DULUTH INTERNATIONAL AIRPORT
NEW PASSENGER TERMINAL BUILDING

Director of Airports: Brian Ryks
4701 GRINDEN DRIVE - DULUTH INTERNATIONAL AIRPORT
DULUTH, MINNESOTA 55811

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

DULUTH AIRPORT AUTHORITY BOARD OF DIRECTORS

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VOLUME 2 OF 2



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CIVIL CERTIFICATION
I hereby certify that the civil plans, specifications or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Illinois.
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Date:_____ License #_____

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I hereby certify that the architectural plans, specifications, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Architect under the laws of the State of Illinois.
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I hereby certify that the structural plans, specifications, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Illinois.
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I hereby certify that the electrical (power and lighting) plans, specifications, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Illinois.
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Signature:_____
Date:_____ License #_____

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DRAWING LIST VOLUME 1

G101 DRAWING LIST

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L106 LANDSCAPE PLAN (AREA 6)
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E113 ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA B
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PG203 OVERALL THIRD FLOOR RCP – FACILITY

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B8109 BAGGAGE HANDLING SYSTEM TYPICAL DETAILS TYPICAL WARNING SIGNAGE

GENERAL NOTE:

FOR ADA STANDARDS, PLUMBING FIXTURES' MOUNTING HEIGHTS AND CLEARANCES, SEE A002.

ZONING DATA

PROJECT LOCATION:	DULUTH INTERNATIONAL AIRPORT 4701 GRINDEN DRIVE DULUTH, MINNESOTA 55811
ZONING:	––
PROPOSED USE:	AIRPORT
GROSS SITE AREA:	N.A.
TOTAL BUILDING AREA:	––
FIRST FLOOR AREA:	––
SECOND FLOOR AREA:	––
THIRD FLOOR AREA:	––
FLOOR AREA RATIO:	––
BUILDING HEIGHT:	––
OFF–STREET PARKING:	––
ON–STREET PARKING:	––
OFF–STREET LOADING AREAS:	––
APPLICABLE CODES:	––
OCCUPANCY:	––

ACCESSIBILITY NOTES

A. GENERAL REQUIREMENTS

THIS PROJECT WILL COMPLY WITH ALL IAC 400.310 – NEW CONSTRUCTION.

1. THE ENTRANCE IS ACCESSIBLE PER IAC 400.310(k).

2. ALL PASSENGER ELEVATORS PROVIDED IN A BUILDING OR FACILITY SHALL BE ACCESSIBLE, SHALL SERVE ALL LEVELS OF A BUILDING OR FACILITY, SHALL BE ON AN ACCESSIBLE ROUTE AND SHALL COMPLY WITH THE ASME A 17.1–1996.

3. ALL DOORS LEADING TO REQUIRED ACCESSIBLE ROOMS AND SPACES SHALL BE A MINIMUM OF 3'–0" WIDE, HAVE LEVER OPERATED HARDWARE (OR EQUAL), HAVE A MININUM OPENING FORCE OF 5 LBF, AND FULLY COMPLY WITH IAC 400.310(j).

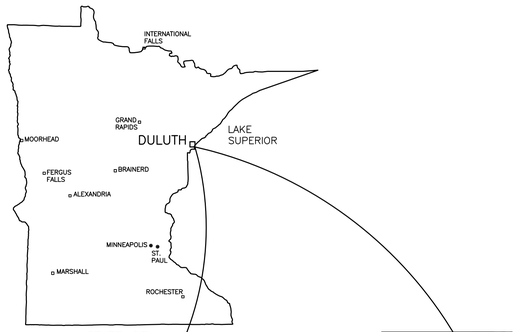
4. ALL DOORS LEADING TO HAZARDOUS ROOMS WILL COMPLY WITH THE ABOVE AND, IN ADDITION, WILL HAVE KNURLED OPERATING HARDWARE (I.E., ELECTRICAL/TELEPHONE ROOMS).

5. ALL ENVIRONMENTAL CONTROLS AND OPERATING MECHANISMS WILL COMPLY WITH IAC 400.310(r) (FRONT REACH BETWEEN 15" AND 48" AFF).

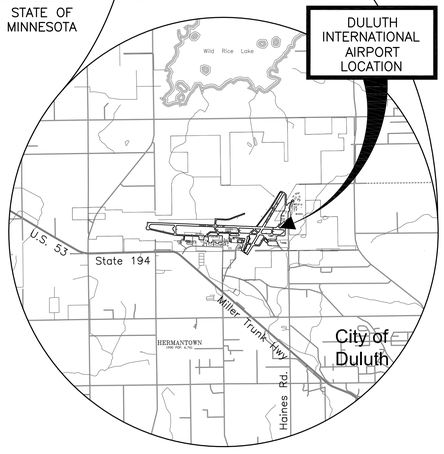
6. ALL EMERGENCY WARNING ALARMS, WHERE PROVIDED, SHALL BE BOTH AUDIBLE AND VISUAL AND COMPLY WITH IAC 400.310(s). THE VISUAL ALARMS WILL BE FLASHING TYPE WHERE THE FLASHING IS SYNCHRONIZED AND IN COMPLIANCE FOR INTENSITY AND FREQUENCY, ALL TENANT SPACES WILL BE WIRED FOR FUTURE INSTALLATION OF EMERGENCY WARNING ALARMS ON AN AS NEEDED BASIS (SEE SECURITY DRAWINGS).

7. ANY NEW REQUIRED SIGNAGE IN CONTRACT SHALL BE INSTALLED AS REQUIRED PER IAC 400.310(u).

8. TOILET ROOMS SERVING PUBLIC AREAS (I.E., LOVVIES, CONCOURSE, ETC.) WILL FULLY COMPLY WITH IAC 400.310(n).



STATE OF MINNESOTA



2 SHEET LAYOUT
N.T.S.

NORTH

1 LOCATION MAP
N.T.S.

NORTH

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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SJA ARCHITECTS
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Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
COSENTINI ASSOCIATES INC.
1 South Wacker Drive, 37th Floor, Chicago IL 60606
TEL: (312) 201-7408 / FAX: (312) 201-0031

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

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: SBS/TC
DRAWN BY: MKG/MI
DESIGNED BY: SBS/TC

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
DRAWING LIST

SHEET NUMBER
G101

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Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\A\Sheets_G101 Drawing List.dwg Plotted on: 4/13/2010 11:35 AM Plotted by: ip, Mark

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 OR 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
AD	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.

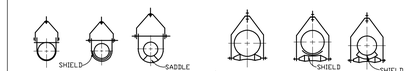
GRILLE, REGISTER AND DIFFUSER SYMBOLS:

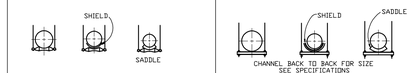
SQUARE CEILING SUPPLY DIFFUSER OR REGISTER; CEILING RETURN OR EXHAUST GRILLE OR REGISTER; SIDEWALL SUPPLY REGISTER; SIDEWALL RETURN OR EXHAUST GRILLE OR REGISTER

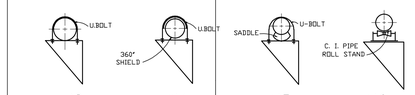
ROUND CEILING SUPPLY DIFFUSER OR REGISTER — TYPE (SEE SCHEDULE); A B / 300 — ø NECK SIZE OR WIDTH X HEIGHT OR SLOT X LENGTH; CFM

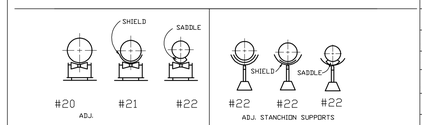
CONTINUOUS FIN TUBE RADIATION

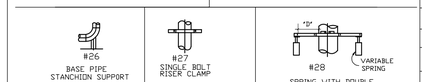
PIPE HANGER & SUPPORT SCHEDULE

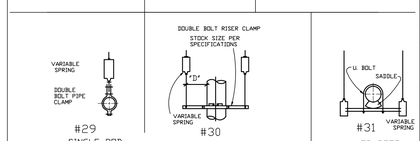


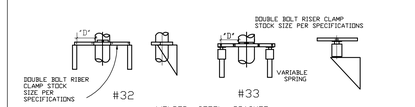












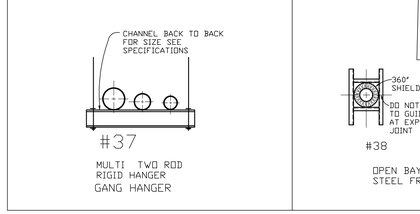
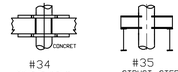


FIG NO.	LESS THAN 1/4" MOVEMENT EXCEPT AS NOTED: NON. INSUL.	CH.W. LINES	HOT LINES	MORE THAN 1/4" MOVEMENT EXCEPT AS NOTED: NON. INSUL.	CH.W. LINES	HOT LINES
OVERHEAD SUPPORTS (HORIZONTAL PIPING)						
1						
2		✳				
3			✳			
4				✳		
5					✳	
6						✳
7				✳		
8					✳	
9						✳
10	✳					
11		✳				
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						✳





G U I D E S

MECHANICAL DRAWING LIST

SHEET NO.	DESCRIPTION	ISSUED FOR	DESIGN DEVELOPMENT	60% CONSTRUCTION DOCUMENTS	90% CONSTRUCTION DOCUMENTS
	DATE		11/30/2009	2/11/2010	4/12/2010
M001	MECHANICAL LEGEND		●	●	●
M002	MECHANICAL SYMBOLS		●	●	●
M108	ENLARGED UNDERGROUND MECHANICAL PLAN - AREA A		●	●	●
M109	ENLARGED UNDERGROUND MECHANICAL PLAN - AREA B		●	●	●
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 ROOF LEVEL MECHANICAL PLAN - AREA A				●
M110	ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN - AREA A				●
M111	ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN - AREA B				●
M112	ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN - AREA A				●
M113	ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN - AREA B				●
M114	ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA A				●
M115	ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA B				●
M201	DIESEL GENERATOR MECHANICAL PLAN & DETAILS		●	●	●
M202	MECHANICAL SECTIONS & ELEVATIONS				●
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		●	●	●

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SEAL

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NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
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SHEET TITLE

MECHANICAL LEGEND

SHEET NUMBER

M001

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Drawing: N:\2008.00 Duluth Airport\5.0 CADD\5-4) HVAC\Dwgs\M001_M001.dwg Plotted on: 4/9/2010 2:17 PM Plotted by: Brandt, Mark

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 1"
- 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
B	BOILER
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BI	BLACK IRON
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. CONN.	CONDENSATE DRAIN (COIL. PAN DRAIN) 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	TANK
TD	TEMPERATURE DIFFERENCE
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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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED:	04-12-10
REVIEWED BY:	MXB
DRAWN BY:	JEH
DESIGNED BY:	XX

AEP PROJECT NUMBER
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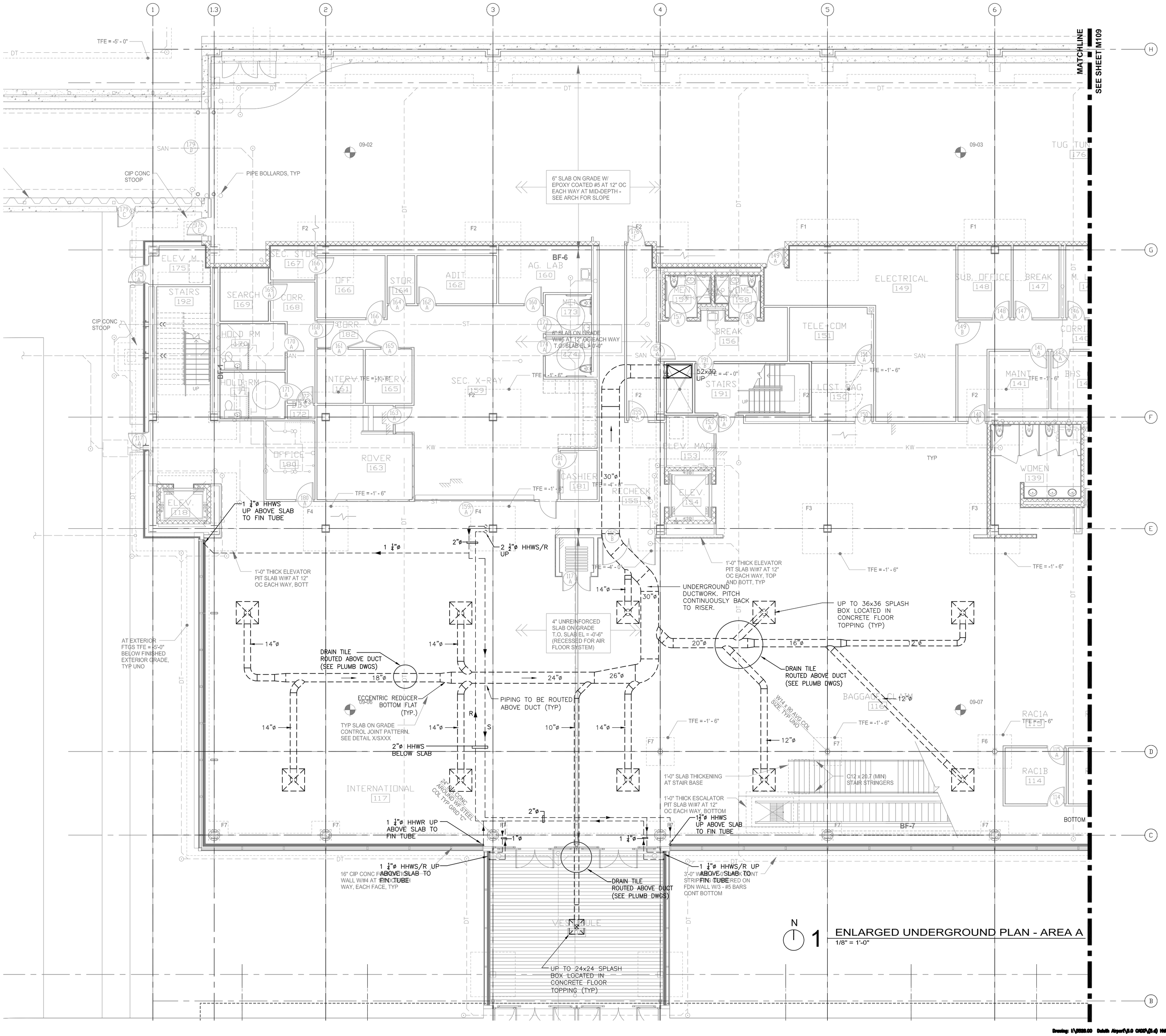
SHEET TITLE

MECHANICAL SYMBOLS

SHEET NUMBER
M002

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Drawing: I:\2008.00 Duluth Airport\5.0 CAD\(5.4) M&C\Dwgs\M002_M002.dwg Plotted on: 4/9/2010 3:18 PM Plotted by: Brandt, Mark



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DRAWN BY: FT
DESIGNED BY: BR

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SHEET TITLE
ENLARGED UNDERGROUND MECHANICAL PLAN AREA A

SHEET NUMBER
M108

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MATCHLINE
SEE SHEET M108

7 8 9 10 11 11.7 12

H G F E D C B

EXISTAIR 194

DT

IG TUNNEL 176

M. LCKR 146 | W. LCKR 145 | CORRIDOR 140

BHS CONT 142 | ELEV. MACH. 143 | MAINT. 144

JAN. 138 | FAM 137 | MEN 136

AIRPORT POLICE 135 | DLH POLICE 134

EDT 133

OFFICE 132 | OPS 127 | OPS 131 | MENS 130 | WOMENS 129 | SPRINKLER 128 | LOADING 126 | CORRIDOR 120

OFFICE 125 | OPS 124 | OFFICE 123 | OPS 122 | STAIRS 190

SAN

BOD 20"

38x38 UP

36"ø

2 ½"ø HHWS/R UP

2 ½"ø

1 ¼"ø HHWS BELOW SLAB

1 ¼"ø HHWS UP ABOVE SLAB TO FIN TUBE

UNDERGROUND DUCTWORK. PITCH CONTINUOUSLY BACK TO RISER.

CHECK-IN COUNTER 103

UP TO 36x36 SPLASH BOX LOCATED IN CONCRETE FLOOR TOPPING (TYP)

PITCH

BOD −2 ½"

12"ø

14"ø

24"ø

26"ø

16"ø

LOBBY/CORRIDOR 104

ECCENTRIC REDUCER (TYP.) (BOTTOM FLAT)

RAC2A 113 | RAC3A 111 | RAC4A 109 | RAC1A 107

RAC2B 112 | RAC3B 110 | RAC4B 108 | RAC1B 106

ELEV. 105

BOD −13 ½"

2"ø HHWS/R BELOW SLAB

DRAIN TILE ROUTED ABOVE DUCT (SEE PLUMB DWGS)

CHECK-IN LOBBY 102

PIPING TO BE ROUTED ABOVE DUCT (TYP)

2"ø

1"ø

1 ¼"ø HHWR UP ABOVE SLAB TO FIN TUBE

BOTTOM OF DUCT (BOD)

1 ¼"ø HHWS/R UP ABOVE SLAB TO FIN TUBE

10"ø

VESTIBULE

UP TO 24x24 SPLASH BOX LOCATED IN CONCRETE FLOOR TOPPING (TYP)

N

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

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TEL: (218) 591-5079

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REVIEWED BY:	MXB
DRAWN BY:	FT
DESIGNED BY:	BR

AEP PROJECT NUMBER
213-1882-091

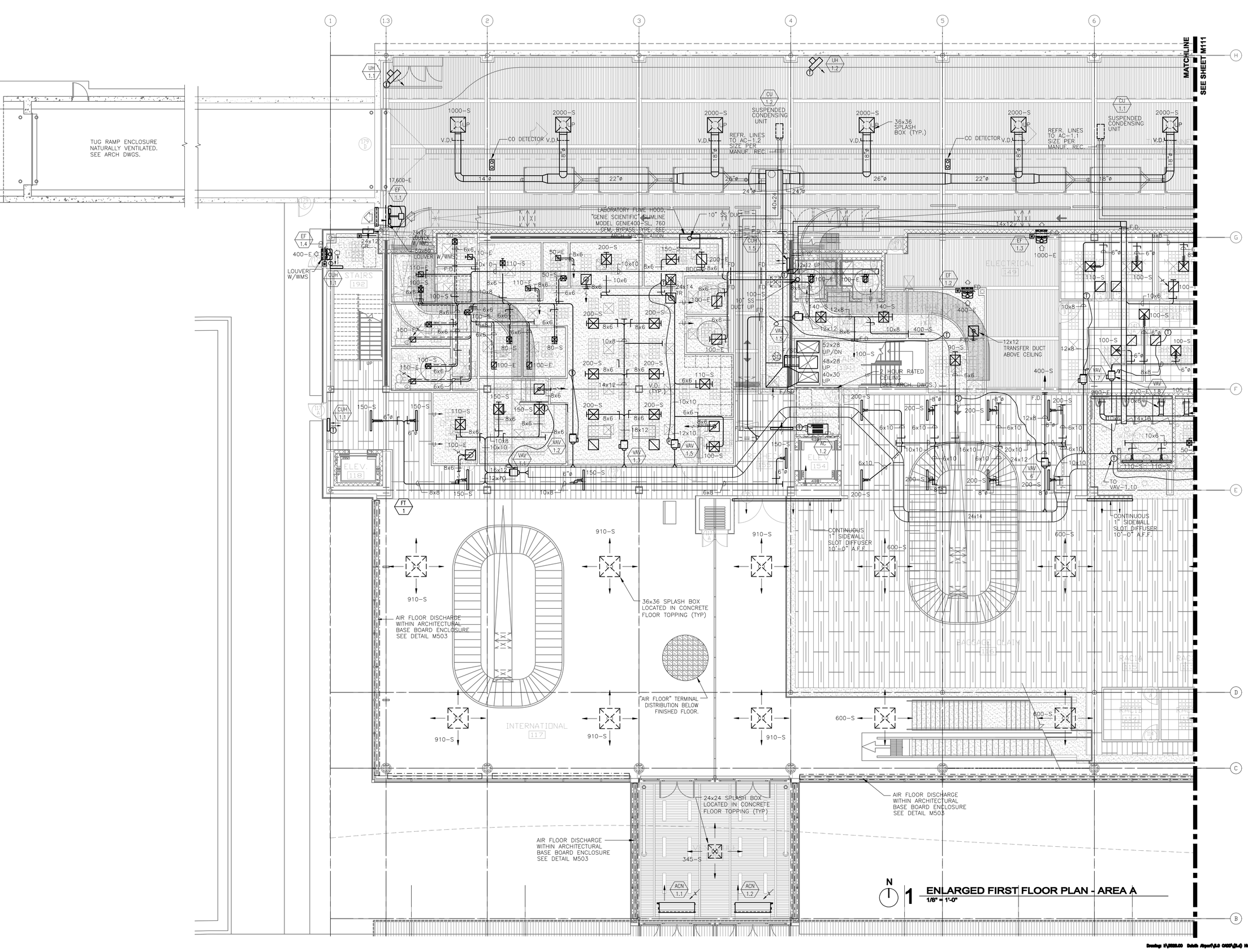
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SHEET TITLE
ENLARGED UNDERGROUND MECHANICAL PLAN AREA B

SHEET NUMBER
M109

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\9.0 CADD\(9.4) HVAC\Dwgs\M2BB_M109.dwg Plotted on: 4/9/2010 3:54 PM Plotted by: Brand, Mark



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REVISIONS

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DATE ISSUED:	04-12-10
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DRAWN BY:	JEH
DESIGNED BY:	MXB

AEP PROJECT NUMBER
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SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER
M110

90% NOT FOR CONSTRUCTION

Drawing: X:\2008.00 Duluth Airport\5.0 CADD\[5-0] HVAC\Dwgs\2008_M110.dwg Plotted on: 4/9/2010 4:29 PM Plotted by: Brandt, Mark

MATCHLINE
SEE SHEET M110

LOCATE AT TOP OF STAIR @ ABOVE DOOR

OVERSIZE SCREENING

OPENING ABOVE CEILING

CO DETECTOR

MANUF. REC.

TUG RAMP ENCLOSURE
NATURALLY VENTILATED.
SEE ARCH DWGS.

48x24
AIR FILTER
16,000 OAI
16 SF FREE AREA LOUVER
LOUVER W/WMS

1 SF FREE AREA
LOUVER W/WMS

2 SF FREE AREA
LOUVER W/WMS

8x6 UP W/
FD @ SLAB

2 SF FREE AREA
LOUVER W/WMS

BMS FIRE CONTROL PANEL IN
LOADING DOCK (BY CONTROLS
CONTRACTOR, SEE SPECS)

TRANSFER
OPENING ABOVE
CEILING W/ FD (TYP.)

CONTINUOUS 1" SIDEWALL
SLOT DIFFUSER 10'-0" A.F.F.

CONTINUOUS 1" SIDEWALL
SLOT DIFFUSER 10'-0" A.F.F.
WALL CAVITY SUPPLY PLENUM
FED FROM AIR FLOOR BELOW

WALL CAVITY SUPPLY
PLENUM FED FROM
AIR FLOOR BELOW

36x36 SPLASH BOX
LOCATED IN CONCRETE
FLOOR TOPPING (TYP.)

AIR FLOOR DISCHARGE
WITHIN ARCHITECTURAL
BASE BOARD ENCLOSURE
SEE DETAIL M503

"AIR FLOOR" TERMINAL
DISTRIBUTION BELOW
FINISHED FLOOR.

AIR FLOOR DISCHARGE
WITHIN ARCHITECTURAL
BASE BOARD ENCLOSURE
SEE DETAIL M503

24x24 SPLASH BOX
LOCATED IN CONCRETE
FLOOR TOPPING (TYP.)

AIR FLOOR DISCHARGE
WITHIN ARCHITECTURAL
BASE BOARD ENCLOSURE
SEE DETAIL M503

CHECK-IN COUNTER
103

CHECK-IN LOBBY
102

ELEV.
105

STAIRS
190

N

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

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: XXX
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

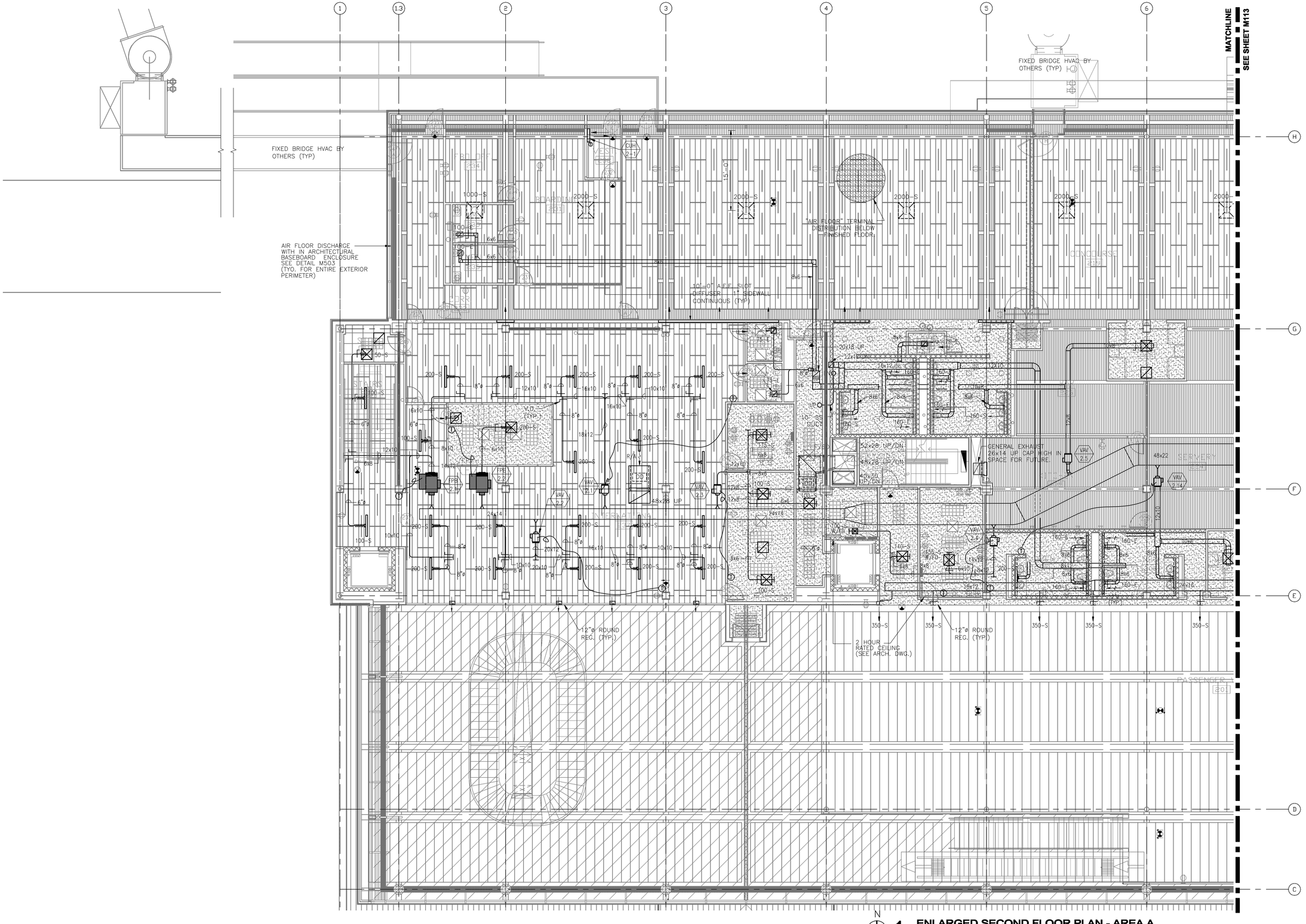
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SHEET TITLE
ENLARGED
FIRST FLOOR
MECHANICAL
PLAN AREA B

SHEET NUMBER
M111

90% NOT FOR CONSTRUCTION

Drawing: H:\2008.00 Duluth Airport\5.0 CADD\5.4) HVAC\Dwgs\2008_M111.dwg Plotted on: 4/9/2010 4:35 PM Plotted by: Brandt, Mark



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

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SHEET TITLE

SHEET NUMBER

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Drawing: K:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_M112.dwg Plotted on: 4/9/2010 4:24 PM Plotted by: Brandt, Mark

MATCHLINE
SEE SHEET M112

7 8 9 10 11 11.7 12

H G F E D C

FIXED BRIDGE HVAC BY OTHERS (TYP)

FIXED BRIDGE HVAC BY OTHERS (TYP)

FIXED BRIDGE
248

"AIR FLOOR" TERMINAL DISTRIBUTION BELOW FINISHED FLOOR.

AIR FLOOR DISCHARGE WITH IN ARCHITECTURAL BASEBOARD ENCLOSURE SEE DETAIL M503 (TYP. FOR ENTIRE EXTERIOR PERIMETER)

10'-0" A.F.F. SLOT DIFFUSER 1" SIDEWALL CONTINUOUS (TYP.)

10x8 UP TO MECH. RM.

12"ø ROUND REG. (TYP.)

12"ø ROUND REG. (TYP.)

VD (TYP.)

R/A (TYP.)

V.D (TYP.)

TSA CHECKPOINT

STAIRS
290

N

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

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DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

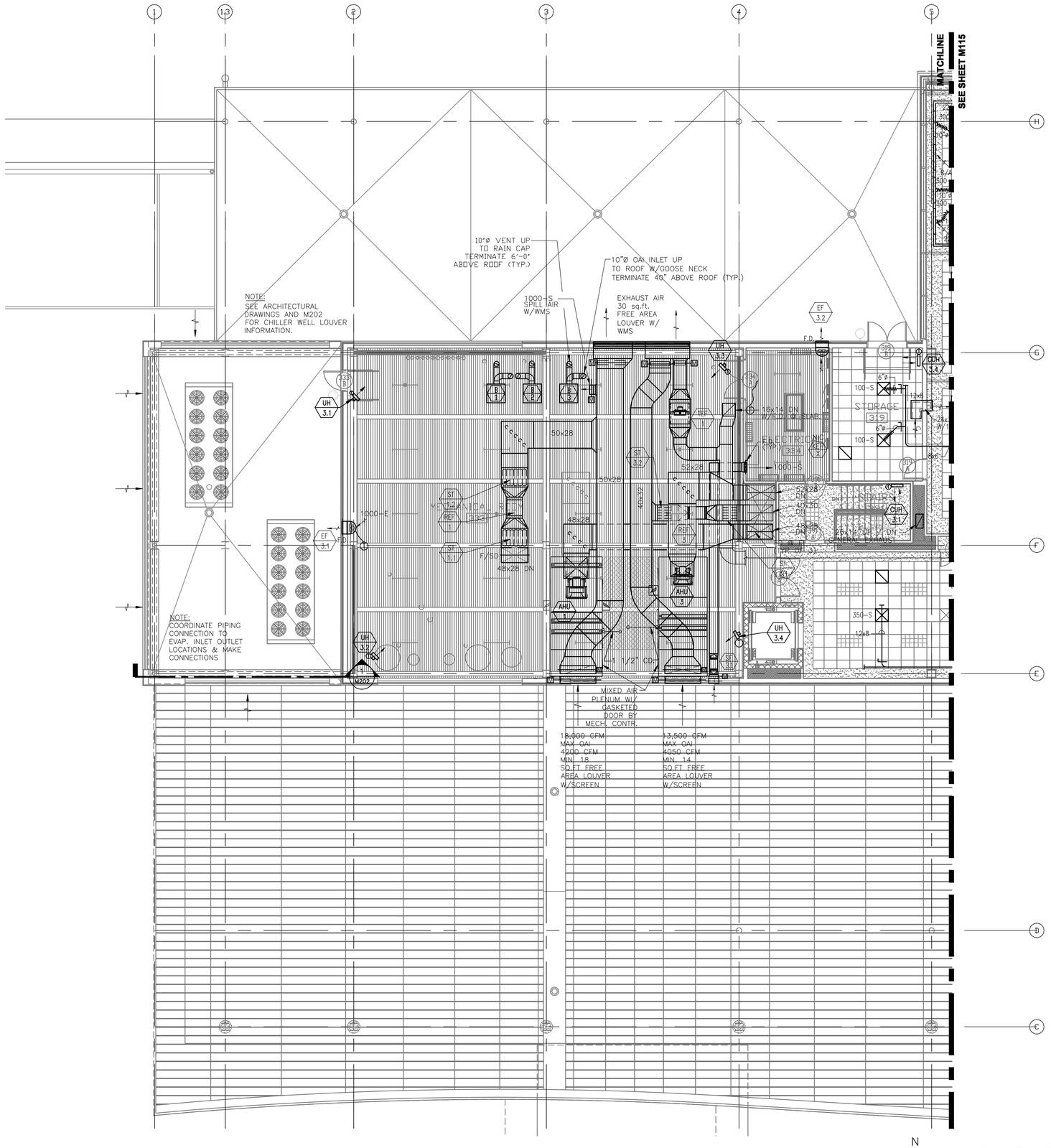
ENLARGED SECOND FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER

M113

90% NOT FOR CONSTRUCTION

Drawings: X:\2008.00 Duluth Airport\5.0 CADD\[5.4] 100CS\Dwgs\2008_M113.dwg Plotted on: 4/9/2010 4:16 PM Plotted by: Brandt, Mark



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NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
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DRAWN BY: MB/JH
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AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER
M114

90% NOT FOR CONSTRUCTION

Drawing: K:\2882.00 Duluth Airport\A.0 CADD\[A.4] HVAC\Dwgs\2882_M114.dwg Plotted on: 4/9/2010 4:11 PM Plotted by: Brandt, Mark

MATCHLINE
SEE SHEET M114

5 6 7 8 9 10 11 11.7 12

H G F E

EXHAUST AIR 70.0 sq.ft. FREE AREA LOUVER AND SCREEN.

IN-LINE EXH. FAN MOUNTED VERTICALY

16x14 DOWN W/F.D. @ SLAB

100x30 R/A DOWN TO MIXING BOX DAMPER

20,000 CFM OAI MAX. 25 sq.ft. FREE AREA LOUVER W/WMS

30,000 CFM OAI 38 sq.ft. FREE AREA LOUVER W/WMS

10x8 DN W/FD @ SLAB

EF 3.4 IN-LINE-EXH.FAN MOUNTED VERTICALLY

1 1/2" CD.

2" CD.

AT RETURN DUCT BELOW

AT OA DUCT BELOW

R/A OPENING ABOVE CEILING 30x18

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

N

Drawing: N:\2008.00 Duluth Airport\4.0 CADD\[4.4] HVAC\Dwgs\M115_M116.dwg Plotted on: 4/9/2010 4:12 PM Plotted by: Brandi, Mark

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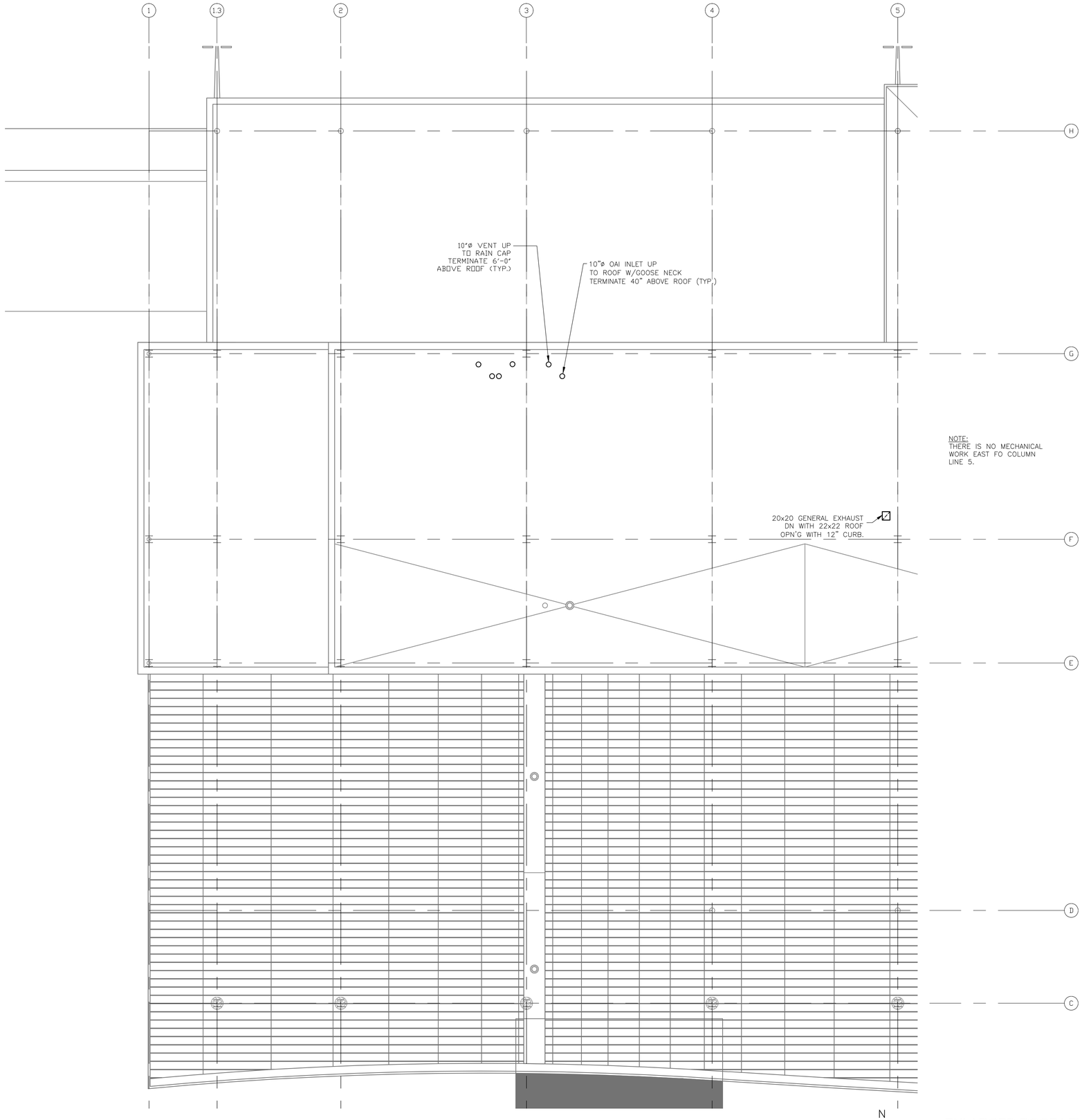
SHEET TITLE

ENLARGED THIRD FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER

M115

90% NOT FOR CONSTRUCTION



N

1 ENLARGED ROOF LEVEL PLAN - AREA A

1/8" = 1'-0"

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AEP PROJECT NUMBER
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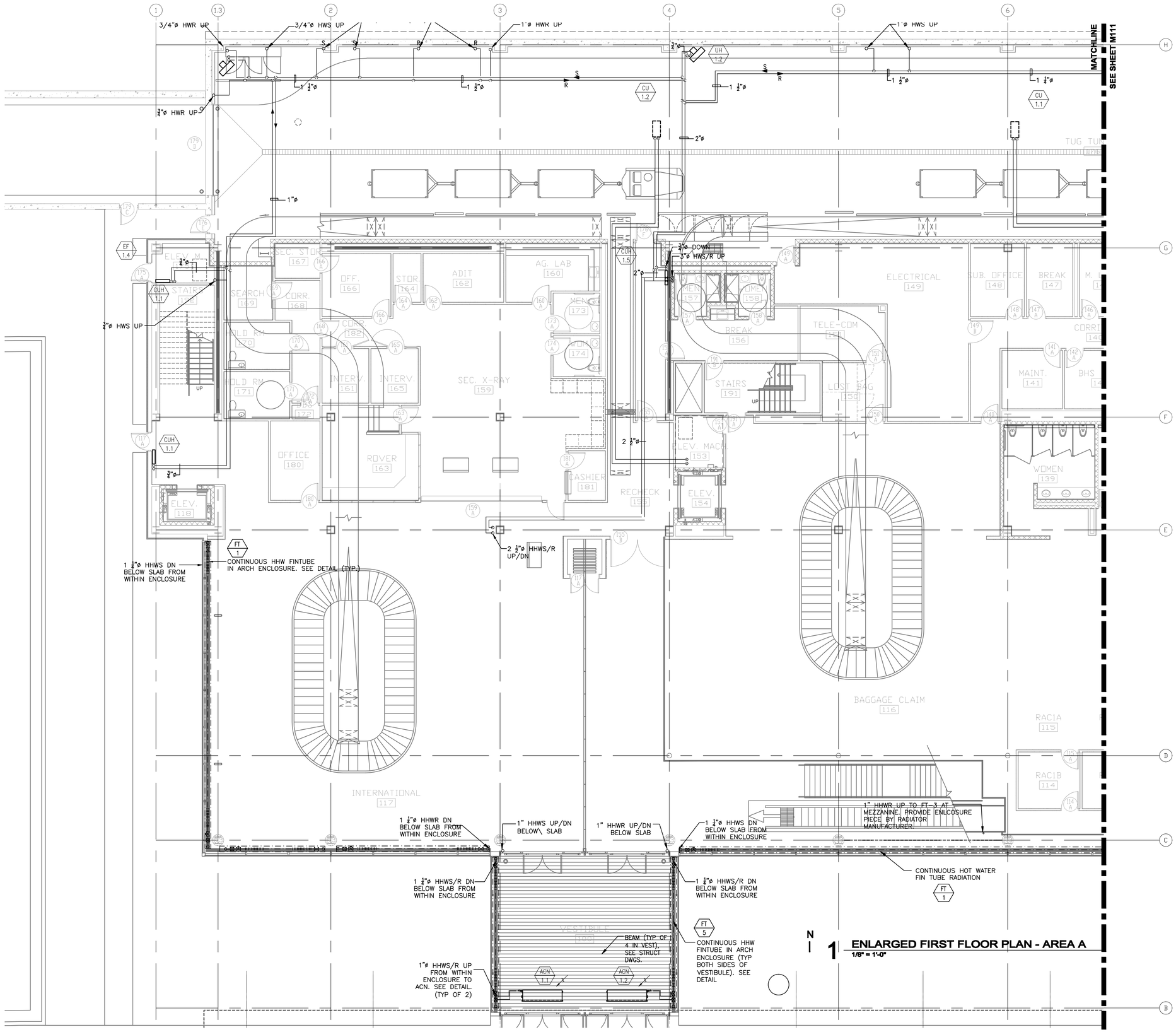
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SHEET TITLE
ENLARGED ROOF LEVEL MECHANICAL PLAN AREA A

SHEET NUMBER
M116

90% NOT FOR CONSTRUCTION

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REVISIONS

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DATE ISSUED: 04-12-10
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DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

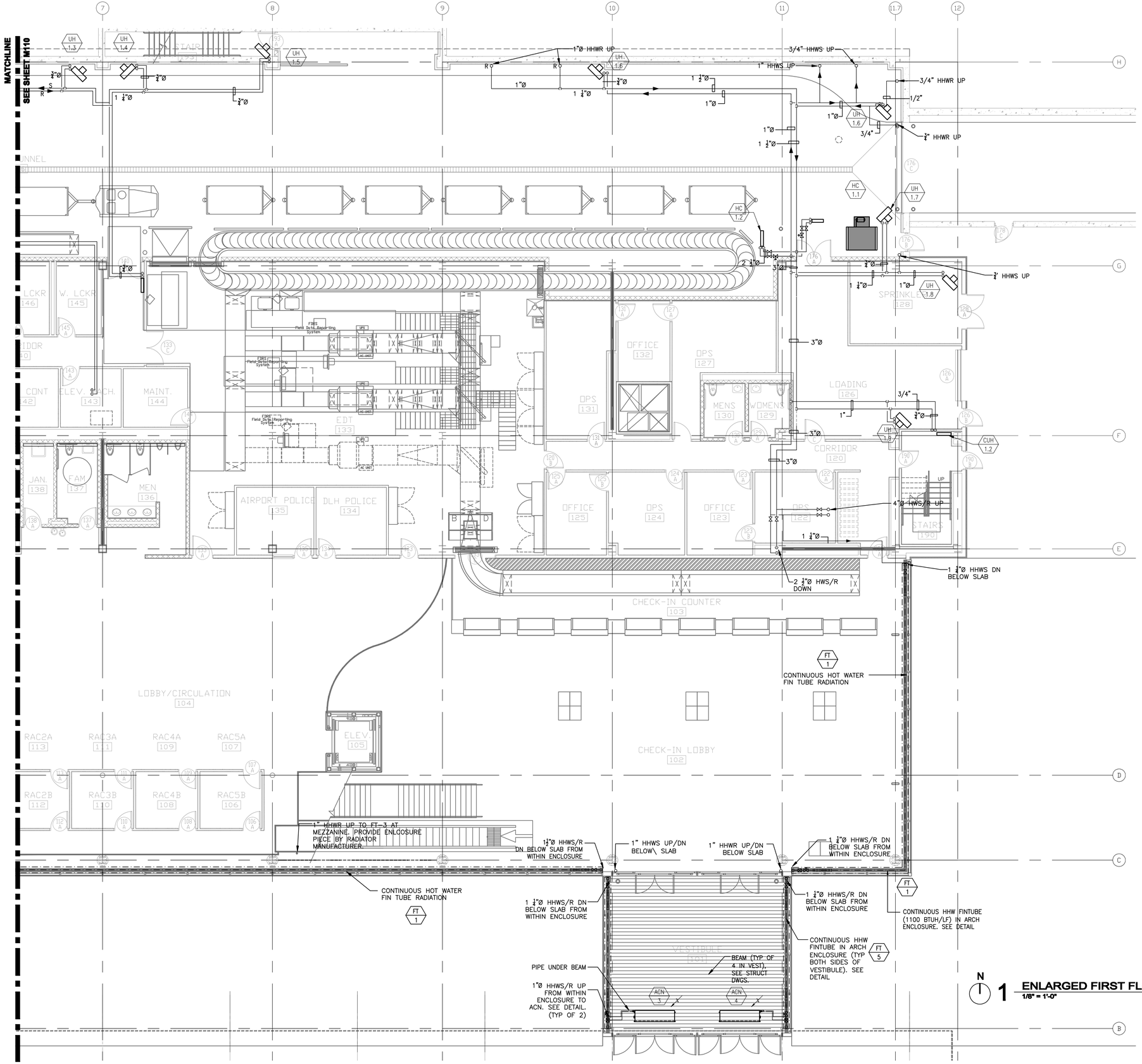
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SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER
MP110

90% NOT FOR CONSTRUCTION

Drawing: H:\2010.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\MP110.dwg Plotted on: 4/9/2010 4:09 PM Plotted by: Brandi, Mark



N

1 ENLARGED FIRST FLOOR PLAN - AREA B

1/8" = 1'-0"

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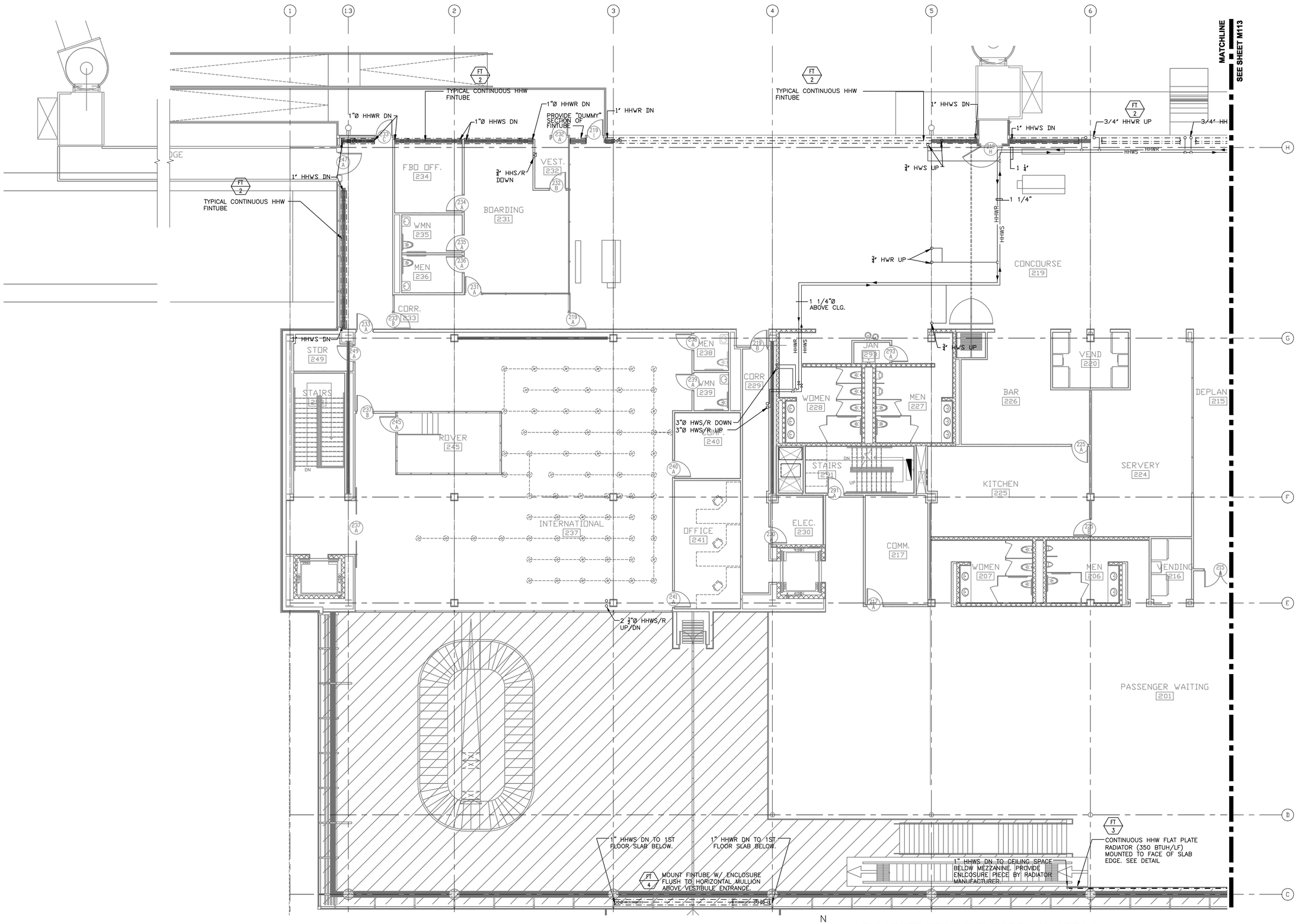
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SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER
MP111

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1 ENLARGED SECOND FLOOR PLAN - AREA A

1/8" = 1'-0"

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: XXX
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER

MP112

90% NOT FOR CONSTRUCTION

Drawing N:\2010\0 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2010_MP112.dwg Plotted on: 4/9/2010 4:54 PM Plotted by: Brandt, Mark

MATCHLINE
SEE SHEET M112

7 8 9 10 11 11.7 12

FT 2 — TYPICAL CONTINUOUS HHW FINTUBE
FT 2 — TYPICAL CONTINUOUS HHW FINTUBE
FT 2 — CONTINUOUS HHW FINTUBE
FT 2 — CONTINUOUS HHW FINTUBE

3/4" HHWS UP
3/4" HHWS UP
3/4" HHWR UP
1" HHWR DN
1"Ø HHWR DN.
1"Ø HHWR DN
1" HHWS DN
1"ø HHWS DN
1"Ø ABOVE CLG.
HHWS
HHWR
1"ø
3/4" HWS UP (TYP.)
3/4" HWR UP (TYP.)
3/4" HHWS UP
1" HHWR DN
1" HHWS DN

FIXED BRIDGE 248

DEPLANING 215
TSA QUEUE 214
TSA CHECKPOINT 208
STOR 209
FAM 223
WOMEN 222
MEN 221
CORR. 203
ELEC. 205
TELECOM 204
TSA 213
TSA 212
TSA 211
REMOTE V 210
CONF 250
OFFICE 251
STOR. 252
HLCHR 253
CORRIDOR 202
STAIRS 290
4"Ø HHWS/R UP & DOWN

AITING

FT 3 — CONTINUOUS HHW FLAT PLATE RADIATOR (350 BTUH/LF) MOUNTED TO FACE OF SLAB EDGE. SEE DETAIL
PLATE
SLAB
1" HHWR DN TO CEILING SPACE BELOW MEZZANINE. PROVIDE ENCLOSURE PIECE BY RADIATOR MANUFACTURER.
1" HHWS DN TO 1ST FLOOR SLAB BELOW.
1" HHWR DN TO 1ST FLOOR SLAB BELOW.
FT 4 — MOUNT FINTUBE W/ ENCLOSURE FLUSH TO HORIZONTAL MULLION ABOVE VESTIBULE ENTRANCE.

N

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

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW TERMINAL DESIGN

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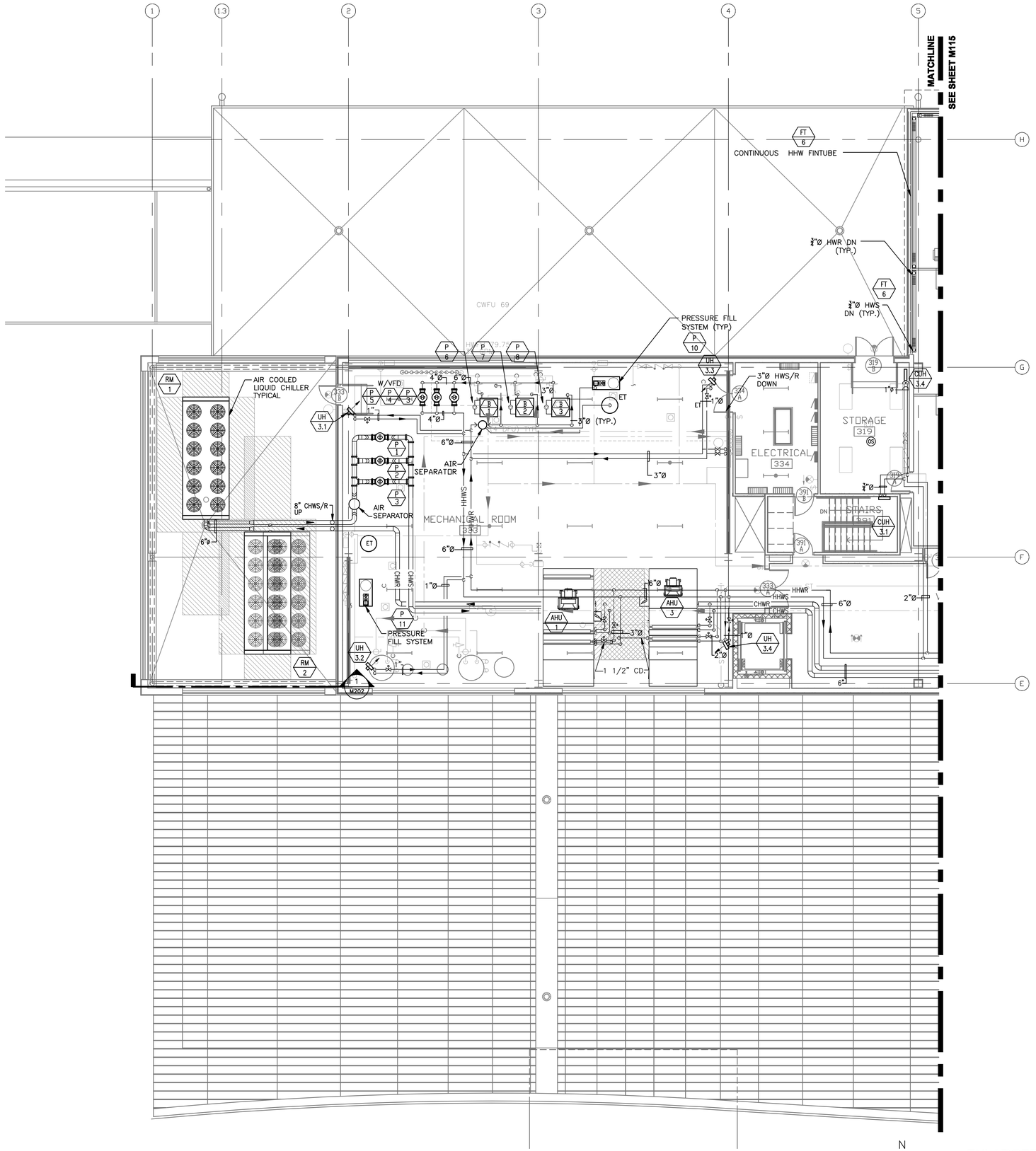
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SHEET TITLE
ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER
MP113

90% NOT FOR CONSTRUCTION

Drawing: k:\2008.00 Duluth Airport\5.0 CAD\(5.4) M&C\Dwgs\2008_MP113.dwg Plotted on: 4/9/2010 4:02 PM Plotted by: Brandi, Mark



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

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DRAWN BY: MB/JH
DESIGNED BY: MXB

AEP PROJECT NUMBER
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SHEET TITLE

ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER

MP114

90% NOT FOR CONSTRUCTION

Drawing N:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_MP114.dwg Plotted on: 4/9/2010 4:46 PM Plotted by: Brandt, Mark

MATCHLINE
SEE SHEET M112

CONTINUOUS HHW FINTUBE
3/4" HWR DN (TYP.)
3/4" HWS DN (TYP.)

OPS CONF. 320
EXEC DIR 323
OPS 324
DIR. 325
DIR. 326
OFF. 327
CORR. 317
COPY 331
OPEN OFFICE 328
BADGE 322
OFFICE 332
EMERG OPS 318
COMM/ELEC. 313
RECEPT 321
JAN. 314
STORAGE 305
M. LOCKRM. LCKR 309 308
TRAINING 307
OFFICE 311
OFFICE 312
MECHANICAL ROOM 304
WAITING 301
WOM 316
MEN 315
UNUSED 336
BREAK 310
CORRIDOR 302
CORRIDOR 330

1" (TYP.)
1/2"
3/4" (TYP.)
1 1/4"
1 1/2" CD.
2" CD.
3/4
4"ø HWS/R DOWN
2 1/2"Ø
3"Ø
4"Ø
6"Ø
2"Ø

HHWR HHWS CHWR CHWS

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

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

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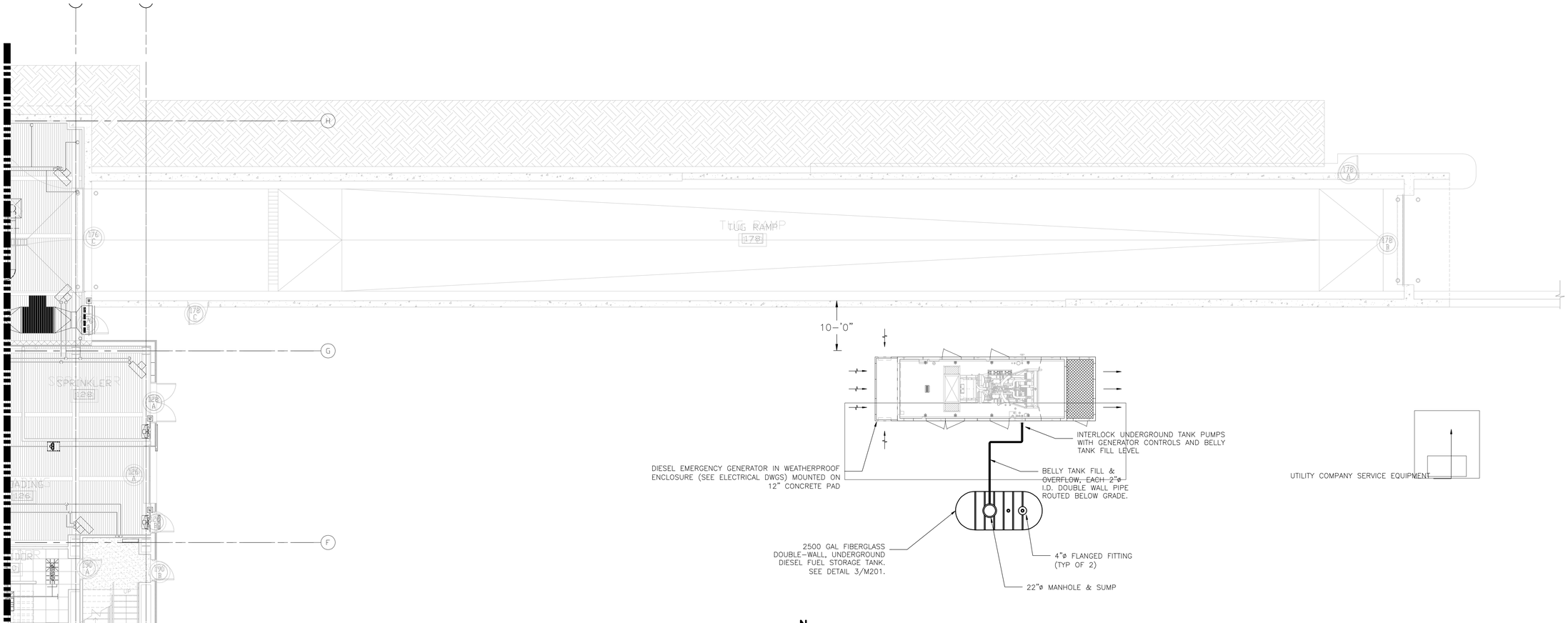
SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER
MP115

90% NOT FOR CONSTRUCTION

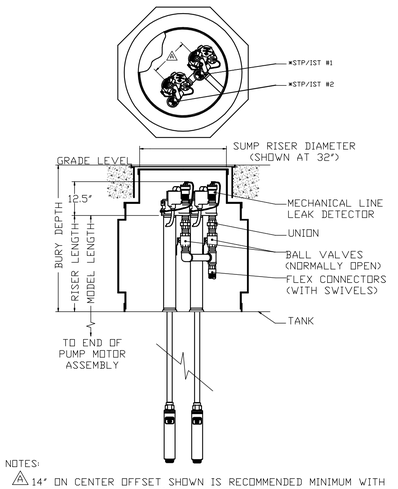
Drawing: k:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_MP115.dwg Plotted on: 4/9/2010 4:09 PM Plotted by: Brandt, Mark

MATCHLINE - SEE SHEET M111



N

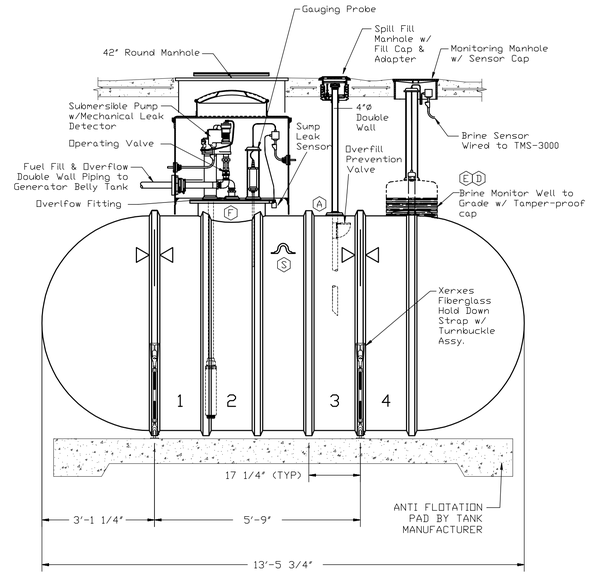
1 ENLARGED FIRST LEVEL TUG TUNNEL EAST
1/8" = 1'-0"



NOTES:

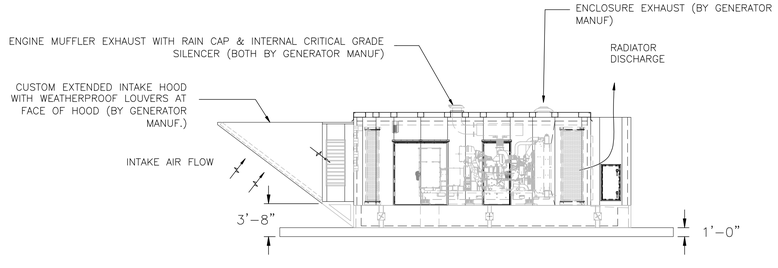
Ⓐ 14" ON CENTER OFFSET SHOWN IS RECOMMENDED MINIMUM WITH INSTALLATION OF STP/IST #1 PRIOR TO THAT OF STP/IST #2. A SMALLER OFFSET OR OTHER CHANGES TO THE STP/IST INSTALLATION MAY REQUIRE A LARGER SUMP RISER DIAMETER, ALTERATIONS OR ADDITIONS TO THE PIPING SHOWN, TURNING OF THE STP/IST'S OTHER THAN SHOWN TO ACCOMMODATE PIPING, OR DISASSEMBLY OF THE JUNCTION BOX FROM THE STP/IST TO ALLOW FOR TURNING OF ASSEMBLY INTO THE TANK. MINIMUM OFFSET OF STP/IST'S IS 12".

*STP/IST MUST BE USED WITH EITHER THE STP-SC OR IST-VFC (IST 2 HP ONLY) CONTROLLERS FOR PROPER MECHANICAL LINE LEAK DETECTION.



Ⓐ 4" NPT SERVICE FITTING WITH 12"x12" STRIKER PLATE
Ⓓ 4" NPT MONITOR FITTING
Ⓔ 18" DIA. HYDROSTATIC MONITORING RESERVOIR WITH 4" NPT FITTING
Ⓕ 22" DIA. MANWAY WITH (4) 4" NPT FITTINGS IN COVER & 4-12"x12" STRIKER PLATES
Ⓢ LIFTING LUG (2 LUGS REQUIRED TOTAL)
⋈ HOLD DOWN STRAP LOCATION

3 UNDERGROUND DOUBLE-WALL FIBERGLASS DIESEL FUEL STORAGE TANK
NOT TO SCALE



2 GENERATOR SOUTH ELEVATION
1/8" = 1'-0"

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NO.	DESCRIPTION	DATE

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213-1882-091 (10-18 WDS)

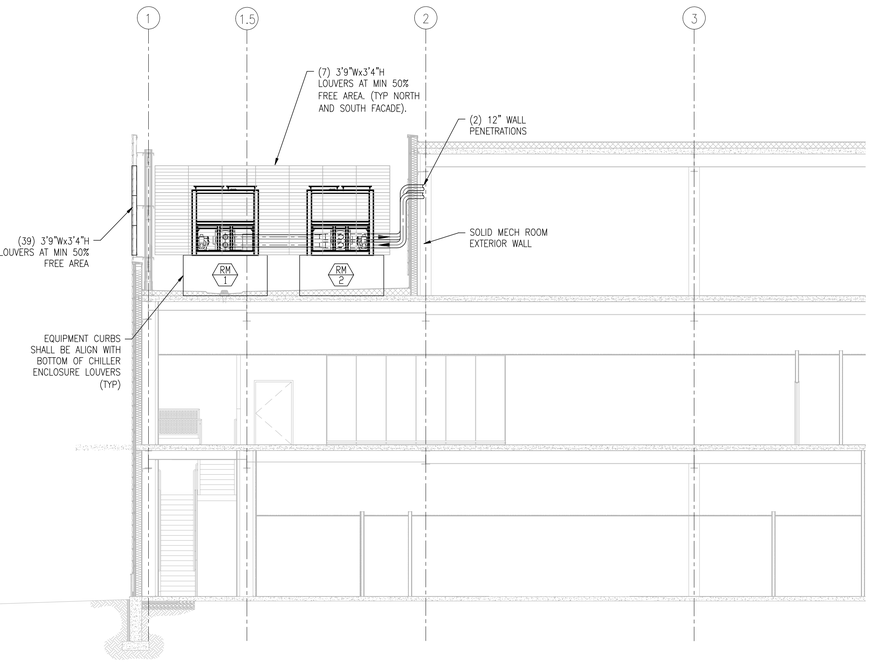
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SHEET TITLE
DIESEL GENERATOR MECHANICAL PLAN & DETAILS

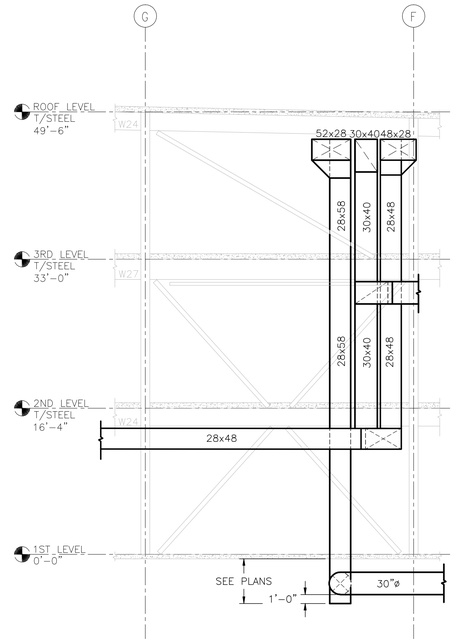
SHEET NUMBER
M201

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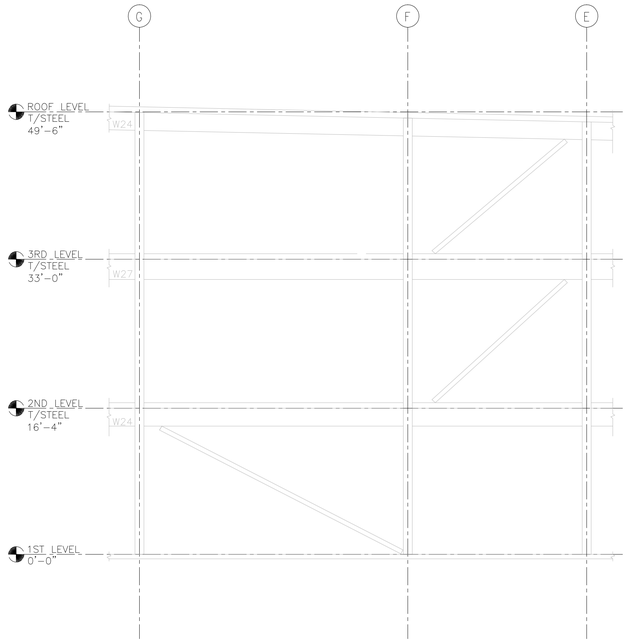
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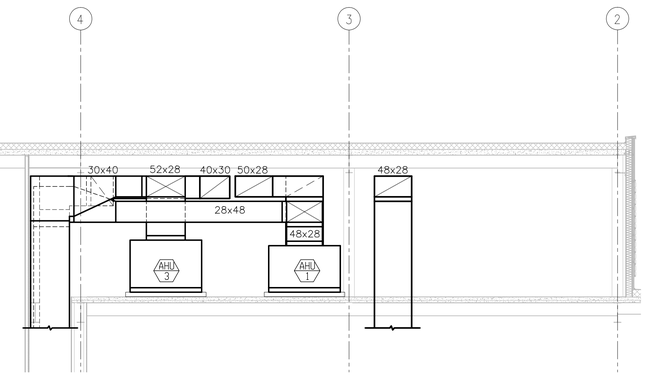
1 CHILLER WELL SOUTH ELEVATION
1/8" = 1'-0"



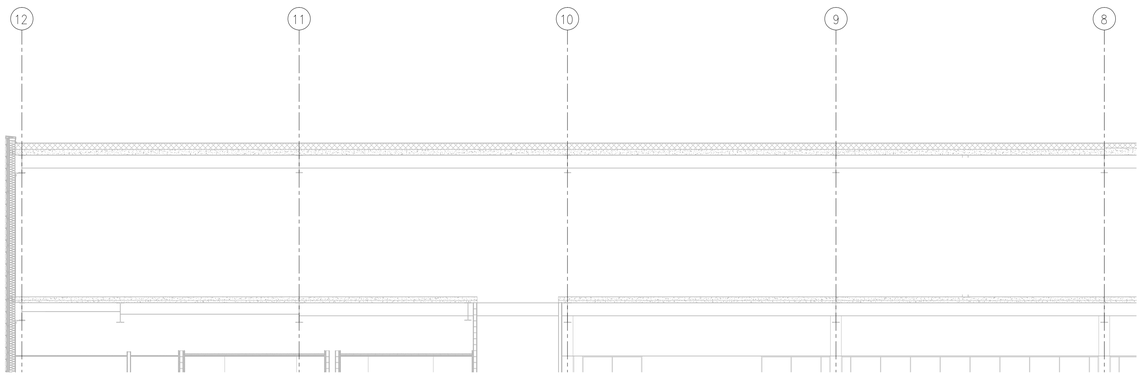
2 DUCTWORK RISER AT COLUMN LINE 4
1/8" = 1'-0"



3 DUCTWORK RISER AT COLUMN LINE 10
1/8" = 1'-0"



4 DUCTWORK SECTION AT EAST MECH RM
1/8" = 1'-0"



5 DUCTWORK SECTION AT WEST MECH RM
1/8" = 1'-0"

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

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213-1882-091

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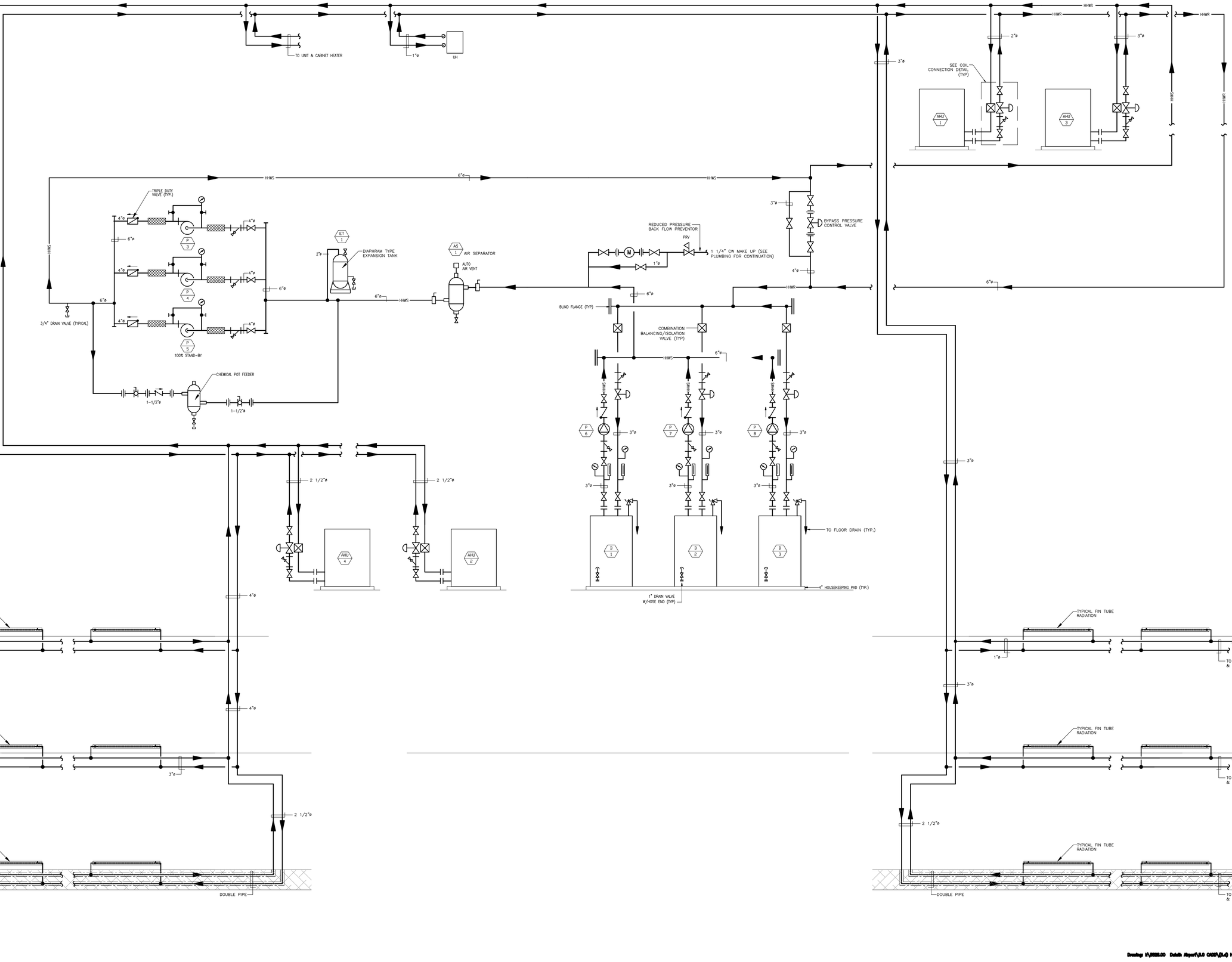
SHEET TITLE

MECHANICAL SECTIONS & ELEVATIONS

SHEET NUMBER
M202

90% NOT FOR CONSTRUCTION

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DESIGNED BY: MXB

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Date: 1/1/00-00 12:00p
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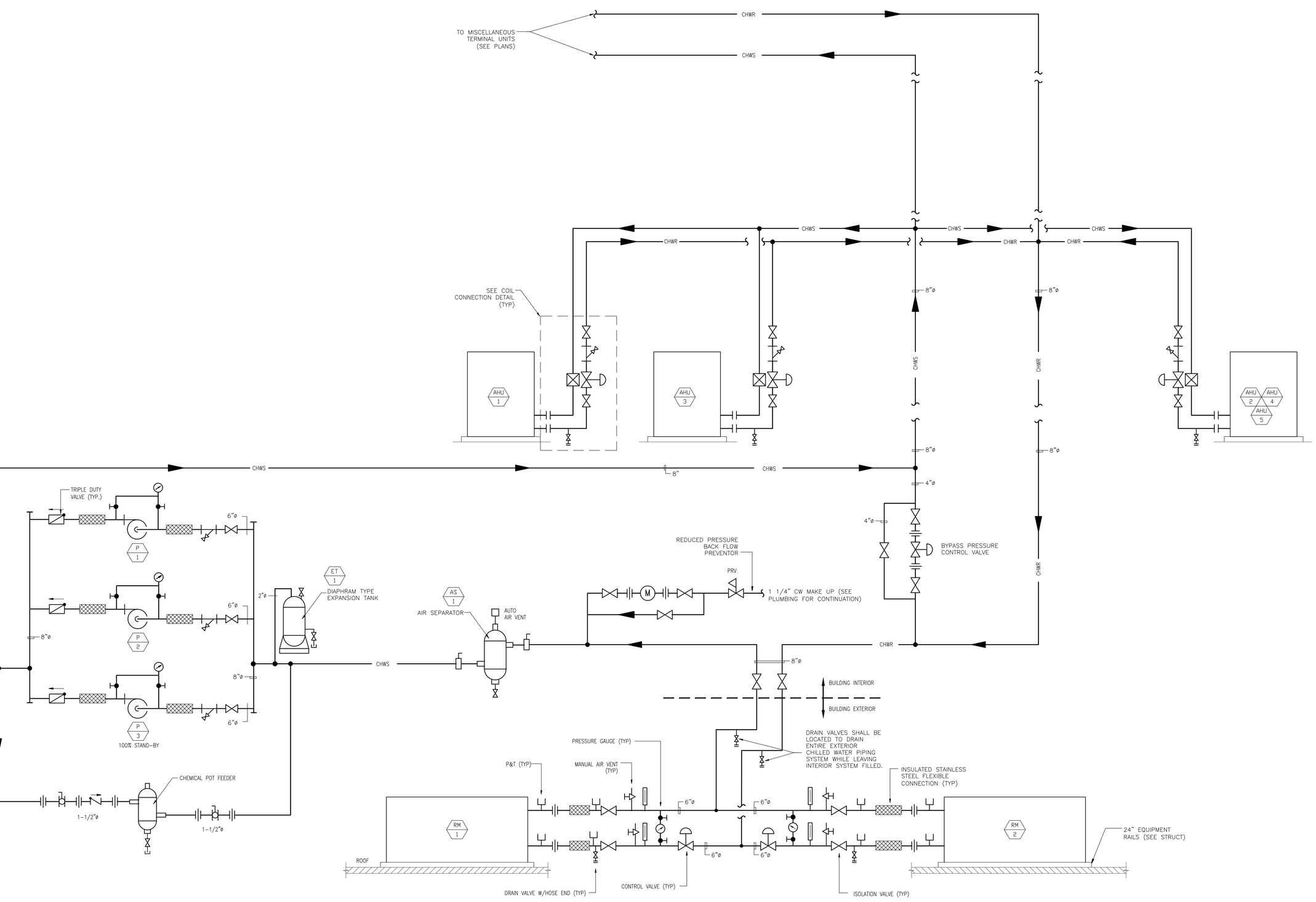
HEATING HOT WATER FLOW DIAGRAM

SHEET NUMBER

M301

90% NOT FOR CONSTRUCTION

Drawing N:\2008.00 Duluth Airport\3.0 CADD\3.4) HVAC\Dwgs\M308_M301.dwg Plotted on: 4/9/2010 3:10 PM Plotted by: Brandt, Mark



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SHEET TITLE
CHILLED WATER FLOW DIAGRAM

SHEET NUMBER
M302

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Drawings H:\2008.00 Duluth Airport\LO CAD\(LO) HVAC\Dwgs\M302_M302.dwg Plotted on: 4/9/2010 2:10 PM Plotted by: Brandt, Mark

AIR HANDLING UNIT UNIT SCHEDULE

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.		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)						AIR (IN)	WTR (FT)	TYPE	NO.	SIZE EACH FILTER	TYPE	NO.	SIZE EACH FILTER			
											DB	DB	WB	DB	WB	DB	WB			DB	DB																						
AIRSIDE WEST	333 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	1,127.0	180	150	75.1	150	27.00	550	0.33	4.28	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/50	TRANE M-SERIES	SEE BELOW
CORE	304 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	679.9	180	150	45	150	60.38	550	0.13	0.08	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/50	TRANE M-SERIES	SEE BELOW
LANDSIDE WEST	333 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	1,405.5	180	150	93.6	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/50	TRANE M-SERIES	SEE BELOW
LANDSIDE EAST	304 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	1,405.5	180	150	93.6	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/50	TRANE M-SERIES	SEE BELOW
AIRSIDE EAST	304 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	1,127.0	180	150	75.1	150	27.00	550	0.33	4.28	PLEATED MERV-8	-	-	CART. MERV-13	-	12" DEEP	460/3/50	TRANE M-SERIES	SEE BELOW

FD WITH INTEGRAL DISCONNECT SWITCH.

FAN SCHEDULE

	LOCATION	SERVICE	CFM	STATIC PRESS. IN.W.G.	TYPE	DRIVE	RPM	BHP	MOTOR HP	VOLT/PH/HZ	MFR.	MODEL NO.	REMARKS
	TUG TUNNEL	TUG TUNNEL	16,000	1.50	INLINE CENT	BELT	992	8.47	10	480/3/60	TWIN CITY	330 TSL	1, 2, 3, 4, 5, 6 W/ VFD, SIDE MOTOR MOUNT
	TUG TUNNEL	TUG TUNNEL	17,600	0.25	PROP	BELT	1043	1.68	2	480/3/60	TWIN CITY	42BTC TCWP	1, 2, 3, 4, 5 W/ VFD
	1ST FL TELE-COMM	1ST FL TELE-COMM	400	0.25	PROP	DIRECT	1350	-	1/8	120/1/60	TWIN CITY	100A TCPE	1, 2, 4
	1ST FL ELECTRICAL	1ST FL ELECTRICAL	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
	WEST ELEV MACH ROOM	WEST ELEV MACH ROOM	400	0.25	PROP	DIRECT	1350	-	1/8	120/1/60	TWIN CITY	100A TCPE	1, 2, 4
	LOADING 126	RECYCLING 127	300	0.50	INLINE CENT	BELT	1250	0.05	1/4	120/1/60	TWIN CITY	080A BSI	1, 2
	SPRINKLER 126	SPRINKLER 126	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
	LOADING 126	LOADING 126	2,400	0.25	PROP	DIRECT	1750	-	1/4	120/1/60	TWIN CITY	16 DTC TCWP	1, 2, 4
	WEST MECH RM	WEST MECH RM	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
	ELECT 334	ELECT 334	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
	EAST MECH RM	EAST MECH RM	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
	EAST MECH RM	2ND FL ELEC & TELECOM	300	0.50	INLINE CENT	BELT	1250	0.05	1/4	120/1/60	TWIN CITY	080A BSI	1, 2
	WEST MECH RM	WEST TOILET ROOMS	2,500	1.00	INLINE CENT	BELT	1799	1.13	1 1/2	480/3/60	TWIN CITY	150 TSL	1, 2
	EAST MECH RM	EAST TOILET ROOMS	2,500	1.00	INLINE CENT	BELT	1799	1.13	1 1/2	480/3/60	TWIN CITY	150 TSL	1, 2
	WEST MECH RM	AHU-1	12,150	1.50	INLINE CENT	BELT	1020	5.4	7 1/2	480/3/60	TWIN CITY	300 TSL	1, 2 W/ VFD
	EAST MECH RM	AHU-2	38,250	2.00	INLINE CENT	BELT	690	20	25	480/3/60	TWIN CITY	490 TSL	1, 2 W/ VFD
	WEST MECH RM	AHU-3	16,200	2.00	INLINE CENT	BELT	850	8.9	10	480/3/60	TWIN CITY	365 TSL	1, 2 W/ VFD
	EAST MECH RM	AHU-4	16,200	2.00	INLINE CENT	BELT	850	8.9	10	480/3/60	TWIN CITY	365 TSL	1, 2 W/ VFD
	EAST MECH RM	AHU-5	12,150	1.50	INLINE CENT	BELT	1020	5.4	7 1/2	480/3/60	TWIN CITY	300 TSL	1, 2 W/ VFD

OMBINATION STARTER/DISCONNECT.
SHA BELT & MOTOR GUARD.
O HAVE NEMA 4X ENCLOSURE WITH VENT FAN AND STRIP HEATER FOR COLD START
L DESIGN.
PLOSION PROOF MOTOR.
ALL SLEEVE WITH INTEGRAL BACKDRAFT DAMPER (U.N.O W/ MOTORIZED DAMPER ON DRAWINGS)

FAN POWERED TERMINAL UNIT SCHEDULE

T SIZE-LET METER CHES	AIRFLOW RANGE (CFM)	PRIMARY AIR MINIMUM (CFM)	PRIMARY AIR MAXIMUM (CFM)	roof load 5.5xSF	wall load	HOT WATER HEATING COIL MBH	HOT WATER HEATING COIL GPM	HOT WATER HEATING COIL P.D. (FT W.C.)	FAN CFM COOLING MINIMUM	FAN CFM COOLING MAXIMUM		FAN CFM HEATING	FAN ESP (IN.)	FAN RPM	FAN HP	ELECT DATA VOLT/PH	ELECT DATA FLA	MANUFACTURER AND MODEL NUMBER	REMARKS
10"	200-1100		900							900	0.00	0	0.3	1750	1/2	277/1	3.1	NAILOR 35 SWST 9	DDC W/ ECM MOTOR
- 8"	110-475		400			10				400	462.96	460	0.3	1750	1/3	277/1	1.9	NAILOR 35 SWST	DDC W/ ECM MOTOR
16"	1400-3400	830	2500	4125	11000	55	3.5	1.5	1400	2220	1918.731481	1900	0.37	1750	2@3/4	277/1	9.2	NAILOR 35 SWST	DDC W/ ECM MOTOR
14"	500-2000	375	1300	3630	2750	22	1.5	0.35	500	1300	726.6203704	730	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
12"	500-2000	450	1125	7312.5	9625	33	3	1.5	500	1125	1197.75463	1200	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
12"	500-2000	400	1150	6875		23	1.5	0.35	500	1150	748.287037	750	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
12"	500-2000	375	1470	3630	2750	22	1.5	0.35	500	1470	726.6203704	730	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
10"	200-1100	200	890	2475	7500	17	1	1.25	200	890	631.8055556	630	0.36	1750	1/2	277/1	3.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
14"	500-2000	600	1510	6600		27	2	0.7	600	1510	815.5555556	820	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
16"	1400-3400	865	2200	14025		54	3.5	1.5	1400	2200	1866.055556	1900	0.37	1750	2@3/4	277/1	9.2	NAILOR 35 SWST	DDC W/ ECM MOTOR
10"	200-1100	300	880	5225		16	1	1.25	300	880	496.8981481	500	0.36	1750	1/2	277/1	3.1	NAILOR 35 SWST	DDC W/ ECM MOTOR

VAV TERMINAL UNIT SCHEDULE

TAG	INLET DIAM. (IN.)	CFM			HEATING CAPACITY			MANUFACTURER & MODEL	REMARKS
		MAXIMUM CAPACITY	MAXIMUM SETTING	MINIMUM SETTING	MBH	GPM	P.D. (FT W.G.)		
FIRST FLOOR									
VAV-1.1	8	1000	600	60	-	-	-	NAILOR 3001	
VAV-1.2	8	1000	760	80	-	-	-	NAILOR 3001	
VAV-1.3	12	2185	1400	100	-	-	-	NAILOR 3001	
VAV-1.4	6	500	370	50	-	-	-	NAILOR 3001	
VAV-1.5	10	1300	880	90	-	-	-	NAILOR 3001	
VAV-1.6	12	2185	1690	200	-	-	-	NAILOR 3001	
VAV-1.7	7	710	410	50	-	-	-	NAILOR 3001	
VAV-1.8	8	1000	590	60	-	-	-	NAILOR 3001	
VAV-1.9	12	2185	1630	200	-	-	-	NAILOR 3001	
VAV-1.10	8	1000	570	60	-	-	-	NAILOR 3001	
VAV-1.11	10	1435	1040	100	-	-	-	NAILOR 3001	
VAV-1.12	6	500	240	50	-	-	-	NAILOR 3001	
VAV-1.13	6	500	360	50	-	-	-	NAILOR 3001	
VAV-1.14	9	1300	950	100	-	-	-	NAILOR 3001	
SECOND FLOOR									
VAV-2.1	12	2185	1400	100	-	-	-	NAILOR 3001	
VAV-2.2	12	2185	1600	200	-	-	-	NAILOR 3001	
VAV-2.3	8	1000	575	60	-	-	-	NAILOR 3001	
VAV-2.4	9	1300	965	50	-	-	-	NAILOR 3001	
VAV-2.5	7	710	440	40	-	-	-	NAILOR 3001	
VAV-2.6	12	2185	1420	100	-	-	-	NAILOR 3001	
VAV-2.7	9	1300	980	50	-	-	-	NAILOR 3001	
VAV-2.8	12	2185	1500	200	-	-	-	NAILOR 3001	
VAV-2.9	8	1000	650	70	-	-	-	NAILOR 3001	
VAV-2.10	8	1000	710	70	-	-	-	NAILOR 3001	
VAV-2.11	8	1000	665	70	-	-	-	NAILOR 3001	

NOTES:
1. ALL UNIT SHALL BE DDC CONTROLLED.
2. MINIMUM CFM SETTING SHALL BE SCHEDULED VALUE OR VAV BOX MINIMUM CAPACITY, WHICHEVER IS GREATER.

CAV TERMINAL UNIT SCHEDULE

TAG	INLET DIAM. (IN.)	CFM			HEATING CAPACITY			MANUFACTURER & MODEL	REMARKS
		MAXIMUM CAPACITY	MAXIMUM SETTING	MINIMUM SETTING	MBH	GPM	P.D. (FT W.G.)		
SECOND FLOOR									
CAV-2.1	SEE PLANS	4375	3500	700	-	-	-	NAILOR 1120	SEE BELOW

NOTES:
1. ALL UNIT SHALL BE DDC CONTROLLED W/ ELECTRIC ACTUATOR, OPPOSED BLADE LOW LEAKAGE CONTROL DAMPER W/ AIRFOIL BLADES.
2. PROVIDE VOLU-PROBE/VS AIR-MONITORING STATION FOR PRESSURE INDEPENDENT CONTROL OF CAV CONTROL DAMPER.
3. CONTRACTOR SHALL PROVIDE ALL EXTERNAL CONTROLS & BMS PROGRAMMING FOR CAV TO FUNCTION IN SAME MANNER AS VAV TERMINAL UNIT.

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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: 04-12-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: XX

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES I

SHEET NUMBER
M401

90% NOT FOR CONSTRUCTION

Drawings I:\2008.00 Duluth Airport\4.0 CADD\[4.4] Mech\Dwgs\2008_M401.dwg Plotted on: 4/9/2010 3:10 PM Plotted by: Brandi, Mark

PACKAGED AIR COOLED WATER CHILLER SCHEDULE

SERVICE	LOCATION	CHILLER DATA						COMPRESSOR DATA					CONDENSER DATA				TOTAL KW UNIT	V/PH/HZ	WEIGHT (LBS)	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				
CHW SYSTEM	WEST LOW ROOF	200	311.6	58	42	5.3	0.0001	2	ROTARY	203.1	R-134a	215	12	12	1.5	82	221.6	460/3/60	12,784	TRANE RTAC 200
CHW SYSTEM	WEST LOW ROOF	200	311.6	58	42	5.3	0.0001	2	ROTARY	203.1	R-134a	215	12	12	1.5	82	221.6	460/3/60	12,784	TRANE RTAC 200

SINGLE POINT POWER CONNECTION. MCA: 412 AMPS, MOCP: 500 AMPS
UNIT MOUNTED WYE-DELTA STARTER.
LOW AMBIENT CONTROL ON CONDENSER AND FREEZE PROTECTION KIT ON EVAPORATOR. PROVIDE LOW POINT DRAINS AND ATOMSPHERIC FILL PORT ON EVAPORATOR.
IENCY MUST MEET MINIMUM ASHRAE STANDARD 90.1-2007 REQUIREMENTS.

HIGH EFFICIENCY GAS FIRED HOT WATER BOILER SCHEDULE

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
01 MECH RM	3,000	2,800		280	160	180	28	10"	NATURAL GAS	COND.	150	FULTON PHW 3000	
01 MECH RM	3,000	2,800		280	160	180	28	10"	NATURAL GAS	COND.	150	FULTON PHW 3000	
01 MECH RM	3,000	2,800		280	160	180	28	10"	NATURAL GAS	COND.	150	FULTON PHW 3000	STAND-BY

HALL BE HIGH-EFFICIENCY CONDENSING TYPE WITH SINGLE HEAT EXCHANGER. VENT MATERIAL PER MANUFACTURER'S RECOMMENDATION.
" SEALED COMBUSTION AIR INTAKE. MATERIAL PER MANUFACTURER'S RECOMMENDATION.
PRESSURE SHALL BE 7"-11" W.C.
ONDENSATE NEUTRALIZATION SYSTEM.
US & FULTON ACCEPTABLE MANUFACTURER

PUMP SCHEDULE

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
CHILLED WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	315	80	150	9.08	15	1750	480/3/60	B&G SERIES 80SC 4x4x11	1
CHILLED WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	315	80	150	9.08	15	1750	480/3/60	B&G SERIES 80SC 4x4x11	1
CHILLED WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	315	80	150	9.08	15	1750	480/3/60	B&G SERIES 80SC 4x4x11	1, 100% STANDBY
HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	280	80	150	7.85	10	1750	480/3/60	B&G SERIES 80SC 3x3x9-1/2B	1
HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	280	80	150	7.85	10	1750	480/3/60	B&G SERIES 80SC 3x3x9-1/2B	1
HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	280	80	150	7.85	10	1750	480/3/60	B&G SERIES 80SC 3x3x9-1/2B	1, 100% STANDBY
BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100	30	150	1.25	1.5	1750	480/3/60	B&G SREIES 90 2A	2
BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100	30	150	1.25	1.5	1750	480/3/60	B&G SREIES 90 2A	2
BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100	30	150	1.25	1.5	1750	480/3/60	B&G SREIES 90 2A	2, 100% STANDBY
CHW PRESSURE FILL	301 MECHANICAL RM	END SUCTION CENT	1035 GPH	20 PSI	150	-	1/3	1750	120/1/60	B&G BPF-3H3005M	
W PRESSURE FILL	301 MECHANICAL RM	END SUCTION CENT	1035 GPH	20 PSI	150	-	1/3	1750	120/1/60	B&G BPF-3H3005M	

FD WITH INTEGRAL DISCONNECT.
WITH BOILER CONTROLS.

CABINET UNIT HEATER SCHEDULE

SERVICE	LOCATION	MBH	EWT (F)	LWT (F)	GPM	CFM	HP	V/Ph/Hz	MANUF. & MODEL NUMBER	REMARKS
STAIRS #192	STAIRS #192	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
ELEVATOR #175	ELEVATOR #175	22.8	180	160	2.3	300	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
STAIRS #190	STAIRS #190	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
VEST. #232	VEST. #232	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
STAIRS #391	STAIRS #391	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
STAIRS #390	STAIRS #390	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CORRIDOR #304	CORRIDOR #304	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
STORAGE #319	STORAGE #319	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3

x 47"H x 9 1/2" DEEP
AIR FILTER
NTEGRAL LINE VOLTAGE THERMOSTAT AND NON-FUSED DISCONNECT.

HYDRONIC AIR CURTAIN SCHEDULE

AREA SERVED	LOCATION	TYPE	CFM (HI SPEED)	AIR TEMP RISE @ HI SPEED (°F)	TOTAL CAPACITY MBH	HEATING COIL HOT WATER TEMP (°F) ENT	HEATING COIL HOT WATER TEMP (°F) LVG	HEATING COIL HOT WATER GPM	HEATING COIL HOT WATER PD (FT)	HEATING COIL PRESS. (PSIG)	FAN MOTOR QUANTITY	FAN MOTOR HP	FAN MOTOR RPM	FAN MOTOR V/Ph/Hz	WEIGHT (LBS)	MANUF. & MODEL	REMARKS
VESTIBULE 100	VESTIBULE 100	SUSPENDED	2093	37	87	180	160	8.7		150	2	1/2	1075	208/1/60	271	POWERED AIRE CHS 2-84	1, 2
VESTIBULE 100	VESTIBULE 100	SUSPENDED	2093	37	87	180	160	8.7		150	2	1/2	1075	208/1/60	271	POWERED AIRE CHS 2-84	1, 2
VESTIBULE 101	VESTIBULE 101	SUSPENDED	2093	37	87	180	160	8.7		150	2	1/2	1075	208/1/60	271	POWERED AIRE CHS 2-84	1, 2
VESTIBULE 101	VESTIBULE 101	SUSPENDED	2093	37	87	180	160	8.7		150	2	1/2	1075	208/1/60	271	POWERED AIRE CHS 2-84	1, 2

INGLE POINT POWER CONNECTION WITH CONTROL PANEL AND INTEGRAL LOCKING DISCONNECT.
NTEGRAL THERMOSTATIC AND CONTROL VALVE.

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

HORIZONTAL TYPE UNIT HEATERS SCHEDULE

TAG	AREA SERVED	LOCATION	OUTPUT MBH	EWT (F)	LWT (F)	RPM	CFM	HP	V/Ph/Hz	MANUF. & MODEL NUMBER	REMARKS
UH-1.1	TUG TUNNEL	TUG TUNNEL	34.8	180	160	1070	400	1/20	115/1/60	STERLING HS-48	1
UH-1.2 TO 1.5	TUG TUNNEL	TUG TUNNEL	34.8	180	160	1070	300	1/20	115/1/60	STERLING HS-48	1
UH-1.6	SPRINKLER ROOM #128	SPRINKLER ROOM #128	26.1	180	160	1070	400	1/20	115/1/60	STERLING HS-36	1
UH-1.7	LOADING DOCK #126	LOADING DOCK #126	45	180	160	1070	400	1/20	115/1/60	STERLING HS-60	1
UH-3.1,3.2, 3.3, 3.4	MECH. ROOM #333	MECH. ROOM #333	34.8	180	160	1070	400	1/20	115/1/60	STERLING HS-48	1
UH-3.5, 3.6 & 3.7	MECH ROOM #304	MECH ROOM #304	34.8	180	160	1070	400	1/20	115/1/60	STERLING HS-48	1

1. PROVIDE LINE VOLTAGE THERMOSTAT AND NON-FUSED DISCONNECT.

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
FT-1	1100	180	160	4-1/4" SQ	40	AL	2	1-1/2"	CU	-	-	-	STERLING BARE "B"	1
FT-2	650	180	160	3-1/4" SQ	40	AL	1	1"	CU	8"	8"	TROUGH	STERLING BARE "A"	1, 2, 3
FT-3	350	180	160	-	-	-	-	3/4"	-	11-1/2"	2"	PANEL RADIATOR	RUNTAL R-4	3, 6
FT-4	500	180	160	3-1/4" SQ.	32	AL	1	1"	CU	14-7/16"	4-3/8"	CLASSIC, TOP OUTLET	STERLING JVA VA-AR14	2, 3, 4
FT-5	900	180	160	3-5/8"x4-1/4"	50	AL	1	3/4"	CU	-	-	-	STERLING BARE "B"	1
FT-6	450	180	160	4-1/4"x3-5/8"	40	AL	1	3/4"	CU	10-3/4"	6-1/16"	PEDESTAL, TOP OUTLET	STERLING CUSTOM	2, 3, 5

1. TO BE INSTALLED WITHIN CUSTOM ARCHITECTURAL ENCLOSURE. MOUNT PER MANUFACTURER RECOMMENDATIONS. SEE ARCH & MECH DETAILS.
2. PROVIDE 14 GA STAINLESS STEEL FINISH.
3. PROVIDE TRIM & MITERED END ENCLOSURE PIECES FOR CONITNUOUS APPEARANCE. FINISH SELECTION & MOUNTING HEIGHT BY ARCH. SEE SPECS FOR MORE INFO.
4. PROVIDE EXTRUDED ALUMINUM INLET GRILLES AT UNDERSIDE OF ENCLOSURE.
5. MOUNTING HEIGHT INCLUDES SUPPORTS. SEE ARCH DWGS FOR CUSTOM ENCLOSURE DETAILS.
6. SIDE INLET & OUTLET CONCEALED, SAME-END PIPING CONNECTIONS. SEE MANUF INFO FOR REQUIRED # OF CONNECTIONS. SURFACE WALL MOUNT W/ CONCEALED BRACKET, FASTENERS & STIFFENERS.

AIR SEPARATOR SCHEDULE

TAG	SERVICE	LOCATION	SIZE	GPM	SIZE-DIM	REMARKS
AS-1	HOT WATER HEATING	MECH. ROOM	6"	650	14" D x 33" H	TACO # 4906AD
AS-2	CHILLED WATER	MECH. ROOM				

HOT WATER COIL SCHEDULE

TAG	SERVICE	LOCATION	CFM	EAT (°F)	LAT (°F)	MBH	GPM	EWT (°F)	LWT (°F)	PD (FT)	NO. ROWS
HC-1.1	TUG SERVICE TUNNEL	TUG SERVICE TUNNEL	8000	-21	60	650	60	180	160	18	4
HC-1.2	TUG SERVICE TUNNEL	TUG SERVICE TUNNEL	8000	-21	60	650	60	180	160	18	4

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: XX

AEP PROJECT NUMBER
213-1882-091

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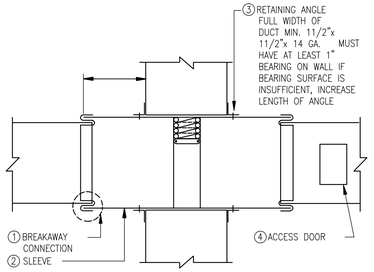
SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES II

SHEET NUMBER
M402

90% NOT FOR CONSTRUCTION

Drawing: h:\2008.00 Duluth Airport\8.0 CADD\8-4 MEP\Dwgs\M000_M402.dwg Plotted on: 4/9/2010 3:59 PM Plotted by: Brandi, Mark



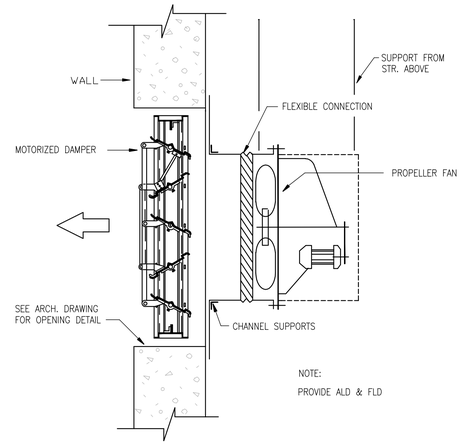
IN-DUCT MOUNTED FIRE DAMPER

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.

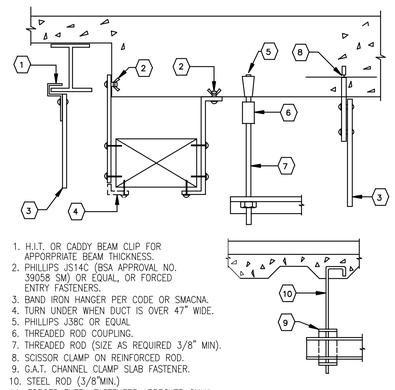
FIRE DAMPER

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



WALL EXHAUST FAN DETAIL

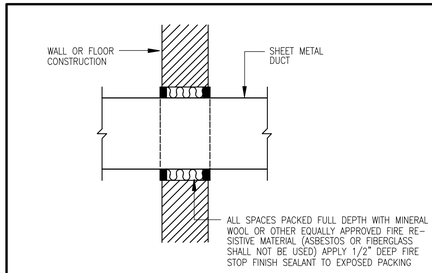
NOT TO SCALE



1. H.I.T. OR CADDY BEAM CLIP FOR APPORPRIATE 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

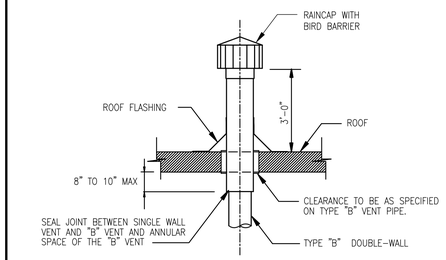


NOTES:

1. FOR WALLS REQUIRING FIRE DAMPERS SEE OTHER DETAILS

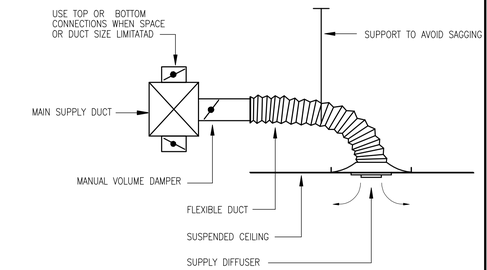
DETAIL OF CAULKING OF DUCT PIERCING RATED WALLS OR FLOORS WHERE FIRE DAMPERS ARE NOT REQUIRED.

NOT TO SCALE



DETAIL - TYPICAL FLUE TERMINAL

NOT TO SCALE

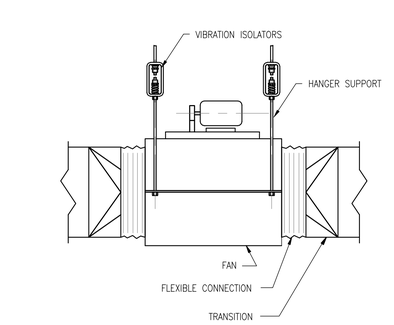


NOTE :

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

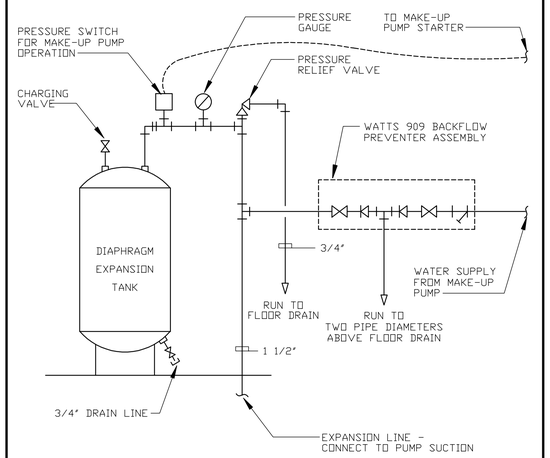
TYPICAL SUPPLY DIFFUSER CONNECTION

NOT TO SCALE



IN-LINE FAN SUPPORT DETAIL

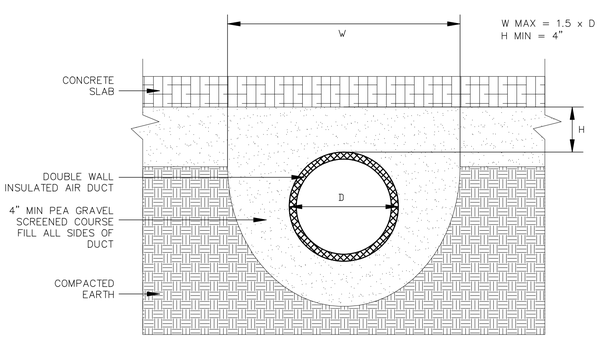
NOT TO SCALE



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

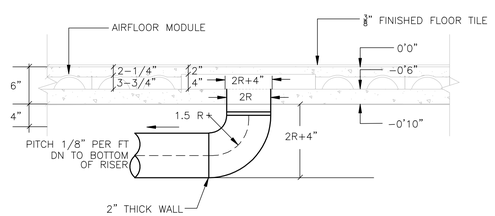


NOTES:

1. BRANCH & TEE CONNECTIONS SHALL BE PER MANUFACTURERS RECOMMNEDATIONS.
2. PITCH DUCTWORK SYSTEM CONTINUALLY DOWNWARD TO BASE OF SHAFT.

UNDERGROUND DUCTWORK DETAIL

N.T.S.



"AIRFLOOR" DUCTWORK CONNECTION DETAIL

N.T.S.

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DESIGNED BY: XX

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

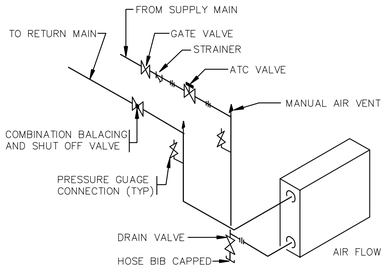
MECHANICAL DETAILS I

SHEET NUMBER

M501

90% NOT FOR CONSTRUCTION

Drawings H:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_M501.dwg Plotted on: 4/9/2010 3:25 PM Plotted by: Brandt, Mark

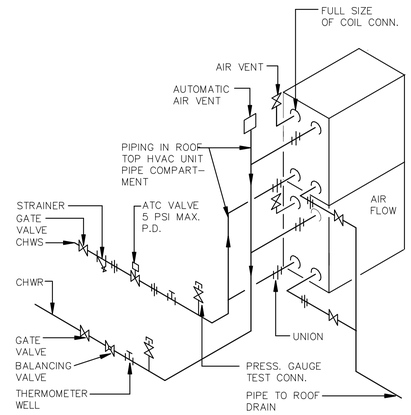


NOTES:

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)

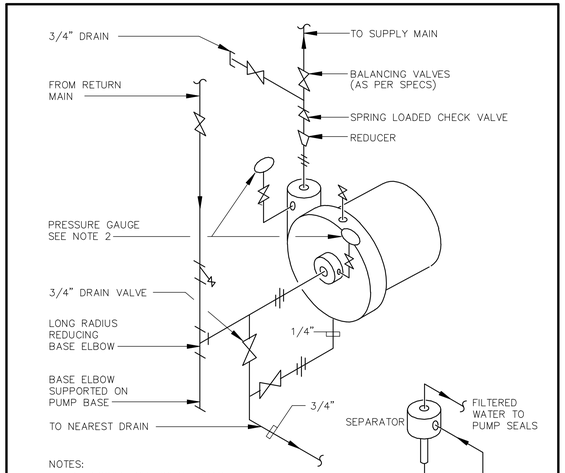
HOT WATER HEATING COIL PIPING

NOT TO SCALE



CHILLED WATER COIL PIPING

NOT TO SCALE



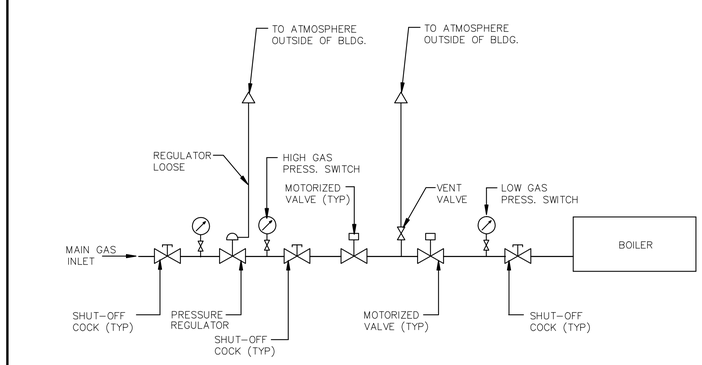
NOTES:

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)

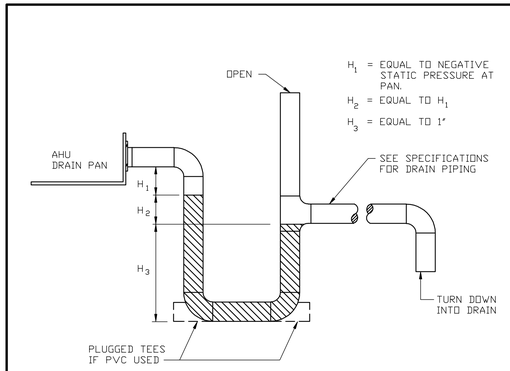
WATER PUMP PIPING END SUCTION PUMP DETAIL

NOT TO SCALE



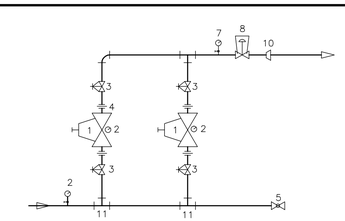
GAS TRAIN DIAGRAM

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

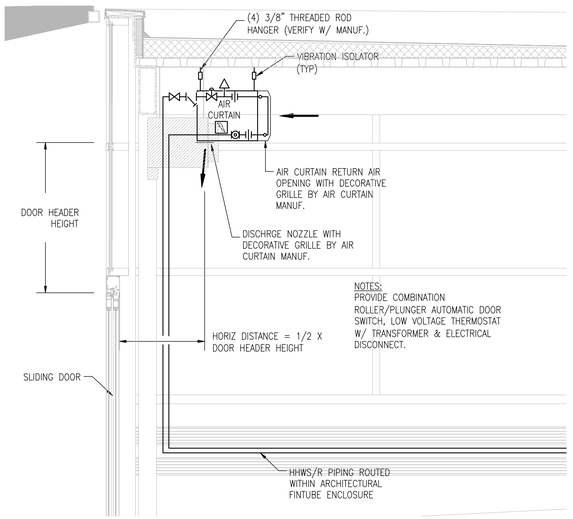
MECHANICAL DETAILS II

SHEET NUMBER

M502

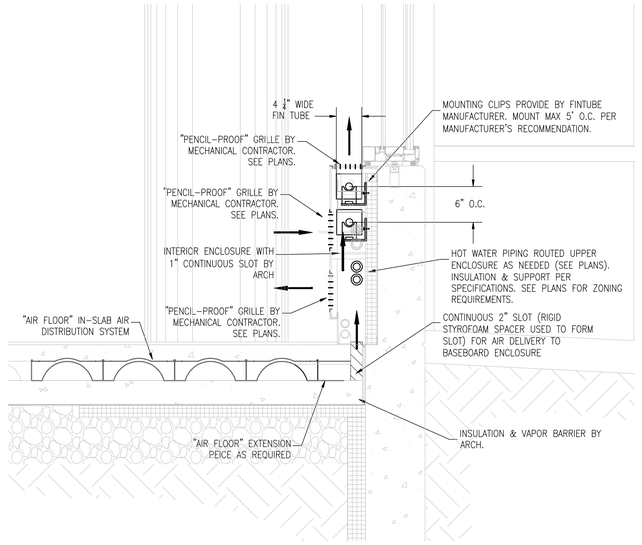
90% NOT FOR CONSTRUCTION

Drawing: H:\2008.00 Duluth Airport\1.0 CADD\[1.4] HVAC\Dwgs\M502_M502.dwg Plotted on: 4/9/2010 3:20 PM Plotted by: Brandt, Mark



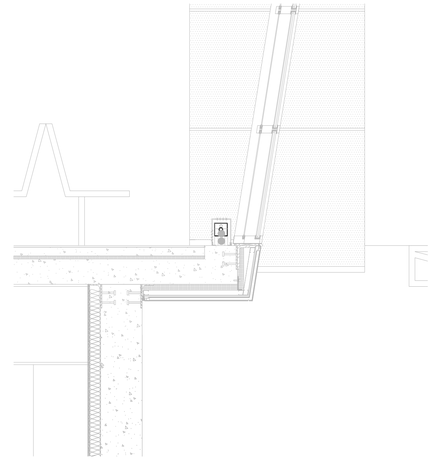
TYPICAL AIR CURTAIN INSTALLATION DETAIL

NOT TO SCALE



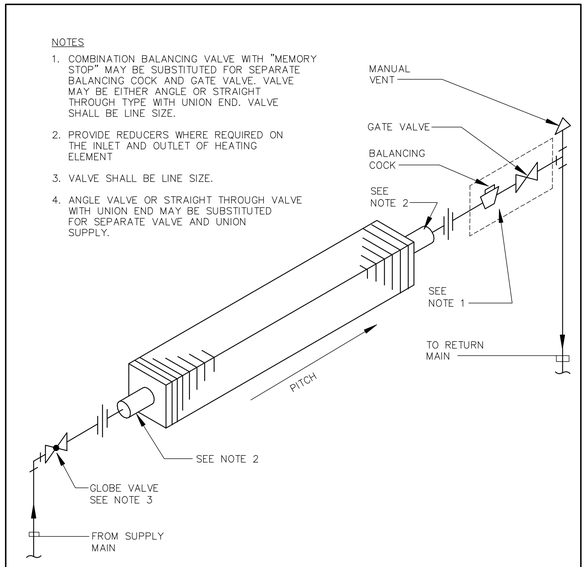
TYPICAL LANDSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

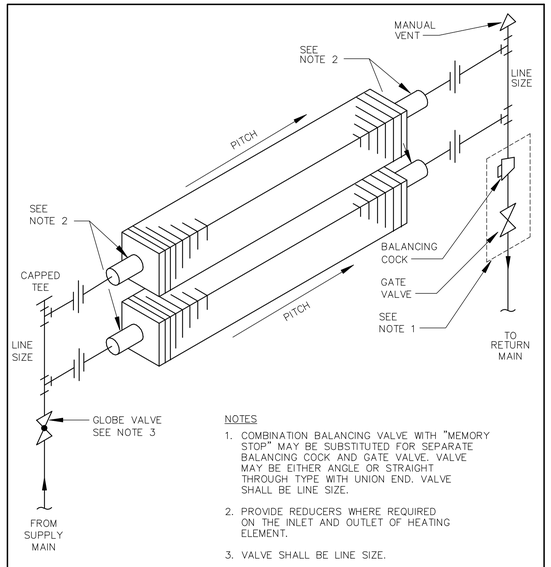


TYPICAL AIRSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

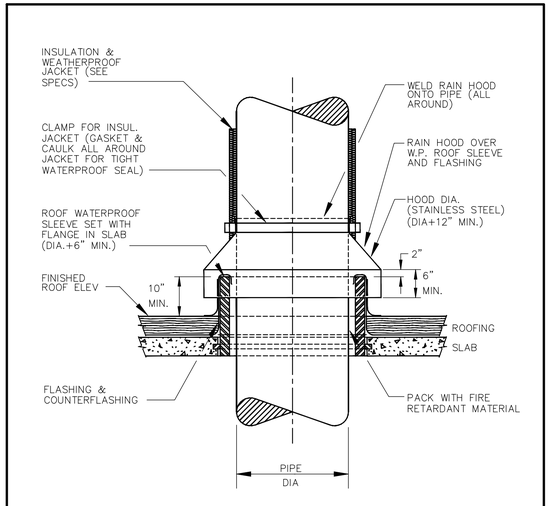


ONE (1) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING



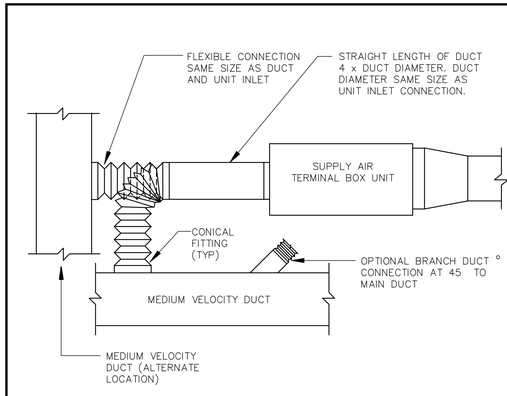
TWO (2) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING

(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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AEP PROJECT NUMBER
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SHEET TITLE

MECHANICAL DETAILS III

SHEET NUMBER
M503

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Drawing: X:\2008.00 Duluth Airport\5.0 CADD\[5.4] MAC\Dwgs\2008_M503.dwg Plotted on: 4/9/2010 3:16 PM Plotted by: Brand, Mark

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 , F3 b , F1 a
F1 a / F4 d	WALL MOUNTED LIGHTING FIXTURES	
	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		
	PULL BOX OR JUNCTION BOX–OUTLET BOX TYPE WALL MOUNTED	
	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:- SV 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 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 SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:- -RT-FIRESTAT–RATE OF RISE PLUS FIXED TEMPERATURE TYPE -FT-FIRESTAT–FIXED TEMPERATURE TYPE -PM–PNEUMATIC TUBE DIAPHRAGM SWITCH SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING FIRESTATS DENOTE EXCEPTIONS TO SPECIFIED STANDARD TEMPERATURE SETTINGS SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING PNEUMATIC TUBE DIAPHRAGM SWITCHES DENOTE LENGTH OF ASSOCIATED TUBING	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	
VSS	VALVE SUPERVISOR SWITCH	
SD	AUTOMATIC FIRE DETECTION ALARM ACTUATING DEVICES SMOKE DETECTOR	
DD	DUCT SMOKE DETECTOR	
D	HEAT DETECTOR	
SD_T	BEAM TYPE SMOKE DETECTOR SUBSCRIPT "T" INDICATES TRANSMITTER	
SD_R	SUBSCRIPT "R" INDICATES RECEIVER	
	ELECTRIC DOOR LOCK	
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 ASSOCCIATIONS.
$\$_T$	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	
	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 60" 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 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
O_{XX}	INDIVIDUAL SLEEVE UP IDENTIFICATION	ADJACENT NUMBERS IN PARENTHESIS INDICATE QUANTITY OF SYSTEM WIRES	
$\bullet_{XX}$	INDIVIDUAL SLEEVE DOWN IDENTIFICATION		
XX	INDIVIDUAL SLEEVE THROUGH IDENTIFICATION		
	IDENTIFICATION OF CONDUIT BANK		
XX	BANK OF SLEEVES UP IDENTIFICATION	ADJACENT NOTATIONS THUS:- 10-3" indicate quantity and size	
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			
S_{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.		
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.		
OS2	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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NO.	DESCRIPTION	DATE

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DRAWN BY: JK
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213-1882-091

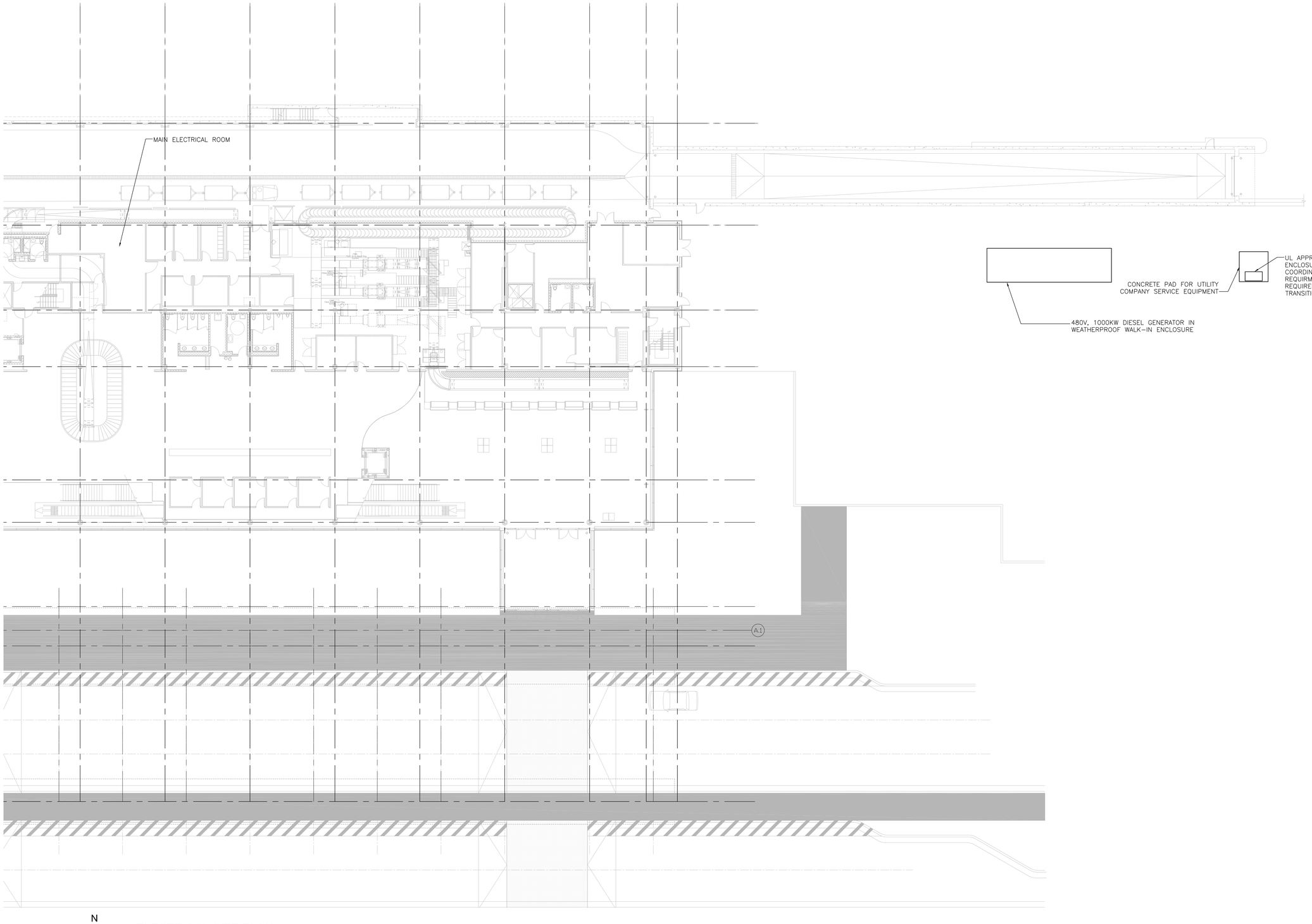
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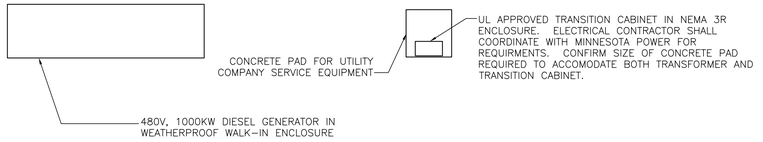
SHEET TITLE
ELECTRICAL SYMBOLS

SHEET NUMBER
E001

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Drawing: I:\2008.00 Duluth Airport\8.0 CADD\8.1 Electrical\Dwgs\2008_E001.dwg Plotted on: 4/9/2010 12:43 PM Plotted by: Koelker, Jennifer





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

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DRAWN BY:	JK
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.
7. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
8. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

KEYED NOTES:

(1) MINIMUM QUANTITY OF SMOKE DETECTORS INDICATED. 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.

(9) RECEPTACLES FOR SECURITY XRAY MACHINE. LOCATED PER MANUFACTURER'S REQUIREMENTS.

(10) JBOX FOR FUME HOOD. COORDINATE OCP DEVICE AND FEEDER SIZE PER MANUFACTURER'S REQUIREMENTS.



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

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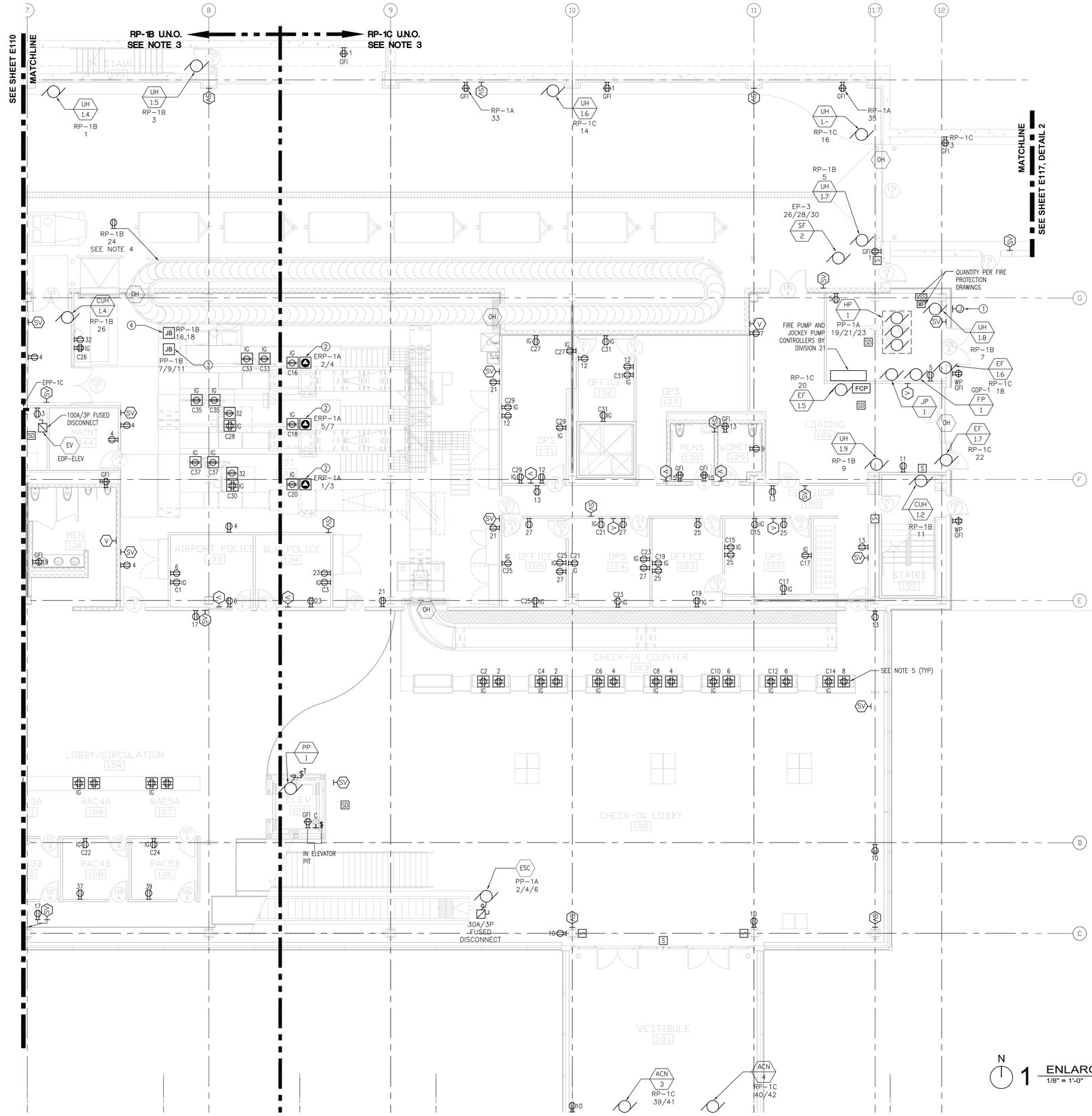
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E110

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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.
5. MOUNTING/LOCATION FOR TICKET COUNTER RECEPTACLES SHALL BE CONFIRMED.
6. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
7. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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.

N

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

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TEL: (218) 591-5079

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

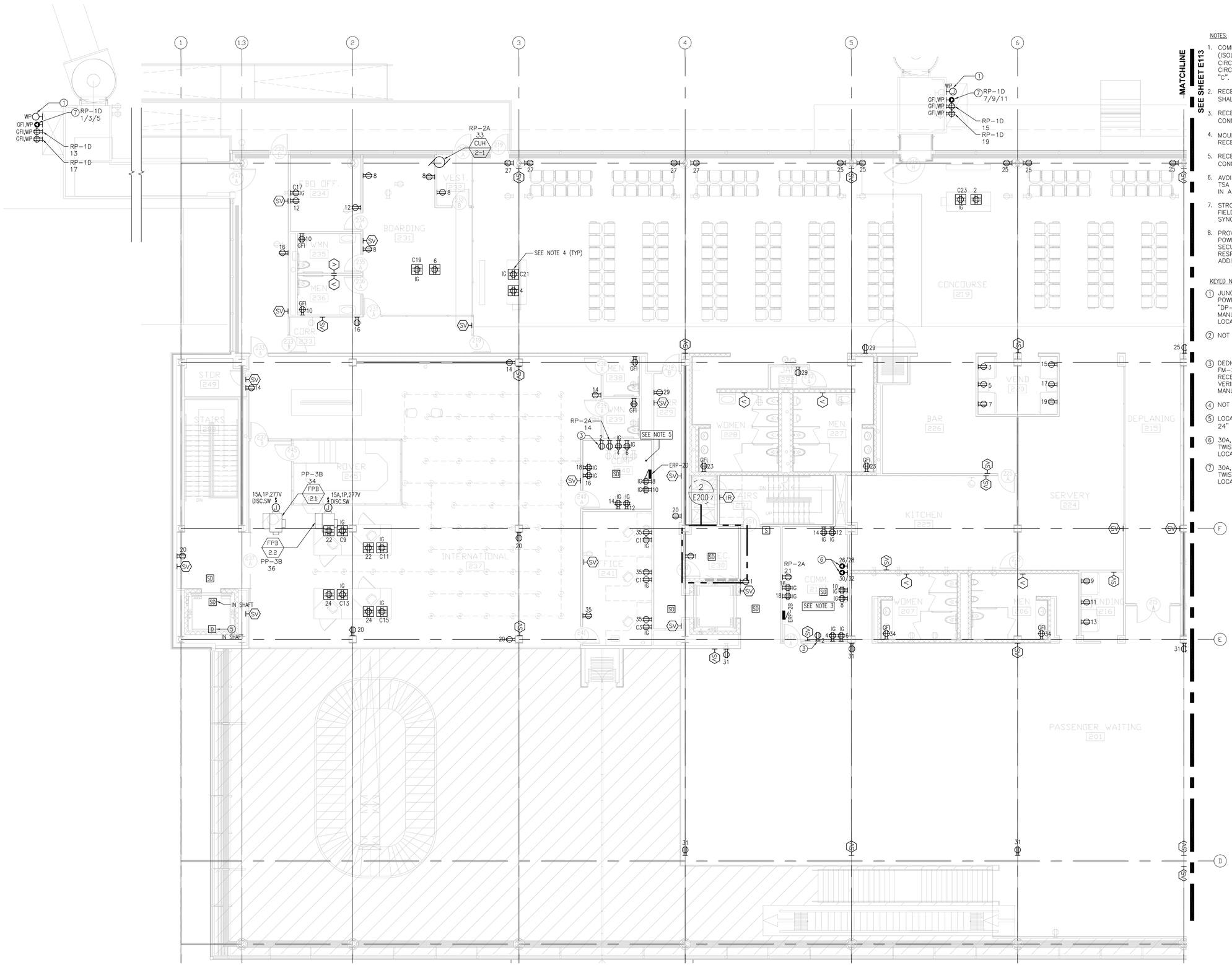
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E111

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.5) Electrical\Dwgs\2008_E111.dwg Plotted on: 4/9/2010 12:45 PM Plotted by: Kestler, Jennifer



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. MOUNTING/LOCATION FOR TICKET COUNTER RECEPTACLES SHALL BE CONFIRMED.
5. RECEPTACLES IN COMP. ROOM 222 SHALL BE CONNECTED TO PANEL "ERP-2D" U.N.O.
6. AVOID ROUTING UNDER FLOOR CONDUIT THROUGH TSA AREA UNLESS CONDUIT IS SERVING DEVICES IN AREA.
7. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
8. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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. NOT USED
3. DEDICATED 20A DUPLEX RECEPTACLE FOR FM-200 SYSTEM CONTROLS. COORDINATE RECEPTACLE LOCATION WITH FM-200 LOCATION. VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER.
4. NOT USED
5. LOCATE A ELEVATOR SHAFT HEAT DETECTOR WITH 24" OF EACH SPRINKLER HEAD.
6. 30A, 208V, SINGLE PHASE RECEPTACLE WITH TWISTLOCK FOR PAGING SYSTEM. CONFIRM LOCATION WITHIN ROOM.
7. 30A, 208V, 3PH, GFI, WP RECEPTACLE WITH TWISTLOCK. CONFIRM AMPERAGE OF RECEPTACLE. LOCATION TO BE COORDINATED WITH OWNER.

N

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

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REVISIONS

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DATE ISSUED: 04-12-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

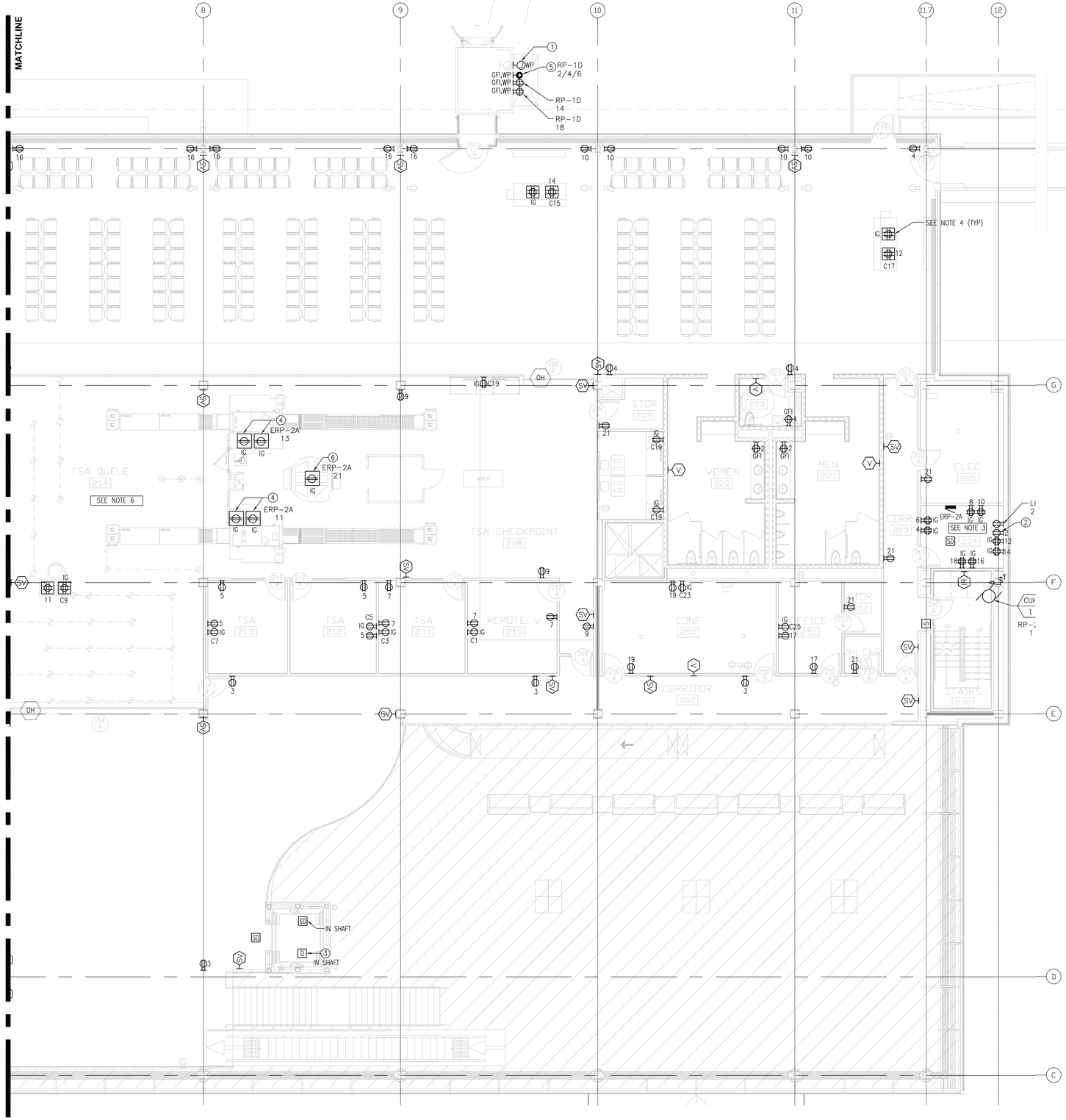
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SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E112

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.1b) Electrical\Dwgs\2008_E112.dwg Plotted on: 4/9/2010 3:33 PM Plotted by: Koehler, Jennifer



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.
4. MOUTNING/LOCATION FOR TICKET COUNTER RECEPTACLES SHALL BE CONFIRMED.
5. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
6. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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.

(5) 30A, 208V, 3PH, GFI, WP RECEPTACLE WITH TWISTLOCK. CONFIRM AMPERAGE OF RECEPTACLE. LOCATION TO BE COORDINATED WITH OWNER.

(6) COORDINATE LOCATION OF RECEPTACLE FOR WHOLE BODY IMAGER PER MANUFACTURER REQUIREMENTS.

N

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

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REVISIONS

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REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

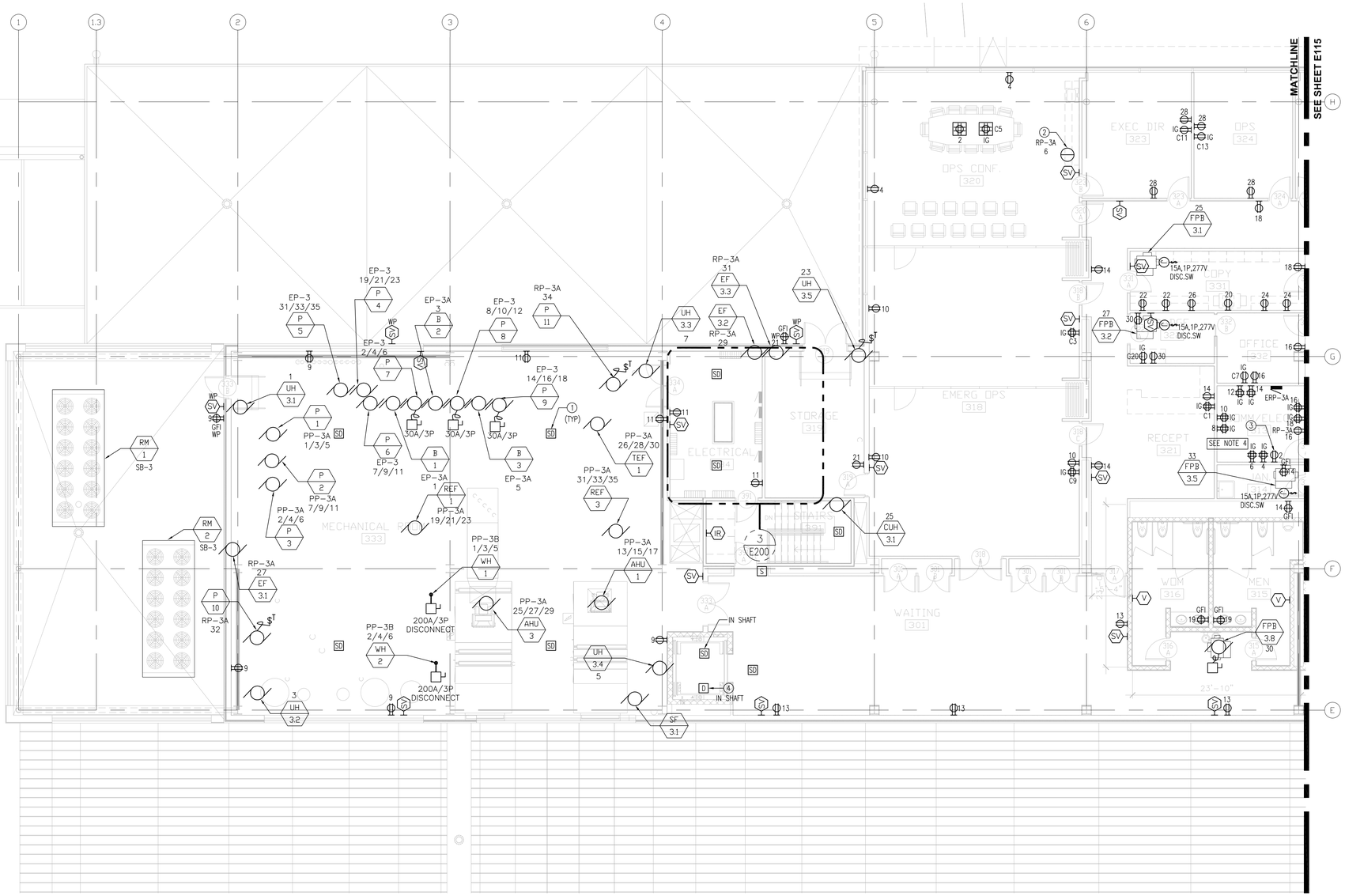
ENLARGED
SECOND FLOOR
ELECTRICAL PLAN
AREA B

SHEET NUMBER

E113

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.1) Electrical\Dwgs\2008_E113.dwg Plotted on: 4/9/2010 12:46 PM Plotted by: Kestler, Jennifer



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.
5. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
6. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7. FAN POWER BOXES "FPB" SHALL BE CONNECTED TO PANEL "PP-3B".

KEYED NOTES:

1. MINIMUM QUANTITY OF SMOKE DETECTORS INIDICATED. 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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DATE ISSUED: 04-12-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

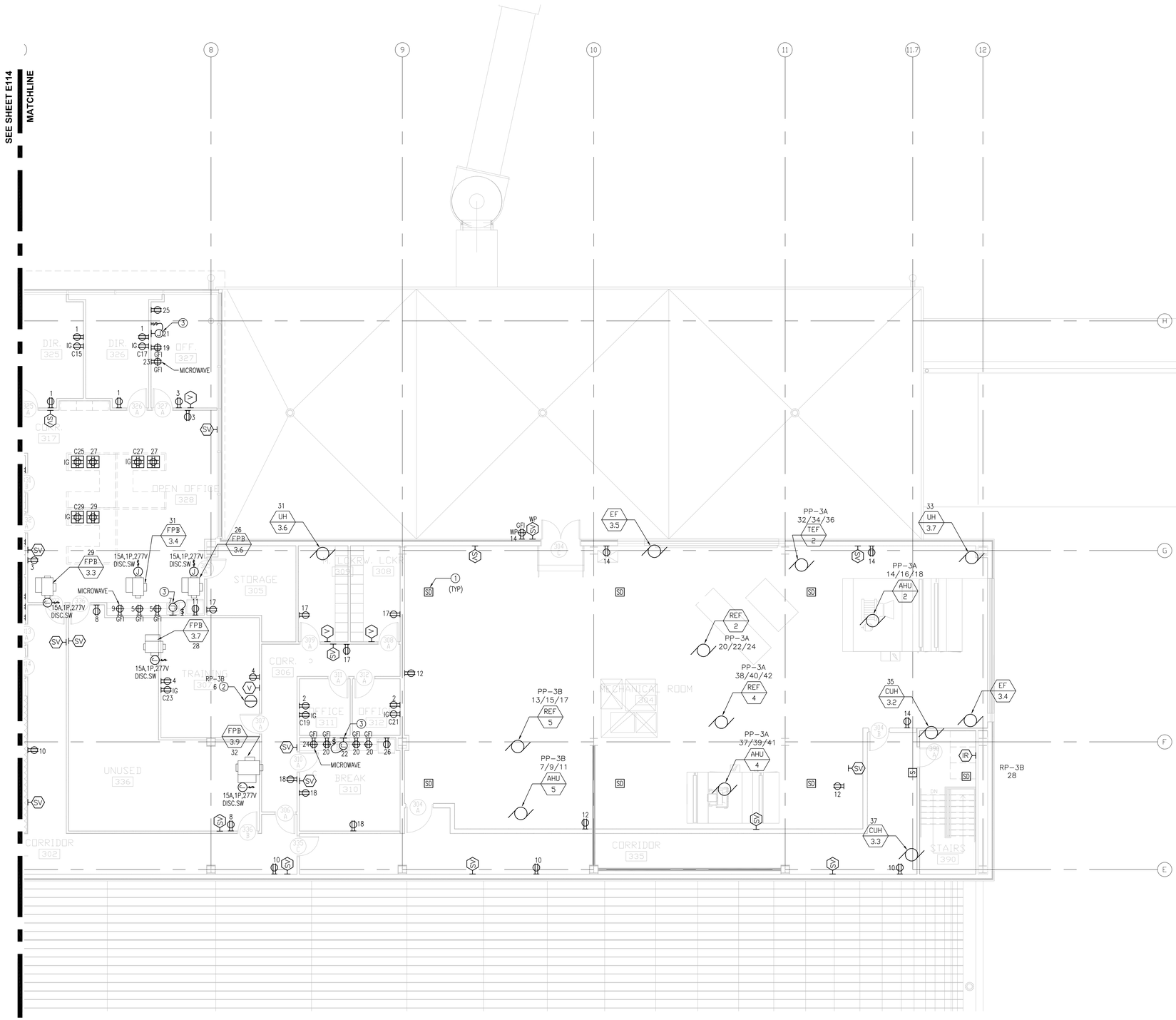
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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E114

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.5x) Electrical\Dwgs\2008_E114.dwg Plotted on: 4/9/2010 12:47 PM Plotted by: Kestler, Jennifer



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. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
5. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. FAN POWER BOXES ("FPB") SHALL BE CONNECTED TO PANEL "PP-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.

(3) JUNCTION BOX FOR GARBAGE DISPOSAL. VERIFY POWER REQUIREMENTS PER EQUIPMENT MANUFACTURER.

N

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

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DESIGNED BY: JK

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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA B

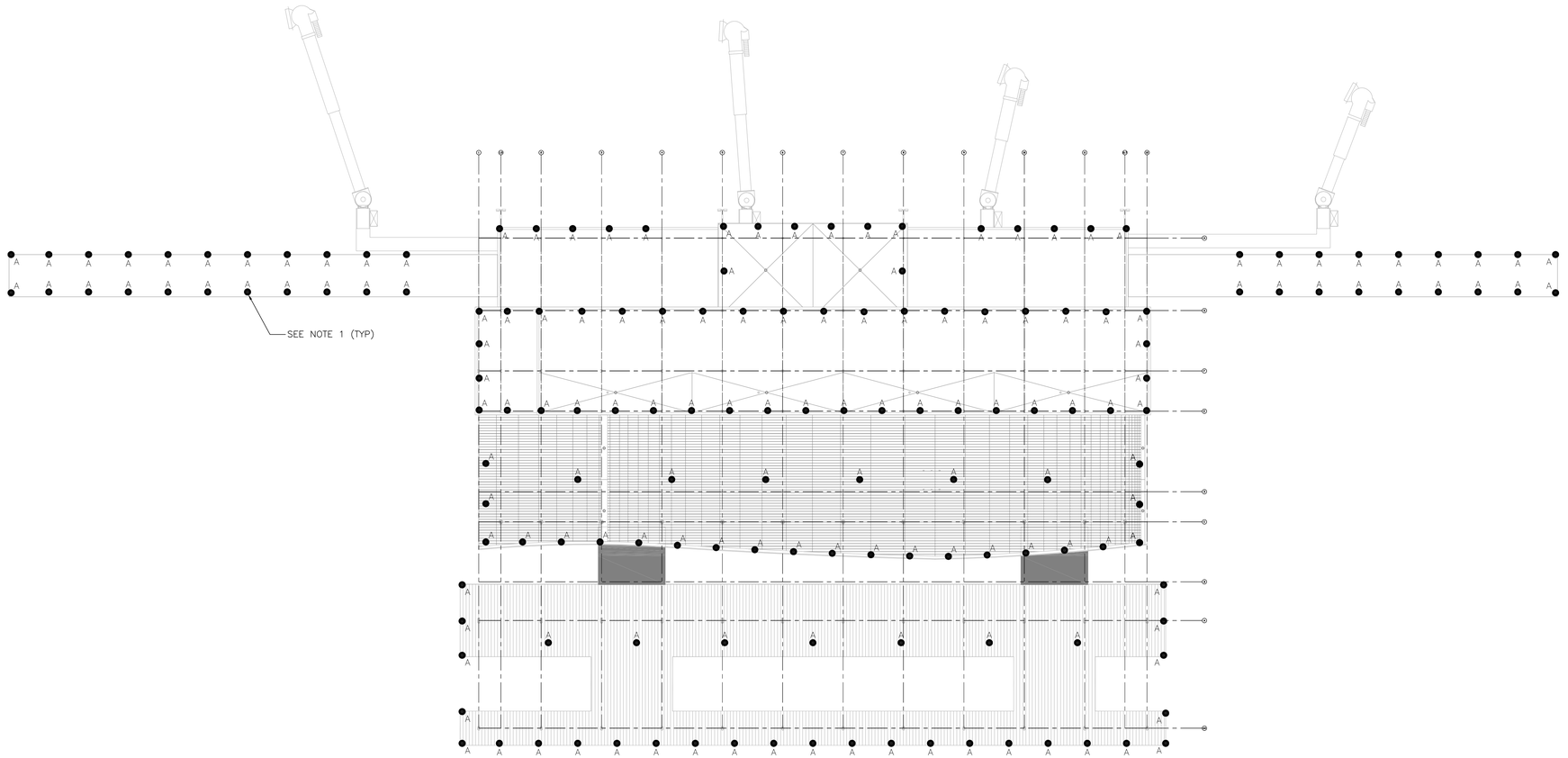
SHEET NUMBER
E115

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2008_E115.dwg Plotted on: 4/9/2010 12:47 PM Plotted by: Koehler, Jennifer

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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DESIGNED BY: JK

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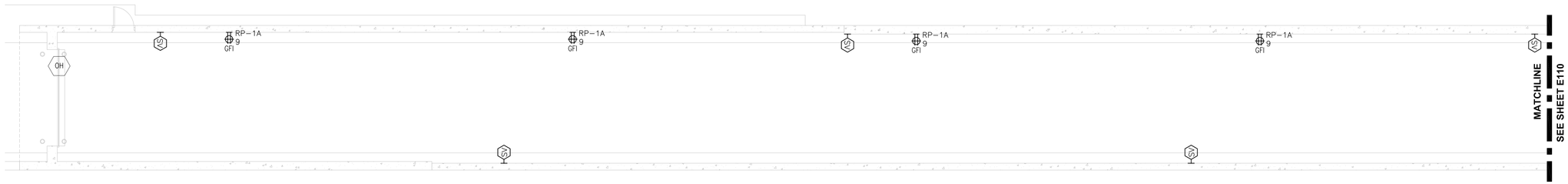
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SHEET TITLE
ELECTRICAL
ROOF PLAN

SHEET NUMBER
E116

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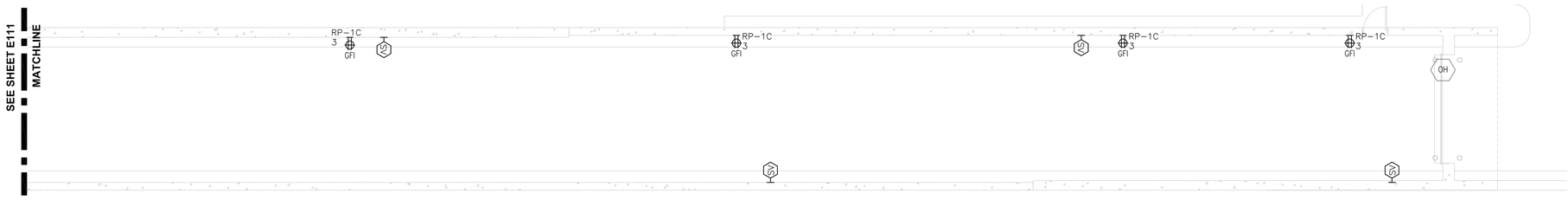
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N

1 WEST RAMP - ELECTRICAL POWER PLAN

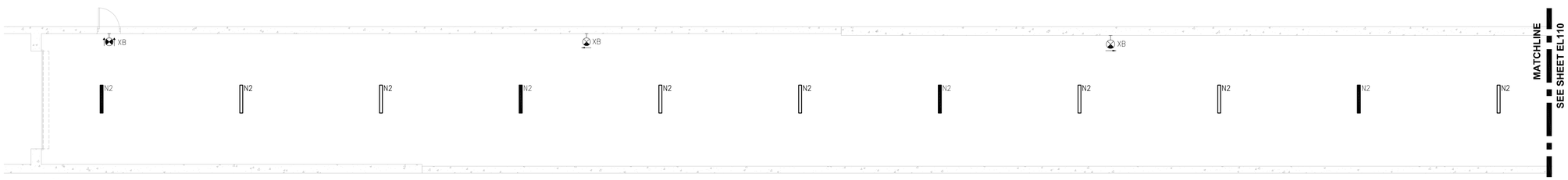
1/8" = 1'-0"



N

2 EAST RAMP - ELECTRICAL POWER PLAN

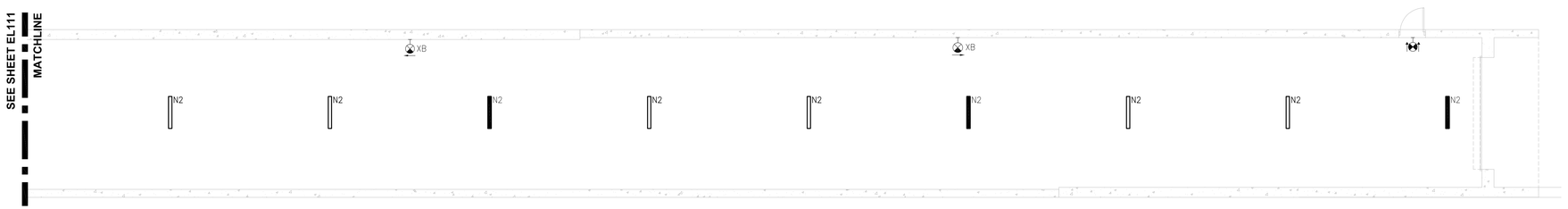
1/8" = 1'-0"



N

3 WEST RAMP - ELECTRICAL LIGHTING PLAN

1/8" = 1'-0"



N

4 EAST RAMP - ELECTRICAL LIGHTING PLAN

1/8" = 1'-0"

NOTES:

1. STROBES THAT ARE LOCATED WITHIN THE SAME FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION.
2. PROVIDE RACEWAYS, JUNCTION BOXES AND POWER, WHERE REQUIRED, FOR TELECOM, SECURITY AND AV DEVICES. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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REVISIONS

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DRAWN BY:	JK
DESIGNED BY:	JK

AEP PROJECT NUMBER
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SHEET TITLE

RAMP
ELECTRICAL POWER
AND LIGHTING PLAN

SHEET NUMBER

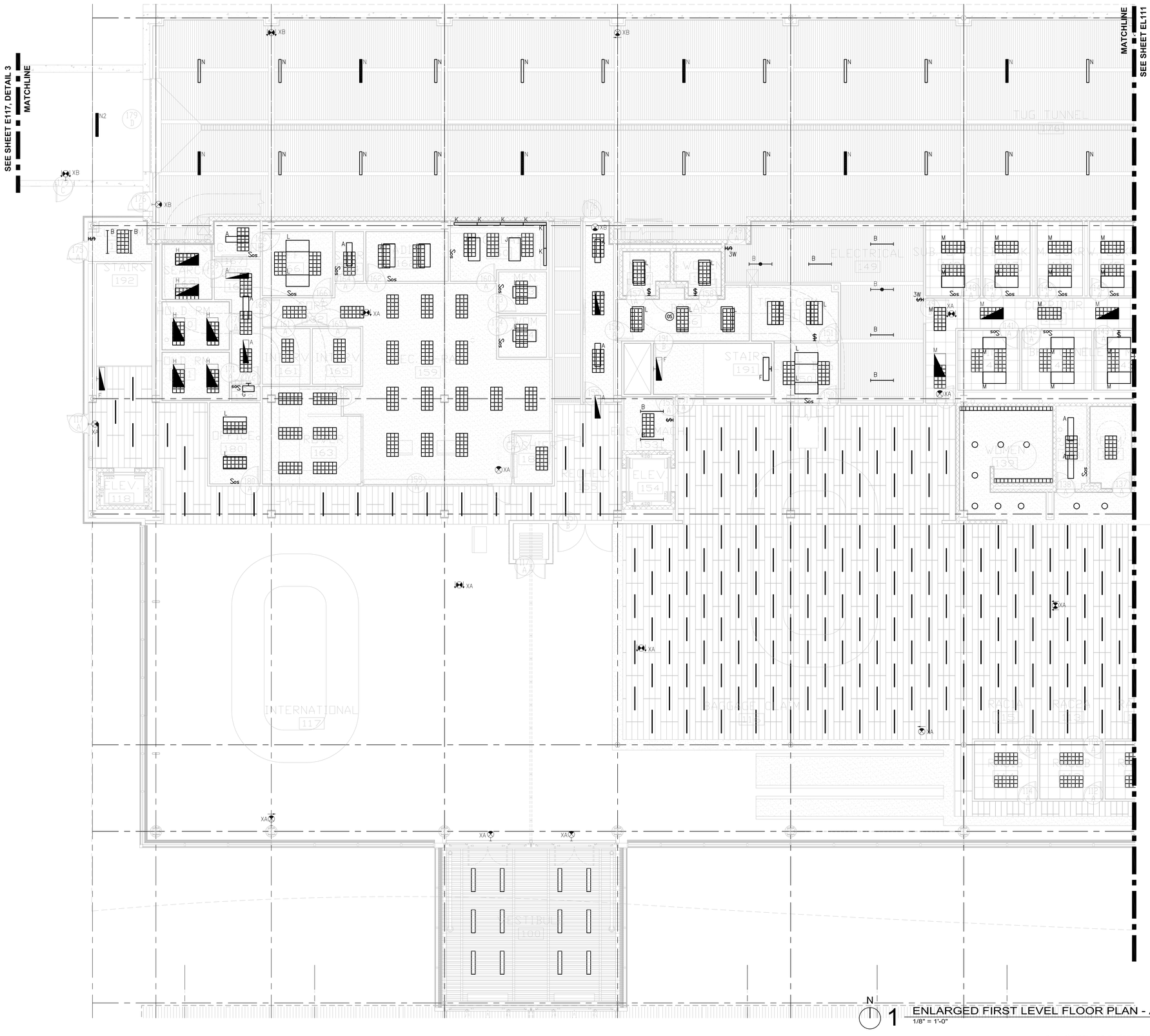
E117

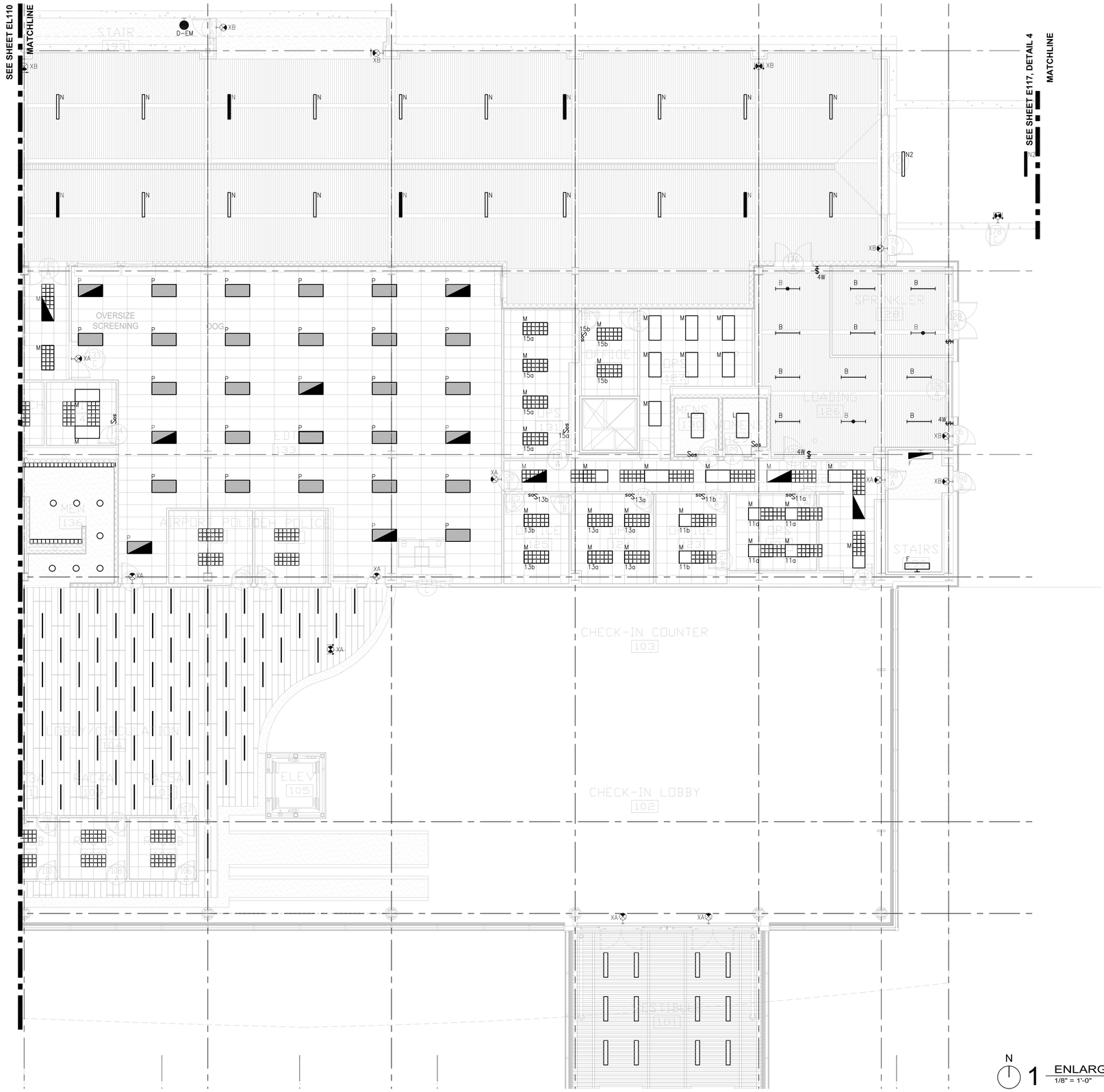
90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.3a) Electrical\Dwgs\2008_E117.dwg Plotted on: 4/9/2010 12:01 PM Plotted by: Kestler, Jennifer

NOTES:

1. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "_" U.N.O.





NOTES:

1. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "_" U.N.O.

N

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

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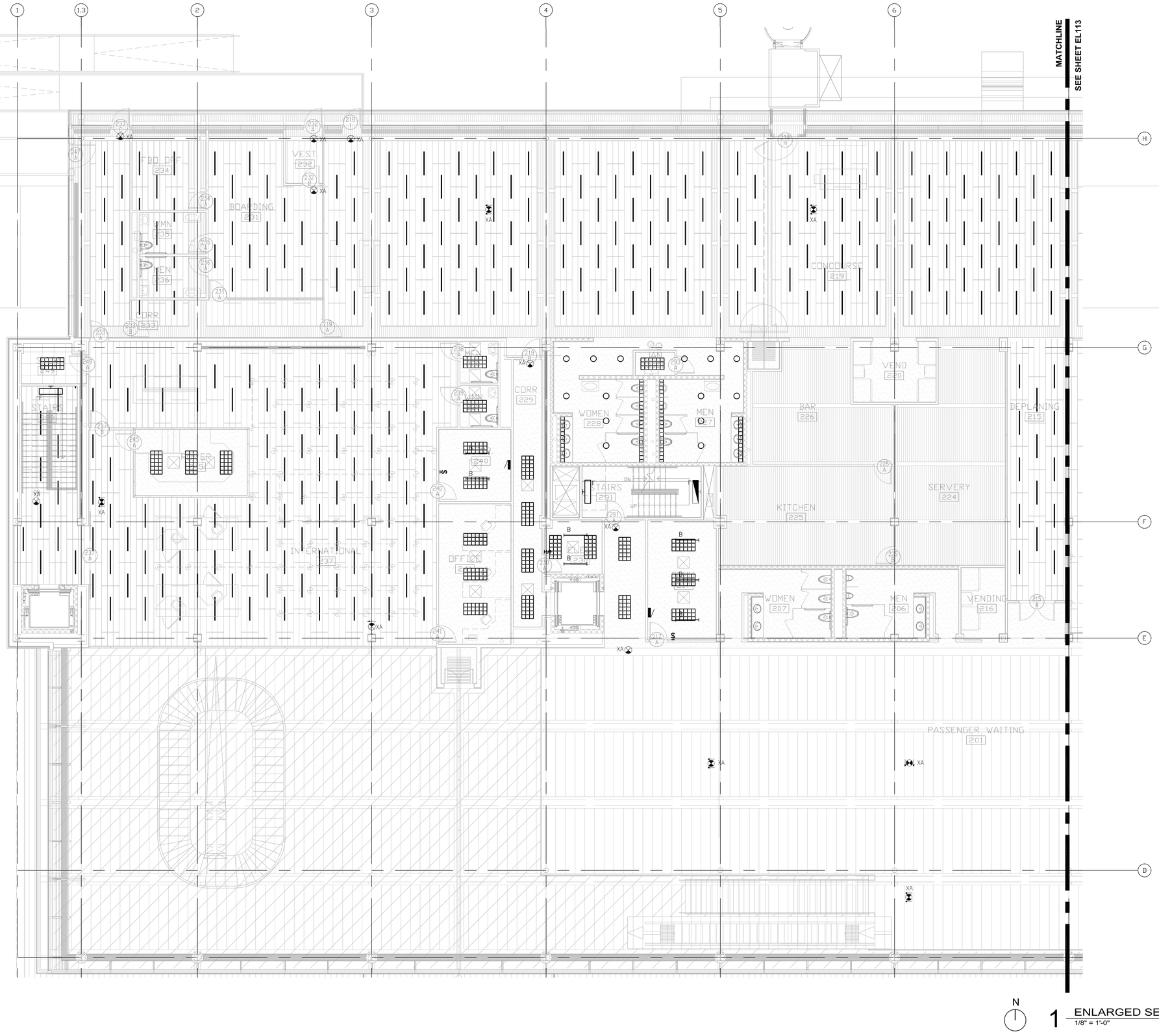
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SHEET TITLE
ENLARGED FIRST FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL111

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Drawing: X:\2008.00 Duluth Airport\5.0 CADD\(5.5) Electrical\Dwgs\2008_EL111.dwg Plotted on: 4/9/2010 1:02 PM Plotted by: Kadlec, Jennifer



NOTES:

1. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "_" U.N.O.
2. APRON LIGHT FIXTURES SHALL BE CONNECTED TO PANEL "LP--APRON", LOCATED IN 1ST FLOOR ELECTRICAL ROOM. REFER TO ARCHICTECTURAL PLAN FOR APRON LIGHTING LAYOUT.

N

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

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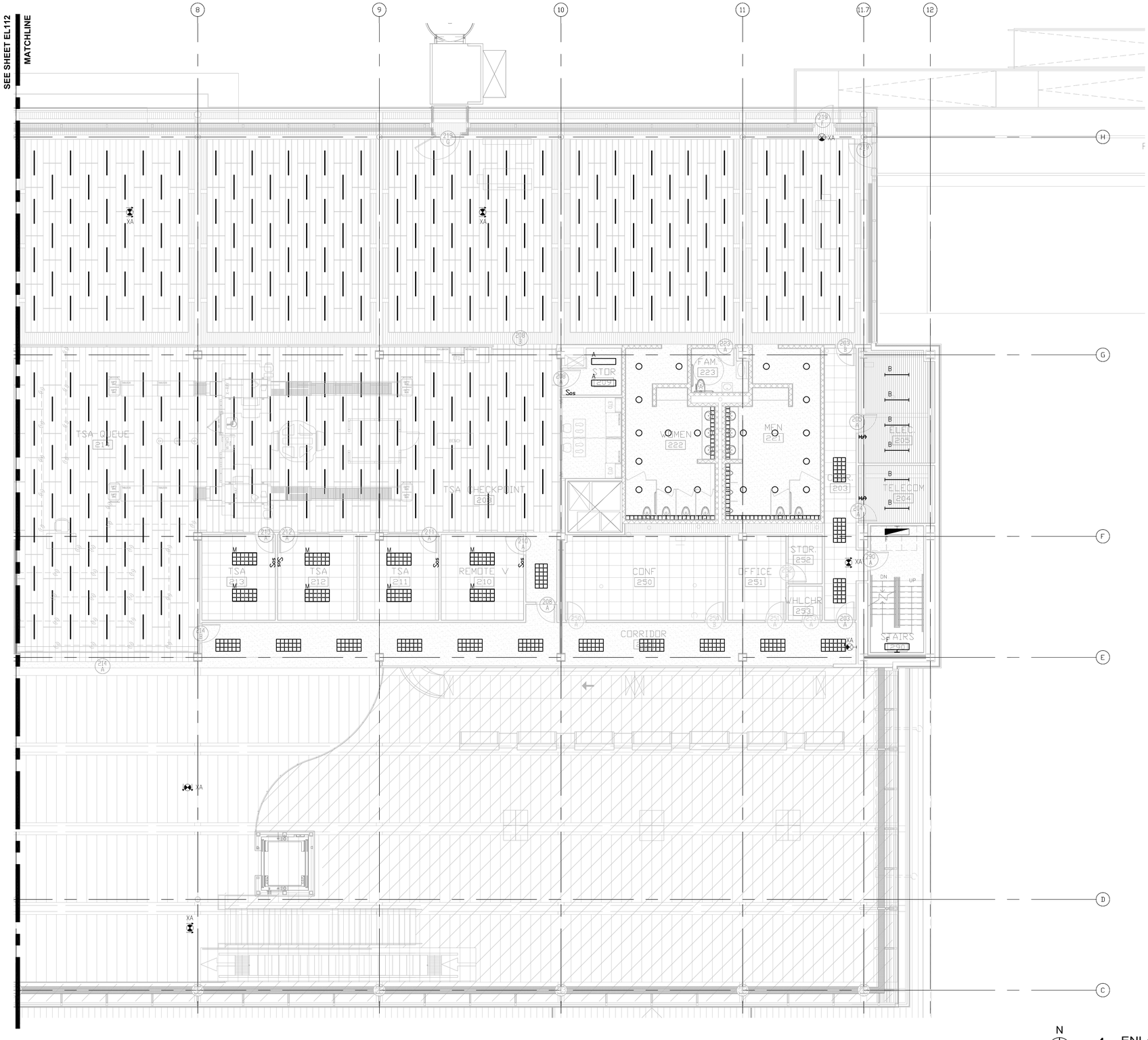
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SHEET TITLE
ENLARGED SECOND FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL112

90% NOT FOR CONSTRUCTION

Drawing: K:\2008.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2008_EL112.dwg Plotted on: 4/9/2010 1:03 PM Plotted by: Koehler, Jennifer



NOTES:

1. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "_" U.N.O.
2. APRON LIGHT FIXTURES SHALL BE CONNECTED TO PANEL "LP-APRON", LOCATED IN 1ST FLOOR ELECTRICAL ROOM. REFER TO ARCHICTECTURAL PLAN FOR APRON LIGHTING LAYOUT.

N

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

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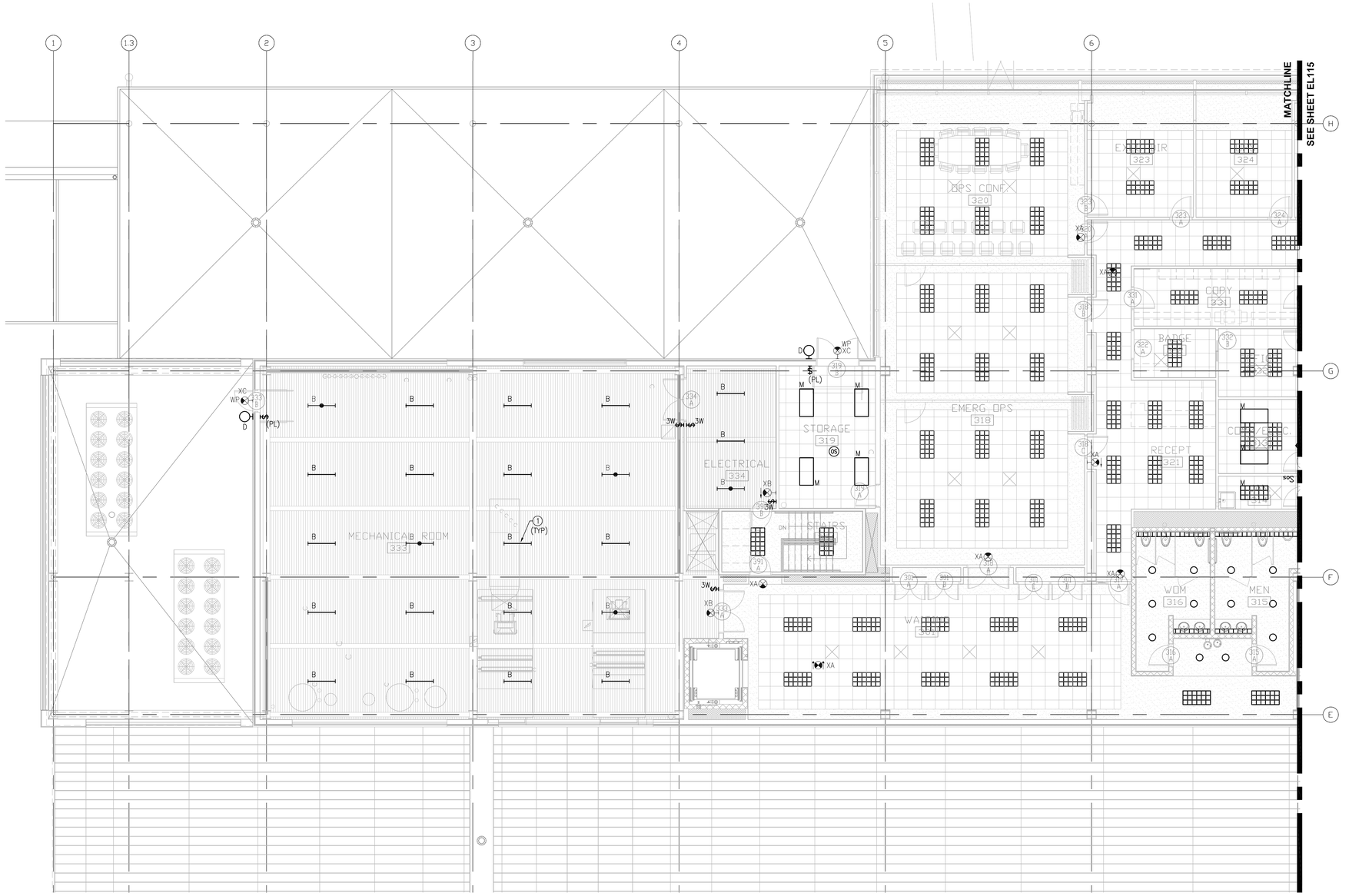
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SHEET TITLE
ENLARGED SECOND FLOOR LIGHTING PLAN AREA B

SHEET NUMBER
EL113

90% NOT FOR CONSTRUCTION

Drawing: X:\2008.00 Duluth Airport\5.0 CADD\(5.5) Electrical\Dwgs\2008_EL113.dwg Plotted on: 4/9/2010 1:04 PM Plotted by: Kestler, 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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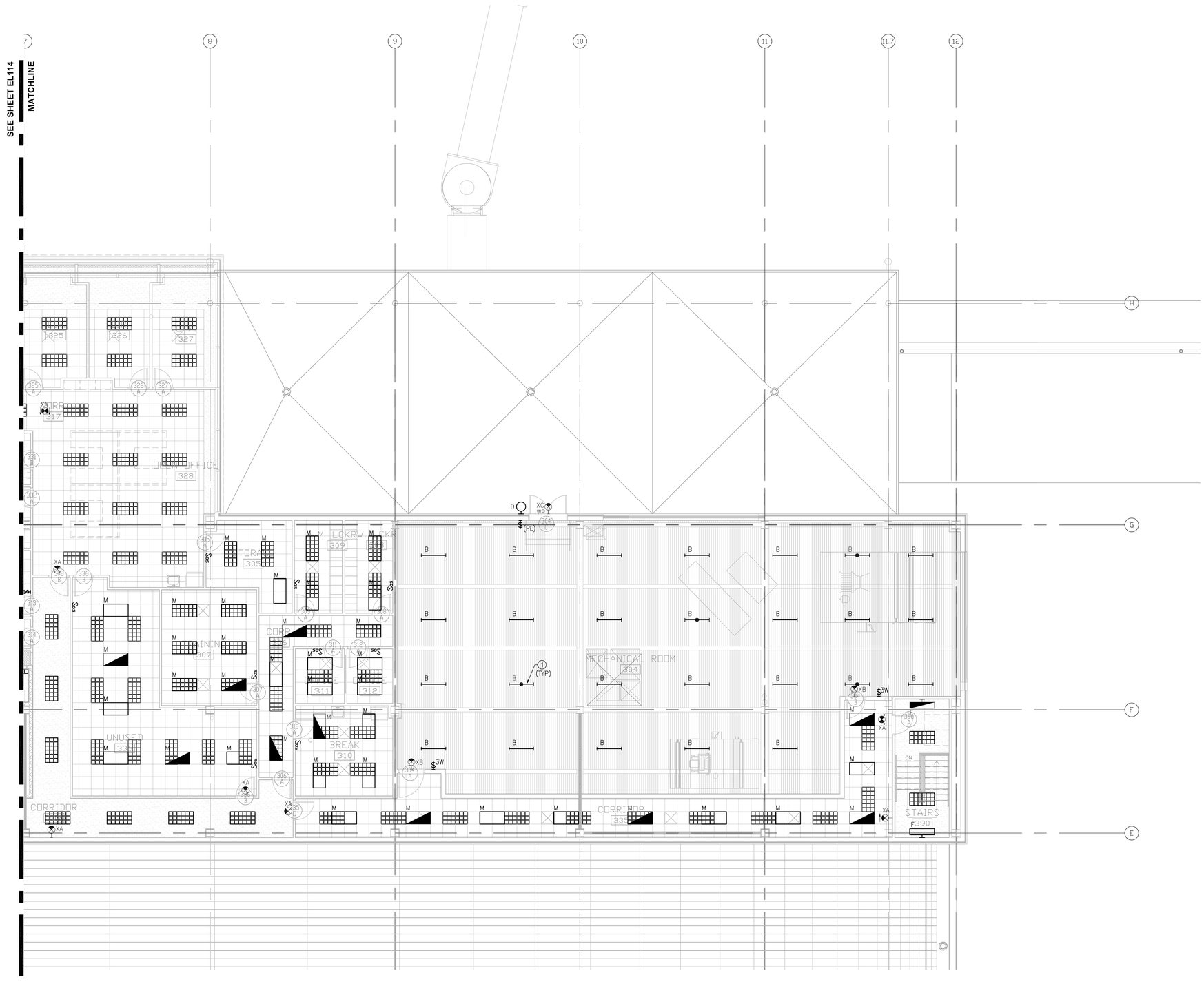
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SHEET TITLE
ENLARGED THIRD FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL114

90% NOT FOR CONSTRUCTION

Drawing: X:\2008.00 Duluth Airport\2.0 CADD\(2.3) Electrical\Dwgs\2008_EL114.dwg Plotted on: 4/9/2010 1:05 PM Plotted by: Koehler, 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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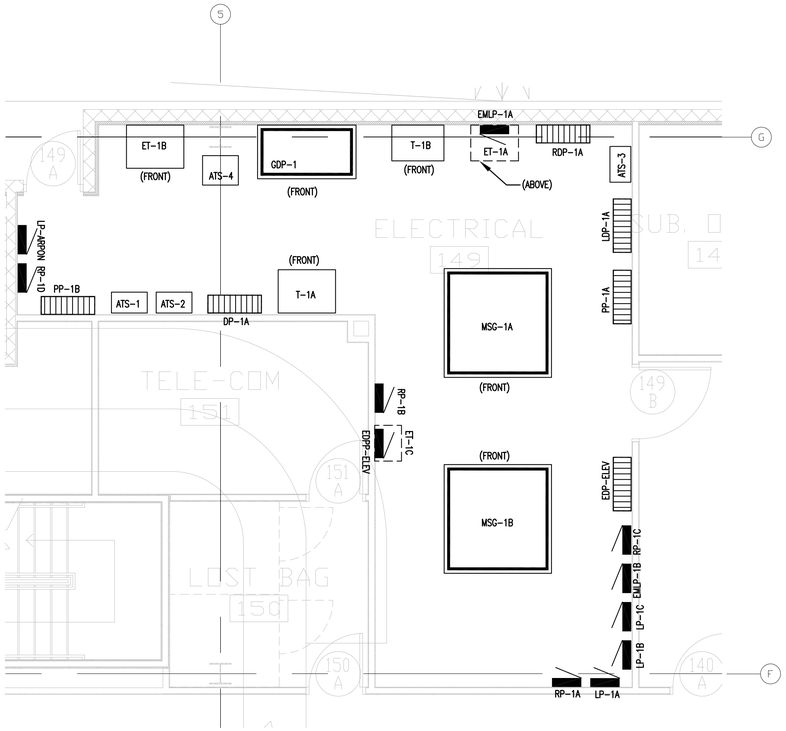
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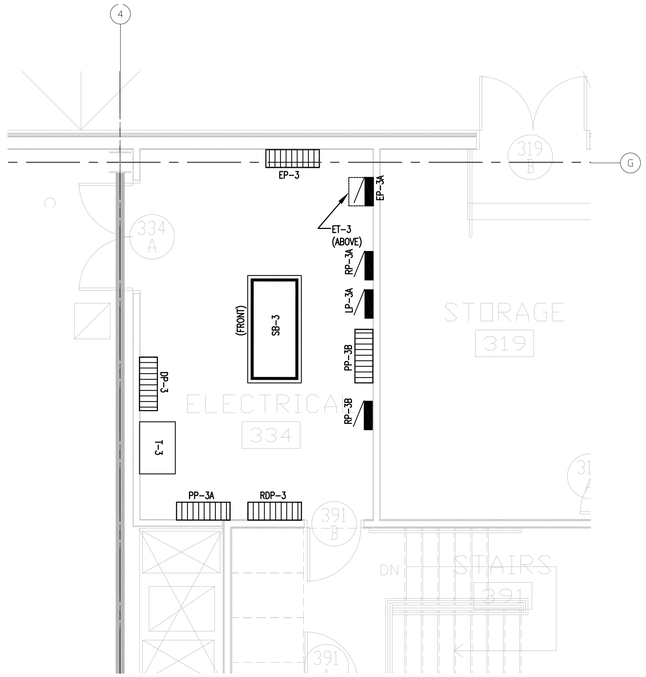
SHEET TITLE
ENLARGED THIRD FLOOR LIGHTING PLAN AREA B

SHEET NUMBER
EL115

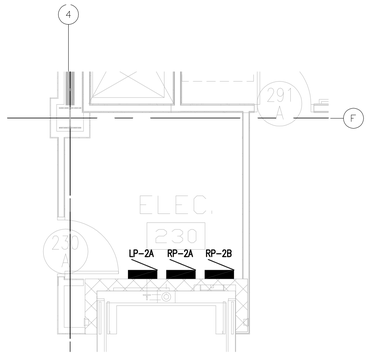
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N
1 ENLARGED MAIN ELECTRICAL ROOM - 1ST FLR
1/4" = 1'-0"



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

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

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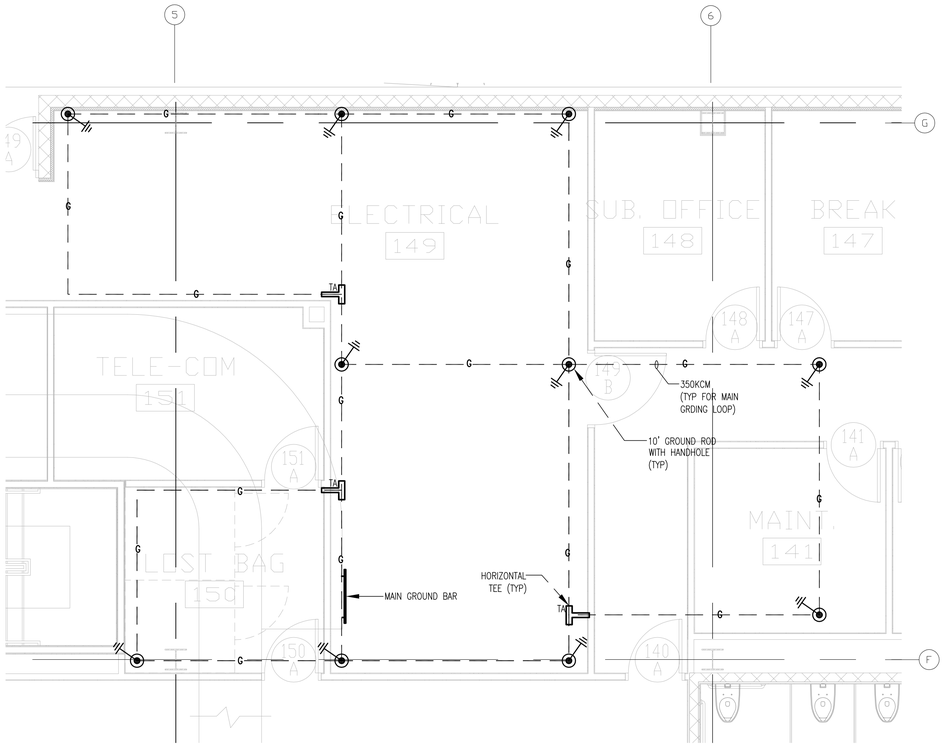
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SHEET TITLE
ENLARGED
EQUIPMENT ROOMS

SHEET NUMBER
E200

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CONSTRUCTION

Drawing: I:\2010\10 Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2010_E200.dwg Plotted on: 4/9/2010 12:41 PM Plotted by: Koelker, Jennifer



N

1 GROUNDING PLAN
1/4" = 1'-0"

GROUNDING TABLE			
#	FROM	TO	WIRE SIZE (AWG)
1	MAIN GROUND BAR	SWGR "MSG-1A"	SEE RISER DIAGRAM ON DWG E300
2	MAIN GROUND BAR	SWGR "MSG-1B"	SEE RISER DIAGRAM ON DWG E300
3	MAIN GROUND BAR	SWBD "GDP-1"	SEE RISER DIAGRAM ON DWG E300
4	MAIN GROUND BAR	ELEV. MACH RM 175 GRD BAR	
5	MAIN GROUND BAR	ELEV. MACH RM 153 GRD BAR	
6	MAIN GROUND BAR	ELEV. MACH RM 143 GRD BAR	
7	MAIN GROUND BAR	BUILDING STEEL	
8	MAIN GROUND BAR	GENERATOR	
9	MAIN GROUND BAR	MAIN TELEPHONE RM 151 GRD BAR	
10	MAIN GROUND BAR	MAIN WATER SERVICE PIPE	
11	MAIN GROUND BAR	TRANSFORMERS IN MAIN ELEC RM 149	SEE RISER DIAGRAM ON DWG E300
12	MAIN GROUND BAR	2ND FLR COMM. RM 217 GRD BAR	
13	MAIN GROUND BAR	2ND FLR COMP. RM 240 GRD BAR	
14	MAIN GROUND BAR	2ND FLR TELECOM RM 204 GRD BAR	
15	MAIN GROUND BAR	3RD FLR ELEC. RM 334 GRD BAR	
16	MAIN GROUND BAR	3RD FLR COMM. RM 313 GRD BAR	
17	MAIN GROUND BAR	LIGHTNING PROTECTION SYSTEM	
18	3RD FLR ELEC. RM 334 GRD BAR	SWBD "SB-3"	SEE RISER DIAGRAM ON DWG E300
19	3RD FLR ELEC. RM 334 GRD BAR	TRANSFORMERS IN 3RD FLR ELEC. RM 334	SEE RISER DIAGRAM ON DWG E300

NOTES:

1. REFER TO SPECIFICATION 16060 FOR ADDITIONAL INFORMATION.

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SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
E201

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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. COOPER BUSSMANN POWER MODULE PANEL (PMP) OR APPROVED EQUAL.
3. "LP" PANELS SHALL BE SQUARE D POWERLINK G3 TYPE PANELS OR APPROVED EQUAL. LIGHTING CIRCUITS SHALL BE ON CONTROLLABLE CIRCUIT BREAKERS AND ARE CONTROLLED BY LIGHTING CONTROL SOFTWARE.

GENERAL NOTES:

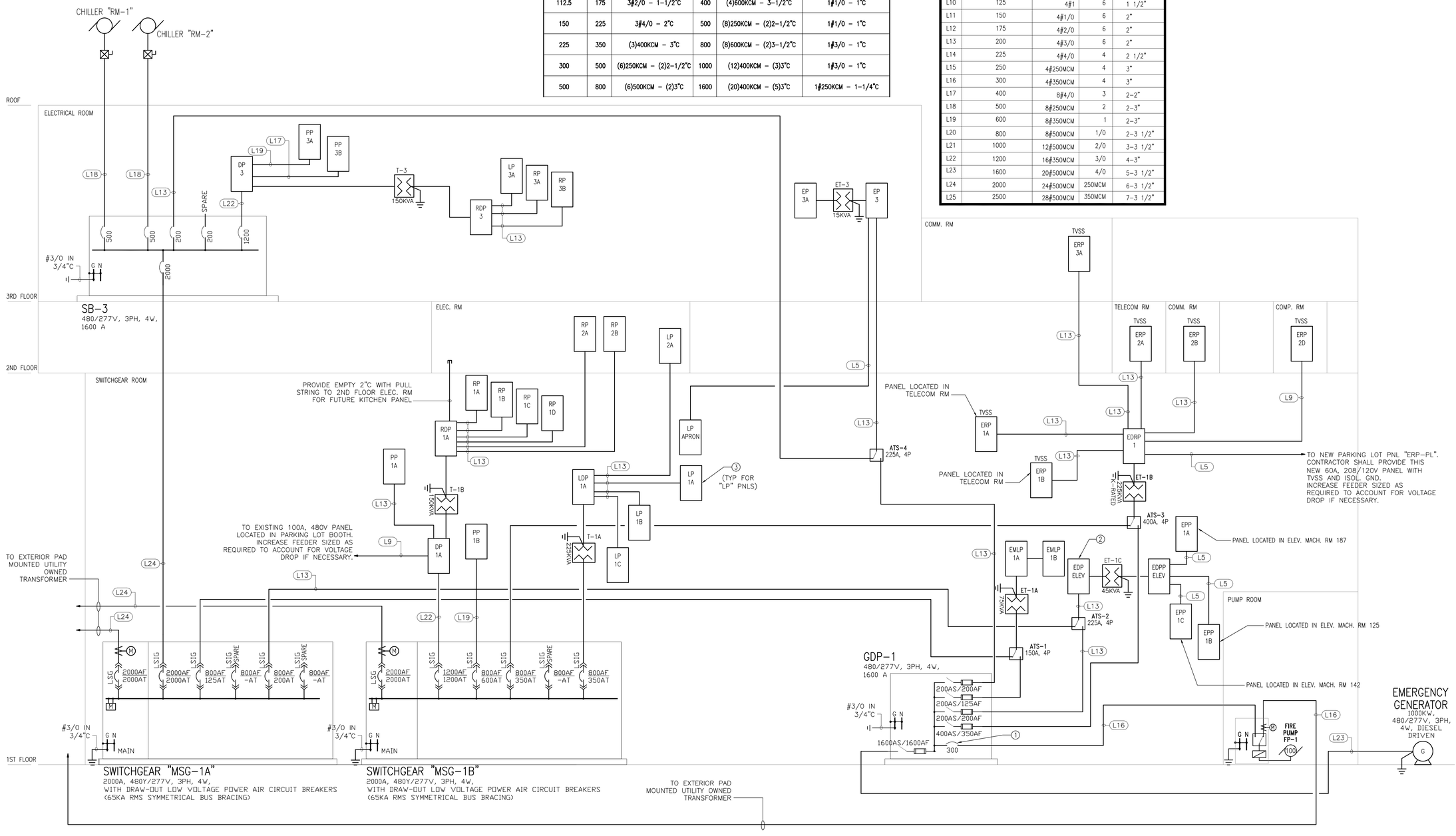
1. SEE TABLE 3 ON THIS DRAWING FOR TRANSFORMER FEEDER SIZES, INCLUDING GROUNDING ELECTRODE SIZE.

TABLE 3

TRANSFORMER SCHEDULE					
TRANSFORMER	480 VOLT SIDE		120/208 VOLT SIDE		
(KVA)	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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SHEET TITLE
POWER RISER DIAGRAM

SHEET NUMBER
E300

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Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5th) Electrical\Dwgs\2035_E300.dwg Plotted on: 4/9/2010 3:25 PM Plotted by: Kastner, 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.

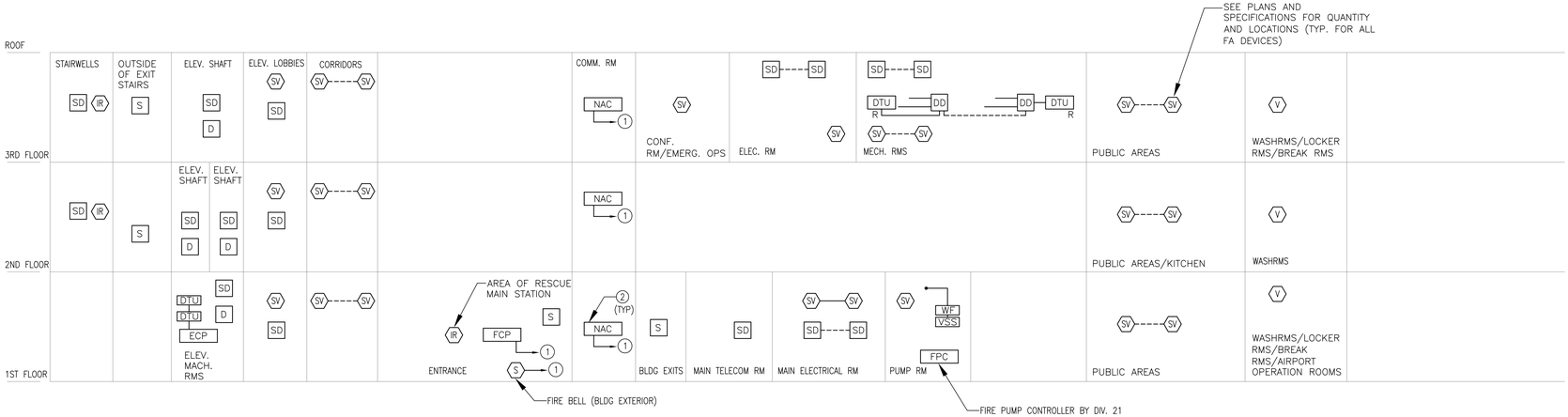
FA KEYED NOTES

(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

90% NOT FOR CONSTRUCTION

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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
∅	-	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 QTY	LAMPS TYPE	LAMPS TOTAL VA	MOUNTINGS: P–PENDANT R–RECESSED S–SURFACE	REMARKS
A	▭	FLUORESCENT WRAPAROUND WITH HIGH IMPACT ACRYLIC LENS	COLUMBIA WC4–232–EU–DR OR APPROVED EQUAL	2	32W T8	60	P/S	
B	⊢⊣	4', ENCLOSED, SURFACE OR PENDANT MOUNTED INDUSTRIAL T8 FLUORESCENT FIXTURE	LITHONIA CLM–232–120–GEB10IS OR APPROVED EQUAL	2	32W T8	60	P/S	PROVIDE SWIVEL–STEM HANGER "SQ" OPTION FOR AREAS W/O FINISHED CLG
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 1 EM LAMP	50W MH 50W MH	70 70	S	EXTERIOR (BACK OF HOUSE)
F	▭	4' SURFACE MOUNTED FLUORESCENT WALL BRACKET WITH T8 LAMPS.	COLUMBIA W4–232–E120 OR APPROVED EQUAL	2	32W T8	60	S	STAIRWELL
G	▭	2' SURFACE MOUNTED FLUORESCENT WALL BRACKET WITH T8 LAMPS.	COLUMBIA W2–217–E120 OR APPROVED EQUAL	2	17W T8	30	S	
H	▭	2'X4' SURFACE MOUNT FLUORESCENT HIGH ABUSE FIXTURE. 18–GAUGE CRS HOUSING AND LENS FRAME.	KENALL HASES124–3–32–IS–2 –2F–2H–6 OR APPROVED EQUAL	3	32W T8	90	S	
J	▭	2'X4' SURFACE MOUNT FLUORESCENT FIXTURE.	COLUMBIA SM24–332–FSA12–EU OR APPROVED EQUAL	3	32W T8	90	S	
K	▬	UNDERCABINET FLUORESCENT FIXTURE	LITHONIA N2S–32–120–GEB10IS OR APPROVED EQUAL	1	32W T8	30	S	
L	▭	2'X4' SURFACE MOUNT FLUORESCENT FIXTURE.	COLUMBIA SM24–232–FSA12–EU OR APPROVED EQUAL	2	32W T8	60	S	
M	▭	2'X4' GRID MOUNT, AIR HANDLING, 18–CELL PARABOLIC FLUORESCENT FIXTURE.	LITHONIA 2ES8P–A–232–120–BILP OR APPROVED EQUAL	2	32W T8	48	G	
N	▬	5"X48" LINEAR FLUORESCENT FIXTURE WITH COLD FORMED, POLYCARBONATE LENS. CEILING (PENDANT) MOUNT.	KENALL TSH548–C–3–32–EB–1 AND SUP–XX–OAH OPTION FOR SUSPENSION OR APPROVED EQUAL	3	32W T8	80	P	FIXTURE SHALL BE MOUNTED 11' AFF
N2	▬	SAME AS FIXTURE "N", WITH COLD WEATHER BALLAST OPTION ADDED.	KENALL TSH548–C–3–32–EB–1 AND SUP–XX–OAH OPTION FOR SUSPENSION AND "CW" OPTION (COLD WEATHER BALLAST) OR APPROVED EQUAL	3	32W T8	80	P	FIXTURE SHALL BE MOUNTED 11' AFF
P	▭	2'X4' GRID MOUNT, AIR HANDLING, PARABOLIC FLUORESCENT FIXTURE.	– – OR APPROVED EQUAL	4	32W T8	–	G	PROVIDE GE SPX LAMP OR APPROVED EQUAL
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.
5. REFER TO ARCHIECTURAL PLANS FOR SPECIFICATION OF ADDITINOAL LIGHTING FIXTURES INCLUDING THOSE, BUT NOT LIMITED TO, SHOWN IN PUBLIC AREAS, EXTERIOR AND APRON.

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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	
OH	MOTORIZED OVERHEAD DOOR			–			–	–	–	33, 9, 13, 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: 04-12-10
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

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\8.1 Electrical\Dwgs\2008_E402.dwg Plotted on: 4/9/2010 12:09 PM Plotted by: Hoelker, Jennifer

SWGR DISTRIBUTION: MSG–1A W/TVSS

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

BUS SIZE: 2000A — LOAD:
MAIN DEVICE: 2000A — CONN. 1388.0 kVA
DEM. 1358.0 kVA
DEM. 1634.2 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	CB AF	CB AT	REMARKS
1	SWITCHBOARD "SB–3"	1259.0	1229.0	2000	2000	
2	"ATS–1" (EM LTG)	30.0	30.0	800	125	
3	SPARE			800		
4	"ATS–2" (ELEV)	99.0	99.0	800	200	
5	SPARE			800		

SWGR DISTRIBUTION: MSG–1B W/TVSS

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

BUS SIZE: 2000A — LOAD:
MAIN DEVICE: 2000A — CONN. 1181.0 kVA
DEM. 1174.0 kVA
DEM. 1412.8 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	CB AF	CB AT	REMARKS
1	PNL "DP–1A"	655.0	648.0	1200	1200	
2	PNL "PP–1B"	335.0	335.0	800	600	
3	"ATS–3" (CRITICAL)	71.0	71.0	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, 3PH, 4W + GND

BUS SIZE: 1600A — LOAD:
MAIN DEVICE: 1600A — CONN. 341.0 kVA
DEM. 341.0 kVA
DEM. 410.3 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)	47.0	47.0	400	350	SWITCH/FUSE
3	"ATS–2" (ELEVATORS)	99.0	99.0	200	200	SWITCH/FUSE
4	"ATS–1" (EM LTG)	60.0	60.0	200	125	SWITCH/FUSE
5	"ATS–4" (HVAC CRTCL)	32.0	32.0	200	200	SWITCH/FUSE

SWBD DISTRIBUTION: SB–3

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

BUS SIZE: 2000A — LOAD:
MAIN DEVICE: 2000A — CONN. 1259.0 kVA
DEM. 1229.0 kVA
DEM. 1478.9 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.)	78.0	64.0	200	
4	PNL "DP–3"	495.0	479.0	1200	
5	SPARE			200	

PANEL DISTRIBUTION: DP–1A

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

BUS SIZE: 1200A — LOAD:
MAIN DEVICE: 1200A — CONN. 715.0 kVA
DEM. 708.0 kVA
DEM. 852.0 Amps

NOTES
1–PROVIDE EMON METER FOR CIRCUIT

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	AIRPLANE BRIDGE	125.0	125.0	200		NOTE 1
2	AIRPLANE BRIDGE	125.0	125.0	200		NOTE 1
3	AIRPLANE BRIDGE	125.0	125.0	200		NOTE 1
4	AIRPLANE BRIDGE	125.0	125.0	200		NOTE 1
5	XMFR "T–1B"	115.0	108.0	225		
6	PNL "PP–1A"	40.0	40.0	200		
7	EXIST. PL PNL	60.0	60.0	100		

PANEL DISTRIBUTION: DP–3

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

BUS SIZE: 1200A — LOAD:
MAIN DEVICE: 1200A — CONN. 495.0 kVA
DEM. 479.0 kVA
DEM. 576.4 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "PP–3A"	251.0	235.0	600		
2	PANEL "PP–3B"	189.0	189.0	400		
3	XMFR "T–3"	55.0	55.0	225		
4	SPACE					

PANEL DISTRIBUTION: EDP–ELEV

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

BUS SIZE: 200A — LOAD:
MAIN DEVICE: 200A — CONN. 99.0 kVA
DEM. 99.0 kVA
DEM. 119.1 Amps

FUSIBLE SWITCH PNL
1 – CONFIRM OCP
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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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
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

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Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.3) Electrical\Dwgs\2008_E403.dwg Plotted on: 4/9/2010 2:41 PM Plotted by: Kastner, Jennifer

PANELBOARD: PP-1A

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

BUS SIZE: 200A | MAIN DEVICE: 200A | LOAD: CONN. 39.9 kVA, DEM. 39.9 kVA, DEM. 48.0 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				0	0								8
9	20/3		SPARE			0	0			SPARE		20/3	10
11								0	0				12
13				0	0								14
15	20/3		SPARE			0	0			SPARE		20/3	16
17								0	0				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:				9,423	3,880	9,423	3,880	9,423	3,880				

PANELBOARD: PP-1B

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

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, 3PH, 4W + GND

BUS SIZE: 600A | MAIN DEVICE: 600A | LOAD: CONN. 234.6 kVA, DEM. 234.6 kVA, DEM. 282.3 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				5,820	0								2
3	40/3		PUMP "P-1"			5,820	0			PUMP "P-3"		40/3	4
5								5,820	0	STANDBY PUMP			6
7				5,820	0								8
9	40/3		PUMP "P-2"			5,820	0			SPARE		30/3	10
11								5,820	0				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	9,422								20
21	20/3		REF-1			3,048	9,422			REF-2		70/3	22
23								3,048	9,422				24
25				7,482	2,106								26
27	60/3		AHU-3			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-3			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-4			7,482	3,880			REF-4		25/3	40
41								7,482	3,880				42
TOTAL CONNECTED LOADS:				39,352	38,853	39,352	38,853	39,352	38,853				

PANELBOARD: PP-3B

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

BUS SIZE: 400A | MAIN DEVICE: 400A | LOAD: CONN. 188.3 kVA, DEM. 188.3 kVA, DEM. 226.5 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				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				5,820	0								8
9	40/3		AHU-5			5,820	0			SPARE		40/3	10
11								5,820	0				12
13				3,048	0								14
15	20/3		REF-5			3,048	0			SPARE		15/3	16
17								3,048	0				18
19				0	0								20
21	15/3		SPARE			0	0			SPARE		15/3	22
23								0	0				24
25	15/1		FPB-3.1	2,548	859					FPB-3.6		15/1	26
27	15/1		FPB-3.2			1,413	1,413			FPB-3.7		15/1	28
29	15/1		FPB-3.3					1,413	2,548	FPB-3.8		15/1	30
31	15/1		FPB-3.4	1,413	859					FPB-3.9		15/1	32
33	15/1		FPB-3.5			1,413	1,413			FPB-2.1		15/1	34
35	15/1		SPARE						360	FPB-2.2		15/1	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:				37,229	26,118	36,094	27,226	34,681	26,908				

PANELBOARD: EP-3

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

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 63.7 kVA, DEM. 63.7 kVA, DEM. 76.7 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			9,533	831							2
3	60AS/60AF	PNL "LP-APRON"			9,533	831			PUMP "P-7"	30AS/15AF	4
5	3P						9,533	831		3P	6
7			0	831							8
9	30AS/20AF	PUMP "P-6"			0	831			PUMP "P-8"	30AS/15AF	10
11	3P	STANDY PUMP					0	831		3P	12
13			0	0							14
15	30AS/	SPARE			0	0			PUMP "P-9"	30AS/15AF	16
17	3P						0	0	STANDY PUMP	3P	18
19			3,880	0							20
21	30AS/20AF	PUMP "P-4"			3,880	0			SPARE	30AS/	22
23	3P						3,880	0		3P	24
25			942	942							26
27	30AS/15AF	"EF-1.1"			942	942			"SF-2"	30AS/15AF	28
29	3P						942	942		3P	30
31			3,880	0							32
33	30AS/20AF	PUMP "P-5"			3,880	0			SPARE	30AS/	34
35	3P						3,880	0		3P	36
37			0	1,200							38
39	30AS/	SPARE			0	0			XMFR "ET-3"	30AS/30AF	40
41	3P						0	0		3P	42
TOTAL CONNECTED LOADS:			18,235	3,804	18,235	2,604	18,235	2,604			

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
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

90% NOT FOR CONSTRUCTION

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2035_E404.dwg Plotted on: 4/9/2010 12:55 PM Plotted by: Kastner, Jennifer

PANEL DISTRIBUTION: EDPP–ELEV

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

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

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, 3PH, 4W + GND

BUS SIZE: 800A | LOAD: CONN. 71.0 kVA, DEM. 71.0 kVA, DEM. 197.2 Amps | NOTES: FUSIBLE SWITCH PNL
MAIN DEVICE: 800A

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	DEVICES (A) FUSE	REMARKS
1	PANEL "ERP–1A"	18.0	18.0	400	250	
2	PANEL "ERP–1B"	12.0	12.0	400	250	
3	PANEL "ERP–2A"	9.0	9.0	400	250	
4	PANEL "ERP–2B"	6.0	6.0	400	250	
5	PANEL "ERP–2D"	4.0	4.0	100	100	
6	PANEL "ERP–3A"	8.0	8.0	400	250	
7	PANEL "ERP–PL"	14.0	14.0	60	60	

PANEL DISTRIBUTION: RDP–1A

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

BUS SIZE: 600A | LOAD: CONN. 115.0 kVA, DEM. 108.0 kVA, DEM. 300.0 Amps | NOTES: CIRCUIT BREAKER PNL
MAIN DEVICE: 500A

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB	DEVICES (A)	REMARKS
1	PANEL "RP–1A"	14.0	14.0	200		
2	PANEL "RP–1B"	20.0	20.0	200		
3	PANEL "RP–1C"	14.0	14.0	200		
4	PANEL "RP–1D"	26.0	19.0	200		
5	PANEL "RP–2A"	31.0	31.0	200		
6	PANEL "RP–2B"	10.0	10.0	200		
7	SPARE (FUT. KIT. PNL)			200		
8	SPACE					

PANEL DISTRIBUTION: RDP–3

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

BUS SIZE: 600A | LOAD: CONN. 55.0 kVA, DEM. 55.0 kVA, DEM. 152.8 Amps | NOTES: CIRCUIT BREAKER PNL
MAIN DEVICE: 500A

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"	16.0	16.0	200		
3	PANEL "RP–3B"	19.0	19.0	200		
4	SPACE					

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E405

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Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2008_E405.dwg Plotted on: 4/9/2010 3:27 PM Plotted by: Hosher, Jennifer

PANELBOARD: RP-1A

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

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 200A | CONN. 13.8 kVA | 1-PROVIDE EMON METER FOR CIRCUIT
DEM. 13.8 kVA
DEM. 38.5 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	15/1		"UH-1.2"	528	360					REC-GENERAL		20/1	2
3	15/1		"UH-1.3"			528	540			REC-GENERAL		20/1	4
5	15/1		"CUH-1.1"					528	1,080	REC-GENERAL		20/1	6
7	15/1		"CUH-1.5"	528	360					REC-WASHRMS		20/1	8
9	20/1		REC-RAMP (GEN)			900	360			REC-WASHRMS		20/1	10
11	20/1		REC-TUNNEL (GEN)					540	540	REC-GENERAL		20/1	12
13	20/1		REC-EXTERIOR (GEN)	360	360					REC-OFFICE		20/1	14
15	15/1		"UH-1.1"			528	500			FUME HOOD		20/1	16
17	20/1		SPARE					0	0	SPARE		20/1	18
19	20/1		REC-ROVER	360	0					SPARE		20/1	20
21	20/1		REC-ROVER			540	360			REC-OFFICE		20/1	22
23	20/1		SPARE					0	0	SPARE		20/1	24
25	20/1		REC-GENERAL	720	0					SPARE		20/1	26
27	20/1		REC-OFFICE/WRKST.			900	540			REC-GENERAL		20/1	28
29	20/1	1	REC-ELEC. CART					180	0	SPARE		20/1	30
31	20/1	1	REC-ELEC. CART	180	0					SPARE		20/1	32
33	20/1	1	REC-ELEC. CART			180	0			SPARE		20/1	34
35	20/1	1	REC-ELEC. CART					180	0	SPARE		20/1	36
37	20/1		SPARE	0	0					SPARE		20/1	38
39						291	291						40
41	15/2		ACN-1.1					291	291	ACN-1.2		15/2	42
TOTAL CONNECTED LOADS:				2,676	1,080	3,867	2,591	1,719	1,911				

PANELBOARD: RP-1B

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

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 200A | CONN. 19.1 kVA
DEM. 19.0 kVA
DEM. 52.8 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	15/1		"UH-1.4"	528	360					REC-TUNNEL (GEN)		20/1	2
3	15/1		"UH-1.5"			528	1,080			REC-GENERAL		20/1	4
5	15/1		"UH-1.7"					528	360	REC-AIRPORT POLICE		20/1	6
7	15/1		"UH-1.8"	528	100					BHS MCP PWR		20/1	8
9	15/1		"UH-1.9"			528	180			BHS MCP PWR		20/1	10
11	15/1		"CUH-1.2"					528	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	528					"CUH-1.4"		15/1	26
27	20/1		REFRIGERATOR			1,200	528			"EF-1.3"		15/1	28
29	20/1		MICROWAVE					1,200	528	"EF-1.2"		15/1	30
31	20/1		REC-RAC 1	360	540					REC-EDT WRKSTAT.		20/1	32
33	20/1		REC-RAC 2			360	0			SPARE		20/1	34
35	20/1		REC-RAC 3					360	0	SPARE		20/1	36
37	20/1		REC-RAC 4	360	0					SPARE		20/1	38
39	20/1		REC-RAC 5			360	0			SPARE		20/1	40
41	20/1		SPARE					0	0	SPARE		20/1	42
TOTAL CONNECTED LOADS:				3,876	2,428	4,056	2,608	4,236	1,888				

PANELBOARD: RP-1C

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

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 200A | CONN. 13.7 kVA
DEM. 13.7 kVA
DEM. 38.0 Amps

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 (AIR 3)		20/1	12
13	20/1		REC-GENERAL	900	528					"UH-1.6"		15/1	14
15	20/1		REC-WASHRMS			360	528			"UH-1.-"		15/1	16
17	20/1		REC-OFFICE					360	528	"EF-1.6"		15/1	18
19	20/1		REC-OFFICE	360	696					"EF-1.5"		15/1	20
21	20/1		REC-GENERAL			720	696			"EF-1.7"		15/1	22
23	20/1		REC-DLH POLICE					360		SPARE		20/1	24
25	20/1		REC-OFFICE/OPS (AIR 1)	720						SPARE		20/1	26
27	20/1		REC-OFFICE/OPS (AIR 2)			720				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						291	291						40
41	15/2		ACN-3					291	291	ACN-4		15/2	42
TOTAL CONNECTED LOADS:				2,700	1,764	3,171	2,595	1,551	1,899				

PANELBOARD: RP-2A

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

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 200A | CONN. 30.6 kVA
DEM. 30.6 kVA
DEM. 85.1 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-GENERAL	540	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	720					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	900					REC-GENERAL		20/1	14
15	20/1		REC-VENDING MACH			1,200	360			REC-GENERAL		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)	900	2,000					REC-PAGING SYS.		30/2	26
27	20/1		REC-CONCRSE (GEN)			720	2,000						28
29	20/1		REC-GENERAL					540	2,000	REC-PAGING SYS.		30/2	30
31	20/1		REC-GENERAL	900	2,000								32
33	15/1		"CUH-2.1"			528	360			REC-WASHRMS		20/1	34
35	20/1		REC-OFFICE					720	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:				5,940	7,020	5,028	4,080	5,220	3,360				

PANELBOARD: RP-2B

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

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 200A | CONN. 9.9 kVA
DEM. 9.9 kVA
DEM. 27.6 Amps

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	360					REC-WASHRMS		20/1	2
3	20/1		REC-GENERAL			900	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	900			REC-GENERAL		20/1	16
17	20/1		REC-OFFICE					360		SPARE		20/1	18
19	20/1		REC-CONF RM	360						SPARE		20/1	20
21	20/1		REC-GENERAL			1,080				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	860	2,520	2,340	1,940	500				

PANELBOARD: RP-1D

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

BUS SIZE: 225A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 200A | CONN. 25.4 kVA | 1-PROVIDE EMON METER FOR CIRCUIT
DEM. 18.1 kVA
DEM. 50.2 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				2,000	2,000								2
3	30/3		REC-PSGR BRIDGE			2,000	2,000			REC-PSGR BRIDGE		30/3	4
5								2,000	2,000				6
7				2,000	2,000								8
9	30/3		REC-PSGR BRIDGE			2,000	2,000			REC-PSGR BRIDGE		30/3	10
11								2,000	2,000				12
13	20/1		REC-GENERAL	180	180					REC-GENERAL		20/1	14
15	20/1		REC-GENERAL			180	180			REC-GENERAL		20/1	16
17	20/1	1	REC-GENERAL					180	180	REC-GENERAL	1	20/1	18
19	20/1	1	REC-GENERAL	180	180					REC-GENERAL	1	20/1	20
21	20/1		SPARE							SPARE		20/1	22
23	20/1		SPARE							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:				4,360	4,360	4,180	4,180	4,180	4,180				

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DRAWN BY: JK
DESIGNED BY: JK

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E406

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\A.0 CADD\(A.1) Electrical\Dwgs\2008_E406.dwg Plotted on: 4/9/2010 1:03 PM Plotted by: Koehler, Jennifer

PANELBOARD: EPP–1A

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

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

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 + GND

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

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 + GND

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

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 + GND

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

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 + GND

BUS SIZE: 250A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 250A | CONN. 17.3 kVA | 1–PROVIDE EMON METER FOR CIRCUIT
DEM. 17.3 kVA
DEM. 48.0 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	30/2	1	EDS MACH.	2,400	2,400					EDS MACH.	1	30/2	2
3						2,400	2,400						4
5	30/2	1	EDS MACH.					2,400	0	SPARE		20/1	6
7				0	250					REC–OFFICE		20/1	8
9	20/1		REC COMP–OFFICE			250	180			REC–RAC 1		20/1	10
11	20/1		REC–INTERVIEW					250	180	REC–RAC 2		20/1	12
13	20/1		REC–ADIT RM	250	180					REC–RAC 3		20/1	14
15	20/1		REC–INTERVIEW			250	250			REC–OFFICE		20/1	16
17	20/1		REC–ROVER					250	500	REC–SEC XRAY		20/1	18
19	20/1		REC–ROVER	250	500					REC–SEC XRAY		20/1	20
21	20/1		REC–ROVER			250	0			SPARE		20/1	22
23	20/1		REC–ROVER					250	0	SPARE		20/1	24
25	20/1		REC–ROVER	250	0					SPARE		20/1	26
27	20/1		REC–ROVER			250	0			SPARE		20/1	28
29	20/1		REC–ROVER					250	0	SPARE		20/1	30
31	20/1		REC–ROVER	250	0					SPARE		20/1	32
33	20/1		REC–ROVER			250	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:				3,400	3,330	3,650	2,830	3,400	680				

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

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

BUS SIZE: 250A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 250A | CONN. 11.1 kVA
DEM. 11.1 kVA
DEM. 30.9 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		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		SPARE					0	250	REC–CHECK IN CNTR		20/1	6
7	20/1		SPARE	0	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		SPARE					0	250	REC–CHECK IN CNTR		20/1	12
13	20/1		SPARE	0	250					REC–CHECK IN CNTR		20/1	14
15	20/1		REC–OPS (AIR 1)			500	250			REC–EDS COMP.		20/1	16
17	20/1		REC–OPS (AIR 1)					500	250	REC–EDS COMP.		20/1	18
19	20/1		REC–OFFICE (AIR 1)	500	250					REC–EDS COMP.		20/1	20
21	20/1		REC–OPS (AIR 2)			500	180			REC–RAC 4		20/1	22
23	20/1		REC–OPS (AIR 2)					500	180	REC–RAC 5		20/1	24
25	20/1		REC–OFFICE (AIR 2)	750	250					REC–EDT WRKSTAT.		20/1	26
27	20/1		REC–OPS (AIR 3)			500	250			REC–EDT WRKSTAT.		20/1	28
29	20/1		REC–OPS (AIR 3)					750	250	REC–EDT WRKSTAT.		20/1	30
31	20/1		REC–OFFICE (AIR 3)	750	0					SPARE		20/1	32
33	20/1		REC–FDRS			500	0			SPARE		20/1	34
35	20/1		REC–FDRS					500	0	SPARE		20/1	36
37	20/1		REC–FDRS	500	0								38
39	20/1		SPARE			0	0			TVSS		60/3	40
41	20/1		SPARE					0	0				42
TOTAL CONNECTED LOADS:				2,750	1,250	2,500	1,180	2,250	1,180				

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

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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

90% NOT FOR CONSTRUCTION

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E407.dwg Plotted on: 4/9/2010 1:20 PM Plotted by: Kastner, Jennifer

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

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

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

MAIN DEVICE: 250A | CONN. 8.2 kVA | DEM. 8.2 kVA | DEM. 22.6 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		REC-ETD MACH.	500	0		SPARE	20/1	20
21	20/1		REC- BODY IMAGER		1,200	0	SPARE	20/1	22
23	20/1		REC-CONF RM			250	0 SPARE	20/1	24
25	20/1		REC-OFFICE	250	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:				1,750	1,700	1,950	750 1,250 750		

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

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

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-OFFICE	500	1,200		FM200 SYS	20/1	2
3	20/1		REC-OFFICE		250	250	REC-COMM. RM	20/1	4
5	20/1		SPARE			0	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:				1,000	1,700	1,000	750 750 750		

PANELBOARD: EP-3A

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

BUS SIZE: 60A | LOAD: | NOTES: PLUG FUSE PANEL

MAIN DEVICE: 50A | CONN. 1.2 kVA | DEM. 1.2 kVA | DEM. 3.3 Amps

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1	"B-1"	1,200			SPARE	20/1	2
3	20/1	"B-2" (STANDY)		0		SPARE	20/1	4
5	20/1	"B-3"(STANDBY)			0	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				SPARE	20/1	22
23	20/1	SPARE				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:			1,200	0	0	0 0 0		

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

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

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 + GND

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

MAIN DEVICE: 250A | CONN. 7.2 kVA | DEM. 7.2 kVA | DEM. 20.0 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-OPS		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	250		REC-BADGE RM	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		REC-WRKSTAT.	250	0		SPARE	20/1	26
27	20/1		REC-WRKSTAT.		250	0	SPARE	20/1	28
29	20/1		REC-WRKSTAT.			250	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:				1,250	1,950	1,250	750 1,250 750		

PANELBOARD: RP-3A

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

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

MAIN DEVICE: 200A | CONN. 15.7 kVA | DEM. 15.7 kVA | DEM. 43.7 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	15/1		"UH-3.1"	528	360		REC-OPS CONF RM	20/1	2
3	15/1		"UH-3.2"		528	360	REC-OPS CONF RM	20/1	4
5	15/1		"UH-3.5"			528	1,200 PROJECTOR	20/1	6
7	15/1		"UH-3.3"	528	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	900		REC-GENERAL	20/1	14
15	20/1		SPARE		0	540	REC-GENERAL	20/1	16
17	20/1		SPARE			0	360 REC-GENERAL	20/1	18
19	20/1		REC-WASHRMS	360	1,200		REC-PRINTER	20/1	20
21	20/1		REC-GENERAL		360	0	REC-COPY RM	20/1	22
23	15/1		"UH-3.5"			528	180 REC-COPY RM	20/1	24
25	15/1		"CUH-3.1"	528	0		REC-COPY RM	20/1	26
27	15/1		"EF-3.1"		528	720	REC-GENERAL	20/1	28
29	15/1		"EF-3.2"			528	360 REC-BADGE RM	20/1	30
31	15/1		"EF-3.3"	528	864		"P-10"	15/1	32
33	20/1		SPARE		0	864	"P-11"	15/1	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:				3,192	3,324	2,316	2,484 2,304 2,100		

PANELBOARD: RP-3B

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

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

MAIN DEVICE: 200A | CONN. 18.0 kVA | DEM. 18.0 kVA | DEM. 50.1 Amps

1 – PROVIDE GFCI TYPE CB

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		360	360	REC-TRAINING RM (GEN)	20/1	4
5	20/1		REC-COUNTER			360	1,200 PROJECTOR	20/1	6
7	20/1		GARBAGE DISPOSAL	1,200	360		REC-GENERAL	20/1	8
9	20/1		MICROWAVE		1,200	720	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		SPARE		0	0	SPARE	20/1	16
17	20/1		REC-GENERAL			720	0 REC-BREAK RM	20/1	18
19	20/1		REC-BREAK RM	360	0		REC-COUNTER	20/1	20
21	20/1		GARBAGE DISPOSAL		1,200	0	GARBAGE DISPOSAL	20/1	22
23	20/1		MICROWAVE			1,200	0 MICROWAVE	20/1	24
25	20/1		REFRIGERATOR	1,200	0		REFRIGERATOR	20/1	26
27	20/1		REC-WRKSTAT.		720	696	"EF-3.5"	15/1	28
29	20/1		REC-WRKSTAT.			360	0 SPARE	20/1	30
31	15/1		"UH-3.6"	528	0		SPARE	20/1	32
33	15/1		"UH-3.7"		528	0	SPARE	20/1	34
35	15/1		"CUH-3.2"			528	0 SPARE	20/1	36
37	15/1		"CUH-3.3"	528	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:				4,536	1,440	4,008	1,776 4,368 1,920		

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
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

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Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2035_E408.dwg Plotted on: 4/8/2010 1:01 PM Plotted by: Kestler, Jennifer

SECURITY/TECHNOLOGY SYSTEMS LEGEND

IDF #	COMMUNICATION OUTLET – (2) RJ-45 CAT6 JACKS (SEE NOTE 12)
IDF #	COMMUNICATION OUTLET – (3) RJ-45 CAT6 JACKS (SEE NOTE 12)
IDF #	COMMUNICATION OUTLET – (4) RJ-45 CAT6 JACKS (SEE NOTE 12)
TV IDF #	TV OUTLET – (1) TYPE F JACK & (2) RJ-45 JACKS, 80" A.F.F. (SEE NOTE 12).
IDF # W	WALL PHONE OUTLET – (1) RJ-45 CAT6 JACK WITH WALL PHONE MOUNTNG PLATE. INSTALLED 54" A.F.F. FOR SIDE REACH AND 48" A.F.F. FOR FORWARD REACH LOCATION PER ADA. (SEE NOTE 12).
IDF #	DATA OUTLET, IN FLOOR BOX, QUANTITY OF JACKS BASED ON SYMBOL ABOVE.
J	JUNCTION BOX
E	ELECTRICAL CONNECTION
	DUPLEX ELECTRICAL OUTLET. PROVIDE 2#12, 1#12 GND IN 3/4" CONDUIT TO PANEL INDICATED. PROVIDE ADDITIONAL CIRCUIT BREAKERS AS REQUIRED. UPDATE PANEL CIRCUIT DIRECTORY WITH TYPE WRITTEN CIRCUIT INFORMATION.
	QUAD ELECTRICAL OUTLET. PROVIDE 2#12, 1#12 GND IN 3/4" CONDUIT TO PANEL INDICATED. PROVIDE ADDITIONAL CIRCUIT BREAKERS AS REQUIRED. UPDATE PANEL CIRCUIT DIRECTORY WITH TYPE WRITTEN CIRCUIT INFORMATION.
	SINGLE PORT ELECTRICAL OUTLET, NEMA STYLE INDICATED ON PLANS. PROVIDE NEMA L6-30 W/ 2#10, 1#10GND IN 1"C UNLESS OTHERWISE INDICATED.
T IDF	COMMUNICATION CONDUIT, CONCEALED, 1" MINIMUM, "IDF" INDICATES TERMINATION POINT.
AP	802.11 WIRELESS ACCESS POINT. (SEE NETWORK RISER)
IFP	INTELLIGENT FIELD PANEL (SEE ACCESS CONTROL RISER)
EIB IDF #	ELECTRICAL INTERFACE BOX (SEE ACCESS CONTROL RISER) PROVIDE COMPLETE CONDUIT TO IFP LOCATION. "IDF-#" INDICATES LOCATION OF INTELLIGENT FIELD PANEL, SEE FLOOR PLANS. PROVIDE JBOX WITH 2#12, 1#10 GND IN 3/4"C TO NEAREST EMERGENCY POWER PANEL.
R	CARD READER. (SEE ACCESS CONTROL RISER)
IDF # C-X	PTZ (PAN/TILT/ZOOM) CCTV CAMERA. (SEE VIDEO SURVEILLANCE RISER DIAGRAM)
IDF # C-X	FIXED CCTV CAMERA. (SEE VIDEO SURVEILLANCE RISER DIAGRAM)
	LCD DISPLAY (MUFIDS/PUBLIC DISPLAY)
SIDA	SECURITY BOUNDARY – PART 1542 SECURITY IDENTIFICATION DISPLAY AREA (DISA). BADGE REQUIRED TO BE WORN AT ALL TIMES.
STERILE	STERILE BOUNDARY – PART 1542 TSA SCREENED STERILE BOUNDARY INSIDE TERMINAL PAST SECURITY CHECKPOINT.
SEC	SECURITY BOUNDARY – NON PART 1542 ACCESS OWNER CONTROLED BOUNDARY.
1 / 3B	SECURITY ACCESS POINT IDENTIFICATION. TOP = NUMBER, BOTTOM = POINT TYPE. (SEE ACCESS CONTROL DETAILS)
	19" OPEN FRAME COMMUNICATIONS RACK. (SEE COMM RACK ELEVATIONS)
	ENCLOSUED COMM EQUIPMENT CABINET. (SEE COMM RACK ELEVATIONS)
	GENERIC CABLE TRAY, WIDTH AS INDICATED
	TELEPHONE TERMINAL BOARD, 4'x8' PAINTED WHITE W/ FIRE RETARDANT PAINT (2) COATS REQUIRED. PROVIDE QUANTITY AS REQUIRED TO COVER WALLS AS INDICATED ON PLANS.
AIS	FLIGHT INFORMATION INPUT WORKSTATION (SEE MUFIDS RISER)

ABBREVIATION

AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
B	BOTTOM
BC	BELOW COUNTER
BID	BAGGAGE INFORMATION DISPLAY
BKR	BREAKER
C	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
CH	COUNTER HEIGHT
CKT	CIRCUIT
CLG	CEILING HEIGHT
CP	COMMUNICATIONS PANEL
CPB	COMMUNICATIONS PULL BOX
CTR	CONTACTOR
CTS	CLOSED CIRCUIT TV SWITCHING EQUIPMENT
D/S	DISCONNECT SWITCH
DTC	DATA TERMINAL CABINET
E	EMERGENCY
ECB	ENCLOSED CIRCUIT BREAKER
EIB	ELECTRICAL INTERFACE BOX
EN	EXISTING TO BE REPLACED
EPB	ELECTRICAL PULL BOX
ER	EXISTING TO BE REMOVED
ERP	EXISTING IN RELOCATED POSITION
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING TO REMAIN
EXP	EXPLOSION PROOF
EXR	EXISTING TO BE RELOCATED
FACP	FIRE ALARM CONTROL PANEL
FATC	FIRE ALARM TRANSPONDER CABINET
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FID	FLIGHT INFORMATION DISPLAY
GCTC	GATE CONTROL TERMINAL CABINET
GFI	GROUND FAULT INTERRUPTER
GID	GATE INFORMATION DISPLAY
GND	GROUND
HID	HIGH INTENSITY DISCHARGE
PATC	PUBLIC ADDRESS TERMINAL CABINET
IDF	INTERMEDIATE DISTRIBUTION FRAME
IFP	INTELLIGENT FIELD PANEL
MDF	MAIN DISTRIBUTION FRAME
MH	MOUNTING HEIGHT
NEC	PER LATEST NATIONAL ELECTRICAL CODES
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT (UNSWITCHED)
OHE	OVERHEAD ELECTRIC
P	PUBLIC
PL	PILOT LIGHT
SCP	SECURITY CONTROL PANEL
SSTC	SOUND SYSTEM TERMINAL CABINET
STC	STARTER
STR	SECURITY TERMINAL CABINET
T	TOP
TBB	TELEPHONE BACKBOARD
TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
UGE	UNDERGROUND ELECTRIC
U.O.N.	UNLESS OTHERWISE NOTED
VDB	VOICE/DATA/BACKBOARD
W	WALL
WP	WEATHERPROOF

GENERAL SECURITY/TECHNOLOGY SYSTEMS NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE LATEST ISSUE OF THE NATIONAL ELECTRICAL CODE (NFPA 70), THE LIFE SAFETY CODE (NFPA 101), OSHA, THE NATIONAL FIRE CODES, THE AMERICANS WITH DISABILITIES ACT, STATE AND LOCAL CODES.
2. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND INDUSTRY STANDARDS.
3. ALL MATERIALS AND EQUIPMENT USED ON THIS PROJECT SHALL BE NEW, U.L. APPROVED/LISTED, U.O.N.
4. ALL WIRING SHALL BE INSTALLED IN CONDUIT AS INDICATED ON THE DRAWINGS, MINIMUM CONDUIT SIZE SHALL BE ¾" U.O.N. TRADE SIZE. CONCRETE ENCASED, OUTDOOR, AND UNDERGROUND CONDUIT SHALL BE RIGID GALVANIZED STEEL U.O.N. SET SCREW FITTINGS ARE NOT PERMITTED. FLEXIBLE CONDUIT SHALL NOT EXCEED 36" IN LENGTH, U.O.N. ALL CONDUIT RUNS SHALL BE CONCEALED IN FINISHED AREAS. WHERE IT IS IMPRACTICAL TO CONCEAL CONDUIT RUNS, PROVIDE SHOP DRAWINGS SHOWING SURFACE METAL RACEWAY LAYOUT FOR APPROVAL OF THE ENGINEER AND OWNER. ALL CONDUIT BENDS FOR DATA WIRING SHALL BE SMOOTH LONG RADIUS TYPE, "LB" TYPE FITTINGS SHALL NOT BE USED. EXTERIOR BURIED CONDUIT RUNS SHALL BE MINIMUM 24" BELOW FINISHED GRADE. PROVIDE CAUTION TAPE 12" BELOW GRADE. BACKFILL PER SPECIFICATION.
5. PROVIDE GROUND STRAP ACROSS ALL CABLE TRAY JOINTS. GROUND CABLE TRAY TO SERVICE GROUND WITH #1/0 BARE COPPER IN 1" CONDUIT.
6. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE #12AWG TYPE THHN INSULATED COPPER, MINIMUM U.O.N. ALL HOMERUNS OF 100' OR LONGER SHALL BE #10AWG TYPE THHN/THWN INSULATED COPPER, MINIMUM U.O.N. EACH EQUIPMENT BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR SIZED PER NEC AND RUN TOGETHER WITH THE PHASE CONDUCTORS.
7. ALL EMERGENCY CIRCUITS SHALL BE RUN IN SEPARATE CONDUITS. EMERGENCY CIRCUIT CONDUIT SHALL BE PERMANENTLY IDENTIFIED WITH A RED BAND AT TEN FOOT INTERVALS AND AT ALL JUNCTION AND PULL BOXES. FIRE ALARM CIRCUITS SHALL BE RUN IN RED EMT AND ALL JUNCTION AND PULL BOX COVERS PAINTED RED.
8. ALL SECURITY SYSTEM CONDUIT SHALL BE SEPARATE, COMPLETE, AND FULLY FUNCTIONAL. SECURITY SYSTEM WIRING SHALL BE RUN IN BLUE EMT AND ALL JUNCTION AND PULL BOX COVERS PAINTED BLUE.
9. ALL ELECTRICAL WIRING DEVICES INDICATED TO BE INSTALLED IN MASONRY WALLS OR FLOORS SHALL BE FLUSH MOUNTED, INCLUDING BRANCH CIRCUIT PANELBOARDS, UNLESS OTHERWISE NOTED. THE CONDUITS TO ASSOCIATED ELECTRICAL EQUIPMENT SHALL BE CONCEALED IN WALLS OR FLOOR. DO NOT LOCATE ELECTRICAL OUTLETS AND DEVICES ON WALL PANEL JOINTS. REFER TO ARCHITECTURAL BUILDING ELEVATIONS FOR WALL PANEL LAYOUT AND PANEL JOINT LOCATIONS
10. ALL LIGHT SWITCHES AND DUPLEX RECEPTACLES SHALL BE RATED FOR 20 AMPERE AT 125 VAC. ALL EXTERIOR RECEPTACLES SHALL BE 125VAC, 20A RATED GFI TYPE IN WEATHER PROOF ENCLOSURES U.N.O. EXTERIOR RECEPTACLES MUST BE WEATHERPROOF WITH THE ATTACHMENT PLUG INSERTED. ALL DISCONNECT SWITCHES SHALL BE THE HEAVY DUTY TYPE TIME DELAY, TYPE RK5 AND INDICATING TYPE RK5 FUSES.
11. FOR 120 VOLT/20AMP BRANCH CIRCUITS FROM OTHER THAN COMMUNICATION PANELS, CONTRACTOR MAY USE A COMMON NEUTRAL FOR A MAXIMUM OF THREE DIFFERENT PHASE CONDUCTORS (PHASES A, B, & C). A MAXIMUM OF THREE PHASE CONDUCTORS PLUS THREE NEUTRAL CONDUCTORS OR THREE PHASE CONDUCTORS PLUS A #10 NEUTRAL MAY BE RUN IN A SINGLE BRANCH CIRCUIT CONDUIT.
12. PROVIDE 4"X4"X2.5" JUNCTION BOX FOR COMMUNICATIONS OUTLET, PROVIDE SINGLE GANG MUD RING ADAPTER. PROVIDE 1"C TO ACCESSIBLE CEILING SPACE. PROVIDE PLENUM RATED CAT6 CABLING TO COMM. ROOM AS INDICATED. OUTLETS SHALL MATCH ELECTRICAL OUTLET COLOR, MATERIAL AND MOUNTING HEIGHT UNLESS OTHERWISE INDICATED. COMMUNICATION OUTLETS INSTALLED OUTDOOR SHALL BE WEATHERPROOF CONNECTIONS OR INSTALLED WITH A HINGED GASKETED COVER AND CLEAR PLEXIGLASS SHIELD.
13. ALL EMPTY CONDUITS SHALL CONTAIN JET LINE #232 POLYOLEFIN 200 LB. TEST PULL STRING.
14. EACH PANELBOARD SHALL BE PROVIDED WITH A TYPEWRITTEN CIRCUIT DIRECTORY SECURED TO THE INSIDE OF THE DOOR IN A STEEL FRAME. EACH PANELBOARD, TRANSFORMER, AUTOMATIC TRANSFER SWITCH, AND MAIN SWITCHGEAR/SWITCHBOARD SHALL BE IDENTIFIED WITH AN ENGRAVED NAMEPLATE.
15. CONDUITS, WIREWAYS AND CABLE TRAYS SHALL BE SUPPORTED FROM BUILDING STRUCTURE AND NOT FROM OTHER PIPES, DUCTS OR EXISTING RACKS U.O.N.
16. THE CONTRACTOR SHALL THOROUGHLY REVIEW THE PROJECT DRAWINGS AND SPECIFICATIONS AND VISIT THE SITE TO DETERMINE THE FULL EXTENT OF THE WORK. THE BID SUBMITTED SHALL BE CONSTRUED AS EVIDENCE THAT THE BIDDER HAS COMPLIED WITH THESE REQUIREMENTS AND SHALL ENSURE THAT ALL WORK MEET OR EXCEED THE PROJECT REQUIREMENTS. ANY ALLEGED DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO BID SUBMITTAL.
17. THE CONTRACTOR IS REMINDED THAT ELECTRICAL SERVICE TO AND FOR MECHANICAL, KITCHEN AND OTHER EQUIPMENT ARE BASED ON EQUIPMENT DESIGN DATA. THE VALUES MAY DIFFER DEPENDING UPON THE ACTUAL EQUIPMENT TO BE FURNISHED. ANY MODIFICATION TO THE ELECTRICAL CIRCUITING, BASED UPON ACTUAL EQUIPMENT SELECTION, SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
18. CONTRACTOR SHALL MAKE ALL REQUIRED OPENINGS THROUGH FOUNDATION WALLS,FLOORS, WALLS, CEILINGS, AND ROOFS AS REQUIRED FOR THE WORK INDICATED. WHERE CABLES OR CONDUITS ARE REQUIRED TO PASS THROUGH FIRE RATED WALL, FLOOR OR CEILING, THEY SHALL BE SEALED WITH 3M FIRE STOP OR APPROVED EQUAL. THE APPROVED FIRE STOP METHOD SHALL COMPLY WITH ARTICLES 300-21 OF NEC AND SHALL BE UL LISTED UNDER "THROUGH -PENETRATION FIRE STOP SYSTEM (XHEZ)" IN UL FIRE RESISTANCE DIRECTORY. PROVIDE MINIMUM 1" EMT THROUGH WALL PENETRATIONS. DAMAGED INSULATION MUST BE REPLACED.
19. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DURING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR/REPLACE ALL MATERIAL AND/OR EQUIPMENT DAMAGED. REPAIR SHALL RETURN THE DAMAGED ITEMS BACK TO THEIR ORIGINAL STATE, AS A MINIMUM, AS DETERMINED BY THE OWNER.
20. ALL REFUSE AND DEBRIS SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF LEGALLY BY THE CONTRACTOR. RETURN ANY SALVAGEABLE EQUIPMENT TO THE OWNER.
21. ANY EXISTING UTILITIES LOCATED IN THE AREA OF CONSTRUCTION WHICH REQUIRE RELOCATION SHALL BE COORDINATED WITH THE OWNER TEN DAYS IN ADVANCE, MINIMUM.

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA/RJL

AIP PROJECT NUMBER
213-1882-091

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SHEET TITLE

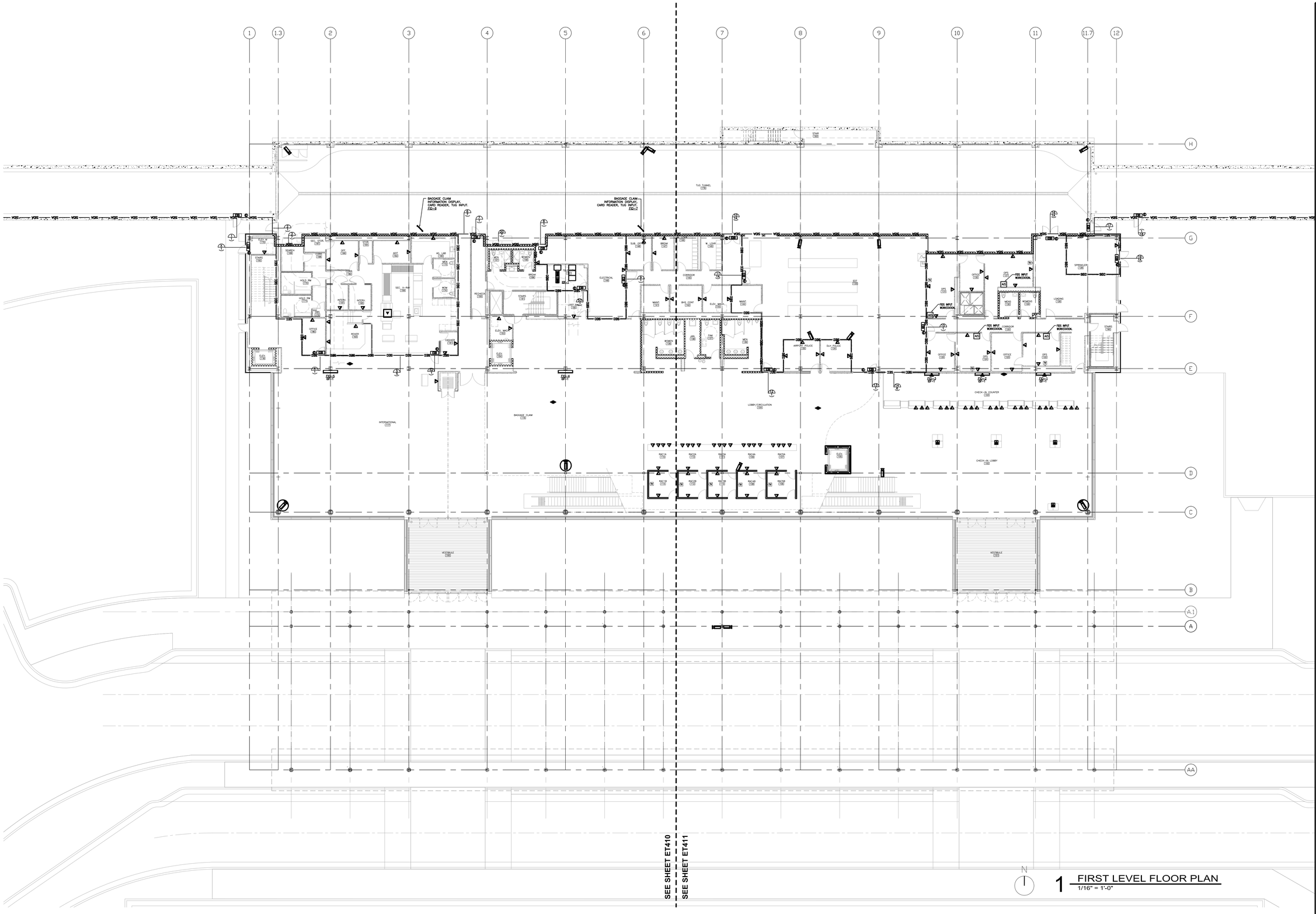
TECHNOLOGY/ SECURITY SYSTEMS LEGEND & NOTES

SHEET NUMBER

ET001

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Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET0-01 – LEGEND.dwg Plotted on: 4/9/2010 12:48 PM Plotted by: Lizarr, Rional



1 FIRST LEVEL FLOOR PLAN
1/16" = 1'-0"

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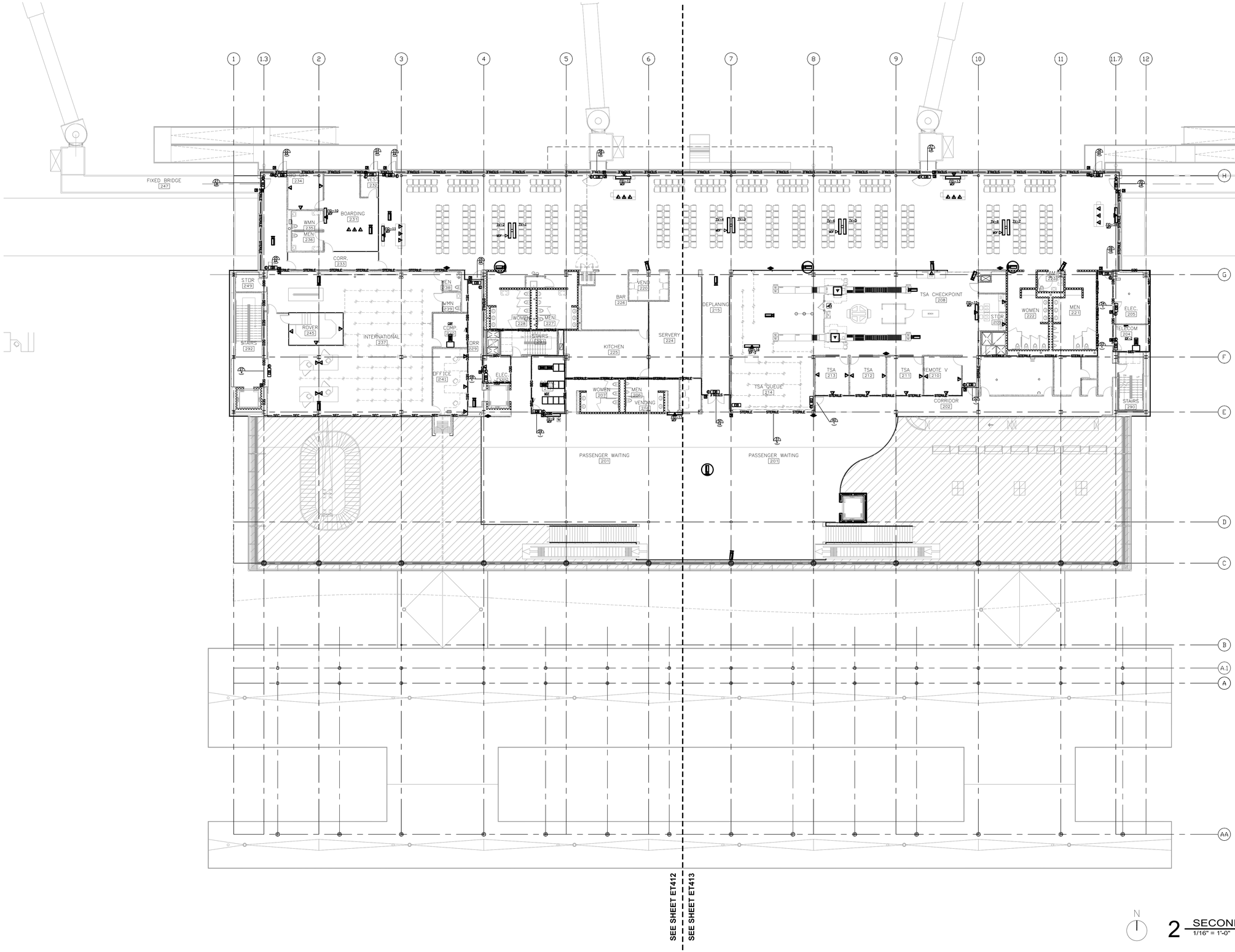
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN

SHEET NUMBER
ET401

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Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-01 FIRST FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:48 PM Plotted by: Lazar, Rional



N

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

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

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

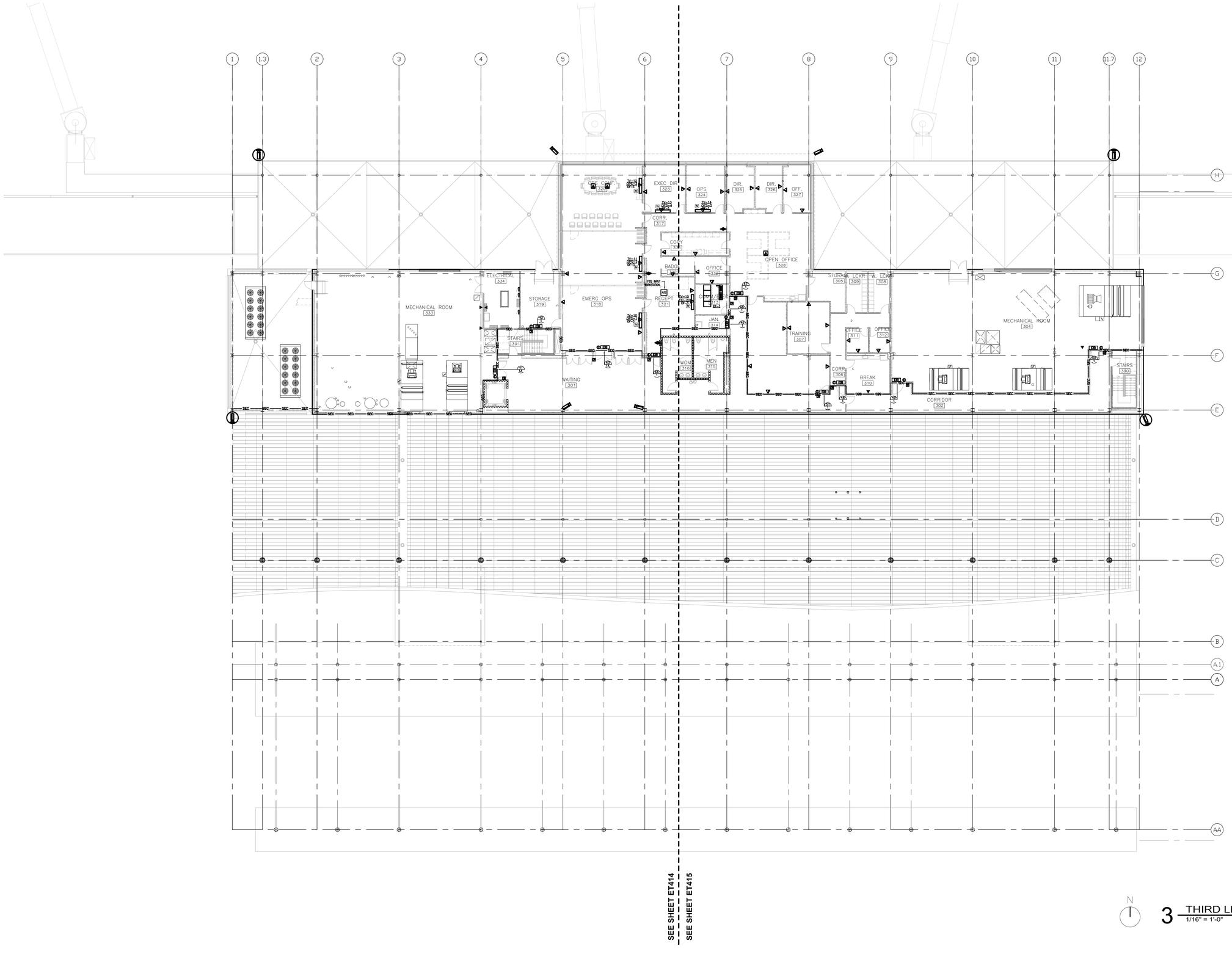
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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN

SHEET NUMBER
ET402

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-02 SECOND FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:49 PM Plotted by: Lazari, Rional



N

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

WARNING: THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

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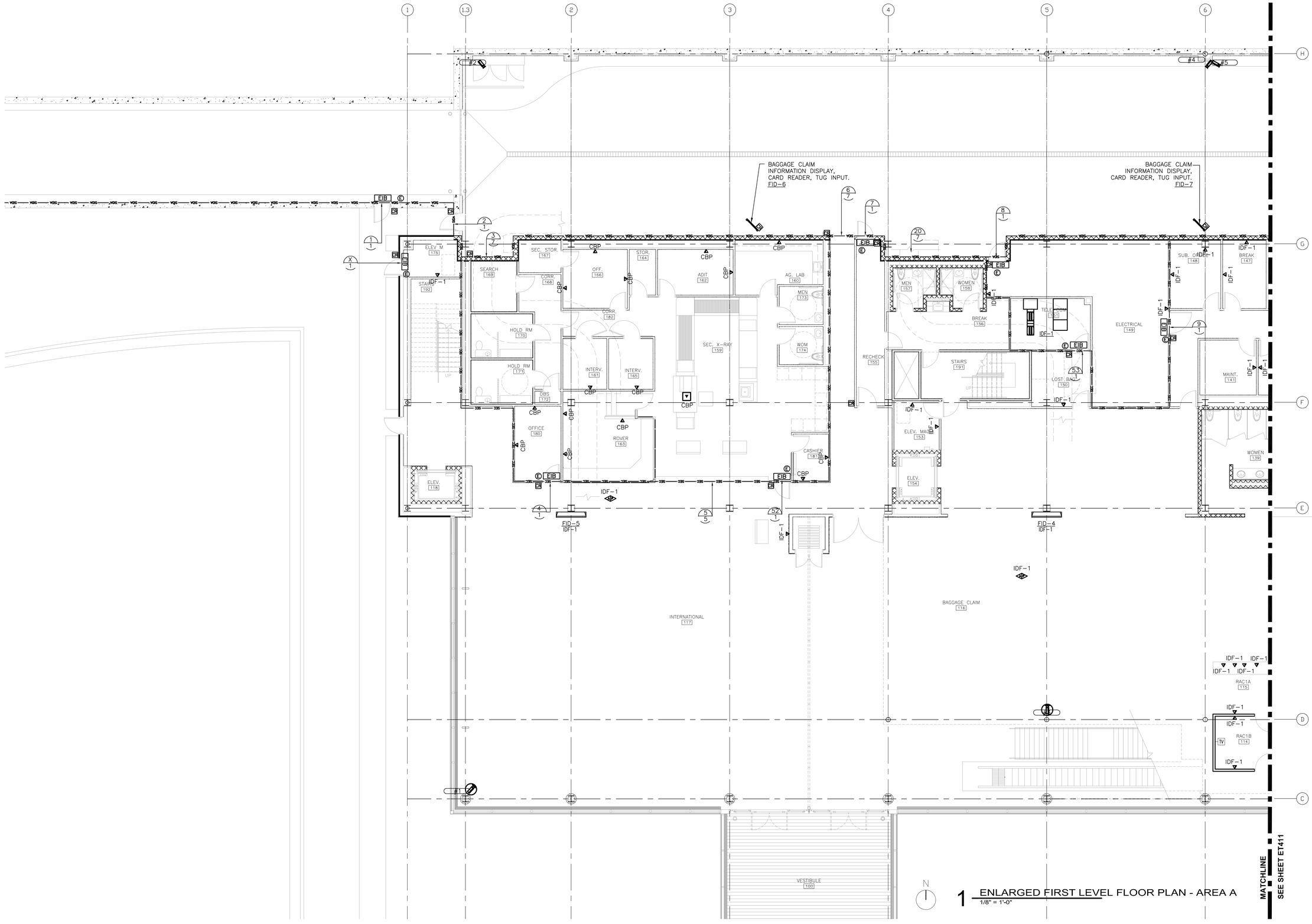
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN

SHEET NUMBER
ET403

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-03 THIRD FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:49 PM Plotted by: Lazaro, Rional



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

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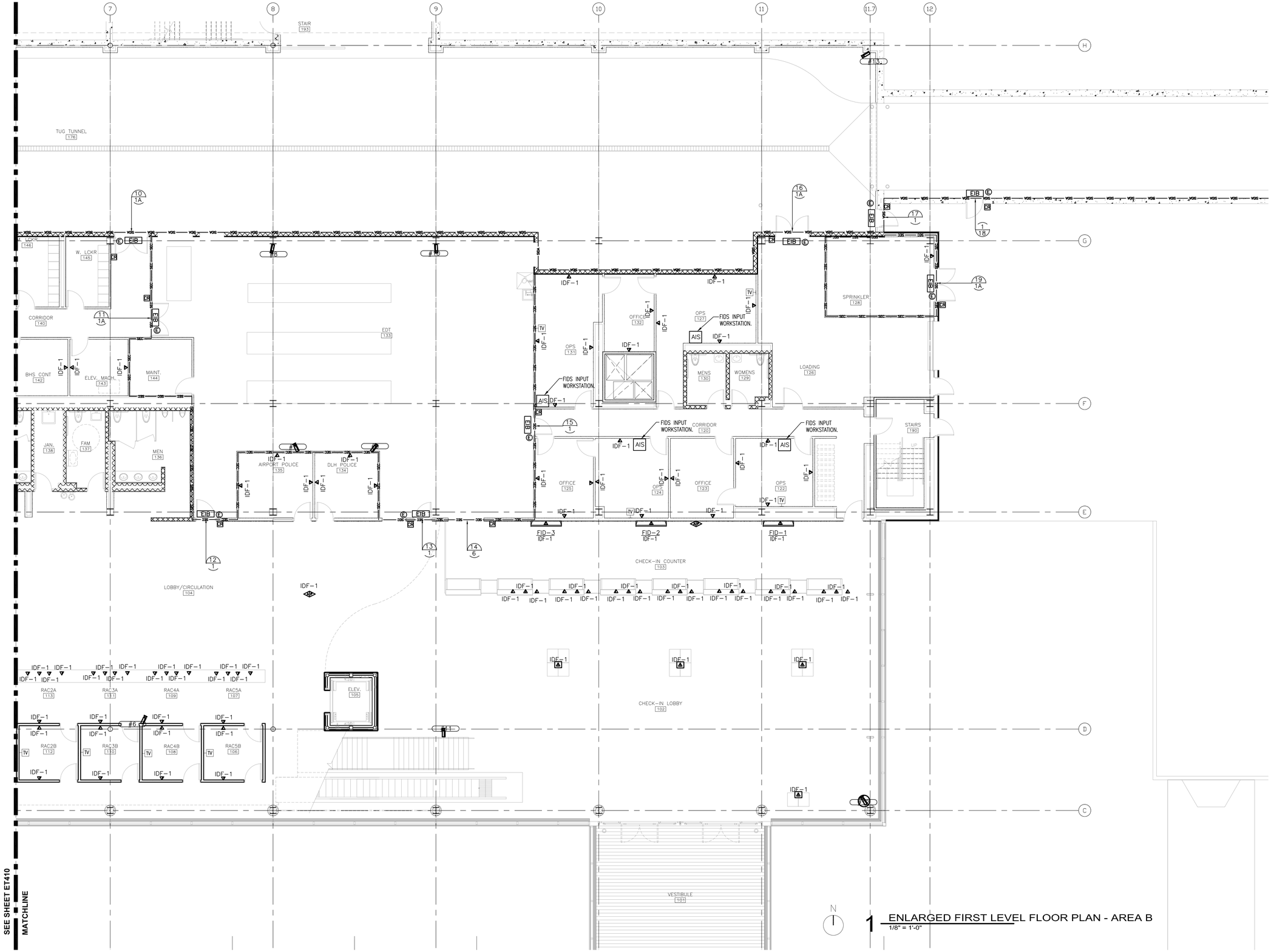
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN AREA A

SHEET NUMBER
ET410

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-01 FIRST FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:49 PM Plotted by: Lizon, Rional



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

WARNING: THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

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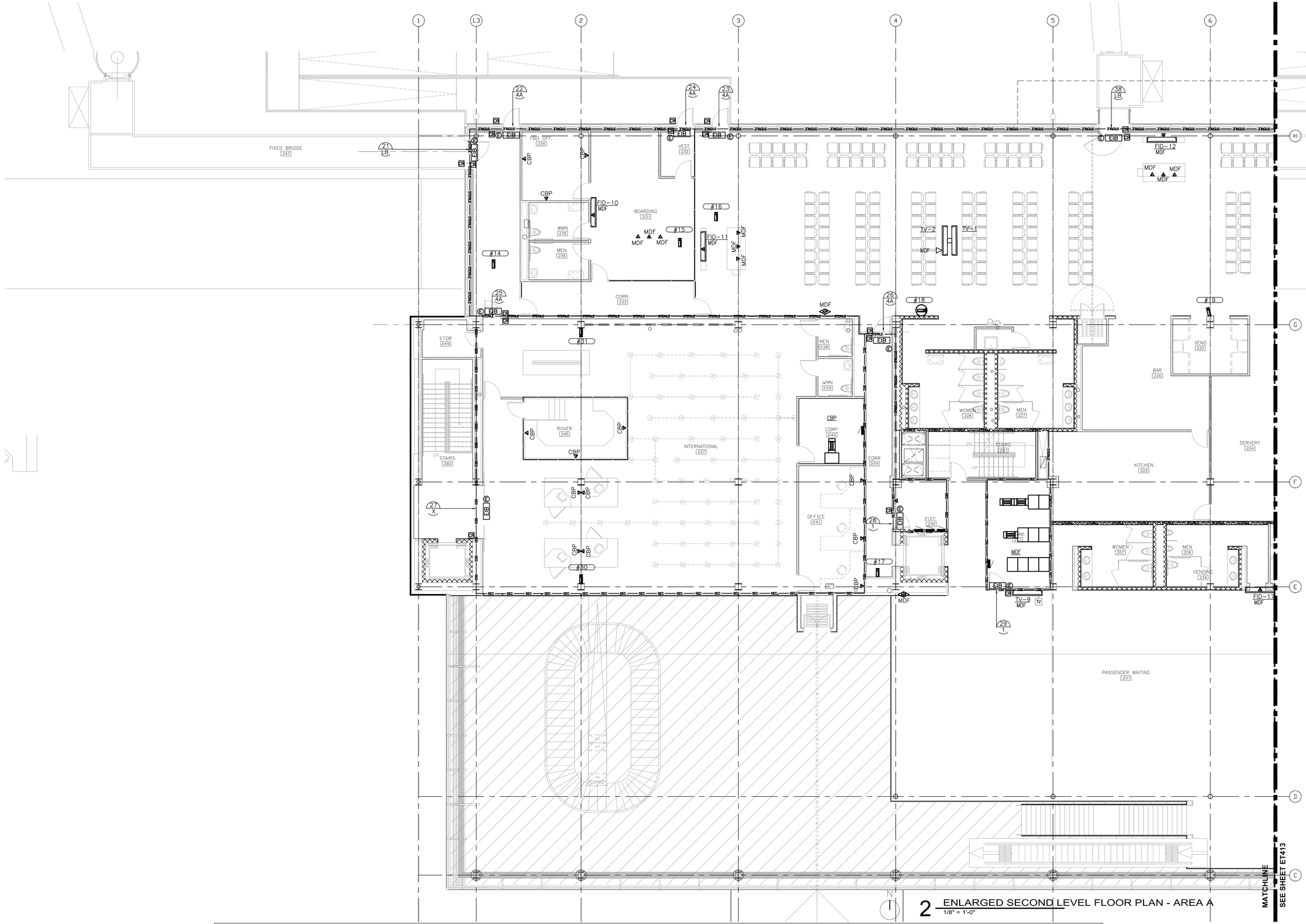
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN AREA B

SHEET NUMBER
ET411

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-01 FIRST FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:49 PM Plotted by: Lazari, Rional



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

WARNING: THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

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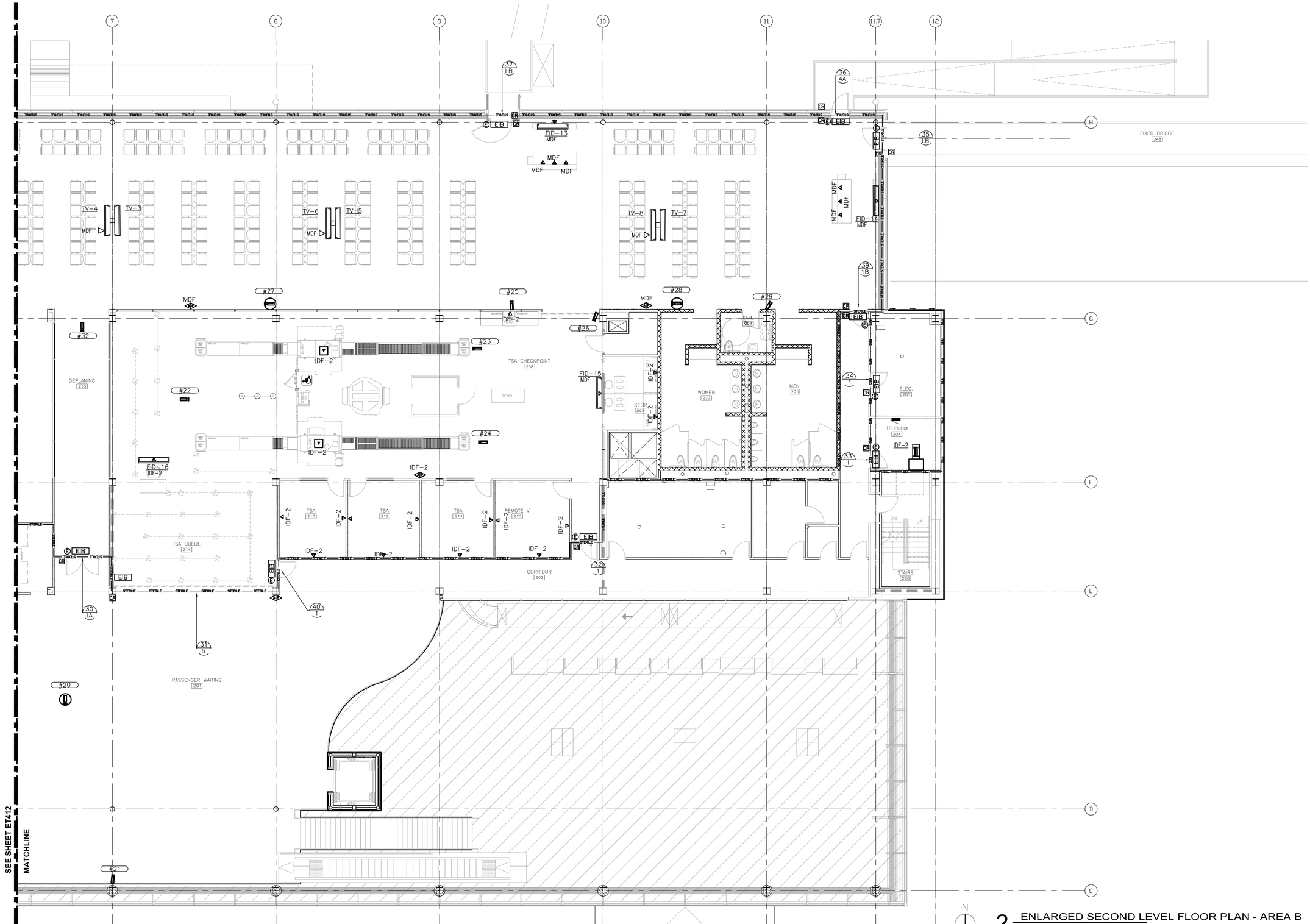
TECHNOLOGY SECOND FLOOR PLAN AREA A

SHEET NUMBER

ET412

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-02 SECOND FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:50 PM Plotted by: Lazan, Rional



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

WARNING: THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

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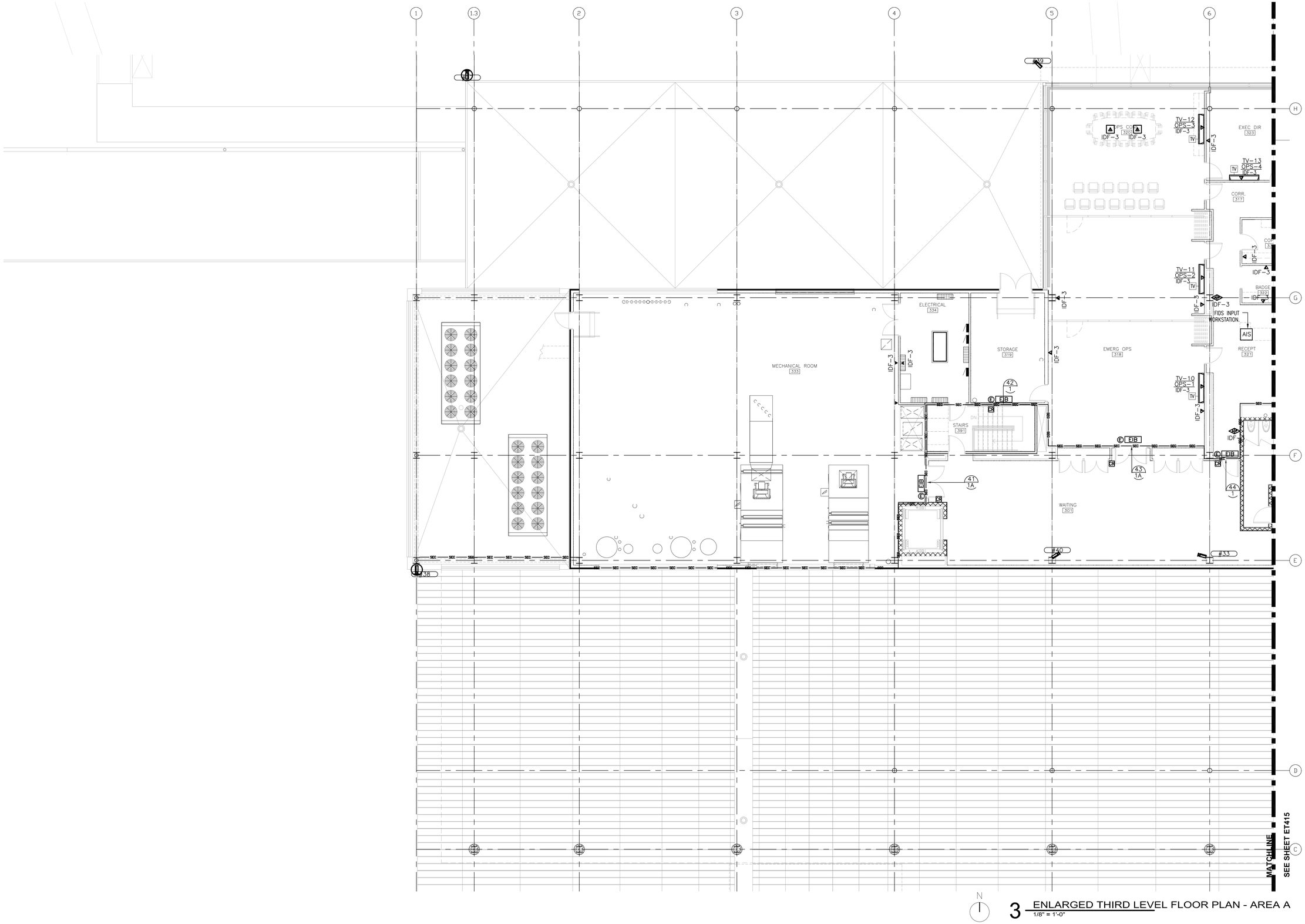
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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN AREA B

SHEET NUMBER
ET413

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-02 SECOND FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:50 PM Plotted by: Lazari, Rional



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

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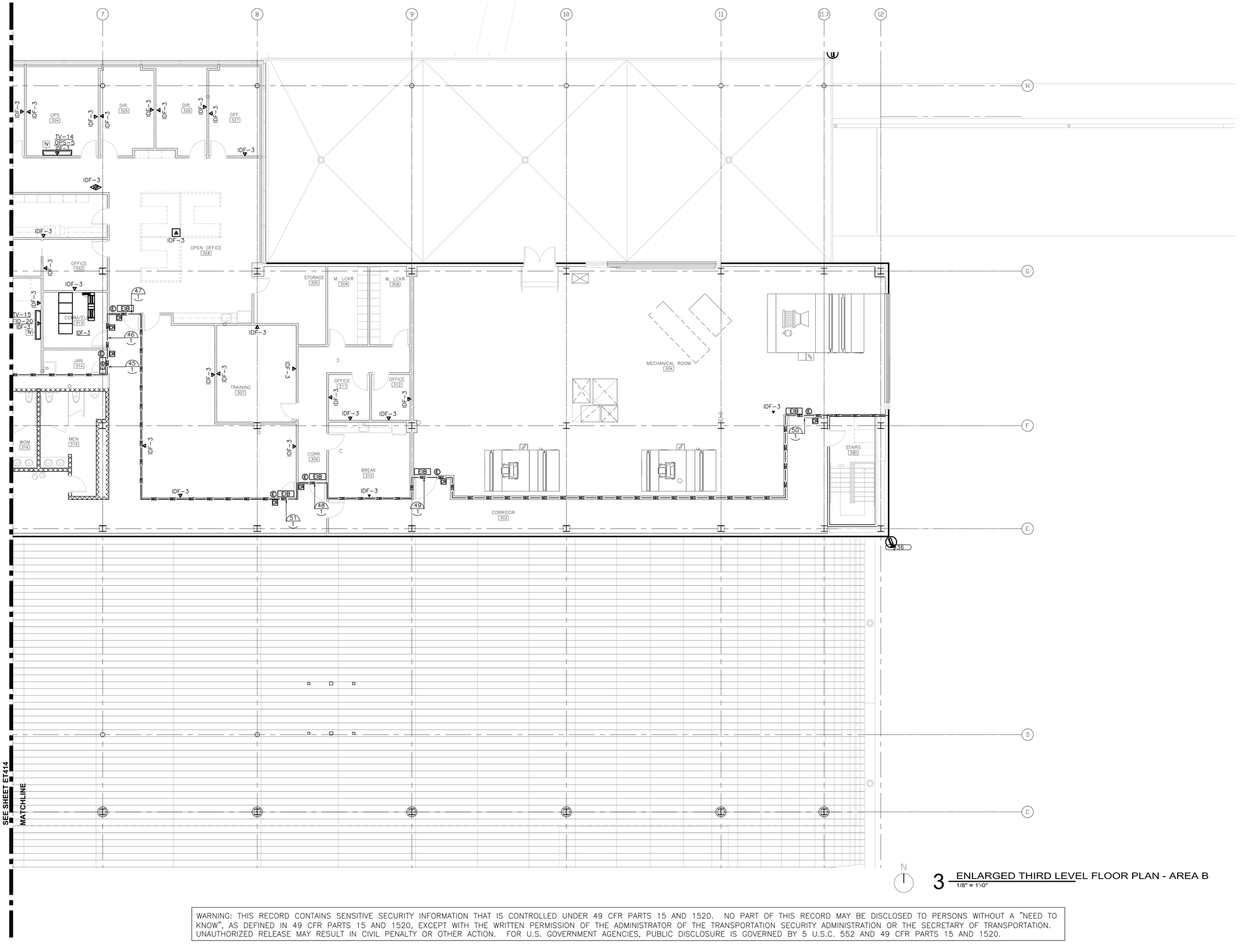
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN AREA A

SHEET NUMBER
ET414

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-03 THIRD FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:51 PM Plotted by: Lazari, Rional



SEE SHEET ET414
MATCHLINE

N

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

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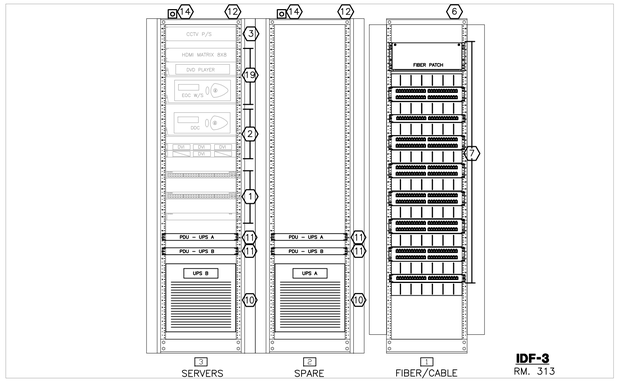
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN AREA B

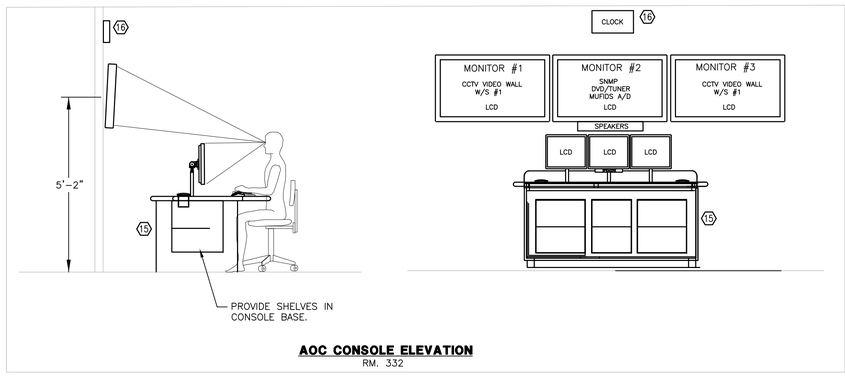
SHEET NUMBER
ET415

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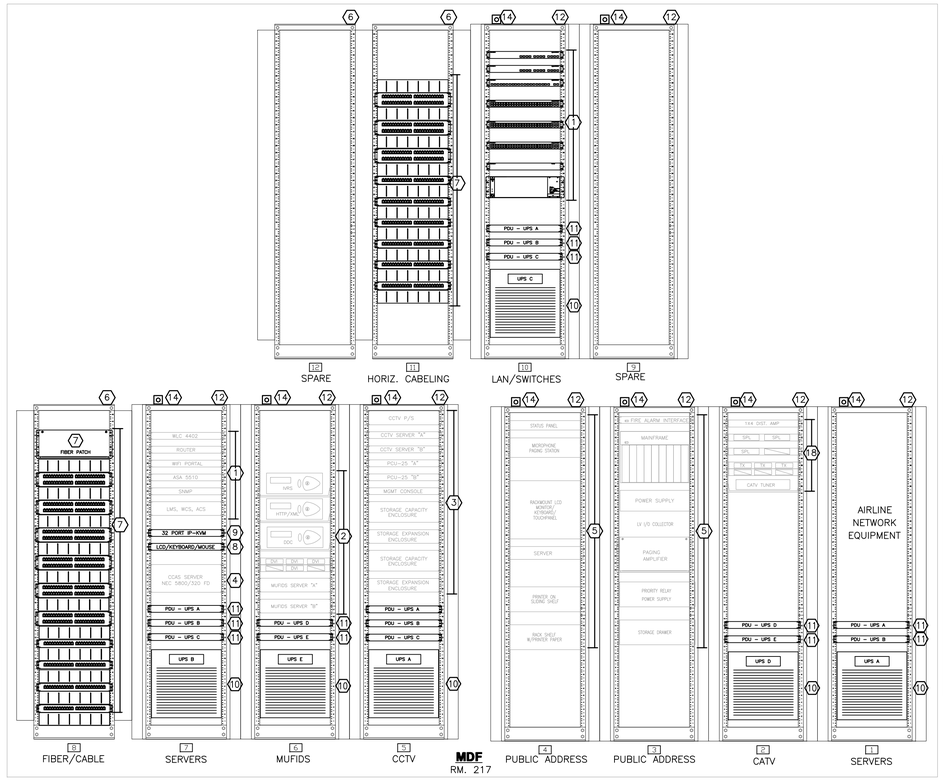
Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET1-03 THIRD FLOOR TECHNOLOGY.dwg Plotted on: 4/9/2010 12:51 PM Plotted by: Llazari, Rional



IDF-3
RM. 313



AOC CONSOLE ELEVATION
RM. 332



WARNING: THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

GENERAL NOTES

1. ALL RACK ELEVATIONS ARE FOR CONCEPT ONLY. COORDINATE MOUNTING AND LAYOUT OF ALL HARDWARE AND DEVICES WITH INTEGRATORS. SUBMIT SHOP DRAWINGS INDICATING RACK LAYOUTS FOR APPROVAL.
2. 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.
3. REFER TO SPECIFICATION SECTIONS 16710, 16715, 16716 FOR ADDITIONAL DETAILS AND REQUIREMENTS.
4. ALL RACKS, DEVICES AND CABLES SHALL BE CLEARLY IDENTIFIED BASED UPON SYSTEM TYPE, LOCATION, IDENTIFICATION #, DESTINATION, ETC. REFER TO PREMISE DISTRIBUTION SPECIFICATION FOR ADDITIONAL IDENTIFICATION REQUIREMENTS.
5. LABELS SHALL BE CREATED USING AN ELECTRONIC LABEL MAKER, AS SPECIFIED. NO HANDWRITTEN LABELS WILL BE ACCEPTABLE.
6. PROVIDE WIRE MANAGEMENT SYSTEMS ABOVE AND BELOW EACH PATCH PANEL.
7. REFER TO DRAWING ET6-04 FOR NETWORK SCOPE AND ET6-06 FOR FIBER OPITC CABLING SCOPE OF WORK.
8. 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.
9. PROVIDE 1U SPACE BETWEEN SERVERS AND RACK MOUNTED HARDWARE. PROVIDE BLANK COVER PLATES FOR ALL UN-USED RACK SPACE IN CABINETS. USE BLANK PLATES TO PROVIDE IDENTIFATION LABLES FOR EQUIPMENT.
10. PATCH CORDS AND CABLING SHALL BE COLOR CODED BETWEEN SYSTEMS AND FUNCTION. DEVELOP AND SUBMIT COLOR CODING SCHEME TO A/E FOR APPROVAL.
11. PROVIDE BONDING PER SPECIFICATION SECTION 16716 AS REQUIRED. TELECOMMUNICATIONS BONDING BACKBONE PROVIDED UNDER PREVIOUS PACKAGE WORKSCOPE.

NOTES

1. NETWORK SCOPE OF WORK. SEE SHEET ET6-04.
2. MUFIDS SCOPE OF WORK. SEE SHEET ET6-02.
3. CCTV SCOPE OF WORK. SEE SHEET ET6-03.
4. CCAS SCOPE OF WORK. SEE SHEET ET6-01.
5. PUBLIC ADDRESS, SCOPE OF WORK BY OTHERS.
6. 19" OPEN FRAME RACK. 19" x 84"/45U WITH 6" WIDE VERTICAL CABLING CHANNEL AND SNAP ON COVER. RACK SHALL BE CHATTSWORTH GLOBAL STANDARD PACK OR EQUAL.
7. FIBER OPTIC AND HORIZONTAL CABLING. PROVIDE ADDITIONAL PATCH PANELS AND WIRE MANAGEMENT AS REQUIRED.
8. 17" PULLOUT LCD W/ KEYBOARD AND TOUCHPAD. SYSTEM SHALL BE BELKIN OMNIVIEW F1DC101P-SR OR EQUAL.
9. 32 PORT KVM W/ 4 USER REMOTE IP. KVM SHALL BE RARITAN DOMINION KX II-432 OR EQUAL. PROVIDE COMPUTER INTERFACE MODULES (CIM) AS REQUIRED FOR ALL SERVERS LOCATED IN RACK. COORDINATE WITH ALL SYSTEM INTEGRATORS. PROVIDE (CIMS) FOR EQUIPMENT IN IDF LOCATIONS. CROSS-PATCH FROM IDF TO MDF KVM VIA CAT6 CABLE.
10. 4KVA, N+1 (6KVA TOTAL) UPS. UPS SHALL BE 208V INPUT, 120V OUTPUT AND SHALL CONTAIN A REDUNDANT INTELLIGENCE MODULE, (4) SYBT2 BATTERY MODULES, RACK MOUNTING HARDWARE AND NETWORK MANAGEMENT CARD WITH ENVIRONMENTAL SENSING. CONNECT UPS TO 208V/30A OUTLET. CONNECT TO NETWORK.
11. RACK MOUNTED, METERED, POWER DISTRIBUTION UNIT (PDU). 1U, 20A, 120V, (8) 5-20R OUTLETS, L5-20P INPUT. APC AP7801 OR EQUAL. NETWORK CONNECTION NOT REQUIRED.
12. 19" GANGABLE ENCLOSURE. 19"X36" X 84"/45U (27.32WX39.62DX84"H). PROVIDE PERFORATED METAL FRONT DOORS AND INTELLIGENT FAN REAR DOORS. PROVIDE SIDE PANELS ON EACH END. PROVIDE ADDITIONAL CABLE MANAGEMENT AS REQUIRED FOR A NEAT AND PROFESSIONAL CABLING SYSTEM. ENCLOSURE SHALL BE CHATTSWORTH M-SERIES MEGAFRAME CABINET OR EQUAL. COORDINATE ADDITIONAL REQUIREMENTS WITH EACH SYSTEM.
13. RACKS AND EQUIPMENT TO BE PROVIDED BY TELEPHONE COMPANY. CONTRACTOR SHALL COORDINATE INSTALLATION OF POWER CIRCUITS WITH TELCO EQUIPMENT.
14. POWER RECEPTACLE FOR RACK EQUIPMENT. INSTALL ABOVE RACK. SEE ET5-02 FOR CIRCUIT INFORMATION.
15. PROVIDE A COMPLETE CONSOLE WITH ALL REQUIRED COMPONENTS TO MATCH THE CONFIGURATION SHOWN ON THE DRAWINGS. THE CONSOLE SHALL BE A MODULAR CONSOLE AS MANUFACTURED BY WINSTED (PRESTIGE SIGHT-LINE) WITH CUSTOM FREEFORM WORK SURFACE, TRESCO OR APPROVED EQUAL MANUFACTURER. THE CONSOLE FINISHES WILL BE SELECTED BY THE A/E FROM STANDARD AVAILABLE COLORS FROM THE MANUFACTURER. PROVIDE MULTI-PURPOSE LOCKING DOORS, CORNER FILLERS, TRIPPLE MONITOR MOUNT, DATA POWER RAIL AND ACCESSORIES AS REQUIRED FOR A COMPLETE CONSOLE SYSTEM. SUBMIT A 1/4" SCALE DIMENSIONAL SHOP DRAWING FOR THE EQUIPMENT. SEE DETAIL 6 ET5-02 FOR ROOM LAYOUT.
16. DIGITAL WALL CLOCK W/ 4" RED LETTERS, 4 DIGIT, ETHERNET CONNECTION WITH POWER OVER ETHERNET (POE). CONNECT TO NETWORK SWITCH. USE NTP TIME SERVER. SEE NETWORK RISER ET6-04. CLOCK SHALL BE INOVA SOLUTIONS, BRG PRECISION PRODUCTS, OR EQUAL
17. NOT USED.
18. PUBLIC TV DISPLAY EQUIPMENT. SEE PUBLIC DISPLAY RISER ET6-05.
19. OPS CENTER DISPLAY EQUIPMENT. SEE OPS CENTER DISPLAY RISER ET6-05.

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

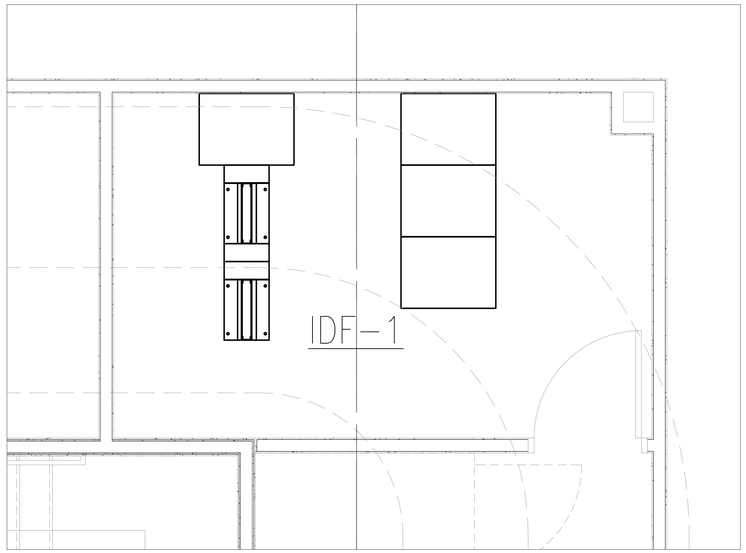
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SHEET TITLE
COMMUNICATIONS EQUIPMENT RACK ELEVATIONS

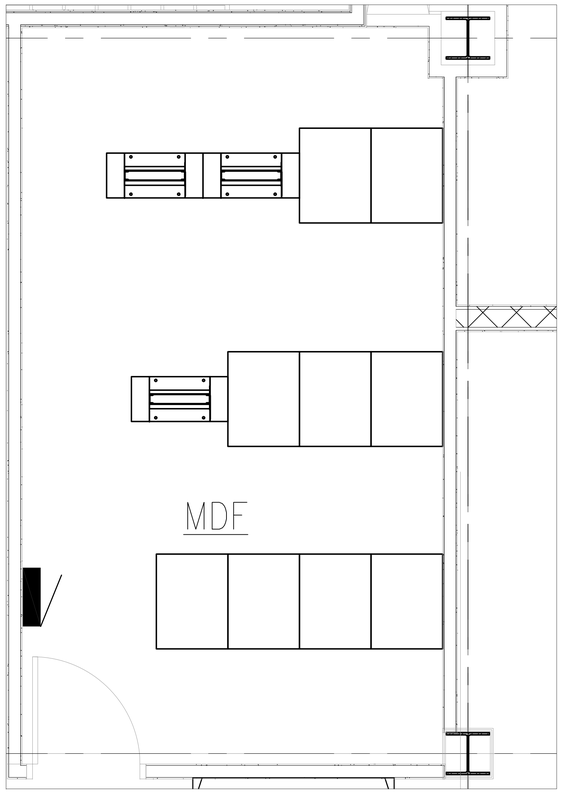
SHEET NUMBER
ET501

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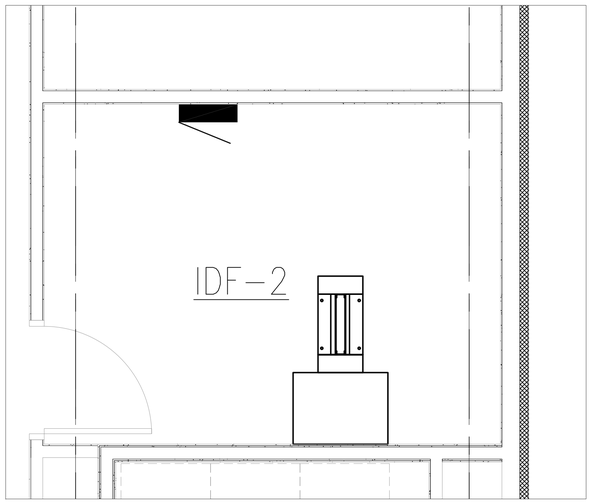
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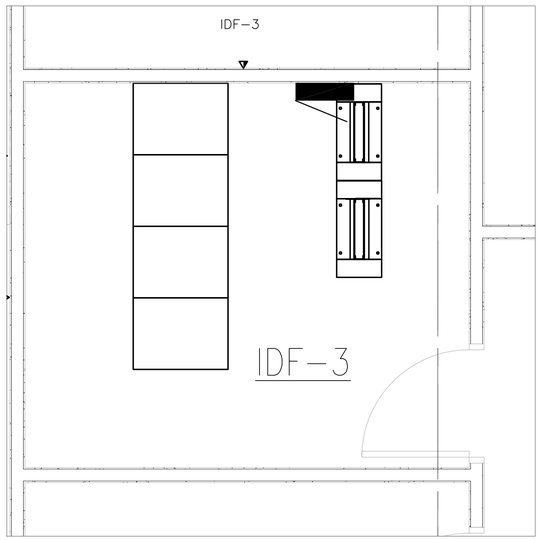
1 ET5-02 **ENLARGED IDF-1 TELE-COM ROOM #151**
SCALE: 1/2"=1' 0"



2 ET5-02 **ENLARGED MDF COMM. ROOM #217**
SCALE: 1/2"=1' 0"



3 ET5-02 **ENLARGED TSA ROOM #204**
SCALE: 1/2"=1' 0"



4 ET5-02 **ENLARGED IDF-3 COMM/ELEC ROOM #313**
SCALE: 1/2"=1' 0"

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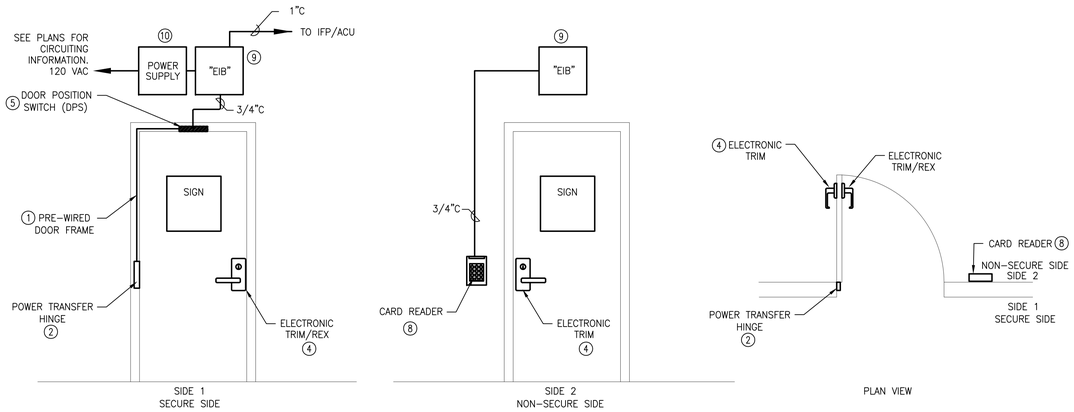
SHEET TITLE

ENLARGED ROOM PLANS

SHEET NUMBER
ET502

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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

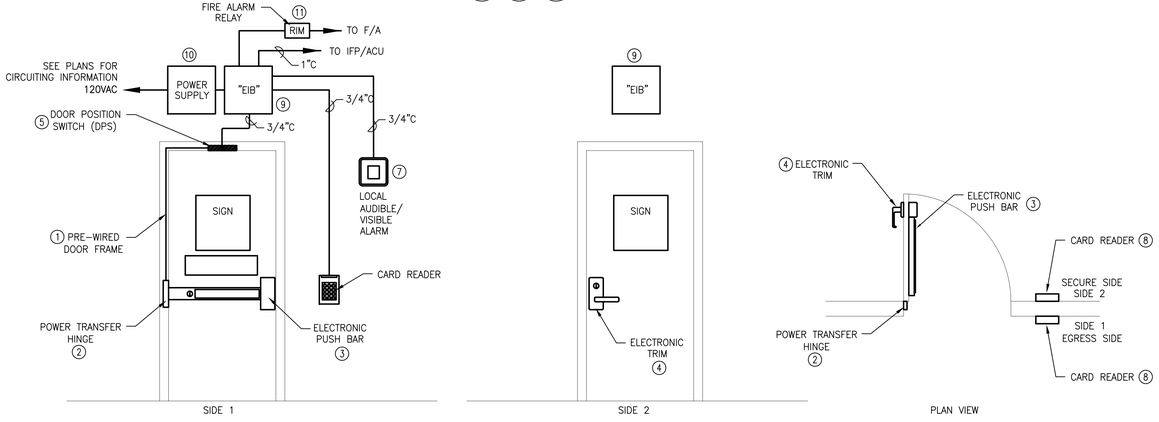
TYPE 1A, 1B, AND 1C DESCRIPTIONS

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)



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 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.

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.

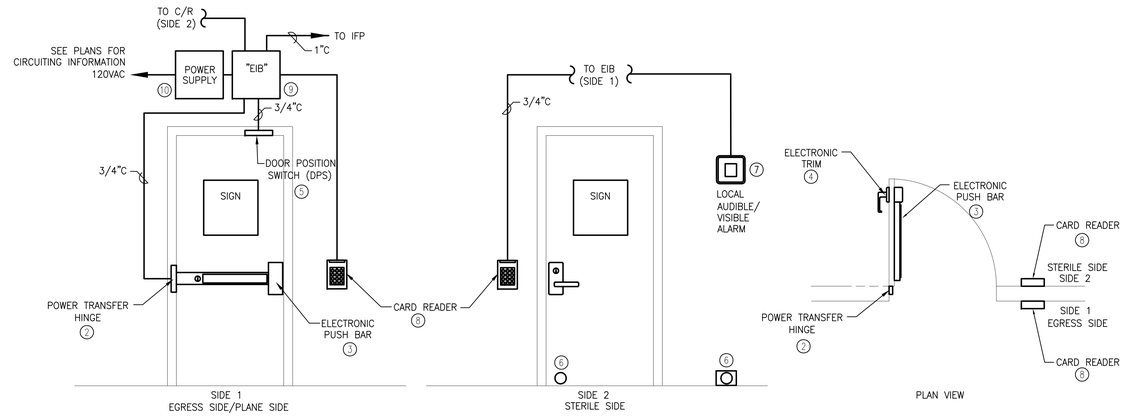
TYPE 4A, 4B AND 4C GENERAL NOTES

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)



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.

DOOR OPERATION UNDER ALARM CONDITIONS:

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

TYPE LB ACCESS POINT (#LB)

PASSENGER LOADING BRIDGE

ACCESS POINT/DOOR HARDWARE SCHEDULE:

	DESCRIPTION	SPEC. #	MANUFACTURER / MODEL	REMARKS
1	PRE-CONDUITED DOOR FRAME	–	ASSA ABLOY / ELECTROLYNX	PROVIDED IN TERMINAL PACKAGE SCOPE
2	ELECTRIFIED HINGE	–	ELECTROLYNX QC8 & QC12	PROVIDED IN TERMINAL PACKAGE SCOPE
3	ELECTRONIC PUSH BAR	–	CORBIN RUSSWIN ED5000 SERIES	PROVIDED IN TERMINAL PACKAGE SCOPE
4	ELECTRONIC TRIM	–	CORBIN RUSSWIN ML20900 SERIES	PROVIDED IN TERMINAL PACKAGE SCOPE
5	DOOR POSITION SWITCH (BMS)	13700	SECURITRON OR GE DPS	
6	MAGNETIC HOLD-OPEN/DOOR RELEASE	–	RIXSON 980	FLOOR MOUNTED
7	AUDIBLE/VISUAL ALARM	13700	SYSTEM SENSOR P4R	4 WIRE, WHITE, WALL MOUNTED
8	CARD READER	13700	HID RK40	
9	ELECTRONIC INTERFACE BOX	13700		READER INTERFACE AND I/O MODULES
10	POWER SUPPLY	13700	ALTRONIX AL125UL	1A, 12VDC, 7.2AH BATTERY
11	FIRE ALARM RELAY	–	PROVIDE AS REQUIRED	USE TERMINAL PACKAGE FIRE ALARM INTEGRATOR
12	WIDE GAP BALANCED MAGNETIC SWITCH	13700	SECURITRON MSS-1	

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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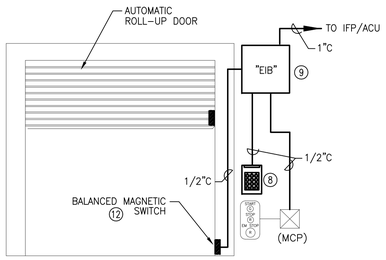
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SHEET TITLE
ACCESS CONTROL DETAILS

SHEET NUMBER
ET503

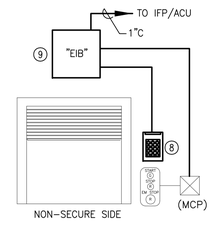
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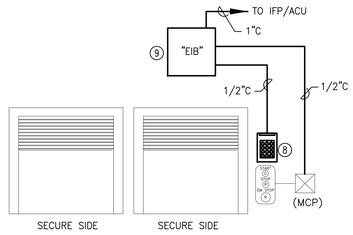
1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE ROLL-UP DOOR (MCP). CARD READER SHALL BE USED TO ACTIVATE THE ROLL-UP DOOR CONTROL PUSH BUTTONS. LOCATE CARD READER NEAR ROLL-UP DOOR PUSH BUTTONS.
2. PROVIDE THE OPTION FOR AUTOMATIC OPEN OR CLOSE OF DOOR WITH CARD SWIPE ONLY.

TYPE 5 ACCESS POINT (#5)
ROLL-UP DOOR



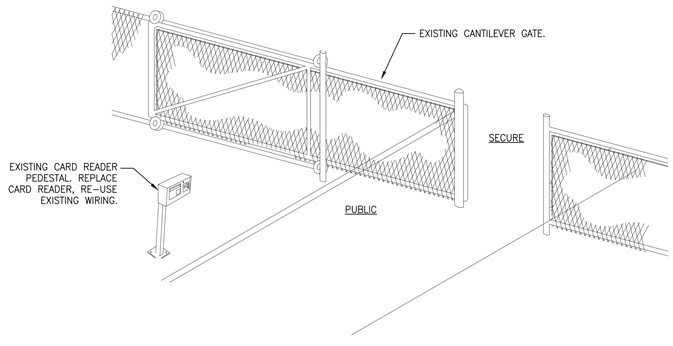
1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE BAGGAGE BELT SYSTEM THROUGH THE BAGGAGE BELT MOTOR CONTROL PANEL (MCP). THE ROLL-UP DOORS SHALL REMAIN OPEN ONLY IF THE BAGGAGE SYSTEM IS OPERATIONAL AND SHALL INDICATE ALARM CONDITIONS IF THE DOOR IS OPEN AND THE BAGGAGE SYSTEM HAS STOPPED FOR 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



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. 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



TYPE 12 NOTES:

1. CONTRACTOR SHALL INTERFACE WITH GATE OPERATOR CONTROL PANEL.
2. PROVIDE WIDE GAP BALANCED MAGNETIC SWITCH AT ALL GATE LOCATIONS.
3. PROVIDE RELAYS TO INTERFACE WITH EXISTING GROUND LOOPS USED AS REQUEST TO EXIT.
4. RE-USE EXISTING CABLING FOR CARD READER AND GATE OPERATOR INTERFACE.
5. REPLACE EXISTING IFS SERIAL TRANSCEIVERS WITH ETHERNET NETWORK SWITCH AS INDICATED ON T6-04 NETWORK RISER.
6. REPLACE EXISTING IDENTICARD ACCESS CONTROL PANEL WITH NEW ACCESS CONTROL INTELLIGENT FIELD PANEL AS INDICATED ON T6-01 SECURITY RISER.

TYPE 12 ACCESS POINT (#12)
VEHICLE GATE

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
#4
49 CFR PART 1542

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 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.

SIGN TYPES

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
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Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AIP PROJECT NUMBER
213-1882-091

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SHEET TITLE

ACCESS CONTROL DETAILS

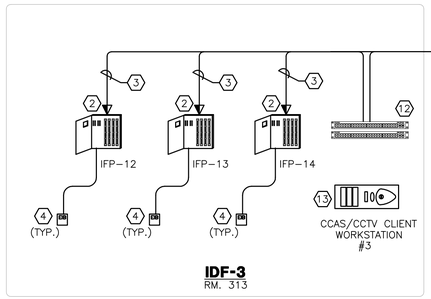
SHEET NUMBER
ET504

90% NOT FOR CONSTRUCTION

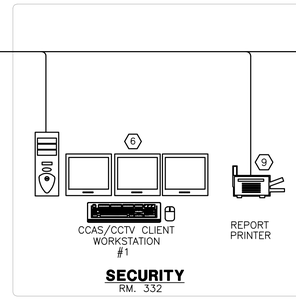
Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET5-03Access Point Det.dwg Plotted on: 4/9/2010 12:52 PM Plotted by: Lazari, Rional

ACCESS POINT SCHEDULE

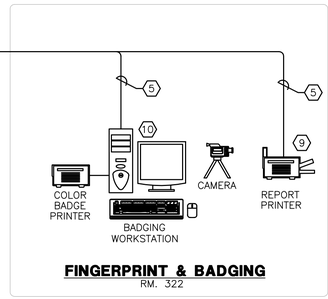
POINT ID	DOOR #	TERM POINT	LOCATION	POINT TYPE	REF DWG	CCTV CAMERA	SECURITY LINE SIDE 1	SECURITY LINE SIDE 2	SIGNAGE SIDE 1	SIGNAGE SIDE 2	NOTES
1	179C	IDF-1	LANDSIDE TO TUG DRIVE	1	ET4-10	–	NON-SECURE	SIDA	TYPE 2	TYPE 3	
2	176E	IDF-1	LANDSIDE TO TUG TUNNEL	1	ET4-10	#2	NON-SECURE	SIDA	TYPE 2	TYPE 3	
3	–	IDF-1	INTERNATIONAL 117 TO TUG TUNNEL	7	ET4-10	#2	NON-SECURE	SIDA	–	–	BAGGAGE BELT
4	159B	IDF-1	INTERNATIONAL 117 TO OFFICE 180	1	ET4-10	#1	NON-SECURE	SECURE	TYPE-2	TYPE-3	
5	159A	IDF-1	INTERNATIONAL 117 TO SEC. X-RAY 159	5	ET4-10	#1	NON-SECURE	SECURE	–	–	
6	–	IDF-1	RECHECK 155 TO TUG TUNNEL	7	ET4-10	#4	NON-SECURE	SIDA	TYPE 2	TYPE 3	
7	176F	IDF-1	RECHECK 155 TO TUG TUNNEL	1	ET4-10	#4	NON-SECURE	SIDA	–	–	
8	149A	IDF-1	ELECTRICAL 149 TO TUG TUNNEL	1	ET4-10	#4	SECURE	SIDA	TYPE 2	TYPE 3	
9	149B	IDF-1	CORRIDOR 140 TO ELECTRICAL 149	1	ET4-10	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
10	140A	IDF-1	CORRIDOR 140 TO TUG TUNNEL	1A	ET4-11	#5	NON-SECURE	SIDA	TYPE 2	TYPE 3	
11	133C	IDF-1	CORRIDOR 140 TO EDT 133	1A	ET4-11	#8	NON-SECURE	SECURE	TYPE 2	TYPE 3	
12	133A	IDF-1	LOBBY/CIRCULATION 104 TO EDT 133	1	ET4-11	#8	NON-SECURE	SECURE	TYPE 2	TYPE 3	
13	133D	IDF-1	LOBBY/CIRCULATION 104 TO EDT 133	1	ET4-11	#10	NON-SECURE	SECURE	TYPE 2	TYPE 3	
14	–	IDF-1	CHECK IN COUNTER 103 TO EDT 133	6	ET4-11	#10	NON-SECURE	SECURE	–	–	BAGGAGE BELT
15	120B	IDF-1	CORRIDOR 120 TO EDT 133	1	ET4-11	#10	NON-SECURE	SECURE	TYPE 2	TYPE 3	
16	126A	IDF-1	LOADING 126 TO TUG TUNNEL	1A	ET4-11	#13	NON-SECURE	SIDA	TYPE 2	TYPE 3	
17	176	IDF-1	LANDSIDE TO TUG TUNNEL	1	ET4-11	#13	NON-SECURE	SIDA	TYPE 2	TYPE 3	
18	178C	IDF-1	LANDSIDE TO TUG DRIVE	1	ET4-11	–	NON-SECURE	SIDA	TYPE 2	TYPE 3	
19	128A	IDF-1	LANDSIDE TO SPRINKLER 128	1A	ET4-11	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
20	–	IDF-1	BAGAGE CLAIM 116 TO TUG TUNNEL	7	ET4-10	#4	NON-SECURE	SIDA	–	–	BAGGAGE BELT
21	247A	MDF	CORRIDOR 233 TO FIXED BRIDGE 247	LB	ET4-12	#14	STERILE	SIDA	TYPE 2	TYPE 1	
22	–	MDF	CORRIDOR 233 TO APRON	4A	ET4-12	#14, #39	STERILE	SIDA	TYPE 3	TYPE 1	
23	219I	MDF	DEPARTURE LOUNGE TO APRON	4A	ET4-12	#16, #39	STERILE	SIDA	TYP3 3	TYPE 1	
24	232A	MDF	VESTIBULE 232 TO APRON	4A	ET4-12	#15, #39	STERILE	SIDA	TYPE 3	TYPE 1	
25	233A	MDF	INTERNATIONAL 237 TO CORRIDOR 233	1B	ET4-12	#31	SECURE	STERILE	TYPE 1	TYPE 3	
26	229B	MDF	CORRIDOR 229 TO DEPARTURE LOUNGE	4A	ET4-12	#17	NON-SECURE	STERILE	TYPE 1	TYPE 3	
27	237A	MDF	STAIRS 292 TO INTERNATIONAL 237	X	ET4-12	#30	NON-SECURE	SECURE	TYPE 2	TYPE 3	
28	230A	MDF	CORRIDOR 229 TO ELECTRICAL 230	1	ET4-12	#17	NON-SECURE	SECURE	TYPE 7	TYPE 8	
29	217A	MDF	PASSENGER WAITING 201 TO COMM. ROOM 217	1	ET4-12	#20	NON-SECURE	SECURE	TYPE 7	TYPE 8	
30	215A	MDF	PASSENGER WAITING 201 TO DEPLANING 215	1A	ET4-13	#21, #32	NON-SECURE	STERILE	TYPE 1	–	
31	214A	IDF-2	PASSENGER WAITING 201 TO TSA QUEUE 214	5	ET4-13	#21	NON-SECURE	SECURE	–	–	
32	208A	IDF-2	CORRIDOR 202 TO TSA CHECKPOINT 208	1	ET4-13	#26	NON-SECURE	STERILE	TYPE 1	TYPE 3	
33	204A	IDF-2	CORRIDOR 202 TO TELECOM 204	1	ET4-13	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
34	205A	IDF-2	CORRIDOR 202 TO ELECTRICAL 205	1	ET4-13	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
35	219E	IDF-2	DEPARTURE LOUNGE TO FIXED BRIDGE 248	LB	ET4-13	#29	STERILE	SIDA	TYPE 2	TYPE 1	
36	219F	IDF-2	DEPARTURE LOUNGE TO APRON	4A	ET4-13	#29, #34	STERILE	SIDA	TYPE 2	TYPE 1	
37	219G	IDF-2	DEPARTURE LOUNGE TO PBB	LB	ET4-13	#25	STERILE	SIDA	TYPE 2	TYPE 1	
38	219H	IDF-2	DEPARTURE LOUNGE TO PBB	LB	ET4-12	#19	STERILE	SIDA	TYPE 2	TYPE 1	
39	219	MDF	DEPARTURE LOUNGE TO CORRIDOR	1B	ET4-13	28	STERILE	NON-SECURE	TYPE 2	TYPE 1	
40	214	MDF	PASSENGER WAITING TO TSA QUEUE	1	ET4-13	21	NON SECURE	STERILE	TYPE 1	TYPE 3	
41	301A	IDF-3	WAITING 301 TO MECH. ROOM 333	1A	ET4-15	#33	NON SECURE	SECURE	TYPE 7	TYPE 8	
42	391B	IDF-3	STAIRS 391 TO ELECTRICAL 334	1	ET4-15	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
43	318A	IDF-3	WAITING 301 TO EMERG OPS 318	1A	ET4-15	#40	NON-SECURE	SECURE	TYPE 2	TYPE 3	
44	317A	IDF-3	WAITING 301 TO RECEPT 321	1	ET4-15	#40	NON-SECURE	SECURE	TYPE 2	TYPE 3	
45	314A	IDF-3	CORRIDOR 302 TO JAN 314	1	ET4-16	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
46	313A	IDF-3	CORRIDOR 302 TO COMM 313	1	ET4-16	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
47	302B	IDF-3	CORRIDOR 302 TO OPEN OFFICE 328	1	ET4-16	–	NON-SECURE	SECURE	TYPE 2	TYPE 3	
48	306A	IDF-3	CORRIDOR 302 TO CORRIDOR 306	1	ET4-16	–	NON-SECURE	SECURE	TYPE 2	TYPE 3	
49	304A	IDF-3	CORRIDOR 302 TO MECHANICAL ROOM 304	1	ET4-16	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
50	304B	IDF-3	CORRIDOR 302 TO MECHANICAL ROOM 304	1	ET4-16	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
51	30x	IDF-3	CORRIDOR 302 TO x	1	ET4-16	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
52	159	IDF-1	INTERNATIONAL 117 TO SEC. X-RAY 159	1	ET4-10	#1	NON-SECURE	SECURE	TYPE 7	TYPE 8	
53	151	IDF-1	LOST BAGGAGE 150 TO TELE-COM 151	1	ET4-10	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	



IDF-3
RM. 313

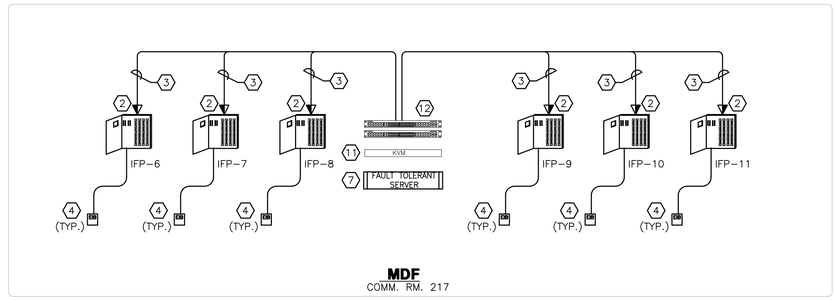


SECURITY
RM. 332



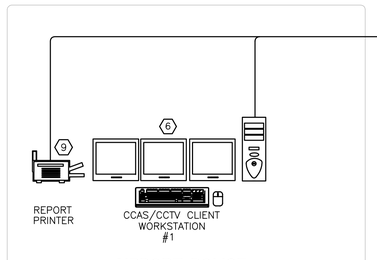
FINGERPRINT & BADGING
RM. 322

THIRD FLOOR

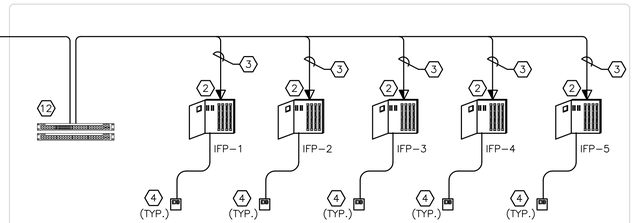


MDF
COMM. RM. 217

SECOND FLOOR

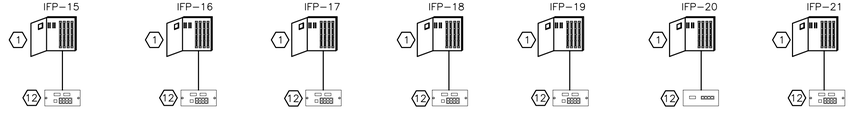


AIRPORT POLICE
RM. 135



IDF-1
COMM. RM. 151

FIRST FLOOR



CP-1 **CP-2** **CP-3** **CP-4** **CP-5** **CP-6** **CP-7**

SITE

GENERAL NOTES:

1. REFER TO SPECIFICATIONS SECTION 13700 FOR COMPUTER CONTROLLED ACCESS SYSTEM (CCAS) SCOPE OF WORK.
2. REFER TO SPECIFICATIONS SECTIONS 16710, 16716, 16717 FOR PREMISE WIRING SYSTEM SCOPE OF WORK.
3. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS AND PRODUCT DATASHEETS FOR ALL COMPONENTS. SHOP DRAWINGS SHALL SHOW ALL COMPONENTS, POINT TO POINT WIRING DIAGRAMS, HARDWARE & SOFTWARE CONFIGURATIONS, CABLE COLOR CODING AND COMPONENT FUNCTIONS. HARDWARE SHALL NOT BE PURCHASED OR INSTALLED UNTIL SUBMITTALS HAVE BEEN APPROVED BY A/E.
4. ON ALL TYPE 1 & 1A ACCESS POINTS CARD READERS SHALL BE LOCATED ON 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. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TSA (TRANSPORTATION SECURITY ADMINISTRATION) FINES INCURRED DUE TO THEIR OR THEIR SUB-CONTRACTOR'S, NEGLIGENCE.
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.
9. PROVIDE GRAPHICAL MAPS OF TERMINAL AREAS, FLOORS AND SITE. GRAPHICAL MAPS SHALL BE PROGRAMMED WITH ACCESS POINTS AND CAMERAS. MAPS SHALL BE CAD VECTOR BASED FORMAT.
10. SEE SHEET T5-01 FOR EQUIPMENT RACK LAYOUTS. PROVIDE DETAILED RACK LAYOUTS OF EQUIPMENT FOR APPROVAL.
11. PROVIDE CRYSTAL REPORTS FOR CUSTOM REPORT GENERATION. PROVIDE CONNECTION TO ACCESS CONTROL DATABASE.

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. ALLOW FOR A MINIMUM OF 20% FUTURE EXPANSION.
3. (3) CAT 6 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. EIB SHALL CONTAIN (1) DUAL READER MODULES & ADDITIONAL I/O BOARDS AS REQUIRED. EIB'S SHALL BE LOCATED ON THE SECURE SIDE OF THE ACCESS POINT UNLESS OTHERWISE INDICATED.
5. COMMUNICATIONS OUTLET INSTALLED UNDER TERMINAL PACKAGE D.
6. CCAS/CCTV CLIENT WORKSTATION. WORKSTATION SHALL BE INTEL CORE 2 QUAD Q9950, 2.83GHZ, 4GB RAM, 250GB HARD DRIVE, 512MB NVIDIA QUADRO NVS 420. WORKSTATION SHALL BE DELL OPTIPLEX 960 MINI TOWER OR EQUAL. PROVIDE (3) 19" LCD MONITORS. LCD MONITORS SHALL SUPPORT 1280X1024 DVI OR DISPLAYPORT. INSTALL IN CONSOLE. SEE DETAIL 6, T5-02 & CONSOLE ELEVATION T5-01.
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 AS SPECIFIED IN SPECIFICATIONS SECTION 13700. WORKSTATION SHALL BE SAME AS HEX NOTE 6 EXCEPT PROVIDE (1) 19" MONITOR.
11. KVM SWITCH. SEE T5-01. CONNECT CCAS SERVERS TO KVM VIA CROSS PATCH TO MDF.
12. NETWORK SCOPE ON T6-04. COORDINATE PORT CONFIGURATIONS AND REQUIREMENTS WITH NETWORK SCOPE. BALANCE PORT USAGE BETWEEN NETWORK SWITCHES. PROVIDE REDUNDANT CONNECTION FOR SERVERS.
13. RACK MOUNTED CCAS/CCTV CLIENT WORKSTATION FOR EMERGENCY OPERATIONS CENTER (EOC). PROVIDE SAME WORKSTATION AS HEX NOTE 6 EXCEPT DUAL OUTPUT 512MB ATI RADEON HD4670 & (1) 17" RACK MOUNTED MONITOR. PROVIDE WIRELESS KEYBOARD MOUSE. KEYBOARD MOUSE SHALL BE WIRELESS COMPUTING RF-420 OR EQUAL. PROVIDE USB EXTENDER OVER UTP TO EXTEND USB RECEIVER TO EOC SPACE FOR WIRELESS KEYBOARD & MOUSE. CONNECT VIDEO OUTPUT 1 TO LOCAL MONITOR AND VIDEO OUTPUT 2 TO HDMI SWITCHER. HDMI OUTPUT SHALL PROVIDE VIDEO & AUDIO. SEE T6-05 FOR OPS CENTER DISPLAY RISER. PROVIDE RACK MOUNTING KITS FOR ALL RACK HARDWARE.

1 ET6-01 **SECURITY RISER**
SCALE: NTS

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TEL: (218) 591-5079

SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AIP PROJECT NUMBER
213-1882-091

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SHEET TITLE

SECURITY RISER

SHEET NUMBER
ET601

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET6-01 Security Riser.dwg Plotted on: 4/9/2010 12:52 PM Plotted by: Lazari, Rional

MUFIDS SCHEDULE

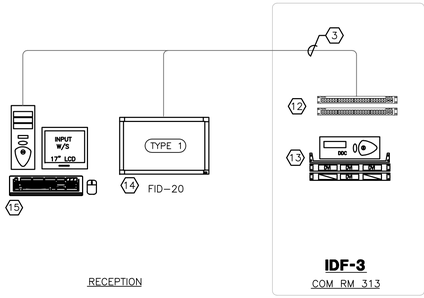
MUFIDS ID	TERM. POINT	LOCATION OF DISPLAY	MUFIDS TYPE	MONITOR SIZE & TYPE	MOUNT TYPE	MOUNT MODEL	REF. DRAWING	REMARKS
FID-1	IDF-1	CHECK-IN LOBBY #102	FID	40" LCD	TILT	PEERLESS ST660	ET1-01	SEE NOTE 12
FID-2	IDF-1	CHECK-IN LOBBY #102	FID	40" LCD	TILT	PEERLESS ST660	ET1-01	SEE NOTE 12
FID-3	IDF-1	CHECK-IN LOBBY #102	FID	40" LCD	TILT	PEERLESS ST660	ET1-01	SEE NOTE 12
FID-4	IDF-1	BAGGAGE CLAIM #116	BID	40" LCD	TILT	PEERLESS ST660	ET1-01	SEE NOTE 12
FID-5	IDF-1	INTERNATIONAL #117	BID	40" LCD	TILT	PEERLESS ST660	ET1-01	SEE NOTE 12
FID-6	IDF-1	TUG TUNEL #176	BID	15" LCD	ARTICULATING	PEERLESS ST660	ET1-01	
FID-7	IDF-1	TUG TUNEL #176	BID	15" LCD	ARTICULATING	PEERLESS ST660	ET1-01	
FID-8	--	--	--	--	--	--	--	--
FID-9	--	--	--	--	--	--	--	--
FID-10	MDF	BOARDING #231	GID	40" LCD	TILT	PEERLESS ST660	T1-12	SEE NOTE 13
FID-11	MDF	BOARDING #219	GID	40" LCD	TILT	PEERLESS ST660	T1-12	SEE NOTE 13
FID-12	MDF	BOARDING #219	GID	40" LCD	TILT	PEERLESS ST660	T1-12	SEE NOTE 13
FID-13	MDF	BOARDING #219	GID	40" LCD	TILT	PEERLESS ST660	T1-12	SEE NOTE 13
FID-14	MDF	BOARDING #219	GID	40" LCD	TILT	PEERLESS ST660	T1-12	SEE NOTE 13
FID-15	MDF	TSA CHECKPOINT	FID	40" LCD	TILT	PEERLESS ST660	T1-12	
FID-16	MDF	TSA QUEUE #214	TSA	40" LCD	CEILING	SEE DETAIL	T1-12	WITH AUDIO
FID-17	MDF	PASSENGER WAITING #201	FID	40" LCD	TILT	PEERLESS ST660	T1-13	
FID-18	--	--	--	--	--	--	--	
FID-19	--	--	--	--	--	--	--	--
FID-20	IDF-3	RECEPTION #332	FID	40" LCD	TILT	PEERLESS ST660	T1-13	
FID-21	--	--	--	--	--	--	--	--
FID-22	IDF-3	OPS CENTER DISPLAY SYSTEM	FID	-	-	-	-	ARRIVALS
FID-23	IDF-3	OPS CENTER DISPLAY SYSTEM	FID	-	-	-	-	DEPARTURES
FID-24	IDF-3	OPS CENTER DISPLAY SYSTEM	FID	-	-	-	-	ARRIVE/DEPART

GENERAL NOTES

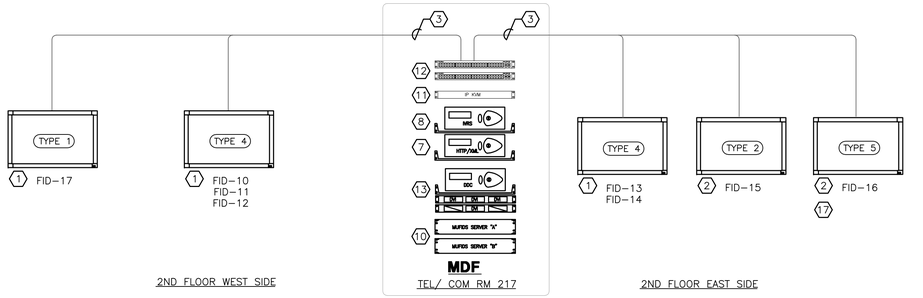
1. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS FOR ALL COPPER PATCH PANEL CONNECTIONS, RACKS AND EQUIPMENT LAYOUTS. THE SHOP DRAWINGS SHALL CLEARLY SHOW POINT TO POINT CONNECTIONS AND LOCATION OF ALL PATCH PANELS, SIZE, QTY, AND PORT USAGE. THESE DRAWINGS INDICATE TYPICAL CONNECTIONS. PROVIDE ADDITIONAL RACKS AND OTHER ACCESSORIES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
2. THE CONTRACTOR SHALL COMPLY WITH THE AIRPORT SECURITY AND SAFETY REQUIREMENTS WHILE WORKING AT THE AIRPORT TERMINAL AND AIRFIELD AREAS.
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, TRAINING TO THE OWNERS STAFF, AIRLINE PERSONAL AND CONNECTION TO ALL THE EQUIPMENT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL COMPONENTS REQUIRED TO CONNECT FLIGHT INFORMATION DISPLAY SYSTEM TO THE NETWORK. THE CONTRACTOR SHALL COORDINATE WITH MUFIDS EQUIPMENT SUPPLIERS TO CONNECT AND TEST THE NETWORK DEVICES. THE CONTRACTOR SHALL COORDINATE WITH AIRPORT "IT" SUPPORT PERSONAL AND CONSULTANTS. SEE NETWORK RISER SHEET ET6-04 FOR NETWORK SCOPE OF WORK.
5. REFER TO SPECIFICATION SECTION 13742 FOR COMPUTER HARDWARE AND SOFTWARE REQUIREMENTS.
6. CONTRACTOR SHALL LABEL ALL PATCH PANELS, CABLES AND TERMINATION LOCATIONS. LABELS SHALL BE TYPE WRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.
7. INSTALL FIDS CLIENT SOFTWARE OR WEB INTERFACE SHORTCUT ON AIRPORT OPERATIONS WORKSTATION.
8. PROGRAM LCD MONITORS TO TURN ON AND OFF BASED ON A OWNER DEFINED SCHEDULE.
9. PROVIDE INSTALLATION OF NEC NAVISET SOFTWARE ON A MINIMUM OF 2 AIRPORT IT DEFINED WORKSTATIONS. INSTALL NEC NAVISET SOFTWARE ON INPUT WORKSTATION LOCATED IN RECEPTION AREA.
10. CONFIGURE DISPLAYS TO PROVIDE AUTOMATIC EMAIL NOTIFICATION TO AIRPORT IT.
11. DISABLE DISPLAY LOCAL CONTROLS TO PREVENT PUBLIC TAMPERING.
12. CABINETRY HOUSING MONITORS MUST FIT WITHIN THE DIMENSIONS AND MUST BE PROVIDED WITH APPROPRIATE MOUNTS AND ANCHORS FOR MOUNTING. CONTRACTOR FOR THIS WORK SHALL BE REQUIRED TO COMPLETE FINAL COORDINATION WITH WAYFINDING CONTRACTOR.

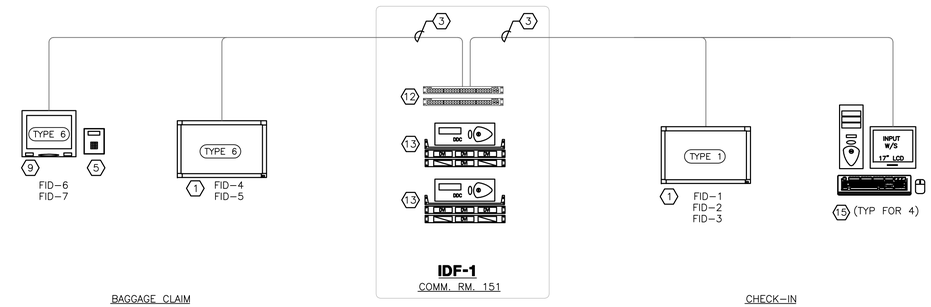
NOTES:

1. 40" LCD MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL (0.65" OR LESS) AND CABLE COVER. MONITOR SHALL BE NEC P401 OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH.
2. 46" LCD MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL (0.65" OR LESS) AND CABLE COVER. MONITOR SHALL BE NEC P461 OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH.
3. (3) CAT6 CABLES TERMINATED ON COMM OUTLET. PROVIDE ADDITIONAL OUTLETS AS INDICATED ON PLANS.
4. INPUT STATION/VISUAL PAGING STATION AS MANUFACTURED BY DELL (MODEL OPTIPLEX SX270) OR APPROVED EQUAL. SEE SPECIFICATIONS FOR COMPLETE SYSTEM SPECIFICATION.
5. PROVIDE TUG INPUT DEVICE COMPATIBLE WITH PROPOSED INFORMATION DISPLAY SYSTEM.
6. PROVIDE 3 OPTIONS FOR EACH GRAPHIC DISPLAY SCREEN FOR OWNER'S APPROVAL. THE GATE COUNTERS SHALL HAVE AIRLINE GRAPHIC DISPLAYS AS APPROVED BY THE AIRLINES.
7. HTML/WEB INTERFACE. REFER TO SPECIFICATIONS.
8. MUFIDS IVRS – IINTEGRATED VOICE RESPONSE SYSTEM. REFER TO SPECIFICATIONS. PROVIDE WIRING TO PHONE SYSTEM FOR A MINIMUM OF (2) PHONE LINES.
9. 15" LCD DISPLAY WALL MOUNTED FOR TUG OPERATOR. DISPLAY SHALL SHOW SAME INFORMATION AS RESPECTIVE BID DISPLAY. DISPLAY SHALL HAVE HIGH BRIGHTNESS 500 CD/M2 OR GREATER AND HIGH CONTRAST 800:1 OR GREATER. DISPLAY SHALL BE NEC ASLCD52V-BK OR EQUAL. PROVIDE DUST COVER.
10. MUFIDS SERVER. SEE SPECIFICATIONS FOR COMPETE SYSTEM SPECIFICATION. PROVIDE CONNECTION TO DUAL SWITCH FOR REDUNDANCY.
11. KVM SWITCH PROVIDED ON ET5-01. CONNECT ALL SERVERS TO KVM IN MDF. CROSS-PATCH IDF DEVICES TO MDF KVM.
12. NETWORK SWITCHES PROVIDED ON ET6-04. COORDINATE NETWORK SWITCH PORT CONFIGURATIONS AND REQUIREMENTS WITH NETWORK SCOPE OF WORK.
13. DIGITAL DISPLAY CONTROLLER (DDC). PROVIDE A RACKMOUNT COMPUTER FOR MUFIDS DISPLAYS. PROVIDE RACKMOUNTED VIDEO EXTENDERS. EACH DDC SHALL BE CAPABLE OF A MINIMUM OF 4 INDEPENDENT DISPLAY OUTPUTS. REFER TO SPECIFICATIONS.
14. PROVIDE MONITOR AS INDICATED IN HEX NOTE 1. PROVIDE TV TUNER (NTSC/ATSC/QAM) & SPEAKER OPTION.
15. FIDS INPUT WORK STATION. SEE PLANS FOR LOCATION. COORDINATE FINAL LOCATIONS WITH OWNER AND AIRLINES.
16. PROVIDE (3) SEPERATE DVI VIDEO OUTPUTS FROM DDC FOR OPERATIONS CENTER DISPLAYS. DVI EXTENDERS NOT REQUIRED. SEE OPERATIONS CENTER DISPLAY RISER ET6-05.
17. PROVIDE SPEAKERS & AUDIO UTP BALUN EXTENSION FROM DDC FOR TSA MONITOR.

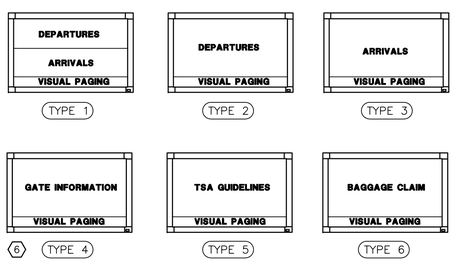


SECOND FLOOR





FIRST FLOOR



1 ET6-02 **MUFIDS RISER**
SCALE: NTS

WARNING: THIS RECORD CONTAINS SENSITIVE SECURITY INFORMATION THAT IS CONTROLLED UNDER 49 CFR PARTS 15 AND 1520. NO PART OF THIS RECORD MAY BE DISCLOSED TO PERSONS WITHOUT A "NEED TO KNOW", AS DEFINED IN 49 CFR PARTS 15 AND 1520, EXCEPT WITH THE WRITTEN PERMISSION OF THE ADMINISTRATOR OF THE TRANSPORTATION SECURITY ADMINISTRATION OR THE SECRETARY OF TRANSPORTATION. UNAUTHORIZED RELEASE MAY RESULT IN CIVIL PENALTY OR OTHER ACTION. FOR U.S. GOVERNMENT AGENCIES, PUBLIC DISCLOSURE IS GOVERNED BY 5 U.S.C. 552 AND 49 CFR PARTS 15 AND 1520.

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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SEAL

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

MUFIDS RISER

SHEET NUMBER
ET602

90% NOT FOR CONSTRUCTION

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET6-02 Mufids Riser.dwg Plotted on: 4/9/2010 12:52 PM Plotted by: Lizarri, Rional

CCTV CAMERA SCHEDULE

CAMERA ID	TERM. POINT	LOCATION SHOWN BY CAMERA	LENS TYPE	LENS MM	INDOOR OUTDOOR	MOUNT TYPE	CAMERA SYSTEM MODEL	ENCLOSURE	VIDEO/DATA CABLE	POWER SUPPLY	POWER CABLE	ANALYTICS	REFERENCE DRAWING
#1	IDF-1	INTERNATIONAL #117	PTZ	--	INDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-01
#2	IDF-1	TUG TUNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-01
#3	IDF-1	BAGGAGE CLAIM # 116	PTZ	--	INDOOR	TYPE-3	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14		ET1-01
#4	IDF-1	TUG TUNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	INDOOR DOME	CAT6	PoE	-		ET1-01
#5	IDF-1	TUG TUNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	INDOOR DOME	CAT6	PoE	-		ET1-01
#6	IDF-1	LOBBY CIRCULATION #104	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	PoE	-		ET1-01
#7	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	PoE	-		ET1-01
#8	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-01
#9	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-01
#10	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-01
#11	IDF-1	CHEK-IN LOBBY #102	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-01
#12	IDF-1	CHEK-IN LOBBY #102	PTZ	--	INDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-01
#13	IDF-1	TUG TUNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-01
#14	MDF	DOORS #247A, 233	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#15	MDF	DOORS 232A, 232B	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#16	MDF	DOOR #219 I	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#17	MDF	CORRIDOR #229	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#18	MDF	CONCOURSE WET SIDE	PTZ	--	INDOOR	TYPE-3	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14		ET1-02
#19	MDF	PBB DOOR #219 H	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#20	MDF	PASSENGER WAITING #201	PTZ	--	INDOOR	TYPE-2	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-02
#21	MDF	DOORS # 214A, 215	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14		ET1-02
#22	MDF	TSA AREA	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#23	MDF	TSA BAGGAGE BELT	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14		ET1-02
#24	MDF	TSA BAGGAGE BELT	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14		ET1-02
#25	MDF	PBB DOOR # 219 G	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
#26	MDF	TSA AREA #209	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14	FACIAL	ET1-02
#27	MDF	CONCOURSE CENTER	PTZ	--	INDOOR	TYPE-3	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14		ET1-02
#28	MDF	CONCOURSE EAST SIDE	PTZ	--	INDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-02
#29	MDF	PBB DOOR 219 F	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-02
-	-	-	-	-	-	-	-	-	-	-	-		-
-	-	-	-	--	-	-	-	-	-	-	-		-
-	-	-	-	--	-	-	-	-	-	-	-		-
#33	IDF-3	WAITING #301	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-03
#34	IDF-3	APRON CENTER EAST	PTZ	--	OUTDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-03
#35	IDF-3	APRON EAST	PTZ	--	OUTDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-03
#36	IDF-3	LANDSIDE EAST	PTZ	--	OUTDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-03
#37	IDF-3	APRON WEST	PTZ	--	OUTDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-03
#38	IDF-3	LANDSIDE WEST	PTZ	--	OUTDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-03
#39	IDF-3	APRON CENTER WEST	PTZ	--	OUTDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14		ET1-03
#40	IDF-3	WAITING #301	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	-		ET1-03
#41	IDF-1	FRONT CANOPY	FIXED	2.8-12	OUTDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14		ET1-01
#42	IDF-1	FRONT CANOPY	FIXED	2.8-12	OUTDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14		ET1-01
#43	CP#1	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#44	CP#2	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#45	CP#3	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#46	CP#4	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#47	CP#5	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#48	CP#6	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#49	CP#7	GATE	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10
#50	CP#8	FAA TOWER	PTZ	--	--	--	EXISTING	--	--	--	--		ETO-10

NOTES:

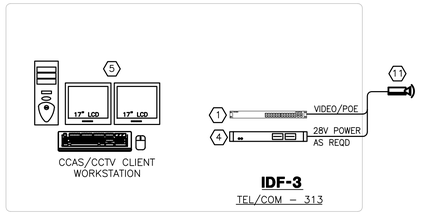
1. PROVIDE HEATER/BLOWER AND ENVIRONMENTAL OPTIONS ON ALL OUTDOOR UNITS.

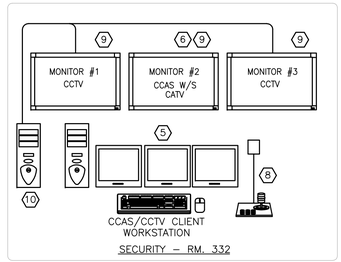
CAM#1- PROVIDE DAY/NIGHT (0.5 LUX OR LESS MIN) FIXED MINI DOME 1.3 MEGAPIXEL (MIN), PROGRESSIVE SCAN, 2.8-12MM OR EQUIVALENT, H264/MJPEG ENCODING MULTI-STREAM CAMERA. CAMERA SHALL BE ARECONT MV1355DN, IQINVISION ALLIANCE 1QA21, AXIS P3344-V OR APPROVED EQUAL.

CAM#2- PROVIDE DAY/NIGHT PTZ DOME CAMERA W/ 36X ZOOM & IMAGE STABALIZATION. CAMERA SHALL BE BOSCH AUTODOME i500 SERIES, 36X, PANASONIC WV-NS964, AXIS 233D OR APPROVED EQUAL.

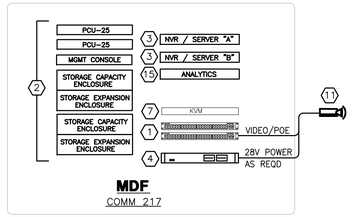
GENERAL NOTES CCTV SYSTEM

1. THE RISER DIAGRAM AND FLOOR PLAN INDICATE GENERAL LOCATION AND FUNCTIONAL REQUIREMENTS. CONTRACTOR SHALL PROVIDE ALL RELATED COMPONENTS TO PROVIDE AN OPERATIONAL SYSTEM.
2. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS AND PRODUCT DATASHEETS FOR ALL COMPONENTS. SHOP DRAWINGS SHALL SHOW ALL COMPONENTS, POINT TO POINT WIRING DIAGRAMS, HARDWARE & SOFTWARE CONFIGURATIONS, CABLE COLOR CODING AND COMPONENT FUNCTIONS. HARDWARE SHALL NOT BE PURCHASED OR INSTALLED UNTIL SUBMITTALS HAVE BEEN APPROVED BY A/E.
3. THE CCTV CAMERA PRESETS SHALL BE INTEGRATED WITH THE ACCESS CONTROL SYSTEM. ACTIVATION OF AN ACCESS CONTROL EVENT (E.G. ALARM) SHALL POINT THE CAMERAS IN THE VICINITY, ON PUBLIC AND SECURE SIDE, TO THE LOCATION AND RECORD IT AT FULL FRAME RATE (30FPS/4CIF OR 15FPS/2MP) AND DISPLAY ON SELECTED MONITORS.
4. ALL CAMERAS SHALL HAVE A PRE-ASSIGNED HOME POSITION. IF NO CONTROL IS BEING EXECUTED FOR A PERIOD OF 5 MINUTES THE CAMERA SHALL RETURN TO ITS HOME POSITION. THE OPERATOR SHALL HAVE AN OPTION TO LOCK CAMERA IN A NEW TEMPORARY POSITION.
5. REFER TO CCTV SCHEDULE FOR CABLING INFORMATION.
6. THE MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. APPROVED EQUAL EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE MAY BE USED. CONTRACTOR SHALL PROVIDE ANY AND ALL ADDITIONAL OPTIONS/COMPONENTS REQUIRED TO MEET THE SPECIFICATION REQUIREMENTS AND TO PROVIDE A FULLY OPERATIONAL SYSTEM.
7. ALL CABLES ROUTED OUTSIDE OF THE COMMUNICATIONS ROOM SHALL BE PLENUM RATED OR IN CONDUIT.
8. ALL FIBER OPTIC CABLE ROUTED OUTSIDE OF THE CABLE TRAY SHALL BE IN 1" MINIMUM CONDUIT.
9. CCTV WIRE SIZES LARGER THAN #14 AWG REQUIRE A SPLICE TO ACCOMODATE THE TERMINAL BLOCK, EXCEPT DINION IP CAMERA WHERE WIRE SIZES LARGER THAN #18 AWG REQUIRE A SPLICE.
10. FIXED CAMERA LENS SHALL BE VARIFOCAL WITH IR CORRECTION.
11. CAMERA MOUNTING TYPES ARE BASED UPON GENERAL PERFORMANCE. CONTRACTOR SHALL PERFORM A STUDY AND ENGINEER A CLEAN MOUNTING SYSTEM AT ALL LOCATIONS AS REQUIRED FOR OPTIMAL VIEW BY CAMERAS. CONTRACTOR SHALL NOTIFY A/E IF THERE ARE ANY CONFLICTS AND SHALL MOVE CAMERA UPTO 25' FROM LOCATION SHOWN ON PLANS AS DIRECTED BY A/E OR OWNER. ALL CABLES SHALL BE CONCEALED.
12. REFER TO SPECIFICATION 13700 FOR CCAS/CCTV SCOPE OF WORK.
13. SEE SHEET ET5-01 FOR EQUIPMENT RACK LAYOUTS. PROVIDE DETAILED RACK LAYOUTS OF EQUIPMENT FOR APPROVAL.
14. PROVIDE SURGE SUPPRESSION ON ALL OUTDOOR COMMUNICATION CABLES. PROVIDE PROTECTION ON BOTH ENDS OF CABLE. BOND TO GROUNDING SYSTEM. SURGE PROTECTORS SHALL BY CYLIX OR EQUAL.
15. ALL PATCH CORDS SHALL BE COLOR CODED. SUBMIT COLOR CODING SCHEME TO A/E FOR APPROVAL.
16. VIDEO MANAGEMENT SYSTEM SHALL CALL UP ALARM VIDEO ON A MINIMUM OF (3) ALARM SCREENS AND PROVIDE THE FOLLOWING FUNCTIONS: CALL UP SITE MAP, CHANGE SITE MAP DOOR ICON STATE/IMAGE, CHANGE THE RECORDING RATE OF THE CAMERA, LOG THE ALARM IN THE LOG BOOK, CAUSE A PTZ TO GO TO A PREPOSITION.
17. CONFIGURE SITE MAPS. VECTOR BASED AUTOCAD "DWG" FORMAT SITE MAPS TO BE PROVIDE BY OWNER. SITE MAPS SHALL BE CREATED FOR THE FOLLOWING VIEWS: CONCOURSE "A", CONCOURSE "B", LANDSIDE, SECURITY CHECKPOINT, VEHICLE GATES, TERMINAL EXTERIOR, ARFF/AOC AND AT MINIMUM (2) ADDITIONAL OWNER DEFINED VIEWS. SUBMIT VIEWS TO A/E AND OWNER FOR APPROVAL BEFORE ADDING DEVICES. COORDINATE DEVICE LOCATIONS WITH OWNER. SITE MAPS SHALL SHOW ALL CAMERAS AND ACCESS CONTROL POINTS/DOORS.
18. CREATE CAMERA SEQUENCE GROUPS. GROUPS SHALL INCLUDE: CONCOURSE "A", CONCOURSE "B", LANDSIDE, SECURITY CHECKPOINT, VEHICLE GATES, TERMINAL EXTERIOR, ARFF/AOC, FRONT CANOPY AND AT MINIMUM (2) ADDITIONAL OWNER DEFINED SEQUENCE GROUPS. DETERMINE SEQUENCE ORDER AND DURATION WITH OWNER. TRAIN OWNER TO ASSIGN SEQUENCE GROUPS TO MONITORS.
19. CONFIGURE AT A MINIMUM (1) MONITOR GROUP. MONITOR GROUP SHALL INCLUDE: ALL MONITORS. ASSIGN (4) MONITOR NUMBERS PER ANALOG DECODER, (16) MONITOR NUMBERS PER VIDEO MANAGEMENT WORKSTATION. SUBMIT MONITOR NUMBER LAYOUT TO A/E AND OWNER FOR APPROVAL. PROVIDE TYPEWRITTEN LABELS ON MONITORS INDICATING MONITOR NUMBERS.

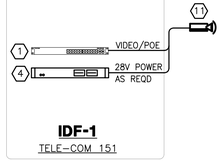


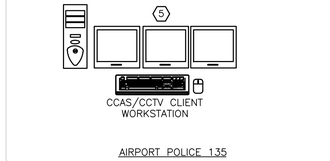


THIRD FLOOR

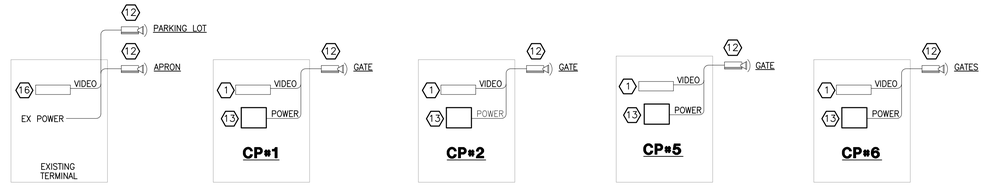


SECOND FLOOR





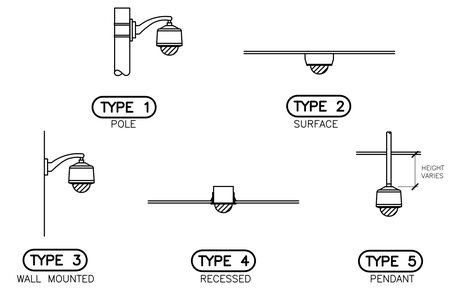
FIRST FLOOR



SITE

NOTES

1. NETWORK SCOPE ON T6-04. COORDINATE PORT CONFIGURATIONS AND REQUIREMENTS WITH NETWORK SCOPE. BALANCE PORT USAGE BETWEEN NETWORK SWITCHES. PROVIDE REDUNDANT CONNECTION FOR SERVERS.
2. PROVIDE VIDEO SURVEILLANCE STORAGE AREA NETWORK (IP SAN). IP SAN SHALL BE ISCSI RAID STORAGE. PROVIDE THE FOLLOWING OPTIONS:
   A. HIGH AVAILABLITY DUAL PERFORMANCE CONTROLLER UNITS AND ENCLOSURES.
   B. 440MB/SECOND SYSTEM THROUGHPUT.
   C. MANAGEMENT CONSOLE (CONNECT TO KVM)
   D. INTEGRATE WITH UPS FOR GRACEFUL SHUTDOWN
   E. PROVIDE RAID 5 CONFIGURATIONS
   F. PROVIDE 1 GLOBAL HOT SPARE DRIVE PER ENCLOSURE.
   G. PROVIDE (2) 15 DRIVE STORAGE CAPACITY ENCLOSURES (FULLY LOADED).
   H. PROVIDE (2) 12 DRIVE STORAGE EXPANSION ENCLOSURES (FULLY LOADED).
   I. 42TB USABLE STORAGE
   J. PROVIDE 7,200 RPM, 1TB, SATA-II DRIVES.
   K. PROVIDE SCE & SEE SPARE KITS,
   L. IP SAN SHALL BE INTRANSA STORSTAC BUILDING BLOCK.
   M. IP SAN SHALL BE CONFIGURED BY INTRANSA CERTIFIED PROFESSIONAL.
3. CCTV SERVER. SERVER SHALL BE REDUNDANT, FAIL OVER DIRECTORY, FAIL OVER ARCHIVER, FAIL OVER MATRIX. SERVER SHALL BE INTRANSA VIDEO APPLIANCE VA20 W/ GENETEC OMNICAST, ONSSI NETDVMS, AMAG NVR OR APPROVED EQUAL. PROVIDE CLIENT SOFTWARE FOR A MINIMUM OF 5 CLIENTS IN ADDITION TO CLIENT WORKSTATIONS SHOWN.
4. 28VAC 560VA - 16 (FUSED) OUTPUT RACK MOUNTED POWER SUPPLY FOR CCTV CAMERAS. POWER SUPPLY SHALL BE ALTRONIX MODEL R24160OUL OR APPROVED EQUAL. PROVIDE QUANTITY AS REQUIRED. DO NOT OVERLOAD. LABEL WITH CAMERA #'S.
5. SECURITY OPERATOR ACS/CCTV WORKSTATION SEE ET6-01.
6. PROVIDE A/V OPTION ON THIS MONITOR. PROVIDE TUNER & SPEAKERS. CONNECT MONITOR # 2 TO OPERATOR WORKSTATION. AND CATV SYSTEM.
7. KVM SWITCH PROVIDED ON ET5-01. CONNECT ALL SERVERS TO KVM IN MDF.
8. CCTV JOYSTICK/KEYBOARD. PELCO KBD300A OR EQUAL. CONNECT TO DECODER/ENCODER SERIAL SUCH AS BOSCH VIP-XD. SYSTEM SHALL OPERATE AS A VIRTUAL MATRIX AND ALLOW CAMERA CALLUP BY CAMERA #, MONITOR # AND TILE # ON VIDEO WALL MONITORS.
9. PROVIDE WALL MOUNTED 40" 1080P LCD MONITOR. MONITOR SHALL BE NEC P401 OR EQUAL. PROVIDE WALL MOUNT. MOUNT SHALL BE PEERLESS ST640 OR EQUAL. PROVIDE POWER AND DISPLAY CABLING BEHIND MONITORS. NO CABLES SHALL BE EXPOSED.
10. VIDEO WALL/CLIENT WORKSTATION. WORKSTATION SHALL BE INTEL CORE 2 QUAD Q9950, 2.83GHZ, 4GB RAM, 250GB HARD DRIVE, 768MB NVIDIA QUADRO FX 1800. WORKSTATION SHALL BE DELL OPTIPLEX 960 DESKTOP OR EQUAL. PROVIDE VIRTUAL MATRIX VIDEO WALL CLIENT SOFTWARE, ONSSI NETMATRIX VIEWER, GENETEC OMNICAST VIDEOWALL OR APPROVED EQUAL. INSTALL IN CONSOLE.
11. CCTV CAMERA AND CABLING SEE CCTV SCHEDULE THIS SHEET.
12. EXISTING CAMERA AND CABLING TO BE REMAIN. PROVIDE ENCODERS AND CABLING AS REQUIRED TO CONNECT TO NETWORK. SEE CCTV SCHEDULE THIS SHEET.
13. 4 FUSED OUTPUT 24V/28V (3.5A OUTPUT) CCTV POWER SUPPLY. ALTRONIX ALTV244UL OR EQUAL. LABEL "CCTV CAMERA POWER" WITH CAMERA #'S.
14. NOT USED
15. INTELLIGENT VIDEO ANALYTICS. ANALYTICS SHALL BE 3VR "P" SERIES, IOMNISCIENT OR APPROVED EQUAL. PROVIDE ADVANCED FACIAL DETECTION, TIME BASED NON-MOTION/PARKED VEHICLE AND ADVANCED MOTION DETECTION AS REQUIRED. PROVIDE ISCSI SUPPORT FOR IP SAN STORAGE. PROVIDE CLIENT SOFTWARE FOR A MINIMUM OF 5 CLIENTS IN ADDITION TO CLIENT WORKSTATIONS SHOWN. PROVIDE ADDITIONAL PROCESSING CAPACITY FOR A MINIMUM OF 10 ADDITIONAL CAMERAS INCLUDING LICENSES.
16. EXISTING IFS (4) CHANNEL VIDEO TRANSMITTER TO REMAIN IN TERMINAL. EXISTING PARKING LOT AND APRON CAMERAS SHALL BE CONNECTED TO NEW CCTV SYSTEM. RELOCATE EXISTING IFS (4) CHANNEL VIDEO RECIEVER FROM PUBLIC SAFETY BUILDING TO NEW TERMINAL MDF. PROVIDE ENCODERS AS REQUIRED TO INTERFACE EXISTING ANALOG SIGNAL INTO SYSTEM.



1 ET603 **VIDEO SURVEILLANCE RISER**
SCALE: NTS

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SEAL

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NO.	DESCRIPTION	DATE

DATE ISSUED: 04-12-10
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

A&P PROJECT NUMBER
213-1882-091

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SHEET TITLE

VIDEO SURVEILLANCE RISER

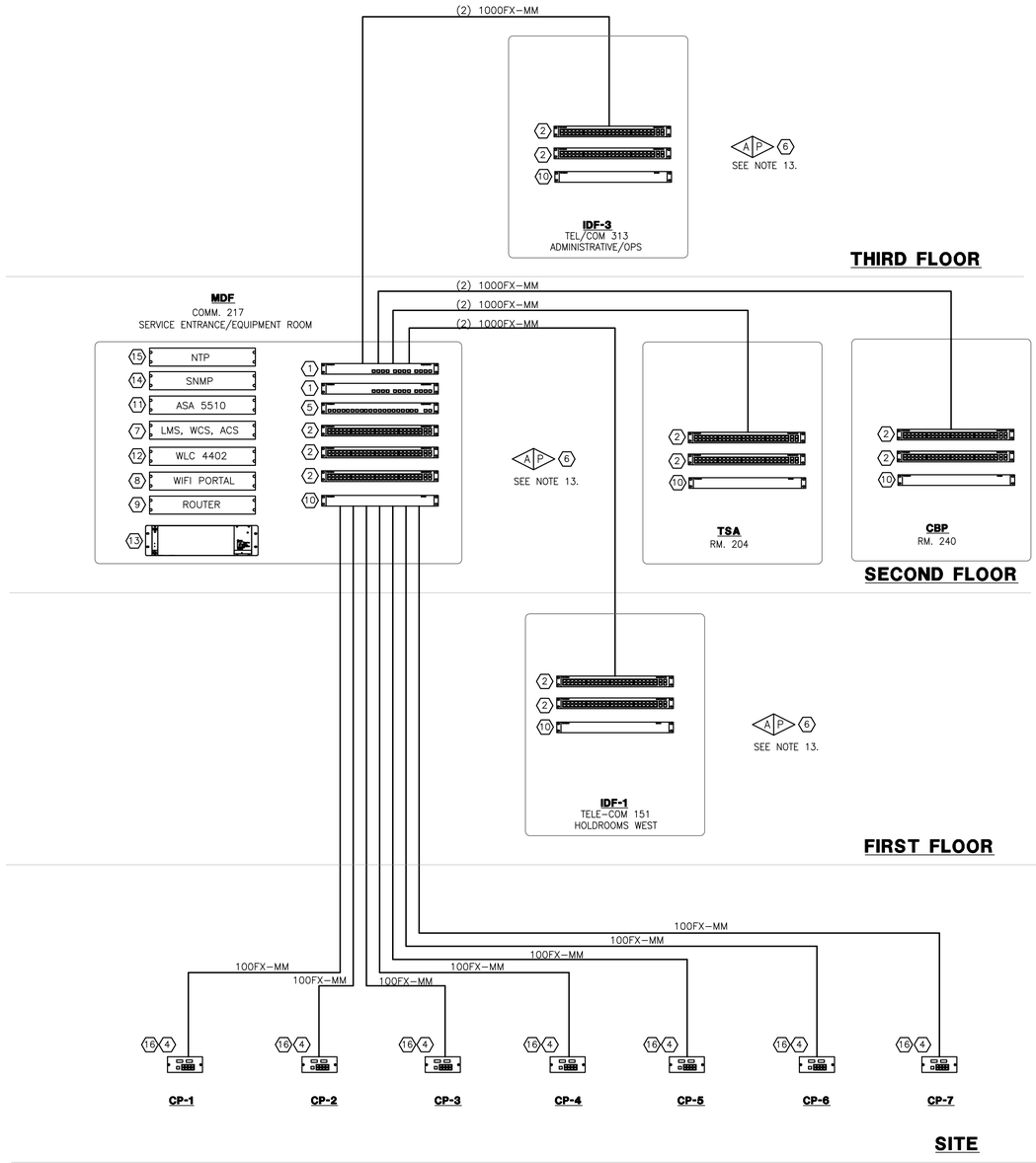
SHEET NUMBER
ET603

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Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\ET6-03 Video Surveilance Riser.dwg Plotted on: 4/9/2010 12:52 PM Plotted by: Lizari, Rional

GENERAL NOTES

1. REFER TO SPECIFICATIONS SECTION 16710 FOR PREMISE WIRING SYSTEM SCOPE OF WORK, SECTION 16715 FOR COMMUNICATIONS NETWORK EQUIPMENT.
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 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 DESIGN, 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 ETHERNET BASED SYSTEMS TO THE NETWORK. THE CONTRACTOR SHALL COORDINATE WITH AIRPORT "IT" SUPPORT PERSONNEL AND CONSULTANTS.
5. CONTRACTOR SHALL LABEL ALL PATCH CABLES AND NETWORK COMPONENTS. LABELS SHALL BE TYPE WRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.
6. THE NETWORK IMPLEMENTATION SHALL BE PERFORMED BY A QUALIFIED INFORMATION TECHNOLOGY (IT) PROFESSIONAL.
   a. THE IT PROFESSIONAL SHALL HAVE A MINIMUM OF TEN YEARS EXPERIENCE IN NETWORK INSTALLATION OF SIMILAR COMPLEXITY.
   b. THE IT PROFESSIONAL SHALL HAVE AT A MINIMUM CCIE "CISCO CERTIFIED INTERNETWORK EXPERT" CERTIFICATION AND SHALL BE FAMILIAR WITH NETWORK REDUNDANCY, 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.
   d. THE IT PROFESSIONAL SUPPORT OFFICE SHALL BE WITHIN 150 MILE RADIUS OF PEORIA, IL AIRPORT.
7. THE NETWORK INSTALLATION SHALL INCLUDE FURNISHING AND INSTALLATION OF ALL NETWORK EQUIPMENT AS SPECIFIED HEREIN TO PROVIDE A COMPLETELY OPERATIONAL NETWORK.
8. VLANS SHALL BE CREATED TO SEPARATE NETWORKED SYSTEMS. VLANS SHALL BE SPANNED ACROSS SWITCHES. VLANS SHALL INCLUDE BUT NOT BE LIMITED TO, SECURITY, MUFIDS, ADMIN, BUILDING AUTOMATION, PUBLIC ADDRESS, VOICE, ETC. INTERVLAN ROUTING SHALL BE UTILIZED ONLY AS REQUIRED AND ACL'S (ACCESS CONTROL LISTS) SHALL BE CREATED TO RESTRICT ACCESS TO AUTHORIZED PERSONNEL AND DEVICES ONLY. ONLY REQUIRED PORTS SHALL BE OPENED. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS INDICATING IP ASSIGNMENTS AND PROPOSED ACCESS CONTROL CONFIGURATIONS TO THE ENGINEER FOR APPROVAL.
9. ALL CISCO COMPONENTS SHALL CARRY SMARTNET 8X5 NEXT BUSINESS DAY FOR A MINIMUM OF 2 YEARS.
10. PROVIDE ALL TRANSCEIVERS FOR A COMPLETE AND OPERATIONAL SYSTEM.
11. NETWORK INTEGRATOR SHALL COORDINATE WITH ALL SYSTEMS TO PROVIDE ADDRESSES, DETERMINE QOS LEVELS AND OTHER NETWORK CONFIGURATION SUPPORT. SYSTEMS SHALL INCLUDE BUT NOT BE LIMITED TO, HVAC CONTRACTOR FOR BUILDING AUTOMATION, PA CONTRACTOR FOR PUBLIC ADDRESS, MUFIDS CONTRACTOR, AIRPORT ADMINISTRATION IT, SECURITY INTEGRATOR AND ELECTRICAL CONTRACTOR FOR METERING AND TRANSFER SWITCH WEB SERVERS. PROVIDE IP ADDRESSING RANGES/SUBNETS TO INTEGRATORS TO USE FOR THEIR DEVICES.
12. ALL NETWORK CONFIGURATIONS SHALL BE BACKED UP TO SERVER. IN THE EVENT A SWITCH FAILS, CONFIGURATIONS SHALL BE EASILY UPDATED TO REPLACEMENT HARDWARE.
13. CONTRACTOR SHALL COORDINATE AND PROVIDE CONNECTION OF PUBLIC WIFI INTERNET (CABLE MODEM OR DSL) AND T1 INTERNET SERVICE TO THE NETWORK. OWNER WILL COORDINATE PURCHASE OF SERVICES. SUBMIT FIREWALL CONFIGURATIONS TO A/E FOR APPROVAL.
14. NETWORK SHALL BE FULLY REDUNDANT. PROVIDE STACKING INTERFACE BETWEEN NETWORK SWITCHES AT EACH LOCATION. PROVIDE DUAL FIBER CONNECTION TO CORE SWITCH.
15. FIBER PATCHES AND CROSS PATCHING NOT SHOWN FOR CLARITY. CONTRACTOR SHALL PROVIDE ALL PATCH CABLES AS REQUIRED FOR NETWORK CONNECTIVITY. SEE COMMUNICATION RISER DIAGRAM ET6-06.
16. CONNECT ALL SERVERS TO KVM AS INDICATED ON SHEET ET5-01.
17. SEE SHEET ET5-01 FOR EQUIPMENT RACK LAYOUTS. PROVIDE DETAILED RACK LAYOUTS OF EQUIPMENT FOR APPROVAL.
18. CONTRACTOR SHALL CREATE VPN CONNECTIONS FOR EACH VLAN SYSTEM FOR REMOTE MAINTENANCE AND TESTING. SUBMIT LIST OF ACCOUNTS AND PASSWORDS TO AIRPORT IT.



1 / ET604 **NETWORK RISER**
SCALE: NTS

NOTES:

1. ETHERNET SWITCH, 12 SFP PORTS, ENHANCED IMAGE IP SERVICES AND 32GBPS STACKING. SWITCH SHALL BE CISCO C3750G-12S-E OR APPROVED EQUAL. SWITCHES SHALL BE STACKED AND OPERATE AS A SINGLE LOGICAL UNIT.
2. ETHERNET SWITCH, 48 ETHERNET 10/100/1000 PORTS WITH IEEE 802.3af PoE AND 4 SFP UNLINKS WITH STANDARD IMAGE. SWITCH SHALL BE CISCO C3750G-48PS-S OR APPROVED EQUAL.
3. NOT USED.
4. HARDENED ETHERNET SWITCH, 12 10/100 ETHERNET PORTS AND 2 100BASE-FX PORTS. SWITCH SHALL BE CISCO 2955C-12 OR APPROVED EQUAL. PROVIDE MOUNTING HARDWARE AND POWER SUPPLY AS REQUIRED.
5. ETHERNET SWITCH, 24 100BASE-FX PORTS AND 2 SFP UPLINKS WITH STANDARD IMAGE. SWITCH SHALL BE CISCO C3750-24FS-S OR APPROVED EQUAL.
6. WIRELESS ACCESS POINT 802.11g. ACCESS POINT SHALL BE CISCO AIRONET 1140G/N LIGHTWEIGHT ACCESS POINT. CONTRACTOR SHALL PROVIDE SEVEN (6) ABOVE CEILING OR CONCEALED PLUS TWO (2) SPARE ACCESS POINTS. CONTRACTOR SHALL PERFORM A WIRELESS RADIO SITE SURVEY TO DETERMINE ACCESS POINT LOCATIONS FOR COMPLETE BUILDING COVRAGE. SUBMIT STUDY AND WIRELES POINT LOCATION DRAWINGS TO A/E FOR APPROVAL, IN COMPLIANCE WITH SPECIFICATION SECTION 16715, PRIOR TO INSTALLATION. PROVIDE PLENUM RATED CAT6 CABLE TO EACH POINT LOCATION AND LEAVE 20' SLACK CABLE TO ALLOW ACCESS POINT RELOCATION.
7. SERVER WITH CISCO LAN MANAGEMENT SOLUTION 3.2 (LMS) 100 DEVICE RESTRICTED LICENSE, WIRELESS CONTROL SYSTEM (WCS) 50 AP LICENSE AND RADIUS SERVER SOFTWARE: CISCO SECURE ACCESS CONTROL SERVER (ACS) OR EQUAL. COORDINATE RADIUS ACCOUNT INFORMATION WITH ADMINISTRATIVE LDAP SERVER USER ACCOUNTS. WIRELESS ACCESS & VPN ACCESS SHALL BE AUTHENTICATED THROUGH THE RADIUS SERVER. HARDWARE SHALL BE DUAL CORE INTEL XEON E5205 1.86GHZ, 4GB RAM, TWO 160GB SATA HARDDRIVES, CDRW/DVD W/ WINDOWS SERVER 2003. SERVER SHALL BE DELL POWEREDGE 1950 III OR EQUAL. CONNECT TO KVM. PROVIDE (3) CLIENT ACCESS LICENSES MINIMUM.
8. CAPTIVE PORTAL/WIRELESS GATEWAY W/ USER AGREEMENT AND REDIRECTION TO AIRPORT WEB PAGE. CAPTIVE PORTAL SHALL BE FIRST SPOT PATRONSOFT OR EQUAL. HARDWARE SHALL BE AT MINIMUM 2.0 GHZ INTEL CELERON 440, 1GB DDR2, 80GB HARD DRIVE, 48X32 CDRW/DVD W/ WINDOWS XP PRO P3. WORKSTATION SHALL BE DELL OPTIPLEX 360 OR EQUAL. CONNECT TO KVM.
9. MODULAR INTEGRATED SERVICES ROUTER WITH T1 INTERFACE. ROUTER SHALL BE CISCO 1841-T1 OR APPROVED EQUAL.
10. REDUNDANT POWER SYSTEM FOR NETWORK SWITCHES. REDUNDANT POWER SYSTEM SHALL BE CISCO RPS 2300. PROVIDE MODULES/CABLES AS REQUIRED.
11. ADAPTIVE SECURITY APPLIANCE WITH CONTENT SECURITY SERVICES. DEVICE SHALL SUPPORT AT MINIMUM 50 USER ANTIVIRUS/ANTISPYWARE, FIREWALL SERVICES, 250 IPSEC VPN, 2 SSL VPN AND 3 FAST ETHERNET INTERFACES. PROVIDE (2) YEAR SUBSCRIPTION SERVICES. ADAPTIVE SECURITY APPLIANCE SHALL BE CISCO ASA5510-CSC10-K9 OR APPROVED EQUAL.
12. WLC 4402 WLAN CONTROLLER FOR 12 LIGHTWEIGHT ACCESS POINTS.
13. PROVIDE 4 PORT 10/100 HARDENED ETHERNET SWITCH AT AIR CARGO. SWITCH SHALL BE IFS D7420-WDM OR EQUAL. PROVIDE RACK MOUNT CAGE AT MDF. PROVIDE 1 PORT 10/100 HARDENED ETHERNET SWITCH AT MDF. SWITCH SHALL BE IFS D7120-WDM-R3.
14. PROVIDE SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP) SERVER. SERVER SHALL BE DELL 1950 OR EQUAL. SOFTWARE SHALL BE WHATSUPGOLD PREMIUM OR EQUAL. CONFIGURE DEVICES THAT SUPPORT SNMP TO PROVIDE UPDATES TO SNMP SERVER. THIS SHALL INCLUDE, UPS, TEMP SENSORS, SERVERS, CCTV CAMERAS, NETWORK SWITCHES AND OTHER DEVICES AS NECESSARY FOR SYSTEM STATUS. COORDINATE WITH ALL SYSTEM INTEGRATORS.
15. PROVIDE NETWORK TIME SERVER. SERVER SHALL BE SYMMETRICOM SYNCSERVER S200 WITH TCXO CLOCK. PROVIDE GPS INTERFACE, ANTENNA AND CABLING TO ROOF. CONFIGURE ALL SERVERS, CAMERAS, WORKSTATIONS TO USE NTP SERVER FOR TIME SYNC. COORDINATE WITH ALL SYSTEM INTEGRATORS.
16. PROVIDE 1000VA UPS W/ (4) 18AH BATTERIES. UPS SHALL BE ALPHA NOVUS OR APPROVED EQUAL. PROVIDE ETHERNET OPTION AND MONITOR ON SNMP SERVER. SEE NETWORK RISER ET6-04. RE-USE EXISTING POWER CIRCUIT. UPS SHALL POWER ACCESS CONTROL PANEL, NETWORK SWITCH AND RELATED SYSTEM HARDWARE. UPS SHALL BE WALL MOUNTED INSIDE EXISTING FACILITY NEAR PANEL LOCATION. FIELD COORDINATE FINAL LOCATION. PROVIDE TRIPP-LITE PS2408 24" POWER STRIP TO CONNECT DEVICES.

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SEAL

REVISIONS

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213-1882-091

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SHEET TITLE
NETWORK RISER

SHEET NUMBER
ET604

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