DULUTH INTERNATIONAL AIRPORT

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

DULUTH AIRPORT AUTHORITY BOARD OF DIRECTORS

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- Roger Wedin

FAA AIP No. - 3-27-0024-48-10
RS&H PROJ. No. - 213.1882.091
CITY OF DULUTH BID No. - 10-4401



NEW PASSENGER TERMINAL BUILDING PERMIT VOLUME 2 OF 2 MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION

AUG 16, 2010

KRAUS-ANDERSON CONSTRUCTION COMPANY

Construction Managers:
KRAUS-ANDERSON.
3716 Oneota Street
Duluth MN 55807
TEL: (218) 722-3775 / FAX: (218) 722-3778

RS&H IMPROVING YOUR WORLD

Architects and Civil Engineers:
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4525 Airport Approach Road,
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TEL: (218) 722-1227 / FAX: (218) 722-1052

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

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501 Lake Avenue South, Suite 300,
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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

DRAWING LIST

G101 DRAWING LIST

ARCHITECTURAL

AS100 OVERALL SITE PLAN
AS101 ARCHITECTURAL SITE PLAN

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A002 SYMBOLS AND ADA
A003 PARTITION TYPES

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A102 OVERALL SECOND FLOOR PLAN
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MP112 ENLARGED SECOND FLOOR MECH. PIPING PLAN AREA A
MP113 ENLARGED SECOND FLOOR MECH. PIPING PLAN AREA B
MP113 ENLARGED THIRD FLOOR MECH. PIPING PLAN AREA A
MP114 ENLARGED THIRD FLOOR MECH. PIPING PLAN AREA B

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M202 MECHANICAL SECTIONS & ELEVATIONS

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M302 CHILLED WATER FLOW DIAGRAM
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E114 ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA A
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E200 ENLARGED EQUIPMENT ROOMS

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E300 POWER RISER DIAGRAM
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E400 ELECTRICAL ABBREVIATIONS AND TABLES
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EL113 ENLARGED SECOND FLOOR LIGHTING PLAN AREA B
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EL115 ENLARGED THIRD FLOOR LIGHTING PLAN AREA B

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P001 PLUMBING SYMBOL LIST, ABBREVIATIONS AND DRAWING LIST

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P101 ENLARGED UNDERGROUND PLUMBING PLAN AREA B
P102 ENLARGED UNDERGROUND PLUMBING PLAN AREA A
P103 ENLARGED UNDERGROUND PLUMBING PLAN AREA B

P110 ENLARGED FIRST FLOOR PLUMBING PLAN AREA A
P111 ENLARGED FIRST FLOOR PLUMBING PLAN AREA B
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P401 PLUMBING DETAILS
P402 PLUMBING DETAILS
P403 PLUMBING DETAILS

P501 PLUMBING SCHEDULES

FIRE PROTECTION

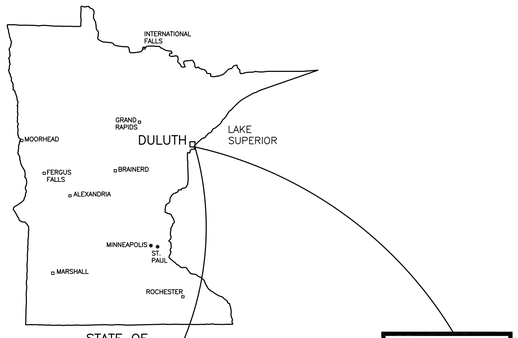
F001 FIRE PROTECTION SYMBOL LIST, ABBREVIATIONS AND DRAWING INDEX

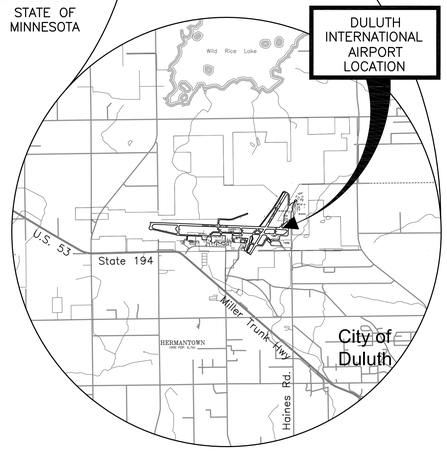
F110 ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA A
F111 ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA B
F112 ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A
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F114 ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA A
F115 ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA B

F401 FIRE PROTECTION DETAILS

F501 FIRE PROTECTION SCHEDULES AND RISER DIAGRAM

GENERAL NOTE:
FOR ADA STANDARDS, PLUMBING FIXTURES' MOUNTING HEIGHTS AND CLEARANCES, SEE A002





N

1 LOCATION MAP
N.T.S.

RS&H
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DULUTH AIRPORT AUTHORITY

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

ARCHITECTURAL CERTIFICATION
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 Minnesota.

Print Name: Mark Ip

Signature:

Date: 06-03-10 Reg. No.: 46001

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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

BUILDING PERMIT

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
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); ø NECK SIZE OR WIDTH X HEIGHT OR SLOT X LENGTH; A.B 300 CFM

CONTINUOUS FIN TUBE RADIATION

PIPE HANGER & SUPPORT SCHEDULE

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

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

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

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

#13 #14 #15 #16

#17 #18 #19 — WELDED STEEL BRACKETS

#20 #21 #22 — A DJ. C.I. PIPE ROLL STAND

#22 #22 #22 — ADJ. STANCHION SUPPORTS

#26 BASE PIPE STANCHION SUPPORT (SIZE PER SPECIFICATIONS)

#27 SINGLE BOLT RISER CLAMP — SEE SPECIFICATIONS FOR SAFE SIZES

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

#29 SINGLE ROD SPRING

#30 DOUBLE SPRING

#31 TRAPEZE SPRING

#32 #33 WELDED STEEL BRACKET

#37 MULTI TWO ROD RIGID HANGER GANG HANGER

#34 SINGLE BOLT RISER CLAMP

#35 STRUCT. STEEL FRAME TO SUIT

#36 MULTI- J HOOK PLATE GANG HANGER

ANCHORS

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

#40 #41 #42 — SINGLE BOLT RISER CLAMS

G U I D E S

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 35	APPLIES TO ALL PIPES TO STOP MOVEMENT					
GANG HANGERS (VERTICAL PIPING)						
36	✳	✳	✳			
GANG HANGERS (HORIZONTAL PIPING)						
37	✳	✳	✳	TO BE INDIVIDUALLY SUPPORTED		
GUIDES (VERTICAL & HORIZONTAL PIPING)						
38					✳	
39						✳
40				✳		
41					✳	
42						✳

MECHANICAL DRAWING LIST

SHEET NO.	DESCRIPTION	ISSUED FOR	DESIGN DEVELOPMENT	60% CONSTRUCTION DOCUMENTS	90% CONSTRUCTION DOCUMENTS	BID PACKAGE 1	SITE WORK AND FNDN PERMIT	BID PACKAGE 1 CONFORMANCE	BUILDING PERMIT
	DATE		11/30/09	02/11/10	04/12/10	05/07/10	06/02/10	07/12/10	08/16/10
M001	MECHANICAL LEGEND		●	●	●	●	●	●	●
M002	MECHANICAL SYMBOLS & ABBREVIATIONS		●	●	●	●	●	●	●
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				●				●
MP110	ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN - AREA A				●				●
MP111	ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN - AREA B				●				●
MP112	ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN - AREA A				●				●
MP113	ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN - AREA B				●				●
MP114	ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA A				●				●
MP115	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		●	●	SHEET DELETED				
M401	MECHANICAL EQUIPMENT SCHEDULES I		●	●	●				●
M402	MECHANICAL EQUIPMENT SCHEDULES II		●	●	●				●
M403	MECHANICAL EQUIPMENT SCHEDULES III								●
M501	MECHANICAL DETAILS I		●	●	●	●	●	●	●
M502	MECHANICAL DETAILS II		●	●	●				●
M503	MECHANICAL DETAILS III		●	●	●				●
M504	MECHANICAL DETAILS IV								●

GENERAL NOTES:

1. ALL WORK SHALL CONFORM TO THE FOLLOWING CODES AND STANDARDS AT A MINIMUM:

   2007 MINNESOTA STATE BUILDING CODE
   2007 MINNESOATE STATE MECHANICAL AND FUEL GAS CODES
   2007 COMMERCIAL ENERGY CODE
   MINNESOTA SUSTAINABLE BUILDING GUIDELINES (REQUIRED SECTIONS ONLY)
   ASHRAE STANDARD 90.1–2007
   ASHRAE STANDARD 62.1–2007
   ASHRAE STANDARD 55–2004

2. ACCESS PANELS ARE REQUIRED FOR ALL AIR TERMINAL DEVICES, VALVES, AND DAMPERS LOCATED ABOVE CEILINGS. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL PANEL SIZES AND LOCATIONS WITH GENERAL CONTRACTOR AND ARCHITECT. ACCESS PANELS TO BE CONSTRUCTED PER ARCHITECTURAL SPECIFICATIONS AND DETAILS.

3. FINAL LOCATION OF ALL DIFFUSERS & SENSORS INSTALLED IN FINISHED SPACES SHALL BE REVIEWED AND APPROVED BY ARCHITECT.

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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TEL: (218) 591-5079

ENGINEER CERTIFICATION
I hereby certify that the engineerinng 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 Minnesota.
Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
MECHANICAL LEGEND

SHEET NUMBER
M001

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M001.dwg Plotted on: 8/13/2010 4:55 PM Plotted by: Brandi, 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
- CO2 — CARBON DIOXIDE SPACE SENSOR

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
CO2	CARBON DIOXIDE
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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Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: XX

AEP PROJECT NUMBER
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SHEET TITLE
MECHANICAL SYMBOLS & ABBREVIATIONS

SHEET NUMBER
M002

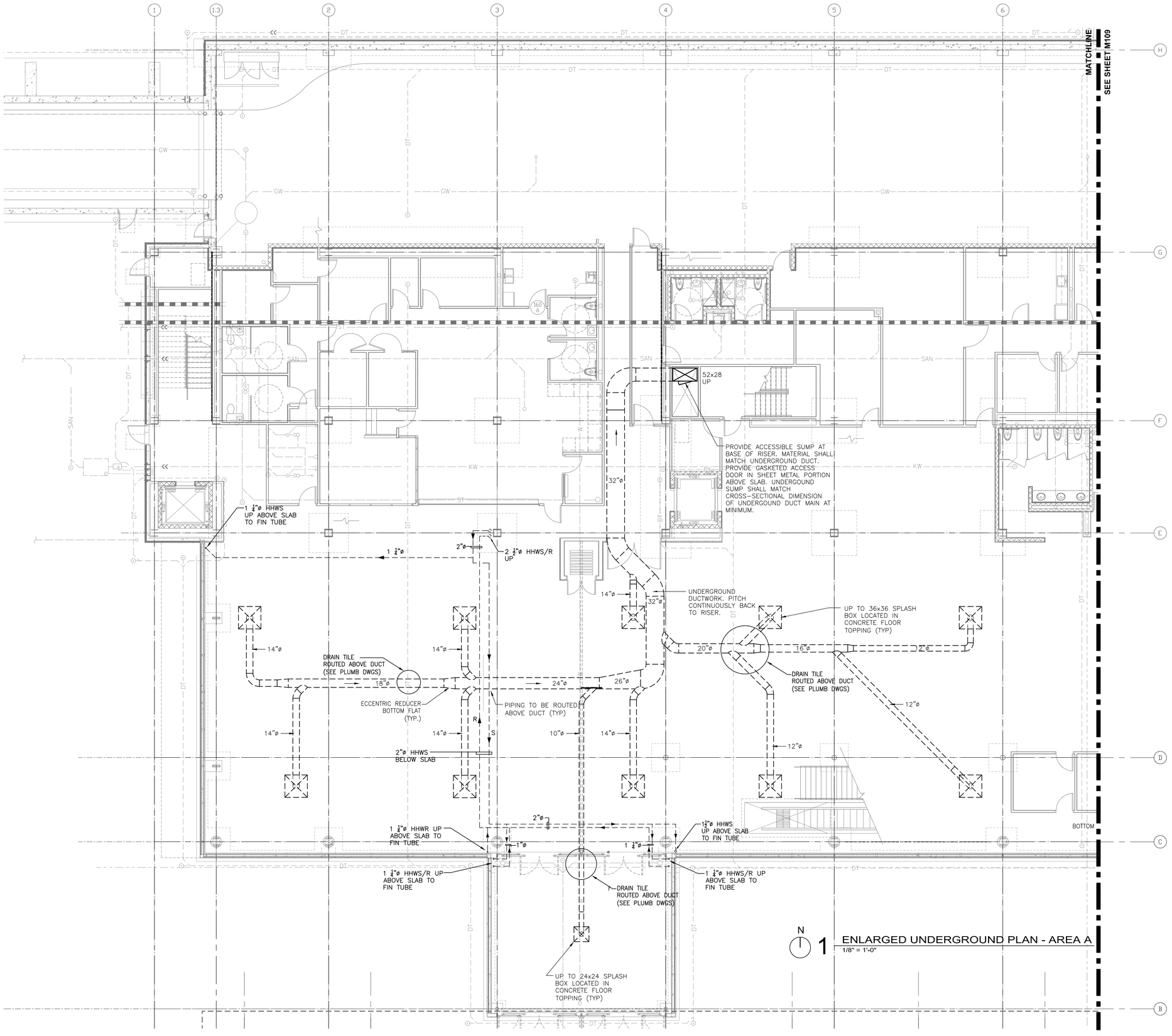
BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\[8.4] HVAC\Dwgs\2008_M002.dwg Plotted on: 8/12/2010 4:57 PM Plotted by: Brandi, Mark

GENERAL NOTES:

1. ALL UNDERGROUND PIPING SHALL BE STUBBED 12" ABOVE TOP OF STRUCTURAL SLAB AND CAPPED WITH NON-METALLIC REMOVABLE PLUG. CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROTECTION FOR PIPE STUBS AFTER SLAB POUR. SEE M501.

2. SEE DETAILS ON M501 FOR CAPPING OF UNDERGROUND DUCT.



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

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DRAWN BY:	FT
DESIGNED BY:	BR

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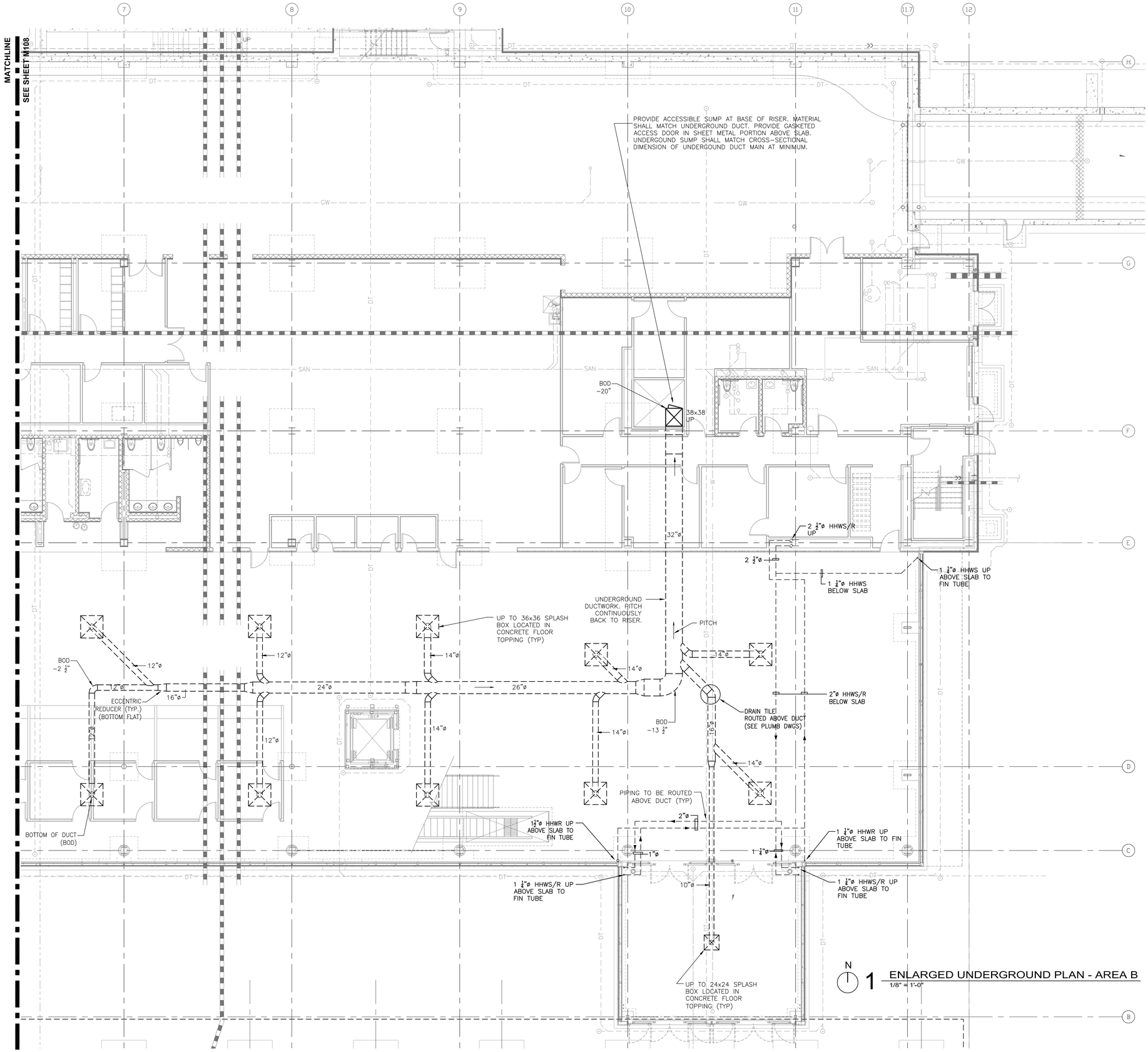
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SHEET TITLE
ENLARGED UNDERGROUND MECHANICAL PLAN AREA A

SHEET NUMBER
M108

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M108.dwg Plotted on: 8/12/2010 3:28 PM Plotted by: Brandi, Mark



N

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

GENERAL NOTES:

1. ALL UNDERGROUND PIPING SHALL BE STUBBED 12" ABOVE TOP OF STRUCTURAL SLAB AND CAPPED WITH NON-METALLIC REMOVABLE PLUG. CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROTECTION FOR PIPE STUBS AFTER SLAB POUR. SEE M501

2. SEE DETAILS ON M501 FOR CAPPING OF UNDERGROUND DUCT.

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DRAWN BY: FT
DESIGNED BY: BR

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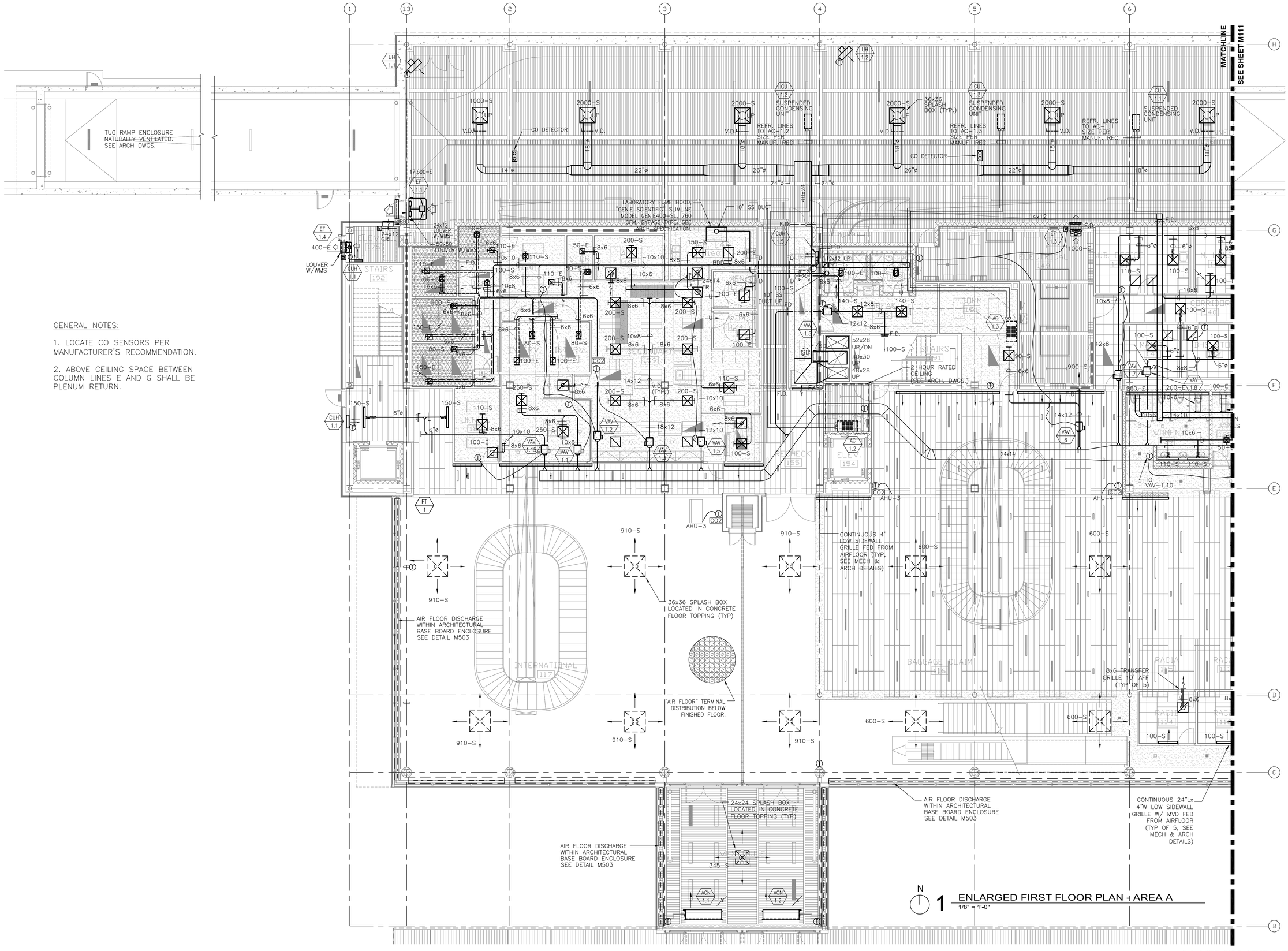
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SHEET TITLE
ENLARGED UNDERGROUND MECHANICAL PLAN AREA B

SHEET NUMBER
M109

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) HVAC\Dwgs\M08_M109.dwg Plotted on: 8/12/2010 3:25 PM Plotted by: Brandt, Mark



GENERAL NOTES:

1. LOCATE CO SENSORS PER MANUFACTURER'S RECOMMENDATION.

2. ABOVE CEILING SPACE BETWEEN COLUMN LINES E AND G SHALL BE PLENUM RETURN.

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SHEET TITLE

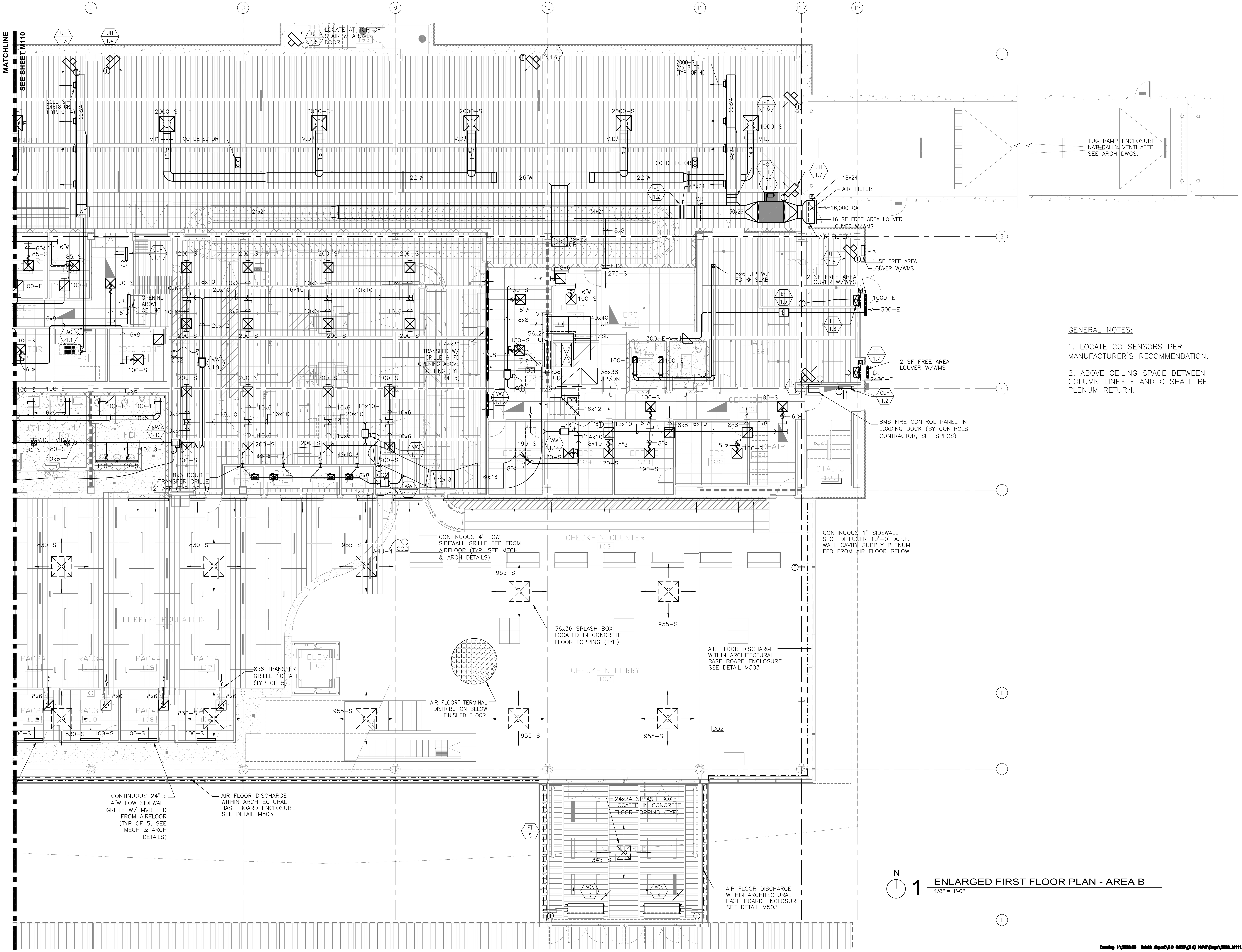
ENLARGED FIRST FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER

M110

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M110.dwg Plotted on: 8/13/2010 3:27 PM Plotted by: Brandi, Mark



GENERAL NOTES:

1. LOCATE CO SENSORS PER MANUFACTURER'S RECOMMENDATION.

2. ABOVE CEILING SPACE BETWEEN COLUMN LINES E AND G SHALL BE PLENUM RETURN.

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

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ENGINEER CERTIFICATION
I hereby certify that the engineering 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 Minnesota.
Print Name: Douglas C. Mass

Signature:

Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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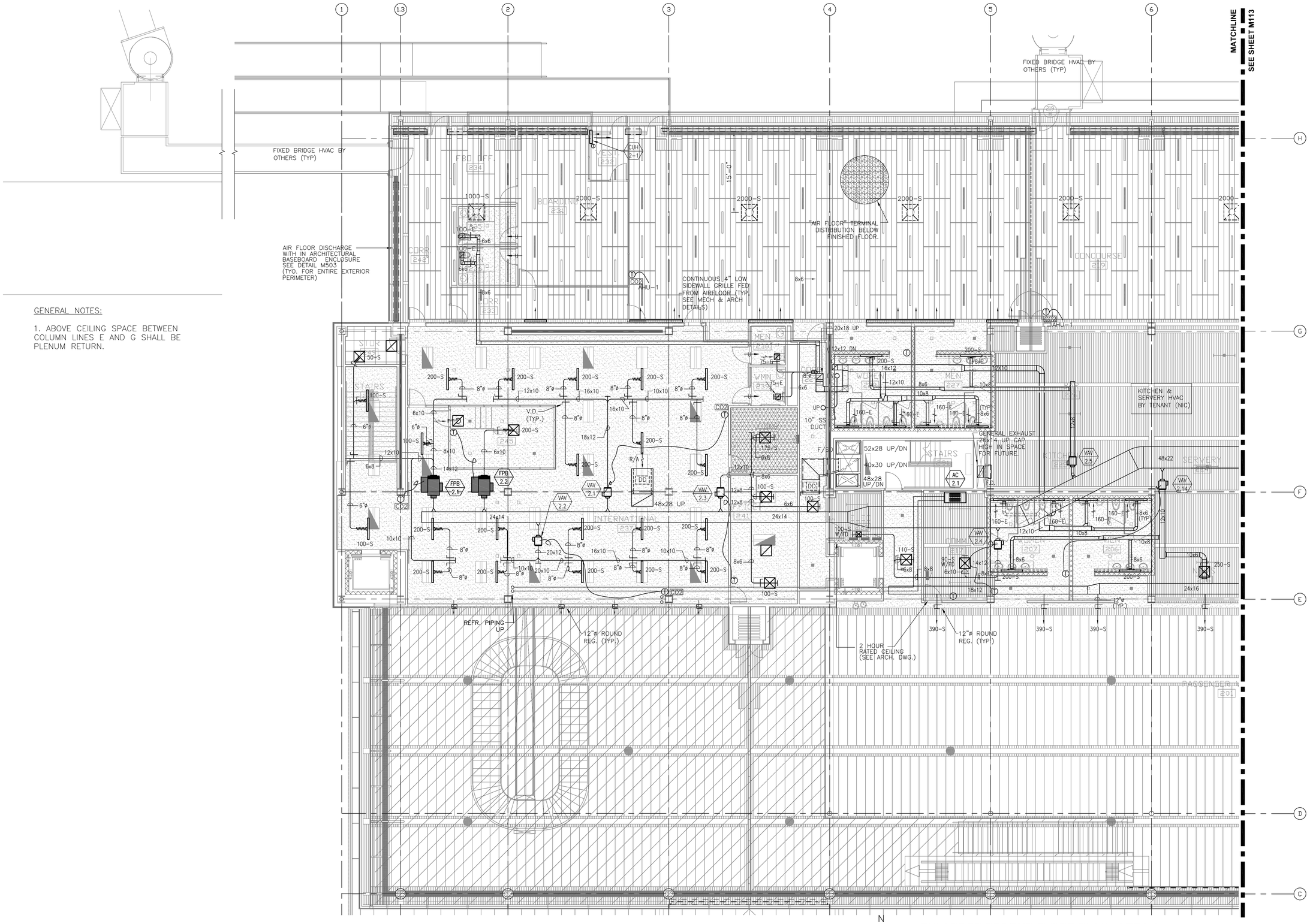
SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER
M111

BUILDING PERMIT

GENERAL NOTES:

1. ABOVE CEILING SPACE BETWEEN COLUMN LINES E AND G SHALL BE PLENUM RETURN.



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Baggage Handling Systems Consultants:
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DRAWN BY: JEH
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SHEET TITLE
ENLARGED SECOND FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER
M112

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M112.dwg Plotted on: 8/13/2010 3:28 PM Plotted by: Brandi, Mark

MATCHLINE
SEE SHEET M112

7 8 9 10 11 11.7 12

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)

CONTINUOUS 4" LOW SIDEWALL GRILLE FED FROM AIRFLOOR (TYP. SEE MECH & ARCH DETAILS)

2000-S 2000-S 2000-S 2000-S 1000-S

15'-0"

AHU-5 AHU-5

DEP. ANNEX 215 | TSA CHECKPOINT 208 | AIRPORT POLICE DUTY OFFICE 213 | AIRPORT POLICE 211 | RESTROOM 210 | CORRIDOR 202 | CORRIDOR 230 | RESTROOM 231 | WOMEN 222 | MEN 221 | JAN 205 | WHEELCHAIR 232 | CORRIDOR 223 | TELECOM 204 | STAIRS 290

10x8 UP TO MECH. RM.

18x12 TRANSFER GRILL W/F.D. (TYP. OF 2)

12"ø ROUND REG. (TYP.) 12"ø ROUND REG. (TYP.)

VD (TYP.)

GENERAL NOTES:

1. ABOVE CEILING SPACE BETWEEN COLUMN LINES E AND G SHALL BE PLENUM RETURN.

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

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SHEET TITLE
ENLARGED SECOND FLOOR MECHANICAL PLAN AREA B

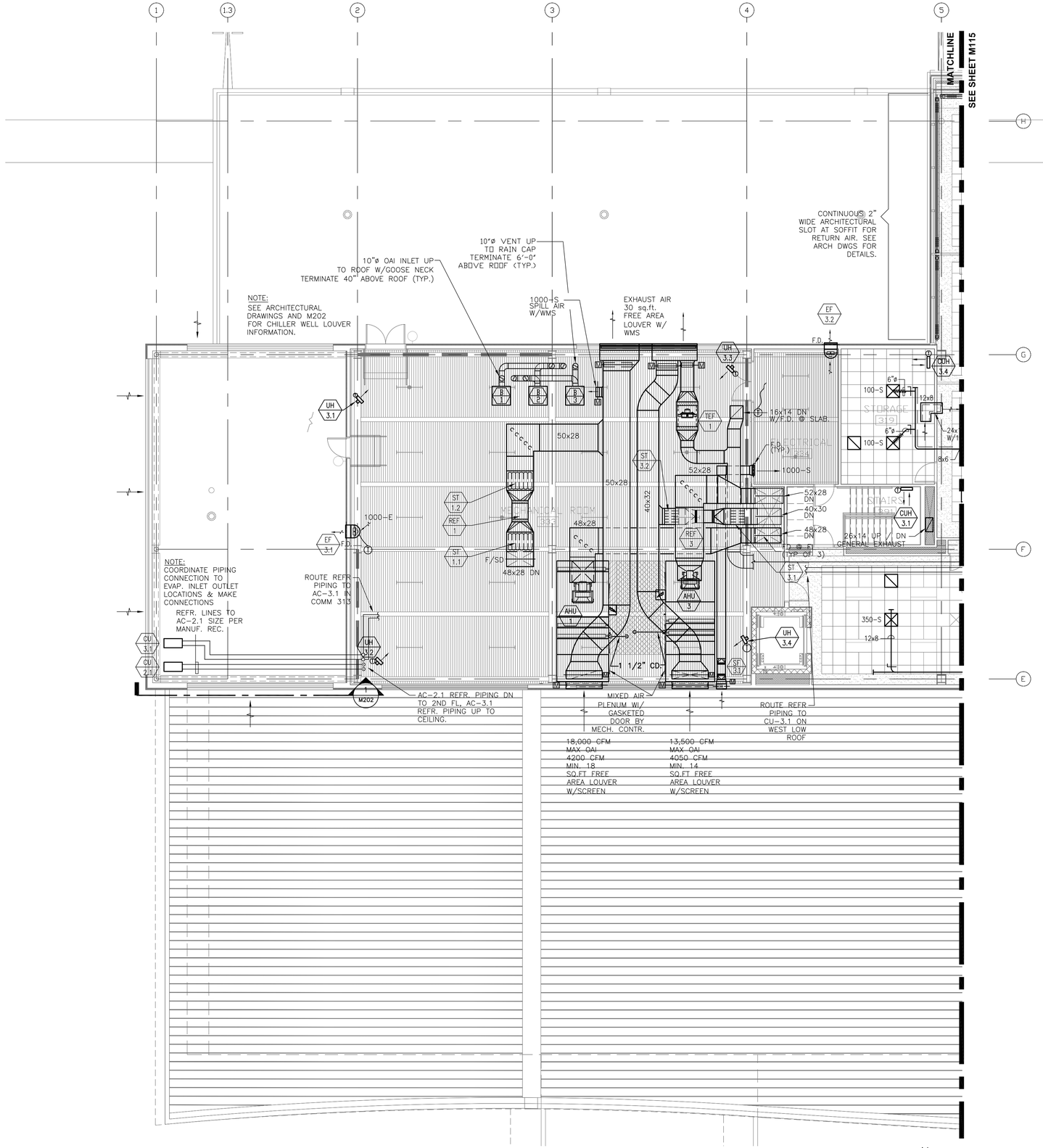
SHEET NUMBER
M113

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) HVAC\Dwgs\2008_M113.dwg Plotted on: 8/12/2010 3:20 PM Plotted by: Brandt, Mark

GENERAL NOTES:

1. ABOVE CEILING SPACE BETWEEN COLUMN LINES E AND G SHALL BE PLENUM RETURN.



N

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

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DRAWN BY: MB/JH
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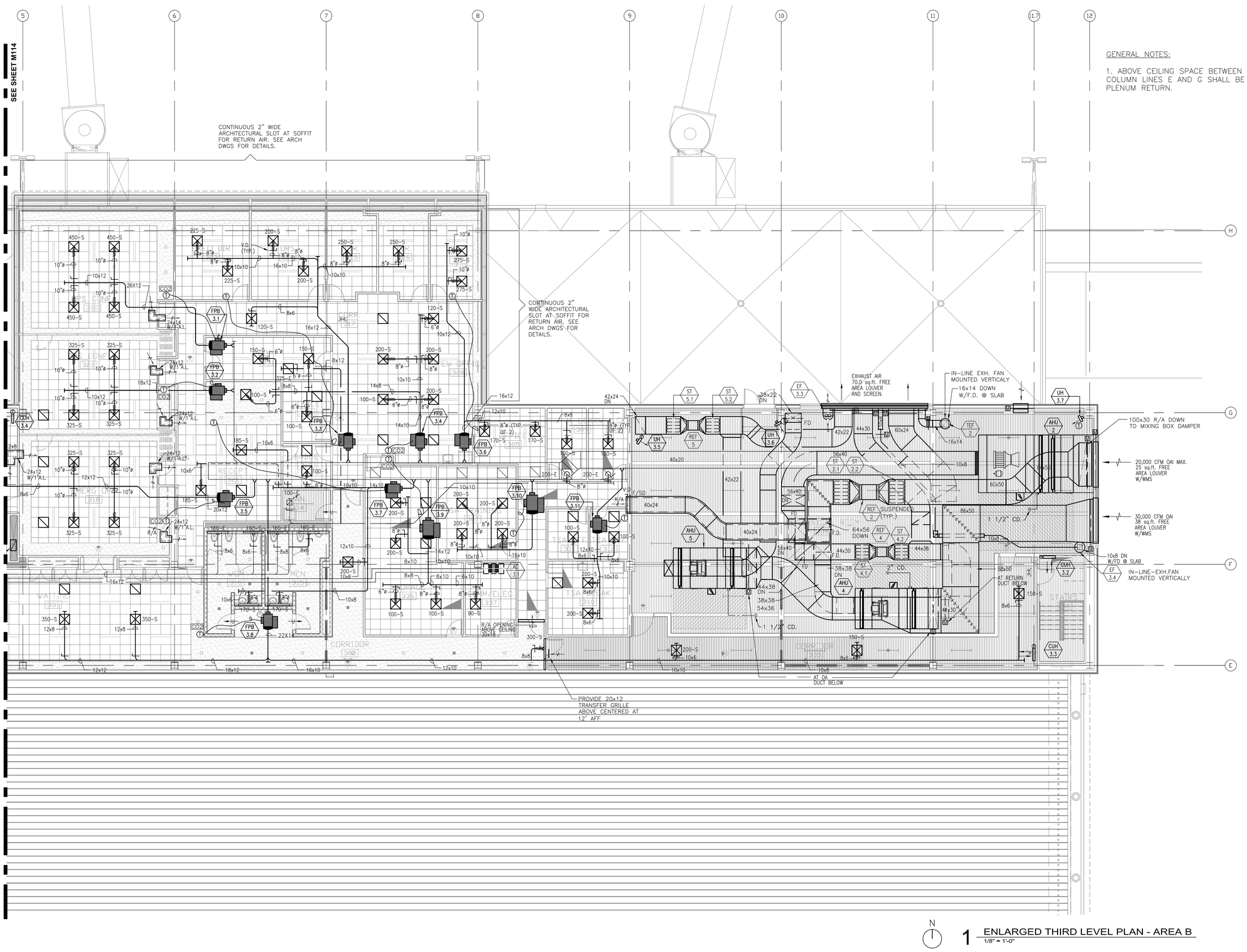
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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER
M114

BUILDING PERMIT

Drawing: I:\2008.09 Duluth Airport\3.0 CADD\(3.4) HVAC\Dwgs\2008_M114.dwg Plotted on: 8/12/2010 8:09 PM Plotted by: Brandi, Mark



GENERAL NOTES:

1. ABOVE CEILING SPACE BETWEEN COLUMN LINES E AND G SHALL BE PLENUM RETURN.

N

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

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DULUTH, MN

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DRAWN BY:	MB/JEH
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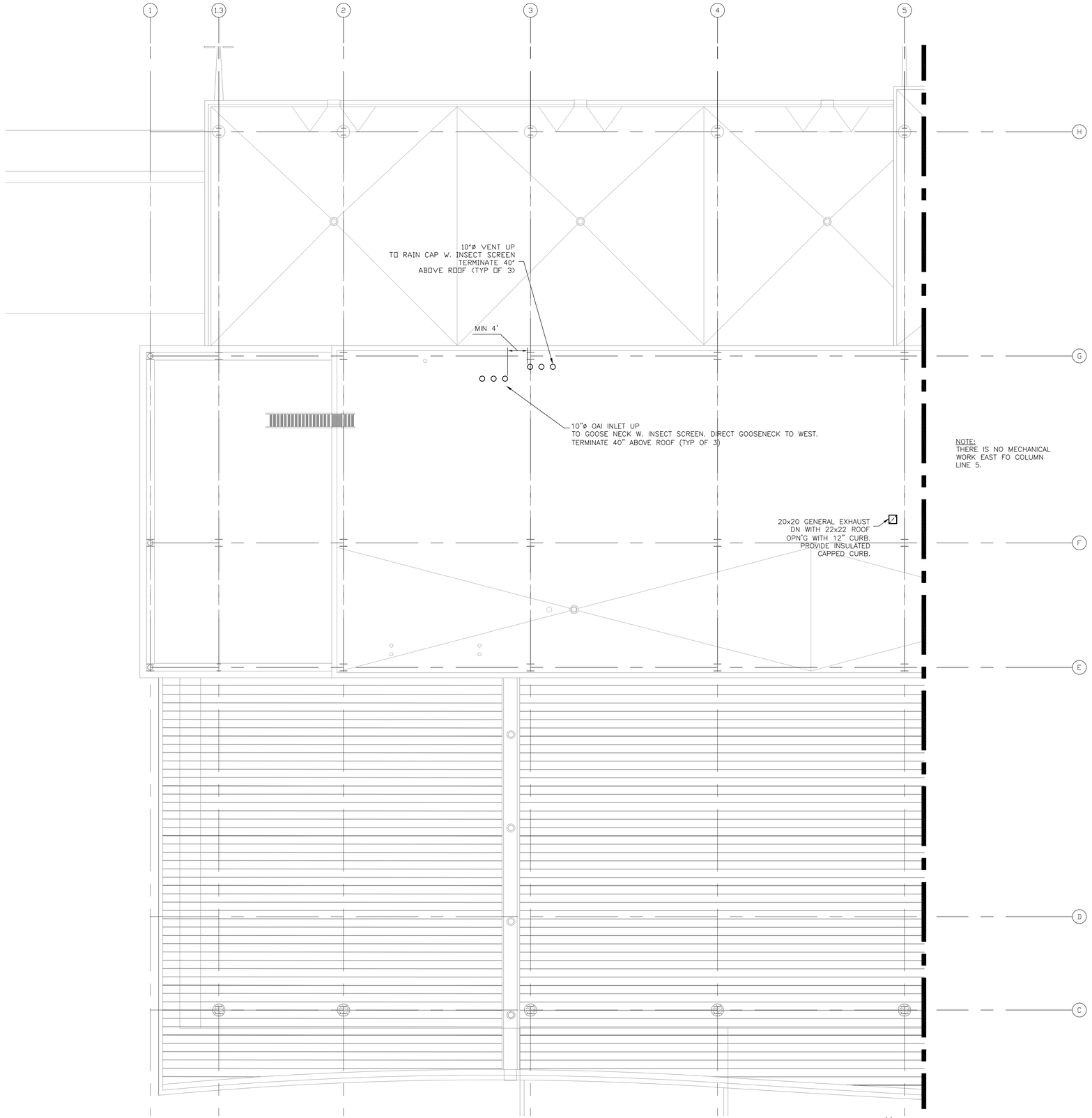
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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER
M115

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M115.dwg Plotted on: 8/13/2010 3:22 PM Plotted by: Brandi, Mark



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

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

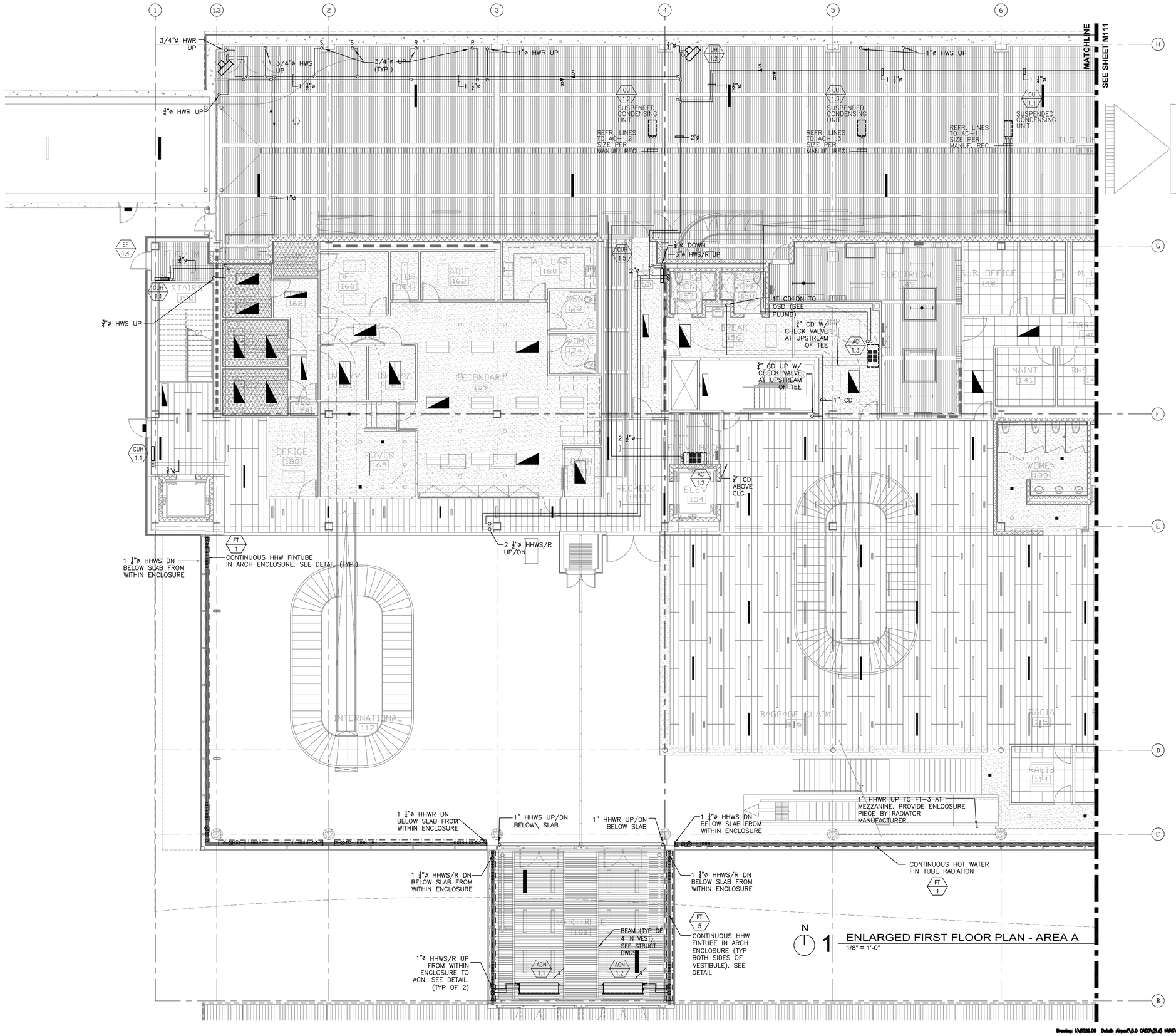
SHEET NUMBER
M116

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) HVAC\Dwgs\2008_M116.dwg Plotted on: 8/12/2010 3:39 PM Plotted by: Brandt, Mark

GENERAL NOTES:

1. SEE M108 FOR BELOW GRADE PIPING IN THIS AREA.



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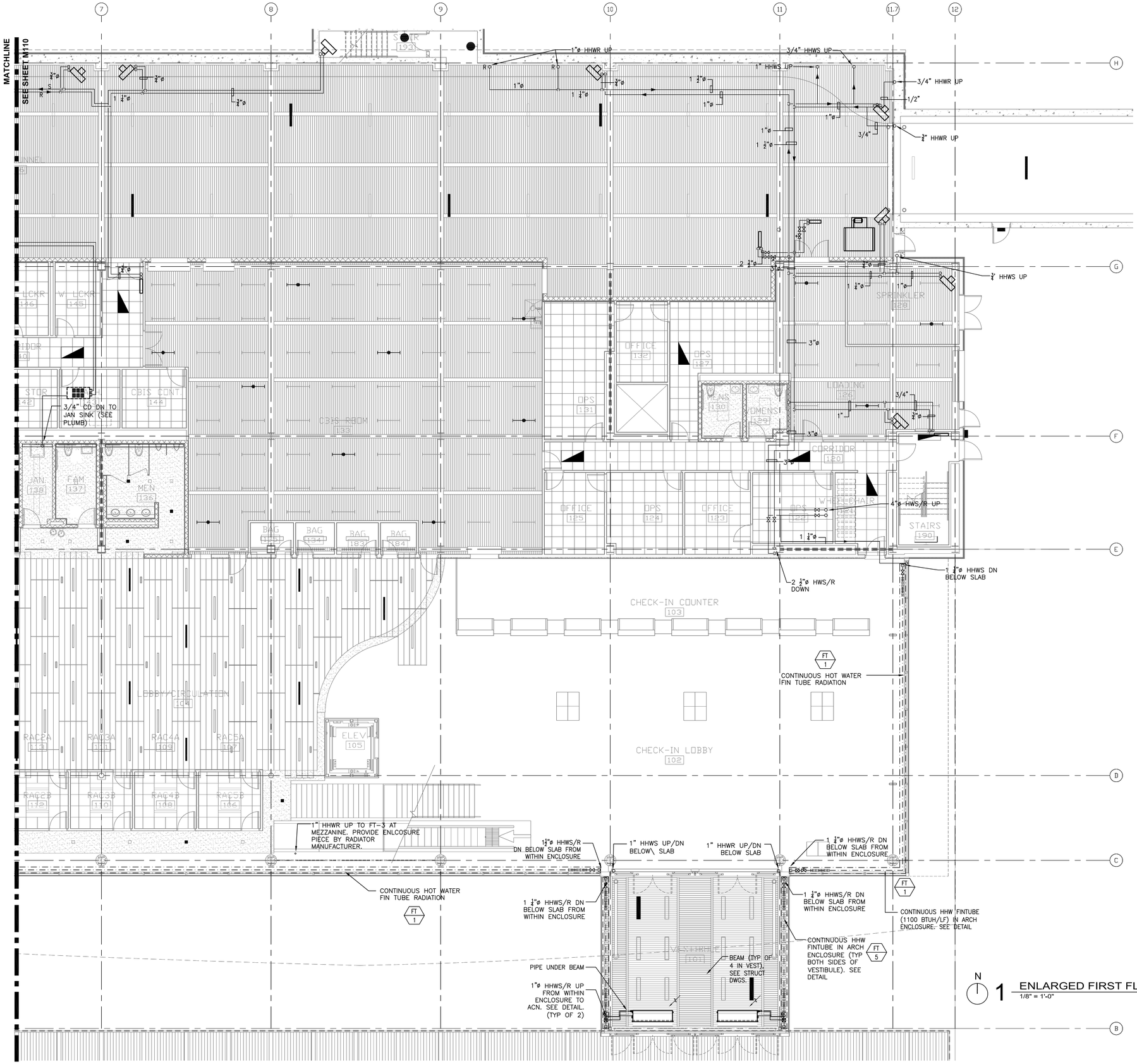
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SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER
MP110

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\[8.4] HVAC\Dwgs\2008_MP110.dwg Plotted on: 8/12/2010 4:23 PM Plotted by: Brandt, Mark



N

1 ENLARGED FIRST FLOOR PLAN - AREA B

1/8" = 1'-0"

GENERAL NOTES:

1. SEE M109 FOR BELOW GRADE PIPING IN THIS AREA.

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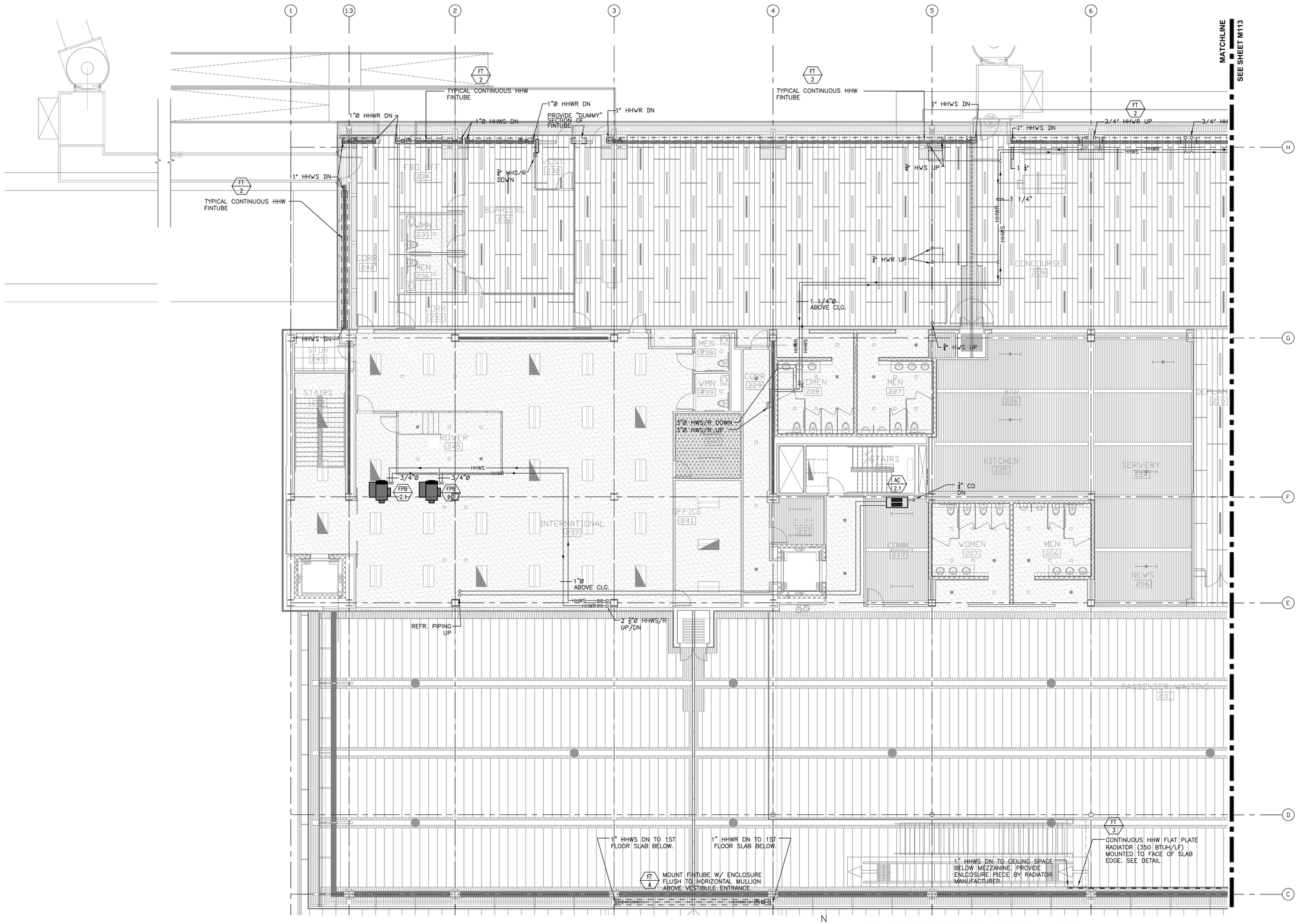
ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER

MP111

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_MP111.dwg Plotted on: 8/12/2010 4:24 PM Plotted by: Brandi, Mark



N

1 ENLARGED SECOND FLOOR PLAN - AREA A

1/8" = 1'-0"

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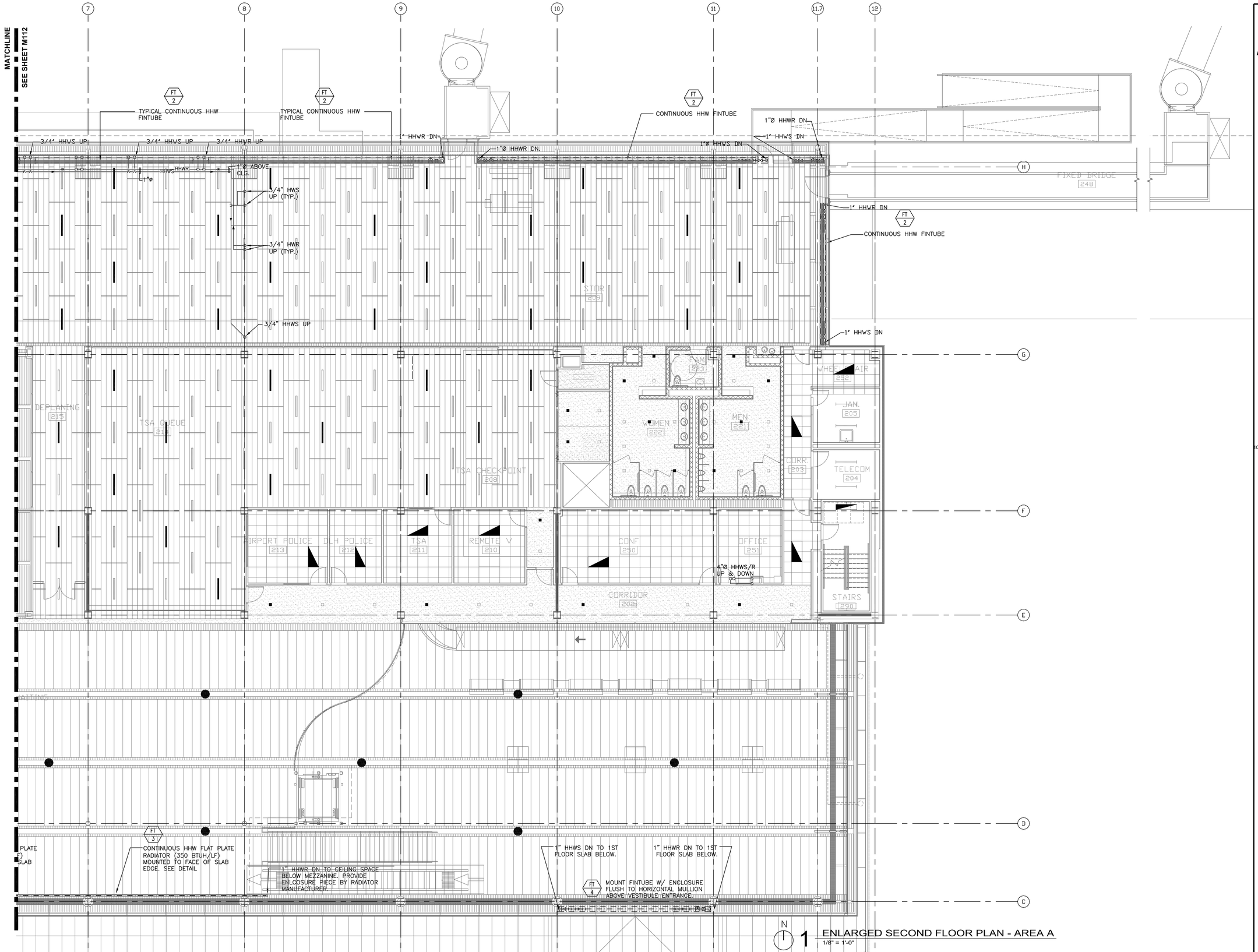
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SHEET NUMBER

MP112

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\5.4 HVAC\Dwgs\2008_MP112.dwg Plotted on: 8/13/2010 4:39 PM Plotted by: Brandi, Mark



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

ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.
Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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 B

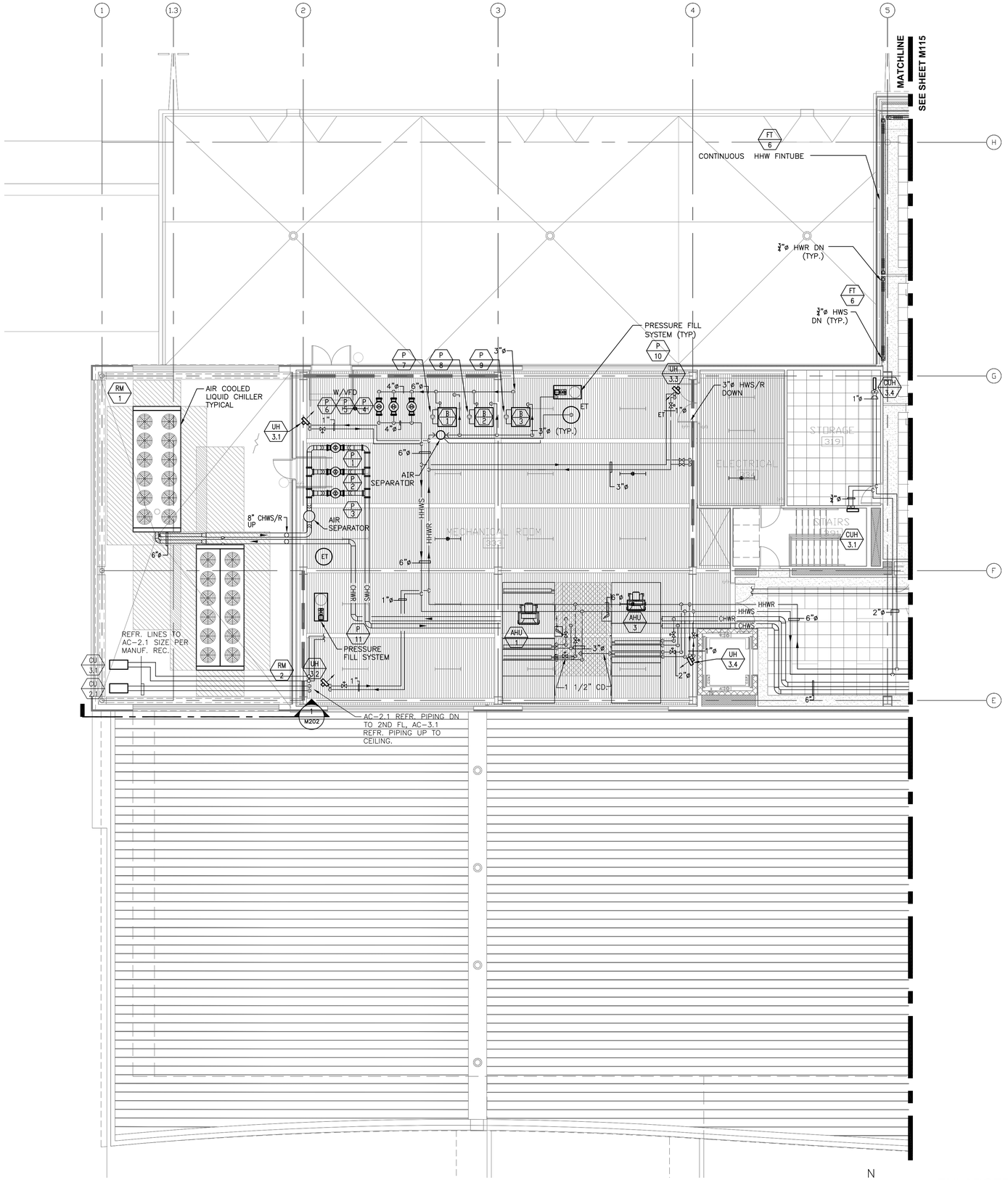
SHEET NUMBER
MP113

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\[5.4] Mech\Dwgs\MP113.dwg Plotted on: 8/12/2010 4:40 PM Plotted by: Brandt, Mark

GENERAL NOTES:

1. PERIMETER FINTUBE SHALL BE CONTROLLED AS FIRST STAGE OF HEATING THROUGH DDC INTERLOCK WITH RESPECTIVE ZONE FPB.



N

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

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Se 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
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

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	BUILDING PERMIT	8.16.10

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REVIEWED BY: MXB
DRAWN BY: MB/JH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER
MP114

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\5.4) HVAC\Dwgs\2008_MP114.dwg Plotted on: 8/12/2010 4:15 PM Plotted by: Brandi, Mark

MATCHLINE
SEE SHEET M112

5 6 7 8 9 10 11 11.7 12

H G F E

GENERAL NOTES:

1. PERIMETER FINTUBE SHALL BE CONTROLLED AS FIRST STAGE OF HEATING THROUGH DDC INTERLOCK WITH RESPECTIVE ZONE FPB.

FT 6 — CONTINUOUS HHW FINTUBE

FT 6 — 3/4" HWR DN (TYP.)

FT 6 — 3/4" HWS DN (TYP.)

EXEC DIR 323 | OPS 324 | DIR. 325 | DIR. 326 | OFF 327

OPS CONF 320

OPS CONF 322

CORR 317

COPY 331

OPEN OFFICE 328

OFFICE 305

M. LCKRM. LCKR 337 338

BADGE 313

RECEPT 321

EMERG OPS 318

JAN 314

WOMEN 316

MEN 315

WAITING 301

STORAGE 336

COMM/ELEC. 337

TSA TRAINING 307

TSA OFF 311

TSA OFF 312

TSA BREAK 310

CORRIDOR 302

CANOPY 202

CANOPY

STAIR 2

STAIR 3

?01
3563 SF

FPB 3.1 | FPB 3.2 | FPB 3.3 | FPB 3.4 | FPB 3.5 | FPB 3.6 | FPB 3.7 | FPB 3.8 | FPB 3.9 | FPB 3.10 | FPB 3.11

UH 3.4 | UH 3.5 | UH 3.6 | UH 3.7 | CUH 3.2 | CUH 3.3

AHU 2 | AHU 4 | AHU 5

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

SWHH | HWHR | HHWS | HHWR | CHWR | CHWS



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

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DRAWN BY: MB/JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
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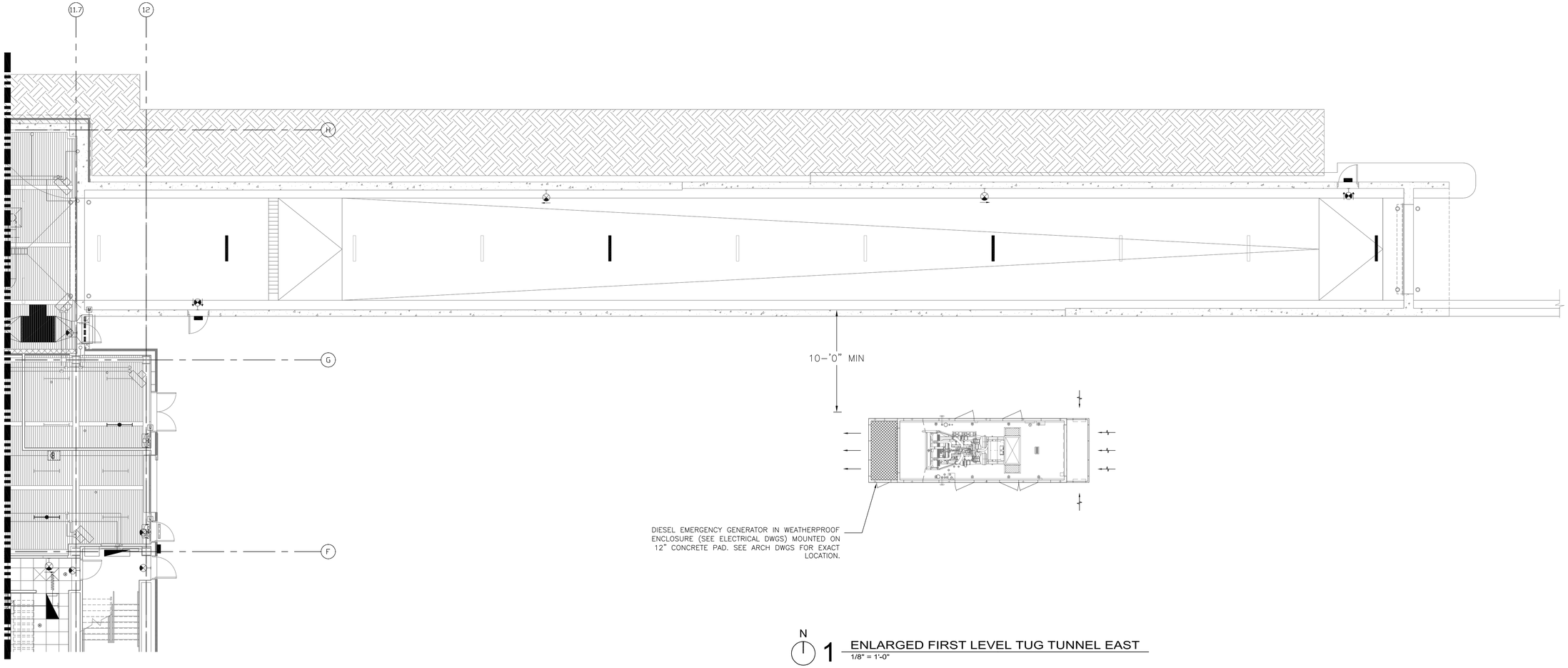
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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER
MP115

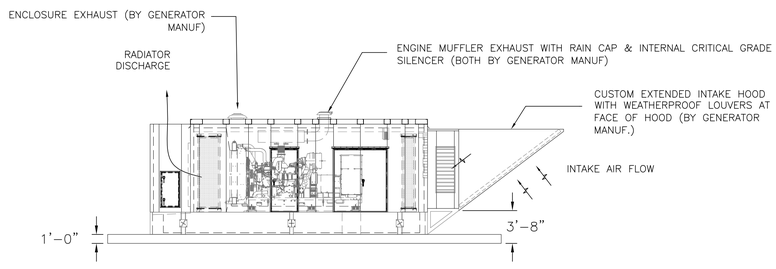
BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\[8.4] HVAC\Dwgs\2008_MP115.dwg Plotted on: 8/13/2010 4:45 PM Plotted by: Brandi, Mark



N

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



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

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DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
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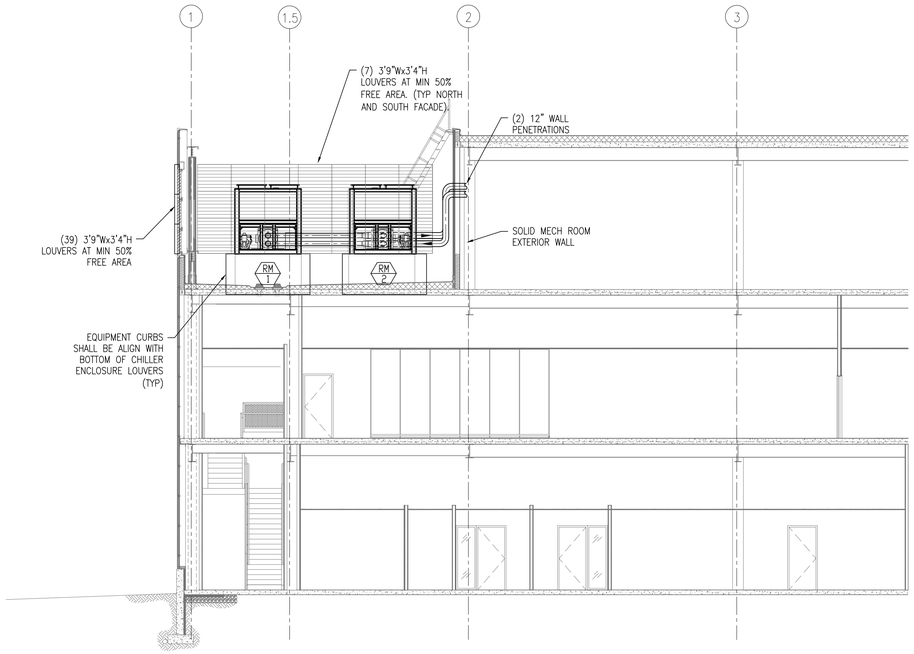
5528.vwx 08-02-09 12:00p
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SHEET TITLE
DIESEL GENERATOR MECHANICAL PLAN & DETAILS

SHEET NUMBER
M201

BUILDING PERMIT

Drawing: I:\5528.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\5528_M201.dwg Plotted on: 8/12/2010 3:59 PM Plotted by: Brandi, Mark



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

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DULUTH, MN

NEW PASSENGER
TERMINAL

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: BR
DRAWN BY: MXB
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

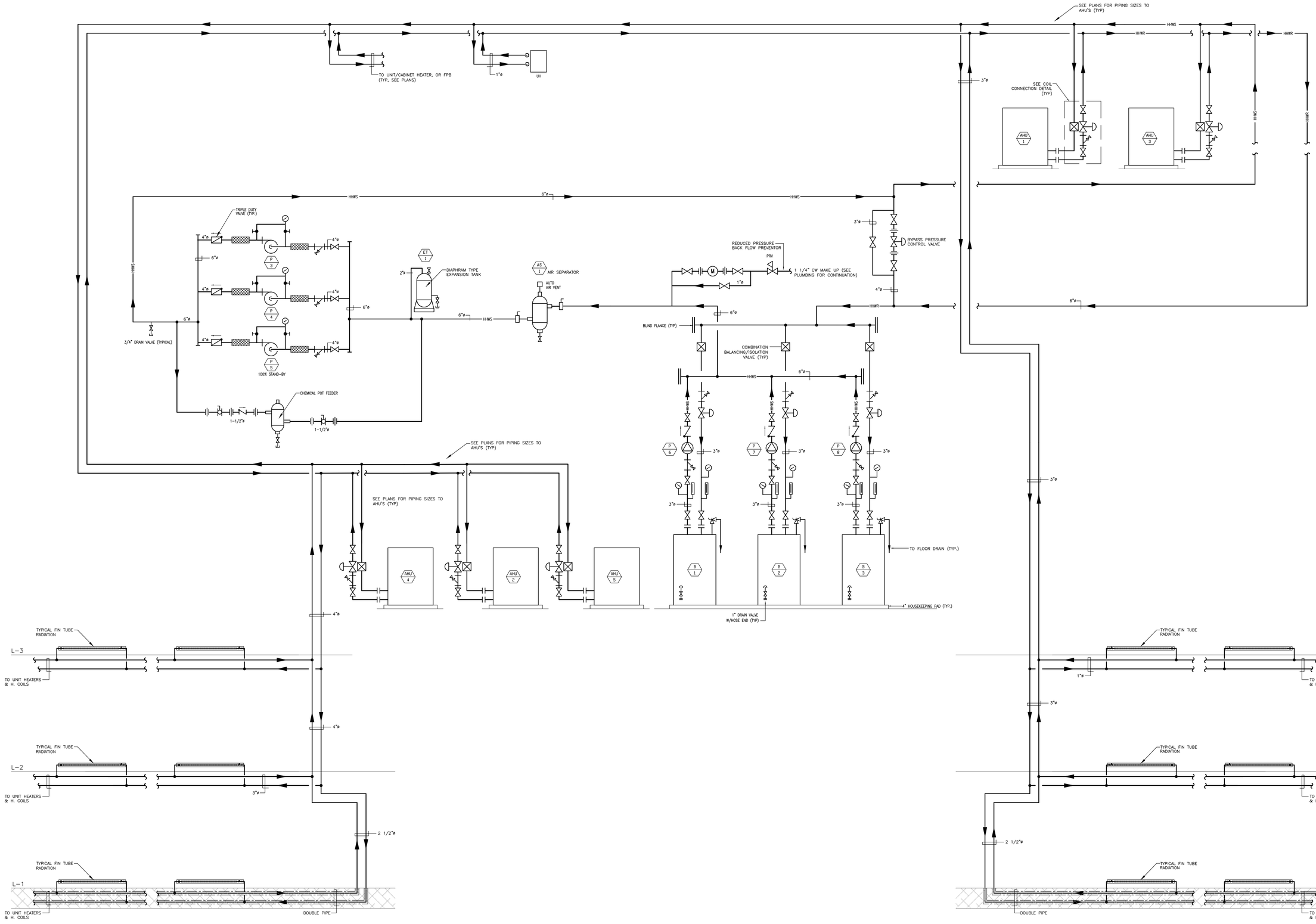
MECHANICAL
SECTIONS &
ELEVATIONS

SHEET NUMBER

M202

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M202.dwg Plotted on: 8/12/2010 4:55 PM Plotted by: Brandt, Mark



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DULUTH, MN

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SHEET TITLE

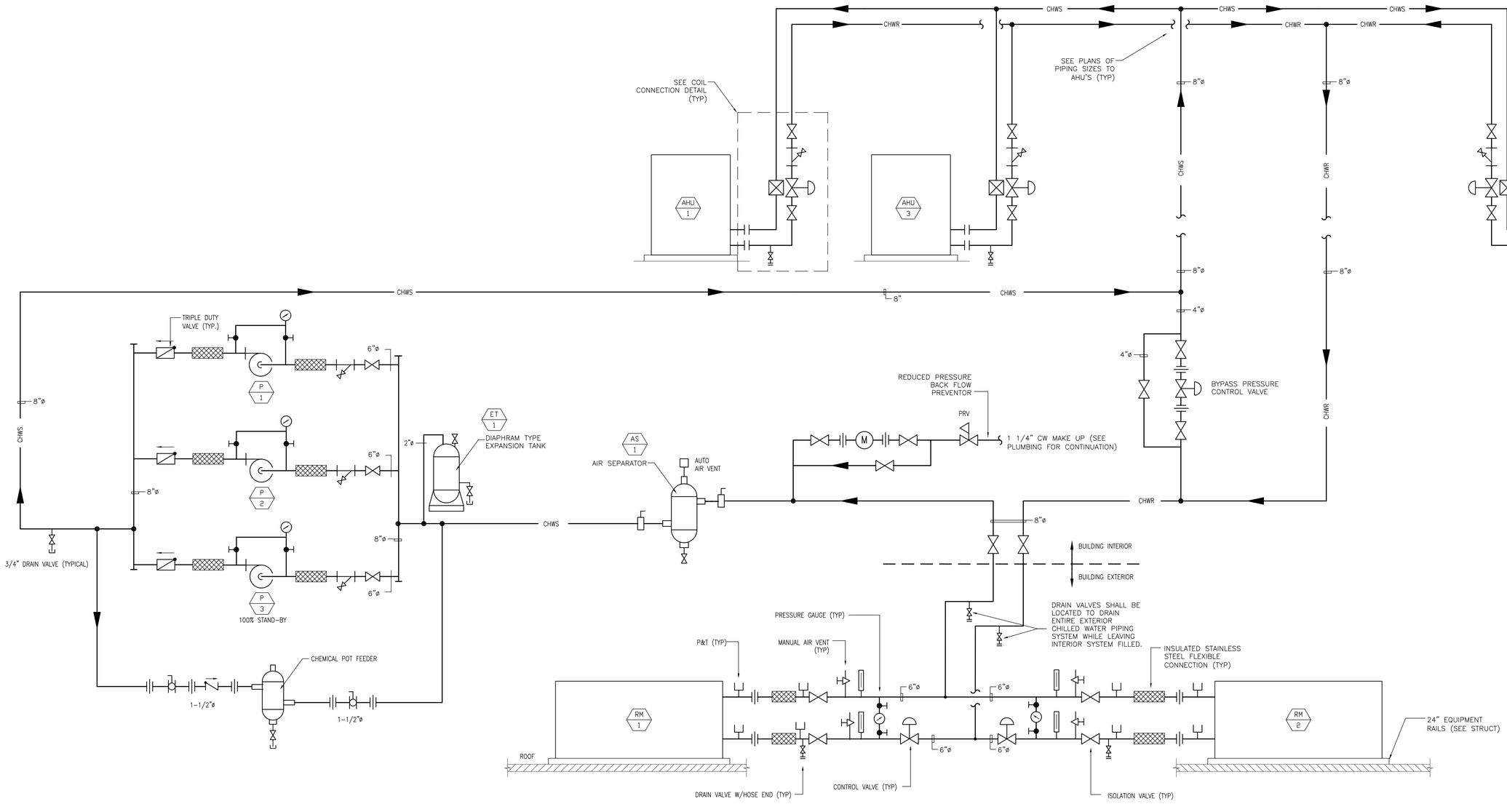
HEATING HOT WATER FLOW DIAGRAM

SHEET NUMBER

M301

BUILDING PERMIT

Drawing: I:\2528.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2528_M301.dwg Plotted on: 8/13/2010 3:50 PM Plotted by: Brandi, Mark



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DRAWN BY:	MXB
DESIGNED BY:	MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
CHILLED WATER FLOW DIAGRAM

SHEET NUMBER
M302

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M302.dwg Plotted on: 8/12/2010 3:43 PM Plotted by: Brandi, Mark

AIR HANDLING UNIT UNIT SCHEDULE

UNIT NO.	SERVICE	LOCATION	FAN DATA								OUTSIDE AIR				COOLING COIL DATA												HEATING COIL DATA								FILTERS									
			CFM	SP (IN W.G.)		RPM	FAN TYPE	MOTOR DATA			CFM	TEMP (°F)			AIR TEMP (°F)				TOTAL MBH	SENS. MBH	WATER TEMP. (°F)		GPM	WORK PRESS (PSIG)	FACE AREA (SF)	MAX FACE VELOC. (FPM)	MAX. P.D.		AIR TEMP (°F)		TOTAL MBH	WATER TEMP. (°F)		GPM	WORK PRESS (PSIG)	FACE AREA (SF)	MAX FACE VELOC. (FPM)	MAX. P.D.		PRE-FILTER				FINAL				Volts/Ph/Hz
				EXT.	TOT.			RPM	BHP	HP		HEATING	COOLING		ENT		LVG				ENT	LVG					AIR (IN)	WTR (FT)	ENT	LVG		ENT	LVG					AIR (IN)	WTR (FT)	TYPE	NO.	SIZE EACH FILTER	MID-LIFE P.D. (IN)	TYPE	NO.	SIZE EACH FILTER	MID-LIFE P.D. (IN)	
												DB	DB	WB	DB	WB	DB	WB											DB	DB																		
AHU-1	AIRSIDE WEST	333 MECH RM	10,000	2.0		1336	PLUG	1200	13.172	15	5,000	-21	81	67	83.0	67.0	52.5	52.1	479.9	360.8	42	58	59.78	150	29.01	550	0.60	12.4	22.5	120.0	1,053.0	180	100	75.1	150	27.00	550	0.33	4.28	PLEATED MERV-8	-	-		ELECT MERV-13	-			460/3/60
AHU-2	CORE	304 MECH RM	38,000	3.5		760	PLUG	1800	56.391	60	15,000	-21	81	67	79.2	64.6	52.5	52.2	1,464.3	1,121.7	42	58	182.4	150	78.75	550	0.71	9.0	31.7	62.0	679.9	180	100	45	150	60.38	550	0.13	0.08	PLEATED MERV-8	-	-		ELECT MERV-13	-			460/3/60
AHU-3	LANDSIDE WEST	333 MECH RM	13,500	2.5		1304	PLUG	1200	22.045	20	4,200	-21	81	67	83.8	67.0	52.5	52.2	622.2	473.1	42	58	77.51	150	34.14	550	0.74	16.7	38.9	120.0	1,405.5	180	100	93.6	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-		ELECT MERV-13	-			460/3/60
AHU-4	LANDSIDE EAST	304 MECH RM	16,500	2.5		1304	PLUG	1200	22.045	20	5,400	-21	81	67	83.7	67.0	52.5	52.2	622.2	473.1	42	58	77.51	150	34.14	550	0.74	16.7	37.5	120.0	1,405.5	180	100	93.6	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-		ELECT MERV-13	-			460/3/60
AHU-5	AIRSIDE EAST	304 MECH RM	10,000	2.0		1336	PLUG	1200	13.172	15	5,000	-21	81	67	83.0	67.0	52.5	52.1	479.9	360.8	42	58	59.78	150	29.01	550	0.60	12.4	22.5	120.0	1,053.0	180	100	75.1	150	27.00	550	0.33	4.28	PLEATED MERV-8	-	-		ELECT MERV-13	-			460/3/60

1. PROVIDE VFD WITH INTEGRAL DISCONNECT SWITCH.
2. FINAL FILTER SHALL BE DYNAMIC AIR TYPE xxx ANGLE FILTER AND BE LOCATED UPSTREAM OF AIR COILS.
3. PROVIDE AUXILIARY DRAIN PAN PIPING CONNECTION WITH DRAIN.

FAN SCHEDULE

FAN NO.	LOCATION	SERVICE	CFM	STATIC PRESS. IN.W.G.	TYPE	DRIVE	RPM	BHP	MOTOR HP	VOLT/PH/HZ	MFR.	MODEL NO.	REMARKS
SF-1.1	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
EF-1.1	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
EF-1.2	NOT USED												
EF-1.3	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
EF-1.4	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
EF-1.5	LOADING 126	RECYCLING 127	300	0.50	INLINE CENT	BELT	1250	0.05	1/4	120/1/60	TWIN CITY	080A BSI	1, 2
EF-1.6	SPRINKLER 126	SPRINKLER 126	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
EF-1.7	LOADING 126	LOADING 126	2,400	0.25	PROP	DIRECT	1750	-	1/4	120/1/60	TWIN CITY	16 DTC TCWP	1, 2, 4
EF-3.1	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
EF-3.2	ELECT 334	ELECT 334	1,000	0.25	PROP	DIRECT	1650	-	1/8	120/1/60	TWIN CITY	122 TCPE	1, 2, 4
EF-3.3	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
EF-3.4	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
TEF-1	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
TEF-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
REF-1	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
REF-2	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
REF-3	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
REF-4	EAST MECH RM	AHU-4	16,200	2.00	INLINE CENT	BELT	850	8.9	10	480/3/60	TWIN CITY	365 TSL	1, 2 W/ VFD
REF-5	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

1. PROVIDE COMBINATION STARTER/DISCONNECT.
2. PROVIDE OSHA BELT & MOTOR GUARD.
3. ALL VFD'S TO HAVE NEMA 4X ENCLOSURE WITH VENT FAN AND STRIP HEATER FOR COLD START
4. CLAM SHELL DESIGN.
5. PROVIDE EXPLOSION PROOF MOTOR.
6. PROVIDE WALL SLEEVE WITH INTEGRAL BACKDRAFT DAMPER (U.N.O W/ MOTORIZED DAMPER ON DRAWINGS)

FAN POWERED TERMINAL UNIT SCHEDULE

TAG	UNIT SIZE-INLET DIAMETER INCHES	AIRFLOW RANGE (CFM)	PRIMARY AIR MINIMUM (CFM)	PRIMARY AIR MAXIMUM (CFM)	roof load	wall load	HOT WATER HEATING COIL			FAN									MANUFACTURER AND MODEL NUMBER	REMARKS
					5.5xSF		MBH	GPM	P.D. (FT W.C.)	FAN CFM COOLING MINIMUM	FAN CFM COOLING MAXIMUM		FAN CFM HEATING	ESP (IN.)	RPM	HP	ELECT DATA VOLT/PH	ELECT DATA FLA		
SECOND FLOOR																				
FPB-2.1	3 - 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
FPB-2.2	1 - 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
THIRD FLOOR																				
FPB-3.1	7 - 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
FPB-3.2	5 - 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
FPB-3.3	5 - 12"	500-2000	450	1125	7012.5	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
FPB-3.4	5 - 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
FPB-3.5	5 - 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
FPB-3.6	3 - 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
FPB-3.7	5 - 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
FPB-3.8	7 - 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
FPB-3.9	3 - 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	500	50	-	-	-	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	1600	200	-	-	-	NAILOR 3001	
VAV-1.10	8	1000	570	60	-	-	-	NAILOR 3001	
VAV-1.11	12	2185	1600	200	-	-	-	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	
VAV-1.15	7	710	450	50	-	-	-	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.

BMS SMOKE PURGE SEQUENCE OF OPERATIONS:

MANUAL FAN SHUT DOWN AND SMOKE PURGE CONTROL PANEL BY (BMS) BUILDING MANAGEMENT SYSTEM. ON/OFF/AUTO TOGGLE SWITCHES SHALL PROVIDE CONTROL OF MAIN HVAC SYSTEM RETURN/EXHAUST FANS. NO AUTO SMOKE EXHAUST SYSTEM PROVIDED PER IBC 909. SIMILAR CONTROL OF ALL SMOKE DAMPERS PROVIDED HERE. FIRE ALARM SYSTEM SHALL PROVIDE AUTO SHUT DOWN OF FANS, CLOSE SMOKE DAMPERS UPON ALARM ACTIVATION. PROVIDE RELAY CONNECTION FROM FIRE ALARM SYSTEM.

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

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ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.
Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M401.dwg Plotted on: 8/12/2010 3:40 PM Plotted by: Brandi, Mark

PACKAGED AIR COOLED WATER CHILLER SCHEDULE

UNIT NO.	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				
RM-1	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
RM-2	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

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

HIGH EFFICIENCY GAS FIRED HOT WATER BOILER SCHEDULE

UNIT NO.	LOCATION	INPUT MBH	OUTPUT MBH	BOILER HP	GPM	WATER TEMP (F) ENT.	WATER TEMP (F) LVG.	P.D. FEET	FLUE OUTLET	FUEL	TYPE	MIN. DESIGN WORKING PRESS. P.S.I.G.	MODEL NO.	REMARKS
B-1	301 MECH RM	3,000	2,800		280	160	180	28	10"	NATURAL GAS	COND.	150	FULTON PHW 3000	
B-2	301 MECH RM	3,000	2,800		280	160	180	28	10"	NATURAL GAS	COND.	150	FULTON PHW 3000	
B-3	301 MECH RM	3,000	2,800		280	160	180	28	10"	NATURAL GAS	COND.	150	FULTON PHW 3000	STAND-BY

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

PUMP SCHEDULE

PUMP NO.	SERVICE	LOCATION	TYPE	GPM	TOTAL HEAD FEET	MIN. DESIGN WORKING PRESS. P.S.I.G.	MOTOR BHP	MOTOR HP	MOTOR RPM	MOTOR V/Ph/Hz	MANUFACTURER & MODEL NO.	REMARKS
P-1	CHILLED WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	315	80	150	9.08	15	1750	480/3/60	B&G SERIES 80SC 4x4x11	1
P-2	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
P-3	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
P-4	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
P-5	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
P-6	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
P-7	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100	30	150	1.25	1.5	1750	480/3/60	B&G SREIES 90 2A	2
P-8	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	100	30	150	1.25	1.5	1750	480/3/60	B&G SREIES 90 2A	2
P-9	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
P-10	CHW PRESSURE FILL	301 MECHANICAL RM	END SUCTION CENT	1035 GPH	20 PSI	150	-	1/3	1750	120/1/60	B&G BPF-3H3005M	
P-11	HW PRESSURE FILL	301 MECHANICAL RM	END SUCTION CENT	1035 GPH	20 PSI	150	-	1/3	1750	120/1/60	B&G BPF-3H3005M	

1. PROVIDE VFD WITH INTEGRAL DISCONNECT.
2. INTEGRATE WITH BOILER CONTROLS.

CABINET UNIT HEATER SCHEDULE

TAG	SERVICE	LOCATION	MBH	EWT (F)	LWT (F)	GPM	CFM	HP	V/Ph/Hz	MANUF. & MODEL NUMBER	REMARKS
CUH-1.0	STAIRS #192	STAIRS #192	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-1.1	ELEVATOR #175	ELEVATOR #175	22.8	180	160	2.3	300	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-1.2	STAIRS #190	STAIRS #190	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-2.1	VEST. #232	VEST. #232	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.1	STAIRS #391	STAIRS #391	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.2	STAIRS #390	STAIRS #390	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.3	CORRIDOR #304	CORRIDOR #304	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.4	STORAGE #319	STORAGE #319	29.8	180	160	3	400	1/1O	115/1/60	STERLING FI-1050	1, 2, 3

1. SIZES 53"L x 47"H x 9 1/2" DEEP
2. INCLUDE 1" AIR FILTER
3. PROVIDE INTEGRAL LINE VOLTAGE THERMOSTAT AND NON-FUSED DISCONNECT.

HYDRONIC AIR CURTAIN SCHEDULE

UNIT NO.	AREA SERVED	LOCATION	TYPE	CFM (HI SPEED)	AIR TEMP RISE @ HI SPEED (°F)	TOTAL CAPACITY MBH	HEATING COIL HOT WATER TEPM (°F) ENT	HEATING COIL HOT WATER TEPM (°F) LVG	HEATING COIL HOT WATER GPM	HEATING COIL HOT WATER 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
ACN-1.1	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
ACN-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
ACN-1.3	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
ACN-1.4	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

1. PROVIDE SINGLE POINT POWER CONNECTION WITH CONTROL PANEL AND INTEGRAL LOCKING DISCONNECT.
2. PROVIDE INTEGRAL 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, FASTENEERS & 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, MN

NEW PASSENGER TERMINAL

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

ENGINEER CERTIFICATION

I hereby certify that the engineering 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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

BUILDING PERMIT

Drawing: I:\8888.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\8888_M402.dwg Plotted on: 8/13/2010 3:39 PM Plotted by: Brandi, Mark

COMPUTER ROOM AIR-CONDITIONING UNIT SCHEDULE

SYMBOL	LOCATION	SERVICE	NOMINAL TONS	REFR. TYPE	REFR. CHARGE (OZ)	FAN			COOLING CAPACITY						FILTER			ELECTRICAL DATA			HUMIDIFIER / REHEAT (FLA/MOPD)	UNIT WEIGHT (LBS)	MFR. & MODEL NUMBER	REMARKS
						CFM	EXT. S.P. IN.W.G.	H.P.	E.A.T.			MBH		FACE AREA SQ. FT.	NO. ROWS	TYPE	NO.	FILTER SIZE (INxINxIN)	VOLT/PH/HZ	FLA	MOPD				
									(°F) DB	(°F) DB	%RH	TOTAL	SENS											
AC-1.1	ELEV MACH 153	ELEV MACH 153	3	R-407C	7	1,000	0.3	0.5	75	61	45	32.5	28.4	3.1	3	MERV-8	1	40x20x20	208/3/60	2.3	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-1.2	ELEV MACH 143	ELEV MACH 143	3	R-407C	7	1,000	0.3	0.5	75	61	45	32.5	28.4	3.1	3	MERV-8	1	40x20x20	208/3/60	2.3	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-1.3	COMM 151	COMM 151	5	R-407C	4	2,500	0.5	1.5	75	61	45	62.7	55.8	5.6	4	MERV-8	2	40x20x20	408/3/60	2.8	15	NONE	498	LIEBERT MMD60E7A00LG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-2.1	COMM 217	COMM 217	3	R-407C	7	1,000	0.3	0.5	75	61	45	32.5	28.4	3.1	3	MERV-8	1	40x20x20	208/3/60	2.3	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-3.1	COMM/ELEC 313	COMM/ELEC 313	3	R-407C	7	1,000	0.3	0.5	75	61	45	32.5	28.4	3.1	3	MERV-8	1	40x20x20	408/3/60	2.3	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS

1. PROVIDE HIGH LEVEL WATER LEVEL SENSOR WITH CUT OFF SWITCH AND BMS ALARM FOR ALL AC UNIT CONDENSATE DRAIN PANS.
2. PROVIDE CONDENSATE PUMP. PUMP TO BE POWERED FROM MAIN AC UNIT ELECTRICAL FEED.

COMPUTER ROOM AIR-COOLED CONDENSING UNIT SCHEDULE

SYMBOL	LOCATION	SERVICE	NOMINAL TONS	NO. OF COMPR.	REFR. TYPE	REFR. CHARGE (OZ.)	FAN			COOLING CAPACITY			ELECTRICAL DATA			HUMIDIFIER / REHEAT (FLA/MOPD)	UNIT WEIGHT (LBS)	MFR. & MODEL NUMBER	REMARKS
							CFM	EXT. S.P. IN.W.G.	H.P.	E.A.T.	FACE AREA SQ. FT.	NO. ROWS	VOLT/PH/HZ	FLA	MOPD				
										(°F) DB									
CU-1.1	TUG TUNNEL	AC-1.1	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	408/3/60	6.4	15	NONE	351	LIEBERT PFHZ37A-AL7	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-1.2	TUG TUNNEL	AC-1.2	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	408/3/60	6.4	15	NONE	351	LIEBERT PFHZ37A-AL7	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-1.3	TUG TUNNEL	AC-1.3	5	1	R-407C	426	4,200	N/A	0.5	95	10.5	3	408/3/60	11.7	20	NONE	351	LIEBERT PFH067A-AL7	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-2.1	WEST LOW ROOF	AC-2.1	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	408/3/60	6.4	15	NONE	351	LIEBERT PFH037A-AL7	ROOF MOUNTED, SEE SPECS
CU-3.1	WEST LOW ROOF	AC-3.1	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	408/3/60	6.4	15	NONE	351	LIEBERT PFH037A-AL7	ROOF MOUNTED, SEE SPECS

1. PROVIDE HIGH LEVEL WATER LEVEL SENSOR WITH CUT OFF SWITCH AND BMS ALARM FOR ALL AC UNIT CONDENSATE DRAIN PANS.
2. PROVIDE CONDENSATE PUMP. PUMP TO BE POWERED FROM MAIN AC UNIT ELECTRICAL FEED.
3. PROVIDE LOW AMBIENT KIT.
4. CONDENSER FAN MUST BE HORIZONTAL DISCHARGE FOR UNITS AC-1.1 THRU 1.3.

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ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.
Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

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DATE ISSUED: 08-16-10
REVIEWED BY: MXB
DRAWN BY: MXB
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
MECHANICAL EQUIPMENT SCHEDULES III

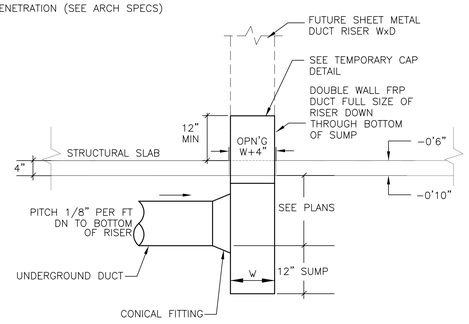
SHEET NUMBER
M403

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M403.dwg Plotted on: 8/12/2010 3:39 PM Plotted by: Brandt, Mark

NOTES:
1. ALL JOINTS & TRANSITIONS, TO BE WET LAY–UP, EXCEPT SHEET METAL RISER TRANSITION. THIS WILL BE DRY METHOD PER MANUF. RECOMMENDATIONS.
2. GROUT WATER TIGHT ANNULAR SPACE AT STRUCTURAL SLAB PENETRATION (SEE ARCH SPECS)

W = SHEET METAIL RISER DUCT WIDTH AT BOTTOM OF RISER ON SIDE OF UNDERGROUND DUCT CONNECTION

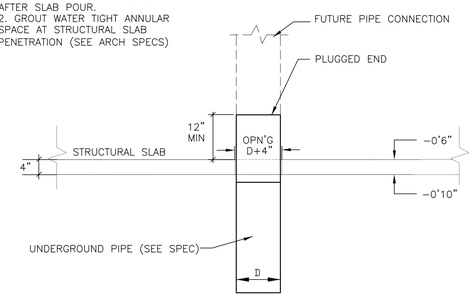


TYPICAL UNDERGROUND DUCTWORK RISER CONNECTION DETAIL

N.T.S.

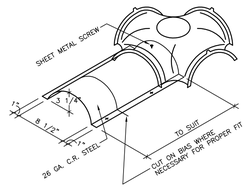
NOTES:
1. ALL UNDERGROUND PIPING SHALL BE STUBBED 12" ABOVE TOP OF STRUCTURAL SLAB AND CAPPED WITH NON–METALLIC REMOVABLE PLUG. CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROTECTION FOR PIPE STUBS AFTER SLAB POUR.
2. GROUT WATER TIGHT ANNULAR SPACE AT STRUCTURAL SLAB PENETRATION (SEE ARCH SPECS)

D = PIPE DIAMETER



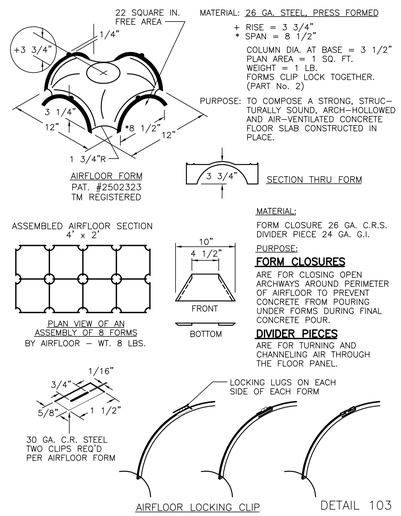
TYPICAL UNDERGROUND PIPING STUB UP DETAIL

N.T.S.



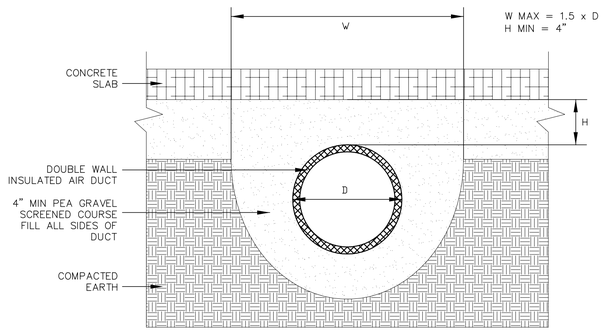
TYPICAL "AIRLFOOR" FORM EXTENSION DETAIL

N.T.S.



"AIRFLOOR" TERMINAL DETAILS

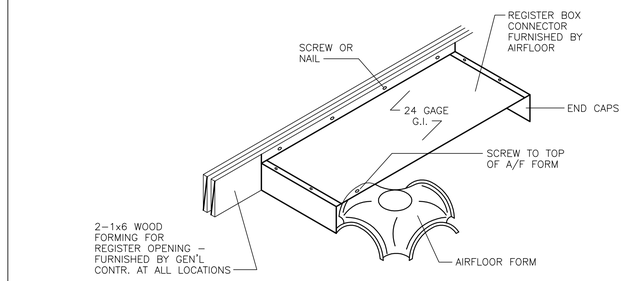
N.T.S.



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

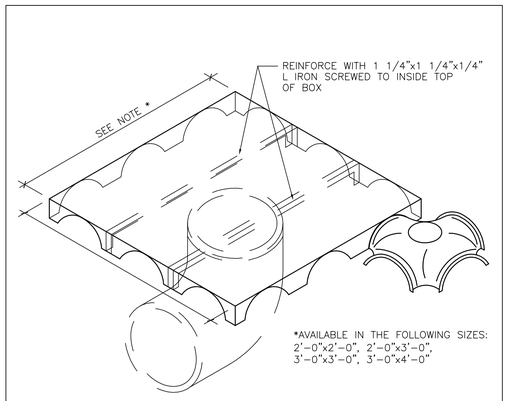
UNDERGROUND DUCTWORK DETAIL

N.T.S.



"AIRFLOOR" REGISTER BOX CONNECTION DETAIL

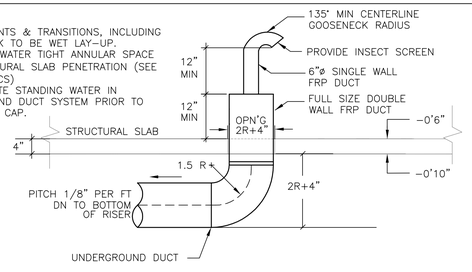
N.T.S.



TYPICAL "ARIFLOOR" SPLASH BOX DUCT CONNECTION DETAIL

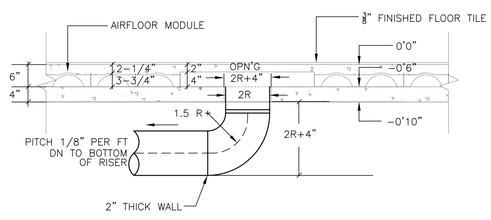
N.T.S.

NOTES:
1. ALL JOINTS & TRANSITIONS, INCLUDING GOOSENECK TO BE WET LAY–UP.
2. GROUT WATER TIGHT ANNULAR SPACE AT STRUCTURAL SLAB PENETRATION (SEE ARCH SPECS)
3. EVACUATE STANDING WATER IN UNDERGROUND DUCT SYSTEM PRIOR TO INSTALLING CAP.



UNDERGROUND DUCTWORK TEMPORARY CAP DETAIL

N.T.S.



"AIRFLOOR" DUCTWORK CONNECTION DETAIL

N.T.S.

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ENGINEER CERTIFICATION
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Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

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NO.	DESCRIPTION	DATE
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DESIGNED BY: XX

AEP PROJECT NUMBER
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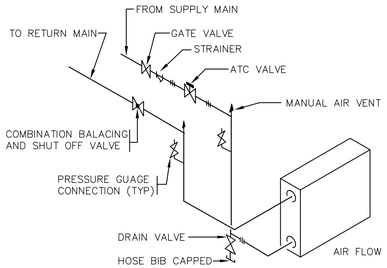
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SHEET TITLE
MECHANICAL DETAILS I

SHEET NUMBER
M501

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\[8.4] HVAC\Dwgs\2008_M501.dwg Plotted on: 8/12/2010 3:39 PM Plotted by: Brandt, Mark

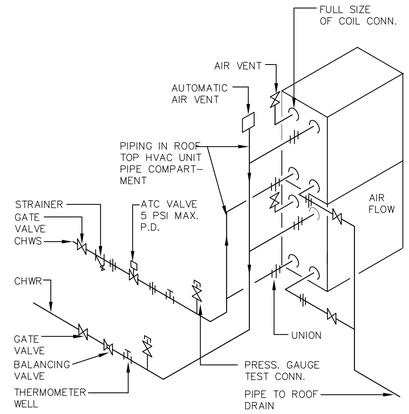


NOTES:

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)

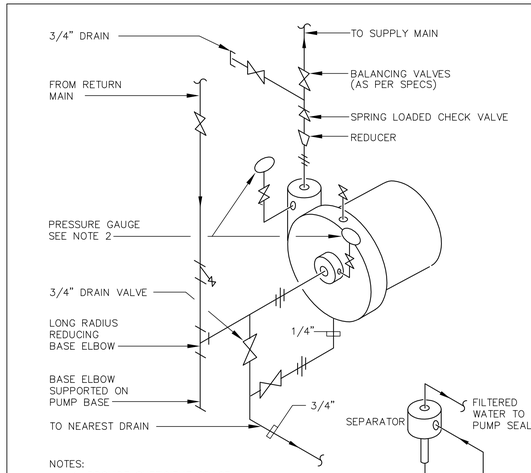
HOT WATER HEATING COIL PIPING

NOT TO SCALE



CHILLED WATER COIL PIPING

NOT TO SCALE



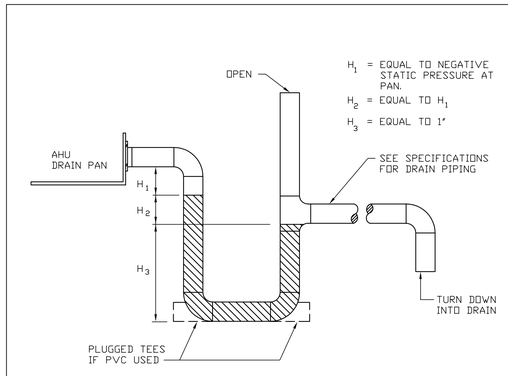
NOTES:

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)

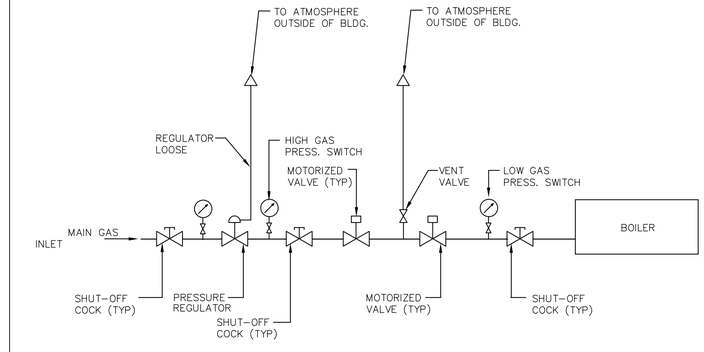
WATER PUMP PIPING END SUCTION PUMP DETAIL

NOT TO SCALE



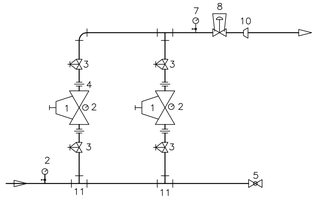
DRAW-THROUGH UNIT DRAIN DETAIL

N.T.S.



GAS TRAIN DIAGRAM

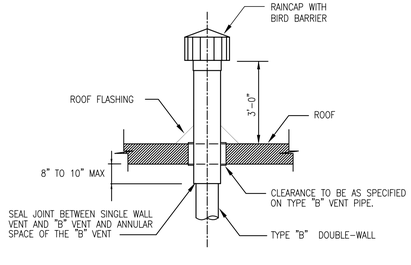
NOT TO SCALE



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

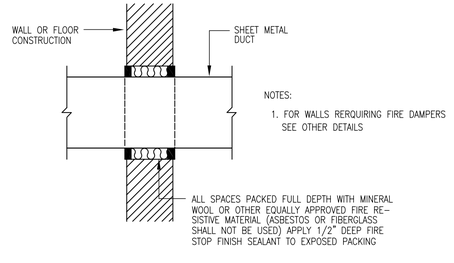
GAS PRV DETAIL

N.T.S.



DETAIL - TYPICAL FLUE TERMINAL

NOT TO SCALE



NOTES:

1. FOR WALLS REROUIRING FIRE DAMPERS SEE OTHER DETAILS

ALL SPACES PACKED FULL DEPTH WITH MINERAL WOOL OR OTHER EQUALLY APPROVED FIRE RE-SISTIVE MATERIAL (ASBESTOS OR FIBERGLASS SHALL NOT BE USED) APPLY 1/2" DEEP FIRE STOP FINISH SEALANT TO EXPOSED PACKING

CAULKING DETAIL OF DUCT PIERCING RATED ASSEMBLIES WHERE FIRE DAMPERS ARE NOT REQUIRED

NOT TO SCALE

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SHEET TITLE

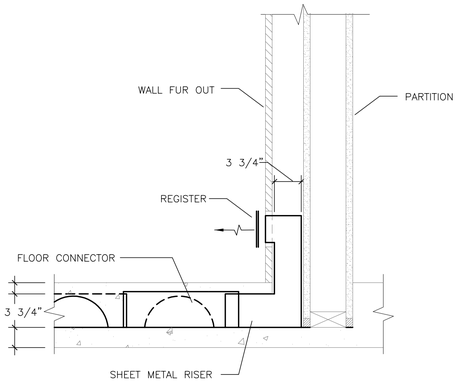
MECHANICAL DETAILS II

SHEET NUMBER

M502

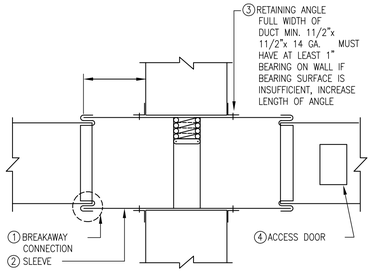
BUILDING PERMIT

Drawing: I:\2008.09 Duluth Airport\3.0 CADD\(3.4) HVAC\Dwgs\2008_M502.dwg Plotted on: 8/12/2010 3:35 PM Plotted by: Brandi, Mark



AIRFLOOR SIDEWALL GRILLE DETAIL

NOT TO SCALE



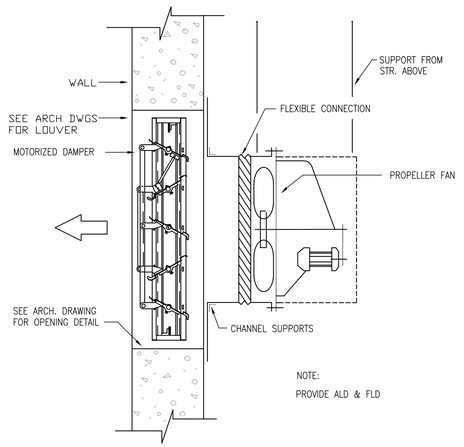
IN-DUCT MOUNTED FIRE DAMPER

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.

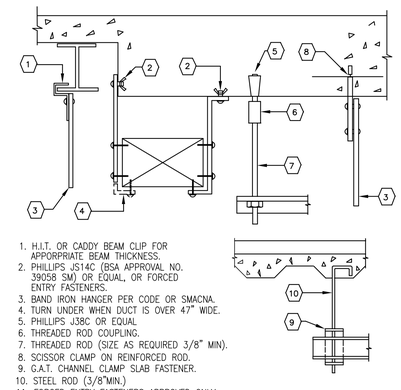
FIRE DAMPER

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



WALL EXHAUST FAN DETAIL

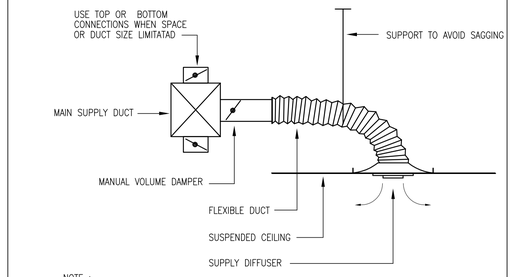
NOT TO SCALE



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

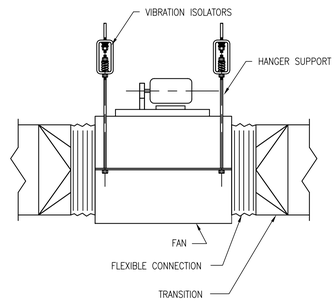


NOTE :

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

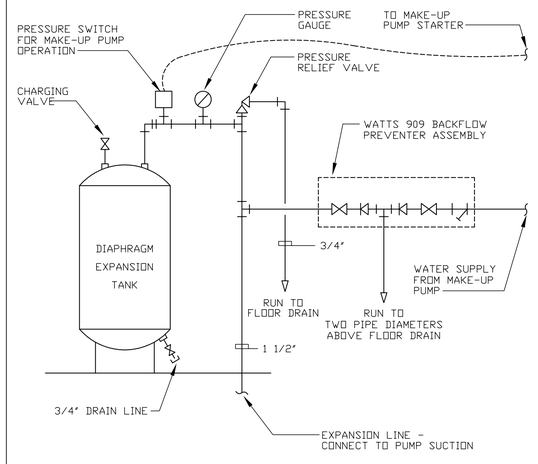
TYPICAL SUPPLY DIFFUSER CONNECTION

NOT TO SCALE



IN-LINE FAN SUPPORT DETAIL

NOT TO SCALE



NOTE:

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

COMPRESSION TANK DETAIL DIAPHRAGM TYPE

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TEL: (218) 591-5079

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.
Print Name: Douglas C. Mass
Signature:
Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: MXB
DRAWN BY: MXB
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

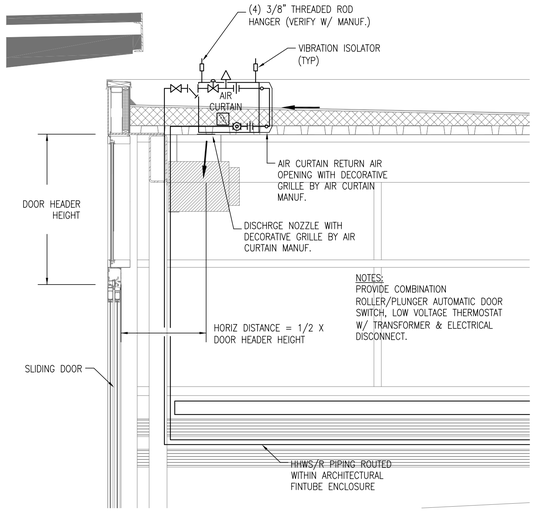
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SHEET TITLE
MECHANICAL DETAILS III

SHEET NUMBER
M503

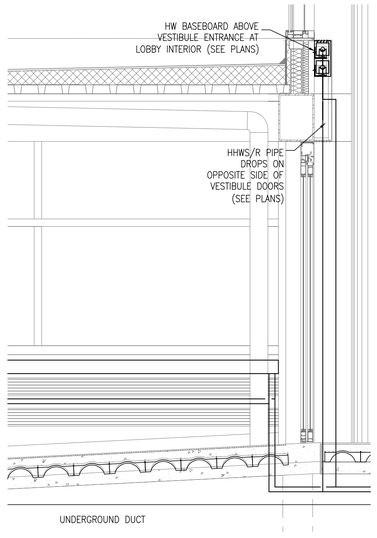
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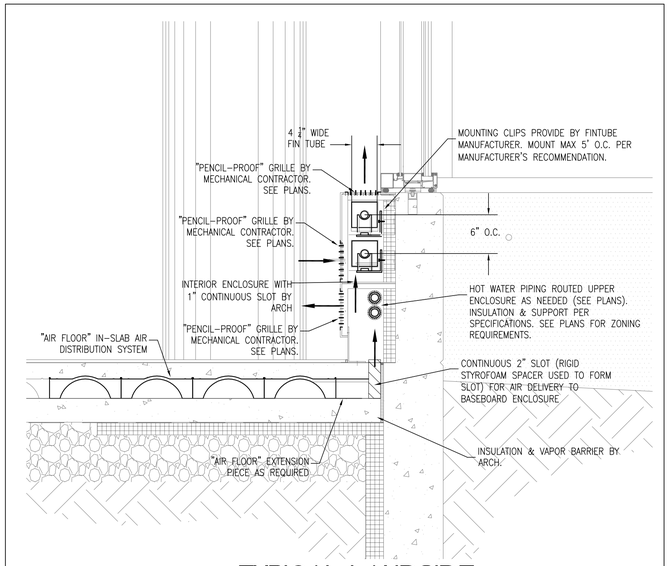
TYPICAL AIR CURTAIN INSTALLATION DETAIL

NOT TO SCALE



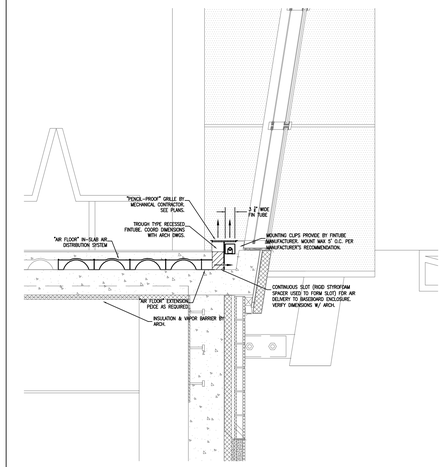
TYPICAL INTERIOR VESTIBULE SILL FINTUBE INSTALLATION DETAIL

NOT TO SCALE



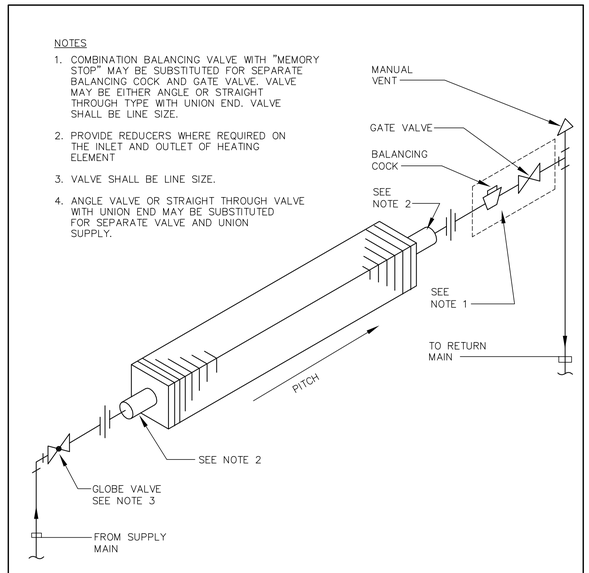
TYPICAL LANDSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

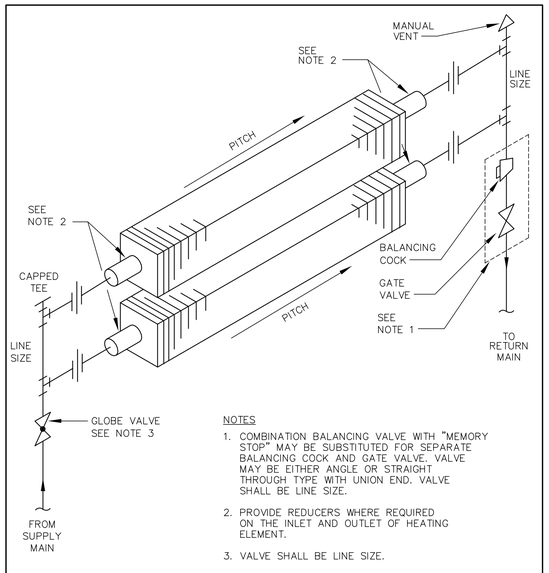


TYPICAL AIRSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

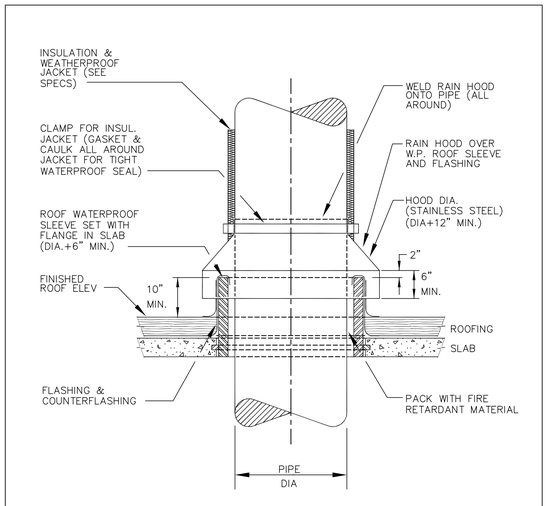


ONE (1) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING



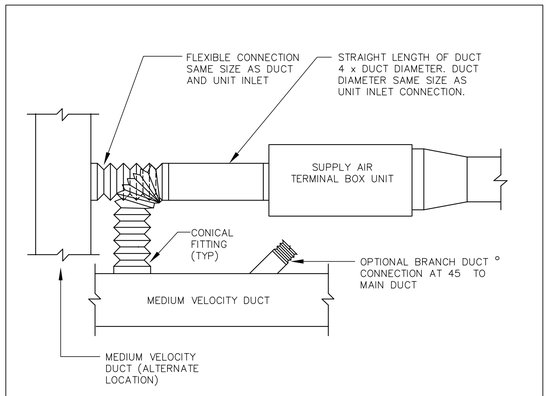
TWO (2) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING

(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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ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10
Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: MXB
DRAWN BY: MXB
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

MECHANICAL DETAILS IV

SHEET NUMBER

M504

BUILDING PERMIT

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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		
HJ	PULL BOX OR JUNCTION BOX–OUTLET BOX TYPE WALL MOUNTED	
J	PULL BOX OR JUNCTION BOX–OUTLET BOX TYPE MOUNTED AT CEILING	
JB	JUNCTION BOX	
SECONDARY FEEDERS		
	FEEDER RUN CONCEALED ABOVE AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF CIRCUITRY.	
	FEEDER RUN CONCEALED BELOW AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF CIRCUITRY.	
	FEEDER RUN EXPOSED AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF	
FIRE PROTECTIVE ALARM SYSTEMS SOUNDING AND VISUAL DEVICES		
S	SPEAKER	SUBSCRIPT -P- DENOTES PRESIGNAL SUBSCRIPT -T- DENOTES TROUBLE SIGNAL SYMBOLS AS SHOWN REPRESENT CLG MOUNTED DEVICES–CIRCUMSCRIBED CIRCLES THUS:- 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	
FIRE PROTECTIVE ALARM SYSTEMS BASIC ITEMS		
FCP	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
WF	SPRINKLER ALARM ACTUATING DEVICE	
VSS	VALVE SUPERVISOR SWITCH	
SD	AUTOMATIC FIRE DETECTION ALARM ACTUATING DEVICES SMOKE DETECTOR	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
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.
T	SWITCH WITH THERMAL OVERLOAD PROTECTION FOR 120V FRACTIONAL HP MOTORS	
K	KEY OPERATED SWITCH	
IR	AREA OF RESCUE ASSISTANCE INTERCOM STATION	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.

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		
PS	POWER SUPPLY FOR ACCESS CONTROL		
	QUAD RECEPTACLE IN FLUSH FLOOR BOX		
	DUPLEX RECEPTACLE IN FLUSH FLOOR BOX		
P	QUAD RECEPTACLE PENDANT MOUNTED FROM CEILING		
	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	
	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
LIGHTING CONTROL		
S os	WALL SWITCH INFRARED 120/277V OCCUPANCY SENSOR WITH 2100SF, 180° COVERAGE. SELF ADJUSTING AMBIENT LIGHT LEVEL SENSOR WITH MANUAL OVERRIDE. LEVITON CATALOG NUMBER ods15–id OR EQUAL.
$^D	DIMMING SWITCH
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.
OSX	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.

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ENGINEER CERTIFICATION
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Print Name: Douglas C. Mass
Signature:
Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

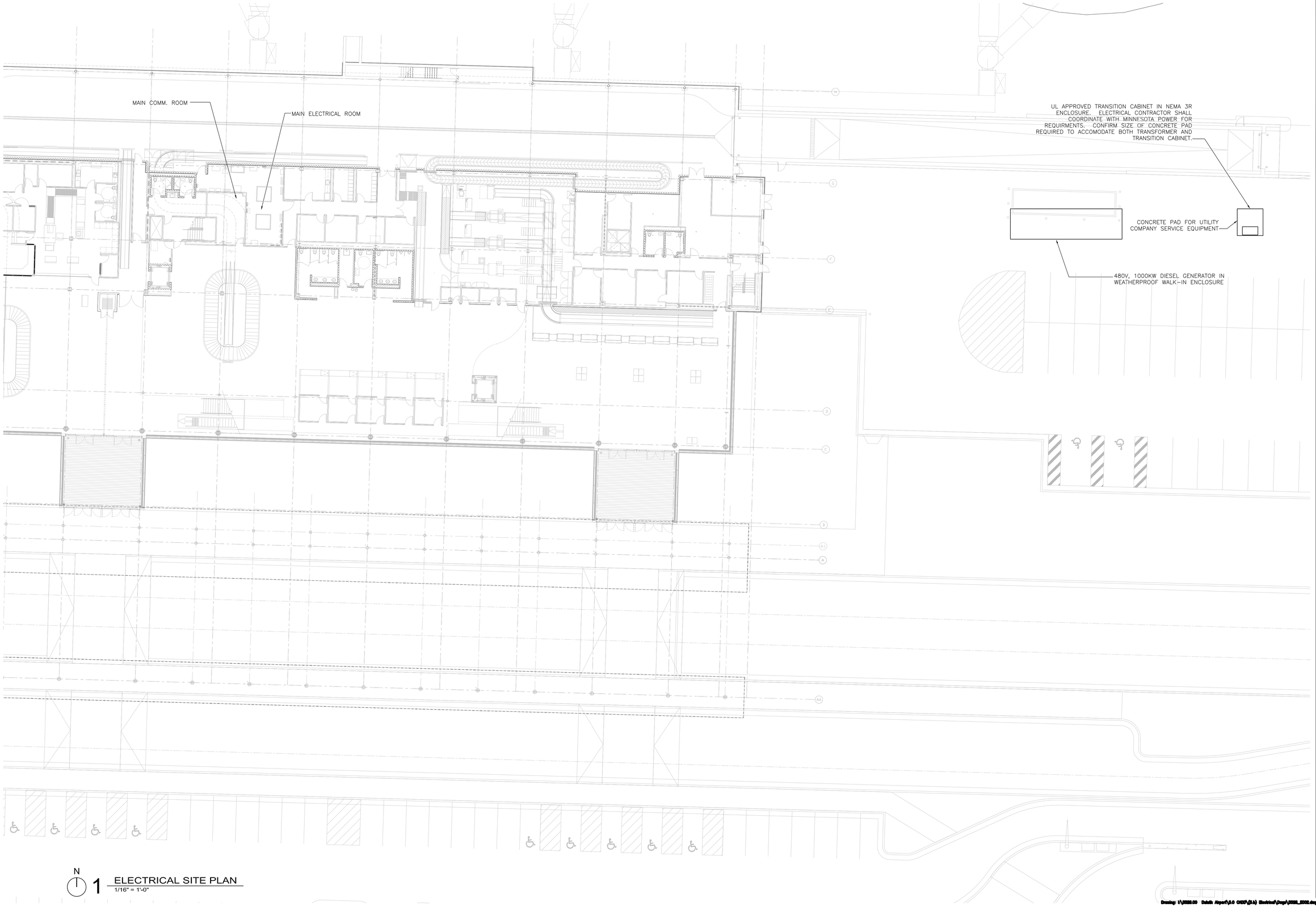
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SHEET TITLE
ELECTRICAL SYMBOLS

SHEET NUMBER
E001

BUILDING PERMIT

Drawing: I:\2008.09 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E001.dwg Plotted on: 8/12/2010 1:49 PM Plotted by: Koelker, Jennifer



N

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

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

ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ELECTRICAL
SITE PLAN

SHEET NUMBER
E002

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E002.dwg Plotted on: 8/12/2010 1:01 PM Plotted by: Koelker, Jennifer

NOTES:

1. BRANCH CIRCUITS IN ELEVATOR MACHINE ROOM SHALL BE CONNECTED TO "ELEV" PANEL LOCATED WITHIN ROOM.
2. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO "ERP" PANEL AS INDICATED ON THIS SHEET U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
3. RECEPTACLES AND OTHER ELECTRICAL DEVICES 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, AV DEVICES AND SIGNAGE. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9. POWER PROVISIONS FOR MOTORIZED ROLLING DOORS AND SHUTTERS SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS (INCLUDING LOCAL DISCONNECT).
10. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.

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) NOT USED

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

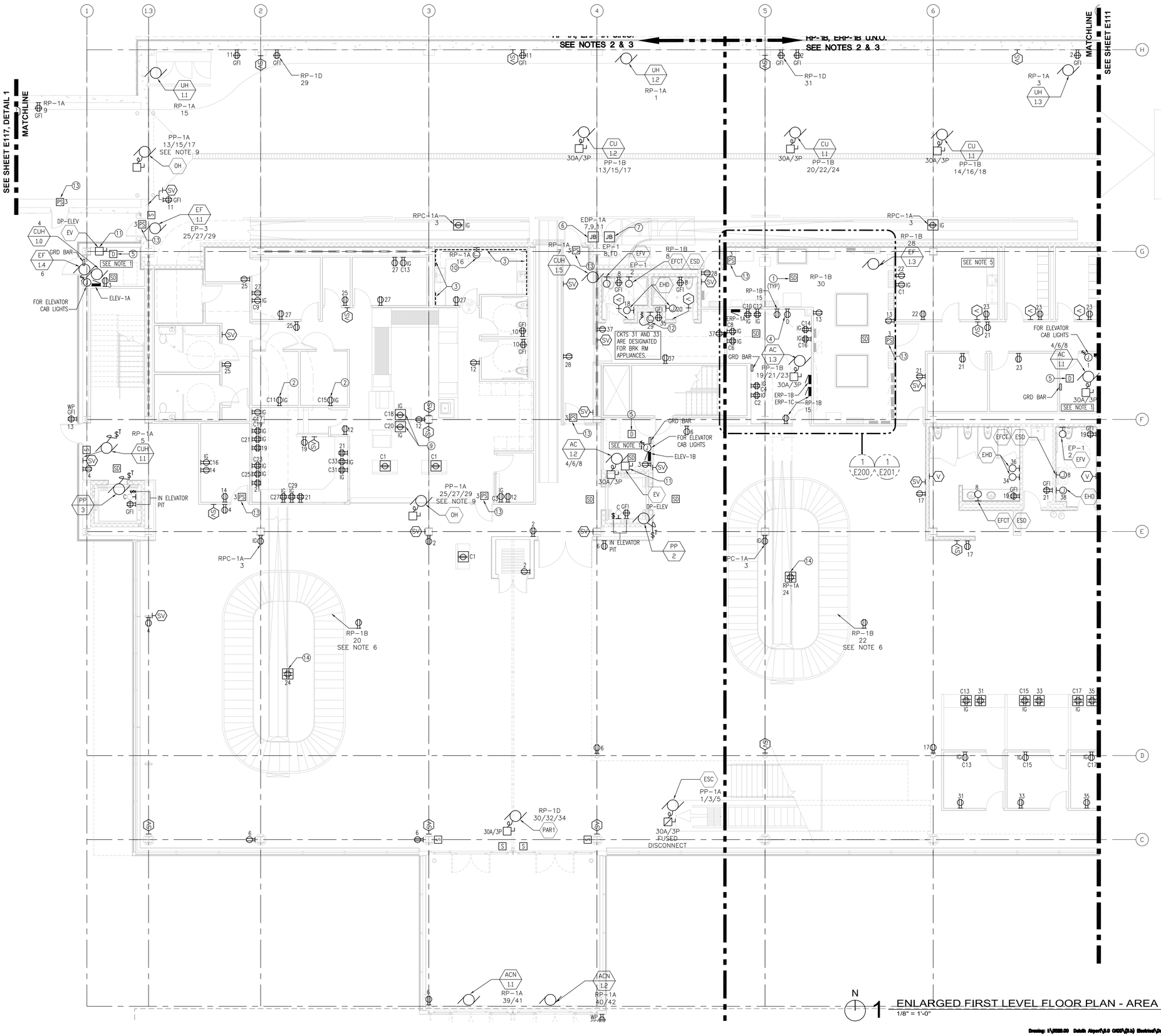
(10) JBOX FOR FUME HOOD. COORDINATE OCP DEVICE AND FEEDER SIZE PER MANUFACTURER'S REQUIREMENTS.

(11) PROVIDE POWER MODULE SWITCH EATON TYPE "PS6T4BR1KGBF3" OR APPROVED EQUAL FOR EACH ELEVATOR. CAT. # IS BASED ON MOTOR SIZE 25HP OR BELOW, ADJUST ACCORDINGLY IF MOTOR EXCEEDS 25HP.

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

(13) PROVIDE POWER FOR ACCESS CONTROL POWER SUPPLY (POWER SUPPLY ENCLOSURE PROVIDED BY OTHERS). REFER TO "ET" SERIES DWGS FOR ADDITIONAL INFORMATION. INTERFACE EIBS WITH FA SYSTEM WHERE INDICATED ON "ET" SERIES DWGS.
ACCESS CONTROL POWER SUPPLIES SHALL BE CONNECTED TO PNL "EPP-1D".

(14) QUAD RECEPTACLE FOR AIRPORT SIGNAGE. CONFIRM CORRECT LOCATION AND POWER REQUIREMENTS.



N

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

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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DRAWN BY:	JK
DESIGNED BY:	JK

AEP PROJECT NUMBER
213-1882-091

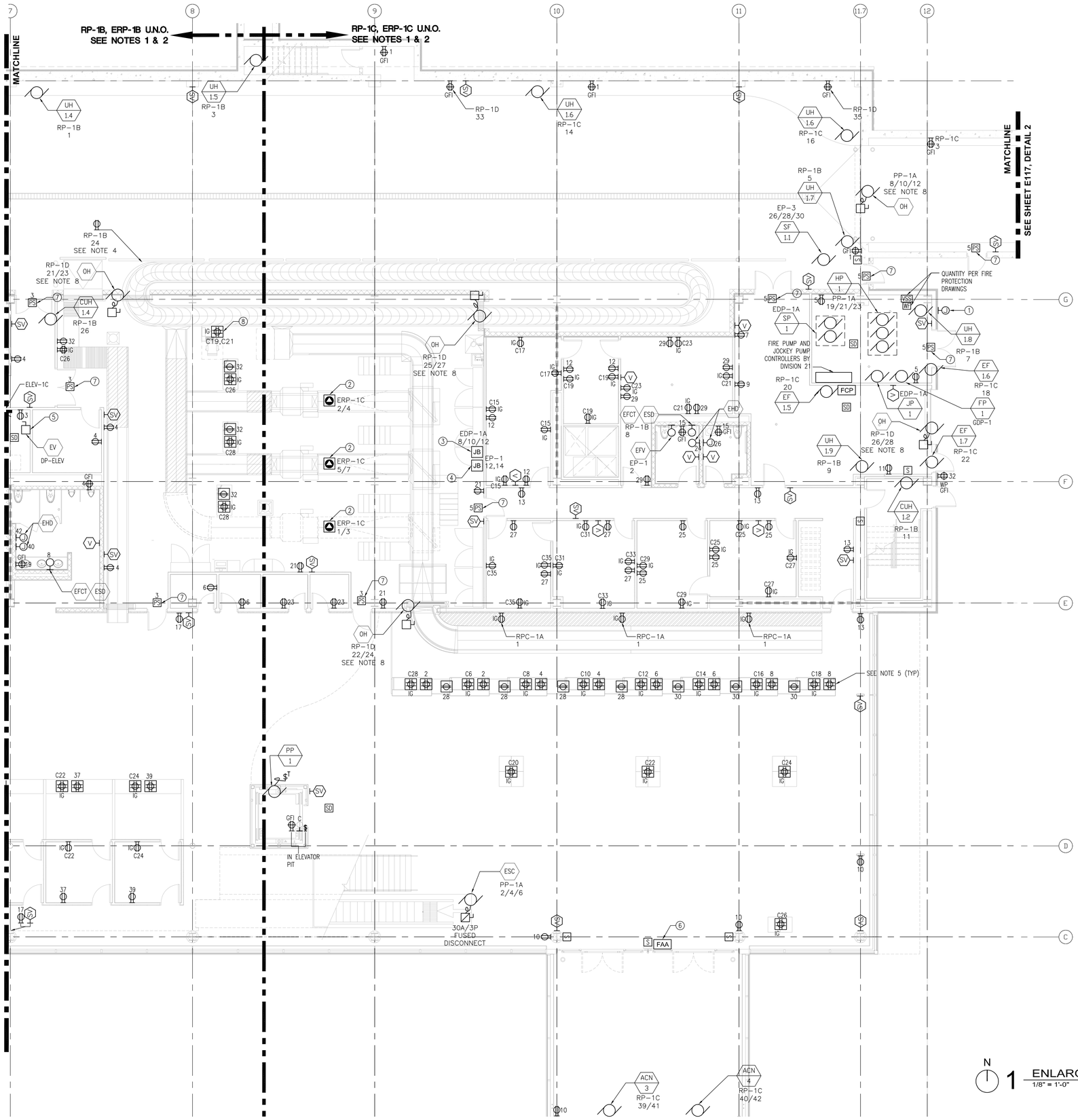
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E110

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E110.dwg Plotted on: 8/13/2010 1:02 PM Plotted by: Koelker, Jennifer



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

NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO "ERP" PANEL AS INDICATED ON THIS SHEET U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES AND OTHER ELECTRICAL DEVICES 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, AV DEVICES AND SIGNAGE. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
8. POWER PROVISIONS FOR MOTORIZED ROLLING DOORS AND SHUTTERS SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS (INCLUDING LOCAL DISCONNECT).
9. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.

KEYED NOTES:

1. JUNCTION BOX FOR FIRE BELL. BELL SHALL BE CONNECTED TO PANEL "EPP-1D", CKT 1.
2. NEMA L6-30R 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.
5. PROVIDE POWER MODULE SWITCH EATON TYPE "PS6T48R1KGBF3" OR APPROVED EQUAL FOR EACH ELEVATOR. CAT. # IS BASED ON MOTOR SIZE 25HP OR BELOW, ADJUST ACCORDINGLY IF MOTOR EXCEEDS 25HP.
6. REMOTE FIRE ALARM ANNUNCIATOR. SEE ARCHITECTURAL PLANS FOR EXACT LOCATION.
7. PROVIDE POWER FOR ACCESS CONTROL POWER SUPPLY (POWER SUPPLY ENCLOSURE PROVIDED BY OTHERS). REFER TO "ET" SERIES DWGS FOR ADDITIONAL INFORMATION. INTERFACE EIBS WITH FA SYSTEM WHERE INDICATED ON "ET" SERIES DWGS.
   ACCESS CONTROL POWER SUPPLIES SHALL BE CONNECTED TO PNL "EPP-1D".
8. WIRE EACH HALF OF QUAD RECEPTACLE SEPARATELY TO ACCOMODATE BOTH BAGGAGE VIEWING STATION AND FIELD DATA RECORDING STATION. VERIFY LOCATION OF POWER CONNECTION.

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
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DATE ISSUED:	08-16-10
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DRAWN BY:	JK
DESIGNED BY:	JK

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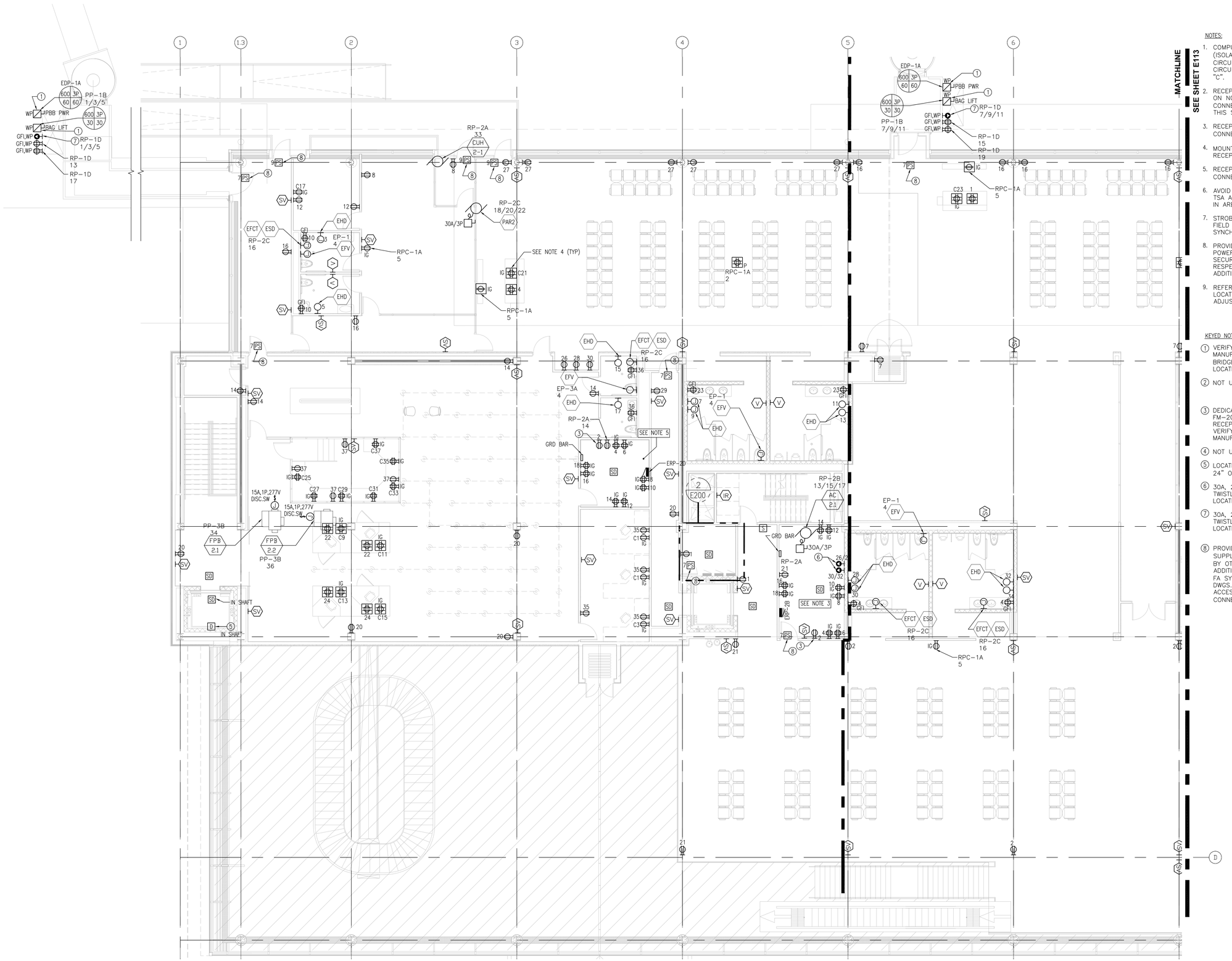
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E111

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E111.dwg Plotted on: 8/12/2010 1:53 PM Plotted by: Kastner, Jennifer



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

NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-2B" U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES AND OTHER ELECTRICAL DEVICES ON NORMAL POWER ON THIS SHEET SHALL BE CONNECTED TO "RP" PANELS AS INDICATED ON THIS SHEET 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, AV DEVICES AND SIGNAGE. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
9. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.

KEYED NOTES:

1. VERIFY POWER REQUIREMENTS WITH MANUFACTURER OF EQUIPMENT FOR PASSENGER BRIDGE (PBB PWR) AND BAG LIFT. 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.
8. PROVIDE POWER FOR ACCESS CONTROL POWER SUPPLY (POWER SUPPLY ENCLOSURE PROVIDED BY OTHERS). REFER TO "ET" SERIES DWGS FOR ADDITIONAL INFORMATION. INTERFACE EIBS WITH FA SYSTEM WHERE INDICATED ON "ET" SERIES DWGS.
ACCESS CONTROL POWER SUPPLIES SHALL BE CONNECTED TO PNL "EPP-1D".

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Signature:

Date: 08/16/10 Reg. No.: 21067

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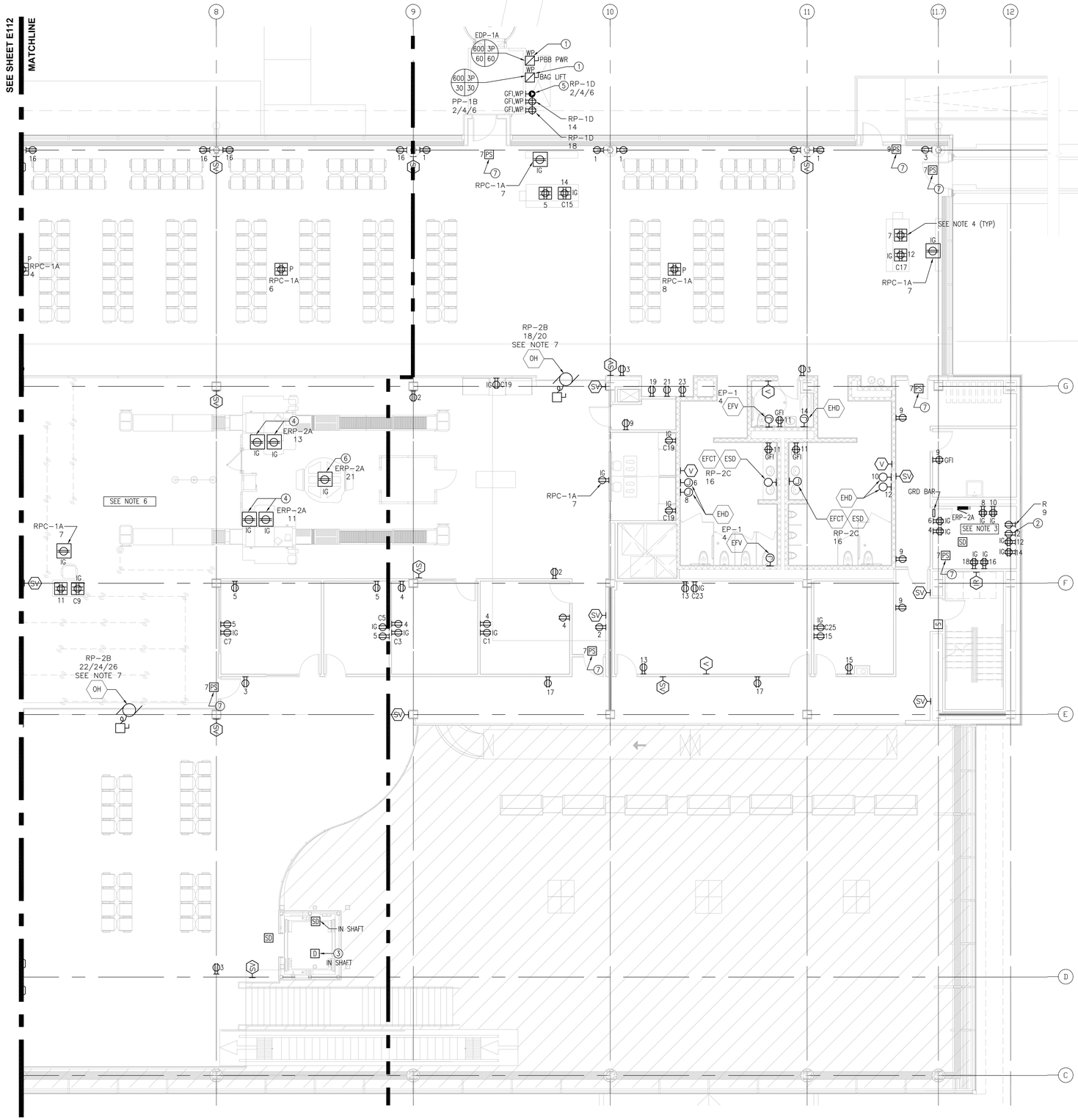
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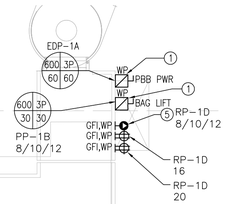
SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E112

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E112.dwg Plotted on: 8/13/2010 1:53 PM Plotted by: Koelker, 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 AND OTHER ELECTRICAL DEVICES ON NORMAL POWER ON THIS SHEET SHALL BE CONNECTED TO "RP" PANELS AS INDICATED ON THIS SHEET, U.N.O.
3. RECEPTACLES IN TELECOM ROOM 243 SHALL BE CONNECTED TO PANEL "ERP-2A" U.N.O.
4. MOUNTING/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, AV DEVICES AND SIGNAGE. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7. POWER PROVISIONS FOR MOTORIZED ROLLING GRILLES SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS (INCLUDING LOCAL DISCONNECT).
8. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.

KEYED NOTES:

(1) VERIFY POWER REQUIREMENTS WITH MANUFACTURER OF EQUIPMENT FOR PASSENGER BRIDGE (PBB PWR) AND BAG LIFT. 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.

(7) PROVIDE POWER FOR ACCESS CONTROL POWER SUPPLY (POWER SUPPLY ENCLOSURE PROVIDED BY OTHERS). REFER TO "ET" SERIES DWGS FOR ADDITIONAL INFORMATION. INTERFACE EIBS WITH FA SYSTEM WHERE INDICATED ON "ET" SERIES DWGS.
ACCESS CONTROL POWER SUPPLIES SHALL BE CONNECTED TO PNL "EPP-1D".

N

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

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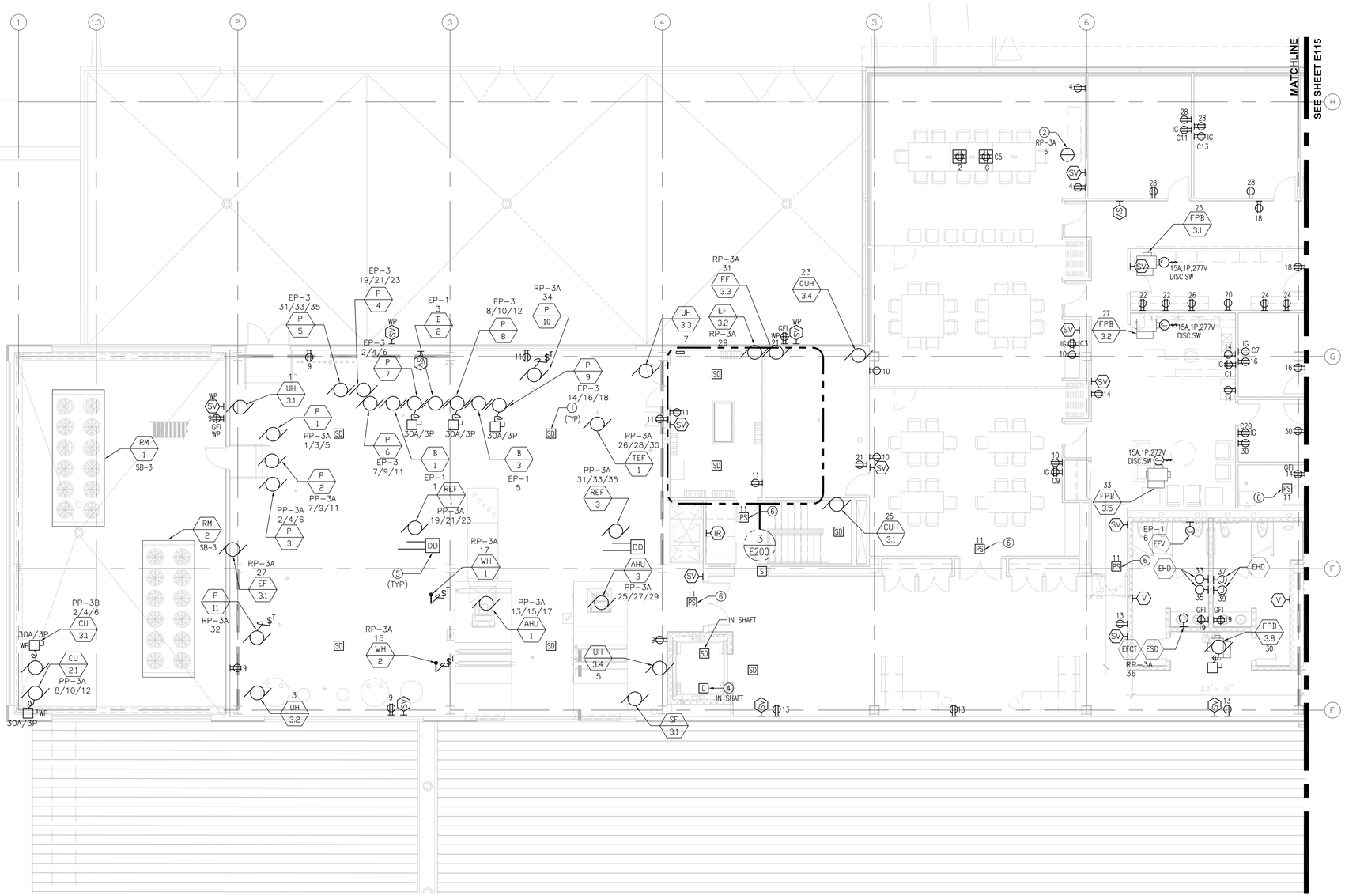
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SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA B

SHEET NUMBER
E113

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E113.dwg Plotted on: 8/12/2010 1:54 PM Plotted by: Kastner, 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 AND OTHER ELECTRICAL DEVICES 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. NOT USED
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, AV DEVICES AND SIGNAGE. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7. FAN POWER BOXES "FPB" SHALL BE CONNECTED TO PANEL "PP-3B".
8. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.

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. NOT USED
4. LOCATE A ELEVATOR SHAFT HEAT DETECTOR WITHIN 24" OF EACH SPRINKLER HEAD.
5. LOCATE DUCT DETECTOR ON RETURN AIR DUCT FOR "REF" EQUIPMENT.
6. PROVIDE POWER FOR ACCESS CONTROL POWER SUPPLY (POWER SUPPLY ENCLOSURE PROVIDED BY OTHERS). REFER TO "ET" SERIES DWGS FOR ADDITIONAL INFORMATION. INTERFACE EIBS WITH FA SYSTEM WHERE INDICATED ON "ET" SERIES DWGS.
ACCESS CONTROL POWER SUPPLIES SHALL BE CONNECTED TO PNL "EPP-1D".

N

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

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TEL: (218) 591-5079

ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

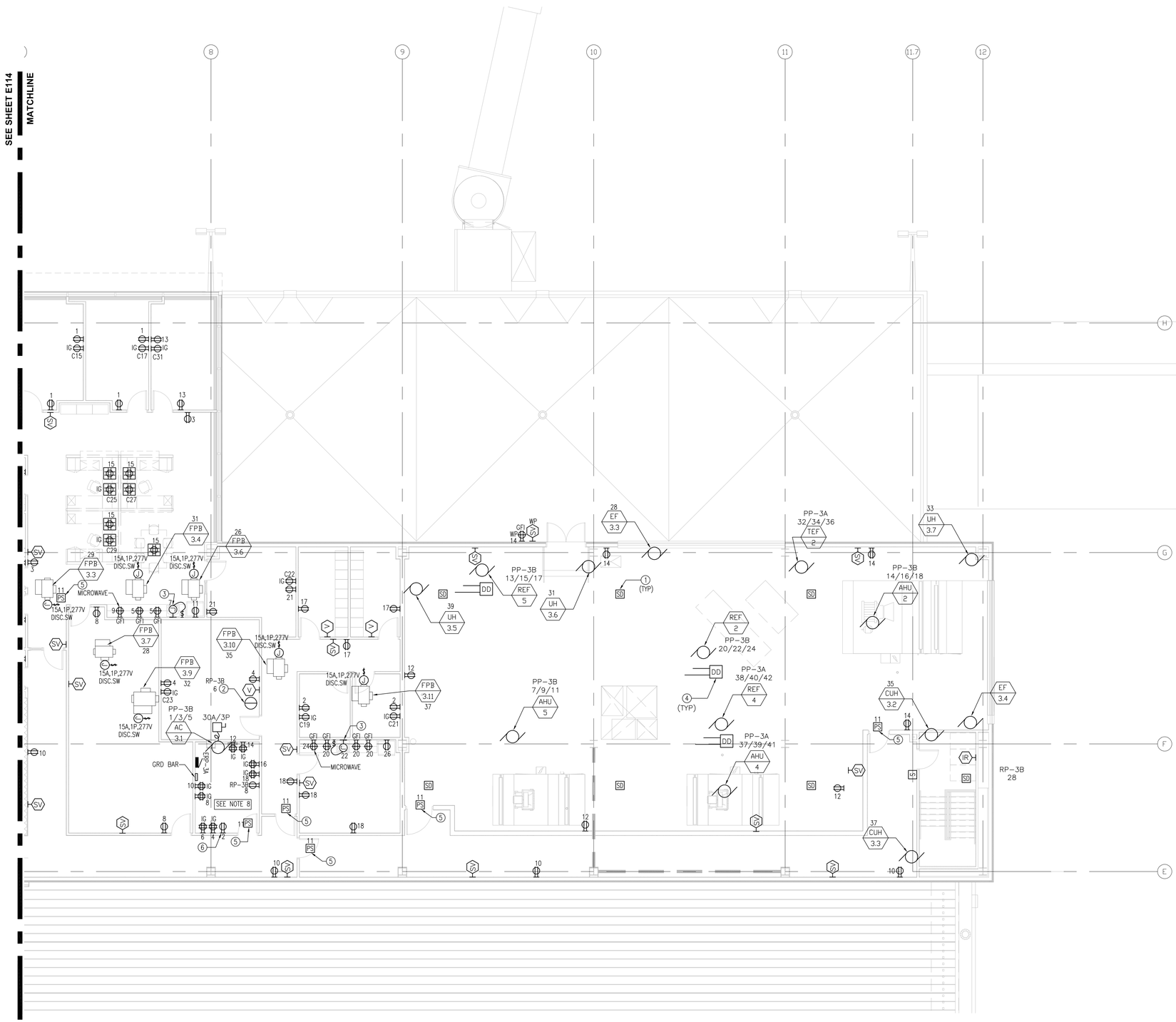
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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E114

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E114.dwg Plotted on: 8/12/2010 1:55 PM Plotted by: Hoelker, 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 AND OTHER ELECTRICAL DEVICES 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, AV DEVICES AND SIGNAGE. REFER TO RESPECTIVE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. FAN POWER BOXES ("FPB") SHALL BE CONNECTED TO PANEL "PP-3B".
7. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.
8. RECEPTACLES IN COMM. RM 337 SHALL BE CONNECTED TO PNL "ERP-3A", U.N.O.

KEYED NOTES:

1. MINIMUM QUANTITY OF SMOKE DETECTORS INDICATED. SMOKE DETECTOR PLACEMENT AND QUANTITY SHALL BE BASED ON COORDINATION WITH DUCTWORK AND EQUIPMENT LAYOUT.
2. CEILING MOUNTED RECEPTACLE FOR PROJECTION SCREEN. CONFIRM LOCATION WITH OWNER.
3. JUNCTION BOX FOR GARBAGE DISPOSAL. VERIFY POWER REQUIREMENTS PER EQUIPMENT MANUFACTURER.
4. LOCATE DUCT DETECTOR ON RETURN AIR DUCT FOR "REF" EQUIPMENT.
5. PROVIDE POWER FOR ACCESS CONTROL POWER SUPPLY (POWER SUPPLY ENCLOSURE PROVIDED BY OTHERS). REFER TO "ET" SERIES DWGS FOR ADDITIONAL INFORMATION. INTERFACE EIBS WITH FA SYSTEM WHERE INDICATED ON "ET" SERIES DWGS.
   ACCESS CONTROL POWER SUPPLIES SHALL BE CONNECTED TO PNL "EPP-1D".
6. DEDICATED 20A DUPLEX RECEPTACLE FOR FM-200 SYSTEM CONTROLS. COORDINATE RECEPTACLE LOCATION WITH FM-200 LOCATION. VERIFY ELECTRICAL REQUIREMENTS WITH MANUFACTURER.

N

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

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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 B

SHEET NUMBER
E115

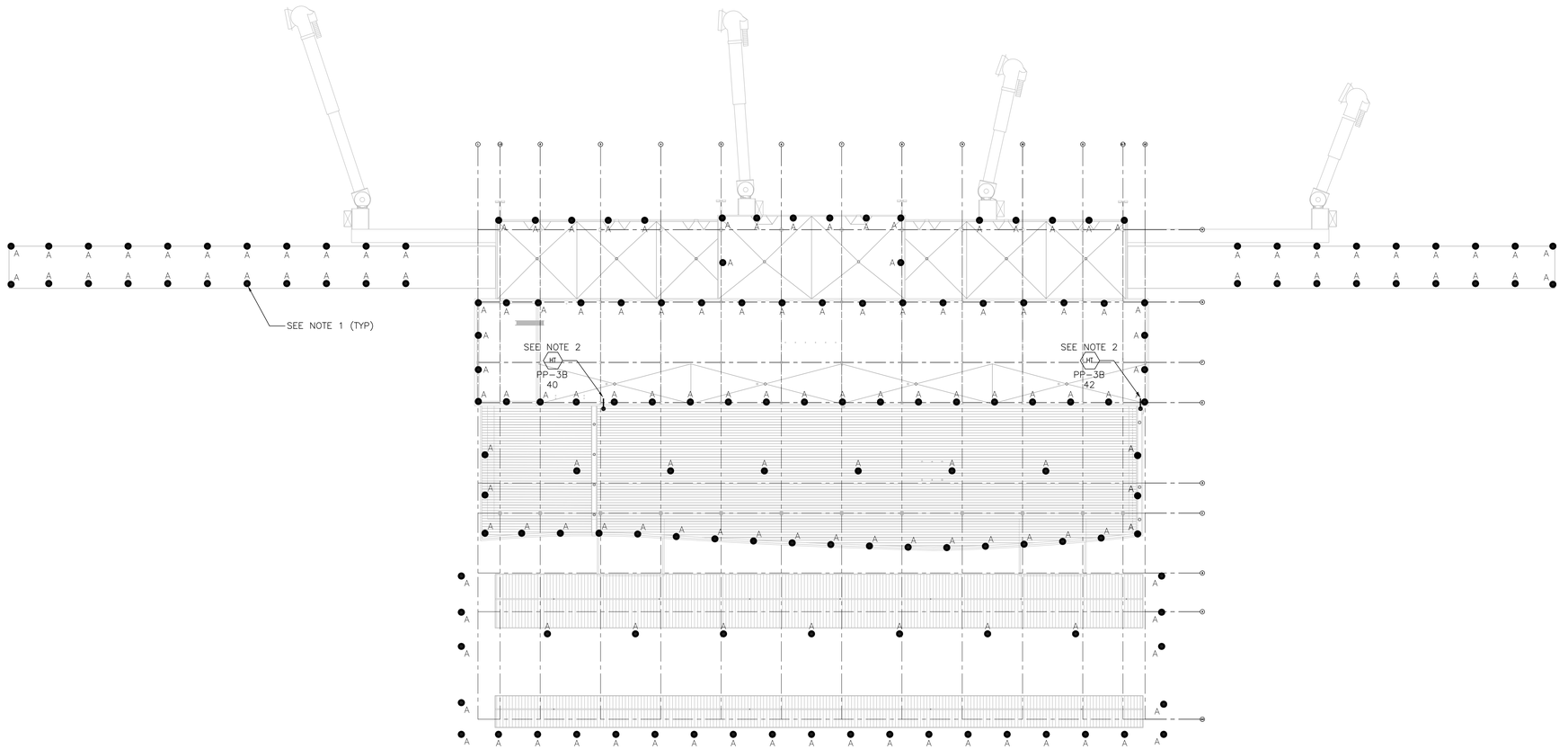
BUILDING PERMIT

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2035_E115.dwg Plotted on: 8/12/2010 1:55 PM Plotted by: Kestner, 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; QUALIFIED INSTALLER SHALL PROVIDE CERTIFICATE UPON COMPLETION.

2. PROVIDE HEAT TRACE CABLE FOR GUTTERS – SEE DWG E402 FOR SPECIFICATION. PROVIDE 277V/1P LOCAL DISCONNECT FOR EACH HEAT TRACE CIRCUIT.



N

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

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Signature:

Date: 08/16/10 Reg. No.: 21067

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DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

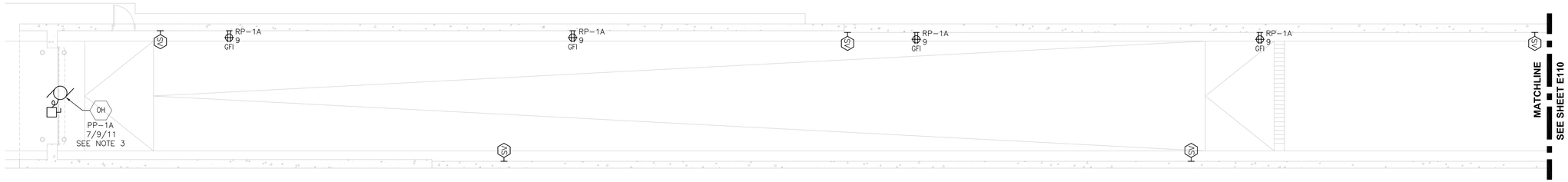
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SHEET TITLE
ELECTRICAL
ROOF PLAN

SHEET NUMBER
E116

BUILDING
PERMIT

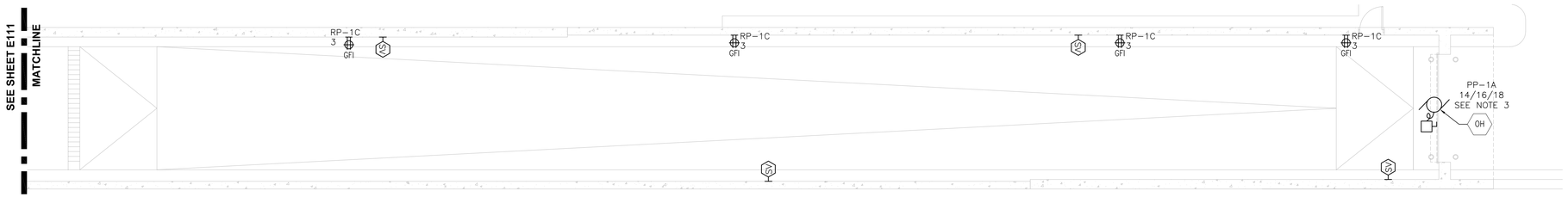
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N

1 WEST RAMP - ELECTRICAL POWER PLAN

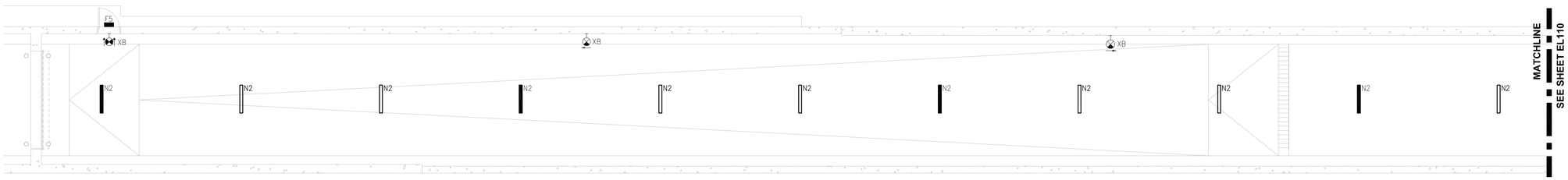
1/8" = 1'-0"



N

2 EAST RAMP - ELECTRICAL POWER PLAN

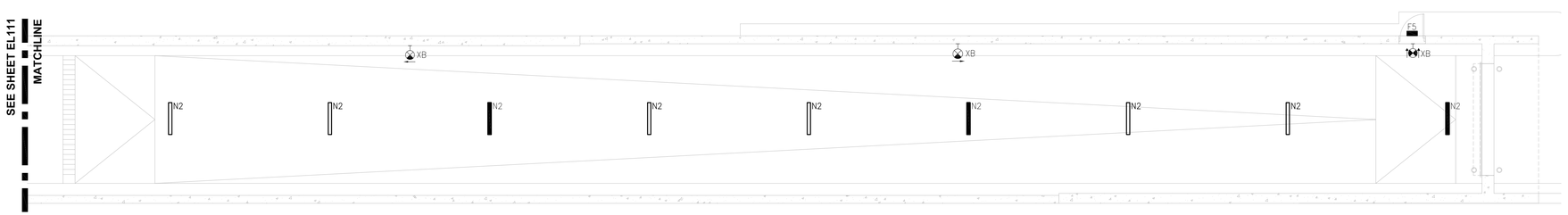
1/8" = 1'-0"



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.
3. POWER PROVISIONS FOR MOTORIZED ROLLING DOORS AND SHUTTERS SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS (INCLUDING LOCAL DISCONNECT).

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ENGINEER CERTIFICATION

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

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1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

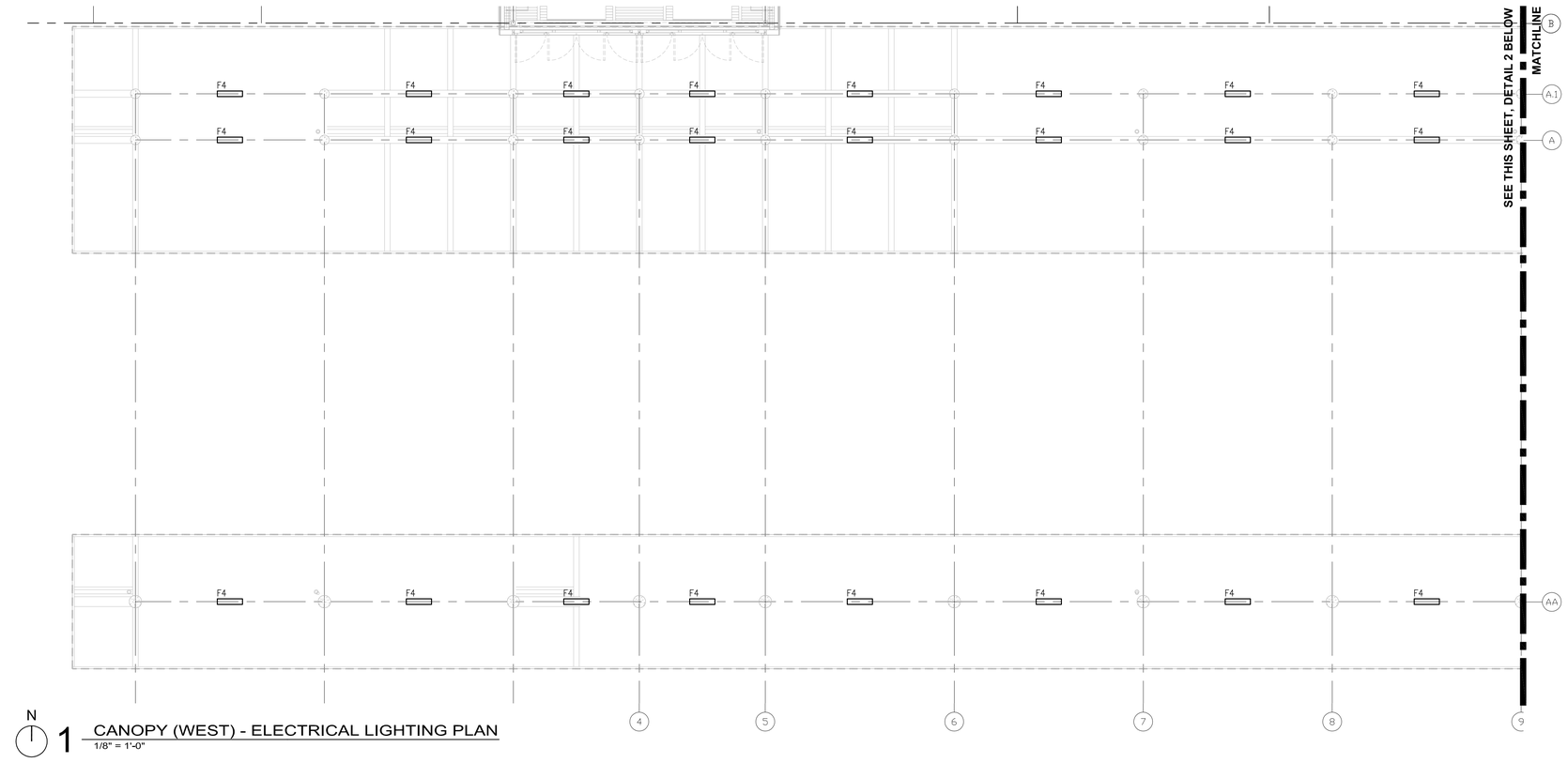
RAMP
ELECTRICAL POWER
AND LIGHTING PLAN

SHEET NUMBER

E117

BUILDING
PERMIT

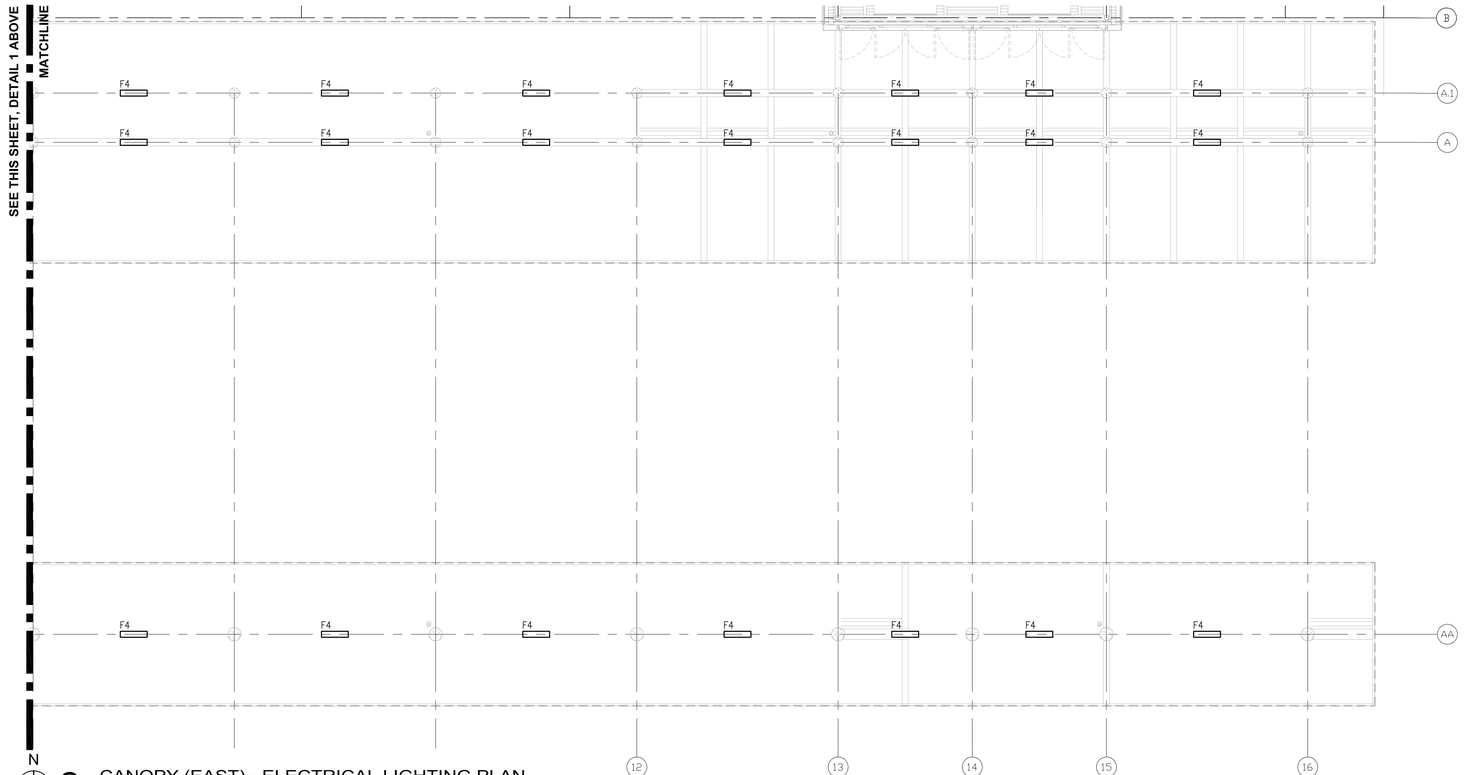
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N

1 CANOPY (WEST) - ELECTRICAL LIGHTING PLAN

1/8" = 1'-0"



N

2 CANOPY (EAST) - ELECTRICAL LIGHTING PLAN

1/8" = 1'-0"

NOTES:

1. CANOPY LIGHTING FIXTURES ARE CONNECTED TO "LP" PANELS.

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

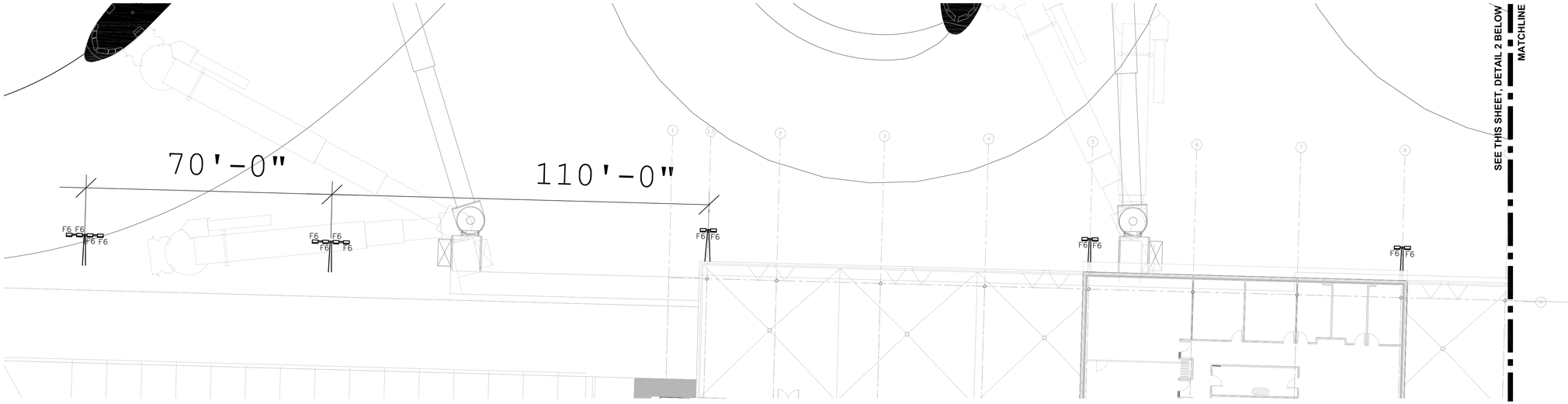
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SHEET TITLE
CANOPY
LIGHTING PLAN

SHEET NUMBER
E118

BUILDING
PERMIT

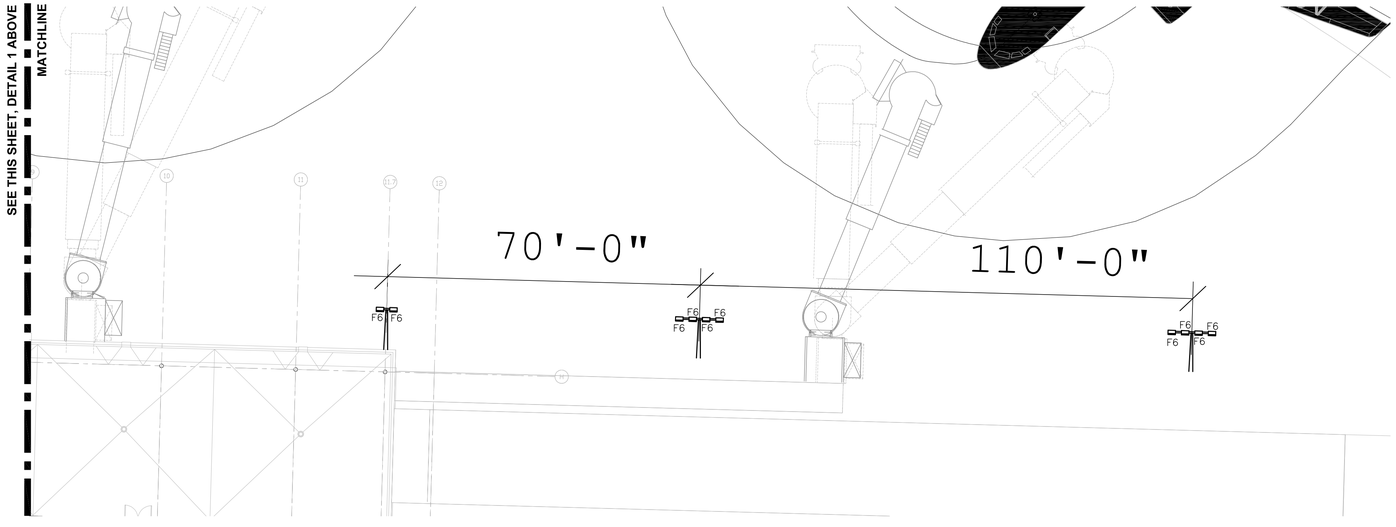
Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.3) Electrical\Dwgs\2008_E118.dwg Plotted on: 8/12/2010 1:59 PM Plotted by: Kastner, Jennifer



N

1 APRON (WEST) - ELECTRICAL LIGHTING PLAN

1/16" = 1'-0"



N

2 APRON (EAST) - ELECTRICAL LIGHTING PLAN

1/16" = 1'-0"

NOTES:

1. APRON LIGHTING FIXTURES ARE CONNECTED TO PANEL "LP-APRON".
2. SEE ARCHITECTURAL DWG A520 FOR ADDITIONAL INFORMATION.

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Date: 08/16/10 Reg. No.: 21067

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
APRON
LIGHTING PLAN

SHEET NUMBER
E119

BUILDING
PERMIT

Drawing: I:\2008.09 Duluth Airport\8.0 CAD\(8.1) Electrical\Dwgs\2008_E119.dwg Plotted on: 8/12/2010 2:02 PM Plotted by: Kestler, Jennifer

NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO "EMLP" PANELS.
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO "LP" PANELS.



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

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DESIGNED BY: JK

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SHEET TITLE
ENLARGED FIRST FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL110

BUILDING PERMIT

Drawing: S:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwg\ESSR_EL110.dwg Plotted on: 8/12/2010 2:15 PM Plotted by: Kastner, Jennifer



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

NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO "EMLP" PANELS.
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO "LP" PANELS.

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ENGINEER CERTIFICATION

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

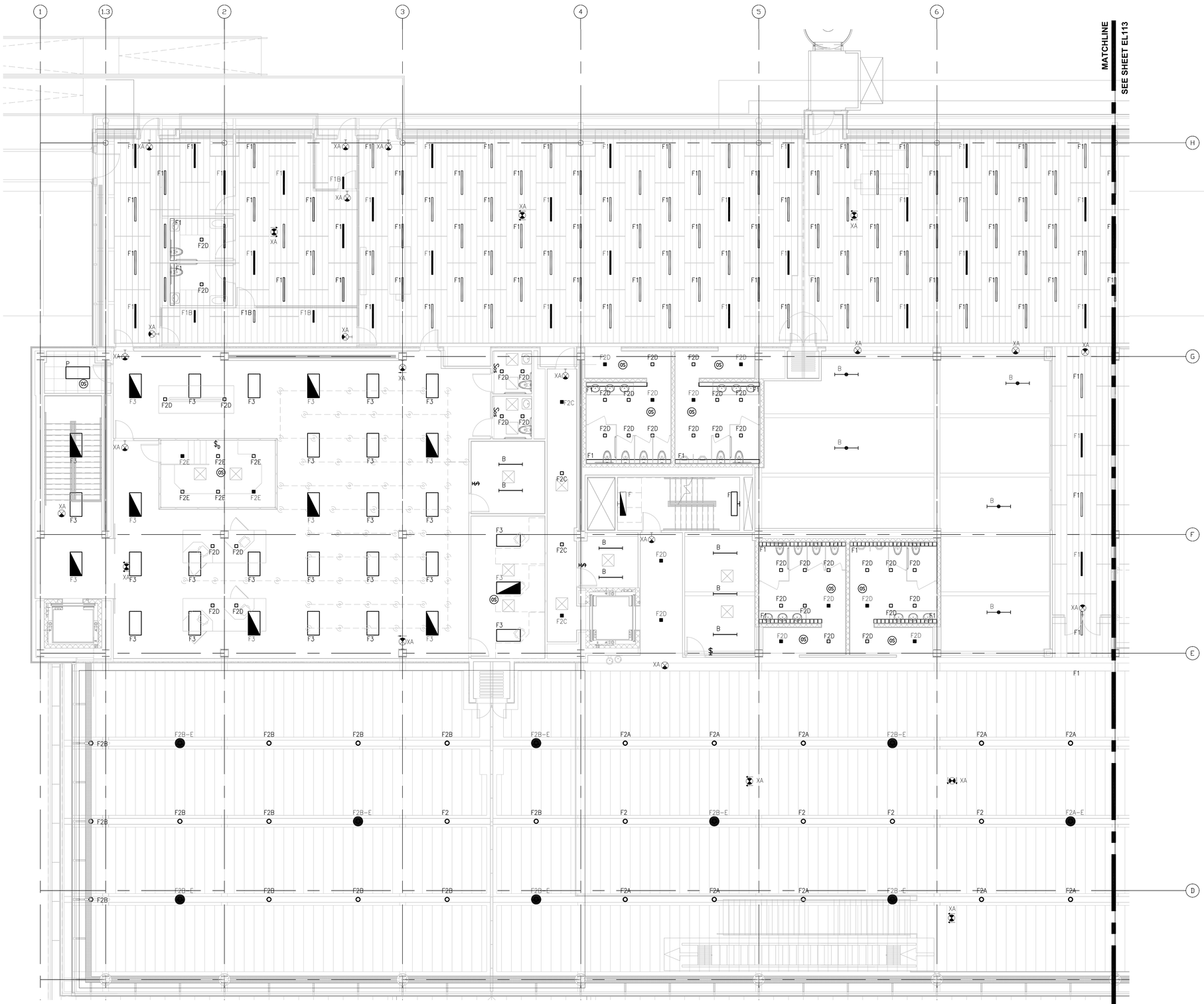
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SHEET TITLE
ENLARGED FIRST FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL111

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.5) Electrical\Dwgs\2008_EL111.dwg Plotted on: 8/12/2010 2:16 PM Plotted by: Kestner, Jennifer



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO "EMLP" PANELS.
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO "LP" PANELS.

N

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

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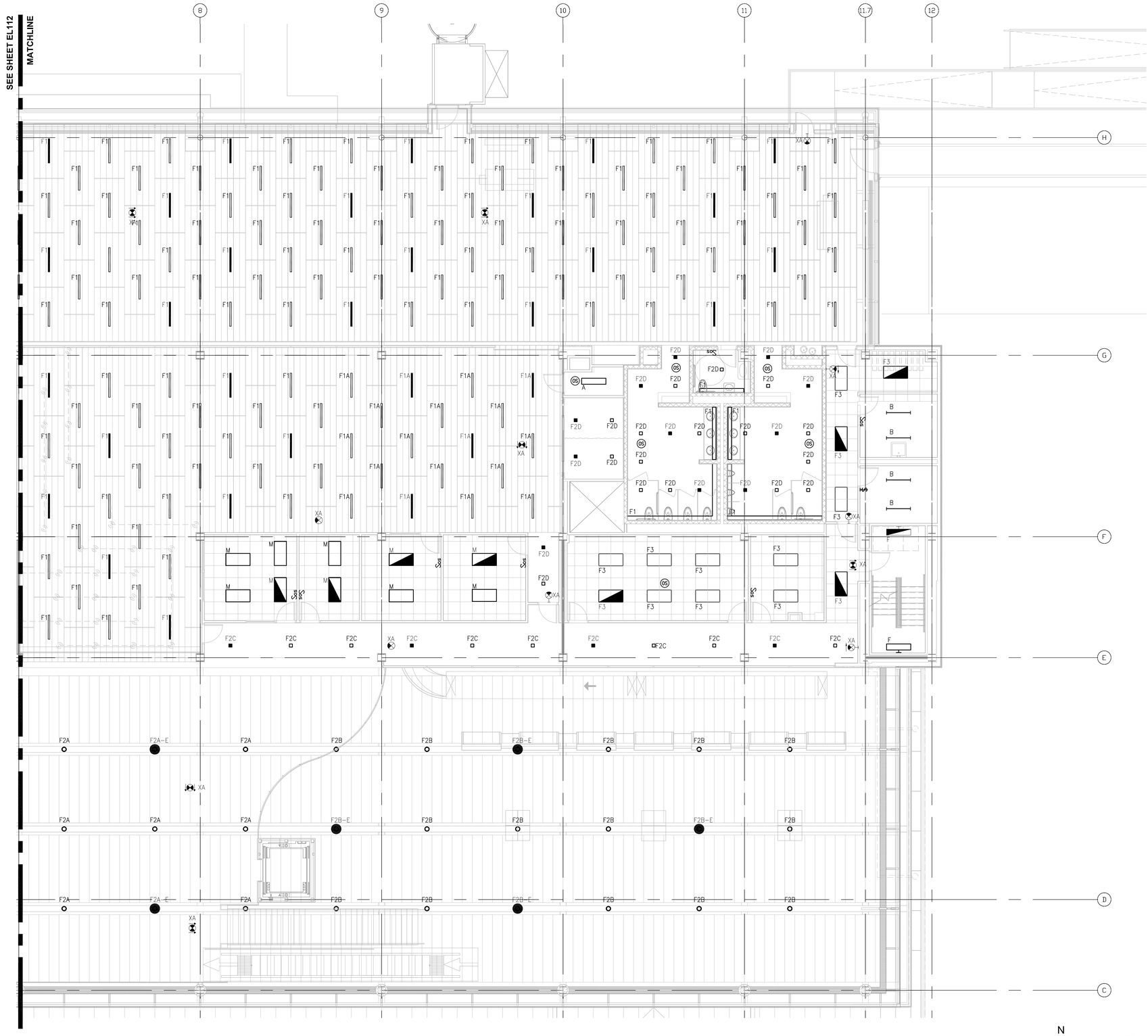
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SHEET TITLE
ENLARGED SECOND FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL112

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\ARSH_EL112.dwg Plotted on: 8/12/2010 2:17 PM Plotted by: Kastner, Jennifer



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO "EMLP" PANELS.
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO "LP" PANELS.

N

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

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Signature:

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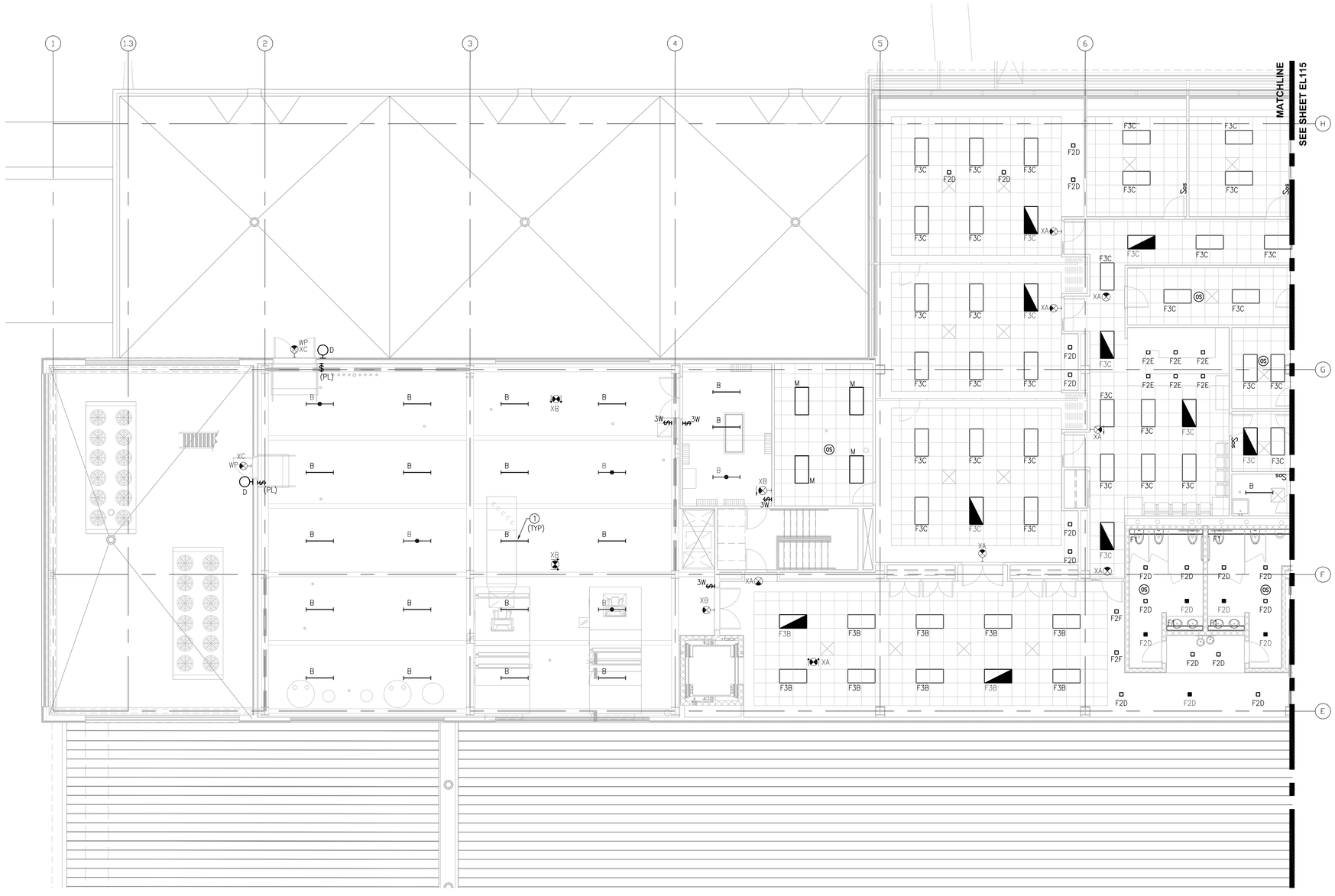
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SHEET TITLE
ENLARGED SECOND FLOOR LIGHTING PLAN AREA B

SHEET NUMBER
EL113

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.6) Electrical\Dwgs\EL\EL113.dwg Plotted on: 8/12/2010 2:16 PM Plotted by: Kestler, Jennifer



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO "EMLP" PANELS.
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP" PANELS.

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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AEP PROJECT NUMBER
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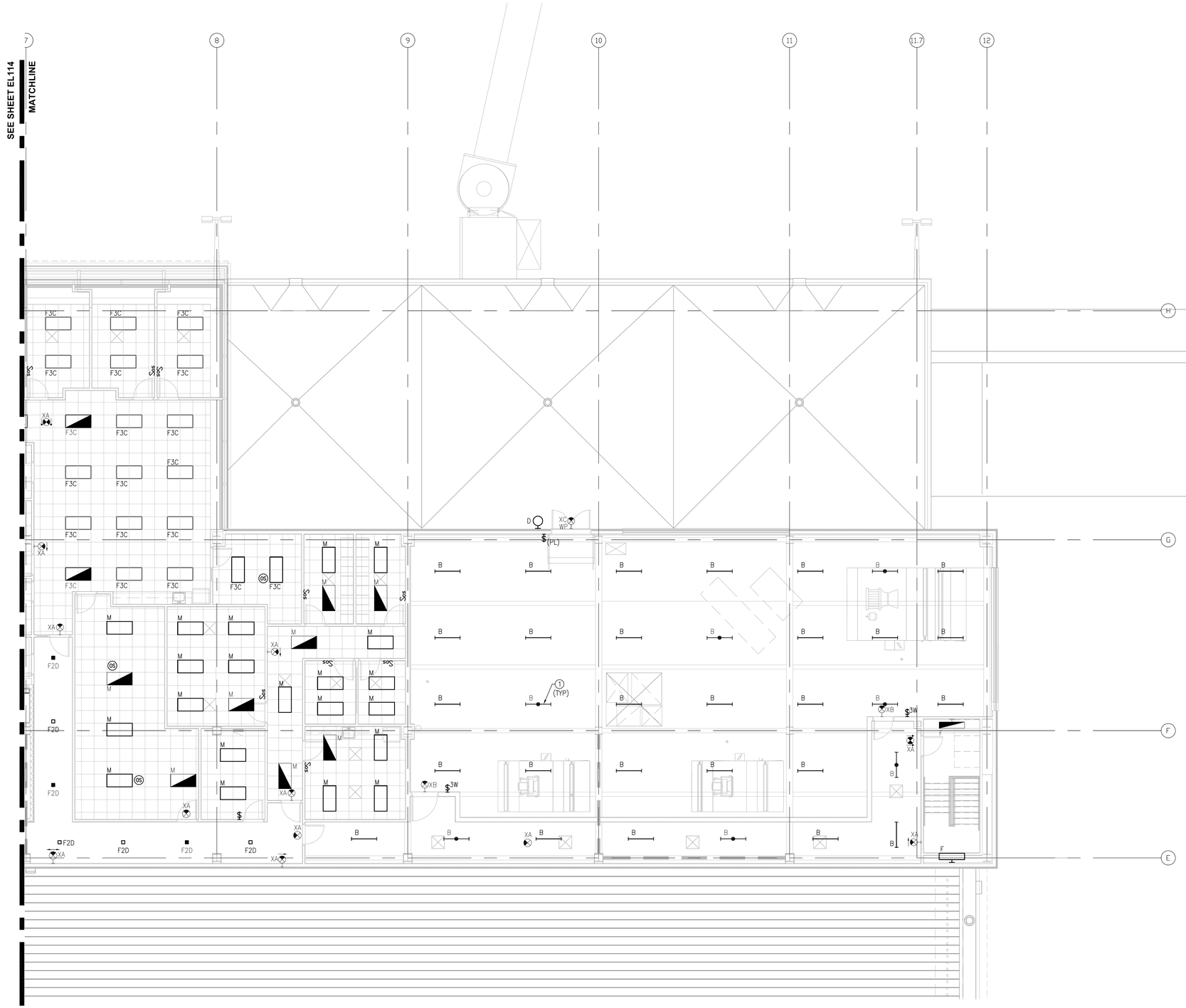
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SHEET TITLE
ENLARGED
THIRD FLOOR
LIGHTING PLAN
AREA A

SHEET NUMBER
EL114

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.5) Electrical\Dwg\2008_EL114.dwg Plotted on: 8/12/2010 2:19 PM Plotted by: Hasher, Jennifer



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO "EMLP" PANELS.
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO "LP" PANELS.

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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DRAWN BY: JK
DESIGNED BY: JK

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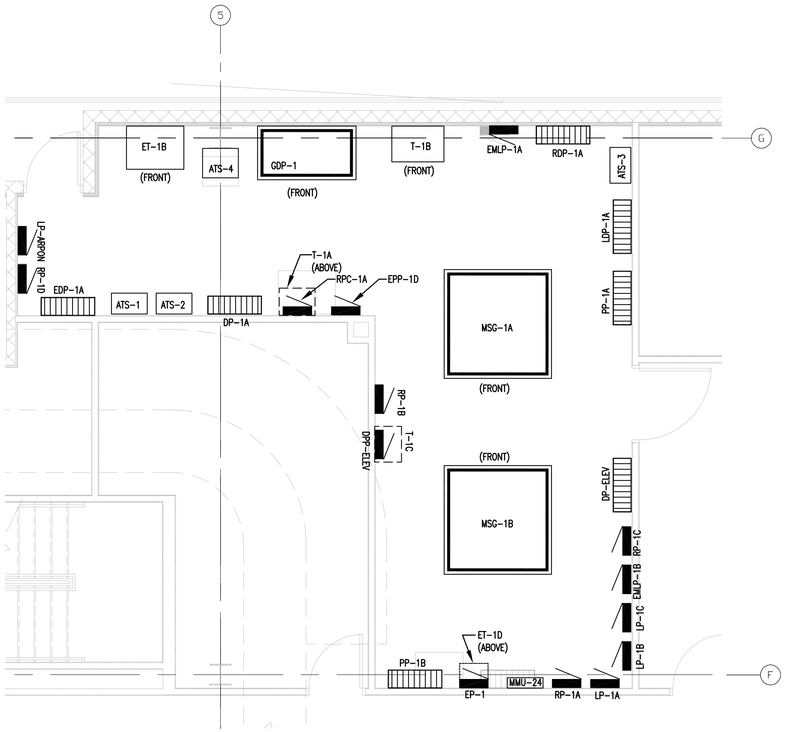
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SHEET TITLE
ENLARGED THIRD FLOOR LIGHTING PLAN AREA B

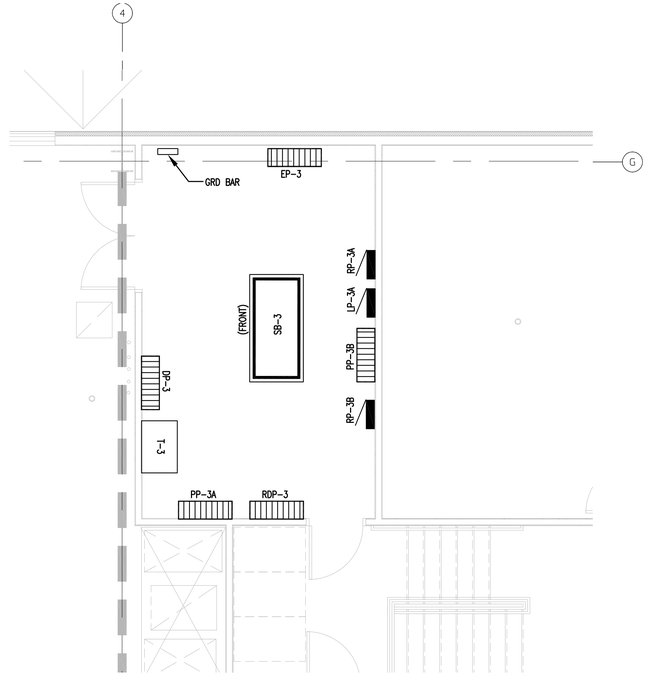
SHEET NUMBER
EL115

BUILDING PERMIT

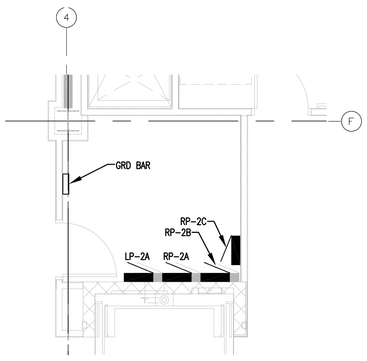
Drawing: X:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_EL115.dwg Plotted on: 8/12/2010 2:20 PM Plotted by: Kastner, Jennifer



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



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



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

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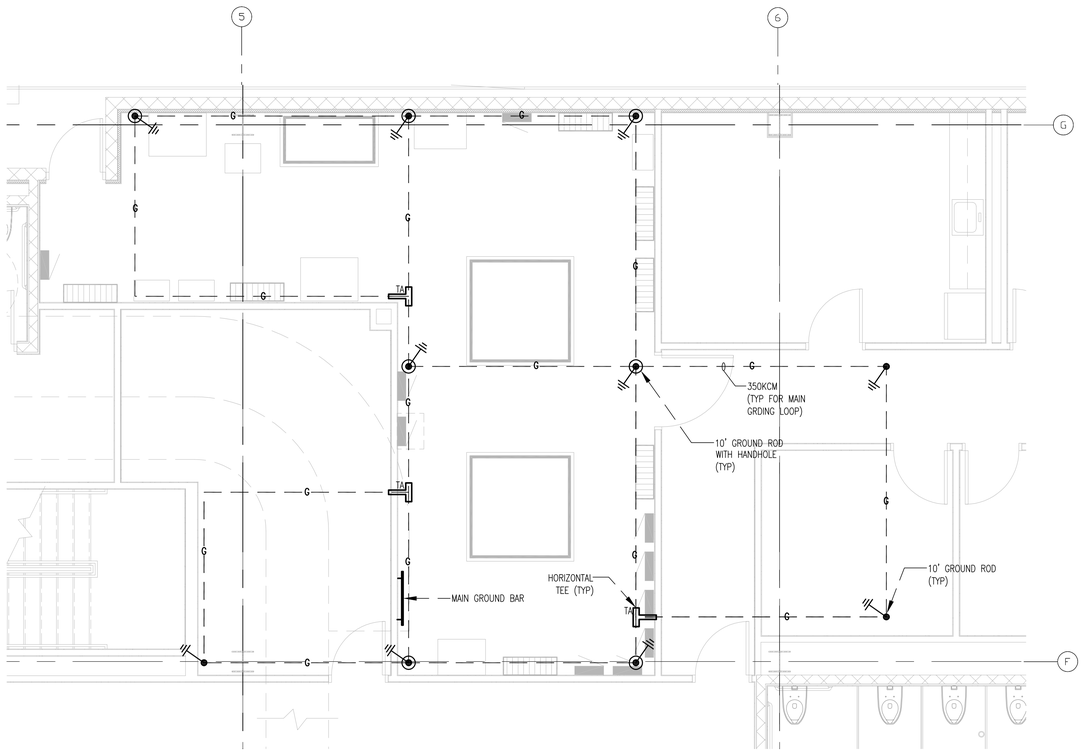
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SHEET TITLE
ENLARGED
EQUIPMENT ROOMS

SHEET NUMBER
E200

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E200.dwg Plotted on: 8/12/2010 2:06 PM Plotted by: Kastner, Jennifer



N

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

GROUNDING TABLE			
#	FROM	TO	GND 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	#8
5	MAIN GROUND BAR	ELEV. MACH RM 153 GRD BAR	#8
6	MAIN GROUND BAR	ELEV. MACH RM 143 GRD BAR	#8
8	MAIN GROUND BAR	GENERATOR	SEE RISER DIAGRAM ON DWG E300
9	MAIN GROUND BAR	FIRE PUMP	SEE RISER DIAGRAM ON DWG E300
10	MAIN GROUND BAR	MAIN TELEPHONE RM 151 ISOL. GRD BAR	#2
11	MAIN GROUND BAR	MAIN WATER SERVICE PIPE	#1/0
12	MAIN GROUND BAR	TRANSFORMERS IN MAIN ELEC RM 149	SEE RISER DIAGRAM ON DWG E300
13	MAIN GROUND BAR	2ND FLR COMM. RM 217 ISOL. GRD BAR	#2
14	MAIN GROUND BAR	2ND FLR COMP. RM 240 ISOL. GRD BAR	#2
15	MAIN GROUND BAR	2ND FLR TELECOM RM 204 ISOL. GRD BAR	#2
16	MAIN GROUND BAR	2ND FLR ELEC. RM 230 GRD BAR	#4
17	MAIN GROUND BAR	3RD FLR ELEC. RM 334 GRD BAR	#1/0
18	MAIN GROUND BAR	3RD FLR COMM. RM 313 ISOL. GRD BAR	#2
19	MAIN GROUND BAR	LIGHTNING PROTECTION SYSTEM	#1
20	MAIN GROUND BAR	LIGHTNING PROTECTION SYSTEM	#1
21	3RD FLR ELEC. RM 334 GRD BAR	SWBD "SB-3"	SEE RISER DIAGRAM ON DWG E300
22	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.
2. SIZE GROUND BARS (LENGTH) AS REQUIRED PER NUMBER OF CONNECTIONS.

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
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SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
E201

BUILDING
PERMIT

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1b) Electrical\Dwgs\2035_E201.dwg Plotted on: 8/12/2010 2:57 PM Plotted by: Kastner, Jennifer

KEYED NOTES:

1. MOTOR PROTECTOR WITH MAGNETIC TRIP THAT OPENS ON SHORT CIRCUIT ONLY. CIRCUIT BREAKER SHALL NOT HAVE THERMAL TRIP.
2. MULTIPLE METER UNIT CABINET FOR SUBMETERS. METER CABINET SHALL BE EMON TYPE "MMU24" OR APPROVED EQUAL. SEE PANEL SCHEDULES AND SPECIFICATION 16428 FOR ADDITIONAL SUBMETERING REQUIREMENTS.
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.
2. PULL NEW WIRE IN EXISTING EMPTY 2" CONDUIT TO EXISTING 100A, 480/277V PARKING LOT PANEL LOCATED IN PARKING LOT BOOTH. INCREASE FEEDER SIZE AS REQUIRED TO ACCOUNT FOR VOLTAGE DROP IF NECESSARY.

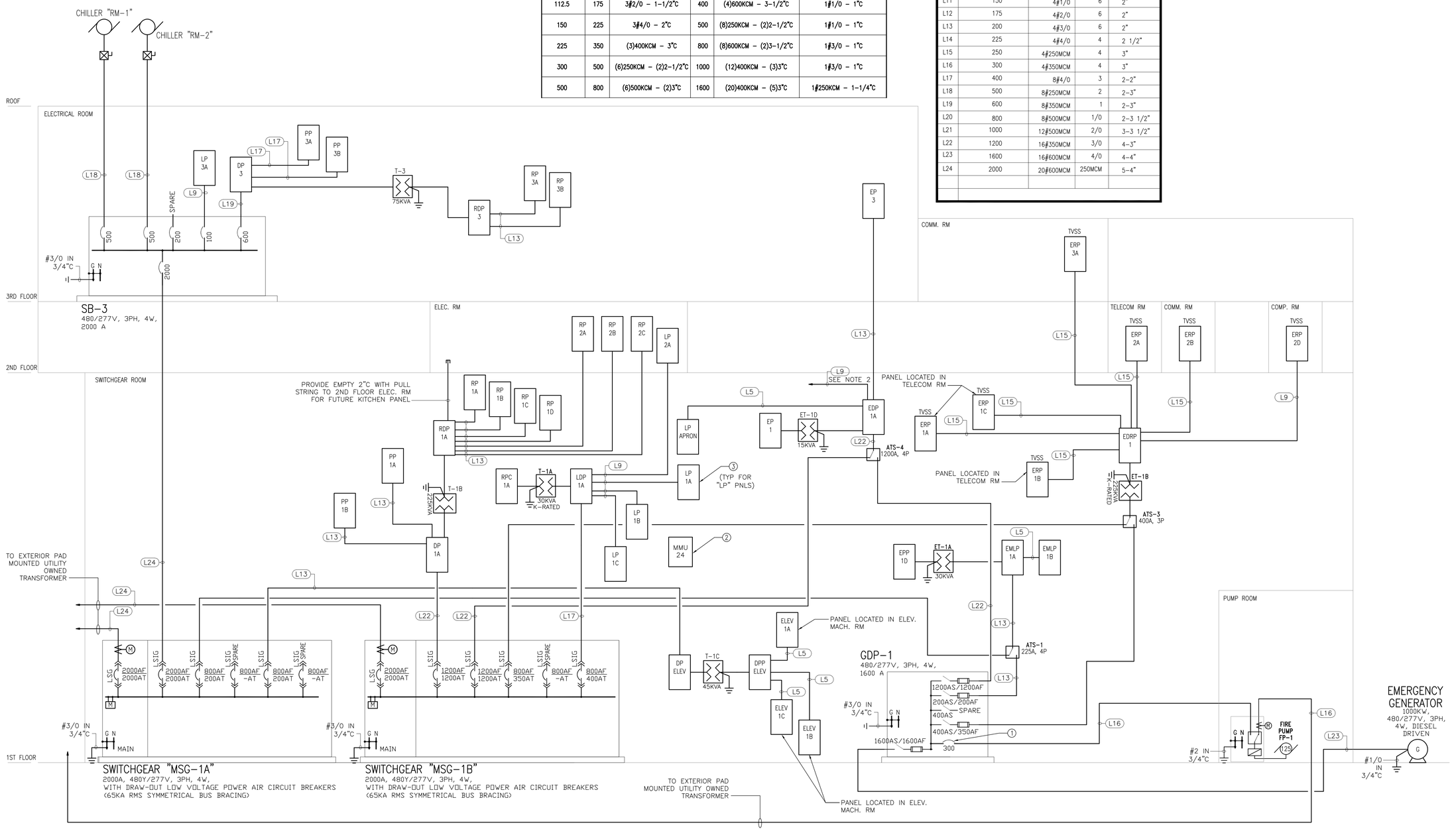
TABLE 3

TRANSFORMER SCHEDULE

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

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

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



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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

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
POWER RISER DIAGRAM

SHEET NUMBER
E300

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2008_E300.dwg Plotted on: 8/12/2010 2:05 PM Plotted by: Koelker, Jennifer

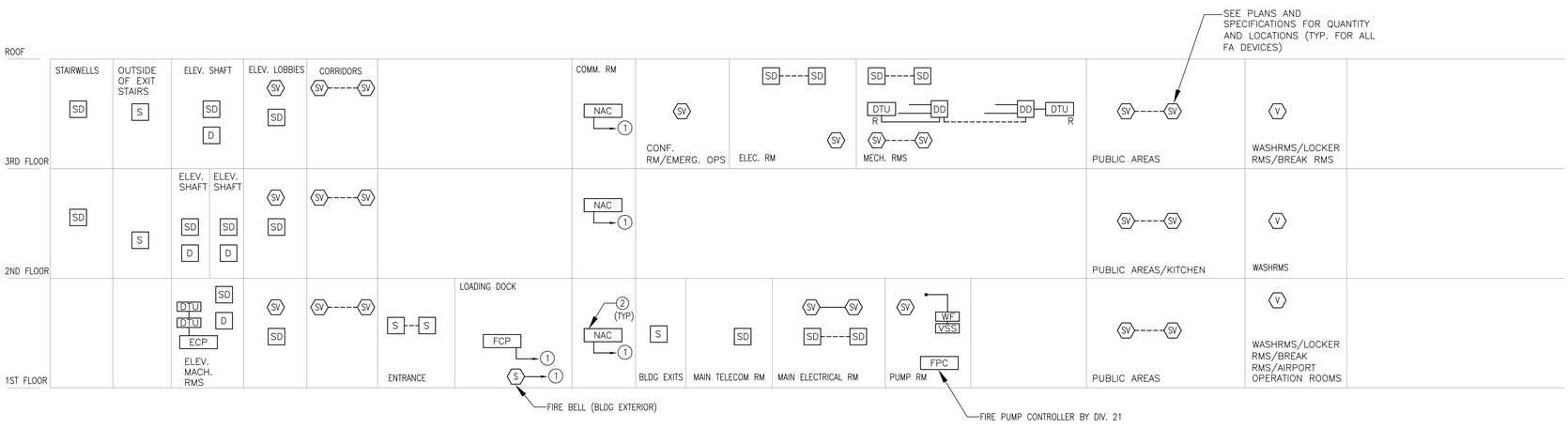
FA GENERAL NOTES:

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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Date: 08/16/10 Reg. No.: 21067

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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
FIRE ALARM AND GROUNDING RISER DIAGRAMS

SHEET NUMBER
E301

BUILDING PERMIT

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1b) Electrical\Dwgs\2035_E301.dwg Plotted on: 8/12/2010 2:05 PM Plotted by: Kastner, Jennifer

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
GRD	-	GROUND
H	-	HERMETIC
HC	-	HUNG CEILING
HGT	-	HEIGHT
HOR	-	HORIZONTAL
HP	-	HORSEPOWER
HT	-	HIGH TENSION
HTG	-	HEATING
HVAC	-	HEATING VENTILATING AND AIR CONDITIONING
IN	-	INCHES
INCAN	-	INCANDESCENT
INT	-	INTERCOM
JB	-	JUNCTION BOX
KVA	-	KILOVOLT AMPERES
KW	-	KILOWATT
KWH	-	KILOWATT HOURS
LP	-	LIGHTING PANEL
LS	-	LOUDSPEAKER
LT	-	LOW TENSION
LTG	-	LIGHTING
M	-	MAIN
MA	-	MILLIAMPS
MACH	-	MACHINE
MCC	-	MOTOR CONTROL CENTER
MCM	-	THOUSAND CIRCULAR MILS
MECH	-	MECHANICAL
MIC	-	MICROPHONE
MISC	-	MISCELLANEOUS
MTD	-	MOUNTED
MTR	-	MOTOR
N	-	NEUTRAL
NEC	-	NATIONAL ELECTRIC CODE
NEMA	-	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
NL	-	ON NIGHT LIGHTING CIRCUIT
OL	-	OVERLOAD
P	-	POLES
PB	-	PULL BOX
PC	-	PULL CHAIN
PF	-	POWER FACTOR
PG	-	PAGING
PH	-	PHASE
PLB	-	PLUMBING
PNL	-	PANEL
PP	-	POWER PANEL
PWR	-	POWER
RC	-	REMOTE CONTROL
REC	-	RECEPTACLE
REQ	-	REQUIRED
RM	-	ROOM
RMS	-	ROOT MEAN SQUARE
S	-	SOUND
SC	-	SQUIRREL CAGE
SO	-	SOUTH
SP	-	SPARE
SPECS	-	SPECIFICATIONS
SPKLR	-	SPRINKLER
SPKR	-	SPEAKER
SQ	-	SQUARE
STD	-	STANDARD
SURF	-	SURFACE
SW	-	SWITCH
SWBD	-	SWITCHBOARD
SYM	-	SYMETRICAL
TEL	-	TELEPHONE
TELCO	-	TELEPHONE CO.
TV	-	TELEVISION
TYP	-	TYPICAL
UFD	-	UNDER FLOOR DUCT
V	-	VOLTS
VENT	-	VENTILATING
VERT	-	VERTICAL
VP	-	VAPORPROOF
W	-	WATTS
WE	-	WEST
WGD	-	WITH GUARD
WP	-	WEATHERPROOF
WR	-	WOUND ROTOR
WT	-	WIRING TROUGH
XFMR	-	TRANSFORMER
YD	-	YARD
# (UNRELATED TO OTHER WORDS)	-	WIRE GAUGE NUMBER
Ø	-	PHASE
F@	-	FUSED AT
C	-	CENTER LINE
C/B	-	CIRCUIT BREAKER
CONV/O	-	CONVENIENCE OUTLET
C/T	-	CURRENT TRANSFORMER
P/T	-	POTENTIAL TRANSFORMER
O/C	-	OVERCURRENT
C/C	-	CENTER TO CENTER
N/O	-	NORMALLY OPEN
N/C	-	NORMALLY CLOSED
1/C,2/C 3/C	-	ONE CONDUCTOR TWO CONDUCTORS, ETC.

TABLE 1

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

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

TABLE 2

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

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

TABLE 3

480 VOLT MOTOR CONTROLLER / FEEDER / DEVICE SCHEDULE

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

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

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SHEET TITLE
ELECTRICAL ABBREVIATIONS AND TABLES

SHEET NUMBER
E400

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(24) Electrical\Dwgs\2008_E400.dwg Plotted on: 8/12/2010 2:09 PM Plotted by: Kastner, Jennifer

LIGHTING FIXTURE SCHEDULE (BACK OF HOUSE)

TYPE	SYMBOL	DESCRIPTION	MANUFACTUR. & CATALOG NO.	LAMPS QTY	LAMPS TYPE	FIXTURE TOTAL VA	VOLTAGE	MOUNTINGS: P–PENDANT R–RECESSED S–SURFACE	REMARKS
A		FLUORESCENT WRAPAROUND WITH HIGH IMPACT ACRYLIC LENS	COLUMBIA WC4–232–EU–DR OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	2	32W T8	60	277	P/S	
B		4', ENCLOSED, SURFACE OR PENDANT MOUNTED INDUSTRIAL T8 FLUORESCENT FIXTURE	LITHONIA CLM–232–277–GEB10IS OR APPROVED EQUAL BY COLUMBIA OR LIGHTOLIER	2	32W T8 PROVIDE GE SPX LAMP OR APPROVED EQUAL FOR FIXTURES IN CBIS RM 133	60	277	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	120	S	ELEVATOR PITS
D		FULL CUTOFF METAL HALIDE WALL PACK. WET LOCATION LISTED	HUBBELL LCC–50P8–* OR APPROVED EQUAL BY COLUMBIA OR LITHONIA *–FINISH BY ARCHITECT	1	50W MH	70	277	S	EXTERIOR (BACK OF HOUSE)
D–EM		SAME AS TYPE "D" WITH EGRESS LAMP SOCKET. PROVIDE 50W HALOGEN EGRESS LAMP.	HUBBELL LCC–50P8–* OR APPROVED EQUAL BY COLUMBIA OR LITHONIA *–FINISH BY ARCHITECT	1 1 EM LAMP	50W MH 50W MH	70 70	277	S	EXTERIOR (BACK OF HOUSE)
F		4' SURFACE MOUNTED FLUORESCENT WALL BRACKET WITH T8 LAMPS.	COLUMBIA W4–232–E120 OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	2	32W T8	60	277	S	STAIRWELL
G		2' SURFACE MOUNTED FLUORESCENT WALL BRACKET WITH T8 LAMPS.	COLUMBIA W2–217–EU OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	2	17W T8	30	277	S	
H		2'X4' SURFACE MOUNT FLUORESCENT HIGH ABUSE FIXTURE. 18–GAUGE CRS HOUSING AND LENS FRAME.	KENALL HASES124–3–32–IS–2–277–2F–2H–6 OR APPROVED EQUAL BY L.C. DOANE OR LIGHTOLIER	3	32W T8	90	277	S	
J		2'X4' SURFACE MOUNT FLUORESCENT FIXTURE.	COLUMBIA SM24–332–FSA12–EU OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	3	32W T8	90	277	S	
K		UNDERCABINET FLUORESCENT FIXTURE	LITHONIA N2S–32–277–GEB10IS OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	1	32W T8	30	277	S	
L		2'X4' SURFACE MOUNT FLUORESCENT FIXTURE.	COLUMBIA SM24–232–FSA12–EU OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	2	32W T8	60	277	S	
M		2'X4' GRID MOUNT, AIR HANDLING, 18–CELL PARABOLIC FLUORESCENT FIXTURE.	LITHONIA 2ES8P–A–232–277–BILP OR APPROVED EQUAL BY COLUMBIA OR LIGHTOLIER	2	32W T8	48	277	G	
N		5"X48" LINEAR FLUORESCENT FIXTURE WITH COLD FORMED, POLYCARBONATE LENS. CEILING (PENDANT) MOUNT.	KENALL TSH548–C–3–32–EB–1–277 AND SUP–XX–OAH OPTION FOR SUSPENSION OR APPROVED EQUAL BY L.C. DOANE OR LIGHTOLIER	3	32W T8	80	277	P	FIXTURE SHALL BE MOUNTED 11' AFF
N2		SAME AS FIXTURE "N", WITH COLD WEATHER BALLAST OPTION ADDED.	KENALL TSH548–C–3–32–EB–1–277 AND SUP–XX–OAH OPTION FOR SUSPENSION AND "CW" OPTION (COLD WEATHER BALLAST) OR APPROVED EQUAL BY L.C. DOANE OR LIGHTOLIER	3	32W T8	80	277	P	FIXTURE SHALL BE MOUNTED 11' AFF
P		2'X4' RECESSED MOUNT FLUORESCENT WITH ACRYLIC LENS	LITHONIA 2GT8–2–32–A12–277–GEB10IS OR APPROVED EQUAL BY LIGHTOLIER OR COLUMBIA	2	32W T8	58	277	S	
XA		EDGE LIT LED EXIT SIGN.	COOPER LIGHTING SURELITES EEX SERIES OR APPROVED EQUAL BY ALKCO OR DAYBRITE		LED	6 – SINGLE FACE 12 – DBL FACE	277	S	PUBLIC AREAS
XB		LED EXIT SIGN WITH STEEL HOUSING.	COOPER LIGHTING SURELITES SLX SERIES OR APPROVED EQUAL BY ALKCO OR DAYBRITE		LED	6 – SINGLE FACE 12 – DBL FACE	277	S	BACK OF HOUSE AREAS
XC	WP	WEATHERPROOF EXIT SIGN.	COOPER LIGHTING SURELITES UX7 SERIES OR APPROVED EQUAL BY ALKCO OR DAYBRITE		LED	6 – SINGLE FACE 12 – DBL FACE	277	S	EXTERIOR AREAS

GENERAL NOTES

1. SEE MANUFACTURER DATA 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 ADDITIONAL LIGHTING FIXTURES INCLUDING THOSE, BUT NOT LIMITED TO, SHOWN IN PUBLIC AREAS, EXTERIOR AND APRON.

Duluth New Terminal

Lighting Luminaire Schedule

Type	Description	Mounting	Lamps Qty	Lamps Type	Lamp Watts	Volts	Manufacturer	Model/Series Number
F1	Low Profile linear fluorescent 4' architectural strip fixture with integral ballast	Suspended/Recessed	1	F28T5	28	277	Bartco Lighting	MiT5–1T/28–28W–277
F1A	Low Profile linear fluorescent 4' architectural strip fixture with integral ballast	Suspended/Recessed	1	F54T5HO	54	277	Bartco Lighting	MiT5–1T/54–54W HO–277
F1C	Low Profile linear fluorescent 4' architectural strip fixture with integral ballast and opaque lens	Surface	1	F28T5	28	277	Bartco Lighting	MiT5–1T/28–28W –277–LNO
F1B	Low Profile linear fluorescent 2' architectural strip fixture with integral ballast.	Suspended/Recessed	1	F14T5	14	277	Bartco Lighting	MiT5–1T/14–14W –277
F2	Suspended Cylinder, two level metal halide, Down light	Suspended	1	50W MH	50	277	Kirlin Lighting	HSR–09095–50
F2A	Suspended Cylinder, two level metal halide, Down light	Suspended	1	70W MH	70	277	Kirlin Lighting	HSR–09095–70
F2C	Open Appearance square can light 6"X6"	Recessed	2	42W CFL	42	277	Kirlin Lighting	FRT–04092–77
F2D	Open Appearance square can light 6" X 6"	Recessed	1	42W CFL	42	277	Kirlin Lighting	FRS–06088–77
F2B	Suspended Cylinder, two level metal halide, Down light	Suspended	1	175W MH	175	277	Kirlin Lighting	HRS–12107–175
F2B–E	Same as type "F2B" but with quartz lamp included							
F2E	Open Appearance square can light 6" X 6"	Recessed	1	42W CFL	42	277	Kirlin Lighting	FRS–06088–39–77
F2F	Wall washer square can light 6" X 6"	Recessed	1	42W CFL	42	277	Kurt Versen Kirlin Lighting	H8653FM–SY FRS–06096–77
F3	Direct/indirect lay–in 2'x4' architectural lighting fixture.	Recessed	3	F28T5	28	277	Mark Arcitectural Lighting	MDLS 24 DF 3T5 EB
F3C	Direct/indirect lay–in 2'x4' architectural lighting fixture.	Recessed	2	F28T5	28	277	Focal Point Mark Arcitectural Lighting	FAR 24 AC 2 T5 E 277 WH MDLS 24 DF 2T5 EB
F3B	Direct/indirect asymmetric lay–in 2'x4' architectural lighting fixture w/ perforated side basket.	Recessed	2	F28T5	28	277	Focal Point	FBX 24 W 2 T5 E 277 PS WH
F4	Pendant, Indirect canopy lighting	Pendent	1	250W MH	250	277	Eliptipar	M152–250C
F5	Wall mounted security metal halide fixture	Surface	1	70W MH	70	277	Lithonia Lighting	WST 70M MD277 QRS
F6	Pole mounted metal halide fixture	Pole	1	1000W MH	1000	277	Sterner Infranor	876–1000MH–277V

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
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SHEET TITLE
LIGHTING FIXTURE SCHEDULE

SHEET NUMBER
E401

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.1) Electrical\Dwgs\2008_E401.dwg Plotted on: 8/12/2010 2:09 PM Plotted by: Keehn, Jennifer

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	
HT	HEAT TRACE CABLE	12 W/FT					277	1	2		SEE DETAIL 1 ON THIS DWG
EHD	ELECTRIC HAND DRYER	1.5					120	1	2	57	
EFV	120/24V TRANSFORMER FOR ELECTRIC FLUSH VALVE		.05				120	1	2	57	
EFCT	120/24V TRANSFORMER FOR ELECTRIC FAUCET		.05				120	1	2	57	
ESD	120/24V TRANSFORMER FOR ELECTRIC SOAP DISPENSOR		.05				120	1	2	57	
PAR1	MOTORIZED PARTITION WALL			1	16		208	3	3	58	
PAR2	MOTORIZED PARTITION WALL			3/4	13.8		208	3	3	58	

PROVIDE PIPE HEATER STRIP OF REQUIRED LENGTH, WITH ALL APPURTENANCES, AND IN ACCORDANCE WITH THE FOLLOWING FOR EACH SYMBOL SHOWN ON PLANS U.N.O.:

LEGEND OF EQUIPMENT DESIGNATION	ELECTRIC OUTPUT (AT 0°F)	RATED VOLTAGE	OPERATING TEMPERATURE	MAXIMUM SAFE LENGTH FOR 20A CB	HEATER STRIP	COMMENTS
	WATTS/FT	VOLTS	°F	FEET		
HT FREEZE PROTECTION	12	277	–40 TO 160	225	RAYCHEM "GM–2XT" ICE STOP CABLE OR APPROVED EQUAL	PROVIDE RAY CLIC–PC, GIT–1 GUTTER SENSOR, RC–SB–02 MOUNTING BRACKET AND (1) APS–4C/277 WITH GROUND FAULT PROTECTION

NOTES:

1. FURNISH AND INSTALL A COMPLETE UL LISTED, CSA CERTIFIED, AND FM APPROVED SYSTEM OF SPECIFIED HEATING CABLE, COMPONENTS, AND CONTROLS. COMPONENT ENCLOSURES SHALL MEET NEMA 4X REQUIREMENTS TO PREVENT WATER INGRESS AND CORROSION.
2. THE SYSTEM SHALL BE SUPPLIED WITH COMPLETE ATTACHMENT CLIPS.
3. THE SYSTEM SHALL BE CONTROLLED BY "GIT–1" GUTTER–MOUNTED SENSORS ALONG WITH A "APS" CONTROLLER.
4. THE HEATING CABLE SHALL BE PROTECTED FROM DAMAGE AND INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
5. AFTER INSTALLATION, THE DIELECTRIC JACKET'S INSULATION RESISTANCE FROM THE CONDUCTORS TO THE SHIELD SHALL BE GREATER THAN 1000 MEGAOHMS.
6. THE SYSTEM SHALL HAVE A COMPLETE 10–YEAR WARRANTY.

SPECIFICATION NOTES FOR ELECTRIC PIPE TRACING 1

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. NOT USED
56. BASEBOARD HEATER SHALL BE VULCAN SERIES "AF" OR APPROVED EQUAL. HEATER SHALL HAVE INTEGRAL THERMOSTAT WITH POSITIVE OFF. FINISH BY ARCHITECT.
57. CONFIRM POWER REQUIREMENTS/CONNECTION WITH MANUFACTURER OF EQUIPMENT INCLUDING QUANTITY OF 120V/LOW VOLTAGE TRANSFORMERS. COORDINATE LOCATION OF POWER CONNECTION WITH EQUIPMENT AND MANUFACTURER'S RECOMMENDATIONS.
58. CONFIRM POWER REQUIREMENTS/CONNECTION WITH MANUFACTURER OF EQUIPMENT. COORDINATE LOCATION OF POWER CONNECTION WITH EQUIPMENT AND MANUFACTURER'S RECOMMENDATIONS.

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ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\8.1 Electrical\Dwgs\2008_E402.dwg Plotted on: 8/12/2010 2:10 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. 1153.0 kVA
DEM. 1153.0 kVA
DEM. 1387.5 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	CB AF	CB AT	REMARKS
1	SWITCHBOARD "SB-3"	1024.0	1024.0	2000	2000	
2	"ATS-1" (EM LTG)	30.0	30.0	800	200	
3	SPARE			800		
4	PNL "DP-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. 1149.0 kVA
DEM. 1141.0 kVA
DEM. 1373.0 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	CB AF	CB AT	REMARKS
1	PNL "DP-1A"	329.0	321.0	1200	1200	
2	"ATS-4" (CRITICAL)	623.0	623.0	1200	1200	
3	"ATS-3" (CRITICAL)	77.0	77.0	800	350	
4	PNL "LDP-1A"	120.0	120.0	800	400	
5	SPARE			800		

SWBD DISTRIBUTION: GDP-1 W/TVSS

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

BUS SIZE: 1600A | LOAD: | NOTES:
MAIN DEVICE: 1600A | CONN. 890.0 kVA | SEE KEYED NOTE 1
DEM. 890.0 kVA | ON DWG E300
DEM. 1071.0 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A)		REMARKS
1	FIRE PUMP "FP-1"	130.0	130.0	300		CB - NOTE 1
2	"ATS-3" (CRITICAL)	77.0	77.0	400	350	SWITCH/FUSE
3	SPARE			400		SWITCH
4	"ATS-1" (EM LTG)	60.0	60.0	200	200	SWITCH/FUSE
5	"ATS-4" (HOUSE CRTCL)	623.0	623.0	1200	1200	SWITCH/FUSE

SWBD DISTRIBUTION: SB-3

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

BUS SIZE: 2000A | LOAD:
MAIN DEVICE: 2000A | CONN. 1024.0 kVA
DEM. 1024.0 kVA
DEM. 1232.3 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	SPARE			400	
4	SPARE			200	
5	PNL "LP-3A"	20.0	20.0	100	
6	PNL "DP-3"	318.0	318.0	600	

PANEL DISTRIBUTION: DP-1A

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

BUS SIZE: 1200A | LOAD: | NOTES
MAIN DEVICE: 1200A | CONN. 332.0 kVA | 1-PROVIDE EMON
DEM. 324.0 kVA | METER FOR CIRCUIT
DEM. 389.9 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PNL "PP-1B"	72.0	72.0	200		
2	XMFR "T-1B"	167.0	159.0	350		
3	PNL "PP-1A"	93.0	93.0	200		
4	SPARE (FUT. PC AIR)			150		
5	SPARE (FUT. PC AIR)			150		
6	SPARE (FUT. PC AIR)			150		
7	SPARE (FUT. LOAD SHED)			150		
8	SPARE (FUT. LOAD SHED)			150		
9	SPARE (FUT. LOAD SHED)			150		
10	SPARE			100		

PANEL DISTRIBUTION: DP-3

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

BUS SIZE: 600A | LOAD:
MAIN DEVICE: 600A | CONN. 327.0 kVA
DEM. 327.0 kVA
DEM. 393.5 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "PP-3A"	151.0	151.0	400		
2	PANEL "PP-3B"	139.0	139.0	400		
3	XMFR "T-3"	37.0	37.0	125		
4	SPARE			200		

PANEL DISTRIBUTION: DP-ELEV

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

BUS SIZE: 200A | LOAD:
MAIN DEVICE: 200A | CONN. 99.0 kVA
DEM. 99.0 kVA | 1 - CONFIRM OCP
DEM. 119.1 Amps | SIZE W/ELEV. MANUF.

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	ELEVATOR #112	28.0	28.0	60		NOTE 1
2	ELEVATOR #124	28.0	28.0	60		NOTE 1
3	ELEVATOR #105	28.0	28.0	60		NOTE 1
4	XMFR "T-1C"	15.0	15.0	70		

PANEL DISTRIBUTION: EDP-1A

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

BUS SIZE: 1200A | LOAD: | FUSIBLE SWITCH PNL
MAIN DEVICE: 1200A | CONN. 629.0 kVA | 1-CONFIRM OCP
DEM. 629.0 kVA | SIZE W/MANUF.
DEM. 756.9 Amps | 2-PROVIDE EMON METER

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	DEVICES (A) FUSE	REMARKS
1	PNL "LP-APRON"	29.0	29.0	60	60	
2	PNL "EP-3"	35.0	35.0	200	200	
3	BAGGAGE SYS-INBND	166.0	166.0	300	300	NOTE 1
4	BAGGAGE SYS-OUTBND	172.0	172.0	300	300	NOTE 1
5	SPARE (FUT. BAG. SYS)			60		
6	SUMP PUMP "SP-1"	23.0	23.0	60	60	NOTE 1
7	PASSENGER BRIDGE	33.0	33.0	60	60	NOTES 1,2
8	PASSENGER BRIDGE	33.0	33.0	60	60	NOTES 1,2
9	PASSENGER BRIDGE	33.0	33.0	60	60	NOTES 1,2
10	PASSENGER BRIDGE	33.0	33.0	60	60	NOTES 1,2
11	JOCKEY PUMP "JP-1"	12.0	12.0	30	20	NOTE 1
12	PNL "P-PL" (PRKING LOTS)	60.0	60.0	100	100	

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

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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

BUILDING
PERMIT

Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2008_E403.dwg Plotted on: 8/12/2010 2:11 PM Plotted by: Kastner, Jennifer

PANELBOARD: PP–1A

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

BUS SIZE: 200A | MAIN DEVICE: 200A | LOAD: CONN. 90.4 kVA, DEM. 90.4 kVA, DEM. 108.8 Amps | NOTES: CIRCUIT BREAKER PANEL; 1–VERIFY OCP DEVICE SIZE PER MANUFACTURER'S REQ.

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				4,000	4,000					8
9	30/3	1	OH DOOR– W. RAMP		4,000	4,000	OH DOOR–E. RAMP	1	30/3	10
11						4,000	4,000			12
13				4,000	4,000					14
15	30/3	1	OH DOOR– W. RAMP		4,000	4,000	OH DOOR–E. RAMP	1	30/3	16
17						4,000	4,000			18
19				5,543			SPARE		20/1	20
21	30/3		HSE PMP "HP–1"		5,543		SPARE		20/1	22
23						5,543			20/1	24
25				831			SPARE		20/1	26
27	15/3	1	OH DOOR–SEC. XRAY		831		SPARE		20/1	28
29						831			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:				18,254	11,880	18,254	11,880	18,254	11,880	

PANELBOARD: PP–1B

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

BUS SIZE: 200A | MAIN DEVICE: 200A | LOAD: CONN. 92.9 kVA, DEM. 92.9 kVA, DEM. 111.8 Amps | NOTES: CIRCUIT BREAKER PANEL; 1–VERIFY OCP DEVICE SIZE PER MANUFACTURER'S REQ.

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	NOTES	TRIP/ POLE	CKT #
1				6,000	6,000					2
3	30/3	1	PASSENGER BRIDGE		6,000	6,000	PASSENGER BRIDGE	1	30/3	4
5			BAG LIFT			6,000	6,000	BAG LIFT		6
7				6,000	6,000					8
9	30/3	1	PASSENGER BRIDGE		6,000	6,000	PASSENGER BRIDGE	1	30/3	10
11			BAG LIFT			6,000	6,000	BAG LIFT		12
13				3,021	1,774					14
15	20/3		CU–1.2 (TUG TNL)		3,021	1,774	CU–1.1 (TUG TNL)		15/3	16
17						3,021	1,774			18
19				388	1,774					20
21	15/3		AC–1.3 (COMM. RM)		388	1,774	CU–1.3 (TUG TNL)		15/3	22
23						388	1,774			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:				15,409	15,548	15,409	15,548	15,409	15,548	

PANELBOARD: PP–3A

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

BUS SIZE: 400A | MAIN DEVICE: 400A | LOAD: CONN. 151.4 kVA, DEM. 151.4 kVA, DEM. 182.2 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				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	3,021					8
9	40/3		PUMP "P–2"		5,820	3,021	CU–2.1 (ROOF)		20/3	10
11						5,820	3,021			12
13				5,820	0					14
15	40/3		AHU–1		5,820	0	SPARE		30/3	16
17						5,820	0			18
19				3,048	0					20
21	20/3		REF–1		3,048	0	SPARE		30/3	22
23						3,048	0			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	11,113	39,352	11,113	39,352	11,113	

PANELBOARD: PP–3B

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

BUS SIZE: 400A | MAIN DEVICE: 400A | LOAD: CONN. 150.4 kVA, DEM. 150.4 kVA, DEM. 180.9 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				776	3,021					2
3	15/3		AC–3.1 (COMM. RM)		776	3,021	CU–3.1 (ROOF)		20/3	4
5						776	3,021			6
7				5,820	0					8
9	40/3		AHU–5		5,820	0	SPARE		20/3	10
11						5,820	0			12
13				3,048	21,339					14
15	20/3		REF–5		3,048	21,339	AHU–2		110/3	16
17						3,048	21,339			18
19				0	9,422					20
21	20/3		SPARE		0	9,422	REF–2		70/3	22
23						0	9,422			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		FPB–3.10			1,413	360	FPB–2.2	15/1	36
37	15/1		FPB–3.11	1,413			SPARE		20/1	38
39	20/1		SPARE			804		HT TRACE–GUTTER	20/1	40
41	20/1		SPARE				804	HT TRACE–GUTTER	20/1	42
TOTAL CONNECTED LOADS:				15,018	35,500	12,470	37,412	12,470	37,494	

PANELBOARD: EP–3

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

BUS SIZE: 200A | MAIN DEVICE: 200A | LOAD: CONN. 33.9 kVA, DEM. 33.9 kVA, DEM. 40.8 Amps | NOTES: FUSIBLE SWITCH PANEL

CKT #	SW/FUSE POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	SW/FUSE POLE	CKT #
1			0	831				2
3	30AS/30AF	SPARE		0	831	PUMP "P–7"	30AS/15AF	4
5	3P				0	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	0				38
39	30AS/	SPARE		0	0	SPARE	30AS/	40
41	3P				0	0	3P	42
TOTAL CONNECTED LOADS:			8,702	2,604	8,702	2,604	8,702	2,604

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

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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

BUILDING PERMIT

Drawing: I:\2010.00 Duluth Airport\5.0 CADD\Dgn\Electrical\Dwgs\2010_E404.dwg Plotted on: 8/12/2010 2:12 PM Plotted by: Kastner, Jennifer

PANEL DISTRIBUTION: DPP–ELEV

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

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

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

PANEL DISTRIBUTION: EDRP–1 W/TVSS

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

BUS SIZE: 800A | LOAD: | NOTES:
MAIN DEVICE: 800A | CONN. 77.0 kVA | FUSIBLE SWITCH PNL
DEM. 77.0 kVA
DEM. 213.9 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	FUSE	REMARKS
1	PANEL "ERP–1A"	6.0	6.0	400	250	
2	PANEL "ERP–1B"	8.0	8.0	400	250	
3	PANEL "ERP–1C"	26.0	26.0	400	250	
4	PANEL "ERP–2A"	8.0	8.0	400	250	
5	PANEL "ERP–2B"	18.0	18.0	400	250	
6	PANEL "ERP–2D"	3.0	3.0	100	100	
7	PANEL "ERP–3A"	8.0	8.0	400	250	
8	SPARE			60		

PANEL DISTRIBUTION: RDP–1A

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

BUS SIZE: 800A | LOAD: | NOTES:
MAIN DEVICE: 800A | CONN. 167.0 kVA | CIRCUIT BREAKER PNL
DEM. 159.0 kVA
DEM. 441.7 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "RP–1A"	22.0	22.0	200		
2	PANEL "RP–1B"	26.0	26.0	200		
3	PANEL "RP–1C"	20.0	20.0	200		
4	PANEL "RP–1D"	30.0	22.0	200		
5	PANEL "RP–2A"	23.0	23.0	200		
6	PANEL "RP–2B"	31.0	31.0	200		
7	SPARE (FUT. KIT. PNL)			200		
8	SPARE			200		
9	PANEL "RP–2C"	15.0	15.0	200		

PANEL DISTRIBUTION: RDP–3

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

BUS SIZE: 250A | LOAD: | NOTES:
MAIN DEVICE: 250A | CONN. 37.0 kVA | CIRCUIT BREAKER PNL
DEM. 37.0 kVA
DEM. 102.8 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "RP–3A"	22.0	22.0	200		
2	PANEL "RP–3B"	15.0	15.0	200		
3	SPARE			200		

PANEL DISTRIBUTION: LDP–1A

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

BUS SIZE: 400A | LOAD: | NOTES
MAIN DEVICE: 400A | CONN. 7.0 kVA
DEM. 7.0 kVA
DEM. 8.4 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	XMFR "T–1A"	7.0	7.0	50		
2	PNL "LP–1A"			100		
3	PNL "LP–1B"			100		
4	PNL "LP–1C"			100		
5	PNL "LP–2A"			100		
6	SPARE			100		

PANELBOARD: LP–APRON

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

BUS SIZE: 60A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 60A | CONN. 26.4 kVA
DEM. 26.4 kVA
DEM. 31.8 Amps

CKT #	TRIP/POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	NOTES	TRIP/POLE	CKT #
1	20/1		LTG–APRON	2,200	2,200		LTG–APRON		20/1	2
3	20/1		LTG–APRON		2,200	2,200	LTG–APRON		20/1	4
5	20/1		LTG–APRON			2,200	2,200	LTG–APRON		20/1	6
7	20/1		LTG–APRON	2,200	2,200		LTG–APRON		20/1	8
9	20/1		LTG–APRON		2,200	2,200	LTG–APRON		20/1	10
11	20/1		LTG–APRON			2,200	2,200	LTG–APRON		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
TOTAL CONNECTED LOADS:				4,400	4,400	4,400	4,400	4,400	4,400		

PANELBOARD: LP–1A

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

BUS SIZE: 100A | LOAD: | NOTES: CIRCUIT BREAKER PANEL
MAIN DEVICE: 100A | CONN. 0.0 kVA
DEM. 0.0 kVA
DEM. 0.0 Amps

CKT #	TRIP/POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	NOTES	TRIP/POLE	CKT #
1	20/1		SPARE				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				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:				0	0	0	0	0	0		

GENERAL NOTES:

1. PANEL "LP–1A" IS TYPICAL FOR PANELS "LP–1B", "LP–1C", "LP–2A" AND "LP–3A".

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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11 E Superior Street Se 340, Duluth MN 55802
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Landscaping Consultants:
APPOLD DESIGN
2432 East First Street, Duluth MN 55812
TEL: (218) 591-5079

ENGINEER CERTIFICATION
I hereby certify that the engineeringg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E405

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E405.dwg Plotted on: 8/12/2010 2:13 PM Plotted by: Kastner, Jennifer

PANELBOARD: RP–1A

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

BUS SIZE: 225A | LOAD: CONN. 21.8 kVA, DEM. 21.8 kVA, DEM. 60.6 Amps | NOTES: CIRCUIT BREAKER PANEL; 1 – CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER

MAIN DEVICE: 200A

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	540		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)			540 720	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 1,500	WASHRM–ELEC DRYER	1	20/1	18
19	20/1		REC–ROVER	360	1,500		WASHRM–ELEC DRYER	1	20/1	20
21	20/1		REC–ROVER		540	360	REC–OFFICE		20/1	22
23	20/1		SPARE			0 1,000	REC–SIGNAGE		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		GARBAGE DISPOSAL			1,200 0	SPARE		20/1	30
31	20/1		REFRIGERATOR	1,200	0		SPARE		20/1	32
33	20/1		MICROWAVE		1,200	0	SPARE		20/1	34
35	20/1		REC–BREAK RM			180 0	SPARE		20/1	36
37	20/1		REC–BREAK RM	540	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:				4,236	2,760	4,887 2,591	2,739 4,591			

PANELBOARD: RP–1B

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

BUS SIZE: 225A | LOAD: CONN. 25.6 kVA, DEM. 25.6 kVA, DEM. 71.1 Amps | NOTES: CIRCUIT BREAKER PANEL; 1 – CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER

MAIN DEVICE: 200A

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–BAG RM		20/1	6
7	15/1		"UH–1.8"	528	200		ELEC FCT/SP DISP, FLR	1	20/1	8
9	15/1		"UH–1.9"		528	0	SPARE		20/1	10
11	15/1		"CUH–1.2"			528 0	SPARE		20/1	12
13	20/1		REC–ELEC RM	360	0		SPARE		20/1	14
15	20/1		REC–TELECOM		360	0	SPARE		20/1	16
17	20/1		REC–GENERAL			900 0	SPARE		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 0	SPARE		15/1	30
31	20/1		REC–RAC 1	360	720		REC–ETD		20/1	32
33	20/1		REC–RAC 2		360	1,500	WASHRM–ELEC DRYER	1	20/1	34
35	20/1		REC–RAC 3			360 1,500	WASHRM–ELEC DRYER	1	20/1	36
37	20/1		REC–RAC 4	360	1,500		WASHRM–ELEC DRYER	1	20/1	38
39	20/1		REC–RAC 5		360	1,500	WASHRM–ELEC DRYER	1	20/1	40
41	20/1		SPARE			0 1,500	WASHRM–ELEC DRYER	1	20/1	42
TOTAL CONNECTED LOADS:				3,876	4,028	4,056 5,328	4,236 4,080			

PANELBOARD: RP–1C

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

BUS SIZE: 225A | LOAD: CONN. 19.9 kVA, DEM. 19.9 kVA, DEM. 55.2 Amps | NOTES: CIRCUIT BREAKER PANEL; 1 – CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER

MAIN DEVICE: 200A

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	360		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–BAG RM			360 1,500	WASHRM–ELEC DRYER	1	20/1	24
25	20/1		REC–OFFICE/OPS (AIR 1)	720	1,500		WASHRM–ELEC DRYER	1	20/1	26
27	20/1		REC–OFFICE/OPS (AIR 2)		720	1,000	REC–SCALE		20/1	28
29	20/1		REC–OPS			900 750	REC–SCALE		20/1	30
31	20/1		SPARE		360		REC–EXTERIOR (GEN)		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	3,804	3,171 3,595	2,451 4,149			

PANELBOARD: RP–2A

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

BUS SIZE: 225A | LOAD: CONN. 25.4 kVA, DEM. 25.4 kVA, DEM. 70.5 Amps | NOTES: CIRCUIT BREAKER PANEL; 1 – CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER

MAIN DEVICE: 200A

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	0		SPARE		20/1	2
3	20/1	1	WASHRM–ELEC DRYER		1,500	500	REC–CONCRSE COUNTER		20/1	4
5	20/1	1	WASHRM–ELEC DRYER			1,500 0	SPARE		20/1	6
7	20/1	1	WASHRM–ELEC DRYER	1,500	540		REC–GENERAL		20/1	8
9	20/1	1	WASHRM–ELEC DRYER		1,500	360	REC–WASHRMS		20/1	10
11	20/1	1	WASHRM–ELEC DRYER			1,500 360	REC–OFFICE (GEN)		20/1	12
13	20/1	1	WASHRM–ELEC DRYER	1,500	1,080		REC–GENERAL		20/1	14
15	20/1	1	WASHRM–ELEC DRYER		1,500	360	REC–GENERAL		20/1	16
17	20/1	1	WASHRM–ELEC DRYER			1,500 0	SPARE		20/1	18
19	20/1		SPARE	0	900		REC–INTERNAT. (GEN)		20/1	20
21	20/1		REC–GENERAL		540	500	REC–PROC. BOOTH		20/1	22
23	20/1		REC–WASHRMS			360 500	REC–PROC. BOOTH		20/1	24
25	20/1		SPARE	0	1,200		VENDING MACH.		20/1	26
27	20/1		REC–CONCRSE (GEN)		900	1,200	VENDING MACH.		20/1	28
29	20/1		SPARE			0 1,200	VENDING MACH.		20/1	30
31	20/1		SPARE	0	0		SPARE		20/1	32
33	15/1		"CUH–2.1"		528	0	SPARE		20/1	34
35	20/1		REC–OFFICE			720 360	REC–WASHRMS		20/1	36
37	20/1		REC–ROVER	720	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:				4,260	3,720	6,468 2,920	5,580 2,420			

PANELBOARD: RP–2B

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

BUS SIZE: 225A | LOAD: CONN. 18.8 kVA, DEM. 18.8 kVA, DEM. 52.2 Amps | NOTES: CIRCUIT BREAKER PANEL; 1–VERIFY OCP DEVICE SIZE PER MANUFACTURER'S REQ.

MAIN DEVICE: 200A

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC–CHECK IN	360	720		REC–GENERAL		20/1	2
3	20/1		REC–GENERAL		540	360	REC–WASHRMS		20/1	4
5	20/1		REC–TSA (GEN)			720 0	SPARE		20/1	6
7	20/1		REC–GENERAL	540	0		SPARE		20/1	8
9	20/1		SPARE		0	720	REC–GENERAL		20/1	10
11	20/1		REC–TSA QUEUE			500 500	REC–CONCRSE COUNTER		20/1	12
13				672	500		REC–CONCRSE COUNTER		20/1	14
15	15/3		AC–2.1 (COMM. RM)		672	1,440	REC–GENERAL		20/1	16
17						672 510	GRILLE–TSA	1	15/2	18
19	20/1		SPARE	0	510					20
21	20/1		SPARE		0	831				22
23	20/1		REC–ELEC RM			360 831	GRILLE–TSA	1	15/3	24
25	20/1		SPARE	0	831					26
27	20/1		SPARE		0	1,500	WASHRM–ELEC DRYER	1	20/1	28
29	20/1		SPARE			0 1,500	WASHRM–ELEC DRYER	1	20/1	30
31	20/1		SPARE	0	1,500		WASHRM–ELEC DRYER	1	20/1	32
33	20/1		SPARE		0	1,500	WASHRM–ELEC DRYER	1	20/1	34
35	20/1		SPARE			0	SPARE		20/1	36
37	20/1		SPARE	0			SPARE		20/1	38
39	20/1		SPARE		0		SPARE		20/1	40
41	20/1		SPARE			0	SPARE		20/1	42
TOTAL CONNECTED LOADS:				1,572	4,061	1,212 6,351	2,252 3,341			

PANELBOARD: RP–1D

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

BUS SIZE: 225A | LOAD: CONN. 36.0 kVA, DEM. 27.8 kVA, DEM. 77.1 Amps | NOTES: CIRCUIT BREAKER PANEL; 1–PROVIDE EMON METER FOR CIRCUIT; 1–VERIFY OCP SIZE PER MANUFACTURER'S REQUIREMENTS

MAIN DEVICE: 200A

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			GRD SERVICE EQUIP.			2,000	2,000 GRD SERVICE EQUIP.			6
7				2,000	2,000					8
9	30/3		REC–PSGR BRIDGE		2,000	2,000	REC–PSGR BRIDGE		30/3	10
11			GRD SERVICE EQUIP.			2,000	2,000 GRD SERVICE EQUIP.			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	15/2	2	SHUTTER–ETD RM		510	510	SHUTTER–ETD RM	2	15/2	22
23						510 510				24
25	15/2	2	SHUTTER–ETD RM	510	510		OH DOOR–LDING DOCK	2	15/2	26
27					510	510				28
29	20/1	1	REC–ELEC. CART			180 1,920				30
31	20/1	1	REC–ELEC. CART	180	1,920		PARTITION WALL	2	20/3	32
33	20/1	1	REC–ELEC. CART		180	1,920				34
35	20/1	1	REC–ELEC. CART			180	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:				5,050	6,790	5,380 7,120	5,050 6,610			

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

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

BUS SIZE: 100A | LOAD: CONN. 6.6 kVA, DEM. 6.6 kVA, DEM. 18.4 Amps | NOTES: CIRCUIT BREAKER PANEL

MAIN DEVICE: 100A

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC–FIDS CHECK IN	600	1,000		REC–TVS, FLR 2		20/1	2
3	20/1		REC–FIDS BAG/TNL		440	1,000	REC–TVS, FLR 2		20/1	4
5	20/1		REC–FIDS FLR 2W			800 1,000	REC–TVS, FLR 2		20/1	6
7	20/1		REC–FIDS FLR 2E	800	1,000		REC–TVS, FLR 2		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			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:				1,400	2,000	440 1,000	800 1,000			

PANELBOARD: RP–2C

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

BUS SIZE: 225A | LOAD: CONN. 22.6 kVA, DEM. 22.6 kVA, DEM. 62.7 Amps | NOTES: CIRCUIT BREAKER PANEL; 1 – CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER

MAIN DEVICE: 200A

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC–GENERAL	900	540		REC–TSA GENERAL		20/1	2
3	20/1		REC–GENERAL		720	720	REC–OFFICES		20/1	4
5	20/1		REC–CHECK IN			360 1,500	WASHRM–ELEC DRYER	1	20/1	6
7	20/1		REC–CHECK IN	360	1,500		WASHRM–ELEC DRYER	1	20/1	8
9	20/1		REC–GENERAL		1,080	1,500	WASHRM–ELEC DRYER	1	20/1	10
11	20/1		REC–WASHRM			540 1,500	WASHRM–ELEC DRYER	1	20/1	12
13	20/1		REC–CONF RM	360	1,500		WASHRM–ELEC DRYER	1	20/1	14
15	20/1		REC–OFFICE		360	200	ELEC FCT/SP DISP, FLR	2	20/1	16
17	20/1		REC–GENERAL			360 1,657				18
19	20/1		VENDING MACH.	1,200	1,657		PARTITION WALL	1	20/3	20
21	20/1		VENDING MACH.		1,200	1,657				22
23	20/1		VENDING MACH.			1,200	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:				2,820	5,197	3,360 4,077	2,460 4,657			

RS&H
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TEL: (218) 591-5079

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E406

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2008_E406.dwg Plotted on: 8/12/2010 2:13 PM Plotted by: Kastner, Jennifer

PANELBOARD: ELEV–1A

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

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 3.0 kVA, DEM. 3.0 kVA, DEM. 8.3 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	20/1		ELEV. #112 CAB LIGHTS	250	1,000		ELEV. #112 CONTROLLER		20/1	2
3	20/1		ELEV. MACH RM REC.		180	528	CUH–1.1		20/1	4
5	20/1		ELEV. RM SECURITY			500 528	EF–1.4		20/1	6
7	20/1		SPARE	0	0		SPARE		20/1	8
9	20/1		SPARE		0	0	SPARE		20/1	10
11	20/1		SPARE			0 0	SPARE		20/1	12
13	20/1		SPARE	0	0		SPARE		20/1	14
15	20/1		SPARE		0	0	SPARE		20/1	16
17	20/1		SPARE			0 0	SPARE		20/1	18
TOTAL CONNECTED LOADS:				250	1,000	180 528 500 528				

PANELBOARD: ELEV–1B

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

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 3.9 kVA, DEM. 3.9 kVA, DEM. 11.0 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	20/1		ELEV. #124 CAB LIGHTS	250	1,000		ELEV. #124 CONTROLLER		20/1	2
3	20/1		ELEV. MACH RM REC.		180	672				4
5	20/1		ELEV. RM SECURITY			500 672	AC–1.2		15/3	6
7	20/1		SPARE	0	672					8
9	20/1		SPARE		0	0	SPARE		20/1	10
11	20/1		SPARE			0 0	SPARE		20/1	12
13	20/1		SPARE	0	0		SPARE		20/1	14
15	20/1		SPARE		0	0	SPARE		20/1	16
17	20/1		SPARE			0 0	SPARE		20/1	18
TOTAL CONNECTED LOADS:				250	1,672	180 672 500 672				

PANELBOARD: ELEV–1C

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

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 2.9 kVA, DEM. 2.9 kVA, DEM. 8.2 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	20/1		ELEV. #105 CAB LIGHTS	250	1,000		ELEV. #105 CONTROLLER		20/1	2
3	20/1		ELEV. MACH RM REC.		180	336				4
5	20/1		ELEV. RM SECURITY			500 336	AC–1.1		15/3	6
7	20/1		SPARE	0	336					8
9	20/1		SPARE		0	0	SPARE		20/1	10
11	20/1		SPARE			0 0	SPARE		20/1	12
13	20/1		SPARE	0	0		SPARE		20/1	14
15	20/1		SPARE		0	0	SPARE		20/1	16
17	20/1		SPARE			0 0	SPARE		20/1	18
TOTAL CONNECTED LOADS:				250	1,336	180 336 500 336				

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

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

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 6.0 kVA, DEM. 6.0 kVA, DEM. 16.7 Amps | NOTES: CIRCUIT BREAKER PANEL; 1–PROVIDE EMON METER FOR CIRCUIT

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC–XRAY PODIUM	750	500		FIRE BELL		20/1	2
3	20/1		REC–CASHIER		250	0	SPARE		20/1	4
5	20/1		SPARE			0 0	SPARE		20/1	6
7	20/1		SPARE	0	0		SPARE		20/1	8
9	20/1		REC COMP–OFFICE		250	0	SPARE		20/1	10
11	20/1		REC–INTERVIEW			250 0	SPARE		20/1	12
13	20/1		REC–ADIT RM	250	0		SPARE		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:				1,750	1,000	1,500 250 1,000 500				

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

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

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 7.6 kVA, DEM. 7.6 kVA, DEM. 21.1 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC–OFFICE	250	250		REC–COMM. RM		20/1	2
3	20/1		SPARE		0	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–OFFICE		250	250	REC–COMM. RM		20/1	10
11	20/1		REC–OPS			500 250	REC–COMM. RM		20/1	12
13	20/1		REC–RAC 1	750	250		REC–COMM. RM		20/1	14
15	20/1		REC–RAC 2		750	250	REC–COMM. RM		20/1	16
17	20/1		REC–RAC 3			750 0	SPARE		20/1	18
19	20/1		BAG VIEW STAT.	500	0		SPARE		20/1	20
21	20/1		FIELD DATA RECORD.		500	180	REC–RAC 4		20/1	22
23	20/1		SPARE			0 180	REC–RAC 5		20/1	24
25	20/1		SPARE	0	500		REC–EDT WRKSTAT.		20/1	26
27	20/1		SPARE		0	500	REC–EDT WRKSTAT.		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:				1,500	1,250	1,500 1,430 1,250 680				

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

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

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 26.2 kVA, DEM. 26.2 kVA, DEM. 72.6 Amps | NOTES: CIRCUIT BREAKER PANEL; 1–PROVIDE EMON METER FOR CIRCUIT

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.			2,400 250	REC–CHECK IN CNTR		20/1	6
7				2,400	250		REC–CHECK IN CNTR		20/1	8
9	20/1		SPARE		0	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		750	250	REC–CHECK IN CNTR		20/1	16
17	20/1		REC–OPS			500 250	REC–CHECK IN CNTR		20/1	18
19	20/1		REC–OFFICE	750	1,000		REC–CHECK IN		20/1	20
21	20/1		REC–OPS		500	1,000	REC–CHECK IN		20/1	22
23	20/1		REC–OPS			500 1,000	REC–CHECK IN		20/1	24
25	20/1		REC–OPS	500	500		REC–ATM MACH.		20/1	26
27	20/1		REC–OPS		500	250	REC–CHECK IN CNTR		20/1	28
29	20/1		REC–OPS			500 0	SPARE		20/1	30
31	20/1		REC–OPS	500	0		SPARE		20/1	32
33	20/1		REC–OPS		500	0	SPARE		20/1	34
35	20/1		REC–OFFICE			750 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:				6,550	4,400	4,650 4,150 4,650 1,750				

PANELBOARD: EPP–1D

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

BUS SIZE: 100A | MAIN DEVICE: 100A | LOAD: CONN. 4.1 kVA, DEM. 4.1 kVA, DEM. 11.3 Amps | NOTES: PLUG FUSE PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		FIRE BELL	500			SPARE		20/1	2
3	20/1		ACCESS CNRL–FLR 1		910		SPARE		20/1	4
5	20/1		ACCESS CNRL–FLR 1			490	SPARE		20/1	6
7	20/1		ACCESS CNRL–FLR 2	1,120			SPARE		20/1	8
9	20/1		ACCESS CNRL–FLR 2		280		SPARE		20/1	10
11	20/1		ACCESS CNRL–FLR 3			770	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:				1,620	0	1,190 0 1,260 0				

PANELBOARD: EMLP–1A

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

BUS SIZE: 200A | MAIN DEVICE: 200A | LOAD: CONN. 0.0 kVA, DEM. 0.0 kVA, DEM. 0.0 Amps | NOTES: FUSE PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		SPARE				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				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				0	0					38
39	60AS/60AF		PNL "EMLP–1B"			0 0	XMFR "ET–1A"	60AS/50AF		40
41	3P					0 0		3P		42
TOTAL CONNECTED LOADS:				0	0	0 0 0 0				

PANELBOARD: EMLP–1B

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

BUS SIZE: 60A | MAIN DEVICE: 60A | LOAD: CONN. 0.0 kVA, DEM. 0.0 kVA, DEM. 0.0 Amps | NOTES: FUSE PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		SPARE				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				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	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:				0	0	0 0 0 0				

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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11 E Superior Street Se 340, Duluth MN 55802
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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

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E407

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.1) Electrical\Dwgs\2008_E407.dwg Plotted on: 8/13/2010 2:14 PM Plotted by: Kestler, Jennifer

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

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

BUS SIZE: 250A | MAIN DEVICE: 250A | LOAD: CONN. 8.2 kVA, DEM. 8.2 kVA, DEM. 22.6 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC–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		TVSS		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 | MAIN DEVICE: 250A | LOAD: CONN. 17.2 kVA, DEM. 17.2 kVA, DEM. 47.8 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC–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		SPARE	0	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		REC–ROVER	500	2,000		PAGING SYSTEM	30/2	26
27	20/1		REC–ROVER		500	2,000			28
29	20/1		REC–ROVER			500	2,000 PAGING SYSTEM	30/2	30
31	20/1		REC–ROVER	500	2,000				32
33	20/1		REC–ROVER		500	0	SPARE	20/1	34
35	20/1		REC–ROVER			500	0 SPARE	20/1	36
37	20/1		REC–ROVER	500	0		TVSS		38
39	20/1		SPARE		0	0	TVSS	60/3	40
41	20/1		SPARE			0	0		42
TOTAL CONNECTED LOADS:				2,250	5,700	2,000	2,750 1,750 2,750		

PANELBOARD: EP–1

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

BUS SIZE: 60A | MAIN DEVICE: 50A | LOAD: CONN. 3.3 kVA, DEM. 3.3 kVA, DEM. 9.2 Amps | NOTES: PLUG FUSE PANEL

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	100		ELEC. FLSH VLV, FLR 1	20/1	2
3	20/1	"B–2"		1,200	200	ELEC. FLSH VLV, FLR 2	20/1	4
5	20/1	"B–3"(STANDBY)			0	50 ELEC. FLSH VLV, FLR 3	20/1	6
7	20/1	SPARE	0	100		BHS MCP PWR	20/1	8
9	20/1	SPARE		0	180	BHS MCP PWR	20/1	10
11	20/1	SPARE			0	100 BHS MCP PWR	20/1	12
13	20/1	SPARE	0	180		BHS MCP PWR	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	380	1,200	380 0 150		

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

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

BUS SIZE: 100A | MAIN DEVICE: 100A | LOAD: CONN. 3.2 kVA, DEM. 3.2 kVA, DEM. 8.9 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		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		TVSS		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 | MAIN DEVICE: 250A | LOAD: CONN. 7.5 kVA, DEM. 7.5 kVA, DEM. 20.7 Amps | NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC 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	REC–OFFICE	20/1	22
23	20/1		REC COMP–TRAINING			250	0 SPARE	20/1	24
25	20/1		REC–OFFICE	250	0		SPARE	20/1	26
27	20/1		REC–OFFICE		250	0	SPARE	20/1	28
29	20/1		REC–OFFICE			250	0 SPARE	20/1	30
31	20/1		REC–OFFICE	250	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		TVSS		38
39	20/1		SPARE		0	0	TVSS	60/3	40
41	20/1		SPARE			0	0		42
TOTAL CONNECTED LOADS:				1,500	1,950	1,250	750 1,250 750		

PANELBOARD: RP–3A

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

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 22.3 kVA, DEM. 22.3 kVA, DEM. 61.8 Amps | NOTES: CIRCUIT BREAKER PANEL; 1 – CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER

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		WTR HTR "WH–1"		240	540	REC–GENERAL	20/1	16
17	20/1		WTR HTR "WH–2"			240	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		"CUH–3.4"			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	1	WASHRM–ELEC DRYER		1,500	864	"P–11"	15/1	34
35	20/1	1	WASHRM–ELEC DRYER			1,500	50 ELEC FCT/SP DISP, FLR 3	20/1	36
37	20/1	1	WASHRM–ELEC DRYER	1,500	0		SPARE	20/1	38
39	20/1	1	WASHRM–ELEC DRYER		1,500	0	SPARE	20/1	40
41	20/1		SPARE			0	0 SPARE	20/1	42
TOTAL CONNECTED LOADS:				4,692	3,324	5,556	2,484 4,044 2,150		

PANELBOARD: RP–3B

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

BUS SIZE: 225A | MAIN DEVICE: 200A | LOAD: CONN. 15.9 kVA, DEM. 15.9 kVA, DEM. 44.1 Amps | NOTES: CIRCUIT BREAKER PANEL; 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	540		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		REC–OFFICE	360	720		REC–MECH RM	20/1	14
15	20/1		REC–OFFICE		540	0	SPARE	20/1	16
17	20/1		REC–GENERAL			720	540 REC–BREAK RM	20/1	18
19	20/1		REC–BREAK RM	360	0		REC–COUNTER	20/1	20
21	20/1		REC–OFFICE		360	0	GARBAGE DISPOSAL	20/1	22
23	20/1		SPARE			0	0 MICROWAVE	20/1	24
25	20/1		SPARE	0	0		REFRIGERATOR	20/1	26
27	20/1		SPARE		0	696	"EF–3.3"	15/1	28
29	20/1		SPARE			0	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	15/1		"UH–3.5"		528	0	SPARE	20/1	40
41	20/1		SPARE			0	0 SPARE	20/1	42
TOTAL CONNECTED LOADS:				3,696	1,620	3,516	1,776 2,808 2,460		

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ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

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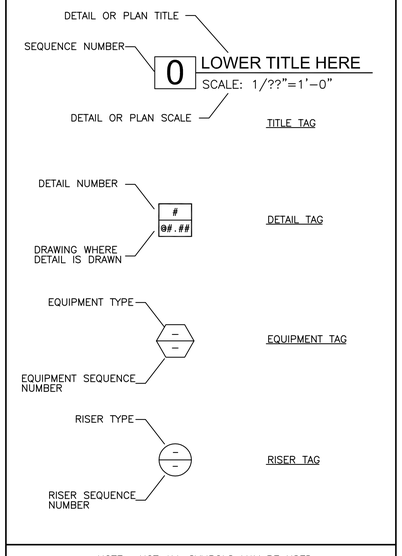
SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E408

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E408.dwg Plotted on: 8/12/2010 2:15 PM Plotted by: Hoefker, Jennifer

DRAWING SYMBOLS



NOTE: NOT ALL SYMBOLS MAY BE USED.

PLUMBING SYMBOLS

SYMBOLS	DESCRIPTION
AD	AREA DRAIN PIPING (UNDERGROUND)
SSD	SUB-SOIL DRAINAGE
ST	STORM (SUSPENDED)
ST	STORM (UNDERGROUND)
SAN	SANITARY (SUSPENDED)
SAN	SANITARY (UNDERGROUND)
W	WASTE (SUSPENDED)
V	VENT PIPING (SUSPENDED)
V	VENT PIPING (UNDERGROUND)
	COLD WATER
	COLD WATER (UNDERGROUND)
	HOT WATER
	HOT WATER RETURN
	PIPING TO BE REMOVED
CC	ROLL DOWN PIPING ON 45°
	DIRECTION OF FLOW
	P-TRAP WITH VENT PIPE CONNECTION
	PIPE LOOKING DOWN
	PIPE LOOKING UP
	TEE CONNECTION LOOKING UP
	TEE CONNECTION LOOKING DOWN
	TEE CONNECTION WITH BRANCH LOOKING UP
	TEE CONNECTION WITH BRANCH LOOKING DOWN
	CAPPED PIPE
	PIPE BREAK
	BALL VALVE
	GATE VALVE (SHUT-OFF)
	CHECK VALVE
	BALANCING VALVE
FCO	FLOOR CLEANOUT
AD-X	AREA DRAIN (AD-X)
	FLOOR DRAIN & TYPE NO. (FD-X)
	CLEANOUT (SUSPENDED)
WCO	WALL CLEANOUT
WC-X	WATER CLOSET & TYPE NO. (WC-X)
UR-X	URINAL & TYPE NO. (UR-X)
EWC-X	ELECTRIC WATER COOLER & TYPE NO. (EWC-X)
JMB-X	JANITOR'S MOP BASIN & TYPE NO. (JMB-X)
LAV-X	LAVATORY & TYPE NO. (LAV-X)
HB-X	HOSE BIBB & TYPE NO. (HB-X)
HWH-X	HOT WATER HEATER & TYPE NO. (HWH-X)
DF-X	DRINKING FOUNTAIN & TYPE NO. (DF-X)
SS-X	SERVICE SINK & TYPE NO. (SS-X)
	POINT OF CONNECTION NEW TO EXISTING

NOTE: NOT ALL SYMBOLS MAY BE USED.

PLUMBING ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
AD	AREA DRAIN
AFF	ABOVE FINISHED FLOOR
ARF	ABOVE RAISED FLOOR
ASC	ABOVE SUSPENDED CEILING
B.F.P.	BACKFLOW PREVENTER
B.O.P.	BOTTOM OF PIPE
B.O.S.	BOTTOM OF STEEL
CI	CAST IRON
CO	CLEANOUT
CONN	CONNECT
CV	CHECK VALVE
CW	COLD WATER
DET	DETAIL
DN	DOWN
DS	DOWNSPOUT
DT	DRAINTILE
DWG	DRAWING
E	EXISTING
ES	EMERGENCY SHOWER
EW	EYE WASH
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
GB	GREASE BASIN
GD	GARAGE DRAIN
GN	GENERAL NOTE
GV	GATE VALVE
GW	GARAGE WASTE
HB	HOSE BIBB
HW	HOT WATER
HWH	HOT WATER HEATER
HWR	HOT WATER RETURN
IE	INVERT ELEVATION
IM	ICE MAKER
LAV	LAVATORY
MAV	MANUAL AIR VENT
MR	MOP RECEPTOR
MV	MAIN VENT
N	NEW
N.C.	NORMALLY CLOSED
NFWH	NON-FREEZE WALL HYDRANT
N.O.	NORMALLY OPEN
OD	OVERFLOW DRAIN
OHD	OPEN HUB DRAIN
PD	PUMPED DISCHARGE
PG	PRESSURE GAUGE
RD	ROOF DRAIN
ROB	ROD OUT BASIN
RPZ	REDUCE PRESSURE ZONE (BACKFLOW PREVENTOR)
SAN or S	SANITARY
SB	SETTLING BASIN
SE	SEWAGE EJECTOR
SF	SQUARE FEET
SEB	SEWAGE EJECTOR BASIN
SH	SHOWER
SEV	SEWAGE EJECTOR VENT
SN	SHEET NOTE
SP	SUMP PUMP
SPB	SUMP PUMP BASIN
SPV	SUMP PUMP VENT
ST	STORM
SSD	SUB-SOIL DRAINAGE
STK	STACK
SK	SINK
T & P	TEMP. & PRESSURE RELIEF VALVE
TD	TRENCH DRAIN
T.O.B.	TRIPLE OIL BASIN
TP	TRAP PRIMER
TYP	TYPICAL
UG	UNDERGROUND
U.N.O.	UNLESS NOTED OTHERWISE
UR	URINAL
V	VENT
VB	VACUUM BREAKER
VIF	VERIFY IN FIELD
VTR	VENT THRU ROOF
W	WASTE
WC	WATER CLOSET
W/L	WATER CLOSET WITH LAVATORY
WCO	WALL CLEANOUT

NOTE: NOT ALL SYMBOLS MAY BE USED.

DULUTH INTERNATIONAL AIRPORT

5528 PLUMBING DRAWING LIST

Sheet No.	Filename (proj.#5528)	DRAWING TITLE	DATE: 11/25/09 ISSUED FOR BID	12/23/09 ISSUED FOR BID	03/26/10 60% REVIEW	04/09/10 90% REVIEW	04/30/10 BID PACK REVISIONS	05/07/10 BID PACK #2	06/01/10 FOUNDATION PERMIT	06/14/10 ADDENDUM #2	07/23/10 CONFORMANCE SET	08/16/10 BUILDING PERMIT
P001	5528P001	PLUMBING SYMBOLS, ABBREVIATIONS AND DRAWING INDEX	●	●	●	●	●	●			●	●
P100	5528P100	ENLARGED UNDERGROUND PLUMBING PLAN AREA A	●	●	●	●	●	●			●	●
P101	5528P101	ENLARGED UNDERGROUND PLUMBING PLAN AREA B	●	●	●	●	●	●			●	●
P102	5528P102	ENLARGED UNDERGROUND CANOPY PLUMBING PLAN AREA A	●	●	●	●	●	●			●	●
P103	5528P103	ENLARGED UNDERGROUND CANOPY PLUMBING PLAN AREA B	●	●	●	●	●	●			●	●
P110	5528P110	ENLARGED FIRST FLOOR PLUMBING PLAN AREA A	●	●	●	●				●	●	●
P111	5528P111	ENLARGED FIRST FLOOR PLUMBING PLAN AREA B	●	●	●	●				●	●	●
P112	5528P112	ENLARGED SECOND FLOOR PLUMBING PLAN AREA A	●	●	●	●				●	●	●
P113	5528P113	ENLARGED SECOND FLOOR PLUMBING PLAN AREA B	●	●	●	●				●	●	●
P114	5528P114	ENLARGED THIRD FLOOR PLUMBING PLAN AREA A	●	●	●	●				●	●	●
P115	5528P115	ENLARGED THIRD FLOOR PLUMBING PLAN AREA B	●	●	●	●				●	●	●
P116	5528P116	ENLARGED ROOF LEVEL PLUMBING PLAN AREA A	●	●	●	●				●	●	●
P117	5528P117	ENLARGED ROOF LEVEL PLUMBING PLAN AREA B	●	●	●	●				●	●	●
P118	5528P118	ENLARGED FIRST FLOOR PLUMBING PLAN AREA A CANOPY	●	●	●	●				●	●	●
P119	5528P119	ENLARGED FIRST FLOOR PLUMBING PLAN AREA B CANOPY	●	●	●	●				●	●	●
P120	5528P120	ENLARGED SECOND FLOOR PLUMBING PLAN AREA A CANOPY ROOF	●	●	●	●				●	●	●
P121	5528P121	ENLARGED SECOND FLOOR PLUMBING PLAN AREA B CANOPY ROOF	●	●	●	●				●	●	●
P122	5528P122	TUG RAMP ROOF PLUMBING PLAN				●	●					●
P301	5528P301	WATER SCHEMATIC, GAS SCHEMATIC AND STORM RISER DIAGRAM	●	●	●	●				●	●	●
P302	5528P302	COLD & HOT WATER RISER DIAGRAM	●	●	●	●						●
P303	5528P303	WASTE AND VENT RISER DIAGRAM				●	●		●		●	●
P401	5528P401	PLUMBING DETAILS	●	●	●	●	●	●			●	●
P402	5528P402	PLUMBING DETAILS	●	●	●	●						●
P403	5528P403	PLUMBING DETAILS				●	●					●
P501	5528P501	PLUMBING SCHEDULES	●	●	●	●	●	●			●	●

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Landscaping Consultants:
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ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

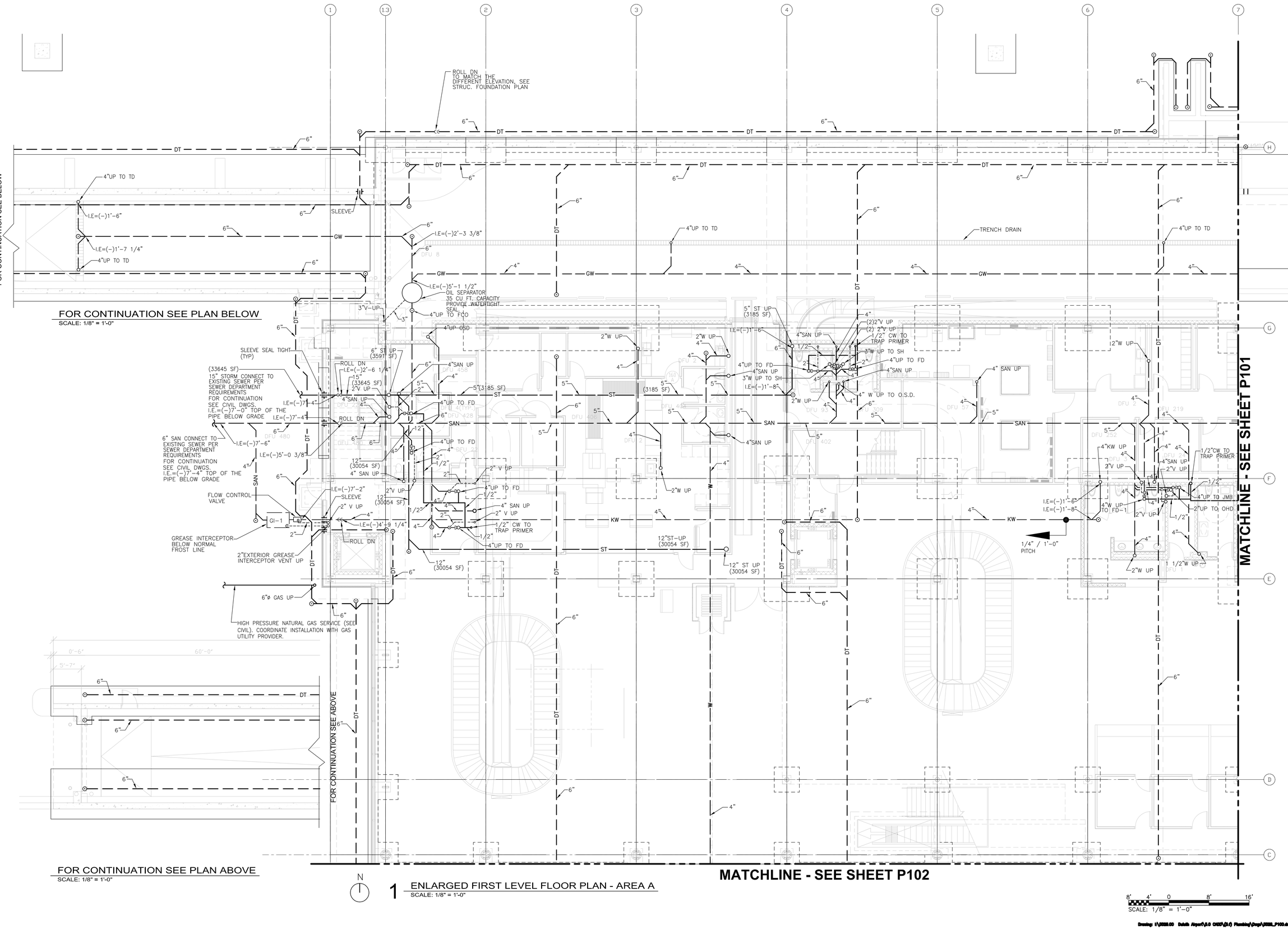
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SHEET TITLE
PLUMBING SYMBOL LIST, ABBREVIATIONS AND DRAWING LIST

SHEET NUMBER
P001

BUILDING PERMIT

Drawing: I:\5528.00 Duluth Airport\5.0 CADD\(5.1) Plumbing\Dwgs\5528_P001.dwg Plotted on: 8/12/2010 11:26 AM Plotted by: Vokes, Henry



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TEL: (218) 724-8578 / FAX: (218) 724-8717

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

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

ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

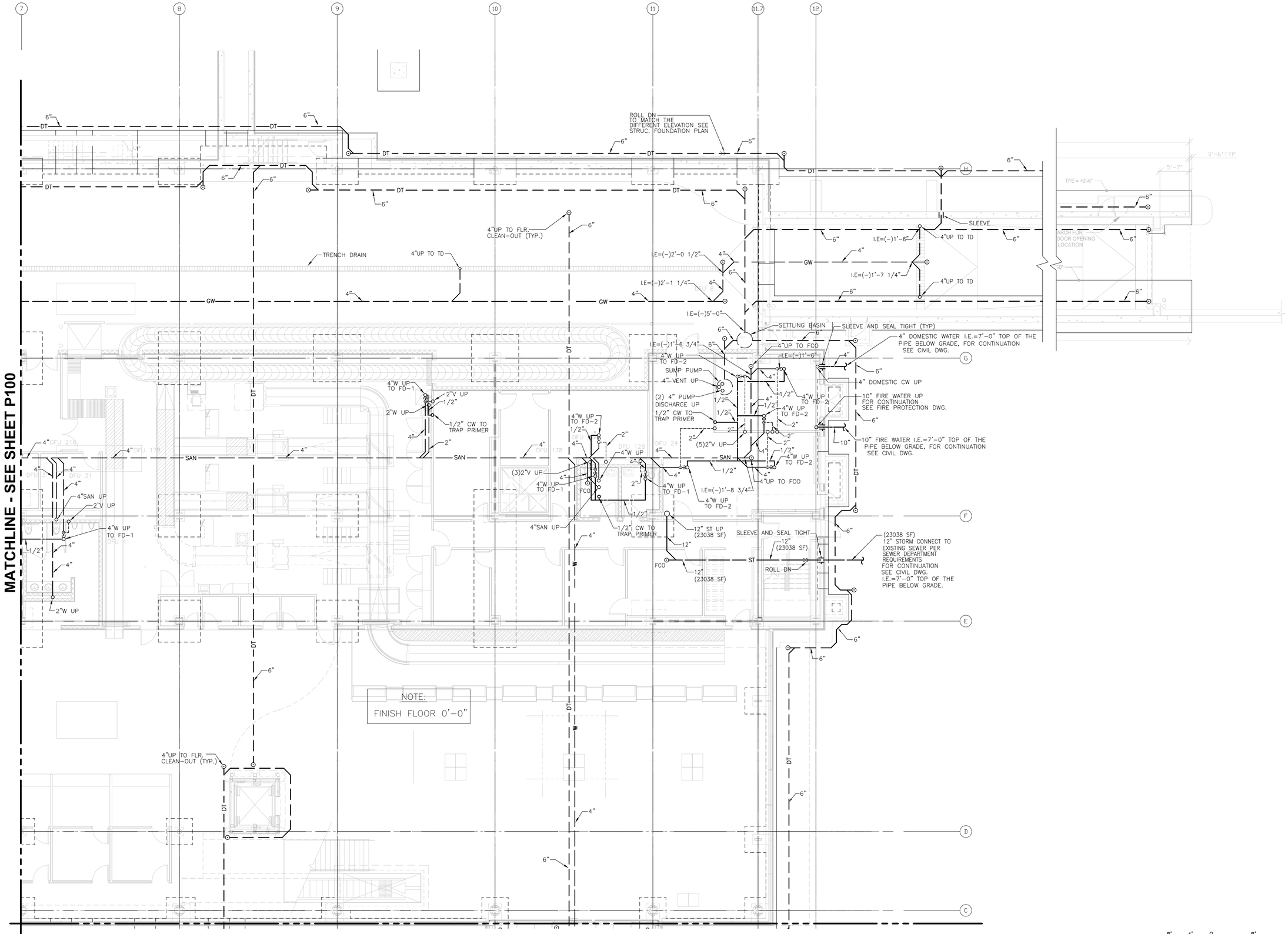
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SHEET TITLE
ENLARGED UNDERGROUND PLUMBING PLAN AREA A

SHEET NUMBER
P100

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Plumbing\Dwgs\2008_P100.dwg Plotted on: 8/12/2010 2:20 PM Plotted by: Velma, Henry



N

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

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

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P101.dwg Plotted on: 8/12/2010 2:35 PM Plotted by: Vokes, Nancy

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CONSULTANTS

Interior Architects:
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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

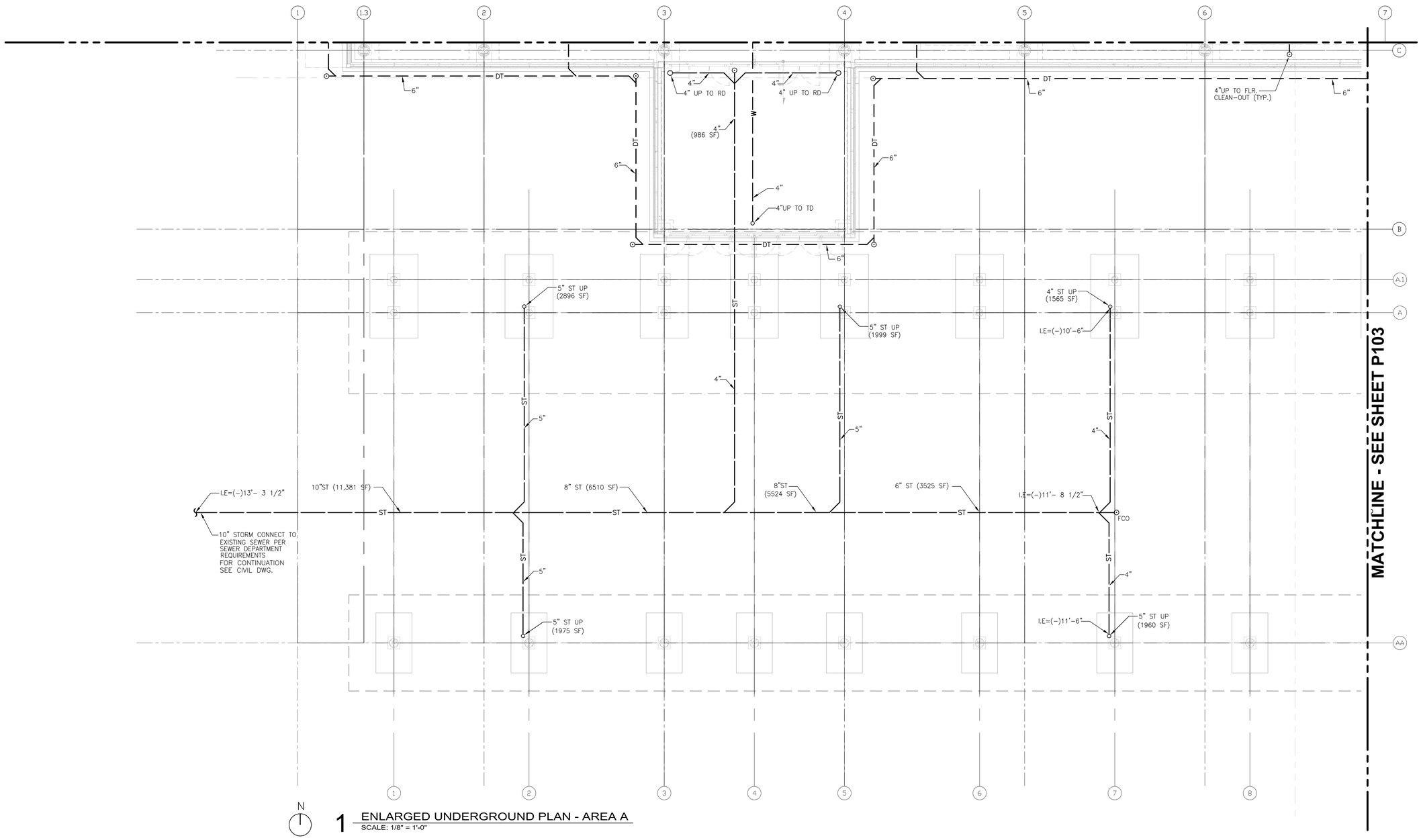
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SHEET TITLE
ENLARGED UNDERGROUND PLUMBING PLAN AREA B

SHEET NUMBER
P101

BUILDING PERMIT

MATCHLINE - SEE SHEET P100



N

1 ENLARGED UNDERGROUND PLAN - AREA A
SCALE: 1/8" = 1'-0"

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

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1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED UNDERGROUND PLUMBING PLAN AREA A

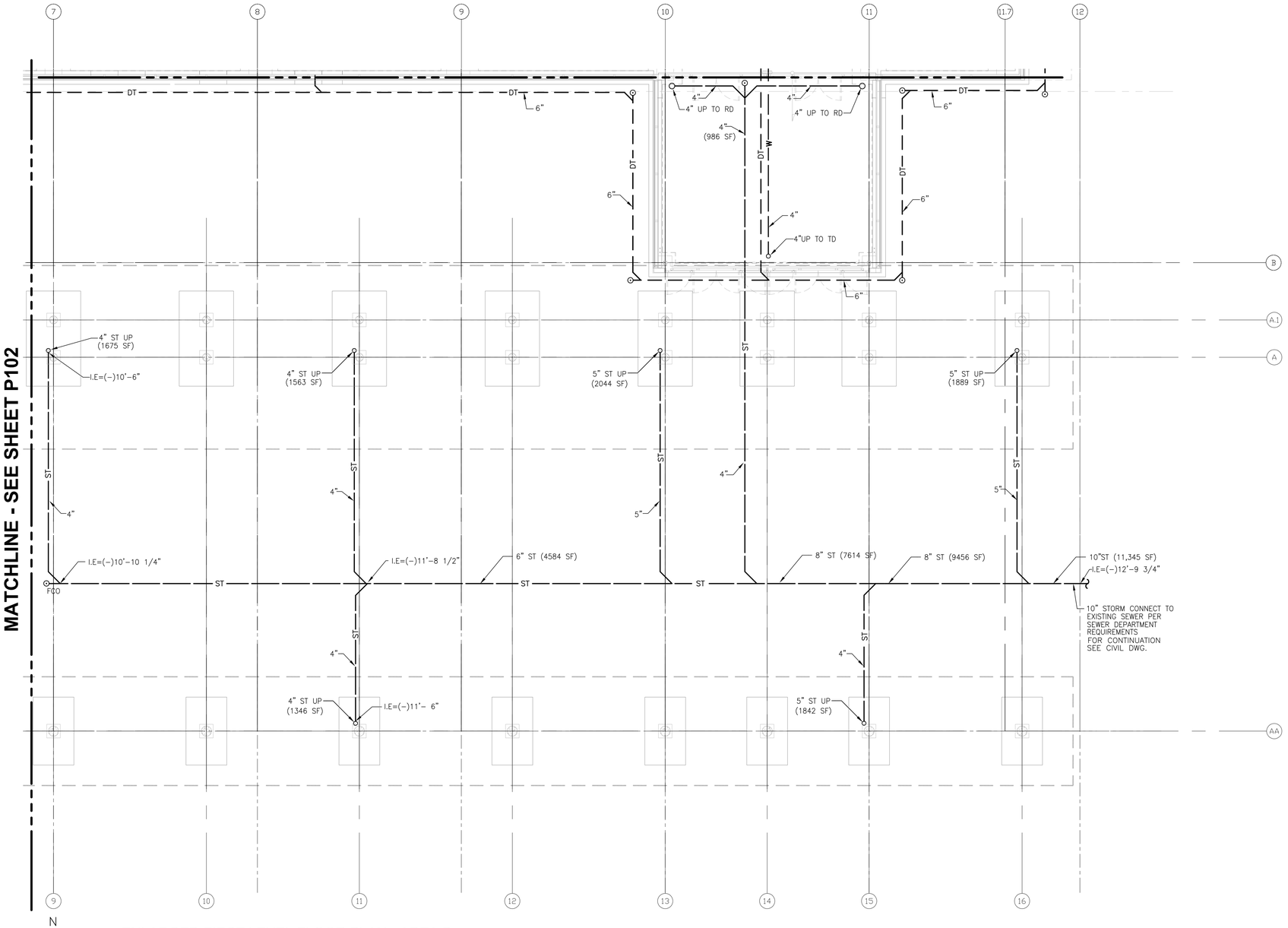
SHEET NUMBER
P102

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P102.dwg Plotted on: 8/13/2010 2:34 PM Plotted by: Vetens, Henry

MATCHLINE - SEE SHEET P102

MATCHLINE - SEE SHEET P101



N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA B

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

8' 4' 0 8' 16'

SCALE: 1/8" = 1'–0"

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

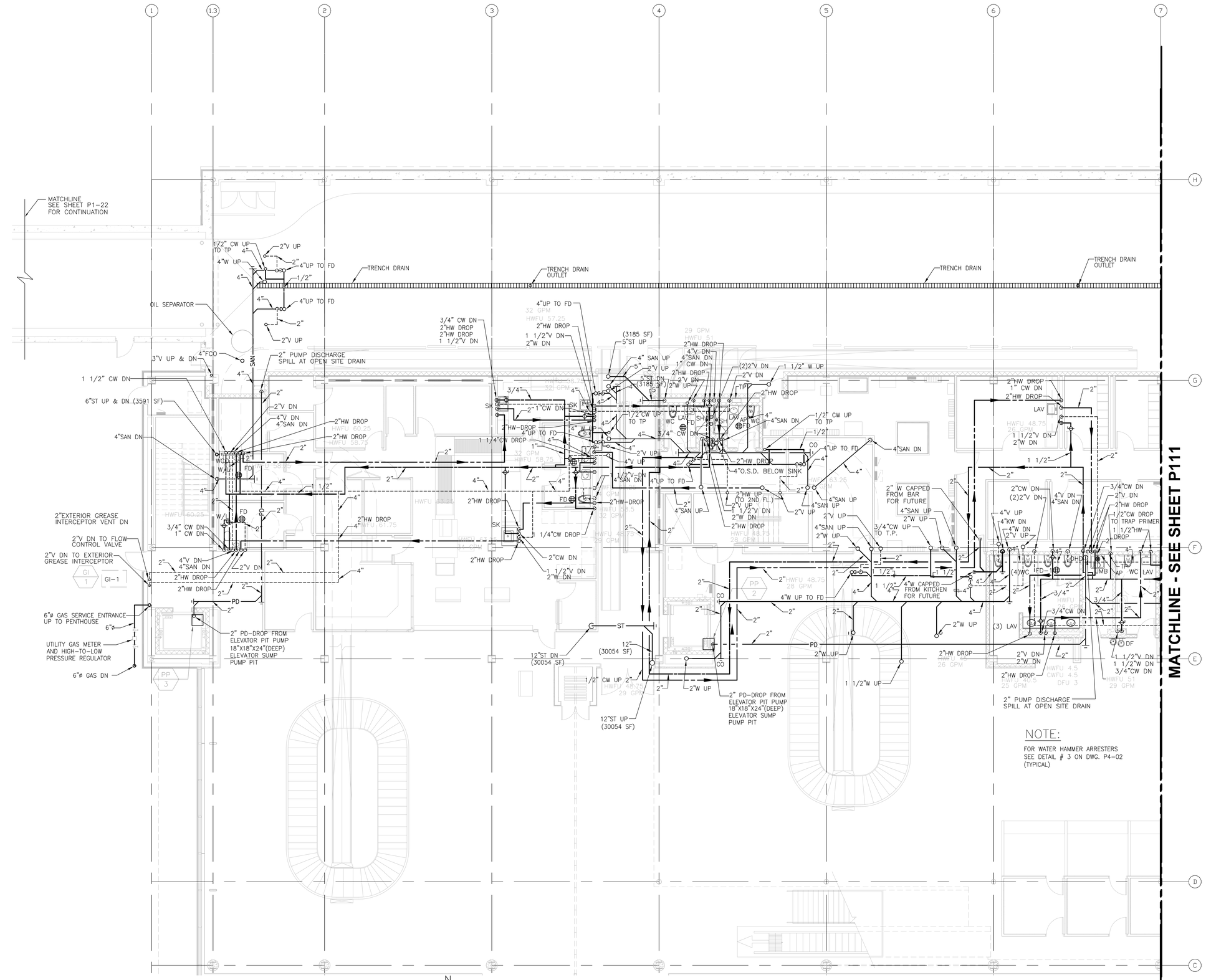
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SHEET TITLE
ENLARGED
UNDERGROUND
PLUMBING
PLAN AREA B

SHEET NUMBER
P103

BUILDING
PERMIT

Drawing: I:\2035.00 Duluth Airport\8.0 CAD\(8.4) Plumbing\Dwgs\2035_P103.dwg Plotted on: 8/12/2010 2:35 PM Plotted by: Velma, Henry



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

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

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\8.6 Plumbing\Dwgs\2008_P110.dwg Plotted on: 8/13/2010 11:01 AM Plotted by: Valens, Henry

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED:	08-16-10
REVIEWED BY:	RDJ
DRAWN BY:	SA
DESIGNED BY:	SA

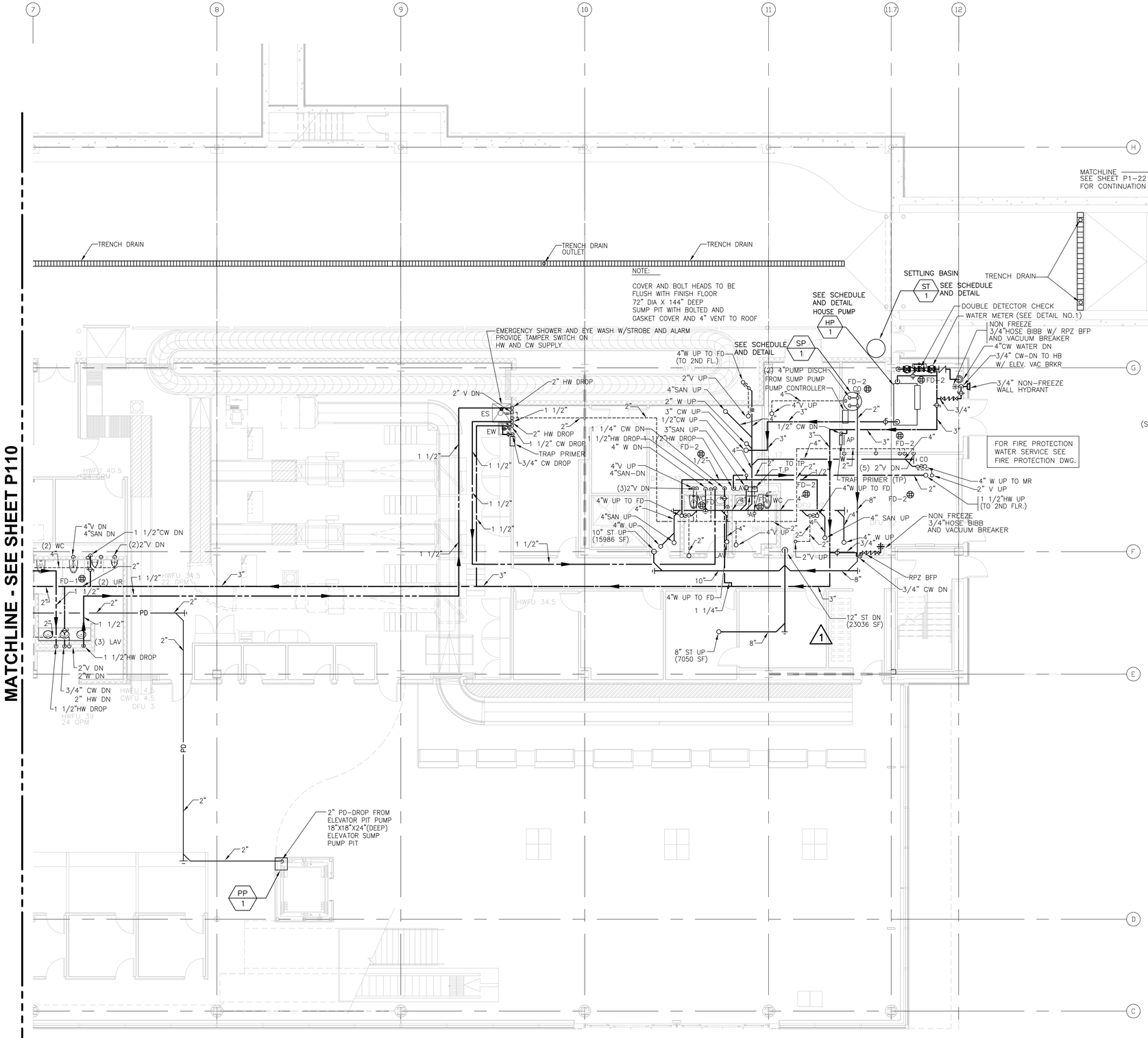
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED
FIRST FLOOR
PLUMBING
PLAN AREA A

SHEET NUMBER
P110

BUILDING
PERMIT



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Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED:	08-16-10
REVIEWED BY:	RDJ
DRAWN BY:	SA
DESIGNED BY:	SA

AEP PROJECT NUMBER
213-1882-091

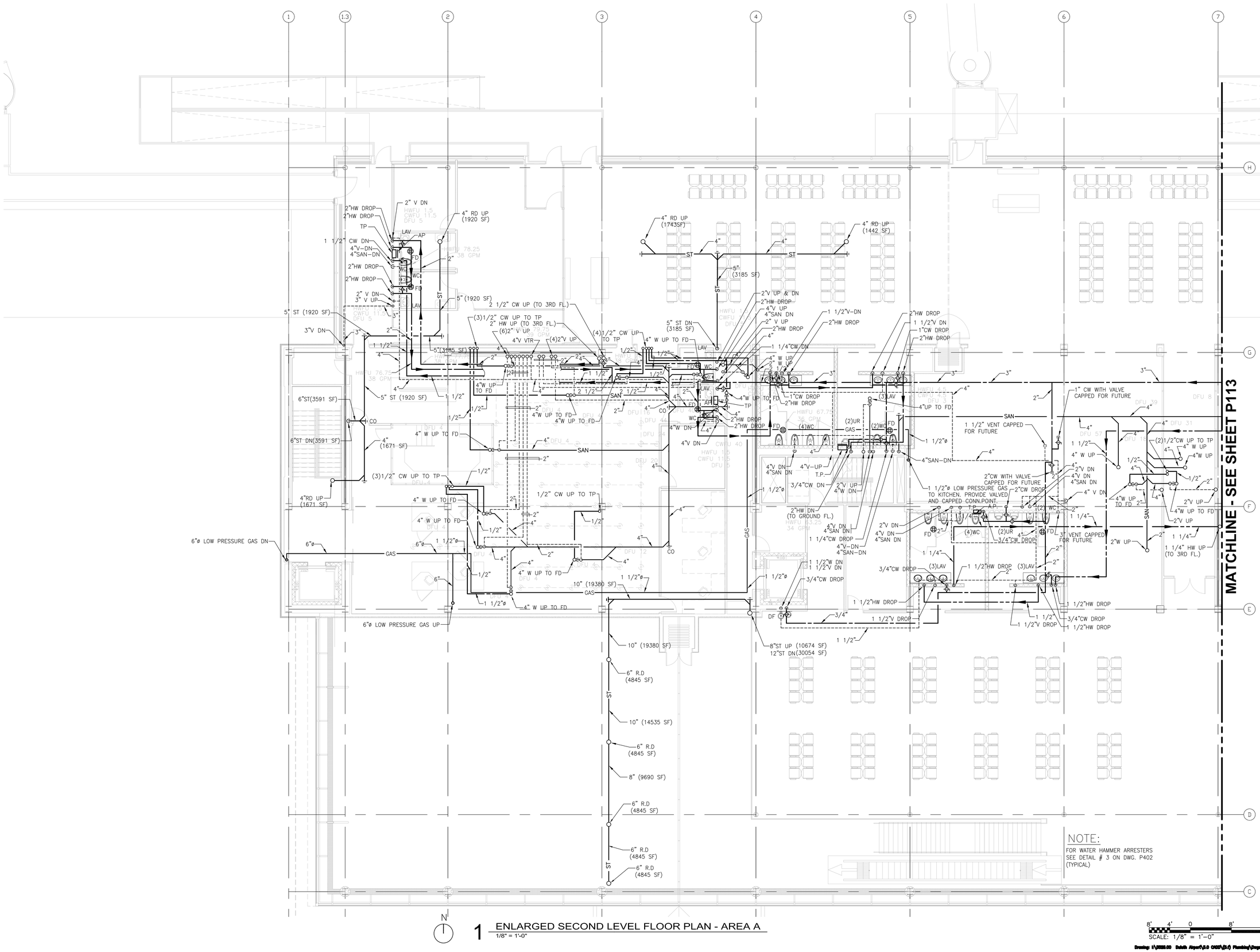
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SHEET TITLE
ENLARGED FIRST FLOOR PLUMBING PLAN AREA B

SHEET NUMBER
P111

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\[8.6] Plumbing\Dwgs\2008_P111.dwg Plotted on: 8/12/2010 11:55 AM Plotted by: Vokes, Henry



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

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Signature:

Date: 08/16/10 Reg. No.: 21067

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NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
2	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

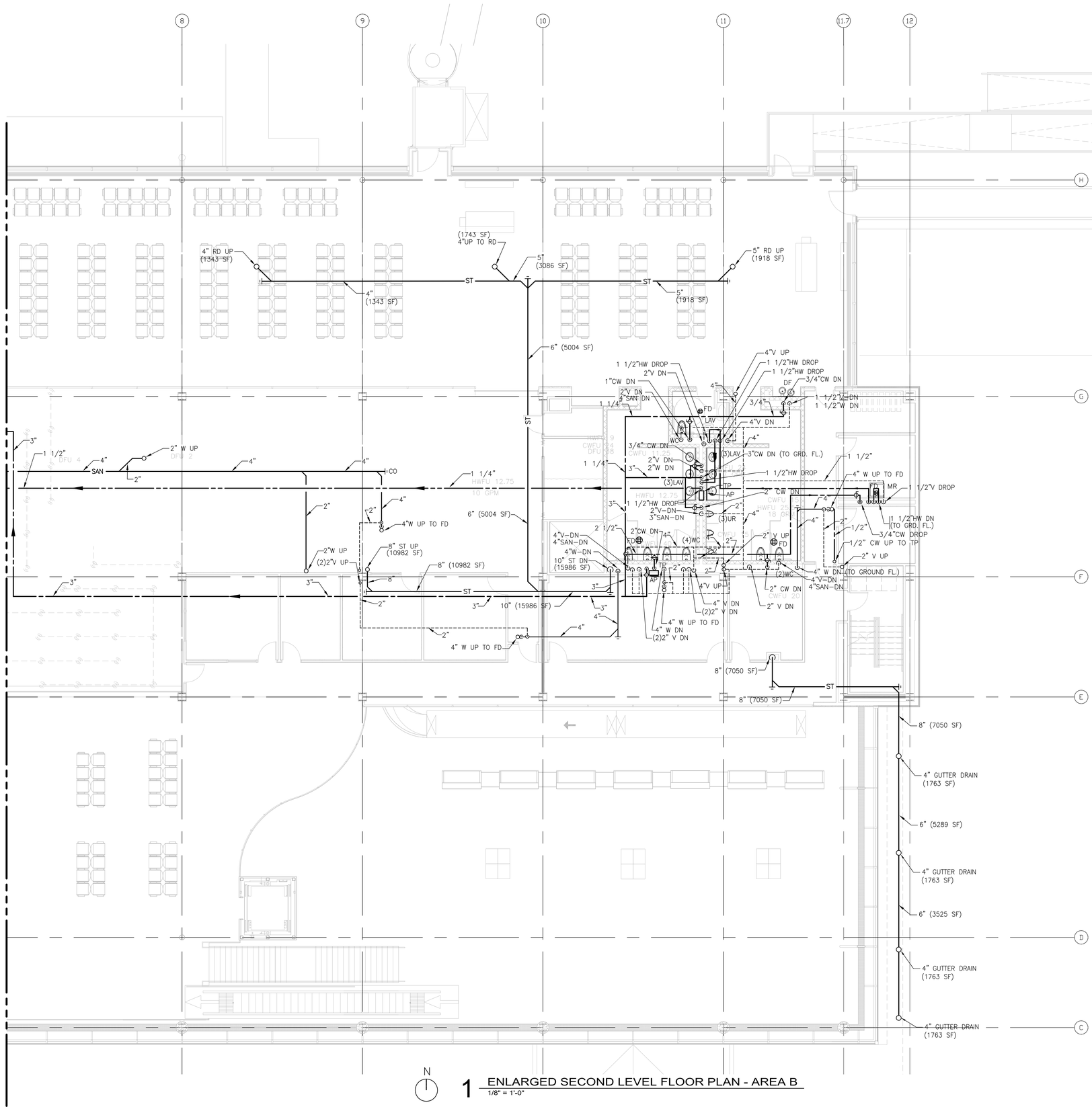
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SHEET TITLE
ENLARGED
SECOND FLOOR
PLUMBING
PLAN AREA A

SHEET NUMBER
P112

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P112.dwg Plotted on: 8/13/2010 11:03 AM Plotted by: Velma, Henry



N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2008_P113.dwg Plotted on: 8/12/2010 11:54 AM Plotted by: Vaissa, Henry

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DULUTH, MN

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

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1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED:	08-16-10
REVIEWED BY:	RDJ
DRAWN BY:	SA
DESIGNED BY:	SA

AEP PROJECT NUMBER
213-1882-091

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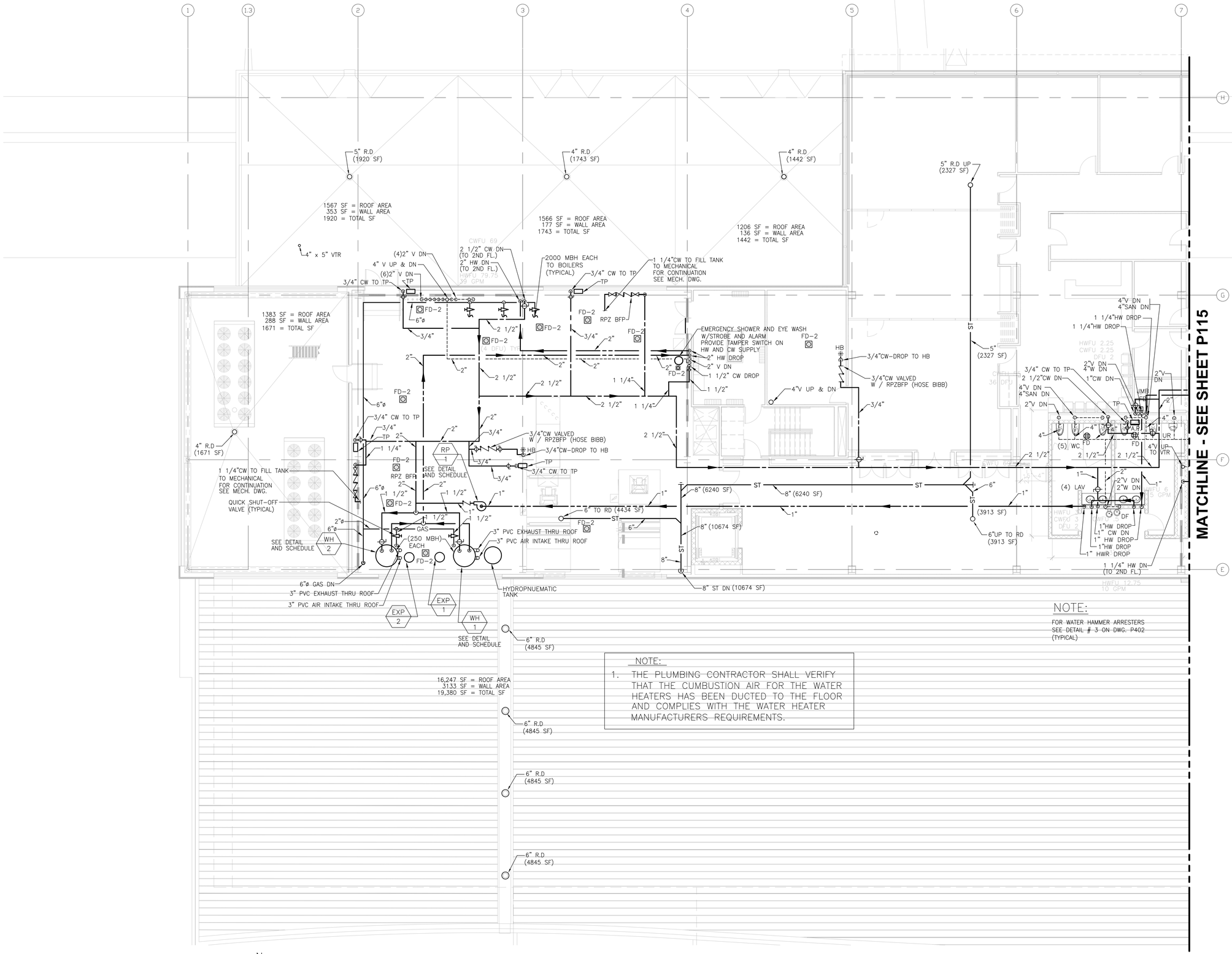
SHEET TITLE

ENLARGED
SECOND FLOOR
PLUMBING
PLAN AREA B

SHEET NUMBER

P113

BUILDING
PERMIT



N

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

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

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) Plumbing\Dwgs\2008_P114.dwg Plotted on: 8/12/2010 11:08 AM Plotted by: Valasa, Henry

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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Signature:

Date: 08/16/10 Reg. No.: 21067

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3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV/SA
DESIGNED BY: SA

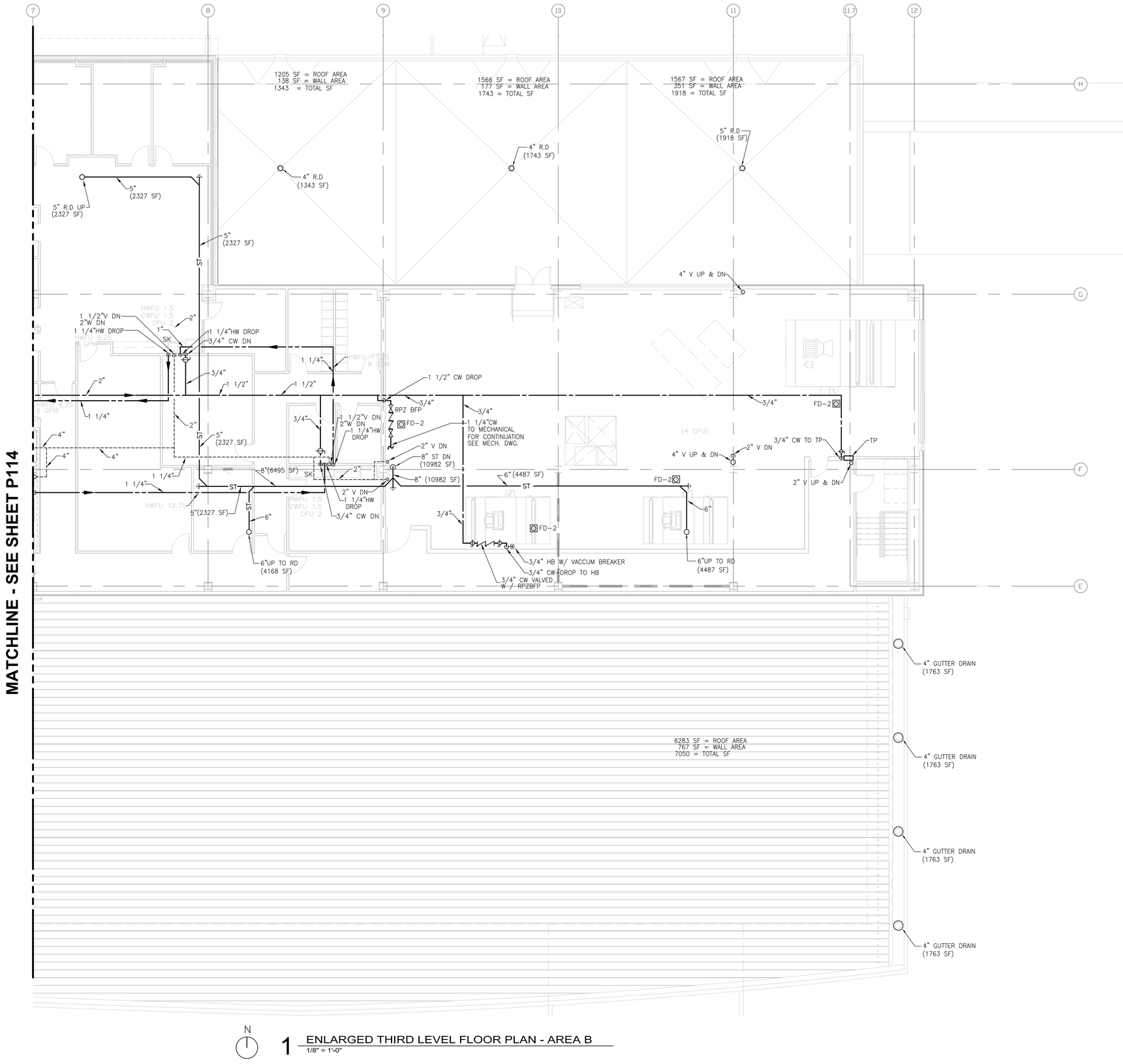
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED THIRD FLOOR PLUMBING PLAN AREA A

SHEET NUMBER
P114

BUILDING PERMIT



N

1 ENLARGED THIRD LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.0) Plumbing\Dwgs\2035_P115.dwg Plotted on: 8/12/2010 1:34 PM Plotted by: Valasa, Henry

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TEL: (218) 724-8578 / FAX: (218) 724-8717

Structural Engineers:
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501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
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TEL: (312) 201-7408 / FAX: (312) 201-0031

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

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

ENGINEER CERTIFICATION

I hereby certify that the engineeringh 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED:	08-16-10
REVIEWED BY:	RDJ
DRAWN BY:	HV/SA
DESIGNED BY:	SA

AEP PROJECT NUMBER
213-1882-091

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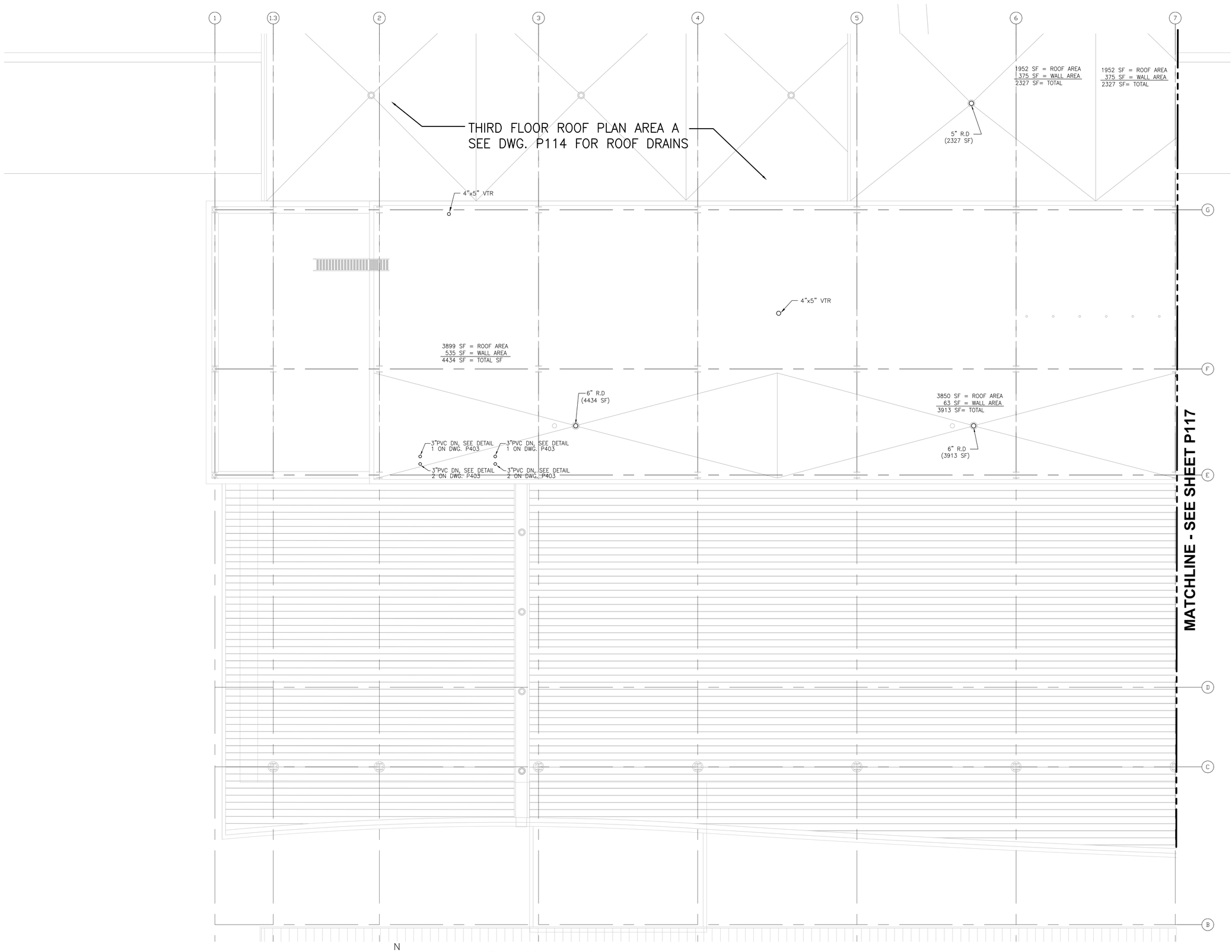
SHEET TITLE

ENLARGED THIRD FLOOR PLUMBING PLAN AREA B

SHEET NUMBER

P115

BUILDING PERMIT



N

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

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

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Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED:	08-16-10
REVIEWED BY:	RDJ
DRAWN BY:	HV
DESIGNED BY:	SA

AEP PROJECT NUMBER
213-1882-091

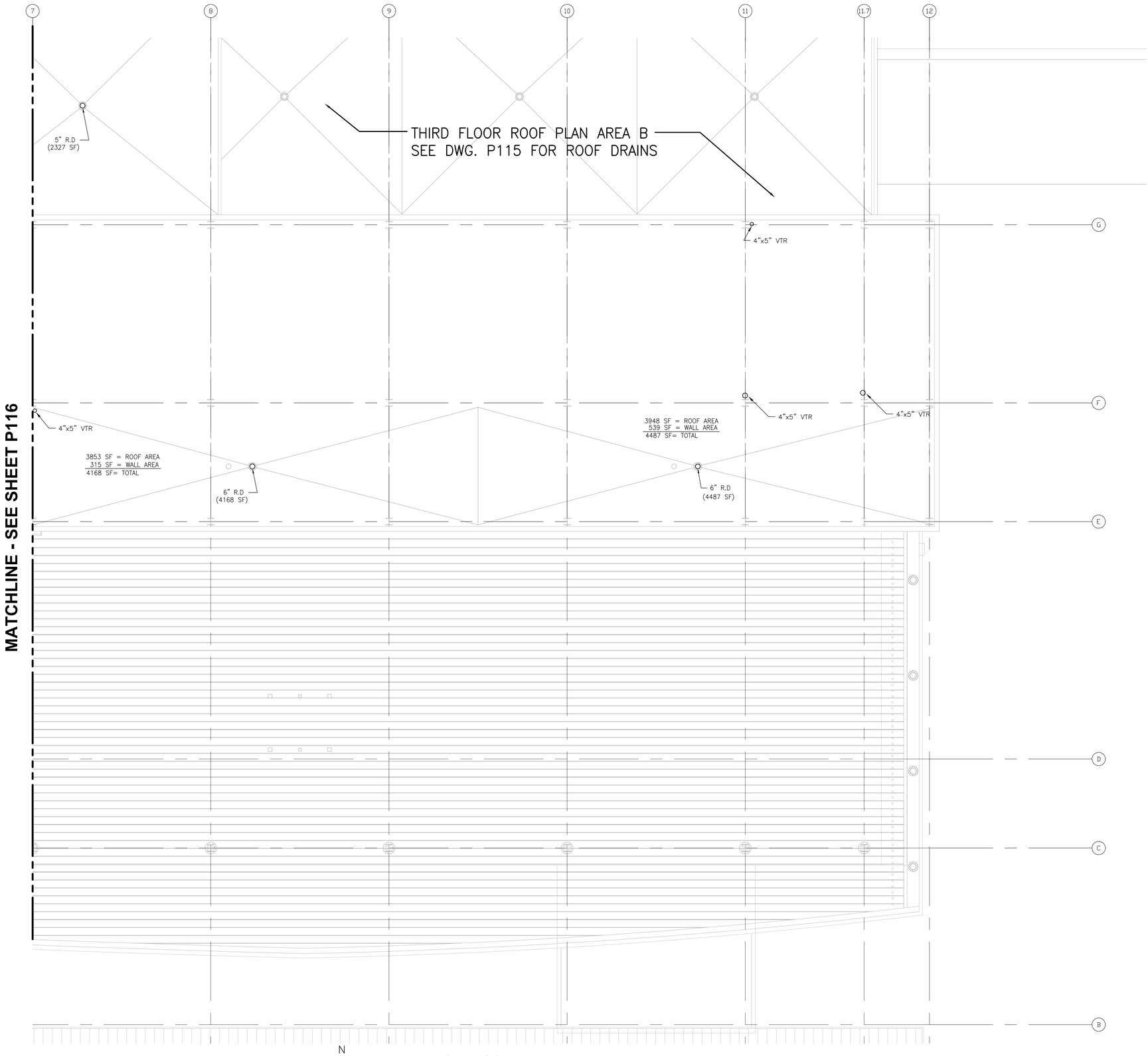
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SHEET TITLE
ENLARGED
ROOF LEVEL
PLUMBING
PLAN AREA A

SHEET NUMBER
P116

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2008_P116.dwg Plotted on: 8/13/2010 11:41 AM Plotted by: Valens, Henry



N

1 ENLARGED ROOF LEVEL PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.4) Plumbing\Dwgs\2008_P117.dwg Plotted on: 8/12/2010 11:42 AM Plotted by: Velma, Henry

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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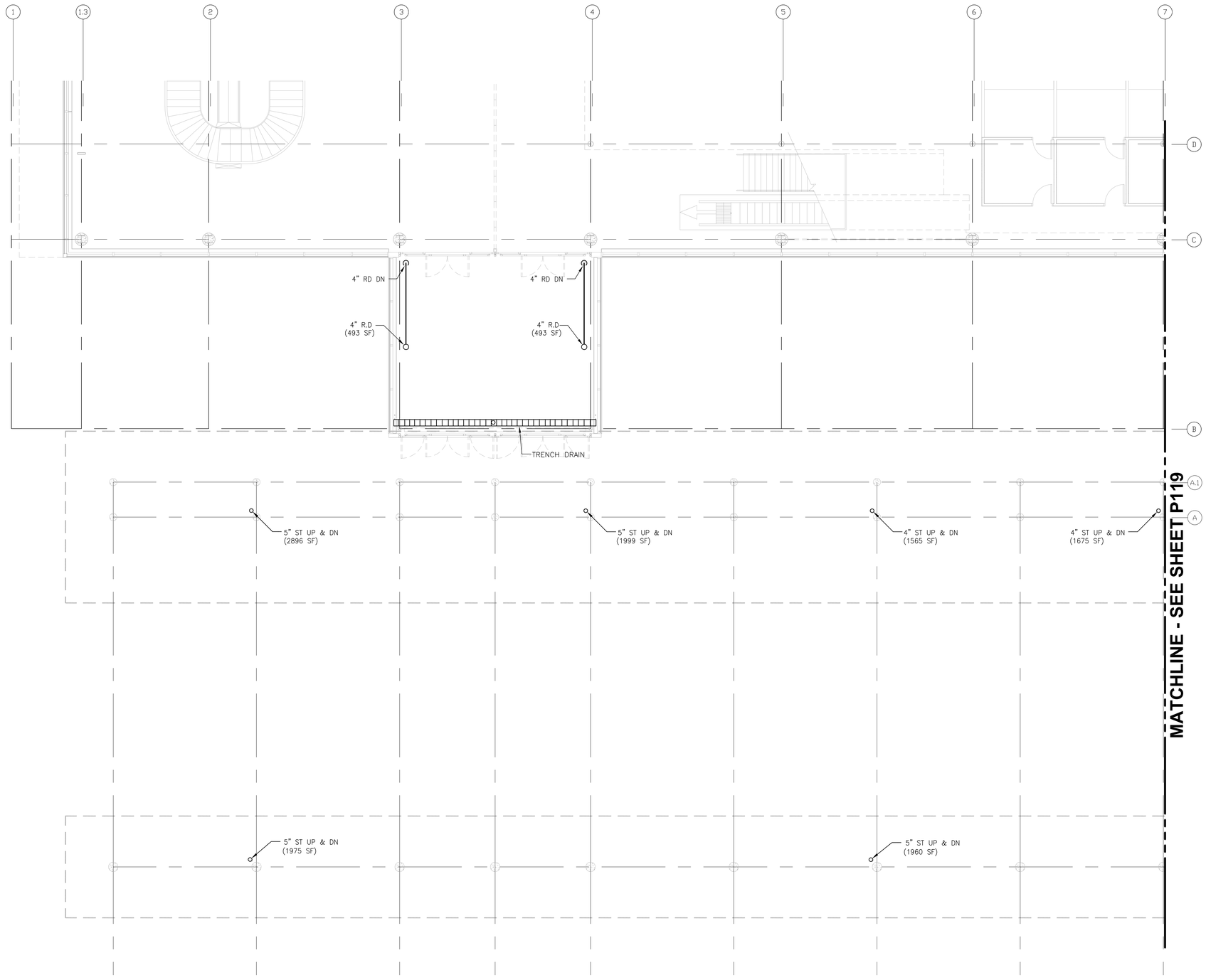
SHEET TITLE

ENLARGED
ROOF LEVEL
PLUMBING
PLAN AREA B

SHEET NUMBER

P117

BUILDING
PERMIT



N

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

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

Drawing: I:\2008.09 Duluth Airport\8.0 CADD\(8.4) Plumbing\Dwgs\2008_P118.dwg Plotted on: 8/12/2010 2:59 PM Plotted by: Vekma, Henry

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

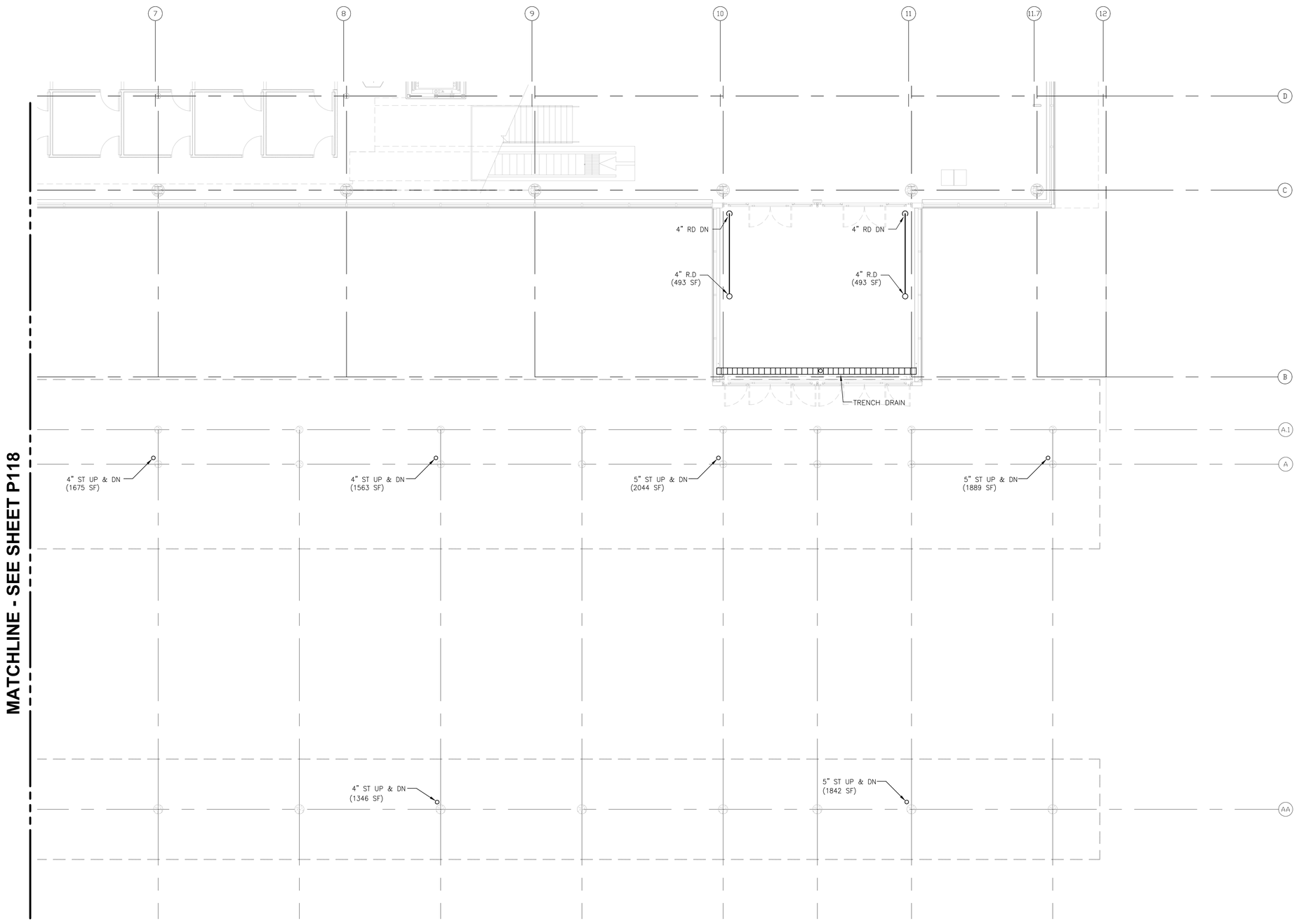
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED
FIRST FLOOR
PLUMBING PLAN
AREA A CANOPY

SHEET NUMBER
P118

BUILDING
PERMIT



MATCHLINE - SEE SHEET P118

N

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

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

Drawing: I:\2008.09 Duluth Airport\8.0 CAD\(8.4) Plumbing\Dwgs\2008_P119.dwg Plotted on: 8/12/2010 2:02 PM Plotted by: Vokes, Henry

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

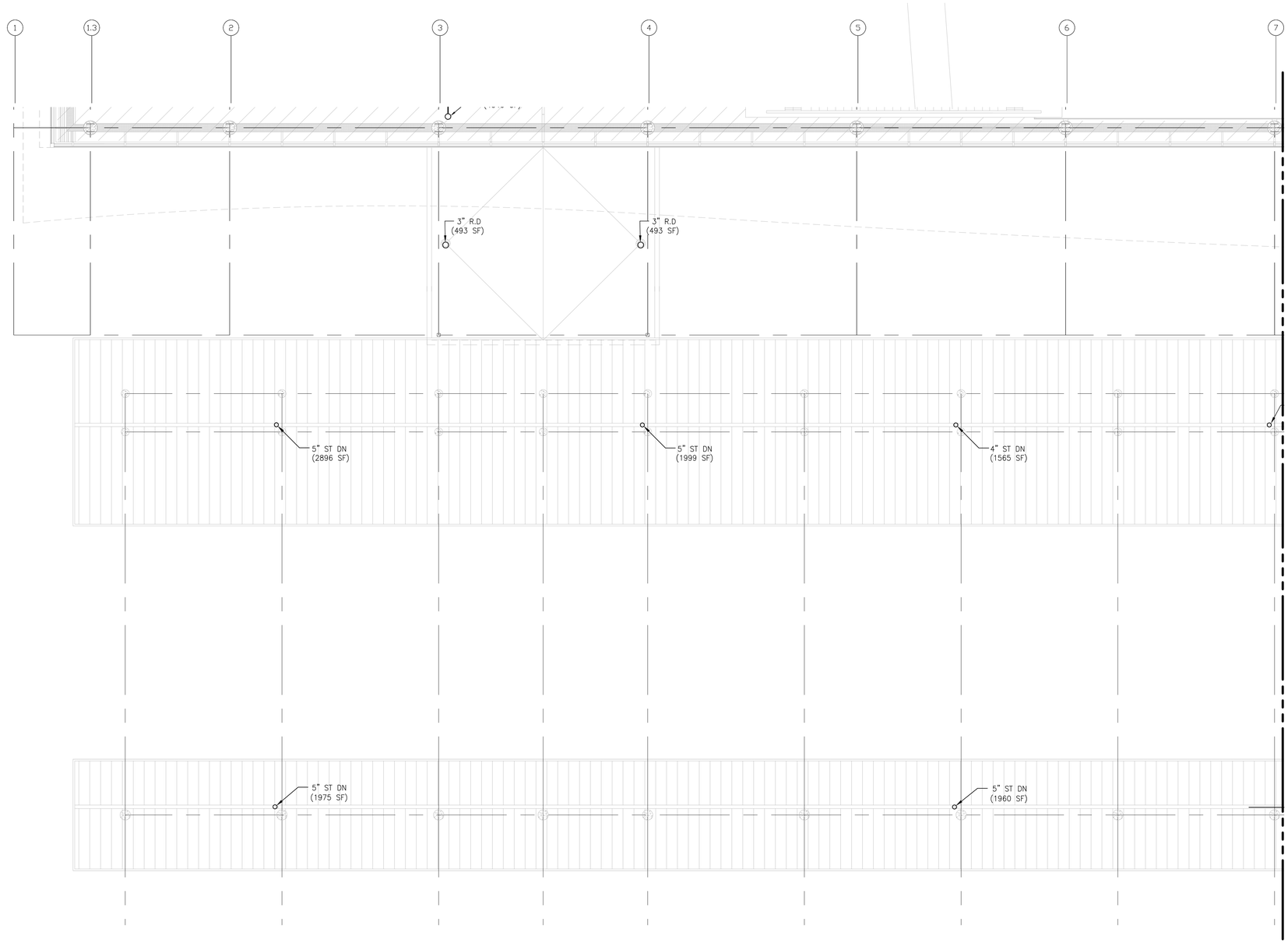
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED
FIRST FLOOR
PLUMBING PLAN
AREA B CANOPY

SHEET NUMBER
P119

BUILDING
PERMIT



N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

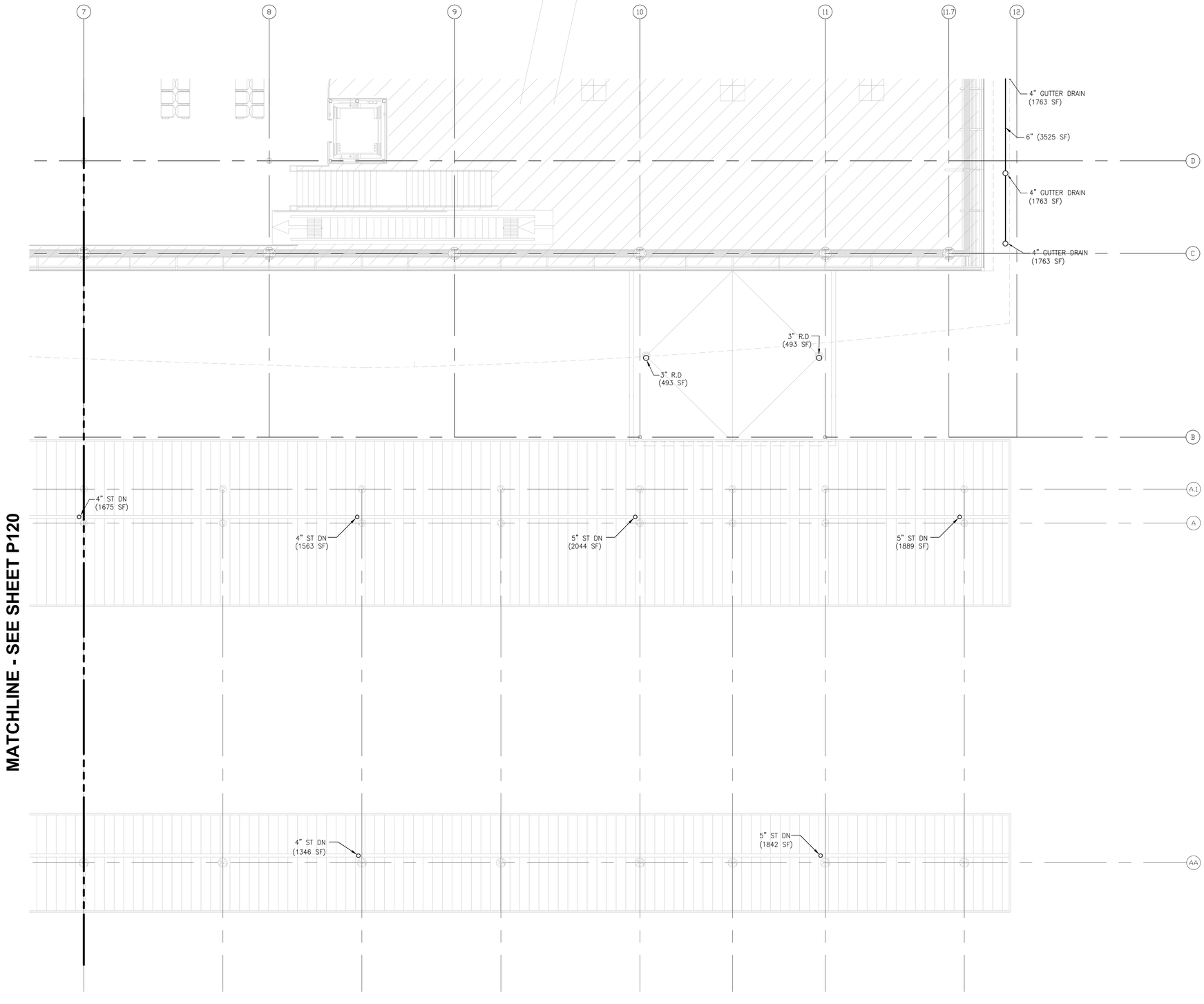
ENLARGED
SECOND FLOOR
PLUMBING PLAN
AREA A CANOPY ROOF

SHEET NUMBER

P120

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.4) Plumbing\Dwgs\2008_P120.dwg Plotted on: 8/12/2010 12:09 PM Plotted by: Velasa, Henry



N

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

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

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

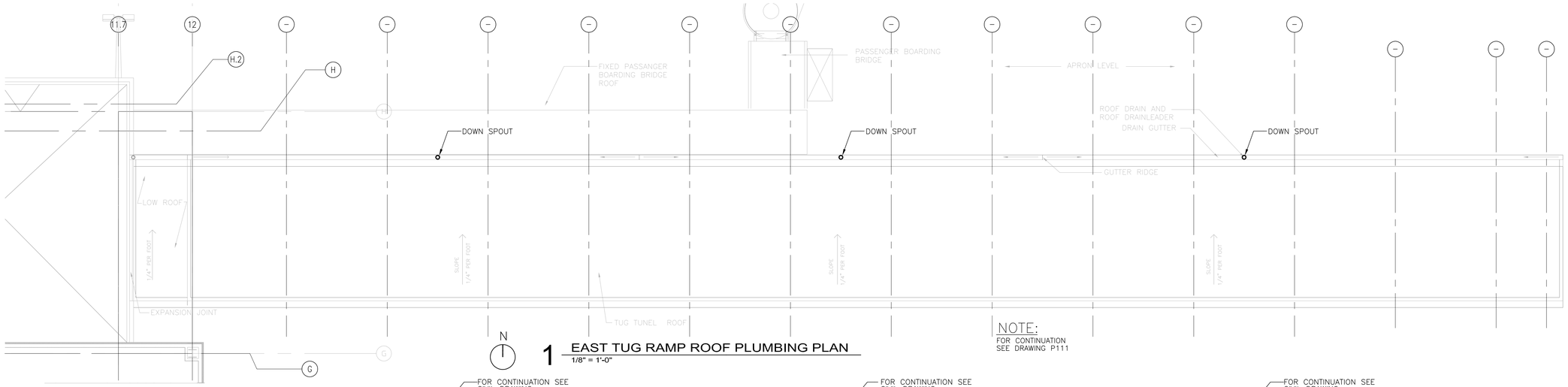
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SHEET TITLE
ENLARGED
SECOND FLOOR
PLUMBING PLAN
AREA B CANOPY ROOF

SHEET NUMBER
P121

BUILDING
PERMIT

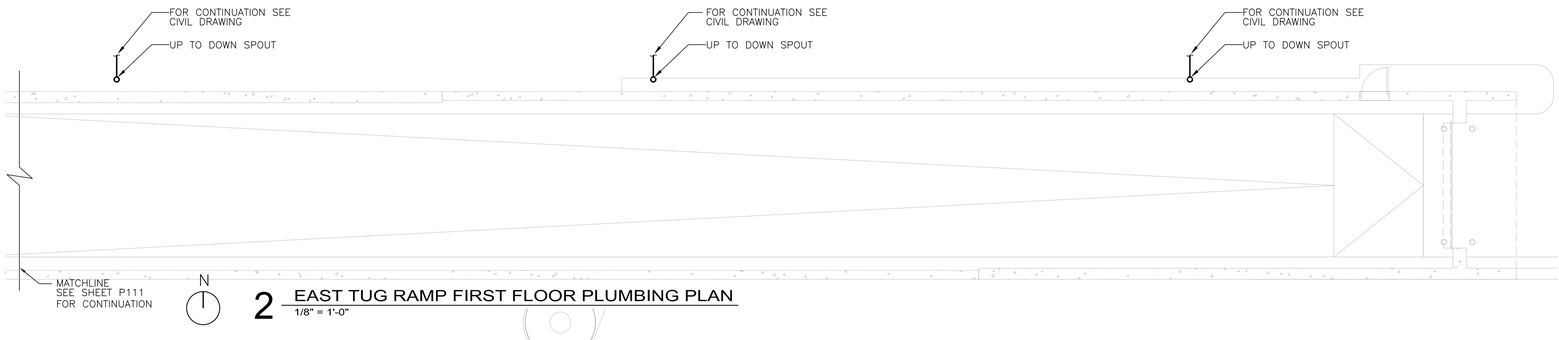
Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2008_P121.dwg Plotted on: 8/12/2010 12:01 PM Plotted by: Vokes, Henry



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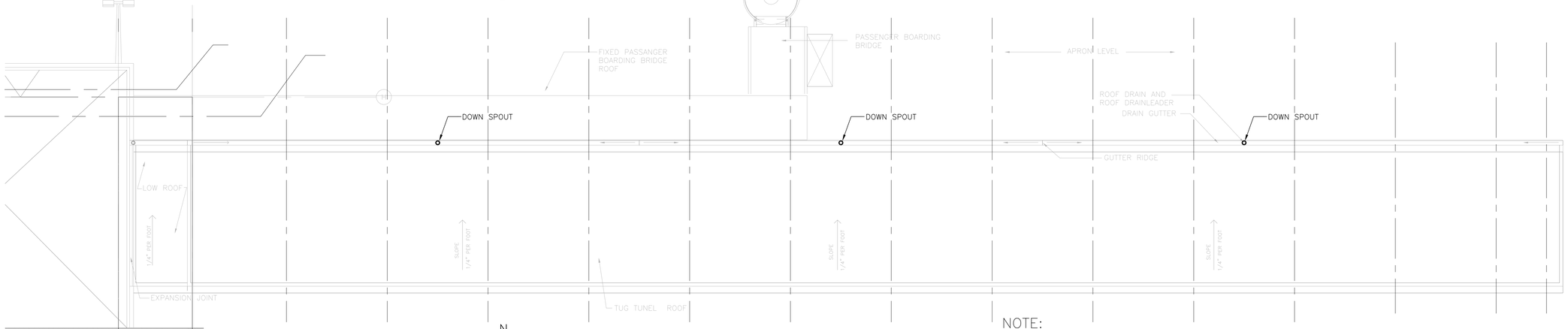
1 EAST TUG RAMP ROOF PLUMBING PLAN
1/8" = 1'-0"

NOTE:
FOR CONTINUATION
SEE DRAWING P111



N

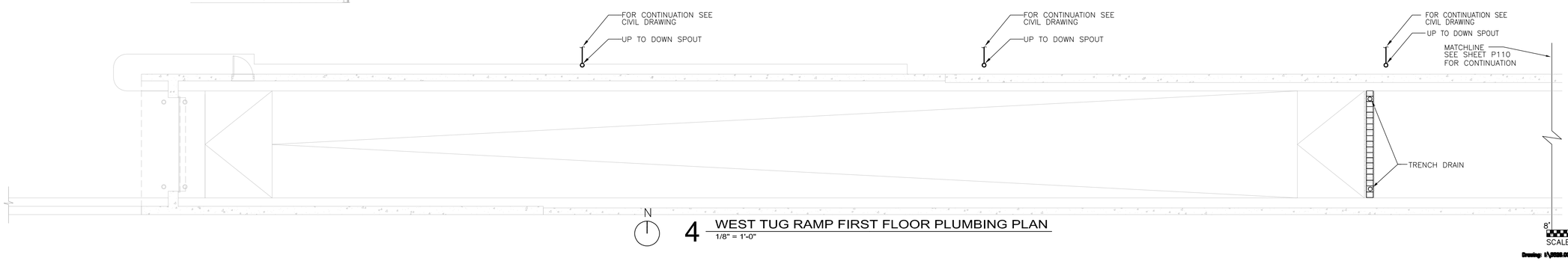
2 EAST TUG RAMP FIRST FLOOR PLUMBING PLAN
1/8" = 1'-0"



N

3 WEST TUG RAMP ROOF PLUMBING PLAN
1/8" = 1'-0"

NOTE:
FOR CONTINUATION
SEE DRAWING P-110



N

4 WEST TUG RAMP FIRST FLOOR PLUMBING PLAN
1/8" = 1'-0"

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

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Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
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DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
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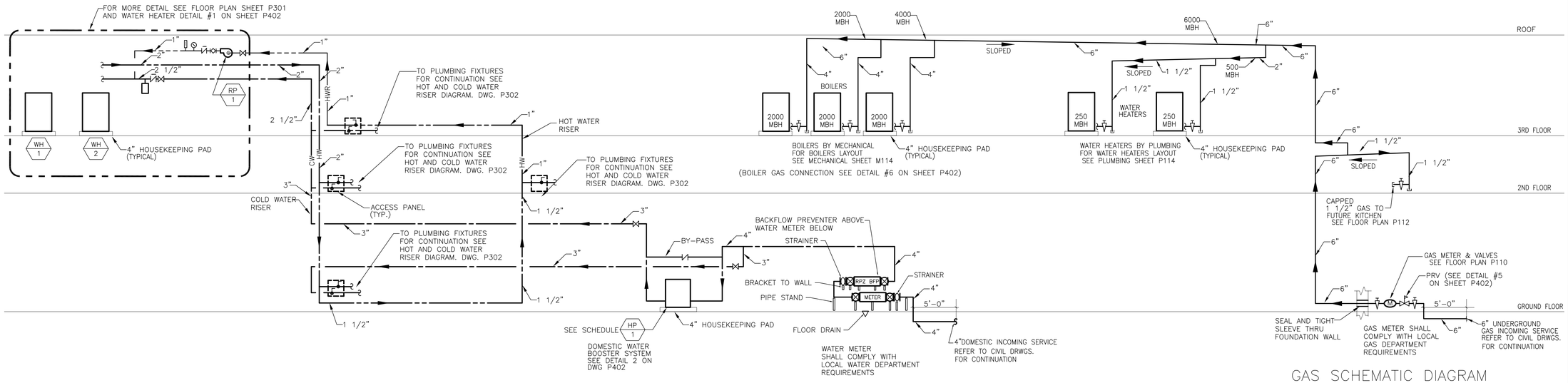
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SHEET TITLE
TUG RAMP
ROOF
PLUMBING PLAN

SHEET NUMBER
P122

BUILDING
PERMIT

Drawing: I:\2010\10.00 Duluth Airport\5.0 CAD\(5.6) Plumbing\Dwgs\2010_P122.dwg Plotted on: 8/12/2010 12:02 PM Plotted by: Velma, Henry

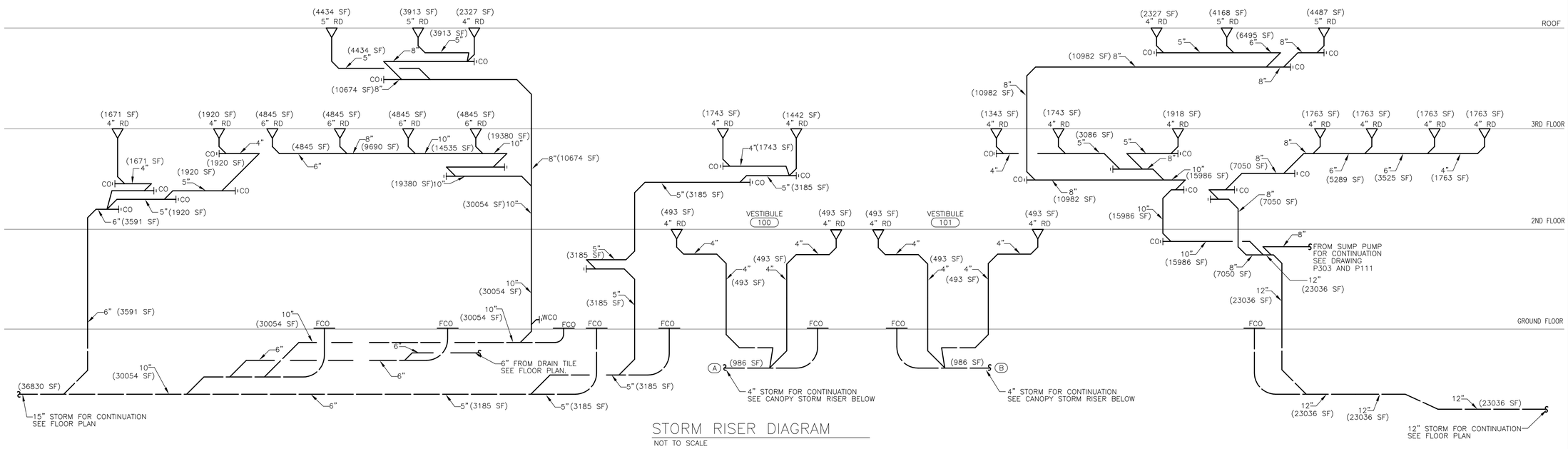


WATER SCHEMATIC DIAGRAM

NOT TO SCALE

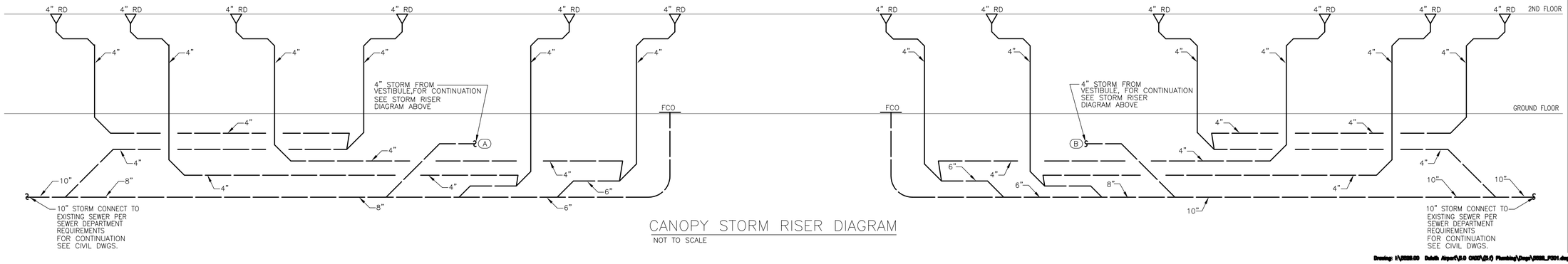
GAS SCHEMATIC DIAGRAM

NOT TO SCALE



STORM RISER DIAGRAM

NOT TO SCALE



CANOPY STORM RISER DIAGRAM

NOT TO SCALE

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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

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

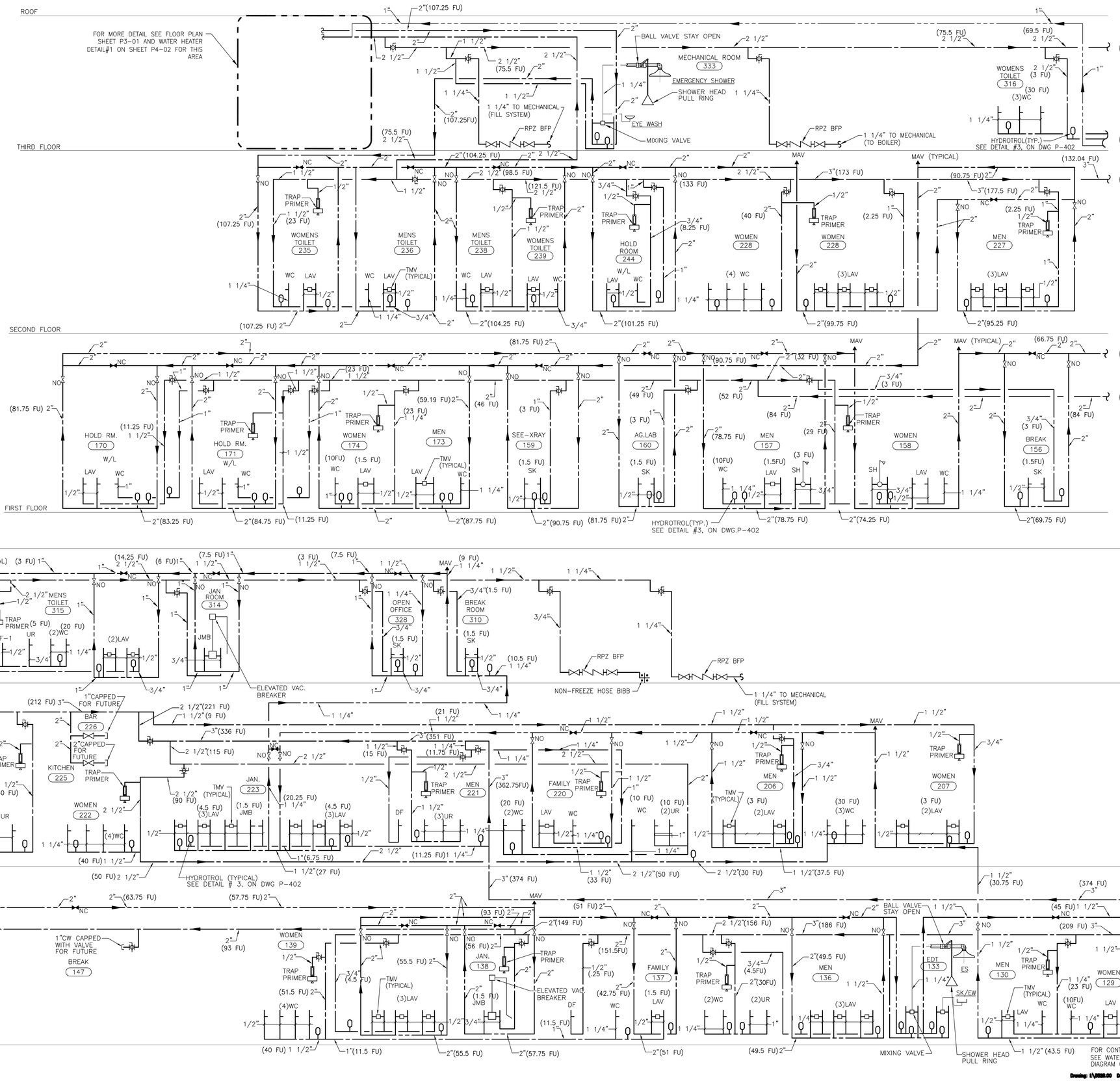
WATER SCHEMATIC, GAS SCHEMATIC AND STORM RISER DIAGRAM

SHEET NUMBER

P301

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P301.dwg Plotted on: 8/12/2010 3:09 PM Plotted by: Vekara, Nancy



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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

Interior Architects:
SJA ARCHITECTS
11 E Superior Street Se 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
TEL: (218) 722-1056 / FAX: (218) 722-9306

M/E/P/FP Engineers:
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DRAWN BY: HV/SA
DESIGNED BY: SA

AEP PROJECT NUMBER
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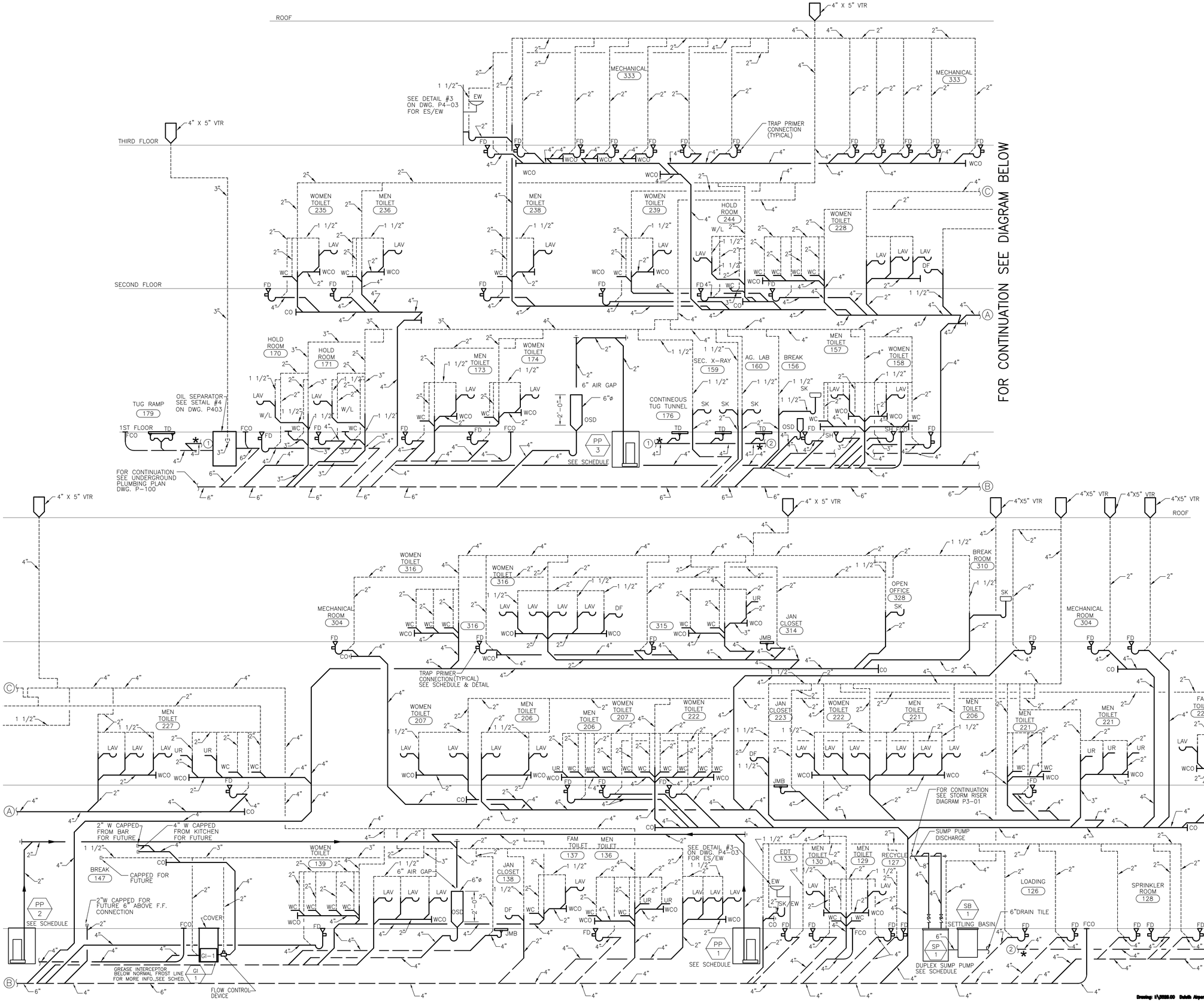
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SHEET TITLE
COLD & HOT WATER RISER DIAGRAM

SHEET NUMBER
P302

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\5.0 Plumbing\Dwgs\2008_P302.dwg Plotted on: 8/12/2010 3:05 PM Plotted by: Brandt, Mark



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SHEET TITLE

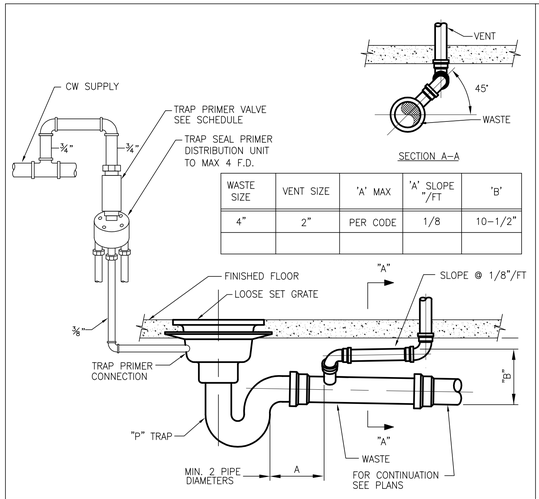
WASTE AND VENT
RISER DIAGRAM

SHEET NUMBER

P303

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\8.0 Plumbing\Dwgs\2008_P303.dwg Plotted on: 8/12/2010 12:07 PM Plotted by: Vokins, Henry

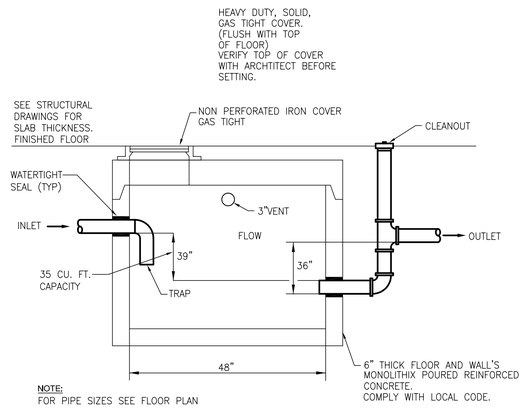


WASTE SIZE	VENT SIZE	'A' MAX	'A' SLOPE "/FT	'B'
4"	2"	PER CODE	1/8	10–1/2"

10 FLOOR DRAIN DETAIL WITH TRAP PRIMER

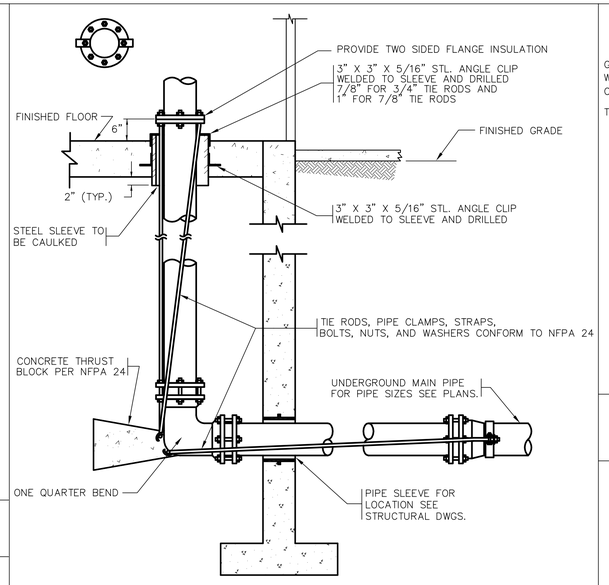
SCALE: NONE

NOTE: DIMENSION 'B' DOES NOT INCLUDE FALL DUE TO SLOPE, ADD FALL DUE TO VENT SLOPE TO OBTAIN INVERT ELEVATION.



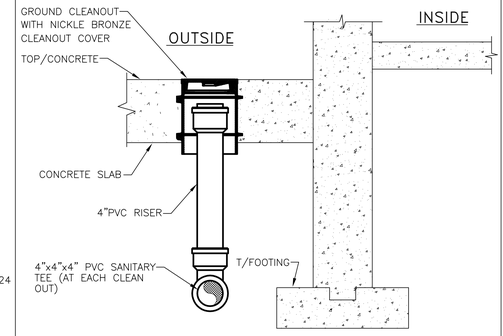
8 OIL SEPARATOR SETTLING BASIN DETAIL

SCALE: NONE



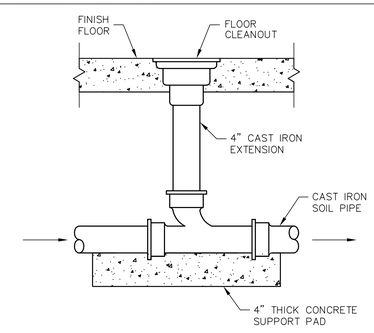
5 WATER MAIN ENTRANCE DETAIL

SCALE: NONE



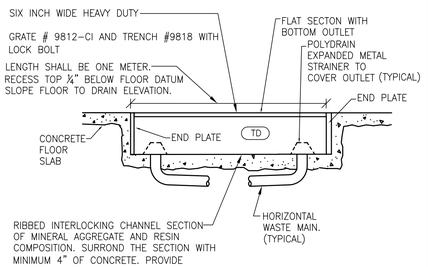
1 EXTERIOR SUB-SOIL DRAIN GROUND CLEANOUT DETAIL (GCO)

SCALE: NONE



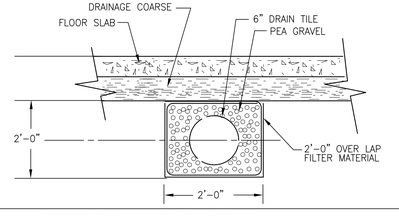
2 CLEANOUT DETAIL

SCALE: NONE



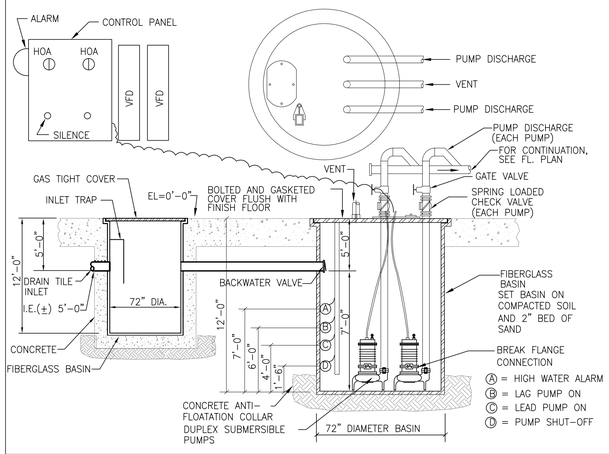
3 TRENCH DETAIL

SCALE: NONE



4 DRAIN TILE DETAIL

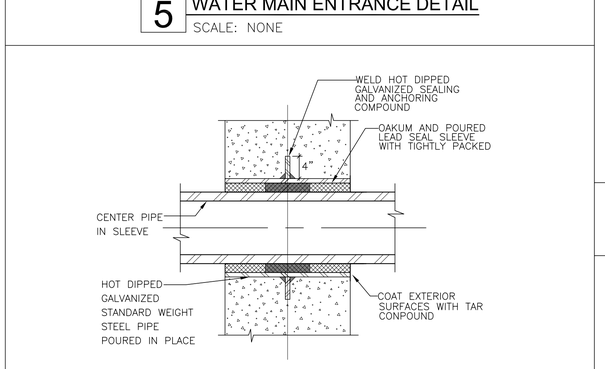
SCALE: NONE



9 DUPLEX SUMP AND SETTLING BASIN

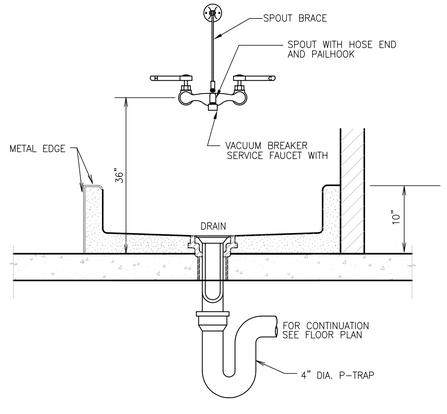
SCALE: NONE

SP 1 SB 1



6 WATERTIGHT SLEEVES (WT SLV) THRU CONCRETE FOUNDATION WALLS

SCALE: NONE



7 MOP SINK DETAIL

SCALE: NONE

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DESIGNED BY: SA

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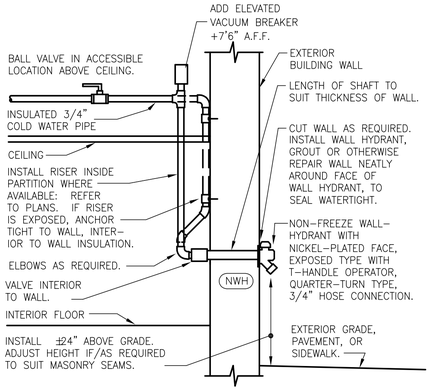
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SHEET TITLE
PLUMBING DETAILS

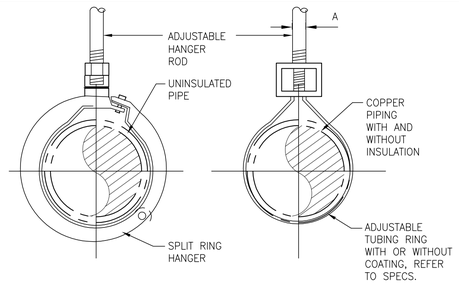
SHEET NUMBER
P401

BUILDING PERMIT

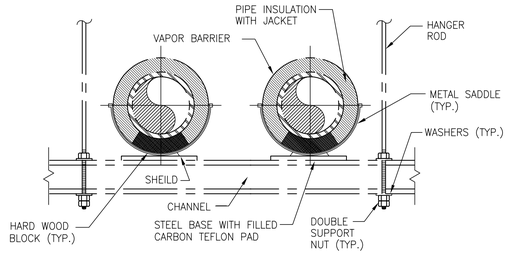
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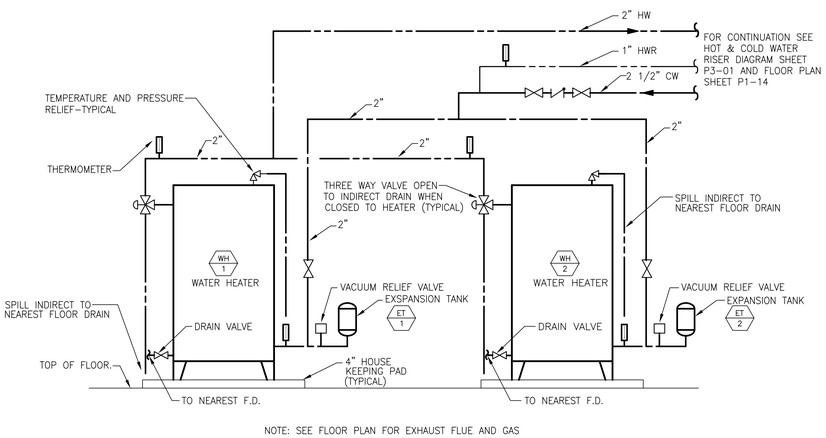
10 NON-FREEZE WALL HYDRANT
SCALE: NONE



5 PIPE HANGER DETAIL
SCALE: NONE

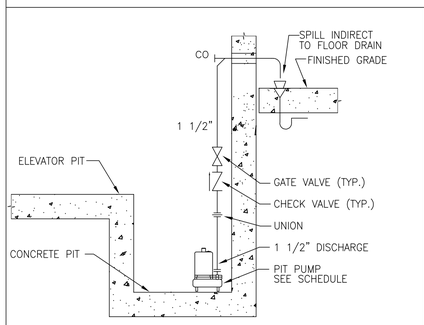


6 TRAPEZE HANGER DETAIL
SCALE: NONE

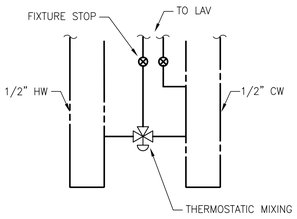


NOTE: SEE FLOOR PLAN FOR EXHAUST FLUE AND GAS

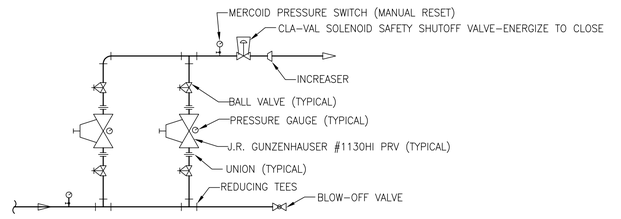
1 GAS FIRED HOT WATER HEATER DETAIL
WH 1 WH 2
SCALE: NONE



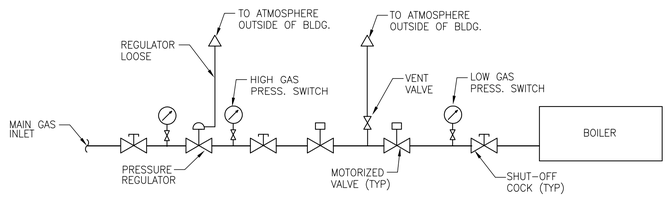
11 ELEVATOR PIT PUMP PIPING DETAIL
SCALE: NONE



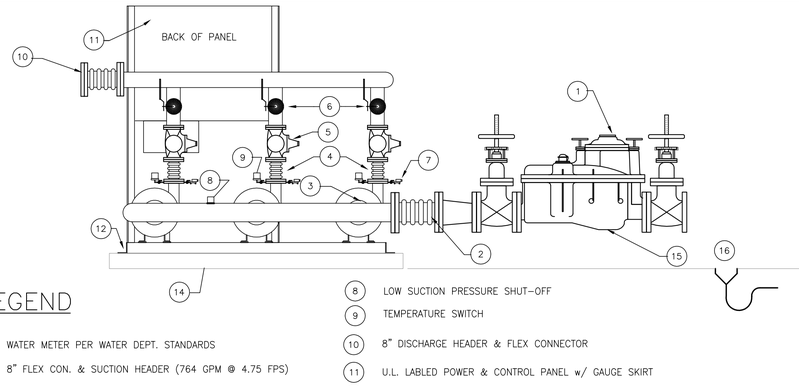
12 THERMOSTATIC MIXING VALVE AT LAV
SCALE: NONE



7 TRAPEZE HANGER DETAIL
SCALE: NONE



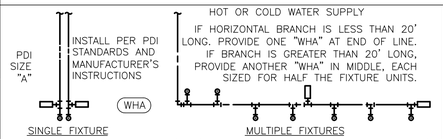
8 GAS TRAIN DIAGRAM
SCALE: NONE



LEGEND

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

2 INCOMING WATER SERVICE AND TRIPLEX DOMESTIC WATER BOOSTER PUMP ARRANGEMENT
WH 1 WH 2
SCALE: NONE



SINGLE FIXTURE

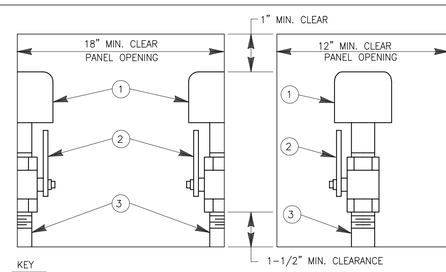
PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

MULTIPLE FIXTURES

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

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

3 WATER HAMMER ARRESTERS
SCALE: NONE

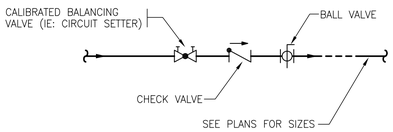


KEY

1. WATER HAMMER ARRESTOR
2. BALL VALVE, SAME NOMINAL SIZE AS PIPE BRANCH IN CHASE. OPENING IN BALL VALVE TO MATCH PIPE I.D.
3. PIPE SAME SIZE AS BRANCH IN CHASE TO WHICH IT IS ATTACHED.

NOTE: PROVIDE REDUCER IF REQUIRED BETWEEN VALVE AND WATER HAMMER ARRESTOR.

4 WATER HAMMER PANEL INSTALLATION
SCALE: NONE (SINGLE AND DOUBLE APPLICATION)



9 BALANCING VALVE DETAIL
SCALE: NONE

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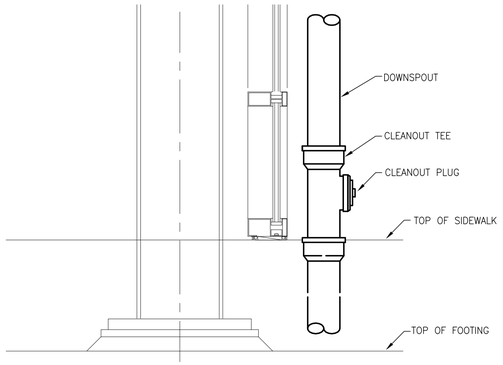
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SHEET TITLE
PLUMBING DETAILS

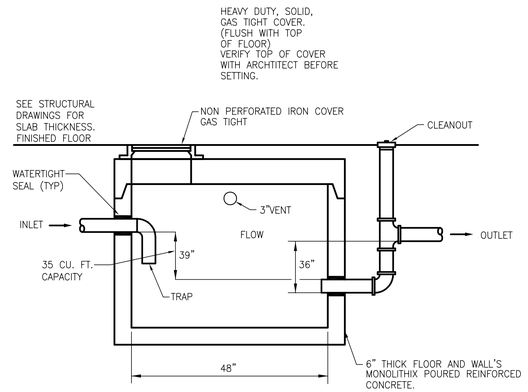
SHEET NUMBER
P402

BUILDING PERMIT

Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.6) Plumbing\Dwgs\2008_P402.dwg Plotted on: 8/12/2010 12:11 PM Plotted by: Vokes, Henry

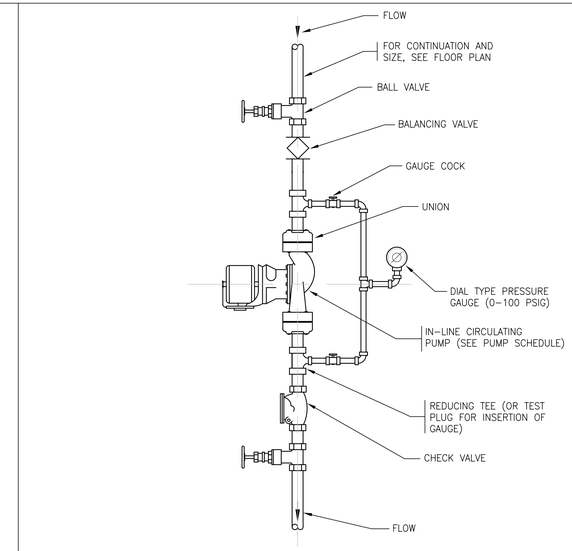


7 DOWNSPOUT DETAIL
SCALE: NONE

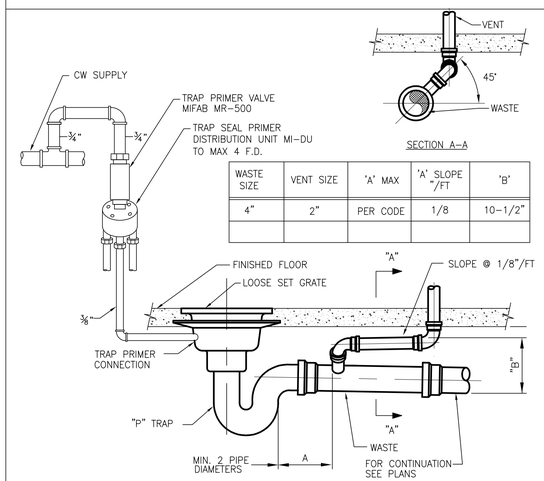


NOTE:
FOR PIPE SIZES SEE FLOOR PLAN

4 OIL SEPARATOR SETTLING BASIN
SCALE: NONE



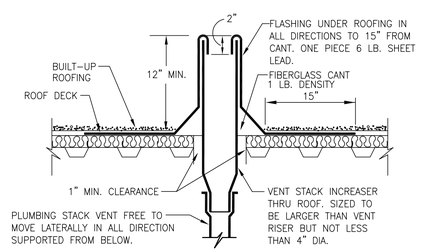
1 CIRCULATING PUMP DETAIL
SCALE: NONE



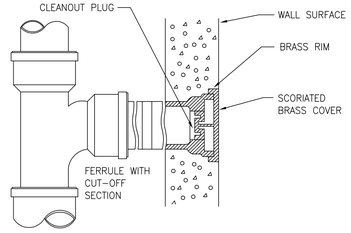
WASTE SIZE	VENT SIZE	'A' MAX	'A' SLOPE "/FT	'B'
4"	2"	PER CODE	1/8	10–1/2"

5 FLOOR DRAIN DETAIL WITH TRAP PRIMER
SCALE: NONE

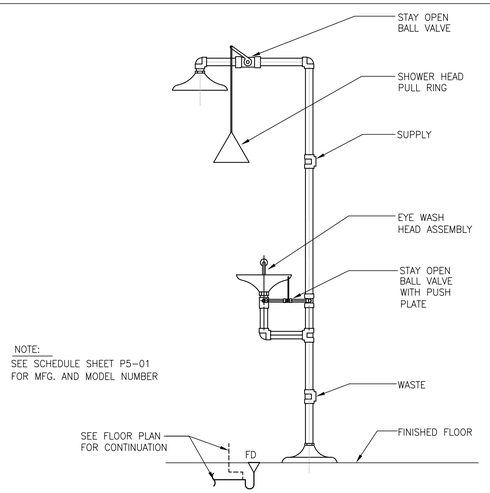
NOTE: DIMENSION 'B' DOES NOT INCLUDE FALL DUE TO SLOPE, ADD FALL DUE TO VENT SLOPE TO OBTAIN INVERT ELEVATION.



6 VENT THRU ROOF
SCALE: NONE



2 WALL CLEANOUT DETAIL
SCALE: NONE



NOTE:
SEE SCHEDULE SHEET P5–01 FOR MFG. AND MODEL NUMBER

3 EMERGENCY SHOWER WITH EYEWASH
SCALE: NONE

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ENGINEER CERTIFICATION
I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

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	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
PLUMBING DETAILS

SHEET NUMBER
P403

BUILDING PERMIT

Drawing: I:\2025.00 Duluth Airport\5.0 CADD\(5.1) Plumbing\Dwgs\2025_P403.dwg Plotted on: 8/12/2010 12:09 PM Plotted by: Velasa, Henry

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

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

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

"X" MEANS NOT AVAILABLE

BUTTERFLY VALVES – 4 INCH AND LARGER 175 PSI MAX.

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

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

SWING CHECK VALVES – 2 INCH AND SMALLER

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

FOR GROOVED CONNECTIONS, USE VICTAULIC SERIES 712

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

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

FOR GROOVED CONNECTIONS, USE VICTAULIC SERIES 712

"X" MEANS NOT AVAILABLE

PLUMBING MATERIALS SPECIFICATION

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

FIXTURE ROUGH-IN PIPE SIZES

FIXTURE	TAG	RISER AND AIR CHAMBER FOR FIXTURE HW	RISER AND AIR CHAMBER FOR FIXTURE CW	FIXTURE NIPPLE (VALVE INLET) HW	FIXTURE NIPPLE (VALVE INLET) CW	CODE REQUIREMENTS WASTE	CODE REQUIREMENTS VENT	MOUNTING HEIGHT (FLR. TO RIM)	ELEC.	MFG.	MODEL	REMARKS
WATER CLOSET	WC–1	–	1 1/4"	–	1"	4"	2"	15"	120V	SEE SPEC.		
WATER CLOSET (ADA)	WC–2	–	1 1/4"	–	1"	4"	2"	17"	120V	SEE SPEC.		
WATER CLOSET/LAV	W/L	3/4"	1 1/4"	1/2"	1/2"	4"	2"	–	–	WILLOUGHBY	ECF–3696	ADA COMPLIANT – LAV /TOILET , FULL MODEL NUMBER ECF–3696 (L OR R) ON–BPH–PM2–PBH–OV–TW4–LF–RTH FLUSH CONTROL CUTOFF SWITCH LOCATE OUTSIDE ROOM.
LAVATORY	LAV–1	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	SEE ARCH.	–	SEE SPEC.		
URINAL	UR–1	–	1"	–	3/4"	2"	1 1/2"	24"	120V	SEE SPEC.		
URINAL (ADA)	UR–2	–	1"	–	3/4"	2"	1 1/2"	17"	120V	SEE SPEC.		
SINK	SK–1	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	–	–	SEE SPEC.		
SINK	SK–2	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	–	–	SEE SPEC.		
DRINKING FOUNTAIN	DF–1	–	3/4"	–	1/2"	2"	1 1/2"	–	–	SEE SPEC.		
JANITOR'S MOP BASIN	JMB	3/4"	3/4"	1/2"	1/2"	3"	2"	–	–	SEE SPEC.		
HOSE BIBB	HB	–	1"	–	3/4"	–	–	–	–	–	–	WITH CODE REQ'D. BACKFLOW PREVENTER
TRAP PRIMER	TP	–	1/2"	–	–	–	–	–	–	PRECISION PLUMBING PRODUCTS	MODEL P1 or P2	RUN 1/2" COLD WATER TO EACH FLOOR DRAINS INCLUDE DISTRIBUTION UNITS AS REQUIRED.
								–				
EMER. SHOWER / EYEWASH (ADA)	ES/EW	2"	1 1/2"	1 1/4"	1 1/4"	2"	2"	–	–			
SHOWER	SH	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	–	–	SEE SPEC.		

DOMESTIC WATER HEATER SCHEDULE

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

PUMP SCHEDULE

	SERVICE	LOCATION	SYSTEM GPM	TOTAL DYNAMIC HEAD	PUMP GPM	MOTOR DATA HP	MOTOR DATA VOLTS	MOTOR DATA PH	MOTOR DATA RPM	MANUFACTURER & MODEL	REMARKS
HP–1	HOUSE PUMP	GROUND FLOOR	145	92	73	5	460	3	3450	SYNCROFLO 55TA354V–VFD	TRIPLEX BOOSTER SYSTEM U.L./C–U.L. SYSTEM FLOW 145 GPM BOOST PRESSURE 40 PSIG INCLUDING A SUCTION PRESSURE OF 38 PSIG MIN.
				92	73	5	460	3	3450		
				92	37	3	460	3	3450		
RP–1	120° HOT WATER RECIRCULATING PUMP	THIRD FLOOR	6	31		1/6	115		3300	B&G PL–36	IN–LINE
PP–1,2&3	ELEVATOR PIT PUMP	GROUND FLOOR	10	15	–	1/4	120	1		ZOELLER PUMP CO, STANCOR	SUBMERSIBLE, SUMP PUMP LOCATED IN 18"X18"X24" W/ OIL MINDER ON EMERGENCY POWER
SP–1	DUPLEX SUBMERSIBLE SUMP PUMP	GROUND FLOOR	800	30	800	10	460	3	1750	FTI FTI150DLF67.54	DUPLEX SUBMERSIBLE SUMP PUMP DUPLEX VARIABLE–SPEED CONTROL SYSTEM TO RESPOND TO THE FLOW CHANGES, PROVIDE SUBMERSIBLE TRANSMITTER, EMERGENCY POWER

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

MIXING VALVE SCHEDULE

TAG	LOCATION	SERVICE	IN HOT	IN COLD	MIXED OUT	GPM MIN.	GPM MAX	COMMENTS	BASIS OF DESIGN
TMV	SINK	LAV	120	40	110	0.1	0.5	PARRALEL PIPED	SYMMONS 5–110–CK

GREASE INTERCEPTOR SCHEDULE

TAG NO.	SERVICE	LOCATION	MANUFACTURER & MODEL #	REMARKS
GI 1	GREASE INTERCEPTOR	GROUND FLOOR	J.R. SMITH MODEL # 8050 50 GPM FLOW, 100 LB. GREASE CAPACITY	

DRAIN SCHEDULE

TAG	SERVICE	DESCRIPTION	JR SMITH NO.	ACCEPTABLE MANUFACTURES
FD–1	FINISHED AREA FLOOR DRAIN	NICKLE BRONZE VANDAL PROOF TOP	2010	WADE OR ZURN
FD–2	MECHANICAL ROOMS	FLOOR SINK W/ 1/2" GRATE	2270	WADE OR ZURN
FD–3		RECESSED GRATE		
RD–1	ROOF DRAIN	CAST IRON WITH FLASHING CLAMP & CAST IRON DOME	1015–ARC	WADE OR ZURN
RD–2	ROOF DRAIN	CAST IRON WITH FLASHING CLAMP, CAST IRON DOME & INTERNAL DAM	–	WADE OR ZURN
RD–3	ROOF DRAIN			
TD	TRENCH DRAIN		TRENCH 9818 GRATE 9812–CI	POLYDRAIN
FS		FLOOR SINK		

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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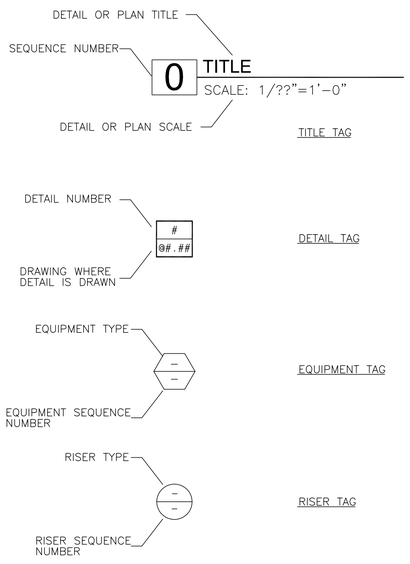
SHEET TITLE
PLUMBING SCHEDULES

SHEET NUMBER
P501

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwg\2008_P501.dwg Plotted on: 8/13/2010 12:11 PM Plotted by: Vokes, Nancy

DRAWING SYMBOLS



FIRE PROTECTION SYMBOLS

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

NOTE: NOT ALL SYMBOLS MAY BE USED.

FIRE PROTECTION ABBREVIATIONS

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

NOTE: NOT ALL SYMBOLS MAY BE USED.

DULUTH INTERNATIONAL AIRPORT

5528 FIRE PROTECTION DRAWING LIST

Sheet No.	Filename (proj.#5528	DRAWING TITLE	DATE: 11/25/09 ISSUED FOR BID	03/26/10 60% REVIEW	05/28/10 95% REVIEW	04/09/10 95% SET	08/16/10 BUILDING PERMIT				
F001	5528F001	FIRE PROT. SYMBOLS, ABBREVIATIONS AND DRAWING INDEX	●	●	●	●	●				
F110	5528F110	ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA A	●	●	●	●	●				
F111	5528F111	ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA B	●	●	●	●	●				
F112	5528F112	ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A	●	●	●	●	●				
F113	5528F113	ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA B	●	●	●	●	●				
F114	5528F114	ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA A	●	●	●	●	●				
F115	5528F115	ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA B	●	●	●	●	●				
F401	5528F401	FIRE PROTECTION DETAILS	●	●	●	●	●				
F501	5528F501	FIRE PROTECTION SCHEDULES AND RISER DIAGRAM	●	●	●	●	●				

GENERAL NOTES:

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

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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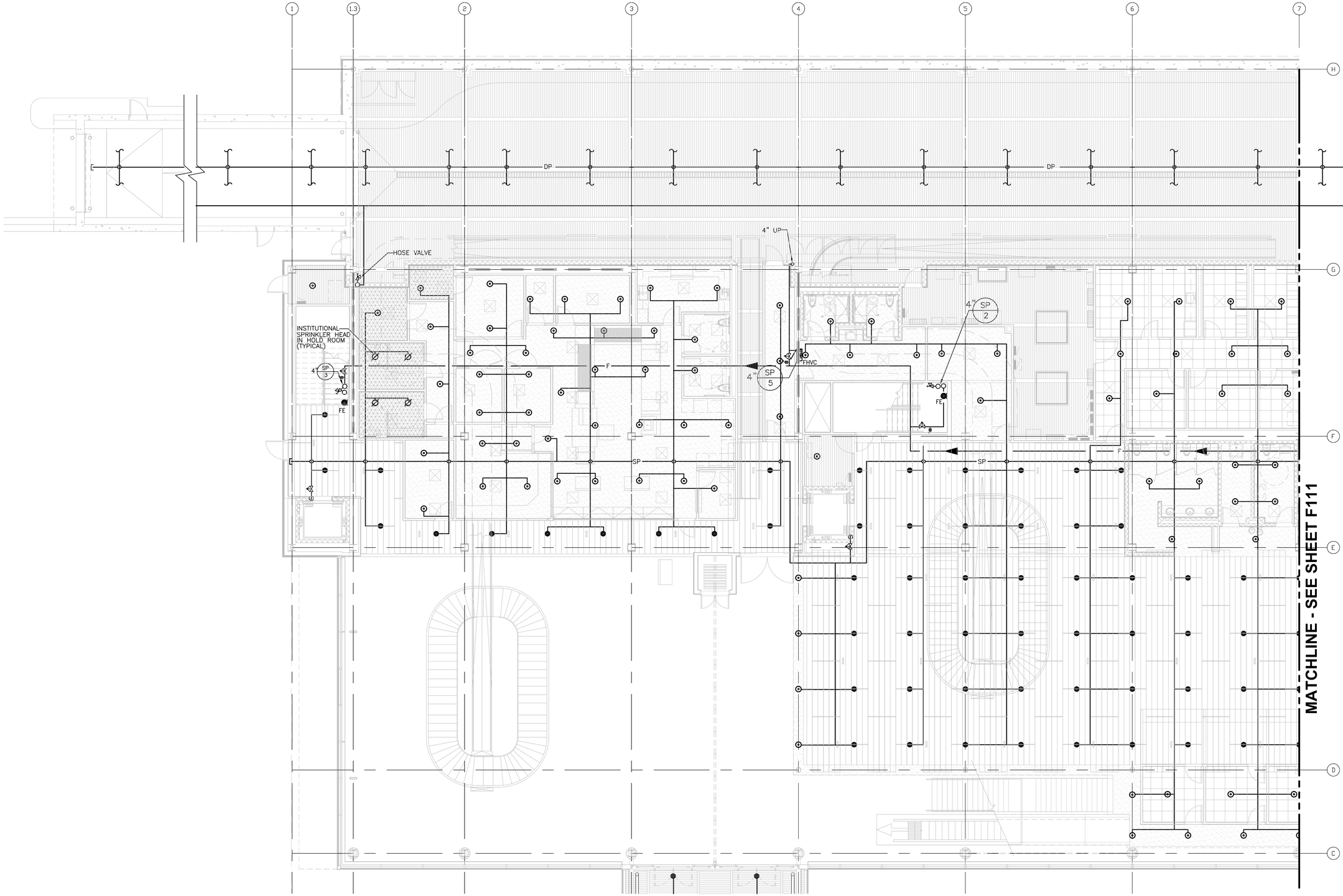
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SHEET TITLE
FIRE PROTECTION SYMBOL LIST, ABBREVIATIONS AND DRAWING INDEX

SHEET NUMBER
F001

BUILDING PERMIT

Drawing: I:\2528.00 Duluth Airport\9.0 CADD\(8.e) Fire Protection\Dwgs\2528_F001.dwg Plotted on: 8/13/2010 11:37 AM Plotted by: Ahmed, Saleem



N

1 ENLARGED FIRST LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) Fire Protection\Dwgs\2008_F110.dwg Plotted on: 8/12/2010 11:39 AM Plotted by: Ahmed, Saleem

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

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

ENGINEER CERTIFICATION

I hereby certify that the engineerinhg 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 Minnesota.

Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 1	6.11.10
	CONFORMANCE SET	7.12.10
3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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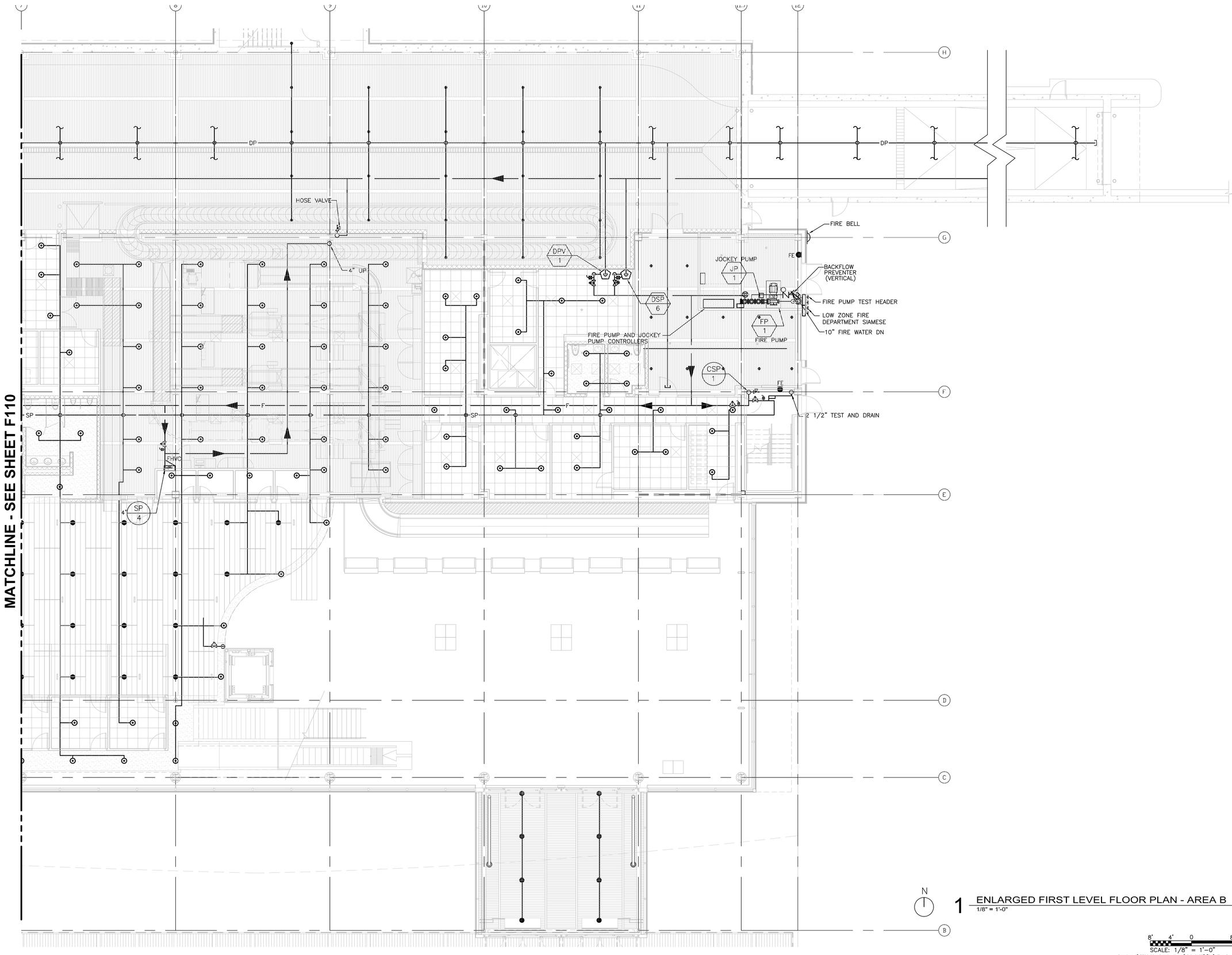
SHEET TITLE

ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER

F110

BUILDING PERMIT



N

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

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

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\[8.4] Fire Protection\Dwgs\2008_F111.dwg Plotted on: 8/13/2010 11:40 AM Plotted by: Ahmed, Saleem

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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

Structural Engineers:
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TEL: (218) 722-1056 / FAX: (218) 722-9306

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3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED:	08-16-10
REVIEWED BY:	RDJ
DRAWN BY:	HV
DESIGNED BY:	SA

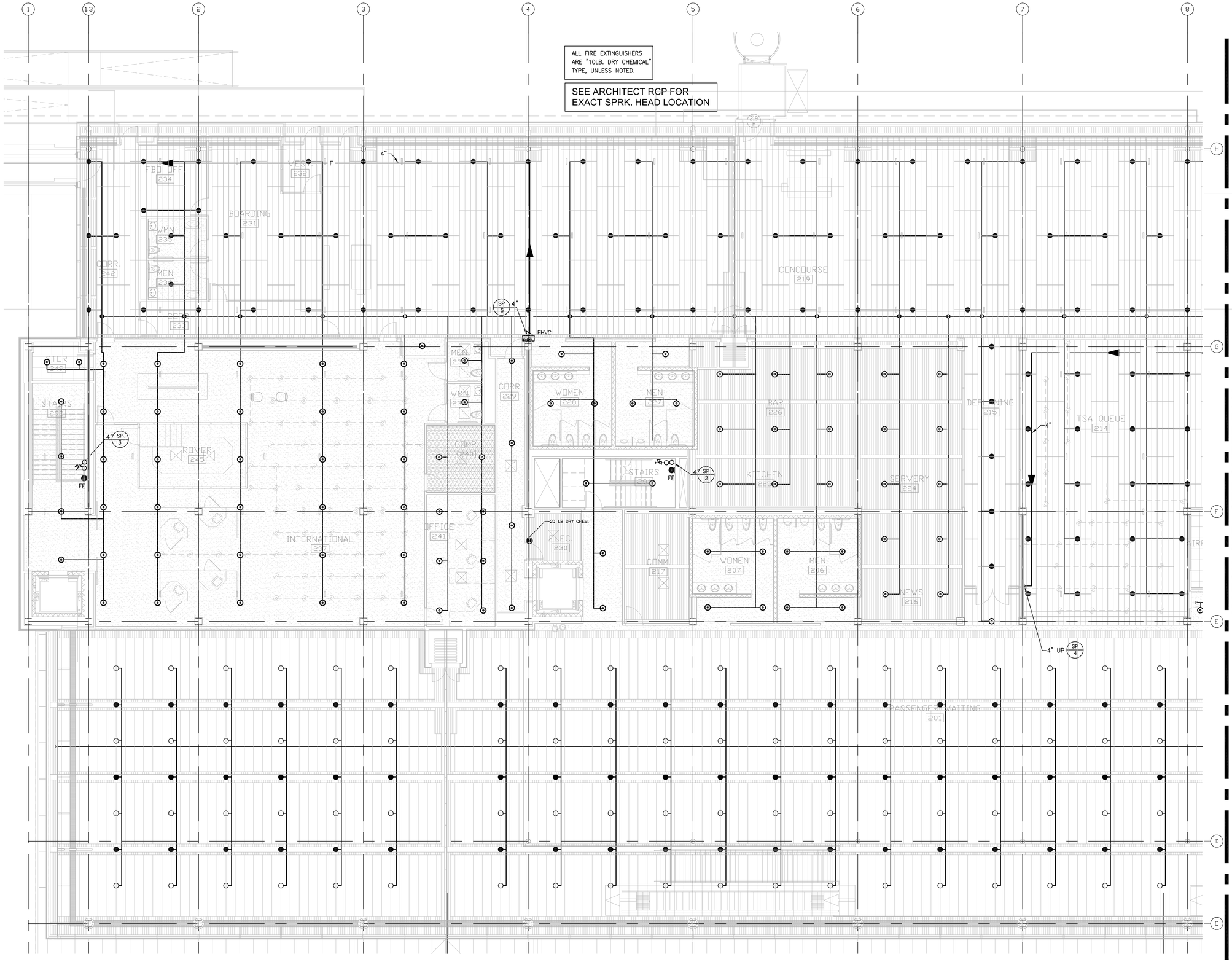
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA B

SHEET NUMBER
F111

BUILDING PERMIT



N

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

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

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.4) Fire Protection\Dwgs\2008_F112.dwg Plotted on: 8/13/2010 11:41 AM Plotted by: Ahmed, Sohem

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Signature:

Date: 08/16/10 Reg. No.: 21067

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3	PERMIT REVISIONS	7.23.10
	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

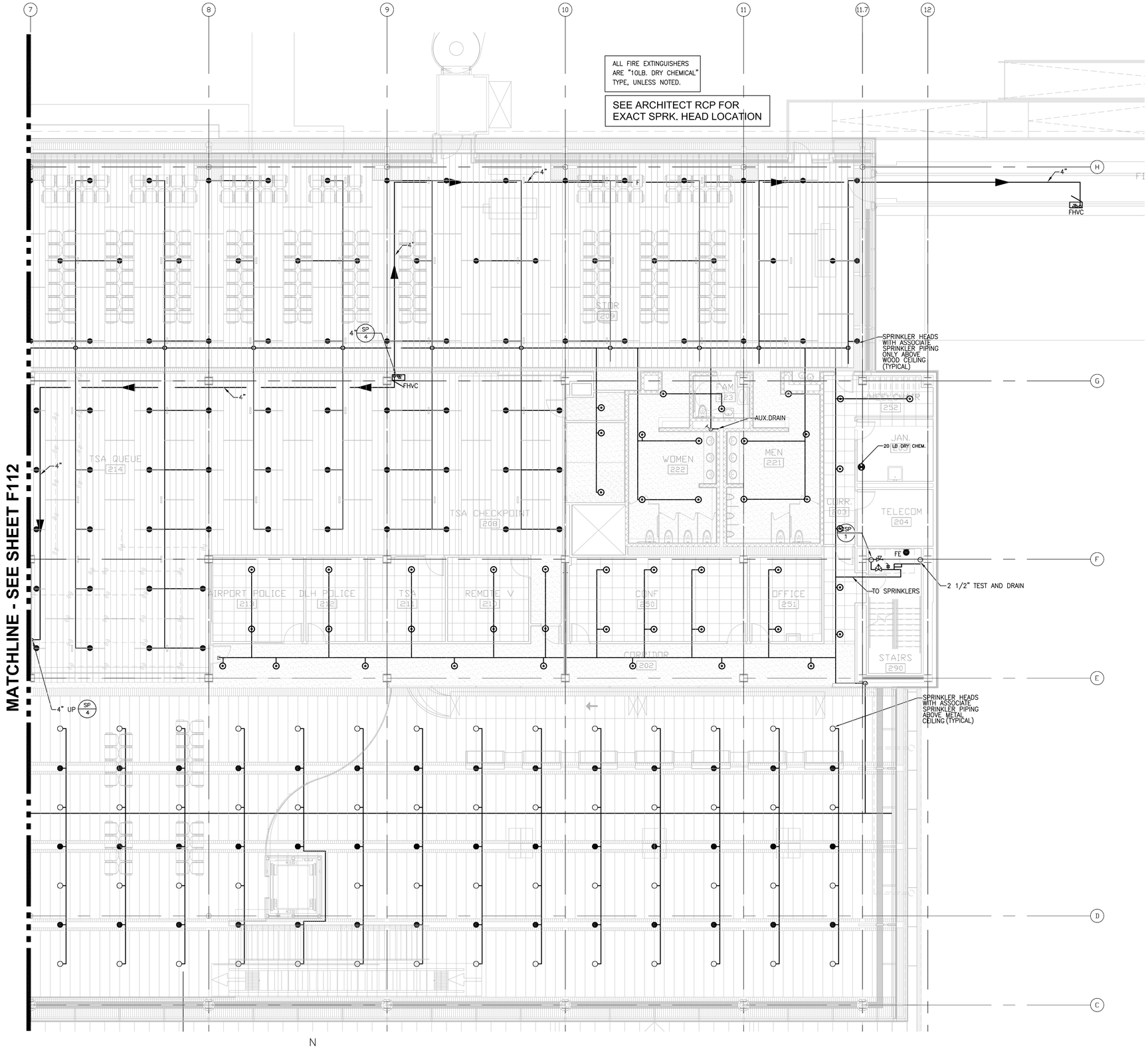
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER
F112

BUILDING PERMIT



N

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

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

Drawing: I:\2008.09 Duluth Airport\8.0 CADD\8.4 Fire Protection\Dwgs\2008_F113.dwg Plotted on: 8/13/2010 11:42 AM Plotted by: Ahmed, Saleem

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Signature:

Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

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DRAWN BY: HV
DESIGNED BY: SA

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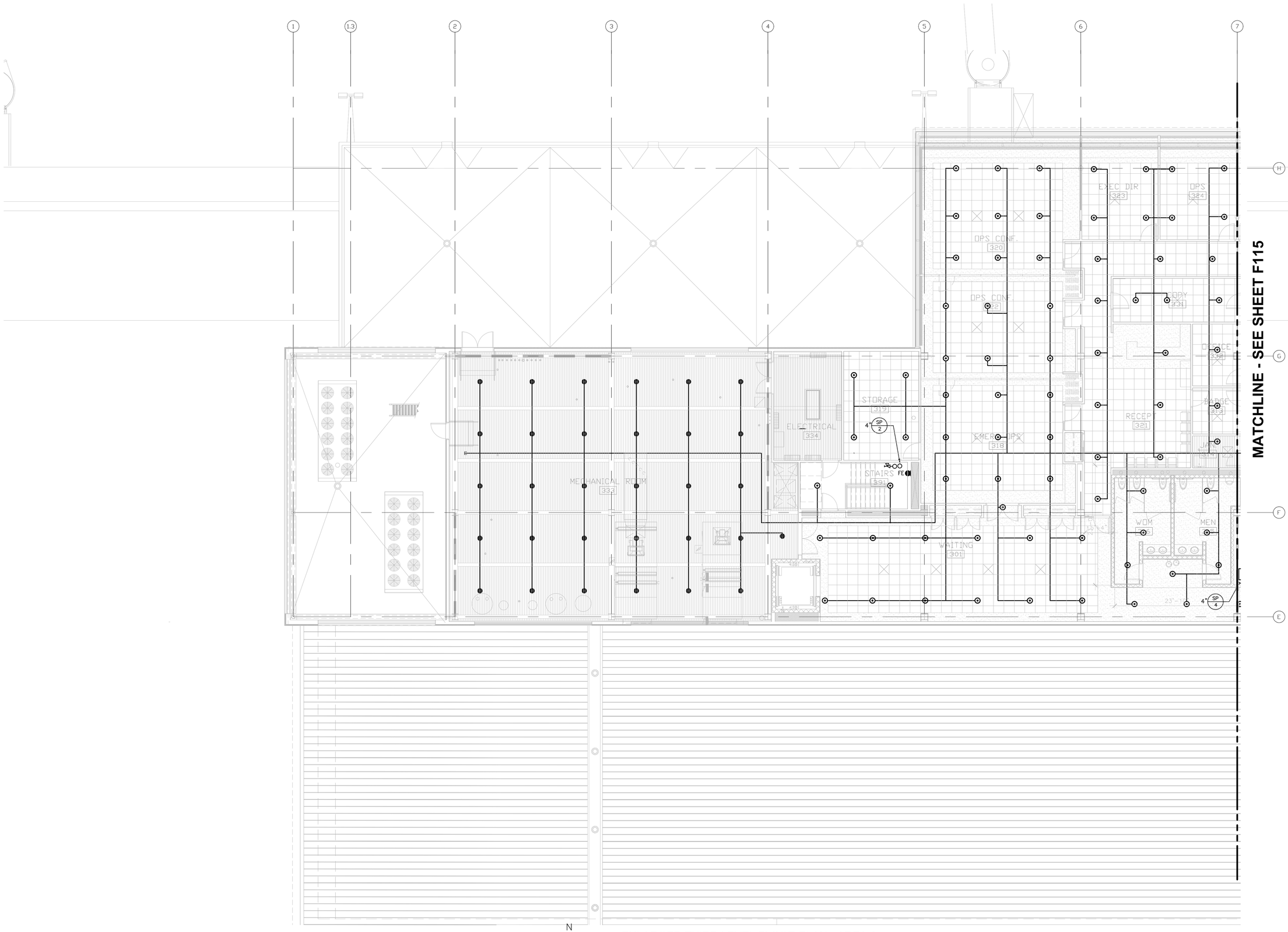
SHEET TITLE

ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA B

SHEET NUMBER

F113

BUILDING PERMIT



MATCHLINE - SEE SHEET F115

N

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

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

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DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

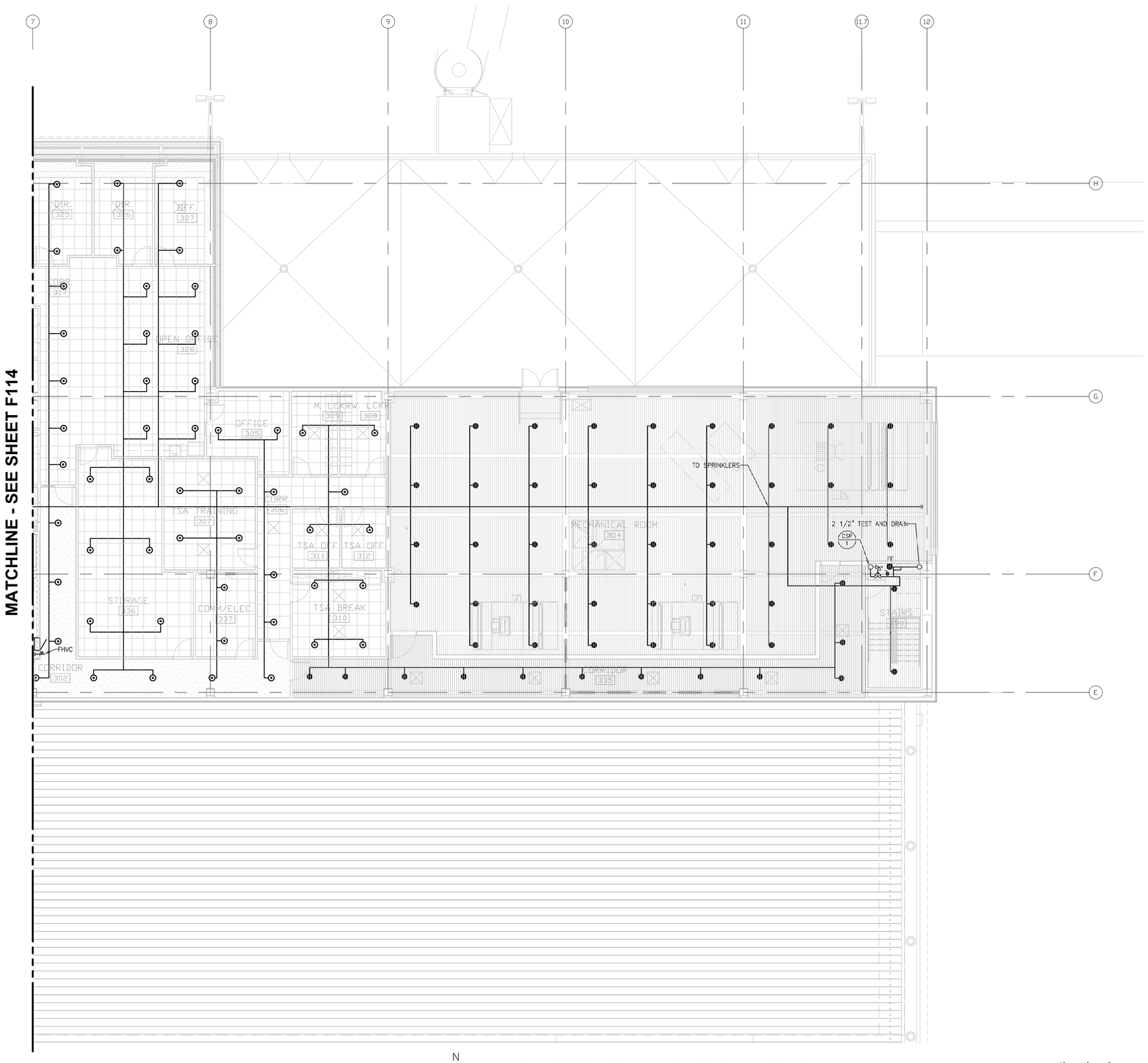
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SHEET TITLE
ENLARGED
THIRD FLOOR
FIRE PROTECTION
PLAN AREA A

SHEET NUMBER
F114

BUILDING
PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2008_F114.dwg Plotted on: 8/12/2010 11:43 AM Plotted by: Ahmed, Saleem



N

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

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

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(D-c) Fire Protection\Dwgs\2008_F115.dwg Plotted on: 8/12/2010 11:43 AM Plotted by: Ahmed, Saleem

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Print Name: Douglas C. Mass

Signature:

Date: 08/16/10 Reg. No.: 21067

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	BUILDING PERMIT	8.16.10

DATE ISSUED: 08-16-10
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

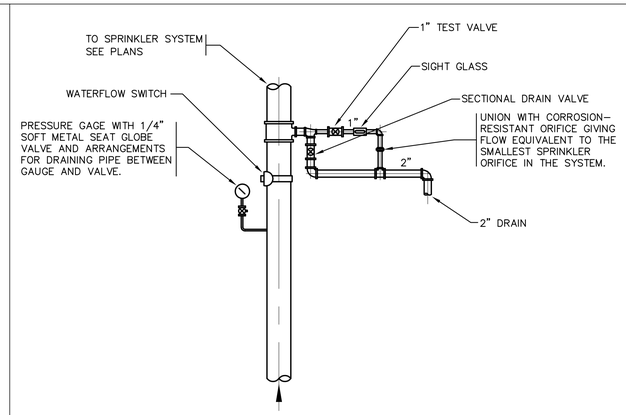
AEP PROJECT NUMBER
213-1882-091

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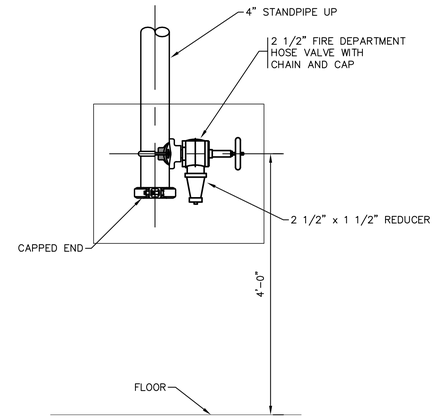
SHEET TITLE
ENLARGED
THIRD FLOOR
FIRE PROTECTION
PLAN AREA A

SHEET NUMBER
F115

BUILDING
PERMIT



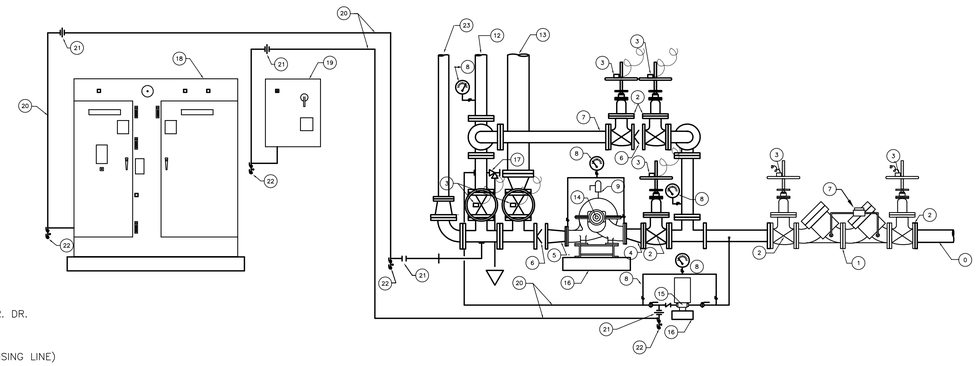
4 INSPECTOR'S TEST CONNECTION DETAIL
SCALE: NONE



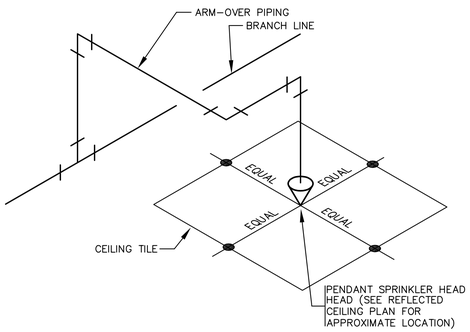
1 FIRE DEPARTMENT VALVE DETAIL
SCALE: NONE

LEGEND

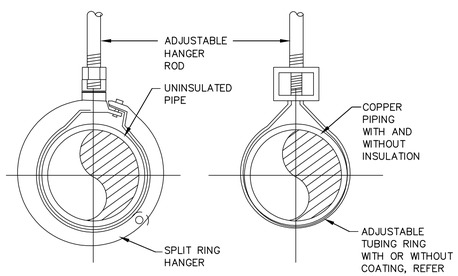
0. INCOMING WATER SERVICE FROM STREET MAIN
1. DOUBLE DETECTOR CHECK VALVE ASSY.
2. GATE VALVE
3. TAMPER SWITCH (TYP.)
4. ECCENTRIC REDUCER
5. CONCENTRIC REDUCER
6. NON-SLAM CHECK VALVE
7. BY-PASS
8. PRESSURE GAUGE (TYP.)
9. AIR RELEASE VALVE
10. VOID
11. VOID
12. TO SPRINKLER SYSTEMS
13. TO FIRE PUMP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



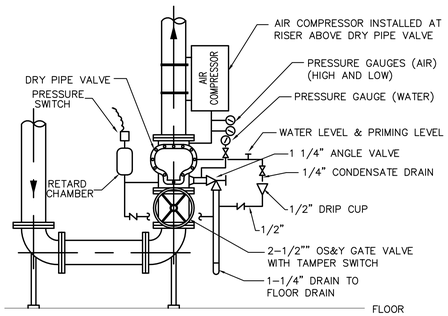
5 FIRE PUMP / JOKEY PUMP / CONTROLLERS ARRANGEMENT
FP 1 JP 1
SCALE: NONE



2 TYPICAL SPRINKLER HEAD LOCATION
SCALE: NONE



6 PIPE HANGER DETAIL
SCALE: NONE



3 DRY PIPE VALVE DETAIL
SCALE: NONE

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Date: 08/16/10 Reg. No.: 21067

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DATE ISSUED: 08-16-10
REVIEWED BY: XXX
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
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SHEET TITLE
FIRE PROTECTION DETAILS

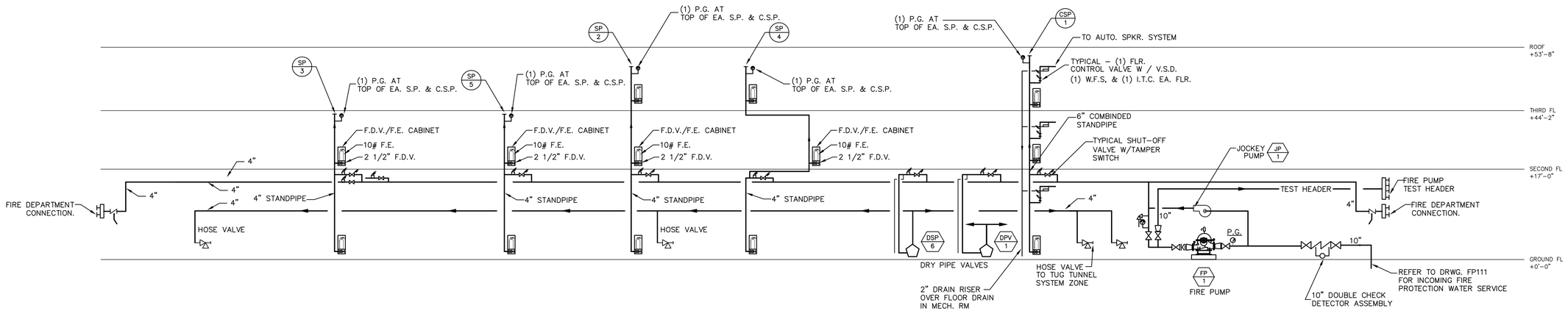
SHEET NUMBER
F401

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2008_F401.dwg Plotted on: 8/12/2010 11:44 AM Plotted by: Ahmed, Saleem

PUMP SCHEDULE

PUMP TAG	SERVICE	LOCATION	GPM EACH PUMP	TOTAL DYNAMIC HEAD	SHUT OFF HEAD	MOTOR DATA				MANUFACTURER	REMARKS
						HP	VOLTS	PH	RPM		
FP-1	FIRE PUMP	GROUND FLOOR	1250	47 FT		125	480	3	3550	PEERLESS MODEL # 6AEF10	130 PSI CHURN
JP-1	JOCKY PUMP	GROUND FLOOR	7			10	480	3			



1 FIRE PROTECTION RISER DIAGRAM
SCALE: NONE

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DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
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SHEET TITLE
FIRE PROTECTION SCHEDULES AND RISER DIAGRAM

SHEET NUMBER
F501

BUILDING PERMIT

Drawing: I:\2008.00 Duluth Airport\9.0 CADD\(B.e) Fire Protection\Dwg\2008_F501.dwg Plotted on: 8/13/2010 2:43 PM Plotted by: Velasa, Henry