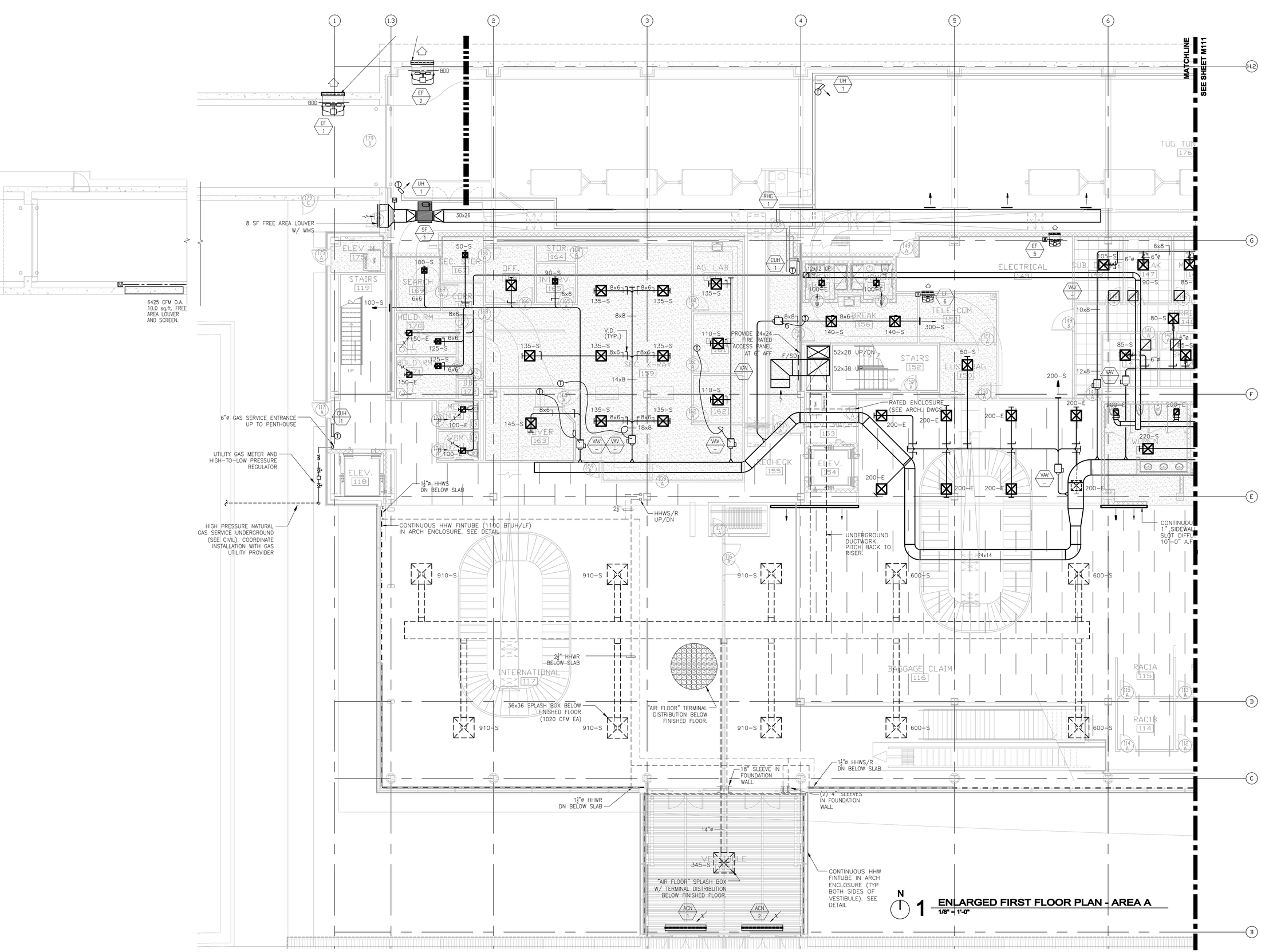
MECHANICAL SYMBOLS

SHEET NUMBER

M002

60% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\5.0 CAD\(5.4) M&P\Dwgs\M002_M002.dwg Plotted on: 2/12/2010 3:05 PM Plotted by: Tobyn, Todd



N

1 ENLARGED FIRST FLOOR PLAN - AREA A

1/8" = 1'-0"

Drawing: X:\2008.00 Duluth Airport\5.0 CADD\[5-0] HVAC\Dwgs\M008_M110.dwg Plotted on: 2/12/2010 4:22 PM Plotted by: Tolys, Todd

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SHEET TITLE

ENLARGED FIRST FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER

M110

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MATCHLINE
SEE SHEET M110

1 ENLARGED FIRST FLOOR PLAN - AREA B
1/8" = 1'-0"

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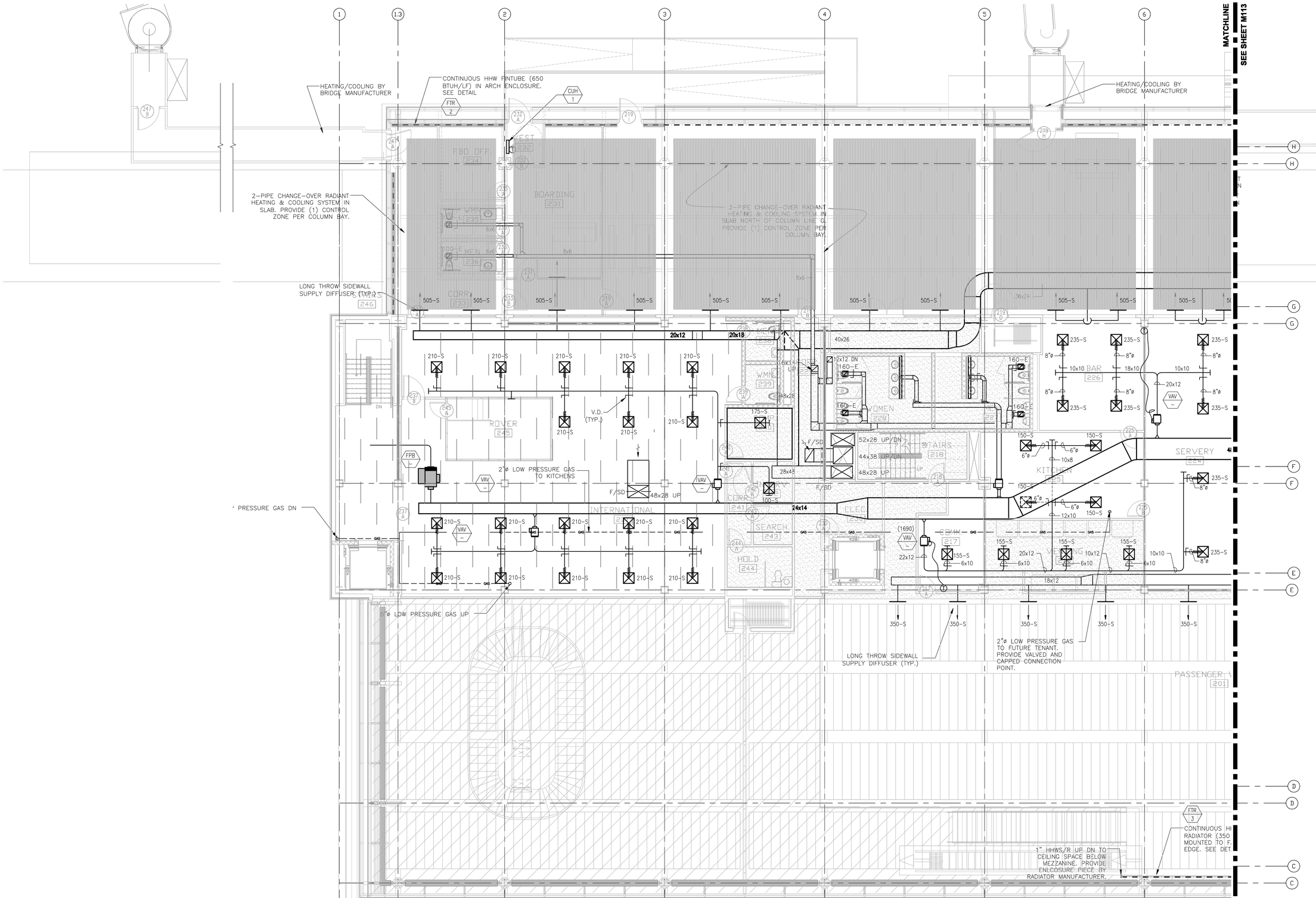
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SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER
M111

60% NOT FOR CONSTRUCTION

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1 **ENLARGED SECOND FLOOR PLAN - AREA A**
1/8" = 1'-0"

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SHEET TITLE
ENLARGED SECOND FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER
M112

60% NOT FOR CONSTRUCTION

Drawing: H:\2008.00 Duluth Airport\A.0 CADD\(2.4) HVAC\Dwgs\2008_M112.dwg Plotted on: 2/12/2010 4:04 PM Plotted by: Tolye, Patti

MATCHLINE
SEE SHEET M112

HEATING/COOLING BY BRIDGE MANUFACTURER

CONTINUOUS HHW FINTUBE (650 BTUH/LF) IN ARCH ENCLOSURE. SEE DETAIL

FTR 2

HEATING/COOLING BY BRIDGE MANUFACTURER

FIXED BRIDGE 248

2-PIPE CHANGE-OVER RADIANT HEATING & COOLING SYSTEM IN SLAB NORTH OF COLUMN LINE G. PROVIDE (1) CONTROL ZONE PER COLUMN BAY.

2-PIPE CHANGE-OVER RADIANT HEATING & COOLING SYSTEM IN SLAB. PROVIDE (1) CONTROL ZONE PER COLUMN BAY.

LONG THROW SIDEWALL SUPPLY DIFFUSER (TYP.)

FTR 3

CONTINUOUS HHW FLAT PLATE RADIATOR (350 BTUH/LF) MOUNTED TO FACE OF SLAB EDGE. SEE DETAIL

1" HHWS/R UP DN TO CEILING SPACE BELOW MEZZANINE. PROVIDE ENCLOSURE PIECE BY RADIATOR MANUFACTURER.

10x8 UP TO MECH. RM.

N

1 ENLARGED SECOND FLOOR PLAN - AREA A
1/8" = 1'-0"

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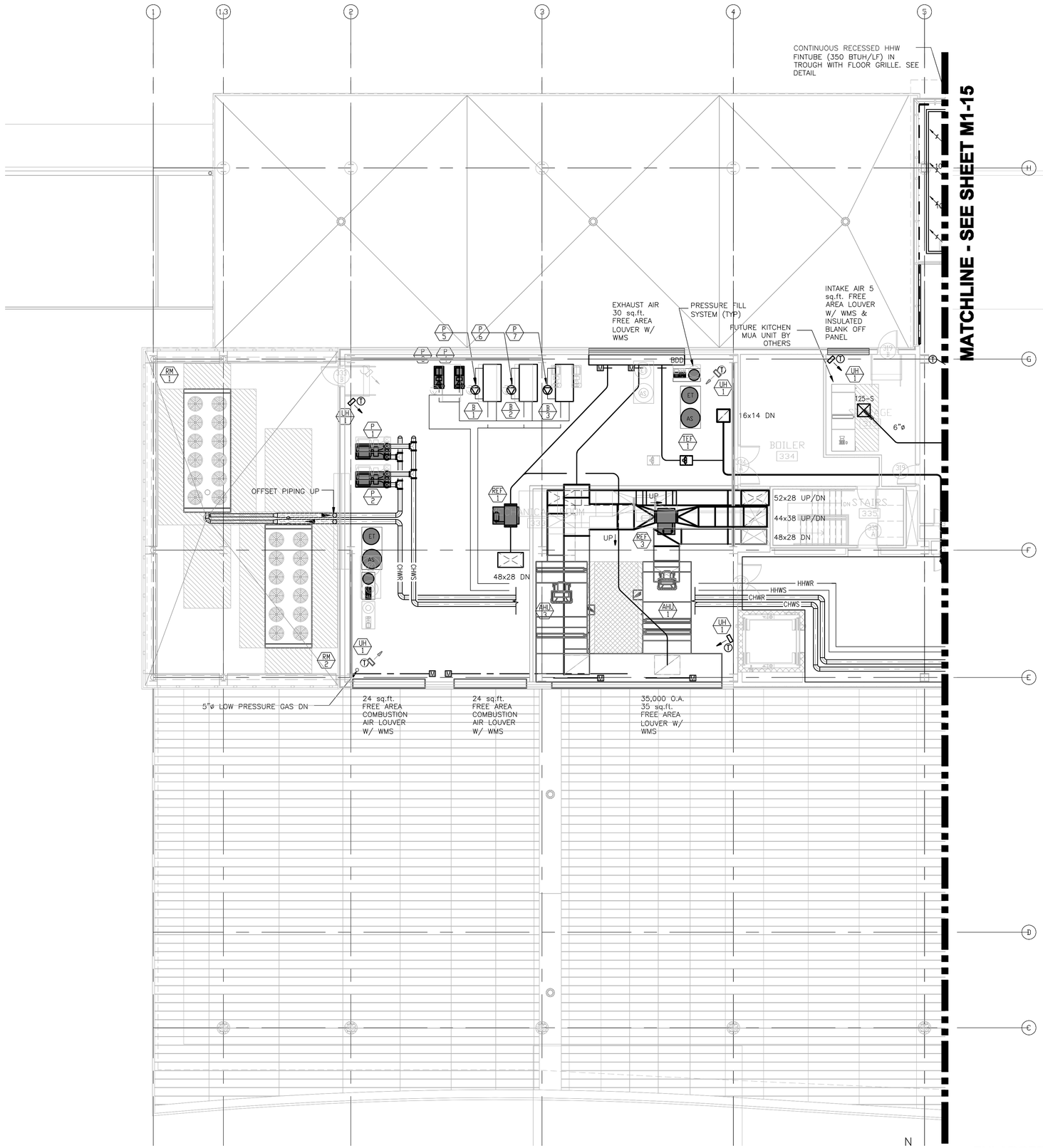
ENLARGED SECOND FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER

M113

60% NOT FOR CONSTRUCTION

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1 ENLARGED THIRD LEVEL FLOOR PLAN - ADMIN.

1/8" = 1'-0"

Drawing: M:\2008.00 Duluth Airport\5.0 CADD\5.4) HVAC\Dwgs\2008_M114.dwg Plotted on: 2/12/2010 4:59 PM Plotted by: Tolpa, Patti

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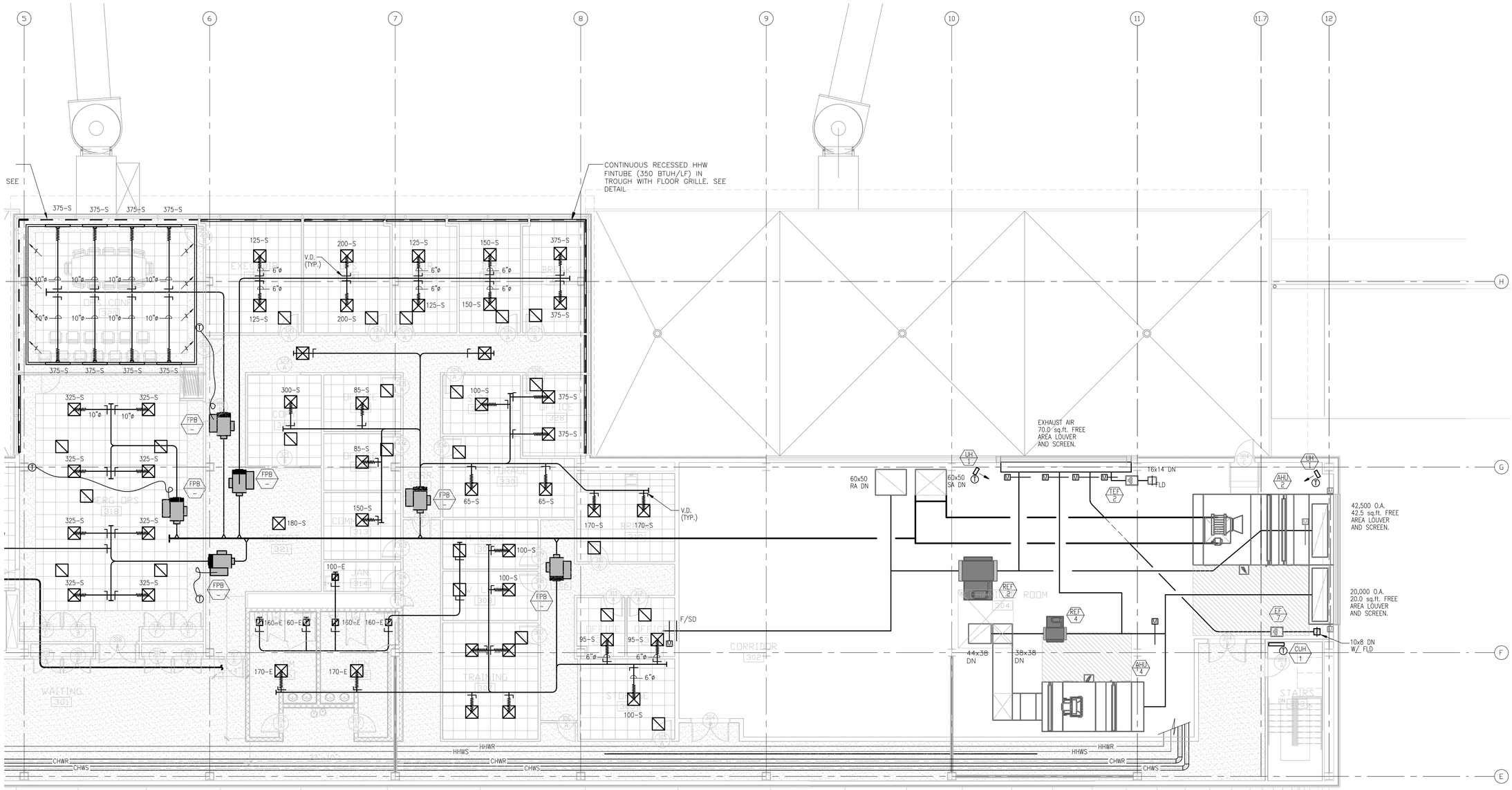
SHEET TITLE

ENLARGED THIRD FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER

M114

60% NOT FOR CONSTRUCTION



N

1 ENLARGED THIRD LEVEL MECHANICAL PLAN - AREA B

1/8" = 1'-0"

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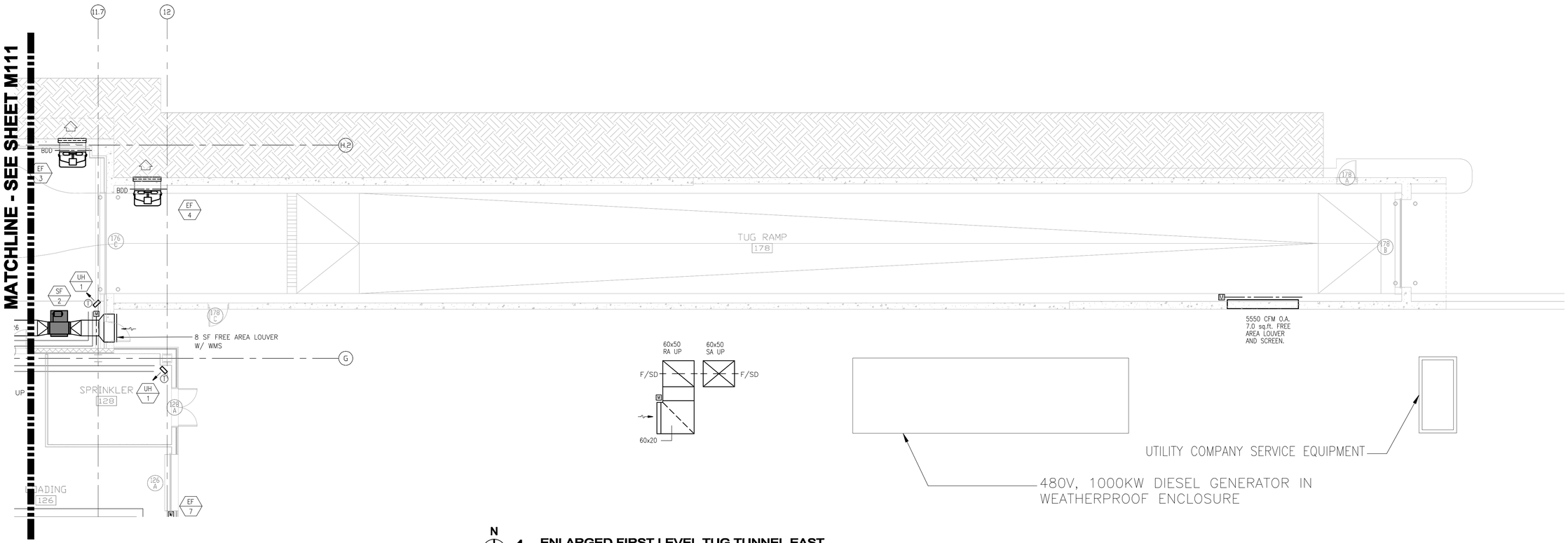
ENLARGED THIRD FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER

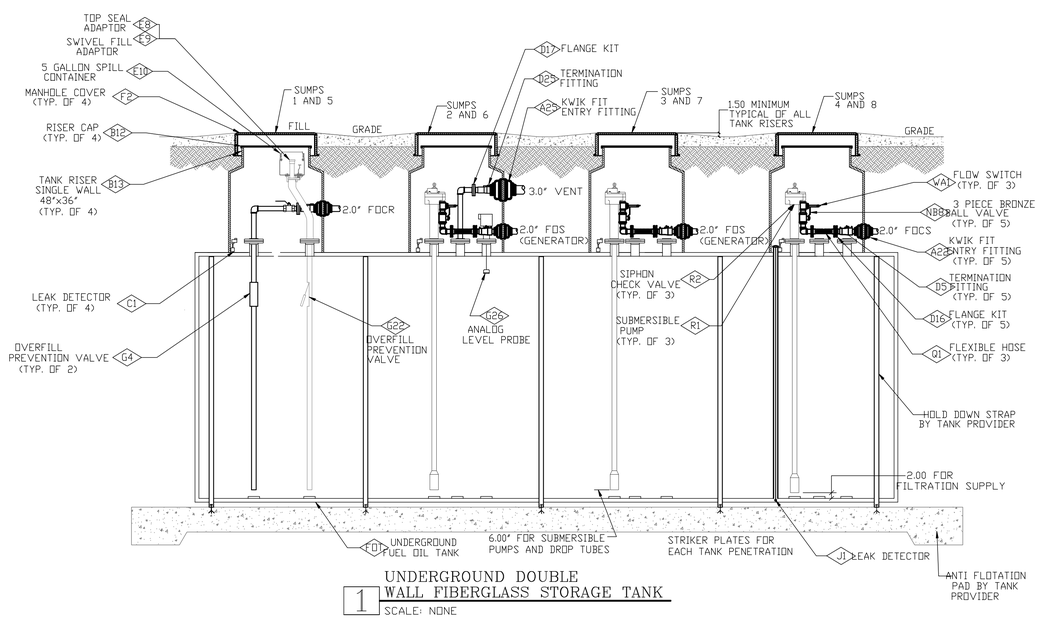
M115

60% NOT FOR CONSTRUCTION

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1 ENLARGED FIRST LEVEL TUG TUNNEL EAST
1/8" = 1'-0"



1 UNDERGROUND DOUBLE WALL FIBERGLASS STORAGE TANK
SCALE: NONE

EQUIPMENT LIST

TAG	SUPPLIER	DESCRIPTION	UL LISTING
A22	FUEL OIL SYSTEMS	ENTRY FITTING- KWIK FIT FOR 2.0" PIPE	N/A
A25	FUEL OIL SYSTEMS	ENTRY FITTING- KWIK FIT FOR 3.0" PIPE	N/A
ABB1	FUEL OIL SYSTEMS	TIME DELAY RELAY - PLC WATCHDOG TIMER 120VAC	NA
B1	FUEL OIL SYSTEMS	TRANSITION SUMP- SINGLE WALL 36" X 36" X 36"	MH17263
B11	FUEL OIL SYSTEMS	TRANSITION SUMP- SINGLE WALL 48" X 48" X 48"	MH17263
B12	FUEL OIL SYSTEMS	RISER CAP FOR TANK RISER 36.00"	N/A
B13	FUEL OIL SYSTEMS	TANK RISER- SINGLE WALL 48" X 36"	N/A
B17	FUEL OIL SYSTEMS	SINGLE WALL TRANSITION SUMP, 60" x 48" x 48"	MH17263
C1	FUEL OIL SYSTEMS	LEAK DETECTOR- FLOAT TYPE	E203176
D16	FUEL OIL SYSTEMS	FLANGE KIT 2.00"	N/A
D17	FUEL OIL SYSTEMS	FLANGE KIT 3.00"	N/A
D20	FUEL OIL SYSTEMS	DOUBLE WALL PIPE 2.0"	MH20383/MH25887
D24	FUEL OIL SYSTEMS	DOUBLE WALL PIPE 3.0" STRAIGHT LENGTHS	MH20383/MH25887
D25	FUEL OIL SYSTEMS	TERMINATION FITTING 3.0"	MH20383/MH25887
D5	FUEL OIL SYSTEMS	TERMINATION FITTING 2.0"	MH20383/MH25887
E10	FUEL OIL SYSTEMS	SPILL CONTAINER 5 GALLONS	CNH1642
E8	FUEL OIL SYSTEMS	ADAPTOR- TOP SEAL 4.0"	N/A
E9	FUEL OIL SYSTEMS	ADAPTOR- SWIVEL FILL 4.0"	N/A
ES1	FUEL OIL SYSTEMS	ULTRASONIC LEVEL TRANSMITTER NEMA 4X 1" MNPT	NA
F2	FUEL OIL SYSTEMS	MANHOLE COVER- HYDRAULIC ASSISTED EZ LIFT H20 RATED 42.00"	N/A
FDT	FUEL OIL SYSTEMS	50K UST WELDED CARBON STEEL PRIMARY, FRP MONOLITHIC SHELL, 144"DIA X 710"L	1746, UL58
G4 - 7101	PREFERRED UTILITIES	OVERFILL PREVENTION VALVE - PUMPED FILL	N/A
G14 - 7101	PREFERRED UTILITIES	ALARM PANEL- OVERFILL 2 TANKS	N/A
G149 - 7101	PREFERRED UTILITIES	4" NORMAL VENT CAP	N/A
G190 - 7101	PREFERRED UTILITIES	7.6 FLA FLOW CONTROL MANIFOLD - 1.5"	N/A
G198 - 7101	PREFERRED UTILITIES	PLC CONTROLLED - SUB MASTER FUEL CONTROL PANEL	UL508
G22 - 7101	PREFERRED UTILITIES	OVERFILL PREVENTION VALVE - NON PUMPED FILL	N/A
G26 - 7101	PREFERRED UTILITIES	ANALOG LEVEL PROBE	N/A
G37 - 7101	PREFERRED UTILITIES	DOUBLE POPPET FOOT VALVE 1.50	N/A
G42 - 7101	PREFERRED UTILITIES	LIQUID LEVEL SWITCH - 4 POSITION	CLASS 1 GROUP
G64 - 7101	PREFERRED UTILITIES	DAYTANK- RUPTURE BASIN 220 GALLON	UL842
G7 - 7101	PREFERRED UTILITIES	FUEL MANAGEMENT SYSTEM	UL508A
J1	PREFERRED UTILITIES	LEAK DETECTOR - FLOAT TYPE	E45168
K1	FUEL OIL SYSTEMS	FLEXIBLE ENTRY BOOT 1.5"	N/A
K2	FUEL OIL SYSTEMS	FLEXIBLE ENTRY BOOT 2.0"	N/A
K4	FUEL OIL SYSTEMS	FLEXIBLE ENTRY BOOT 3.5"	N/A
MA3	FUEL OIL SYSTEMS	SOLENOID VALVE, 1.50", NC, WITH MANUAL OVERIDE 24 V DC	N/A
MA16	FUEL OIL SYSTEMS	SOLENOID VALVE, 1.50", NC,110V AC	N/A
NB17	FUEL OIL SYSTEMS	BRONZE CHECK VALVE - 1.50" MSS SP-80	N/A
NB18	FUEL OIL SYSTEMS	BRONZE CHECK VALVE - 2.00" MSS SP-80	N/A
NB7	FUEL OIL SYSTEMS	3 PIECE BRONZE BALL VALVE- 1.50" MSS-SP-110, UL842	MH16313
NB8	FUEL OIL SYSTEMS	3 PIECE BRONZE BALL VALVE- 2.00" MSS-SP-110, UL842	MH16313
OM1	FUEL OIL SYSTEMS	RTD PROBE ASSEMBLY 0.25" DIA X 40' LONG	N/A
OM2	FUEL OIL SYSTEMS	4-20 ma RTD MICRO TRANSMITTER 0 - 300 DEG F	N/A
Q1	FUEL OIL SYSTEMS	FLEXIBLE HOSE	MH25059
R1	FUEL OIL SYSTEMS	SUBMERSIBLE PUMP 1 1/2 HP	MH6497
R2	FUEL OIL SYSTEMS	CHECK VALVE- ANTI SYPHON	MH6497
TM1	FUEL OIL SYSTEMS	POWER TRANSFER RELAY - 120 VAC	NA
U4	FUEL OIL SYSTEMS	SIGHT FLOW INDICATOR- GLASS WITH PROPELLER 1.5"	N/A
WA1	FUEL OIL SYSTEMS	FLOW SWITCH 2.0"	N/A
WA2	FUEL OIL SYSTEMS	FLOW SWITCH 1.5"	N/A
X1	FUEL OIL SYSTEMS	BLACK STEEL	N/A

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Landscaping Consultants:
APPOLD DESIGN
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TEL: (218) 591-5079

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

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REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

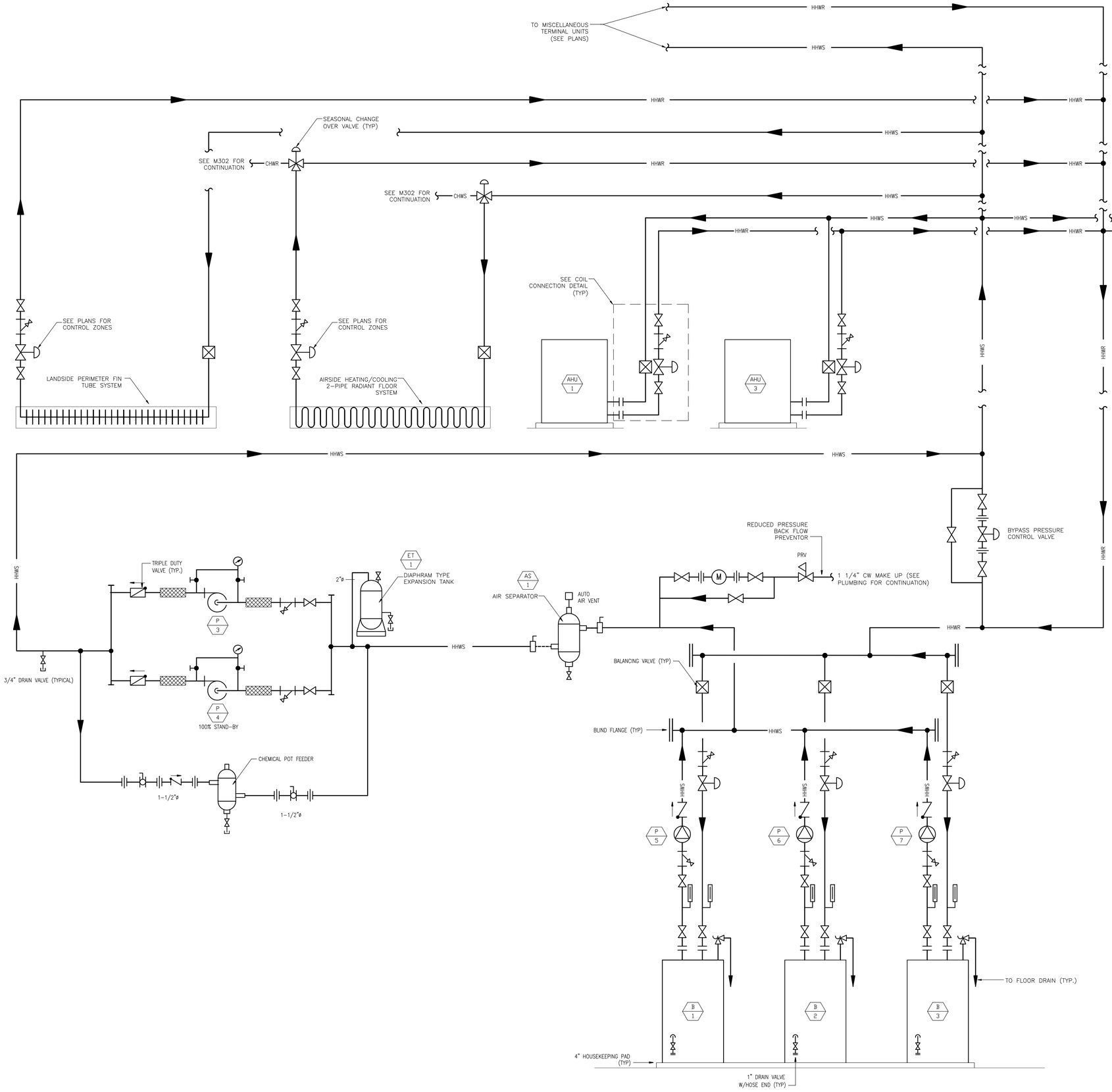
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SHEET TITLE
DIESEL GENERATOR MECHANICAL PLAN & DETAILS

SHEET NUMBER
M201

60% NOT FOR CONSTRUCTION

Drawing: H:\2008.00 Duluth Airport\LO CAD\Dwg\M200_M201.dwg Plotted on: 2/12/2010 4:10 PM Plotted by: Tolya, Fuld



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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

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Structural Engineers:
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501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1058 / FAX: (218) 722-9306

M/E/P/FP Engineers:
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2006 02 10 12:00p
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SHEET TITLE

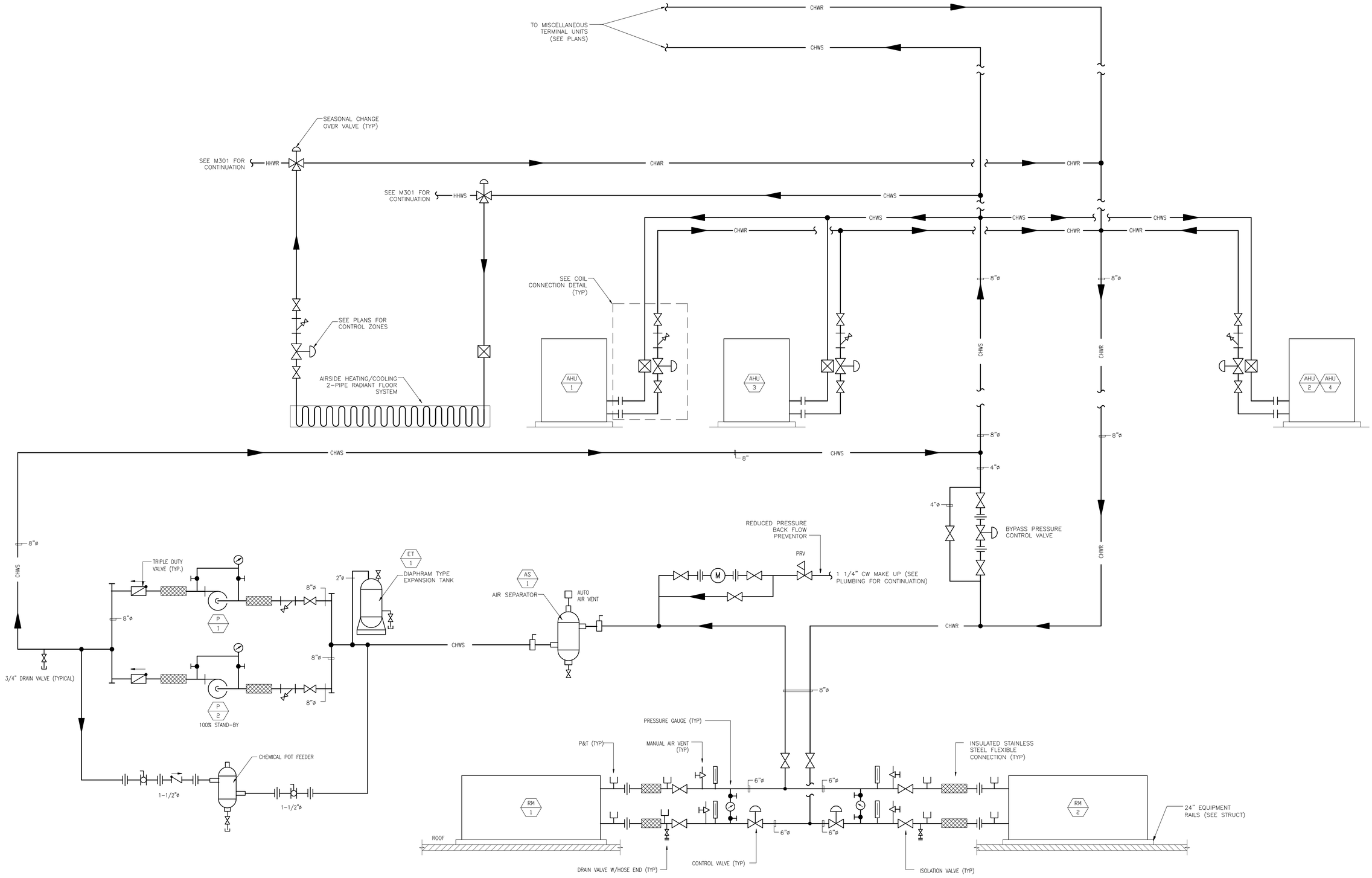
HEATING HOT WATER FLOW DIAGRAM

SHEET NUMBER

M301

60% NOT FOR CONSTRUCTION

Drawing: N:\2588.00 Duluth Airport\LS CADD\(B-4) HVAC\Dwgs\M300_M301.dwg Plotted on: 2/12/2010 4:11 PM Plotted by: Tolja, Petr



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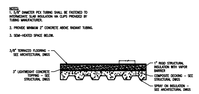
CHILLED WATER FLOW DIAGRAM

SHEET NUMBER

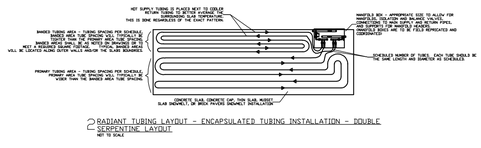
M302

60% NOT FOR CONSTRUCTION

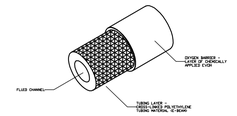
Drawing: N:\2338.00 Duluth Airport\1.0 CAD\(2-D) HVAC\Dwgs\M302_M302.dwg Plotted on: 2/12/2010 4:12 PM Plotted by: Tolliv, Patti



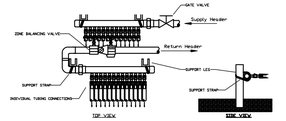
1 RADIANT TUBING SECTION
NOT TO SCALE



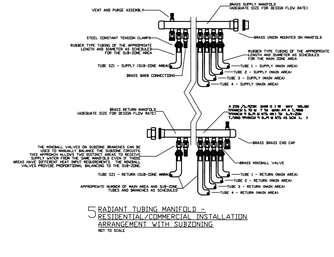
2 RADIANT TUBING LAYOUT - ENCAPSULATED TUBING INSTALLATION - DOUBLE SERPENTINE LAYOUT
NOT TO SCALE



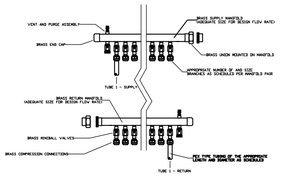
3 RADIANT TUBING MATERIAL - PEX
NOT TO SCALE



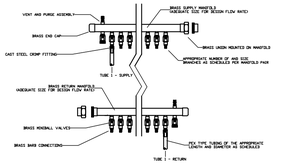
4 RADIANT TUBING MANIFOLD - COMMERCIAL INSTALLATION ARRANGEMENT
NOT TO SCALE



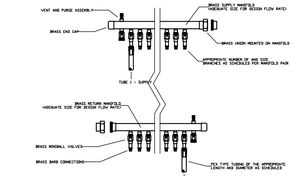
5 RADIANT TUBING MANIFOLD - RESIDENTIAL/COMMERCIAL INSTALLATION ARRANGEMENT WITH SUBZONING
NOT TO SCALE



6 RADIANT TUBING MANIFOLD - PEX TUBING (COMPRESSION FIT DESIGN)
NOT TO SCALE



7 RADIANT TUBING MANIFOLD - PEX TUBING (CRIMP LOCK DESIGN)
NOT TO SCALE



8 RADIANT TUBING MANIFOLD - PEX TUBING (SLIDE LOCK DESIGN)
NOT TO SCALE

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SHEET TITLE

AIRSIDE RADIANT SLAB FLOW DIAGRAM & DETAILS

SHEET NUMBER

M303

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Drawing: H:\2588.00 Duluth Airport\LD CAD\Dgn\M303_M303.dwg Plotted on: 2/12/2010 4:13 PM Plotted by: Tolye, Todd

AIR HANDLING UNIT UNIT SCHEDULE

UNIT NO.	SERVICE	LOCATION	FAN DATA								OUTSIDE AIR				COOLING COIL DATA											HEATING COIL DATA										FILTERS										Volts/Ph/Hz	MANUF & MODEL NO.	REMARKS
			CFM	SP (IN W.G.)		RPM	FAN TYPE	MOTOR DATA			CFM	TEMP (°F)			AIR TEMP (°F)				TOTAL MBH	SENS. MBH	WATER TEMP. (°F)		GPM	WORK PRESS (PSIG)	FACE AREA (SF)	MAX FACE VELOC. (FPM)	MAX. P.D.		AIR TEMP (°F)				TOTAL MBH	WATER TEMP. (°F)		GPM	WORK PRESS (PSIG)	FACE AREA (SF)	MAX FACE VELOC. (FPM)	MAX. P.D.		PRE-FILTER			FINAL							
				EXT.	TOT.			RPM	BHP	HP		HEATING	COOLING		ENT		LVG				ENT	LVG						AIR (IN)	WTR (FT)	ENT	LVG				ENT	LVG					AIR (IN)	WTR (FT)	TYPE	NO.	SIZE EACH FILTER	TYPE	NO.	SIZE EACH FILTER			
												DB	DB	WB	DB	WB	DB	WB											DB	DB																					
AHU-1	AIRSIDE	301 MECH RM	13,500	2.0	-	1336	PLUG	1200	13.172	15	4,050	-21	81	67	76.8	64.2	52.5	52.1	479.9	360.8	42	58	59.78	150	29.01	550	0.60	12.4	42.7	81.0	561.0	180	120	18.71	150	27.00	550	0.12	1.58	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/60	TRANE M-SERIES	SEE BELOW
AHU-2	CORE	338 MECH RM	42,500	3.5	-	760	PLUG	1800	56.391	60	10,625	-21	81	67	76.5	64.0	52.5	52.2	1,464.3	1,121.7	42	58	182.4	150	78.75	550	0.71	9.0	47.3	62.0	679.9	180	120	22.67	150	60.38	550	0.13	0.08	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/60	TRANE M-SERIES	SEE BELOW
AHU-3	LANDSIDE	301 MECH RM	18,000	2.5	-	1304	PLUG	1200	22.045	20	4,200	-21	81	67	76.4	64.0	52.5	52.2	622.2	473.1	42	58	77.51	150	34.14	550	0.74	16.7	48.0	120.0	1,405.5	180	120	46.87	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/60	TRANE M-SERIES	SEE BELOW
AHU-4	LANDSIDE	338 MECH RM	18,000	2.5	-	1304	PLUG	1200	22.045	20	4,200	-21	81	67	76.4	64.0	52.5	52.2	622.2	473.1	42	58	77.51	150	34.14	550	0.74	16.7	48.0	120.0	1,405.5	180	120	46.87	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/60	TRANE M-SERIES	SEE BELOW

1. PROVIDE VFD WITH INTEGRAL DISCONNECT SWITCH.

FAN SCHEDULE

FAN NO.	LOCATION	SERVICE	CFM	STATIC PRESS. IN.W.G.	TYPE	DRIVE	RPM	BHP	MOTOR HP	VOLT/PH/HZ	MFR.	MODEL NO.	REMARKS
SF-1	TUG TUNNEL 161	TUG TUNNEL 161	7,825	1.50	INLINE CENT	BELT	1500	4.2	5	480/3/60	TWIN CITY	222 TSL	2-SPEED
SF-2	TUG TUNNEL 161	TUG TUNNEL 161	7,825	1.50	INLINE CENT	BELT	1500	4.2	5	480/3/60	TWIN CITY	222 TSL	2-SPEED
EF-1	INBOUND TUG TUNNEL RAMP	INBOUND TUG TUNNEL RAMP	8,175	0.25	PROP	BELT	1650	1.5	2	480/3/60	TWIN CITY	24BTC TCWP	2-SPEED
EF-2	TUG TUNNEL 161	TUG TUNNEL 161	8,175	0.25	PROP	BELT	1650	1.5	2	480/3/60	TWIN CITY	24BTC TCWP	2-SPEED
EF-3	TUG TUNNEL 161	TUG TUNNEL 161	8,175	0.25	PROP	BELT	1650	1.5	2	480/3/60	TWIN CITY	24BTC TCWP	2-SPEED
EF-4	OUTBOUND TUG TUNNEL RAMP	OUTBOUND TUG TUNNEL RAMP	8,175	0.25	PROP	BELT	1650	1.5	2	480/3/60	TWIN CITY	24BTC TCWP	2-SPEED
EF-5	ELECTRICAL 131	ELECTRICAL 131	1,000	0.25	PROP	DIRECT	1650	225 W	0.125	???	TWIN CITY	122 TCF	
EF-6	TELE-COMM 136	TELE-COMM 136	300	0.25	PROP	DIRECT	1350	115 W	0.125	???	TWIN CITY	100A TCF	
EF-7	EAST MECH RM	ELEC 239/TELECOM 243	300	0.50	INLINE CENT	BELT	1250	0.05	0.25	???	TWIN CITY	080A BSI	
TEF-1	WEST MECH RM	WEST TOILET ROOMS	2,500	1.00	INLINE CENT	BELT	1799	1.13	1.5	480/3/60	TWIN CITY	150 TSL	
TEF-2	EAST MECH RM	EAST TOILET ROOMS	2,500	1.00	INLINE CENT	BELT	1799	1.13	1.5	480/3/60	TWIN CITY	150 TSL	
REF-1	WEST MECH RM	AHU-1	12,150	1.50	INLINE CENT	BELT	1020	5.4	7.5	480/3/60	TWIN CITY	300 TSL	W/ VFD
REF-2	EAST MECH RM	AHU-2	38,250	2.00	INLINE CENT	BELT	690	20	25	480/3/60	TWIN CITY	490 TSL	W/ VFD
REF-3	EAST MECH RM	AHU-3	16,200	2.00	INLINE CENT	BELT	850	8.9	10	480/3/60	TWIN CITY	365 TSL	W/ VFD
REF-4	EAST MECH RM	AHU-4	16,200	2.00	INLINE CENT	BELT	850	8.9	10	480/3/60	TWIN CITY	365 TSL	W/ VFD

DIFFUSER SCHEDULE

TAG	MANUFACTURER	MODEL	DESCRIPTION	C.F.M.	SIZE/LENGTH	CORE VELOCITY	MATERIAL	REMARKS
	NAILOR							
	NAILOR							
	NAILOR							

ALL REGISTERS, DIFFUSERS, AND GRILLES TO HAVE INTEGRAL OPPOSED BLADE BALANCING DAMPERS
*CONTINUOUS SLOT DIFFUSER TO HAVE 4' SUPPLY SECTION & UNUSED SECTION OF THE DIFFUSER TO BE USED AS RETURN U.N.O.

VAV TERMINAL UNIT SCHEDULE

SYMBOL	INLET DIAM. (IN.)	CFM			REMARKS
		MAXIMUM CAPACITY	MAXIMUM SETTING	MINIMUM SETTING	

FAN COIL UNIT SCHEDULE

SYMBOL	LOCATION	SERVICE	NOMINAL TONS	FAN				COOLING CAPACITY									P.D. FT. H20	FILTER			HUMIDIFIER / REHEAT (FLA/MOPD)	MFR. & MODEL NUMBER	REMARKS
				CFM	EXT. S.P. IN.W.G.	H.P.	ELEC	E.A.T.		E.W.T. (°F)	L.W.T. (°F)	KBTUH		FACE AREA SQ. FT.	NO. ROWS	TOTAL GPM		TYPE	NO.	FILTER SIZE			
								(°F) DB	(°F) DB			TOTAL	SENS										

PROVIDE HIGH LEVEL WATER LEVEL SENSOR WITH CUT OFF SWITCH AND BMS ALARM FOR ALL FAN COIL UNIT CONDENSATE DRAIN PANS.

FAN POWERED TERMINAL UNIT SCHEDULE

SYMBOL	LOCATION	SIZE-INLET DIAMETER INCHES	AIRFLOW RANGE (CFM)	HOT WATER HEATING COIL			PRIMARY AIR MINIMUM (CFM)	PRIMARY AIR MAXIMUM (CFM)	FAN						MANUFACTURER AND MODEL NUMBER	REMARKS
				MBH	GPM	P.D. (FT W.C.)			FAN CFM COOLING MINIMUM	FAN CFM COOLING MAXIMUM	FAN CFM HEATING	ESP (IN.)	HP	RPM		
FPB															NAILOR 35 SWST	DDC W/ ECM MOTOR

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DESIGNED BY: XX

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SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES I

SHEET NUMBER
M401

60% NOT FOR CONSTRUCTION

Drawing: M_DS00.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\DS00_M401.dwg Plotted on 2/12/2010 4:15 PM Plotted by: Tolga, Fatih

PACKAGED AIR COOLED WATER CHILLER SCHEDULE

UNIT NO.	SERVICE	LOCATION	CHILLER DATA						COMPRESSOR DATA					CONDENSER DATA				TOTAL KW UNIT	V/PH/HZ	MFG. & MODEL NO.
			MIN RATED TONS (ARI)	TOTAL GPM	TEMP ENT (°F)	TEMP LVG (°F)	MAX. PD FT.	FOULING FACTOR	NO.	TYPE	MAX POWER KW	REFRIG.	CHARGE (LBS/COMP)	NO. OF FANS	NO. OF MOTORS	H.P. EACH	AMBIENT TEMP			
RM-1	CHW SYSTEM	WEST LOW ROOF	197.2	285.3	58	42	4.7	0.0001	2	ROTARY	225	R-134a	215	6	6	1.5	95	243.1	460/3/60	TRANE RTAC 200
RM-2	CHW SYSTEM	WEST LOW ROOF	197.2	285.3	58	42	4.7	0.0001	2	ROTARY	225	R-134a	215	6	6	1.5	95	243.1	460/3/60	TRANE RTAC 200

1. PROVIDE SINGLE POINT POWER CONNECTION. MCA: 412 AMPS, MOCP: 500 AMPS
2. PROVIDE UNIT MOUNTED WYE-DELTA STARTER.
3. PROVIDE LOW AMBIENT CONTROL ON CONDENSER AND FREEZE PROTECTION KIT ON EVAPORATOR.

BOILER SCHEDULE

UNIT NO.	LOCATION	INPUT MBH	OUTPUT MBH	BOILER HP	GPM	WATER TEMP (F) ENT.	WATER TEMP (F) LVG.	P.D. FEET	FLUE OUTLET	FUEL	TYPE	MIN. DESIGN WORKING PRESS. P.S.I.G.	MODEL NO.	REMARKS
B-1	301 MECH RM	2,000	1,800		100	120	180		6"	NATURAL GAS		150	FULTON PHW 2000	
B-2	301 MECH RM	2,000	1,800		100	120	180		6"	NATURAL GAS		150	FULTON PHW 2000	
B-3	301 MECH RM	2,000	1,800		100	120	180		6"	NATURAL GAS		150	FULTON PHW 2000	

1. BOILERS SHALL BE HIGH-EFFICIENCY CONDENSING TYPE WITH SINGLE HEAT EXCHANGER. VENT MATERIAL PER MANUFACTURER'S RECOMMENDATION.
2. PROVIDE 6" SEALED COMBUSTION AIR INTAKE. MATERIAL PER MANUFACTURER'S RECOMMENDATION.
3. INLET GAS PRESSURE SHALL BE 7"-11" W.C.
4. PROVIDE CONDENSATE NEUTRALIZATION SYSTEM.

PUMP SCHEDULE

PUMP NO.	SERVICE	LOCATION	TYPE	GPM	TOTAL HEAD FEET	MIN. DESIGN WORKING PRESS. P.S.I.G.	MOTOR BHP	MOTOR HP	MOTOR RPM	MOTOR V/Ph/Hz	MANUFACTURER & MODEL NO.	REMARKS
P-1	CHILLED WATER	301 MECHANICAL RM	VERTICAL SPLIT CASE	600		150				480/3/60	BELL & GOSSETT	1
P-2	CHILLED WATER	301 MECHANICAL RM	VERTICAL SPLIT CASE	600		150				480/3/60	BELL & GOSSETT	1, 100% STANDBY
P-4	HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT CASE	300		150				480/3/60	BELL & GOSSETT	1
P-5	HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT CASE	300		150				480/3/60	BELL & GOSSETT	1, 100% STANDBY
P-6	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100		150				480/3/60	BELL & GOSSETT	2
P-7	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100		150				480/3/60	BELL & GOSSETT	2
P-8	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100		150				480/3/60	BELL & GOSSETT	2

1. PROVIDE VFD WITH INTEGRAL DISCONNECT.
2. PROVIDE COMBINATION STARTER/DISCONNECT. INTEGRATE WITH BOILER CONTROLS.

EXPANSION TANK SCHEDULE

UNIT NO.	SERVICE	LOCATION	LENGTH (IN)	DIAM. (IN)	CAPAC. (GAL)	WORK. PRESS. (PSIG)	OPERATING WEIGHT	MANUFACTURER & MODEL NO.	REMARKS
ET-1	CHILLED WATER	301 MECH RM				125		BELL & GOSSETT	DIAPHRAGM TYPE, ASME CONSTRUCTION
ET-2	HOT WATER	301 MECH RM				125		BELL & GOSSETT	DIAPHRAGM TYPE, ASME CONSTRUCTION

CABINET & UNIT HEATER SCHEDULE

UNIT NO.	AREA SERVED	LOCATION	TYPE	STATIC PRESS. IN W.G.	AIR TEMP (°F) ENT.	AIR TEMP (°F) LVG.	TOTAL CAPACITY MBH	HEATING COIL HOT WATER TEPM (°F) ENT	HEATING COIL HOT WATER TEPM (°F) LVG	HEATING COIL HOT WATER GPM	HEATING COIL HOT WATER WATER PD (FT)	HEATING COIL HOT WATER PRESS. (PSIG)	FAN MOTOR HP	FAN MOTOR RPM	FAN MOTOR V/Ph/Hz	MANUF. & MODEL NUMBER	REMARKS
UH-1	SEE PLANS	SEE PLANS	SUSPENDED				70	180	140								
CUH-1	SEE PLANS	SEE PLANS	RECESSED				7	180	140								

1. PROVIDE INTEGRAL COMBINATION STARTER/DISCONNECT.
2. PROVIDE INTEGRAL THERMOSTATIC AND CONTROL VALVE.

FINNED-TUBE RADIATION SCHEDULE

SYMBOL	BTUH/LF	E.W.T. (°F)	L.W.T. (°F)	FINS SIZE	FINS PER FT.	FINS MAT.	FINS ROWS	PIPE SIZE	PIPE MAT.	ENCLOSURE HGT.	ENCLOSURE DEPTH	ENCLOSURE TYPE	MODEL	REMARKS

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02-11-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: XX

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

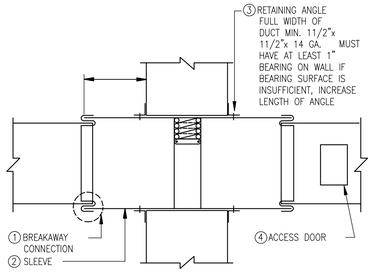
MECHANICAL EQUIPMENT SCHEDULES II

SHEET NUMBER

M402

60% NOT FOR CONSTRUCTION

Drawing: N:\2882.00 Duluth Airport\A.0 CADD\(2.4) MEP\Dwgs\M2882_M402.dwg Plotted on: 2/12/2010 4:17 PM Plotted by: Tolya, Feld



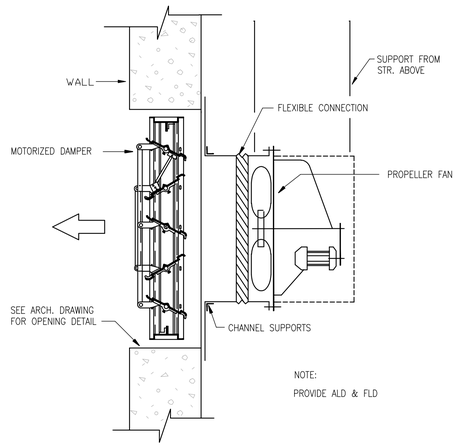
IN-DUCT MOUNTED FIRE DAMPER

NOTE: THIS INSTALLATION DETAIL IS TYPICAL FOR ALL TYPES OF DAMPERS (A-B-C). FOR TYPE B & C DAMPERS, THE SHUTTER SHALL BE OUTSIDE OF AIR STREAM.

1 BREAKAWAY CONNECTION SHALL BE SIMILAR TO UL555 SEC. 14.4 AND NFPA 90A APPROVED TYPES
2 SLEEVE MAY BE DUCT GAUGE IF UL555 CONNECTIONS ARE USED GAUGE SHALL BE #16 UP TO 36Wx24H OR 14 GA. FOR LARGER SIZES.
3 SHEET METAL CONTRACTOR SHALL FURNISH CONSTRUCTION CONTRACTOR WITH OPENING SIZES, ALL OPENINGS SHALL BE PACKED WITH SUITABLE FIRE RETARDANT MATERIAL.
4 ACCESS DOOR MUST BE LOCATED AS REQUIRED TO ENABLE RESETTING OF DAMPER. MORE THAN ONE DOOR MAY BE REQUIRED ON LARGE DUCTS.

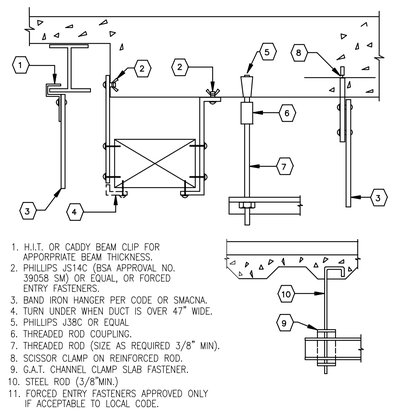
FIRE DAMPER

FOR DUCT SYSTEMS WHICH ARE NOT PART OF SMOKE EXHAUST SYSTEM AND WITHOUT NFPA BOOT.



WALL EXHAUST FAN DETAIL

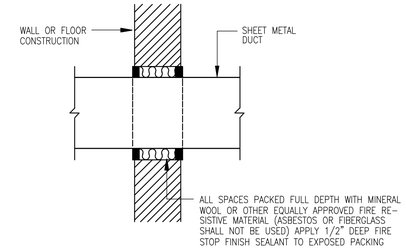
NOT TO SCALE



1. H.I.T. OR CADDY BEAM CLIP FOR APPOPRRIATE BEAM THICKNESS.
2. PHILLIPS JS14C (BSA APPROVAL NO. 39058 SM) OR EQUAL, OR FORCED ENTRY FASTENERS.
3. BAND IRON HANGER PER CODE OR SMACNA.
4. TURN UNDER WHEN DUCT IS OVER 47" WIDE.
5. PHILLIPS J38C OR EQUAL
6. THREADED ROD COUPLING.
7. THREADED ROD (SIZE AS REQUIRED 3/8" MIN).
8. SCISSOR CLAMP ON REINFORCED ROD.
9. G.A.T. CHANNEL CLAMP SLAB FASTENER.
10. STEEL ROD (3/8"MIN.)
11. FORCED ENTRY FASTENERS APPROVED ONLY IF ACCEPTABLE TO LOCAL CODE.

METHOD OF HANGING DUCTWORK

NOT TO SCALE

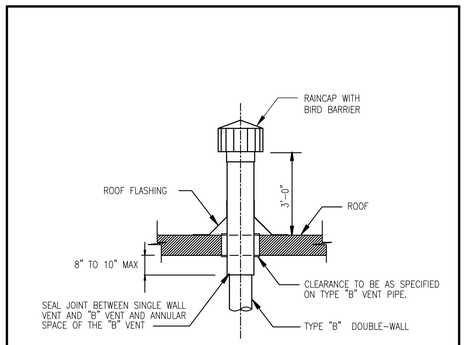


NOTES:

1. FOR WALLS REROUIRING FIRE DAMPERS SEE OTHER DETAILS

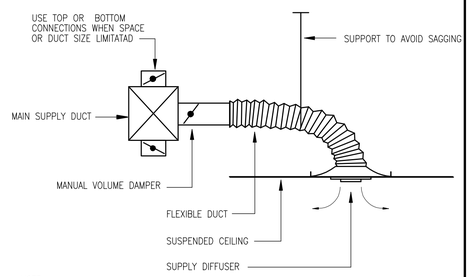
DETAIL OF CAULKING OF DUCT PIERCING RATED WALLS OR FLOORS WHERE FIRE DAMPERS ARE NOT REQUIRED.

NOT TO SCALE



DETAIL - TYPICAL FLUE TERMINAL

NOT TO SCALE

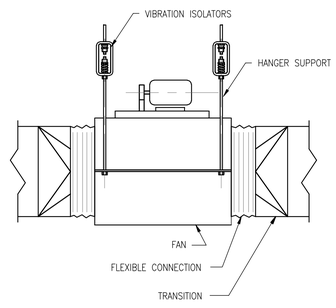


NOTE :

1. LENGTH OF FLEXIBLE DUCTS SHALL NOT EXCEED 5'-0", INCLUDING ELBOWS.

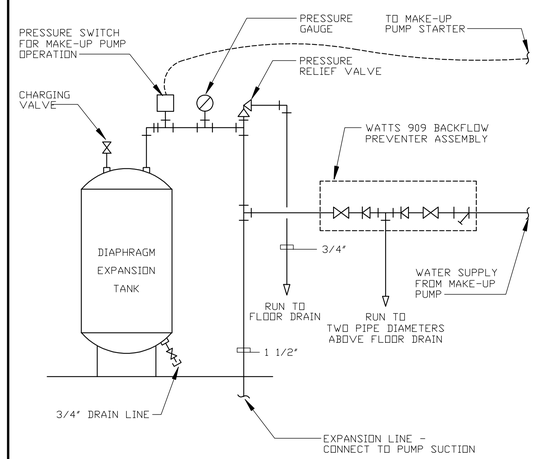
TYPICAL SUPPLY DIFFUSER CONNECTION

NOT TO SCALE



IN-LINE FAN SUPPORT DETAIL

NOT TO SCALE



NOTE:

1. USE ONLY WHERE DOMESTIC WATER PRESS IS HIGHER THAN INITIAL TANK CHARGE PRESS AND WHERE DIRECT DOMESTIC WATER CONNECTION IS ALLOWED.

COMPRESSION TANK DETAIL DIAPHRAGM TYPE

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SEAL

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REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: XX

AEP PROJECT NUMBER
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SHEET TITLE

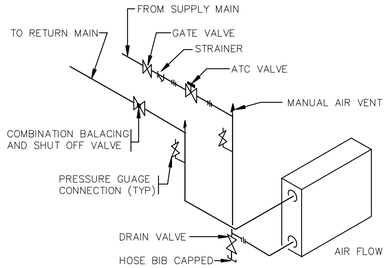
MECHANICAL DETAILS I

SHEET NUMBER

M501

60% NOT FOR CONSTRUCTION

Drawing: X:\2588.00 Duluth Airport\5.0 CAD\(5.4) HVAC\Dwgs\2588_M501.dwg Plotted on: 2/12/2010 4:17 PM Plotted by: Tolye, Patti

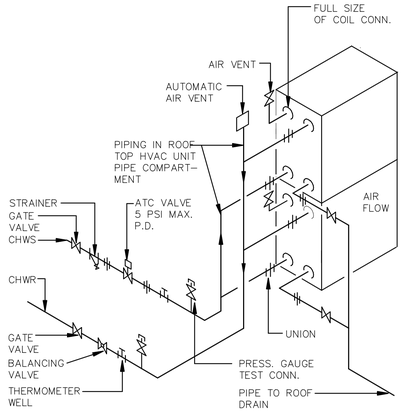


NOTES:

1. HOOK UP COIL COUNTERFLOW
2. FOR ACCESS TO VALVES, STRAINERS ETC. COMPLY WITH "ACCESS DOORS" IN SPECS. PROVIDE ACCESS DOOR IN SHEET METAL FOR CLEANING OF COIL SURFACES
3. SIMILAR PIPING ARRANGEMENT FOR VARIABLE AIR VOLUME TERMINAL UNIT COILS
4. SHUT OFF GATE VALVES MUST BE SCREWED OF FLANGED (NOT SWEAT)

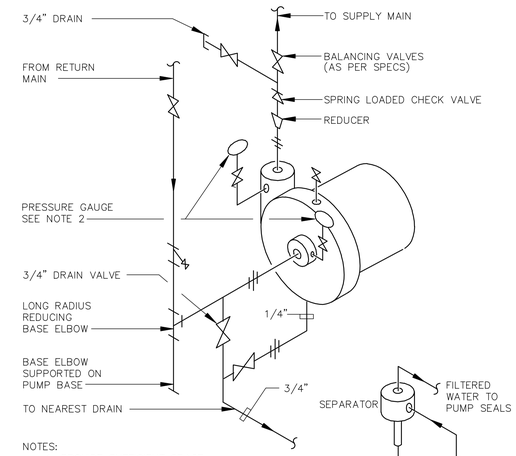
HOT WATER HEATING COIL PIPING

NOT TO SCALE



CHILLED WATER COIL PIPING

NOT TO SCALE



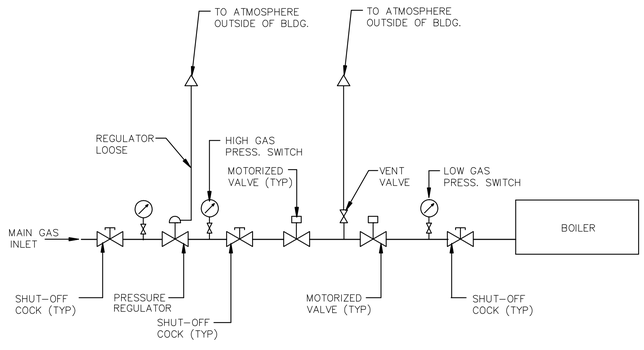
NOTES:

1. PROVIDE SUFFICIENT SPACE BETWEEN MAIN AND PUMP INLET TO PERMIT REMOVAL OF IMPELLER. FOR PUMPS WITH FLANGE INLET PROVIDE SPOOL PIECE FOR IMPELLER REMOVAL.
2. INSTALL PRESSURE GAUGES FOR 150% OF WORKING PRESSURE IN 1/4" TAPPING PROVIDED BY VENDOR. IF TAPS ARE NOT PROVIDED, PROVIDE IN PIPING.

ABRASIVE SEPARATOR PIPING
(SEE SPECIFICATIONS)

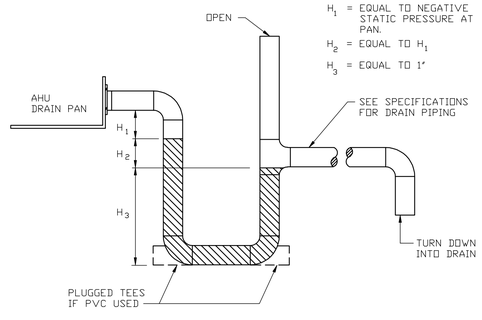
WATER PUMP PIPING END SUCTION PUMP DETAIL

NOT TO SCALE



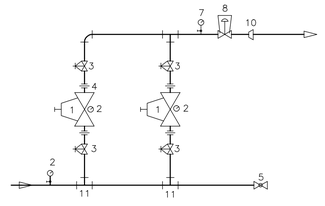
GAS TRAIN DIAGRAM

NOT TO SCALE



DRAW-THROUGH UNIT DRAIN DETAIL

N.T.S.



1 J.R.GUNZENHAUSER #1130HI PRV
2 PRESSURE GAUGE
3 BALL VALVE
4 UNION
5 BLOW-OFF VALVE
7 MERCOID PRESSURE SWITCH (MANUAL RESET)
8 CLA-VAL SOLENOID SAFETY SHUTOFF VALVE-ENERGIZE TO CLOSE
10 INCREASER
11 REDUCING TEES

GAS PRV DETAIL

N.T.S.

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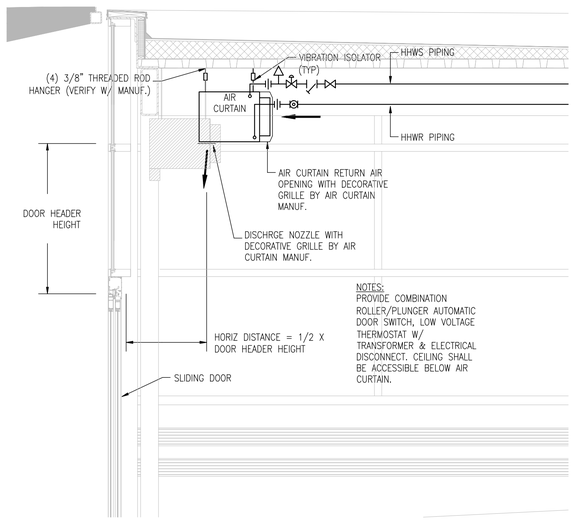
SHEET TITLE

MECHANICAL DETAILS II

SHEET NUMBER
M502

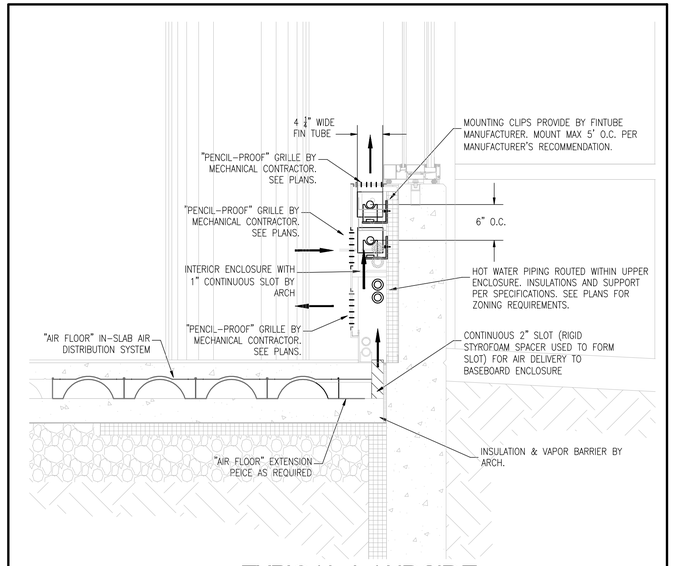
60% NOT FOR CONSTRUCTION

Drawings K:\2008.00 Duluth Airport\5.0 CAD\(5.4) HVAC\Dwgs\2008_M502.dwg Plotted on: 2/12/2010 4:19 PM Plotted by: Tolya, Pavel



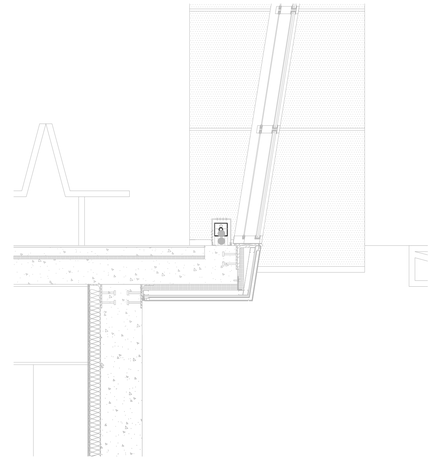
TYPICAL AIR CURTAIN INSTALLATION DETAIL

NOT TO SCALE



TYPICAL LANDSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

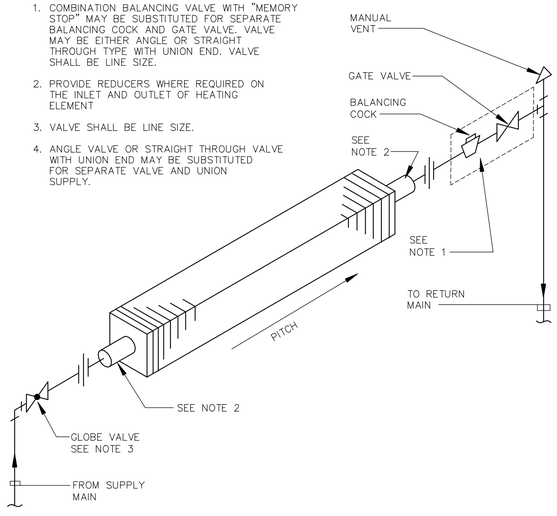


TYPICAL AIRSIDE PERIMETER FIN TUBE DETAIL

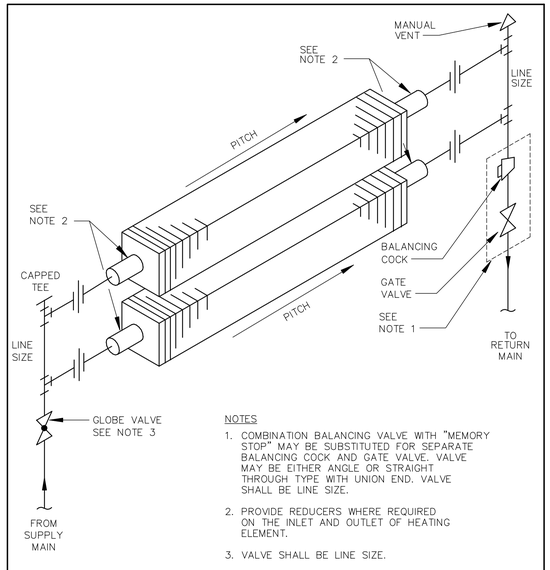
NOT TO SCALE

NOTES

1. COMBINATION BALANCING VALVE WITH "MEMORY STOP" MAY BE SUBSTITUTED FOR SEPARATE BALANCING COCK AND GATE VALVE. VALVE MAY BE EITHER ANGLE OR STRAIGHT THROUGH TYPE WITH UNION END. VALVE SHALL BE LINE SIZE.
2. PROVIDE REDUCERS WHERE REQUIRED ON THE INLET AND OUTLET OF HEATING ELEMENT
3. VALVE SHALL BE LINE SIZE.
4. ANGLE VALVE OR STRAIGHT THROUGH VALVE WITH UNION END MAY BE SUBSTITUTED FOR SEPARATE VALVE AND UNION SUPPLY.



ONE (1) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING

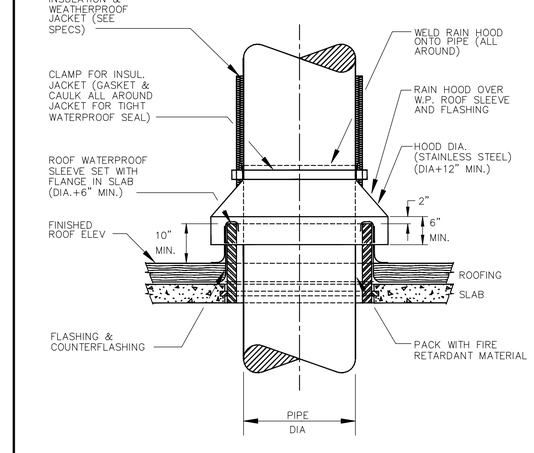


NOTES

1. COMBINATION BALANCING VALVE WITH "MEMORY STOP" MAY BE SUBSTITUTED FOR SEPARATE BALANCING COCK AND GATE VALVE. VALVE MAY BE EITHER ANGLE OR STRAIGHT THROUGH TYPE WITH UNION END. VALVE SHALL BE LINE SIZE.
2. PROVIDE REDUCERS WHERE REQUIRED ON THE INLET AND OUTLET OF HEATING ELEMENT.
3. VALVE SHALL BE LINE SIZE.

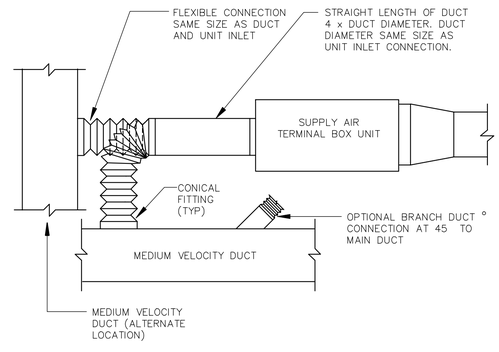
TWO (2) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING

(ROWS IN PARALLEL)



PIPE PENETRATION THRU ROOF SLAB

NOT TO SCALE



PLAN VIEW

NOTE:
MAXIMUM LENGTH OF FLEXIBLE CONNECTION WILL NOT EXCEED 2'-0" AND SHALL CONFORM TO LOCAL UNION REQUIREMENTS.

TYPICAL TERMINAL UNIT FLEXIBLE DUCT CONNECTION DETAIL

NOT TO SCALE

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SHEET TITLE

MECHANICAL DETAILS III

SHEET NUMBER
M503

60% NOT FOR CONSTRUCTION

Drawing: K:\2882.00 Duluth Airport\5.0 CADD\(5.4) MACP\Dwgs\2882_M503.dwg Plotted on: 2/12/2010 4:57 PM Plotted by: Tolye, Patti

SYMBOL	DESCRIPTION	NOTES
LIGHTING FIXTURES		
F1 a, F2 c, F3 b, F4 d	CEILING MOUNTED LIGHTING FIXTURES	UPPER CASE LETTERS INSCRIBED IN SYMBOL INDICATE FIXTURE TYPE REFERENCES TO FIXTURE LIST SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS INIDCATES EMERGENCY LIGHTING:
F1 a, F4 d	WALL MOUNTED LIGHTING FIXTURES	F1 d, F3 b, F1 a
	FLOOR MOUNTED LIGHTING FIXTURE	
EXIT SIGNS		
	WALL MOUNTED EXIT SIGN	APPLICATION OF SHADED QUADRANTS AND ARROWS THUS: INDICATE LETTERED FACE AND DIRECTIONAL ARROWS AT SYMBOLS FOR SIGNS FOR WHICH SELECTION OF SUCH FEATURES IS REQUIRED. SUBSCRIPT DESIGNATIONS XA, XB, XC, ETC. INDICATE EXIT SIGN TYPE REFERENCES TO LIGHTING FIXTURE LIST.
	CEILING MOUNTED EXIT SIGN	
JUNCTION AND PULL BOXES – SECONDARY LIGHT AND POWER WIRING		
H	PULL BOX OR JUNCTION BOX–OUTLET BOX TYPE WALL MOUNTED	
J	PULL BOX OR JUNCTION BOX–OUTLET BOX TYPE MOUNTED AT CEILING	
JB	JUNCTION BOX	
SECONDARY FEEDERS		
	FEEDER RUN CONCEALED ABOVE AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF CIRCUITRY.	
	FEEDER RUN CONCEALED BELOW AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF CIRCUITRY.	
	FEEDER RUN EXPOSED AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF	
FIRE PROTECTIVE ALARM SYSTEMS SOUNDING AND VISUAL DEVICES		
S	SPEAKER	SUBSCRIPT -P- DENOTES PRESIGNAL SUBSCRIPT -T- DENOTES TROUBLE SIGNAL SYMBOLS AS SHOWN REPRESENT CLG MOUNTED DEVICES–CIRCUMSCRIBED CIRCLES THUS:- DENOTE WALL MOUNTING SYMBOLS WITH LOWER PORTION LEFT UNSHADED DENOTE THAT THE ITEMS ARE PART OF AN OVERALL FIRE PROTECTIVE ALARM SYSTEM INSCRIBED SHADING IN LOWER PORTION DENOTES THAT THE ITEMS ARE PART OF A SEPARATE SYSTEM WHICH INCORPORATES ACTUATING DEVICES REPRESENTED BY SIMILARLY SHADED SYMBOLS SUBSCRIPT LOWER CASE LETTERS IN QUOTES DENOTE EXCEPTIONS TO SPECIFIED MOUNTING AS FOLLOWS: "f" - flush "s" - surface
SV	SPEAKER w/ VISUAL ALARM DEVICE	
V	VISUAL ALARM DEVICE	
IR	AREA OF RESCUE ASSISTANCE INTERCOM STATION	
FIRE PROTECTIVE ALARM SYSTEMS BASIC ITEMS		
FACP	CENTRAL EQUIPMENT OF SYSTEM	
FAA	OUTLYING ANNUNCIATOR	

SYMBOL	DESCRIPTION	NOTES	
FIRE PROTECTIVE ALARM SYSTEM ACTUATING DEVICES			
S	MANUAL FIRE ALARM ACTUATING DEVICE OR STATION	SUBSCRIPT -K- DENOTES STRAP KEY STATION	SUBSCRIPT NUMBERS INDICATE ZONE OR CIRCUIT SUBSCRIPT LOWER CASE LETTERS IN QUOTES DENOTE EXCEPTIONS TO SPECIFIED STANDARD MOUNTING AS FOLLOWS:- "f" - flush "sf" -semiflush "s" - surface "d" - in duct SUBSCRIPT ROMAN NUMERALS DENOTE SYSTEM WHERE THERE IS MORE THAN ONE. SYMBOLS AS SHOWN REPRESENT WALL MOUNTED DEVICES –CIRCUMSCRIBED CIRCLES THUS:- DENOTE CEILING MOUNTING EXCEPT THAT FOR AUTOMATIC FIRE DETECTION ACTUATING DEVICES AS SHOWN DENOTE CEILING MOUNTED DEVICES AND CIRCUMSCRIBED CIRCLES DENOTE MOUNTING IN RAISED FLOOR. SUBSCRIPT UPPER CASE LETTERS IN PARENTHESIS DENOTE DEVICE FUNCTION THUS:- (TE)-TOCCC EVACUATION (FE)-FLOOR EVACUATION
WF	SPRINKLER ALARM ACTUATING DEVICE	SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:- a–main alarm valve waterflow detector W–WATERFLOW DETECTOR T–TAMPER SWITCH F–FLOAT SWITCH FR-FIRE PUMP RUNNING ALARM RELAY CONTACTS fp-fire pump power available alarm relay contacts P–AIR PRESSURE SWITCH DF-DRY PIPE AIR COMP. power failure DP-DRY PIPE air comp. low air comp	
VSS	VALVE SUPERVISOR SWITCH		
SD	AUTOMATIC FIRE DETECTION ALARM ACTUATING DEVICES SMOKE DETECTOR	SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:-	
DD	DUCT SMOKE DETECTOR	-RT-FIRESTAT–RATE OF RISE PLUS FIXED TEMPERATURE TYPE	
D	HEAT DETECTOR	-FT-FIRESTAT–FIXED TEMPERATURE TYPE	
SD T	BEAM TYPE SMOKE DETECTOR SUBSCRIPT "T" INDICATES TRANSMITTER	-PM–PNEUMATIC TUBE DIAPHRAGM SWITCH	
SD R	SUBSCRIPT "R" INDICATES RECEIVER	SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING FIRESTATS DENOTE EXCEPTIONS TO SPECIFIED STANDARD TEMPERATURE SETTINGS	
	ELECTRIC DOOR LOCK	SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING PNEUMATIC TUBE DIAPHRAGM SWITCHES DENOTE LENGTH OF ASSOCIATED TUBING	
DTU	DATA TRANSMISSION UNIT		

SYMBOL	DESCRIPTION	NOTES	
WIRING DEVICES			
$	WIRING DEVICE TYPE SWITCH	WITHOUT SUBSCRIPT NUMBER SYMBOL DENOTES "SINGLE POLE" SUBSCRIPT NUMBERS DENOTE -2 POLE-, -3 WAY-, -4 WAY-, ETC. SUBSCRIPT LETTERS IN PARENTHESIS THUS:- (PL) INDICATE SEPARATE PILOT LIGHT.	WITHOUT SUBSCRIPT UPPER CASE LETTERS SYMBOLS DENOTE WIRING DEVICE STANDARD AS SPECIFIED. SUBSCRIPT UPPER CASE LETTERS DENOTE NON STANDARD TYPE REFERENCE TO SCHEDULE OF NON STANDARD WIRING DEVICES. SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS.
$T	SWITCH WITH THERMAL OVERLOAD PROTECTION FOR 120V FRACTIONAL HP MOTORS		
$OS	WALL MOUNTED OCCUPANCY SENSOR		
$K	KEY OPERATED SWITCH		

SYMBOL	DESCRIPTION	NOTES	
WIRING DEVICES (CONT)			
	WALL DUPLEX CONVENIENCE RECEPTACLE	SHADING OF SYMBOL THUS:- INDICATES RECEPTACLE WITH EACH HALF SEPARATELY WIRED (HALF CONSTANT, HALF SWITCH CONTROLLED)	"D" INDICATES DEDICATED RECEPTACLE
	WALL DOUBLE DUPLEX (QUAD) CONV. RECEPT.		
	GFI (GROUND FAULT INTERRUPTING) WALL DUPLEX CONVENIENCE RECEPTACLE		
	WALL SINGLE CONVENIENCE RECEPTACLE		
	FLOOR SINGLE CONVENIENCE RECEPTACLE		
	FLOOR DUPLEX CONVENIENCE RECEPTACLE		
	DUPLEX RECEPTACLE IN FLUSH FLOOR BOX		
	QUAD RECEPTACLE IN FLUSH FLOOR BOX		
	CEILING CONVENIENCE RECEPTACLE		
	WALL SPECIAL PURPOSE POWER SUPPLY RECEPTACLE		
	FLOOR SPECIAL PURPOSE POWER SUPPLY RECEPTACLE		
	CEILING SPECIAL PURPOSE POWER SUPPLY RECEPTACLE	GANGING SYMBOL SHOWN IN CIRCUITRY RUN IN COMBINATION WITH ANY WIRING DEVICE SYMBOLS THUS:- DENOTES WIRING DEVICES WHICH ARE	
D	WALL BOX DIMMER		
	WIRING DEVICE GANGING SYMBOL	TO BE GANGED IN A SINGLE COMMON PLATE OUTLET.	
MOTORS, PANELS, AND INDIVIDUALLY MOUNTED DEVICES AND EQUIPMENT - SECONDARY LIGHT AND POWER WIRING			
	MOTORS IN MECHANICAL SYSTEM EQUIPMENT.	COMPLETE INFORMATION FOR MOTORS IS INDICATED BY APPLICATION OF TAG SYMBOL REFERENCE TO MOTOR LIST	
	INDIVIDUALLY MOUNTED SECONDARY OVERCURRENT AND SWITCHING DEVICES (CIRCUIT BREAKERS, FUSIBLE SWITCHES, UNFUSED SWITCHES, ETC.) APPLIED AS SPECIFIED.	COMPLETE INFORMATION FOR DEVICES IS INDICATED BY APPLICATION OF TAG SYMBOLS –OMISSION OF TAG SYMBOLS DENOTES DEVICES WHICH ARE NOT PART OF ELECTRIC WORK–IN THIS INSTANCE SUBSCRIPT NUMBERS ARE USED TO INDICATE SIZE OF FUSING WHERE REQUIRED (3 POLE FUSING UNLESS NOTED).	
	MOTOR STARTER FOR MOTORS IN MECHANICAL SYSTEM EQUIPMENT.	SUBSCRIPT NUMBERS INDICATE FUSING WHERE REQUIRED (3 POLE FUSING UNLESS NOTED).	COMPLETE INFORMATION FOR MOTOR CONTROL ITEMS IS INDICATED BY THE TAG SYMBOL REFERENCE APPLIED TO ASSOCIATED MOTORS–WHERE RELATION OF MOTORS TO CONTROL ITEMS IS NOT EVIDENT, MOTOR TAG SYMBOLS ARE REPEATED AT SYMBOLS REPRESENTING THESE ITEMS TO CLARIFY THESE ASSOCIATIONS.
	POWER OR DISTRIBUTION PANEL.	ARROW OF NOTE INDICATING PANEL DESIGNATION ALSO DENOTES FRONT FACE OF PANEL.	
	LIGHTING OR APPLIANCE PANEL.		
	INDIVIDUALLY MOUNTED DRY TYPE TRANSFORMER PRIMARY VOLTAGE TO SECONDARY VOLTAGE	SUBSCRIPT NUMBERS INDICATE KVA RATING.	

SYMBOL	DESCRIPTION	NOTES	
FACILITIES FOR TELEPHONE COMPANY WIRES & INSTRUMENTS			
	OUTLET FOR TELEPHONE INSTRUMENT	SYMBOLS AS SHOWN REPRESENT MOUNTED OUTLET – CIRCUMSCRIBED CIRCLES THUS: DENOTE FLOOR MOUNTING SUBSCRIPT LOWER CASE LETTERS IN QUOTES DENOTE EXCEPTIONS TO SPECIFIED STANDARD FLOOR MOUNTING AS FOLLOWS:- "f" - IN FLUSH FLOOR FITTING "s" - IN STANCHION FITTING SUBSCRIPT UPPER CASE LETTER DENOTES THE FOLLOWING: W–WALL MOUNTED 54" A.F.F. M–MODEM OUTLET MOUNTED 80" A.F.F C–COMBINATION (DATA/VOICE) SEE CD (COMMUNICATION DRAWINGS) SHEETS FOR ADDITIONAL INFORMATION	
	OUTLET FOR DATA INSTRUMENT		
X	COMBINATION TELEPHONE/DATA OUTLET		
T	JUNCTION OR PULL BOX ASSIGNED FOR TELEPHONE COMPANY WIRING		
TEL	STRIP CABINET FOR TELEPHONE COMPANY WIRING	ADJACENT INCH DIMENSIONS INDICATE CABINET SIZE WITHOUT DIMENSION SYMBOL DENOTES STRIP CABINET BY TELEPHONE COMPANY SUBSCRIPT LOWER CASE LETTERS IN QUOTES DENOTE EXCEPTIONS TO SPECIFIED MOUNTING AS FOLLOWS:- "f" - FLUSH "s" - SURFACE	
CIRCUITRY IDENTIFICATION			
xx	IDENTIFICATION OF INDIVIDUAL RUN	ADJACENT INCH DIMENSIONS INDICATE CONDUIT SIZING	ON DRAWINGS, LETTERS ARE SUBSTITUTED FOR "XX" TO DENOTE SYSTEMS IN ACCORDANCE WITH THE FOLLOWING: t – telephone p – primary
Oxx	INDIVIDUAL SLEEVE UP IDENTIFICATION	ADJACENT NUMBERS IN PARENTHESIS INDICATE QUANTITY OF SYSTEM WIRES	
xx	INDIVIDUAL SLEEVE DOWN IDENTIFICATION		
xx	INDIVIDUAL SLEEVE THROUGH IDENTIFICATION		
xx	IDENTIFICATION OF CONDUIT BANK		
xx	BANK OF SLEEVES UP IDENTIFICATION	ADJACENT NOTATIONS THUS:- 10-3" indicate quantity and size	NUMBERS SUBSTITUTED FOR "XX" INDICATE THAT THE INDICATED WORK IS ROUGHING FOR LIGHTING AND APPLIANCE BRANCH CIRCUITRY OPERATING AT THE VOLTAGE DENOTED BY THE NUMBERS
xx	BANK OF SLEEVES DOWN IDENTIFICATION		
xx	BANK OF SLEEVES THROUGH IDENTIFICATION		
XX	JUNCTION BOX FOR OTHER THAN SECONDARY LIGHT AND POWER WIRING		
LIGHTING CONTROL			
W1 OS	WALL SWITCH INFRARED OCCUPANCY SENSOR WITH 2100SF, 180° COVERAGE. SELF ADJUSTING AMBIENT LIGHT LEVEL SENSOR WITH MANUAL OVERRIDE. LEVITON CATALOG NUMBER ods15–id OR EQUAL.		
W2 OS	WALL SWITCH INFRARED, LONG RANGE OCCUPANCY SENSOR, 100', 14' WIDE COVERAGE AT 10' HEIGHT. LEVITON CATALOG NUMBER oswlr–10w OR EQUAL.		
W3 OS	WALL SWITCH INFRARED AND ULTRASONIC SENSING OCCUPANCY SENSOR. 1200SF COVERAGE. LEVITON CATALOG NUMBER osw12–mow OR EQUAL.		
C OS	INFRARED CEILING–MOUNT SENSOR WITH 450SF, 360° COVERAGE. LEVITON CATALOG NUMBER osc04–i0w OR EQUAL. RECEIVES LOW VOLTAGE POWER FROM SWITCHPACK AND RETURNS A LOW–VOLTAGE SIGNAL TO SWITCHPACK WHEN MOTION IS DETECTED.		
C2 OS	INFRARED CEILING–MOUNT SENSOR WITH 1500SF, 360° COVERAGE. LEVITON CATALOG NUMBER osc15–i0w OR EQUAL. RECEIVES LOW VOLTAGE POWER FROM SWITCHPACK AND RETURNS A LOW–VOLTAGE SIGNAL TO SWITCHPACK WHEN MOTION IS DETECTED.		

SYMBOL	DESCRIPTION	NOTES
TAG SYMBOLS		
	SECONDARY FEEDER TAG SYMBOL	INFORMATION IS LISTED IN THE TAG SYMBOL THUS:- FEEDER DESIGNATION NUMBER AND SIZE OF CONDUITS NUMBER AND SIZE OF CONDUCTORS REFERENCE TO AN APPLICABLE NOTE CONDUIT SIZE INDICATED ALONE DENOTES A SINGLE CONDUIT.
	SECONDARY INDIVIDUALLY MOUNTED OVERCURRENT AND/OR SWITCHING DEVICE TAG SYMBOL	INFORMATION IS LISTED IN THE TAG SYMBOL THUS:- "600" OR "250" INDICATES VOLTAGE RANGE AT WHICH DEVICE IS TO OPERATE. "2", "3", "3-N", ETC, INDICATES "2" POLE "3 POLE "3 POLE PLUS NEUTRAL, "ETC. DEVICE SIZE IN AMPERES. "U" INDICATES THAT NO OVERCURRENT PROTECTION IS REQUIRED–NUMBER INDICATES SIZE OF OVERCURRENT PROTECTION REQUIRED. INDIVIDUALLY MOUNTED OVERCURRENT AND SWITCHING DEVICES ARE FOR SURFACE MOUNTING UNLESS THE TAG SYMBOL CARRIES AN EXTERNAL SUBSCRIPT "f" INDICATING FLUSH MOUNTING.
	INDEXING SYMBOL	HEXAGONAL SYMBOLS CONTAINING UPPER CASE LETTERS WITH OR WITHOUT ARABIC NUMERALS INDICATE REFERENCE TO A LEGEND OR INDEX OF SPECIAL EQUIPMENT. HEXAGONAL SYMBOLS CONTAINING ARABIC NUMERALS ONLY INDICATE REFERENCE TO AN EXPLANATION OF ELECTRIC WORK REQUIREMENTS.
	REFERENCE SYMBOL	TRIANGULAR SYMBOLS CONTAINING UPPER CASE LETTERS INDICATE A MOTOR LIST REFERENCE. TRIANGULAR SYMBOLS CONTAINING ROMAN NUMERALS INDICATE REFERENCE TO A DETAIL.
	GANGING CROSS REFERENCE	THE NOTED INDICATION ADJACENT TO ANY SYMBOL FOR AN OUTLET TYPE DEVICE DENOTES THAT THE DEVICE IS TO BE GANGED IN A BOX WITH ANOTHER DEVICE WHOSE SYMBOL APPEARS SIMILARLY NOTED AT THE SAME LOCATION ON ANOTHER DRAWING.
(3'-9")	SPECIAL MOUNTING HEIGHT INDICATIONS	DIMENSION NOTED IN PARENTHESIS ADJACENT TO ANY ITEM ON THE DRAWINGS INDICATES THE HEIGHT OF ITS HORIZONTAL CENTERLINE ABOVE FINISHED FLOOR.
(*)	MOUNTING HEIGHT REFERENCE TO ARCHITECTURAL DRAWINGS	
*	APPLIANCE CIRCUIT OUTLET INDICATION	
	LINE INDICATING ASSOCIATION OF LOCAL SWITCHES WITH CONTROLLED OUTLETS	SYMBOLS USED WHERE DELINEATION OF LIGHTING AND APPLIANCE BRANCH CIRCUITRY IS OMITTED.
	SUBSCRIPT INDICATION DENOTING OUTLET REQUIRED ON SEPARATE CIRCUIT OPERATING AT 20 AMPS OR LESS	
	LINE INDICATING PHYSICAL SIZE OF ELECTRICAL ITEMS	INDICATION USED CIRCUMSCRIBING OTHER SYMBOLS TO DELINEATE PHYSICAL SIZE.

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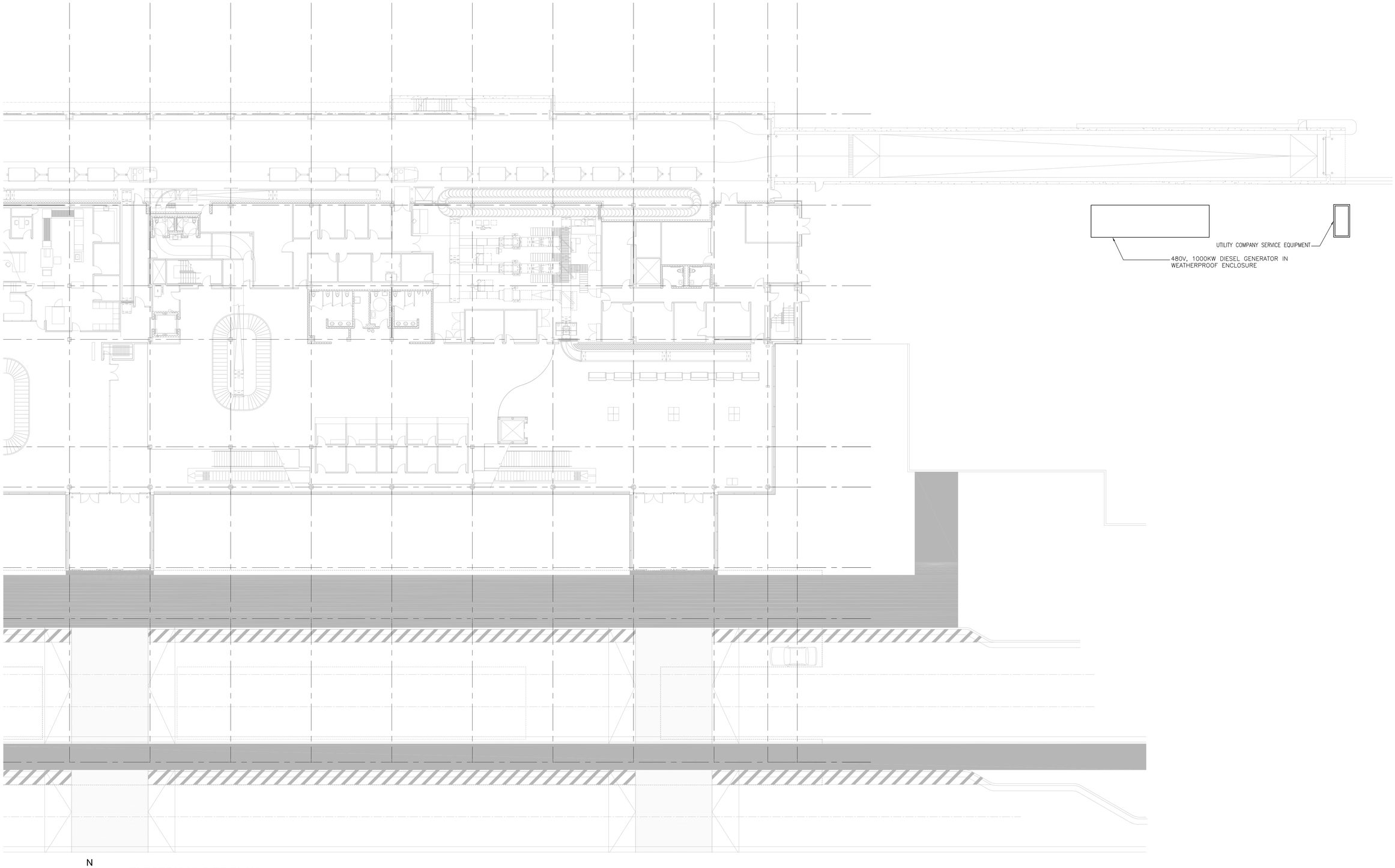
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SHEET TITLE
ELECTRICAL SYMBOLS

SHEET NUMBER
E001

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N

1 ELECTRICAL SITE PLAN
1/16" = 1'-0"

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DESIGNED BY: JK

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SHEET TITLE
ELECTRICAL SITE PLAN

SHEET NUMBER
E002

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NOTES:

1. BRANCH CIRCUITS IN ELEVATOR MACHINE ROOM SHALL BE CONNECTED TO "EPP" PANEL LOCATED WITHIN ROOM.
2. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-1A U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
3. RECEPTACLES ON NORMAL POWER SHALL BE CONNECTED TO PANEL "RP" PANELS AS INDICATED ON THIS SHEET U.N.O.
4. FANS FOR UNIT HEATERS ("UH") AND CABINET UNIT HEATERS ("CUH") ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-1A" U.N.O.
5. CIRCUITS 25,27 AND 29 ARE DESIGNATED FOR BREAK ROOM APPLIANCES. SEE PANEL SCHEDULE "RP-1B".
6. PROVIDE BHS MAINTENANCE RECECPTACLES ALONG CONVEYOR LINES. RECEPTACLES SHALL BE 20A, 120V GROUNDED DUPLEX. COORDINATE WITH BHS MANUFACTURER FOR RECOMMENDED LOCATIONS AND SPACING.

KEYED NOTES:

(1) MINIMUM QUANTITY OF SMOKE DETECTORS INIDICATED. SMOKE DETECTOR PLACEMENT AND QUANTITY SHALL BE BASED ON COORDINATION WITH EQUIPMENT LAYOUT.

(2) LOCATE RECEPTACLE IN INTERVIEW ROOM 6" ABOVE WRITING COUNTER.

(3) LOCATE POWER STRIP CONTAINING IG, GFI TYPE RECEPTACLES 6" ABOVE WORK SURFACE.

(4) DEDICATED 20A DUPLEX RECEPTACLE FOR FM-200 SYSTEM CONTROLS. COORDINATE RECEPTACLE LOCATION WITH FM-200 LOCATION. VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER.

(5) PROVIDE A ELEVATOR MACHINE ROOM HEAT DETECTOR WITHIN 24" OF EACH SPRINKLER HEAD.

(6) JBOX FOR BAGGAGE CONVEYOR MCP 480V POWER. CONTRACTOR SHALL VERIFY LOCATION OF MCP AND POWER REQUIREMENTS PER BAGGAGE HANDLING SYSTEM MANUFACURER.

(7) JBOX FOR BAGGAGE CONVEYOR MCP 120V POWER. CONTRACTOR SHALL VERIFY LOCATION OF MCP.

(8) JBOX FOR RECHECK BAG BELT 480V POWER. CONTRACTOR SHALL VERIFY LOCATION FOR POWER CONNECTION AND POWER REQUIREMENTS PER BAGGAGE HANDLING SYSTEM MANUFACTURER.



N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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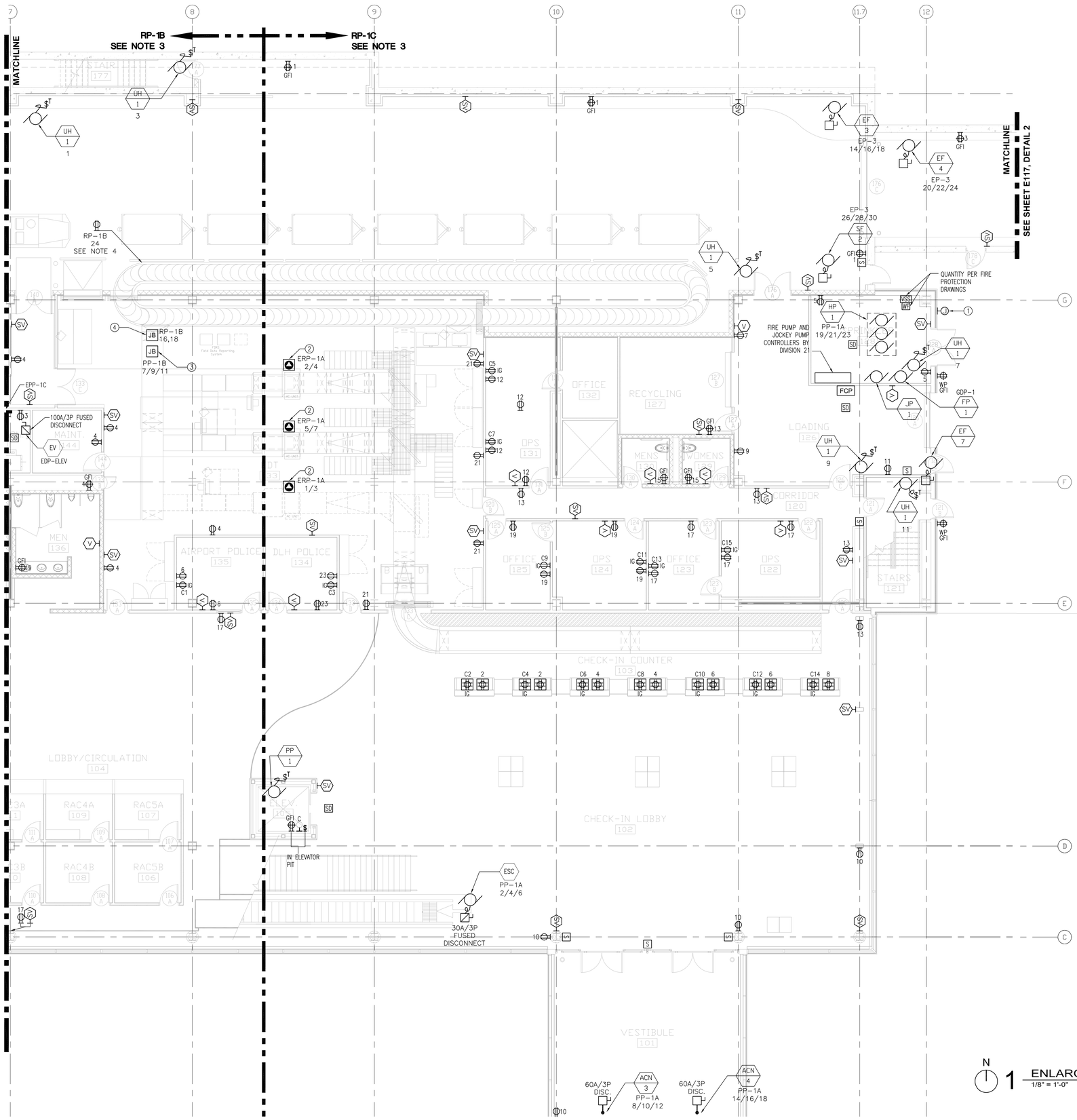
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E110

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N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-1B U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "c".
2. RECEPTACLES ON NORMAL POWER SHALL BE CONNECTED TO "RP" PANELS AS INDICATED ON THIS SHEET U.N.O.
3. FANS FOR UNIT HEATERS ("UH") AND CABINET UNIT HEATERS ("CUH") ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-1B" U.N.O.
4. PROVIDE BHS MAINTENANCE RECEPTACLES ALONG CONVEYOR LINES. RECEPTACLES SHALL BE 20A, 120V GROUNDED DUPLEX. COORDINATE WITH BHS MANUFACTURER FOR RECOMMENDED LOCATIONS AND SPACING.

KEYED NOTES:

1. JUNCTION BOX FOR FIRE BELL. BELL SHALL BE CONNECTED TO PANEL "EMLP-1A", CKT 1.
2. NEMA L6-30 RECEPTACLE FOR EDS MACHINE. LOCATE RECEPTACLE PER MANUFACTURER REQUIREMENTS.
3. JBOX FOR BAGGAGE CONVEYOR MCP 480V POWER. CONTRACTOR SHALL VERIFY LOCATION OF MCP AND POWER REQUIREMENTS PER BAGGAGE HANDLING SYSTEM MANUFACTURER.
4. JBOX FOR BAGGAGE CONVEYOR MCP 120V POWER. CONTRACTOR SHALL VERIFY LOCATION OF MCP.

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DESIGNED BY: JK

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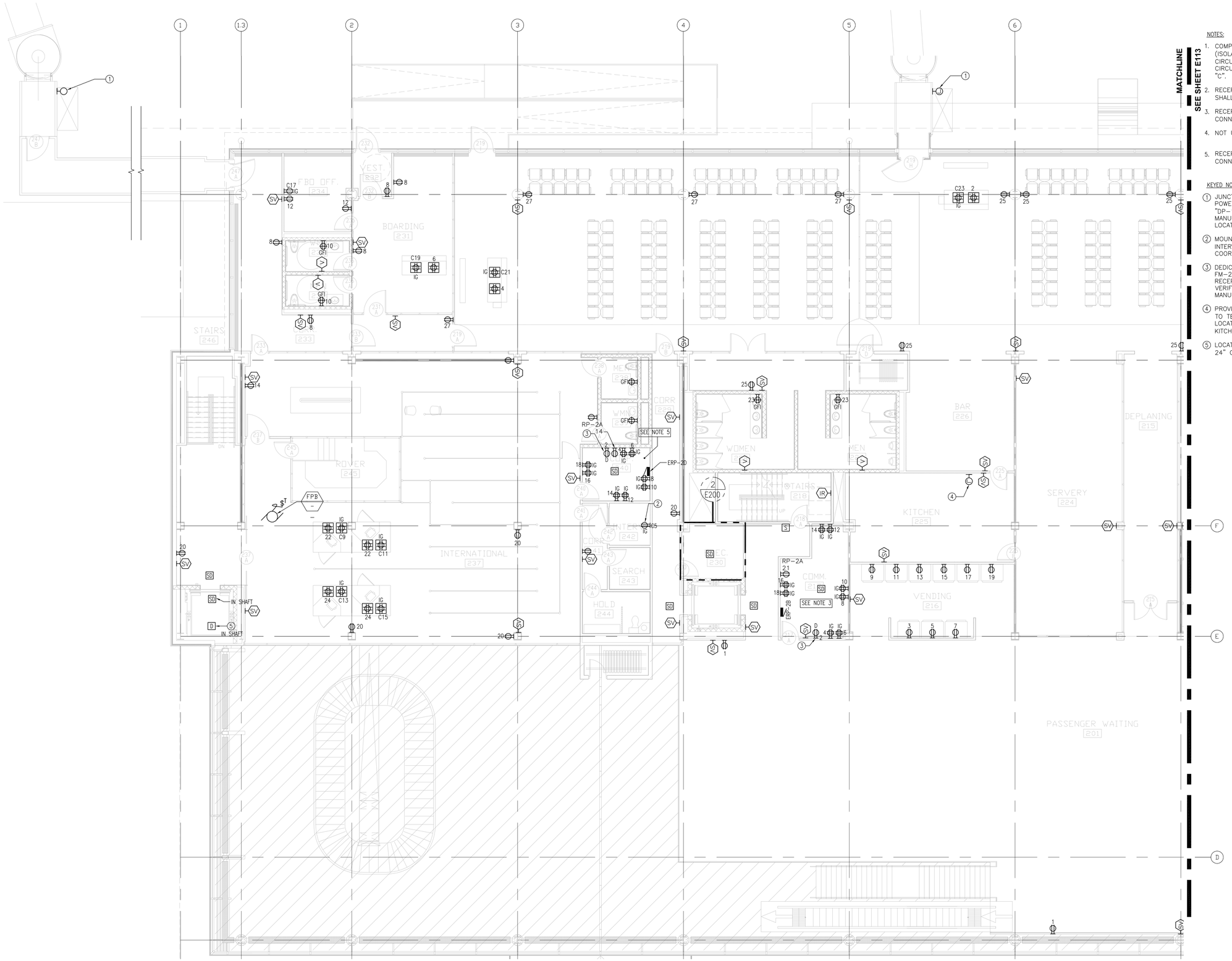
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E111

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N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-2B" U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES ON NORMAL POWER ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-2A" U.N.O.
3. RECEPTACLES IN COMM. ROOM 211 SHALL BE CONNECTED TO PANEL "ERP-2B" U.N.O.
4. NOT USED
5. RECEPTACLES IN COMP. ROOM 222 SHALL BE CONNECTED TO PANEL "ERP-2D" U.N.O.

KEYED NOTES:

1. JUNCTION BOX FOR AIRPLANE PASSENGER BRIDGE. POWER FOR BRIDGE SHALL COME FROM PANEL "DP-1A". VERIFY POWER REQUIREMENTS WITH MANUFACTURER OF EQUIPMENT. COORDINATE LOCATION OF POWER CONNECTION WITH OWNER.
2. MOUNT DEDICATED COMPUTER RECEPTACLE IN INTERVIEW ROOM 6" ABOVE WRITING COUNTER. COORDINATE LOCATION IN FIELD.
3. DEDICATED 20A DUPLEX RECEPTACLE FOR FM-200 SYSTEM CONTROLS. COORDINATE RECEPTACLE LOCATION WITH FM-200 LOCATION. VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER.
4. PROVIDE EMPTY CONDUIT FROM JUNCTION BOX TO TENANT DISTRIBUTION PANEL "DP-RET" LOCATED IN MAIN ELECTRICAL ROOM FOR FUTURE KITCHEN PANEL(S).
5. LOCATE A ELEVATOR SHAFT HEAT DETECTOR WITH 24" OF EACH SPRINKLER HEAD.

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TEL: (218) 591-5079

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

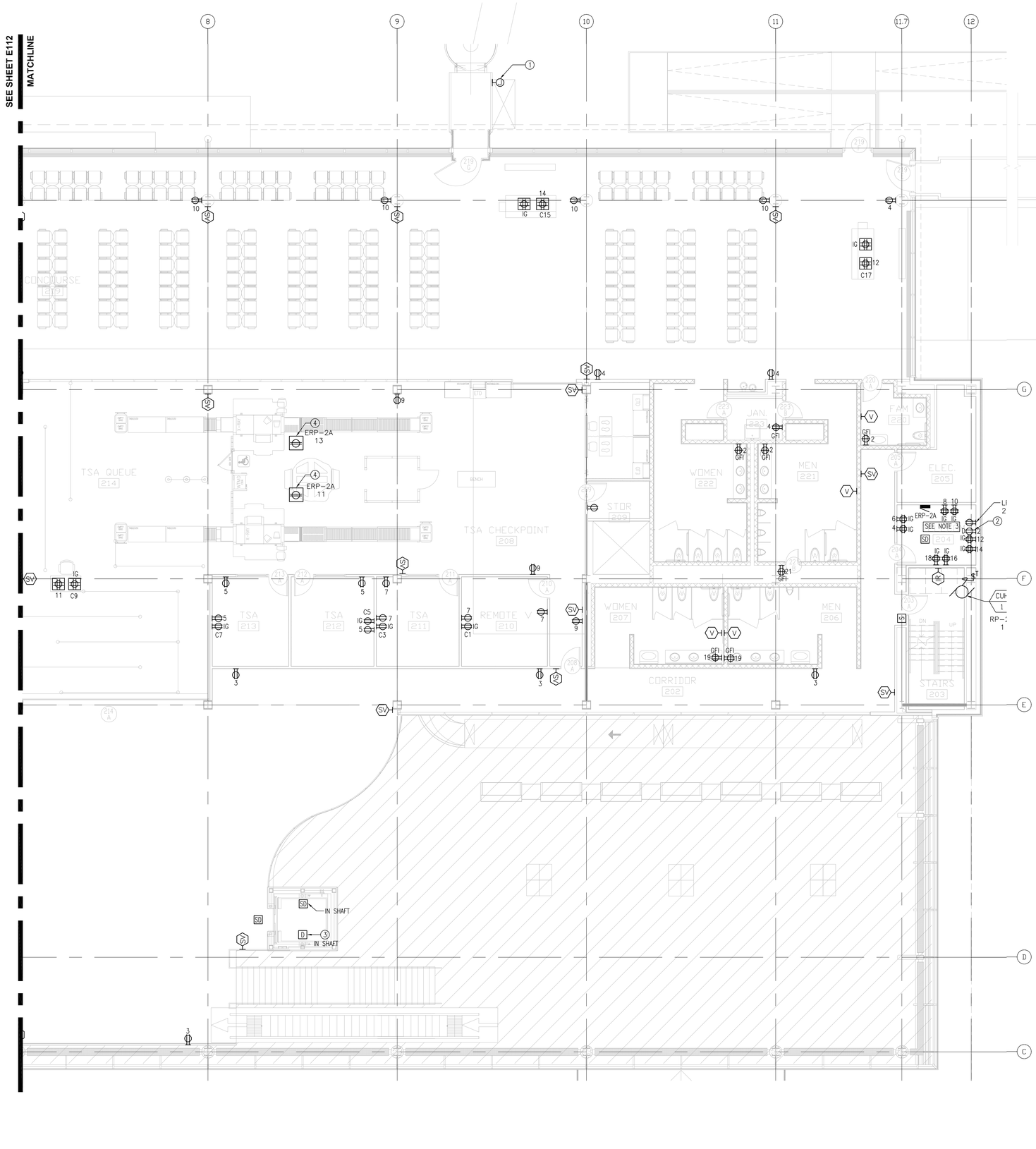
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SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E112

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NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP–2A" U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES ON NORMAL POWER ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP–2B" U.N.O.
3. RECEPTACLES IN TELECOM ROOM 243 SHALL BE CONNECTED TO PANEL "ERP–2A" U.N.O.

KEYED NOTES:

(1) JUNCTION BOX FOR AIRPLANE PASSENGER BRIDGE. POWER FOR BRIDGE SHALL COME FROM PANEL "DP–1A". VERIFY POWER REQUIREMENTS WITH MANUFACTURER OF EQUIPMENT. COORDINATE LOCATION OF POWER CONNECTION WITH OWNER.

(2) DEDICATED 20A DUPLEX RECEPTACLE FOR FM–200 SYSTEM CONTROLS. COORDINATE RECEPTACLE LOCATION WITH FM–200 LOCATION. VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER.

(3) LOCATE A ELEVATOR SHAFT HEAT DETECTOR WITH 24" OF EACH SPRINKLER HEAD.

(4) COORDINATE LOCATION OF RECEPTACLE FOR XRAY MACHINE PER MANUFACTURER REQUIREMENTS.

N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

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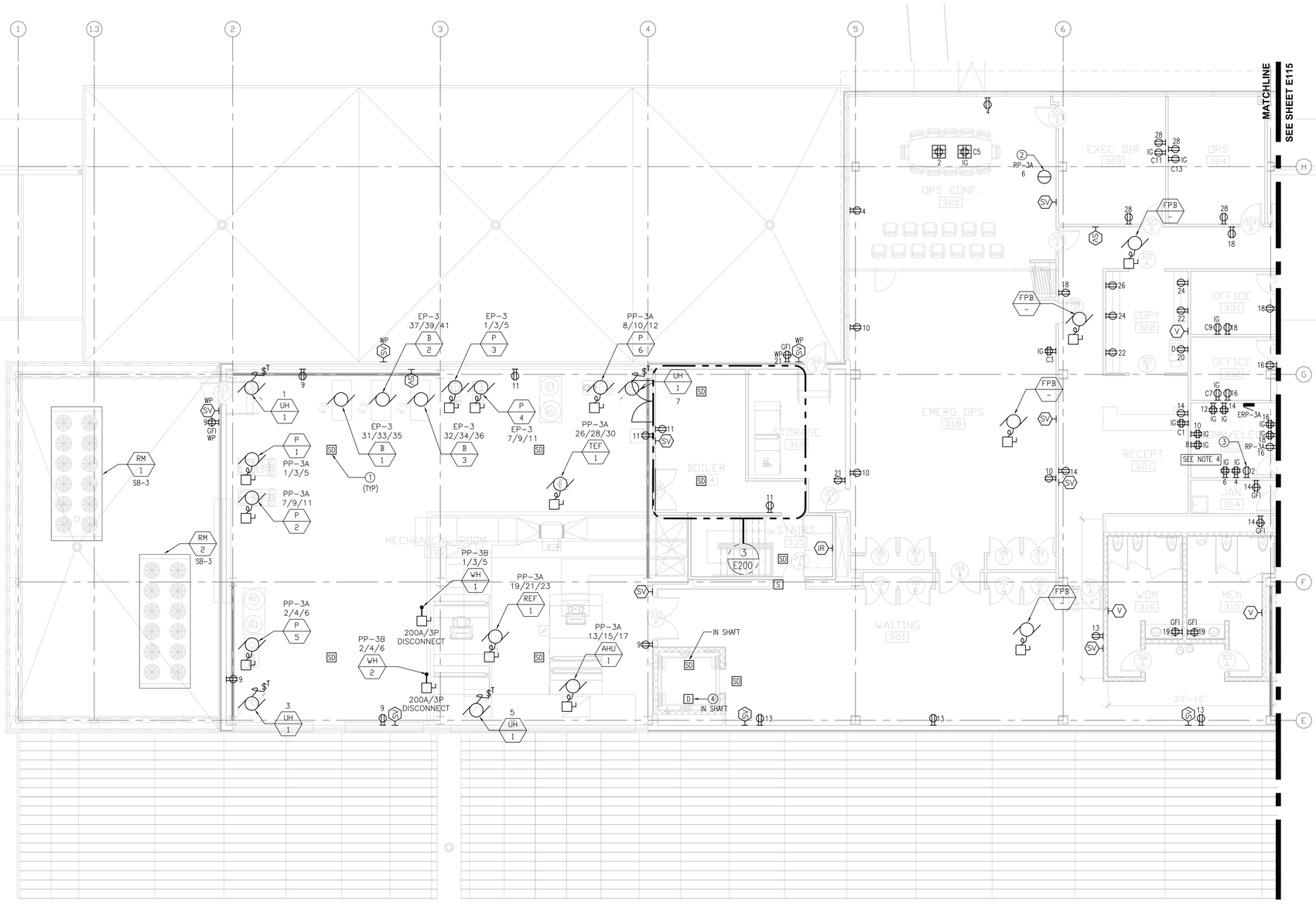
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SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA B

SHEET NUMBER
E113

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NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-3A". CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES ON NORMAL POWER ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-3A" U.N.O.
3. FANS FOR UNIT HEATERS ("UH") AND CABINET UNIT HEATERS ("CUH") ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-3A" U.N.O.
4. RECEPTACLES IN COMM. ROOM 171 SHALL BE CONNECTED TO PANEL "ERP-3A" U.N.O.

KEYED NOTES:

(1) MINIMUM QUANTITY OF SMOKE DETECTORS INDICATED. SMOKE DETECTOR PLACEMENT AND QUANTITY SHALL BE BASED ON COORDINATION WITH DUCTWORK AND EQUIPMENT LAYOUT.

(2) CEILING MOUNTED RECEPTACLE FOR PROJECTION SCREEN. CONFIRM LOCATION WITH OWNER.

(3) DEDICATED 20A DUPLEX RECEPTACLE FOR FM-200 SYSTEM CONTROLS. COORDINATE RECEPTACLE LOCATION WITH FM-200 LOCATION. VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER.

(4) LOCATE A ELEVATOR SHAFT HEAT DETECTOR WITHIN 24" OF EACH SPRINKLER HEAD.

N

1 ENLARGED THIRD LEVEL FLOOR PLAN - ADMIN.
1/8" = 1'-0"

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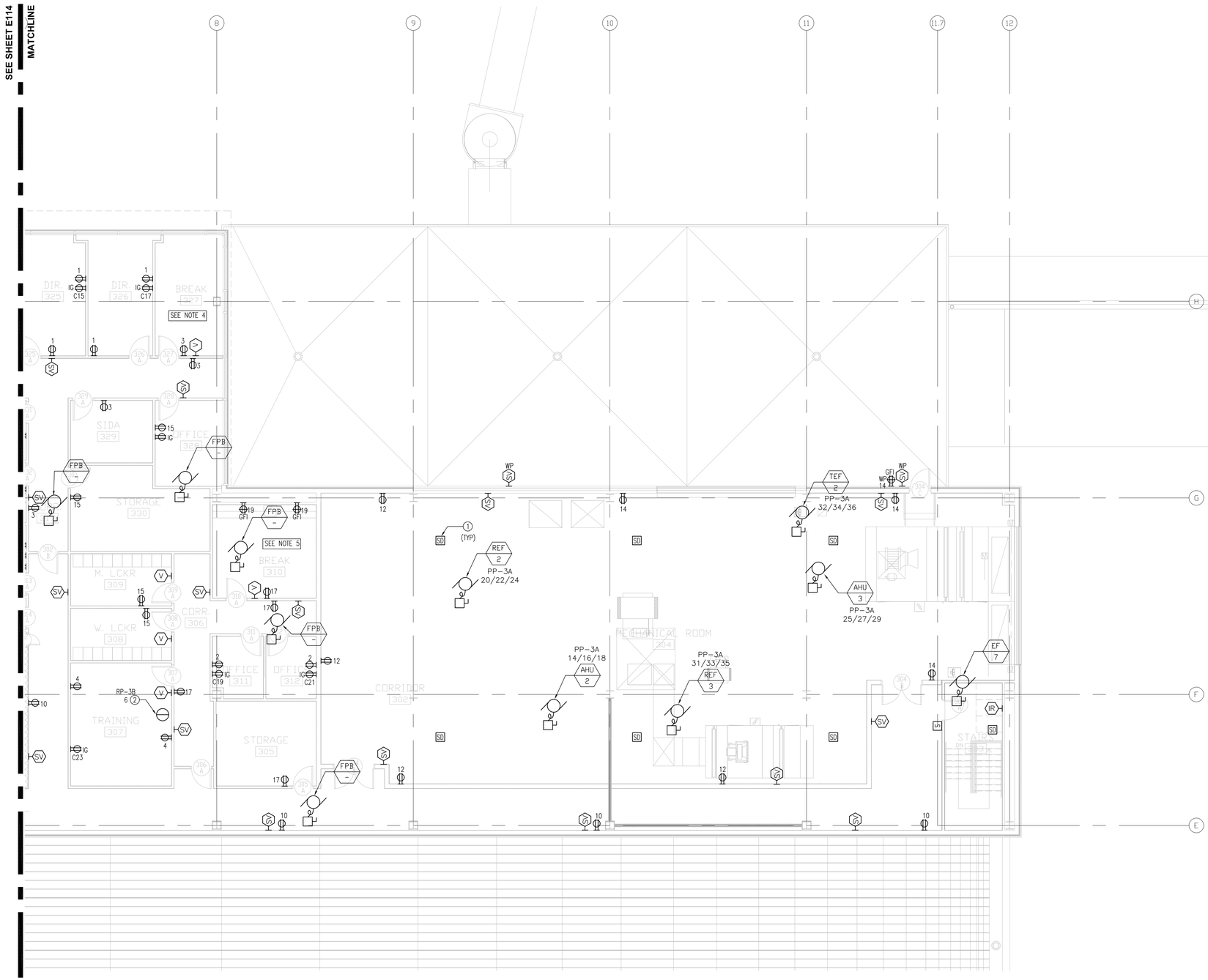
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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E114

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NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-3A". CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES ON NORMAL POWER ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-3B" U.N.O.
3. FANS FOR UNIT HEATERS ("UH") AND CABINET UNIT HEATERS ("CUH") ON THIS SHEET SHALL BE CONNECTED TO PANEL "RP-3B" U.N.O.
4. CIRCUITS 7,9 AND 11 ARE DESIGNATED FOR BREAK ROOM APPLIANCES. SEE PANEL SCHEDULE "RP-3B".
5. CIRCUITS 21,23 AND 25 ARE DESIGNATED FOR BREAK ROOM APPLIANCES. SEE PANEL SCHEDULE "RP-3B".

KEYED NOTES:

(1) MINIMUM QUANTITY OF SMOKE DETECTORS INDICATED. SMOKE DETECTOR PLACEMENT AND QUANTITY SHALL BE BASED ON COORDINATION WITH DUCTWORK AND EQUIPMENT LAYOUT.

(2) CEILING MOUNTED RECEPTACLE FOR PROJECTION SCREEN. CONFIRM LOCATION WITH OWNER.

N

1 ENLARGED THIRD LEVEL FLOOR PLAN - ADMIN.
1/8" = 1'-0"

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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA B

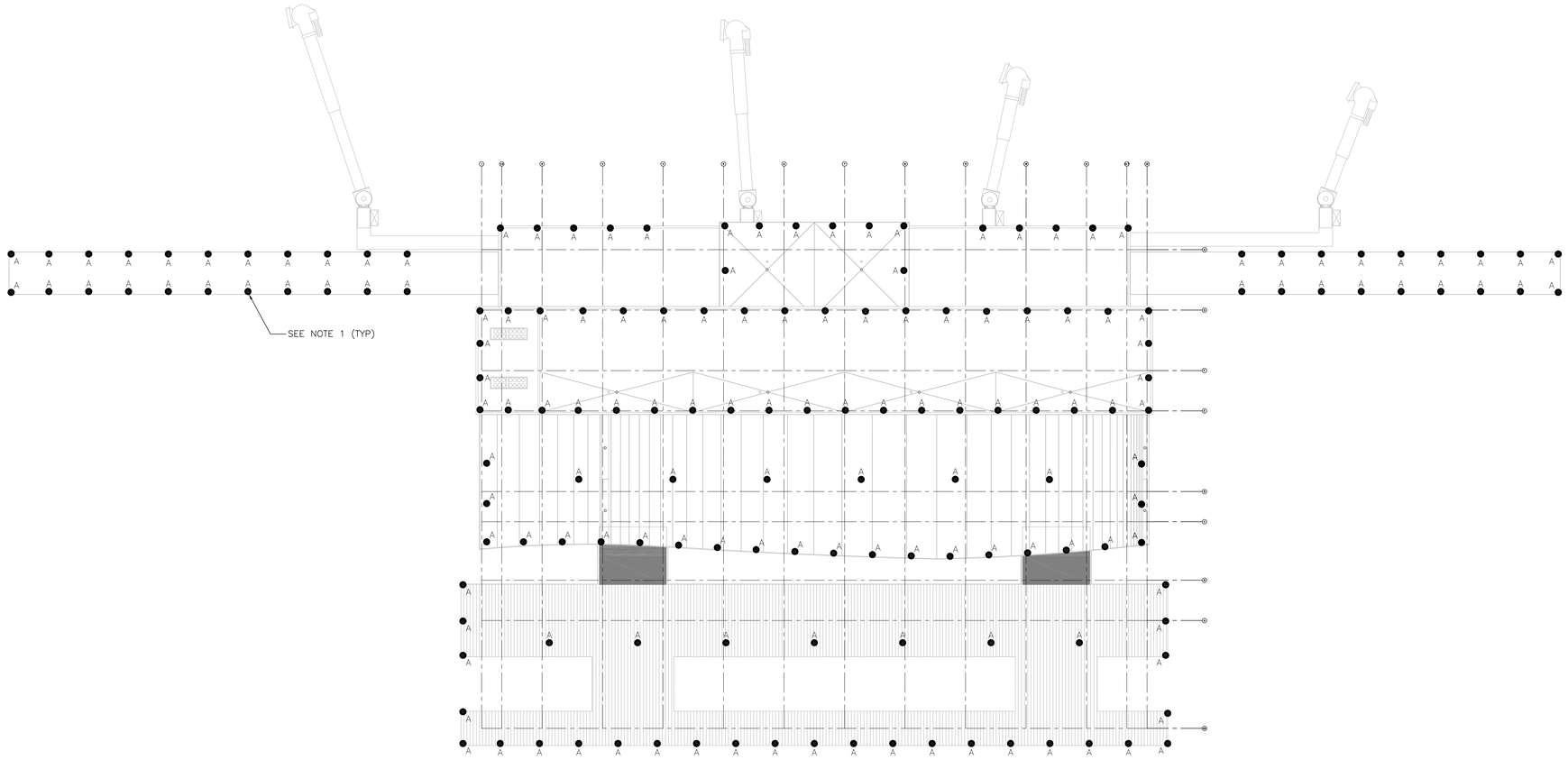
SHEET NUMBER
E115

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NOTES:

1. AIR TERMINAL LOCATIONS SHOWN ON DRAWINGS FOR LIGHTNING PROTECTION SYSTEM ARE FOR REFERENCE ONLY. HLP OR APPROVED EQUAL SHALL PROVIDE MASTER LABEL LIGHTNING PROTECTION SYSTEM.



N

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

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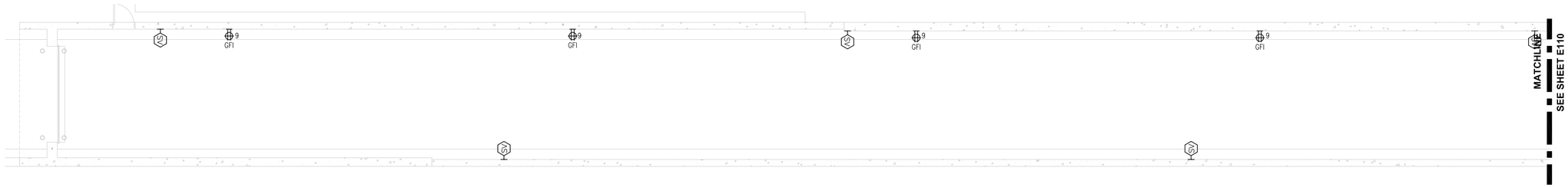
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SHEET TITLE
ELECTRICAL
ROOF PLAN

SHEET NUMBER
E116

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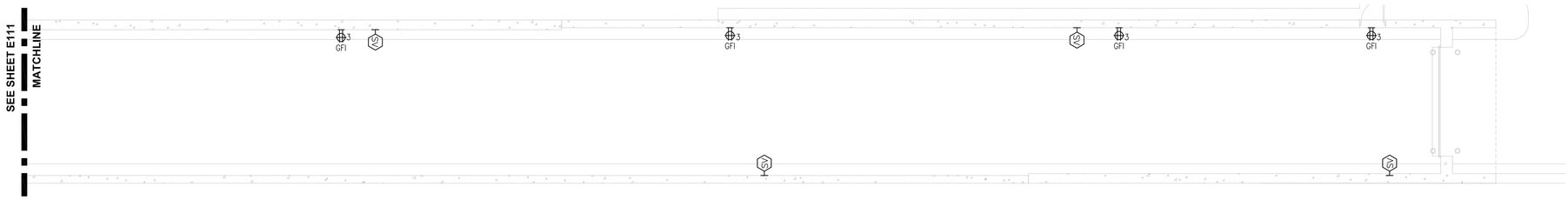
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N

1 WEST RAMP - ELECTRICAL POWER PLAN

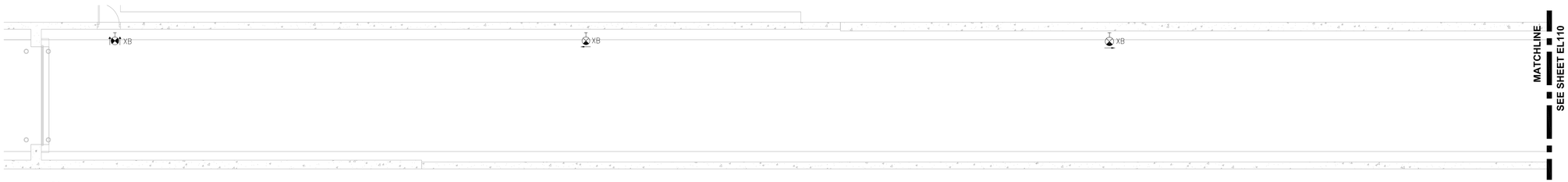
1/8" = 1'-0"



N

2 EAST RAMP - ELECTRICAL POWER PLAN

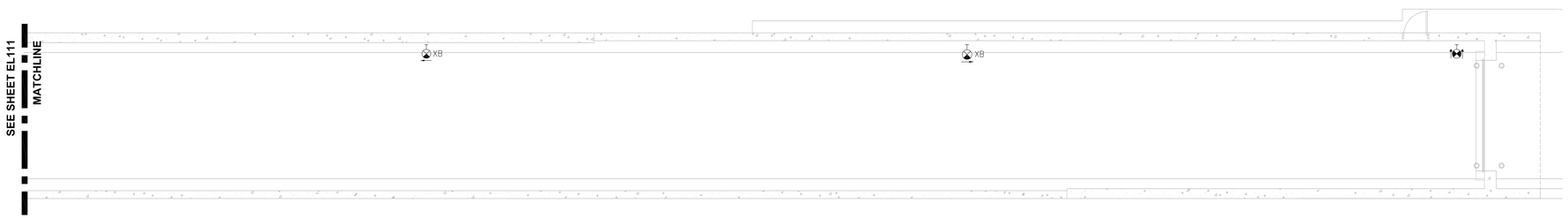
1/8" = 1'-0"



N

3 WEST RAMP - ELECTRICAL LIGHTING PLAN

1/8" = 1'-0"



N

4 EAST RAMP - ELECTRICAL LIGHTING PLAN

1/8" = 1'-0"

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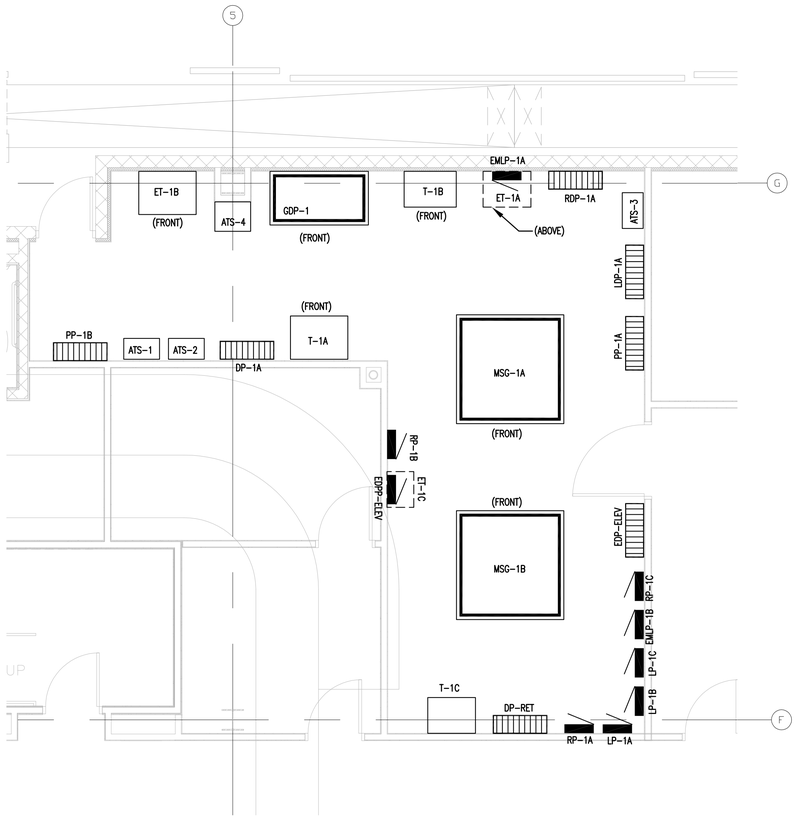
SHEET TITLE

RAMP
ELECTRICAL POWER
AND LIGHTING PLAN

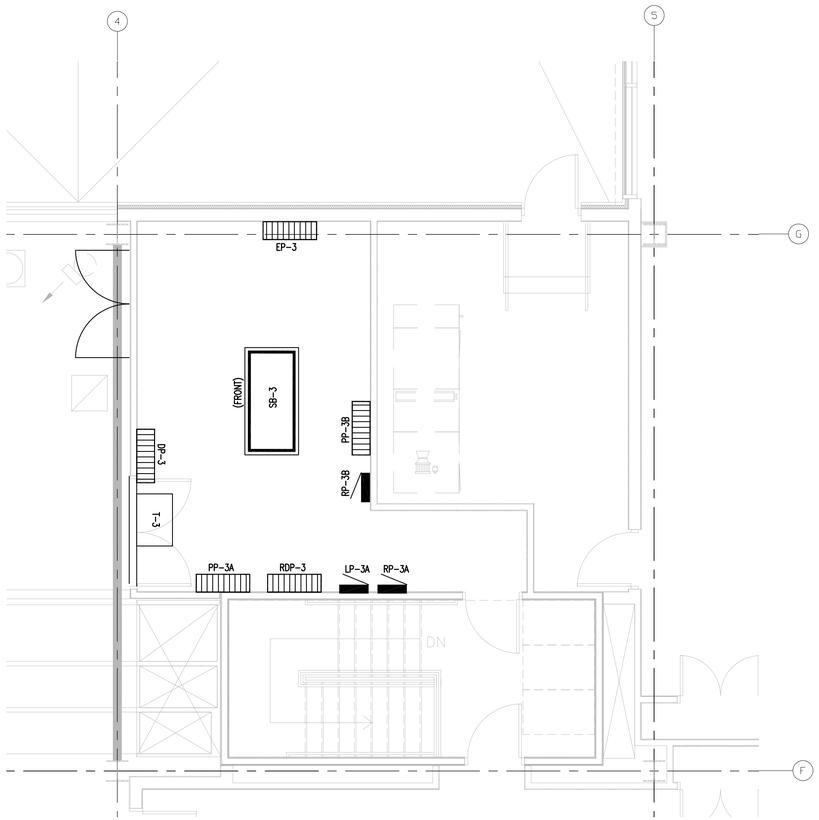
SHEET NUMBER
E117

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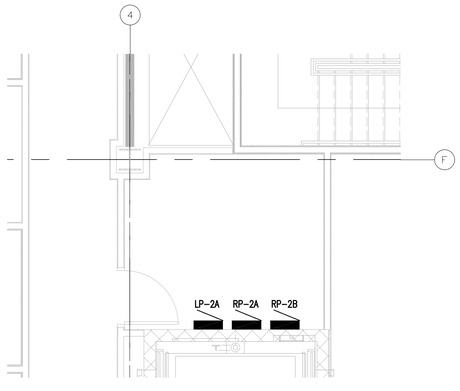
Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.3a) Electrical\Dwgs\2008_E117.dwg Plotted on: 2/11/2010 1:28 PM Plotted by: Nadler, Jennifer



N 1 ENLARGED MAIN ELECTRICAL ROOM - 1ST FLR
1/4" = 1'-0"



N 3 ENLARGED 3RD FLOOR ELECTRICAL ROOM
1/4" = 1'-0"



N 2 ENLARGED 2ND FLOOR ELECTRICAL ROOM
1/4" = 1'-0"

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SHEET TITLE
ENLARGED
EQUIPMENT ROOMS

SHEET NUMBER
E200

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KEYED NOTES:

1. MOTOR PROTECTOR WITH MAGNETIC TRIP THAT OPENS ON SHORT CIRCUIT ONLY. CIRCUIT BREAKER SHALL NOT HAVE THERMAL TRIP.
2. PROVIDE ELECTRONIC METERING FOR EACH TENANT OCP DEVICE. PROVIDE EMON SYSTEM OR APPROVED EQUAL.

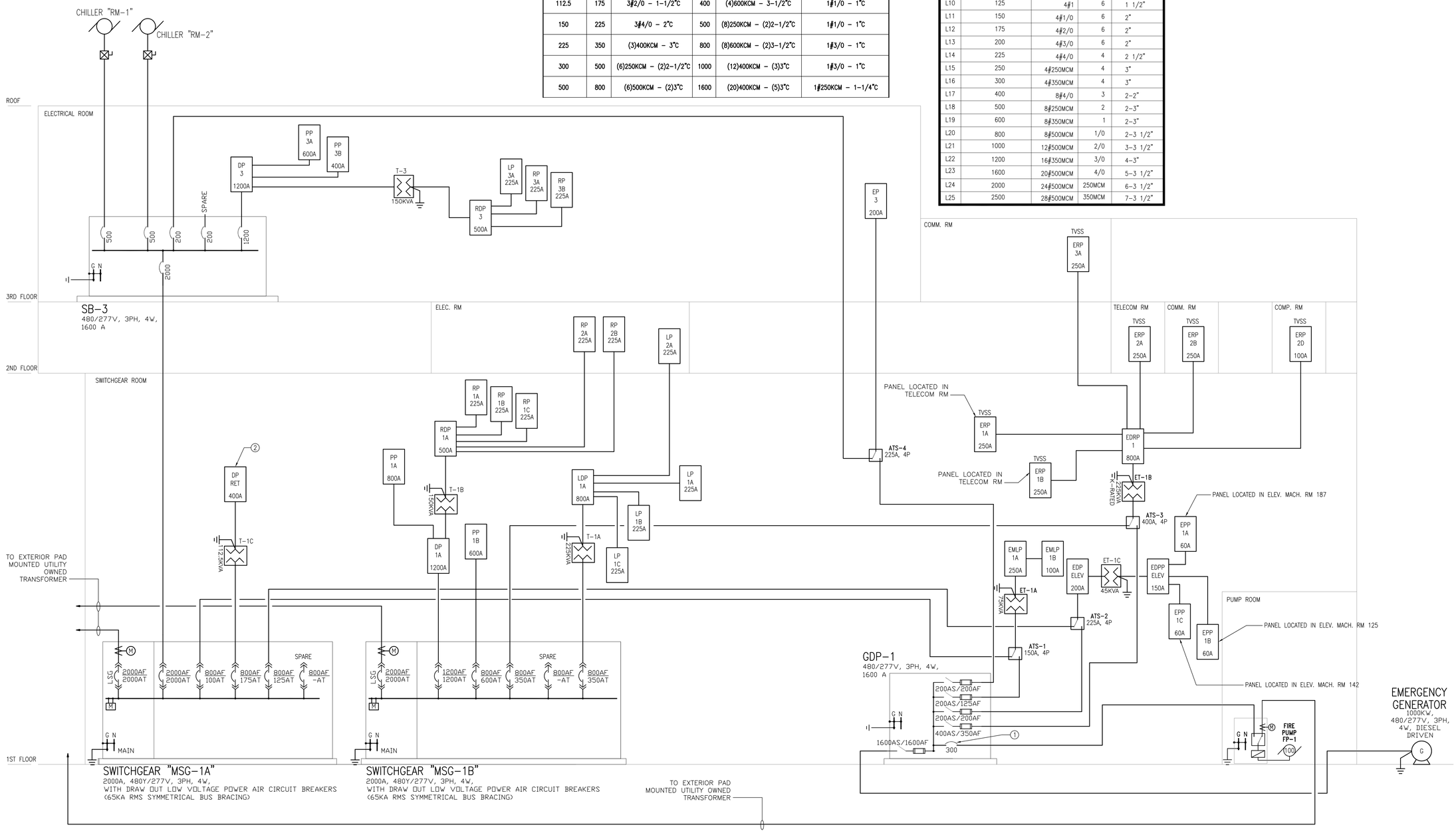
TABLE 3

TRANSFORMER SCHEDULE

TRANSFORMER (KVA)	480 VOLT SIDE		120/208 VOLT SIDE		
	OCD (AMPS)	FEEDER	OCD (AMPS)	NON "K" RATED TRANSFORMER FEEDER	GROUNDING ELECTRODE CONDUCTOR
9	15	3#12 – 3/4"C	40	4#8 – 3/4"C	1#8 – 1/2"C
15	30	3#10 – 3/4"C	50	4#6 – 1"C	1#8 – 1/2"C
30	50	3#6 – 1"C	100	4#2 – 1-1/4"C	1#8 – 1/2"C
45	70	3#4 – 1"C	150	4#1/0 – 2"C	1#6 – 1/2"C
75	125	3#1 – 1-1/4"C	250	4#250KCM – 2-1/2"C	1#2 – 3/4"C
112.5	175	3#2/0 – 1-1/2"C	400	(4)600KCM – 3-1/2"C	1#1/0 – 1"C
150	225	3#4/0 – 2"C	500	(8)250KCM – (2)2-1/2"C	1#1/0 – 1"C
225	350	(3)400KCM – 3"C	800	(8)600KCM – (2)3-1/2"C	1#3/0 – 1"C
300	500	(6)250KCM – (2)2-1/2"C	1000	(12)400KCM – (3)3"C	1#3/0 – 1"C
500	800	(6)500KCM – (2)3"C	1600	(20)400KCM – (5)3"C	1#250KCM – 1-1/4"C

SIZING OF 3PH, 4W & GROUND FEEDERS (COPPER CONDUCTORS)

TAG	REQUIRED OVERCURRENT DEVICE (OCD) WITH FUSE OR C/B TRIP (AMPS)	QUANTITY AND SIZE OF CONDUCTORS AND CONDUIT		
		4WIRE SET	GROUND WIRE	CONDUIT(S)
L1	20	4#12	12	3/4"
L2	30	4#10	10	3/4"
L3	40	4#8	10	3/4"
L4	50	4#6	10	1"
L5	60	4#6	10	1"
L6	70	4#4	8	1 1/4"
L7	80	4#2	8	1 1/4"
L8	90	4#2	8	1 1/4"
L9	100	4#1	8	1 1/2"
L10	125	4#1	6	1 1/2"
L11	150	4#1/0	6	2"
L12	175	4#2/0	6	2"
L13	200	4#3/0	6	2"
L14	225	4#4/0	4	2 1/2"
L15	250	4#250MCM	4	3"
L16	300	4#350MCM	4	3"
L17	400	8#4/0	3	2-2"
L18	500	8#250MCM	2	2-3"
L19	600	8#350MCM	1	2-3"
L20	800	8#500MCM	1/0	2-3 1/2"
L21	1000	12#500MCM	2/0	3-3 1/2"
L22	1200	16#350MCM	3/0	4-3"
L23	1600	20#500MCM	4/0	5-3 1/2"
L24	2000	24#500MCM	250MCM	6-3 1/2"
L25	2500	28#500MCM	350MCM	7-3 1/2"



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AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
POWER RISER DIAGRAM

SHEET NUMBER
E300

60% NOT FOR CONSTRUCTION

Drawing: I:\2010.00 Duluth Airport\5.0 CADD\(24) Electrical\Dwgs\2010_E300.dwg Plotted on: 2/11/2010 1:28 PM Plotted by: Koehne, Jennifer

FA GENERAL NOTES:

1. OPENINGS FOR DUCT SMOKE DETECTORS ARE PROVIDED BY OTHERS.
2. RISER CIRCUITRY SHALL BE IN 2-HOUR RATED ENCLOSURE PROVIDED BY GENERAL CONTRACTOR.
3. FOR CLARITY, DTU'S ARE GENERALLY NOT SHOWN. REFER TO SPECIFICATIONS FOR REQUIREMENTS.
4. ALL PLACES OF ASSEMBLY, PUBLIC CORRIDORS, PUBLIC STORAGE ROOMS, ETC. SHALL BE PROVIDED WITH ALARM INDICATING DEVICES PER ADA, UL AND LOCAL AUTHORITY.

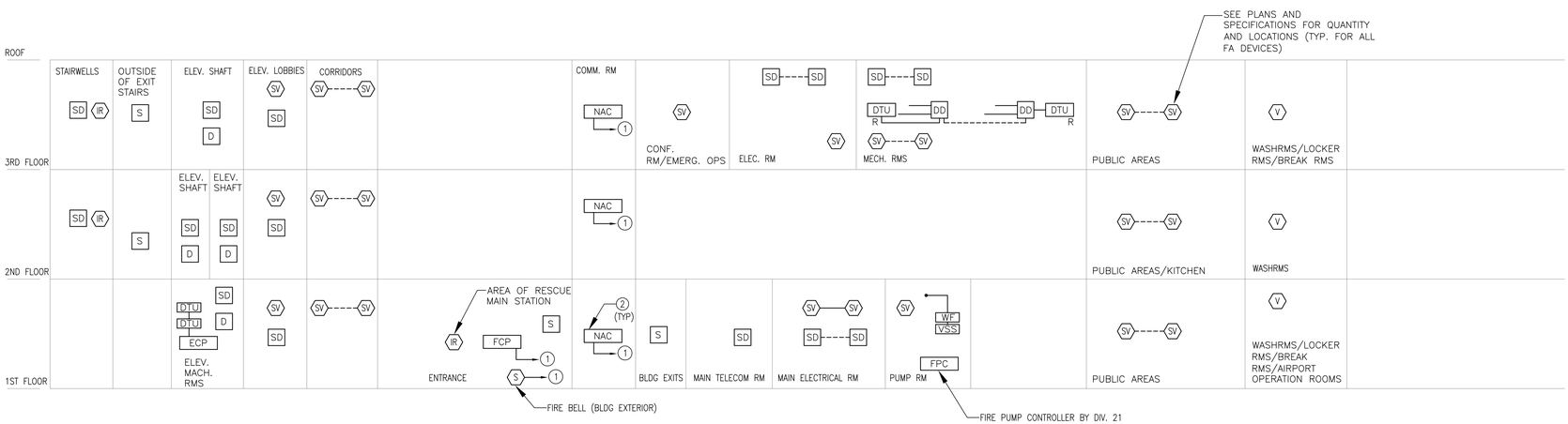
FA KEYED NOTES

(1) CONNECT TO SINGLE POLE, 20A CIRCUIT BREAKER.

(2) NOTIFICATION APPLIANCE CIRCUIT PANEL. LOCATED IN 2-HR ENCLOSURE. PROVIDE ADEQUATE QUANTITY OF NAC PANELS TO POWER NOTIFICATION DEVICES SHOWN ON PLANS AND NOTED IN SPECIFICATIONS.

(3) QUANTITY OF DTU DEVICES TO BE VERIFIED WITH EQUIPMENT MANUFACTURER. TYPICAL FOR ALL DTU DEVICES SHOWN.

THE SUCCESSFUL MANUFACTURER SHALL SUBMIT DETAILED SHOP DRAWINGS AND SPECIFICATIONS FOR APPROVAL TO THE LOCAL FIRE PREVENTION BUREAU



FIRE ALARM DIAGRAM

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SHEET TITLE
FIRE ALARM AND GROUNDING RISER DIAGRAMS

SHEET NUMBER
E301

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ABBREVIATIONS

(THIS LIST OF ABBREVIATIONS DOES NOT APPLY TO ANY LETTERS USED IN CONJUNCTION WITH SYMBOLS)

A	-	AMPS
AC	-	ALTERNATING CURRENT
ADJ	-	ADJACENT
AFD	-	AUTOMATIC FIRE DETECTION
AFF	-	ABOVE FINISHED FLOOR
AFG	-	ABOVE FINISHED GRADE
AIR COND	-	AIR CONDITIONING
AP	-	APPLIANCE PANEL
ARCH	-	ARCHITECTURAL
ASYM	-	ASYMMETRICAL
AUTO	-	AUTOMATIC
AVG	-	AVERAGE
BL	-	BLANK
BLDG	-	BUILDING
C	-	CONDUIT
CAB	-	CAB
CAT	-	CATALOGUE
CKT	-	CIRCUIT
CL	-	CLOCK
CLG	-	CEILING
CLOS	-	CLOSET
CM	-	CIRCULAR MIL
COL	-	COLUMN
CONC	-	CONCRETE
CONST	-	CONSTRUCTION
CONT	-	CONTINUOUS
CONV	-	CONVENIENCE
CS	-	CABLE SUPPORT
CU	-	CUBIC
DC	-	DIRECT CURRENT
DIA	-	DIAMETER
DN	-	DOWN
DP	-	DISTRIBUTION PANEL
DTL	-	DETAIL
DWG	-	DRAWING
EA	-	EAST
EC	-	EMPTY CONDUIT
EL	-	ELEVATION
ELEC	-	ELECTRIC
ELEV	-	ELEVATOR
EM	-	ON EMERGENCY CIRCUIT
ENTR	-	ENTRANCE
EP	-	EXPLOSION PROOF
EQ	-	EQUAL
EQPMT	-	EQUIPMENT
EXIST	-	EXISTING
F	-	FLOOR
FA	-	FIRE ALARM
FDR	-	FEEDER
FIN	-	FINISH
FIXT	-	FIXTURE
FL	-	FLUSH
FLUOR	-	FLUORESCENT
FSTP	-	FIRE-STANDPIPE
FT	-	FEET
GA	-	GAUGE
GALV	-	GALVANIZED
GD	-	GROUND
H	-	HERMETIC
HC	-	HUNG CEILING
HGT	-	HEIGHT
HOR	-	HORIZONTAL
HP	-	HORSEPOWER
HT	-	HIGH TENSION
HTG	-	HEATING
HVAC	-	HEATING VENTILATING AND AIR CONDITIONING
IN	-	INCHES
INCAN	-	INCANDESCENT
INT	-	INTERCOM
JB	-	JUNCTION BOX
KVA	-	KILOVOLT AMPERES
KW	-	KILOWATT
KWH	-	KILOWATT HOURS
LP	-	LIGHTING PANEL
LS	-	LOUDSPEAKER
LT	-	LOW TENSION
LTG	-	LIGHTING
M	-	MAIN
MA	-	MILLIAMPS
MACH	-	MACHINE
MCC	-	MOTOR CONTROL CENTER
MCM	-	THOUSAND CIRCULAR MILS
MECH	-	MECHANICAL
MIC	-	MICROPHONE
MISC	-	MISCELLANEOUS
MTD	-	MOUNTED
MTR	-	MOTOR
N	-	NEUTRAL
NEC	-	NATIONAL ELECTRIC CODE
NEMA	-	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
NL	-	ON NIGHT LIGHTING CIRCUIT
OL	-	OVERLOAD
P	-	POLES
PB	-	PULL BOX
PC	-	PULL CHAIN
PF	-	POWER FACTOR
PG	-	PAGING
PH	-	PHASE
PLB	-	PLUMBING
PNL	-	PANEL
PP	-	POWER PANEL
PWR	-	POWER
RC	-	REMOTE CONTROL
REC	-	RECEPTACLE
REQ	-	REQUIRED
RM	-	ROOM
RMS	-	ROOT MEAN SQUARE
S	-	SOUND
SC	-	SQUIRREL CAGE
SO	-	SOUTH
SP	-	SPARE
SPECS	-	SPECIFICATIONS
SPKLR	-	SPRINKLER
SPKR	-	SPEAKER
SQ	-	SQUARE
STD	-	STANDARD
SURF	-	SURFACE
SW	-	SWITCH
SWBD	-	SWITCHBOARD
SYM	-	SYMETRICAL
TEL	-	TELEPHONE
TELCO	-	TELEPHONE CO.
TV	-	TELEVISION
TYP	-	TYPICAL
UFD	-	UNDER FLOOR DUCT
V	-	VOLTS
VENT	-	VENTILATING
VERT	-	VERTICAL
VP	-	VAPORPROOF
W	-	WATTS
WE	-	WEST
WGD	-	WITH GUARD
WP	-	WEATHERPROOF
WR	-	WOUND ROTOR
WT	-	WIRING TROUGH
XFMR	-	TRANSFORMER
YD	-	YARD
# (UNRELATED TO OTHER WORDS)	-	WIRE GAUGE NUMBER
ø	-	PHASE
F@	-	FUSED AT
C	-	CENTER LINE
C/B	-	CIRCUIT BREAKER
CONV/O	-	CONVENIENCE OUTLET
C/T	-	CURRENT TRANSFORMER
P/T	-	POTENTIAL TRANSFORMER
O/C	-	OVERCURRENT
C/C	-	CENTER TO CENTER
N/O	-	NORMALLY OPEN
N/C	-	NORMALLY CLOSED
1/C,2/C 3/C	-	ONE CONDUCTOR TWO CONDUCTORS, ETC.

TABLE 1

3 PHASE FEEDER VOLTAGE DROP CALCULATIONS
(TO LIMIT VOLTAGE DROP TO 3% PER NEC 215.2)

FEEDER SIZE	FEEDER OCP, A	MAXIMUM LOAD, A	VOLTAGE DROP FACTOR @ 0.8 P.F. (VOLTS PER AMPERE PER 100FT)	MAXIMUM FEEDER LENGTH, FT 208V	480V
#12	20	16	0.27	144	333
#10	30	24	0.17	153	353
#8	50	40	0.11	142	327
#6	60	48	0.073	178	411
#4	80	64	0.048	203	469
#2	100	80	0.032	244	563
#1	150	120	0.026	200	462
#1/0	175	140	0.023	194	447
#2/0	200	160	0.019	205	474
#3/0	225	180	0.016	217	500
#4/0	250	200	0.014	223	514
250KCM	300	240	0.012	217	500
300KCM	300	240	0.011	236	545
350KCM	350	280	0.01	223	514
400KCM	350	280	0.0095	235	541
500KCM	400	320	0.0085	229	529
600KCM	400	355	0.008	220	507

TABLE 2

1 PHASE FEEDER VOLTAGE DROP CALCULATIONS
(TO LIMIT VOLTAGE DROP TO 3% PER NEC 210.19)

FEEDER SIZE	FEEDER OCP, A	MAXIMUM LOAD, A	VOLTAGE DROP FACTOR @ 0.8 P.F. (VOLTS PER AMPERE PER 100FT)	MAXIMUM FEEDER LENGTH, FT 120V	277V
#12	20	16	0.31	73	168
#10	20	16	0.2	113	260
#8	20	16	0.13	173	400

TABLE 3

480 VOLT MOTOR CONTROLLER / FEEDER / DEVICE SCHEDULE

MOTOR HP	NEMA CONTROLLER SIZE	OVERCURRENT DEVICE (AMPS)	LOCAL MOTOR DISCONNECT (AMPS)	FEEDER FOR ACROSS THE LINE START, VARIABLE FREQUENCY CONTROLLER	FEEDER FOR REDUCED VOLTAGE START - WYE-DELTA OR PART WINDING
1/2	00	15	30	3 # 12 - 3/4" C	
3/4	00	15	30	3 # 12 - 3/4" C	
1	00	15	30	3 # 12 - 3/4" C	
1-1/2	00	15	30	3 # 12 - 3/4" C	
2	00	15	30	3 # 12 - 3/4" C	
3	0	15	30	3 # 12 - 3/4" C	
5	0	15	30	3 # 12 - 3/4" C	
7-1/2	1	20	30	3 # 12 - 3/4" C	
10	1	25	30	3 # 12 - 3/4" C	6 # 12 - 3/4" C
15	2	35	30	3 # 10 - 3/4" C	6 # 12 - 3/4" C
20	2	45	60	3 # 8 - 3/4" C	6 # 12 - 3/4" C
25	2	60	60	3 # 6 - 1" C	6 # 8 - 1" C
30	3	70	60	3 # 6 - 1" C	6 # 8 - 1" C
40	3	90	60	3 # 4 - 1" C	6 # 6 - 1-1/4" C
50	3	110	100	3 # 2 - 1-1/4" C	6 # 4 - 1-1/4" C
60	4	125	100	3 # 1 - 1-1/4" C	6 # 4 - 1-1/4" C
75	4	150	200	3 # 1 - 1-1/4" C	6 # 2 - 1-1/2" C
100	4	200	200	3 # 2/0 - 1-1/2" C	6 # 1 - 2" C
125	5	250	200	3 # 3/0 - 2" C	6 # 1 - 2" C
150	5	300	400	3 # 4/0 - 2" C	6 # 1/0 - 2" C
200	5	400	400	3 - 350 MCM - 2-1/2" C	6 # 3/0 - 2-1/2" C
250	6	500	400	3 - 500 MCM - 3" C	6 - 250 MCM - 3" C
300	6	600	600	6 -250 MCM - 3" C	6 - 350 MCM - 3-1/2" C
400	6	800	600	6 - 300 MCM - 3-1/2" C	12 # 3/0 - (2) 2-1/2" C
500	7	1000	800	6 - 500 MCM - (2) 3" C	12 - 250 MCM - (2) 3" C

NOTES:
1 - FOR FEEDERS IN EXCESS OF 300 FEET IN LENGTH PROVIDE NEXT LARGER SIZE CONDUCTORS. INCREASE CONDUIT SIZE AS REQUIRED.
2 - FOR REDUCED VOLTAGE STARTERS, DISCONNECT SWITCHES INTERPOSED INTO FEEDER BETWEEN STARTER AND MOTOR SHALL BE 6 POLE TYPE.
3 - PROVIDE A GROUND CONDUCTOR (SIZED PER CODE) FROM EACH VFD TO NEAREST GROUNDING ELECTRODE.

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SHEET TITLE
ELECTRICAL ABBREVIATIONS AND TABLES

SHEET NUMBER
E400

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LIGHTING FIXTURE SCHEDULE (BACK OF HOUSE)

TYPE	SYMBOL	DESCRIPTION	MANUFACTUR. & CATALOG NO.	LAMPS			MOUNTINGS: P–PENDANT R–RECESSED S–SURFACE	REMARKS
				QTY	TYPE	TOTAL VA		
A		FLUORESCENT WRAPAROUND WITH HIGH IMPACT ACRYLIC LENS	COLUMBIA WC4–232–EU–DR OR APPROVED EQUAL	2	32W T8	60	P/S	BACK OF HOUSE, STORAGE
B		ENCLOSED AND GASKETED 4' SURFACE OR PENDANT MOUNTED INDUSTRIAL FIXTURE	COLUMBIA LU4–232–E120 OR APPROVED EQUAL	2	32W T8	60	P/S	EQUIPMENT RMS
C		WALL OR CEILING MOUNTED GUARDED GLASS COVERED VAPOR–PROOF INCANDESCENT	HALUX ELBA20GSV OR ELJA20GSV. GE–H7 SERIES HUBBELL–V SERIES	1	100W–A21	100	S	ELEVATOR PITS
D		FULL CUTOFF METAL HALIDE WALL PACK. WET LOCATION LISTED	HUBBELL LCC–50P8–* OR APPROVED EQUAL *–FINISH BY ARCHITECT	1	50W MH	70	S	EXTERIOR (BACK OF HOUSE)
D–EM		SAME AS TYPE "D" WITH EGRESS LAMP SOCKET. PROVIDE 50W HALOGEN EGRESS LAMP.	HUBBELL LCC–50P8–*–EM OR APPROVED EQUAL *–FINISH BY ARCHITECT	1	50W MH	70	S	EXTERIOR (BACK OF HOUSE)
				1 EM LAMP	50W MH	70		
F		4' SURFACE MOUNTED FLUORESCENT WALL BRACKET WITH T8 LAMPS.	COLUMBIA W4–232–E120 OR APPROVED EQUAL	2	32W T8	60	S	STAIRWELL
XA		EDGE LIT LED EXIT SIGN.	COOPER LIGHTING SURELITES EEX SERIES OR APPROVED EQUAL		LED	5	S	PUBLIC AREAS
XB		LED EXIT SIGN WITH STEEL HOUSING.	COOPER LIGHTING SURELITES SLX SERIES OR APPROVED EQUAL		LED	5	S	BACK OF HOUSE AREAS
XC	WP	WEATHERPROOF EXIT SIGN.	COOPER LIGHTING SURELITES UX7 SERIES OR APPROVED EQUAL		LED	5	S	EXTERIOR AREAS

GENERAL NOTES

1. SEE FIXTURE CUT SHEETS FOR MORE INFORMATION.
2. CONTRACTOR TO PROVIDE ALL PARTS AND HARDWARE NESESSARY FOR A COMPLETE INSTALLATION.
3. ALL REMOTE LOW VOLTAGE TRANSFORMERS AND SECONDARY WIRING RUNS TO BE LOCATED AND INSTALLED BY CONTRACTOR TO LIMIT VOLTAGE DROP TO NO MORE THAN 5% MEASURED AT THE LAST LAMP.
4. CONTRACTOR TO INSTALL ALL COVE LIGHTING IN A CONTINUOUS FASHION SO AS TO MINIMIZE DARK SPOTS ON ADJACENT WALLS, FLOOR, OR CEILING.

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SHEET TITLE
LIGHTING FIXTURE SCHEDULE

SHEET NUMBER
E401

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LEGEND OF EQUIPMENT

IDENTIFICATION SYMBOL	EQUIPMENT DESCRIPTION	ELECTRICAL RATING								ELECTRICAL WORK NOTES REFERENCE SYMBOL	REMARKS
		KW U.N.O.	KVA	HP	EQUIPMENT AMPS	OUTLET AMPS	VOLTS	PHASE	WIRES		
EV	ELEVATOR			25			480	3	3	1, 9, 12, 13, 45	
ESC	ESCALATOR			10			480	3	3	38, 45	
WC	WATER COOLER					20	115	1	2	34, 38	

WORK NOTES PERTAINING TO LEGEND OF EQUIPMENT

1. EXTEND INDICATED POWER CIRCUIT AND CONNECT SAME TO THE LINE TERMINALS OF THE EQUIPMENT -- THE FINAL PORTION (NOTE TO EXCEED 48" IN LENGTH) SHALL BE WITH FLEXIBLE METALLIC RACEWAY.
2. PROVIDE THE CONTROL CIRCUITRY UTILIZING WIRING METHOD AND SIZING AS SPECIFIED FOR MOTOR CONTROLS.
3. PROVIDE SUITABLE PLATE ON OUTLET BOX -- PROVIDE "SOLID" POWER CIRCUIT CONNECTION TO EQUIPMENT CONSISTING OF FLEXIBLE METALLIC RACEWAY CONTAINING WIRES OF SIZE AND TYPE EQUAL TO THOSE SUPPLYING THE OUTLET -- NUMBER OF WIRES SHALL BE AS REQUIRED FOR THE EQUIPMENT (FOR FLUSH OUTLET BOX, PROVIDE EXTENSION COLLAR TO ALLOW FOR SIDE ENTRY OF CONNECTION).
4. CONNECT LEADS OF EQUIPMENT LOCATED AT OUTLET BOX DIRECTLY TO WIRES IN SAME.
5. LEAVE SUITABLE SLACK ON WIRES FOR POWER CIRCUIT CONNECTION SEPARATE FROM THE ELECTRIC WORK.
6. CONTINUATION WILL BE SEPARATE FROM ELECTRIC WORK.
7. PROVIDE POWER CIRCUIT WORK WITHIN EQUIPMENT AS DIRECTED.
8. INSERT PLUG OF EQUIPMENT INTO RECEPTACLE.
9. PROVIDE POWER CIRCUIT WIRING BETWEEN THE VARIOUS COMPONENTS OF THE EQUIPMENT AS DIRECTED.
10. PROVIDE ELECTRIC WORK AS PER DETAIL NOTED ON PLANS ADJACENT TO EQUIPMENT DESIGNATION SYMBOL.
11. PROVIDE CONTROL WIRES WITHIN EQUIPMENT HOUSING AS DIRECTED TO CONNECT UP CONTROL DEVICES.
12. INSTALL CONTROLLER, FURNISHED SEPARATE FROM ELECTRIC WORK, WHERE INDICATED ON PLANS.
13. INSTALL CONTROL DEVICES FURNISHED SEPARATE FROM ELECTRIC WORK AND PROVIDE CONTROL WIRING BETWEEN SAME AS DIRECTED.
14. INSTALL UNIT AS DIRECTED.
15. FURNISH UNIT AS PER SPECIFICATIONS.
16. FURNISH UNIT AS PER DETAIL NOTED ON PLANS ADJACENT TO EQUIPMENT SIGNATION SYMBOL.
17. PROVIDE CONTROL CIRCUIT RUN FROM EQUIPMENT TO CONTROLLER LOCATED WHERE INDICATED ON THE PLANS -- RUN TO CONTAIN AN ADEQUATE NUMBER OF WIRES FOR THE PROPER EXTENSION OF SAFETY AND SINGLE OR MULTI-STAGE THERMOSTATIC CONTROL.
18. PROVIDE CONTROL CIRCUIT RUN FROM EQUIPMENT TO CONTROL LOCATION WITHIN 75 FEET CIRCUITING DISTANCE -- CONTROL CIRCUIT RUN TO CONTAIN AN ADEQUATE NUMBER OF WIRES FOR THE REQUIRED STAGES OF CONTROL -- PROVIDE FLUSH OUTLET BOX AT CONTROL LOCATION AND, IN SAME, INSTALL THERMOSTAT FURNISHED SEPARATE FROM THE ELECTRIC WORK -- CONNECT FOR OPERATION AS DIRECTED.
19. PROVIDE 2-WIRE CONTROL CIRCUIT RUN FROM CONTROLLER TO CONTROL LOCATION WITHIN 75 FEET CIRCUITING DISTANCE -- PROVIDE FLUSH OUTLET BOX AT CONTROL LOCATION AND, IN SAME, INSTALL THERMOSTAT / TRANSDUCER, FURNISHED SEPARATE FROM ELECTRIC WORK, FOR THE VOLTAGE MODULATING CONTROLLER -- CONNECT FOR OPERATION AS DIRECTED.
20. PROVIDE 2-WIRE CONTROL CIRCUIT RUN FROM EQUIPMENT TO CONTROLLER LOCATED WHERE INDICATED ON THE PLANS -- CONNECT SO AS TO INTRODUCE UNMODULATED VOLTAGE INTO THE EQUIPMENT FOR CONTROL PURPOSES.
21. PROVIDE PIPE HEATER STRIP AS PER DETAIL, OF LENGTH AS NOTED ON PLANS WITHIN EQUIPMENT DESIGNATION SYMBOL.
22. NOT USED.
23. NOT USED.
24. NOT USED.
25. PROVIDE TWO WIRE LIGHTING AND APPLIANCE BRANCH CIRCUITRY EXTENSION ALONG INSIDE EDGE OF HOOD UTILIZING WIRING AS SPECIFIED FOR DAMP LOCATIONS -- ON THE BASIS OF ONE FOR EACH THREE LINEAR FEET OF HOOD PERIMETER, PROVIDED INCANDESCENT LIGHTING FIXTURES, CROUSE-HINDS CATALOG NO. VC 1759 OR OTHER APPROVED, LOCATED, MOUNTED AND INTERPOSED IN THE CIRCUITRY EXTENSION AS DIRECTED.
26. PROVIDE TWO WIRE CONTROL CIRCUIT RUNS FROM EQUIPMENT TO PROOF OF FLOW DEVICE WITHIN 30 FEET, 0 INCHES CIRCUITING DISTANCE -- CONNECT UP FOR SAFETY OVERRIDE CONTROL.
27. PROVIDE TWO WIRE CONTROL CIRCUIT RUN FROM EQUIPMENT TO CONTROL LOCATION WITHIN 75 FEET, 0 INCHES CIRCUITING DISTANCE -- PROVIDE FLUSH OUTLET BOX AT CONTROL LOCATION AND, IN SAME, INSTALL THERMOSTAT/TRANSDUCER, FURNISHED SEPARATE FROM ELECTRIC WORK, FOR THE VOLTAGE MODULATING CONTROLLER INCLUDED INTEGRALLY IN THE EQUIPMENT -- CONNECT FOR OPERATION AS DIRECTED.
28. PROVIDE FOUR WIRE CONTROL CIRCUIT RUN FROM EQUIPMENT TO CONTROL LOCATION WITHIN 30 FEET, 0 INCHES CIRCUITING DISTANCE -- PROVIDE FLUSH OUTLET BOX AT CONTROL LOCATION AND, IN SAME, INSTANCE SELECTOR SWITCH FURNISHED SEPARATE FROM ELECTRIC WORK -- CONNECT FOR OPERATION AS DIRECTED.
29. PROVIDE THREE WIRE CONTROL CIRCUIT RUN FROM EQUIPMENT TO CONTROL LOCATION WITHIN 30 FEET, 0 INCHES CIRCUITING DISTANCE -- PROVIDE FLUSH OUTLET BOX AT CONTROL LOCATION AND, IN SAME, INSTALL THERMOSTAT, FURNISHED SEPARATE FROM ELECTRIC WORK -- CONNECT FOR OPERATION AS DIRECTED.
30. PROVIDE SLEEVES, CONDUIT EXTENSIONS AND WIRING THROUGH EXTERIOR WALL AS DIRECTED.
31. WITHIN INDICATED BOUNDARY, PROVIDE SNOW MELTING CABLE ASSEMBLY AS PER DETAIL.
32. EXTEND INDICATED POWER CIRCUIT AND CONNECT SAME TO THE LINE TERMINALS OF THE EQUIPMENT.
33. EXTEND INDICATED POWER CIRCUIT AND CONNECT SAME TO THE LINE TERMINALS OF THE EQUIPMENT -- THE FINAL PORTION (NOT TO EXCEED 48 INCHES IN LENGTH) SHALL BE WITH LIQUID TIGHT FLEXIBLE METALLIC CONDUIT (OR PLENFLEX IN CEILING CAVITY)
34. PROVIDE SUITABLE PLATE ON OUTLET BOX -- PROVIDE "SOLID" POWER CIRCUIT CONNECTION TO EQUIPMENT CONSISTING OF LIQUID - TIGHT FLEXIBLE METALLIC CONDUIT CONTAINING WIRES OF SIZE AND TYPE EQUAL TO THOSE SUPPLYING THE OUTLET -- NUMBER OF WIRES SHALL BE AS REQUIRED FOR THE EQUIPMENT. (FOR FLUSH OUTLET BOX, PROVIDE EXTENSION COLLAR TO ALLOW FOR SIDE ENTRY OF CONNECTION).
35. PROVIDE TWO-WIRE LIGHTING AND APPLIANCE BRANCH CIRCUITRY EXTENSION INTO AIR PLENUM UTILIZING WIRING AS SPECIFIED FOR DAMP LOCATIONS -- PROVIDE FOUR (4) INCANDESCENT LIGHTING FIXTURES, CROUSE-HINDS CATALOGUE NO. VC1759 OR OTHER APPROVED, LOCATED, MOUNTED AND INTERPOSED IN THE CIRCUITRY EXTENSION AS DIRECTED.
36. CONNECT FAN COIL UNIT MOTOR TO SUPPLY CIRCUIT RESERVED FOR MOTORS ONLY.
37. SEE PRIMARY DISTRIBUTION SYSTEM SINGLE LINE DIAGRAM FOR EXPLANATION OF WORK REQUIRED.
38. PROVIDE DISCONNECT MEANS WITH CONNECTIONS AS REQUIRED TO INTERPOSE SAME BETWEEN TERMINATION OF BUILDING WIRING AND LINE TERMINALS OF UNIT -- TYPE OF DISCONNECT MEANS AND MOUNTING LOCATION TO BE IN ACCORDANCE WITH INSTRUCTIONS ISSUED BY THE MANUFACTURER OF THE UNIT.
39. ITEM IS PART OF PACKAGED MOTORIZED EQUIPMENT -- ELECTRIC WORK IS DESCRIBED ELSEWHERE.
40. PROVIDE 250 WATTS PER LINEAR FOOT ELECTRIC BASEBOARD HEATER (OF LENGTH AS NOTED ON PLANS WITHIN EQUIPMENT DESIGNATION SYMBOL) COMPLETE WITH BUILT-IN IN-LINE THERMOSTAT HAVING AN OPERATING POLE FOR EACH PHASE LEG SUPPLYING THE RADIATOR, AND A MANUAL OFF FEATURE WHICH CAN BE OVER RIDDEN AUTOMATICALLY. THE HEATERS SHALL BE FEDERAL PACIFIC MODEL "HG" SERIES "X", OR OTHER APPROVED.
41. PROVIDE TWO-WIRE CONTROL CIRCUIT FROM EQUIPMENT TO FAN SHUTDOWN PANEL CALLED FOR ELSEWHERE IN CONJUNCTION WITH FIRE PROTECTIVE ALARM SYSTEMS -- WIRE UP SUCH THAT, WHEN OPENED, THE RELAY CONTACTS ASSIGNED TO THIS EQUIPMENT IN THE AFOREMENTIONED PANEL SHUT THE EQUIPMENT DOWN.
42. PROVIDE TWO-WIRE CONTROL CIRCUIT FROM EQUIPMENT TO FIRE PROTECTIVE ALARM SYSTEM EQUIPMENT CONTROL PANEL CALLED FOR ELSEWHERE TO BE LOCATED 30 FEET, 0 INCHES CIRCUITING DISTANCE AWAY -- WIRE UP SUCH THAT, WHEN OPENED, THE RELAY CONTACTS ASSIGNED TO THIS EQUIPMENT IN THE AFOREMENTIONED PANEL SHUT THE EQUIPMENT DOWN.
43. PROVIDE TWO-WIRE CONTROL CIRCUIT FROM MECHANISM TO FAN SHUTDOWN PANEL CALLED FOR ELSEWHERE IN CONJUNCTION WITH FIRE PROTECTIVE ALARM SYSTEMS -- WIRE UP SUCH THAT, WHEN CLOSED, THE RELAY CONTACTS ASSIGNED TO THIS MECHANISM IN THE AFOREMENTIONED
44. PROVIDE TWO-WIRE CONTROL CIRCUIT FROM DOOR CONTROLLER TO GENERATOR CONTROL PANEL CALLED FOR ELSEWHERE. WIRE UP SUCH THAT, WHEN CLOSED THE RELAY CONTACTS ASSIGNED TO THIS MECHANISM IN THE AFOREMENTIONED PANEL WILL OPEN THE DOOR.
45. EXTEND INDICATED POWER CIRCUITRY AND CONNECT SAME TO LINE TERMINALS OF EQUIPMENT -- PROVIDE ANY ADDITIONAL DISCONNECT MEANS AND/OR POWER OR CONTROL CIRCUITRY EXTENSIONS REQUIRED TO CONFORM TO CODE INTERPRETATIONS OF AUTHORITIES HAVING JURISDICTION
46. HYDRAULIC ELEVATOR MACHINE ROOM LINE VOLTAGE DISCONNECT SWITCH SHALL INCORPORATE AN ELECTRICAL INTERLOCK COMPRISED OF TWO NORMALLY OPEN CONTACTS THAT SHALL OPEN BEFORE THE SAFETY SWITCHES MAIN BLADES BREAK.
47. PROVIDE TWO WIRE LIGHTING AND APPLIANCE BRANCH CIRCUITRY EXTENSION TO GENERATOR COOLING EXHAUST AIR LOUVERS DAMPER MOTOR OPERATORS CALLED FOR ELSEWHERE. WIRE UP SUCH THAT WHEN THE BRANCH CIRCUITRY IS ENERGIZED THE DAMPERS ARE HELD CLOSED, AND WHEN THE BRANCH CIRCUITRY IS DE-ENERGIZED, THE DAMPERS FAIL OPEN.
48. PROVIDE TWO WIRE CONTROL CIRCUITRY FROM THE GENERATORS CONTROL PANELS SUCH THAT WHEN ENERGIZED BY THE RUNNING GENERATOR, THE CONTROL CIRCUITRY OPENS A CONTROL RELAY IN THE COOLING AIR SUPPLY AND EXHAUST LOUVERS DAMPER MOTOR LIGHTING AND APPLIANCE BRANCH CIRCUITRY, THERE BY CAUSING THE DAMPERS TO FAIL OPEN.

*SEE SCHEDULE ON PLAN FOR REQUIRED INFORMATION

49. PROVIDE EQUIPMENT AND CIRCUITRY PER DETAILS. SUBSCRIPTED NUMBER IN PARENTHESES ("X") INDICATES QUANTITY OF WATER CLOSETS (LAVATORIES) AT INDICATED LOCATION.
50. PROVIDE TWO WIRE CONTROL CIRCUIT FROM EQUIPMENT TO FIRE PROTECTIVE ALARM SYSTEMS INTERFACE RELAY LOCATED 30'-0" CIRCUITING DISTANCE AWAY. WIRE SUCH THAT DOOR CLOSES AND MOTOR OPERATOR IS DEACTIVATED WHEN ASSIGNED F.P.A. RELAY OPENS.
51. PROVIDE SELF-REGULATING PIPE HEATER STRIP ON HOT WATER PIPING AS PER DETAIL OF LENGTH NOTED ON PLANS WITH EQUIPMENT DESIGNATION SYMBOL. INSTALL ON ALL HORIZONTAL PIPING AT DESIGNATED AREAS FROM RISER TO EACH LAVATORY VALVE. "RAYCHEM" #HWAT-B2 OR APPROVED EQUAL. (.006 AMP/LIN FT. @ 105° F.)
52. PROVIDE 10 WATTS/LINEAR FOOT (OUTPUT RATING) PIPE HEATER STRIP RATED FOR SUBMERSIBLE USE. AS PER DETAIL FOR DOWNSPOUT DE-ICING, OF LENGTH AS NOTED ON PLAN WITH EQUIPMENT DESIGNATION.
53. E.C. SHALL PROVIDE 20A/2P GFI. CIRCUIT BREAKERS ON ALL CIRCUITS SERVING HEAT TRACING.
54. E.C. SHALL FURNISH AND INSTALL CONTROL POWER TRANSFORMER 50 KVA AND MAKE ALL FINAL CONNECTIONS. COORDINATE WITH HARDWARE VENDOR.
55. PROVIDE SELF-REGULATING HEATER CONSISTED OF TWO (2) 16 AWG TINNED-COPPER BUS WIRES EMBEDDED IN PARALLEL IN A SELF-REGULATING POLYMER CORE. THE SELF-REGULATING HEATER SHALL HAVE A POWER OUTPUT OF 10 WATTS PER LINEAR FOOT WHERE IT CONTACTS ICE AND SNOW AND 5 WATTS PER LINEAR FOOT IN AIR. THE HEATER SHALL BE COVERED BY A RADIATION CROSS-LINKED MODIFIED POLYOLEFIN DIELECTRIC JACKET AND PROTECTED BY A TINNED-COPPER BRAID AND A POLYOLEFIN OUTER JACKET. THE SYSTEM SHALL BE CONTROLLED BY A THERMOSTAT EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTACTOR. REFER TO DET. XXXVIII.
56. BASEBOARD HEATER SHALL BE VULCAN SERIES "AF" OR APPROVED EQUAL. HEATER SHALL HAVE INTEGRAL THERMOSTAT WITH POSITIVE OFF. FINISH BY ARCHITECT.

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02-11-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ELECTRICAL EQUIPMENT SCHEDULE AND NOTES

SHEET NUMBER
E402

60% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.1) Electrical\Dwg\2008_E402.dwg Plotted on: 2/11/2010 1:31 PM Plotted by: Mathes, Jennifer

SWGR DISTRIBUTION: MSG–1A W/TVSS

SERVICE: 480/277V, PH, 4 W + GND

BUS SIZE: 2000A — LOAD:
MAIN DEVICE: 2000A — CONN. 1442.0 kVA
DEM. 1442.0 kVA
DEM. 1735.3 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	CB AF	CB AT	REMARKS
1	SWITCHBOARD "SB–3"	1233.0	1233.0	2000	2000	
2	"ATS–1" (EM LTG)	30.0	30.0	800	125	
3	XMFR "T–1C" (DP–RET)	80.0	80.0	800	175	
4	"ATS–2" (ELEV)	99.0	99.0	800	200	
5	SPARE			800		

SWGR DISTRIBUTION: MSG–1B W/TVSS

SERVICE: 480/277V, PH, 4 W + GND

BUS SIZE: 2000A — LOAD:
MAIN DEVICE: 2000A — CONN. 1197.0 kVA
DEM. 1197.0 kVA
DEM. 1440.4 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	CB AF	CB AT	REMARKS
1	PNL "DP–1A"	691.0	691.0	1200	1200	
2	PNL "PP–1B"	335.0	335.0	800	600	
3	"ATS–3" (CRITICAL)	51.0	51.0	800	350	
4	XMFR "T–1A" (LTG)	120.0	120.0	800	350	
5	SPARE			800		

SWBD DISTRIBUTION: GDP–1 W/TVSS

SERVICE: 480/277V, PH, 4 W + GND

BUS SIZE: 1600A — LOAD:
MAIN DEVICE: 1600A — CONN. 331.0 kVA
DEM. 331.0 kVA
DEM. 398.3 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A)		REMARKS
1	FIRE PUMP "FP–1"	103.0	103.0	300		CB – NOTE 1
2	"ATS–3" (CRITICAL)	51.0	51.0	400	350	SWITCH/FUSE
3	"ATS–2" (ELEVATORS)	99.0	99.0	200	200	SWITCH/FUSE
4	"ATS–1" (EM LTG)	30.0	30.0	200	125	SWITCH/FUSE
5	"ATS–4" (HVAC CRTCL)	48.0	48.0	200	200	SWITCH/FUSE

SWBD DISTRIBUTION: SB–3

SERVICE: 480/277V, PH, 4 W + GND

BUS SIZE: 2000A — LOAD:
MAIN DEVICE: 2000A — CONN. 1227.0 kVA
DEM. 1227.0 kVA
DEM. 1476.5 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB	REMARKS
1	CHILLER "RM–1"	343.0	343.0	500	
2	CHILLER "RM–2"	343.0	343.0	500	
3	ATS–4 (CRITICAL MECH.)	48.0	48.0	200	
4	PNL "DP–3"	493.0	493.0	1200	
5	SPARE			200	

PANEL DISTRIBUTION: DP–1A

SERVICE: 480/277V, 3PH, 4W + GND

BUS SIZE: 1200A — LOAD:
MAIN DEVICE: 1200A — CONN. 691.0 kVA
DEM. 691.0 kVA
DEM. 831.5 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	AIRPLANE BRIDGE	125.0	125.0	200		
2	AIRPLANE BRIDGE	125.0	125.0	200		
3	AIRPLANE BRIDGE	125.0	125.0	200		
4	AIRPLANE BRIDGE	125.0	125.0	200		
5	XMFR "T–1B"	39.0	39.0	225		
6	PNL "PP–1A"	152.0	152.0	200		

PANEL DISTRIBUTION: DP–3

SERVICE: 480/277V, 3PH, 4W + GND

BUS SIZE: 1200A — LOAD:
MAIN DEVICE: 1200A — CONN. 493.0 kVA
DEM. 493.0 kVA
DEM. 593.3 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "PP–3A"	299.0	299.0	600		
2	PANEL "PP–3B"	146.0	146.0	400		
3	XMFR "T–3"	48.0	48.0	225		
4	SPACE					

PANEL DISTRIBUTION: EDP–ELEV

SERVICE: 480/277V, 3PH, 4W + GND

BUS SIZE: 200A — LOAD:
MAIN DEVICE: 200A — CONN. 99.0 kVA — FUSIBLE SWITCH PNL
DEM. 99.0 kVA — 1 – CONFIRM OCP
DEM. 119.1 Amps — SIZE W/ELEV. MANUF.

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	DEVICES (A) FUSE	REMARKS
1	ELEVATOR #112	28.0	28.0	60	60	NOTE 1
2	ELEVATOR #124	28.0	28.0	60	60	NOTE 1
3	ELEVATOR #105	28.0	28.0	60	60	NOTE 1
4	XMFR "ET–1C"	15.0	15.0	100	70	

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02–11–10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E403

60% NOT FOR CONSTRUCTION

Drawing: I:\2025.00 Duluth Airport\5.0 CADD\(5.1b) Electrical\Dwgs\2025_E403.dwg Plotted on: 2/11/2010 1:31 PM Plotted by: Kastner, Jennifer

PANELBOARD: PP-1A

SERVICE: 480/277V, PH, 4 W

BUS SIZE: 800A | MAIN DEVICE: 800A | LOAD: CONN. 167.9 kVA, DEM. 167.9 kVA, DEM. 202.1 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	NOTES	TRIP/ POLE	CKT #
1				3,880	3,880								2
3	30/3		ESCALATOR			3,880	3,880			ESCALATOR		30/3	4
5								3,880	3,880				6
7				10,670	10,670								8
9	60/3		AIR CURTAIN "ACN-1"			10,670	10,670			AIR CURTAIN "ACN-3"		60/3	10
11								10,670	10,670				12
13				10,670	10,670								14
15	60/3		AIR CURTAIN "ACN-2"			10,670	10,670			AIR CURTAIN "ACN-4"		60/3	16
17								10,670	10,670				18
19				5,543						SPARE		20/1	20
21	30/3		HSE PMP "HP-1"			5,543				SPARE		20/1	22
23								5,543		SPARE		20/1	24
25	20/1		SPARE							SPARE		20/1	26
27	20/1		SPARE							SPARE		20/1	28
29	20/1		SPARE							SPARE		20/1	30
31	20/1		SPARE							SPARE		20/1	32
33	20/1		SPARE							SPARE		20/1	34
35	20/1		SPARE							SPARE		20/1	36
37	20/1		SPARE							SPARE		20/1	38
39	20/1		SPARE							SPARE		20/1	40
41	20/1		SPARE							SPARE		20/1	42
TOTAL CONNECTED LOADS:				30,763	25,220	30,763	25,220	30,763	25,220				

PANELBOARD: PP-1B

SERVICE: 480/277V, PH, 4 W

BUS SIZE: 600A | MAIN DEVICE: 600A | LOAD: CONN. 335.0 kVA, DEM. 335.0 kVA, DEM. 403.2 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				23,279	23,279								2
3	125/3		BAG CONVEYOR (INBND)			23,279	23,279			BAG CONVEYOR (INBND)		125/3	4
5								23,279	23,279				6
7				55,980	0								8
9	300/3		BAG CONVEYOR (OUTBND)			55,980	0			SPARE		60/3	10
11								55,980	0				12
13				9,145	0								14
15	60/3		RECHECK BELT			9,145	0			SPARE		20/3	16
17								9,145	0				18
TOTAL CONNECTED LOADS:				88,404	23,279	88,404	23,279	88,404	23,279				

PANELBOARD: PP-3A

SERVICE: 480/277V, PH, 4 W

BUS SIZE: 600A | MAIN DEVICE: 600A | LOAD: CONN. 298.7 kVA, DEM. 298.7 kVA, DEM. 359.4 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				9,333	9,333								2
3	70/3		PUMP "P-1"			9,333	9,333			PUMP "P-5"		70/3	4
5								9,333	9,333				6
7				0	9,333								8
9	70/3		PUMP "P-2" (NON-COIN. LOAD)			0	9,333			PUMP "P-6"		70/3	10
11								0	9,333				12
13				5,820	21,339								14
15	40/3		AHU-1			5,820	21,339			AHU-2		110/3	16
17								5,820	21,339				18
19				3,048	14,411								20
21	20/3		REF-1			3,048	14,411			REF-2		90/3	22
23								3,048	14,411				24
25				7,482	2,106								26
27	60/3		AHU-3A			7,482	2,106			TEF-1		15/3	28
29								7,482	2,106				30
31				3,880	2,106								32
33	25/3		REF-3A			3,880	2,106			TEF-2		15/3	34
35								3,880	2,106				36
37				7,482	3,880								38
39	60/3		AHU-3B			7,482	3,880			REF-3B		25/3	40
41								7,482	3,880				42
TOTAL CONNECTED LOADS:				37,045	62,508	37,045	62,508	37,045	62,508				

PANELBOARD: PP-3B

SERVICE: 480/277V, PH, 4 W

BUS SIZE: 400A | MAIN DEVICE: 400A | LOAD: CONN. 146.0 kVA, DEM. 146.0 kVA, DEM. 175.7 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				24,400	24,400								2
3	125/3		"WH-1"			24,400	24,400			"WH-2"		125/3	4
5								24,400	24,000				6
7													8
9	20/3		SPARE							SPARE		20/3	10
11													12
13													14
15	20/3		SPARE							SPARE		20/3	16
17													18
19													20
21	20/3		SPARE							SPARE		20/3	22
23													24
25													26
27	20/3		SPARE							SPARE		20/3	28
29													30
31													32
33	20/3		SPARE							SPARE		20/3	34
35													36
37	20/1		SPARE							SPARE		20/1	38
39	20/1		SPARE							SPARE		20/1	40
41	20/1		SPARE							SPARE		20/1	42
TOTAL CONNECTED LOADS:				24,400	24,400	24,400	24,400	24,400	24,000				

PANELBOARD: EP-3

SERVICE: 480/277V, PH, 4 W

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 48.0 kVA, DEM. 48.0 kVA, DEM. 57.8 Amps | NOTES: FUSIBLE SWITCH PANEL

CKT #	SW/FUSE POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	SW/FUSE POLE	CKT #
1			9,333	0							2
3	60AS/50AF	PUMP "P-3"			9,333	0			SPARE	30AS/	4
5	3P						9,333	0		3P	6
7			0	0							8
9	60AS/50AF	PUMP "P-4"			0	0			SPARE	30AS/	10
11	3P	(NON-COIN. LOAD)					0	0		3P	12
13			942	582							14
15	30AS/15AF	"EF-1"			942	582			"EF-3"	30AS/15AF	16
17	3P						942	582		3P	18
19			942	582							20
21	30AS/15AF	"EF-2"			942	582			"EF-4"	30AS/15AF	22
23	3P						942	582		3P	24
25			942	942							26
27	30AS/15AF	"SF-1"			942	942			"SF-2"	30AS/15AF	28
29	3P						942	942		3P	30
31			582	582							32
33	30AS/15AF	"B-1" FAN			582	582			"B-3" FAN	30AS/15AF	34
35	3P						582	582		3P	36
37			582	0							38
39	30AS/15AF	"B-2" FAN			582	0			SPARE	30AS/	40
41	3P						582	0		3P	42
TOTAL CONNECTED LOADS:			13,323	2,688	13,323	2,688	13,323	2,688			

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02-11-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E404

60% NOT FOR CONSTRUCTION

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1b) Electrical\Dwgs\2035_E404.dwg Plotted on: 2/11/2010 1:33 PM Plotted by: Kastner, Jennifer

PANEL DISTRIBUTION: EDPP–ELEV

SERVICE: 208/120V, PH, 4 W

BUS SIZE: 200A | LOAD: | NOTES:
MAIN DEVICE: 150A | CONN. 15.0 kVA | FUSIBLE SWITCH PNL
DEM. 15.0 kVA
DEM. 41.7 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	DEVICES (A) FUSE	REMARKS
1	PNL "EPP–1A"	5.0	5.0	60	60	
2	PNL "EPP–1B"	5.0	5.0	60	60	
3	PNL "EPP–1C"	5.0	5.0	60	60	

PANEL DISTRIBUTION: EDRP–1 W/TVSS

SERVICE: 208/120V, PH, 4 W

BUS SIZE: 800A | LOAD: | NOTES:
MAIN DEVICE: 800A | CONN. 47.0 kVA | FUSIBLE SWITCH PNL
DEM. 47.0 kVA
DEM. 130.6 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	DEVICES (A) FUSE	REMARKS
1	PANEL "ERP–1A"	19.0	19.0	400	250	
2	PANEL "ERP–1B"	4.0	4.0	400	250	
3	PANEL "ERP–2A"	6.0	6.0	400	250	
4	PANEL "ERP–2B"	7.0	7.0	400	250	
5	PANEL "ERP–2D"	4.0	4.0	100	100	
6	PANEL "ERP–3A"	7.0	7.0	400	250	

PANEL DISTRIBUTION: RDP–1A

SERVICE: 208/120V, PH, 4 W

BUS SIZE: 600A | LOAD: | NOTES:
MAIN DEVICE: 500A | CONN. 39.0 kVA | CIRCUIT BREAKER PNL
DEM. 39.0 kVA
DEM. 108.3 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB	DEVICES (A)	REMARKS
1	PANEL "RP–1A"	13.0	13.0	200		
2	PANEL "RP–1B"	17.0	17.0	200		
3	PANEL "RP–1C"	9.0	9.0	200		
4	SPACE					

PANEL DISTRIBUTION: RDP–3

SERVICE: 208/120V, PH, 4 W

BUS SIZE: 600A | LOAD: | NOTES:
MAIN DEVICE: 500A | CONN. 48.0 kVA | CIRCUIT BREAKER PNL
DEM. 48.0 kVA
DEM. 133.3 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB	DEVICES (A)	REMARKS
1	PANEL "LP–3A"	20.0	20.0	200		
2	PANEL "RP–3A"	13.0	13.0	200		
3	PANEL "RP–3B"	15.0	15.0	200		
4	SPACE					

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02–11–10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E405

60% NOT FOR CONSTRUCTION

Drawing: I:\2213.00 Duluth Airport\5.0 CADD\(2.1a) Electrical\Dwgs\2213_E405.dwg Plotted on: 2/11/2010 1:33 PM Plotted by: Kastner, Jennifer

PANELBOARD: RP–1A

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 9.3 kVA, DEM. 9.3 kVA, DEM. 25.7 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	15/1	UNIT HTR FAN	696	720		REC–GENERAL	20/1	2
3	15/1	UNIT HTR FAN		696	540	REC–GENERAL	20/1	4
5	15/1	CAB. UNIT HTR FAN			696 1,080	REC–GENERAL	20/1	6
7	15/1	CAB. UNIT HTR FAN	696	360		REC–WASHRMS	20/1	8
9	20/1	REC–RAMP (GEN)		540	0	SPARE	20/1	10
11	20/1	REC–TUNNEL (GEN)			900 0	SPARE	20/1	12
13	20/1	REC–EXTERIOR (GEN)	360	0		SPARE	20/1	14
15	20/1	SPARE		0	0	SPARE	20/1	16
17	20/1	SPARE			0 0	SPARE	20/1	18
19	20/1	SPARE	0	0		SPARE	20/1	20
21	20/1	SPARE		0	360	REC–OFFICE	20/1	22
23	20/1	SPARE			0 0	SPARE	20/1	24
25	20/1	REC–GENERAL	360	0		SPARE	20/1	26
27	20/1	REC–INTERVIEW		360	540	REC–GENERAL	20/1	28
29	20/1	SPARE			360 0	SPARE	20/1	30
31	20/1	SPARE	0	0		SPARE	20/1	32
33	20/1	SPARE		0	0	SPARE	20/1	34
35	20/1	SPARE			0 0	SPARE	20/1	36
37	20/1	SPARE	0	0		SPARE	20/1	38
39	20/1	SPARE		0	0	SPARE	20/1	40
41	20/1	SPARE			0 0	SPARE	20/1	42
TOTAL CONNECTED LOADS:			2,112	1,080	1,596 1,440	1,956 1,080		

PANELBOARD: RP–1B

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 16.2 kVA, DEM. 16.2 kVA, DEM. 44.9 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	15/1	UNIT HTR FAN	696	360		REC–TUNNEL (GEN)	20/1	2
3	15/1	UNIT HTR FAN		696	1,080	REC–GENERAL	20/1	4
5	15/1	UNIT HTR FAN			696 360	REC–AIRPORT POLICE	20/1	6
7	15/1	UNIT HTR FAN	696	100		BHS MCP PWR	20/1	8
9	15/1	UNIT HTR FAN		696	180	BHS MCP PWR	20/1	10
11	15/1	CAB. UNIT HTR FAN			696 100	BHS MCP PWR	20/1	12
13	20/1	REC–ELEC RM	360	180		BHS MCP PWR	20/1	14
15	20/1	REC–TELECOM		360	100	BHS MCP PWR	20/1	16
17	20/1	REC–GENERAL			900 180	BHS MCP PWR	20/1	18
19	20/1	REC–WASHRMS	540	720		REC–BHS MAINT.	20/1	20
21	20/1	REC–GENERAL		720	720	REC–BHS MAINT.	20/1	22
23	20/1	REC–GENERAL			720 720	REC–BHS MAINT.	20/1	24
25	20/1	GARBAGE DISPOSAL	1,200	0		SPARE	20/1	26
27	20/1	REFRIGERATOR		1,200	0	SPARE	20/1	28
29	20/1	MICROWAVE			1,200 0	SPARE	20/1	30
31	20/1	SPARE	0	0		SPARE	20/1	32
33	20/1	SPARE		0	0	SPARE	20/1	34
35	20/1	SPARE			0 0	SPARE	20/1	36
37	20/1	SPARE	0	0		SPARE	20/1	38
39	20/1	SPARE		0	0	SPARE	20/1	40
41	20/1	SPARE			0 0	SPARE	20/1	42
TOTAL CONNECTED LOADS:			3,492	1,360	3,672 2,080	4,212 1,360		

PANELBOARD: RP–1C

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 8.8 kVA, DEM. 8.8 kVA, DEM. 24.5 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1	REC–TUNNEL (GEN)	540	360		REC–CHECK IN CTR	20/1	2
3	20/1	REC–RAMP (GEN)		900	360	REC–CHECK IN CTR	20/1	4
5	20/1	REC–PUMP RM			360 360	REC–CHECK IN CTR	20/1	6
7	20/1	REC–LOADING DOCK	180	180		REC–CHECK IN CTR	20/1	8
9	20/1	REC–LOADING DOCK		180	720	REC–GENERAL	20/1	10
11	20/1	REC–LOADING DOCK			180 720	REC–OFFICE/OPS	20/1	12
13	20/1	REC–GENERAL	900			SPARE	20/1	14
15	20/1	REC–WASHRMS		360		SPARE	20/1	16
17	20/1	REC–OPS/OFFICE			720	SPARE	20/1	18
19	20/1	REC–OPS/OFFICE	720			SPARE	20/1	20
21	20/1	REC–GENERAL		720		SPARE	20/1	22
23	20/1	REC–DLH POLICE			360	SPARE	20/1	24
25	20/1	SPARE				SPARE	20/1	26
27	20/1	SPARE				SPARE	20/1	28
29	20/1	SPARE				SPARE	20/1	30
31	20/1	SPARE				SPARE	20/1	32
33	20/1	SPARE		0	0	SPARE	20/1	34
35	20/1	SPARE			0 0	SPARE	20/1	36
37	20/1	SPARE	0	0		SPARE	20/1	38
39	20/1	SPARE		0	0	SPARE	20/1	40
41	20/1	SPARE			0 0	SPARE	20/1	42
TOTAL CONNECTED LOADS:			2,340	540	2,160 1,080	1,620 1,080		

PANELBOARD: RP–2A

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 19.1 kVA, DEM. 19.1 kVA, DEM. 52.9 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1	REC–GENERAL	360	500		REC–CONCRSE COUNTER	20/1	2
3	20/1	REC–VENDING MACH		1,200	500	REC–CONCRSE COUNTER	20/1	4
5	20/1	REC–VENDING MACH			1,200 500	REC–COUNTER	20/1	6
7	20/1	REC–VENDING MACH	1,200	900		REC–GENERAL	20/1	8
9	20/1	REC–VENDING MACH		1,200	360	REC–WASHRMS	20/1	10
11	20/1	REC–VENDING MACH			1,200 360	REC–OFFICE (GEN)	20/1	12
13	20/1	REC–VENDING MACH	1,200	540		REC–GENERAL	20/1	14
15	20/1	REC–VENDING MACH		1,200	0	SPARE	20/1	16
17	20/1	REC–VENDING MACH			1,200 0	SPARE	20/1	18
19	20/1	REC–VENDING MACH	1,200	900		REC–INTERNAT. (GEN)	20/1	20
21	20/1	REC–GENERAL		180	500	REC–PROC. BOOTH	20/1	22
23	20/1	REC–WASHRMS			360 500	REC–PROC. BOOTH	20/1	24
25	20/1	REC–CONCRSE (GEN)	1,080	0		SPARE	20/1	26
27	20/1	REC–CONCRSE (GEN)		720	0	SPARE	20/1	28
29	20/1	SPARE			0 0	SPARE	20/1	30
31	20/1	SPARE	0	0		SPARE	20/1	32
33	20/1	SPARE		0	0	SPARE	20/1	34
35	20/1	SPARE			0 0	SPARE	20/1	36
37	20/1	SPARE	0	0		SPARE	20/1	38
39	20/1	SPARE		0	0	SPARE	20/1	40
41	20/1	SPARE			0 0	SPARE	20/1	42
TOTAL CONNECTED LOADS:			5,040	2,840	4,500 1,360	3,960 1,360		

PANELBOARD: RP–2B

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 8.0 kVA, DEM. 8.0 kVA, DEM. 22.1 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	15/1	CAB. UNIT HTR FAN	696	540		REC–WASHRMS	20/1	2
3	20/1	REC–GENERAL		720	720	REC–GENERAL	20/1	4
5	20/1	REC–TSA (GEN)			720 0	SPARE	20/1	6
7	20/1	REC–TSA (GEN)	720	0		SPARE	20/1	8
9	20/1	REC–TSA CHECK (GEN)		540	720	REC–GENERAL	20/1	10
11	20/1	REC–TSA QUEUE			500 500	REC–CONCRSE COUNTER	20/1	12
13	20/1	SPARE	0	500		REC–CONCRSE COUNTER	20/1	14
15	20/1	SPARE		0		SPARE	20/1	16
17	20/1	SPARE			0	SPARE	20/1	18
19	20/1	REC–WASHRMS	360			SPARE	20/1	20
21	20/1	REC–GENERAL		360		SPARE	20/1	22
23	20/1	REC–ELEC RM			360	SPARE	20/1	24
25	20/1	SPARE				SPARE	20/1	26
27	20/1	SPARE				SPARE	20/1	28
29	20/1	SPARE				SPARE	20/1	30
31	20/1	SPARE				SPARE	20/1	32
33	20/1	SPARE				SPARE	20/1	34
35	20/1	SPARE				SPARE	20/1	36
37	20/1	SPARE				SPARE	20/1	38
39	20/1	SPARE				SPARE	20/1	40
41	20/1	SPARE				SPARE	20/1	42
TOTAL CONNECTED LOADS:			1,776	1,040	1,620 1,440	1,580 500		

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02–11–10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E406

60% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.0) Electrical\Dwgs\2008_E406.dwg Plotted on: 2/11/2010 1:34 PM Plotted by: Koehler, Jennifer

PANELBOARD: EPP–1A

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 1.9 kVA, DEM. 1.9 kVA, DEM. 5.4 Amps | NOTES: PLUG FUSE PANEL

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	15/1		ELEV. #112 CAB LIGHTS	250	1,000					ELEV. #112 CONTROLLER		15/1	2
3	15/1		ELEV. MACH RM REC.			180	0			SPARE		15/1	4
5	15/1		ELEV. RM SECURITY					500	0	SPARE		15/1	6
7	15/1		SPARE	0	0					SPARE		15/1	8
9	15/1		SPARE			0	0			SPARE		15/1	10
11	15/1		SPARE					0	0	SPARE		15/1	12
13	15/1		SPARE	0	0					SPARE		15/1	14
15	15/1		SPARE			0	0			SPARE		15/1	16
17	15/1		SPARE					0	0	SPARE		15/1	18
TOTAL CONNECTED LOADS:				250	1,000	180	0	500	0				

PANELBOARD: EPP–1B

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 1.9 kVA, DEM. 1.9 kVA, DEM. 5.4 Amps | NOTES: PLUG FUSE PANEL

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	15/1		ELEV. #124 CAB LIGHTS	250	1,000					ELEV. #124 CONTROLLER		15/1	2
3	15/1		ELEV. MACH RM REC.			180	0			SPARE		15/1	4
5	15/1		ELEV. RM SECURITY					500	0	SPARE		15/1	6
7	15/1		SPARE	0	0					SPARE		15/1	8
9	15/1		SPARE			0	0			SPARE		15/1	10
11	15/1		SPARE					0	0	SPARE		15/1	12
13	15/1		SPARE	0	0					SPARE		15/1	14
15	15/1		SPARE			0	0			SPARE		15/1	16
17	15/1		SPARE					0	0	SPARE		15/1	18
TOTAL CONNECTED LOADS:				250	1,000	180	0	500	0				

PANELBOARD: EPP–1C

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 1.9 kVA, DEM. 1.9 kVA, DEM. 5.4 Amps | NOTES: PLUG FUSE PANEL

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	15/1		ELEV. #105 CAB LIGHTS	250	1,000					ELEV. #105 CONTROLLER		15/1	2
3	15/1		ELEV. MACH RM REC.			180	0			SPARE		15/1	4
5	15/1		ELEV. RM SECURITY					500	0	SPARE		15/1	6
7	15/1		SPARE	0	0					SPARE		15/1	8
9	15/1		SPARE			0	0			SPARE		15/1	10
11	15/1		SPARE					0	0	SPARE		15/1	12
13	15/1		SPARE	0	0					SPARE		15/1	14
15	15/1		SPARE			0	0			SPARE		15/1	16
17	15/1		SPARE					0	0	SPARE		15/1	18
TOTAL CONNECTED LOADS:				250	1,000	180	0	500	0				

PANELBOARD: EMLP–1A

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 0.1 kVA, DEM. 0.1 kVA, DEM. 0.3 Amps | NOTES: PLUG FUSE PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		FIRE BELL	100						SPARE		20/1	2
3	20/1		SPARE							SPARE		20/1	4
5	20/1		SPARE							SPARE		20/1	6
7	20/1		SPARE							SPARE		20/1	8
9	20/1		SPARE							SPARE		20/1	10
11	20/1		SPARE							SPARE		20/1	12
13	20/1		SPARE							SPARE		20/1	14
15	20/1		SPARE							SPARE		20/1	16
17	20/1		SPARE							SPARE		20/1	18
19	20/1		SPARE							SPARE		20/1	20
21	20/1		SPARE			0	0			SPARE		20/1	22
23	20/1		SPARE					0	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0					SPARE		20/1	38
39	20/1		SPARE			0	0			SPARE		20/1	40
41	20/1		SPARE					0	0	SPARE		20/1	42
TOTAL CONNECTED LOADS:				100	0	0	0	0	0				

PANELBOARD: ERP–1A – PNL W/TVSS, 200% NEUTRAL & ISO GRD

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 14.9 kVA, DEM. 14.9 kVA, DEM. 41.4 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	30/2		EDS MACH.	2,400	2,400					EDS MACH.		30/2	2
3						2,400	2,400						4
5	30/2		EDS MACH.					2,400	0	SPARE		20/1	6
7				2,400	250					REC–OFFICE		20/1	8
9	20/1		SPARE			0	0			SPARE		20/1	10
11	20/1		SPARE					0	0	SPARE		20/1	12
13	20/1		SPARE	0	0					SPARE		20/1	14
15	20/1		REC–INTERVIEW			250	0			SPARE		20/1	16
17	20/1		SPARE					0	0	SPARE		20/1	18
19	20/1		SPARE	0	0					SPARE		20/1	20
21	20/1		SPARE			0	0			SPARE		20/1	22
23	20/1		SPARE					0	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				4,800	2,650	2,650	2,400	2,400	0				

PANELBOARD: ERP–1B – PNL W/TVSS, 200% NEUTRAL & ISO GRD

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 3.8 kVA, DEM. 3.8 kVA, DEM. 10.4 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC–AIRPRT POLICE	250	250					REC–CHECK IN CNTR		20/1	2
3	20/1		REC–DLH POLICE			250	250			REC–CHECK IN CNTR		20/1	4
5	20/1		REC–OFFICE					250	250	REC–CHECK IN CNTR		20/1	6
7	20/1		REC–OPS	250	250					REC–CHECK IN CNTR		20/1	8
9	20/1		REC–OFFICE			250	250			REC–CHECK IN CNTR		20/1	10
11	20/1		REC–OPS					250	250	REC–CHECK IN CNTR		20/1	12
13	20/1		REC–OFFICE	250	250					REC–CHECK IN CNTR		20/1	14
15	20/1		REC–OPS			250	0			SPARE		20/1	16
17	20/1		SPARE					0	0	SPARE		20/1	18
19	20/1		SPARE	0	0					SPARE		20/1	20
21	20/1		SPARE			0	0			SPARE		20/1	22
23	20/1		SPARE					0	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				750	750	750	500	500	500				

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2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02–11–10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E407

60% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E407.dwg Plotted on: 2/11/2010 1:35 PM Plotted by: Koehler, Jennifer

PANELBOARD: ERP-2A – PNL W/TVSS, 200% NEUTRAL & ISO GRD

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 250A | LOAD: | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 250A | CONN. 6.0 kVA

DEM. 6.0 kVA

DEM. 16.5 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-TSA	250	1,200					FM200 SYS		20/1	2
3	20/1		REC-TSA			250	250			REC-COMM. RM		20/1	4
5	20/1		REC-TSA					250	250	REC-COMM. RM		20/1	6
7	20/1		REC-TSA	250	250					REC-COMM. RM		20/1	8
9	20/1		REC-TSA			250	250			REC-COMM. RM		20/1	10
11	20/1		XRAY					500	250	REC-COMM. RM		20/1	12
13	20/1		XRAY	500	250					REC-COMM. RM		20/1	14
15	20/1		REC-COUNTER			250	250			REC-COMM. RM		20/1	16
17	20/1		REC-COUNTER					250	250	REC-COMM. RM		20/1	18
19	20/1		SPARE	0	0					SPARE		20/1	20
21	20/1		SPARE			0	0			SPARE		20/1	22
23	20/1		SPARE					0	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				1,000	1,700	750	750	1,000	750				

PANELBOARD: ERP-2B – PNL W/TVSS, 200% NEUTRAL & ISO GRD

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 250A | LOAD: | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 250A | CONN. 5.5 kVA

DEM. 5.5 kVA

DEM. 15.1 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		SPARE	0	1,200					FM200 SYS		20/1	2
3	20/1		SPARE			0	250			REC-COMM. RM		20/1	4
5	20/1		REC-INTERVIEW					250	250	REC-COMM. RM		20/1	6
7	20/1		SPARE	0	250					REC-COMM. RM		20/1	8
9	20/1		REC-PROC. BOOTH			250	250			REC-COMM. RM		20/1	10
11	20/1		REC-PROC. BOOTH					250	250	REC-COMM. RM		20/1	12
13	20/1		REC-PROC. BOOTH	250	250					REC-COMM. RM		20/1	14
15	20/1		REC-PROC. BOOTH			250	250			REC-COMM. RM		20/1	16
17	20/1		REC COMP-OFFICE					250	250	REC-COMM. RM		20/1	18
19	20/1		REC – BOARDING	250	0					SPARE		20/1	20
21	20/1		REC-COUNTER			250	0			SPARE		20/1	22
23	20/1		REC-COUNTER					250	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				500	1,700	750	750	1,000	750				

PANELBOARD: ERP-2D – PNL W/TVSS, 200% NEUTRAL & ISO GRD

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 100A | LOAD: | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 100A | CONN. 3.2 kVA

DEM. 3.2 kVA

DEM. 8.9 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		SPARE	0	1,200					FM200 SYS		20/1	2
3	20/1		SPARE			0	250			REC-COMP. RM		20/1	4
5	20/1		SPARE					0	250	REC-COMP. RM		20/1	6
7	20/1		SPARE	0	250					REC-COMP. RM		20/1	8
9	20/1		SPARE			0	250			REC-COMP. RM		20/1	10
11	20/1		SPARE					0	250	REC-COMP. RM		20/1	12
13	20/1		SPARE	0	250					REC-COMP. RM		20/1	14
15	20/1		SPARE			0	250			REC-COMP. RM		20/1	16
17	20/1		SPARE					0	250	REC-COMP. RM		20/1	18
19	20/1		SPARE	0	0					SPARE		20/1	20
21	20/1		SPARE			0	0			SPARE		20/1	22
23	20/1		SPARE					0	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				0	1,700	0	750	0	750				

PANELBOARD: ERP-3A – PNL W/TVSS, 200% NEUTRAL & ISO GRD

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 250A | LOAD: | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 250A | CONN. 6.2 kVA

DEM. 6.2 kVA

DEM. 17.2 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC COMP-SEC.	250	1,200					FM200 SYS		20/1	2
3	20/1		REC COMP-OPS			250	250			REC-COMM. RM		20/1	4
5	20/1		REC COMP-OPS					250	250	REC-COMM. RM		20/1	6
7	20/1		REC COMP-OFFICE	250	250					REC-COMM. RM		20/1	8
9	20/1		REC COMP-OFFICE			250	250			REC-COMM. RM		20/1	10
11	20/1		REC COMP-OFFICE					250	250	REC-COMM. RM		20/1	12
13	20/1		REC COMP-OFFICE	250	250					REC-COMM. RM		20/1	14
15	20/1		REC COMP-OFFICE			250	250			REC-COMM. RM		20/1	16
17	20/1		REC COMP-OFFICE					250	250	REC-COMM. RM		20/1	18
19	20/1		REC COMP-OFFICE	250	0					SPARE		20/1	20
21	20/1		REC COMP-OFFICE			250	0			SPARE		20/1	22
23	20/1		REC COMP-TRAINING					250	0	SPARE		20/1	24
25	20/1		SPARE	0	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				1,000	1,700	1,000	750	1,000	750				

PANELBOARD: RP-3A

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 200A | CONN. 12.6 kVA

DEM. 12.6 kVA

DEM. 34.9 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	15/1		UNIT HTR FAN	696	360					REC-OPS CONF RM		20/1	2
3	15/1		UNIT HTR FAN			696	360			REC-OPS CONF RM		20/1	4
5	15/1		UNIT HTR FAN					696	1,200	PROJECTOR		20/1	6
7	15/1		UNIT HTR FAN	696	0					SPARE		20/1	8
9	20/1		REC-MECH RM			900				REC-EMERG OPS RM		20/1	10
11	20/1		REC-MECH/ELEC RM					720		SPARE		20/1	12
13	20/1		REC-GENERAL	720	720					REC-GENERAL		20/1	14
15	20/1		SPARE			0	540			REC-GENERAL		20/1	16
17	20/1		SPARE					0	720	REC-GENERAL		20/1	18
19	20/1		REC-WASHRMS	360	1,200					REC-PRINTER		20/1	20
21	20/1		REC-GENERAL			360	360			REC-COPY RM		20/1	22
23	20/1		SPARE					0	360	REC-COPY RM		20/1	24
25	20/1		SPARE	0	180					REC-COPY RM		20/1	26
27	20/1		SPARE			0	720			REC-GENERAL		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0					SPARE		20/1	38
39	20/1		SPARE			0	0			SPARE		20/1	40
41	20/1		SPARE					0	0	SPARE		20/1	42
TOTAL CONNECTED LOADS:				2,472	2,460	1,956	1,980	1,416	2,280				

PANELBOARD: RP-3B

SERVICE: 208/120V, 3PH, 4W

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 200A | CONN. 14.3 kVA | 1 – PROVIDE GFCI TYPE CB

DEM. 14.3 kVA

DEM. 39.8 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-GENERAL	720	360					REC-OFFICES (GEN)		20/1	2
3	20/1		REC-GENERAL			720	360			REC-TRAINING RM (GEN)		20/1	4
5	20/1		SPARE					0	1,200	PROJECTOR		20/1	6
7	20/1		GARBAGE DISPOSAL	1,200	0					SPARE		20/1	8
9	20/1		MICROWAVE			1,200	540			REC-GENERAL		20/1	10
11	20/1		REFRIGERATOR					1,200	720	REC-MECH RM		20/1	12
13	20/1		SPARE	0	720					REC-MECH RM		20/1	14
15	20/1		REC-GENERAL			720	0			SPARE		20/1	16
17	20/1		REC-GENERAL					720	0	SPARE		20/1	18
19	20/1		REC-BREAK RM	360	0					SPARE		20/1	20
21	20/1		GARBAGE DISPOSAL			1,200	0			SPARE		20/1	22
23	20/1		MICROWAVE					1,200	0	SPARE		20/1	24
25	20/1		REFRIGERATOR	1,200	0					SPARE		20/1	26
27	20/1		SPARE			0	0			SPARE		20/1	28
29	20/1		SPARE					0	0	SPARE		20/1	30
31	20/1		SPARE	0	0					SPARE		20/1	32
33	20/1		SPARE			0	0			SPARE		20/1	34
35	20/1		SPARE					0	0	SPARE		20/1	36
37	20/1		SPARE	0	0					SPARE		20/1	38
39	20/1		SPARE			0	0			SPARE		20/1	40
41	20/1		SPARE					0	0	SPARE		20/1	42
TOTAL CONNECTED LOADS:				3,480	1,080	3,840	900	3,120	1,920				

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DULUTH, MN

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02-11-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

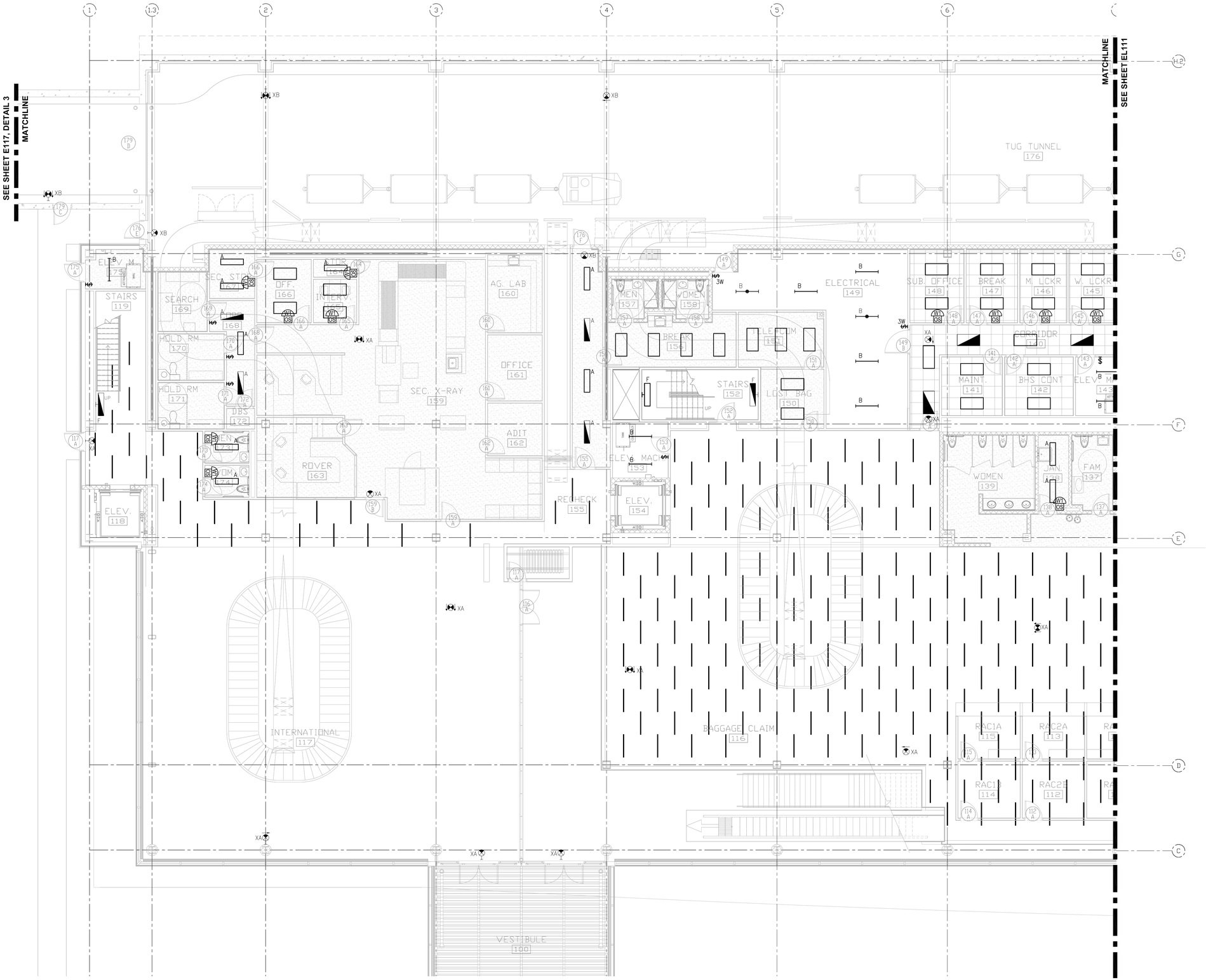
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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E408

60% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E408.dwg Plotted on: 2/11/2010 1:39 PM Plotted by: Nether, Jennifer



N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

Drawing: X:\2010.00 Duluth Airport\5.0 CAD\(5.1) Electrical\Dwgs\EL110.dwg Plotted on: 2/11/2010 4:59 PM Plotted by: Kuehne, Jennifer

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
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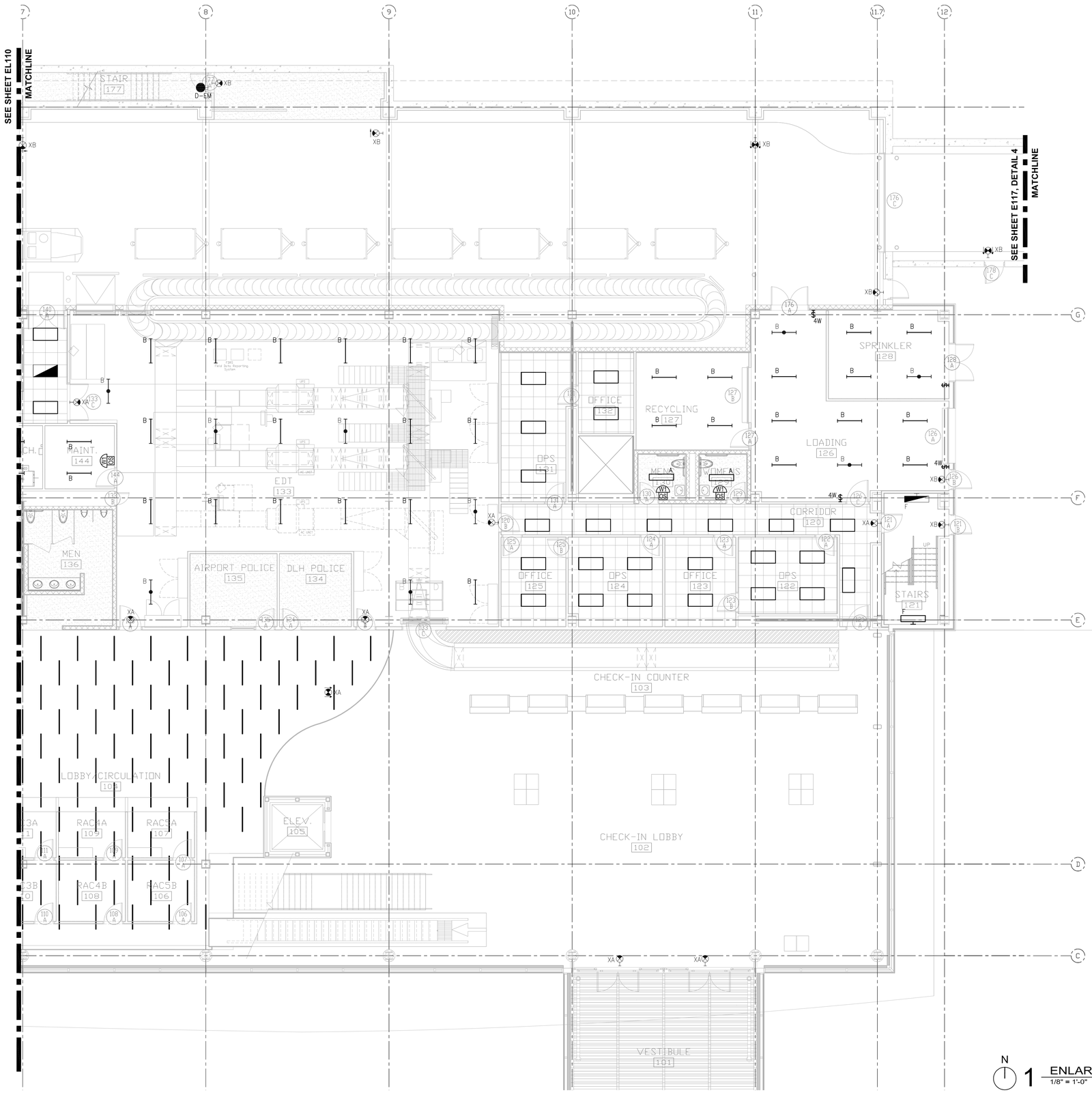
SHEET TITLE

ENLARGED FIRST FLOOR LIGHTING PLAN AREA A

SHEET NUMBER

EL110

60% NOT FOR CONSTRUCTION



N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

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SHEET TITLE

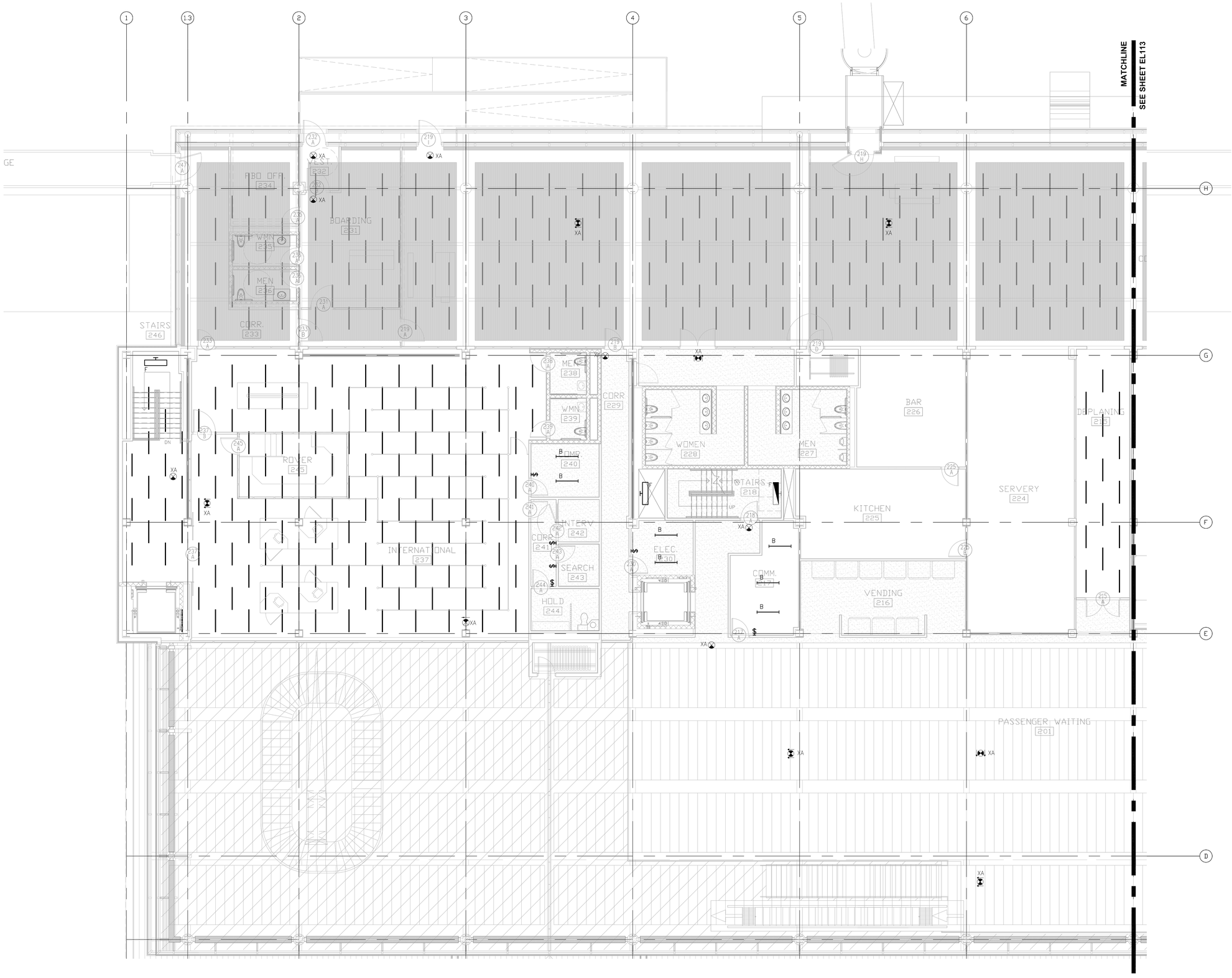
ENLARGED FIRST FLOOR LIGHTING PLAN AREA A

SHEET NUMBER

EL111

60% NOT FOR CONSTRUCTION

Drawing: X:\2008.00 Duluth Airport\5.0 CADD\(5.5) Electrical\Dwgs\ELEL_EL111.dwg Plotted on: 2/11/2010 4:13 PM Plotted by: Koelker, Jennifer



N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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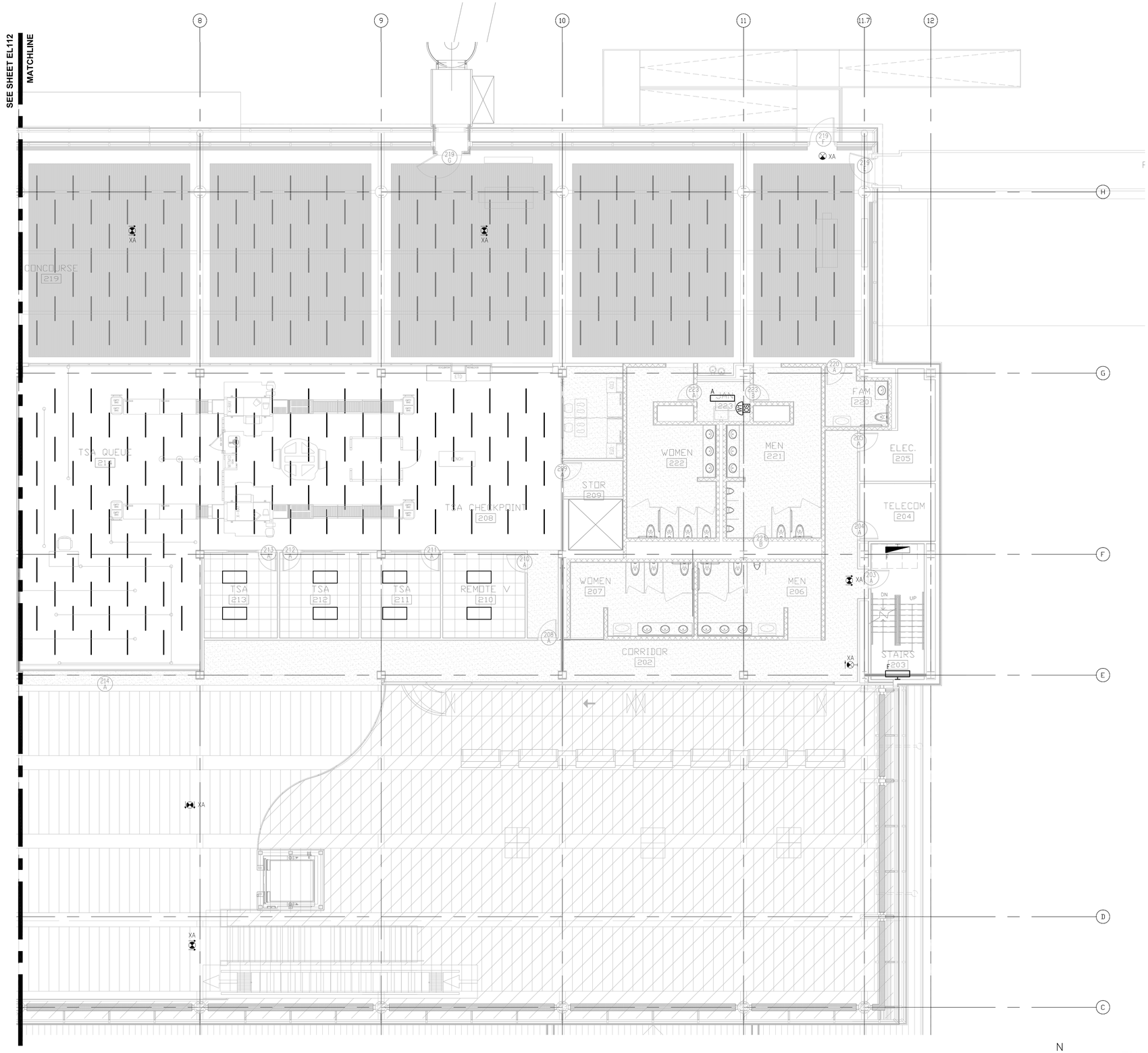
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SHEET TITLE
ENLARGED SECOND FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL112

60% NOT FOR CONSTRUCTION

Drawing: K:\2008.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2008_EL112.dwg Plotted on: 2/11/2010 2:08 PM Plotted by: Koehler, Jennifer



N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
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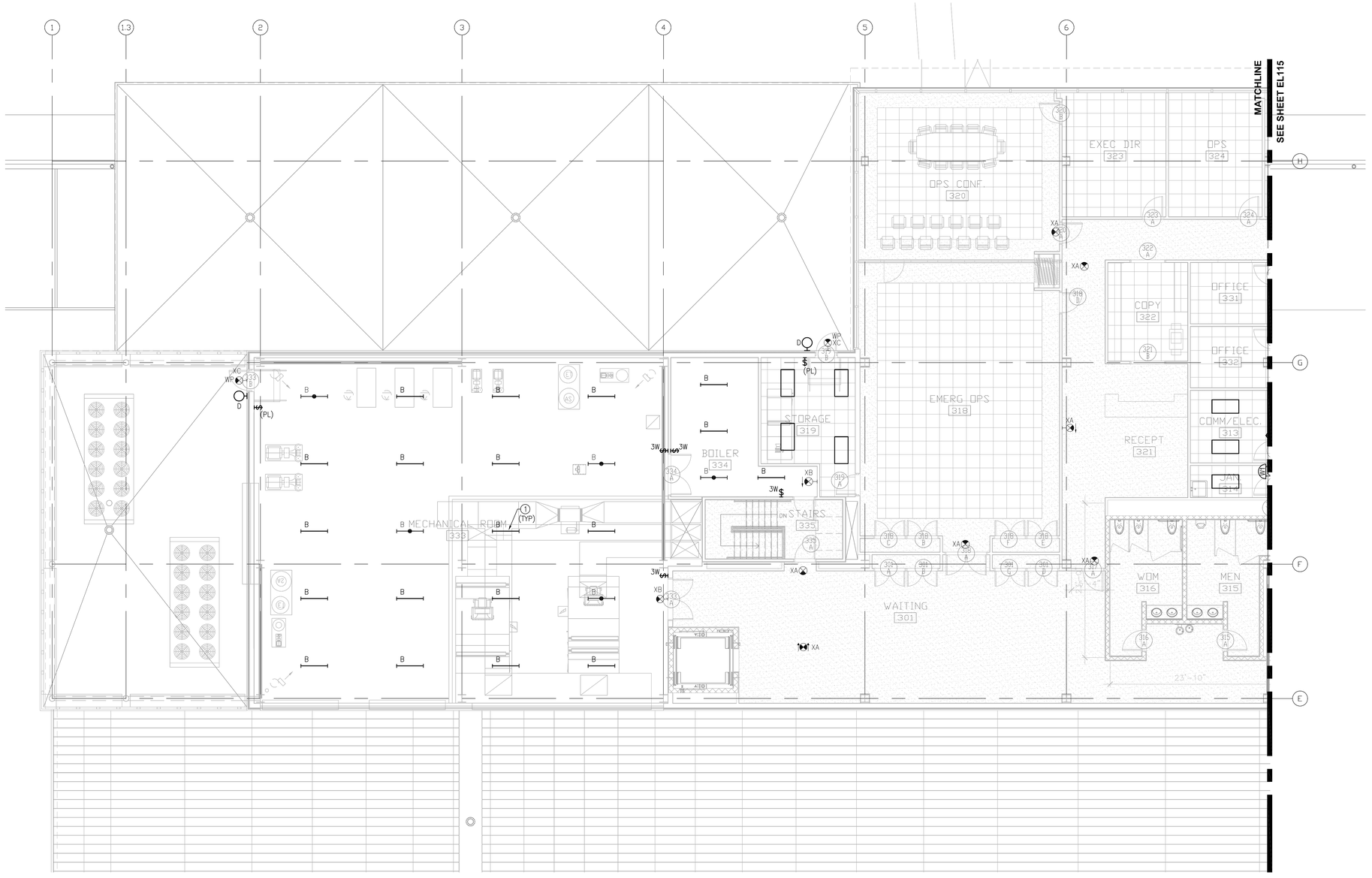
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SHEET TITLE
ENLARGED SECOND FLOOR LIGHTING PLAN AREA B

SHEET NUMBER
EL113

60% NOT FOR CONSTRUCTION

Drawing: S:\2010.00 Duluth Airport\3.0 CADD\(3.3) Electrical\Dwgs\2010_EL113.dwg Plotted on: 2/11/2010 2:10 PM Plotted by: Nether, Jennifer



KEYED NOTES:

1. COORDINATE PLACEMENT OF LIGHTING FIXTURES WITH DUCTWORK AND EQUIPMENT LAYOUT.

N

1 ENLARGED THIRD LEVEL FLOOR PLAN - ADMIN.

1/8" = 1'-0"

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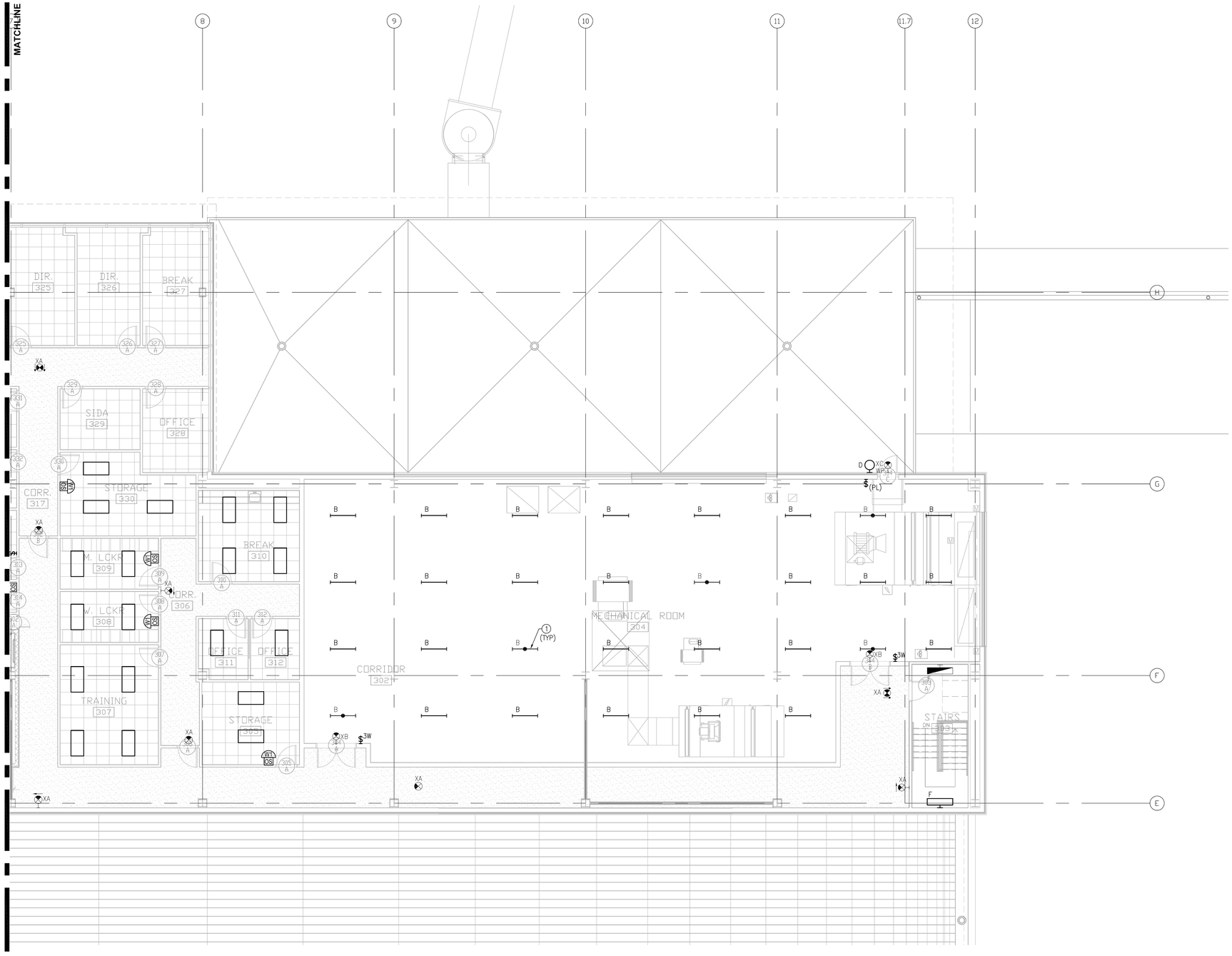
SHEET TITLE
ENLARGED
THIRD FLOOR
LIGHTING PLAN
AREA A

SHEET NUMBER
EL114

60% NOT FOR
CONSTRUCTION

Drawing: X:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_EL114.dwg Plotted on: 2/11/2010 2:11 PM Plotted by: Kastner, Jennifer

SEE SHEET EL114
MATCHLINE



KEYED NOTES:

1. COORDINATE PLACEMENT OF LIGHTING FIXTURES WITH DUCTWORK AND EQUIPMENT LAYOUT.

N

1 ENLARGED THIRD LEVEL FLOOR PLAN - ADMIN.
1/8" = 1'-0"

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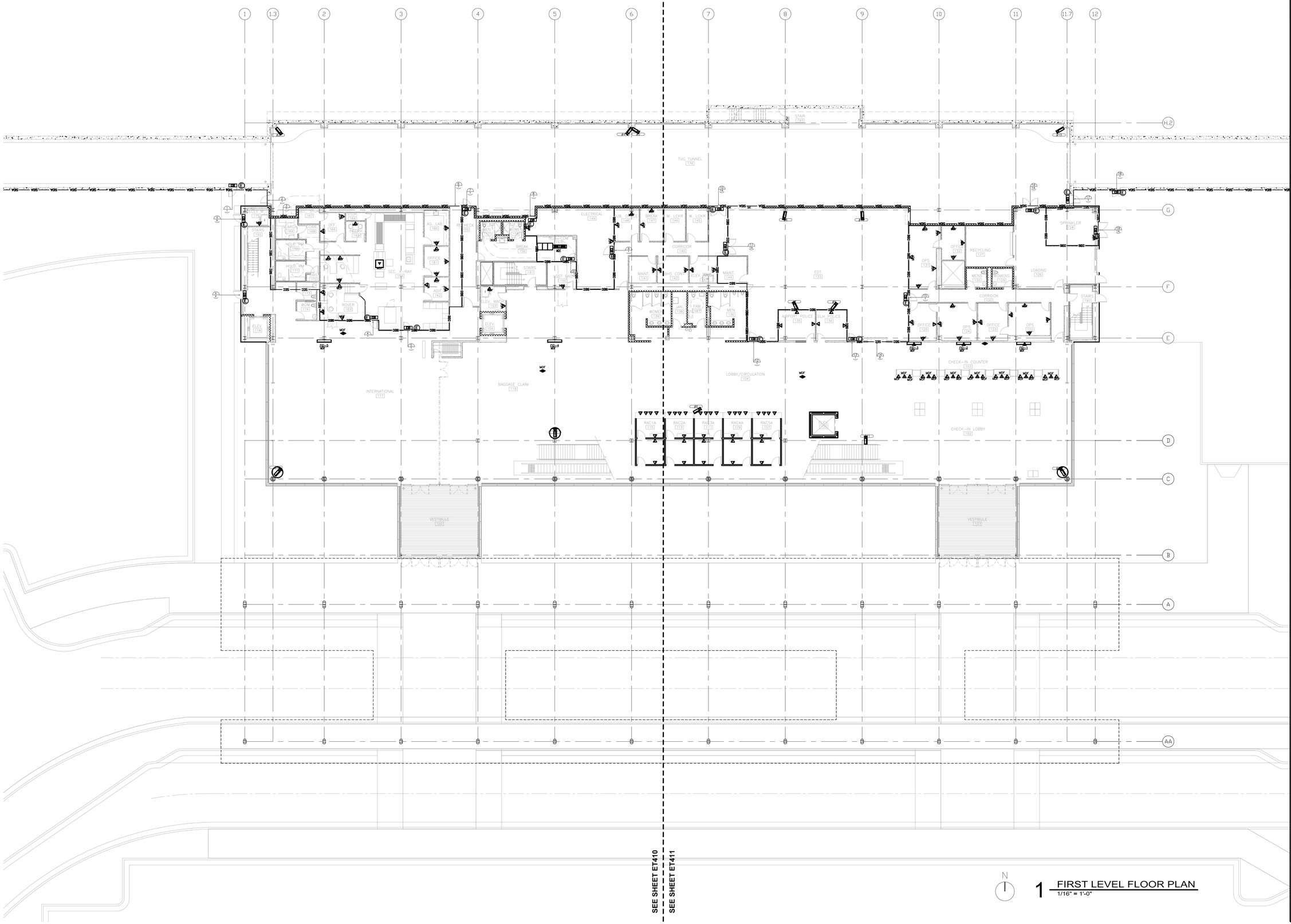
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SHEET TITLE
ENLARGED THIRD FLOOR LIGHTING PLAN AREA B

SHEET NUMBER
EL115

60% NOT FOR CONSTRUCTION

Drawing: I:\2025.00 Duluth Airport\8.0 CADD\(8.2) Electrical\Dwgs\2025_EL115.dwg Plotted on: 2/11/2010 2:11 PM Plotted by: Koelker, Jennifer



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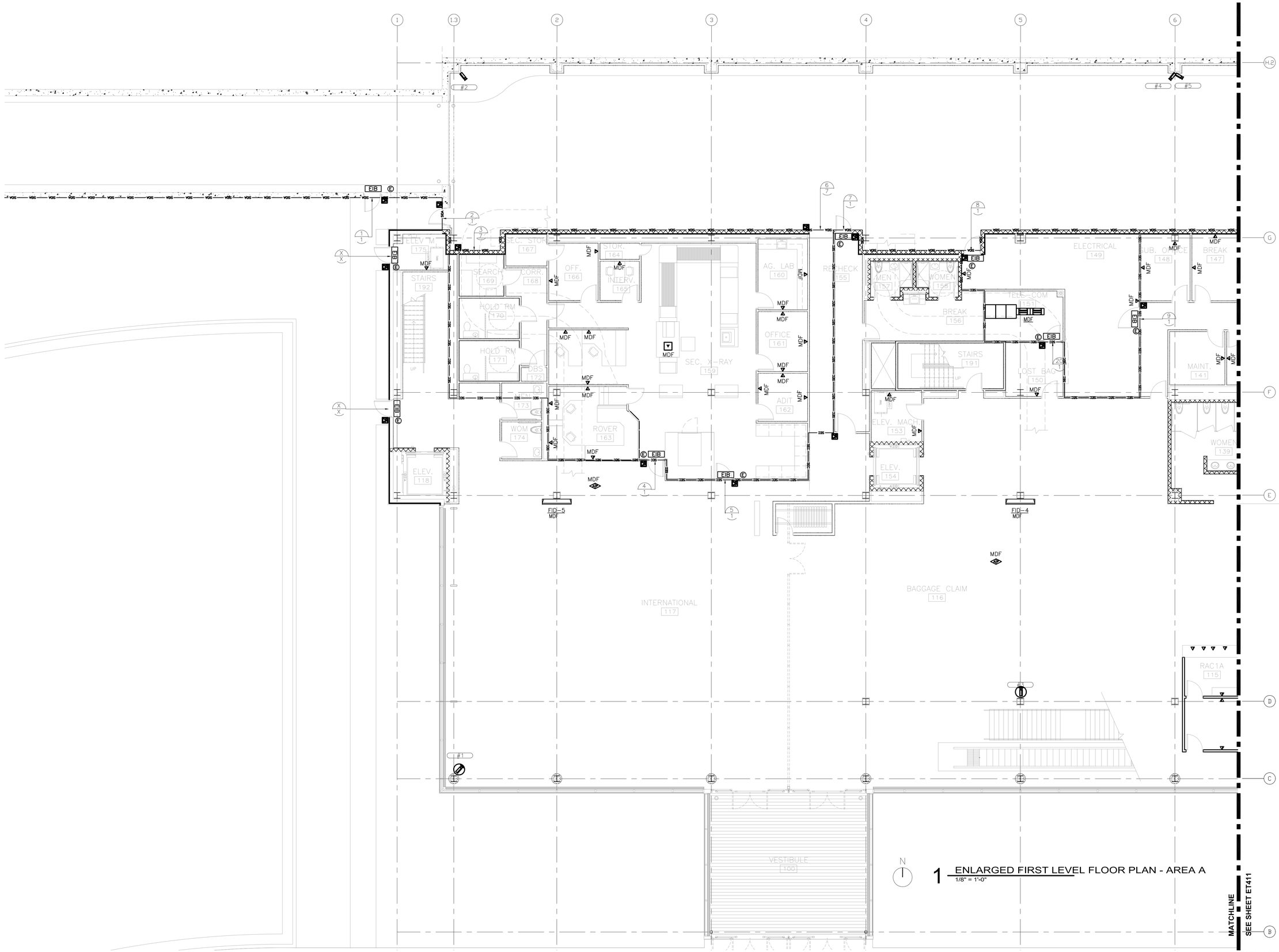
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN

SHEET NUMBER
ET401

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N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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AEP PROJECT NUMBER
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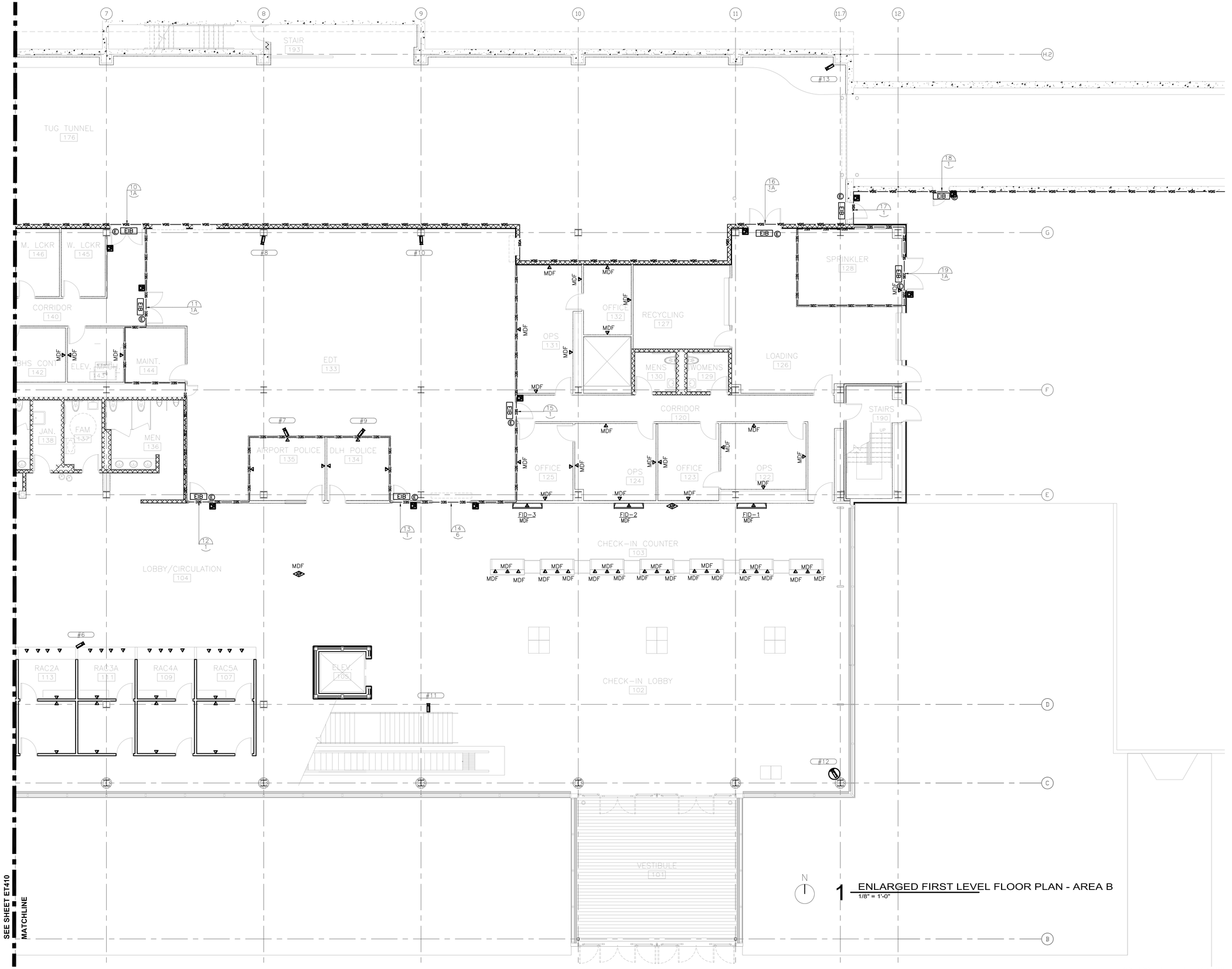
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN AREA A

SHEET NUMBER
ET410

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1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

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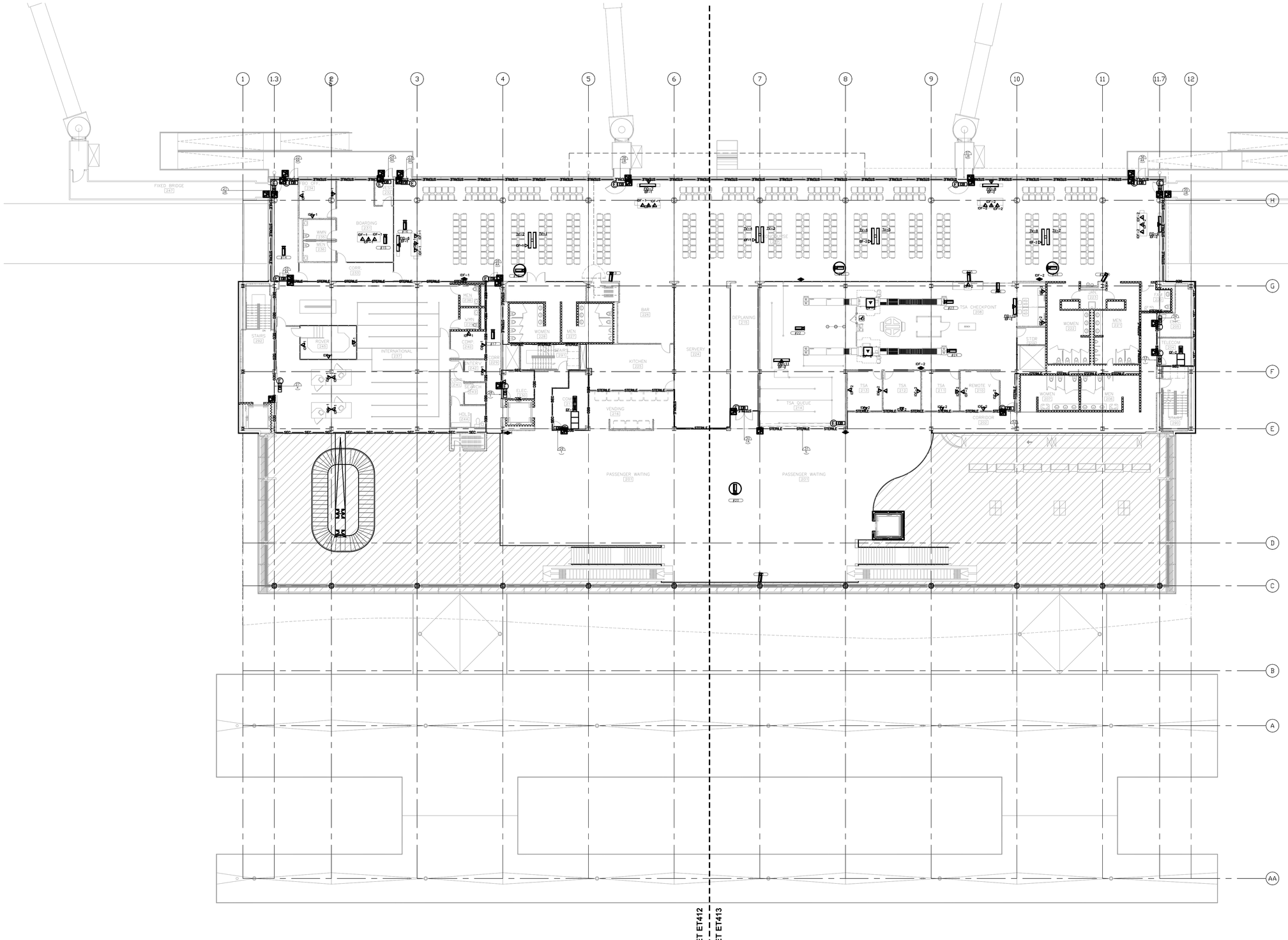
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN AREA B

SHEET NUMBER
ET411

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N

2 SECOND LEVEL FLOOR PLAN
1/16" = 1'-0"

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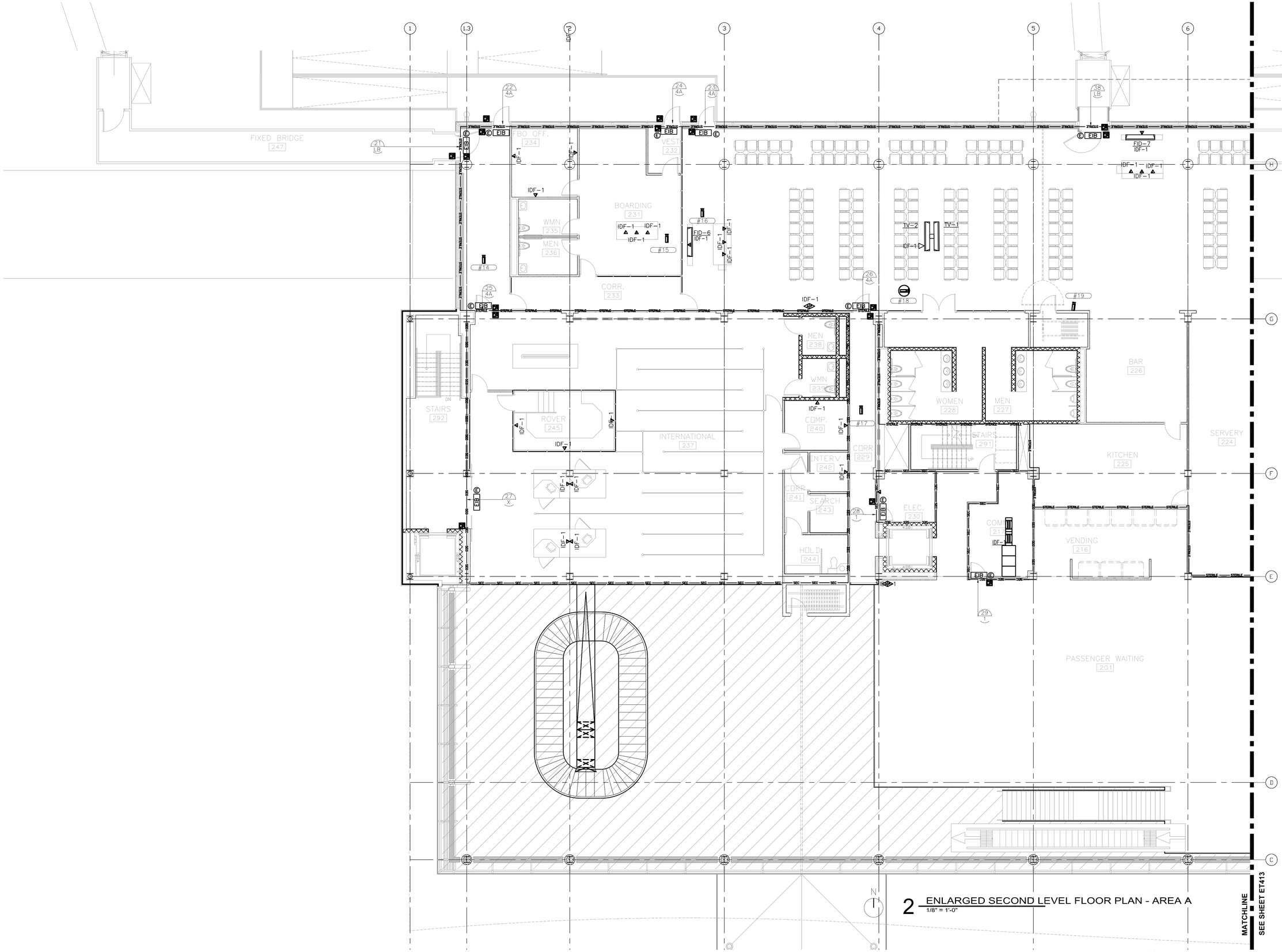
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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN

SHEET NUMBER
ET402

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2 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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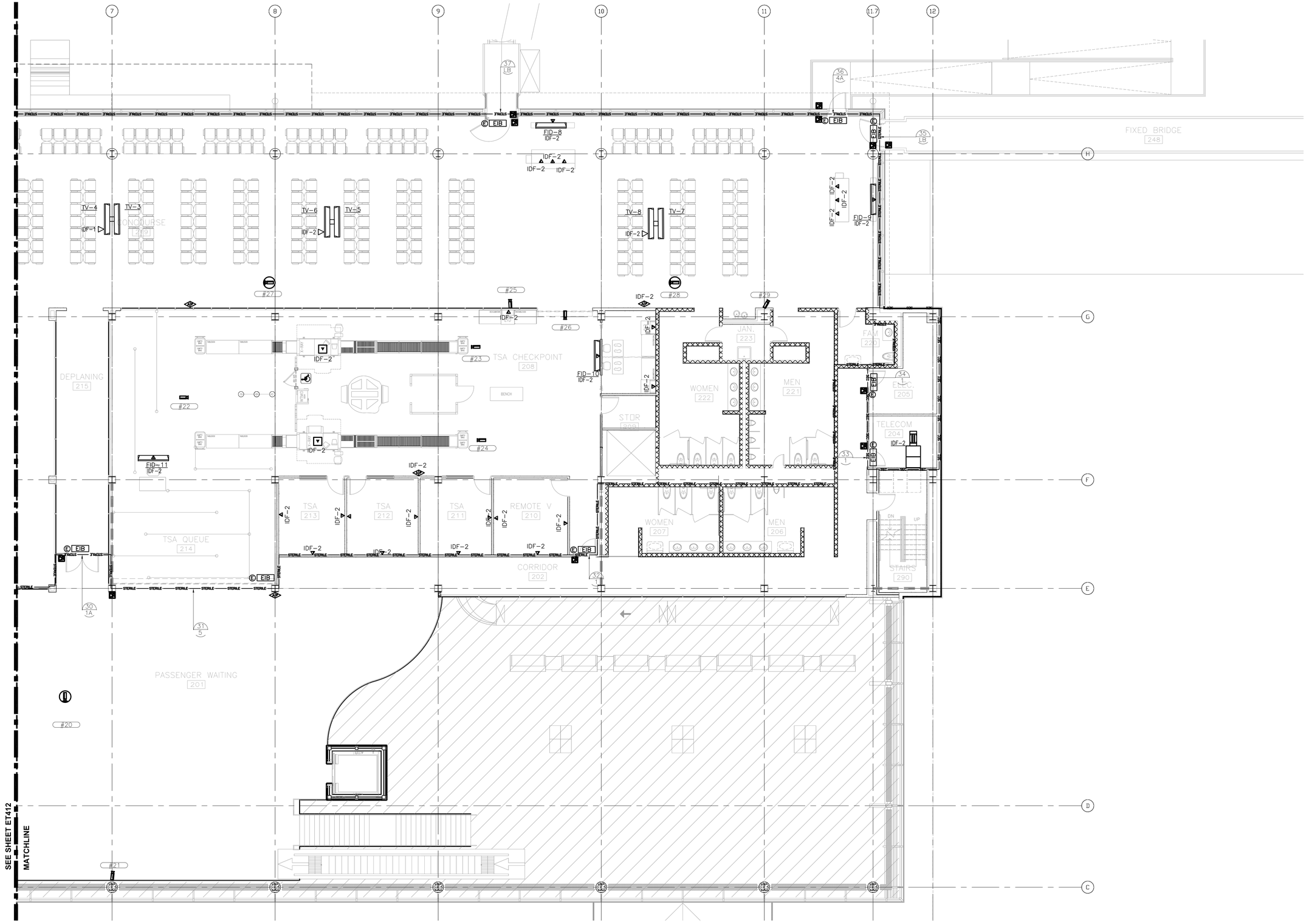
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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN AREA A

SHEET NUMBER
ET412

60% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Termina\Cad\E\SECOND FLOOR TECHNOLOGY.dwg Plotted on: 2/15/2010 2:17 PM Plotted by: Lazari, Rional



N

2 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

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Landscaping Consultants:
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2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

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NO.	DESCRIPTION	DATE

DATE ISSUED: 02-15-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN AREA B

SHEET NUMBER
ET413

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N

3 THIRD LEVEL FLOOR PLAN
1/16" = 1'-0"

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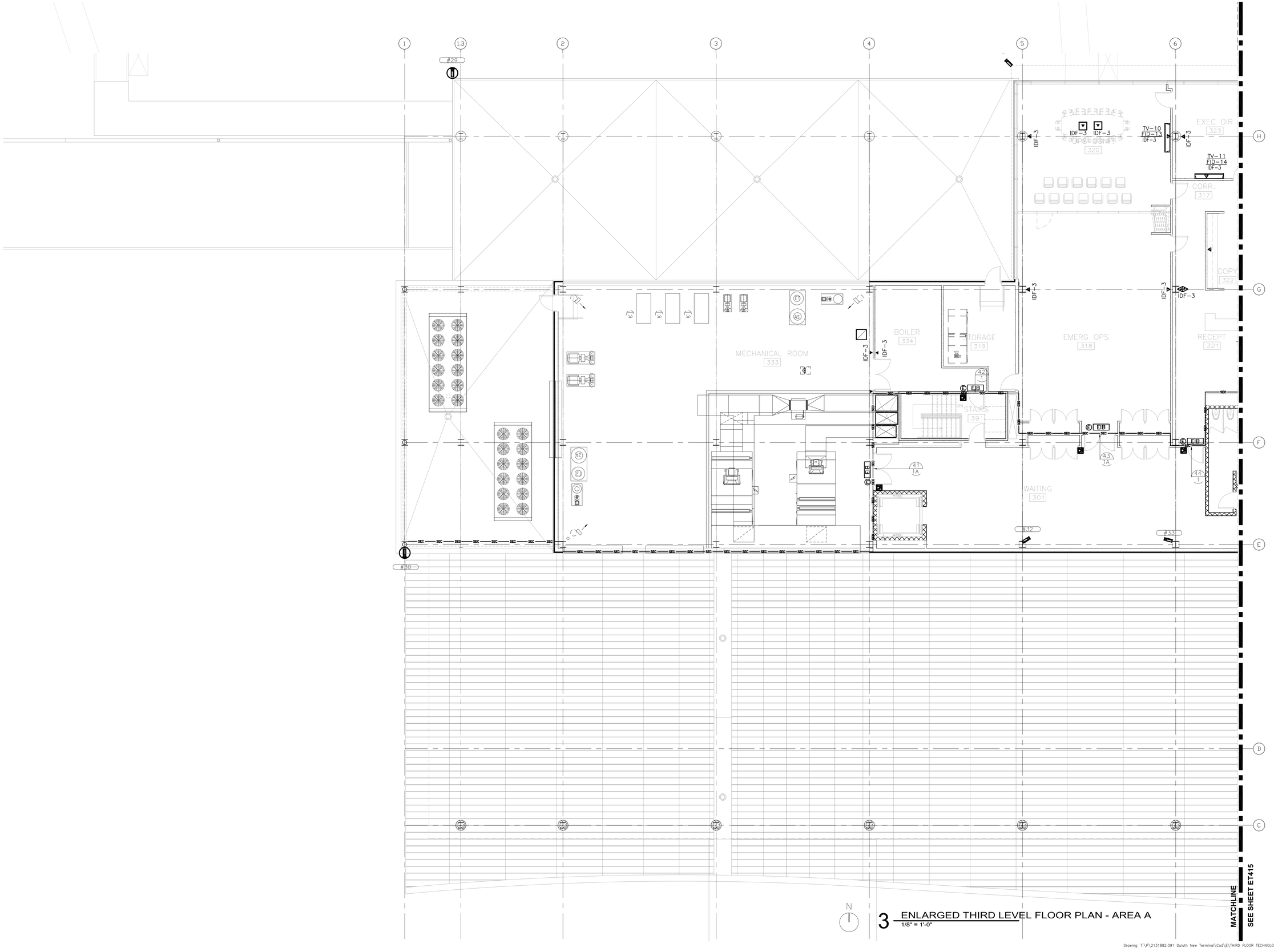
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SHEET TITLE
SECURITY & MUFID'S THIRD FLOOR PLAN

SHEET NUMBER
ET403

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3 ENLARGED THIRD LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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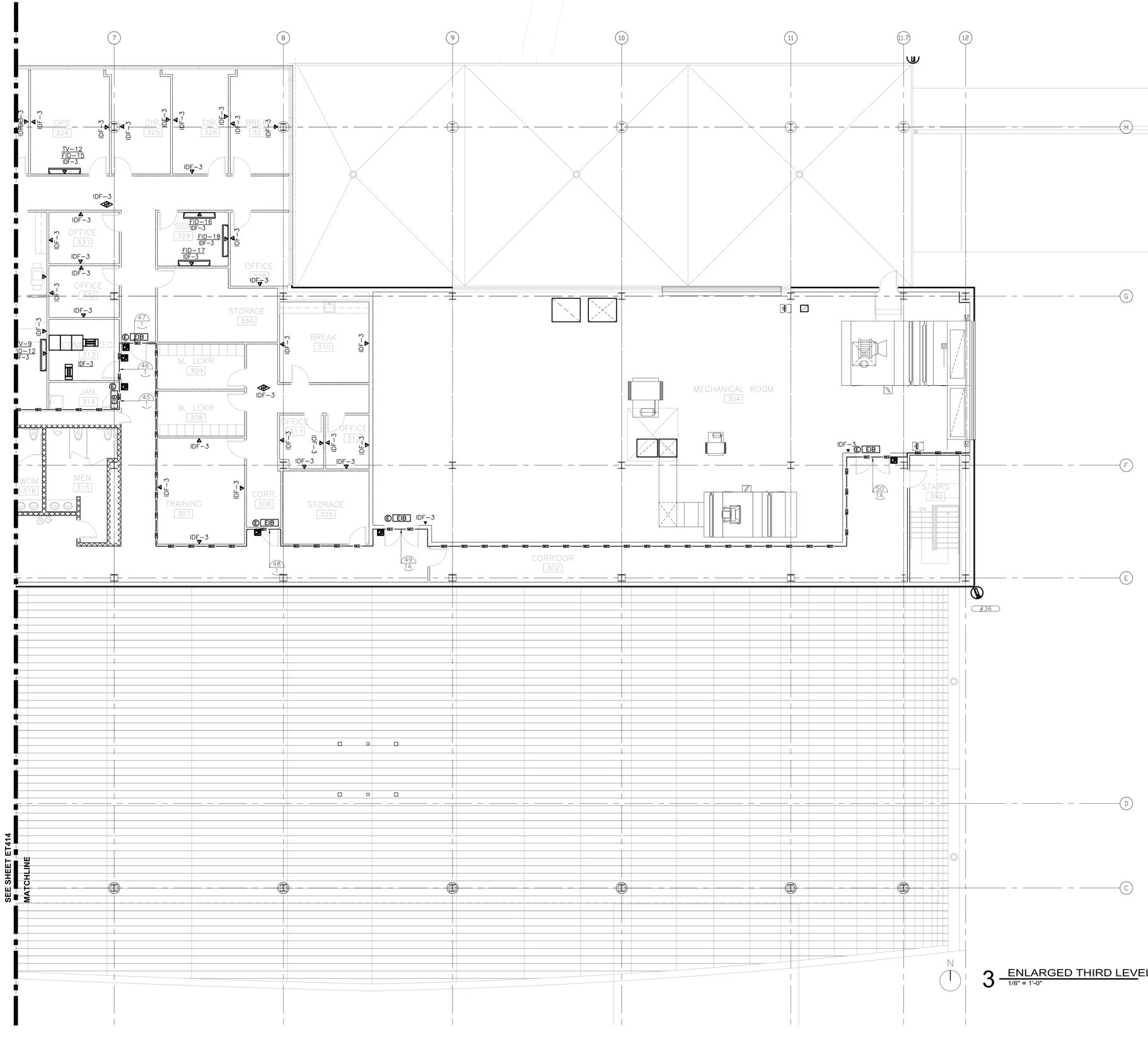
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN AREA A

SHEET NUMBER
ET414

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3 ENLARGED THIRD LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

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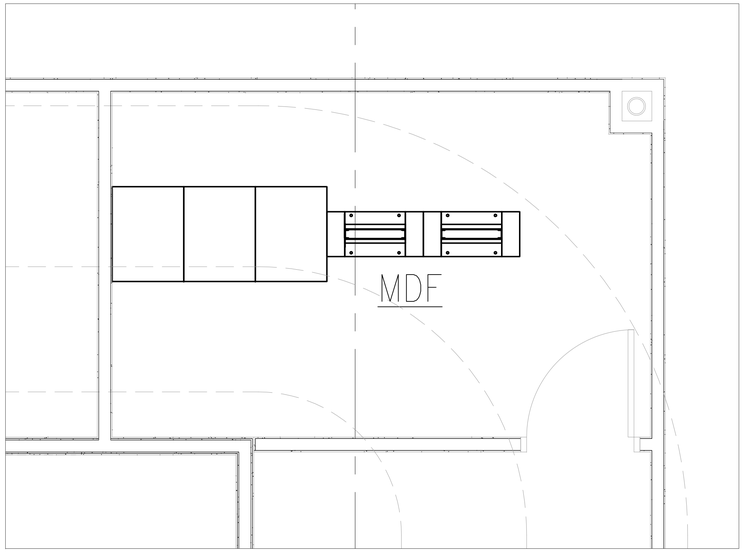
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN AREA B

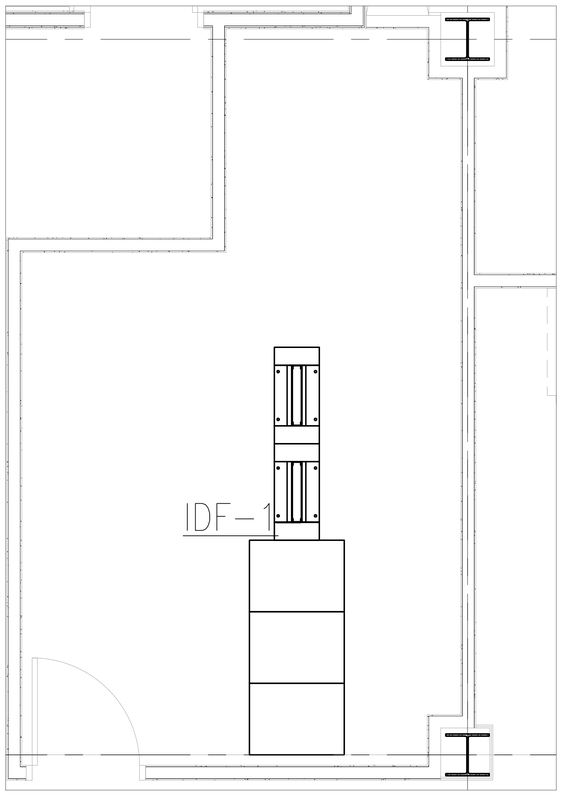
SHEET NUMBER
ET415

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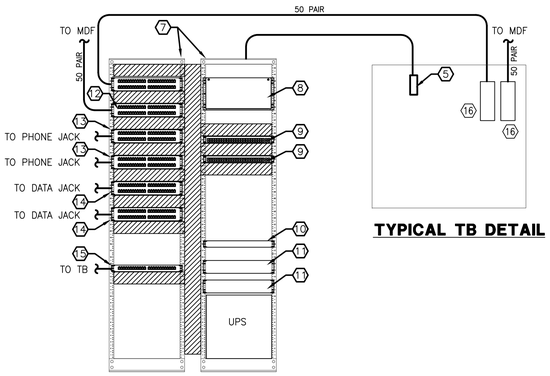
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1 ET5-01 **ENLARGED MDF TELE-COM ROOM #141**
SCALE: 1/2"=1' 0"



2 ET5-01 **ENLARGED IDF-1 COMM. ROOM #211**
SCALE: 1/2"=1' 0"



TYPICAL IDF DETAIL

TYPICAL TB DETAIL

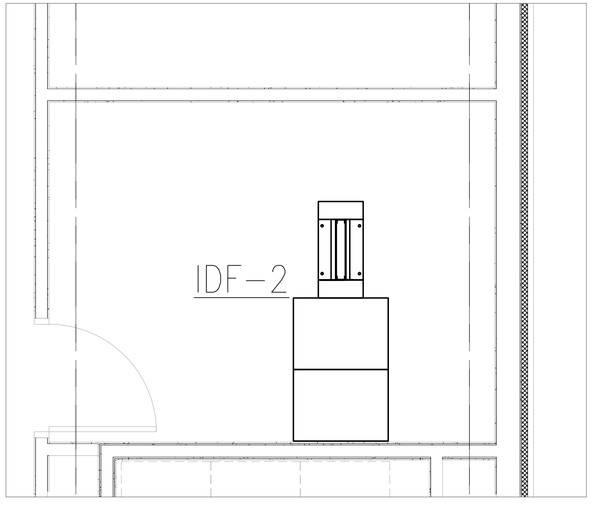
GENERAL NOTES:

1. PROVIDE WIRE MANAGEMENT SYSTEMS ABOVE AND BELOW EACH PATCH PANEL AND NETWORK SWITCH. PROVIDE VERTICAL WIRE MANAGEMENT ON OPEN FRAME RACKS. WIRE MANAGEMENT SYSTEM SHALL CONCEAL CABLES WITH SOLID REMOVABLE COVERS.
2. CABLING INSTALLATION SHALL CONFORM WITH THE LATEST EDITION OF ANSI/TIA/EIA-568-B.1 COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD, ANSI/TIA/EIA-568-B.2 100 OHM TWISTED PAIR CABLING STANDARD AND ANSI/TIA/EIA-568-B.3 OPTICAL FIBER STANDARDS. ALL PRODUCTS SHALL BE UL LISTED AND COMPLY WITH THE NEC AND APPLICABLE CODES.
3. SUBMIT SHOP DRAWINGS AND DATA SHEETS FOR ALL COMPONENTS. SHOP DRAWINGS SHALL INCLUDE CABLE IDENTIFICATION ASSIGNMENTS AND PORT USAGE. DRAWINGS SHALL CLEARLY IDENTIFY POINT TO POINT INFORMATION FOR A COMPLETE SYSTEM.

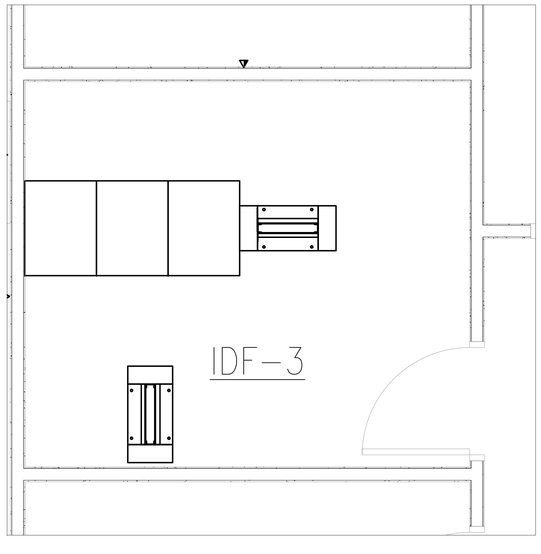
NOTES

1. PROVIDE 8'X4' READYSPEC TELEPHONE BACKBOARD OR APPROVED EQUAL.
2. NOT USED.
3. NOT USED
4. NOT USED
5. GROUND BUS BAR WITH #4 COPPER GROUND CONDUCTOR TO SYSTEM GROUND. PROVIDE #6 COPPER GROUND CONDUCTORS TO RACKS, CABINETS, CABLE TRAYS, CONDUITS, CATV SPLITTER AND ALL OTHER COMMUNICATIONS SYSTEMS REQUIRING A SYSTEM GROUND.
8. FIBER OPTIC PATCH AND SPLICE SHELF AS INDICATED ON TUBE RISER, SHEET ET6-01.
9. NOT USED
10. NOT USED
11. NOT USED
12. 48 PORT CAT6 PATCH PANEL FOR TERMINATION OF 50 PAIR CABLE BETWEEN IDF AND MDF. PUNCH 2 PAIR ON PORT 1 AND 1 PAIR ON REMAINING PORTS.
13. 48 PORT CAT6 PATCH PANEL FOR TERMINATION OF PHONE CABLES FROM WALL JACKS. PUNCH ALL 4 PAIRS. PROVIDE WHITE JACKS. PROVIDE PATCH PANELS AS REQUIRED FOR TERMINATION OF ALL COMM. OUTLETS AS SPECIFIED ON THE PLANS PLUS 20% SPARE CAPACITY.
14. 48 PORT CAT6 PATCH PANEL FOR TERMINATION OF DATA CABLES FROM WALL JACKS. PUNCH ALL 4 PAIRS. PROVIDE BLUE JACKS. PROVIDE PATCH PANELS AS REQUIRED FOR TERMINATION OF ALL COMM. OUTLETS AS SPECIFIED ON THE PLANS PLUS 20% SPARE CAPACITY.
15. 24 PORT CAT6 PATCH PANEL FOR TERMINATION OF DATA/PHONE CABLES FROM TENANT TB. PUNCH ALL 4 PAIRS. (1) PATCH PANEL PER TENANT AS SHOWN ON ONE-LINE COMM. RISER SHEET ET6-01.
16. 110 PUNCH BLOCK - 50 PAIR

5 ET5-01 **TYPICAL IDF DETAIL**
SCALE: NTS



3 ET5-01 **ENLARGED IDF-2 TELECOMM. ROOM #243**
SCALE: 1/2"=1' 0"



4 ET5-01 **ENLARGED IDF-3 COMM/ELEC ROOM #325**
SCALE: 1/2"=1' 0"

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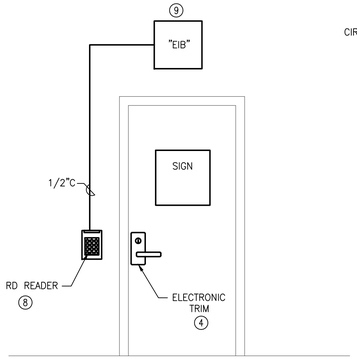
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SHEET TITLE
TECHNOLOGY TELECOMM. ROOM DETAILS

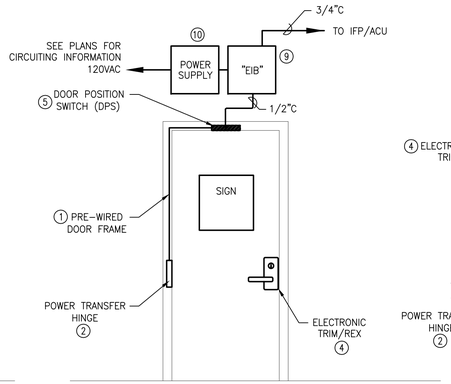
SHEET NUMBER
ET501

60% NOT FOR CONSTRUCTION

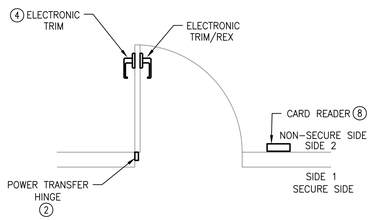
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SIDE 2
NON–SECURE SIDE



SIDE 1
SECURE SIDE



PLAN VIEW

SIDE 1 – EGRESS/SECURE SIDE

1. DOOR HARDWARE SHALL BE RELEASED WITH NO DELAY EGRESS UPON ACTIVATION OF ELECTRONIC TRIM/REX.
2. DOOR HARDWARE SHALL BE RELEASED UPON AN AUTHORIZED ACCESS NOTIFICATION FROM THE ACCESS CONTROL SYSTEM FOR TYPE 1A.

SIDE 2 – NON–SECURE SIDE

1. DOOR HARDWARE SHALL BE RELEASED UPON AN AUTHORIZED ACCESS NOTIFICATION FROM ACCESS CONTROL SYSTEM.

DOOR OPERATION UNDER LOSS OF POWER:

1. ELECTRONIC TRIM/REX SHALL FAIL SAFE.
2. ELECTRONIC TRIM SHALL FAIL SECURE.
3. MASTER KEY SHALL OVERRIDE/OPEN DOOR HARDWARE

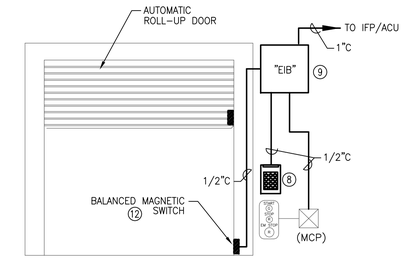
TYPE 1A, 1B, AND 1C DESCRIPTIONS

1. TYPE 1B IS THE SAME AS TYPE 1 EXCEPT WITH DUAL CARD READER (SGL DOOR, SIDE 1 SIGN TYPE 4).
2. TYPE 1A IS THE SAME AS TYPE 1 (SGL CARD READER) EXCEPT WITH DOUBLE DOORS (PROVIDE DPS BOTH DOORS).
3. TYPE 1C IS THE SAME AS TYPE 1B EXCEPT DOUBLE DOOR (DBL DOOR).
4. TYPE 1 SHOWN IN DETAIL.

TYPE 1 ACCESS POINT (#1)

TERMINAL OPERATIONAL DOOR
(SEE NOTES FOR TYPES 1A, 1B, AND 1C DOORS)

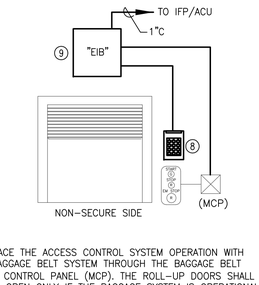
(#1A) (#1B) (#1C)



1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE ROLL–UP DOOR (MCP). CARD READER SHALL BE USED TO ACTIVATE THE ROLL–UP DOOR CONTROL PUSH BUTTONS. LOCATE CARD READER NEAR ROLL–UP DOOR PUSH BUTTONS.
2. PROVIDE THE OPTION FOR AUTOMATIC OPEN OR CLOSE OF DOOR WITH CARD SWIPE ONLY.

TYPE 5 ACCESS POINT (#5)

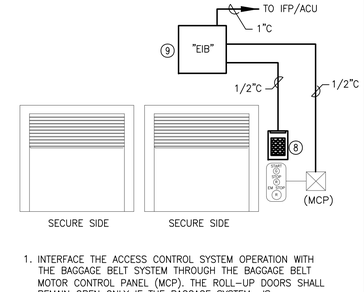
ROLL–UP DOOR



1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE BAGGAGE BELT SYSTEM THROUGH THE BAGGAGE BELT MOTOR CONTROL PANEL (MCP). THE ROLL–UP DOORS SHALL REMAIN OPEN ONLY IF THE BAGGAGE SYSTEM IS OPERATIONAL AND SHALL INDICATE ALARM CONDITIONS IF THE DOOR IS OPEN AND THE BAGGAGE SYSTEM HAS STOPPED FOR AN ADJUSTABLE PERIOD OF 1 TO 15 MINUTES. CARD READER SHALL BE USED TO ACTIVATE THE BAGGAGE CLAIM DEVICE CONTROL PUSH BUTTONS.
2. MOUNT THE CARD READER NEXT TO THE CONTROLS FOR THE BAGGAGE SYSTEM.
3. USE BAGGAGE SYSTEM LIMIT SWITCHS FOR DOOR POSITON. IF INTERFACE IS NOT AVAILABLE PROVIDE WIDE GAP BALANCED MAGNETIC SWITCH.

TYPE 6 ACCESS POINT (#6)

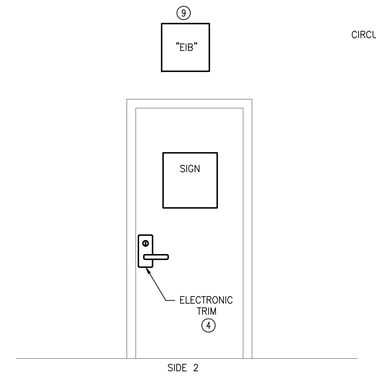
OUTBOUND TICKET COUNTER BAGGAGE BELT



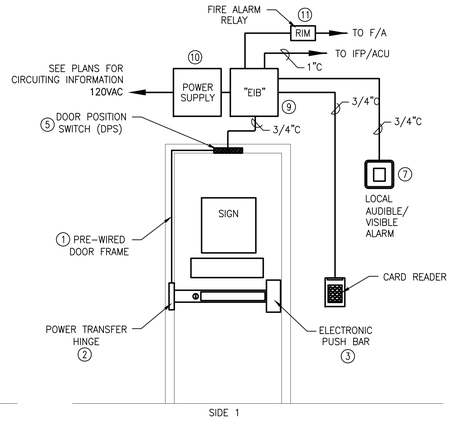
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2. MOUNT THE CARD READER NEXT TO THE CONTROLS FOR THE BAGGAGE SYSTEM. COORDINATE LAY–OUT WITH MUFIDS TUG INPUT STATION, 15" MUFIDS MONITOR AND PA MICROPHONE SYSTEM.
3. USE BAGGAGE SYSTEM LIMIT SWITCHS FOR DOOR POSITON. IF INTERFACE IS NOT AVAILABLE PROVIDE WIDE GAP BALANCED MAGNETIC SWITCH.

TYPE 7 ACCESS POINT (#7)

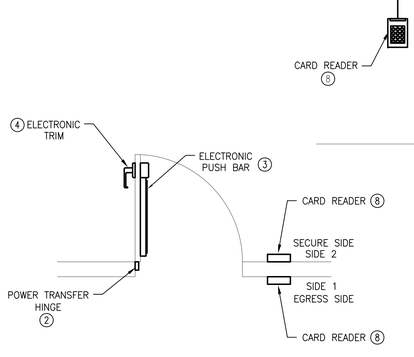
INBOUND BAGGAGE CLAIM BAGGAGE BELT



SIDE 2



SIDE 1



PLAN VIEW

DOOR OPERATION UNDER ALARM CONDITIONS:

1. FIRE ALARM SHALL ALLOW THE ACCESS THROUGH THE DOOR WITHOUT THE 15 SECOND DELAY UPON THE DETECTION OF A FIRE ALARM WITHIN THE ZONE (SMOKE OR SPRINKLER ONLY). PULL STATION SHALL NOT BYPASS THE 15 SECOND DELAY REQUIREMENT.

SIDE 1 – EGRESS SIDE

1. DOOR HARDWARE SHALL BE RELEASED AFTER 15 SECOND DELAY EGRESS UPON ACTIVATION OF ELECTRONIC PUSH BAR BY PRESSING BAR FOR 3 TO 5 SECONDS.
2. DOOR HARDWARE SHALL BE RELEASED UPON AN AUTHORIZED ACCESS NOTIFICATION FROM ACCESS CONTROL SYSTEM.
3. ACTIVATE AUDIBLE/VISIBLE ALARM ON ANY FORCED ENTRY OR EGRESS ALARM INDICATION.
4. RELEASE DOOR WITHOUT DELAY UPON ACTIVATION OF RIM BY FIRE ALARM SYSTEM ACTIVATION.

SIDE 2 – STERILE SIDE/SECURE SIDE

1. DOOR HARDWARE SHALL BE RELEASED WITH NO DELAY EGRESS UPON ACTIVATION OF ELECTRONIC TRIM/REX.
2. DOOR HARDWARE SHALL BE RELEASED UPON AN AUTHORIZED ACCESS NOTIFICATION FROM THE ACCESS CONTROL SYSTEM FOR TYPE 4A.

DOOR OPERATION UNDER LOSS OF POWER:

1. ELECTRONIC PUSH BAR SHALL FAIL SAFE.
2. ELECTRONIC TRIM SHALL FAIL SECURE.

TYPE 4A, 4B AND 4C DESCRIPTIONS

1. TYPE 4A IS THE SAME AS TYPE 4 EXCEPT WITH DUAL CARD READER.
2. TYPE 4B IS THE SAME AS TYPE 4 EXCEPT WITH DOUBLE DOORS. PROVIDE DPS ON BOTH DOORS.
3. TYPE 4C IS THE SAME AS TYPE 4B EXCEPT WITH DUAL CARD READER.
4. TYPE 4 SHOWN IN DETAIL.

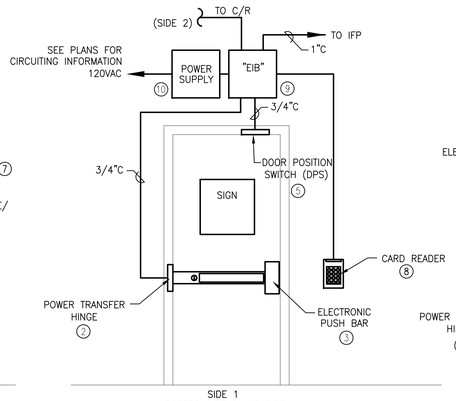
TYPE 4A, 4B AND 4C GENERAL NOTES

1. PROGRAM READER TO ALLOW AUTHORIZED USERS TO KEY–IN THE TIME TO KEEP DOOR OPEN. ONCE THE DOOR IS CLOSED THE DOOR SHALL RESET INTO SECURE POSITION.
2. ACTIVATE A PRE–ALARM ON CARD READER TO INDICATE EXPIRATION OF TIME IS NEARING. COORDINATE PRE–ALARM TIME WITH OWNER.
3. DELAYED EGRESS CRASH BAR SHALL RE–SECURE UPON DETECTION FROM DPS THAT DOOR HAS BEEN CLOSED AND NOT RELY ON INTEGRATED TIMER.
4. MONITOR RELEASE COUNTDOWN ON ACCESS CONTROL AS AN ALARM CONDITION.

TYPE 4 ACCESS POINT (#4)

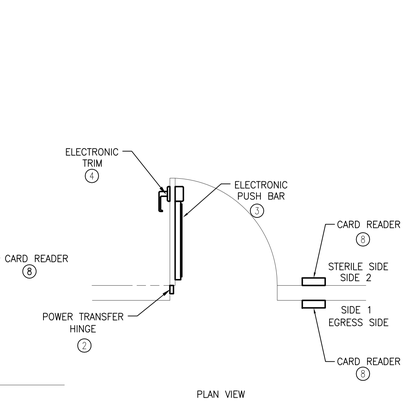
TERMINAL OPERATIONAL/EMERGENCY EXIT DOOR/STERILE TO SECURE
(SEE NOTES FOR TYPES 4A AND 4B DOORS)

(#4A) (#4B) (#4C)



DOOR OPERATION UNDER ALARM CONDITIONS:

1. THERE SHALL BE NO DELAY ENTERING BUILDING FROM PLANE SIDE IN CASE OF FIRE ON PLANE.



TYPE "LB" GENERAL NOTES

1. PROVIDE 20A CIRCUIT FROM EMERGENCY PANEL. ONE CIRCUIT SHALL FEED NO MORE THAN 4 DOORS. LABEL PANEL SCHEDULE "ACCESS CONTROL DOOR".
2. PROVIDE CONDUIT FOR AUDIBLE/VISIBLE ALARM UNDER THIS PACKAGE.

TYPE LB ACCESS POINT (#LB)

PASSENGER LOADING BRIDGE

ACCESS CONTROL SYSTEM GENERAL NOTES

1. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
2. REFER TO ACCESS POINT SCHEDULE FOR DOOR CONFIGURATION AND SIGNAGE TYPE. SEE T5–04 FOR SECURITY SIGNAGE.
3. ACCESS CONTROL SYSTEM SHALL MONITOR OR INTERFACE WITH THE FOLLOWING ITEMS AT EACH ACCESS POINT (IF AVAILABLE):
   - A. CARD READER TAMPER
   - B. EIB TAMPER
   - C. POWER SUPPLY TAMPER
   - D. DOOR POSITION SWITCHES
   - E. POWER SUPPLY POWER FAIL
   - F. POWER SUPPLY BATTERY LOW/FAIL
   - G. REQUEST TO EXIT (REX)
   - H. PANIC BAR ALARM – COUNTDOWN (DELAYED EGRESS ONLY)
   - I. FIRE ALARM RELEASE (DELAYED EGRESS ONLY)
   - J. LOCAL ALARM
4. DOORS TO BE HELD OPEN FOR LONGER THAN 30 SECONDS SHALL:
   - A. ALLOW AUTHORIZED USERS TO KEY–IN THE TIME TO KEEP DOOR OPEN. ONCE THE DOOR IS CLOSED, THE DOOR SHALL RESET INTO SECURE POSITION.
   - B. ACTIVATE A PRE–ALARM AUDIO BEEP ON CARD READER TO INDICATE EXPIRATION OF TIME IS NEARING. COORDINATE PRE–ALARM TIME WITH OWNER.
   - C. AFTER PRE–ALARM AND PRIOR TO EXPIRATION OF TIME DOORS WITH MAGNETIC HOLD OPEN DEVICES SHALL RELEASE DOOR TO PREVENT HOLD OPEN ALARM.
   - D. EXPIRATION OF TIME SHALL ACTIVATE THE HORN/STROBE AT THE DOOR AND A STEADY BEEP ON THE READER.

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REVISIONS

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SHEET TITLE
ACCESS CONTROL DETAILS

SHEET NUMBER
ET502

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10"

STERILE AREA #1
AUTHORIZED PERSONNEL ONLY

AIRPORT ISSUED BADGE MUST BE DISPLAYED

ENSURE THIS ACCESS POINT IS SECURED AFTER USE

AREA MONITORED BY SECURITY #4

49 CFR PART 1542

13"

TYPE 1 SIGN

10"

SECURED AREA #2
AUTHORIZED PERSONNEL ONLY

AIRPORT ISSUED BADGE MUST BE DISPLAYED

ENSURE THIS ACCESS POINT IS SECURED AFTER USE

AREA MONITORED BY SECURITY #4

49 CFR PART 1542

13"

TYPE 2 SIGN

10"

CAUTION #3

DO NOT LEAVE DOOR UNTIL COMPLETELY CLOSED

ENSURE THIS ACCESS POINT IS SECURED AFTER USE

YOU ARE RESPONSILBE FOR ILLEGAL ENTRY

49 CFR PART 1542 #4

13"

TYPE 3 SIGN

18"

EMERGENCY EXIT

#2 PUSH UNTIL ALARM SOUNDS
DOOR WILL OPEN IN 15 SECONDS

5"

TYPE 4 SIGN

10"

EFFECTIVE IMMEDIATELY
BY ORDER OF THE DEPARTMENT OF HOMELAND SECURITY
TRANSPORTATION SECURITY ADMINISTRATION

EMPLOYEES ENTERING THE STERILE AREA ARE SUBJECT TO INSPECTION

EMPLOYEES NOT TRAVELING ON AIRCRAFT MAY BRING LIQUIDS, GELS, AND/OR AEROSOLS THROUGH ACCESS POINTS OTHER THAN THE PASSENGER SCREENING CHECKPOINT

ATTACHMENT 1 TO SD 1542-08-01D #4

5"

TYPE 6 SIGN

18"

EMERGENCY EXIT

#2 WAIT FOR GATE AGENT
OPENING DOOR SOUNDS ALARM

5"

TYPE 5 SIGN

10"

SECURED AREA #2
AUTHORIZED PERSONNEL ONLY

5"

TYPE 7 SIGN

10"

CAUTION

DO NOT LEAVE DOOR UNTIL COMPLETELY CLOSED #3

5"

TYPE 8 SIGN

SIGN TYPES

SIGN NOTES:

1. SIGNAGE SHALL BE PROVIDED AS INDICATED ON THE DRAWINGS AT SELECTED ACCESS POINTS TO PROVIDE INFORMATION FOR THE USERS.
2. SIGNS SHALL BE VINYL WITH ADHESIVE BACK.
3. EMERGENCY EXIT LETTERING SHALL BE 1" MINIMUM IN HEIGHT PER LIFE SAFETY CODE/BUILDING CODE.
4. BORDER SHALL BE 3/16" BLACK.
5. FONT SHALL BE ARIAL BLACK FOR LARGE BOLD AND ARIAL FOR SMALLER TEXT.
6. BACKGROUND/TEXT COLORS:
   - #1 – BLUE BACKGROUND W/ WHITE TEXT
   - #2 – RED BACKGROUND W/ WHITE TEXT
   - #3 – YELLOW/ORANGE BACKGROUND W/ BLACK TEXT
   - #4 – WHITE BACKGROUND W/ BLACK TEXT
7. PROVIDE SIGN TYPE 6 AT ALL DOORS WITH A TYPE 1 SIGN (STERILE AREA).
8. PROVIDE SIGN TYPE 4 AT ALL TYPE "4" DOORS. (DELAYED EGRESS).
9. PROVIDE SIGN TYPE 5 AT ALL TYPE "LB" DOORS. (PLANE EGRESS)
10. PROVIDE SIGN TYPES 1, 2 OR 3 AT ALL POINTS CROSSING A SIDA OR STERILE BOUNDARY. TYPES 7 & 8 SHALL ONLY BE USED ON NON-SECURE/SECURE OR SECURE/SECURE POINTS.

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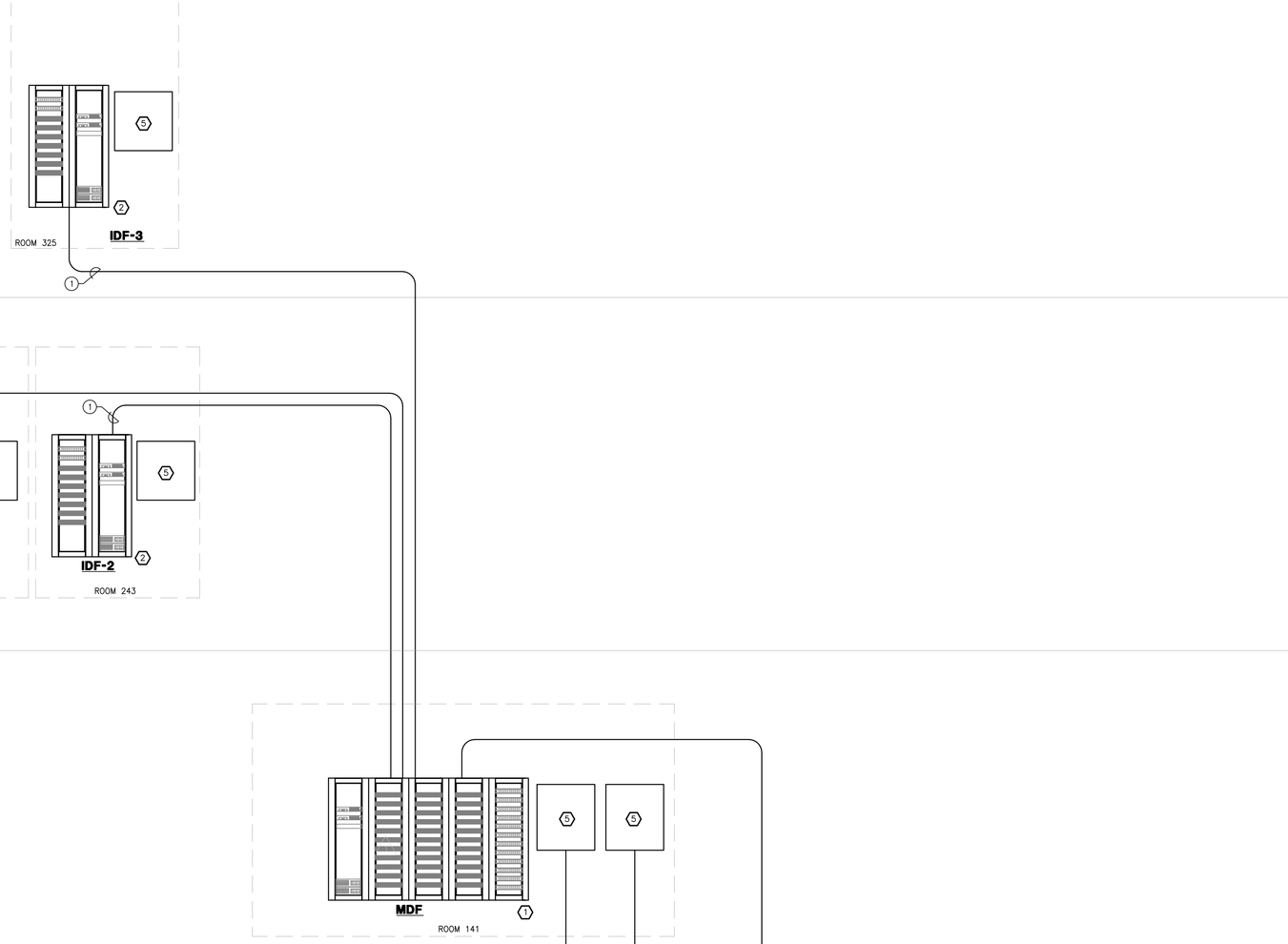
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SHEET TITLE
SECURITY SIGNAGE DETAILS

SHEET NUMBER
ET503

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GENERAL NOTES:

1. REFER TO SHEET ET5-01 FOR COMM. ROOM DETAILS AND NOTES.
2. FIBER OPTIC CONNECTORS SHALL BE SC TYPE. PROVIDE FACTORY MOLDED PIGTAIL. FUSION SPLICE TO FIBER STRAND AT FIBER TERMINATION SHELF (FTU).

FOR REFERENCE ONLY

1. REFER TO NETWORK RISER, SHEET ET6-02 FOR NETWORK EQUIPMENT DETAILS AND NOTES.
2. REFER TO CATV RISER, SHEET ET6-03 FOR CATV EQUIPMENT DETAILS AND NOTES.

CABLE NOTES: ○

(1) CABLE RUN INCLUDES THE FOLLOWING:

- (1) – 18 STRAND 62.5/125 MM FIBER OPTIC BUNDLE
- (1) – 18 STRAND 9/125 SM FIBER OPTIC BUNDLE
- (2) – 2 X 25 PAIR CAT5E TELEPHONE CABLE (50 PAIR)
- (2) – RG11/U COAXIAL CABLES

(2) CABLE RUN INCLUDES THE FOLLOWING:

- (1) – 18 STRAND 62.5/125 MM FIBER OPTIC BUNDLE
- (1) – 18 STRAND 9/125 SM FIBER OPTIC BUNDLE

(3) CABLE RUN INCLUDES THE FOLLOWING:

- (1) – 12 STRAND 62.5/125 MM FIBER OPTIC BUNDLE
- (1) – 12 STRAND 9/125 SM FIBER OPTIC BUNDLE

(4) CABLE RUN INCLUDES THE FOLLOWING:

- (1) – 6 STRAND 62.5/125 MM FIBER OPTIC BUNDLE
- (1) – 6 STRAND 9/125 SM FIBER OPTIC BUNDLE

(5) CABLE RUN INCLUDES THE FOLLOWING:

- (1) – 6 STRAND 62.5/125 MM FIBER OPTIC BUNDLE
- (1) – 6 STRAND 9/125 SM FIBER OPTIC BUNDLE
- (2) – 2 X 25 PAIR CAT5E TELEPHONE CABLE (50 PAIR)

(6) CABLE RUN INCLUDES THE FOLLOWING:

- (2) – 18 STRAND 62.5/125 MM FIBER OPTIC BUNDLE
- (2) – 18 STRAND 9/125 SM FIBER OPTIC BUNDLE
- (2) – 2 X 25 PAIR CAT5E TELEPHONE CABLE (50 PAIR)

NOTES: ⬡

1. MAIN DISTRIBUTION FRAME. SEE SHEET ET5-01.
2. INTERMEDIATE DISTRIBUTION FRAME. SEE SHEET ET5-01.
3. INTERMEDIATE DISTRIBUTION FRAME, SECURITY SERVERS AND ADMINISTRATIVE/IT SERVERS. SHEET ET5-01.
4. NOT USED
5. TELEPHONE BACKBOARD. SEE SHEET ET5-01.
6. NOT USED
7. NOT USED
8. NOT USED
9. NOT USED
10. INTERMEDIATE DISTRIBUTION FRAME, DEDICATED TO TSA SCREENING EQUIPMENT.

1 / ET6-01 PREMISE DISTRIBUTION RISER

SCALE: NTS

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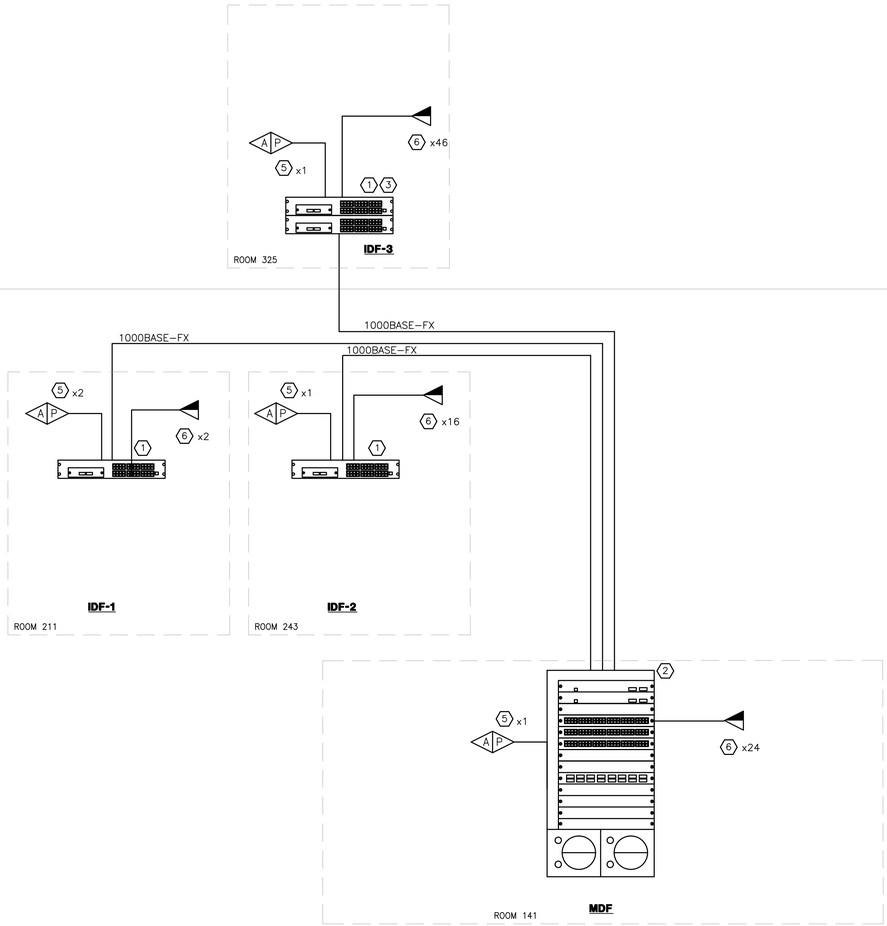
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SHEET TITLE
PREMISE DISTRIBUTION RISER

SHEET NUMBER
ET601

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UPPER LEVEL

MAIN LEVEL

1 / ET6-02 **NETWORK RISER**

SCALE: NTS

GENERAL NOTES:

1. REFER TO SPECIFICATIONS SECTION 16740 FOR PREMISE WIRING SYSTEM SCOPE OF WORK.
2. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS FOR ALL FIBER AND COPPER CABLES AND PATCH PANELS CONNECTIONS. THE SHOP DRAWINGS SHALL CLEARLY SHOW LOCATION OF ALL PATCH PANELS, SIZE, QTY, AND PORT USAGE. THESE DRAWINGS INDICATE TYPICAL CONNECTIONS. PROVIDE ADDITIONAL RACKS AND OTHER ACCESSORIES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
3. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
4. THE SCOPE SHALL INCLUDE IMPLEMENTATION, SETUP AND TRAINING TO THE OWNERS STAFF AND CONNECTION TO ALL THE EQUIPMENT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL COMPONENTS REQUIRED TO CONNECT THE ACCESS CONTROL SYSTEM TO THE NETWORK. THE CONTRACTOR SHALL COORDINATE WITH SECURITY EQUIPMENT SUPPLIERS TO CONNECT AND TEST THE NETWORK DEVICES. THE CONTRACTOR SHALL COORDINATE WITH AIRPORT "IT" SUPPORT PERSONAL AND CONSULTANTS.
5. CONTRACTOR SHALL LABEL ALL PATCH PANELS, CABLES AND TERMINATION LOCATIONS. LABELS SHALL BE TYPE WRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.

NETWORK SCOPE:

1. THE NETWORK IMPLEMENTATION SHALL BE PERFORMED BY A QUALIFIED INFORMATION TECHNOLOGY (IT) PROFESSIONAL.
   a. THE IT PROFESSIONAL SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE IN NETWORK INSTALLATION OF SIMILAR COMPLEXITY.
   b. THE IT PROFESSIONAL SHALL HAVE AT A MINIMUM CCNP "CISCO CERTIFIED NETWORK PROFESSIONAL" CERTIFICATION AND SHALL BE FAMILIAR WITH ACCESS CONTROL LISTS (ACL), ROUTING, SECURITY, CONVERGED NETWORKS, QUALITY OF SERVICE "QOS", VIRTUAL PRIVATE NETWORKS (VPN) AND BROADBAND TECHNOLOGIES.
   c. SUBMIT QUALIFICATION INFORMATION TO A/E FOR APPROVAL.
2. THE NETWORK INSTALLATION SHALL INCLUDE FURNISHING AND INSTALLATION OF ALL NETWORK EQUIPMENT AS SPECIFIED HEREIN TO PROVIDE A COMPLETELY OPERATIONAL NETWORK.
3. VLANS SHALL BE CREATED TO SEPARATE NETWORK USAGE (IE, CCTV, ACS, SAFIDS, ADMIN, ETC.). INTERVLAN ROUTING SHALL BE USED AND ACL'S (ACCESS CONTROL LISTS) SHALL BE CREATED TO RESTRICT ACCESS TO AUTHORIZED PERSONNEL AND DEVICES ONLY. ONLY REQUIRED PORTS SHALL BE OPENED. THE ADMINISTRATIVE VLAN SHALL BE ABLE TO ACCESS HTTP (PORT 80) ON BOTH THE SAFIDS AND CCTV VLANS. THE ACS, CCTV AND SAFIDS VLANS SHALL NOT HAVE ACCESS TO THE INTERNET. THE SITE NETWORK SHALL BE CONFIGURED ON THE CCTV VLAN AND THE ACS DEVICES SHALL BE ASSIGNED IP ADDRESSES IN THE SAME NETWORK AS THE ACS SYSTEM AND SHALL ROUTE ALL REGISTERED ACS IP TRAFFIC TO THE ACS VLAN. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS INDICATING IP ASSIGNMENTS AND PROPOSED ACCESS CONTROL CONFIGURATIONS TO THE ENGINEER FOR APPROVAL.

NOTES: ⬡

(1) NETWORK SWITCH, 48 ETHERNET 10/100/1000 PORTS WITH IEEE 802.3af PoE AND 4 SFP UNLINKS. SWITCH SHALL BE CISCO C3750G-48PS.

(2) NETWORK CORE SWITCH SHALL CONTAIN THE FOLLOWING MODULES.

a. SUPERVISOR ENGINE 2
b. CONTENT SERVICE GATEWAY
c. WIRELESS LAN SERVICE MODULE
d. FIREWALL SERVICE MODULE
e. INTRUSION DETECTION SYSTEM
f. 24 PORT FXS – 24 ANALOG PHONES
g. 48 PORT 10/100 POE
h. 48 PORT 10/100/1000
i. NETWORK ANALYSIS MODULE
j. 8 PORT VOICE T1 & SERVICES
k. 48 PORT SFP
l. 4 PORT 10 GIGABIT XENPAK
m. 6000W POWER SUPPLY

NETWORK CORE SWITCH SHALL BE CISCO 6513 SERIES SWITCH.

(3) NETWORK SWITCH, 16 ETHERNET 10/100/1000 PORTS WITH 1 10GB XENPAK PORT. SWITCH SHALL BE CISCO C3750G-16TD.

(4) NETWORK SWITCH, 12 ETHERNET 10/100 PORTS WITH 2 100BASE-FX MULTIMODE FIBER PORTS. SWITCH SHALL BE CISCO C2955C-12.

(5) WIRELESS ACCESS POINT, 802.11g. ACCESS POINT SHALL BE CISCO AIRONET 1200.

(6) WALL COMMUNICATION OUTLET RJ-45 JACK.

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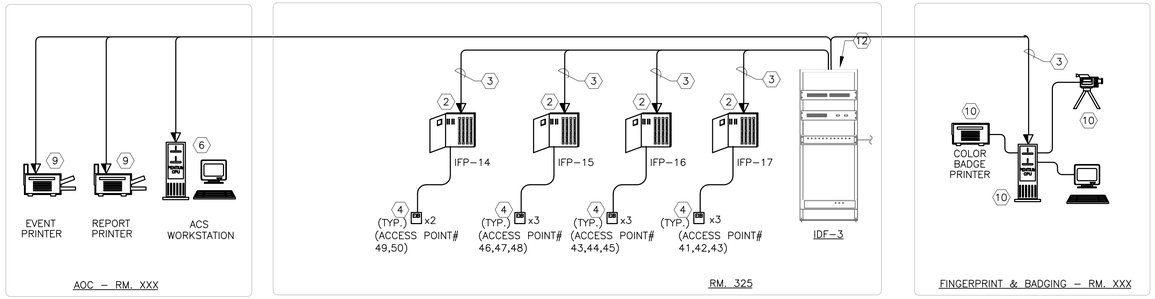
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SHEET TITLE
NETWORK RISER

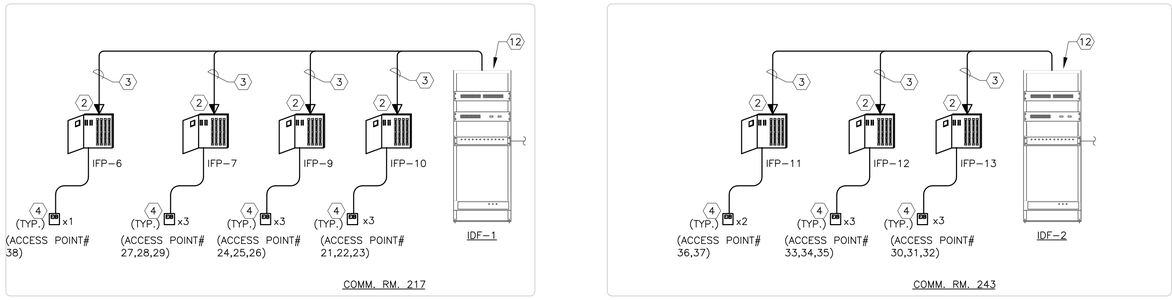
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ET602

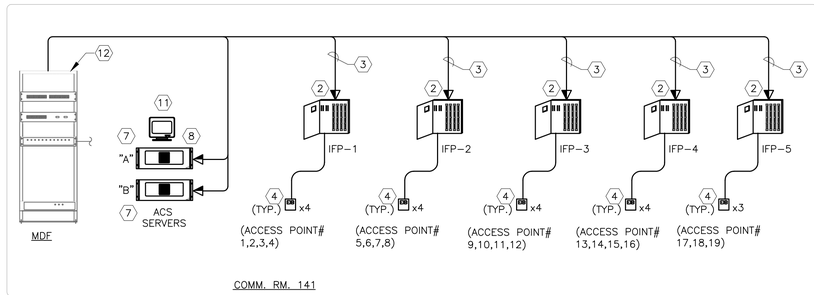
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UPPER LEVEL





MAIN LEVEL

SECURITY RISER

1 / ET603

SCALE: NTS

GENERAL NOTES:

1. REFER TO SPECIFICATIONS SECTION 13720 FOR COMPUTER CONTROLED ACCESS SYSTEM (CCAS) SCOPE OF WORK.
2. REFER TO SPECIFICATIONS SECTION 16740 FOR PREMISE WIRING SYSTEM SCOPE OF WORK.
3. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS FOR ALL FIBER AND COPPER CABLES AND PATCH PANELS CONNECTIONS. THE SHOP DRAWINGS SHALL CLEARLY SHOW LOCATION OF ALL PATCH PANELS, SIZE, QTY, AND PORT USAGE. THESE DRAWINGS INDICATE TYPICAL CONNECTIONS. PROVIDE ADDITIONAL RACKS AND OTHER ACCESSORIES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
4. ON ALL TYPE 1, 1A, 1B ACCESS POINTS CARD READERS SHALL BE LOCATED AT THE UNSECURED SIDE OF THE DOOR.
5. CONTRACTOR SHALL COMPLY WITH THE AIRPORT SECURITY AND SAFETY REQUIREMENTS WHILE WORKING AT THE AIRPORT TERMINAL AND AIRFIELD AREAS.
6. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
7. THE SCOPE SHALL INCLUDE IMPLEMENTATION, SETUP AND TRAINING OF THE OWNERS STAFF AND CONNECTION TO ALL THE EQUIPMENT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL COMPONENTS REQUIRED TO CONNECT THE ACCESS CONTROL SYSTEM TO THE NETWORK. THE CONTRACTOR SHALL COORDINATE WITH SECURITY EQUIPMENT SUPPLIERS TO CONNECT AND TEST THE NETWORK DEVICES. THE CONTRACTOR SHALL COORDINATE WITH AIRPORT "IT" SUPPORT PERSONNEL AND CONSULTANTS.
8. CONTRACTOR SHALL LABEL ALL PATCH PANELS, CABLES AND TERMINATION LOCATIONS. LABELS SHALL BE TYPE WRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.

NOTES:

1. 2 CARD READER INTELLIGENT FIELD PANEL (IFP) AS SPECIFIED IN SPECIFICATION SECTION 13700.
2. 16 CARD READER INTELLIGENT FIELD PANEL (IFP) AS SPECIFIED IN SPECIFICATION SECTION 13700.
3. (3) CAT 5E (350mhz) CABLES TERMINATED ON COM OUTLET. COM OUTLET SHALL BE INSTALLED INSIDE IFP WHERE APPLICABLE.
4. ELECTRONIC INTERFACE BOX (EIB). TYPICALLY (1) EIB IS LOCATED AT EACH ACCESS POINT.
5. NOT USED
6. PROVIDE WORKSTATION WITH MONITOR AS MANUFACTURED BY DELL. SEE SPECIFICATIONS (SECTION 13700) FOR COMPLETE SPECS.
7. PROVIDE FAULT TOLERANT OR DUAL CONFIGURATION SERVER. SEE SPECIFICATIONS (SECTION 13700) FOR COMPLETE SPECS.
8. NOT USED
9. PROVIDE PRINTERS AS SPECIFIED IN SPECIFICATION SECTION 13700.
10. PROVIDE BADGING CAMERA, PRINTER AND WORKSTATION AS SPECIFIED IN SPECIFICATIONS SECTION 13700.
11. PROVIDE RACK MOUNTED 17" LCD DISPLAY WITH 8 PORT KVM SWITCH, KEYBOARD AND MOUSE, FOR CONTROL OF ACS SERVER, SAFIDS SERVER, AND SAFIDS DDC'S.
12. COMMUNICATIONS RACK AND EQUIPMENT. SEE SHEET ET6–02

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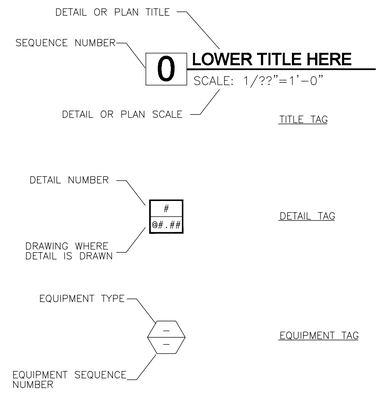
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SHEET NUMBER
ET603

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DRAWING SYMBOLS



PLUMBING SYMBOLS

SYMBOLS	DESCRIPTION
ST	STORM (SUSPENDED)
ST	STORM (UNDERGROUND)
SAN	SANITARY (SUSPENDED)
SAN	SANITARY (UNDERGROUND)
W	WASTE (SUSPENDED)
V	VENT PIPING (SUSPENDED)
V	VENT PIPING (UNDERGROUND)
	COLD WATER
	HOT WATER
	HOT WATER RETURN
CC	ROLL DOWN PIPING ON 45°
	DIRECTION OF FLOW
	PIPE LOOKING DOWN
	PIPE LOOKING UP
	P-TRAP WITH VENT PIPE CONNECTION
	TEE CONNECTION WITH BRANCH LOOKING UP
	TEE CONNECTION WITH BRANCH LOOKING DOWN
	SHUT-OFF VALVE
	CHECK VALVE
	BALANCING VALVE
FCO	FLOOR CLEANOUT
	FLOOR DRAIN & TYPE NO. (FD-X)
WC-X	WATER CLOSET & TYPE NO. (WC-X)
UR-X	URINAL & TYPE NO. (UR-X)
JMB-X	JANITOR'S MOP BASIN & TYPE NO. (JMB-X)
L-X	LAVATORY & TYPE NO. (L-X)
HB-X	HOSE BIBB & TYPE NO. (HB-X)
HWH	HOT WATER HEATER
EWC	ELECTRIC WATER COOLER

PLUMBING ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
AD	AREA DRAIN
AFF	ABOVE FINISHED FLOOR
ARF	ABOVE RAISED FLOOR
ASC	ABOVE SUSPENDED CEILING
CI	CAST IRON
CO	CLEANOUT
CONN	CONNECT
CV	CHECK VALVE
CW	COLD WATER
DET	DETAIL
DN	DOWN
DS	DOWNSPOUT
DWG	DRAWING
E	EXISTING
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
GD	GARAGE DRAIN
GN	GENERAL NOTE
GV	GATE VALVE
HB	HOSE BIBB
HW	HOT WATER
HWH	HOT WATER HEATER
HWR	HOT WATER RETURN
IE	INVERT ELEVATION
L	LAVATORY
MR	MOP RECEPTOR
N	NEW
OFD	OVERFLOW DRAIN
PD	PIT DRAIN
PG	PRESSURE GAUGE
RD	ROOF DRAIN
ROB	ROD OUT BASIN
RPZBFP	REDUCE PRESSURE ZONE BACK FLOW PREVENTOR
SAN	SANITARY
SEV	SEWAGE EJECTOR VENT
SN	SHEET NOTE
SSD	SUB-SOIL DRAINAGE
ST	STORM
STK	STACK
T & P	TEMP. & PRESSURE RELIEF VALVE
TD	TRENCH DRAIN
TP	TRAP PRIMER
TYP	TYPICAL
UG	UNDERGROUND
UR	URINAL
V	VENT
VB	VACUUM BREAKER
VIF	VERIFY IN FIELD
VTR	VENT THRU ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
W.I.V.	WALL INDUCATING VALVES

DULUTH INTERNATIONAL AIRPORT

5528 PLUMBING DRAWING LIST

Sheet No.	Filename (proj.#5528)	DRAWING TITLE	DATE: 11/26/09 ISSUED FOR 60% REVIEW
P0-01	5528P001	PLUMBING SYMBOLS, ABBREVIATIONS AND DRAWING INDEX	● ●
P1-100	5528P100	ENLARGED UNDERGROUND PLUMBING PLAN AREA A	● ●
P1-101	5528P101	ENLARGED UNDERGROUND PLUMBING PLAN AREA B	● ●
P1-102	5528P102	ENLARGED UNDERGROUND PLUMBING PLAN AREA A	● ●
P1-103	5528P103	ENLARGED UNDERGROUND PLUMBING PLAN AREA B	● ●
P1-10	5528P110	ENLARGED FIRST FLOOR PLUMBING PLAN AREA A	● ●
P1-11	5528P111	ENLARGED FIRST FLOOR PLUMBING PLAN AREA B	● ●
P1-12	5528P112	ENLARGED SECOND FLOOR PLUMBING PLAN AREA A	● ●
P1-13	5528P113	ENLARGED SECOND FLOOR PLUMBING PLAN AREA B	● ●
P1-14	5528P114	ENLARGED THIRD FLOOR PLUMBING PLAN AREA A	● ●
P1-15	5528P115	ENLARGED THIRD FLOOR PLUMBING PLAN AREA B	● ●
P1-16	5528P116	ENLARGED ROOF LEVEL PLUMBING PLAN AREA A	● ●
P1-17	5528P117	ENLARGED ROOF LEVEL PLUMBING PLAN AREA B	● ●
P1-18	5528P118	ENLARGED FIRST FLOOR PLUMBING PLAN AREA A CANOPY	● ●
P1-19	5528P119	ENLARGED FIRST FLOOR PLUMBING PLAN AREA B CANOPY	● ●
P1-20	5528P120	ENLARGED SECOND FLOOR PLUMBING PLAN AREA A CANOPY ROOF	● ●
P1-21	5528P121	ENLARGED SECOND FLOOR PLUMBING PLAN AREA B CANOPY ROOF	● ●
P3-01	5528P301	WATER RISER DIAGRAM	● ●
P3-02	5528P302	WASTE AND VENT RISER DIAGRAM	
P4-01	5528P401	PLUMBING DETAILS	● ●
P4-02	5528P402	PLUMBING DETAILS	● ●
P5-01	5528P501	PLUMBING SCHEDULES	● ●

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DESIGNED BY: SA

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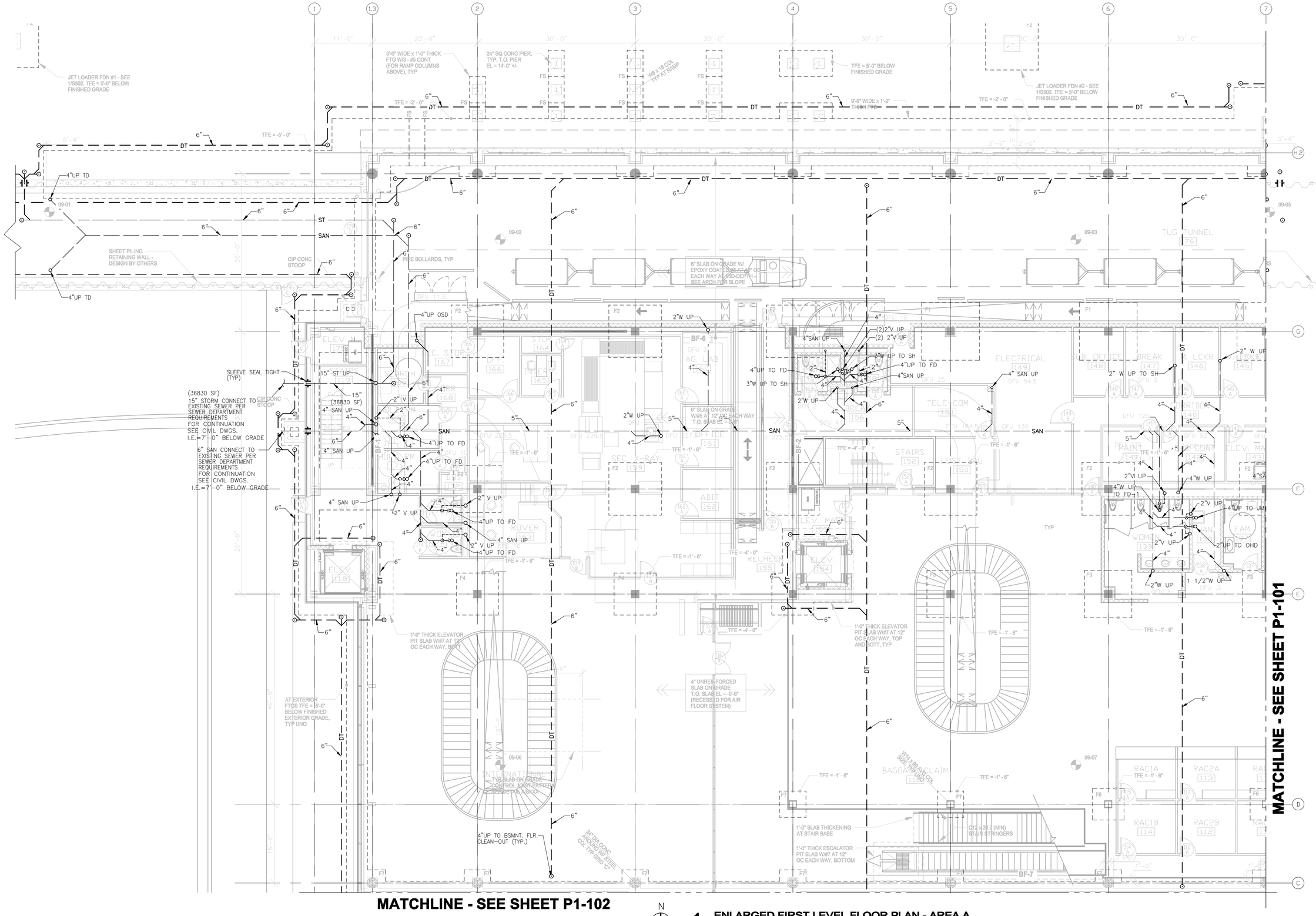
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PLUMBING SYMBOL LIST, ABBREVIATIONS AND DRAWING LIST

SHEET NUMBER
P0-01

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1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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

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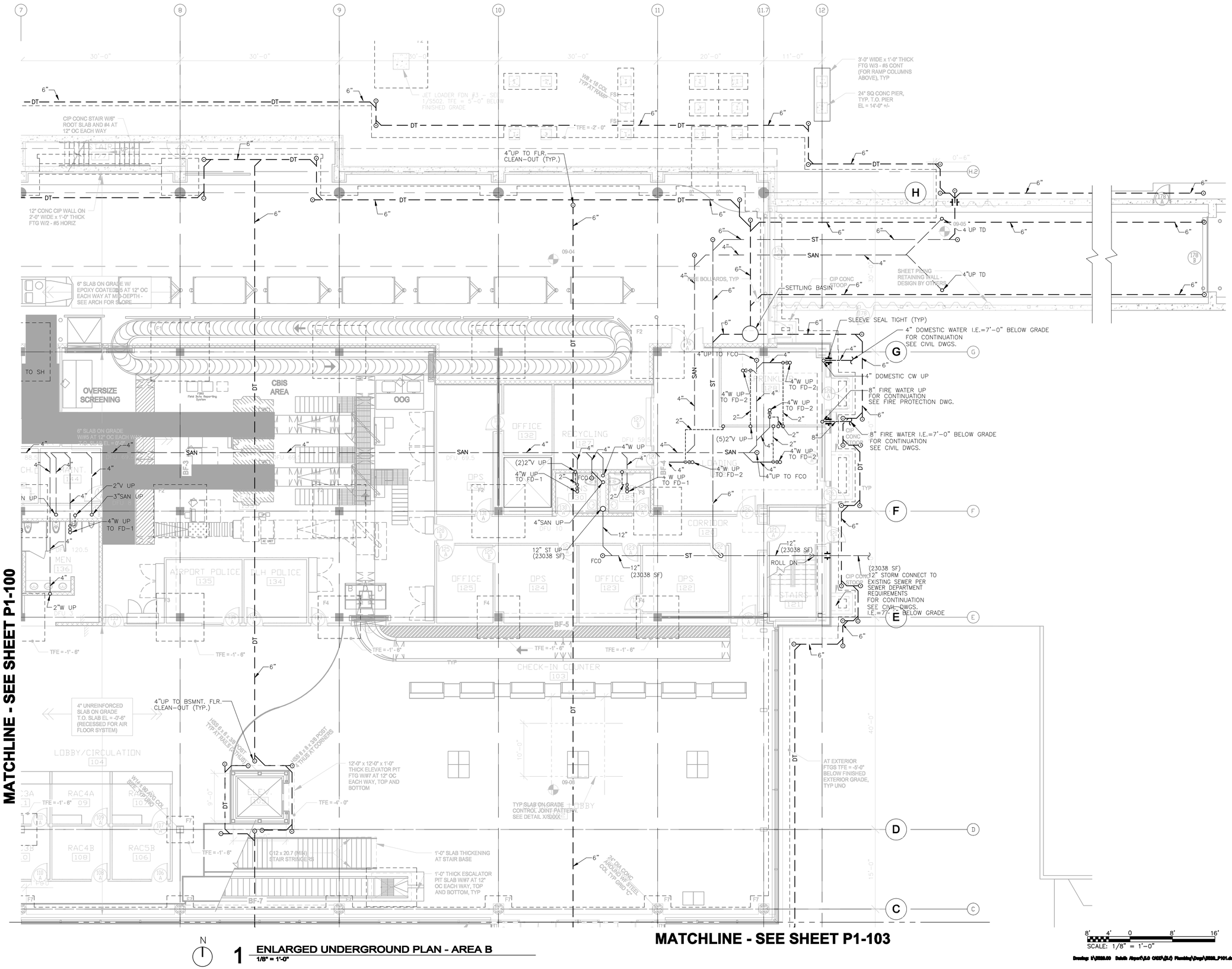
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SHEET TITLE
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SHEET NUMBER
P1-100

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1 ENLARGED UNDERGROUND PLAN - AREA B
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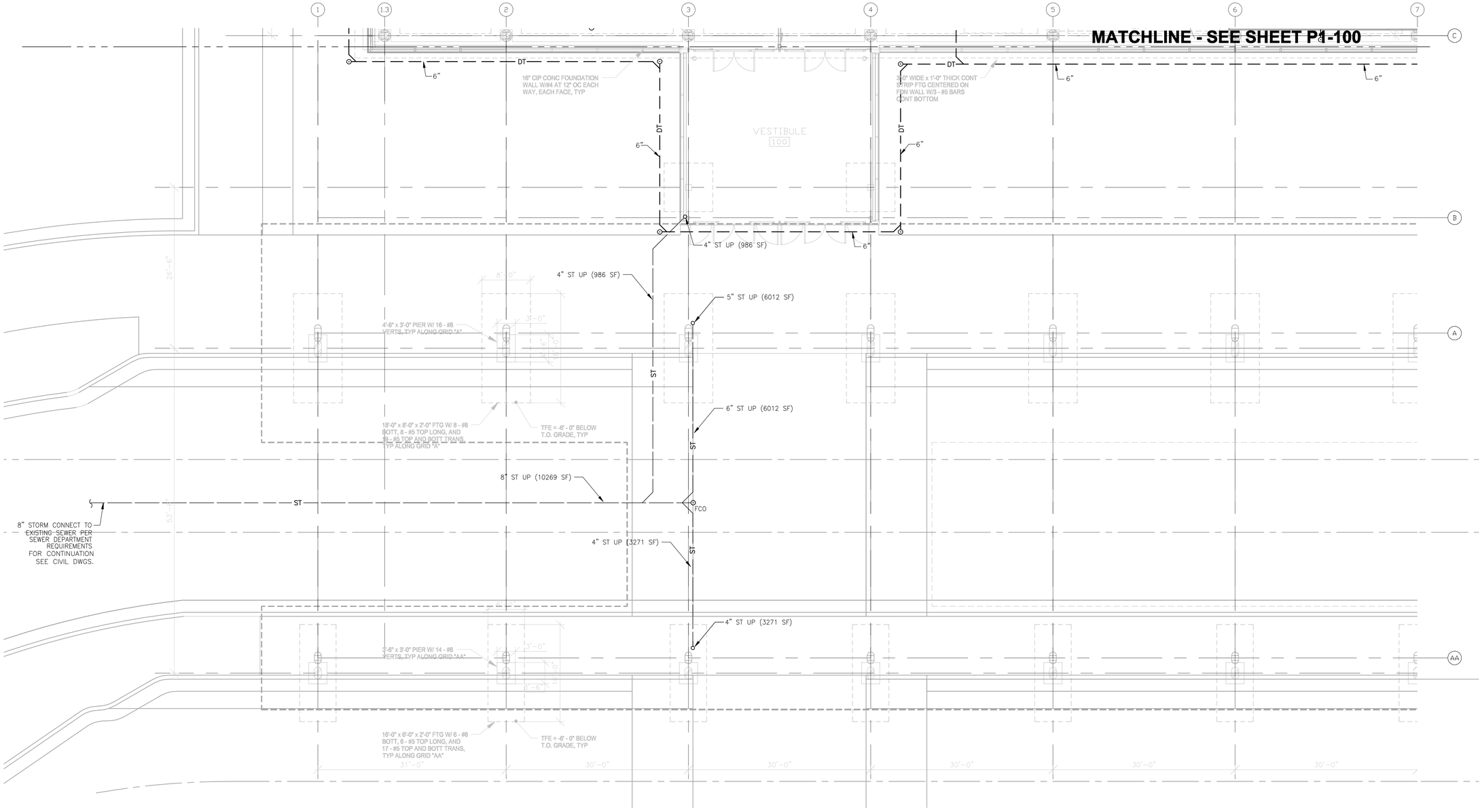
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SHEET NUMBER
P1-101

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N

1 ENLARGED UNDERGROUND PLAN - AREA A

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8' 4' 0 8' 16'

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

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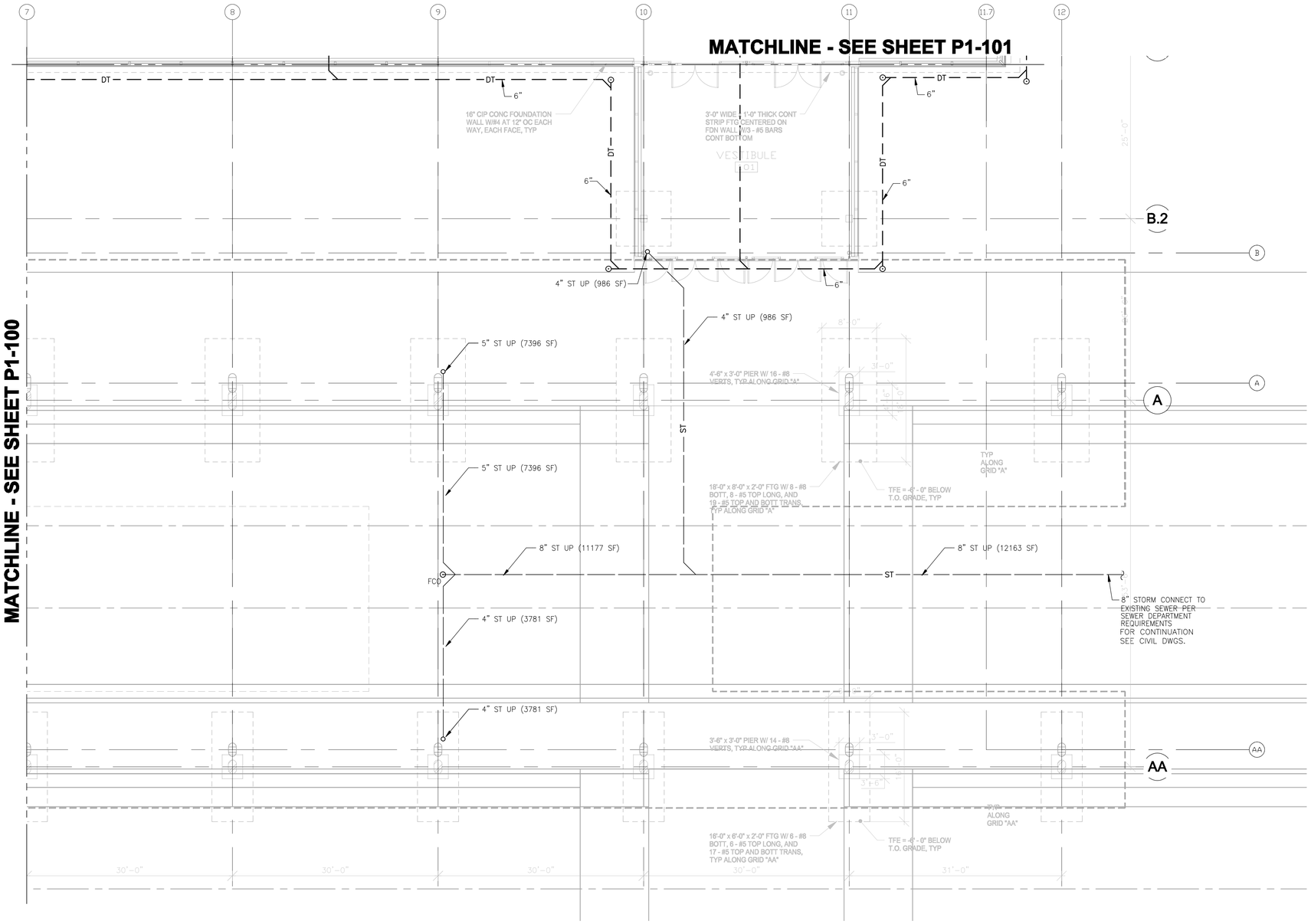
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SHEET NUMBER
P1-102

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1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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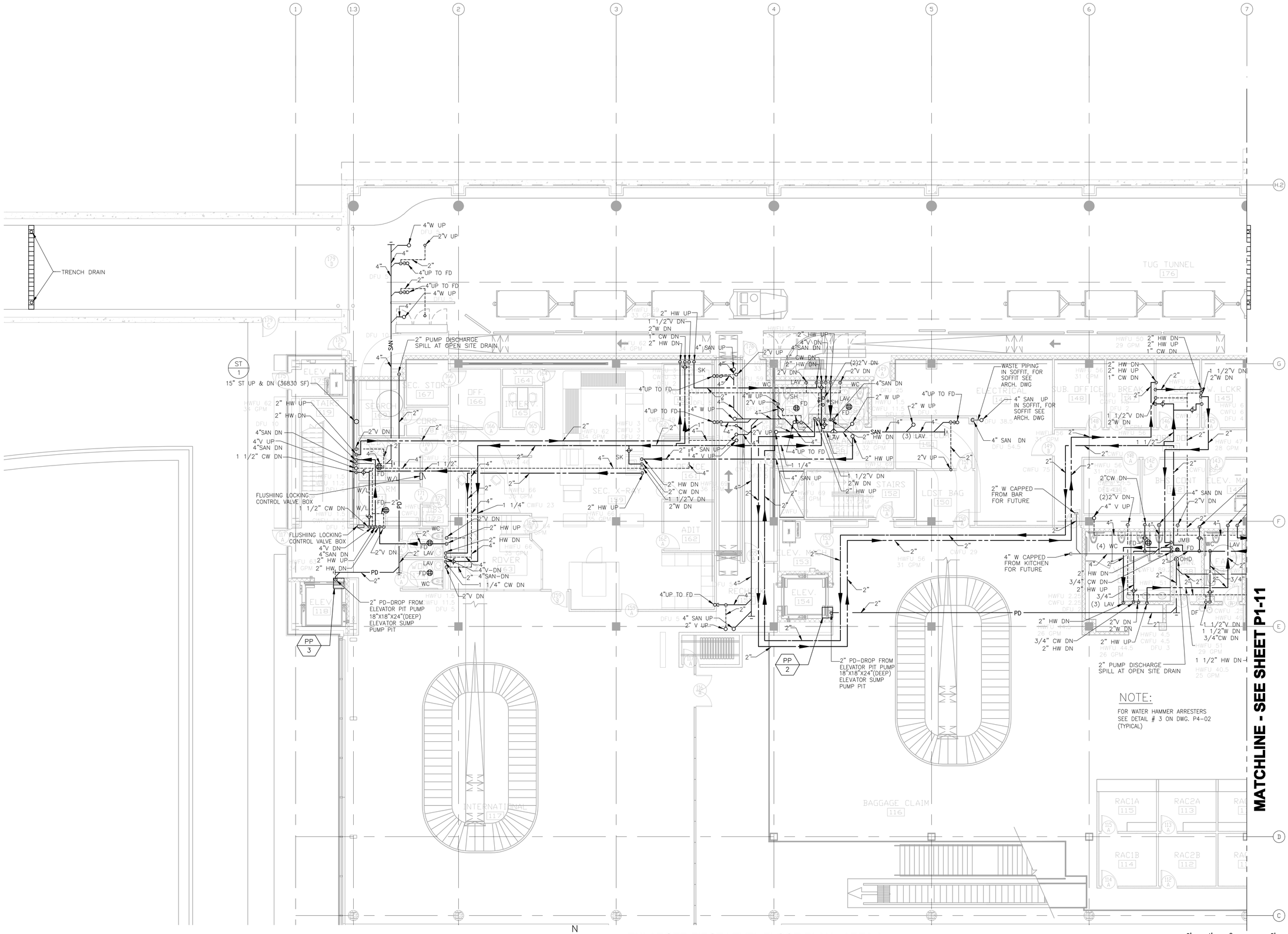
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SHEET TITLE
ENLARGED UNDERGROUND PLUMBING PLAN AREA B

SHEET NUMBER
P1-103

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1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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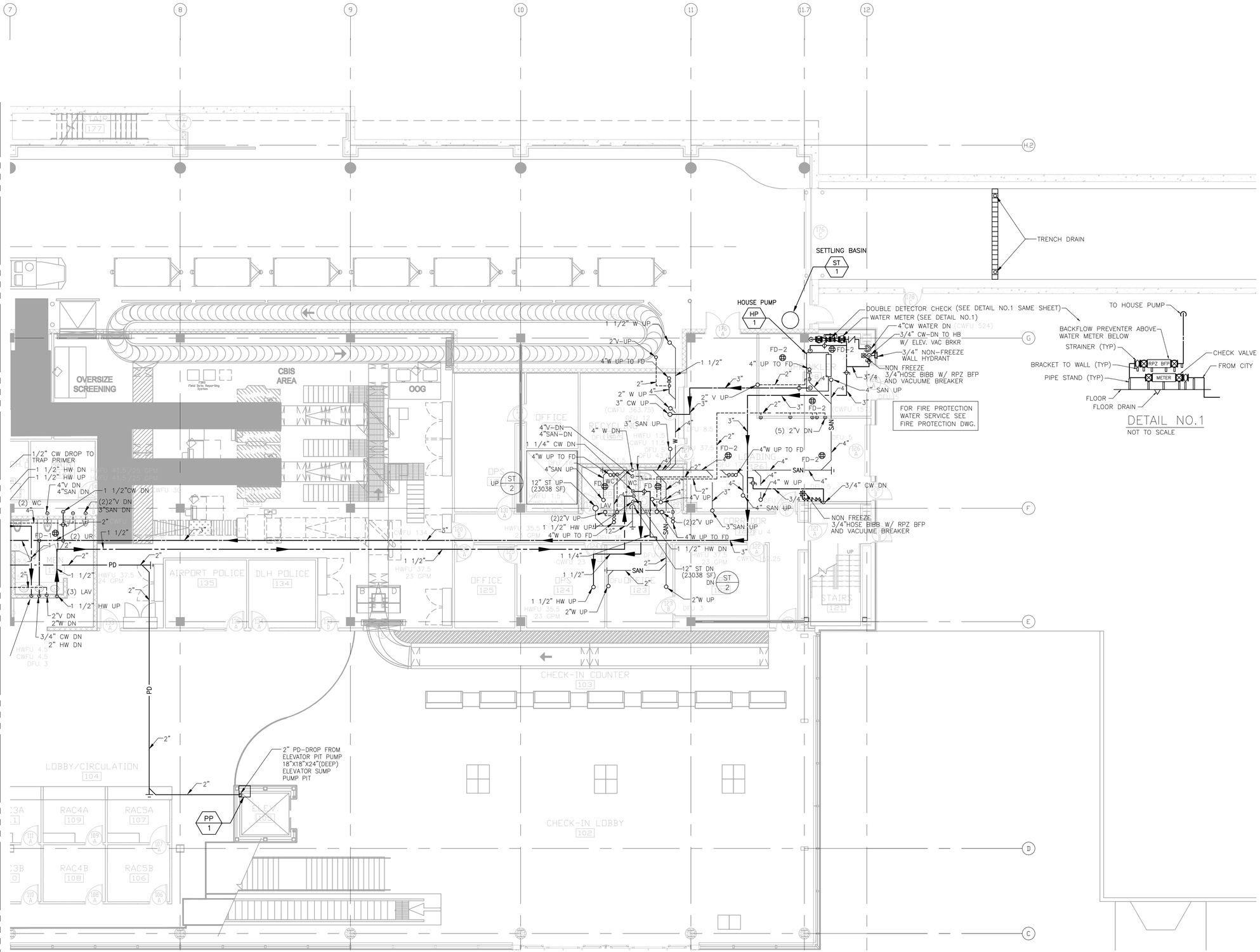
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SHEET TITLE
ENLARGED FIRST FLOOR PLUMBING PLAN AREA A

SHEET NUMBER
P1-10

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MATCHLINE - SEE SHEET P1-10



N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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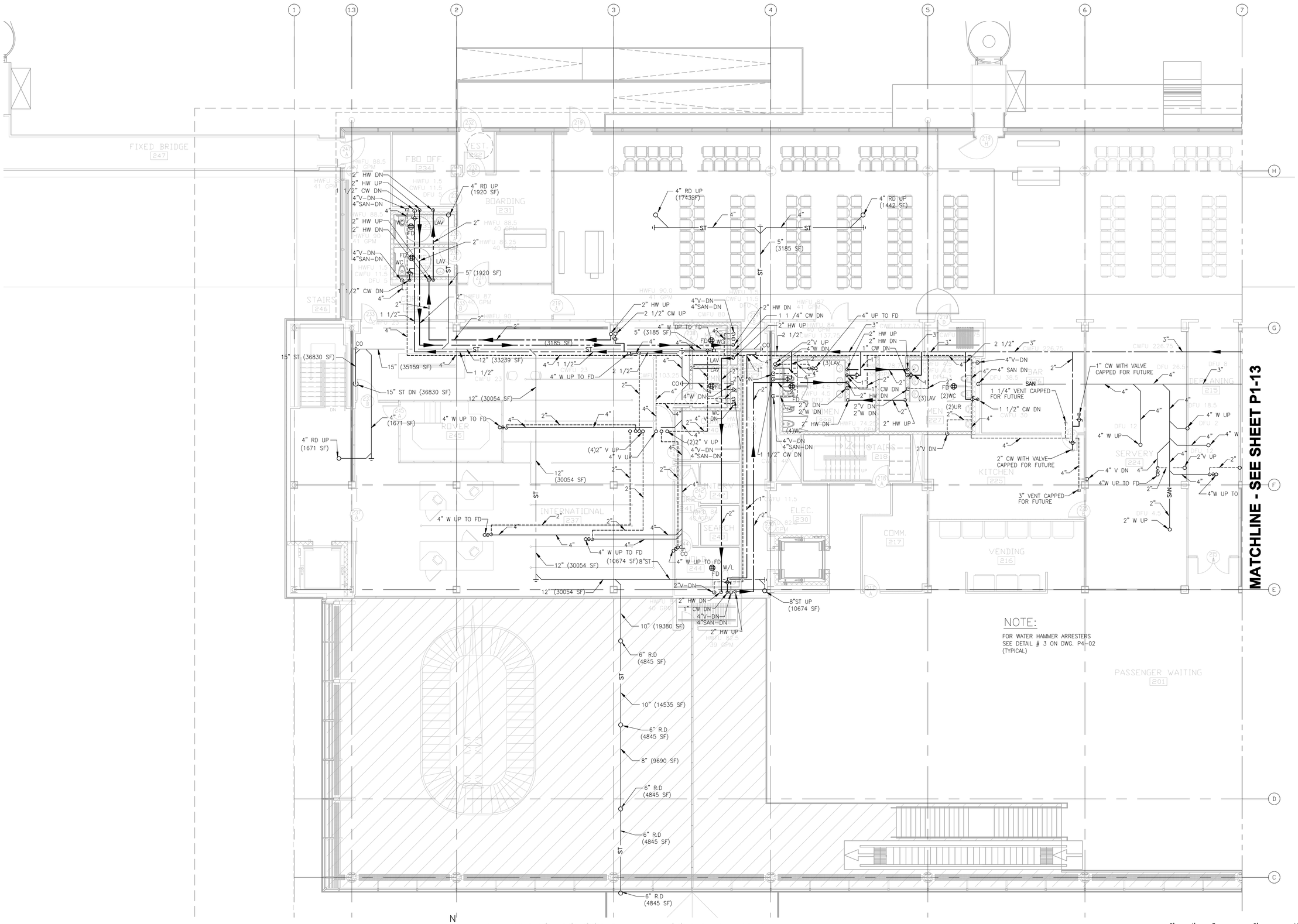
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ENLARGED FIRST FLOOR PLUMBING PLAN AREA B

SHEET NUMBER
P1-11

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1 **ENLARGED SECOND LEVEL FLOOR PLAN - AREA A**
1/8" = 1'-0"

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

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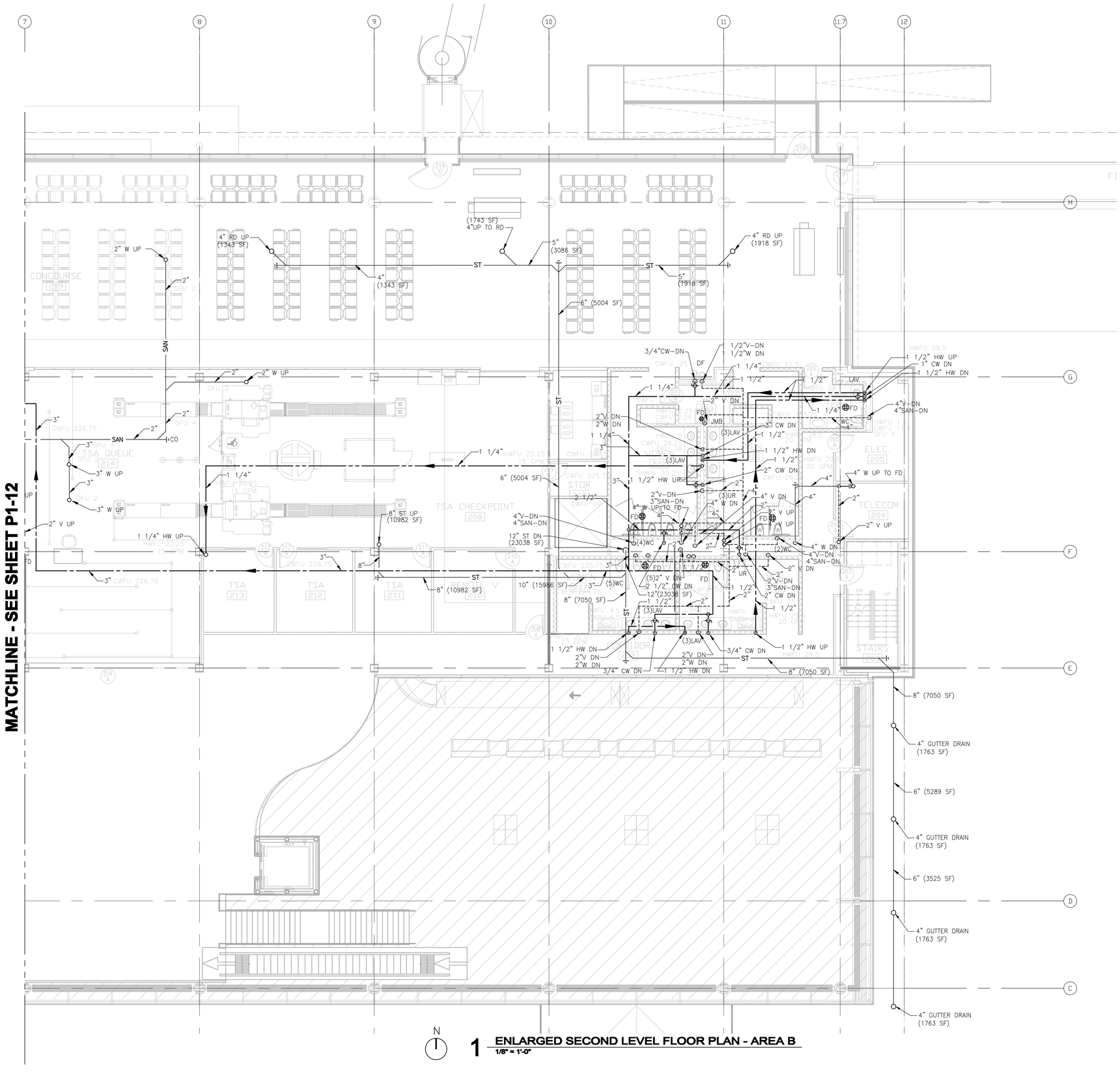
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ENLARGED SECOND FLOOR PLUMBING PLAN AREA A

SHEET NUMBER
P1-12

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1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2008.50 Duluth Airport\LD CAD\LD Plumbing\Dwgs\2008_P113.dwg Plotted on: 2/12/2010 8:42 AM Plotted by: Velma, Nancy

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

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TEL: (218) 722-1058 / FAX: (218) 722-9306

M/E/P/FP Engineers:
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1 East Wacker Drive, Suite 103, Chicago IL 60601
TEL: (312) 670-1800 / FAX: (312) 670-1801

Baggage Handling Systems Consultants:
BNP ASSOCIATES INC.
101 East Ridge Office Park, Suite 103, Danbury CT 06810
TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
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TEL: (218) 591-5079

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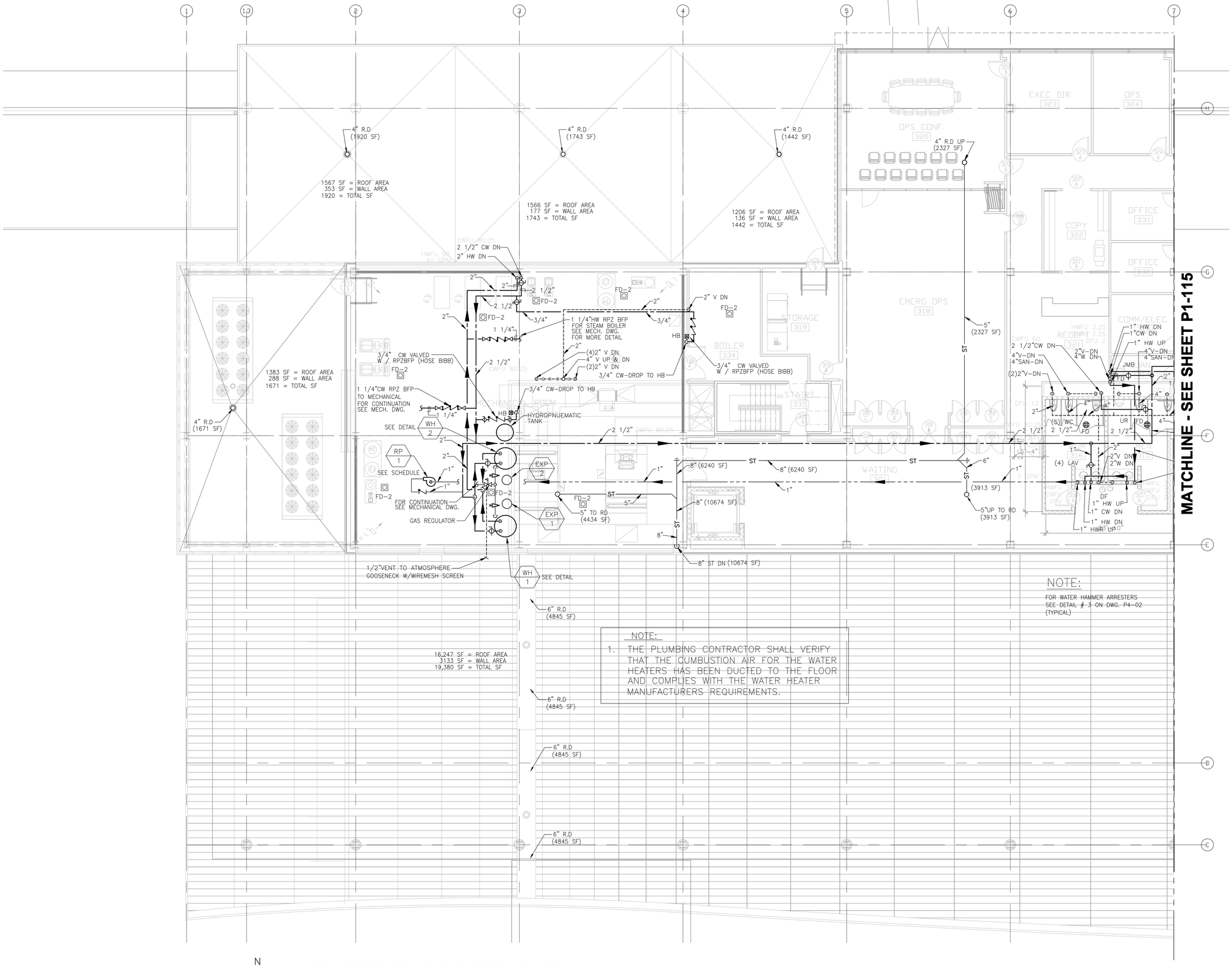
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213-1882-091

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SHEET TITLE
ENLARGED SECOND FLOOR PLUMBING PLAN AREA B

SHEET NUMBER
P1-13

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NOTE:

1. THE PLUMBING CONTRACTOR SHALL VERIFY THAT THE CUMBUSTION AIR FOR THE WATER HEATERS HAS BEEN DUCTED TO THE FLOOR AND COMPLIES WITH THE WATER HEATER MANUFACTURERS REQUIREMENTS.

NOTE:

FOR WATER HAMMER ARRESTERS SEE DETAIL # 3 ON DWG. P4-02 (TYPICAL)

N

1 ENLARGED THIRD LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing I:\2010\10 Duluth Airport\LO CAD\LO Plumbing\Dwgs\2010_P114.dwg Plotted on: 2/12/2010 8:42 AM Plotted by: Valens, Henry

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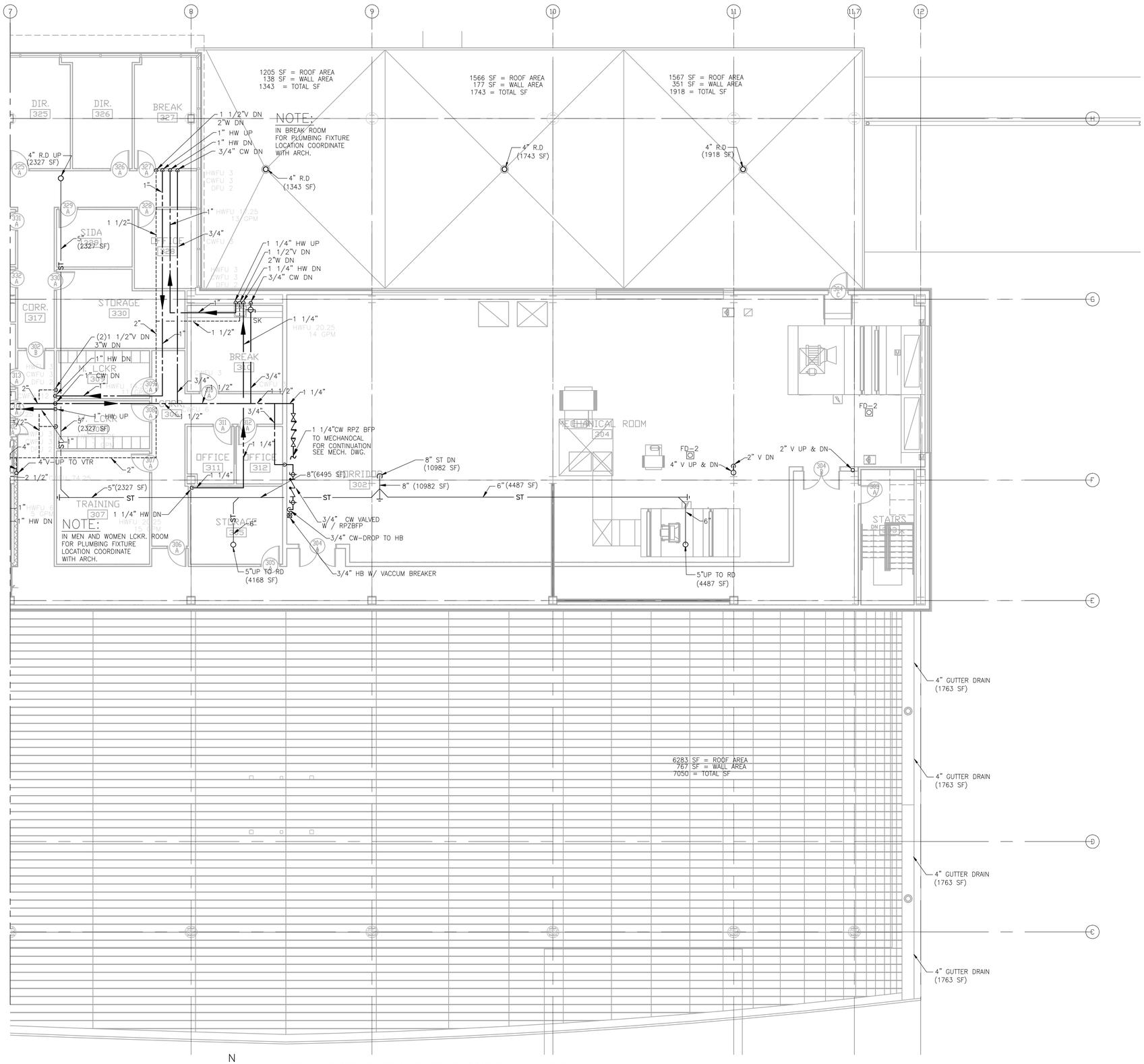
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ENLARGED THIRD FLOOR PLUMBING PLAN AREA A

SHEET NUMBER

P1-14

60% NOT FOR CONSTRUCTION



MATCHLINE - SEE SHEET P1-14

N

1 ENLARGED THIRD LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

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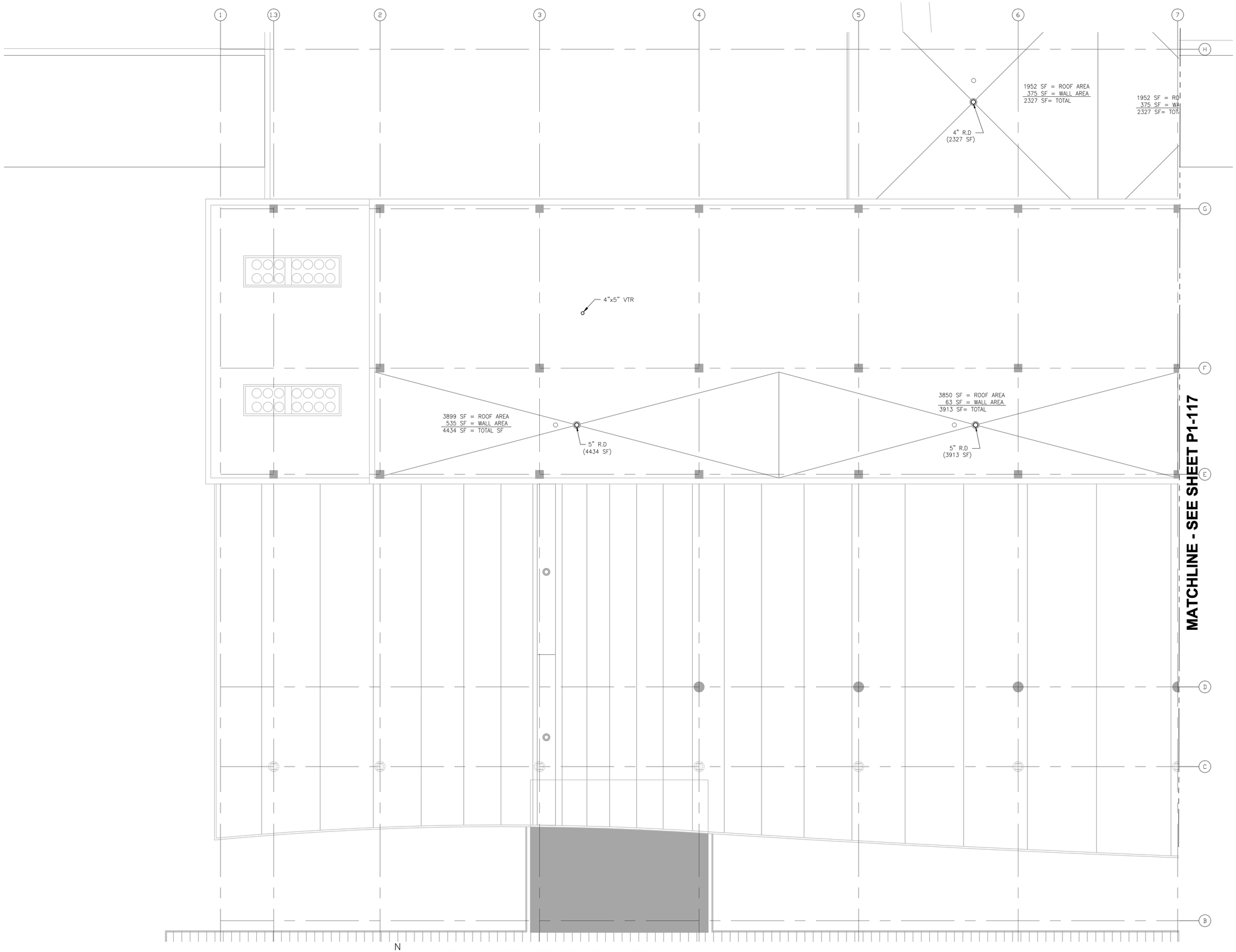
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SHEET TITLE
ENLARGED THIRD FLOOR PLUMBING PLAN AREA B

SHEET NUMBER
P1-15

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N

1 ENLARGED ROOF LEVEL PLAN - AREA A
1/8" = 1'-0"

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

Drawing: I:\2008.00 Duluth Airport\5.0 CAD\(5.1) Plumbing\Dwgs\2008_P116.dwg Plotted on: 2/12/2010 8:48 AM Plotted by: Velma, Henry

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MATCHLINE - SEE SHEET P1-117

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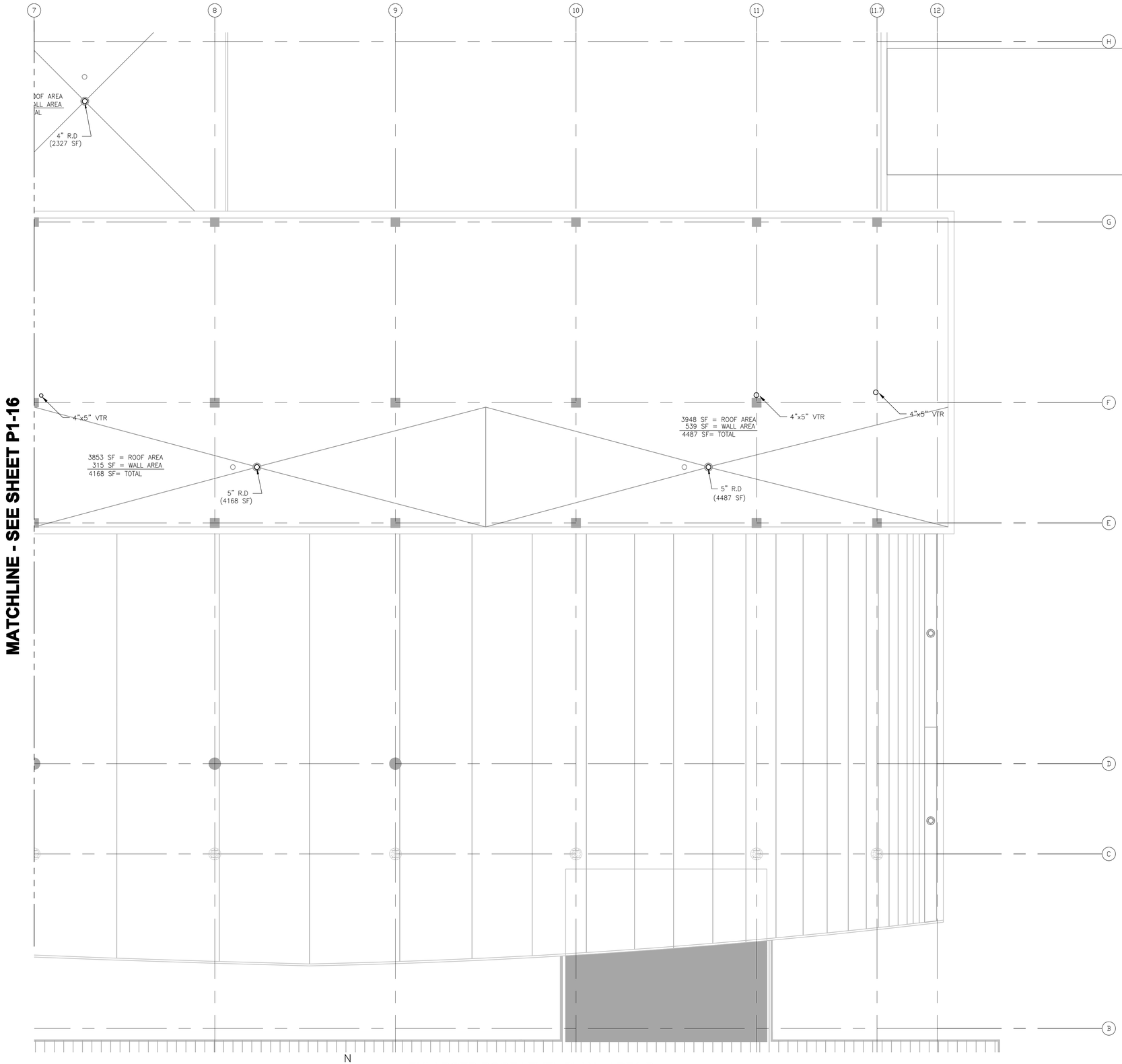
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED
ROOF LEVEL
PLUMBING
PLAN AREA A

SHEET NUMBER
P1-16

60% NOT FOR CONSTRUCTION



N

1 ENLARGED ROOF LEVEL PLAN - AREA B
1/8" = 1'-0"

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

Drawing: H:\2008.00 Duluth Airport\A.0 CADD\(A.0) Plumbing\Dwgs\2008_P117.dwg Plotted on: 2/12/2010 8:48 AM Plotted by: Velma, Henry

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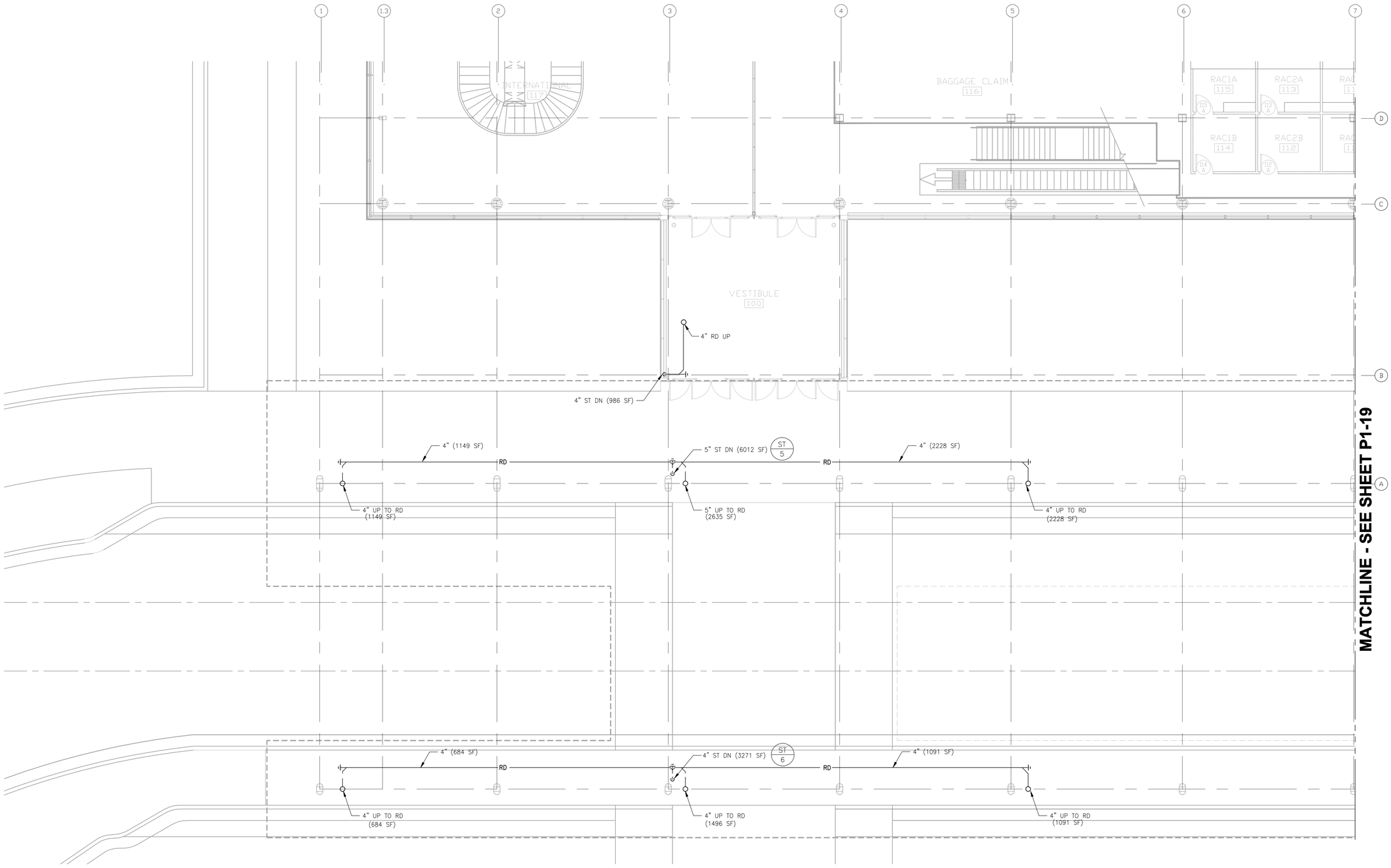
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED
ROOF LEVEL
PLUMBING
PLAN AREA B

SHEET NUMBER
P1-17

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CONSTRUCTION



MATCHLINE - SEE SHEET P1-19

N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

Drawing: I:\2008.00 Duluth Apron\5.0 CAD\5.0 Plumbing\Dwgs\2008_P118.dwg Plotted on: 3/12/2010 9:48 AM Plotted by: Vahne, Henry

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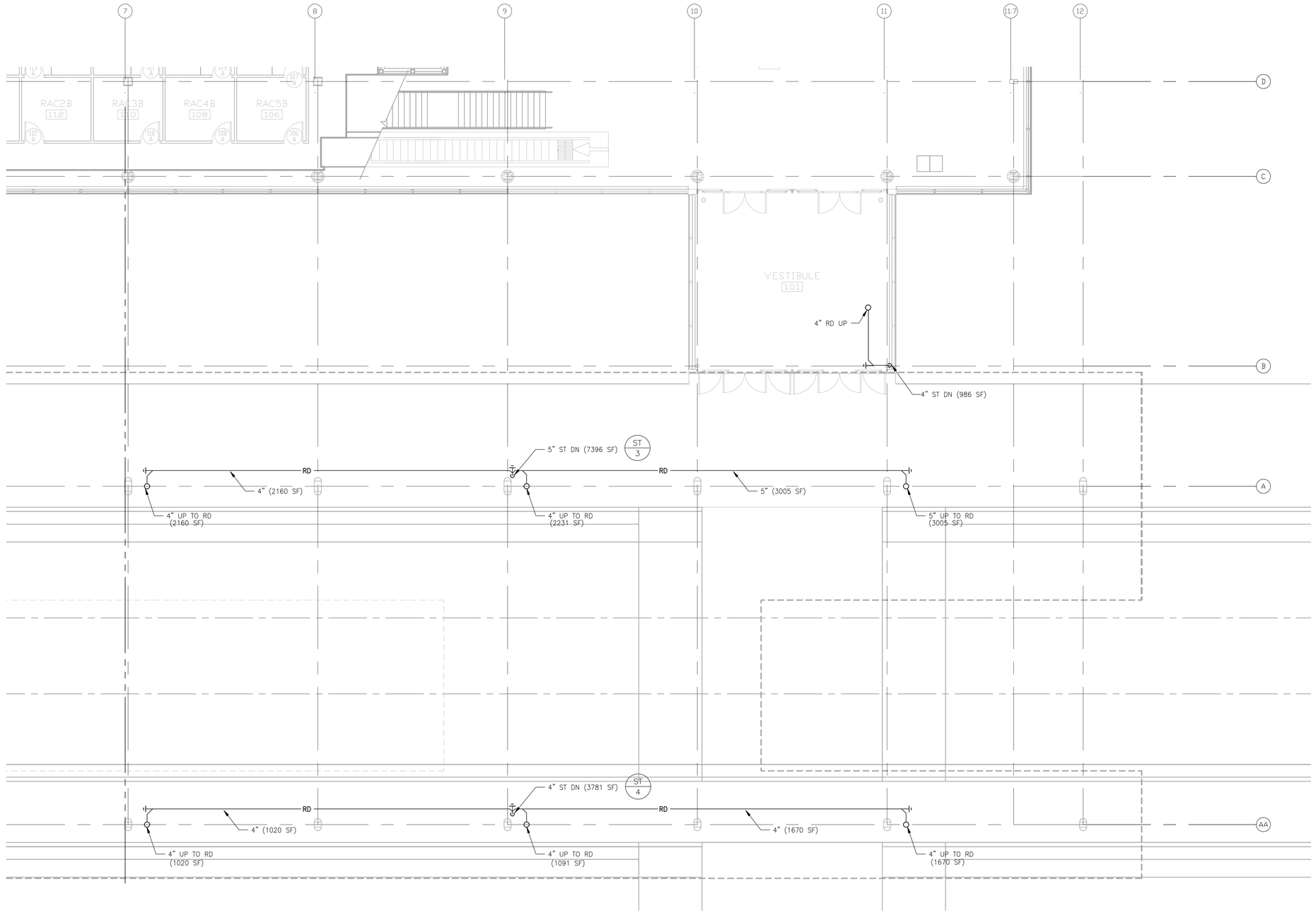
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SHEET TITLE
ENLARGED FIRST FLOOR PLUMBING PLAN PLAN AREA A CANOPY

SHEET NUMBER
P1-18

60% NOT FOR CONSTRUCTION



MATCHLINE - SEE SHEET P1-18

N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2010.00 Duluth Airport\LO CAD\LO Plumbing\Dwgs\2010_P119.dwg Plotted on: 2/12/2010 8:57 AM Plotted by: Valone, Nancy

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

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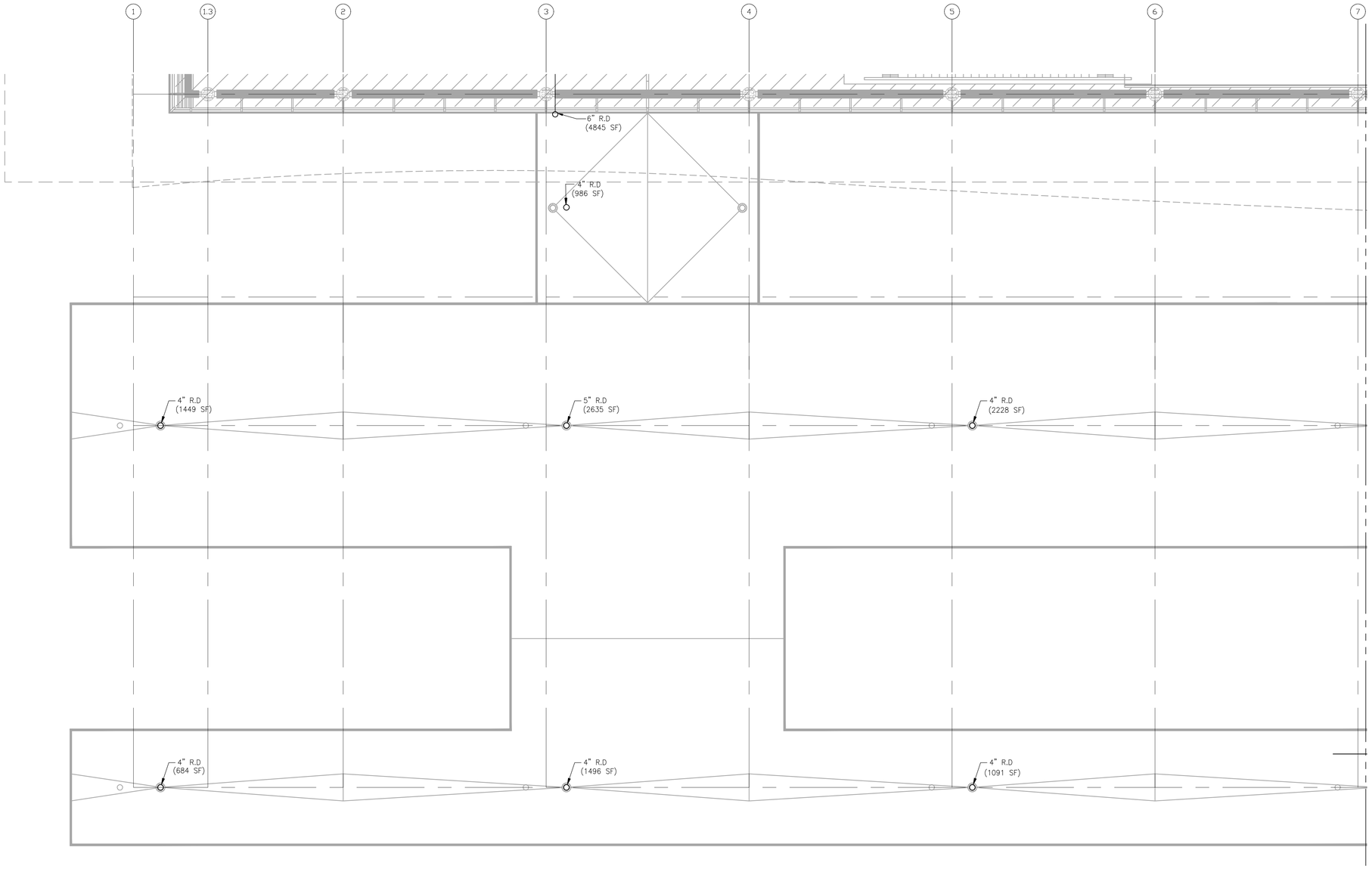
SHEET TITLE

ENLARGED FIRST FLOOR PLUMBING PLAN PLAN AREA B CANOPY

SHEET NUMBER

P1-19

60% NOT FOR CONSTRUCTION



MATCHLINE - SEE SHEET P1-21

N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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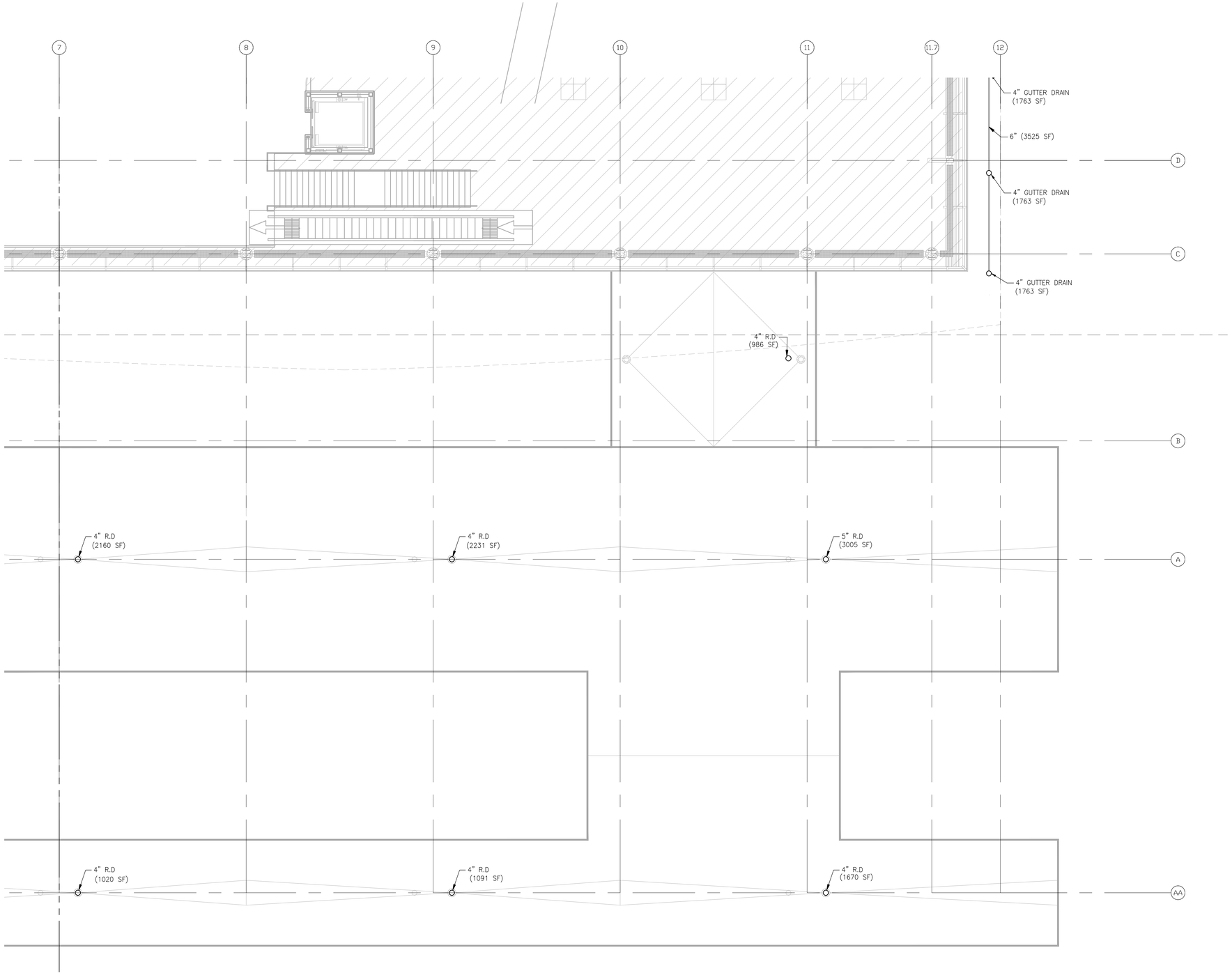
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ENLARGED SECOND FLOOR PLUMBING PLAN AREA A CANOPY ROOF

SHEET NUMBER
P1-20

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MATCHLINE - SEE SHEET P1-20

N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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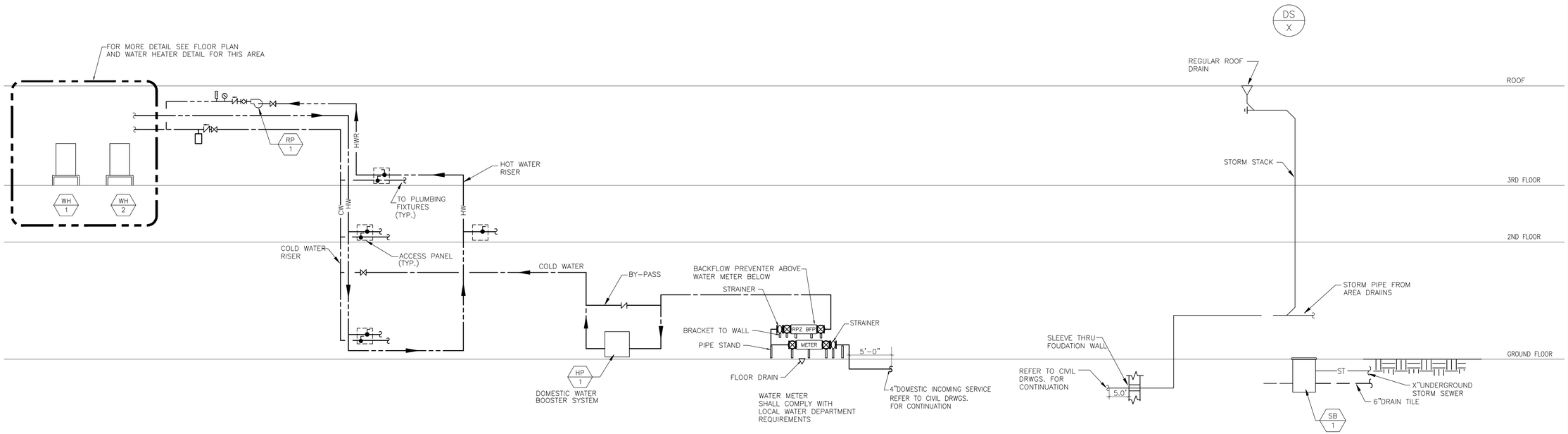
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ENLARGED SECOND FLOOR PLUMBING PLAN AREA B CANOPY ROOF

SHEET NUMBER
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WATER SCHEMATIC DIAGRAM

STORM RISER DIAGRAM

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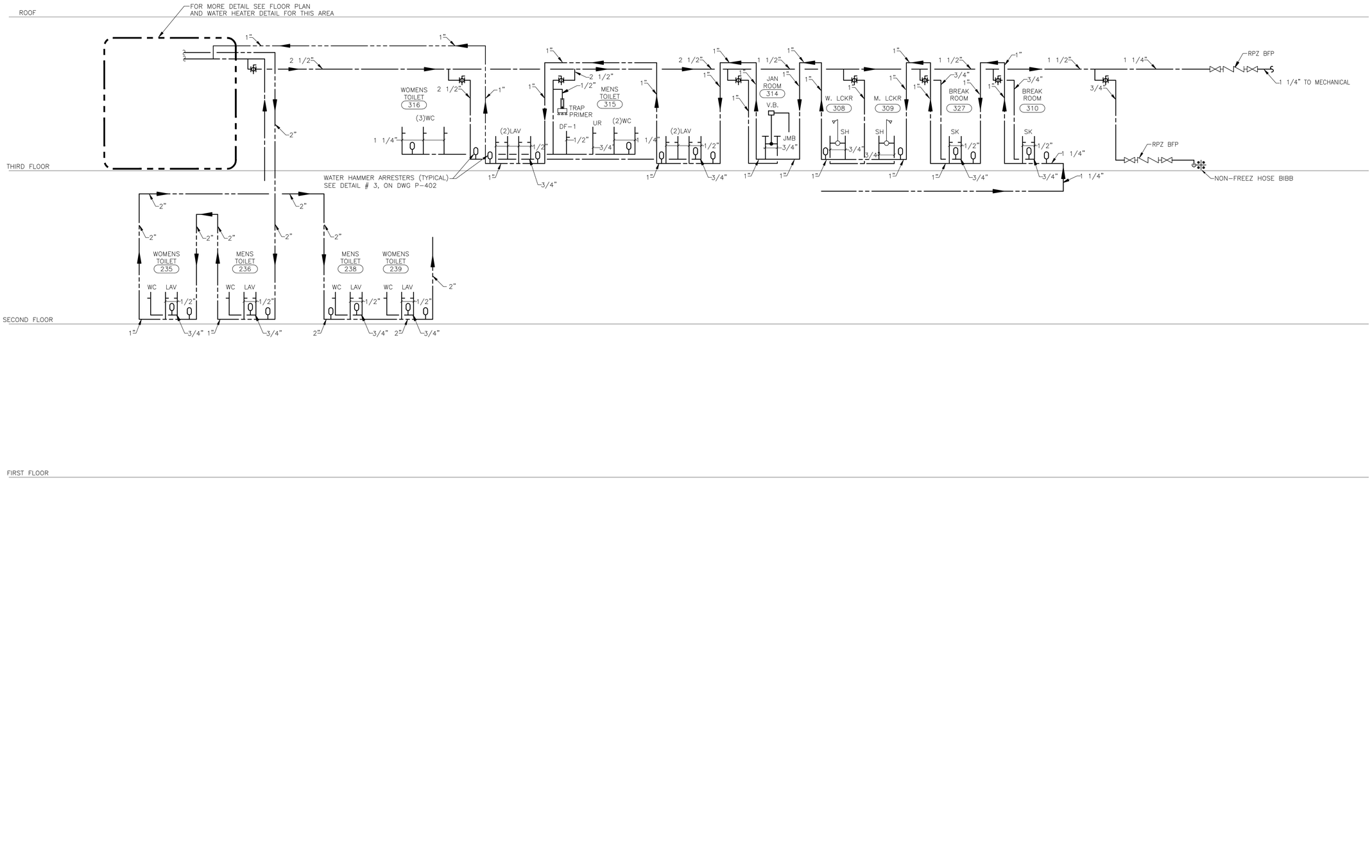
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WATER RISER DIAGRAM

SHEET NUMBER
P3-01

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XXX.DWG 02-08-10 12:00p

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SHEET TITLE

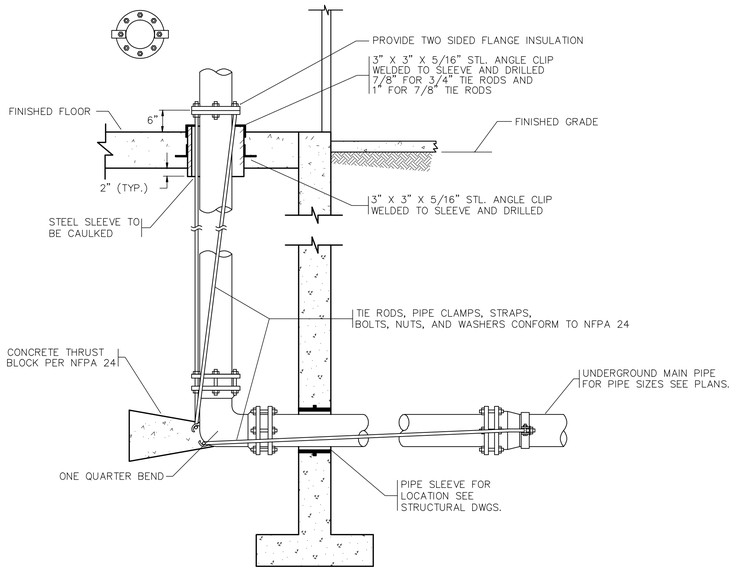
WATER RISER AND WASTE AND VENT DIAGRAM

SHEET NUMBER

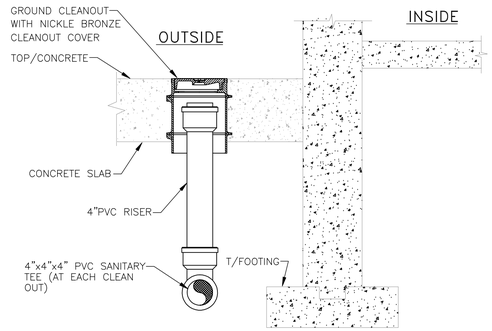
P3-02

60% NOT FOR CONSTRUCTION

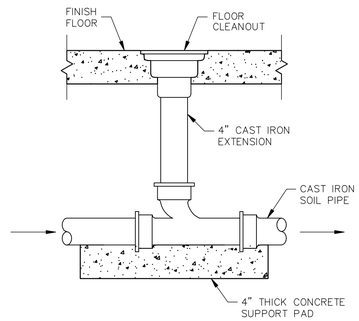
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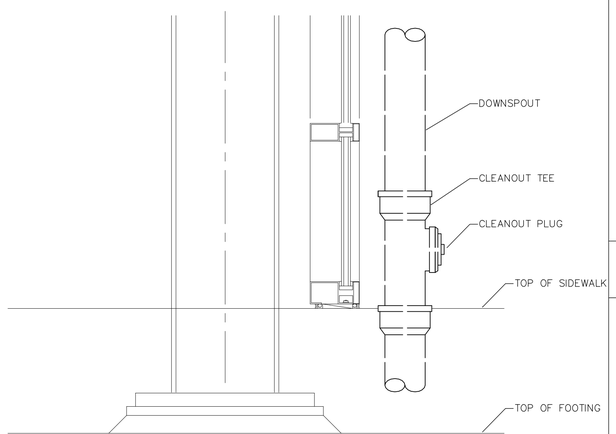
8 WATER MAIN ENTRANCE DETAIL
SCALE: NONE



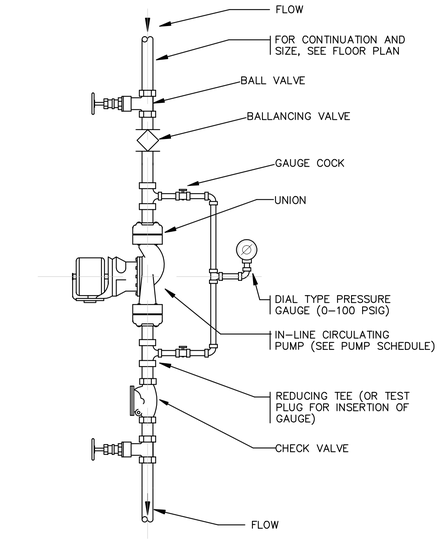
5 EXTERIOR SUB-SOIL DRAIN GROUND CLEANOUT DETAIL (GCO)
NOT TO SCALE



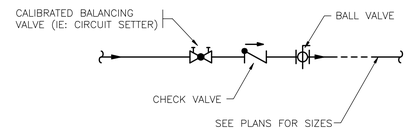
6 CLEANOUT DETAIL
SCALE: NONE



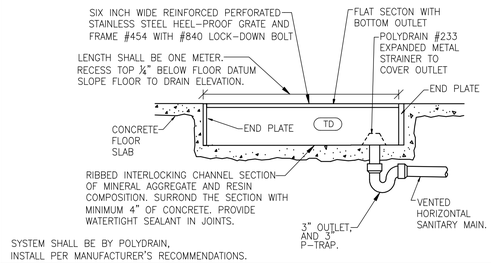
7 DOWNSPOUT DETAIL
SCALE: NONE



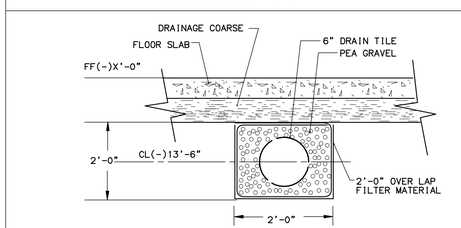
1 CIRCULATING PUMP DETAIL
SCALE: NONE



2 BALANCING VALVE DETAIL
SCALE: NONE



3 TRENCH DETAIL
SCALE: NONE



4 DRAIN TILE DETAIL
SCALE: NONE

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02–11–10
REVIEWED BY: XX
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213–1882–091
XXX.DWG 00-00-00 12:00p

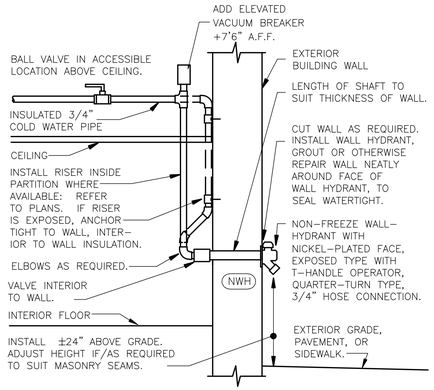
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SHEET TITLE
PLUMBING DETAILS

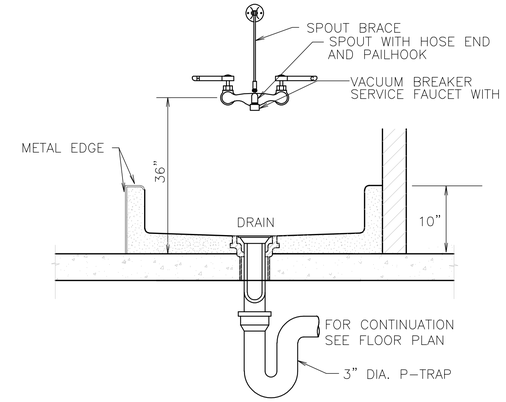
SHEET NUMBER
P4–01

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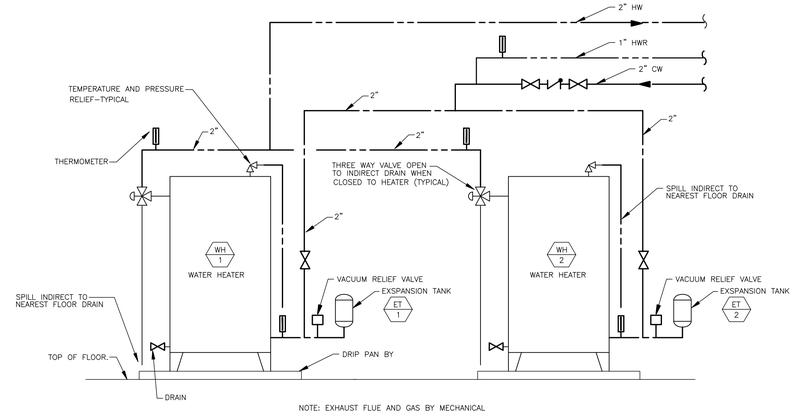
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7 NON-FREEZE WALL HYDRANT
SCALE: NONE

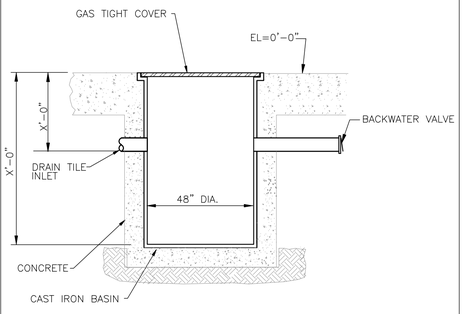


4 MOP SINK DETAIL
NO SCALE

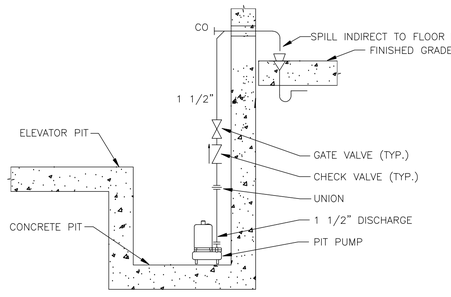


NOTE: EXHAUST FLUE AND GAS BY MECHANICAL

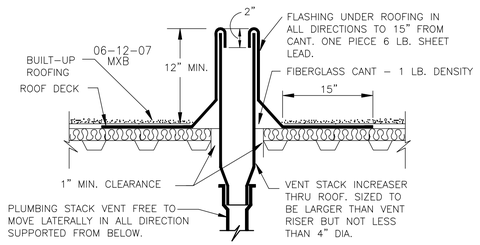
1 GAS FIRED HOT WATER HEATER DETAIL
WH 1 WH 2
SCALE: NONE



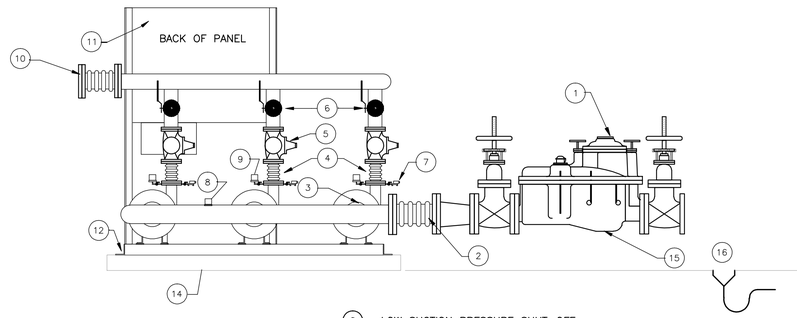
8 SETTLING BASIN DETAIL
SB 1
SCALE: NONE



5 ELEVATOR PIT PUMP PIPING DETAIL
SCALE: NONE



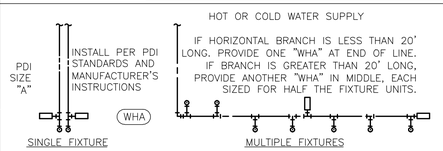
6 VENT THRU ROOF
SCALE: NONE



LEGEND

1. WATER METER PER WATER DEPT. STANDARDS
2. 8" FLEX CON. & SUCTION HEADER (764 GPM @ 4.75 FPS)
3. SUCTION CHECK VA. & BALL VA. SHUT-OFF
4. DISCHARGE FLEX CONNECTOR
5. SOLEINOID ENABLED PRESSURE REDUCING CHECK VALVE
6. BUTTERFLY VALVE SHUT-OFF
7. PURGE VALVE
8. LOW SUCTION PRESSURE SHUT-OFF
9. TEMPERATURE SWITCH
10. 8" DISCHARGE HEADER & FLEX CONNECTOR
11. U.L. LABLED POWER & CONTROL PANEL w/ GAUGE SKIRT
12. ANGLE IRON BASE
13. ANTI-VIBRATION PADS
14. 4" CONCRETE HOUSEKEEPING PAD
15. SUPPORT WATER METER & BACKFLOW DEVICE PER WATER DEPT. STANDARDS
16. FLOOR DRAIN

2 INCOMING WATER SERVICE AND TRIPLEX DOMESTIC WATER BOOSTER PUMP ARRANGEMENT
NOT TO SCALE



PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

FIXTURE UNIT TABULATION		
FIXTURE	COLD	HOT
VALVE WATER CLOSET	10	--
TANK WATER CLOSET	5	--
URINAL	5	--
LAVATORY/SINK	1.5	1.5
JANITOR'S SINK	3	3
SHOWER/BATHTUB	2	2

DO NOT PROVIDE AIR CHAMBERS. PROVIDE WATER HAMMER ARRESTERS BY SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUIVALENT WITH PISTON AND O-RING CONSTRUCTION, HAVING PDI #WH-201, ASSE # 1010 AND ANSI # A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL IN LINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE THE UNITS AS SHOWN ON THE DRAWINGS AND/OR PER THE TABLES SHOWN ABOVE.

3 WATER HAMMER ARRESTERS
SCALE: NONE

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SHEET TITLE
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SHEET NUMBER
P4-02

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Drawing: I:\2008.60 Duluth Airport\LO CAD\[LO] Plumbing\Dwgs\2008_P402.dwg Plotted on: 2/12/2010 8:02 AM Plotted by: Velma, Nancy

VALVE SCHEDULE / 32° F TO 150° F SERVICE TEMPERATURE

BALL VALVES - 4 INCH AND SMALLER FULL PORT 600# WOG

MANUFACTURER	THREADED	SOLDER		
CONBRACO (APOLLO)	70-100	70-200		
CRANE	9302	9322		
GRINNELL	3700	3700 SJ		
NIBCO	T-585-70	S-585-70		
RED-WHITE	5044 F.	5094 F.		
STOCKHAM	S216-BR-RT	S216-BR-RS		
WATTS	B-6000	B-6001		

"X" MEANS NOT AVAILABLE

BUTTERFLY VALVES - 4 INCH AND LARGER 175 PSI MAX.

MANUFACTURER	WAFER	LUG		
KEYSTONE	AR-1	AR-2		
BRAY	30-119	31-119		
CENTERLINE	200-W	200-L		

FOR COPPER GRV'D. CONNECTIONS, USE VICTAULIC SERIES 608 300 PSI MAX.

SWING CHECK VALVES - 2 INCH AND SMALLER

	CLASS 125	CLASS 125	CLASS 150	CLASS 150
MANUFACTURER	THREADED	SOLDER	THREADED	SOLDER
CRANE	37	1342	137	X
GRINNELL	3300	3300SJ	3320	X
HAMMOND	IB940	IB941	IB946	IB945
MILWAUKEE	509	1509	510	1510
NIBCO	T-413	S-413	T-433	S-433
STOCKHAM	B-319	B-309	B-321	X

FOR GROOVED CONNECTIONS, USE VICTAULIC SERIES 712

SWING CHECK VALVES - 2 1/2 INCH AND LARGER - FLANGED

MANUFACTURER	CLASS 125	CLASS 250		
CRANE	373			
GRINNELL	X			
HAMMOND	IR1124			
MILWAUKEE	F-2974			
NIBCO	F-918-B			
STOCKHAM	G-931			

FOR GROOVED CONNECTIONS, USE VICTAULIC SERIES 712

"X" MEANS NOT AVAILABLE

PLUMBING MATERIALS SPECIFICATION

TYPE of MATERIAL	SIZE	SUSPEN. DRAINS & STACKS	SUSPEN. VENTS & STACKS	SUSPEN. STORM DRAINS & DOWNSPOUTS	SUSPEN. DOM. WTR. DISTRIB. TO 150#	BURIED DOM. WTR. DISTRIB. 151#-400#	BURIED DOM. WTR. SERVICE	BURIED FIRE PROT. SERVICE	BURIED BLDG. SEWER	BURIED BLDG. DRAINS	BURIED STORM
CAST IRON SOIL PIPE & FITTINGS ASTM A74	2"-15" dia.										
CAULKED JOINTS w\ LEAD & OAKUM FS QQ-C-40		*	*	*			*	*			
PUSH-ON JOINTS w\ ASTM C564 GASKETS							*	*			
GALV. STL. PIPE ASTM A53 & DRAINAGE FITTINGS											
CUT-GROOVED COUPLINGS & FTTGS.	2"-24" dia.			*							
THREADED CAST IRON ASTM B16.12	1 1/2"-2 1/2" dia.	*	*								
COPPER PIPE HARD DRAWN TYPE M ASTM B88 w\											
CAST ASTM B16.23 or WROT ASTM B16.29											
COPPER SOLDER JOINT DRAINAGE FITTINGS	1 1/2"-2 1/2" dia.	*	*								
COPPER PIPE HARD DRAWN TYPE K ASTM B88	1 1/2"-2 1/2" dia.				*						
VITRIFIED CLAY PIPE & FITTINGS ASTM C700 w\											
COMPRESSION GASKET JOINTS ASTM C425	6"-24" dia.						*				
REINFORCED CONCRETE PIPE ASTM C76 w\											
RUBBER GASKET JOINTS ASTM C443	14"-54" dia.						*		*		
DUCTILE IRON PIPE & FITTINGS AWWA C151											
CEMENT LINED AWWA A21.4, w\ PUSH-ON or											
MECHANICAL JOINTS AWWA A21.11	3"-24" dia.				*	*					
GALV. STL. PIPE ASTM A53 Sch.40 w\ GALV. 125#											
THREADED MALLEABLE IRON FITTINGS ANSI B16.3	to 2 1/2" dia.			*							
FLANGED CAST IRON FITTINGS ANSI B16.1	3"-12" dia.			*							
COPPER PIPE HARD DRAWN TYPE L ASTM B88 w\											
CAST ASTM B16.18 or WROT ASTM B16.22											
COPPER SOLDER JOINT PRESSURE FITTINGS	to 2 1/2" dia.			*							
ROLL-GROOVED COPPER FITTINGS & COPPER											
PLATED DUCTILE IRON COUPLINGS	3"-6" dia.			*							
T-DRILL EXTRUDED CONNECTIONS	1 1/2"-6" dia.			*							
GALV. STL. PIPE ASTM A53 Sch.40 w\ GALV. 250#											
THREADED MALLEABLE IRON FITTINGS ANSI B16.3	to 2 1/2" dia.				*						
FLANGED CAST IRON FITTINGS ANSI B16.1	3"-12" dia.				*						
PREFORATED VITRIFIED CLAY PIPE & FTTGS ASTM C700	4"-8" dia.										
POLYVINYL CHLORIDE (PVC) PLASTIC PIPE (TYPE DWV PIPE),		*	*	*				*	*		
ASTM F 891	6"-12" dia.										
POLYVINYL CHLORIDE (PVC) PLASTIC FITTINGS		*	*	*				*	*		
ASTM D 2464											

FIXTURE ROUGH-IN PIPE SIZES

FIXTURE	TAG	RISER AND AIR CHAMBER FOR FIXTURE		FIXTURE NIPPLE (VALVE INLET)		CODE REQUIREMENTS		MOUNTING HEIGHT (FLR. TO RIM)	ELEC.	MFG.	MODEL	REMARKS
		HW	CW	HW	CW	WASTE	VENT					
WATER CLOSET	WC-1	-	1 1/4"	-	1"	4"	2"	15"	120V			
WATER CLOSET (ADA)	WC-2	-	1 1/4"	-	1"	4"	2"	17"	120V			
WATER CLOSET/LAV	W/L	3/4"	1 1/4"	1/2"	1/2"	4"	2"	-	-			SECURITY
LAVATORY	LAV-1	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	SEE ARCH.	-			
URINAL	UR-1	-	1"	-	3/4"	2"	1 1/2"	24"	120V			
URINAL (ADA)	UR-2	-	1"	-	3/4"	2"	1 1/2"	17"	120V			
SINK	SK-1	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	-	-			
SINK	SK-2	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	-	-			
DRINKING FOUNTAIN	DF-1	-	3/4"	-	1/2"	2"	1 1/2"	-	-			
								-	-			
JANITOR'S MOP BASIN	JMB	3/4"	3/4"	1/2"	1/2"	3"	2"	-	-			
TRAP PRIMER	TP	-	1/2"	-	-	-	-	-	-			
SHOWER	SH	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	-	-			

PUMP SCHEDULE

	SERVICE	LOCATION	SYSTEM GPM	TOTAL DYNAMIC HEAD	PUMP GPM	MOTOR DATA HP	VOLTS	PH	RPM	MANUFACTURER & MODEL	REMARKS
HP-1	HOUSE PUMP	GROUND FLOOR	145	92	73	5	460	3	3450	SYNCROFLO 55TA354V-VFD	TRIPLEX BOOSTER SYSTEM U.L./C-U.L. SYSTEM FLOW 145 GPM BOOST PRESSURE 40 PSIG INCLUDING A SUCTION PRESSURE OF 38 PSIG MIN.
				92	73	5	460	3	3450		
				92	37	3	460	3	3450		
RP-1	120° HOT WATER RECIRCULATING PUMP	THIRD FLOOR	6	31		1/6	115		3300	B&G PL-36	IN-LINE
PP-1,2&3	ELEVATOR PIT PUMP	GROUND FLOOR	10	15	-	1/4	120	1		ZOELLER PUMP CO, STANCOR	SUBMERSIBLE, SUMP PUMP LOCATED IN 18"X18"X24" W/ OIL MINDER ON EMERGENCY POWER

(OTHER ACCEPTABLE MANUFACTURES ARE BELL AND GOSSETT, METROPOLITAN AND CANARIIS)

DRAIN SCHEDULE

TAG	SERVICE	DESCRIPTION	JR SMITH NO.	ACCEPTABLE MANUFACTURES
FD-1	FINISHED AREA FLOOR DRAIN	NICKLE BRONZE VANDAL PROOF TOP		
FD-2	MECHANICAL ROOMS	FLOOR SINK W/ 1/2" GRATE		
FD-3		RECESSED GRATE		
RD-1	ROOF DRAIN	CAST IRON WITH FLASHING CLAMP & CAST IRON DOME		
RD-2	ROOF DRAIN	CAST IRON WITH FLASHING CLAMP, CAST IRON DOME & INTERNAL DAM	-	
RD-3	ROOF DRAIN			
TD	TRENCH DRAIN			POLYDRAIN
FS		FLOOR SINK		

DOMESTIC WATER HEATER SCHEDULE

HEATER TAG	SERVICE	LOCATION	STORAGE CAPACITY	ELECTRICAL PUMP	ELEMENT KW	BURNER	BLOWER	VOLTS	PHASE	GAS BTU/HR INPUT	RECOVERY RATE AT 100 DEG. F TEMP. RISE	STORED WATER TEMP. F.	BASIS OF DESIGN	MODEL NO.	COMMONS
WH-1	DOMESTIC WATER HEATING	3RD FLOOR MECHANICAL ROOM	100	-						250,000	294	140	LAARS	LUHE-100T-250E-3N(A)	99.1% EFFICIENT
WH-2			100	-						250,000	294			LUHE-100T-250E-3N(A)	

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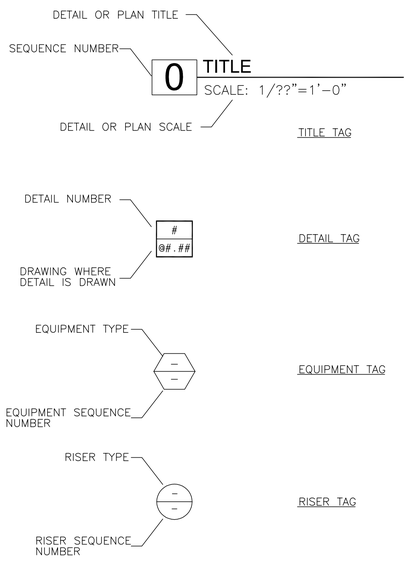
SHEET TITLE
PLUMBING SCHEDULES

SHEET NUMBER
P5-01

60% NOT FOR CONSTRUCTION

Drawing I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Plumbing\Dwgs\2008_P501.dwg Plotted on 2/12/2010 8:58 AM Plotted by: Velma, Henry

DRAWING SYMBOLS



FIRE PROTECTION SYMBOLS

SYMBOL	DESCRIPTION
●	PENDENT TYPE SPRINKLER HEAD
○	UPRIGHT SPRINKLER HEAD
⊙	CONCEALED PENDENT TYPE SPRINKLER HEAD
▼	SIDEWALL HEAD
⊠	VANDAL-RESISTANT PENDENT SPRINKLER HEAD
—F—	FIRE PROTECTION MAIN PIPING
	CHECK VALVE W/ 1/2" BALL DRIP
	FLOOR CONTROL VALVE W/ VSD
	WATER FLOW SWITCH
	SIAMESE CONNECTION
	FIRE DEPT. HOSE VALVE (FDV)
	FIRE DEPT. TEST HEADER
—SP—	WET SPRINKLER
—DP—	DRY SPRINKLER

NOTE: NOT ALL SYMBOLS MAY BE USED.

FIRE PROTECTION ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
ASZ	AUTOMATIC SPRINKLER ZONE
CSP	COMBINED FIRE STANDPIPE/SPINKLER RISER
FSP	FIRE STANDPIPE
ITC	INSPECTION TEST CONNECTION
FDV	FIRE DEPT. HOSE VALVE
FE	FIRE EXTINGUISHER
FVC/FE	FIRE VALVE CABINET WITH FIRE EXTINGUISHER
FDC	FIRE DEPT. CONNECTION (SIAMESE)
FP	FIRE PUMP
JP	JOCKEY PUMP
P.I.V.	POST INDICATING VALVES
TS	TAMPER SWITCH
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER (PROVIDED BY PLUMBING CONTRACTOR)
VSD	VALVE SUPERVISORY DEVICE (TAMPER SWITCH)
WFS	WATER FLOW SWITCH
W.I.V.	WALL INDICATING VALVES

NOTE: NOT ALL SYMBOLS MAY BE USED.

DULUTH INTERNATIONAL AIRPORT

5528 FIRE PROTECTION DRAWING LIST

Sheet No.	Filename (proj.#5528	DRAWING TITLE	DATE: 11/25/09 (80-90% CD SUBMITTAL REVIEW)	DATE: 60% REVIEW
F0-01	5528F001	FIRE PROT. SYMBOLS, ABBREVIATIONS AND DRAWING INDEX	●	●
F1-10	5528F110	ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA A	●	●
F1-11	5528F111	ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA B	●	●
F1-12	5528F112	ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A	●	●
F1-13	5528F113	ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA B	●	●
F1-14	5528F114	ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA A	●	●
F1-15	5528F115	ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA B	●	●
F4-01	5528F401	FIRE PROTECTION DETAILS	●	●
F5-01	5528F501	FIRE PROTECTION SCHEDULES AND RISER DIAGRAM	●	●

GENERAL NOTES:

1. COORDINATE DESIGN AND INSTALLATION WITH ARCHITECT AND ALL OTHER TRADES
2. OBTAIN AND PAY FOR ALL REQUIRED PERMITS
3. AUTOMATIC SPRINKLERS SHALL BE ARRANGED SYMETRICALLY IN ALL REQUIRED SPACES AND AS APPROVED BY THE ARCHITECT.
3. FIRE PROTECTION CONTRACTOR SHALL CONDUCT A SEASONAL WATER FLOW TEST IN CONJUNCTION WITH THE LOCAL AUTHORITIES. THE FLOW TEST RESULTS SHALL BE USED FOR PERFORMING THE HYDRAULIC CALCULATIONS.
4. THE FIRE PROTECTION CONTRACTOR SHALL SIZE THE SPRINKLER PIPING HYDRAULICALLY SUCH THAT EACH SPRINKLER HEAD OUTLET LOCATED THROUGHOUT IS CALCULATED TO FEED TWO SPRINKLER HEADS.

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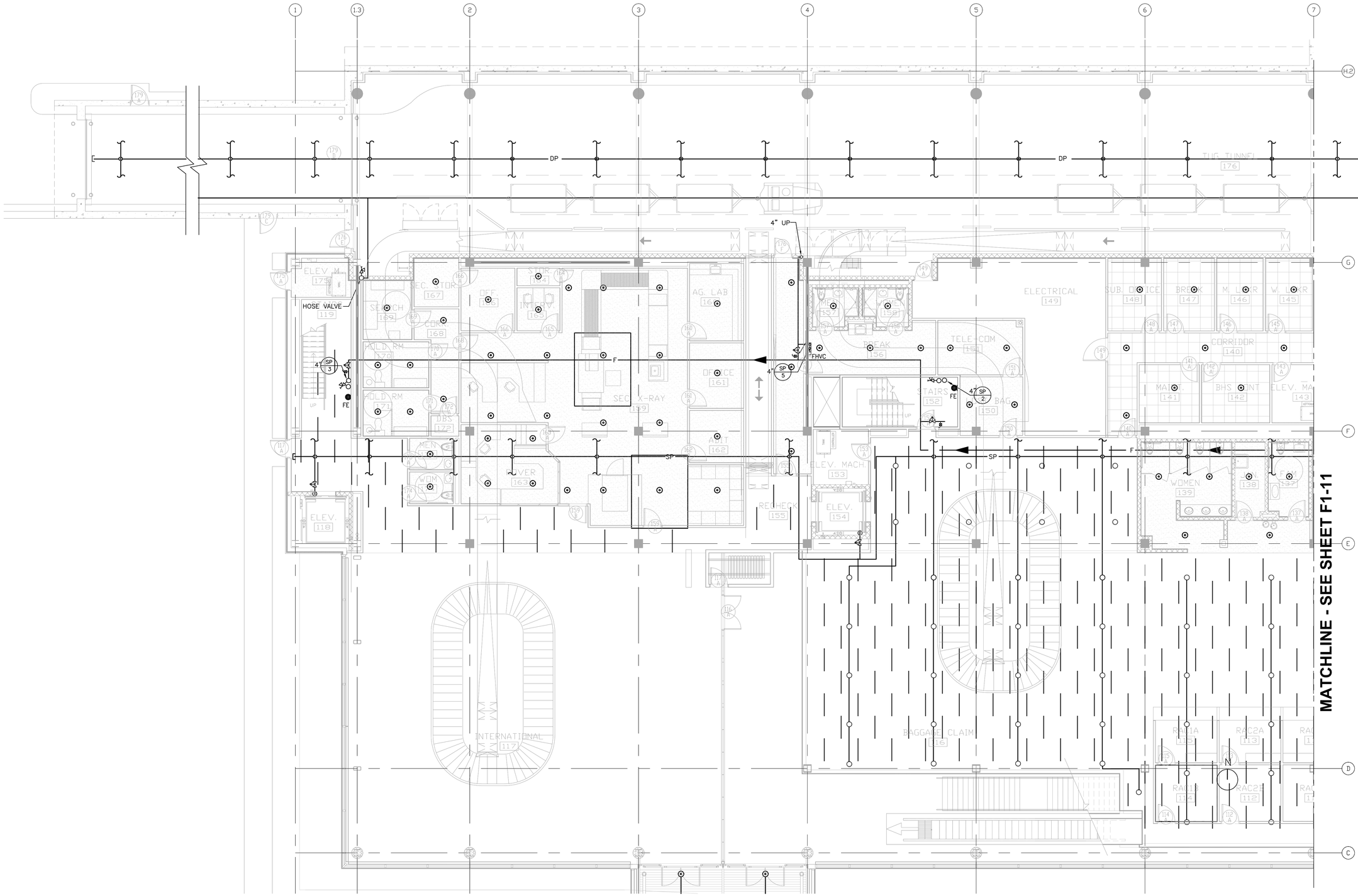
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SHEET TITLE
FIRE PROTECTION SYMBOL LIST, ABBREVIATIONS AND DRAWING INDEX

SHEET NUMBER
F0-01

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1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2008_F110.dwg Plotted on: 2/12/2010 8:31 AM Plotted by: Ahmed, Saleem

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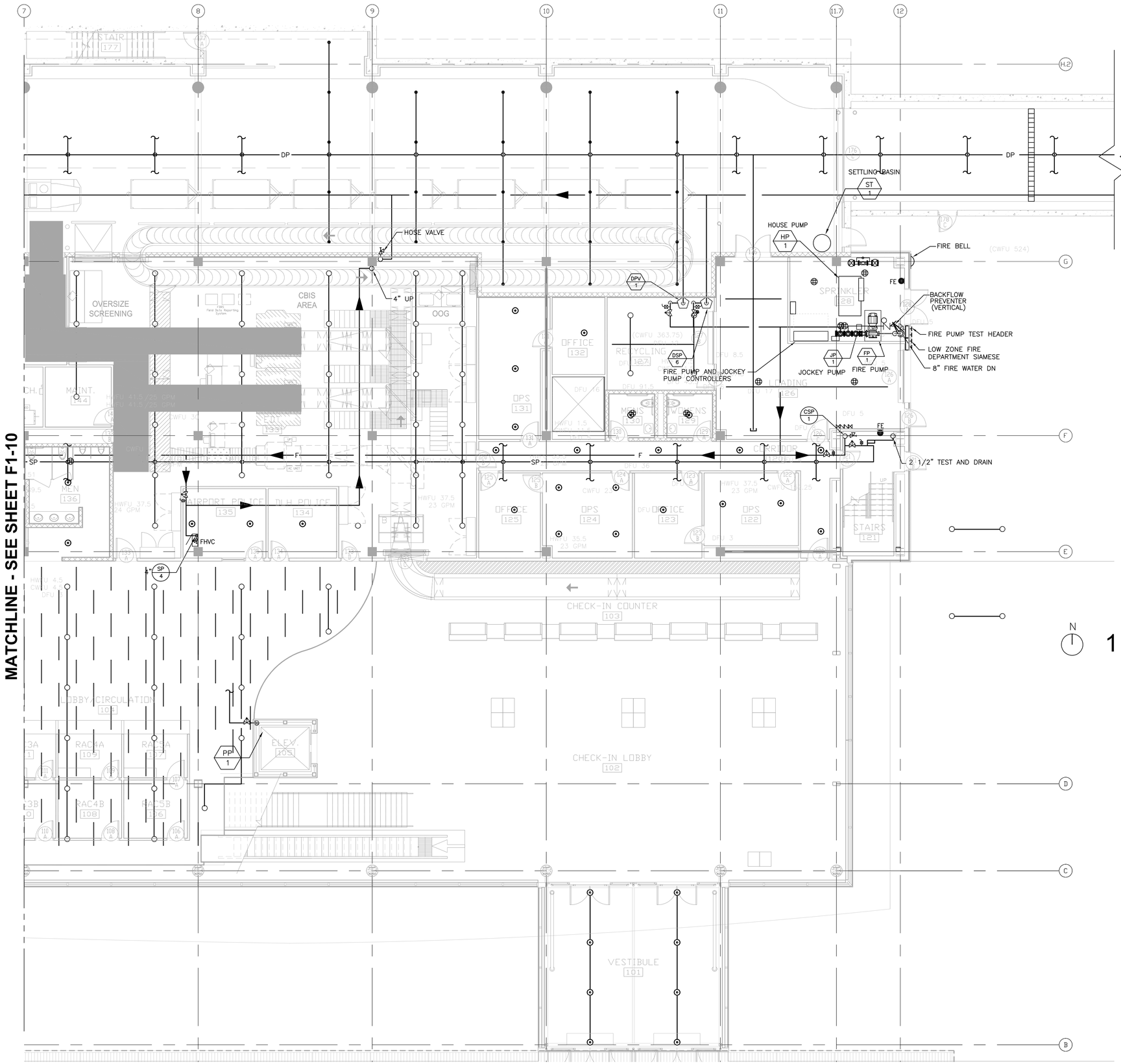
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SHEET TITLE
ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER
F1-10

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N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2008_F111.dwg Plotted on: 2/12/2010 8:32 AM Plotted by: Ahmed, Saleem

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SHEET NUMBER
F1-11

60% NOT FOR CONSTRUCTION

ALL FIRE EXTINGUISHERS ARE "10LB. DRY CHEMICAL" TYPE, UNLESS NOTED.

SEE ARCHITECT RCP FOR EXACT SPRK. HEAD LOCATION

RCP FOR EAD LOCATION

MATCHLINE - SEE SHEET F1-13

20 LB DRY CHEM.

4" UP SP 4

N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

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SHEET TITLE
ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER
F1-12

60% NOT FOR CONSTRUCTION

ALL FIRE EXTINGUISHERS ARE "10LB. DRY CHEMICAL" TYPE, UNLESS NOTED.

SEE ARCHITECT RCP FOR EXACT SPRK. HEAD LOCATION

MATCHLINE - SEE SHEET F1-13

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A
1/8" = 1'-0"

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

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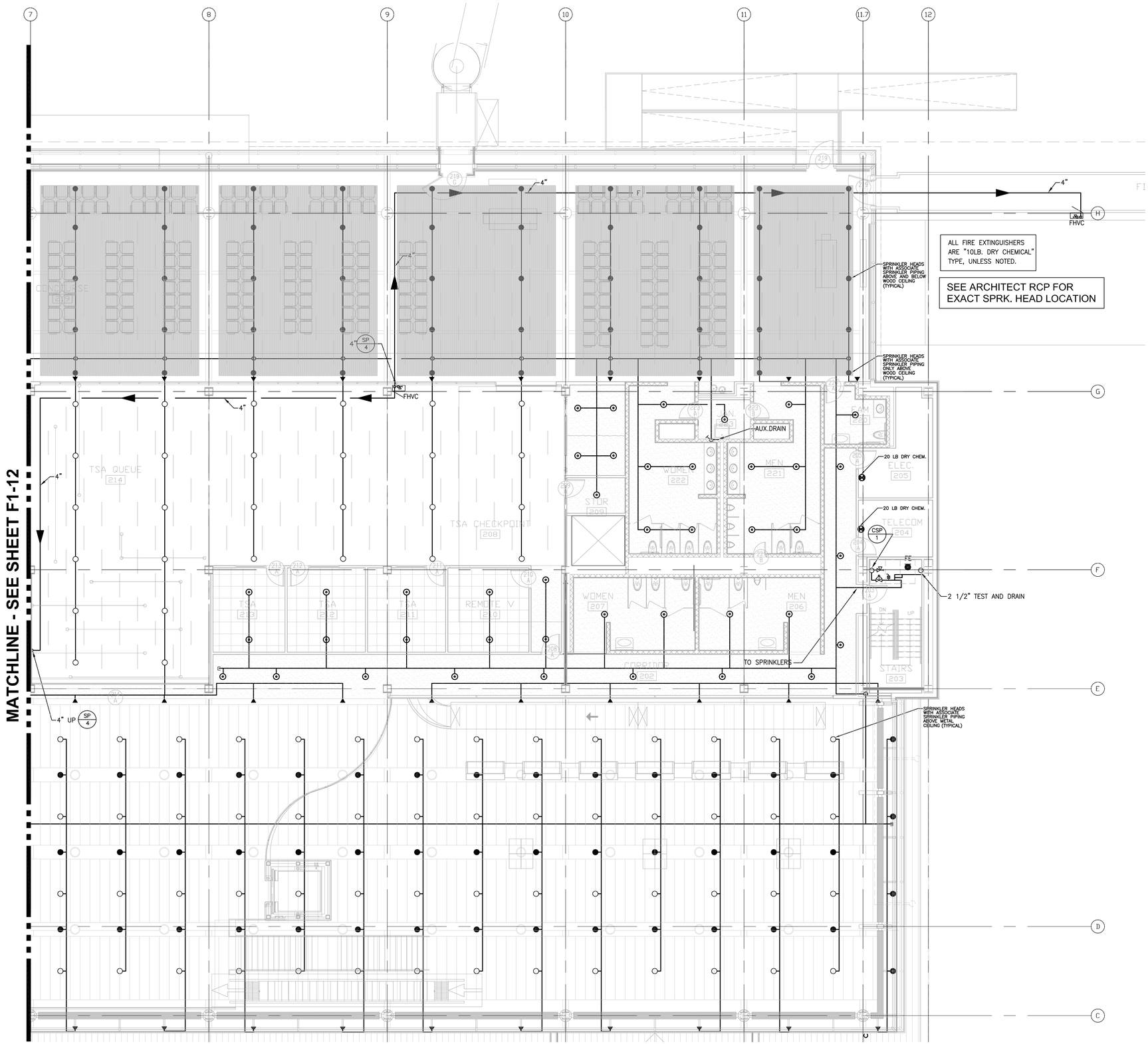
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SHEET TITLE
ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER
F1-12

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N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2028.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2028_F113.dwg Plotted on: 2/12/2010 8:35 AM Plotted by: Ahmed, Saleem

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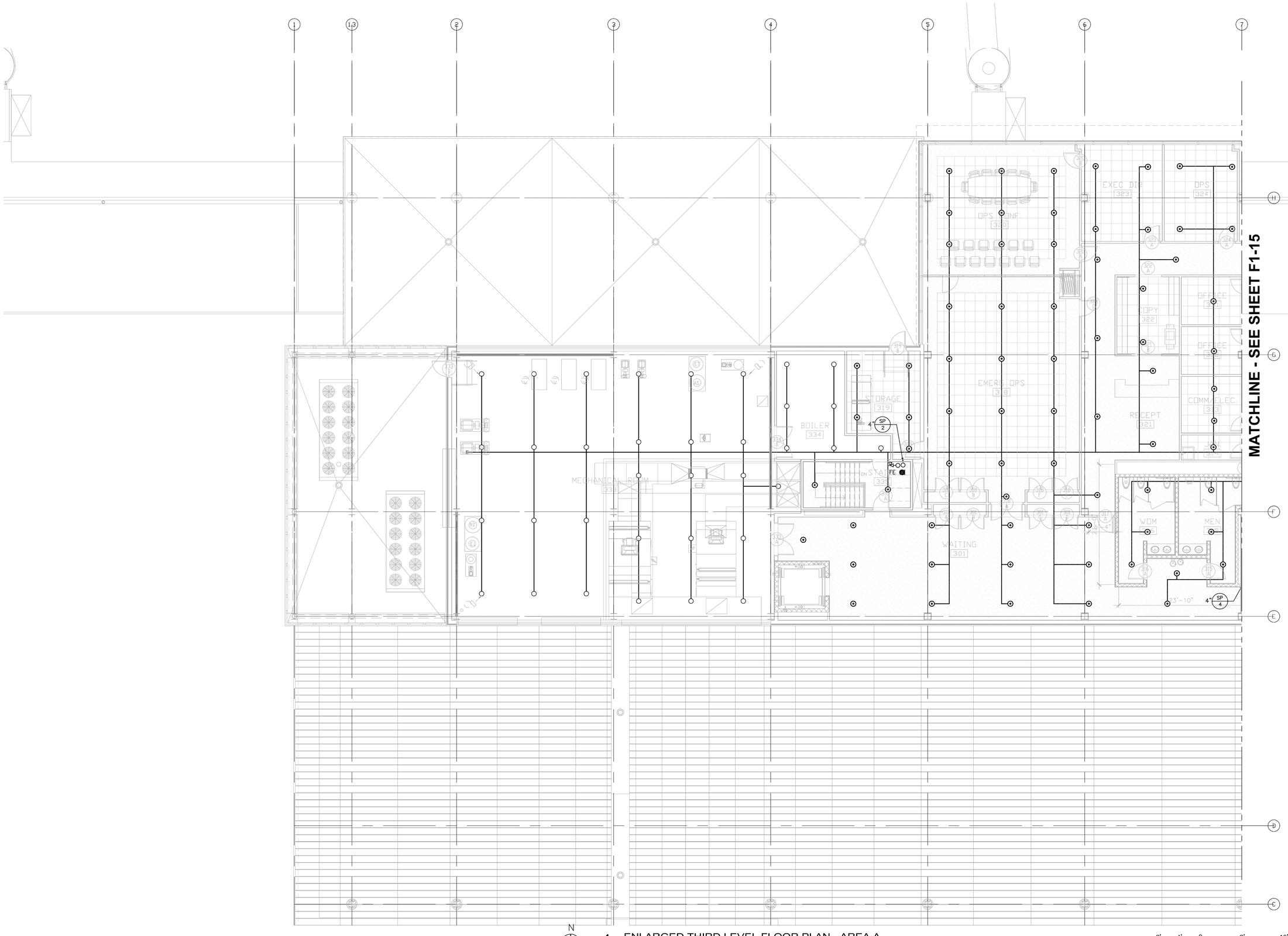
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SHEET TITLE
ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA B

SHEET NUMBER
F1-13

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N

1 ENLARGED THIRD LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.4) Fire Protection\Dwgs\2008_F114.dwg Plotted on: 2/12/2010 9:36 AM Plotted by: Ahmed, Saleem

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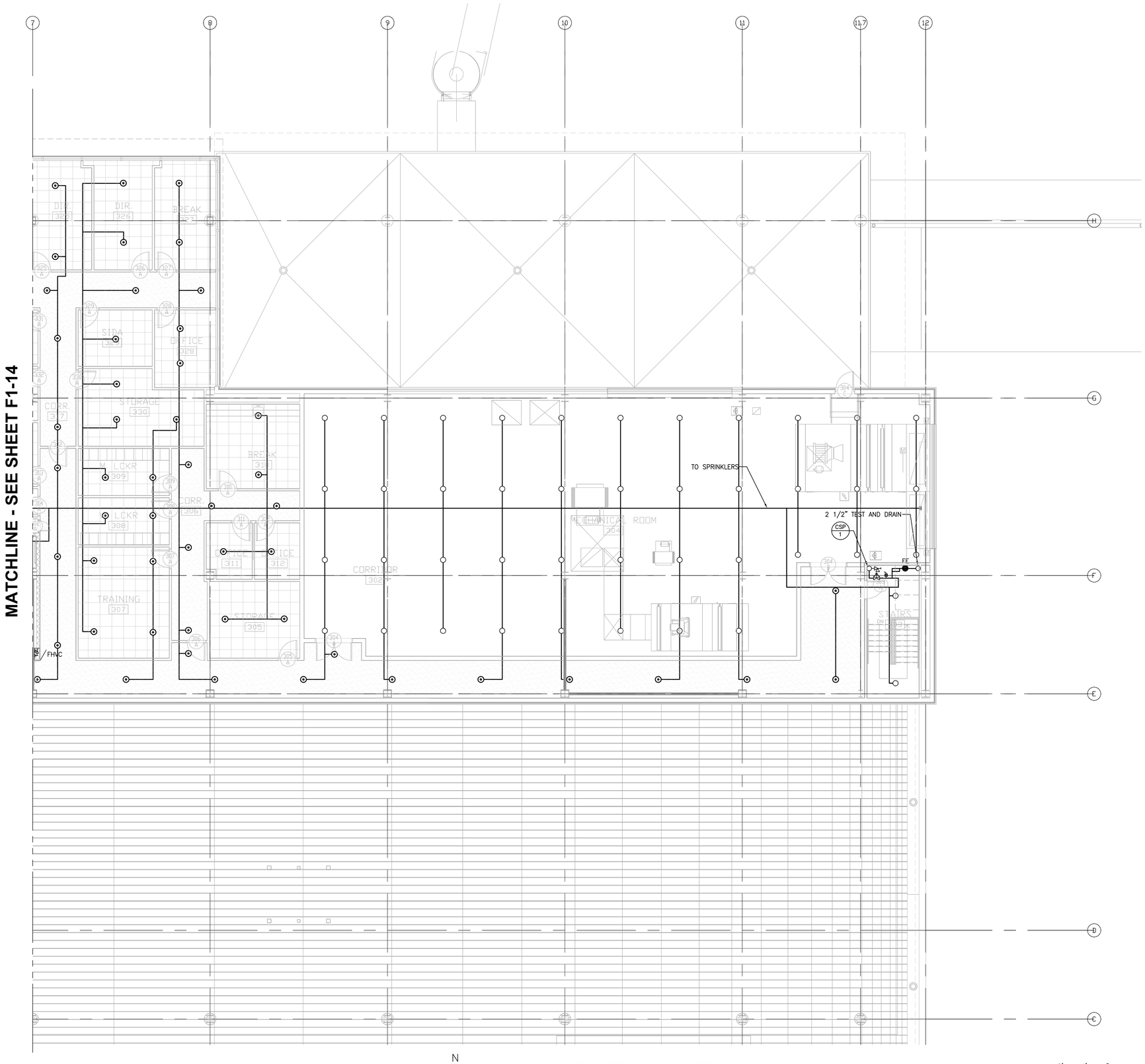
SHEET TITLE

ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER

F1-14

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1 ENLARGED THIRD LEVEL FLOOR PLAN - AREA B
1/8" = 1'-0"

N

8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

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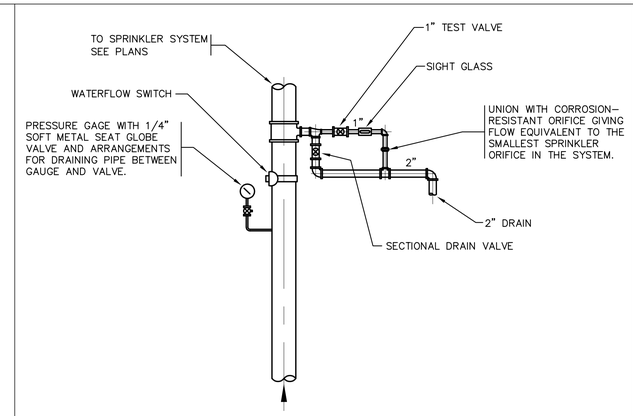
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SHEET TITLE
ENLARGED
THIRD FLOOR
FIRE PROTECTION
PLAN AREA A

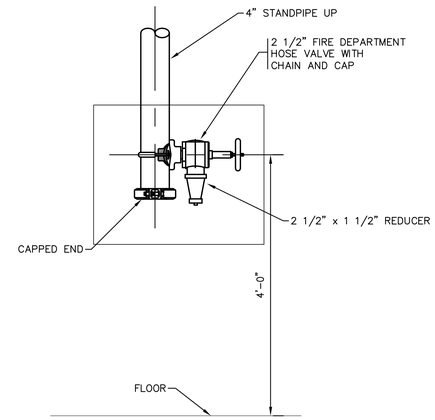
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F1-15

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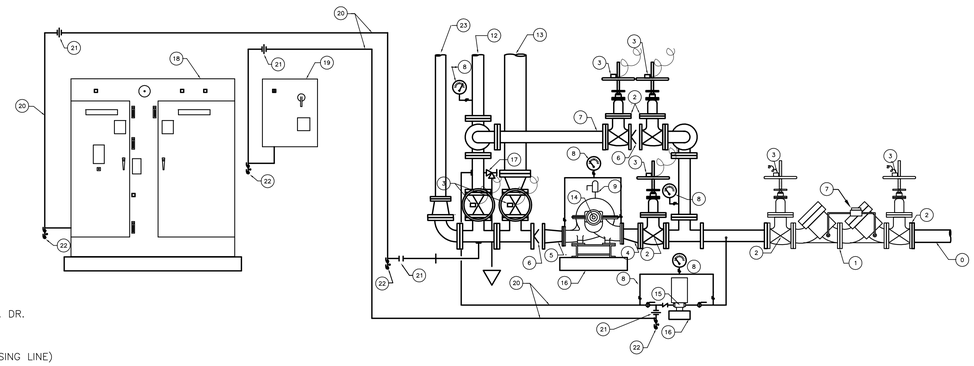
5 INSPECTOR'S TEST CONNECTION DETAIL
SCALE: NONE



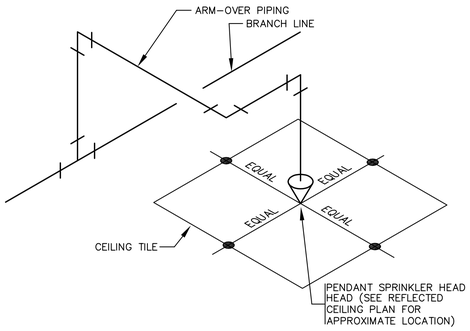
1 FIRE DEPARTMENT VALVE DETAIL
SCALE: NONE

LEGEND

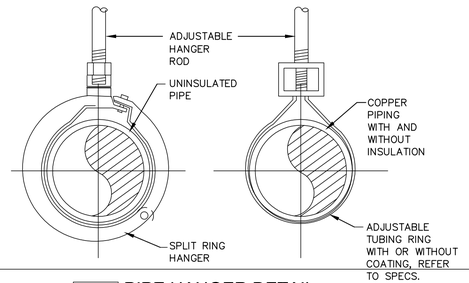
0. INCOMING WATER SERVICE FROM STREET MAIN
1. DOUBLE DETECTOR CHECK VALVE ASSY.
2. GATE VALVE
3. TAMPER SWITCH (TYP.)
4. ECCENTRIC REDUCER
5. CONCENTRIC REDUCER
6. NON-SLAM CHECK VALVE
7. BY-PASS
8. PRESSURE GAUGE (TYP.)
9. AIR RELEASE VALVE
10. VOID
11. VOID
12. TO SPRINKLER SYSTEMS
13. TO FIRE PUMP TEST HEADER
14. FIRE PUMP (FP)
15. JOCKEY PUMP (JP)
16. CONCRETE HOUSEKEEPING PAD
17. MAIN DRAIN VALVE SPILL OVER FLR. DR.
18. FIRE PUMP CONTROLLER (FPC)
19. JOCKEY PUMP CONTROLLER (JPC)
20. 1/2" BRASS PIPE & FITTINGS (SENSING LINE)
21. GROUND-FACE UNION W/ ORIFICE
22. 1/2" GLOBE VALVES-TEE W/ PLUG
23. 4" TO FIRE DEPT.CONNECTION



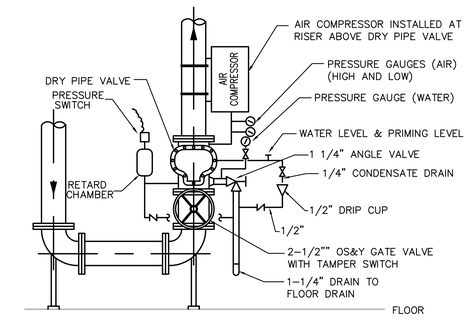
6 FIRE PUMP / JOKEY PUMP / CONTROLLERS ARRANGEMENT
SCALE: NONE



2 TYPICAL SPRINKLER HEAD LOCATION
SCALE: NONE



7 PIPE HANGER DETAIL
SCALE: NONE



3 DRY PIPE VALVE DETAIL
SCALE: NONE

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IMPROVING YOUR WORLD
Reynolds, Smith and Hills, Inc.
4525 Airport Approach Rd, Ste A
Duluth, Minnesota 55811
218-722-1227 Fax: 218-722-1052
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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW TERMINAL DESIGN

CONSULTANTS

Interior Architects:
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11 E Superior Street Suite 340, Duluth MN 55802
TEL: (218) 724-8578 / FAX: (218) 724-8717

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TEL: (312) 670-1800 / FAX: (312) 670-1801

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TEL: (203) 792-3000 / FAX: (203) 792-4900

Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 02-11-10
REVIEWED BY: XXX
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
FIRE PROTECTION DETAILS

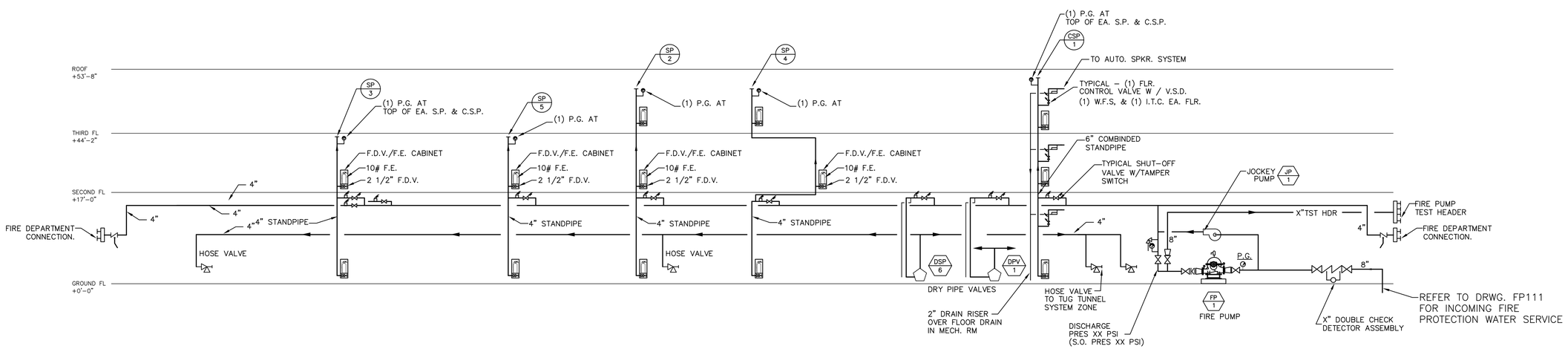
SHEET NUMBER
F4-01

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PUMP SCHEDULE

PUMP TAG	SERVICE	LOCATION	GPM EACH PUMP	TOTAL DYNAMIC HEAD	SHUT OFF HEAD	MOTOR DATA				MANUFACTURER	REMARKS
						HP	VOLTS	PH	RPM		
FP-1	FIRE PUMP	GROUND FLOOR					480				
JP-1	JOCKY PUMP	GROUND FLOOR					480				



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REVIEWED BY: XXX
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DESIGNED BY: SA

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SHEET TITLE
FIRE PROTECTION SCHEDULES AND RISER DIAGRAM

SHEET NUMBER
F5-01

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