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NEW PASSENGER TERMINAL
BID PACKAGE 2B - ISSUED FOR BID
VOLUME 3 OF 3
MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION
AUGUST 23, 2011

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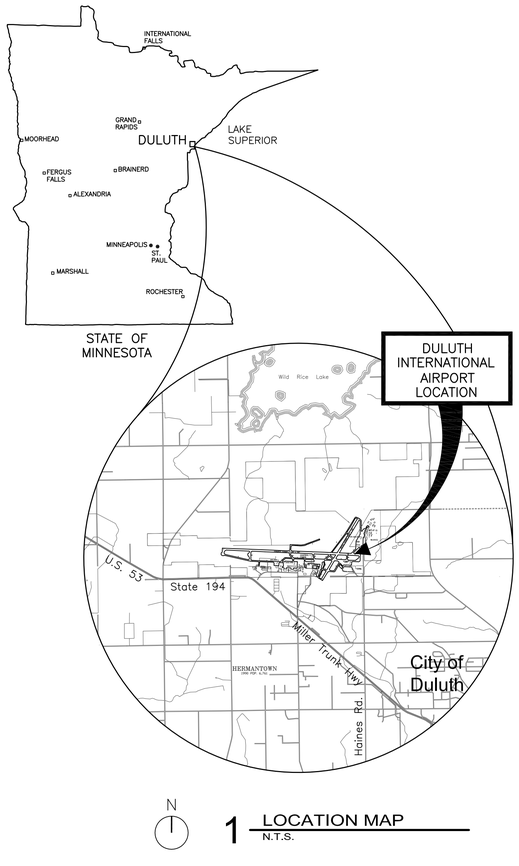
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ARCHITECTURAL CERTIFICATION
I hereby certify that the architectural plans, specifications or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Architect under the laws of the State of Minnesota.

Print Name: Mark Ip

Signature:

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

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.11.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.16.10
4	BUILDING PERMIT REVISIONS	11.12.10
	BID PACKAGE 2A	1.24.11
	BP2A CONFORMANCE SET	5.2.11
	BID PACKAGE 2B REVIEW	7.6.11

DATE ISSUED: 08-23-11
REVIEWED BY: SBS/TC
DRAWN BY: MKG/MI
DESIGNED BY: SBS/TC

AEP PROJECT NUMBER
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SHEET TITLE
DRAWING LIST

SHEET NUMBER
G101

BID PACKAGE 2B ISSUED FOR BID

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 — THERMOSTAT
FLEXIBLE CONNECTION	TRANSITION

SUPPLY — RETURN OR EXHAUST — SOLID CROSS INDICATES UP OR TOWARD. DASHED CROSS INDICATES DOWN OR AWAY.

GRILLE, REGISTER AND DIFFUSER SYMBOLS:

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

ROUND CEILING SUPPLY DIFFUSER OR REGISTER — TYPE (SEE SCHEDULE); A 8 / 300: ø NECK SIZE OR WIDTH X HEIGHT OR SLOT X LENGTH; CFM

CONTINUOUS FIN TUBE RADIATION

PIPE HANGER & SUPPORT SCHEDULE

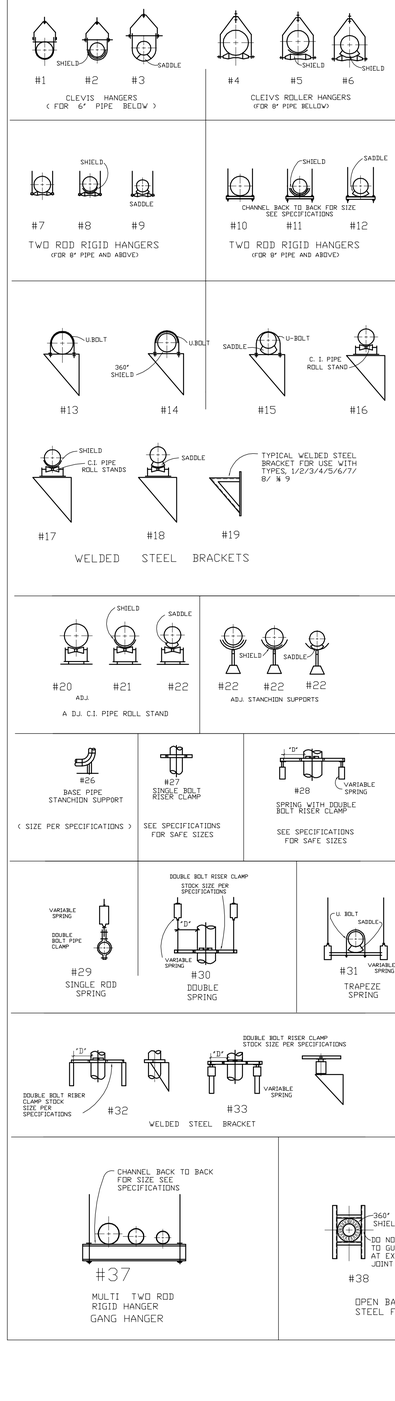
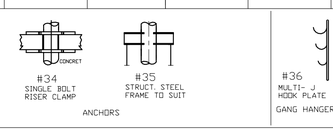


FIG NO.	LESS THAN 1/4" MOVEMENT EXCEPT AS NOTED: NON. INSUL.	CH.W. LINES	HOT LINES	MORE THAN 1/4" MOVEMENT EXCEPT AS NOTED: NON. INSUL.	CH.W. LINES	HOT LINES
	OVERHEAD SUPPORTS (HORIZONTAL PIPING)					
1						
2		✳				
3			✳			
4				✳		
5					✳	
6						✳
7				✳		
8					✳	
9						✳
10	✳					
11		✳				
12			✳			
	WALL SUPPORTS (HORIZONTAL PIPING)					
13	✳					
14		✳				
15			✳			
16				✳		
17					✳	
18						✳
19	✳	✳	✳	✳	✳	✳
	FLOOR SUPPORTS (HORIZONTAL PIPING)					
20				✳		
21					✳	
22						✳
23	✳					
24		✳				
25			✳			
	FLOOR SUPPORTS (VERTICAL PIPING)					
26	✳	✳	✳			
27	✳	✳	✳			
28				✳	✳	✳
	OVERHEAD SUPPORTS (VERTICAL ¾ HORIZ. PIPING)					
29				✳ ●	✳ ●	✳ ●
30				✳ ●	✳ ●	✳ ●
31				✳ ●	✳ ●	✳ ●
	WALL SUPPORTS (VERTICAL PIPING)					
32	✳	✳	✳			
33				✳ ●	✳ ●	✳ ●
	ANCHORS (VERTICAL ¾ HORIZONTAL PIPING)					
34	5/8 APPLIES TO ALL PIPES TO STOP MOVEMENT					
35						
	GANG HANGERS (VERTICAL PIPING)					
36	✳	✳	✳			
	GANG HANGERS (HORIZONTAL PIPING)					
37	✳	✳	✳	TO BE INDIVIDUALLY SUPPORTED		
	GUIDES (VERTICAL ¾ 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	100% REVIEW	BID PACKAGE 2A	BID PACKAGE 2A - ADDENDUM 2	BID PACKAGE 2A CONFORMANCE	BID PACKAGE 2B CONFORMANCE
		DATE	11/30/09	02/11/10	04/12/10	05/07/10	06/02/10	07/12/10	08/16/10	12/17/10	1/24/2011	2/25/2011	5/2/2011	8/23/2011
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	TUG TUNNEL RAMP SNOW MELT PLAN, FLOW DIAGRAM & DETAILS		●	●	SHEET DELETED							●	●	●
M303A	LANDSIDE SNOW MELT SYSTEM SCHEMATIC INTERIOR PIPE ROUTING DIAGRAM									●	●	●	●	●
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								●	●	●		●	●
M505	MECHANICAL DETAILS V										●		●	●
M506	RAMP SNOW MELT SYSTEM DETAILS											●	●	●

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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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
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

BID PACKAGE 2B ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M001.dwg Plotted on: 8/17/2011 8:35 AM Plotted by: Tolga, Farid

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.	CONDENSATE DRAIN (COIL, PAN DRAIN)
CONN.	CONNECTION
CR	CEILING REGISTER
CT	COOLING TOWER
CW	CLOCKWISE
CY	CYCLE
DB	DRY BULB TEMPERATURE
DD	DUCT SMOKE DETECTOR
DFN	DEFLECTION
DG	DOOR GRILLE
DIA	DIAMETER
DIFF	DIFFUSER
DX	DIRECT EXPANSION
DN	DOWN
DWG.	DRAWING
EF	EXHAUST FAN
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ED	EXHAUST DISCHARGE
EE	ELECTRICAL ROOM EXHAUST
EFF	EFFICIENCY
EH	EXHAUST HEAD
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC.	ELECTRIC
ELEV.	ELEVATOR
EOAT	ENTERING OUTSIDE AIR TEMPERATURE
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
F	FILTER
FA	FREE AREA
FD	FIRE DAMPER
F/SD	FIRE SMOKE DAMPER
FHE	FUME HOOD EXHAUST
FL	FLOOR
FLEX.	FLEXIBLE
FMD	FLOW MEASURING DEVICE
FO	FILTER ON OUTSIDE AIR
FP	FAN POWER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FR	FILTER ON RETURN AIR
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT
FTR	FINNED TUBE RADIATOR
FLGD	FLANGED
GA	GAGE OR GAUGE
GC	GENERAL CONTRACTOR
GD	GRAVITY DAMPER
GE	GENERAL EXHAUST
GR	GRILLE
GALV	GALVANIZED
H	HORIZONTAL
HC	HEATING COIL
HP	HORSEPOWER
HTG	HEATING
HU	HUMIDIFIER
HVAC	HEATING VENTILATION & AIR CONDITIONING
HX	HEAT EXCHANGER
HZ	HERTZ
ID	INSIDE DIAMETER
IAC	INSTRUMENTS AIR COMPRESSOR
IN	INCH
INSUL	INSULATION
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
KWH	KILOWATT HOUR
LD	LINED DUCT
LN	LINEAR
LOV	INTAKE OR EXHAUST LOUVER
LWT	LEAVING WATER TEMPERATURE
MACH	MACHINE
MAT	MIXED AIR TEMPERATURE
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MD	MOTORIZED DAMPER
MIN	MINIMUM
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
NC	NOISE CRITERIA
N.C.	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
NK	NECK
N.O.	NORMALLY OPEN
NR	NO REQUIREMENT
NRO	NET ROOF OPENING
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DAMPER
OSD	OPEN SITE DRAIN
OV	OUTLET VELOCITY
PFR	PREFILTER ON RETURN AIR
1 PH	SINGLE PHASE
3 PH	THREE PHASE
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PSIG	POUND PER SQUARE INCH
PNEU.	PNEUMATIC
R	REFRIGERATION
RA	RETURN AIR
REF	RECIRCULATION/EXHAUST FAN
REG	REGISTER
REQ'D	REQUIRED
RET	RETURN
RM	ROOM
RP	REFRIGERANT PUMPOUT UNIT
RPM	REVOLUTIONS PER MINUTE
RV	PRESSURE RELIEF VALVE
S	SUPPLY FAN
SA	SUPPLY AIR
SD	SMOKE DAMPER
SF	SQUARE FEET
SHT	SHEET
SM	SHEET METAL
SMS/R	SNOW MELT SUPPLY & RETURN ⚠1
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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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
⚠1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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

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SHEET TITLE

MECHANICAL SYMBOLS & ABBREVIATIONS

SHEET NUMBER

M002

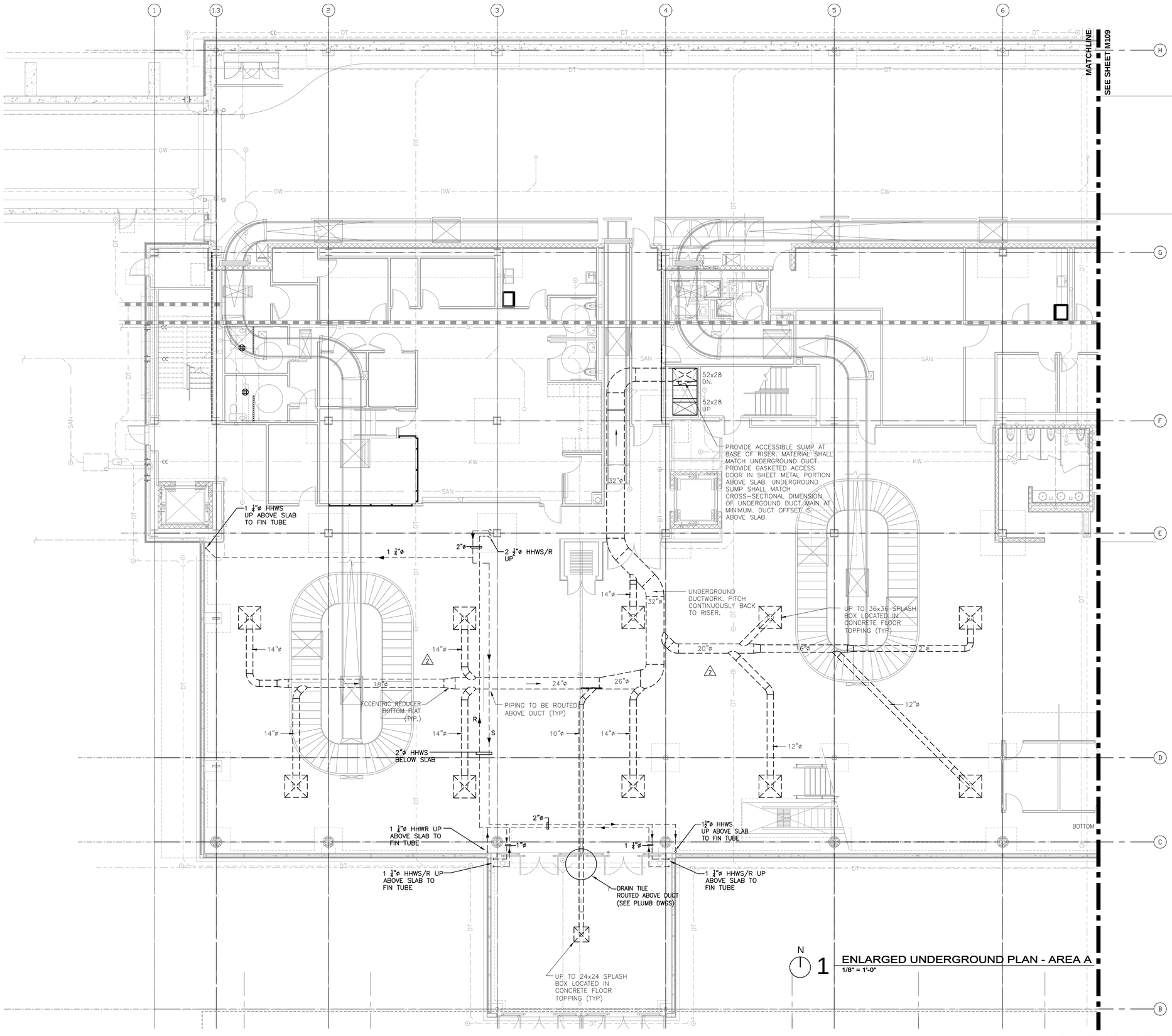
BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M002.dwg Plotted on: 8/17/2011 8:39 AM Plotted by: Tolbye, Ferd

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.



N

1 ENLARGED UNDERGROUND PLAN - AREA A

1/8" = 1'-0"

SCOPE NOTE:

ALL UNDERGROUND WORK IS PART OF A SEPARATE BID PACKAGE AND IS NOT IN CONTRACT. INFORMATION IS SHOWN FOR COORDINATION PURPOSES ONLY.

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	8.16.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 1	2.22.11
2	BID PACKAGE 1 - RFP 91	4.08.11
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	BID PACKAGE 2B	8.23.11

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

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SHEET TITLE

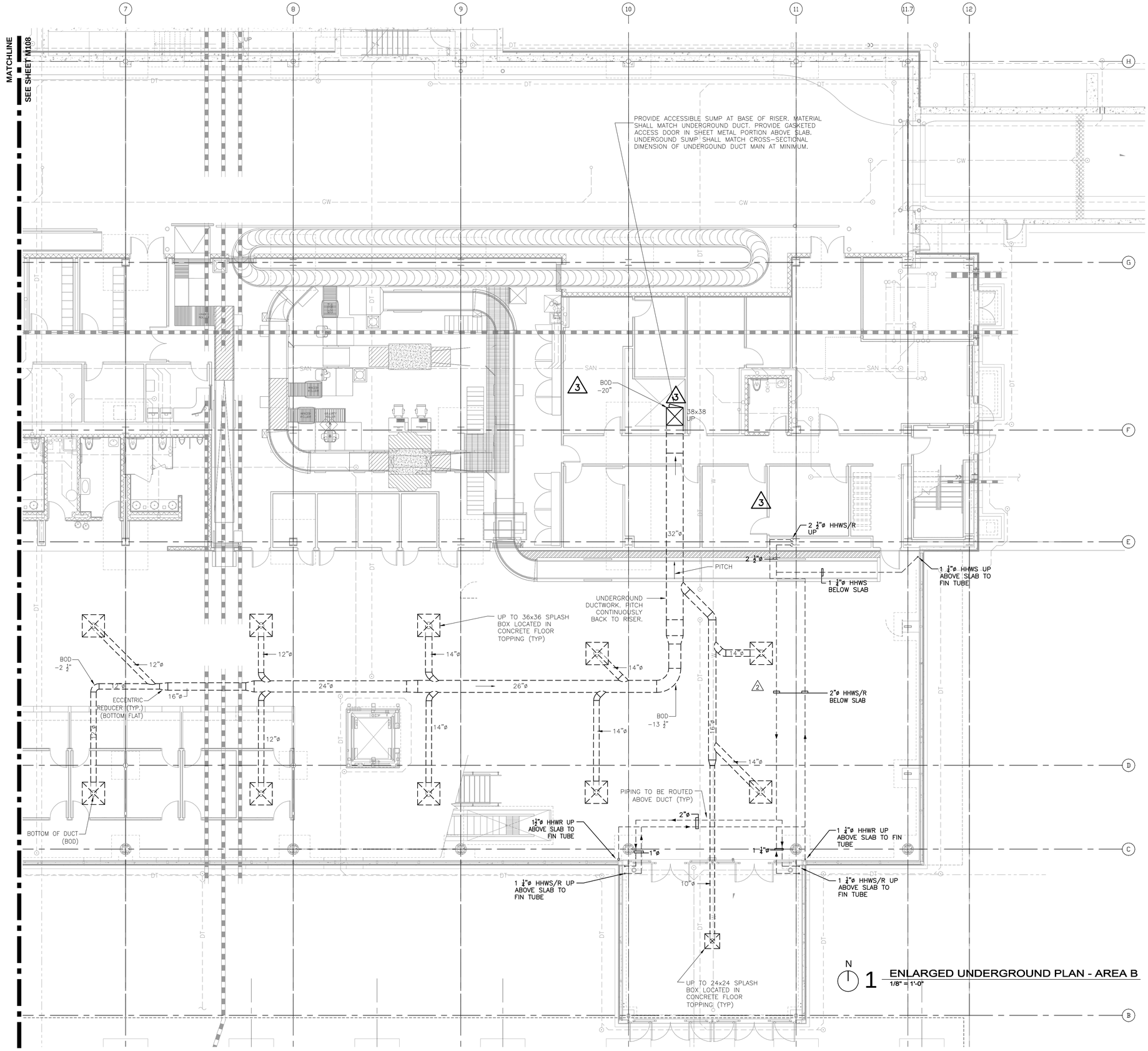
ENLARGED UNDERGROUND MECHANICAL PLAN AREA A

SHEET NUMBER

M108

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2555.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2555_M108.dwg Plotted on: 8/17/2011 8:42 AM Plotted by: Tokyo, Ford



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.

NOTES :

ALL SUPPLY DUCTWORK IN EXPOSED AREAS TO BE INTERNALLY LINED PER SPECIFICATIONS.
ALL DUCTWORK IN EXPOSED AREAS TO HAVE PAINT GRIP FINISHED. COORDINATE PAINTING OF DUCTWORK WITH GENERAL CONTRACTOR.

SCOPE NOTE:

ALL UNDERGROUND WORK IS PART OF A SEPARATE BID PACKAGE AND IS NOT IN CONTRACT. INFORMATION IS SHOWN FOR COORDINATION PURPOSES ONLY.

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DULUTH, MN

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	8.16.10
	BID PACKAGE 2A	1.24.11
1	BID PACKAGE 1 - RFP 91	4.08.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: FT
DESIGNED BY: BR

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED UNDERGROUND MECHANICAL PLAN AREA B

SHEET NUMBER
M109

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\5228.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\5228_M109.dwg Plotted on: 8/17/2011 8:43 AM Plotted by: Tolpa, Ferd

GENERAL NOTES:

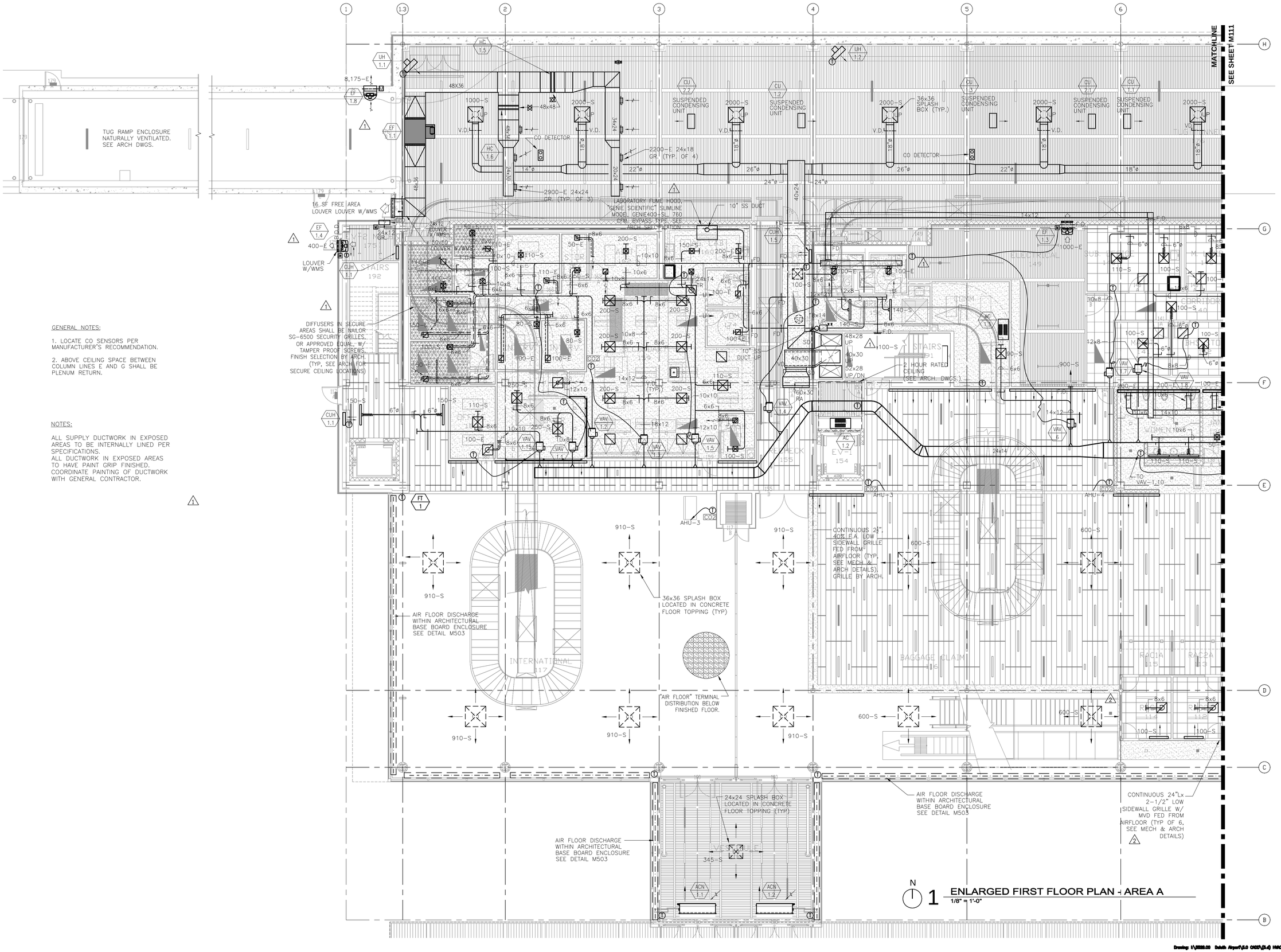
1. LOCATE CO SENSORS PER MANUFACTURER'S RECOMMENDATION.

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

NOTES:

ALL SUPPLY DUCTWORK IN EXPOSED AREAS TO BE INTERNALLY LINED PER SPECIFICATIONS.
ALL DUCTWORK IN EXPOSED AREAS TO HAVE PAINT GRIP FINISHED. COORDINATE PAINTING OF DUCTWORK WITH GENERAL CONTRACTOR.

1



N

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	8.16.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED FIRST FLOOR MECHANICAL PLAN AREA A

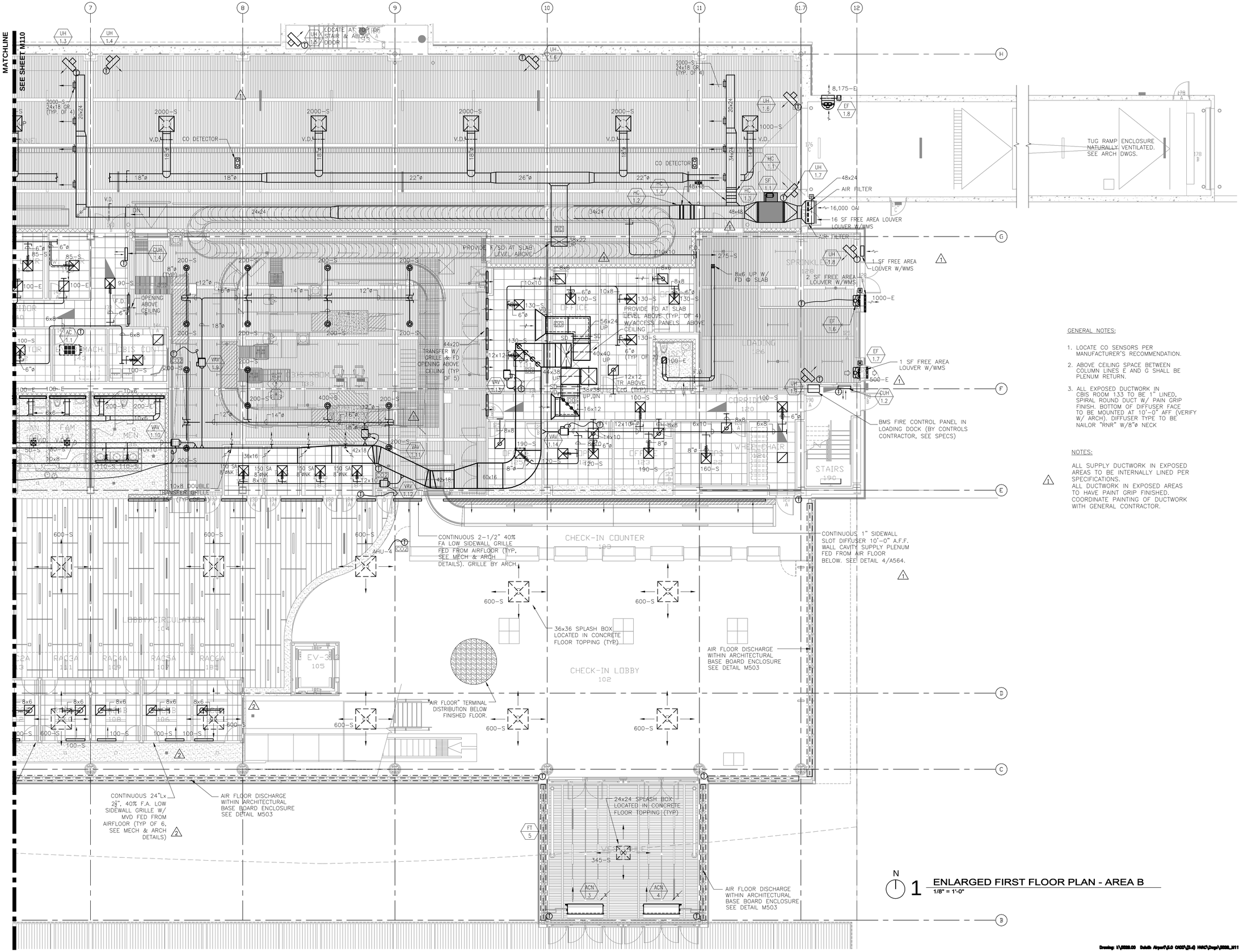
SHEET NUMBER
M110

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M110.dwg Plotted on: 8/17/2011 8:45 AM Plotted by: Tolpa, Ferd

MATCHLINE

SEE SHEET M110

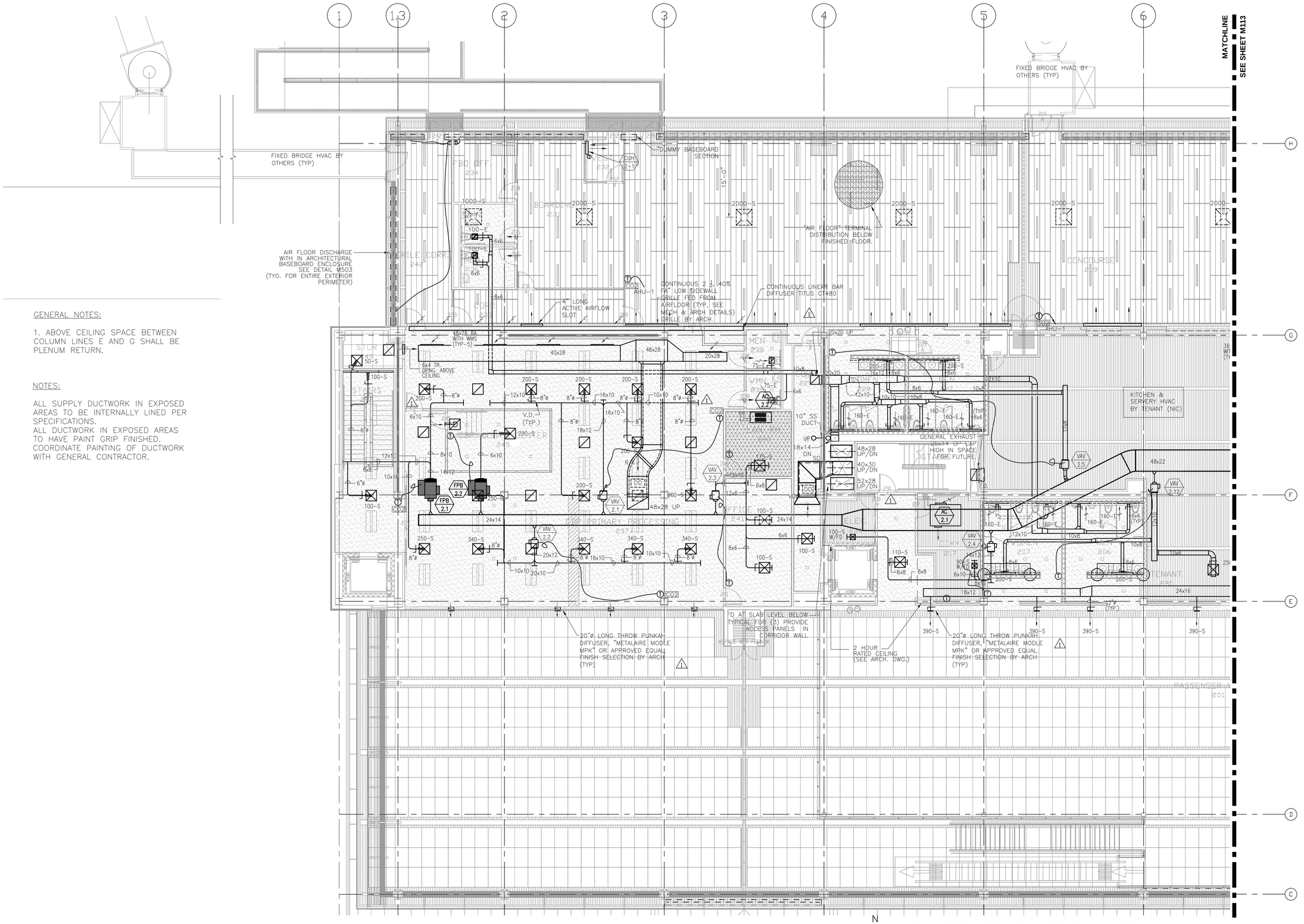


GENERAL NOTES:

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

NOTES:

ALL SUPPLY DUCTWORK IN EXPOSED AREAS TO BE INTERNALLY LINED PER SPECIFICATIONS.
ALL DUCTWORK IN EXPOSED AREAS TO HAVE PAINT GRIP FINISHED. COORDINATE PAINTING OF DUCTWORK WITH GENERAL CONTRACTOR.



N

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

ENLARGED SECOND FLOOR MECHANICAL PLAN AREA A

SHEET NUMBER

M112

BID PACKAGE 2B
ISSUED FOR BID

Drawing: H:\5555.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\5555_M112.dwg Plotted on: 8/17/2011 3:48 PM Plotted by: Hayward, John

MATCHLINE
SEE SHEET M112

7 8 9 10 11 11.7 12

H G F E D C

FIXED BRIDGE HVAC BY OTHERS (TYP)

FIXED BRIDGE HVAC BY OTHERS (TYP)

FIXED BRIDGE 248

"AIR FLOOR" TERMINAL DISTRIBUTION BELOW FINISHED FLOOR.

15'-0"

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

CONTINUOUS, LINEAR "BAR DIFFUSER TITUS CT480

CONTINUOUS 2 1/2", 40% LOW SIDEWALL GRILLE FED FROM AIRFLOOR (TYP., SEE MECH & ARCH DETAILS) GRILLE BY ARCH.

20"ø LONG THROW PUNKAH DIFFUSER, "METALAIRE MODLE MPK" OR APPROVED EQUAL. FINISH SELECTION BY ARCH (TYP)

20"ø LONG THROW PUNKAH DIFFUSER, "METALAIRE MODLE MPK" OR APPROVED EQUAL. FINISH SELECTION BY ARCH (TYP)

VD (TYP.)

DEPARTURES 215

TSA CHECKPOINT 208

AIRPORT POLICE 213

POLICE 211

CORRIDOR 202

WOMEN 221

MEN 220

FAM. 223

JAN. 205

STORAGE 204

STAIRS 290

WHEELCHAIR 252

CONCOURSE 250

SEATING

N

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

GENERAL NOTES:

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

NOTES:

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

ENLARGED SECOND FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER

M113

BID PACKAGE 2B
ISSUED FOR BID

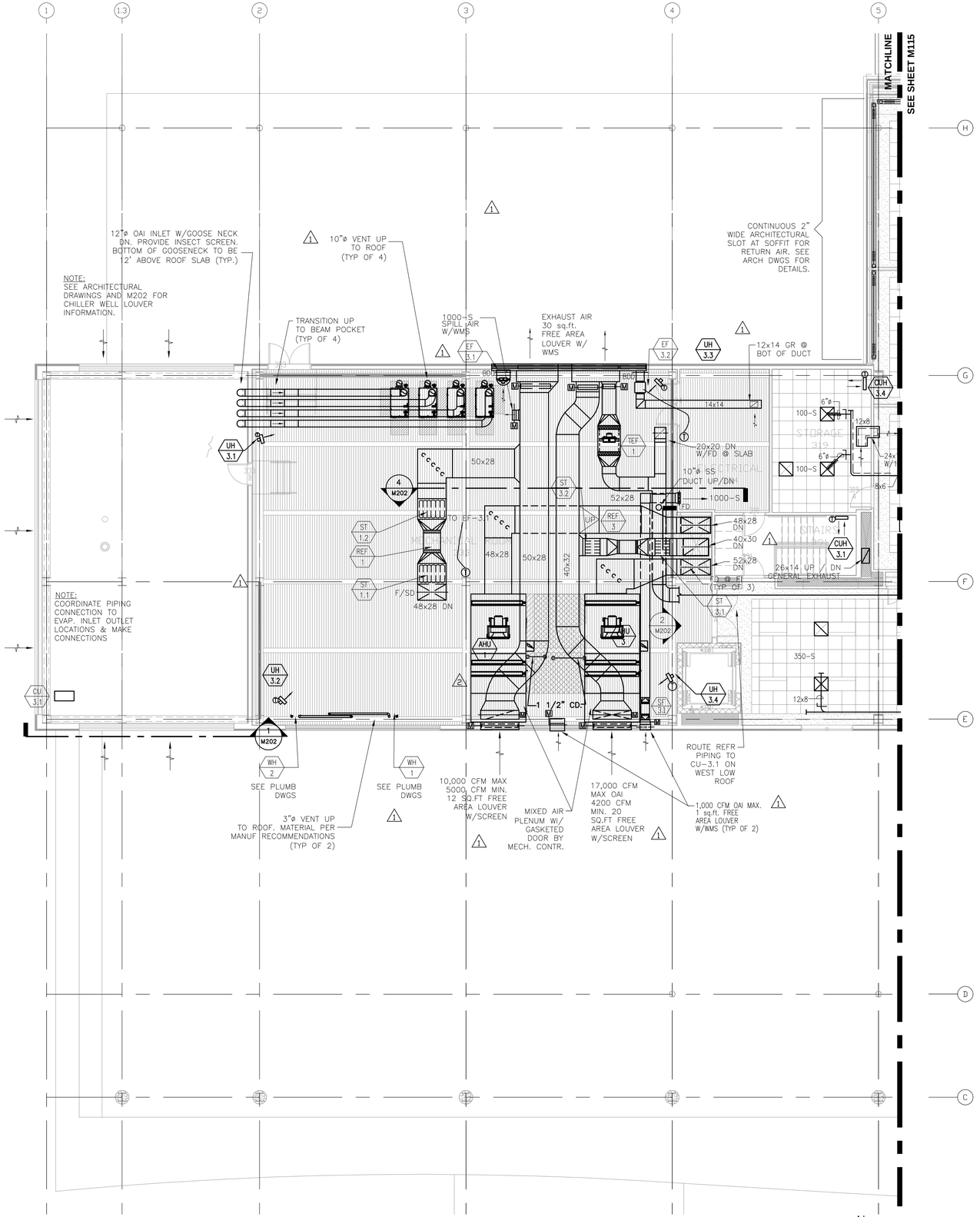
Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M113.dwg Plotted on: 8/17/2011 3:50 PM Plotted by: Hayward, John

GENERAL NOTES:

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

NOTES :

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N

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
⚠1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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 PLAN AREA A

SHEET NUMBER

M114

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\5035.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\5035_M114.dwg Plotted on: 8/17/2011 8:54 AM Plotted by: Tallyn, Ferd

MATCHLINE
SEE SHEET M114

5 6 7 8 9 10 11 11.7 12

H G F E D

CONTINUOUS 2" WIDE ARCHITECTURAL SLOT AT SOFFIT FOR RETURN AIR. SEE ARCH DWGS FOR DETAILS.

CONTINUOUS 2" WIDE ARCHITECTURAL SLOT AT SOFFIT FOR RETURN AIR. SEE ARCH DWGS FOR DETAILS.

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

IN-LINE EXH. FAN MOUNTED VERTICALY
16x14 DOWN W/F.D. @ SLAB

100x30 R/A DOWN TO MIXING BOX DAMPER

38,000 CFM OAI MAX. 42 sq.ft. FREE AREA LOUVER W/WMS

1,000 CFM OAI MAX. 1 sq.ft. FREE AREA LOUVER W/WMS

27,000 CFM OAI 30 sq.ft. FREE AREA LOUVER W/WMS

10x8 DN W/F.D. @ SLAB

EF 3.4 IN-LINE-EXH.FAN MOUNTED VERTICALLY

AT RETURN DUCT BELOW

AT OA DUCT BELOW

PROVIDE 20x12 TRANSFER GRILLE ABOVE CENTERED AT 12' AFF

GENERAL NOTES:

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

1

NOTES:

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N

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: MB/JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

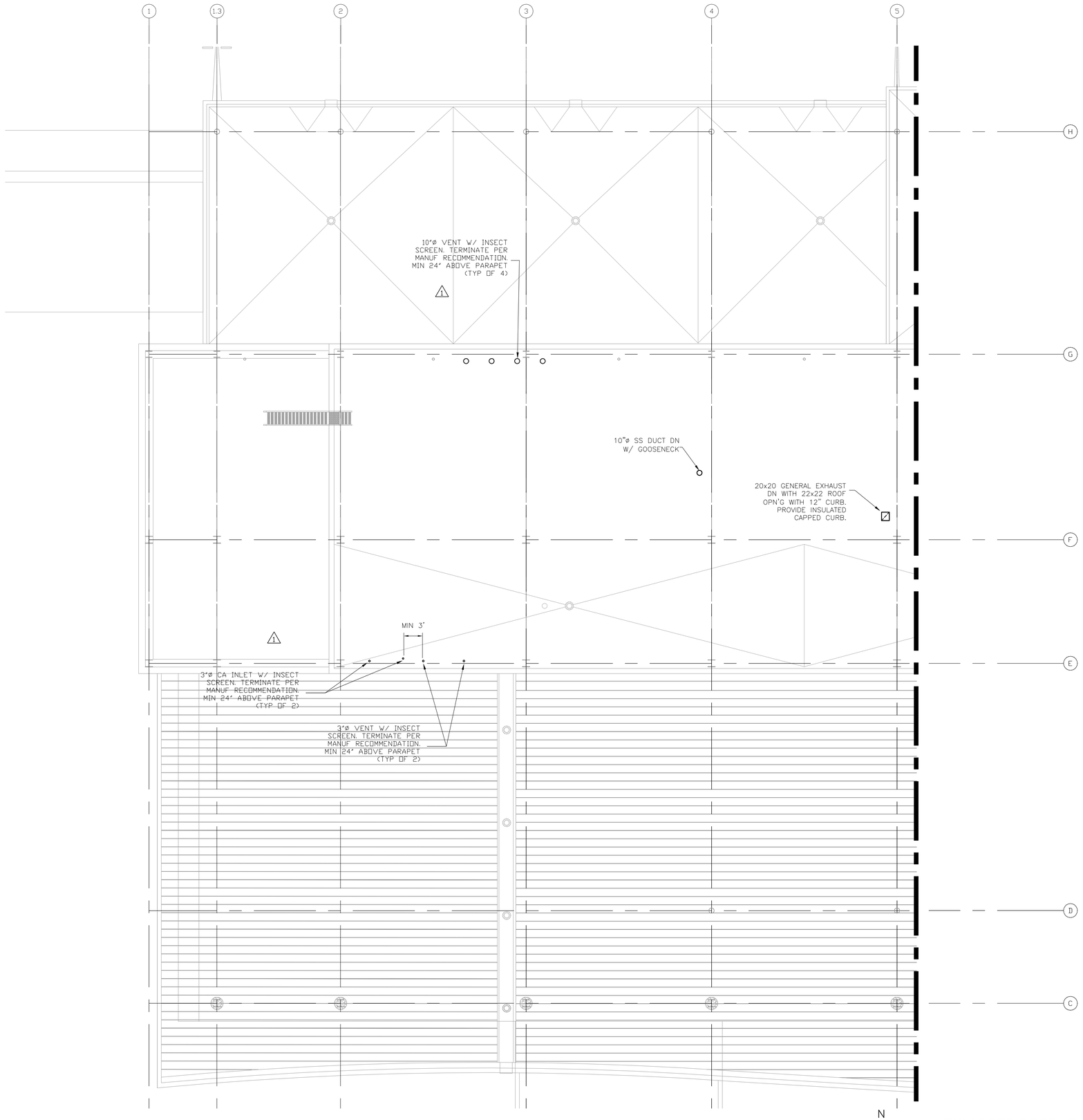
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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PLAN AREA B

SHEET NUMBER
M115

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2035_M115.dwg Plotted on: 8/17/2011 8:57 AM Plotted by: Tellyn, Ferd



N

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: MB/JH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

ENLARGED ROOF LEVEL MECHANICAL PLAN AREA A

SHEET NUMBER

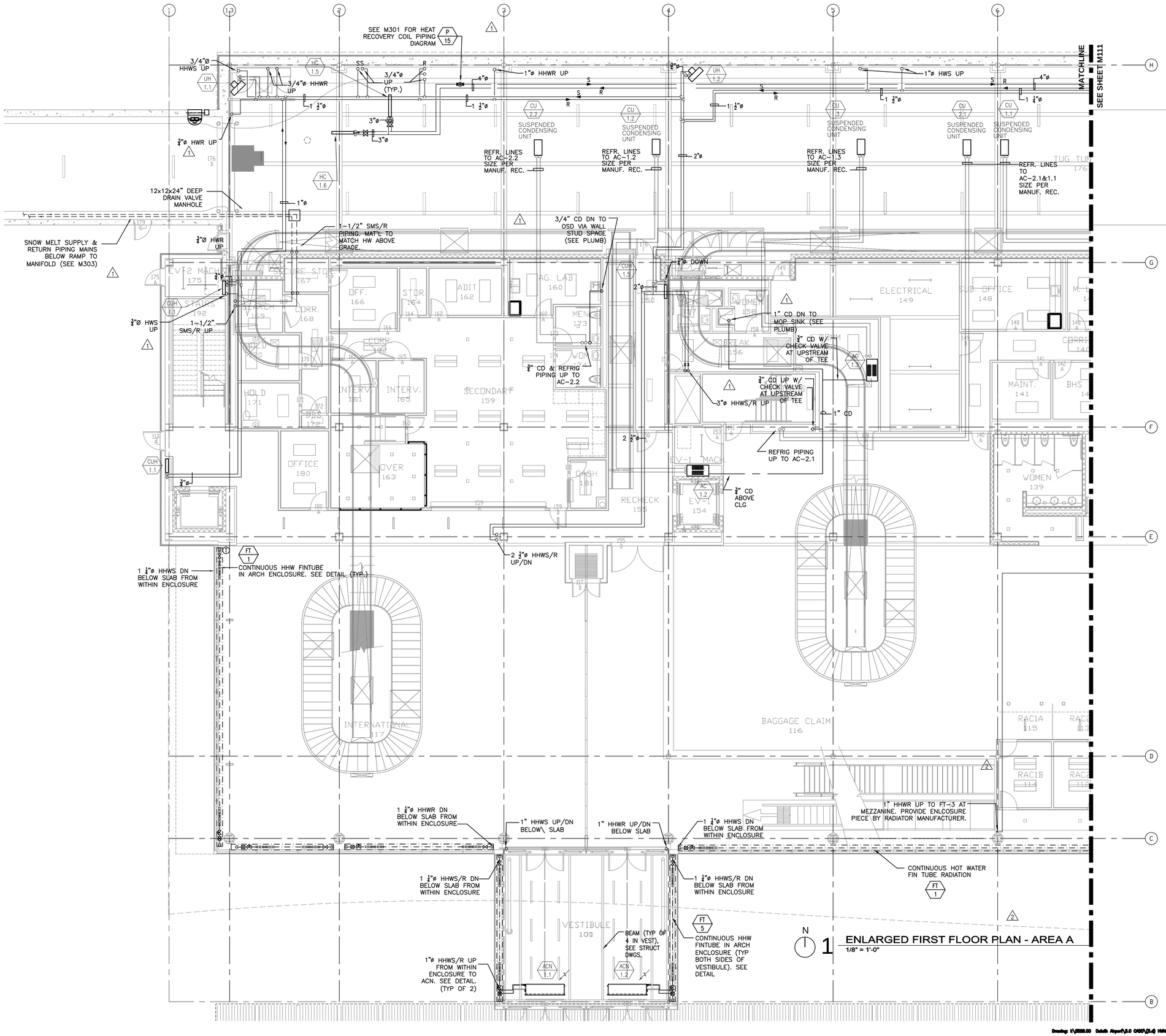
M116

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2009.09 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2009_M116.dwg Plotted on: 8/17/2011 8:59 AM Plotted by: Tolpa, Ferd

GENERAL NOTES:

1. SEE M108 FOR BELOW GRADE PIPING IN THIS AREA.
2. EXPOSED PIPING IN MAIN ENTRANCE VESTIBULES TO HAVE 0.04" ALUMINUM JACKET WITH POLISHED FINISH & PRE-FORMED ELBOWS.
3. EXPOSED PIPING IN MAIN ENTRANCE VESTIBULES TO HAVE 0.04" ALUMINUM JACKET WITH POLISHED FINISH & PRE-FORMED ELBOWS.



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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

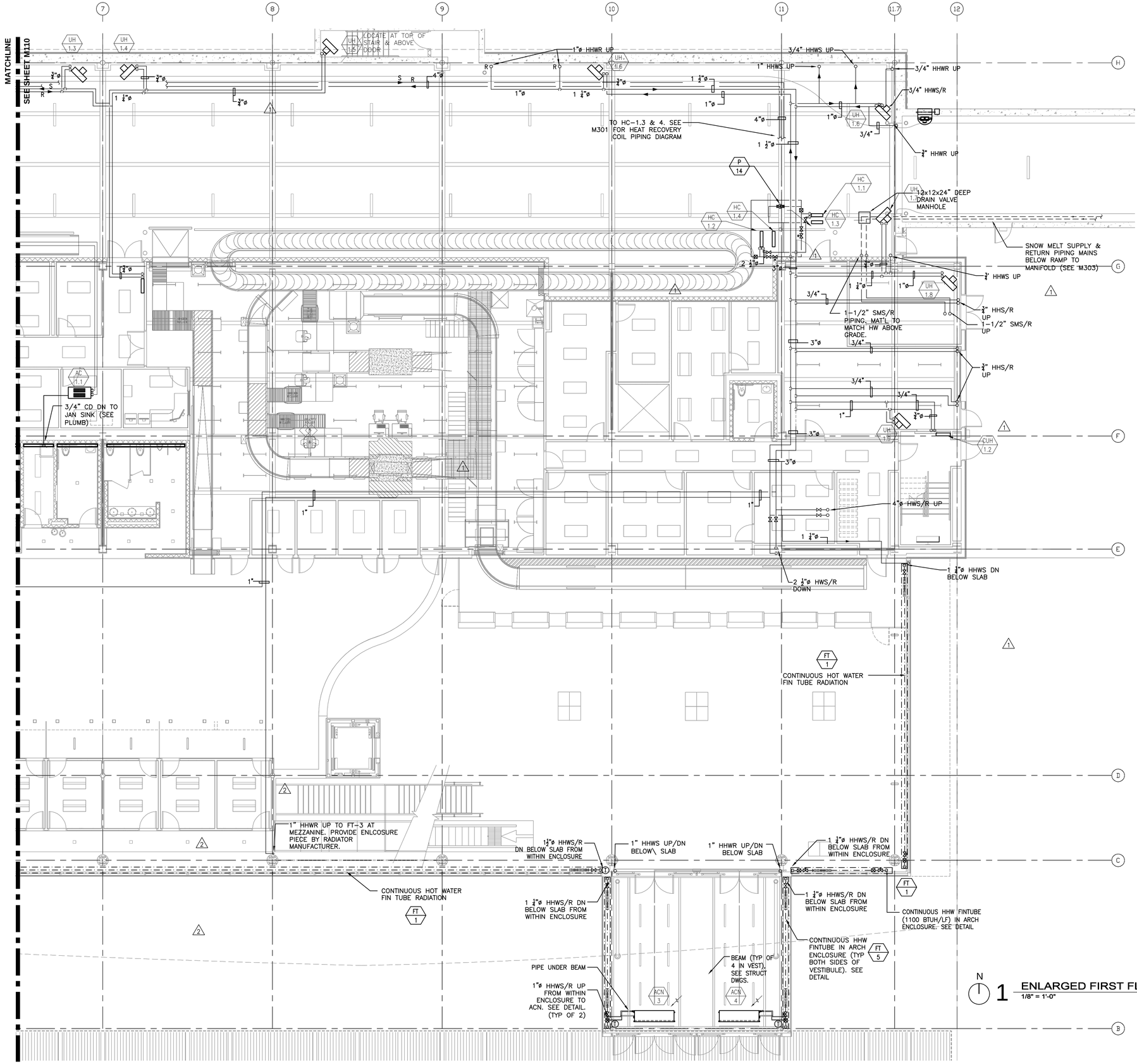
ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER

MP110

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_MP110.dwg Plotted on: 8/17/2011 10:45 AM Plotted by: Tolpa, Ford



N

1 ENLARGED FIRST FLOOR PLAN - AREA B

1/8" = 1'-0"

GENERAL NOTES:

1. SEE M109 FOR BELOW GRADE PIPING IN THIS AREA.
2. EXPOSED PIPING IN MAIN ENTRANCE VESTIBULES TO HAVE 0.04" ALUMINUM JACKET WITH POLISHED FINISH & PRE-FORMED ELBOWS.
3. EXPOSED PIPING IN MAIN ENTRANCE VESTIBULES TO HAVE 0.04" ALUMINUM JACKET WITH POLISHED FINISH & PRE-FORMED ELBOWS.

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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APPOLD DESIGN
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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

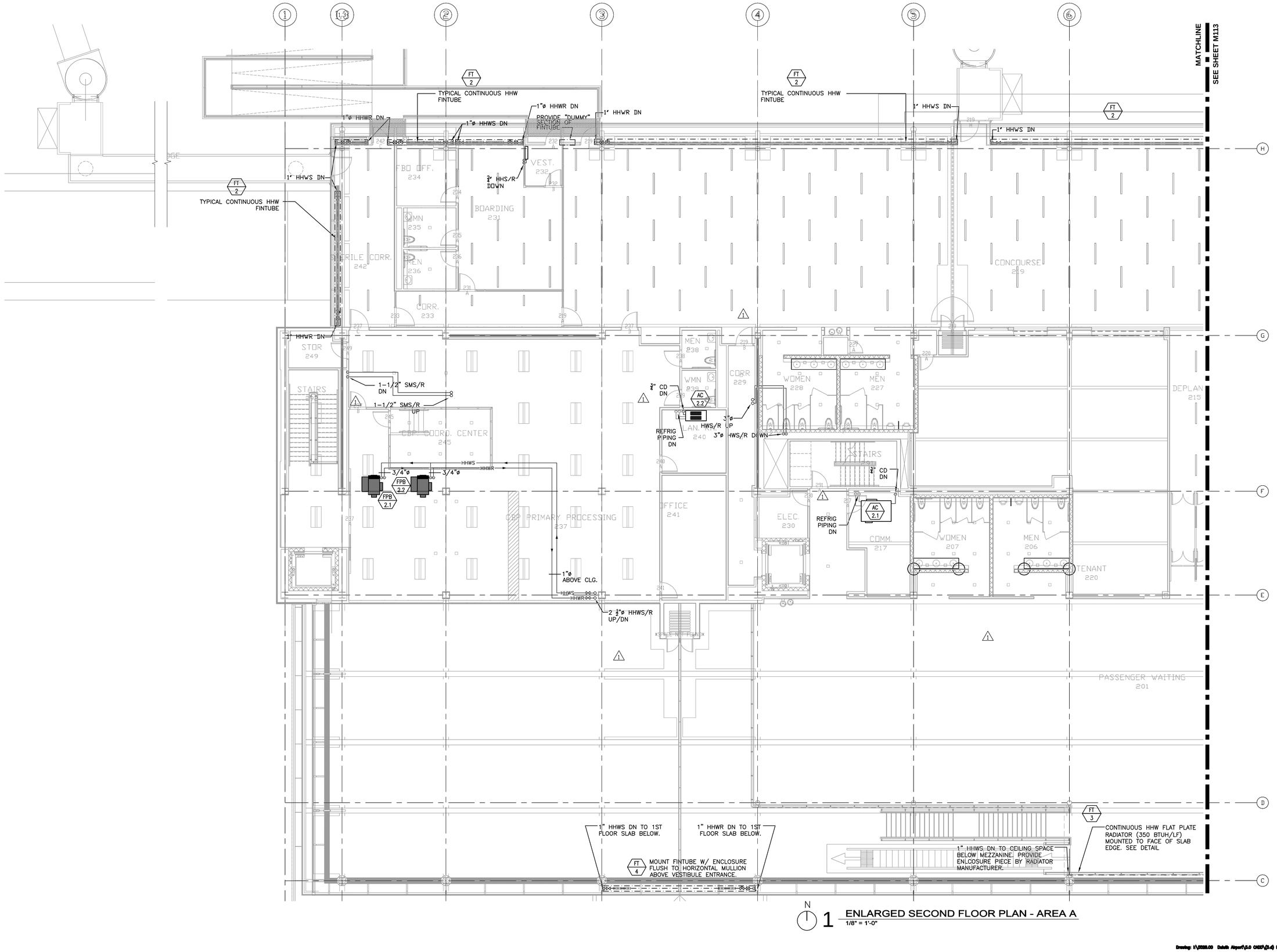
ENLARGED FIRST FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER

MP111

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\5-4) HVAC\Dwgs\2008_MP111.dwg Plotted on: 8/17/2011 3:57 PM Plotted by: Hayward, John



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

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SHEET TITLE

ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER

MP112

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_MP112.dwg Plotted on: 8/17/2011 3:55 PM Plotted by: Hayward, John

MATCHLINE
SEE SHEET M112

7 8 9 10 11 11.7 12

FT 2 TYPICAL CONTINUOUS HHW FINTUBE

FT 2 TYPICAL CONTINUOUS HHW FINTUBE

1" HHWR DN

1"ø HHWR DN.

FT 2 CONTINUOUS HHW FINTUBE

1"ø HHWR DN

1" HHWS DN

1"ø HHWS DN

H

FIXED BRIDGE 248

1" HHWR DN

FT 2 CONTINUOUS HHW FINTUBE

STOR 209

1" HHWS DN

G

DEPLANING 215

TSA QUEUE 214

TSA CHECKPOINT 208

FAM 223

WOMEN 222

MEN 221

WHEELCHAIR 252

JAN. 205

CORR 203

STORAGE 204

1-1/2" SMS/R UP

3" HHS/R DOWN

1-1/2" SMS/R DN

3" HHS/R DOWN

3" HHS/R DOWN

F

AIRPORT POLICE 213

DLH POLICE 212

OFFICE 211

OFFICE 210

CONF 250

OFFICE 251

4"ø HHWS/R UP & DOWN

CORRIDOR 202

STAIRS 290

E

AITING

D

W FLAT PLATE
BTUH/LF)
CE OF SLAB
L

FT 3 CONTINUOUS HHW FLAT PLATE RADIATOR (350 BTUH/LF) MOUNTED TO FACE OF SLAB EDGE. SEE DETAIL

1" HHWR DN TO CEILING SPACE BELOW MEZZANINE. PROVIDE ENLCOSURE PIECE BY RADIATOR MANUFACTURER.

1" HHWS DN TO 1ST FLOOR SLAB BELOW.

1" HHWR DN TO 1ST FLOOR SLAB BELOW.

FT 4 MOUNT FINTUBE W/ ENCLOSURE FLUSH TO HORIZONTAL MULLION ABOVE VESTIBULE ENTRANCE.

C

N

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

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REVIEWED BY: XXX
DRAWN BY: JEH
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SHEET TITLE

ENLARGED SECOND FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER

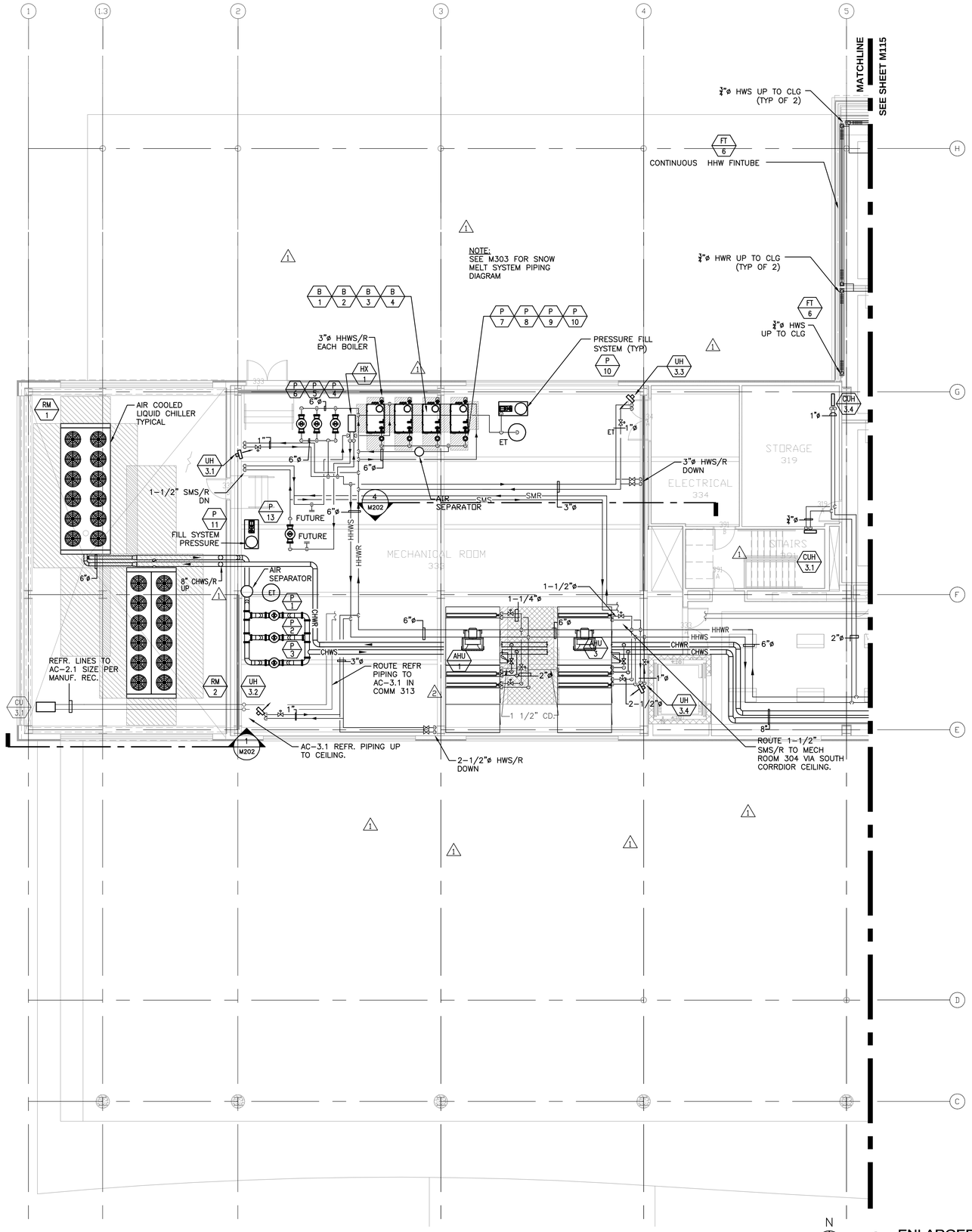
MP113

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\[5.4] HVAC\Dwgs\2008_MP113.dwg Plotted on: 8/17/2011 3:58 PM Plotted by: Hayward, John

GENERAL NOTES:

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



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

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1	BP2A ADDENDUM 2	2.25.11
2	BP2A ADDENDUM 3	3.04.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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DRAWN BY: MB/JH
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SHEET TITLE

ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN AREA A

SHEET NUMBER

MP114

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) HVAC\Dwgs\2008_MP114.dwg Plotted on: 8/17/2011 10:01 AM Plotted by: Tobyn, Ferd

MATCHLINE
SEE SHEET M112

GENERAL NOTES:

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

CONTINUOUS HHW FINTUBE
3/4" HHWR UP TO CLG (TYP)
3/4" HHWS UP TO CLG (TYP)
3/4" HWS UP TO CLG (TYP OF 2)
3/4" HWR UP TO CLG (TYP OF 2)
3/4" HWS TO CLG
1 1/4"
1"ø ABOVE CLG.
1"ø
2"
3/4" (TYP.)
1-1/2" SMS/R DN
ROUTE 1-1/2" SMS/R TO MECH ROOM 301 VIA SOUTH CORRDIOR CEILING.
4"ø HWS/R DOWN
PROVIDE VALVE AND BLIND FLANGE AFTER ELBOW (8")
1 1/2" CD.
2 1/2"ø
3"ø
2"ø
1-1/2"ø
1-1/4"ø
6"ø
8"ø
SOUTH

EXEC DIR 323 · UPS DIR. 324 · DIR. 325 · DIR. 326 · OFF. 327 · OPS/CONF 320 · CORR 317 · COPY 331 · OPEN OFFICE 328 · OPS/CONF 329 · OFFICE 330 · OFFICE 305 · TSA STOR. 309 · RECEPT 321 · BADGING 313 · EMERG OPS 318 · JAN. 314 · TSA OFF. 308 · TSA TRAINING 307 · TSA CONF. 311 · WOM 316 · MEN 315 · STORAGE 336 · COMM/ELEC 337 · TSA COMM. 312 · TSA BREAK 310 · WAITING 301 · CORRIDOR 302 · MECHANICAL ROOM 304 · CORR 303

FT 6 · FPB 3.1 · FPB 3.2 · FPB 3.3 · FPB 3.4 · FPB 3.5 · FPB 3.7 · FPB 3.9 · FPB 3.10 · FPB 3.11 · FPB 3.12 · FPB 3.8 · UH 3.4 · UH 3.5 · UH 3.6 · UH 3.7 · AHU 2 · AHU 4 · AHU 5 · CUH 3.2 · CUH 3.3 · M2/2.2

N

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

Drawing: I:\2028.00 Duluth Airport\5.0 CADD\5.4) MEP\Dwgs\2028_MP115.dwg Plotted on: 8/17/2011 10:02 AM Plotted by: Tolpa, Ferd

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DATE ISSUED: 08-23-11
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DRAWN BY: MB/JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

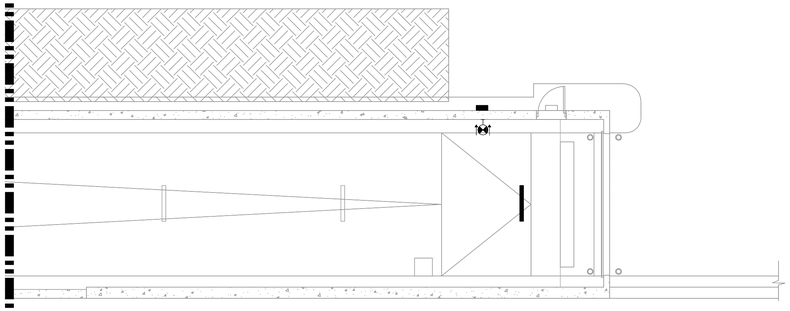
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SHEET TITLE
ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN AREA B

SHEET NUMBER
MP115

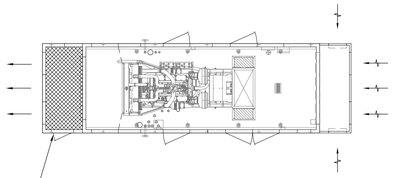
BID PACKAGE 2B
ISSUED FOR BID

MATCHLINE - SEE SHEET M111

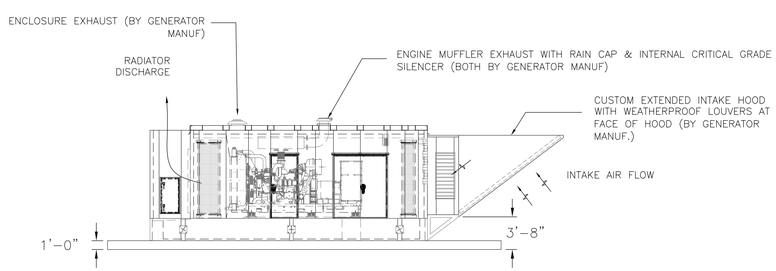


N

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



DIESEL EMERGENCY GENERATOR IN WEATHERPROOF ENCLOSURE (SEE ELECTRICAL DWGS) MOUNTED ON 12" CONCRETE PAD. SEE ARCH DWGS FOR EXACT LOCATION.



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

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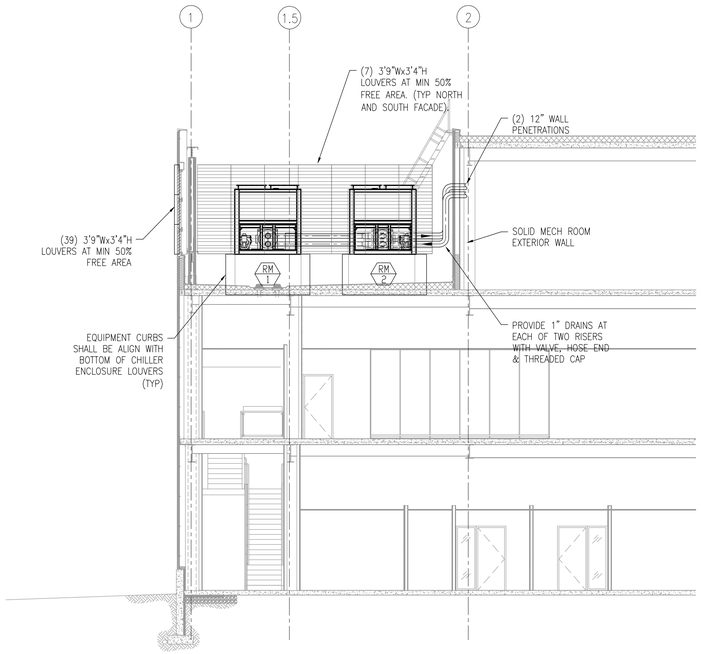
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SHEET TITLE
DIESEL GENERATOR MECHANICAL PLAN & DETAILS

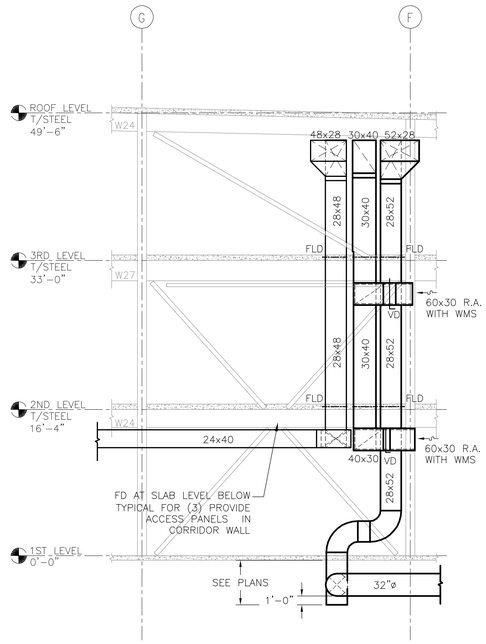
SHEET NUMBER
M201

BID PACKAGE 2B
ISSUED FOR BID

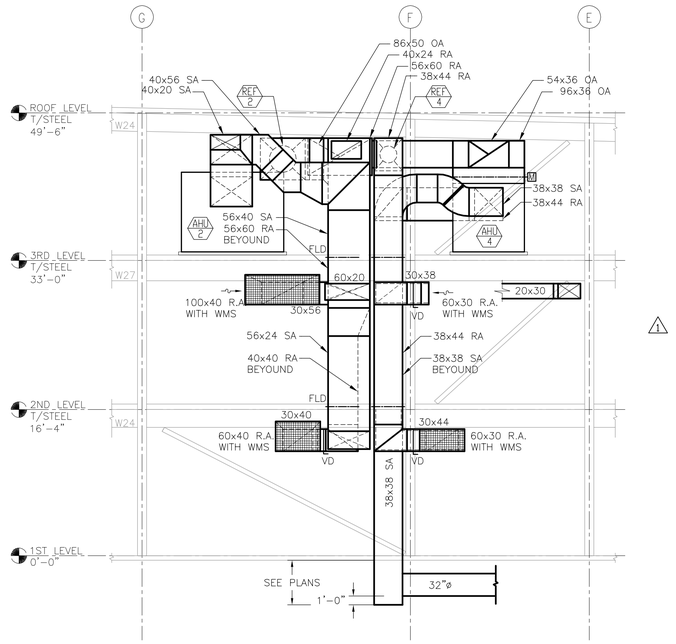
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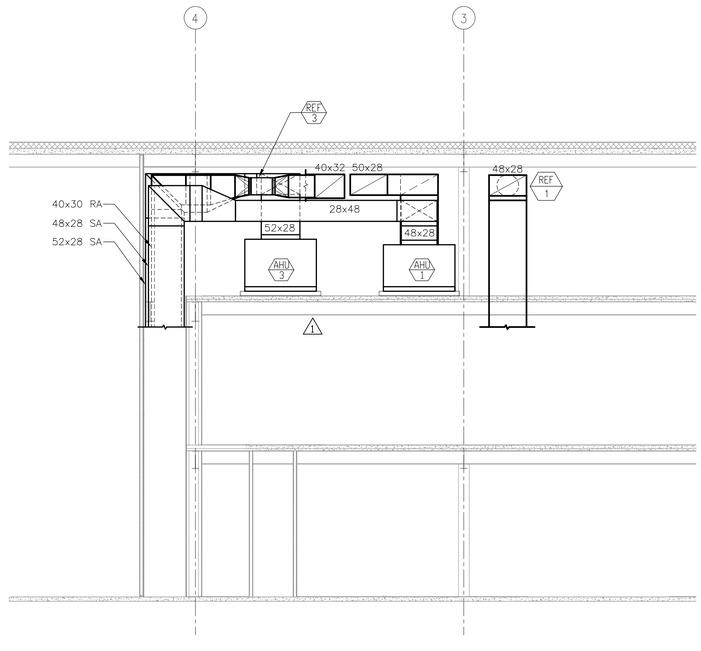
1 CHILLER WELL SOUTH ELEVATION
1/8" = 1'-0"



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



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



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

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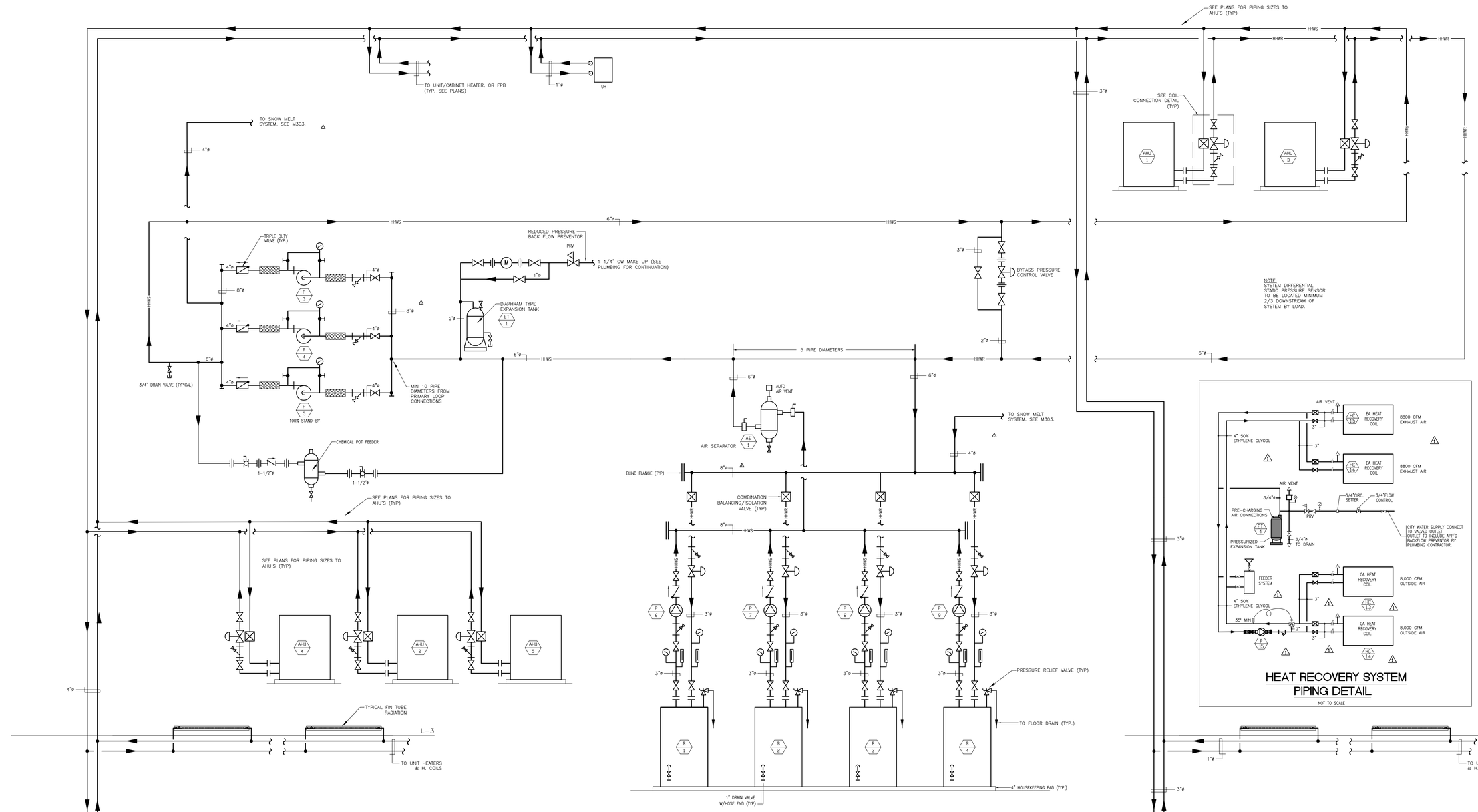
MECHANICAL SECTIONS & ELEVATIONS

SHEET NUMBER

M202

BID PACKAGE 2B
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Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\M202_M203.dwg Plotted on: 8/17/2011 10:14 AM Plotted by: Tolpa, Ferd



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SHEET TITLE

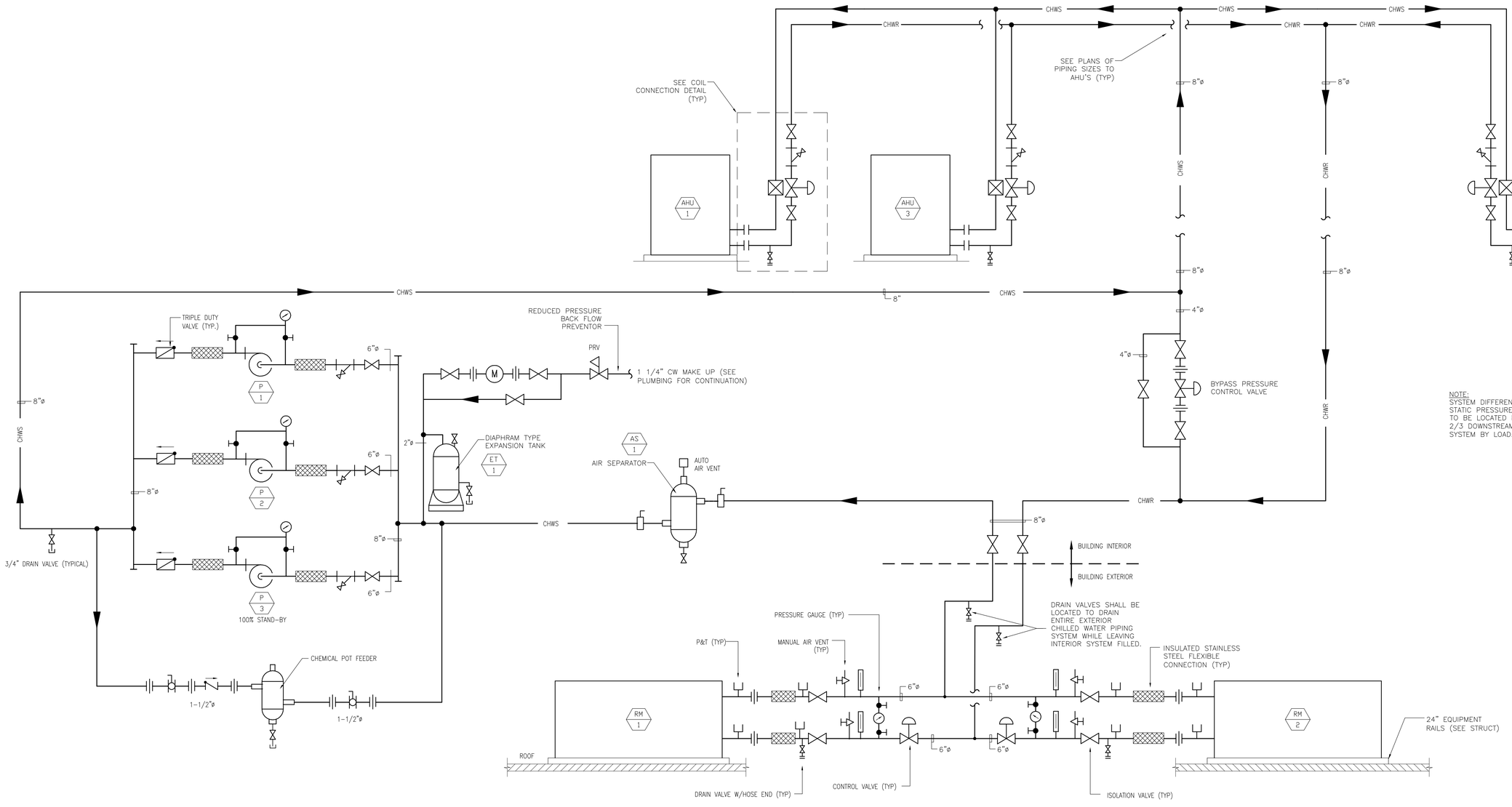
HEATING HOT WATER FLOW DIAGRAM

SHEET NUMBER

M301

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M301.dwg Plotted on: 8/17/2011 10:17 AM Plotted by: Tolpa, Ford



NOTE:
SYSTEM DIFFERENTIAL STATIC PRESSURE SENSOR TO BE LOCATED MINIMUM 2/3 DOWNSTREAM OF SYSTEM BY LOAD.

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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

REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: MXB
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

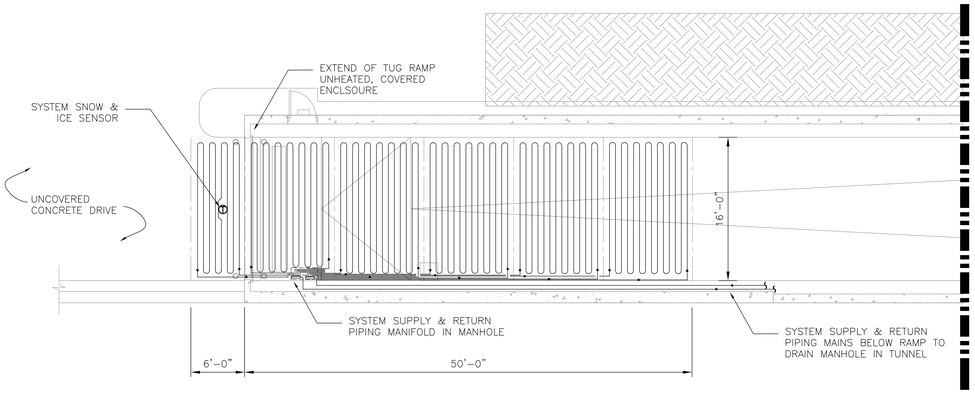
CHILLED WATER FLOW DIAGRAM

SHEET NUMBER

M302

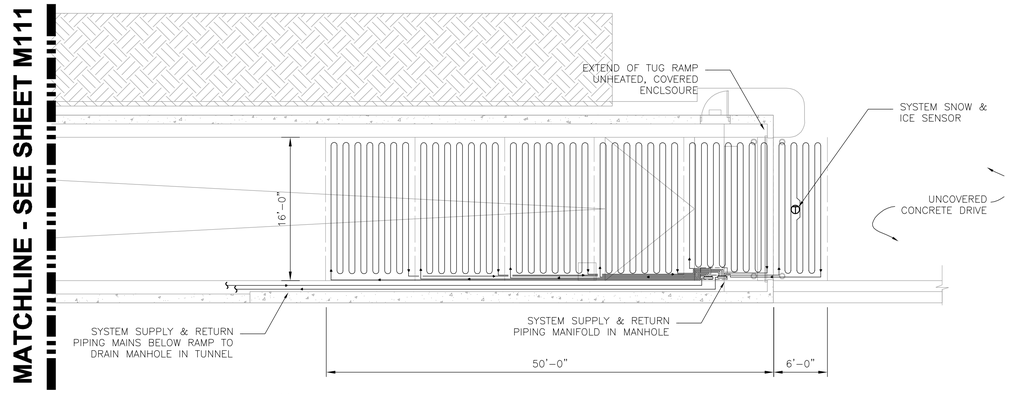
BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M302.dwg Plotted on: 8/17/2011 10:10 AM Plotted by: Tolpa, Ferd



MATCHLINE - SEE SHEET M110

MATCHLINE - SEE SHEET M111

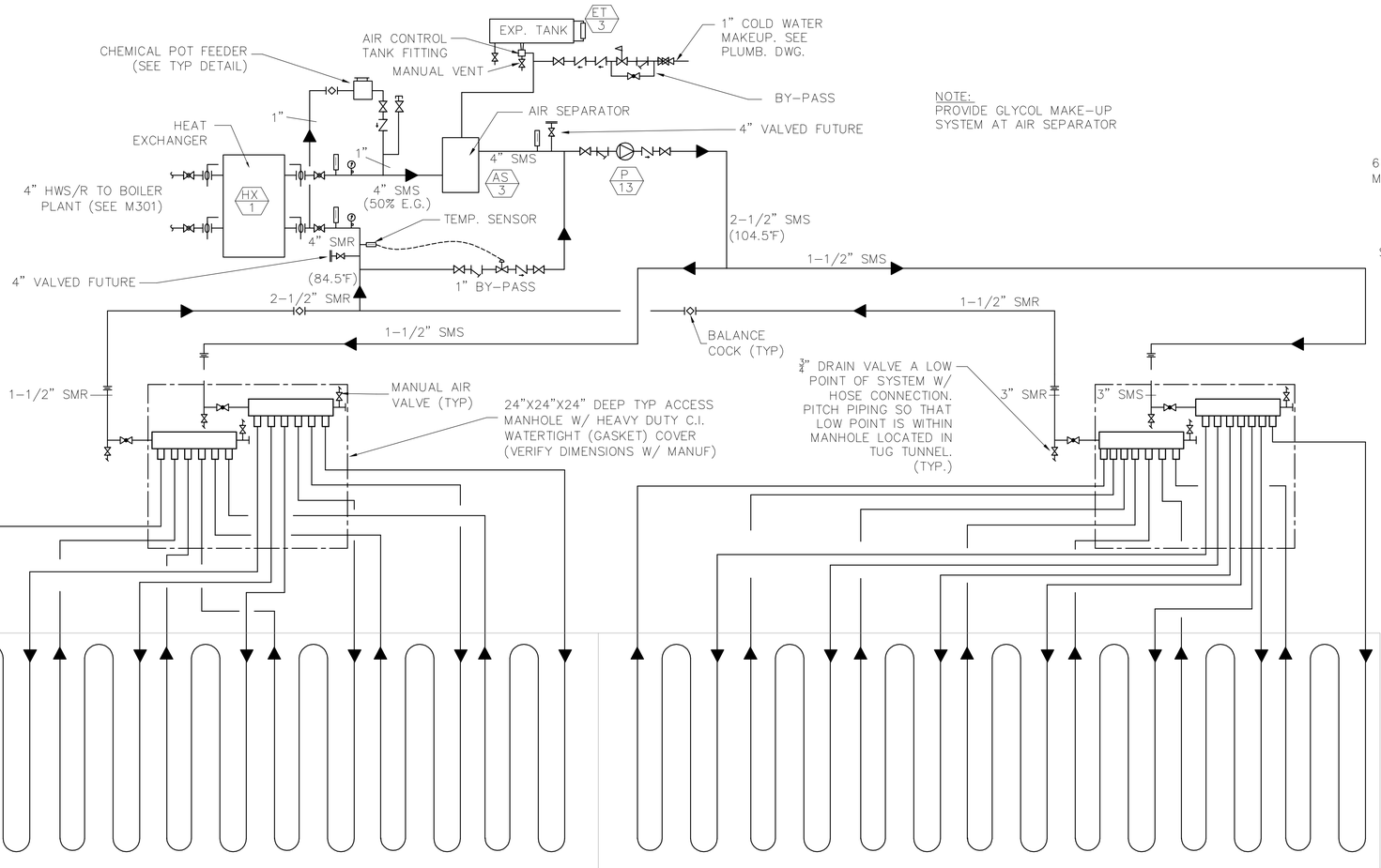


N

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

N

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

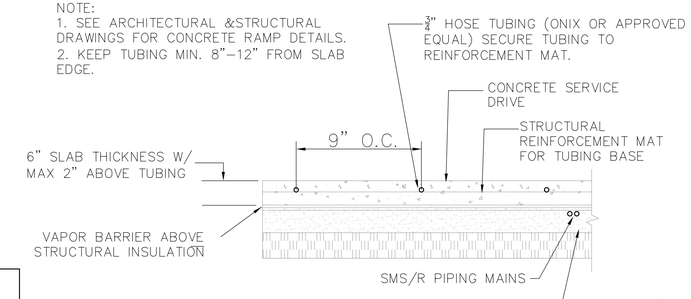


NOTE:
PROVIDE GLYCOL MAKE-UP SYSTEM AT AIR SEPARATOR

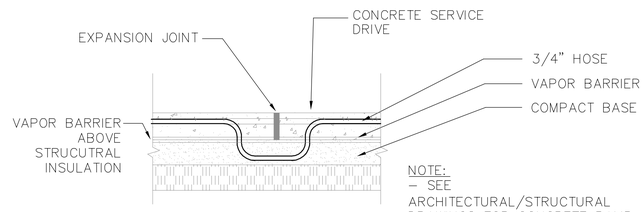
SNOW MELTING FLOW DIAGRAM
NOT TO SCALE

3 SNOW MELT SYSTEM DIAGRAM, NOTES & DETAILS
NO SCALE

NOTE:
1. SEE ARCHITECTURAL &STRUCTURAL DRAWINGS FOR CONCRETE RAMP DETAILS.
2. KEEP TUBING MIN. 8"-12" FROM SLAB EDGE.



TYP. SNOW MELTING HOSE DETAIL
NOT TO SCALE



TYP. HOSE DETAIL AT EXPANSION JOINT
NOT TO SCALE

NOTE:
- SEE ARCHITECTURAL/STRUCTURAL DRAWINGS FOR CONCRETE RAMP DETAILS.
- 12" LONG SLEEVE THROUGH EXPANSION JOINT IS ACCEPTABLE UPON REVIEW AND APPROVAL BY STRUCTURAL ENGINEER.

NOTES:

1. PROVIDE COMPLETE SNOW MELTING SYSTEM INCLUDING THREE ZONES, EIGHT CIRCUITS MAXIMUM PER ZONE (SEE PLANS), 9" O.C. SPACING PER CIRCUIT. PROVIDE 3/4" ONIX TUBING FOR CIRCUITS EMBEDDED IN CONCRETE SERVICE DRIVE RAMP.
2. TUBING WILL BE AS MANUFACTURED BY WATTS RADIANT, OR APPROVED EQUAL.
3. DISTRIBUTING MANIFOLDS SHALL BE REVERSE RETURN CONFIGURATION AND SHALL INCLUDE BRANCHES AND FITTINGS, MINI-BALL VALVES AT SUPPLY AND RETURN SIDE OF EACH TUBE, VENT/PURGE VALVES & TENSION CLAMPS.
4. PROVIDE 40% ETHYLENE GLYCOL BY VOLUME IN SNOW MELTING HEATING WATER SYSTEM.
5. PROVIDE VENT/PURGE ASSEMBLY W/ HOSE CONNECTIONS ON RETURN SIDE MANIFOLDS. RETURN MANIFOLDS SHALL BE MOUNTED HIGHER THAN SUPPLY MANIFOLD FOR SAME ZONE.
6. THE SYSTEM SHALL BE DESIGNED AND TESTED FOR LEAKS, AT 100 PSIG MINIMUM PRESSURE.
7. SECURE & SUPPORT PIPING, 6'-0" ON CENTERS, & PITCH FOR DRAINAGE.
8. SLAB TEMPERATURE SENSORS SHALL BE PROVIDED FOR EACH ZONE. SENSOR & CONTROLLER TO BE PROVIDED BY TEKMAR OR APPROVED EQUAL. CONTROLS SHAL INTEGRATE BOILER & PUMP PACKAGES. ROUTE 3/4" PVC CONDUIT IN TOPPING SLAB FOR EACH SENSOR TO CONTROL PANEL IN BOILER ROOM. CONDUIT SHALL BE ROUTED FROM SENORS TO MANIFOLD MANHOLE FOR EACH ZONE. ROUTE CONDUIT TRUNK IN TOPPING SLAB AT SIDE OF RAMP TO MAIN CONTROLLER. LOCATE SENSOR APPROXIMATELY 2 FT. OFF WEST CURB OR PER MANUFACTURERS RECOMMENDATION.
9. BURIED SMS/R MAIN PIPING BELOW RAMP SHALL BE PRE-INSULATED, FLEXIBLE PEX PIPING (WATTS RADIANT R-FLEX OR APPROVED EQUAL). INSULATION SHALL BE CELLULAR FOAM MINIMUM 1" THICK, U=0.025 BTU/HR SQ.FT °F. JACKET SHALL BE CORRUGATED, DOUBLEWALL HDPE. PIPING SHALL HAVE OXYGEN BARRIER COATING. PROVIDE ALL FITTINGS BY SAME MANUFACTURER.

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REVISIONS

NO.	DESCRIPTION	DATE
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

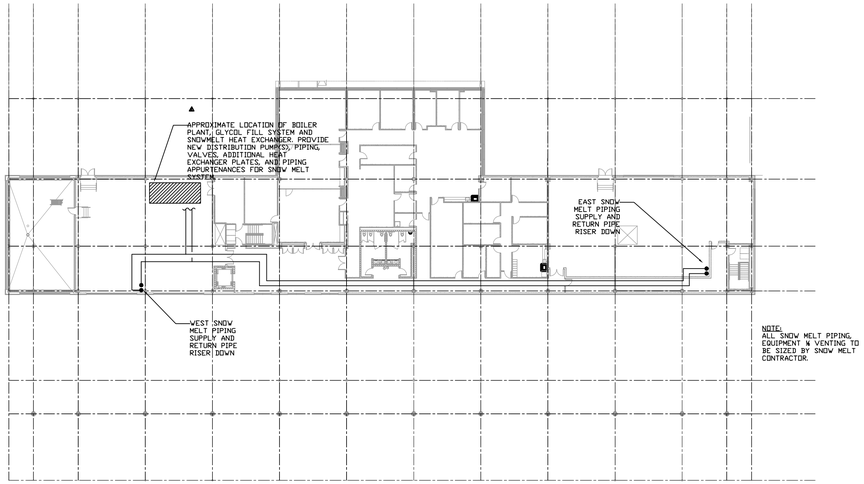
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SHEET TITLE
TUG TUNNEL RAMP SNOW MELT PLAN, FLOW DIAGRAM & DETAILS

SHEET NUMBER
1 M303

BID PACKAGE 2B
ISSUED FOR BID

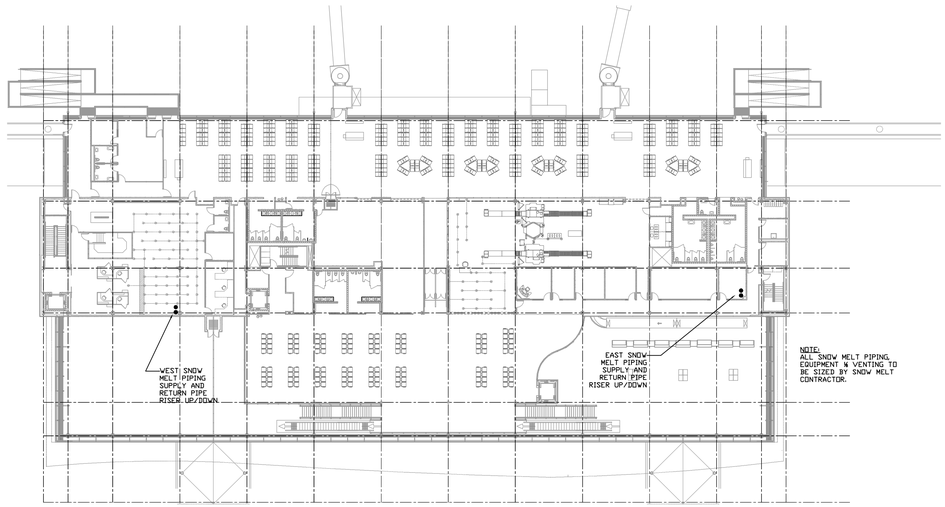
Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M303.dwg Plotted on: 8/17/2011 10:22 AM Plotted by: Tolpa, Ferd



N

3 THIRD FLOOR PLAN

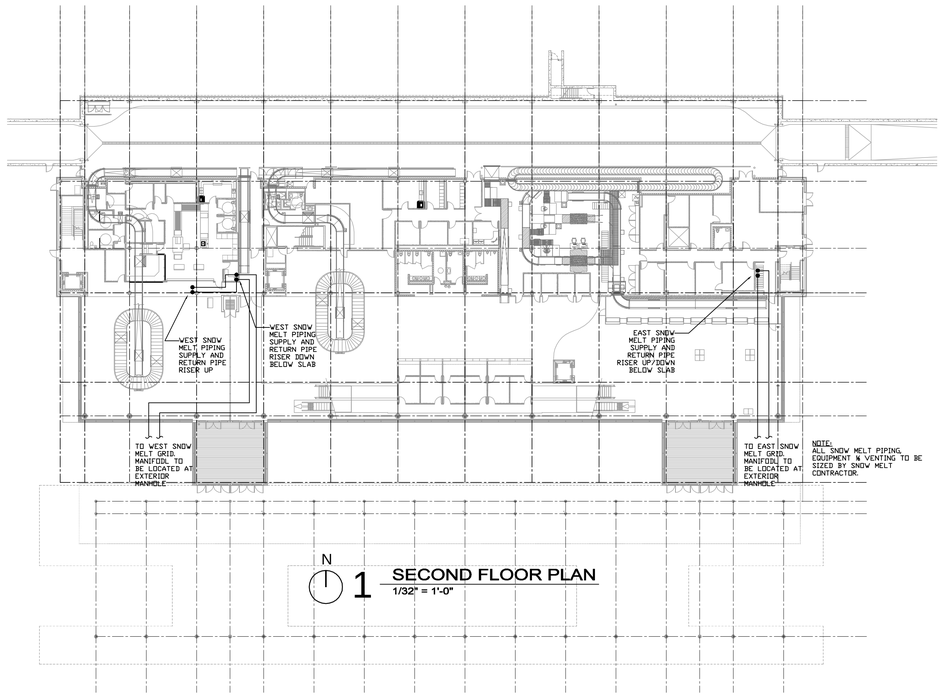
1/32" = 1'-0"



N

2 SECOND FLOOR PLAN

1/32" = 1'-0"



N

1 SECOND FLOOR PLAN

1/32" = 1'-0"

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: MXB
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

LANDSIDE SNOW MELT SYSTEM SCHEMATIC INTERIOR PIPING ROUTING DIAGRAM

SHEET NUMBER

M303A

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\2.0 CADD\2.4) MEP\Dwgs\2008_M303A.dwg Plotted on: 8/17/2011 10:25 AM Plotted by: Tolpa, Ferd

AIR HANDLING UNIT UNIT SCHEDULE

UNIT NO.	SERVICE	LOCATION	FAN DATA							OUTSIDE AIR				COOLING COIL DATA													PREHEAT COIL DATA			REHEAT COIL DATA			TYPICAL PREHEAT & REHEAT COIL DATA						FILTERS											Volts/Ph/Hz	MANUF & MODEL NO.	REMARKS
			CFM	ESP (IN W.G.) 2	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)			WATER TEMP. (°F)		GPM	TOTAL MBH	AIR TEMP (°F)		GPM	TOTAL MBH	WATER TEMP. (°F)		WORK PRESS (PSIG)	FACE AREA (SF)	MAX FACE VELOC. (FPM)	MAX. P.D.		PRE-FILTER				FINAL							
							RPM	BHP	HP		HEATING	COOLING		ENT		LVG				ENT	LVG							(IN)	(FT)	AIR TEMP (°F)																					
											DB	DB	WB	DB	WB	DB	WB											DB	DB																					
AHU-1	AIRSIDE WEST	333 MECH RM	10,000	2.3	1336	PLUG	1200	13.2	15	5,000	-21	81	67	83.0	67.0	52.5	52.1	480	361	42	58	59.8	150	29.01	550	0.60	12.4	22.5	100.0	27.9	837	100.0	120.0	7.2	216	180	120	150	27.00	550	0.33	4.28	PLEATED MERV-8	-	-	-	ELECT MERV-13	-	-	-	460/3/60	TRANE PERFORMANCE CLIMATECHANGER	SEE BELOW
AHU-2	CORE	304 MECH RM	38,000	3.8	760	PLUG	1800	56.4	60	15,000	-21	81	67	79.2	64.6	52.5	52.2	1,464	1,122	42	58	182.4	150	78.75	550	0.71	9.0	31.7	62.0	22.7	680	-	-	-	-	180	120	150	60.38	550	0.13	0.08	PLEATED MERV-8	-	-	-	ELECT MERV-13	-	-	-	460/3/60	TRANE PERFORMANCE CLIMATECHANGER	SEE BELOW
AHU-3	LANDSIDE WEST	333 MECH RM 4	17,000	2.8	1304	PLUG	1200	22.0	20	4,200	-21	81	67	84.0	67.0	52.5	52.2	622	473	42	58	77.5	150	34.14	550	0.74	16.7	44.5	100.0	34.0	1,019	100.0	120.0	12.2	367	180	120	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-	-	ELECT MERV-13	-	-	-	460/3/60	TRANE PERFORMANCE CLIMATECHANGER	SEE BELOW
AHU-4	LANDSIDE EAST	304 MECH RM	17,000	2.8	1304	PLUG	1200	22.0	20	5,400	-21	81	67	83.7	67.0	52.5	52.2	622	473	42	58	77.5	150	34.14	550	0.74	16.7	38.4	100.0	37.7	1,132	100.0	120.0	12.2	367	180	120	150	34.14	550	0.33	4.28	PLEATED MERV-8	-	-	-	ELECT MERV-13	-	-	-	460/3/60	TRANE PERFORMANCE CLIMATECHANGER	SEE BELOW
AHU-5	AIRSIDE EAST	304 MECH RM	10,000	2.3	1336	PLUG	1200	13.2	15	5,000	-21	81	67	83.0	67.0	52.5	52.1	480	361	42	58	59.8	150	29.01	550	0.60	12.4	22.5	100.0	27.9	837	100.0	120.0	7.2	216	180	120	150	27.00	550	0.33	4.28	PLEATED MERV-8	-	-	-	ELECT MERV-13	-	-	-	460/3/60	TRANE PERFORMANCE CLIMATECHANGER	SEE BELOW

1. PROVIDE VFD WITH INTEGRAL DISCONNECT SWITCH.
2. FINAL FILTER SHALL BE ELECTRONIC DYNAMIC AIR TYPE ANGLE FILTER AND BE LOCATED UPSTREAM OF AIR COILS.
3. PROVIDE AUXILIARY DRAIN PAN PIPING CONNECTION WITH DRAIN.
4. PREHEAT COIL SHALL BE MOUNTED UPSTREAM OF COOLING COIL. REHEAT COIL SHALL BE MOUNTED DOWNSTREAM OF FAN.
5. PROVIDE DISCHARGE PLENUM.

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 W/ VFD, SIDE MOTOR MOUNT
EF-1.1	TUG TUNNEL	TUG TUNNEL	17,600	0.50	INLINE CENT	BELT	934	5.7	7 1/2	480/3/60	TWIN CITY	330 TSL	1, 2, 3, 4, 5 W/ VFD, SIDE MOTOR MOUNT
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, 6
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, 6
EF-1.5	NOT USED												
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, 6
EF-1.7	LOADING 126	LOADING 126 1	500	0.25	PROP	DIRECT	1650	- 1	1/8 1	120/1/60	TWIN CITY	102A TCPE	1, 2, 6
EF-1.8	WEST TUG RAMP 179	WEST TUG RAMP 179	8,175	0.25	PROP	BELT	1650	1.5	2	480/3/60	TWIN CITY 1	24BTCTCWP	1,2 2-SPEED
EF-1.9	EAST TUG RAMP 178	EAST TUG RAMP 178	8,175	0.25	PROP	BELT	1650	1.5	2	480/3/60	TWIN CITY	24BTCTCWP	1,2 2-SPEED
EF-3.1 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, 6
EF-3.2	ELECT 334	ELECT 334	1,000	0.25	INLINE CENT	BELT	1275	-	1/4	120/1/60	TWIN CITY	100A BSI	1, 2
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, 6
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	5,515	1.00	INLINE CENT	BELT	1471	2.37	3	480/3/60	TWIN CITY	200 TSL	1, 2
TEF-2	EAST MECH RM	EAST TOILET ROOMS	1,465	1.00	INLINE CENT	BELT	1625	0.40	1/2	480/3/60	TWIN CITY	120A BSI	1, 2
REF-1	WEST MECH RM	AHU-1	9,000	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	32,000	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	15,000	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	15,000	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	9,000	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)	HOT WATER HEATING COIL			FAN								MANUFACTURER AND MODEL NUMBER	REMARKS
					MBH	GPM	P.D. (FT W.C.)	FAN CFM COOLING MINIMUM	FAN CFM COOLING MAXIMUM	FAN CFM HEATING	ESP (IN.)	RPM	HP	ELECT DATA VOLT/PH	ELECT DATA FLA		
SECOND FLOOR																	
FPB-2.1	3 - 10"	200-1100	180	700	17	1	1.25	180	700	700	0.3	1750	1/2	277/1	3.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-2.2	1 - 8"	100-475	110	400	12	0.5	1.0	110	200	200	0.3	1750	1/3	277/1	1.9	NAILOR 35 SWST	DDC W/ ECM MOTOR
1					THIRD FLOOR 1												
FPB-3.1	5 - 14"	500-2000	360	1800	48	3.5	1.5	1400	2220	1900	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.2	5 - 14"	500-2000	375	1300	22	1.5	0.35	500	1300	730	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.3	5 - 12"	500-2000	300	1470	31	3	1.5	500	1125	1200	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.4	3 - 10"	200-1100	400	820	21	1.5	0.35	400	820	660	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.5	5 - 12"	500-2000	165	1500	19	1.5	0.35	500	1470	740	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.6	3 - 10"	200-1100	200	550	17	1	1.25	200	890	630	0.36	1750	1/2	277/1	3.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.7	3 - 10"	200-1100	200	810	1 21	2	0.7 1	600	810	810	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.8	5 - 14"	500-2000	825	1850	43	3.5	1.5	825	1850	1400	0.38	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.9	3 - 10"	200-1100	300	690	16	1	1.25	300	880	500	0.36	1750	1/2	277/1	3.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.10	3 - 10"	200-1100	400	800	21	1.5	0.35	400	800	660	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.11	3 - 8"	200-1100	200	600	9	1.5	0.35	200	600	280	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR
FPB-3.12	3 - 8"	200-1100	200	400	9	1.5	0.35	200	400	280	0.36	1750	3/4	277/1	5.1	NAILOR 35 SWST	DDC W/ ECM MOTOR

1. ALL FPB W/ PRIMARY AIR MAXIMUM OVER 2000 CFM SHALL HAVE PERFORATED, DOUBLE-WALL HOUSING.
2. PROVIDE PLENUM RETURN INLET SMOKE DETECTORS FOR ALL FPB'S W/ PRIMARY AIR MAXIMUM OVER 2000 CFM. DETECTOR SHALL BE HARDWIRED TOFAN TO SHUT DOWN UPON DETECTION AND ALARM BMS.

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 1									
VAV-1.1	8	1000	500	50	-	-	-	NAILOR 3001	
VAV-1.2	8	1000	770	80	-	-	-	NAILOR 3001	
VAV-1.3	12	2185	1200	100	-	-	-	NAILOR 3001	
VAV-1.4	8	710	480	50	-	-	-	NAILOR 3001	
VAV-1.5	8	1000	560	60	-	-	-	NAILOR 3001	
VAV-1.6	9	1300	990	100	-	-	-	NAILOR 3001	
VAV-1.7	7	710	380	50	-	-	-	NAILOR 3001	
VAV-1.8	8	710	490	50	-	-	-	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	8	1000 1	600	60	-	-	-	NAILOR 3001	
VAV-1.13	8	1000	750	125	-	-	-	NAILOR 3001	
VAV-1.14	9	1300	980	100	-	-	-	NAILOR 3001	
VAV-1.15	7	710	410	50	-	-	-	NAILOR 3001	
SECOND FLOOR									
VAV-2.1	12	2185	1400	100	-	-	-	NAILOR 3001	
VAV-2.2	12	2185	1610	200	-	-	-	NAILOR 3001	
VAV-2.3	8	710	475	50	-	-	-	NAILOR 3001	
VAV-2.4	7	710	300	50	-	-	-	NAILOR 3001	
VAV-2.5	7	710	400	40	-	-	-	NAILOR 3001	
VAV-2.6	12	2185	1520	200	-	-	-	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	9	1300	1010	100	-	-	-	NAILOR 3001	
VAV-2.11	8	1000	600	60	-	-	-	NAILOR 3001	
VAV-2.12	8	1000	650	70	-	-	-	NAILOR 3001	
VAV-2.13	8	1000	700	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

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DULUTH, MN

NEW PASSENGER TERMINAL

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REVISIONS

NO.	DESCRIPTION	DATE
4	BUILDING PERMIT REVISIONS	10.15.10
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
2	BP2A ADDENDUM 3	3.04.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
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SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES I

SHEET NUMBER

M401

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M401.dwg Plotted on: 8/17/2011 10:34 AM Plotted by: Tolljes, Ferd

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.	REMARKS
			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	SEE BELOW
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	SEE BELOW

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.
5. UNIT WEIGHT, DIMENSIONS & UNIT CONNECTIONS TO BE VERIFIED WITH MANUFACTURER. COORDINATE VARIATIONS WITH OTHER TRADES AT NO COST TO OWNER.
6. SELECTION BASED ON 82 DEG F AMBIENT.

PUMP SCHEDULE

PUMP NO.	SERVICE	LOCATION	TYPE	GPM	TOTAL HEAD FEET	MIN. DESIGN WORKING PRESS. P.S.I.G.	MOTOR				MANUFACTURER & MODEL NO.	REMARKS
							BHP	HP	RPM	V/Ph/Hz		
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, 50% CAPACITY STANDBY
P-4	HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	560	80	150	9.02	15	1750	480/3/60	B&G SERIES 80SC 4x4x9-1/2	1
P-5	HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	560	80	150	9.02	15	1750	480/3/60	B&G SERIES 80SC 4x4x9-1/2	1
P-6	HEATING HOT WATER	301 MECHANICAL RM	VERTICAL SPLIT IN-LINE	560	80	150	9.02	15	1750	480/3/60	B&G SERIES 80SC 4x4x9-1/2	1, 50% STANDBY/ 100% SNOW MELT
P-7	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	280	25	150	2.71	5	1750	480/3/60	B&G SERIES 80 5x5x7	1, 2
P-8	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	280	25	150	2.71	5	1750	480/3/60	B&G SERIES 80 5x5x7	1, 2
P-9	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	280	25	150	2.71	5	1750	480/3/60	B&G SERIES 80 5x5x7	1, 2
P-9	BOILER CIRCULATING	301 MECHANICAL RM	INLINE	280	25	150	2.71	5	1750	480/3/60	B&G SERIES 80 5x5x7	1, 2
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	
P-12	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-13	TUG TUNNEL RAMP SNOW MELT	301 MECHANICAL RM	INLINE	40	75	150	-	5	1750	480/3/60	B&G SERIES 80 2x2x9-1/2B	1, 2, 3 (50% ETHYLENE GLYCOL)
P-14	TUG TUNNEL HC-1&2 RECIRC	TUG TUNNEL	INLINE	150	20	150	1.21	1.5	1750	480/3/60	B&G SERIES 80 3x3x7B	1, 4
P-15	TUG TUNNEL HC-1.3 THRU 6 CIRC	TUG TUNNEL	INLINE	250	40	150	4.62	7.5	1750	480/3/60	B&G SERIES 80 3x3x9-1/2B	1 (50% ETHYLENE GLYCOL)

1. PROVIDE VFD WITH INTEGRAL DISCONNECT.
2. INTEGRATE WITH BOILER CONTROLS.
3. INTEGRATE WITH SNOW MELT SYSTEM CONTROLS.
4. PROVIDE PUMP FREEZESTAT WITH PUMP INTERLCOK AND BMS ALARM.

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.	PD (FT, MAX FLOW)	FLUE OUTLET	FUEL	TYPE	MIN. DESIGN WORKING PRESS. (PSIG)	OPERATING WEIGHT (LBS)	MANUF & MODEL NO.	REMARKS
B-1	301 MECH RM	3,000	2,850	85.1	260	140	180	18	10"	NATURAL GAS	CONDENSING	150	1600	PATTERSON-KELLEY MACH 3000	
B-2	301 MECH RM	3,000	2,850	85.1	260	140	180	18	10"	NATURAL GAS	CONDENSING	150	1600	PATTERSON-KELLEY MACH 3000	
B-3	301 MECH RM	3,000	2,850	85.1	260	140	180	18	10"	NATURAL GAS	CONDENSING	150	1600	PATTERSON-KELLEY MACH 3000	
B-4	301 MECH RM	3,000	2,850	85.1	260	140	180	18	10"	NATURAL GAS	CONDENSING	150	1600	PATTERSON-KELLEY MACH 3000	

1. BOILERS CONTROLS SHALL BE NON-PROPRIETARY AND FULLY INTEGRATABLE TO BUILDING MANAGEMENT SYSTEM.
2. PROVIDE 12" SEALED COMBUSTION AIR INTAKE. INTAKE & VENT MATERIAL PER MANUFACTURER'S RECOMMENDATION.
3. INLET GAS PRESSURE SHALL BE 4.5"-14" W.C. (MAY VARY BY MANUF).
4. PROVIDE CONDENSATE NEUTRALIZATION SYSTEM.
5. ELECTRICAL REQUIREMENTS ARE 208V/3-PH, LESS THAN 20 AMPS PER BOILER.
6. AJAX, CAMUS & FULTON ACCEPTABLE MANUFACTURER

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	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-1.1	ELEVATOR #175	ELEVATOR #175	22.8	180	160	2.3	300	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-1.2	STAIRS #190	STAIRS #190	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-2.1	VEST. #232	VEST. #232	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-2.2	WHEELCHAIR #252	WHEELCHAIR #252	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-2.3	JAN #205	JAN #205	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-2.4	STOR #204	STOR #204	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.1	STAIRS #391	STAIRS #391	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.2	STAIRS #390	STAIRS #390	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.3	CORRIDOR #304	CORRIDOR #304	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3
CUH-3.4	STORAGE #319	STORAGE #319	29.8	180	160	3	400	1/10	115/1/60	STERLING FI-1050	1, 2, 3

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

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				

FINNED-TUBE RADIATION SCHEDULE

SYMBOL	BTUH/LF	E.W.T. (°F)	L.W.T. (°F)	FINS				PIPE		ENCLOSURE			MODEL	REMARKS
				SIZE	PER FT.	MAT.	ROWS	SIZE	MAT.	HGT.	DEPTH	TYPE		
FT-1	1100	180	160	4-1/4" SQ	40	AL	2	1-1/2"	CU	-	-	-	STERLING BARE "B"	1, 5
FT-2	650	180	160	3-1/4" SQ	40	AL	1	1"	CU	-	-	TROUGH	STERLING BARE "A"	1, 2, 3, 5
FT-3	350	180	160	-	-	-	-	3/4"	-	11-1/2"	2"	PANEL RADIATOR	RUNTAL R-4	3, 5, 6
FT-4	500	180	160	3-1/4" SQ.	32	AL	1	1"	CU	-	-	-	STERLING BARE "A"	1, 2, 3, 5
FT-5	900	180	160	3-5/8"x4-1/4"	50	AL	1	3/4"	CU	-	-	-	STERLING BARE "B"	1, 5
FT-6	450	180	160	3-1/4" SQ	32	AL	1	3/4"	CU	-	-	-	STERLING BARE "A"	1, 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. ALL INLET AND OUTLET GRILLES SHALL BE ALUMIMINUM PENCIL PROOF LINEAR BAR TYPE SIMILAR TO TITUS CT-PP.
5. 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.

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 TO 1.7	TUG TUNNEL	TUG TUNNEL	34.8	180	160	1070	300	1/20	115/1/60	STERLING HS-48	1
UH-1.8	SPRINKLER ROOM #128	SPRINKLER ROOM #128	26.1	180	160	1070	400	1/20	115/1/60	STERLING HS-36	1
UH-1.9	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.

HOT WATER COIL SCHEDULE

TAG	SERVICE	LOCATION	CFM	EAT (°F)	LAT (°F)	MBH	GPM	EWT (°F)	LWT (°F)	FLUID PD (FT)	AIR PD (IN)	MAX.FACE VELOCITY (FPM)	NO. ROWS	REMARKS
HC-1.1	TUG SERVICE TUNNEL	TUG SERVICE TUNNEL	8000	-21	60	702	75	160	140	6.3	0.16	500	4	
HC-1.2	TUG SERVICE TUNNEL	TUG SERVICE TUNNEL	8000	-21	60	702	75	160	140	6.3	0.16	500	4	
HC-1.3	TUG SUPPLY HEAT RECOVERY	TUG SERVICE TUNNEL	8000	-21	-8	115	125	20.8	18.9	7.1	0.16	500	2	SEE BELOW
HC-1.4	TUG SUPPLY HEAT RECOVERY	TUG SERVICE TUNNEL	8000	-21	-8	115	125	20.8	18.9	7.1	0.16	500	2	SEE BELOW
HC-1.5	TUG EXHAUST HEAT RECOVERY	TUG SERVICE TUNNEL	8800	60 DB/48 WB	48.1 DB/42.4 WB	115	125	18.9	20.8	6.8	0.19	500	2	SEE BELOW
HC-1.6	TUG EXHAUST HEAT RECOVERY	TUG SERVICE TUNNEL	8800	60 DB/48 WB	48.1 DB/42.4 WB	115	125	18.9	20.8	6.8	0.19	500.0	2	SEE BELOW

NOTES:
1. HC-1.3 THRU 1.6 SHALL CICRCULATE A 50% ETHYLENE GLYCOL SOLUTION.

HYDRONIC AIR CURTAIN SCHEDULE

UNIT NO.	AREA SERVED	LOCATION	TYPE	CFM (HI SPEED)	AIR TEMP RISE @ HI SPEED (°F)	TOTAL CAPACITY MBH	HEATING COIL				FAN MOTOR				WEIGHT (LBS)	MANUF. & MODEL	REMARKS
							HOT WATER TEMP (°F) ENT	HOT WATER TEMP (°F) LVG	GPM	WATER PD (FT)	PRESS. (PSIG)	QUANTITY	HP	RPM	V/Ph/Hz			
ACN-1.1	VESTIBULE 100	VESTIBULE 100	SUSPENDED	2093	37	87	140	120	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	140	120	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	140	120	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	140	120	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 CONTROL VALVE & THERMOSTAT (BY BMS CONTROCTOR) WITH LOCKING COVER & DOOR SWITCH INTERLOCK CONTROL.. T-STAT SHALL PROVIDE OVERRIDE FOR FAN OPERATION WHEN DOORS ARE CLOSED. INTERLOCK AIR CURTAINS IN SAME VESTIBULE TO SINGLE T-STAT.

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DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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

Structural Engineers:
MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
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TEL: (203) 792-3000 / FAX: (203) 792-4900

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

REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: MXB
DRAWN BY: JEH
DESIGNED BY: MXB

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES II

SHEET NUMBER

M402

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2010.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2010_M402.dwg Plotted on: 8/23/2011 2:03 PM Plotted by: Brandt, 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.		%RH	MBH		FACE AREA SQ. FT.	NO. ROWS	TYPE	NO.	FILTER SIZE (INxINxIN)	VOLT/PH/HZ	FLA	MOPD				
									(°F) DB	(°F) DB		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	2.8	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	2.8	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-1.3	COMM 151	COMM 151	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	2.8	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-2.1	COMM 217	COMM 217	7	R-407C	16	3,350	0.5	2	75	61	45	80.7	76.2	6.7	4	MERV-8	2	20x20	208/3/60	6.9	15	NONE	410	SATS OHS-084-DAHU	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-2.2	LAN ROOM 240	LAN ROOM 240	2	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	2.8	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS
AC-3.1	COMM/ELEC 337	COMM/ELEC 337	2	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	2.8	15	NONE	225	LIEBERT MMD36E7P00DG	CEILING MOUNT W/ 1" VIBRATION ISOLATORS

⚠1

FOR ALL UNITS:
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. INSULATE DISCHARGE LINE TO CONDENSING UNIT THROUGH & ABOVE ALL CONDITIONED SPACES.

⚠1

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	480/3/60	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	480/3/60	6.4	15	NONE	351	LIEBERT PFHZ37A-AL7	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-1.3	TUG TUNNEL	AC-1.3	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	480/3/60	6.4	15	NONE	351	LIEBERT PFHZ37A-AL7	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-2.1	TUG TUNNEL	AC-2.1	7	2	R-407C	497	2,800	N/A	0.3	95	5.5	3	480/3/60	7.1	15	NONE		SATS (2) SCO-042-H22	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-2.2	TUG TUNNEL	AC-2.2	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	480/3/60	6.4	15	NONE	351	LIEBERT PFH037A-AL7	SUSPENDED W/ 1" VIBRATION ISOLATORS
CU-3.1	WEST LOW ROOF	AC-3.1	3	1	R-407C	213	3,000	N/A	0.2	95	7.7	2	480/3/60	6.4	15	NONE	351	LIEBERT PFH037A-AL7	ROOF MOUNTED, SEE SPECS

⚠1

FOR ALL UNITS:
1. PROVIDE HIGH LEVEL WATER LEVEL SENSOR WITH CUT OFF SWITCH AND BMS ALARM FOR ALL AC UNIT CONDENSATE DRAIN PANS.
2. PROVIDE INSECT SCREEN ON CONDENSENING UNIT INLET/OUTLET.
3. PROVIDE LOW AMBIENT KIT (-30 DEG F).
4. CONDENSER FAN MUST BE HORIZONTAL DISCHARGE FOR UNITS AC-1.1 THRU 2.2

PLATE & FRAME HEAT EXCHANGER SCHEDULE

UNIT NO.	SERVICE	LOCATION	HEAT EXCHANGED (MBH)	COLD SIDE				HOT SIDE				MFR. AND MODEL NO.	SURFACE AREA SQ. FT.	OPERATING WEIGHT (LBS)	REMARKS
				GPM	EWT (°F)	LWT (°F)	PD FT.	GPM	EWT (°F)	LWT (°F)	PD FT.				
HX-1	TUG TUNNEL RAMP SNOW MELT	301 MECHANICAL RM	360.3	40	85	105	7.47	36.9	160	140	6.16	ALFA LAVAL AQ2-FG	16	306	SEE BELOW

⚠1

NOTES:
1. COLD SIDE IS 50% ETHYLENE GLYCOL MIXTURE.
2. FRAME SHALL BE SIZED SUCH THAT PLATES CAN BE ADDED FOR TOTAL HEAT EXCHANGE CAPACITY OF 2266 MBH AT SAME TEMPERATURES (211 GPM HOT, 229 GPM COLD), 116 SQ FT SURFACE AREA, 422 LBS OPERATING WEIGHT

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DRAWN BY: MXB
DESIGNED BY: MXB

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SHEET TITLE

MECHANICAL EQUIPMENT SCHEDULES III

SHEET NUMBER

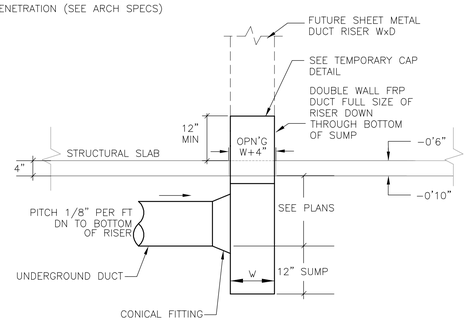
M403

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M403.dwg Plotted on: 8/17/2011 3:59 PM Plotted by: Hayward, John

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 METAL RISER DUCT WIDTH AT BOTTOM OF RISER ON SIDE OF UNDERGROUND DUCT CONNECTION

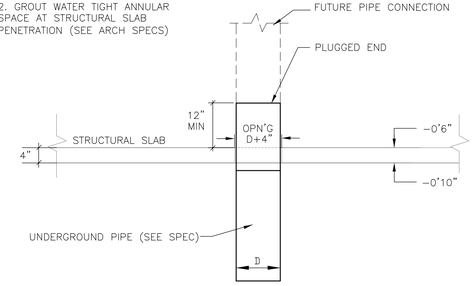


TYPICAL UNDERGROUND DUCTWORK RISER CONNECTION DETAIL

N.T.S.

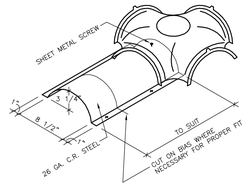
NOTES:
1. ALL UNDERGROUND PIPING SHALL BE STUBBED 12" ABOVE TOP OF STRUCTURAL SLAB AND CAPPED WITH NON-METALLIC REMOVABLE PLUG. CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROTECTION FOR PIPE STUBS AFTER SLAB POUR.
2. GROUT WATER TIGHT ANNULAR SPACE AT STRUCTURAL SLAB PENETRATION (SEE ARCH SPECS)

D = PIPE DIAMETER



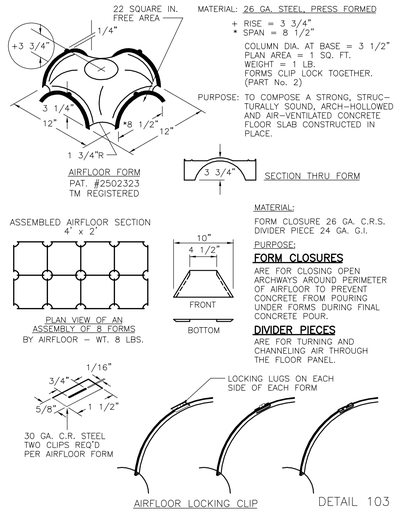
TYPICAL UNDERGROUND PIPING STUB UP DETAIL

N.T.S.



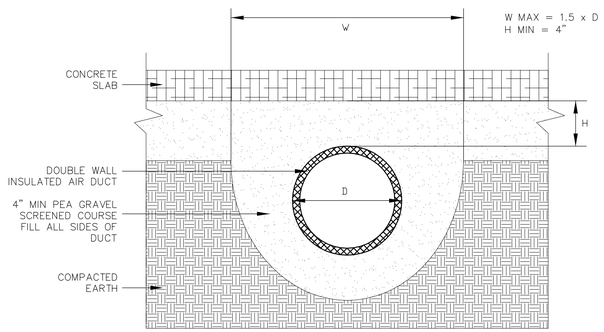
TYPICAL "AIRLFOOR" FORM EXTENSION DETAIL

N.T.S.



"AIRFLOOR" TERMINAL DETAILS

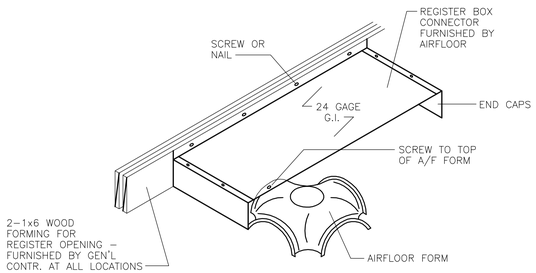
N.T.S.



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

UNDERGROUND DUCTWORK DETAIL

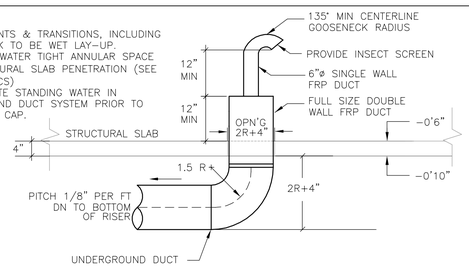
N.T.S.



"AIRFLOOR" REGISTER BOX CONNECTION DETAIL

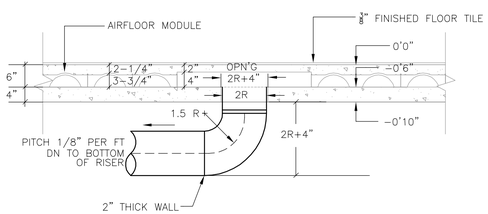
N.T.S.

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 UNDERGOUND DUCT SYSTEM PRIOR TO INSTALLING CAP.



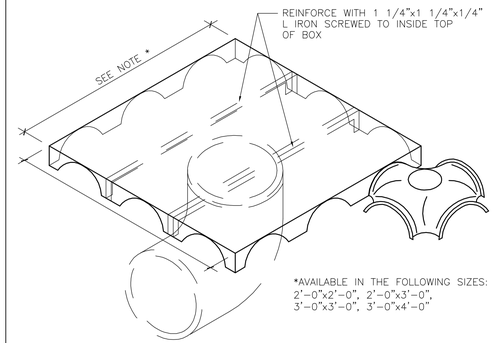
UNDERGROUND DUCTWORK TEMPORARY CAP DETAIL

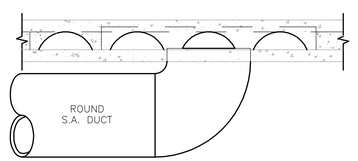
N.T.S.



"AIRFLOOR" DUCTWORK CONNECTION DETAIL

N.T.S.





TYPICAL "ARIFLOOR" SPLASH BOX DUCT CONNECTION DETAIL

N.T.S.

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SHEET TITLE

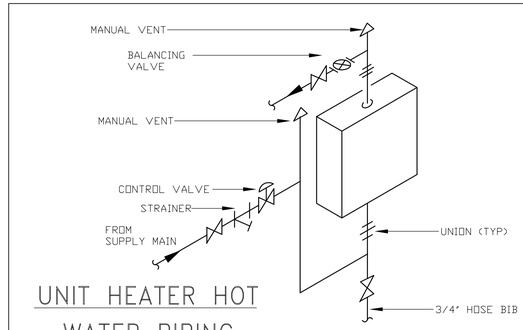
MECHANICAL DETAILS I

SHEET NUMBER

M501

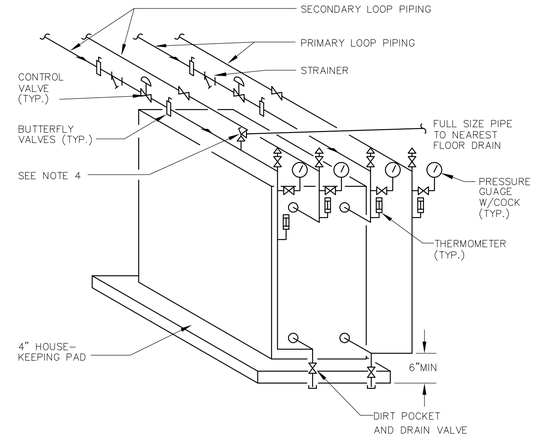
BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2222.00 Duluth Airport\3.0 CADD\(3.4) M&C\Dwgs\2222_M501.dwg Plotted on: 8/17/2011 10:37 AM Plotted by: Tolpa, Ferd



UNIT HEATER HOT WATER PIPING

N.T.S.

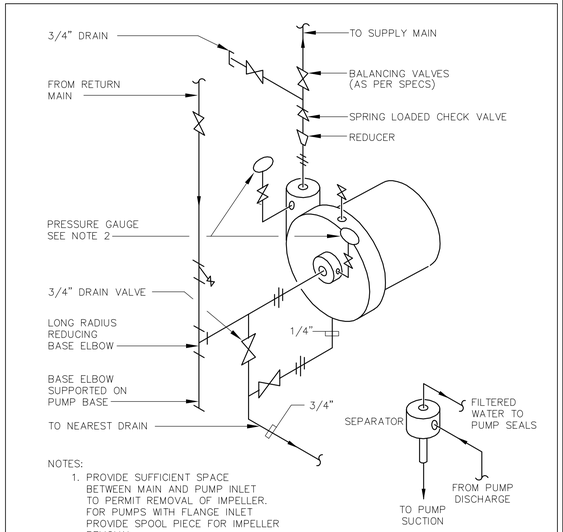


NOTES:

1. PROVIDE THERMOMETERS AND SEPARABLE SOCKETS FOR THERMOMETERS.
2. PROVIDE PRESSURE GUAGES AND GUAGE TEST CONNECTIONS.
3. ALL PIPING SHALL BE ARRANGED TO ALLOW REMOVAL OF PLATE FIN SECTIONS FOR CLEANING W/MIN. DISTURBANCE TO PIPING.
4. RELIEF VALVE SETTING SHALL BE 10 PSI BELOW RATING OF PIPING SYSTEM OF HEAT EXCHANGER.

PLATE + FRAME HEAT EXCHANGER

NOT TO SCALE



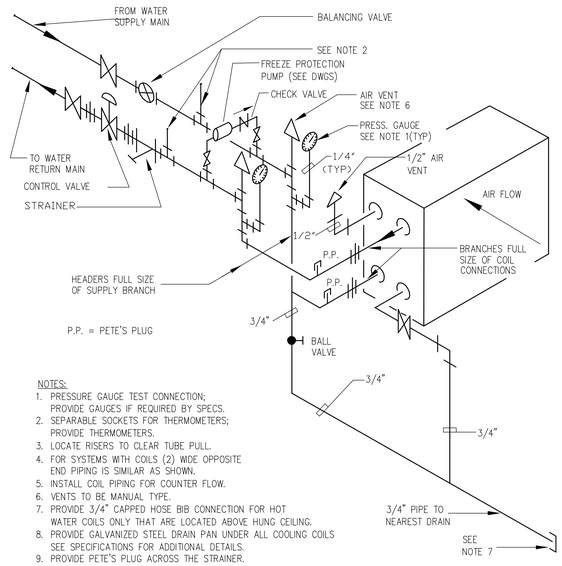
NOTES:

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

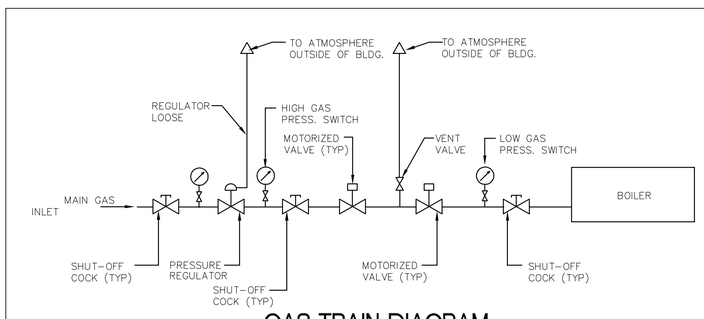


NOTES:

1. PRESSURE GAUGE TEST CONNECTION; PROVIDE GAUGES IF REQUIRED BY SPECS.
2. SEPARABLE SOCKETS FOR THERMOMETERS; PROVIDE THERMOMETERS.
3. LOCATE RISERS TO CLEAR TUBE PULL.
4. FOR SYSTEMS WITH COILS (2) WIDE OPPOSITE END PIPING IS SIMILAR AS SHOWN.
5. INSTALL COIL PIPING FOR COUNTER FLOW.
6. VENTS TO BE MANUAL TYPE.
7. PROVIDE 3/4" CAPPED HOSE BIB CONNECTION FOR HOT WATER COILS ONLY THAT ARE LOCATED ABOVE HUNG CEILING.
8. PROVIDE GALVANIZED STEEL DRAIN PAN UNDER ALL COOLING COILS SEE SPECIFICATIONS FOR ADDITIONAL DETAILS.
9. PROVIDE PETE'S PLUG ACROSS THE STRAINER.

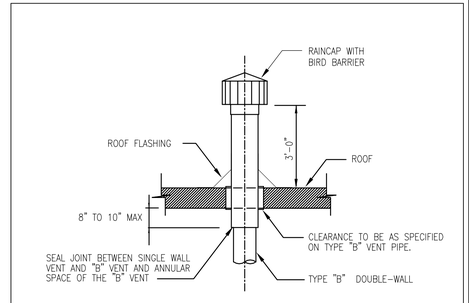
ONE HIGH VERT. WATER COIL PIPING (THROTTLING CONTROL VALVE)

N.T.S.



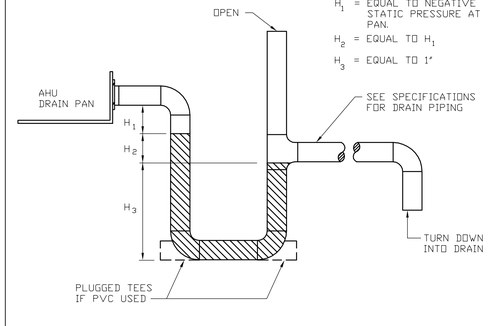
GAS TRAIN DIAGRAM

NOT TO SCALE



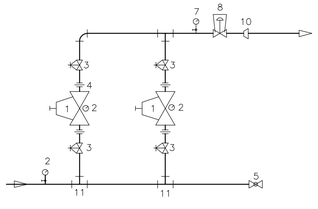
DETAIL - TYPICAL FLUE TERMINAL

NOT TO SCALE



DRAW-THROUGH UNIT DRAIN DETAIL

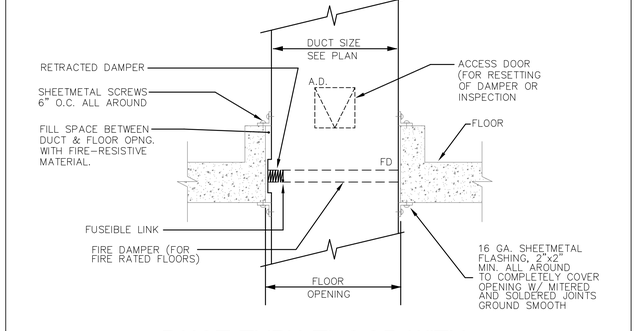
N.T.S.



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

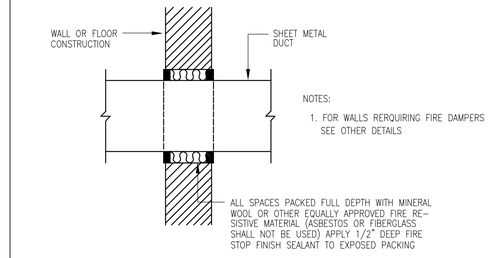
GAS PRV DETAIL

N.T.S.



DUCT THRU FLOOR WITH FIRE DAMPER DETAIL

NOT TO SCALE



NOTES:

1. FOR WALLS REQUIRING FIRE DAMPERS SEE OTHER DETAILS

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

NOT TO SCALE

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SHEET TITLE

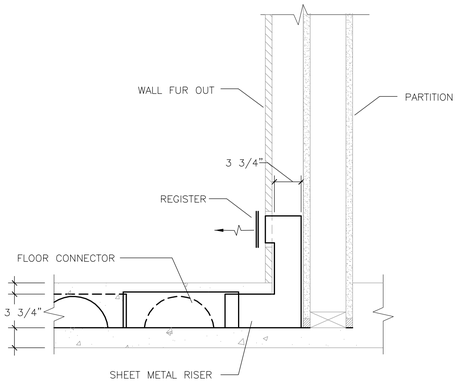
MECHANICAL DETAILS II

SHEET NUMBER

M502

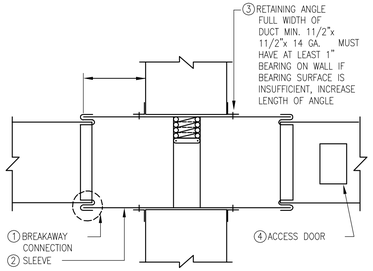
BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.4) HVAC\Dwgs\2008_M502.dwg Plotted on: 8/17/2011 10:38 AM Plotted by: Tolljes, Ferd



AIRFLOOR SIDEWALL GRILLE DETAIL

NOT TO SCALE



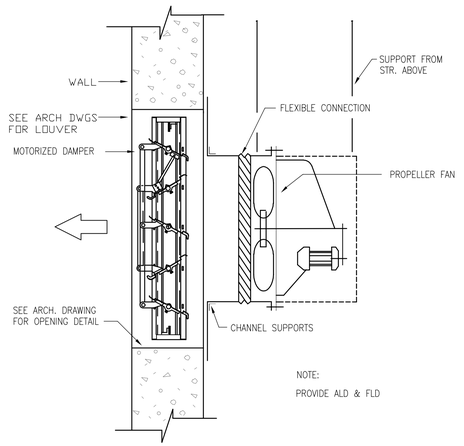
IN-DUCT MOUNTED FIRE DAMPER

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.

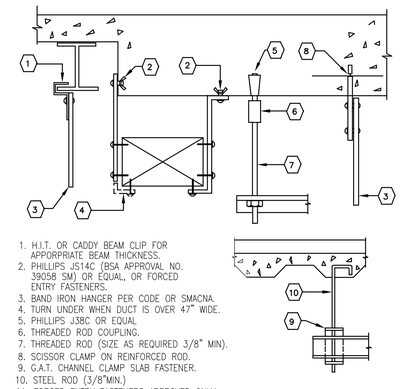
FIRE DAMPER

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



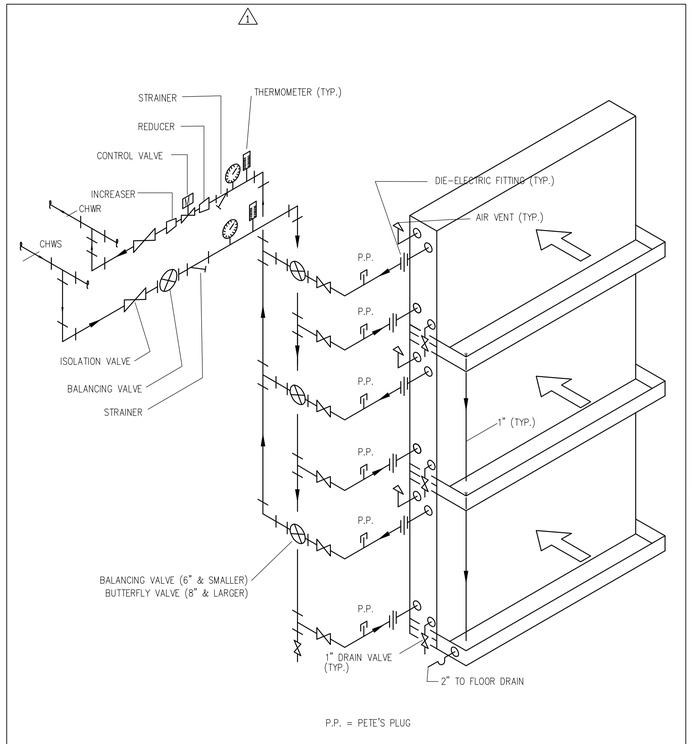
WALL EXHAUST FAN DETAIL

NOT TO SCALE



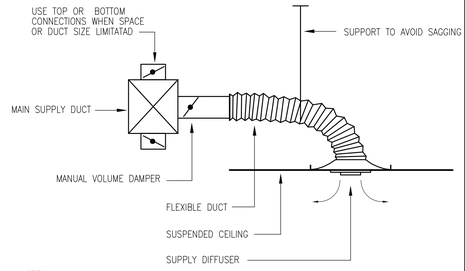
METHOD OF HANGING DUCTWORK

NOT TO SCALE



TYPICAL MULTIPLE CHILLED WATER COOLING COIL PIPING DETAIL

N.T.S.

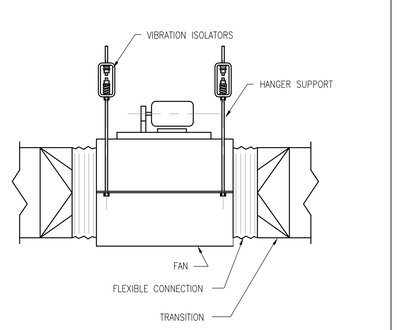


NOTE :

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

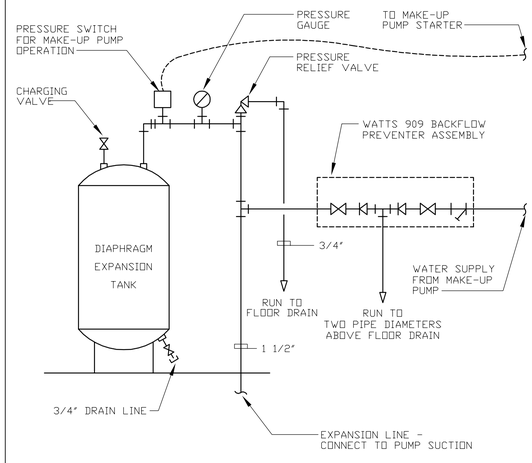
TYPICAL SUPPLY DIFFUSER CONNECTION

NOT TO SCALE



IN-LINE FAN SUPPORT DETAIL

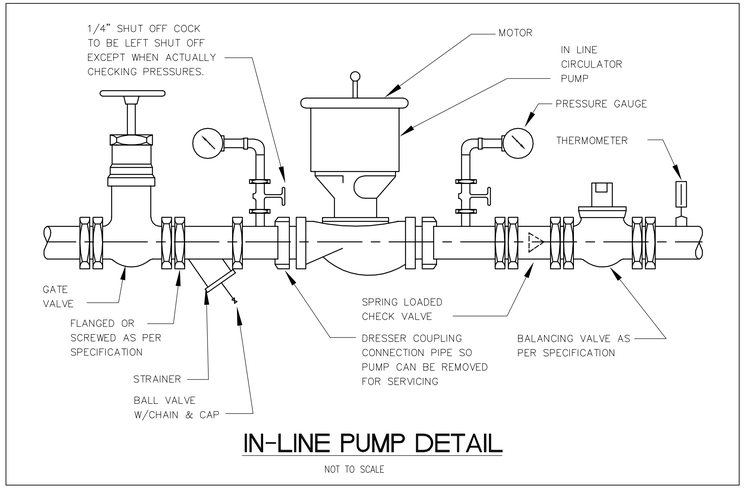
NOT TO SCALE



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



IN-LINE PUMP DETAIL

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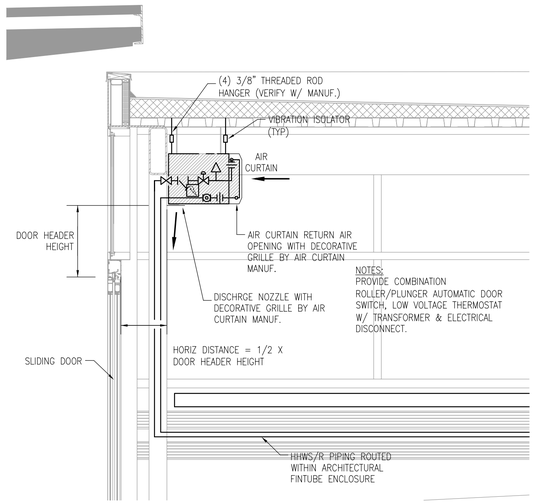
MECHANICAL DETAILS III

SHEET NUMBER

M503

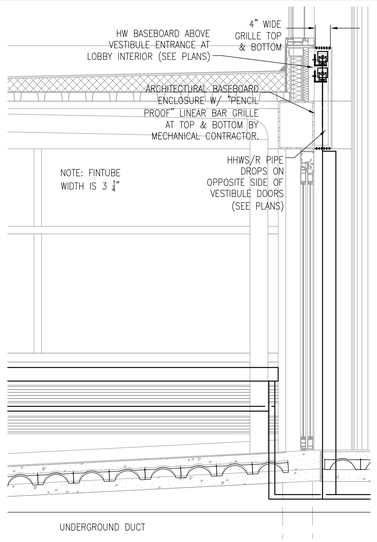
BID PACKAGE 2B
ISSUED FOR BID

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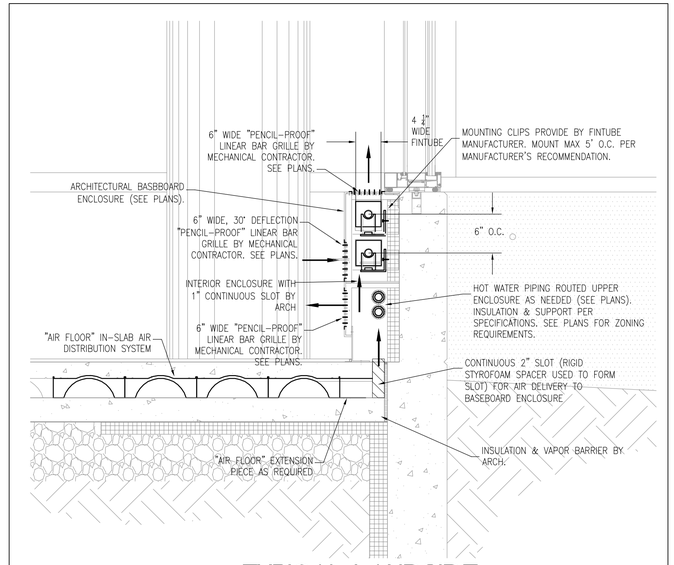
TYPICAL AIR CURTAIN INSTALLATION DETAIL

NOT TO SCALE



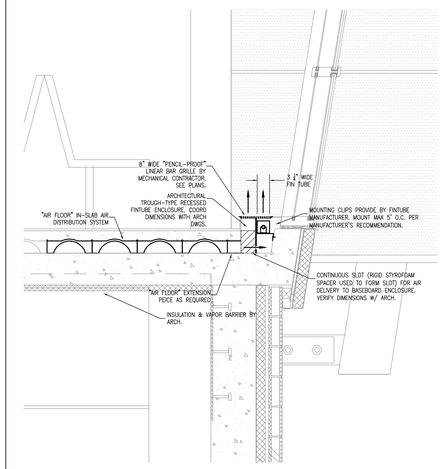
TYPICAL INTERIOR VESTIBULE SILL FINTUBE INSTALLATION DETAIL

NOT TO SCALE



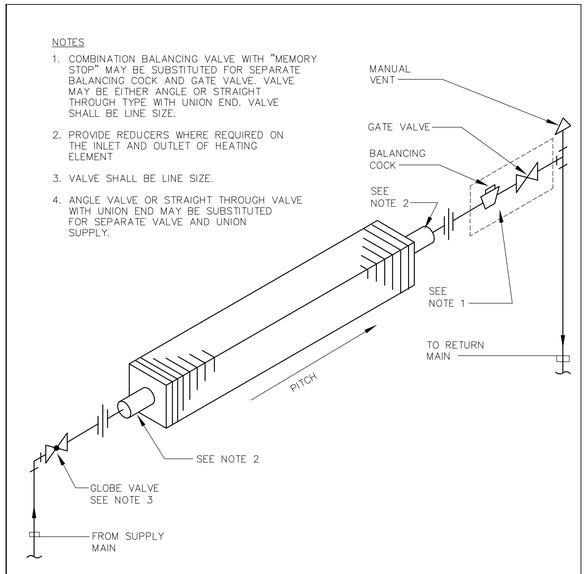
TYPICAL LANDSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

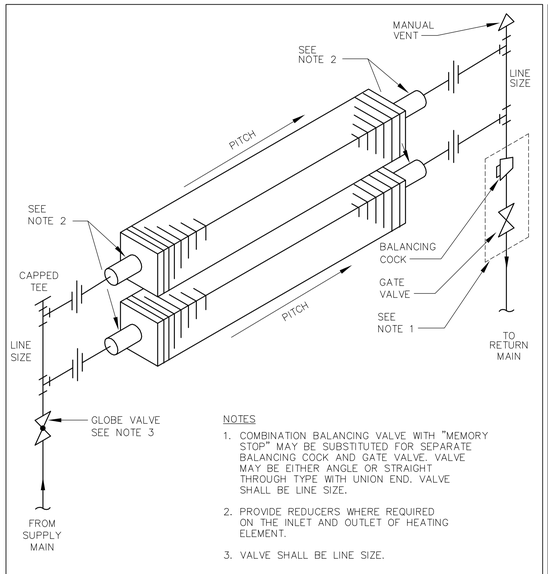


TYPICAL AIRSIDE PERIMETER FIN TUBE DETAIL

NOT TO SCALE

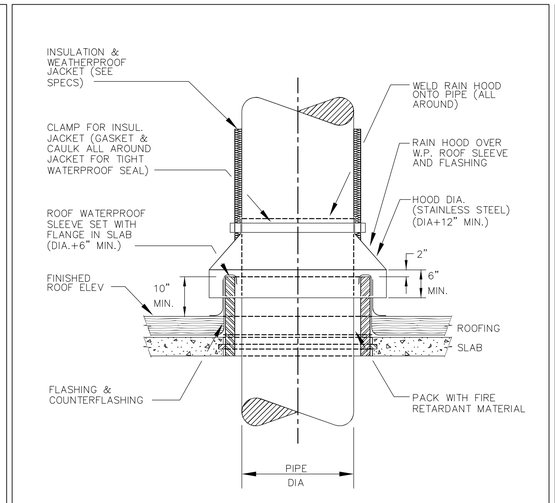


ONE (1) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING



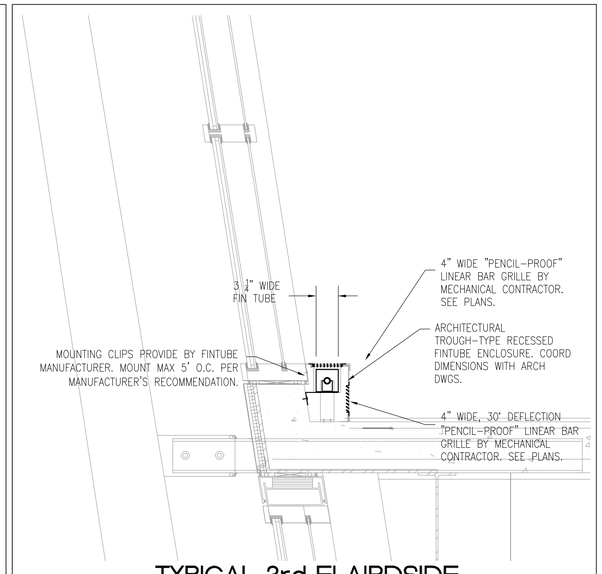
TWO (2) HIGH HOT WATER FIN TUBE RADIATION UP FEED PIPING

(ROWS IN PARALLEL)



PIPE PENETRATION THRU ROOF SLAB

NOT TO SCALE



TYPICAL 3rd Fl AIRDSIDE PERIMETER FIN TUBE DETAIL

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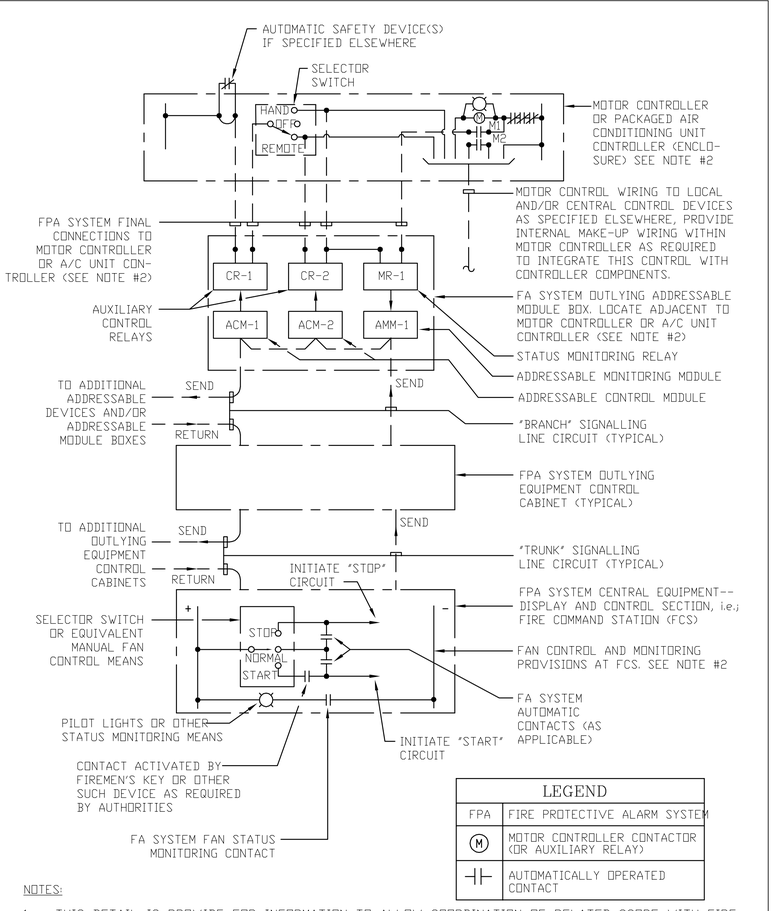
MECHANICAL DETAILS IV

SHEET NUMBER

M504

BID PACKAGE 2B
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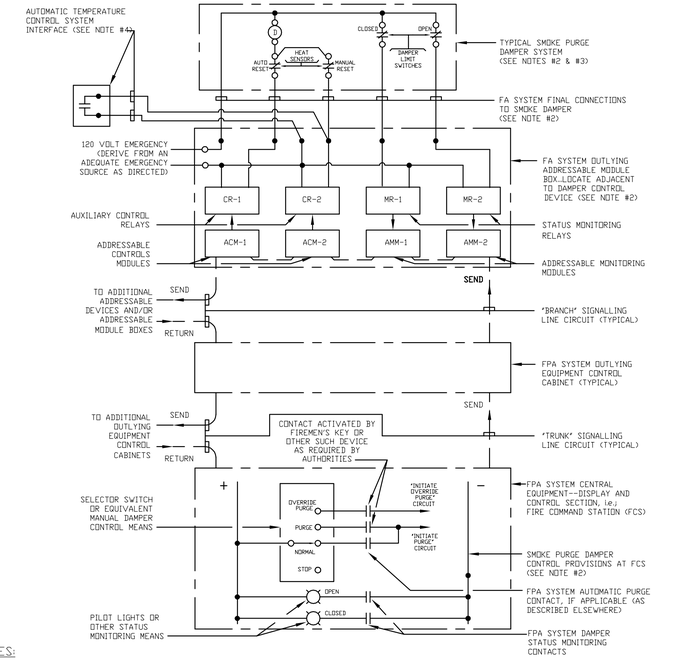
LEGEND	
FPA	FIRE PROTECTIVE ALARM SYSTEM
(M)	MOTOR CONTROLLER CONTACTOR (OR AUXILIARY RELAY)
⊣⊢	AUTOMATICALLY OPERATED CONTACT

NOTES:

1. THIS DETAIL IS PROVIDE FOR INFORMATION TO ALLOW COORDINATION OF RELATED SCOPE WITH FIRE ALARM (FA) CONTRACTOR. ALL FA SYSTEM WIRING BY FA CONTRACTOR. SEE HVAC INSTRUMENTATION AND CONTROLS SPECIIFCATION FOR ADDITIONAL INFORMATION.
2. THIS DETAIL IS A DIAGRAMMATIC REPRESENTATION OF COMPONENTS AND CIRCUITRY (SPECIFIED ELSEWHERE) FULFILLING FA SYSTEM PERFORMANCE REQUIREMENTS.
3. THE REQUIREMENTS OF THIS DETAIL PERTAIN INDIVIDUALLY TO EACH FAN. REFER TO HVAC RISER DIAGRAMS AND PLAN DRAWINGS TO ESTABLISH QUANTITIES OF DAMPERS.REFER TO FA SYSTEM SPECIFICATIONS AND/OR TO A SCHEDULE OF CONTROLLED EQUIPMENT ON THE DRAWINGS FOR ADDITIONAL INFORMATION.
4. FOR CLARITY, ONLY THOSE COMPONENTS NECESSARY TO ESTABLISH THE FUNCTIONAL INTENT OF THE FAN CONTROL AND STATUS MONITORING FEATURES OF THE FPA SYSTEM ARE SHOWN HEREIN.

FAN MOTOR WIRING DIAGRAM INCORPORATING MANUAL CONTROL FROM THE FIRE COMMAND STATION (ADDRESSABLE SYSTEM)

NO SCALE



LEGEND	
FPA	FIRE PROTECTIVE ALARM SYSTEM
(D)	DAMPER CONTROL DEVICE (EP SWITCH OR ELECTRIC DAMPER MOTOR AS APPLICABLE
⊣⊢	AUTOMATICALLY OPERATED CONTACT

NOTES:

1. THIS DETAIL IS PROVIDE FOR INFORMATION TO ALLOW COORDINATION OF RELATED SCOPE WITH FIRE ALARM (FA) CONTRACTOR. ALL FA SYSTEM WIRING BY FA CONTRACTOR. SEE HVAC INSTRUMENTATION AND CONTROLS SPECIIFCATION FOR ADDITIONAL INFORMATION.
2. THIS DETAIL IS A DIAGRAMMATIC REPRESENTATION OF COMPONENTS AND CIRCUITRY (SPECIFIED ELSEWHERE) FULFILLING FA SYSTEM PERFORMANCE REQUIREMENTS.
3. THE REQUIREMENTS OF THIS DETAIL PERTAIN INDIVIDUALLY TO EACH SMOKE DAMPER SYSTEM. REFER TO HVAC RISER DIAGRAMS AND PLAN DRAWINGS TO ESTABLISH QUANTITIES OF DAMPERS. REFER TO FPA SYSTEM SPECIFICATIONS AND/OR TO A SCHEDULE OF CONTROLLED EQUIPMENT ON THE DRAWINGS FOR ADDITIONAL INFORMATION.
4. FOR SYSTEMS WITH ADDITIONAL OPERABLE UPSTREAM OR DOWNSTREAM DAMPERS OR MULTIPLE SECTION DAMPERS THROUGH WHICH SMOKE IS EXHAUSTED, EXTEND WIRING AND CONNECT AS FOLLOWS:

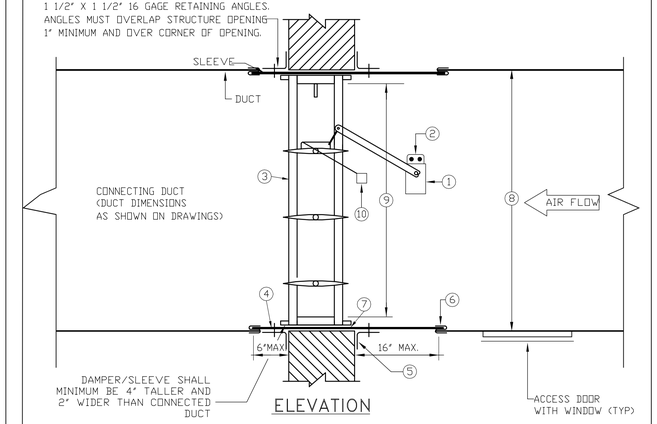
   a) LIMIT SWITCHES IN SERIES GROUPS (OPEN, CLOSED) SO THAT ALL DAMPERS MUST BE IN FULLY OPEN OR FULLY CLOSED POSITION TO CAUSE STATUS INDICATION.

   b) HEAT SENSORS AND DAMPER CONTROL DEVICES SHALL BE CONNECTED IN GROUPS SO THAT ALL DAMPERS IN A GROUP OPERATE TOGETHER IN RESPONSE TO 'PURGE' AND 'OVER-RIDE PURGE' COMMANDS FROM THE FA SYSTEM, WITH HEAT SENSORS INHIBITING THE OPERATION OF INDIVIDUAL DAMPERS.

   REFER TO THE HVAC DRAWINGS TO DETERMINE SUCH DAMPER GROUPINGS - IF ANY.
5. WHERE DAMPERS ARE NORMALLY CONTROLLED AS PART OF THE HVAC AUTOMATIC TEMPERATURE CONTROL SYSTEM - IN ADDITION TO REQUIRING CONTROL BY THE FA SYSTEM FOR SMOKE CONTROL - CONNECT AS INDICATED TO AN INTERFACE CONTROL RELAY FURNISHED AND INSTALLED WITHIN 10 FEET OF THE DAMPER AS PART OF THE TEMPERATURE CONTROL SYSTEM.
6. FOR CLARITY, ONLY THOSE COMPONENTS NECESSARY TO ESTABLISH THE FUNCTIONAL INTENT OF THE SMOKE EXHAUST DAMPER SYSTEM CONTROL AND STATUS MONITORING FEATURES OF THE FA SYSTEM ARE SHOWN HEREIN.

SMOKE DAMPER SYSTEM WIRING DIAGRAM INCORPORATING MANUAL CONTROL FROM THE FIRE COMMAND STATION (ADDRESSABLE SYSTEM)

NO SCALE



ELEVATION

ITEM	DESCRIPTION
1.	OPERATOR/ACTUATOR (MOUNTED OUTSIDE OF AIR STREAM)
2.	HEAT RESPONSIVE DEVICE (PRIMARY AND SECONDARY)
3.	DAMPER FRAME
4.	SLEEVE
5.	MOUNTING ANGLES
6.	UL LISTED BREAKAWAY CONNECTION
7.	CAULKING MATERIAL
8.	CONNECTING DUCT OPEN AREA
9.	DAMPER CLEAR OPEN AREA
10.	DAMPER END SWITCH

NOTES:

A. COMBINATION FIRE AND SMOKE RATED DAMPERS ARE DESIGNED TO OPERATE WITH BLADES RUNNING HORIZONTALLY AND MUST BE INSTALLED WITHIN THE FIRE WALL DUCT OPENING.

B. DAMPERS SHALL BE INSTALLED PER THE CONDITION OF THEIR UL LISTING AND THE MANUFACTURER'S INSTALLATION INSTRUCTION.

C. DAMPER SHALL BE IN ACCORDANCE , UL 555S (LATEST EDITION) AND ALL REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION AND SHALL HAVE UL LABEL.

D. DAMPER ACTUATOR SHALL BE UL RATED FOR 350°F DAMPER SLEEVE SHALL NOT EXTEND MORE THAN 6" BEYOND THE FIRE WALL OR PARTITION AND NOT MORE THAN 16" ON THE OPERATOR/ACT- UATOR SIDE.

E. CONTRACTOR SHALL SUBMIT STATIC PRESSURE LOSS THRU DAMPER AT OPERATING DUCT VELOCITIES.

F. PROVIDE ACCESS DOORS AS PER CODE AND SPECIFICATIONS.

G. THE MAXIMUM SINGLE DAMPER ASSEMBLY WHETHER SINGLE OR MULTI-SECTION MAY NOT EXCEED THE LIMIT AS CERTIFIED BY UL. WHERE MULTIPLE ASSEMBLIES ARE REQUIRED PROVIDE AN APPROVED MULLIONS (FOR MASONRY WALL APPLICATION ONLY)

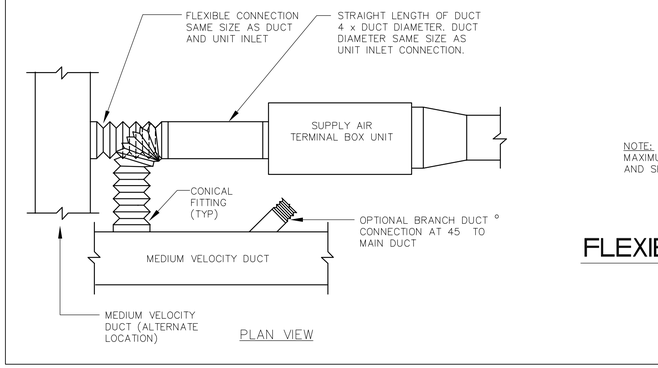
H. SEE SPECS FOR ADDITIONAL REQUIREMENTS.

I. PROVIDE PRIMARY HEAT RESPONSIVE DEVICE. FOR SMOKE MANAGEMENT SYSTEM, PROVIDE PRIMARY AND SECONDARY HEAT RESPONSIVE DEVICES.

CONTROLS
REFER TO SPECIFICATIONS FOR SYSTEM SEQUENCES.

FIRE/SMOKE DAMPER INSTALLATION DETAIL

NOT TO SCALE



PLAN VIEW

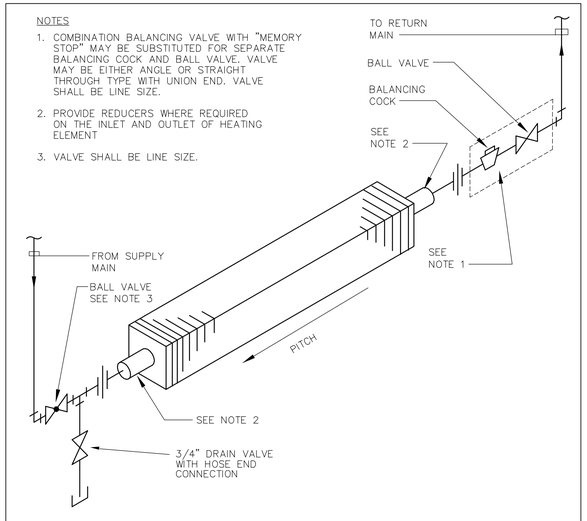
NOTE:
MAXIMUM LENGTH OF FLEXIBLE CONNECTION WILL NOT EXCEED 2'-0" AND SHALL CONFORM TO LOCAL UNION REQUIREMENTS.

TYPICAL TERMINAL UNIT FLEXIBLE DUCT CONNECTION DETAIL

NOT TO SCALE

NOTES

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



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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
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213-1882-091

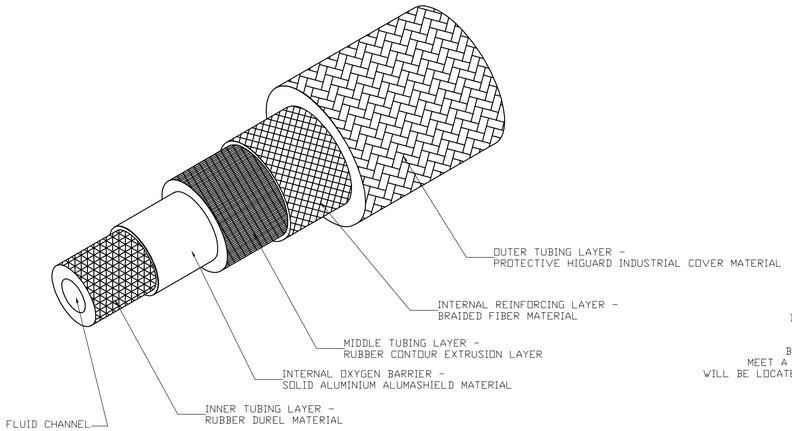
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SHEET TITLE
MECHANICAL DETAILS V

SHEET NUMBER
M505

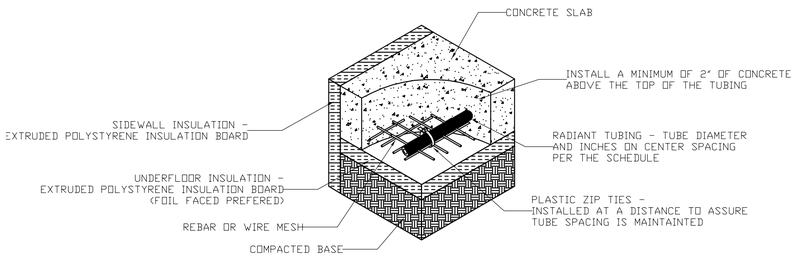
BID PACKAGE 2B
ISSUED FOR BID

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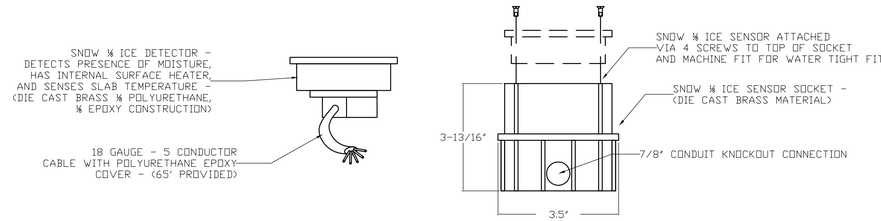
RADIANT TUBING MATERIAL - RUBBER

NOT TO SCALE



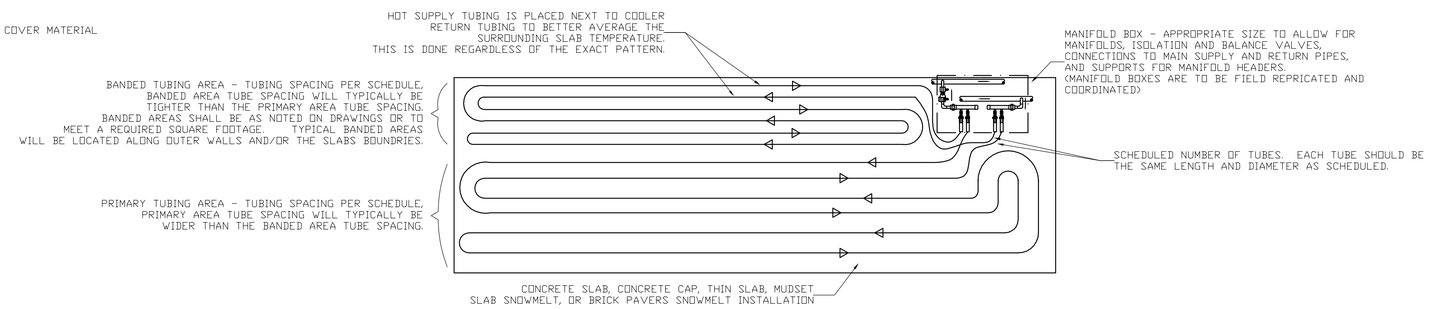
RADIANT SNOWMELT - SLAB ON GRADE WITH FOAM INSULATION

NOT TO SCALE



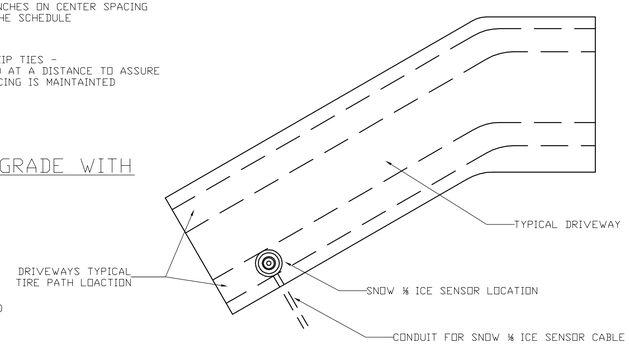
RADIANT SNOWMELT SYSTEM - SNOW ⅛ ICE SENSOR WITH SOCKET DETAIL

NOT TO SCALE

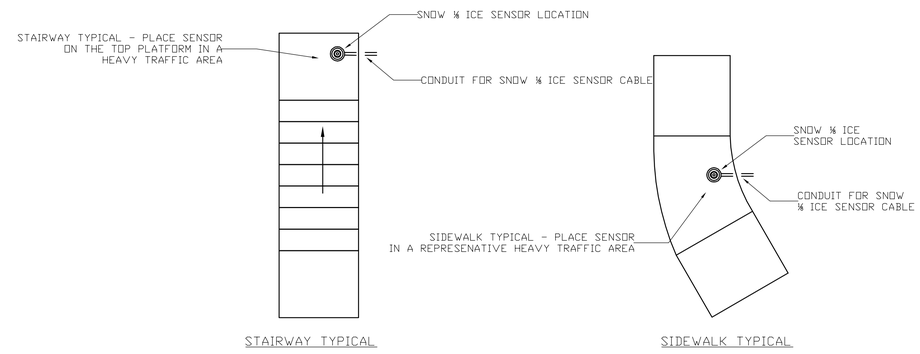


RADIANT TUBING LAYOUT - ENCAPSULATED TUBING INSTALLATION - DOUBLE SERPENTINE LAYOUT

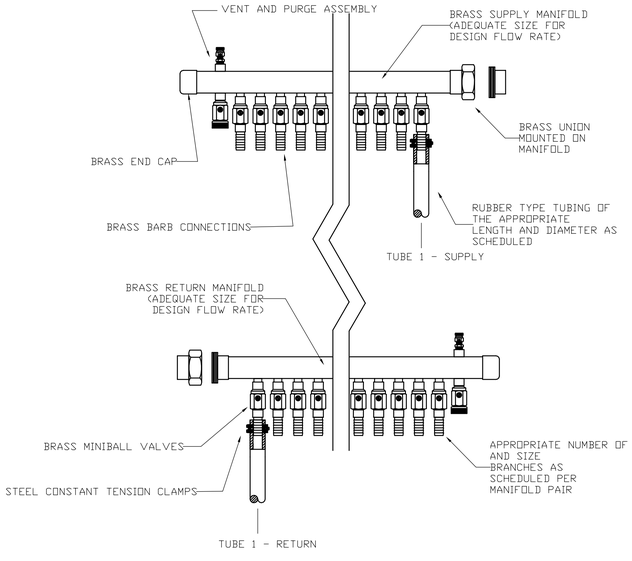
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RECOMMENDED SENSOR INSTALLATION - DRIVEWAY INSTALLATIONS

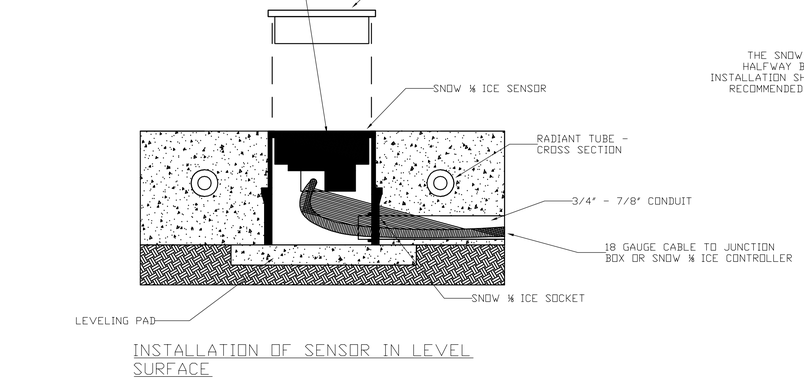


RECOMMENDED SENSOR INSTALLATION - STAIRS AND SIDEWALKS INSTALLATIONS

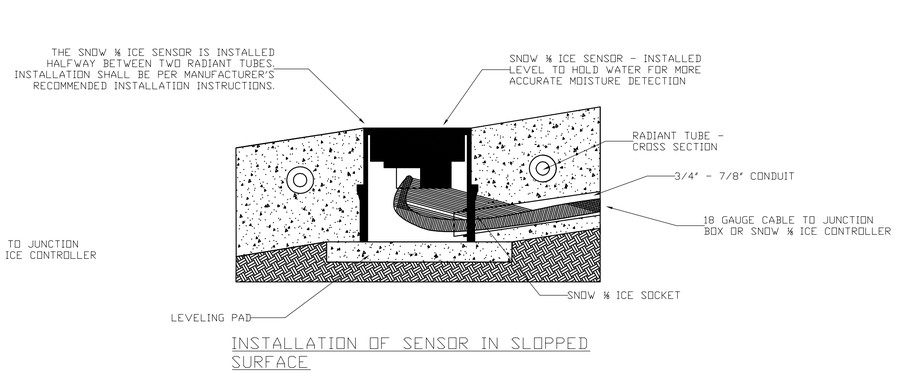


RADIANT TUBING MANIFOLD - RUBBER TUBING

NOT TO SCALE



INSTALLATION OF SENSOR IN LEVEL SURFACE



INSTALLATION OF SENSOR IN SLOPPED SURFACE

RADIANT SNOWMELT SYSTEM - SNOW ⅛ ICE SENSOR (WITH SOCKET) INSTALLATION

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SHEET TITLE

RAMP SNOW MELT SYSTEM DETAILS

SHEET NUMBER

⚠ M506

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.09 Duluth Airport\5.0 CADD\(5.4) M&C\Dwgs\2008_M506.dwg Plotted on: 8/17/2011 10:43 AM Plotted by: Tollyn, Ferd

SYMBOL	DESCRIPTION	NOTES
	LIGHTING FIXTURES	
F1 a, F2 c, F3 b, F4 d	CEILING MOUNTED LIGHTING FIXTURES	UPPER CASE LETTERS INSCRIBED IN SYMBOL INDICATE FIXTURE TYPE REFERENCES TO FIXTURE LIST SUBSCRIPT LOWER CASE LETTERS INDICATE SWITCH CONTROL ASSOCIATIONS INIDCATES EMERGENCY LIGHTING:
F1 a, F4 d	WALL MOUNTED LIGHTING FIXTURES	F1 a, F3 b, F1 a CIRCUITRY FOR EMERGENCY LIGHTING AND EXIT SIGNS ARE DESIGNATED WITH "E" BEFORE THE CIRCUIT NUMBER.
	FLOOR MOUNTED LIGHTING FIXTURE	
	EXIT SIGNS	
	WALL MOUNTED EXIT SIGN	APPLICATION OF SHADED QUADRANTS AND ARROWS THUS:
	CEILING MOUNTED EXIT SIGN	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.
	JUNCTION AND PULL BOXES -- SECONDARY LIGHT AND POWER WIRING	
	PULL BOX OR JUNCTION BOX--OUTLET BOX TYPE WALL MOUNTED	
	PULL BOX OR JUNCTION BOX--OUTLET BOX TYPE MOUNTED AT CEILING	
JB	JUNCTION BOX	
	SECONDARY FEEDERS	
	FEEDER RUN CONCEALED ABOVE AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF CIRCUITRY.	
	FEEDER RUN CONCEALED BELOW AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF CIRCUITRY.	
	FEEDER RUN EXPOSED AS PER BASIC REQUIREMENTS FOR THE INSTALLATION OF	
	FIRE PROTECTIVE ALARM SYSTEMS SOUNDING AND VISUAL DEVICES	
S	SPEAKER	SUBSCRIPT -P- DENOTES PRESIGNAL SUBSCRIPT -T- DENOTES TROUBLE SIGNAL SYMBOLS AS SHOWN REPRESENT CLG MOUNTED DEVICES--CIRCUMSCRIBED CIRCLES THUS:- SV DENOTE WALL MOUNTING SYMBOLS WITH LOWER PORTION LEFT UNSHADED DENOTE THAT THE ITEMS ARE PART OF AN OVERALL FIRE PROTECTIVE ALARM SYSTEM INSCRIBED SHADING IN LOWER PORTION DENOTES THAT THE ITEMS ARE PART OF A SEPARATE SYSTEM WHICH INCORPORATES ACTUATING DEVICES REPRESENTED BY SIMILARLY SHADED SYMBOLS SUBSCRIPT LOWER CASE LETTERS IN QUOTES DENOTE EXCEPTIONS TO SPECIFIED MOUNTING AS FOLLOWS: "f" - flush "s" - surface
SV	SPEAKER w/ VISUAL ALARM DEVICE	
V	VISUAL ALARM DEVICE	
	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 NUMBERS INDICATE ZONE OR CIRCUIT SUBSCRIPT LOWER CASE LETTERS IN QUOTES DENOTE EXCEPTIONS TO SPECIFIED STANDARD MOUNTING AS FOLLOWS:- "f" - flush "sf" -semiflush "s" - surface "d" - in duct SUBSCRIPT ROMAN NUMERALS DENOTE SYSTEM WHERE THERE IS MORE THAN ONE. SYMBOLS AS SHOWN REPRESENT WALL MOUNTED DEVICES --CIRCUMSCRIBED CIRCLES THUS:- DENOTE CEILING MOUNTING EXCEPT THAT FOR AUTOMATIC FIRE DETECTION ACTUATING DEVICES AS SHOWN DENOTE CEILING MOUNTED DEVICES AND CIRCUMSCRIBED CIRCLES DENOTE MOUNTING IN RAISED FLOOR. SUBSCRIPT UPPER CASE LETTERS IN PARENTHESIS DENOTE DEVICE FUNCTION THUS:- (TE)-TOCCC EVACUATION (FE)-FLOOR EVACUATION
WF	SPRINKLER ALARM ACTUATING DEVICE	SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:-
VSS	VALVE SUPERVISOR SWITCH	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
SD	AUTOMATIC FIRE DETECTION ALARM ACTUATING DEVICES SMOKE DETECTOR	SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:-
DD	DUCT SMOKE DETECTOR	-RT-FIRESTAT--RATE OF RISE PLUS FIXED TEMPERATURE TYPE
D	HEAT DETECTOR	-FT-FIRESTAT--FIXED TEMPERATURE TYPE
SD T	BEAM TYPE SMOKE DETECTOR SUBSCRIPT "T" INDICATES TRANSMITTER	-PM--PNEUMATIC TUBE DIAPHRAGM SWITCH
SD R	SUBSCRIPT "R" INDICATES RECEIVER	SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING FIRESTATS DENOTE EXCEPTIONS TO SPECIFIED STANDARD TEMPERATURE SETTINGS
	ELECTRIC DOOR LOCK	SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING PNEUMATIC TUBE DIAPHRAGM SWITCHES DENOTE LENGTH OF ASSOCIATED TUBING
DTU	DATA TRANSMISSION UNIT	

SYMBOL	DESCRIPTION	NOTES
	WIRING DEVICES	
$	WIRING DEVICE TYPE SWITCH	WITHOUT SUBSCRIPT NUMBER SYMBOL DENOTES "SINGLE POLE" SUBSCRIPT NUMBERS DENOTE -2 POLE- -3 WAY-, -4 WAY-, ETC. SUBSCRIPT LETTERS IN PARENTHESIS THUS:- (PL) INDICATE SEPARATE PILOT LIGHT.
$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 ASSOCIATIONS.

SYMBOL	DESCRIPTION	NOTES
	WIRING DEVICES (CONT)	
	WALL DUPLEX CONVENIENCE RECEPTACLE	SHADING OF SYMBOL THUS:-
	WALL DOUBLE DUPLEX (QUAD) CONV. RECEPT.	INDICATES RECEPTACLE WITH EACH HALF SEPARATELY WIRED (HALF CONSTANT, HALF SWITCH CONTROLLED)
	GFI (GROUND FAULT INTERRUPTING) WALL DUPLEX CONVENIENCE RECEPTACLE	
	WALL SINGLE CONVENIENCE RECEPTACLE	
PS	POWER SUPPLY FOR ACCESS CONTROL	
	QUAD RECEPTACLE IN FLUSH FLOOR BOX	SEE TELECOM PLANS ("ET" SERIES) FOR INDICATION WHETHER BOX CONTAINS DATA
	DUPLEX RECEPTACLE IN FLUSH FLOOR BOX	
P	QUAD RECEPTACLE PENDANT MOUNTED FROM CEILING	
	CEILING DUPLEX RECEPTACLE 1	
	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
FB	FLOOR BOX FOR ILLUMINATED SIGNS - COORDINATE WITH MANUFACTURER REQUIREMENTS FOR COMPONENTS.	
	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.	PROVIDE VOLTAGE TO MATCH EQUIPMENT VOLTAGE. AMPERAGE AND POLES ARE INDICATED ON PLANS - SOME SIZES SHOULD BE VERIFIED WITH EQUIPMENT MANUFACTURER (WHERE 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	MANUFACTURER/CAT. #
	LIGHTING CONTROL - ALL LIGHTING CONTROL TO ACCOMODATE 277V U.N.O.	
Sos	LINE VOLTAGE, DUAL TECHNOLOGY WALL SWITCH SENSOR WALL-MOUNTED AT STANDARD SWITCH HEIGHT NEAR DOORS. SET FOR MANUAL-ON, AUTOMATIC-OFF OPERATION. PROVIDE THREE-WAY VERSION WHERE REQUIRED. 180° COVERAGE PATTERN REQUIRED.	WATTSTOPPER DT-200 LEVITON OSSMT HUBBELL H-MOSS AD1277W1
Sos2	LINE VOLTAGE, DUAL RELAY WALL SWITCH SENSOR WALL-MOUNTED AT STANDARD SWITCH HEIGHT NEAR DOORS. SET FOR MANUAL-ON, AUTOMATIC-OFF OPERATION. 180° COVERAGE PATTERN REQUIRED.	WATTSTOPPER DW-200 LEVITON OSSMD HUBBELL WS1277W2
$D	DIMMING SWITCH	
DL	INDOOR DAYLIGHTING SENSOR. CEILING MOUNTED.	SQUARE D C-BUS LIGHT LEVEL SENSOR
OS	LINE VOLTAGE, DUAL TECHNOLOGY MOTION SENSOR. MINIMUM 1,000 SQUARE FOOT COVERAGE. RECEIVES LOW VOLTAGE POWER FROM SWITCHPACK, AND RETURNS A LOW-VOLTAGE SIGNAL TO SWITCHPACK WHEN MOTION IS DETECTED. CEILING MOUNTED.	WATTSTOPPER DT-300 LEVITON OSC10-MDW HUBBELL OMNI-DT-2000

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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	BID PACKAGE 2B	8.23.11
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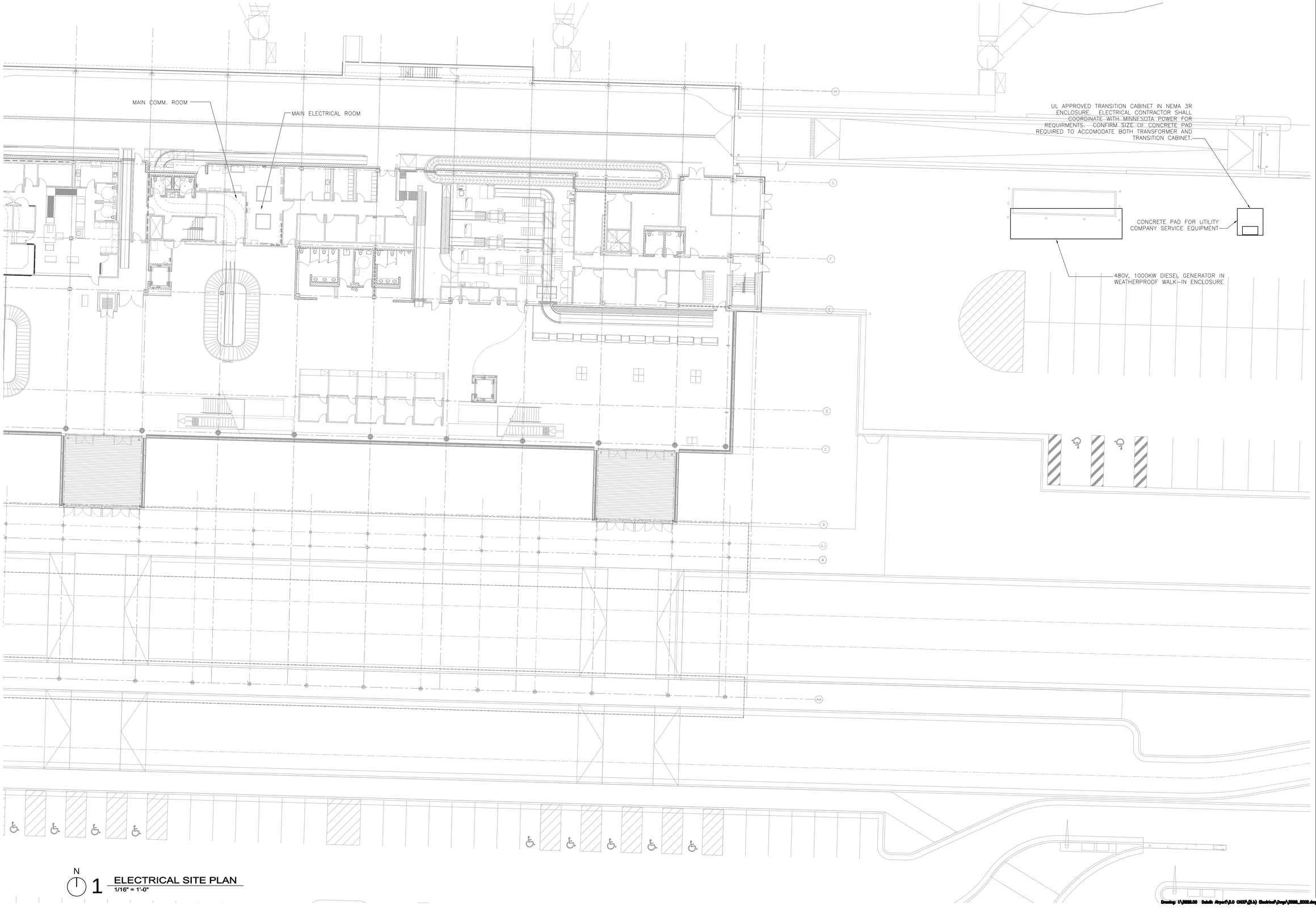
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SHEET TITLE
ELECTRICAL SYMBOLS

SHEET NUMBER
E001

BID PACKAGE 2B
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Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1b) Electrical\Dwgs\2008_E001.dwg Plotted on: 8/17/2011 11:01 AM Plotted by: Tokyo, Ford



N

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

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SHEET TITLE
ELECTRICAL SITE PLAN

SHEET NUMBER
E002

BID PACKAGE 2B
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Drawing: I:\2008.00 - Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2008_E002.dwg Plotted on: 8/17/2011 11:04 AM Plotted by: Tolpa, Ferd

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". COORDINATE LOCATIONS OF APPLIANCES WITH OWNER; PROVIDE RECEPTACLES/POWER CONNECTIONS AS REQUIRED.
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). CONTRACTOR SHALL ALSO WIRE ASSOCIATED PUSHBUTTONS SUPPLIED WITH DOORS/SHUTTERS.
10. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.
11. PROVIDE CODE REQUIRED CLEARANCE IN FRONT OF PANELBOARDS LOCATED IN ELEVATOR MACHINE ROOMS.

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) NOT USED

(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 MANUFACTURER.

(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.

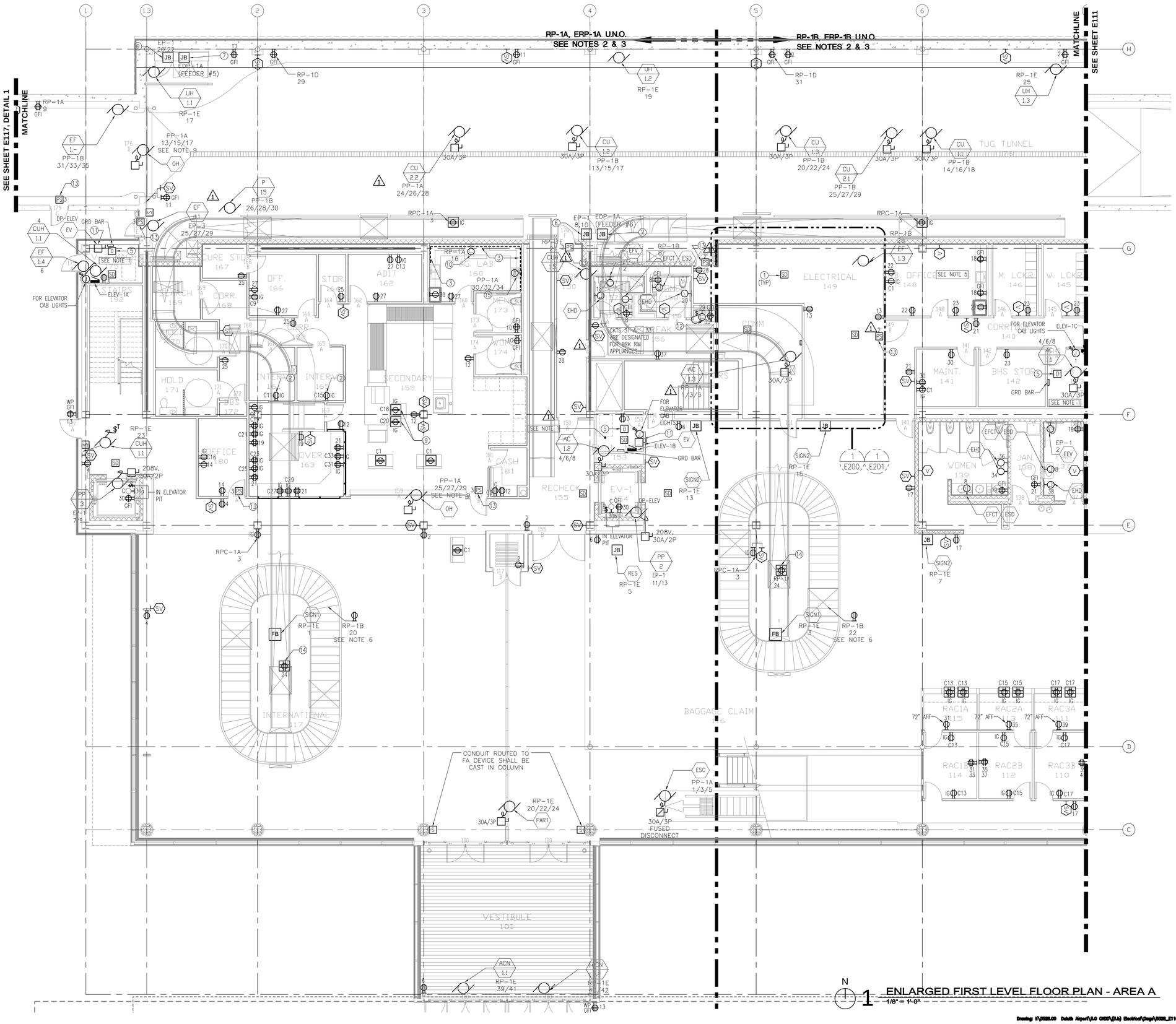
(11) PROVIDE POWER MODULE SWITCH EATON TYPE "PS6T48R1KGBF3" OR APPROVED EQUAL FOR EACH ELEVATOR. CAT. # IS BASED ON MOTOR SIZE 25HP OR BELOW, ADJUST ACCORDINGLY IF MOTOR EXCEEDS 25HP.

(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". THERE SHALL BE NO MORE THAN 4 POWER SUPPLIES PER CIRCUIT. 1

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

(15) POWER CONNECTION FOR FOOD GRINDER. ELECTRICAL CONTRACTOR SHALL CONNECT IN ACCORDANCE TO MANUFACTURER REQUIREMENTS INCLUDING SPECIAL GROUNDING PROVISIONS AND WATER TIGHT CONNECTIONS, BOXES, ETC. THAT MAY BE REQUIRED.



N

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

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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

AEP PROJECT NUMBER
213-1882-091

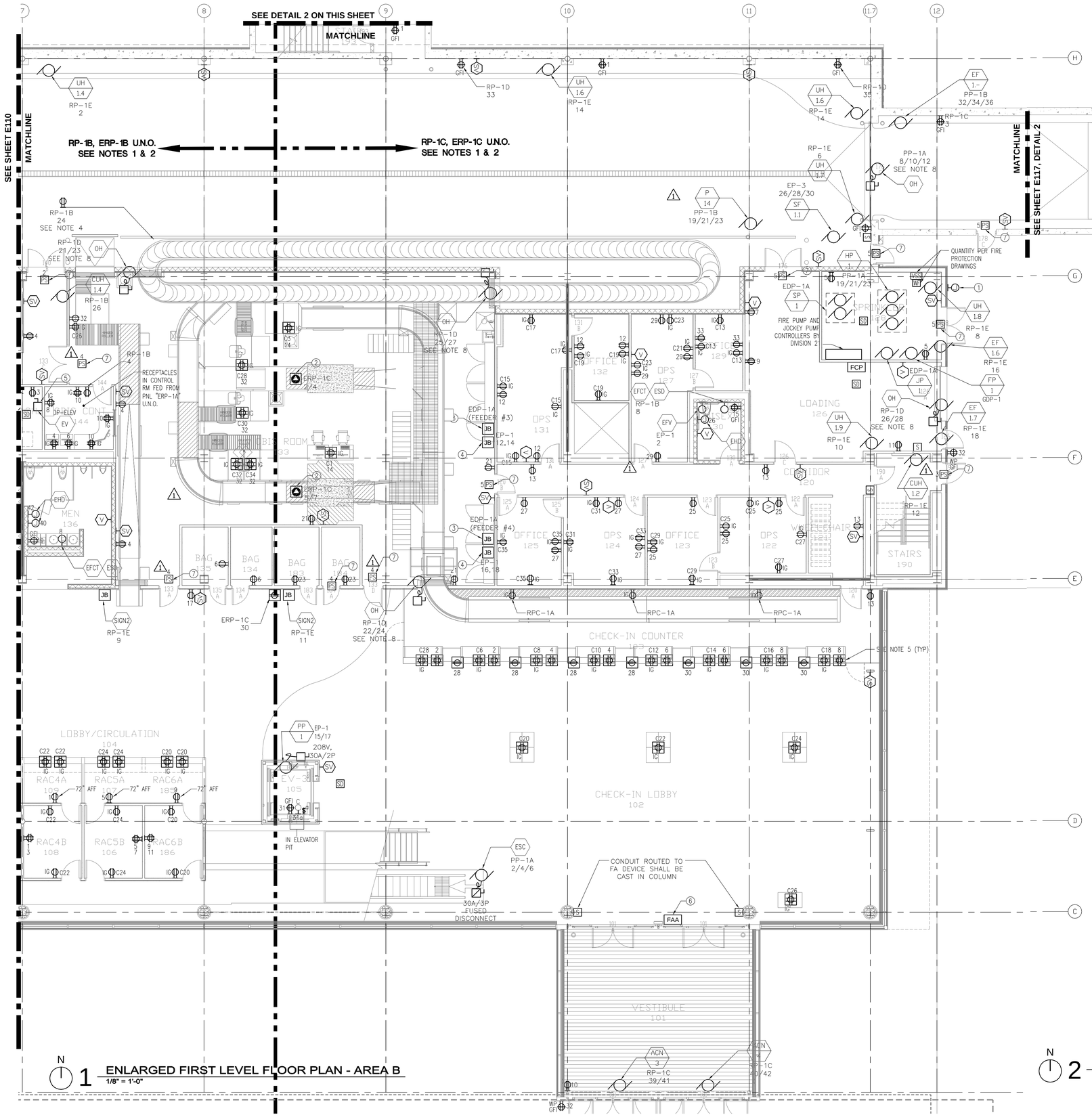
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SHEET TITLE
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E110

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2555.00 Duluth Airport\5.0 CADD\(5.3) Electrical\Dwgs\2555_E110.dwg Plotted on: 8/23/2011 12:48 PM Plotted by: Kastner, Jennifer



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

2 ENLARGED FIRST LVL PARTIAL PLAN
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). CONTRACTOR SHALL ALSO WIRE ASSOCIATED PUSHBUTTONS SUPPLIED WITH DOORS/SHUTTERS.
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". THERE SHALL BE NO MORE THAN 4 POWER SUPPLIES PER CIRCUIT. ⚠1

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	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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DRAWN BY: JK
DESIGNED BY: JK

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SHEET TITLE

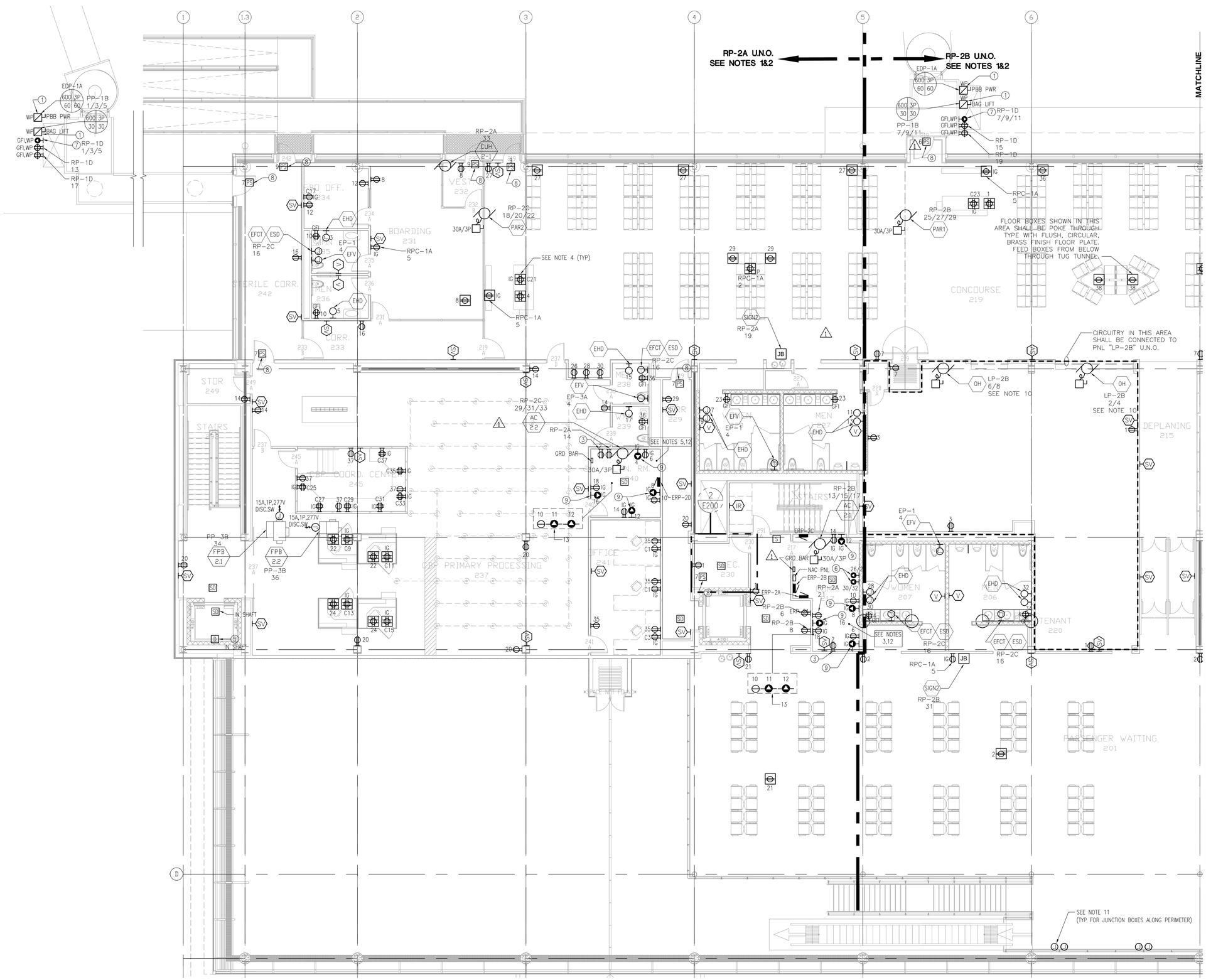
ENLARGED FIRST FLOOR ELECTRICAL PLAN AREA B

SHEET NUMBER

E111

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.3a) Electrical\Dwgs\2008_E111.dwg Plotted on: 8/25/2011 1:19 PM Plotted by: Koelker, Jennifer



N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

NOTES:

1. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO PANEL "ERP-2B" U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
2. RECEPTACLES 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. WALL RECEPTACLES IN COMM. ROOM 211 SHALL BE CONNECTED TO PANEL "ERP-2B" U.N.O. CEILING MOUNTED RECEPTACLES SHALL BE CONNECTED TO PANEL "ERP-2C". (1)
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.
10. POWER PROVISIONS FOR MOTORIZED ROLLING GRILLES AND PARTITIONS SHALL BE BASED ON MANUFACTURER'S REQUIREMENTS (INCLUDING LOCAL DISCONNECT). CONTRACTOR SHALL ALSO WIRE ASSOCIATED PUSHBUTTONS SUPPLIED WITH GRILLES.
11. JUNCTION BOX FOR MECHOSHADE MOTORIZED SHADE, "WHISPER SHADE" SERIES – CONNECT SHADES TO PANEL "RP-2C". WORK ASSOCIATED WITH MOTORIZED SHADES IS AN ALTERNATE AND SHOULD BE PRICED SEPARATELY. SEE ARCHITECTURAL PLANS FOR FULL SHADE SPECIFICATION. INCLUDE WIRING FOR BUS SUPPLIES, MOTOR CONTROLLERS AND OTHER SHADE SYSTEM COMPONENTS – COORDINATE WITH MANUFACTURER FOR FULL REQUIREMENTS.
12. COORDINATE LOCATIONS OF GROUND BAR, PANELBOARDS AND WALL MOUNTED RECEPTACLES WITH LOCATIONS OF TELECOM EQUIPMENT. PROVIDE CODE REQUIRED CLEARANCES FOR ELECTRICAL EQUIPMENT.
13. PROVIDE QUAD RECEPTACLE FOR ASTRO BASE STATIONS LOCATED IN TELECOM EQUIPMENT ROOMS ON DEDICATED 20A/1P CIRCUIT. CONNECT TO "ERP" PANEL WITHIN SAME ROOM. LOCATION SHALL BE FIELD VERIFIED.

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". THERE SHALL BE NO MORE THAN 4 POWER SUPPLIES PER CIRCUIT. (1)

(9) 20A DUPLEX RECEPTACLE WITH TWISTLOCK, NEMA L5-20.

(10) PROVIDE DUPLEX CEILING MOUNTED RECEPTACLE ABOVE EACH RACK ON A DEDICATED CIRCUIT. SEE SHEET ET502 FOR RACK LOCATIONS.

(11) PROVIDE DUPLEX CEILING MOUNTED RECEPTACLE WITH TWISTLOCK, NEMA L5-20, ABOVE EACH RACK ON A DEDICATED CIRCUIT. SEE SHEET ET502 FOR RACK LOCATIONS.

(12) PROVIDE A 30A, 208V CEILING MOUNTED RECEPTACLE FOR EACH RACK MOUNTED UPS ON A DEDICATED CIRCUIT. SEE SHEET ET501 FOR INDICATION OF RACKS CONTAINING UPS EQUIPMENT AND SHEET ET502 FOR RACK LOCATIONS.

(13) INSTALL CEILING MOUNTED RECEPTACLES WITHIN 8'-0" OF BOTTOM OF RACK. SEE SHEET ET502 FOR RACK LOCATIONS.

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NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
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	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
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DRAWN BY: JK
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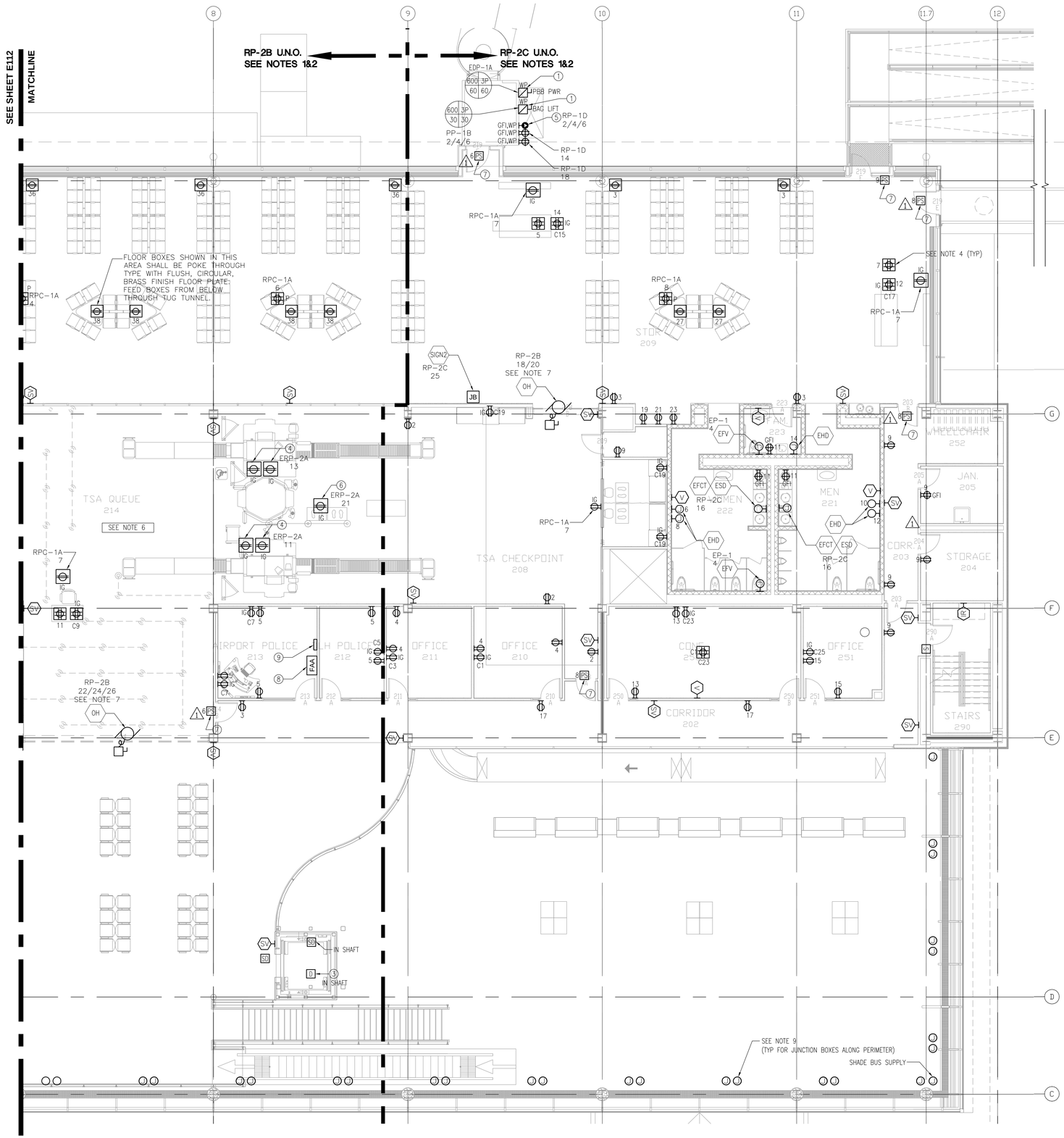
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SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E112

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2008_E112.dwg Plotted on: 8/17/2011 11:11 AM Plotted by: Tollyn, Ferld



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. NOT USED
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). CONTRACTOR SHALL ALSO WIRE ASSOCIATED PUSHBUTTONS SUPPLIED WITH GRILLES.
8. REFER TO "ET" SERIES DWGS FOR EXACT LOCATION AND MOUNTING DETAILS FOR FIDS. ADJUST POWER PROVISIONS ACCORDINGLY.
9. JUNCTION BOX FOR MECHOSHADE MOTORIZED SHADE, "WHISPER SHADE" SERIES – CONNECT SHADES TO PANEL "RP-2C". WORK ASSOCIATED WITH MOTORIZED SHADES IS AN ALTERNATE AND SHOULD BE PRICED SEPARATELY. SEE ARCHITECTURAL PLANS FOR FULL SHADE SPECIFICATION. INCLUDE WIRING FOR BUS SUPPLIES, MOTOR CONTROLLERS AND OTHER SHADE SYSTEM COMPONENTS – COORDINATE WITH MANUFACTURER FOR FULL REQUIREMENTS.

⚠1 10. NOT USED

11. PROVIDE QUAD RECEPTACLE FOR ASTRO BASE STATIONS LOCATED IN TELECOM EQUIPMENT ROOMS ON DEDICATED 20A/1P CIRCUIT. CONNECT TO "ERP" PANEL WITHIN SAME ROOM. LOCATION SHALL BE FIELD VERIFIED.

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". THERE SHALL BE NO MORE THAN 4 POWER SUPPLIES PER CIRCUIT.

⚠1 (8) REMOTE FIRE ALARM ANNUNCIATOR. SEE "ET" SERIES DRAWINGS FOR EXACT LOCATION.

⚠1 (9) REMOTE GENERATOR ANNUNCIATOR PANEL. SEE "ET" SERIES DRAWINGS FOR EXACT LOCATION.

N

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

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⚠1	BP2A ADDENDUM 2	2.25.11
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DRAWN BY: JK
DESIGNED BY: JK

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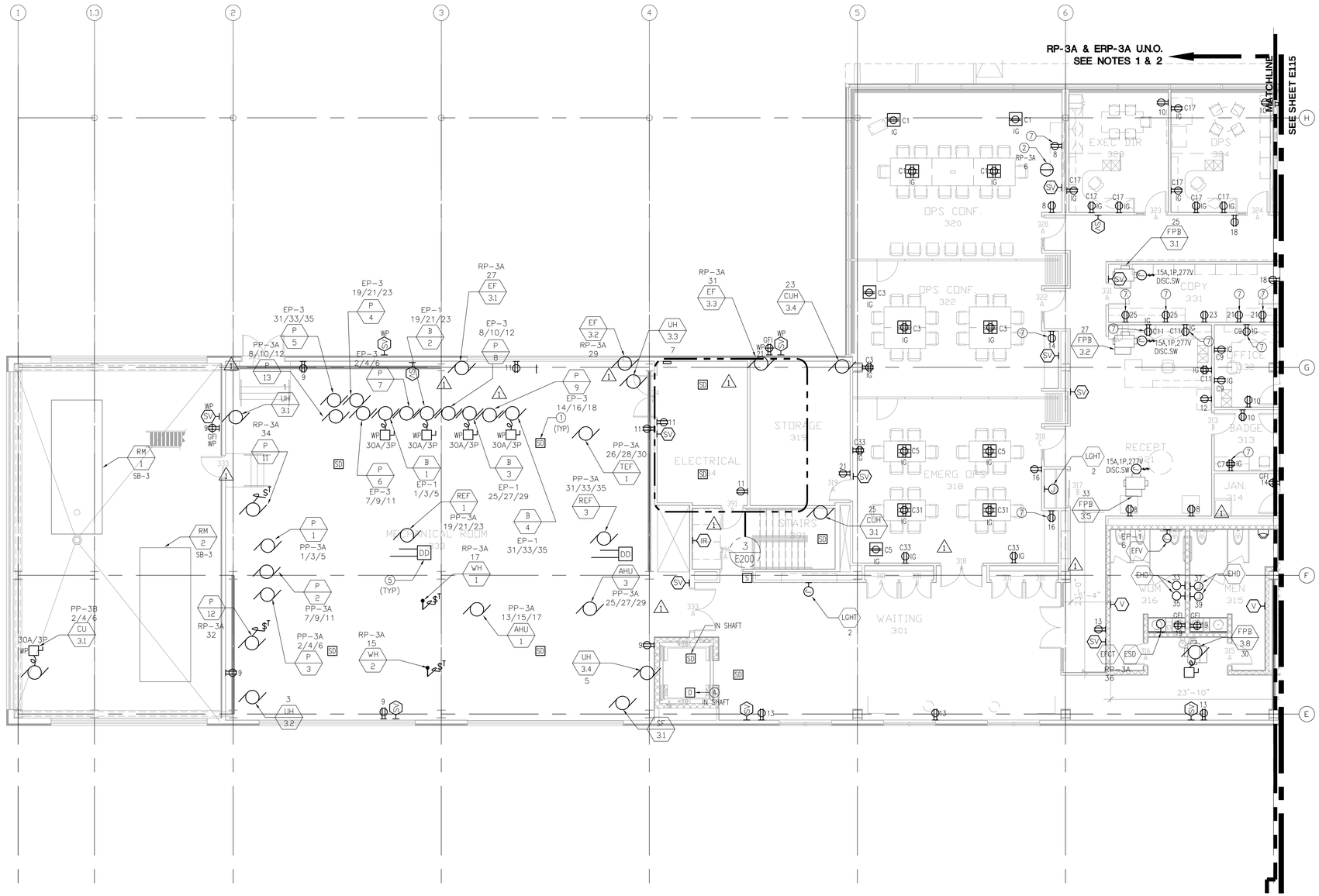
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SHEET TITLE
ENLARGED SECOND FLOOR ELECTRICAL PLAN AREA B

SHEET NUMBER
E113

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2008_E113.dwg Plotted on: 8/17/2011 11:13 AM Plotted by: Tolga, Ferid



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

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. SOME FLOORBOX RECEPTACLES CONTAIN DATA, SEE "ET" SERIES DRAWINGS FOR LOCATIONS.
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". THERE SHALL BE NO MORE THAN 4 POWER SUPPLIES PER CIRCUIT.
7. MOUNT RECEPTACLE ABOVE COUNTER.

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TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213-1882-091

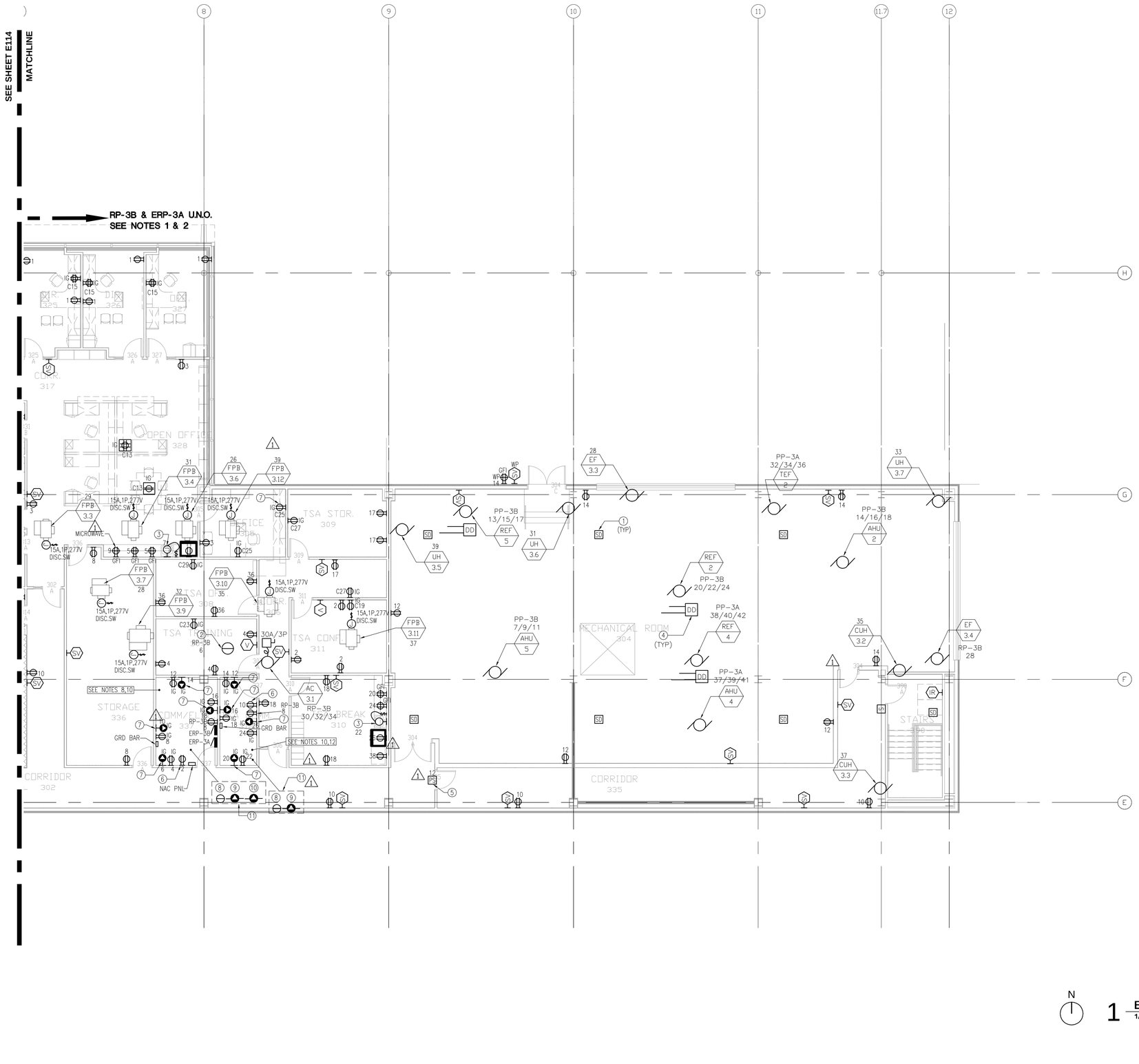
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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA A

SHEET NUMBER
E114

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2008_E114.dwg Plotted on: 8/17/2011 11:14 AM Plotted by: Tolpa, Ford



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. WALL MOUNTED RECEPTACLES IN COMM. RM 337 SHALL BE CONNECTED TO PNL "ERP-3A", U.N.O. CEILING MOUNTED RECEPTACLES SHALL BE CONNECTED TO PNL "ERP-3B".
9. SOME FLOORBOX RECEPTACLES CONTAIN DATA, SEE "ET" SERIES DRAWINGS FOR LOCATIONS.
10. COORDINATE LOCATIONS OF GROUND BAR, PANELBOARDS AND WALL MOUNTED RECEPTACLES WITH LOCATIONS OF TELECOM EQUIPMENT. PROVIDE CODE REQUIRED CLEARANCES FOR ELECTRICAL EQUIPMENT.
11. PROVIDE QUAD RECEPTACLE FOR ASTRO BASE STATIONS LOCATED IN TELECOM EQUIPMENT ROOMS ON DEDICATED 20A/1P CIRCUIT. CONNECT TO "ERP" PANEL WITHIN SAME ROOM. LOCATION SHALL BE FIELD VERIFIED.
12. RECEPTACLES IN TSA COMM. RM 312 SHALL BE CONNECTED TO PNL "ERP-3B", U.N.O. CONFIRM LOCATION, TYPE AND QUANTITY OF RECEPTACLES WITH OWNER AND COMPARE TO REQUIREMENTS SHOWN ON "ET" DRAWINGS.

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-10". THERE SHALL BE NO MORE THAN 4 POWER SUPPLIES PER CIRCUIT.

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

(7) 20A DUPLEX RECEPTACLE WITH TWISTLOCK, NEMA L5-20.

(8) PROVIDE DUPLEX CEILING MOUNTED RECEPTACLE ABOVE EACH RACK ON A DEDICATED CIRCUIT. SEE SHEET ET502 FOR RACK LOCATIONS.

(9) PROVIDE DUPLEX CEILING MOUNTED RECEPTACLE WITH TWISTLOCK, NEMA L5-20, ABOVE EACH RACK ON A DEDICATED CIRCUIT. SEE SHEET ET502 FOR RACK LOCATIONS.

(10) PROVIDE A 30A, 208V CEILING MOUNTED RECEPTACLE FOR EACH RACK MOUNTED UPS ON A DEDICATED CIRCUIT. SEE SHEET ET501 FOR INDICATION OF RACKS CONTAINING UPS EQUIPMENT AND SHEET ET502 FOR RACK LOCATIONS.

(11) INSTALL CEILING MOUNTED RECEPTACLES WITHIN 8'-0" OF BOTTOM OF RACK. SEE SHEET ET502 FOR RACK LOCATIONS.

N

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

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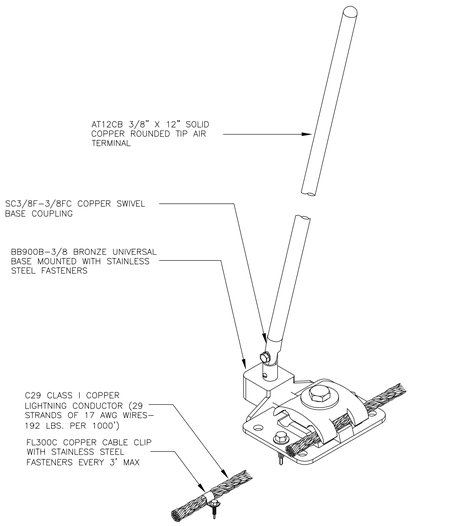
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SHEET TITLE
ENLARGED THIRD FLOOR ELECTRICAL PLAN AREA B

SHEET NUMBER
E115

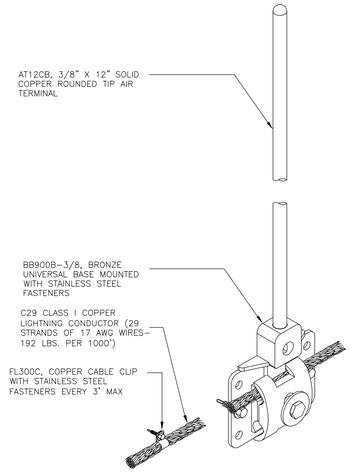
BID PACKAGE 2B
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Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1a) Electrical\Dwgs\2008_E115.dwg Plotted on: 8/17/2011 11:17 AM Plotted by: Tolga, Ferid



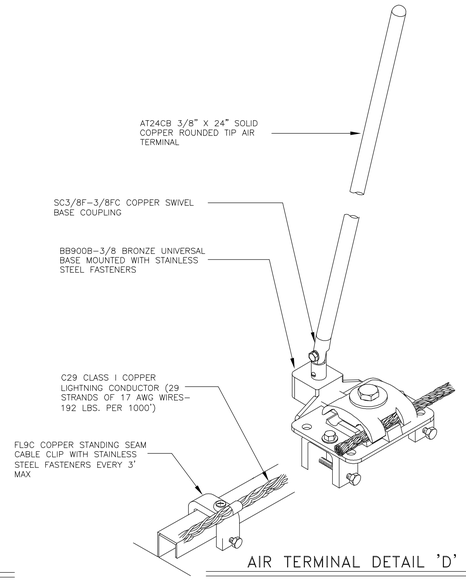
AIR TERMINAL DETAIL 'A'

NTS



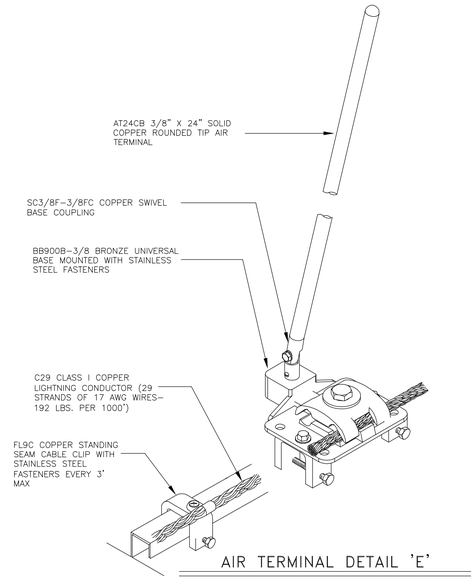
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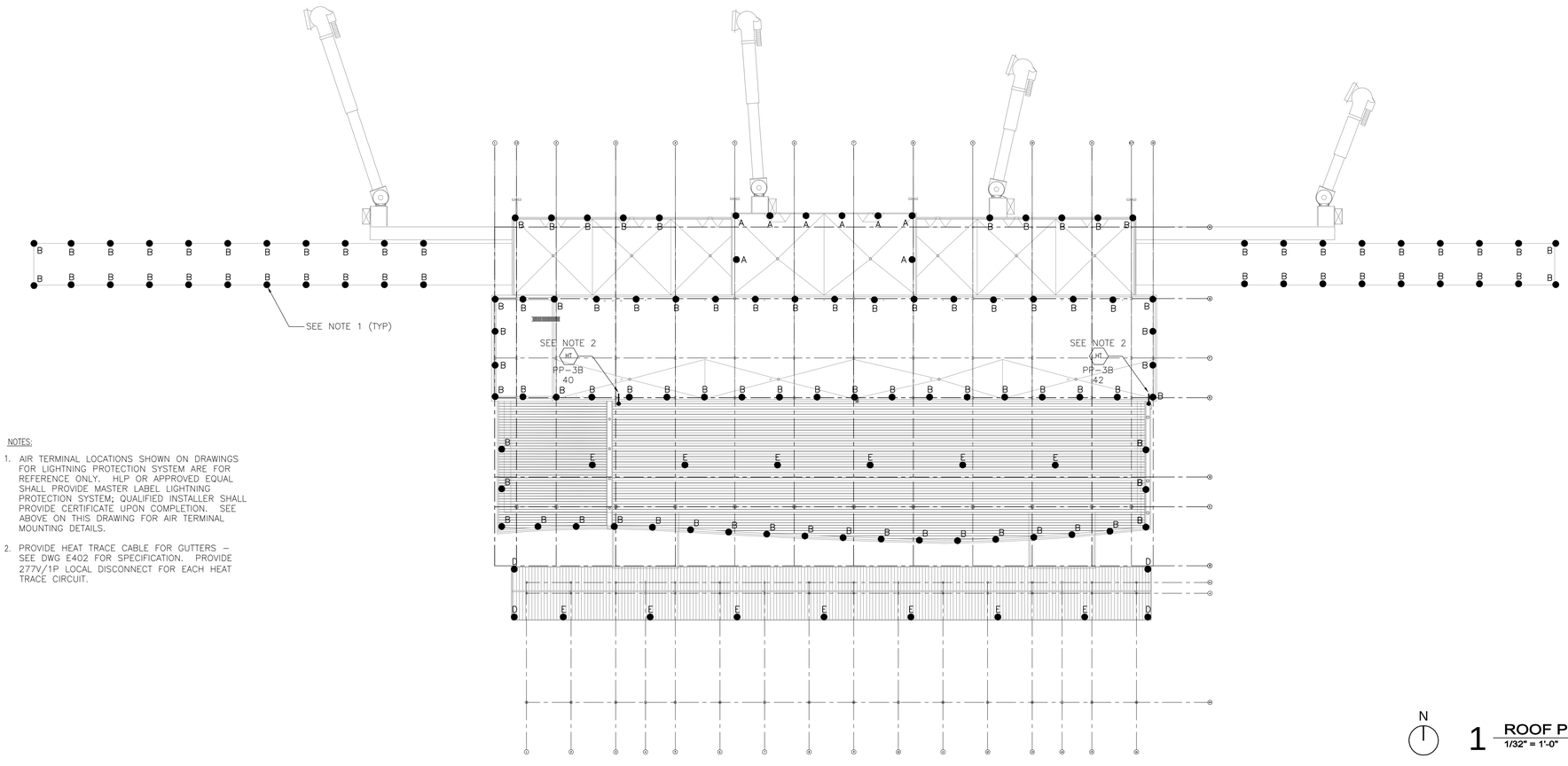
AIR TERMINAL DETAIL 'D'

NTS



AIR TERMINAL DETAIL 'E'

NTS



1 ROOF PLAN

1/32" = 1'-0"

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. SEE ABOVE ON THIS DRAWING FOR AIR TERMINAL MOUNTING DETAILS.

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

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DATE ISSUED: 08-23-11
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DESIGNED BY: JK

AEP PROJECT NUMBER
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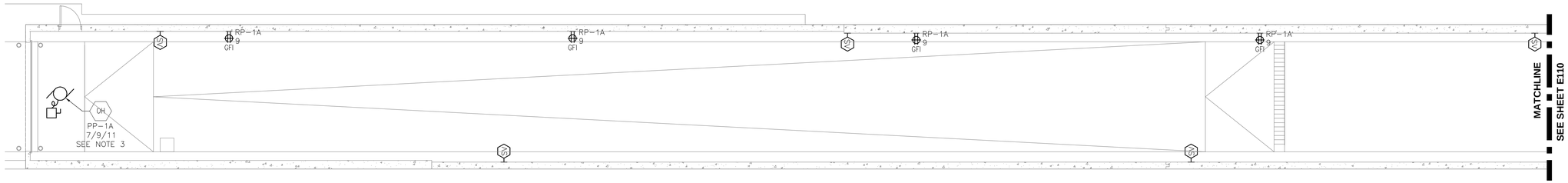
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SHEET TITLE
ELECTRICAL ROOF PLAN

SHEET NUMBER
E116

BID PACKAGE 2B
ISSUED FOR BID

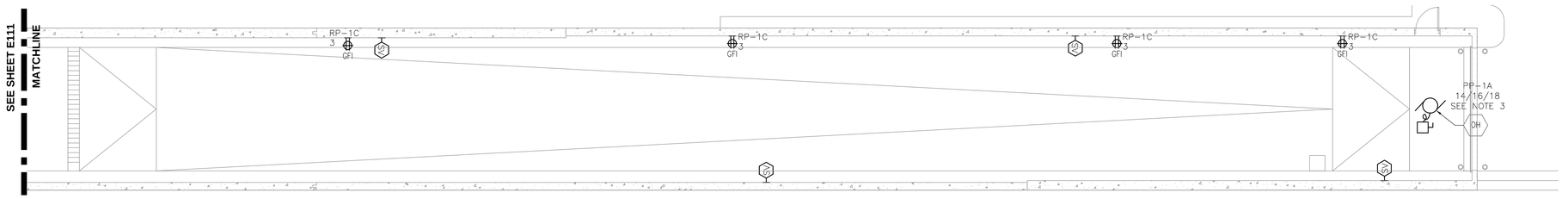
Drawing: I:\2038.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2038_E116.dwg Plotted on: 8/17/2011 11:18 AM Plotted by: Tolpo, Ferd



N

1 WEST RAMP - ELECTRICAL POWER PLAN

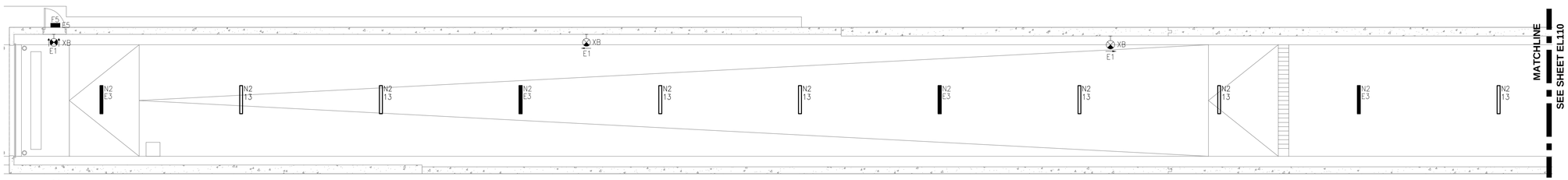
1/8" = 1'-0"



N

2 EAST RAMP - ELECTRICAL POWER PLAN

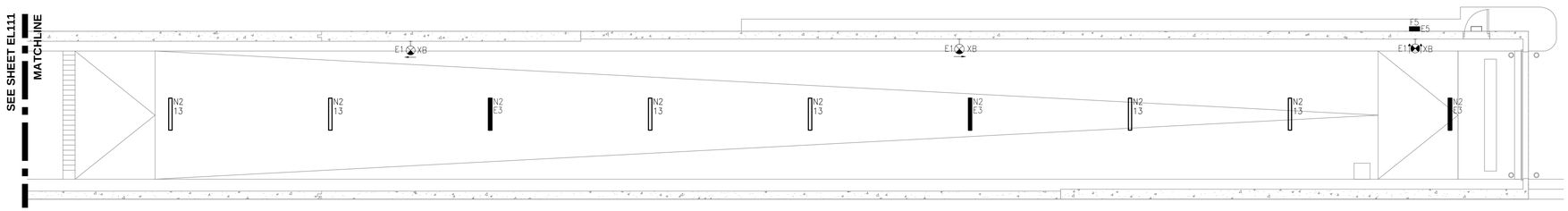
1/8" = 1'-0"



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).
4. LIGHT FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-1A". EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".

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DRAWN BY: JK
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AEP PROJECT NUMBER
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SHEET TITLE

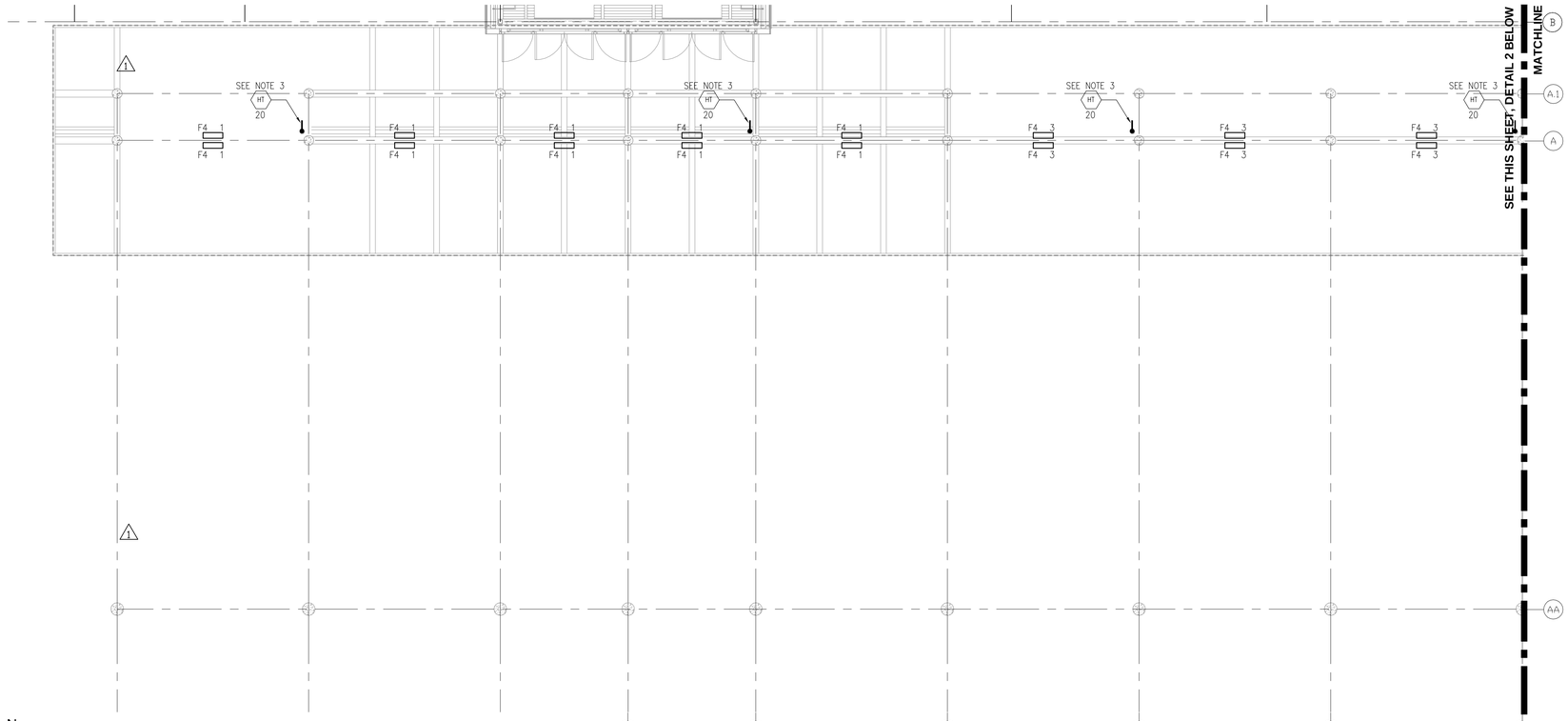
RAMP ELECTRICAL POWER AND LIGHTING PLAN

SHEET NUMBER

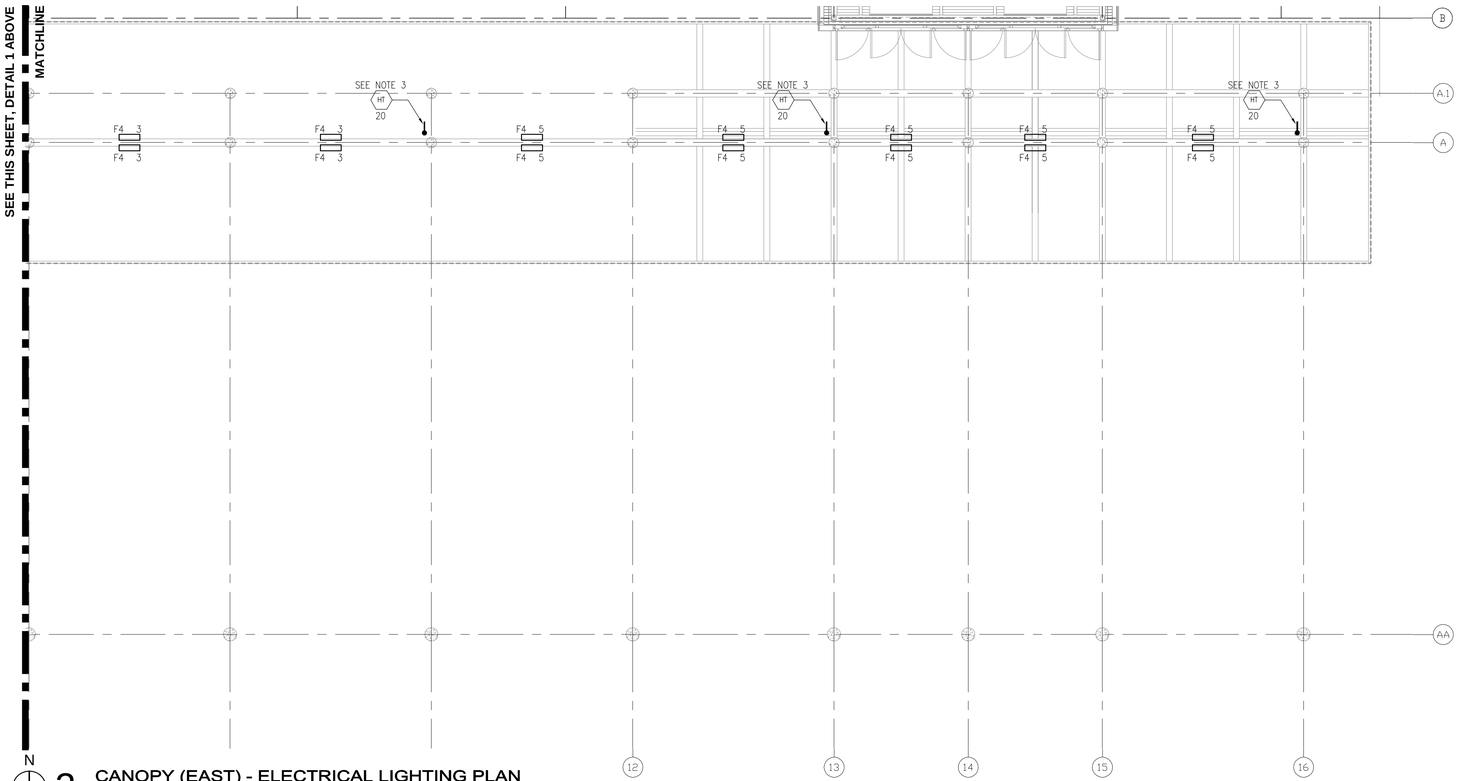
E117

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2088.00 Duluth Airport\8.0 CADD\(8.2a) Electrical\Dwgs\2088_E117.dwg Plotted on: 8/25/2011 3:20 PM Plotted by: Koehler, Jennifer



1 CANOPY (WEST) - ELECTRICAL LIGHTING PLAN
1/8" = 1'-0"



2 CANOPY (EAST) - ELECTRICAL LIGHTING PLAN
1/8" = 1'-0"

NOTES:

1. CANOPY LIGHTING FIXTURES ARE CONNECTED TO PANEL "LP-1A".
2. UTILIZE EXISTING EMPTY CONDUIT (INSTALLED IN UNDERGROUND PACKAGE) FOR CIRCUITRY ASSOCIATED WITH CANOPY LIGHTING.
1. PROVIDE HEAT TRACE CABLE IN CANOPY STORM PIPES – SEE DWG E402 FOR SPECIFICATION. PROVIDE 277V/1P LOCAL DISCONNECT FOR EACH HEAT TRACE CIRCUIT. CONNECT CIRCUITS TO PANEL "PP-1A".



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AEP PROJECT NUMBER
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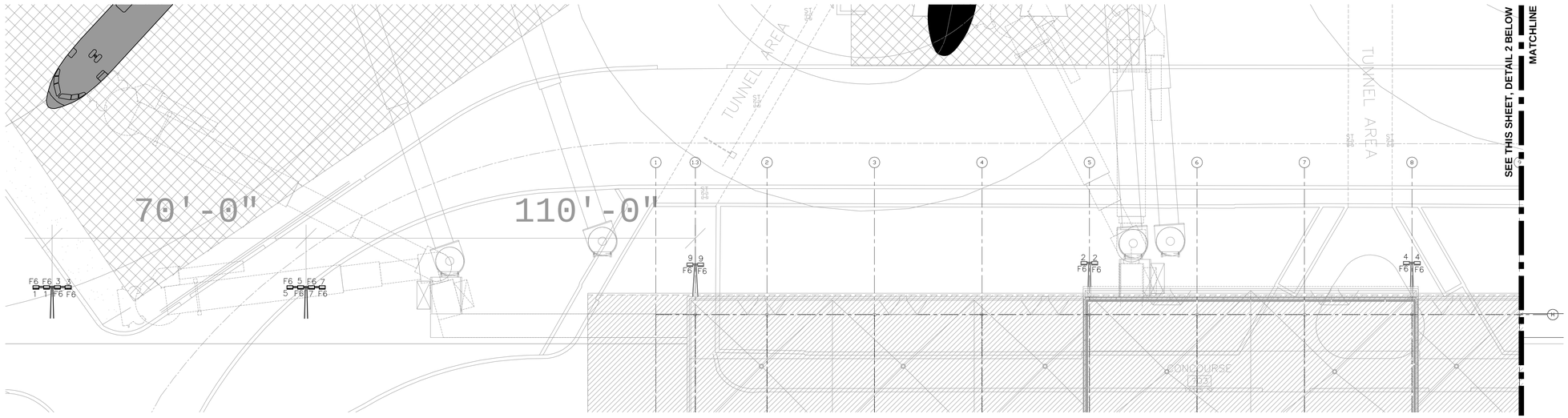
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SHEET TITLE
CANOPY
LIGHTING PLAN

SHEET NUMBER
E118

BID PACKAGE 2B
ISSUED FOR BID

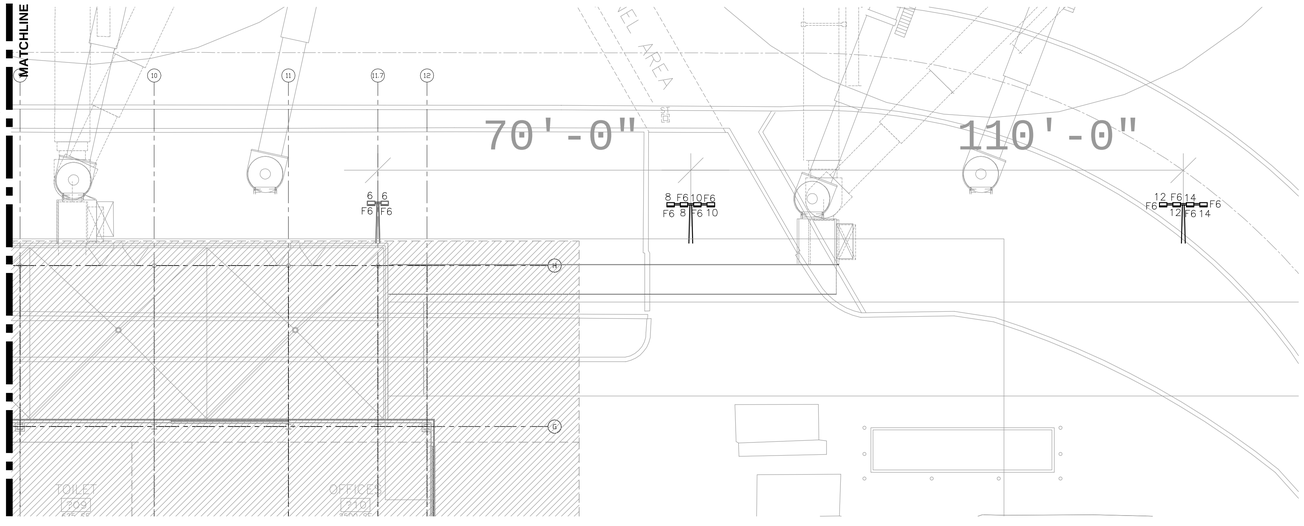
Drawing: I:\2088.00 Duluth Airport\8.0 CADD\[8.5] Electrical\Dwgs\2088_E118.dwg Plotted on: 8/17/2011 11:22 AM Plotted by: Tolpa, Field



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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SHEET TITLE

APRON LIGHTING PLAN

SHEET NUMBER

E119

BID PACKAGE 2B
ISSUED FOR BID

Drawing: H:\2588.00 Duluth Airport\8.0 CADD\(8.1a) Electrical\Dwgs\2588_E119.dwg Plotted on: 8/17/2011 11:24 AM Plotted by: Tolpa, Field

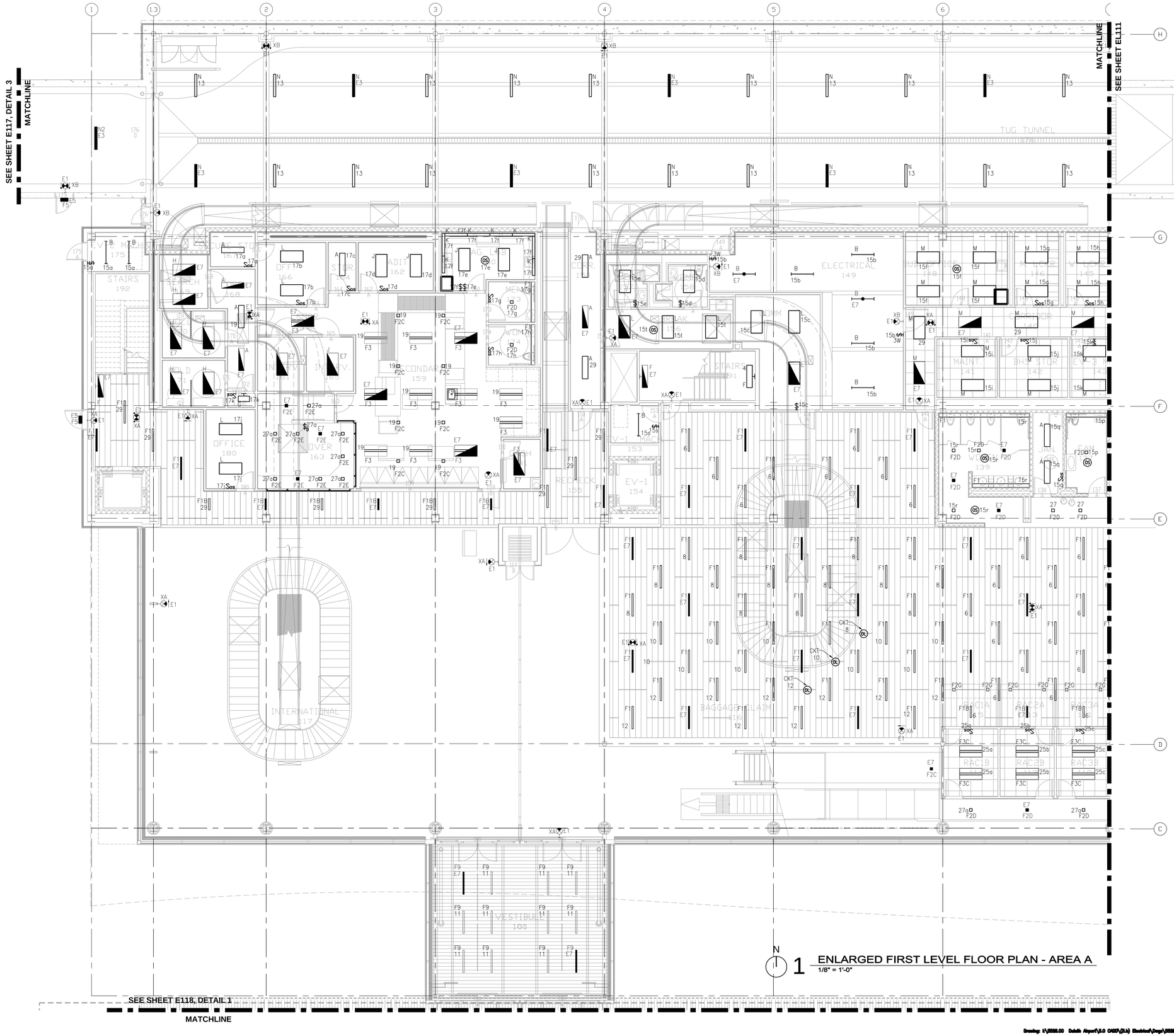
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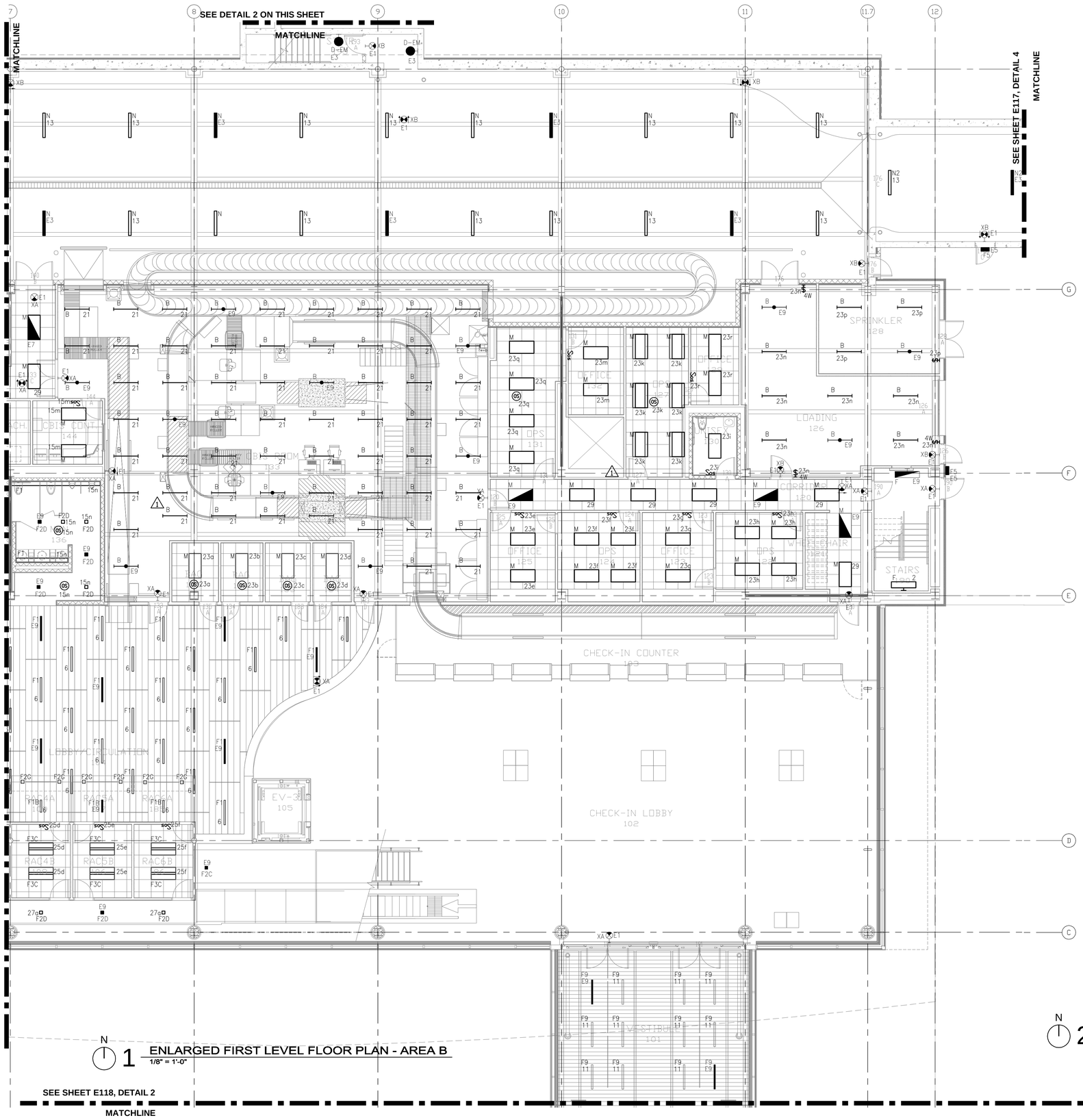
EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".

LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-1A".

EXTERIOR LIGHTING SHALL BE CONTROLLED BY PHOTOCELL.

LOCATIONS FOR DAYLIGHTING SENSORS ARE APPROXIMATE; LOCATE PER MANUFACTURER'S RECOMMENDATIONS.





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

2 ENLARGED FIRST LVL PARTIAL PLAN
1/8" = 1'-0"

NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-1A".
3. EXTERIOR LIGHTING SHALL BE CONTROLLED BY PHOTOCELL.
4. LOCATIONS FOR DAYLIGHTING SENSORS ARE APPROXIMATE; LOCATE PER MANUFACTURER'S RECOMMENDATIONS.

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1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
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DATE ISSUED: 08-23-11
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213-1882-091

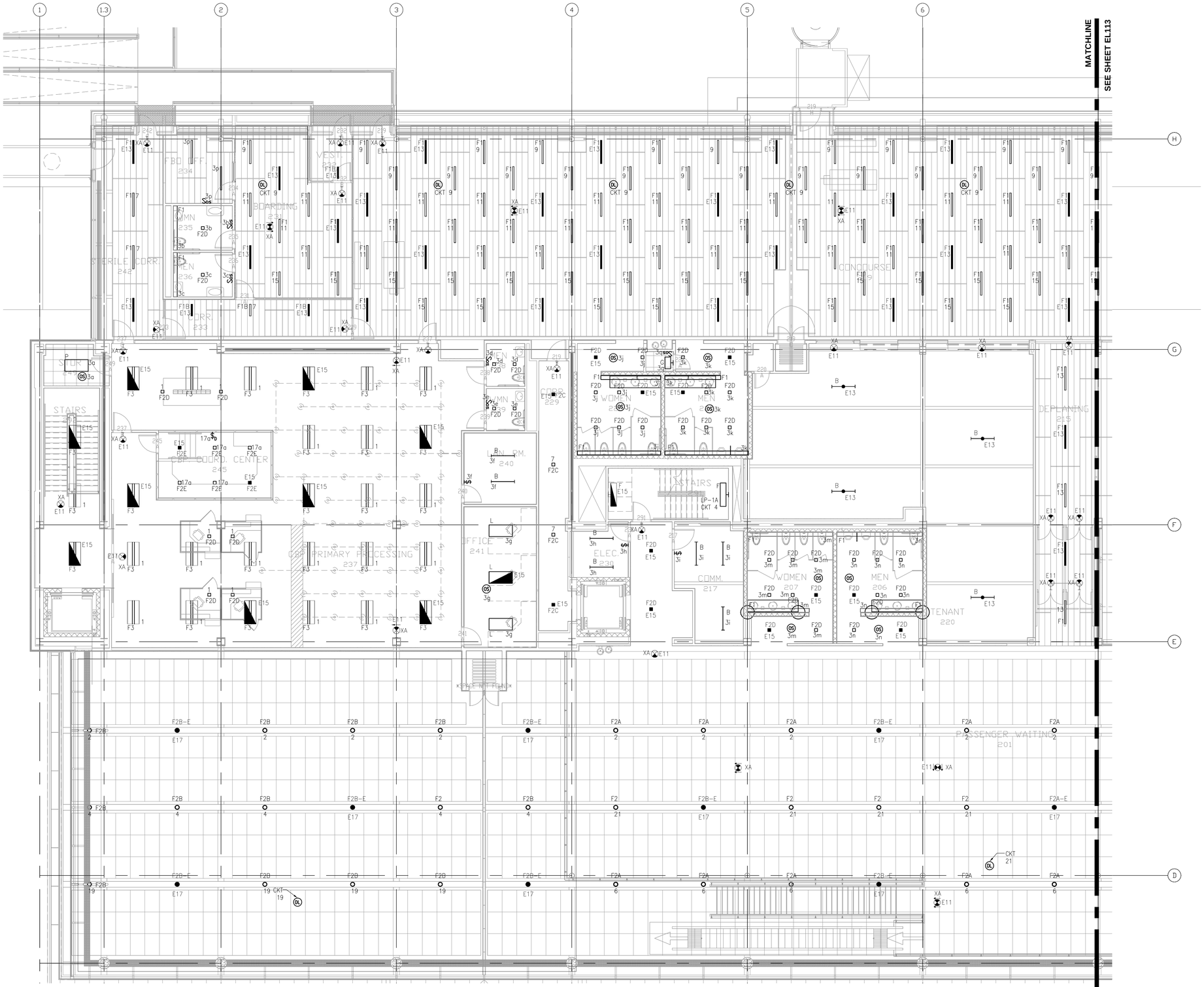
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SHEET TITLE
ENLARGED FIRST FLOOR LIGHTING PLAN AREA B

SHEET NUMBER
EL111

BID PACKAGE 2B
ISSUED FOR BID

Drawing: X:\2010.00 Duluth Airport\5.0 CADD\(5.5) Electrical\Dwgs\2010_EL111.dwg Plotted on: 8/25/2011 1:26 PM Plotted by: Kastler, Jennifer



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-2A" U.N.O.
3. LOCATIONS FOR DAYLIGHTING SENSORS ARE APPROXIMATE; LOCATE PER MANUFACTURER'S RECOMMENDATIONS.

N

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

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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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213-1882-091

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SHEET TITLE

ENLARGED SECOND FLOOR LIGHTING PLAN AREA A

SHEET NUMBER

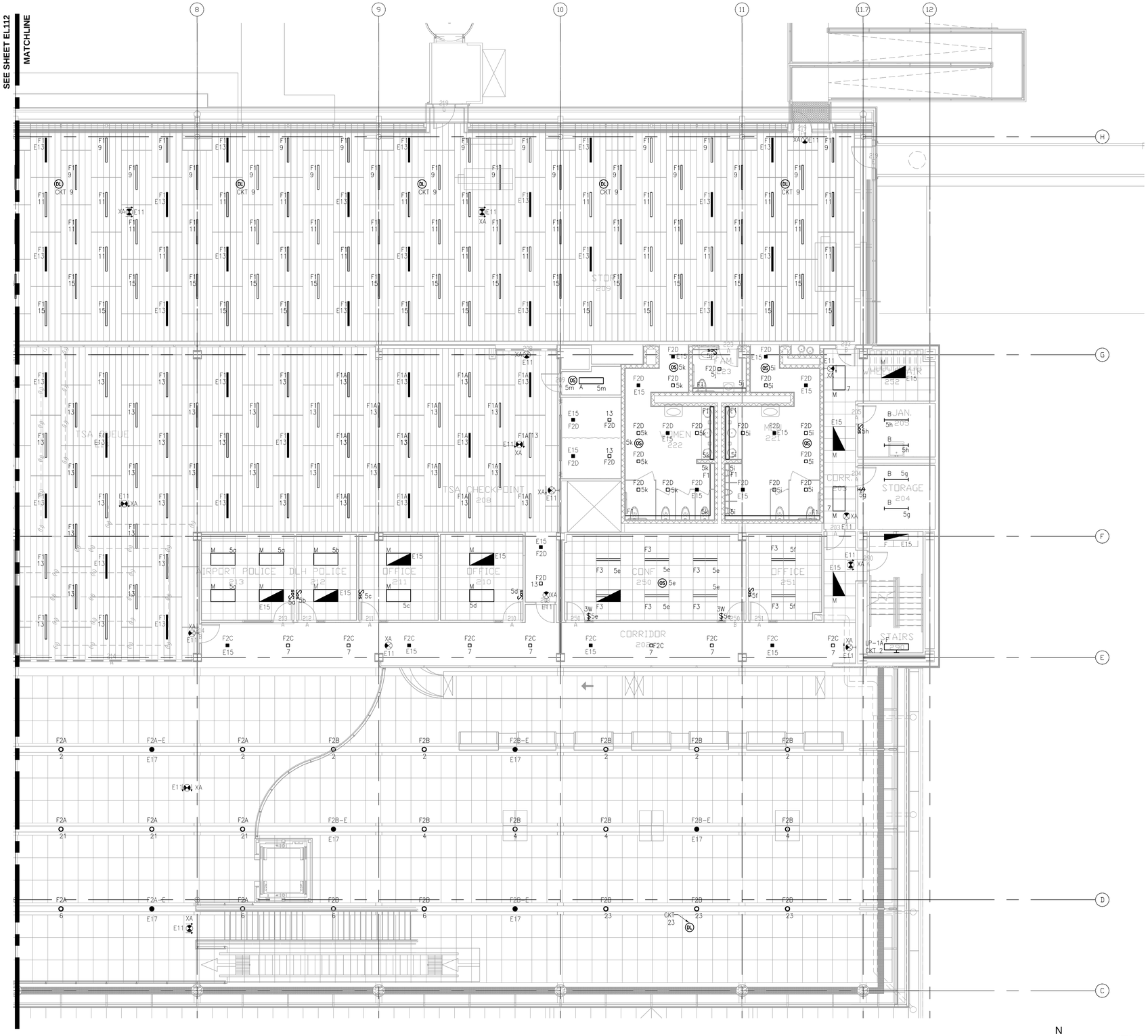
EL112

BID PACKAGE 2B
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Drawing: I:\2028.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2028_EL112.dwg Plotted on: 8/17/2011 12:48 PM Plotted by: Tolga, Ferid

SEE SHEET EL112

MATCHLINE



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-2A" U.N.O.
3. LOCATIONS FOR DAYLIGHTING SENSORS ARE APPROXIMATE; LOCATE PER MANUFACTURER'S RECOMMENDATIONS.

N

1 ENLARGED SECOND LEVEL FLOOR PLAN - AREA B

1/8" = 1'-0"

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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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DESIGNED BY: JK

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SHEET TITLE

ENLARGED SECOND FLOOR LIGHTING PLAN AREA B

SHEET NUMBER

EL113

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2528.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2528_EL113.dwg Plotted on: 8/17/2011 12:02 PM Plotted by: Tolpa, Ferd



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-2A" U.N.O.

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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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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SHEET TITLE
ENLARGED THIRD FLOOR LIGHTING PLAN AREA A

SHEET NUMBER
EL114

BID PACKAGE 2B
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Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.5) Electrical\Dwg\2008_EL114.dwg Plotted on: 8/17/2011 12:54 PM Plotted by: Tallyn, Ferd



NOTES:

1. EMERGENCY LIGHTING FIXTURES AND EXIT SIGNS ARE CONNECTED TO PANEL "EMLP-1A".
2. LIGHTING FIXTURES ON NORMAL POWER ARE CONNECTED TO PANEL "LP-2A" U.N.O.

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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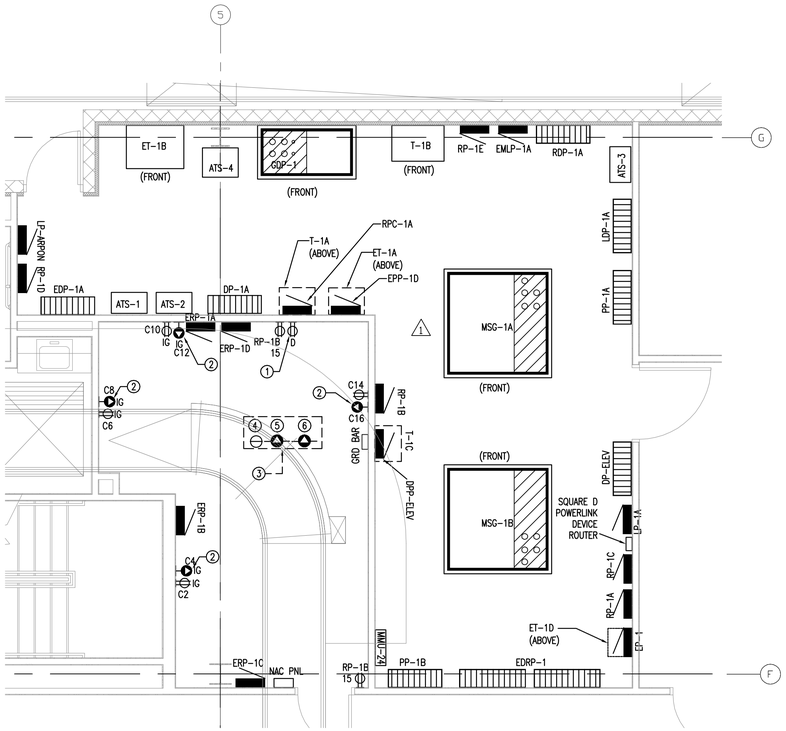
ENLARGED THIRD FLOOR LIGHTING PLAN AREA B

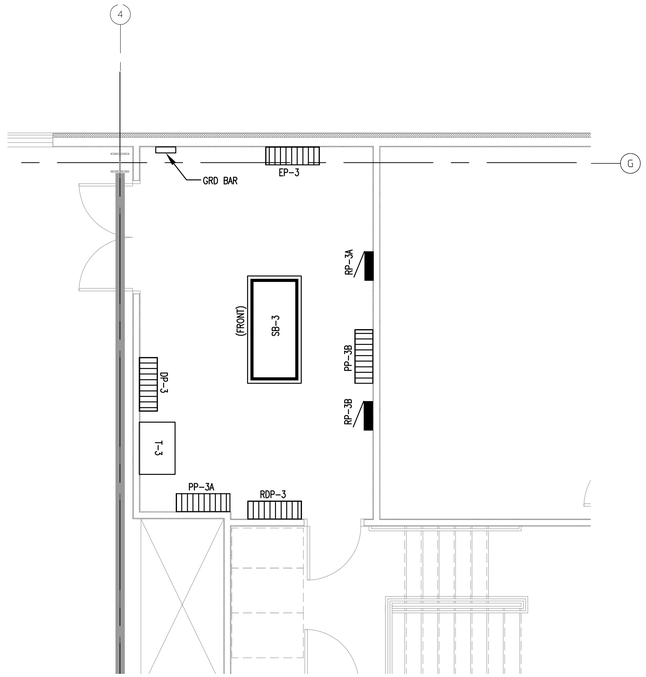
SHEET NUMBER

EL115

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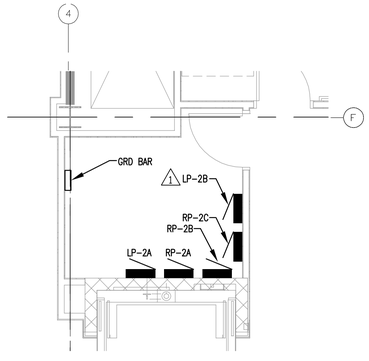
Drawing: K:\2028.00 Duluth Airport\8.0 CADD\(8.1) Electrical\Dwgs\2028_EL115.dwg Plotted on: 8/17/2011 12:08 PM Plotted by: Tolga, Ferid





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"

1

NOTES COMM RM 151 IN DETAIL 1:

1. COORDINATE LOCATIONS OF GROUND BAR, PANELBOARDS AND WALL MOUNTED RECEPTACLES WITH LOCATIONS OF TELECOM EQUIPMENT. PROVIDE CODE REQUIRED CLEARANCES FOR ELECTRICAL EQUIPMENT.
2. COMPUTER RECEPTACLES SHALL BE IG TYPE (ISOLATED GROUND) AND ON A DEDICATED CIRCUIT, CONNECTED TO "ERP" PANELS AS INDICATED ON THIS SHEET U.N.O. CIRCUIT NUMBERS ARE DESIGNATED WITH PREFIX "C".
3. WALL MOUNTED COMPUTER RECEPTACLES SHALL BE CONNECTED TO PANEL "ERP-1B".
4. PROVIDE QUAD RECEPTACLE FOR ASTRO BASE STATION ON DEDICATED 20A/1P CIRCUIT. CONNECT TO "ERP" PANEL WITHIN SAME ROOM. LOCATION SHALL BE FIELD VERIFIED.

KEYED NOTES FOR COMM RM 151 IN DETAIL 1:

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

(2) 20A DUPLEX RECEPTACLE WITH TWISTLOCK, NEMA L5-20. CONNECT TO PANEL "ERP-1B".

(3) INSTALL CEILING MOUNTED RECEPTACLES WITHIN 8'-0" OF BOTTOM OF RACK. SEE SHEET ET502 FOR RACK LOCATIONS.

(4) PROVIDE DUPLEX CEILING MOUNTED RECEPTACLE ABOVE EACH RACK ON A DEDICATED CIRCUIT FROM PANEL "ERP-1B". SEE SHEET ET502 FOR RACK LOCATIONS.

(5) PROVIDE DUPLEX CEILING MOUNTED RECEPTACLE WITH TWISTLOCK, NEMA L5-20, ABOVE EACH RACK ON A DEDICATED CIRCUIT FROM PANEL "ERP-1D". SEE SHEET ET502 FOR RACK LOCATIONS.

(6) PROVIDE A 30A, 208V CEILING MOUNTED RECEPTACLE FOR EACH RACK MOUNTED UPS ON A DEDICATED CIRCUIT FROM PANEL "ERP-1D". SEE SHEET ET501 FOR INDICATION OF RACKS CONTAINING UPS EQUIPMENT AND SHEET ET502 FOR RACK LOCATIONS.

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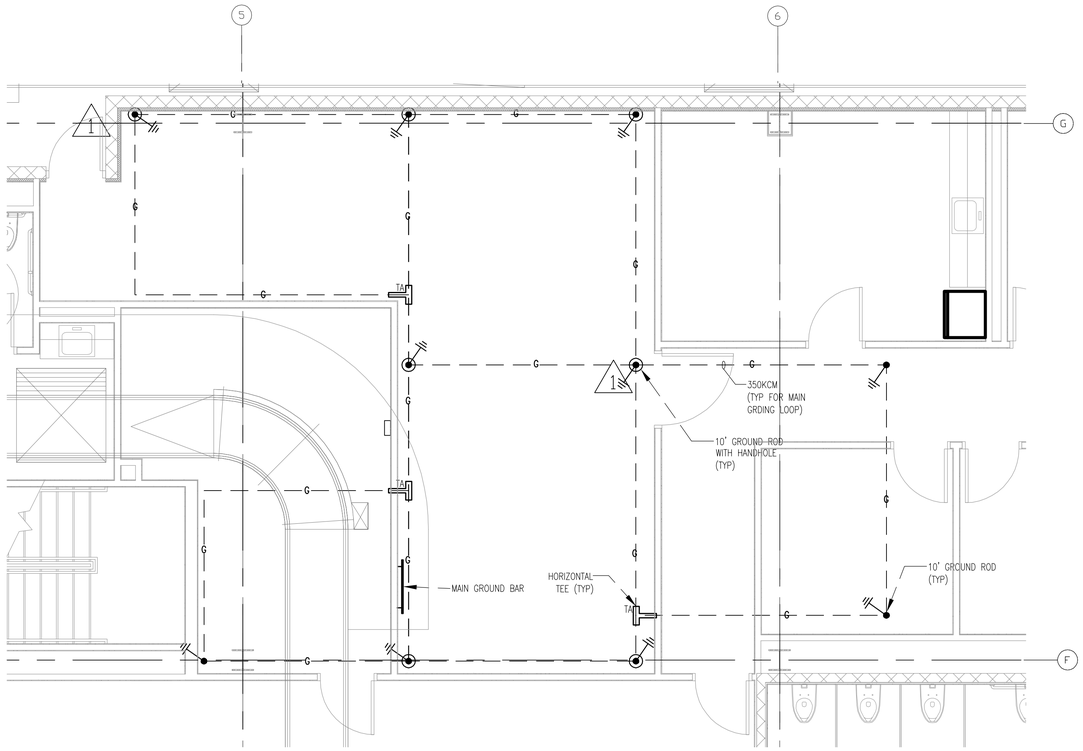
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SHEET TITLE
ENLARGED EQUIPMENT ROOMS

SHEET NUMBER
E200

BID PACKAGE 2B
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Drawing: I:\2010\10.09 Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2010_E200.dwg Plotted on: 8/17/2011 11:39 AM Plotted by: Tolpa, Ferd



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	TELEPHONE RM 151 ISOL. GRD BAR	#6
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	#6
14	MAIN GROUND BAR	2ND FLR COMP. RM 240 ISOL. GRD BAR	#6
15	MAIN GROUND BAR	2ND FLR TELECOM RM 204 ISOL. GRD BAR	#6
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	#6
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.
3. SEE UNDERGROUND PACKAGE TO COORDINATE EXISTING AND NEW WORK.
4. TELECOMMUNICATIONS GROUNDING BUSBARS SHALL BE NEWTON PART FIG. 3058 INSULATED GROUND BAR, 1/4"X4"X10" OR EQUIVALENT. (1)

(1)

(1)

(1)

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	BID PACKAGE 2B	8.23.11

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DRAWN BY: JK
DESIGNED BY: JK

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SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
E201

BID PACKAGE 2B
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Drawing: I:\2882.00 Duluth Airport\5.0 CADD\(5.1c) Electrical\Dwgs\2882_E201.dwg Plotted on: 8/17/2011 11:27 AM Plotted by: Tolpa, Ferd

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.
3. EMPTY CONDUIT WAS PROVIDED FOR FEEDER TAGS WITH THIS NOTE ADJACENT TO IT AS PART OF UNDERGROUND PACKAGE 1.
4. PROVIDE POWER WHERE REQUIRED PER "ET" SERIES DRAWINGS AND ASSOCIATED SPECIFICATIONS FOR TELECOM, SECURITY, AV DEVICES AND SIGNAGE. NOTE THAT 25% SPARE QUANTITY OF CIRCUIT BREAKERS SHALL BE PROVIDED IN PANELBOARDS. AN ADDITIONAL PANELBOARD SHALL BE PROVIDED IF BRANCH CIRCUIT QUANTITY EXCEEDS THIS AMOUNT WITH PANELS SHOWN IN RISER BELOW.
5. GENERATOR ENCLOSURE SHOULD BE PROVIDED IN ACCORDANCE WITH STATE OF MINNESOTA REQUIREMENTS, INCLUDING "INDUSTRIALIZED MODULAR BUILDING BULLETIN #38"; THIS STATES ENCLOSURE REQUIRES IMBC (INDUSTRIALIZED MODULAR BUILDING COMMISSION) CERTIFICATION LABEL AND REQUIREMENTS FOR H-3 TYPE OCCUPANCIES AS DEFINED IN INTERNATIONAL BUILDING CODE 2006. REFER TO CIVIL DRAWING FOR LOCATION OF GENERATOR.

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 WHERE INDICATED ON PANEL SCHEDULES AND ARE CONTROLLED BY THE BAS (BUILDING AUTOMATION SYSTEM) – COORDINATE WITH BAS CONTRACTOR.

   PANELS SHOWN ON RISER WITH "M" INSIDE THEM ARE SQUARE D POWERLINK G3 MASTER PANELS (INCLUDE CONTROLLER). PANELS SHOWN WITH "S" INSIDE OF THEM ARE SQUARE D POWERLINK G3 SLAVE PANELS. SEE SPECIFICATION SECTION 16146 FOR ADDITIONAL REQUIREMENTS AND INFORMATION.
4. SQUARE D POWERLINK DEVICE ROUTER. LOCATE ROUTER WITHIN 50 FT OF MASTER PANEL. RS232 CABLE CONNECTION BETWEEN MASTER PANEL AND ROUTER IS PROVIDED BY SQUARE D.
5. CONTROL WIRE IN BETWEEN SQUARE D MASTER PANEL AND SLAVE PANELS SHALL BE 4-WIRE, CLASS 1 COMMUNICATIONS CABLE (BELDEN 27326 OR EQUIVALENT).

TABLE 3

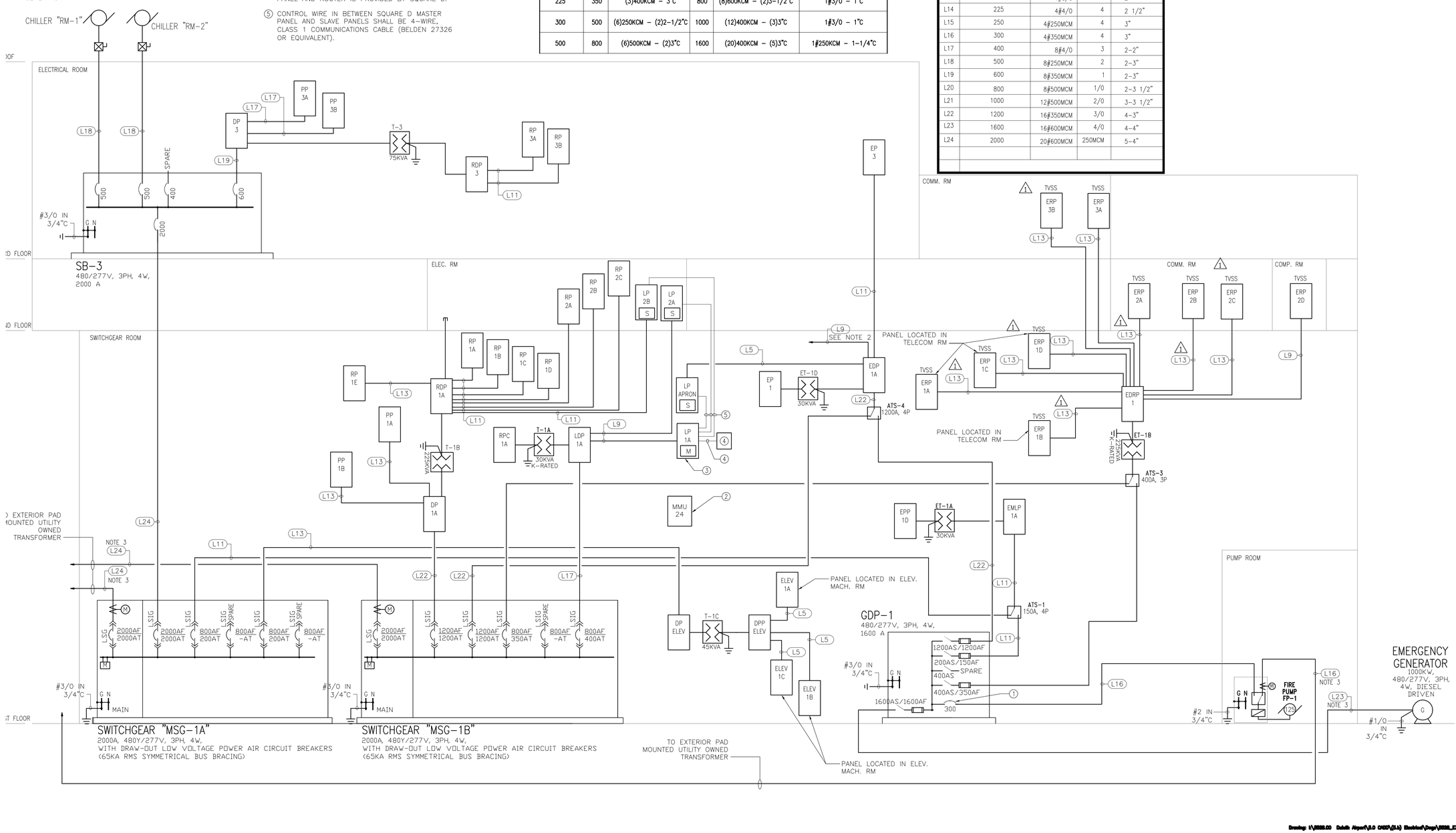
TRANSFORMER SCHEDULE

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

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

1 NOTE: PROVIDE 200% NEUTRAL FOR "ERP" PANELS

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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NEW PASSENGER TERMINAL

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CAD\(5.1a) Electrical\Dwgs\2008_E300.dwg Plotted on: 8/17/2011 11:28 AM Plotted by: Tolpa, Ferd

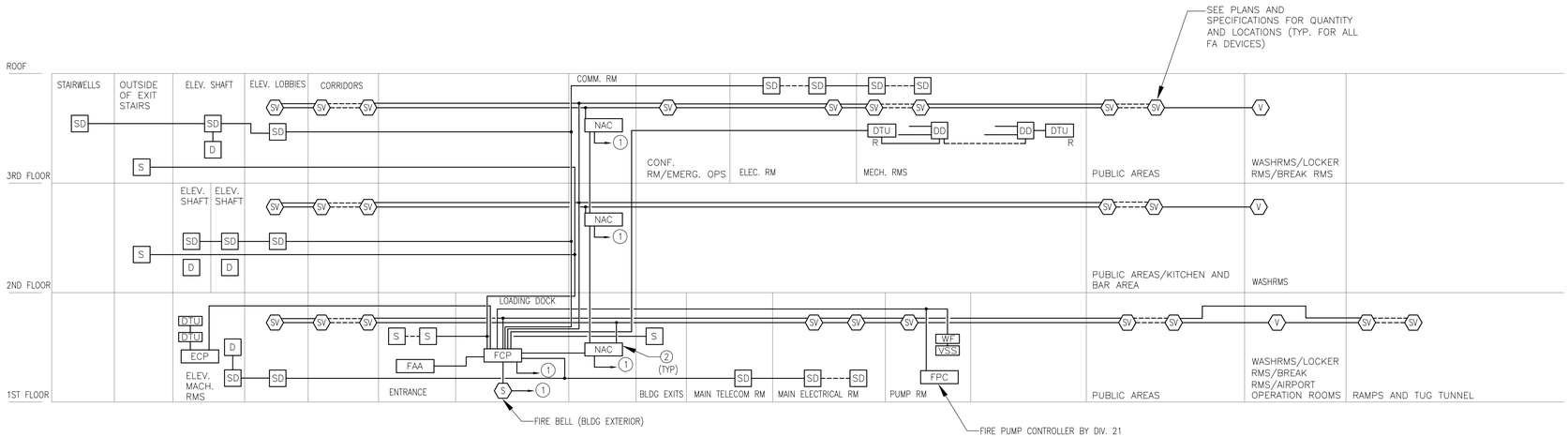
FA GENERAL NOTES:

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.
5. INTERFACE EIBS (ELECTRONIC INTERFACE BOXES) ASSOCIATED WITH ACCESS CONTROL SYSTEM WITH FIRE ALARM SYSTEM WHERE REQUIRED. SEE "ET" SERIES DRAWINGS FOR ADDITIONAL INFORMATION.

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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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

BID PACKAGE 2B
ISSUED FOR BID

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ABBREVIATIONS

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

A	-	AMPS
AC	-	ALTERNATING CURRENT
ADJ	-	ADJACENT
AFD	-	AUTOMATIC FIRE DETECTION
AFF	-	ABOVE FINISHED FLOOR
AFG	-	ABOVE FINISHED GRADE
AIR COND	-	AIR CONDITIONING
AP	-	APPLIANCE PANEL
ARCH	-	ARCHITECTURAL
ASYM	-	ASYMMETRICAL
AUTO	-	AUTOMATIC
AVG	-	AVERAGE
BL	-	BLANK
BLDG	-	BUILDING
C	-	CONDUIT
CAB	-	CAB
CAT	-	CATALOGUE
CKT	-	CIRCUIT
CL	-	CLOCK
CLG	-	CEILING
CLOS	-	CLOSET
CM	-	CIRCULAR MIL
COL	-	COLUMN
CONC	-	CONCRETE
CONST	-	CONSTRUCTION
CONT	-	CONTINUOUS
CONV	-	CONVENIENCE
CS	-	CABLE SUPPORT
CU	-	CUBIC
DC	-	DIRECT CURRENT
DIA	-	DIAMETER
DN	-	DOWN
DP	-	DISTRIBUTION PANEL
DTL	-	DETAIL
DWG	-	DRAWING
EA	-	EAST
EC	-	EMPTY CONDUIT
EIB	-	ELECTRONIC INTERFACE BOX
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
NAC	-	NOTIFICATION APPLIANCE CIRCUIT PANEL
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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	BID PACKAGE 2B	8.23.11
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	BP2A CONFORMANCE SET	5.02.11
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DRAWN BY: JK
DESIGNED BY: JK

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SHEET TITLE
ELECTRICAL ABBREVIATIONS AND TABLES

SHEET NUMBER
E400

BID PACKAGE 2B
ISSUED FOR BID

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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
B2		SIMILAR TO FIXTURE "B" EXCEPT 120V	LITHONIA CLM–232–120–GEB10IS OR APPROVED EQUAL BY COLUMBIA OR LIGHTOLIER	2	32W T8	60	120	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 (48") N2S–25–277–GEB101S (36") OR APPROVED EQUAL BY LIGHTOLIER OR LITHONIA	1	32W T8	30	277	S	LENGTH AS SHOWN ON PLANS
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	
M2		SAME AS FIXTURE "M" BUT 120V.	LITHONIA 2ES8P–A–232–120–BILP OR APPROVED EQUAL BY COLUMBIA OR LIGHTOLIER	2	32W T8	48	120	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 FOR LIGHTING FIXTURE SCHEDULES

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.
6. CONTRACTOR TO COORDINATE MOUNTING PROVISIONS FOR FIXTURES WITH CEILING TYPE.
7. TV CAMERA LIGHTS ARE TO BE RELOCATED FROM EXISTING TERMINAL TO NEW TERMINAL TO LOCATION AS SHOWN ON PLANS. PROVIDE 120–277V STEP UP TRANSFORMER IF EXISTING LIGHT FIXTURES ARE 120V.
8. PROVIDE CEILING MOUNTED DAYLIGHT SENSORS WITH ASSOCIATED LOW VOLTAGE POWER SUPPLYS TO CONTROL FIXTURES WHERE INDICATED ON DRAWINGS EL110, EL112 AND EL113.

Duluth New Terminal

Lighting Schedule

Type	Description	Mounting	Lamp Qty	Lamp Type	Total Fixture VA	Volts	Manufacturer	Model/Series Number
F1	Low Profile linear fluorescent 4' architectural strip fixture with integral ballast. Provide length as required for fixtures shown in restrooms.	Suspended/Recessed/Cove	1	F28T5	Approx. 9VA/LF	277	Bartco Lighting	MiT5-1T/28-28W-277
F1A	Low Profile linear fluorescent 4' architectural strip fixture with integral ballast	Suspended/Recessed	1	F54T5HO	60	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	35	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	20	277	Bartco Lighting	MiT5-1T/14-14W -277
F2	Suspended Cylinder, two level metal halide, Down light. See note 8 on this drawing.	Suspended	1	50W MH	60	277	Kirlin Lighting	HSR-09095-50
F2A	Suspended Cylinder, two level metal halide, Down light. See note 8 on this drawing.	Suspended	1	70W MH	80	277	Kirlin Lighting	HSR-09095-70
F2C	Open Appearance square can light 6"X6"	Recessed	2	42W CFL	100	277	Kirlin Lighting	FRT-04092-77
F2D	Open Appearance square can light 6" X 6"	Recessed	1	42W CFL	50	277	Kirlin Lighting	FRS-06088-77
F2B	Suspended Cylinder, two level metal halide, Down light. See note 8 on this drawing.	Suspended	1	175W MH	215	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" with dimming ballast	Recessed	1	42W CFL	50	277	Kirlin Lighting	FRS-06088-39-77
F2F	Wall washer square can light 6" X 6"	Recessed	1	42W CFL	50	277	Kurt Versen Kirlin Lighting	H8653FM-SY FRS-06096-77
F2G	Open Appearance square can light 6" X 6"	Recessed	1	32W CFL	35	277	Kirlin Lighting	FRS-04087-57
F3	Direct/indirect lay-in 2'x4' architectural lighting fixture.	Recessed	3	F28T5	100	277	Mark Arcitectural Lighting	MDLS 24 DF 3T5 EB
F3C	Direct/indirect lay-in 2'x4' architectural lighting fixture.	Recessed	2	F28T5	70	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	60	277	Focal Point	FBX 24 W 2 T5 E 277 PS WH
F4	Pendant, Indirect canopy lighting	Pendent	1	150W MH	190	277	Elliptipar	M154-150C
F5	Wall mounted security metal halide fixture	Surface	1	70W MH	80	277	Lithonia Lighting	WST 70M MD277 QRS
F6	Pole mounted metal halide fixture, pole mounted 60' AFG	Pole mounted. Millerbernd Pole Model #UWLA 600, base "A", prime paint finish, type 2 brackets for poles attached to building and type 4R for the poles located at the apron. For building attached poles, contractor shall coordinate with architectural and structural drawings for special attachment.	1	1000W MH	1100	277	Sterner Infranor	876-1000MH-277V
F7	Halogen TV Camera lights		1	750W HAL.	750	277	Lowel	"Tota", See note 7 on this sheet
F8	Similar to fixture "F1" except 120V	Suspended	1	F28T5	35	120	Bartco Lighting	MiT5-1T/28-28W-120
F9	4' Fluorscent fixture with acrylic diffuser		1	F28T5	35	277	Delray Lighting	ST54128.421

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DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
⚠	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE
LIGHTING FIXTURE SCHEDULE

SHEET NUMBER
E401

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.1s) Electrical\Dwgs\2008_E401.dwg Plotted on: 8/17/2011 12:33 PM Plotted by: Tolga, Ferid

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 OR GRILLE			–			–	–	–	33, 9, 13, 58, 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	
SIGN1	LED LLUMINATED SIGN						120			59	PROVIDE (1) DEDICATED 20A CIRCUIT
RES	POWER REQUIREMENTS FOR ADVERTISING IN RESERVATION CENTER						120			60	PROVIDE (1) DEDICATED 20A CIRCUIT
SIGN2	EDGELITE ILLUMINATED SIGN	1.2					120			60	PROVIDE (1) DEDICATED 20A CIRCUIT
LGHT	LIGHT WITHIN RECESSED DISPLAY CASE						120			61	

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.
59. PROVIDE FLUSH TYPE ELECTRIC FLOOR OUTLET WITH BOX AND COVER. PROVIDE MILLWORK FEED CONDUIT AS REQUIRED FOR ELECTRIC, DATA AND/OR TELEPHONE. COORDINATE WITH MANUFACTURER FOR REQUIREMENTS AND LOCATION OF POWER CONNECTION.
60. PROVIDE ELECTRIC JUNCTION BOX TO DESIGNATED AREA, CONCEAL WITHIN CEILING FOR FUTURE USE AND CAP UNTIL NEEDED. MARK BOX AS "CGA USE ONLY". COORDINATE WITH MANUFACTURER FOR REQUIREMENTS AND LOCATION OF POWER CONNECTION.
61. CONFIRM POWER REQUIREMENTS AND POWER CONNECTION TYPE WITH MANUFACTURER OF DISPLAY CASE/LIGHT INCLUDING EXACT LOCATION OF POWER CONNECTION.

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.1s) Electrical\Dwgs\2008_E402.dwg Plotted on: 8/17/2011 12:34 PM Plotted by: Tolga, Ferit

SWGR DISTRIBUTION: MSG-1A W/TVSS

SERVICE: 480/277V, 3PH, 4W + GND
BUS SIZE: 2000A
MAIN DEVICE: 2000A
LOAD: CONN 1146.0 kVA; DEM. 1146.0 kVA; DEM. 1379.1 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEM.	CB AF	AT	REMARKS
1	SWITCHBOARD "SB-3"	1024.0	1024.0	2000	2000	
2	"ATS-1" (EM LTG)	23.0	23.0	800	150	
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
MAIN DEVICE: 2000A
LOAD: CONN 1221.0 kVA; DEM. 1213.0 kVA; DEM. 1459.7 Amps 1

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEM.	CB AF	AT	REMARKS
1	PNL "DP-1A"	373.0	365.0	1200	1200	
2	"ATS-4" (CRITICAL)	633.0	633.0	1200	1200	
3	"ATS-3" (CRITICAL) 1	134.0	134.0	800	350	
4	PNL "LDP-1A"	81.0	81.0	800	400	
5	SPARE			800		

SWBD DISTRIBUTION: GDP-1 W/TVSS

SERVICE: 480/277V, 3PH, 4W + GND
BUS SIZE: 1600A
MAIN DEVICE: 1600A
LOAD: CONN 993.0 kVA; DEM. 993.0 kVA; DEM. 1194.9 Amps 1
NOTES: SEE KEYED NOTE 1 ON DWG E300

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEM.	DEVICES (A)		REMARKS
1	FIRE PUMP "FP-1" 1	130.0	130.0	300		CB - NOTE 1
2	"ATS-3" (CRITICAL)	134.0	134.0	400	350	SWITCH/FUSE
3	SPARE			400		SWITCH
4	"ATS-1" (EM LTG)	23.0	23.0	200	200	SWITCH/FUSE
5	"ATS-4" (HOUSE CRTCL)	706.0	706.0	1200	1200	SWITCH/FUSE

PANEL DISTRIBUTION: DP-ELEV

SERVICE: 480/277V, 3PH, 4W + GND
BUS SIZE: 200A
MAIN DEVICE: 200A
LOAD: CONN 99.0 kVA; DEM. 99.0 kVA; DEM. 119.1 Amps
1 - CONFIRM OCP
SIZE W/ELEV. MANUF.

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	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		

SWBD DISTRIBUTION: SB-3

SERVICE: 480/277V, 3PH, 4W + GND
BUS SIZE: 2000A
MAIN DEVICE: 2000A
LOAD: CONN 1024.0 kVA; DEM. 1024.0 kVA; DEM. 1232.3 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	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	PNL "DP-3"	338.0	338.0	600		

PANEL DISTRIBUTION: DP-1A

SERVICE: 480/277V, 3PH, 4W + GND
BUS SIZE: 1200A
MAIN DEVICE: 1200A
LOAD: CONN 373.0 kVA; DEM. 365.0 kVA; DEM. 439.2 Amps
NOTES: 1-PROVIDE EMON METER FOR CIRCUIT

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEM.	DEVICES (A) CB		REMARKS
1	PNL "PP-1B"	93.0	93.0	200		
2	XMFR "T-1B"	189.0	181.0	350		
3	PNL "PP-1A"	91.0	91.0	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
MAIN DEVICE: 600A
LOAD: CONN 338.0 kVA; DEM. 338.0 kVA; DEM. 406.7 Amps

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEM.	DEVICES (A) CB		REMARKS
1	PANEL "PP-3A"	151.0	151.0	400		
2	PANEL "PP-3B"	151.0	151.0	400		
3	XMFR "T-3"	36.0	36.0	125		

PANEL DISTRIBUTION: EDP-1A

SERVICE: 480/277V, 3PH, 4W + GND
BUS SIZE: 1200A
MAIN DEVICE: 1200A
LOAD: CONN 706.0 kVA; DEM. 706.0 kVA; DEM. 849.6 Amps
FUSIBLE SWITCH PNL 1-CONFIRM OCP SIZE W/MANUF. 2-PROVIDE EMON METER

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEM.	DEVICES (A) SWITCH	FUSE	REMARKS
1	PNL "LP-APRON"	27.0	27.0	60	60	
2	PNL "EP-3"	60.0	60.0	200	150	
3	BAG SYS-OUTBND PDP 1	155.0	155.0	400	250	NOTE 1
4	BAG SYS-OUTBND PDP 2	68.0	68.0	200	150	NOTE 1
5	BAG SYS-INBND PDP 3	70.0	70.0	200	150	NOTE 1
6	BAG SYS-INBND PDP 4	79.0	79.0	200	150	NOTE 1
7	SUMP PUMP "SP-1"	23.0	23.0	60	60	NOTE 1
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	PASSENGER BRIDGE	33.0	33.0	60	60	NOTES 1,2
12	JOCKEY PUMP "JP-1"	12.0	12.0	30	20	NOTE 1
13	XMFR "ET-1D"	20.0	20.0	60	50	
14	PNL "P-PL" (PRKING LOT)	60.0	60.0	100	100	

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	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
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REVIEWED BY: XXX
DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E403

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2035.00 Duluth Airport\5.0 CADD\(5.1) Electrical\Dwgs\2035_E403.dwg Plotted on: 8/17/2011 12:35 PM Plotted by: Tolga, Farid

PANELBOARD: PP-1A

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

BUS SIZE: 200A | **MAIN DEVICE: 200A**

LOAD: CONN 99.9 kVA | DEM. 99.9 kVA | DEM. 120.2 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	1,600					HEAT TRACE-CANOPY		20/1	20
21	30/3		HSE PMP "HP-1"			5,543				SPARE		20/1	22
23								5,543	1,774				24
25				831	1,774					CU-2.2		15/3	26
27	15/3	1	OH DOOR-SEC. XRAY			831	1,774						28
29								831	860				30
31	20/1		SPARE		860					GRINDER - AG LAB		15/3	32
33	20/1		SPARE				860						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**	**16,114**	**18,254**	**14,514**	**18,254**	**14,514**				

1

PANELBOARD: PP-1B

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

BUS SIZE: 200A | **MAIN DEVICE: 200A**

LOAD: CONN 115.0 kVA | DEM. 115.0 kVA | DEM. 138.4 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				1,774	1,774								14
15	15/3		CU-1.2 (TUG TNL)			1,774	1,774			CU-1.1 (TUG TNL)		15/3	16
17								1,774	1,774				18
19				831	3,242								20
21	15/3		PUMP "P-14"			831	3,242			CU-1.3 (TUG TNL)		20/3	22
23								831	3,242				24
25				1,774	3,048								26
27	15/3		CU-2.1			1,774	3,048			PUMP "P-15"		20/3	28
29								1,774	3,048				30
31				942	942								32
33	15/3		EF-1.- (TUG TUNNEL)			942	942			EF-1.- (TUG TUNNEL)		15/3	34
35								942	942				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:				**17,321**	**21,006**	**17,321**	**21,006**	**17,321**	**21,006**				

1

PANELBOARD: PP-3A

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

BUS SIZE: 400A | **MAIN DEVICE: 400A**

LOAD: CONN 148.7 kVA | DEM. 148.7 kVA | DEM. 178.9 Amps

NOTES: CIRCUIT BREAKER PANEL

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				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	2,106								8
9	40/3		PUMP "P-2"			5,820	2,106			PUMP "P-13"		15/3	10
11								5,820	2,106				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**	**10,198**	**39,352**	**10,198**	**39,352**	**10,198**				

1

PANELBOARD: PP-3B

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

BUS SIZE: 400A | **MAIN DEVICE: 400A**

LOAD: CONN 146.8 kVA | DEM. 146.8 kVA | DEM. 176.7 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				0	1,774								2
3	15/3		SPARE			0	1,774			CU-3.1 (ROOF)		15/3	4
5								0	1,774				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		FPB-3.12			2,548	804			HT TRACE-GUTTER		20/1	40
41	20/1		SPARE						804	HT TRACE-GUTTER		20/1	42
TOTAL CONNECTED LOADS:				**14,242**	**34,253**	**14,242**	**36,165**	**11,694**	**36,247**				

1

PANELBOARD: EP-3

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

BUS SIZE: 200A | **MAIN DEVICE: 150A**

LOAD: CONN 65.8 kVA | DEM. 65.8 kVA | DEM. 79.2 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	2,106							2
3	30AS/30AF	SPARE			0	2,106			PUMP "P-7"	30AS/15AF	4
5	3P						0	2,106		3P	6
7			0	2,106							8
9	30AS/30AF	PUMP "P-6"			0	2,106			PUMP "P-8"	30AS/15AF	10
11	3P	STANDY PUMP					0	2,106		3P	12
13			0	2,106							14
15	30AS/	SPARE			0	2,106			PUMP "P-9"	30AS/15AF	16
17	3P						0	2,106		3P	18
19			5,820	0							20
21	30AS/30AF	PUMP "P-4"			5,820	0			SPARE	30AS/	22
23	3P						5,820	0		3P	24
25			3,048	942							26
27	30AS/20AF	"EF-1.1"			3,048	942			"SF-2"	30AS/15AF	28
29	3P						3,048	942		3P	30
31			5,820	0							32
33	30AS/30AF	PUMP "P-5"			5,820	0			SPARE	30AS/	34
35	3P						5,820	0		3P	36
37			0	0							38
39	30AS/	SPARE			0	0			SPARE	30AS/	40
41	3P						0	0		3P	42
TOTAL CONNECTED LOADS:			**14,688**	**7,260**	**14,688**	**7,260**	**14,688**	**7,260**			

1

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	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2088.00 Duluth Airport\8.0 CADD\(8.3) Electrical\Dwgs\2088_E404.dwg Plotted on: 8/25/2011 12:48 PM Plotted by: Koehler, 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		

1

PANEL DISTRIBUTION: EDRP-1 W/TVSS

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

BUS SIZE: 800A	LOAD:		NOTES:
MAIN DEVICE: 800A	CONN 134.0 kVA		FUSIBLE SWITCH PNL
	DEM. 134.0 kVA		TWO SECTION
	DEM. 372.2 Amps		

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) SWITCH	FUSE	REMARKS
1	PANEL "ERP-1A"	6.0	6.0	200	200	
2	PANEL "ERP-1B"	12.0	12.0	200	200	
3	PANEL "ERP-1C"	27.0	27.0	200	200	
4	PANEL "ERP-1D"	12.0	12.0	200	200	
5	PANEL "ERP-2A"	13.0	13.0	200	200	
6	PANEL "ERP-2B"	18.0	18.0	200	200	
7	PANEL "ERP-2C"	18.0	18.0	200	200	
8	PANEL "ERP-2D"	8.0	8.0	100	100	
9	PANEL "ERP-3A"	12.0	12.0	200	200	
10	PANEL "ERP-3B"	8.0	8.0	200	200	
11	SPARE			60		

PANEL DISTRIBUTION: RDP-1A

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

BUS SIZE: 800A	LOAD:		NOTES:
MAIN DEVICE: 800A	CONN 189.0 kVA		CIRCUIT BREAKER PNL
	DEM. 181.0 kVA		1-PROVIDE EMON
	DEM. 502.8 Amps		METER FOR CIRCUIT

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "RP-1A"	22.0	22.0	150		
2	PANEL "RP-1B"	26.0	26.0	150		
3	PANEL "RP-1C"	19.0	19.0	150		
4	PANEL "RP-1D"	36.0	28.0	150		
5	PANEL "RP-2A"	27.0	27.0	150		
6	PANEL "RP-2B"	26.0	26.0	150		
7	PANEL "LP-2B"			150	NOTE 1	
8	PANEL "RP-1E"	10.0	10.0	150		
9	PANEL "RP-2C"	23.0	23.0	150		

PANEL DISTRIBUTION: RDP-3

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

BUS SIZE: 250A	LOAD:		NOTES:
MAIN DEVICE: 250A	CONN 36.0 kVA		CIRCUIT BREAKER PNL
	DEM. 36.0 kVA		
	DEM. 100.0 Amps		

FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	LOAD (kVA) DEM.	DEVICES (A) CB		REMARKS
1	PANEL "RP-3A"	20.0	20.0	150		
2	PANEL "RP-3B"	16.0	16.0	150		

PANEL DISTRIBUTION: LDP-1A

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

BUS SIZE: 400A	LOAD:		NOTES
MAIN DEVICE: 400A	CONN 81.0 kVA		
	DEM. 81.0 kVA		
	DEM. 97.5 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"	34.0	34.0	100		
3	PNL "LP-2A"	40.0	40.0	100		
4	SPARE			200		

PANELBOARD: LP-APRON

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

BUS SIZE: 60A	LOAD:		NOTES:	SQUARE D POWERLINK PNL
MAIN DEVICE: 60A	CONN 26.4 kVA		1 - PROVIDE CONTROLLABLE CIRCUIT BREAKER	
	DEM. 26.4 kVA		2 - CONTROLLED BY PHOTOCELL	
	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	1,2	LTG-APRON	2,200	2,200					LTG-APRON	1,2	20/1	2
3	20/1	1,2	LTG-APRON			2,200	2,200			LTG-APRON	1,2	20/1	4
5	20/1	1,2	LTG-APRON					2,200	2,200	LTG-APRON	1,2	20/1	6
7	20/1	1,2	LTG-APRON	2,200	2,200					LTG-APRON	1,2	20/1	8
9	20/1	1,2	LTG-APRON			2,200	2,200			LTG-APRON	1,2	20/1	10
11	20/1		SPARE						2,200	LTG-APRON	1,2	20/1	12
13	20/1		SPARE		2,200					LTG-APRON	1,2	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	6,600	4,400	4,400	2,200	4,400				

PANELBOARD: LP-1A

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

BUS SIZE: 100A	LOAD:		NOTES:	SQUARE D POWERLINK PNL
MAIN DEVICE: 100A	CONN 31.4 kVA		1 - PROVIDE CONTROLLABLE CIRCUIT BREAKER	
	DEM. 31.4 kVA		2 - CONTROLLED BY DAYLIGHT SENSOR	
	DEM. 37.8 Amps		3 - CONTROLLED BY PHOTOCELL	

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	NOTES	TRIP/ POLE	CKT #
1	20/1	1,3	LTG-CANOPY	3,800	180					LTG-EAST STAIR	1	20/1	2
3	20/1	1,3	LTG-CANOPY			3,800	180			LTG-CENTER STAIR	1	20/1	4
5	20/1	1,3	LTG-CANOPY					3,800	1,710	LTG-FLR 1 LOBBY	1	20/1	6
7	20/1		SPARE		490					LTG-FLR 1 LOBBY	1,2	20/1	8
9	20/1		SPARE				350			LTG-FLR 1 LOBBY	1,2	20/1	10
11	20/1	1	LTG-FLR 1 VESTIBULES					700	350	LTG-FLR 1 LOBBY	1,2	20/1	12
13	20/1	1	LTG-RAMPS/TUNNEL	2,760						SPARE		20/1	14
15	20/1		LTG-FLR 1 NW			2,573				SPARE		20/1	16
17	20/1		LTG-FLR 1 CBP AREA					1,216		SPARE		20/1	18
19	20/1	1	LTG-FLR 1 CBP AREA	1,660						SPARE		20/1	20
21	20/1	1	LTG-FLR 1 CBIS RM			3,420				SPARE		20/1	22
23	20/1		LTG-FLR 1 NE					1,952		SPARE		20/1	24
25	20/1		LTG-FLR 1 RAC	840						SPARE		20/1	26
27	20/1	1	LTG-FLR 1 ROVER			400				SPARE		20/1	28
29	20/1	1	LTG-FLR 1 CORR.					739		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						500	DEVICE ROUTER		20/1	42
TOTAL CONNECTED LOADS:				9,060	670	10,193	530	8,407	2,560				

PANELBOARD: LP-2A

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

BUS SIZE: 100A	LOAD:		NOTES:	SQUARE D POWERLINK PNL
MAIN DEVICE: 100A	CONN 40.0 kVA		1 - PROVIDE CONTROLLABLE CIRCUIT BREAKER	
	DEM. 40.0 kVA		2 - CONTROLLED BY DAYLIGHT SENSOR	
	DEM. 48.1 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	1	LTG-FLR 2 CBP AREA	2,200	3,440					LTG-FLR 2 WAITING	1	20/1	2
3	20/1		LTG-FLR 2 WEST			2,938	2,960			LTG-FLR 2 WAITING	1	20/1	4
5	20/1		LTG-FLR 2 EAST					2,604	1,935	LTG-FLR 2 WAITING	1	20/1	6
7	20/1	1	LTG-FLR 2 CORR.	1,086	210					LTG-ROOF		20/1	8
9	20/1	1,2	LTG-FLR 2 CONCRS.			1,575	2,332			LTG-FLR 3 STOR./OPS		20/1	10
11	20/1	1	LTG-FLR 2 CONCRS.					2,310	3,320	LTG-FLR 3 OPS/OFFICES		20/1	12
13	20/1	1	LTG-FLR 2 TSA/DEPLAN.	2,100	1,990					LTG-FLR 3 RESTRM/OFF.		20/1	14
15	20/1	1	LTG-FLR 2 CONCRS.			1,540	2,580			LTG-FLR 3 EQUIP. RMS		20/1	16
17	20/1	1	LTG-CBP COORD.					200	1,076	LTG-FLR 3 WAIT./CORR.	1	20/1	18
19	20/1	1,2	LTG-FLR 2 WAITING	860	1,310					LTG-FLR 3 RECEPT/OFFICE	1	20/1	20
21	20/1	1,2	LTG-FLR 2 WAITING			480	300			LTG-FLR 3 RECEPT.	1	20/1	22
23	20/1	1,2	LTG-FLR 2 WAITING					645		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:				6,246	6,950	6,533	8,172	5,759	6,331				

PANELBOARD: LP-2B

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

BUS SIZE: 225A	LOAD:		NOTES:	SQUARE D POWERLINK PNL
MAIN DEVICE: 150A	CONN 2.8 kVA		1 - PROVIDE CONTROLLABLE CIRCUIT BREAKER	
	DEM. 2.8 kVA		2-VERIFY OCP DEVICE SIZE PER MANUFACTURER'S REQ.	
	DEM. 7.7 Amps			

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-GENERAL	360	510					GRILLE	2	15/2	2
3	20/1		REC-GENERAL			360	510						4
5	20/1		SPARE						510	GRILLE	2	15/2	6
7	20/1		SPARE		510								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:				360	1,020	360	510	0	510				

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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DRAWN BY: JK
DESIGNED BY: JK

AEP PROJECT NUMBER
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SHEET TITLE
PANEL SCHEDULES

SHEET NUMBER
E405

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\8888.00 Duluth Airport\5.0 CADD\[8.b] Electrical\Dwgs\8888_E405.dwg Plotted on: 8/17/2011 12:38 PM Plotted by: Tolga, Ferid

PANELBOARD: RP-1A

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 20.6 kVA** | 1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER
DEM. 20.6 kVA
DEM. 57.3 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				672	540					REC-GENERAL		20/1	2
3	15/3		AC-1.3 (COMM. RM)			672	540			REC-GENERAL		20/1	4
5								672	540	REC-GENERAL		20/1	6
7	20/1		SPARE	0	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	20/1		SPARE			0	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	560	ELEV. PIT LTG/REC		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	20/1		REC-REFRIG.			600	0			SPARE		20/1	40
41	20/1		SPARE					0	0	SPARE		20/1	42
TOTAL CONNECTED LOADS:				**3,852**	**2,760**	**4,812**	**2,300**	**2,592**	**4,320**				

1

PANELBOARD: RP-1B

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 24.4 kVA** | 1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER
DEM. 24.4 kVA
DEM. 67.8 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-RAC 4B	360	360					REC-TUNNEL (GEN)		20/1	2
3	20/1		REC-RAC 4B			180	1,080			REC-GENERAL		20/1	4
5	20/1		REC-RAC 5B					360	360	REC-BAG RM		20/1	6
7	20/1		REC-RAC 5B	180	200					ELEC FCT/SP DISP, FLR 1		20/1	8
9	20/1		REC-RAC 6B			360	0			SPARE		20/1	10
11	20/1		REC-RAC 6B					180	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					720	360	REC-COUNTER		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	180	REC-MAINT. OFFICE		15/1	30
31	20/1		REC-RAC 1B	360	900					REC-EDT WRKSTAT.		20/1	32
33	20/1		REC-RAC 1B			180	1,500			WASHRM-ELEC DRYER	1	20/1	34
35	20/1		REC-RAC 2B					360	1,500	WASHRM-ELEC DRYER	1	20/1	36
37	20/1		REC-RAC 2B	180	1,500					WASHRM-ELEC DRYER	1	20/1	38
39	20/1		REC-RAC 3B			360	1,500			WASHRM-ELEC DRYER	1	20/1	40
41	20/1		REC-RAC 3B					180	1,500	WASHRM-ELEC DRYER	1	20/1	42
TOTAL CONNECTED LOADS:				**3,180**	**4,208**	**3,360**	**5,328**	**3,720**	**4,620**				

PANELBOARD: RP-1C

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 15.9 kVA** | 1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER
DEM. 15.5 kVA
DEM. 43.0 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-TUNNEL (GEN)	540	360					REC-CHECK IN CTR		20/1	2
3	20/1		REC-RAMP (GEN)			900	360			REC-CHECK IN CTR		20/1	4
5	20/1		REC-PUMP RM					360	360	REC-CHECK IN CTR		20/1	6
7	20/1		REC-LOADING DOCK	180	360					REC-CHECK IN CTR		20/1	8
9	20/1		REC-LOADING DOCK			180	180			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	360					REC-EDT WRKSTAT.		20/1	14
15	20/1		REC-WASHRMS			360	0			SPARE		20/1	16
17	20/1		REC-OFFICE					360	0	SPARE		20/1	18
19	20/1		REC-OFFICE	360	0					SPARE		20/1	20
21	20/1		REC-GENERAL			720	0			SPARE		20/1	22
23	20/1		REC-BAG RM					360	0	SPARE		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		ELEV. PIT LTG/REC.	280	360					REC-EXTERIOR (GEN)		20/1	32
33	20/1		REC-OFFICE			360	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	15/2		ACN-3			291	291			ACN-4		15/2	40
41								291	291				42
TOTAL CONNECTED LOADS:				**2,980**	**2,940**	**3,531**	**1,831**	**2,451**	**2,121**				

PANELBOARD: RP-1D

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 30.2 kVA** | 1-PROVIDE EMON METER FOR CIRCUIT
DEM. 22.0 kVA | 2-VERIFY OCP SIZE PER MANUFACTURER'S REQUIREMENTS
DEM. 61.1 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1				2,000	2,000								2
3	30/3		REC-PSGR BRIDGE			2,000	2,000			REC-PSGR BRIDGE		30/3	4
5			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	0	SPARE		20/1	30
31	20/1	1	REC-ELEC. CART	180	0					SPARE		20/1	32
33	20/1	1	REC-ELEC. CART			180	0			SPARE		20/1	34
35	20/1	1	REC-ELEC. CART					180		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**	**4,870**	**5,380**	**5,200**	**5,050**	**4,690**				

PANELBOARD: RP-1E

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 23.9 kVA** | 1-VERIFY OCP SIZE PER MANUFACTURER'S REQUIREMENTS
DEM. 23.9 kVA
DEM. 66.4 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		LED ILLUM. SIGN	1,200	528					UH-1.4		15/1	2
3	20/1		LED ILLUM. SIGN			1,200	528			UH-1.5		15/1	4
5	20/1		RESERV. CENTER					1,200	528	UH-1.7		15/1	6
7	20/1		EDGELITE-1ST FLR	1,200	528					UH-1.8		15/1	8
9	20/1		EDGELITE-1ST FLR			1,200	528			UH-1.9		15/1	10
11	20/1		EDGELITE-1ST FLR					1,200	528	CUH-1.2		15/1	12
13	20/1		EDGELITE-1ST FLR	1,200	528					UH-1.6		15/1	14
15	20/1		EDGELITE-1ST FLR			1,200	528			EF-1.6		15/1	16
17	15/1		UH-1.1					528	528	EF-1.7		15/1	18
19	15/1		UH-1.2	528	1,920								20
21	15/1		CUH-1.5			528	1,920			PARTITION WALL	1	20/3	22
23	15/1		CUH-1.1					528	1,920				24
25	15/1		UH-1.3	528						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	15/2		ACN-1.1			291	291			ACN-1.2		15/2	40
41								291	291				42
TOTAL CONNECTED LOADS:				**4,656**	**3,504**	**4,419**	**3,795**	**3,747**	**3,795**				

PANELBOARD: RP-2A

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 27.1 kVA** | 1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER
DEM. 27.1 kVA
DEM. 75.3 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-GENERAL	540	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	720					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		EDGELITE - 2ND FLR	1,200	900					REC-INTERNAT. (GEN)		20/1	20
21	20/1		REC-GENERAL			720	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)			720	1,200			VENDING MACH.		20/1	28
29	20/1		REC-CONCRSE (GEN)					360	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:				**5,460**	**3,900**	**6,468**	**2,920**	**5,940**	**2,420**				

PANELBOARD: RP-2B

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 28.9 kVA** | 1-VERIFY OCP DEVICE SIZE PER MANUFACTURER'S REQ.
DEM. 28.9 kVA
DEM. 80.2 Amps

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	900					REC-GENERAL		20/1	2
3	20/1		REC-GENERAL			540	360			REC-WASHRMS		20/1	4
5	20/1		REC- POLICE OFFICE					900	1,200	REC-VENDING MACH.		20/1	6
7	20/1		REC-GENERAL	540	1,200					REC-VENDING MACH.		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	0			SPARE		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				1,920	831								26
27	20/3	1	PARTITION WALL			1,920	1,500			WASHRM-ELEC DRYER	1	20/1	28
29								1,920	1,500	WASHRM-ELEC DRYER	1	20/1	30
31	20/1		EDGELITE - 2ND FLR	1,200	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	720	REC-GENERAL		20/1	36
37	20/1		SPARE	0	1,080					REC-GENERAL		20/1	38
39	20/1		SPARE			0				SPARE		20/1	40
41	20/1		SPARE					0		SPARE		20/1	42
TOTAL CONNECTED LOADS:				**4,692**	**6,521**	**3,132**	**4,911**	**4,352**	**5,261**				

PANELBOARD: RP-2C

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

BUS SIZE: 225A | **LOAD:** | **NOTES:** CIRCUIT BREAKER PANEL
MAIN DEVICE: 150A | **CONN 29.1 kVA** | 1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER
DEM. 29.1 kVA | 2 - CIRCUITS ASSOCIATED WITH ALTERNATE-PRICE SEPARATE
DEM. 80.9 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		SPARE	0	540					REC-TSA GENERAL		20/1	2
3	20/1		REC-GENERAL			900	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	540	MOTORIZED SHADES	2	20/1	24
25	20/1		EDGELITE - 2ND FLR	1,200	540					MOTORIZED SHADES	2	20/1	26
27	20/1		REC-GENERAL			360	540			MOTORIZED SHADES	2	20/1	28
29								672	540	MOTORIZED SHADES	2	20/1	30
31	15/3		AC-2.2 (LAN RM)	672	540					MOTORIZED SHADES	2	20/1	32
33						672	500			SHADE BUS SUPPLY	2	20/1	34
35	20/1		SPARE						500	SHADE BUS SUPPLY	2	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:				**3,792**	**6,277**	**4,572**	**5,117**	**3,132**	**6,237**				

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

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

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

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-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							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**				

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.3) Electrical\Dwgs\2008_E406.dwg Plotted on: 8/17/2011 12:40 PM Plotted by: Tolga, Ferid

PANELBOARD: ELEV-1A

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

BUS SIZE: 60A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 60A | **CONN 3.0 kVA**

DEM. 3.0 kVA

DEM. 8.3 Amps

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	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 | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 60A | **CONN 2.9 kVA**

DEM. 2.9 kVA

DEM. 8.2 Amps

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	20/1		ELEV. #124 CAB LIGHTS	250 1,000			ELEV. #124 CONTROLLER		20/1	2
3	20/1		ELEV. MACH RM REC.		180 336					4
5	20/1		ELEV. RM SECURITY			500 336	AC-1.2		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: ELEV-1C

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

BUS SIZE: 60A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 60A | **CONN 2.9 kVA**

DEM. 2.9 kVA

DEM. 8.2 Amps

CKT #	TRIP/ POLE	Floor Serving	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION	Floor Serving	TRIP/ POLE	CKT #
1	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: EPP-1D

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

BUS SIZE: 100A | **LOAD:** | **NOTES:** | **PLUG FUSE PANEL**

MAIN DEVICE: 100A | **CONN 3.6 kVA**

DEM. 3.6 kVA

DEM. 10.0 Amps

CKT #	TRIP/ POLE		CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		FIRE BELL	500 400			ACCESS CNTRL-FLR 1		20/1	2
3	20/1		ACCESS CNRL-FLR 1		400 400		ACCESS CNTRL-FLR 1		20/1	4
5	20/1		ACCESS CNRL-FLR 1			400 300	ACCESS CNTRL-FLR 2		20/1	6
7	20/1		ACCESS CNRL-FLR 2	400 300			ACCESS CNTRL-FLR 2		20/1	8
9	20/1		ACCESS CNRL-FLR 2		400		SPARE		20/1	10
11	20/1		SPARE			100	ACCESS CNTRL-FLR 3		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:				900 700	800 400	400 400				

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 8.1 kVA** | **1-PROVIDE EMON METER FOR CIRCUIT**

DEM. 8.1 kVA

DEM. 22.4 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-XRAY PODIUM	750 500			FIRE BELL		20/1	2
3	20/1		REC-CASHIER		250 500		REC-FDRS		20/1	4
5	20/1		SPARE			0 500	REC-MCC		20/1	6
7	20/1		SPARE	0 360			REC-CONTROL RM		20/1	8
9	20/1		REC COMP-OFFICE		250 720		REC-CONTROL RM		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 1,360	1,500 1,470	1,000 1,000				

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 15.5 kVA**

DEM. 15.5 kVA

DEM. 43.0 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-OFFICE	500 250			REC-COMM. RM		20/1	2
3	20/1		REC-CLG DUPLEX		500 250		REC-COMM. RM		20/1	4
5	20/1		REC-CLG DUPLEX			500 250	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	1,080 250			REC-COMM. RM		20/1	14
15	20/1		REC-RAC 2		1,080 250		REC-COMM. RM		20/1	16
17	20/1		REC-RAC 3			1,080 0	SPARE		20/1	18
19	20/1		SPARE	0 1,080			REC-RAC 6		20/1	20
21	20/1		SPARE		0 1,080		REC-RAC 4		20/1	22
23	20/1		REC-CLG DUPLEX			500 1,080	REC-RAC 5		20/1	24
25	20/1		REC-CLG DUPLEX	500 250			REC-EDT WRKSTAT.		20/1	26
27	20/1		REC-CLG DUPLEX		500 250		REC-EDT WRKSTAT.		20/1	28
29	20/1		REC-CLG DUPLEX			500 250	REC-EDT WRKSTAT.		20/1	30
31	20/1		REC-CLG DUPLEX	500 250			REC-EDT WRKSTAT.		20/1	32
33	20/1		REC-CLG DUPLEX		500 250		REC-EDT WRKSTAT.		20/1	34
35	20/1		REC-CLG DUPLEX			500 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:				2,580 2,330	2,830 2,330	3,580 1,830				

1

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 23.1 kVA** | **1-PROVIDE EMON METER FOR CIRCUIT**

DEM. 23.1 kVA

DEM. 64.2 Amps

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1		REC-EDT WRKSTAT.	250 2,400			EDS MACH.	1	30/2	2
3	20/1		REC-EDT WRKSTAT.		250 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		REC-OFFICE	750 250			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			500 500	REC-ATM MACH.		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:				5,150 4,400	2,500 4,150	4,650 2,250				

PANELBOARD: EMLP-1A

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

BUS SIZE: 200A | **LOAD:** | **NOTES:**

MAIN DEVICE: 150A | **CONN 23.2 kVA** | **FUSE PANEL**

DEM. 23.2 kVA

DEM. 28.0 Amps

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A	PHASE B	PHASE C	CIRCUIT DESCRIPTION		TRIP/ POLE	CKT #
1	20/1	EXIT SIGNS - 1ST FLR	366 186			EXIT SIGNS - 3RD FLR		20/1	2
3	20/1	EM LTG-RAMP/TUNNEL		1,810 2,364		EM LTG - 3RD FLR		20/1	4
5	20/1	EM LTG-EXTERIOR			640	SPARE		20/1	6
7	20/1	EM LTG-FLR 1 WEST	3,197			SPARE		20/1	8
9	20/1	EM LTG-FLR 1 EAST		1,587		SPARE		20/1	10
11	20/1	EXIT SIGNS - 2ND FLR			324	SPARE		20/1	12
13	20/1	EM LTG-FLR 2 NORTH	2,295			SPARE		20/1	14
15	20/1	EM LTG-FLR 2 MIDDLE		3,166		SPARE		20/1	16
17	20/1	EM LTG-FLR 2 SOUTH			3,225	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 1,620						38
39	20/1	SPARE		0 1,190		XMFR "ET-1A"	60A S/50AF		40
41	20/1	SPARE			0 1,260		3P		42
TOTAL CONNECTED LOADS:			5,858 1,806	6,563 3,554	4,189 1,260				

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PANELBOARD: ERP-1D - PNL W/TVSS, 200% NEUTRAL & ISO GRD

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 11.5 kVA**

DEM. 11.5 kVA

DEM. 31.9 Amps

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

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11

DATE ISSUED: 08–23–11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CAD\(5.1) Electrical\Dwgs\2008_E407.dwg Plotted on: 8/17/2011 12:41 PM Plotted by: Tolga, Ferit

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 5.5 kVA** | **DEM. 5.5 kVA** | **DEM. 15.3 Amps**

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC-TSA	250	0					SPARE	20/1	2
3	20/1		REC-TSA			250	0			SPARE	20/1	4
5	20/1		REC-DLH POLICE					250	0	SPARE	20/1	6
7	20/1		REC-AIRPORT POLICE	500	0					SPARE	20/1	8
9	20/1		REC-TSA			250	0			SPARE	20/1	10
11	20/1		XRAY					500	0	SPARE	20/1	12
13	20/1		XRAY	500	0					SPARE	20/1	14
15	20/1		REC-COUNTER			250	0			SPARE	20/1	16
17	20/1		REC-COUNTER					250	0	SPARE	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					540	0	SPARE	20/1	24
25	20/1		REC-OFFICE	250	0					SPARE	20/1	26
27	20/1		SPARE			0	0			SPARE	20/1	28
29	20/1		SPARE					0	0	SPARE	20/1	30
31	20/1		SPARE	0	0					SPARE	20/1	32
33	20/1		SPARE			0	0			SPARE	20/1	34
35	20/1		SPARE					0	0	SPARE	20/1	36
37	20/1		SPARE	0	0							38
39	20/1		SPARE			0	0			TVSS	60/3	40
41	20/1		SPARE					0	0			42
TOTAL CONNECTED LOADS:				2,000	0	1,950	0	1,540	0			

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 17.2 kVA** | **DEM. 17.2 kVA** | **DEM. 47.8 Amps**

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC-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							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: 100A | **LOAD:** | **NOTES:** | **PLUG FUSE PANEL**

MAIN DEVICE: 100A | **CONN 19.6 kVA** | **DEM. 19.6 kVA** | **DEM. 54.5 Amps**

CKT #	TRIP/ POLE	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1			1,200	100					ELEC. FLSH VLV, FLR 1	20/1	2
3	20/3	BOILER "B-1"			1,200	200			ELEC. FLSH VLV, FLR 2	20/1	4
5							1,200	50	ELEC. FLSH VLV, FLR 3	20/1	6
7	15/2	ELEV. PIT PUMP	624	100					BHS MCP PWR	20/1	8
9					624	180			BHS MCP PWR	20/1	10
11	15/2	ELEV. PIT PUMP					624	100	BHS MCP PWR	20/1	12
13			624	180					BHS MCP PWR	20/1	14
15	15/2	ELEV. PIT PUMP			624	100			BHS MCP PWR	20/1	16
17							624	180	BHS MCP PWR	20/1	18
19			1,200	100					BHS MCP PWR	20/1	20
21	20/3	BOILER "B-2"			1,200	180			BHS MCP PWR	20/1	22
23							1,200		SPARE	20/1	24
25			1,200						SPARE	20/1	26
27	20/3	BOILER "B-3"			1,200				SPARE	20/1	28
29							1,200		SPARE	20/1	30
31			1,200						SPARE	20/1	32
33	20/3	BOILER "B-4"			1,200				SPARE	20/1	34
35							1,200		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:			6,048	480	6,048	660	6,048	330			

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

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

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

MAIN DEVICE: 100A | **CONN 7.2 kVA** | **DEM. 7.2 kVA** | **DEM. 20.0 Amps**

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

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 13.8 kVA** | **DEM. 13.8 kVA** | **DEM. 38.4 Amps**

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC-OPS CONF RM	900	1,200					FM200 SYS	20/1	2
3	20/1		REC-OPS CONF RM			1,260	250			REC-COMM. RM	20/1	4
5	20/1		REC-OPS CONF RM					900	250	REC-COMM. RM	20/1	6
7	20/1		REC-BADGE RM	360	250					REC-COMM. RM	20/1	8
9	20/1		REC-OFFICE			540	250			REC-COMM. RM	20/1	10
11	20/1		REC-RECEPT.					720	250	REC-COMM. RM	20/1	12
13	20/1		REC-OPEN OFFICE	720	250					REC-COMM. RM	20/1	14
15	20/1		REC-OFFICES			1,080	250			REC-COMM. RM	20/1	16
17	20/1		REC-OFFICES					1,200	250	REC-COMM. RM	20/1	18
19	20/1		REC TSA CONF.	180	0					SPARE	20/1	20
21	20/1		SPARE			0	0			SPARE	20/1	22
23	20/1		REC COMP-TRAINING					250	0	SPARE	20/1	24
25	20/1		REC-OFFICE	540	0					SPARE	20/1	26
27	20/1		REC-TSA STOR.			360	0			SPARE	20/1	28
29	20/1		REC-TSA OFFICE					180	0	SPARE	20/1	30
31	20/1		REC-OPS ROOM	720	0					SPARE	20/1	32
33	20/1		REC-OPS ROOM			720	0			SPARE	20/1	34
35	20/1		SPARE					0	0	SPARE	20/1	36
37	20/1		SPARE	0	0							38
39	20/1		SPARE			0	0			TVSS	60/3	40
41	20/1		SPARE					0	0			42
TOTAL CONNECTED LOADS:				3,420	1,700	3,960	750	3,250	750			

PANELBOARD: RP-3A

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

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

MAIN DEVICE: 150A | **CONN 19.6 kVA** | **1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER**

DEM. 19.6 kVA | **DEM. 54.5 Amps**

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	15/1		"UH-3.1"	528	200					DISPLAY CASE LIGHT	20/1	2
3	15/1		"UH-3.2"			528	0			SPARE	20/1	4
5	15/1		"UH-3.5"					528	1,200	PROJECTOR	20/1	6
7	15/1		"UH-3.3"	528	360					REC-OPS CONF.	20/1	8
9	20/1		REC-MECH RM			900	720			REC-GENERAL	20/1	10
11	20/1		REC-MECH/ELEC RM					720	180	REC-RECEPT.	20/1	12
13	20/1		REC-GENERAL	720	180					REC-OPS CONF.	20/1	14
15	20/1		WTR HTR "WH-1"			240	360			REC-OPS ROOM	20/1	16
17	20/1		WTR HTR "WH-2"					240	360	REC-GENERAL	20/1	18
19	20/1		REC-WASHRMS	360	0					SPARE	20/1	20
21	20/1		REC-GENERAL			360	0			SPARE	20/1	22
23	15/1		"CUH-3.4"					528	0	SPARE	20/1	24
25	15/1		"CUH-3.1"	528	0					SPARE	20/1	26
27	15/1		"EF-3.1"			528	0			SPARE	20/1	28
29	15/1		"EF-3.2"					528	0	SPARE	20/1	30
31	15/1		"EF-3.3"	528	864					"P-11"	15/1	32
33	20/1	1	WASHRM-ELEC DRYER			1,500	864			"P-12"	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	1,604	5,556	1,944	4,044	1,790			

PANELBOARD: RP-3B

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

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

MAIN DEVICE: 150A | **CONN 21.7 kVA** | **1 - PROVIDE GFCI TYPE CB**

DEM. 21.7 kVA | **DEM. 60.4 Amps**

CKT #	TRIP/ POLE	NOTES	CIRCUIT DESCRIPTION	CONNECTED LOAD (VA) PHASE A		PHASE B		PHASE C		CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #
1	20/1		REC-GENERAL	900	360					REC-TSA CONF.	20/1	2
3	20/1		REC-GENERAL			540	540			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	720					REC-GENERAL	20/1	8
9	20/1		MICROWAVE			1,200	720			REC-GENERAL	20/1	10
11	20/1		REFRIGERATOR					1,200	720	REC-MECH RM	20/1	12
13	20/1		SPARE	0	720					REC-MECH RM	20/1	14
15	20/1		SPARE			0	0			SPARE	20/1	16
17	20/1		REC-GENERAL					720	540	REC-BREAK RM	20/1	18
19	20/1		REC-BREAK RM	360	180					REC-COUNTER	20/1	20
21	20/1		REC-COPY RM			360	1,200			GARBAGE DISPOSAL	20/1	22
23	20/1		REC-COPY RM					180	180	REC-COUNTER	20/1	24
25	20/1		REC-COPY RM	360	1,200					REFRIGERATOR	20/1	26
27	20/1		SPARE			0	696			"EF-3.3"	15/1	28
29	20/1		SPARE					0	672			30
31	15/1		"UH-3.6"	528	672					AC-3.1 (COMM. RM)	15/3	32
33	15/1		"UH-3.7"			528	672					34
35	15/1		"CUH-3.2"					528	540	REC-TSA OFFICE	20/1	36
37	15/1		"CUH-3.3"	528	180					REC-BREAK RM	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:				3,876	4,032	3,156	3,828	2,988	3,852			

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 18.0 kVA** | **DEM. 18.0 kVA** | **DEM. 50.0 Amps**

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

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

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

BUS SIZE: 200A | **LOAD:** | **NOTES:** | **CIRCUIT BREAKER PANEL**

MAIN DEVICE: 200A | **CONN 9.2 kVA** | **DEM. 9.2 kVA** | **DEM. 25.6 Amps**

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

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN

NEW PASSENGER TERMINAL

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REVISIONS

NO.	DESCRIPTION	DATE
	BID PACKAGE 2B	8.23.11
	100% REVIEW	12.17.10
	BID PACKAGE 2A	1.24.11
1	BP2A ADDENDUM 2	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 - Duluth Airport\5.0 CAD\(5.1s) Electrical\Dwgs\2008_E408.dwg Plotted on: 8/17/2011 12:48 PM Plotted by: Tolpo, Ford

SECURITY/TECHNOLOGY SYSTEMS LEGEND

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

D	DURESS ALARM
DK	DURESS ALARM WITH KEY RESET
	INTERCOM MASTER STATION AND KEY RESET (DURESS ALARM)
	DURESS STROBE – CLG MTD WHITE STROBE SYSTEM SENSOR 24V DC, 15cd SCW–P–LENSB
AIS	FLIGHT INFORMATION INPUT WORKSTATION (SEE MUFIDS RISER)
WS	WORKSTATION (SEE NETWORK RISER)

ABBREVIATION

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

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

GENERAL SECURITY/TECHNOLOGY SYSTEMS NOTES

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	02.25.11
	BP2A CONFORMANCE SET	05.02.11

DATE ISSUED: 08-23-11
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA/RJL

AEP PROJECT NUMBER
213-1882-091

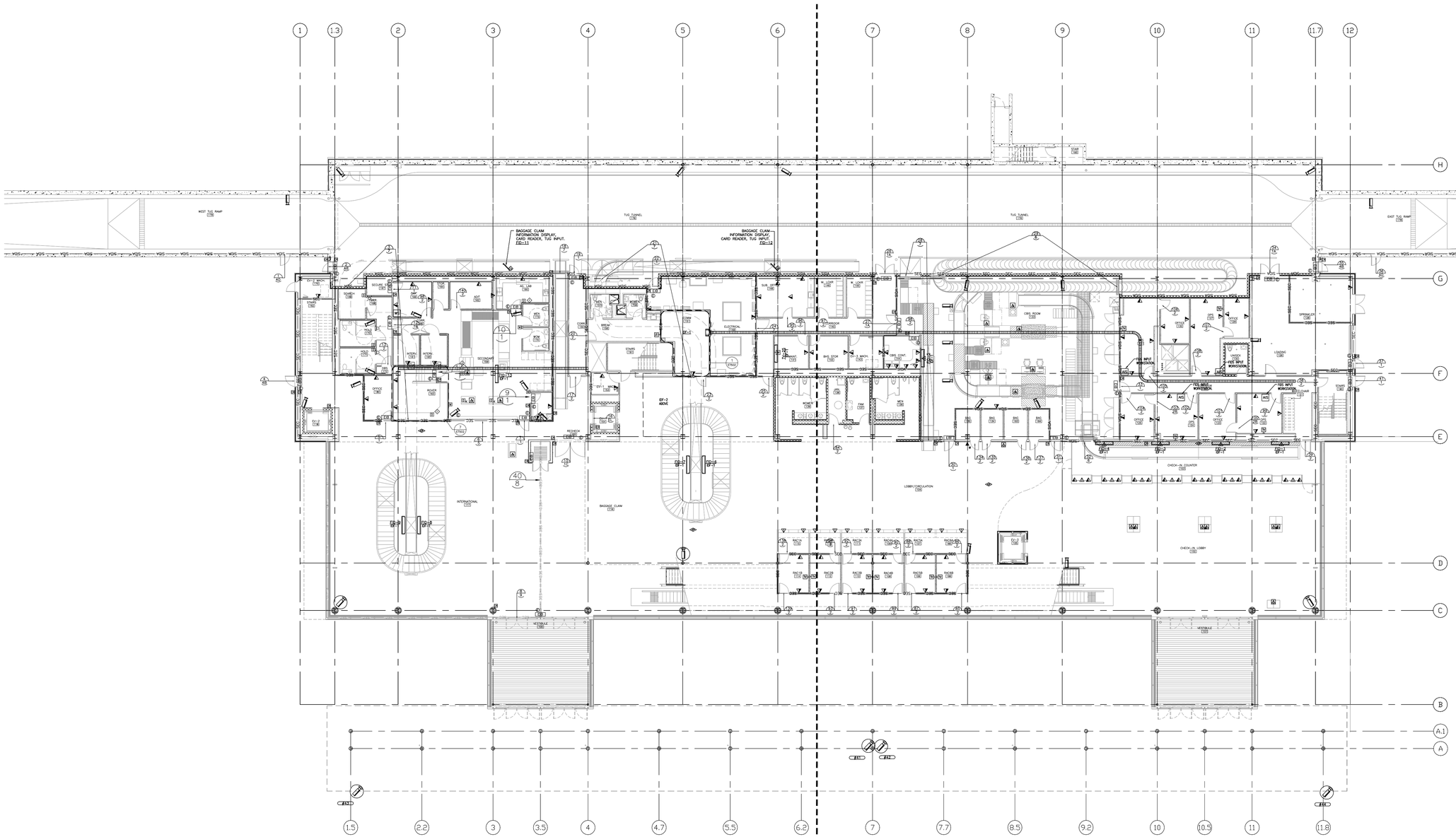
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SHEET TITLE
TECHNOLOGY/ SECURITY SYSTEMS LEGEND & NOTES

SHEET NUMBER
ET001

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET0-01 – LEGEND.dwg Plotted on: 8/24/2011 3:26 PM Plotted by: Lizzari, Riona



N

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

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

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	BP2A CONFORMANCE SET	05.02.11

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REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

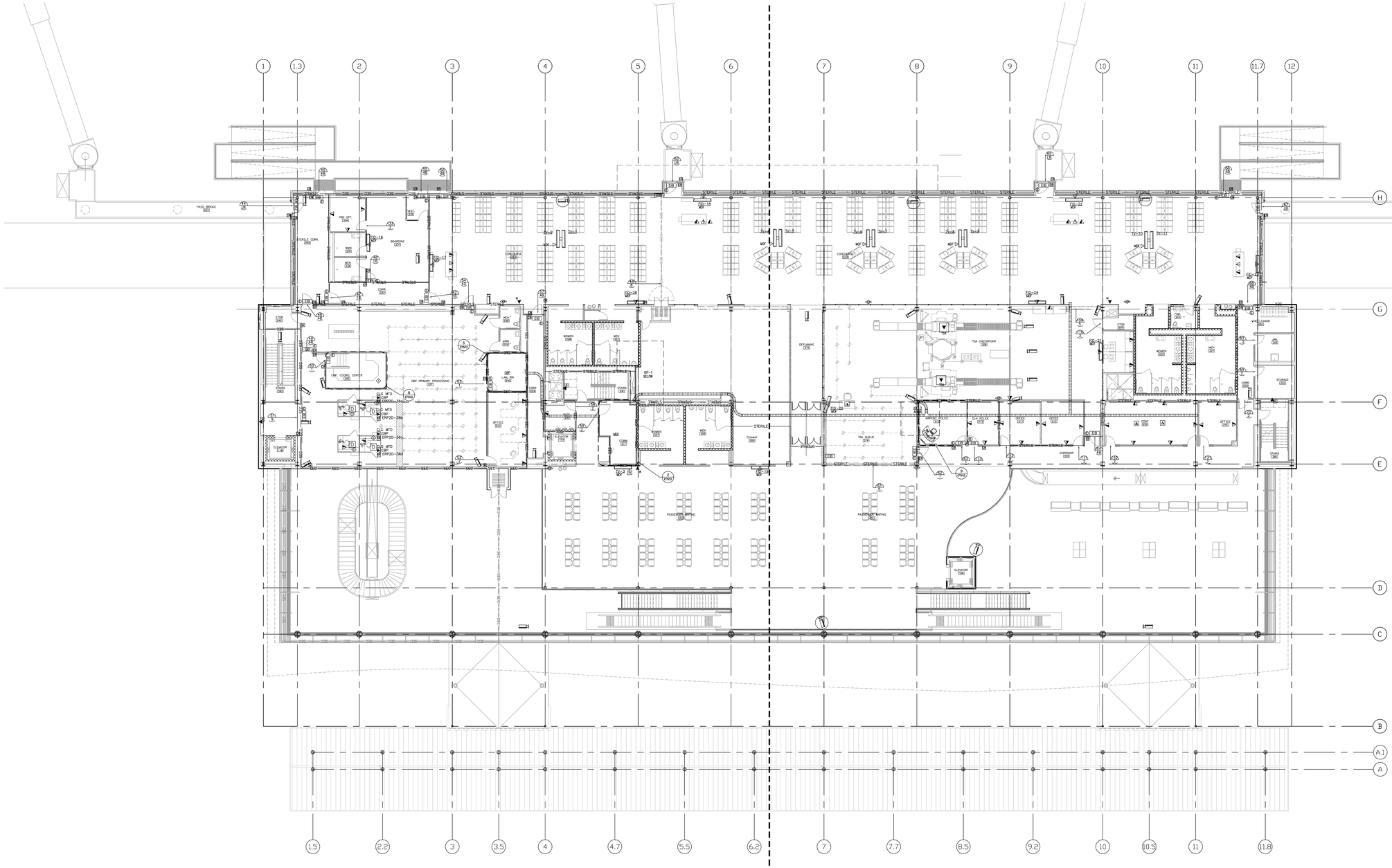
TECHNOLOGY FIRST FLOOR PLAN

SHEET NUMBER

ET401

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-01 FIRST FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:27 PM Plotted by: Lazari, Rional



N

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

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

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DRAWN BY: RJL
DESIGNED BY: BA

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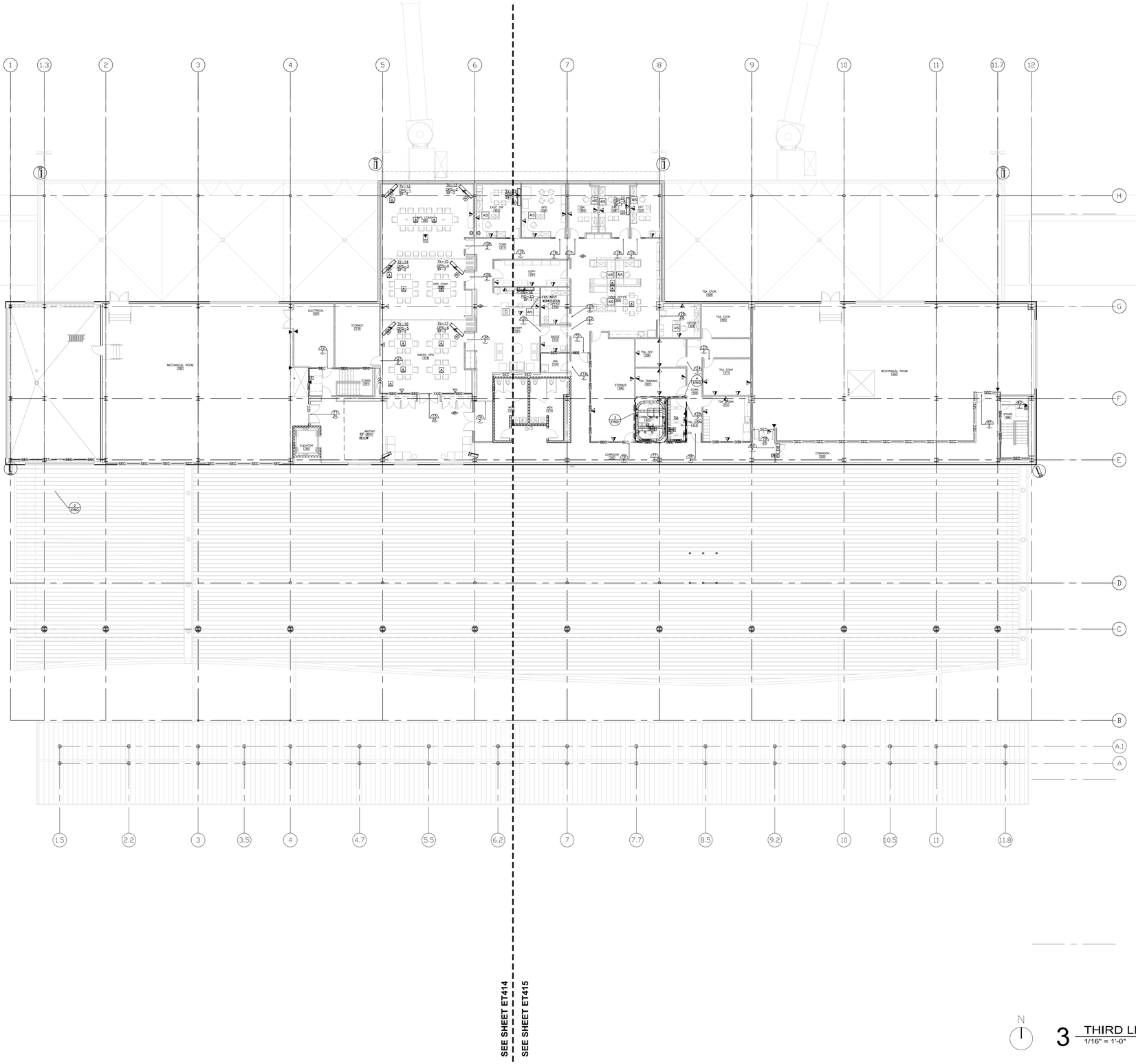
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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN

SHEET NUMBER
ET402

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-02 SECOND FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:28 PM Plotted by: Lazaro, Rional



N

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

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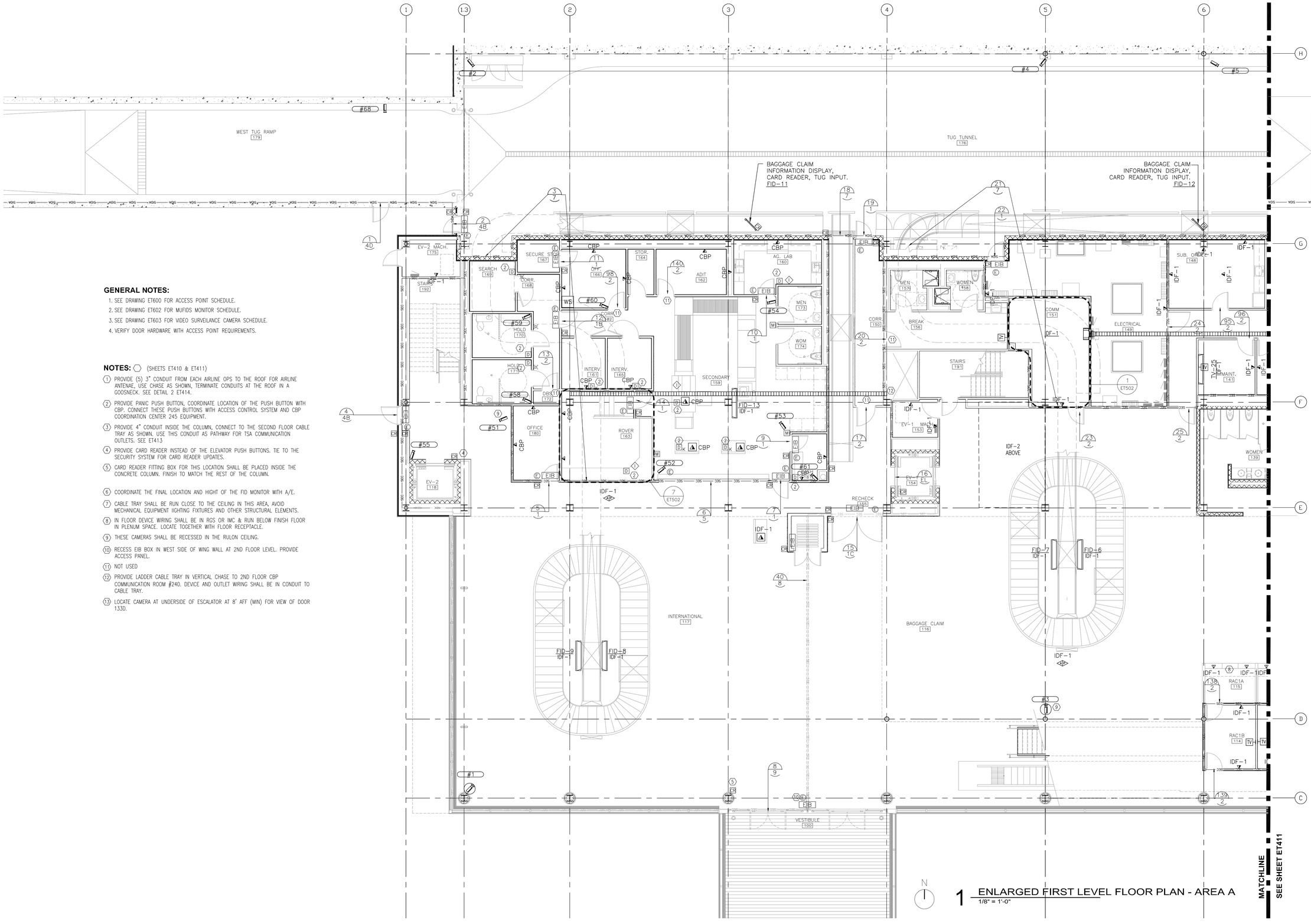
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN

SHEET NUMBER
ET403

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-03 THIRD FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:28 PM Plotted by: Lizaori, Rional



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

GENERAL NOTES:

1. SEE DRAWING ET600 FOR ACCESS POINT SCHEDULE.
2. SEE DRAWING ET602 FOR MUFIDS MONITOR SCHEDULE.
3. SEE DRAWING ET603 FOR VIDEO SURVEILANCE CAMERA SCHEDULE.
4. VERIFY DOOR HARDWARE WITH ACCESS POINT REQUIREMENTS.

NOTES: ⟨ ⟩ (SHEETS ET410 & ET411)

⟨1⟩ PROVIDE (5) 3" CONDUIT FROM EACH AIRLINE OPS TO THE ROOF FOR AIRLINE ANTENAE. USE CHASE AS SHOWN, TERMINATE CONDUITS AT THE ROOF IN A GOOSNECK. SEE DETAIL 2 ET414.

⟨2⟩ PROVIDE PANIC PUSH BUTTON, COORDINATE LOCATION OF THE PUSH BUTTON WITH CBP. CONNECT THESE PUSH BUTTONS WITH ACCESS CONTROL SYSTEM AND CBP COORDINATION CENTER 245 EQUIPMENT.

⟨3⟩ PROVIDE 4" CONDUIT INSIDE THE COLUMN, CONNECT TO THE SECOND FLOOR CABLE TRAY AS SHOWN. USE THIS CONDUIT AS PATHWAY FOR TSA COMMUNICATION OUTLETS. SEE ET413

⟨4⟩ PROVIDE CARD READER INSTEAD OF THE ELEVATOR PUSH BUTTONS. TIE TO THE SECURITY SYSTEM FOR CARD READER UPDATES.

⟨5⟩ CARD READER FITTING BOX FOR THIS LOCATION SHALL BE PLACED INSIDE THE CONCRETE COLUMN. FINISH TO MATCH THE REST OF THE COLUMN.

⟨6⟩ COORDINATE THE FINAL LOCATION AND HIGHT OF THE FID MONITOR WITH A/E.

⟨7⟩ CABLE TRAY SHALL BE RUN CLOSE TO THE CEILING IN THIS AREA, AVOID MECHANICAL EQUIPMENT IGHTING FIXTURES AND OTHER STRUCTURAL ELEMENTS.

⟨8⟩ IN FLOOR DEVICE WIRING SHALL BE IN RGS OR IMC & RUN BELOW FINISH FLOOR IN PLENUM SPACE. LOCATE TOGETHER WITH FLOOR RECEPTACLE.

⟨9⟩ THESE CAMERAS SHALL BE RECESSED IN THE RULON CEILING.

⟨10⟩ RECESS EIB BOX IN WEST SIDE OF WING WALL AT 2ND FLOOR LEVEL. PROVIDE ACCESS PANEL.

⟨11⟩ NOT USED

⟨12⟩ PROVIDE LADDER CABLE TRAY IN VERTICAL CHASE TO 2ND FLOOR CBP COMMUNICATION ROOM #240. DEVICE AND OUTLET WIRING SHALL BE IN CONDUIT TO CABLE TRAY.

⟨13⟩ LOCATE CAMERA AT UNDERSIDE OF ESCALATOR AT 8' AFF (MIN) FOR VIEW OF DOOR 133D.

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DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
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SHEET TITLE

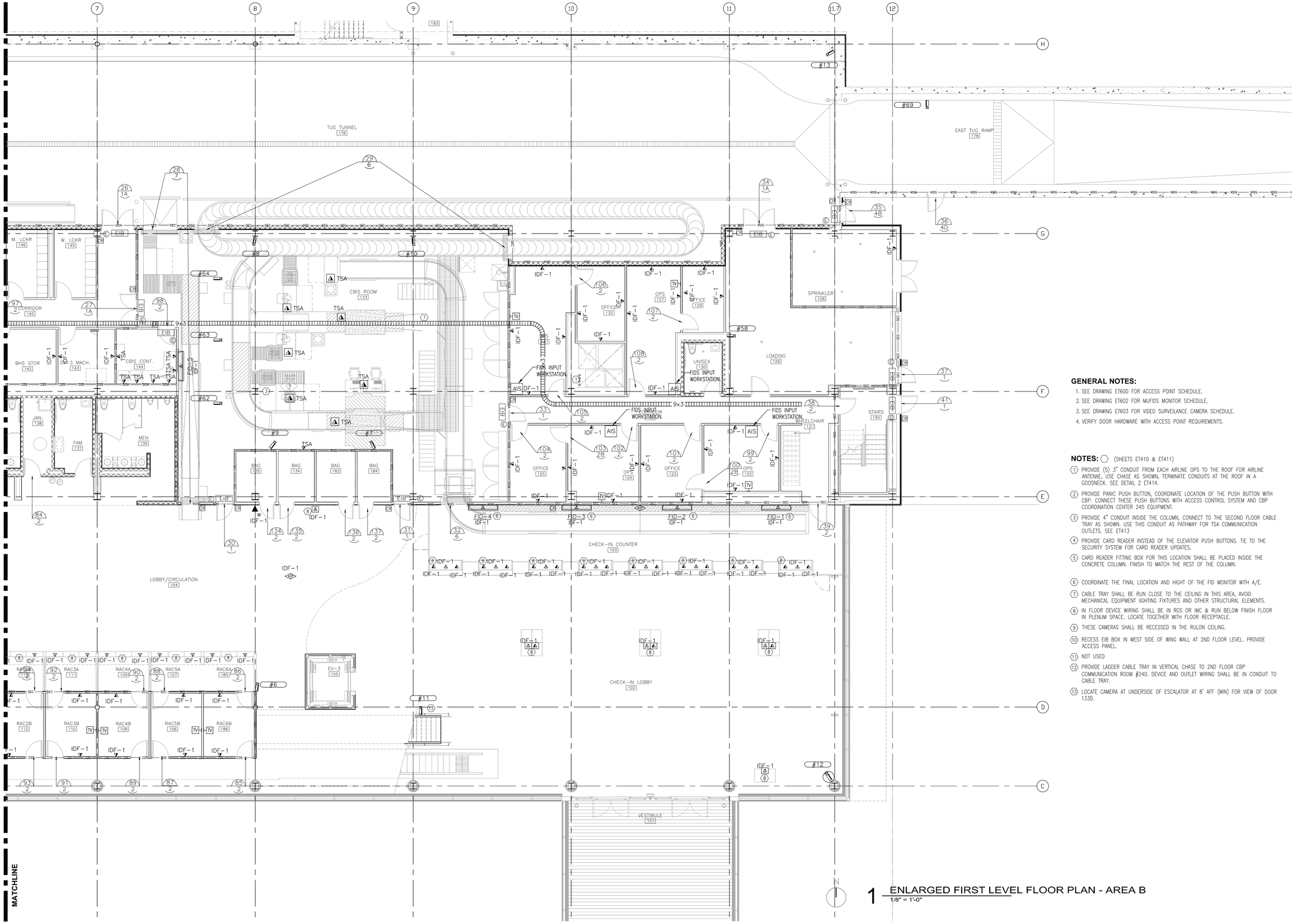
TECHNOLOGY FIRST FLOOR PLAN AREA A

SHEET NUMBER

ET410

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-01 FIRST FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:30 PM Plotted by: Liazari, Rional



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

GENERAL NOTES:

1. SEE DRAWING ET600 FOR ACCESS POINT SCHEDULE.
2. SEE DRAWING ET602 FOR MUFIDS MONITOR SCHEDULE.
3. SEE DRAWING ET603 FOR VIDEO SURVEILANCE CAMERA SCHEDULE.
4. VERIFY DOOR HARDWARE WITH ACCESS POINT REQUIREMENTS.

NOTES: ⬡ (SHEETS ET410 & ET411)

1. PROVIDE (5) 3" CONDUIT FROM EACH AIRLINE OPS TO THE ROOF FOR AIRLINE ANTENAE, USE CHASE AS SHOWN, TERMINATE CONDUITS AT THE ROOF IN A GOOSNECK. SEE DETAIL 2 ET414.
2. PROVIDE PANIC PUSH BUTTON, COORDINATE LOCATION OF THE PUSH BUTTON WITH CBP. CONNECT THESE PUSH BUTTONS WITH ACCESS CONTROL SYSTEM AND CBP COORDINATION CENTER 245 EQUIPMENT.
3. PROVIDE 4" CONDUIT INSIDE THE COLUMN, CONNECT TO THE SECOND FLOOR CABLE TRAY AS SHOWN. USE THIS CONDUIT AS PATHWAY FOR TSA COMMUNICATION OUTLETS. SEE ET413
4. PROVIDE CARD READER INSTEAD OF THE ELEVATOR PUSH BUTTONS. TIE TO THE SECURITY SYSTEM FOR CARD READER UPDATES.
5. CARD READER FITTING BOX FOR THIS LOCATION SHALL BE PLACED INSIDE THE CONCRETE COLUMN. FINISH TO MATCH THE REST OF THE COLUMN.
6. COORDINATE THE FINAL LOCATION AND HIGHT OF THE FID MONITOR WITH A/E.
7. CABLE TRAY SHALL BE RUN CLOSE TO THE CEILING IN THIS AREA, AVOID MECHANICAL EQUIPMENT IGHTING FIXTURES AND OTHER STRUCTURAL ELEMENTS.
8. IN FLOOR DEVICE WIRING SHALL BE IN RGS OR IMC & RUN BELOW FINISH FLOOR IN PLENUM SPACE. LOCATE TOGETHER WITH FLOOR RECEPTACLE.
9. THESE CAMERAS SHALL BE RECESSED IN THE RULON CEILING.
10. RECESS EIB BOX IN WEST SIDE OF WING WALL AT 2ND FLOOR LEVEL. PROVIDE ACCESS PANEL.
11. NOT USED
12. PROVIDE LADDER CABLE TRAY IN VERTICAL CHASE TO 2ND FLOOR CBP COMMUNICATION ROOM #240. DEVICE AND OUTLET WIRING SHALL BE IN CONDUIT TO CABLE TRAY.
13. LOCATE CAMERA AT UNDERSIDE OF ESCALATOR AT 8' AFF (MIN) FOR VIEW OF DOOR 133D.

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DRAWN BY: RJL
DESIGNED BY: BA

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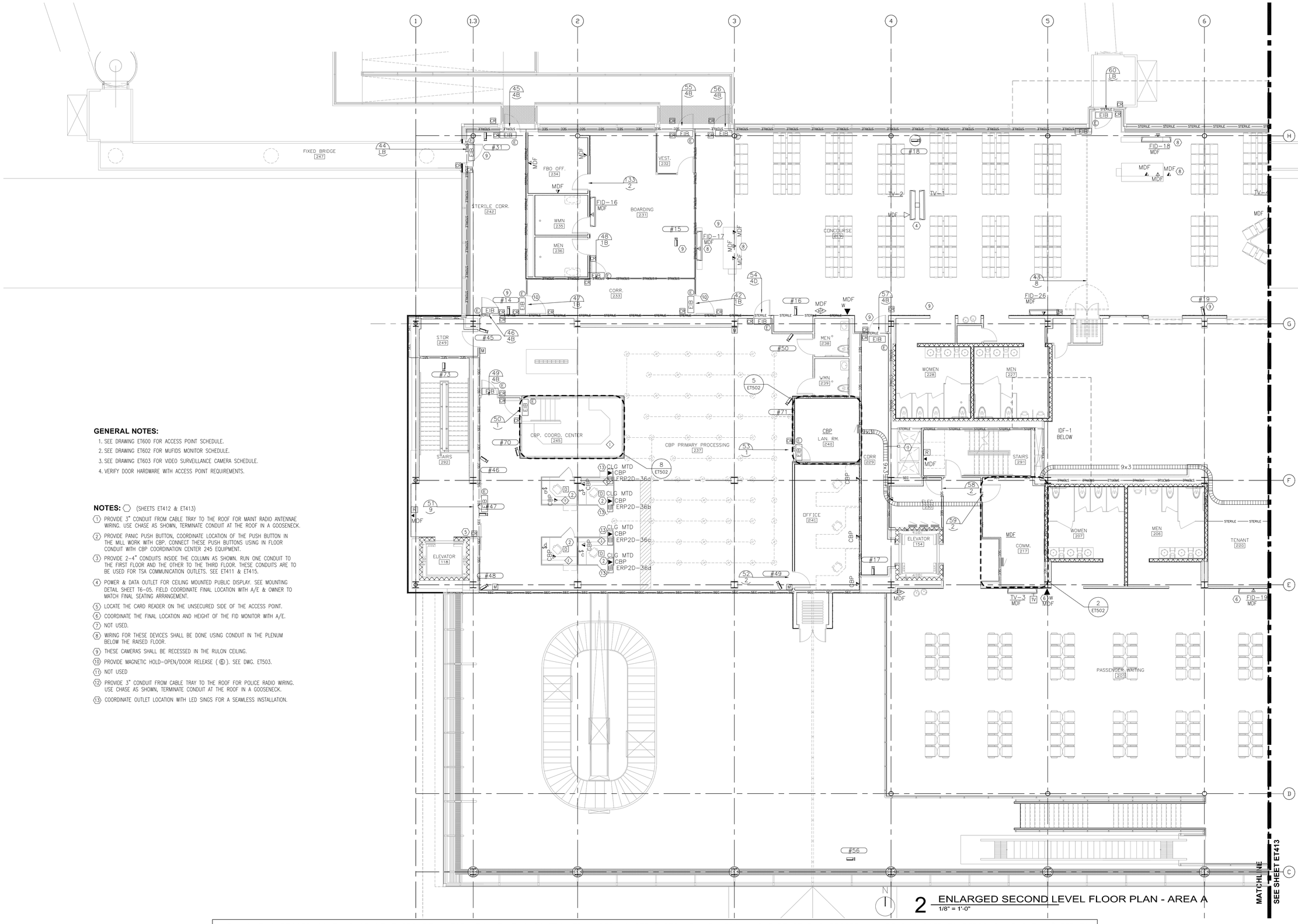
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SHEET TITLE
TECHNOLOGY FIRST FLOOR PLAN AREA B

SHEET NUMBER
ET411

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-01 FIRST FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:30 PM Plotted by: Llazari, Rional



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

GENERAL NOTES:

1. SEE DRAWING ET600 FOR ACCESS POINT SCHEDULE.
2. SEE DRAWING ET602 FOR MUFIDS MONITOR SCHEDULE.
3. SEE DRAWING ET603 FOR VIDEO SURVEILLANCE CAMERA SCHEDULE.
4. VERIFY DOOR HARDWARE WITH ACCESS POINT REQUIREMENTS.

NOTES: ⬡ (SHEETS ET412 & ET413)

1. PROVIDE 3" CONDUIT FROM CABLE TRAY TO THE ROOF FOR MAINT RADIO ANTENNAE WIRING. USE CHASE AS SHOWN, TERMINATE CONDUIT AT THE ROOF IN A GOOSENECK.
2. PROVIDE PANIC PUSH BUTTON, COORDINATE LOCATION OF THE PUSH BUTTON IN THE MILL WORK WITH CBP. CONNECT THESE PUSH BUTTONS USING IN FLOOR CONDUIT WITH CBP COORDINATION CENTER 245 EQUIPMENT.
3. PROVIDE 2-4" CONDUITS INSIDE THE COLUMN AS SHOWN. RUN ONE CONDUIT TO THE FIRST FLOOR AND THE OTHER TO THE THIRD FLOOR. THESE CONDUITS ARE TO BE USED FOR TSA COMMUNICATION OUTLETS. SEE ET411 & ET415.
4. POWER & DATA OUTLET FOR CEILING MOUNTED PUBLIC DISPLAY. SEE MOUNTING DETAIL SHEET T6-05. FIELD COORDINATE FINAL LOCATION WITH A/E & OWNER TO MATCH FINAL SEATING ARRANGEMENT.
5. LOCATE THE CARD READER ON THE UNSECURED SIDE OF THE ACCESS POINT.
6. COORDINATE THE FINAL LOCATION AND HEIGHT OF THE FID MONITOR WITH A/E.
7. NOT USED.
8. WIRING FOR THESE DEVICES SHALL BE DONE USING CONDUIT IN THE PLENUM BELOW THE RAISED FLOOR.
9. THESE CAMERAS SHALL BE RECESSED IN THE RULON CEILING.
10. PROVIDE MAGNETIC HOLD-OPEN/DOOR RELEASE (ⓔ). SEE DWG. ET503.
11. NOT USED
12. PROVIDE 3" CONDUIT FROM CABLE TRAY TO THE ROOF FOR POLICE RADIO WIRING. USE CHASE AS SHOWN, TERMINATE CONDUIT AT THE ROOF IN A GOOSENECK.
13. COORDINATE OUTLET LOCATION WITH LED SINGS FOR A SEAMLESS INSTALLATION.

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REVISIONS

NO	DESCRIPTION	
	100% REVIEW	12.15.10
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DRAWN BY: RJL
DESIGNED BY: BA

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SHEET TITLE

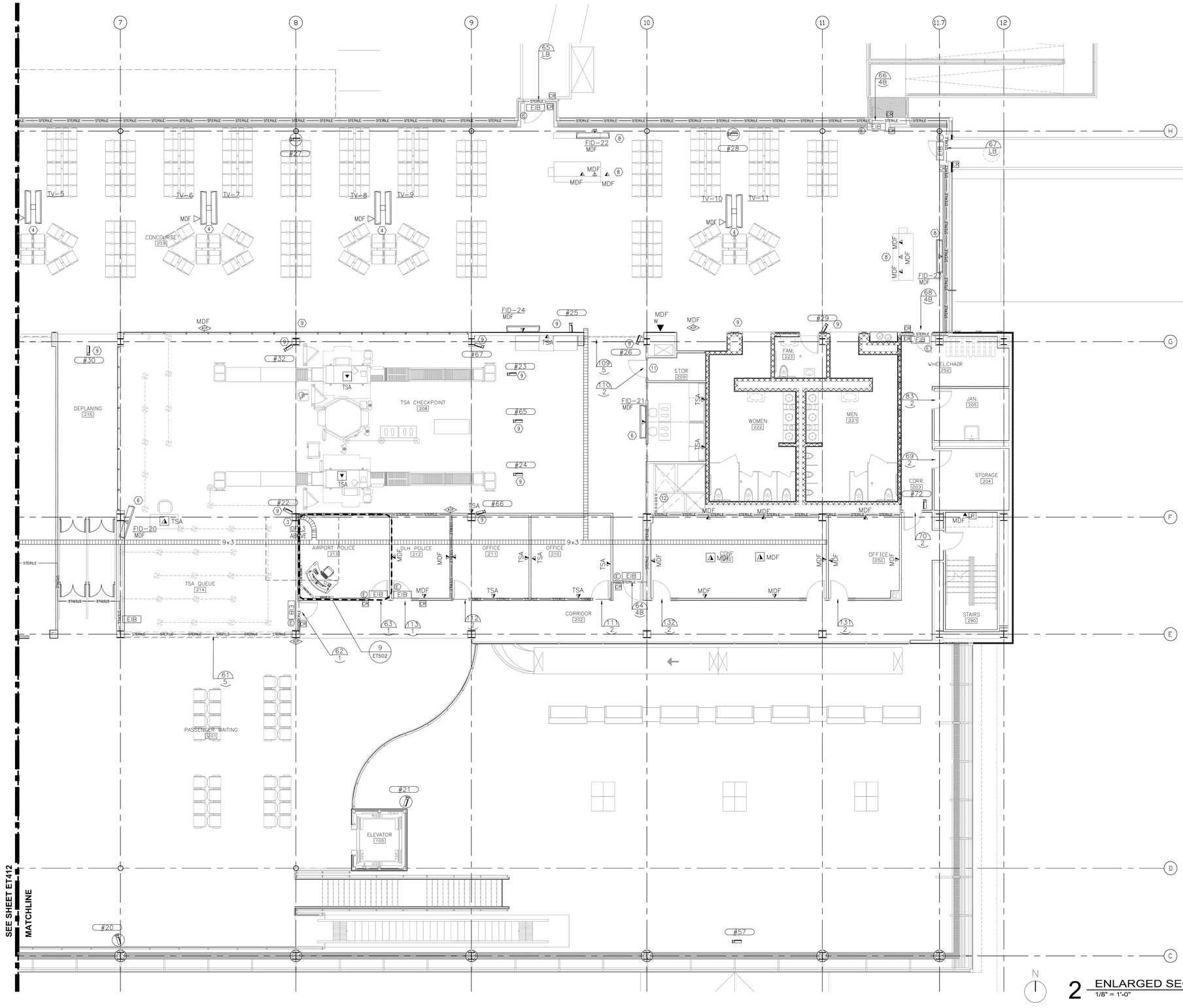
TECHNOLOGY SECOND FLOOR PLAN AREA A

SHEET NUMBER

ET412

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-02 SECOND FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:31 PM Plotted by: Llazari, Rional



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

GENERAL NOTES:

1. SEE DRAWING ET600 FOR ACCESS POINT SCHEDULE.
2. SEE DRAWING ET602 FOR MUFIDS MONITOR SCHEDULE.
3. SEE DRAWING ET603 FOR VIDEO SURVEILLANCE CAMERA SCHEDULE.
4. VERIFY DOOR HARDWARE WITH ACCESS POINT REQUIREMENTS.

NOTES: ⬡ (SHEETS ET412 & ET413)

1. PROVIDE 3" CONDUIT FROM CABLE TRAY TO THE ROOF FOR MAINT RADIO ANTENNAE WIRING. USE CHASE AS SHOWN, TERMINATE CONDUIT AT THE ROOF IN A GOOSENECK.
2. PROVIDE PANIC PUSH BUTTON, COORDINATE LOCATION OF THE PUSH BUTTON IN THE MILL WORK WITH CBP. CONNECT THESE PUSH BUTTONS USING IN FLOOR CONDUIT WITH CBP COORDINATION CENTER 245 EQUIPMENT.
3. PROVIDE 2-4" CONDUITS INSIDE THE COLUMN AS SHOWN. RUN ONE CONDUIT TO THE FIRST FLOOR AND THE OTHER TO THE THIRD FLOOR. THESE CONDUITS ARE TO BE USED FOR TSA COMMUNICATION OUTLETS. SEE ET411 & ET415.
4. POWER & DATA OUTLET FOR CEILING MOUNTED PUBLIC DISPLAY. SEE MOUNTING DETAIL SHEET T6-05. FIELD COORDINATE FINAL LOCATION WITH A/E & OWNER TO MATCH FINAL SEATING ARRANGEMENT.
5. LOCATE THE CARD READER ON THE UNSECURED SIDE OF THE ACCESS POINT.
6. COORDINATE THE FINAL LOCATION AND HEIGHT OF THE FID MONITOR WITH A/E.
7. NOT USED.
8. WIRING FOR THESE DEVICES SHALL BE DONE USING CONDUIT IN THE PLENUM BELOW THE RAISED FLOOR.
9. THESE CAMERAS SHALL BE RECESSED IN THE RULON CEILING.
10. PROVIDE MAGNETIC HOLD-OPEN/DOOR RELEASE (ⓓ). SEE DWG. ET503.
11. NOT USED
12. PROVIDE 3" CONDUIT FROM CABLE TRAY TO THE ROOF FOR POLICE RADIO WIRING. USE CHASE AS SHOWN, TERMINATE CONDUIT AT THE ROOF IN A GOOSENECK.
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DATE ISSUED: 08-23-11
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
TECHNOLOGY SECOND FLOOR PLAN AREA B

SHEET NUMBER
ET413

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-02 SECOND FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:31 PM Plotted by: Lizzari, Rional

GENERAL NOTES:

1. SEE DRAWING ET600 FOR ACCESS POINT SCHEDULE.
2. SEE DRAWING ET602 FOR MUFIDS MONITOR SCHEDULE.
3. SEE DRAWING ET603 FOR VIDEO SURVEILANCE CAMERA SCHEDULE.
4. VERIFY DOOR HARDWARE WITH ACCESS POINT REQUIREMENTS.

NOTES: ⬡ (SHEETS ET414 & ET415)

(1) SEE DRAWINGS ET411 & ET412

(2) PROVIDE A PUSH BUTTON AND THE WIRING REQUIRED FOR THE RECEPTIONIST TO BUZZ PEOPLE IN DURING WORKING HOURS.

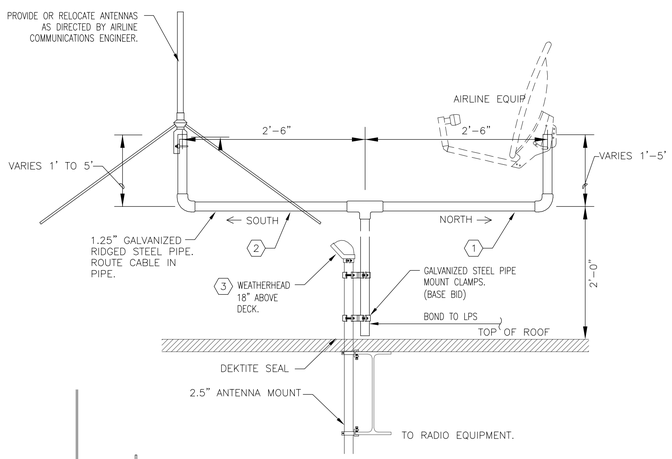
(3) PROVIDE 4" CONDUIT INSIDE THE COLUMN, CONNECT TO THE SECOND FLOOR CABLE TRAY AS SHOWN. THIS CONDUIT IS TO BE USED AS WIREWAY FOR TSA COMMUNICATION OUTLETS. SEE ET413

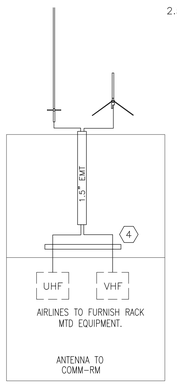
(4) POWER & DATA OUTLET FOR CEILING MOUNTED OPS-1 TO OPS-6 ARE TO BE PLACED ABOVE CEILING. PROVIDE PEERLESS MOUNT #PLCM-UNL AND ALL REQUIRED HARDWARE FOR A COMPLETE INSTALLATION. ROUTE THE WIRING INSIDE THE COLUMN. PENETRATE THE CEILING TILE IN THE CENTER.

(5) PROVIDE LMR-400DB 50 OHM FLEXIBLE LOW LOSS WATERTIGHT COAXIAL CABLE TO ROOFTOP ANTENNA VIA ANTENNA CONDUIT ROOF PENETRATION. SEE A104 TERMINATE W/N CONNECTOR MONT AND CONNECT VHF ANTENNA ANDREN #DB224FAA PER DETAIL 2 ET414.

(6) NOT USED.

(7) PROVIDE CEILING MOUNTED COMMERCIAL GRADE FULL HD PROJECTOR. COORDINATE EXACT LOCATION WITH OWNER. CEILING COMMUNICATION OUTLET TO BE LOCATED NEXT TO THE PROJECTOR.





TYPICAL RADIO RISER DIAGRAM

ANTENNA NOTES

1. CONTRACTOR SHALL COORDINATE RADIO SCOPE OF WORK WITH EACH AIRLINE. CONTRACTOR SHALL NOTIFY AIRLINE OF WORK SCHEDULE.
2. CONTRACTOR SHALL WORK CLOSELY WITH AIRLINE RADIO TECHNICIAN. TECHNICIAN MAY WISH TO BE PRESENT DURING FINAL INSTALLATION. CONTRACTOR SHALL ACQUIRE AIRLINE APPROVAL OF ANTENNA INSTALLATION.
3. ANTENNAS # A3, A4, A5, A6 ARE FOR AIRLINE USE. PROVIDE FOR COAX FOR TWO ANTENNAS, UHF (GROUND TO GROUND) AND VHF (AIR TO GROUND), PROVIDE CONDUIT ROUGH IN FOR ALL OTHER ANTENNA LOCATIONS.
4. CONTRACTOR SHALL PROVIDE ENGRAVED LABEL AT EACH ANTENNA. LABEL SHALL INDIACATE AIRLINE, FREQUENCY AND OWNER CONTACT INFORMATION.
5. ALL OUTDOOR COMPONENTS SHALL BE WEATHERPROOF. PROVIDE DEKTITE DIVERTER FLASHING SYSTEM FOR ALL PIPE PENETRATIONS (SEE http://www.itwbuildex.com/dektite.htm).
6. EQUIPMENT LIST DIAGRAMTIC AND TO BE VERIFIED WITH AIRLINE / AND OR AIRPORT BEFORE INSTALLATION. ASSUME 8 RADIO ROOMS, AND 2 ADDITIONAL ROOF ANTENNA LOCATIONS.

ANTENNA NOTES: ⬡

(1) PROVIDE (2) LMR-300-75 OHM FLEXIBLE LOW LOSS COAXIAL CABLE TO AIRLINE COMM TTB BACKBOARD. PROVIDE 4' SLACK IN 1' COIL AT BOTH ENDS. TERMINATE WITH WEATHERPROOF "F" MALE CONNECTORS.

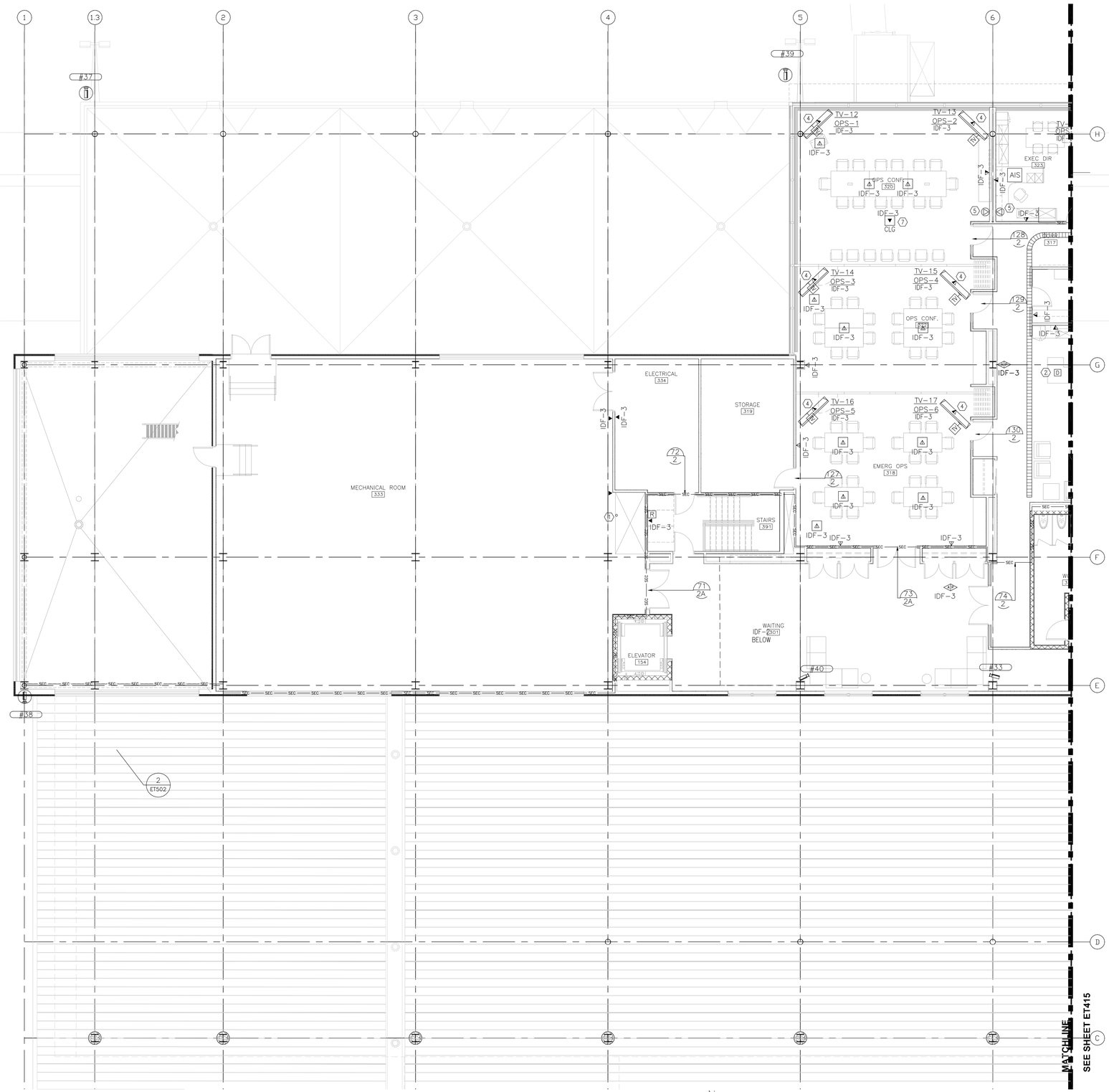
(2) PROVIDE (1) LMR-600 50 OHM FLEXIBLE LOW LOSS COAXIAL CABLE. PROVIDE 10' SLACK AT AIRLINE RADIO LOCATION. TERMINATE WITH WEATHERPROOF "N" MALE CONNECTORS.

(3) PROVIDE AN ADDITIONAL 4' SLACK IN A 1' COIL FOR ALL CABLES AT WEATHER HEAD FOR FUTURE MODIFICATIONS TO CABLES.

(4) PROVIDE 1/4" x 1" x 12" GROUND BAR 12" BELOW CEILING. GROUND BAR SHALL BE HARGER GBI14112E OR EQUAL. PROVIDE #2 GROUND CONDUCTOR TO SYSTEM GROUND. FOR EACH ANTENNA CABLE, PROVIDE A GAS TUBE SURGE PROTECTOR WITH MOUTING BRACKET, N-FEMALE CONNECTORS, SURGE PROTECTOR SHALL BE POLYPHASER RGT OR EQUAL.

2 ET414 TYPICAL ANTENNA

SCALE: NOT TO SCALE



N

3 ENLARGED THIRD LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

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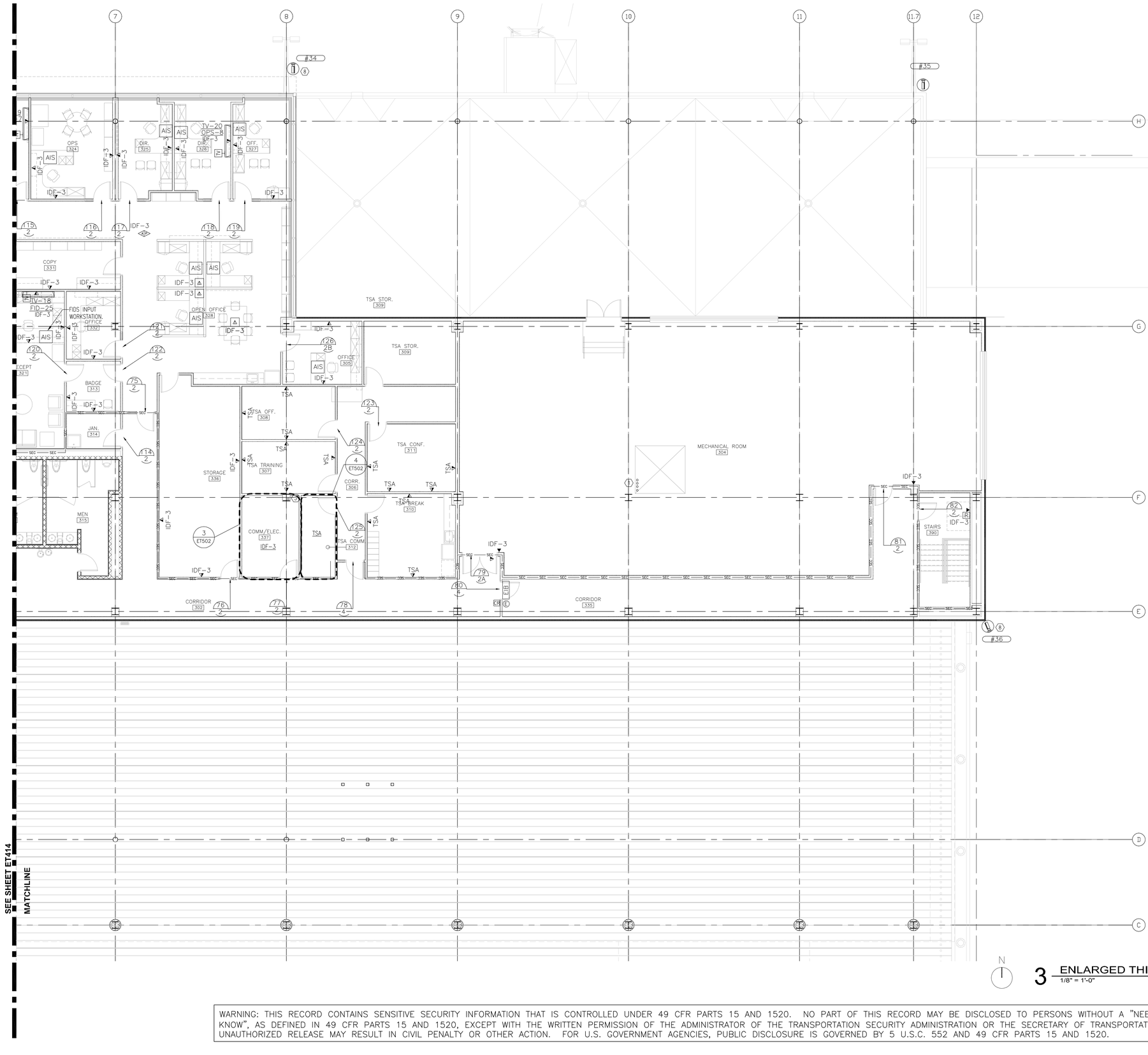
TECHNOLOGY THIRD FLOOR PLAN AREA A

SHEET NUMBER

ET414

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET1-03 THIRD FLOOR TECHNOLOGY.dwg Plotted on: 8/24/2011 3:32 PM Plotted by: Liazari, Rional



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

GENERAL NOTES:

1. SEE DRAWING ET600 FOR ACCESS POINT SCHEDULE.
2. SEE DRAWING ET602 FOR MUFIDS MONITOR SCHEDULE.
3. SEE DRAWING ET603 FOR VIDEO SURVEILANCE CAMERA SCHEDULE.
4. VERIFY DOOR HARDWARE WITH ACCESS POINT REQUIREMENTS.

NOTES: ⬡ (SHEETS ET414 & ET415)

1. SEE DRAWINGS ET411 & ET412
2. PROVIDE A PUSH BUTTON AND THE WIRING REQUIRED FOR THE RECEPTIONIST TO BUZZ PEOPLE IN DURING WORKING HOURS.
3. PROVIDE 4" CONDUIT INSIDE THE COLUMN, CONNECT TO THE SECOND FLOOR CABLE TRAY AS SHOWN. THIS CONDUIT IS TO BE USED AS WIREWAY FOR TSA COMMUNICATION OUTLETS. SEE ET413
4. POWER & DATA OUTLET FOR CEILING MOUNTED OPS-1 TO OPS-6 ARE TO BE PLACED ABOVE CEILING. PROVIDE PEERLESS MOUNT #PLCM-UNL AND ALL REQUIRED HARDWARE FOR A COMPLETE INSTALLATION. ROUTE THE WIRING INSIDE THE COLUMN. PENETRATE THE CEILING TILE IN THE CENTER.
5. PROVIDE LMR-400DB 50 OHM FLEXIBLE LOW LOSS WATERTIGHT COAXIAL CABLE TO ROOFTOP ANTENNA VIA ANTENNA CONDUIT ROOF PENETRATION. SEE A104 TERMINATE W/N CONNECTOR MONT AND CONNECT VHF ANTENNA ANDREN #DB224FAA PER DETAIL 2 ET414.
6. NOT USED.
7. PROVIDE CEILING MOUNTED COMMERCIAL GRADE FULL HD PROJECTOR. COORDINATE EXACT LOCATION WITH OWNER. CEILING COMMUNICATION OUTLET TO BE LOCATED NEXT TO THE PROJECTOR.
8. PROVIDE DUAL CONNECTION TO IDF-3.

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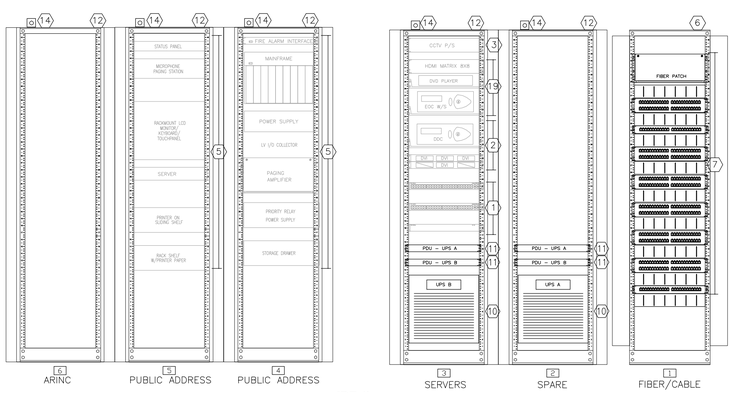
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SHEET TITLE
TECHNOLOGY THIRD FLOOR PLAN AREA B

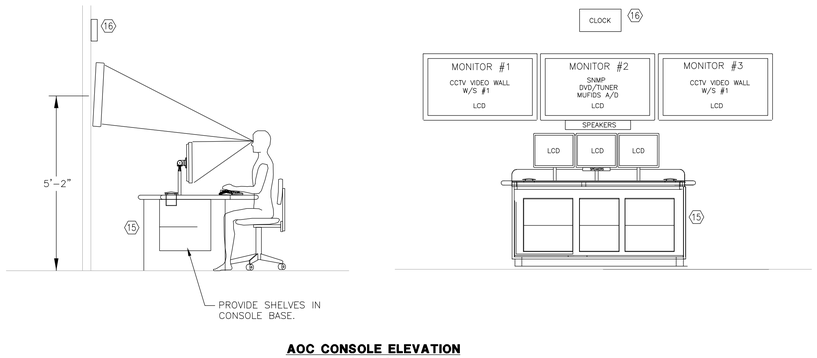
SHEET NUMBER
ET415

BID PACKAGE 2B ISSUED FOR BID

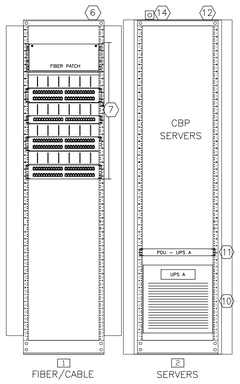
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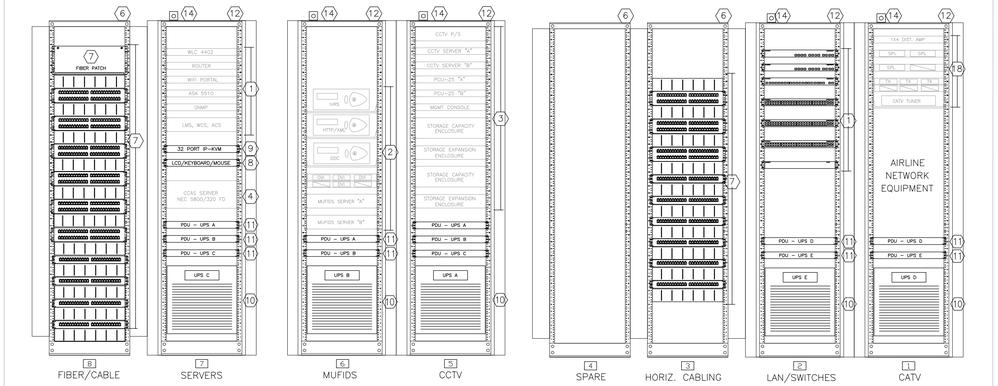
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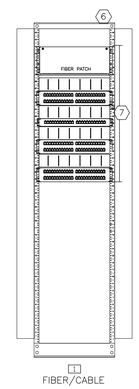
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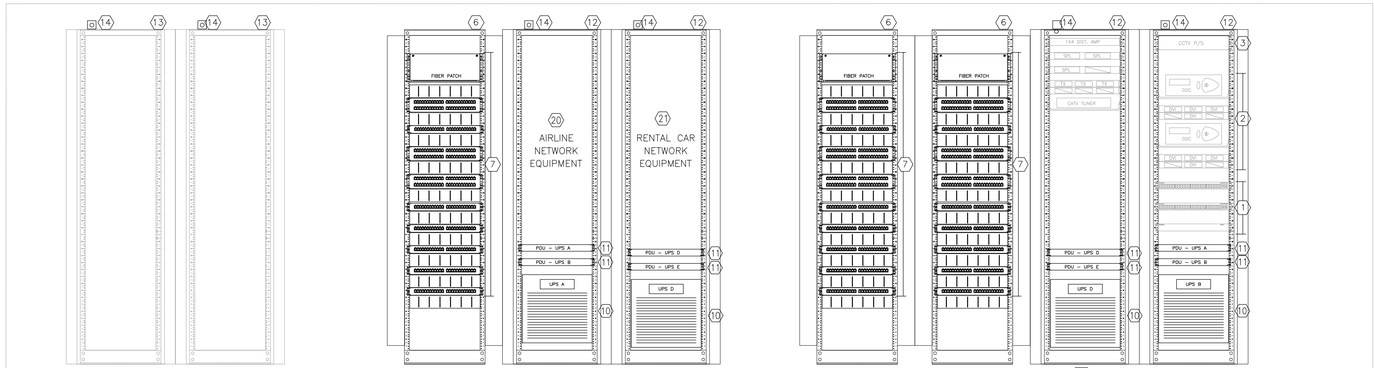
CBP (IDF-2)
RM. 240



MDF
RM. 217



TSA (IDF-4)
RM. 312



IDF-1
RM. 151

GENERAL NOTES

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

NOTES

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

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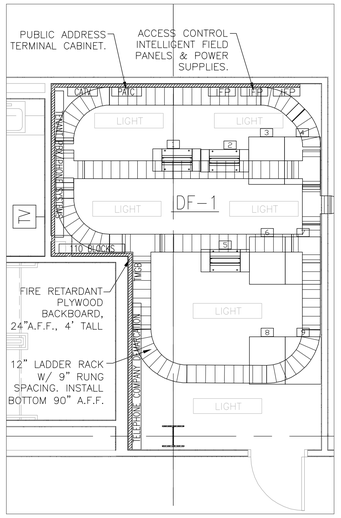
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SHEET TITLE
COMMUNICATIONS EQUIPMENT RACK ELEVATIONS

SHEET NUMBER
ET501

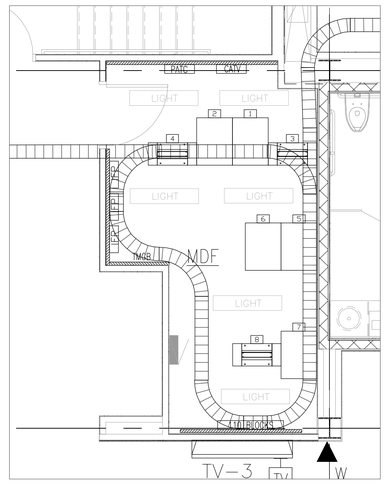
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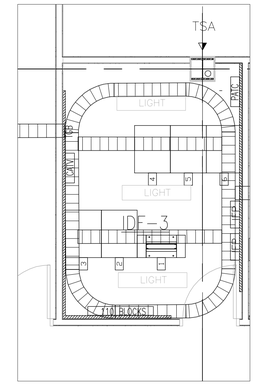
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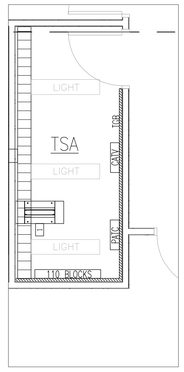
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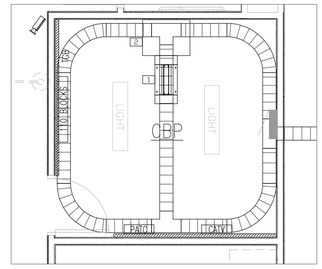
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SCALE: 1/4"=1' 0"



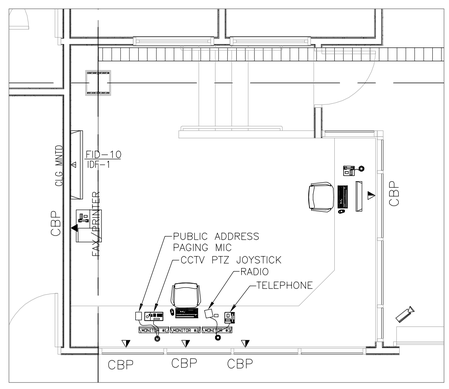


4 ET502 **ENLARGED TSA TELECOM ROOM (IDF-4) #312**

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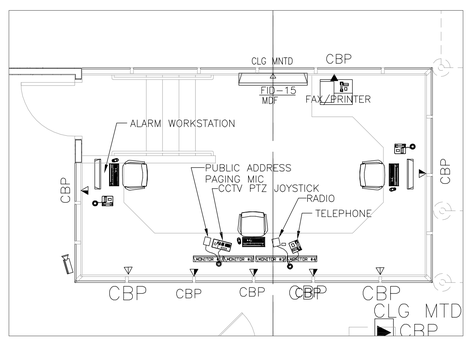
5 ET502 **ENLARGED CBP COMPUTER ROOM (IDF-2) #240**

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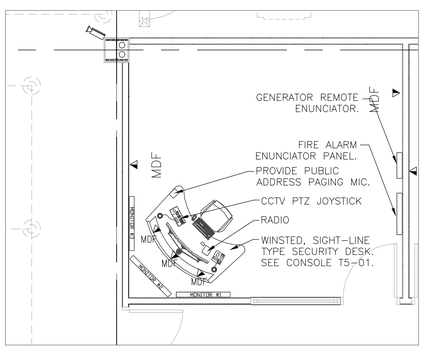
7 ET502 **ENLARGED CBP ROVER ROOM #163**

SCALE: 1/4"=1' 0"



8 ET502 **ENLARGED CBP COORD. CTR ROOM #245**

SCALE: 1/4"=1' 0"



9 ET502 **ENLARGED AIRPORT POLICE #213**

SCALE: 1/4"=1' 0"

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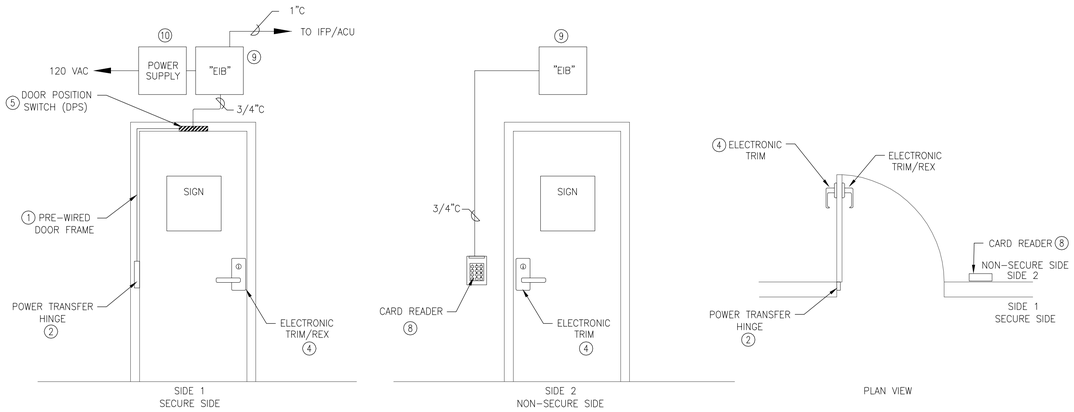
ENLARGED ROOM PLANS

SHEET NUMBER

ET502

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET5-02 Enlarged Rooms.dwg Plotted on: 8/24/2011 3:34 PM Plotted by: Lazari, Rional



SIDE 1 – EGRESS/SECURE SIDE

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

SIDE 2 – NON-SECURE SIDE

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

DOOR OPERATION UNDER LOSS OF POWER:

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

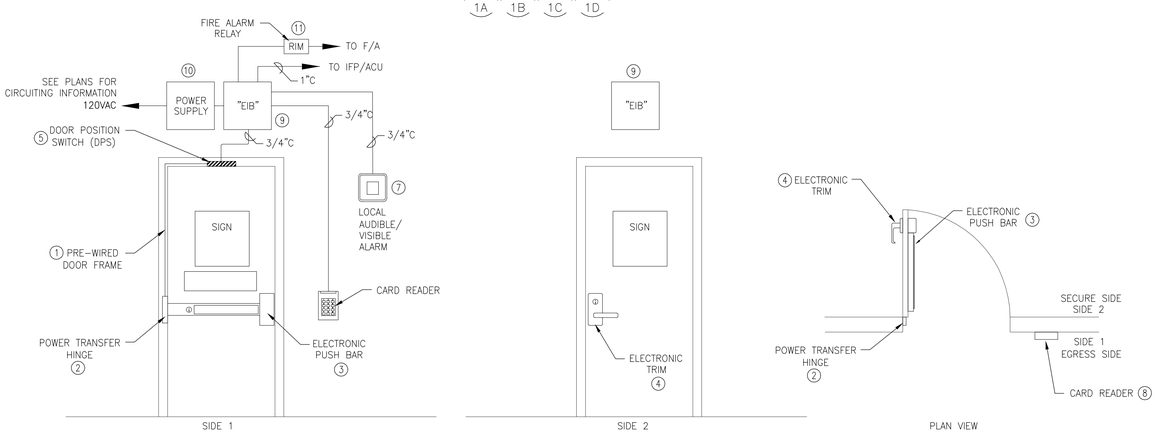
TYPE 1A, 1B, 1C, AND 1D DESCRIPTIONS

1. TYPE 1 SHOWN IN DETAIL.
2. TYPE 1A IS THE SAME AS TYPE 1 (SGL CARD READER) EXCEPT WITH DOUBLE DOORS (PROVIDE DPS BOTH DOORS).
3. TYPE 1B IS THE SAME AS TYPE 1 EXCEPT WITH DUAL CARD READER (SGL DOOR, SIDE 1 SIGN TYPE 4).
4. TYPE 1C IS THE SAME AS TYPE 1B EXCEPT DOUBLE DOOR (DBL DOOR).
5. TYPE 1D IS THE SAME AS TYPE 1 EXCEPT ELECTRONIC TRIM/REX IS REPLACED WITH ELECTRONIC PUSH BAR/REX ON SIDE 1..

TYPE 1 ACCESS POINT (#1)

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

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



SIDE 1 – EGRESS SIDE

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

SIDE 2 – STERILE SIDE/SECURE SIDE

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

DOOR OPERATION UNDER ALARM CONDITIONS:

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

DOOR OPERATION UNDER LOSS OF POWER:

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

TYPE 4A, 4B, 4C AND 4D DESCRIPTIONS

1. TYPE 4 SHOWN IN DETAIL.
2. TYPE 4A IS THE SAME AS TYPE 4 EXCEPT WITH DOUBLE DOORS. PROVIDE DPS ON BOTH DOORS.
3. TYPE 4B IS THE SAME AS TYPE 4 EXCEPT WITH DUAL CARD READER.
4. TYPE 4C IS THE SAME AS TYPE 4B EXCEPT WITH DOUBLE DOORS.
5. TYPE 4D IS THE SAME AS TYPE 4 EXEPT THERE IS NO HARDARE ON SIDE 2. (ONE WAY DOOR).

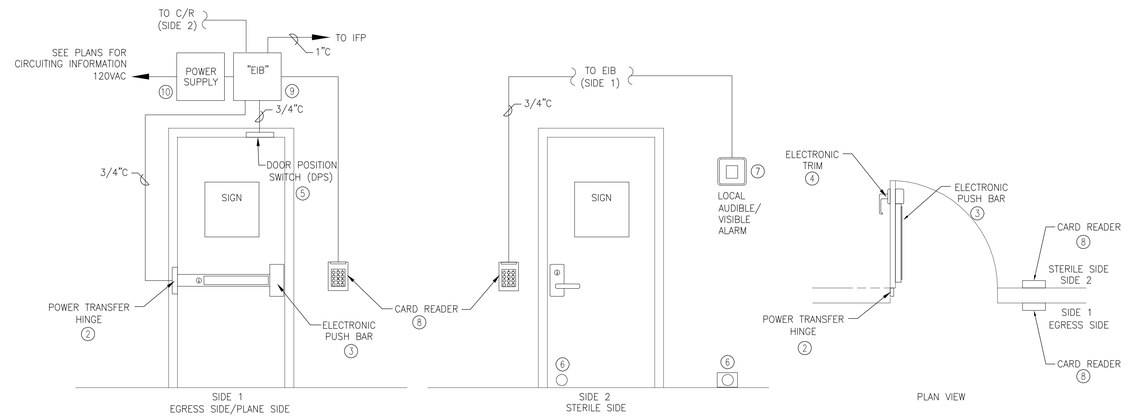
TYPE 4A, 4B, 4C AND 4D GENERAL NOTES

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

TYPE 4 ACCESS POINT (#4)

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

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



TYPE "LB" GENERAL NOTES

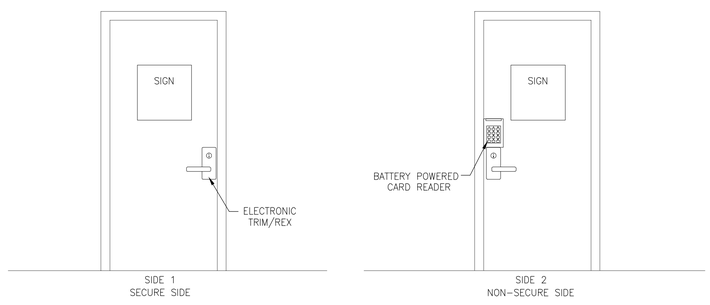
1. PROVIDE 20A CIRCUIT FROM EMERGENCY PANEL. ONE CIRCUIT SHALL FEED NO MORE THAN 4 DOORS. LABEL PANEL SCHEDULE "ACCESS CONTROL DOOR".
2. PROVIDE CONDUIT FOR AUDIBLE/VISIBLE ALARM UNDER THIS PACKAGE.

DOOR OPERATION UNDER ALARM CONDITIONS:

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

TYPE LB ACCESS POINT (#LB)

PASSENGER LOADING BRIDGE



TYPE 2A & 2B DESCRIPTIONS

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

TYPE 2 ACCESS POINT (#2)

ACCESS CONTROL SYSTEM GENERAL NOTES

1. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
2. REFER TO ACCESS POINT SCHEDULE DWG ET600 FOR DOOR CONFIGURATION AND SIGNAGE TYPE. SEE ET5-05 FOR SECURITY SIGNAGE.
3. ACCESS CONTROL SYSTEM SHALL MONITOR OR INTERFACE WITH THE FOLLOWING ITEMS AT EACH ACCESS POINT (IF AVAILABLE):
   - A. CARD READER TAMPER
   - B. EIB TAMPER
   - C. POWER SUPPLY TAMPER
   - D. DOOR POSITION SWITCHES
   - E. POWER SUPPLY POWER FAIL
   - F. POWER SUPPLY BATTERY LOW/FAIL
   - G. REQUEST TO EXIT (REX)
   - H. PANIC BAR ALARM – COUNTDOWN (DELAYED EGRESS ONLY)
   - I. FIRE ALARM RELEASE (DELAYED EGRESS ONLY)
   - J. LOCAL ALARM
4. DOORS TO BE HELD OPEN FOR LONGER THAN 30 SECONDS SHALL:
   - A. ALLOW AUTHORIZED USERS TO KEY-IN THE TIME TO KEEP DOOR OPEN. ONCE THE DOOR IS CLOSED, THE DOOR SHALL RESET INTO SECURE POSITION.
   - B. ACTIVATE A PRE-ALARM AUDIO BEEP ON CARD READER TO INDICATE EXPIRATION OF TIME IS NEARING. COORDINATE PRE-ALARM TIME WITH OWNER.
   - C. AFTER PRE-ALARM AND PRIOR TO EXPIRATION OF TIME DOORS WITH MAGNETIC HOLD OPEN DEVICES SHALL RELEASE DOOR TO PREVENT HOLD OPEN ALARM.
   - D. EXPIRATION OF TIME SHALL ACTIVATE THE HORN/STROBE AT THE DOOR AND A STEADY BEEP ON THE READER.
5. SEE ET504 FOR ACCESS POINT/DOOR HARDWARE SCHEDULE.

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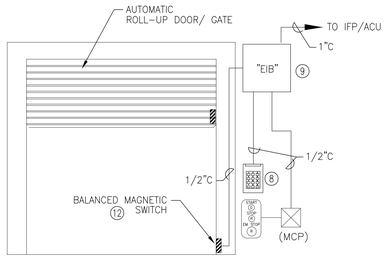
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SHEET TITLE
ACCESS CONTROL DETAILS

SHEET NUMBER
ET503

BID PACKAGE 2B ISSUED FOR BID

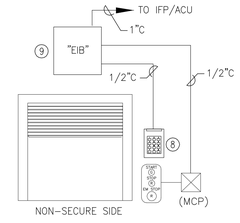
Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET5-03Access Point Det.dwg Plotted on: 8/24/2011 3:38 PM Plotted by: Lazari, Rional



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

TYPE 5 ACCESS POINT (#5)

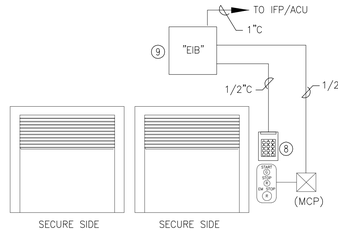
ROLL-UP DOOR/ GATE



1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE BAGGAGE BELT SYSTEM THROUGH THE BAGGAGE BELT MOTOR CONTROL PANEL (MCP). THE ROLL-UP DOORS SHALL REMAIN OPEN ONLY IF THE BAGGAGE SYSTEM IS OPERATIONAL AND SHALL INDICATE ALARM CONDITIONS IF THE DOOR IS OPEN AND THE BAGGAGE SYSTEM HAS STOPPED FOR AN ADJUSTABLE PERIOD OF 1 TO 15 MINUTES. CARD READER SHALL BE USED TO ACTIVATE THE BAGGAGE CLAIM CONVEYOR CONTROL PUSH BUTTONS.
2. MOUNT THE CARD READER NEXT TO THE CONTROLS FOR THE BAGGAGE SYSTEM.
3. USE BAGGAGE SYSTEM LIMIT SWITCHS TO SENSE DOOR POSITON OTHERWISE PROVIDE WIDE GAP BALANCED MAGNETIC SWITCH.

TYPE 6 ACCESS POINT (#6)

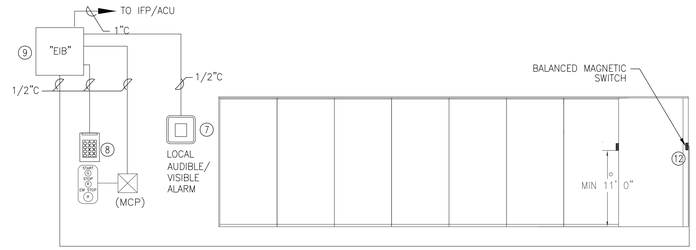
OUTBOUND TICKET COUNTER BAGGAGE BELT



1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE BAGGAGE BELT SYSTEM THROUGH THE BAGGAGE BELT MOTOR CONTROL PANEL (MCP). THE ROLL-UP DOORS SHALL REMAIN OPEN ONLY IF THE BAGGAGE SYSTEM IS OPERATIONAL AND SHALL INDICATE ALARM CONDITIONS IF THE DOOR IS OPEN AND THE BAGGAGE SYSTEM HAS STOPPED FOR AN ADJUSTABLE PERIOD OF 1 TO 15 MINUTES. CARD READER SHALL BE USED TO ACTIVATE THE BAGGAGE CLAIM DEVICE CONTROL PUSH BUTTONS.
2. MOUNT THE CARD READER NEXT TO THE CONTROLS FOR THE BAGGAGE SYSTEM. COORDINATE LAY-OUT WITH MUFIDS TUG INPUT STATION, 15" MUFIDS MONITOR AND PA MICROPHONE SYSTEM.
3. USE BAGGAGE SYSTEM LIMIT SWITCHS TO SENSE DOOR POSITON OTHERWISE PROVIDE WIDE GAP BALANCED MAGNETIC SWITCH.

TYPE 7 ACCESS POINT (#7)

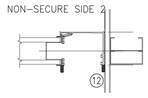
INBOUND BAGGAGE CLAIM BAGGAGE BELT

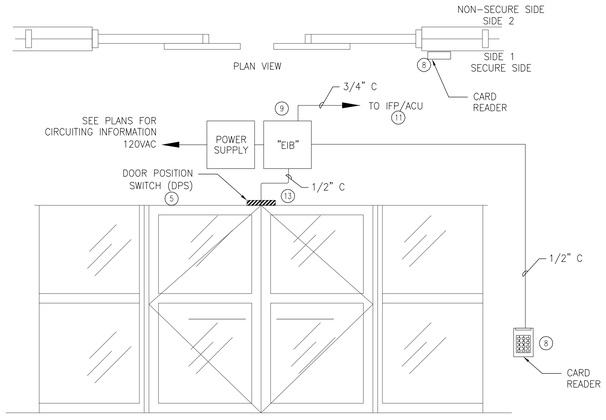


1. INTERFACE THE ACCESS CONTROL SYSTEM OPERATION WITH THE ELECTRIFIED PARTITION (MCP). CARD READER SHALL BE USED TO ACTIVATE THE ELECTRIFIED PARTITION CONTROL PUSH BUTTONS. LOCATE CARD READER NEAR ELECTRIFIED PARTITION DOOR PUSH BUTTONS.
2. PROVIDE THE OPTION FOR AUTOMATIC OPEN OR CLOSE OF DOOR WITH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

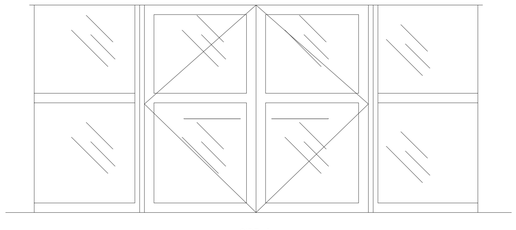
TYPE 8 ACCESS POINT (#8)

ELECTRIFIED PARTITION





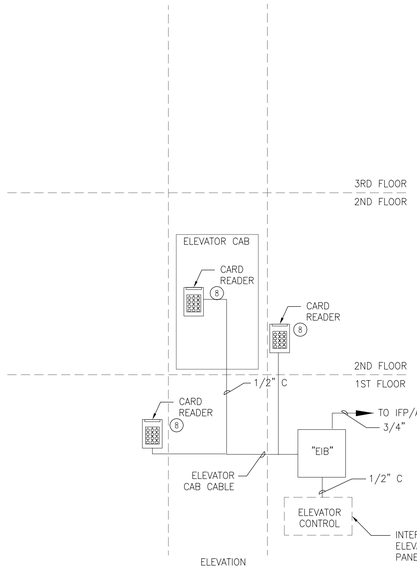
SIDE 1
SECURE SIDE



SIDE 2
NON-SECURE SIDE

TYPE 9 ACCESS POINT (#9)

SLIDING GLASS TERMINAL DOOR



ELEVATION

DOOR OPERATION UNDER ALARM CONDITIONS:

1. FIRE ALARM SHALL RESTRICT ACCESS TO THE ELEVATOR. ACCESS CONTROL SHALL NOT ALLOW ACCESS. FIRE MARSHALL KEY SHALL ALLOW ACCESS BUT PROVIDE ALARM ON ACCESS CONTROL SYSTEM.

TYPE "EL" GENERAL NOTES

1. ADDRESSABLE RELAY WITH N.O. & N.C. DRY CONTACTS TO BE LOCATED IN THE ELEVATOR MACHINE ROOM. THE ACCESS CONTROL CONTRACTOR SHALL INTERFACE WITH THE ELEVATOR CONTROLS SO THE CARD READER WILL ENABLE ELEVATOR CALL BUTTONS FOR USER CONFIGURATION PERIOD OF 1-30 SECONDS.

ELEVATOR SEQUENCE OF OPERATION

PUBLIC OPERATION

1. UNDER NORMAL OPERATION THE ELEVATOR WEST DOORS ARE CLOSED AT ALL TIMES

CBP OPERATION

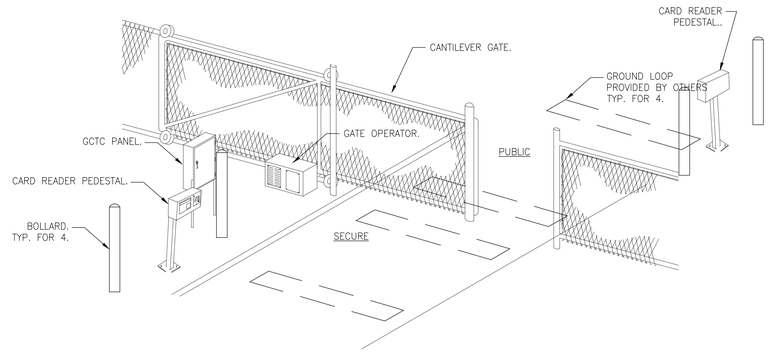
1. UPON CLOSURE OF THE INTERNATIONAL DIVIDING WALLS AND CBP VERIFICATION OF EMPTY CAR, ELEVATOR 154 WILL BE PLACED UNDER CBP CONTROL BY THE IN CAR CARD READER ALLOWING CALLS FROM CORRIDOR 155 OR CORRIDOR 229 PUSH BUTTONS AND PROVIDING ALARM NOTIFICATION THAT THE CAR IS IN CBP SERVICE.
2. "ELEVATOR NOT AVAILABLE" SIGN WILL BE ILLUMINATED AT EAST ELEVATOR DOORS ON THE 1st 2nd AND 3rd LEVELS. EAST ELEVATOR DOOR CALL STATIONS FROM BAG CLAIM 116, PASSENGER WAITING 201 AND WAITING 301 SHALL NOT BE ANSWERED UNTIL ELEVATOR IS RETURNED TO PUBLIC USE.
3. IF THE DPS ON EITHER SIDE DIVIDING WALL INDICATES "OPEN" A CARD ACCESS ALARM WILL SOUND, THE ELEVATOR 154 WILL RETURN TO THE 1st LEVEL & PARK WITH WEST DOORS OPEN.
4. UPON COMPLETION OF INTERNATIONAL PASSENGER PROCESSING, CBP WILL RELEASE ELEVATOR USING THE IN-CAR CARD READER WITH CARD AND PIN # ENTRY WHICH WILL CLOSE WEST DOOR, TURN OFF "ELEVATOR NOT AVAILABLE" SIGN, AND OPEN EAST DOOR.

TYPE EL ACCESS POINT (#EL)

SECURE ELEVATOR

ACCESS POINT/DOOR HARDWARE SCHEDULE:

	DESCRIPTION	SPEC. #	MANUFACTURER / MODEL	REMARKS
1	PRE-CONDUITED DOOR FRAME	–	ASSA ABLOY / ELECTROLYNX	PROVIDED IN TERMINAL PACKAGE SCOPE
2	ELECTRIFIED HINGE	–	ELECTROLYNX QC8 & QC12	PROVIDED IN TERMINAL PACKAGE SCOPE
3	ELECTRONIC PUSH BAR	–	CORBIN RUSSWIN ED5000 SERIES	PROVIDED IN TERMINAL PACKAGE SCOPE
4	ELECTRONIC TRIM	–	CORBIN RUSSWIN ML20900 SERIES	PROVIDED IN TERMINAL PACKAGE SCOPE
5	DOOR POSITION SWITCH (BMS)	13700	SECURITRON OR GE DPS	
6	MAGNETIC HOLD-OPEN/DOOR RELEASE	–	RIXSON 980	FLOOR MOUNTED
7	AUDIBLE/VISUAL ALARM	13700	SYSTEM SENSOR P4R	4 WIRE, WHITE, WALL MOUNTED
8	CARD READER	13700	HID RK40	
9	ELECTRONIC INTERFACE BOX	13700		READER INTERFACE AND I/O MODULES
10	POWER SUPPLY	13700	ALTRONIX AL125UL	1A, 12VDC, 7.2AH BATTERY
11	FIRE ALARM RELAY	–	PROVIDE AS REQUIRED	USE TERMINAL PACKAGE FIRE ALARM INTEGRATOR
12	WIDE GAP BALANCED MAGNETIC SWITCH	13700	SECURITRON MSS-1	
13	TWO POINT LOCK SOLONOID	8460		



TYPE 12 NOTES:

1. CONTRACTOR SHALL INTERFACE WITH GATE OPERATOR CONTROL PANEL.
2. PROVIDE WIDE GAP BALANCED MAGNETIC SWITCH AT ALL GATE LOCATIONS.
3. PROVIDE RELAYS TO INTERFACE WITH GROUND LOOPS USED AS REQUEST TO EXIT.

TYPE 12 ACCESS POINT (#12)

VEHICLE GATE

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

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DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

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

REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	02.25.11
	BP2A CONFORMANCE SET	05.02.11

DATE ISSUED: 08-23-11
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

ACCESS CONTROL DETAILS

SHEET NUMBER

ET504

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET5-03Access Point Det.dwg Plotted on: 8/24/2011 3:38 PM Plotted by: Lizarri, Rional

10"

STERILE AREA #1

AUTHORIZED PERSONNEL ONLY

AIRPORT ISSUED BADGE MUST BE DISPLAYED

ENSURE THIS ACCESS POINT IS SECURED AFTER USE

AREA MONITORED BY SECURITY #4

49 CFR PART 1542

13"

TYPE 1 SIGN

10"

SECURED AREA #2

AUTHORIZED PERSONNEL ONLY

AIRPORT ISSUED BADGE MUST BE DISPLAYED

ENSURE THIS ACCESS POINT IS SECURED AFTER USE

AREA MONITORED BY SECURITY #4

49 CFR PART 1542

13"

TYPE 2 SIGN

10"

CAUTION #3

DO NOT LEAVE DOOR UNTIL COMPLETELY CLOSED

ENSURE THIS ACCESS POINT IS SECURED AFTER USE

YOU ARE RESPONSIBLE FOR ILLEGAL ENTRY #4

49 CFR PART 1542

13"

TYPE 3 SIGN

18"

EMERGENCY EXIT

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

5"

TYPE 4 SIGN

18"

EMERGENCY EXIT

#2 **WAIT FOR GATE AGENT OPENING DOOR SOUNDS ALARM**

5"

TYPE 5 SIGN

10"

EFFECTIVE IMMEDIATELY

BY ORDER OF THE DEPARTMENT OF HOMELAND SECURITY TRANSPORTATION SECURITY ADMINISTRATION

EMPLOYEES ENTERING THE STERILE AREA ARE SUBJECT TO INSPECTION

EMPLOYEES NOT TRAVELING ON AIRCRAFT MAY BRING LIQUIDS, GELS, AND/OR AEROSOLS THROUGH ACCESS POINTS OTHER THAN THE PASSENGER SCREENING CHECKPOINT #4

5"

TYPE 6 SIGN

10"

SECURED AREA #2

AUTHORIZED PERSONNEL ONLY

5"

TYPE 7 SIGN

10"

CAUTION

DO NOT LEAVE DOOR UNTIL COMPLETELY CLOSED #3

5"

TYPE 8 SIGN

10"

AUTHORIZED PERSONNEL USE ONLY #4

5"

TYPE 9 SIGN

SIGN TYPES

SIGN NOTES:

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

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SHEET TITLE

ACCESS CONTROL SIGNS

SHEET NUMBER

ET505

BID PACKAGE 2B ISSUED FOR BID

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ACCESS POINT SCHEDULE

POINT ID	DOOR #	TERM POINT	LOCATION	POINT TYPE	REF DWG	CCTV CAMERA	SECURITY LINE SIDE 1	SECURITY LINE SIDE 2	SIGNAGE SIDE 1	SIGNAGE SIDE 2	NOTES
1	179C	IDF-1	TUG DRIVE TO LANDSIDE	4D	ET410	–	SIDA	NON-SECURE	TYPE 3	TYPE 2	ALARM WHEN OPEN, NO HARDWARE SIDE 2
2	176E	IDF-1	TUG DRIVE TO LANDSIDE	4D	ET410	#2	SIDA	NON-SECURE	TYPE 3	TYPE 2	ALARM WHEN OPEN, NO HARDWARE SIDE 2
3	–	IDF-1	INTERNATIONAL 117 TO TUG TUNNEL	7	ET410	#1,#2	NON SECURE	SIDA	–	–	BAGGAGE BELT
4	117A	IDF-1	INTERNATIONAL 117 TO LANDSIDE	4B	ET410	#51	SECURE	NON-SECURE	TYPE 4	TYPE 2	
5	180A	IDF-1	INTERNATIONAL 117 TO OFFICE 180	1	ET410	#1	NON-SECURE	SECURE	TYPE 7	TYPE 8	
6	159A	IDF-1	INTERNATIONAL 117 TO SEC. X-RAY 159	5	ET410	#1	NON-SECURE	SECURE	–	–	
7	159B	IDF-1	INTERNATIONAL 117 TO SEC. X-RAY 159	1	ET410	#1	SECURE	NON-SECURE	TYPE 8	TYPE 7	
8	100A	IDF-1	VESTIBULE 100 TO INTERNATIONAL 117	9	ET410	#1	NON-SECURE	SECURE	–	–	
9	181A	IDF-1	SECONDARY 159 TO CASH 181	1	ET410	#52	SECURE	SECURE	TYPE 7	TYPE 8	
10	160A	IDF-1	SECONDARY 159 TO AG. LAB 160	1	ET410	#52	SECURE	SECURE	TYPE 7	TYPE 8	
11	167A	IDF-1	OFFICE 166 TO SECURE STORAGE 167	1	ET410	–	SECURE	SECURE	TYPE 7	TYPE 8	
12	168A	IDF-1	CORRIDOR 168 TO CORRIDOR 182	1	ET410	#54	SECURE	SECURE	TYPE 8	TYPE 7	
13	172A	IDF-1	CORRIDOR 168 TO DBS 172	2	ET410	–	SECURE	SECURE	–	–	
14	163A	IDF-1	SECONDARY 159 TO ROVER 163	1	ET410	#53	SECURE	SECURE	TYPE 8	TYPE 7	
15	155B	IDF-1	BAGGAGE CLAIM 116 TO RECHECK 155	1C	ET410	#3	SECURE	NON-SECURE	TYPE 8	TYPE 7	
16	154	IDF-1	RECHECK 155 TO ELEV. 154	EL	ET410	–	–	–	–	–	
17	150A	IDF-1	RECHECK 155 TO CORRIDOR 150	2	ET410	–	SECURE	NON-SECURE	TYPE 8	TYPE 7	
18	–	IDF-1	RECHECK 155 TO TUG TUNNEL	7	ET410	#4	NON-SECURE	SIDA	–	–	BAGGAGE BELT
19	176F	IDF-1	RECHECK 155 TO TUG TUNNEL	1	ET410	#4	SECURE	SIDA	TYPE 2	TYPE 3	
20	156A	IDF-1	CORRIDOR 150 TO BREAK 156	2	ET410	–	SECURE	SECURE	TYPE 7	TYPE 8	
21	–	IDF-1	BAGGAGE CLAIM 116 TO TUG TUNNEL	7	ET410	#4,#3	NON-SECURE	SIDA	–	–	BAGGAGE BELT
22	149A	IDF-1	ELECTRICAL 149 TO TUG TUNNEL	1	ET410	#4	SECURE	SIDA	TYPE 2	TYPE 3	
23	151A	IDF-1	BAGGAGE CLAIM 116 TO COMM. 151	2	ET410	–	SECURE	NON-SECURE	TYPE 8	TYPE 7	
24	149B	IDF-1	CORRIDOR 140 TO ELECTRICAL 149	2	ET410	–	SECURE	SECURE	TYPE 8	TYPE 7	
25	140A	IDF-1	CORRIDOR 140 TO BAGGAGE CLAIM 116	2	ET410	#3	SECURE	NON-SECURE	TYPE 8	TYPE 7	
26	140B	IDF-1	CORRIDOR 140 TO TUG TUNNEL	1A	ET411	#5	SECURE	SIDA	TYPE 2	TYPE 3	
27	133C	IDF-1	CORRIDOR 140 TO CBIS ROOM 133	1A	ET411	–	SECURE	SECURE	TYPE 8	TYPE 7	
28	–	IDF-1	CBIS ROOM 133 TO TUG TUNNEL	7	ET411	#5,#6,#7,#8	NON-SECURE	SIDA	–	–	BAGGAGE BELT
29	–	IDF-1	CBIS ROOM 133 TO TUG TUNNEL	7	ET411	#5,#7,#9,#13	SECURE	SIDA	–	–	BAGGAGE BELT
30	133A	IDF-1	LOBBY/CIRCULATION 104 TO CBIS 133	1	ET411	#6	SECURE	NON-SECURE	TYPE 8	TYPE 7	
31	133D	IDF-1	LOBBY/CIRCULATION 104 TO CBIS 133	1	ET411	#10,#11	SECURE	NON-SECURE	TYPE 8	TYPE 7	
32	–	IDF-1	CHECK IN COUNTER 103 TO CBIS 133	6	ET411	#10,#11	NON-SECURE	SECURE	–	–	
33	120B	IDF-1	CORRIDOR 120 TO CBIS ROOM 133	1	ET411	–	SECURE	SECURE	TYPE 8	TYPE 7	
34	176A	IDF-1	LOADING 126 TO TUG TUNNEL	1A	ET411	#13	SECURE	SIDA	TYPE 2	TYPE 3	
35	176B	IDF-1	TUG TUNEL 176 TO LANDSIDE	4D	ET411	#13	SIDA	NON-SECURE	TYPE 3	TYPE 2	ALARM WHEN OPEN, NO HARDWARE SIDE 2
36	178C	IDF-1	EAST TUG RAMP 178 TO ALNDSIDE	4D	ET411	–	SIDA	NON-SECURE	TYPE 3	TYPE 2	ALARM WHEN OPEN, NO HARDWARE SIDE 2
37	126B	IDF-1	LANDSIDE TO LOADING 126	1	ET411	–	SECURE	NON-SECURE	TYPE 8	TYPE 7	
38	126C	IDF-1	CORRIDOR 126 TO LOADING 126	2	ET411	–	SECURE	NON-SECURE	TYPE 8	TYPE 7	
39	120A	IDF-1	CHECK-IN LOBBY TO CORRIDOR 120	2	ET411	#12	SECURE	NON-SECURE	TYPE 8	TYPE 7	
40	117B	IDF-1	BAGGAGE CLAIM 116 TO INTERNATIONAL 117	8	ET411	–	SECURE	NON-SECURE	–	–	
41	190B	IDF-1	LANDSIDE TO STAIRS	2	ET411	–	NON-SECURE	NON-SECURE	–	–	
42	219A	MDF	CONCOURSE 219 TO CORRIDOR 233	1B	ET412	#18	STERILE	STERILE	TYPE 8	TYPE 7	
43	219C	MDF	CONCOURSE 219 TO CONCOURSE 219	8	ET412	#18,#19	SECURE	NON-SECURE	–	–	
44	242A	MDF	STERILIE CORRIDOR 242 TO RAMP 247	LB	ET412	#44	SIDA	STERILE	TYPE 1	TYPE 2	
45	242C	MDF	STERILIE CORRIDOR 242 APRON	4B	ET412	#14	STERILE	SIDA	TYPE 2	TYPE 1	
46	237C	MDF	STERILE CORRIDOR 242 TO CBP PRIM. PROC.	4B	ET412	#31	SECURE	STERILE	TYPE 1	TYPE 2	
47	233B	MDF	STERILE CORRIDOR 242 TO CORRIDOR 233	1B	ET412	#31	STERILE	STERILE	TYPE 2	TYPE 3	
48	237B	MDF	CORRIDOR 233 TO BOARDING 231	1	ET412	–	STERILE	STERILE	TYPE 2	TYPE 3	
49	233B	MDF	CBP PRIM. PROC. 237 TO CBP PRIM. PROC.	4B	ET412	#45	SECURE	SECURE	TYPE 2	TYPE 3	
50	245A	MDF	CBP PRIM. PROC. 237 TO CBP COORD. CNTR.	1	ET412	–	SECURE	SECURE	TYPE 3	TYPE 2	
51	--	MDF	CBP PRIM. PROC. 237 TO STAIRS 292	9	ET412	#30	SECURE	NON-SECURE	TYPE 3	TYPE 2	
52	241A	MDF	CBP PRIM. PROC. 237 TO OFFICE 241	2	ET412	–	SECURE	SECURE	–	–	
53	240A	MDF	CBP PRIM. PROC. 237 TO LAN. RM. 240	1	ET412	–	SECURE	SECURE	TYP3 2	TYPE 3	
54	237D	MDF	CBP PRIM. PROC. 237 TO DEPARTURE LOUNGE	4D	ET412	#18,#49	SECURE	STERILE	TYP3 4	–	
55	232A	MDF	VESTIBULE 232 TO APRON	4B	ET412	#15	STERILE	SIDA	TYPE 2	TYPE 1	
56	219I	MDF	DEPARTURE LOUNGE 219 TO APRON	4B	ET412	#16	STERILE	SIDA	TYPE 2	TYPE 1	
57	219B	MDF	DEPARTURE LOUNGE 219 TO CORRIDOR 229	4B	ET412	#17	SECURE	STERILE	TYPE 1	TYPE 2	
58	230A	MDF	PASSENGER WAITING 201 TO ELEC. RM 230	2	ET412	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
59	217A	MDF	PASSENGER WAITING 201 TO COMM. RM. 217	2	ET412	–	NON-SECURE	SECURE	TYPE 7	TYPE 8	
60	219H	MDF	DEPARTURE LOUNGE 219 TO BOARDING BRIDGE	LB	ET412	#19	SIDA	STERILE	TYPE 1	TYPE 2	
61	214A	MDF	PASSENGER WAITING 201 TO TSA QUEUE	5	ET413	#21	NON SECURE	STERILE	–	–	
62	214B	MDF	PASSENGER WAITING 201 TO TSA QUEUE	1	ET413	#21	NON-SECURE	STERILE	TYPE 3	TYPE 1	
63	213A	MDF	PASSENGER WAITING 201 TO AIRPORT POLICE	1	ET413	#21	NON-SECURE	SECURE	TYPE 7	TYPE 8	
64	208A	MDF	CORRIDOR 202 TO TSA CHECKPOINT 208	1	ET413	#26	NON-SECURE	STERILE	TYPE 3	TYPE 1	
65	219G	MDF	CONCOURSE 219 TO BOARDING BRIDGE	LB	ET413	#25	SIDA	STERILE	TYPE 1	TYPE 2	
66	219F	MDF	CONCOURSE 219 TO APRON	4B	ET413	#29	STERILE	SIDA	TYPE 2	TYPE 1	
67	219E	MDF	CONCOURSE 219 TO FIXED BRIDGE 248	LB	ET413	#29	SIDA	STERILE	TYPE 1	TYPE 2	

GENERAL NOTES:

1. SEE DRAWINGS ET503, ET504 FOR ACCESS POINT DETAILS.
2. SEE DRAWING ET505 FOR ACCESS POINT SIGNAGE.
3. SEE DRAWING ET601 FOR ACCESS POINT RISER DIAGRAM AND NOTES.

ACCESS POINT SCHEDULE

POINT ID	DOOR #	TERM POINT	LOCATION	POINT TYPE	REF DWG	CCTV CAMERA	SECURITY LINE SIDE 1	SECURITY LINE SIDE 2	SIGNAGE SIDE 1	SIGNAGE SIDE 2	NOTES
68	203B	MDF	CONCOURSE 219 TO COORIDOR 203	4B	ET413	#28	STERILE	SECURE	–	–	
69	204A	MDF	CORRIDOR 203 TO TELECOM 204	2	ET413	–	SECURE	SECURE	–	–	
70	203A	MDF	CORRIDOR 202 TO CORRIDOR 203	2	ET413	–	SECURE	NON-SECURE	–	–	
71	333A	IDF-3	WAITING 301 TO MECHANICAL ROOM 333	2A	ET414	#33	SECURE	NON-SECURE	–	–	
72	391B	IDF-3	STAIRS 391 TO ELECTRICAL 334	2	ET414	–	SECURE	NON-SECURE	–	–	
73	318A	IDF-3	WAITING 301 TO EMERGENCY OPS 318	2A	ET414	#40	SECURE	NON-SECURE	–	–	
74	317A	IDF-3	WAITING 301 TO RECEPTION 321	2	ET414	#40	SECURE	NON-SECURE	–	–	
75	302A	IDF-3	CORRIDOR 302 TO OPEN OFFICE 328	2	ET415	–	SECURE	NON-SECURE	–	–	
76	336A	IDF-3	CORRIDOR 302 TO STORAGE 336	2	ET415	–	NON-SECURE	SECURE	–	–	
77	337A	IDF-3	CORRIDOR 302 TO COM/ELEC 337	2	ET415	–	NON-SECURE	SECURE	–	–	
78	306A	IDF-3	CORRIDOR 302 TO CORRIDOR 306	2	ET415	–	SECURE	NON-SECURE	–	–	
79	304A	IDF-3	CORRIDOR 302 TO MECHANICAL 304	2A	ET415	–	SECURE	NON-SECURE	–	–	
80	335C	IDF-3	CORRIDOR 302 TO CORRIDOR 335	4	ET415	–	NON-SECURE	SECURE	–	–	
81	304B	IDF-3	CORRIDOR 335 TO MECHANICAL 304	2	ET415	–	SECURE	SECURE	–	–	
82	390A	IDF-3	CORRIDOR 335 TO STAIRS 390	2	ET415	–	SECURE	NON-SECURE	–	–	
83	205A	MDF	CORRIDOR 209 TO JAN 205	2	ET413	–	SECURE	SECURE	–	–	
84	138A	IDF-1	LOBBY/CIRCULATION 104 TO JAN 138	2	ET411	–	SECURE	NON-SECURE	–	–	
85	106A	IDF-1	LOBBY/CIRCULATION 104 TO RAC6B	2	ET411	–	SECURE	NON-SECURE	–	–	
86	107A	IDF-1	RAC6A TO RAC6B	2	ET411	–	SECURE	NON-SECURE	–	–	
87	108A	IDF-1	LOBBY/CIRCULATION 104 TO RAC5B	2	ET411	–	SECURE	NON-SECURE	–	–	
88	109A	IDF-1	RAC5A TO RAC5B	2	ET411	–	SECURE	NON-SECURE	–	–	
89	110A	IDF-1	LOBBY/CIRCULATION 104 TO RAC4B	2	ET411	–	SECURE	NON-SECURE	–	–	
90	111A	IDF-1	RAC4A TO RAC4B	2	ET411	–	SECURE	NON-SECURE	–	–	
91	112A	IDF-1	LOBBY/CIRCULATION 104 TO RAC3B	2	ET411	–	SECURE	NON-SECURE	–	–	
92	113A	IDF-1	RAC3A TO RAC3B	2	ET411	–	SECURE	NON-SECURE	–	–	
93	114A	IDF-1	LOBBY/CIRCULATION 104 TO RAC2B	2	ET410	–	SECURE	NON-SECURE	–	–	
94	115A	IDF-1	RAC2A TO RAC2B	2	ET410	–	SECURE	NON-SECURE	–	–	
95	148A	IDF-1	CORRIDOR 140 TO SUB.OFFICE148	2	ET410	–	SECURE	SECURE	–	–	
96	141A	IDF-1	CORRIDOR 140 TO MAINT.141	2	ET410	–	SECURE	SECURE	–	–	
97	142A	IDF-1	CORRIDOR 140 TO BHS STOR 142	2	ET411	–	SECURE	SECURE	–	–	
98	166A	IDF-1	CORRIDOR TO OFFICE 166	2	ET410	–	SECURE	SECURE	–	–	
99	122A	IDF-1	CORRIDOR 120 TO OPS 122	2	ET411	–	SECURE	SECURE	–	–	
100	123B	IDF-1	OPS 122 TO OFFICE 123	2	ET411	–	SECURE	SECURE	–	–	
101	123A	IDF-1	CORRIDOR 120 TO OFFICE 123	2	ET411	–	SECURE	SECURE	–	–	
102	124A	IDF-1	CORRIDOR 120 TO OPS 124	2	ET411	–	SECURE	SECURE	–	–	
103	125B	IDF-1	OPS 124 TO OFFICE 125	2	ET411	–	SECURE	SECURE	–	–	
104	125A	IDF-1	CORRIDOR 120 TO OFFICE 125	2	ET411	–	SECURE	SECURE	–	–	
105	131A	IDF-1	CORRIDOR 120 TO OPS 131	2	ET411	–	SECURE	SECURE	–	–	
106	131B	IDF-1	OPS 131 TO OFFICE 132	2	ET411	–	SECURE	SECURE	–	–	
107	127B	IDF-1	OFFICE 132 TO OPS 127	2	ET411	–	SECURE	SECURE	–	–	
108	127A	IDF-1	CORRIDOR 120 TO OPS 127	2	ET411	–	SECURE	SECURE	–	–	
109	208B	MDF	CONCOURSE 219 TO TSA CHECKPOINT 208	5	ET413	–	STERILE	SECURE	–	–	
110	209A	MDF	TSA CHECKPOINT 208 TO STOR 209	2	ET413	–	SECURE	SECURE	–	–	
111	210A	MDF	TSA CHECKPOINT 208 TO REMOTE V 210	2	ET413	–	SECURE	SECURE	–	–	
112	211A	MDF	TSA CHECKPOINT 208 TO TSA 211	2	ET413	–	SECURE	NON-SECURE	–	–	
113	212A	MDF	CORRIDOR 202 TO DLH POLICE 112	2	ET413	–	SECURE	NON-SECURE	–	–	
114	314A	IDF-3	COORIDOR 302 TO JAN 314	2	ET415	–	SECURE	NON-SECURE	–	–	
115	323A	IDF-3	CORRIDOR 317 TO EXEC. DIR 323	2	ET415	–	SECURE	SECURE	–	–	
116	324A	IDF-3	CORRIDOR 317 TO OPS 324	2	ET415	–	SECURE	SECURE	–	–	
117	325A	IDF-3	OPEN OFFICE 328 TO DIR 325	2	ET415	–	SECURE	SECURE	–	–	
118	326A	IDF-3	OPEN OFFICE 328 TO DIR 326	2	ET415	–	SECURE	SECURE	–	–	
119	327A	IDF-3	OPEN OFFICE 328 TO OFF 327	2	ET415	–	SECURE	SECURE	–	–	
120	313B	IDF-3	RECEPT 321 TO BADGE 313	2	ET415	–	SECURE	SECURE	–	–	
121	332A	IDF-3	OPEN OFFICE 328 TO OFFICE 332	2	ET415	–	SECURE	SECURE	–	–	
122	313A	IDF-3	OPEN OFFICE 328 TO BADGE 313	2	ET415	–	SECURE	SECURE	–	–	
123	311A	IDF-3	CORRIDOR 306 TO TSA OFF 311	2	ET415	–	SECURE	SECURE	–	–	
124	312A	IDF-3	CORRIDOR 306 TO TSA OFF 312	2	ET415	–	SECURE	SECURE	–	–	
125	305B	IDF-3	CORRIDOR 306 TO OFFICE 305	2	ET415	–	SECURE	SECURE	–	–	
126	305A	IDF-3	OPEN OFFICE 328 TO OFFICE 305	2	ET415	–	SECURE	SECURE	–	–	
127	319A	IDF-3	EMERG OPS 318 TO STORAGE 319	2	ET414	–	SECURE	SECURE	–	–	
128	320A	IDF-3	CORRIDOR 317 TO OPS CONF 320	2	ET414	–	SECURE	SECURE	–	–	
129	322A	IDF-3	CORRIDOR 317 TO OPS CONF 322	2	ET414	–	SECURE	SECURE	–	–	
130	318A	IDF-3	CORRIDOR 317 TO EMERG OPS 318	2	ET414	–	SECURE	SECURE	–	–	
131	251A	IMDF	CORRIDOR 203 TO OFFICE 251	2	ET413	–	NON-SECURE	SECURE	–	–	
132	250A	MDF	CORRIDOR 203 TO CONF 250	2	ET413	–	NON-SECURE	SECURE	–	–	
133	234A	MDF	BOARDING 231 TO FBO OFFICE 234	2	ET412	–	SECURE	SECURE	–	–	
134	135A	IDF-1	LOBBY/ CIRCULATION 104 TO BAG 135	2	ET411	–	NON-SECURE	SECURE	–	–	
135	134A	IDF-1	LOBBY/ CIRCULATION 104 TO BAG 134	2	ET411	–	NON-SECURE	SECURE	–	–	
136	183A	IDF-1	LOBBY/ CIRCULATION 104 TO BAG 183	2	ET411	–	NON-SECURE	SECURE	–	–	
137	184A	IDF-1	LOBBY/ CIRCULATION 104 TO BAG 184	2	ET411	–	NON-SECURE	SECURE	–	–	
138	183A	IDF-1	LOBBY/CIRCULATION 104 TO RAC1B	2	ET410	–	NON-SECURE	SECURE	–	–	
139	184A	IDF-1	RAC1A TO RAC1B	2	ET410	–	NON-SECURE	SECURE	–	–	
140	161	IDF-1	CORRIDOR 182 TO ADIT 162	2	ET410	–	SECURE	SECURE	–	–	

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 2	02.25.11
	BP2A CONFORMANCE SET	05.02.11

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REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
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SHEET TITLE

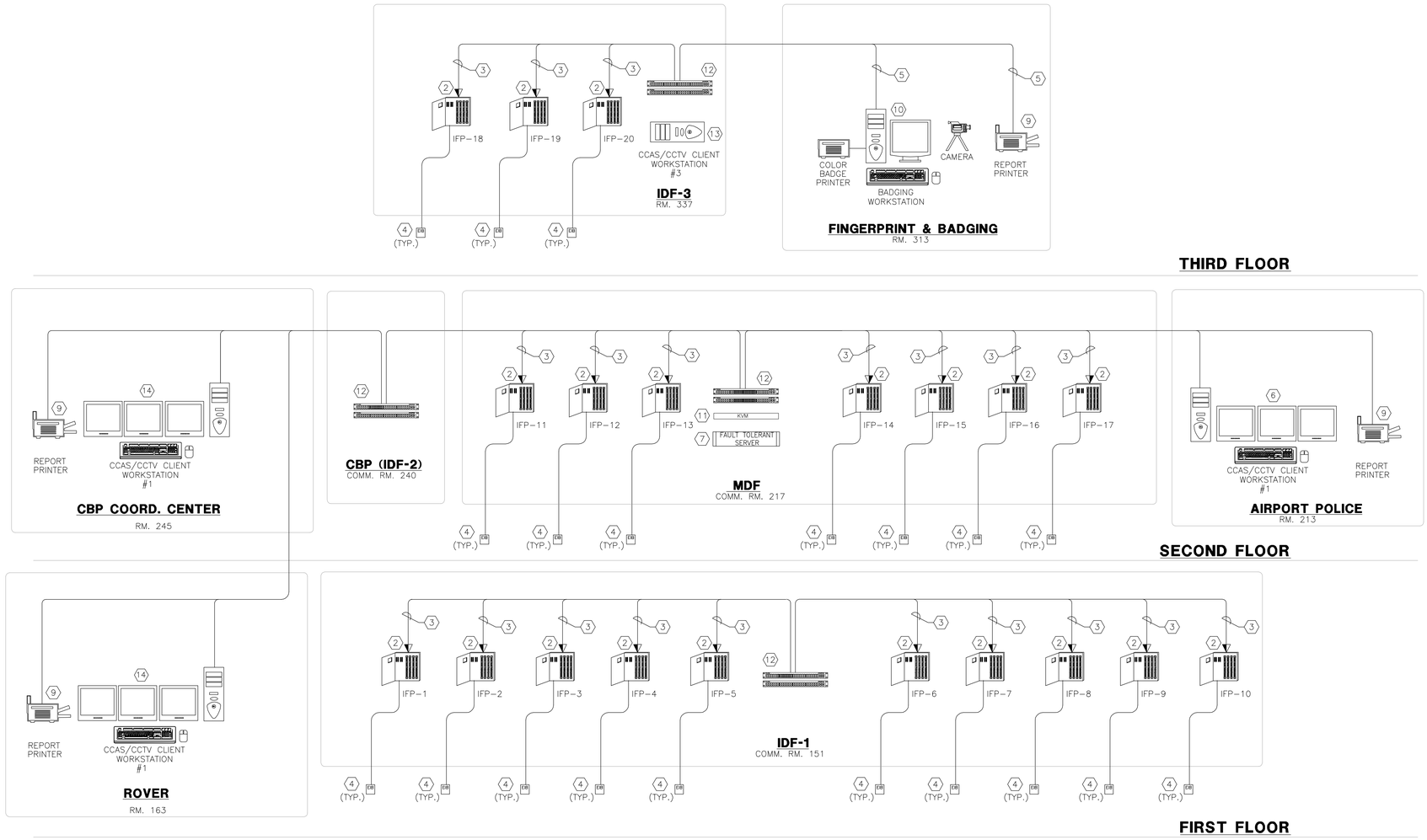
ACCESS POINT SCHEDULE

SHEET NUMBER

ET600

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET6-01 Security Riser.dwg Plotted on: 8/24/2011 3:38 PM Plotted by: Llazari, Rional



1 ET6-01 **SECURITY RISER**

SCALE: NTS

GENERAL NOTES:

1. REFER TO SPECIFICATIONS SECTION 13700 FOR COMPUTER CONTROLLED ACCESS SYSTEM (CCAS) SCOPE OF WORK.
2. REFER TO SPECIFICATIONS SECTIONS 16710, 16716, 16717 FOR PREMISE WIRING SYSTEM SCOPE OF WORK.
3. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS AND PRODUCT DATASHEETS FOR ALL COMPONENTS. SHOP DRAWINGS SHALL SHOW ALL COMPONENTS, POINT TO POINT WIRING DIAGRAMS, HARDWARE & SOFTWARE CONFIGURATIONS, CABLE COLOR CODING AND COMPONENT FUNCTIONS. HARDWARE SHALL NOT BE PURCHASED OR INSTALLED UNTIL SUBMITTALS HAVE BEEN APPROVED BY A/E.
4. ON ALL TYPE 1 & 1A ACCESS POINTS CARD READERS SHALL BE LOCATED ON THE UNSECURED SIDE OF THE DOOR.
5. CONTRACTOR SHALL COMPLY WITH THE AIRPORT SECURITY AND SAFETY REQUIREMENTS WHILE WORKING AT THE AIRPORT TERMINAL AND AIRFIELD AREAS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY TSA (TRANSPORTATION SECURITY ADMINISTRATION) FINES INCURRED DUE TO THEIR OR THEIR SUB-CONTRACTOR'S, NEGLIGENCE.
6. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
7. THE SCOPE SHALL INCLUDE IMPLEMENTATION, SETUP AND TRAINING OF THE OWNERS STAFF AND CONNECTION TO ALL THE EQUIPMENT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL COMPONENTS REQUIRED TO CONNECT THE ACCESS CONTROL SYSTEM TO THE NETWORK. THE CONTRACTOR SHALL COORDINATE WITH SECURITY EQUIPMENT SUPPLIERS TO CONNECT AND TEST THE NETWORK DEVICES. THE CONTRACTOR SHALL COORDINATE WITH AIRPORT "IT" SUPPORT PERSONNEL AND CONSULTANTS.
8. CONTRACTOR SHALL LABEL ALL PATCH PANELS, CABLES AND TERMINATION LOCATIONS. LABELS SHALL BE TYPE WRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.
9. PROVIDE GRAPHICAL MAPS OF TERMINAL AREAS, FLOORS AND SITE. GRAPHICAL MAPS SHALL BE PROGRAMMED WITH ACCESS POINTS AND CAMERAS. MAPS SHALL BE CAD VECTOR BASED FORMAT.
10. SEE SHEET T5-01 FOR EQUIPMENT RACK LAYOUTS. PROVIDE DETAILED RACK LAYOUTS OF EQUIPMENT FOR APPROVAL.
11. PROVIDE CRYSTAL REPORTS FOR CUSTOM REPORT GENERATION. PROVIDE CONNECTION TO ACCESS CONTROL DATABASE.
12. SEE DRAWINGS ET503 AND ET504 FOR DOOR ACCESS POINT TYPES.

NOTES: ⬡

1. 2 CARD READER INTELLIGENT FIELD PANEL (IFP) AS SPECIFIED IN SPECIFICATION SECTION 13700.
2. 16 CARD READER INTELLIGENT FIELD PANEL (IFP) AS SPECIFIED IN SPECIFICATION SECTION 13700. ALLOW FOR A MINIMUM OF 20% FUTURE EXPANSION.
3. (3) CAT 6 CABLES TERMINATED ON COM OUTLET. COM OUTLET SHALL BE INSTALLED INSIDE IFP WHERE APPLICABLE.
4. ELECTRONIC INTERFACE BOX (EIB). TYPICALLY (1) EIB IS LOCATED AT EACH ACCESS POINT. EIB SHALL CONTAIN (1) DUAL READER MODULES & ADDITIONAL I/O BOARDS AS REQUIRED. EIB'S SHALL BE LOCATED ON THE SECURE SIDE OF THE ACCESS POINT UNLESS OTHERWISE INDICATED.
5. COMMUNICATIONS OUTLET INSTALLED UNDER TERMINAL PACKAGE D.
6. CCAS/CCTV CLIENT WORKSTATION. WORKSTATION SHALL BE INTEL CORE 2 QUAD Q9950, 2.83GHZ, 4GB RAM, 250GB HARD DRIVE, 512MB NVIDIA QUADRO NVS 420. WORKSTATION SHALL BE DELL OPTIPLEX 960 MINI TOWER OR EQUAL. PROVIDE (3) 19" LCD MONITORS. LCD MONITORS SHALL SUPPORT 1280X1024 DVI OR DISPLAYPORT. INSTALL IN CONSOLE. SEE DETAIL 9, T5-02 & CONSOLE ELEVATION T5-01.
7. PROVIDE FAULT TOLERANT OR DUAL CONFIGURATION SERVER. SEE SPECIFICATIONS (SECTION 13700) FOR COMPLETE SPECS.
8. NOT USED
9. PROVIDE PRINTERS AS SPECIFIED IN SPECIFICATION SECTION 13700.
10. PROVIDE BADGING CAMERA, PRINTER AS SPECIFIED IN SPECIFICATIONS SECTION 13700. WORKSTATION SHALL BE SAME AS HEX NOTE 6 EXCEPT PROVIDE (1) 19" MONITOR.
11. KVM SWITCH. SEE T5-01. CONNECT CCAS SERVERS TO KVM VIA CROSS PATCH TO MDF.
12. NETWORK SCOPE ON T6-04. COORDINATE PORT CONFIGURATIONS AND REQUIREMENTS WITH NETWORK SCOPE. BALANCE PORT USAGE BETWEEN NETWORK SWITCHES. PROVIDE REDUNDANT CONNECTION FOR SERVERS.
13. RACK MOUNTED CCAS/CCTV CLIENT WORKSTATION FOR EMERGENCY OPERATIONS CENTER (EOC). PROVIDE SAME WORKSTATION AS HEX NOTE 6 EXCEPT DUAL OUTPUT 512MB ATI RADEON HD4670 & (1) 17" RACK MOUNTED MONITOR. PROVIDE WIRELESS KEYBOARD MOUSE. KEYBOARD MOUSE SHALL BE WIRELESS COMPUTING RF-420 OR EQUAL. PROVIDE USB EXTENDER OVER UTP TO EXTEND USB RECEIVER TO EOC SPACE FOR WIRELESS KEYBOARD & MOUSE. CONNECT VIDEO OUTPUT 1 TO LOCAL MONITOR AND VIDEO OUTPUT 2 TO HDMI SWITCHER. HDMI OUTPUT SHALL PROVIDE VIDEO & AUDIO. SEE T6-05 FOR OPS CENTER DISPLAY RISER. PROVIDE RACK MOUNTING KITS FOR ALL RACK HARDWARE.
14. CCAS/CCTV CLIENT WORKSTATION. WORKSTATION SHALL BE INTEL CORE 2 QUAD Q9950, 2.83GHZ, 4GB RAM, 250GB HARD DRIVE, 512MB NVIDIA QUADRO NVS 420. WORKSTATION SHALL BE DELL OPTIPLEX 960 MINI TOWER OR EQUAL. PROVIDE (3) 20" LCD MONITORS. LCD MONITORS SHALL SUPPORT 1280X1024 DVI OR DISPLAYPORT. INSTALL IN CONSOLE. SEE DETAILS 7&8, T5-02

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	02.25.11
	BP2A CONFORMANCE SET	05.02.11

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DRAWN BY: RJL
DESIGNED BY: BA

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SHEET TITLE

SECURITY RISER

SHEET NUMBER

ET601

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET6-01 Security Riser.dwg Plotted on: 8/24/2011 3:38 PM Plotted by: Lazari, Rional

MUFIDS DISPLAY SCHEDULE

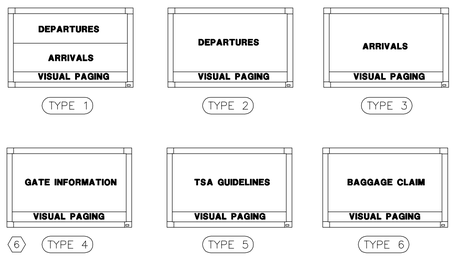
MUFIDS ID	TERM. POINT	LOCATION OF DISPLAY	MUFIDS TYPE	MONITOR SIZE & TYPE	MOUNT TYPE	MOUNT MODEL	REF. DRAWING	REMARKS
FID-1	IDF-1	CHECK-IN LOBBY #102	FID	55" LED	TILT	PEERLESS ST660	ET411	
FID-2	IDF-1	CHECK-IN LOBBY #102	FID	55" LED	TILT	PEERLESS ST660	ET411	
FID-3	IDF-1	CHECK-IN LOBBY #102	FID	55" LED	TILT	PEERLESS ST660	ET411	
FID-4	IDF-1	CHECK-IN LOBBY #102	FID	55" LED	TILT	PEERLESS ST660	ET411	
FID-5	IDF-1	CBIS ROOM #133	FID	32" LCD	TILT	PEERLESS ST660	ET411	PROVIDED BY OWNER
FID-6	IDF-1	BAGGAGE CLAIM #104	BID	47" LED	TILT	PEERLESS ST660	ET410	
FID-7	IDF-1	BAGGAGE CLAIM #104	BID	47" LED	TILT	PEERLESS ST660	ET410	
FID-8	IDF-1	INTERNATIONAL #117	BID	47" LED	TILT	PEERLESS ST660	ET410	
FID-9	IDF-1	INTERNATIONAL #117	BID	47" LED	TILT	PEERLESS ST660	ET410	
FID-10	IDF-1	ROVER #163	FID	32" LCD	TILT	PEERLESS ST660	ET410	PROVIDED BY OWNER
FID-11	IDF-1	TUG TUNNEL #176	BID	15" LED	ARTICULATING	PEERLESS SAL730P	ET410	
FID-12	IDF-1	TUG TUNNEL #176	BID	15" LED	ARTICULATING	PEERLESS SAL730P	ET410	
FID-13	IDF-1	SECONDARY #159	FID	42" LED	TILT	PEERLESS ST660	ET410	
FID-14						PEERLESS ST660		
FID-15	MDF	CBP COORDINATION CNTR. #245	FID	32" LCD	TILT	PEERLESS ST660	ET412	PROVIDED BY OWNER
FID-16	MDF	BOARDING #231	GID	42" LED	TILT	PEERLESS ST660	ET412	
FID-17	MDF	CONCOURSE GATE 1 #219	GID	42" LED	TILT	PEERLESS ST660	ET412	
FID-18	MDF	CONCOURSE GATE 2 #219	GID	42" LED	TILT	PEERLESS ST660	ET412	
FID-19	MDF	PASSENGER WAITING #201	FID	47" LED	TILT	PEERLESS ST660	ET412	
FID-20	MDF	TSA QUEUE #214	TSA	47" LED	ARTICULATING	PEERLESS SA750PU	ET413	WITH AUDIO
FID-21	MDF	TSA CHECKPOINT #208	FID	47" LED	TILT	PEERLESS ST660	ET413	--
FID-22	MDF	CONCOURSE GATE 3 #219	GID	42" LED	TILT	PEERLESS ST660	ET413	
FID-23	MDF	CONCOURSE GATE 4 #219	GID	42" LED	TILT	PEERLESS ST660	ET413	--
FID-24	MDF	CONCOURSE EAST #219	FID	47" LED	TILT	PEERLESS ST660	ET413	
FID-25	IDF-3	RECEPTION #321	FID	32" LCD	TILT	PEERLESS ST660	ET415	PROVIDED BY OWNER
FID-26	MDF	CONCOURSE WEST #219	FID	47" LED	TILT	PEERLESS ST660	ET412	
FID-27	IDF-3	OPS CENTER DISPLAY SYSTEM	FID	–	–	–	–	ARRIVALS
FID-28	IDF-3	OPS CENTER DISPLAY SYSTEM	FID	–	–	–	–	DEPARTURES
FID-29	IDF-3	OPS CENTER DISPLAY SYSTEM	FID	–	–	–	–	ARRIVE/DEPART

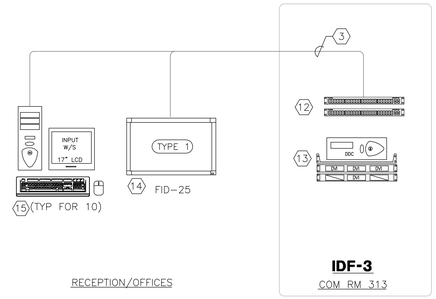
GENERAL NOTES

1. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS FOR ALL COPPER PATCH PANEL CONNECTIONS, RACKS AND EQUIPMENT LAYOUTS. THE SHOP DRAWINGS SHALL CLEARLY SHOW POINT TO POINT CONNECTIONS AND LOCATION OF ALL PATCH PANELS, SIZE, QTY, AND PORT USAGE. THESE DRAWINGS INDICATE TYPICAL CONNECTIONS. PROVIDE ADDITIONAL RACKS AND OTHER ACCESSORIES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
2. THE CONTRACTOR SHALL COMPLY WITH THE AIRPORT SECURITY AND SAFETY REQUIREMENTS WHILE WORKING AT THE AIRPORT TERMINAL AND AIRFIELD AREAS.
3. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
4. THE SCOPE SHALL INCLUDE IMPLEMENTATION, SETUP, TRAINING TO THE OWNERS STAFF, AIRLINE PERSONAL AND CONNECTION TO ALL THE EQUIPMENT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL PROVIDE ALL COMPONENTS REQUIRED TO CONNECT FLIGHT INFORMATION DISPLAY SYSTEM TO THE NETWORK. THE CONTRACTOR SHALL COORDINATE WITH MUFIDS EQUIPMENT SUPPLIERS TO CONNECT AND TEST THE NETWORK DEVICES. THE CONTRACTOR SHALL COORDINATE WITH AIRPORT "IT" SUPPORT PERSONAL AND CONSULTANTS. SEE NETWORK RISER SHEET ET6-04 FOR NETWORK SCOPE OF WORK.
5. REFER TO SPECIFICATION SECTION 13742 FOR COMPUTER HARDWARE AND SOFTWARE REQUIREMENTS.
6. CONTRACTOR SHALL LABEL ALL PATCH PANELS, CABLES AND TERMINATION LOCATIONS. LABELS SHALL BE TYPE WRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.
7. INSTALL FIDS CLIENT SOFTWARE OR WEB INTERFACE SHORTCUT ON AIRPORT OPERATIONS WORKSTATION.
8. PROGRAM LCD MONITORS TO TURN ON AND OFF BASED ON A OWNER DEFINED SCHEDULE.
9. PROVIDE INSTALLATION OF NEC NAVISET SOFTWARE ON A MINIMUM OF 2 AIRPORT IT DEFINED WORKSTATIONS. INSTALL NEC NAVISET SOFTWARE ON INPUT WORKSTATION LOCATED IN RECEPTION AREA.
10. CONFIGURE DISPLAYS TO PROVIDE AUTOMATIC EMAIL NOTIFICATION TO AIRPORT IT.
11. DISABLE DISPLAY LOCAL CONTROLS TO PREVENT PUBLIC TAMPERING.

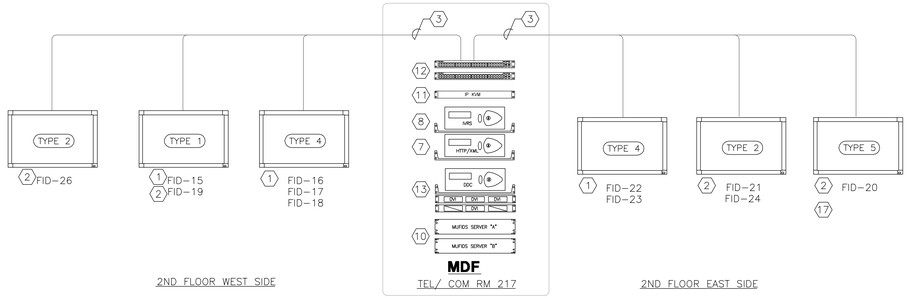
NOTES:

1. 42" LED MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL (0.65" OR LESS) AND CABLE COVER. MONITOR SHALL BE LG 42LE530C OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH.
2. 47" LED MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL (0.65" OR LESS) AND CABLE COVER. MONITOR SHALL BE LG 47LE530C OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH.
3. (3) CAT6 CABLES TERMINATED ON COMM OUTLET. PROVIDE ADDITIONAL OUTLETS AS INDICATED ON PLANS.
4. INPUT STATION/VISUAL PAGING STATION AS MANUFACTURED BY DELL (MODEL OPTIPLEX SX270) OR APPROVED EQUAL. SEE SPECIFICATIONS FOR COMPLETE SYSTEM SPECIFICATION.
5. PROVIDE TUG INPUT DEVICE COMPATIBLE WITH PROPOSED INFORMATION DISPLAY SYSTEM.
6. PROVIDE 3 OPTIONS FOR EACH GRAPHIC DISPLAY SCREEN FOR OWNER'S APPROVAL. THE GATE COUNTERS SHALL HAVE AIRLINE GRAPHIC DISPLAYS AS APPROVED BY THE AIRLINES.
7. HTML/WEB INTERFACE. REFER TO SPECIFICATIONS.
8. MUFIDS IVRS – IINTEGRATED VOICE RESPONSE SYSTEM. REFER TO SPECIFICATIONS. PROVIDE WIRING TO PHONE SYSTEM FOR A MINIMUM OF (2) PHONE LINES.
9. 15" LCD DISPLAY WALL MOUNTED FOR TUG OPERATOR. DISPLAY SHALL SHOW SAME INFORMATION AS RESPECTIVE BID DISPLAY. DISPLAY SHALL HAVE HIGH BRIGHTNESS 500 CD/M2 OR GREATER AND HIGH CONTRAST 800:1 OR GREATER. DISPLAY SHALL BE NEC ASLCD52V-BK OR EQUAL. PROVIDE DUST COVER.
10. MUFIDS SERVER. SEE SPECIFICATIONS FOR COMPETE SYSTEM SPECIFICATION. PROVIDE CONNECTION TO DUAL SWITCH FOR REDUNDANCY.
11. KVM SWITCH PROVIDED ON ET5-01. CONNECT ALL SERVERS TO KVM IN MDF. CROSS-PATCH IDF DEVICES TO MDF KVM.
12. NETWORK SWITCHES PROVIDED ON ET6-04. COORDINATE NETWORK SWITCH PORT CONFIGURATIONS AND REQUIREMENTS WITH NETWORK SCOPE OF WORK.
13. DIGITAL DISPLAY CONTROLLER (DDC). PROVIDE A RACKMOUNT COMPUTER FOR MUFIDS DISPLAYS. PROVIDE RACKMOUNTED VIDEO EXTENDERS. EACH DDC SHALL BE CAPABLE OF A MINIMUM OF 4 INDEPENDENT DISPLAY OUTPUTS. REFER TO SPECIFICATIONS.
14. PROVIDE MONITOR AS INDICATED IN HEX NOTE 1. PROVIDE TV TUNER (NTSC/ATSC/QAM) & SPEAKER OPTION.
15. FIDS INPUT WORK STATION. SEE PLANS FOR LOCATION. COORDINATE FINAL LOCATIONS WITH OWNER AND AIRLINES.
16. PROVIDE (3) SEPERATE DVI VIDEO OUTPUTS FROM DDC FOR OPERATIONS CENTER DISPLAYS. DVI EXTENDERS NOT REQUIRED. SEE OPERATIONS CENTER DISPLAY RISER ET6-05.
17. PROVIDE SPEAKERS & AUDIO UTP BALUN EXTENSION FROM DDC FOR TSA MONITOR.
18. 55" LED MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL (0.65" OR LESS) AND CABLE COVER. MONITOR SHALL BE LG 55LE530C OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH.

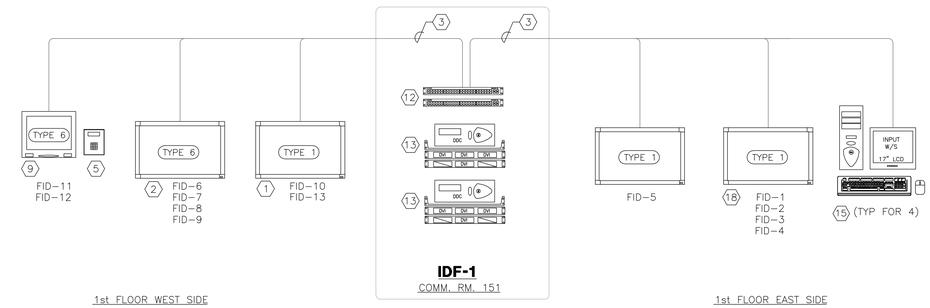




THIRD FLOOR



SECOND FLOOR



FIRST FLOOR

1 ET6-02 **MUFIDS RISER**

SCALE: NTS

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

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DULUTH AIRPORT AUTHORITY

DULUTH INTERNATIONAL AIRPORT DULUTH, MN

NEW PASSENGER TERMINAL

CONSULTANTS

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SJA ARCHITECTS
11 E Superior Street Suite 340, Duluth MN 55802
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MBJ CONSULTING ENG.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

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

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2432 East First Street, Duluth MN 55812
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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	02.25.11
	BP2A CONFORMANCE SET	05.02.11

DATE ISSUED: 08-23-11
REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

MUFIDS RISER

SHEET NUMBER

ET602

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET6-02 Mufids Riser.dwg Plotted on: 8/24/2011 3:39 PM Plotted by: Lizarri, Rional

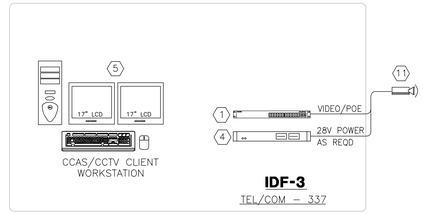
CCTV CAMERA SCHEDULE

CAMERA ID	TERM. POINT	LOCATION SHOWN BY CAMERA	LENS TYPE	LENS MM	INDOOR OUTDOOR	MOUNT TYPE	CAMERA SYSTEM MODEL	ENCLOSURE	VIDEO/DATA CABLE	POWER SUPPLY	POWER CABLE	REFERENCE DRAWING	NOTES
#1	IDF-1	INTERNATIONAL #117	PTZ	--	INDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET401	
#2	IDF-1	TUG TUNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	--	ET401	
#3	IDF-1	BAGGAGE CLAIM # 116	PTZ	--	INDOOR	TYPE-5	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET401	
#4	IDF-1	TUG TUNNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	INDOOR DOME	CAT6	PoE	--	ET401	
#5	IDF-1	TUG TUNNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	INDOOR DOME	CAT6	PoE	--	ET401	
#6	IDF-1	LOBBY CIRCULATION #104	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET401	
#7	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	PoE	--	ET401	
#8	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	--	ET401	
#9	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	--	ET401	
#10	IDF-1	EDT #133	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	--	ET401	
#11	IDF-1	CHEK-IN LOBBY #102	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	--	ET401	
#12	IDF-1	CHEK-IN LOBBY #102	PTZ	--	INDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET401	
#13	IDF-1	TUG TUNNEL #176	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	SURFACE DOME	CAT6	PoE	--	ET401	
#14	MDF	DOORS #247A, 233	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#15	MDF	DOORS 232A, 232B	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#16	MDF	DOOR #219 I	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#17	MDF	CORRIDOR #229	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#18	MDF	CONCOURSE WEST SIDE	PTZ	--	INDOOR	TYPE-5	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET402	
#19	MDF	PBB DOOR #219 H	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#20	MDF	PASSENGER WAITING #201	PTZ	--	INDOOR	TYPE-3	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET402	
#21	MDF	DOORS # 210-215	PTZ	--	INDOOR	TYPE-3	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET402	
#22	MDF	TSA AREA	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#23	MDF	TSA BAGGAGE BELT	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14	ET402	
#24	MDF	TSA BAGGAGE BELT	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14	ET402	
#25	MDF	PBB DOOR # 219 G	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#26	MDF	TSA AREA #209	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	28 VAC	2#14	ET402	
#27	MDF	CONCOURSE CENTER	PTZ	--	INDOOR	TYPE-5	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET402	
#28	MDF	CONCOURSE EAST SIDE	PTZ	--	INDOOR	TYPE-5	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET402	
#29	MDF	PBB DOOR 219 F	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#30	MDF	DEPLANING #215	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#31	MDF	DOOR 237 & 233	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	SURFACE DOME	CAT6	PoE	--	ET402	
#32	MDF	TSA CHECKPOINT #208	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	--	
#33	IDF-3	WAITING #301	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	SURFACE DOME	CAT6	PoE	--	ET403	
#34	IDF-3	APRON CENTER EAST	PTZ	--	OUTDOOR	TYPE-6	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET403	DUAL OUTPUT
#35	IDF-3	APRON EAST	PTZ	--	OUTDOOR	TYPE-6	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET403	
#36	IDF-3	LANDSIDE EAST	PTZ	--	OUTDOOR	TYPE-6	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET403	DUAL OUTPUT
#37	IDF-3	APRON WEST	PTZ	--	OUTDOOR	TYPE-6	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET403	
#38	IDF-3	LANDSIDE WEST	PTZ	--	OUTDOOR	TYPE-6	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET403	
#39	IDF-3	APRON CENTER WEST	PTZ	--	OUTDOOR	TYPE-6	CAM#2	SURFACE DOME	CAT6	28 VAC	2#14	ET403	
#40	IDF-3	WAITING #301	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	SURFACE DOME	CAT6	PoE	--	ET403	
#41	IDF-1	FRONT CANOPY	PTZ	--	OUTDOOR	TYPE-1	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET401	
#42	IDF-1	FRONT CANOPY	PTZ	--	OUTDOOR	TYPE-1	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET401	
#43	IDF-1	FRONT CANOPY	PTZ	--	OUTDOOR	TYPE-3	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET401	
#44	IDF-1	FRONT CANOPY	PTZ	--	OUTDOOR	TYPE-3	CAM#2	PENDANT DOME	CAT6	28 VAC	2#14	ET401	
#45	MDF	CBP PRIMARY PROC. #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#46	MDF	CBP PRIMARY PROC. #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#47	MDF	CBP PRIMARY PROC. #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#48	MDF	CBP PRIMARY PROC. #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#49	MDF	CBP PRIMARY PROC. #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#50	MDF	CBP PRIMARY PROC. #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#51	IDF-1	ELEVATOR #118 LOBBY	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET410	
#52	IDF-1	SECONDARY #159	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET410	
#53	IDF-1	SECONDARY #159	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET410	
#54	IDF-1	SECONDARY #159	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET410	
#55	IDF-1	STAIRS #192	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET410	
#56	MDF	ESCALATOR WEST	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET412	
#57	MDF	ESCALATOR EAST	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET413	
#58	IDF-1	HOLD #171	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	--	ET410	
#59	IDF-1	HOLD #170	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	--	ET410	
#60	IDF-1	OFFICE #166	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	--	ET410	
#61	IDF-1	CASH #181	FIXED	2.8-12	INDOOR	TYPE-2	CAM#1	SURFACE DOME	CAT6	PoE	--	ET410	
#62	IDF-1	CBIS ROOM #133	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET410	
#63	IDF-1	CBIS ROOM #133	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET410	
#64	IDF-1	CBIS ROOM #133	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET412	
#65	MDF	TSA CHECKPOINT #208	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET413	
#66	MDF	TSA CHECKPOINT #208	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET412	
#67	MDF	TSA CHECKPOINT #208	FIXED	2.8-12	INDOOR	TYPE-5	CAM#1	PENDANT DOME	CAT6	PoE	--	ET413	
#68	IDF-1	WEST TAG RAMP #179	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	PoE	--	ET410	
#69	IDF-1	EAST TAG RAMP #178	FIXED	2.8-12	INDOOR	TYPE-3	CAM#1	PENDANT DOME	CAT6	PoE	--	ET411	
#70	MDF	DOORS #233B & 245A	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#71	MDF	CBP PRIM PROCESS #237	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#72	MDF	DOOR #203B	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET413	
#73	MDF	STAIRS #292	FIXED	2.8-12	INDOOR	TYPE-4	CAM#1	RECESSED DOME	CAT6	PoE	--	ET412	
#74	--	--	--	--	--	--	--	--	--	--	--	--	

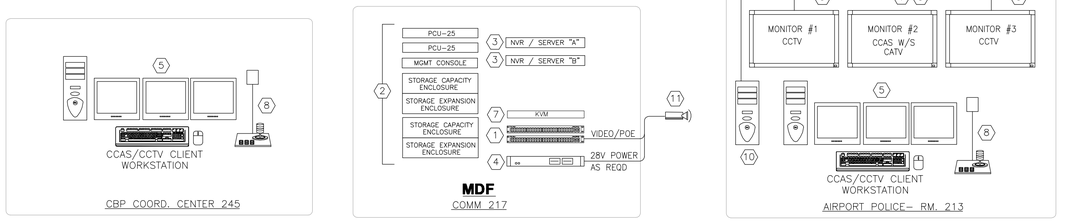
NOTES: 1. PROVIDE HEATER/BLOWER AND ENVIRONMENTAL OPTIONS ON ALL OUTDOOR UNITS.
CAM#1- PROVIDE DAY/NIGHT (0.5 LUX OR LESS MIN) FIXED MINI DOME 1.3 MEGAPIXEL (MIN), PROGRESSIVE SCAN, 2.8-12MM OR EQUIVALENT, H264/MJPEG ENCODING MULTI-STREAM CAMERA. CAMERA SHALL BE ARECONT MV13555DN, IQINVISION ALLIANCE 1QA21, AXIS P3344-V OR APPROVED EQUAL.
CAM#2- PROVIDE DAY/NIGHT PTZ DOME CAMERA W/ 36X ZOOM & IMAGE STABALIZATION. CAMERA SHALL BE BOSCH AUTODOME i500 SERIES, 36X, PANASONIC WV-NS964, AXIS 233D OR APPROVED EQUAL.

GENERAL NOTES CCTV SYSTEM

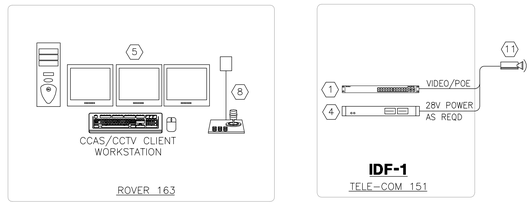
1. THE RISER DIAGRAM AND FLOOR PLAN INDICATE GENERAL LOCATION AND FUNCTIONAL REQUIREMENTS. CONTRACTOR SHALL PROVIDE ALL RELATED COMPONENTS TO PROVIDE AN OPERATIONAL SYSTEM.
2. CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS AND PRODUCT DATASHEETS FOR ALL COMPONENTS. SHOP DRAWINGS SHALL SHOW ALL COMPONENTS,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



THIRD FLOOR



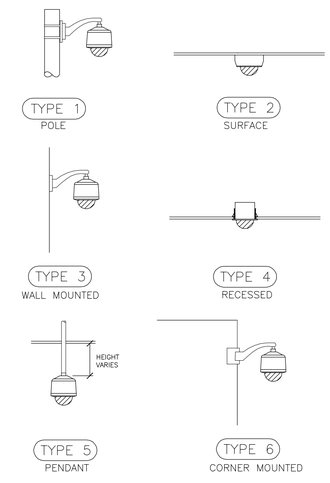
SECOND FLOOR



FIRST FLOOR

1 ET603 VIDEO SURVEILLANCE RISER

SCALE: NTS



NOTES

1. NETWORK SCOPE ON T6-04. COORDINATE PORT CONFIGURATIONS AND REQUIREMENTS WITH NETWORK SCOPE. BALANCE PORT USAGE BETWEEN NETWORK SWITCHES. PROVIDE REDUNDANT CONNECTION FOR SERVERS.
2. PROVIDE VIDEO SURVEILLANCE STORAGE AREA NETWORK (IP SAN). IP SAN SHALL BE ISCSI RAID STORAGE. PROVIDE THE FOLLOWING OPTIONS:
   A. HIGH AVAILABLITY DUAL PERFORMANCE CONTROLLER UNITS AND ENCLOSURES.
   B. 440MB/SECOND SYSTEM THROUGHPUT.
   C. MANAGEMENT CONSOLE (CONNECT TO KVM)
   D. INTEGRATE WITH UPS FOR GRACEFUL SHUTDOWN
   E. PROVIDE RAID 5 CONFIGURATIONS
   F. PROVIDE 1 GLOBAL HOT SPARE DRIVE PER ENCLOSURE.
   G. PROVIDE (2) 15 DRIVE STORAGE CAPACITY ENCLOSURES (FULLY LOADED).
   H. PROVIDE (2) 12 DRIVE STORAGE EXPANSION ENCLOSURES (FULLY LOADED).
   I. 42TB USABLE STORAGE
   J. PROVIDE 7,200 RPM, 1TB, SATA-II DRIVES.
   K. PROVIDE SCE & SEE SPARE KITS.
   L. IP SAN SHALL BE INTRANSA STORSTAC BUILDING BLOCK.
   M. IP SAN SHALL BE CONFIGURED BY INTRANSA CERTIFIED PROFESSIONAL.
3. CCTV SERVER. SERVER SHALL BE REDUNDANT, FAIL OVER DIRECTORY, FAIL OVER ARCHIVER, FAIL OVER MATRIX. SERVER SHALL BE INTRANSA VIDEO APPLIANCE VA20 W/ GENETEC OMNICAST, ONSSI NETDVMS, AMAG NVR OR APPROVED EQUAL. PROVIDE CLIENT SOFTWARE FOR A MINIMUM OF 5 CLIENTS IN ADDITION TO CLIENT WORKSTATIONS SHOWN.
4. 28VAC 560VA - 16 (FUSED) OUTPUT RACK MOUNTED POWER SUPPLY FOR CCTV CAMERAS. POWER SUPPLY SHALL BE ALTRONIX MODEL R2416600UL OR APPROVED EQUAL. PROVIDE QUANTITY AS REQUIRED. DO NOT OVERLOAD. LABEL WITH CAMERA #'S.
5. SECURITY OPERATOR ACS/CCTV WORKSTATION SEE ET6-01.
6. PROVIDE A/V OPTION ON THIS MONITOR. PROVIDE TUNER & SPEAKERS. CONNECT MONITOR # 2 TO OPERATOR WORKSTATION. AND CATV SYSTEM.
7. KVM SWITCH PROVIDED ON ET5-01. CONNECT ALL SERVERS TO KVM IN MDF.
8. CCTV JOYSTICK/KEYBOARD. PELCO KBD300A OR EQUAL. CONNECT TO DECODER/ENCODER SERIAL SUCH AS BOSCH VIP-XD. SYSTEM SHALL OPERATE AS A VIRTUAL MATRIX AND ALLOW CAMERA CALLUP BY CAMERA #, MONITOR # AND TILE # ON VIDEO WALL MONITORS.
9. PROVIDE WALL MOUNTED 42" 1080P LED MONITOR. MONITOR SHALL BE LG 42LE530C OR EQUAL. PROVIDE WALL MOUNT. MOUNT SHALL BE PEERLESS ST640 OR EQUAL. PROVIDE POWER AND DISPLAY CABLING BEHIND MONITORS. NO CABLES SHALL BE EXPOSED.
10. VIDEO WALL/CLIENT WORKSTATION. WORKSTATION SHALL BE INTEL CORE 2 QUAD Q9950, 2.83GHZ, 4GB RAM, 250GB HARD DRIVE, 768MB NVIDIA QUADRO FX 1800. WORKSTATION SHALL BE DELL OPTIPLEX 960 DESKTOP OR EQUAL. PROVIDE VIRTUAL MATRIX VIDEO WALL CLIENT SOFTWARE, ONSSI NETMATRIX VIEWER, GENETEC OMNICAST VIDEOWALL OR APPROVED EQUAL. INSTALL IN CONSOLE.
11. CCTV CAMERA AND CABLING SEE CCTV SCHEDULE THIS SHEET.
12. EXISTING CAMERA AND CABLING TO BE REMAIN. PROVIDE ENCODERS AND CABLING AS REQUIRED TO CONNECT TO NETWORK. SEE CCTV SCHEDULE THIS SHEET.
13. 4 FUSED OUTPUT 24V/28V (3.5A OUTPUT) CCTV POWER SUPPLY. ALTRONIX ALTV244UL OR EQUAL. LABEL "CCTV CAMERA POWER" WITH CAMERA #'S.
14. NOT USED
15. NOT USED
16. EXISTING IFS (4) CHANNEL VIDEO TRANSMITTER TO REMAIN IN TERMINAL. EXISTING PARKING LOT AND APRON CAMERAS SHALL BE CONNECTED TO NEW CCTV SYSTEM. RELOCATE EXISTING IFS (4) CHANNEL VIDEO RECIEVER FROM PUBLIC SAFETY BUILDING TO NEW TERMINAL MDF. PROVIDE ENCODERS AS REQUIRED TO INTERFACE EXISTING ANALOG SIGNAL INTO SYSTEM.

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REVIEWED BY: BA
DRAWN BY: RJL
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213-1882-091

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SHEET TITLE

VIDEO SURVEILLANCE RISER

SHEET NUMBER

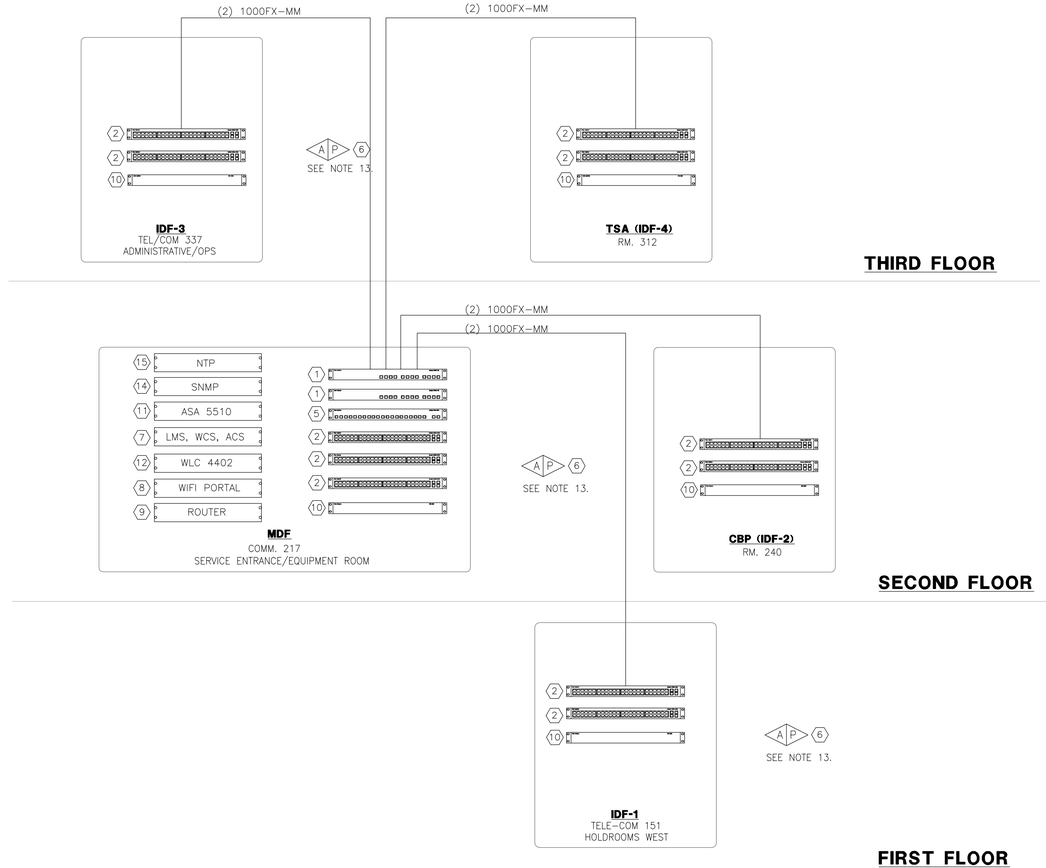
ET603

BID PACKAGE 2B ISSUED FOR BID

Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET6-03 Video Surveilance Riser.dwg Plotted on: 8/24/2011 3:39 PM Plotted by: Lizaori, Rional

GENERAL NOTES

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



NOTES:

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

NETWORK RISER

1 / ET604

SCALE: NTS

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

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NEW PASSENGER TERMINAL

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SHEET TITLE

NETWORK RISER

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ET604

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Drawing: T:\P\2131882.091 Duluth New Terminal\Cad\E\Technology\ET6-04 Network Riser.dwg Plotted on: 8/24/2011 3:39 PM Plotted by: Lizzari, Rional

GENERAL NOTES

1. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS. THE SHOP DRAWINGS SHALL CLEARLY SHOW LOCATION OF ALL CATV EQUIPMENT, SIZE, QTY, AND PORT USAGE. THE DRAWINGS INDICATE SCHEMATIC LAYOUT. PROVIDE ADDITIONAL RACKS AND OTHER ACCESSORIES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
2. ROUTE COAX CABLES SHOWN ON PLANS WITH "TV" SYMBOL TO CATV ENCLOSURE. TERMINATE WITH "F" STYLE COMPRESSION FITTINGS AND LABEL. CONNECT TO CATV SPLITTER/TAP AS NEEDED. PROVIDE CABLE MANAGEMENT INSIDE ENCLOSURE FOR CABLE DROPS.
3. CATV SYSTEM SHALL BE DESIGNED FOR 5–1000MHz PASSIVE AND 860 MHZ ACTIVE OPERATION.
4. OWNER TO PURCHASE SERVICE FROM LOCAL CATV PROVIDER. COORDINATE SYSTEM PERFORMANCE WITH CATV PROVIDER.
5. SYSTEM SHALL BE LAID OUT SUCH THAT FUTURE CHANNEL FILTERS AND RF MODULATORS CAN BE ADDED AT A FUTURE DATE.
6. SUBMIT RF TEST REPORTS TO A/E AFTER SYSTEM HAS BEEN INSTALLED. TEST REPORTS SHALL BE PERFORMED ON ALL CHANNELS, FORWARD AND REVERSE. TESTS SHALL BE FOR DIGITAL AND ANALOG SIGNAL. TESTS SHALL INCLUDE CHANNEL AVERAGE POWER, IN–CHANNEL NOISE, ENHANCED SPECTRAL ANALYSIS AND INGRESS.
7. CONNECTION TO PUBLIC ADDRESS SPEAKER ZONES SHALL BE PERFORMED BY PUBLIC ADDRESS INTEGRATOR.
8. CONTRACTOR SHALL PROVIDE TYPE WRITTEN LABELS ON ALL CABLES AT EACH END. CONTRACTOR SHALL PROVIDE TYPE WRITTEN LABELS ON ALL CABINETS/ENCLOSURES, DEVICES AND DEVICE PORTS.
9. CONTRACTOR SHALL PROVIDE 12 MONTHS FULL MAINTENANCE BY SKILLED CATV SYSTEM INSTALLER, INCLUDING QUARTERY ADJUSTING AS REQUIRED FOR OPTIMUM SYSTEM PEROFMANCE.
10. CATV DISTRIBUTION SYSTEM COMPONENTS SHALL BE MANUFACTURED BY BLONDER TONGUE, CHANNEL MASTER, CANARE CORP, LEVITON, MOTOROLA, SCIENTIFIC–ATLANTA OR APPROVED EQUAL.
11. PROVIDE 75 OHM TERMINATION ON ALL UNUSED COAX PORTS.

CATV PERFORMANCE REQUIREMENTS:

MINIMUM ACCEPTABLE PERFORMANCE OF DISTRIBUTION SYSTEM AT ALL USER–INTERFACE POINTS SHALL BE AS FOLLOWS:

1. RF VIDEO–CARRIER LEVEL: BETWEEN 3 AND 12 DBMV.
2. RELATIVE VIDEO–CARRIER LEVEL: WITHIN 3 DB TO ADJACENT CHANNEL.
3. CARRIER LEVEL STABILITY, SHORT TERM: LEVEL SHALL NOT CHANGE MORE THAN 0.5 DB DURING A 60–MINUTE PERIOD.
4. CARRIER LEVEL STABILITY, LONG TERM: LEVEL SHALL NOT CHANGE MORE THAN 2 DB DURING A 24–HOUR PERIOD.
5. CHANNEL FREQUENCY RESPONSE: ACROSS ANY 6–MHZ CHANNEL IN THE 54MHZ TO 860MHZ FREQUENCY RANGE, REFERENCED TO VIDEO; SIGNAL AMPLITUDE SHALL BE PLUS OR MINUS 1 DB, MAXIMUM
6. CARRIER–TO–NOISE RATIO: 45 DB OR MORE.
7. RF VISUAL SIGNAL–TO–NOISE RATIO: 43 DB OR MORE.
8. ANTENNA COMBINER INSERTION LOSS: 40 DB MAXIMUM.
9. SIGNAL POWER SPLITTER AND ISOLATION TAP RETURN LOSS: 17 DB MAXIMUM.
10. CABLE CONNECTORS ATTENUATION: LESS THAN 0.1 DB.
11. CROSS MODULATION: LESS THAN MINUS 50 DB.
12. CARRIER–TO–ECHO RATIO: MORE THAN 40 DB.
13. COMPOSITE TRIPLE BEAT: LESS THAN MINUS 53 DB.
14. SECOND ORDER BEAT: LESS THAN MINUS 60 DB.
15. TERMINAL ISOLATION FROM TELEVISION TO TELEVISION: 25 DB, MINIMUM.
16. TERMINAL ISOLATION BETWEEN TELEVISION AND FM: 35 DB, MINIMUM.
17. HUM MODULATION: 2 PERCENT, MAXIMUM.
18. TILT/SLOPE: 10 DB, MAXIMUM.

NOTES:

(1) CATV DISTRIBUTION HUB W/ 16 UTP PORT OUTPUT. HUB SHALL BE RACKMOUNTED. CATV DISTRIBUTION HUB SHALL BE MUXLAB VIDEOEASE (500303). PROVIDE (5) SINGLE PORT CATV BALUNS (500302) PER LOCATION. BALUNS SHALL BE MUXLAB OR EQUAL.

(2) CATV DISTRIBUTION COAX. COAX SHALL BE 75 OHM PLENUM RATED 1/2". COAX SHALL BE COMMSCOPE 2312K OR EQUAL. TERMINATE W/ COMPRESSION "F" STYLE FITTINGS.

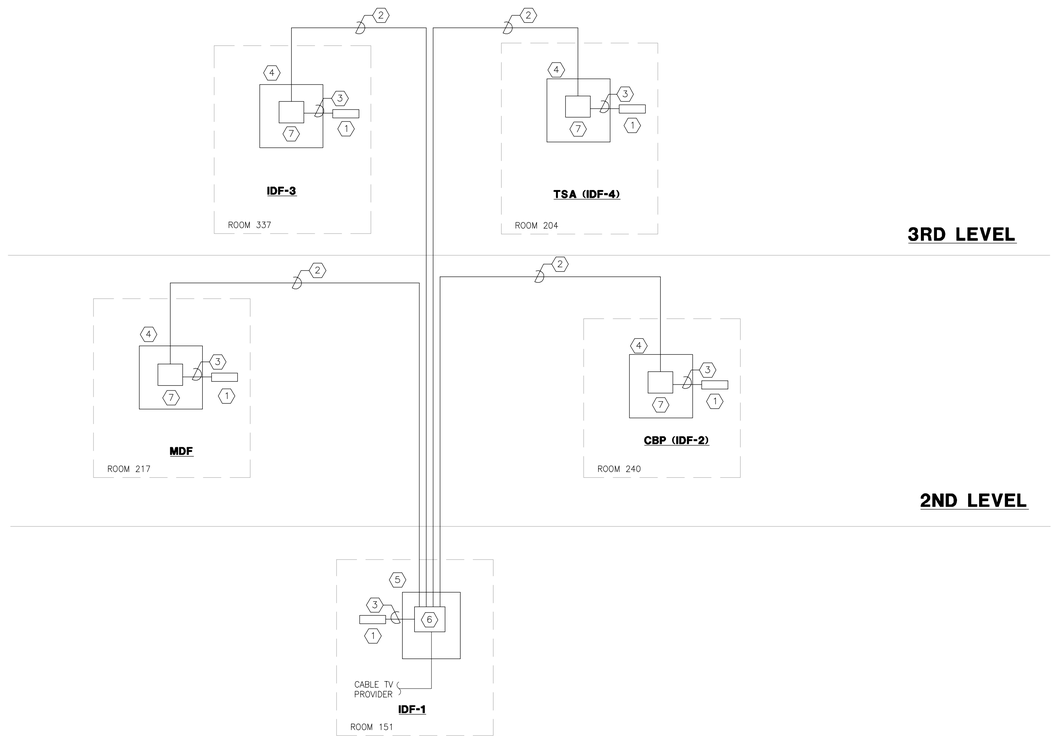
(3) CATV COAX. COAX SHALL BE WESTPENN 841 OR EQUAL. TERMINATE W/ COMPRESSION "F" STYLE FITTINGS.

(4) 16" X 16" X 6.62" TYPE 1 ENCLOSURE. ENCLOSURE SHALL BE HOFFMAN A16N16ALP W/ PERFORATED PANEL. PROVIDE #6 GROUND FROM ENCLOSURE TO COMM. ROOM GROUND BUS BAR. PROVIDE 1.5" EMT TO CABLE TRAY FOR DISTRIBUTION COAX.

(5) 24" X 20" X 6.62" TYPE 1 ENCLOSURE. ENCLOSURE SHALL BE HOFFMAN A24N24ALP W/ PERFORATED PANEL. PROVIDE #6 GROUND FROM ENCLOSURE TO COMM. ROOM GROUND BUS BAR. PROVIDE (3) 1.5" EMT TO CABLE TRAY FOR DISTRIBUTION COAX.

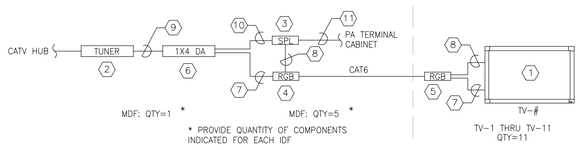
(6) CATV BROADBAND DISTRIBUTION AMPLIFIER W/ 43DB GAIN, 10DB GAIN CONTROL, 8DB SLOPE CONTROL AND INTEGRATED ACTIVE RETURN (42/54MHZ SPLIT). BROADBAND DISTRIBUTION AMPLIFIER SHALL BE BLONDER TONGUE BIDA 86B–43P (5900P84) OR EQUAL. PROVIDE 6–WAY SPLITTER ON AMPLIFIER OUTPUT. PROVIDE 8 PORT TAP (MODEL SRT–8A).

(7) CATV 8 PORT DIRECTIONAL COUPLER/TAP (MODEL SRT–8A). PROVIDE LINE EQUALIZER TO COMPENSATE FOR CABLE ATTENUATION TILT. AS REQUIRED (MODEL LE–860). CONTRACTOR SHALL DETERMINE TAP AND EQ VALUES BASED UPON SYSTEM PERFORMANCE. PROVIDE SIGNAL ATTENUATORS IF REQUIRED. OUTPUT SHALL BE 15DB.



1 ET605 CATV RISER

SCALE: NTS



NOTES:

(1) 47" LED MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL AND SPEAKER OPTION. MONITOR SHALL BE LG 47LE530C OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH. PROGRAM LCD MONITORS TO TURN ON AND OFF BASED ON A OWNER DEFINED SCHEDULE. QUANTITY 12. SEE MOUNT DETAIL THIS SHEET.

(2) RF INTERFACE BOX WITH INTEGRATED HD TUNER. ZENITH HCS5610. PROVIDE CAT5 UTP TO COAX VIDEO BALUN. BALUN SHALL BE MUXLAB VIDEOEASE CATV BALUN II (500302). CONNECT TO UTP CATV HUB IN RACK. PROVIDE RACK SHELF & SECURE TUNER TO SHELF. LABEL WITH TV #'S CONNECTED. OWNER MAY PROVIDE CATV LEASED TUNER. IF SO CONNECT OWNER TUNER AND TURN OVER SPECIFIED TUNER TO OWNER. PROVIDE TUNER (MDF) SPLIT COMPONENT AND STEREO OUTPUT WITH DISTRIBUTION AMPLIFIER.

(3) AMBIENT LEVEL CONTROLLER W/ DUCKER CONTROL. CONTROLLER SHALL BE SYMETRIX 271 SPL COMPUTER. LABEL WITH PA ZONE CIRCUIT. PROVIDE RACK MOUNT TRAY.

(4) COMPONENT VIDEO WITH STEREO AUDIO TRANSMITTER FOR CAT6 UTP CABLING. UNIT SHALL BE MAGENTA RESEARCH MULTIVIEW T4 4–PORT TRANSMITTER OR EQUAL. PROVIDE RACK MOUNT KIT. LABEL WITH TV #'S

(5) COMPONENT VIDEO WITH STEREO AUDIO RECEIVER FOR CAT6 UTP CABLING. UNIT SHALL BE MAGENTA RESEARCH MULTIVIEW AK600DP RECEIVER OR EQUAL. COORDINATE CONNECTION TO UTP TRANSMITTER BY APPROPRIATE PA CKT, SEE TV/PA SCHEDULE. LABEL W/ TV #'S

(6) 1U RACKMOUNT 1X4 RCA COMPONENT VIDEO AND RCA STEREO AUDIO DISTRIBUTION AMPLIFIER. AMP SHALL BE IMPACT ACOUSTICS #40397 OR EQUAL.

(7) COMPONENT RCA TO HD15 BREAKOUT CABLE. HIGH QUALITY, GOLD PLATED TERMINALS.

(8) 3.5MM STEREO AUDIO TO RCA STEREO CABLE. HIGH QUALITY, GOLD PLATED TERMINALS.

(9) COMPONENT WITH STEREO RCA CABLE. HIGH QUALITY, GOLD PLATED TERMINALS.

(10) STEREO RCA CABLE TO TERMINAL STRIP. HIGH QUALITY, GOLD PLATED TERMINALS.

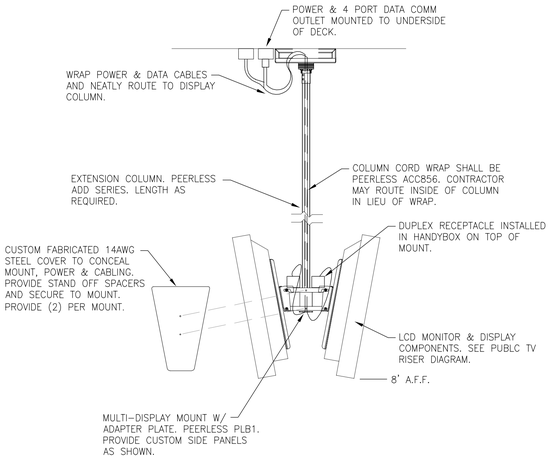
(11) PROVIDE AUDIO CABLE TO PUBLIC ADDRESS TERMINAL CABINET SPEAKER CIRCUIT. CABLE SHALL BE WEST PENN 25224 OR EQUAL. CONNECTION TO PUBLIC ADDRESS SPEAKER ZONES SHALL BE PERFORMED BY PUBLIC ADDRESS INTEGRATOR. MDF PROVIDE CONNECTION TO PA CIRCUITS LS GATE 1, 2, 3, 4, 5 & 6. IN LIEU OF AUDIO CIRCUIT INTERFACE CONTRACTOR MAY INTERFACE WITH PA RELAY INTERFACE IF AVAILABLE.

TV/PA CIRCUIT SCHEDULE:

TV–1 – LS GATE 1
TV–2 – LS GATE 2
TV–3 – PASS, WAITING
TV–4 – LS GATE 2
TV–5 – LS GATE 2
TV–6 – LS GATE 2/3
TV–7 – LS GATE 2/3
TV–8 – LS GATE 3
TV–9 – LS GATE 3
TV–10– LS GATE 4
TV–11– LS GATE 4

3 ET605 PUBLIC TV RISER

SCALE: NTS

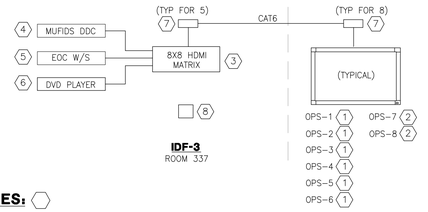


MOUNTING SYSTEM GENERAL NOTES

1. MANUFACTURER AND MODEL NUMBERS ARE USED TO ESTABLISH QUALITY AND PERFORMANCE OF THE SYSTEM. ANY EQUIPMENT THAT MEETS OR EXCEEDS THE PERFORMANCE SHALL BE CONSIDERED AND APPROVED AT THE DISCRETION OF THE ENGINEER AND/OR OWNER.
2. INSTALL PER MANUFACTURERS INSTRUCTIONS. DO NOT EXCEED WEIGHT LIMITATIONS.
3. BEAMS FOR CEILING MOUNTED DISPLAYS ARE W24 (24" DEEP) W/ A BEAM WIDTH OF 7" TO 13" AND THICKNESS OF 0.59" TO 1.09". PROVIDE PEERLESS DCT SERIES HEAVY DUTY I–BEAM CLAMP WITH DECOUPLER.
4. PROVIDE SO CORD WITH TWIST LOCK DISCONNECT AT POWER OUTLET. PROVIDE (2) DUPLEX RECEPTACLES ON TOP OF DISPLAY MOUNT AS SHOWN.
5. PROVIDE (4) 10' CAT6 PATCH CORDS FROM COMM OUTLET TO DISPLAY MOUNT.
6. PAINT ALL COMPONENTS TO MATCH CEILING/STRUCTURE. COORDINATE FINAL COLOR WITH A/E AND OWNER PRIOR TO FABRICATION.
7. BOTTOM OF MONITORS SHALL BE INSTALLED 8' A.F.F., FIELD COORDINATE FINAL HEIGHT AND TILT FOR OPTIMAL VIEW.

2 ET605 PUBLIC TV MOUNT DETAIL

SCALE: NTS



NOTES:

(1) 47" LED MONITOR, 1920X1080 NATIVE RESOLUTION, ETHERNET CONTROL, PIP, SCHEDULING, TILE MATRIX W/ THIN BEZEL AND SPEAKER OPTION. MONITOR SHALL BE LG 47LE530C OR APPROVED EQUAL. CONNECT TO NETWORK SWITCH.

(2) PROVIDED BY OWNER

(3) 8 X 8 HDMI MATRIX SWITCHER WITH ETHERNET AND SERIAL CONTROL. HDMI MATRIX SWITCHER SHALL BE EXTRON DXP HDMI SERIES DXP88. PROVIDE LABELS ON EACH CONNECTION AND BUTTON. CONNECT TO NETWORK. PROVIDE WINDOWS CONTROL PROGRAM.

(4) MUFIDS DDC INTERFACE. PROVIDE DVI TO HDMI CABLES (QTY 3). SEE ET6–02 MUFIDS RISER.

(5) EOC WORKSTATION INTERFACE. PROVIDE HDMI CABLE. SEE ET6–01 SECURITY RISER.

(6) DVD PLAYER, 1080P HDMI UPSCALING, PROGRESSIVE SCAN, USB, DIVX. DVD PLAYER SHALL BE PHILIPS DVP5992 OR EQUAL. PROVIDE HDMI CABLE. LOCATE IN ROOM 320.

(7) HDMI AUDIO & VIDEO UTP EXTENDER. EXTENDER SHALL SUPPORT 1080P AT 150' MINIMUM. EXTENDER SHALL BE MAGENTA RESEARCH HD ONE. PROVIDE RACK MOUNTING KIT FOR TRANSMITTERS. (TYPICAL FOR 5, PROVIDE 1 SPARE)

(8) HDMI SWITCHER EXTERNAL WALL MOUNTED CONTROL PANEL. INSTALL CONTROL PANEL NEAR MONITOR LOCATION. CONTROL PANEL SHALL BE EXTRON MKP 2000 OR EQUAL. CONNECT TO NETWORK SWITCH. CONFIGURE INTEGRATED WEBSERVER FOR REMOTE ACCESS. PROVIDE (1) CONTROL PANEL IN EACH (OPS RMS 318, 320, 322, EXEC DIRECTOR RM 323, OPS RM 324).

HDMI MATRIX SCHEDULE: IDF–3

INPUTS

1. FID–27
2. FID–28
3. FID–29
4. EOC WORKSTATION
5. DVD PLAYER
6. SPARE
7. SPARE
8. SPARE

OUTPUTS

1. OPS–1
2. OPS–2
3. OPS–3
4. OPS–4
5. OPS–5
6. OPS–6
7. OPS–7
8. OPS–8

4 ET605 OPS CENTER DISPLAY RISER

SCALE: NTS

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NEW PASSENGER TERMINAL

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.15.10
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1	BP2A ADDENDUM 1	02.25.11
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REVIEWED BY: BA
DRAWN BY: RJL
DESIGNED BY: BA

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213-1882-091

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SHEET TITLE

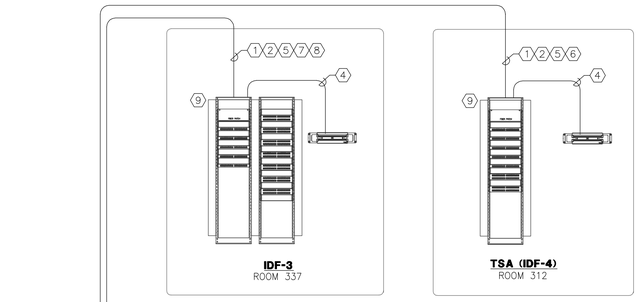
CATV & DISPLAY RISERS

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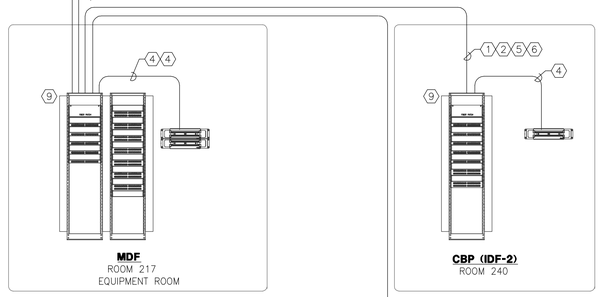
ET605

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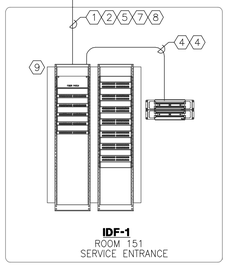
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THIRD FLOOR



SECOND FLOOR



FIRST FLOOR

GENERAL NOTES

1. REFER TO SPECIFICATIONS SECTION 16710, 16714, 16716 & 16717 FOR PREMISE WIRING SYSTEM SCOPE OF WORK.
2. THESE DRAWINGS INDICATE TYPICAL CONNECTIONS ONLY. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS FOR ALL FIBER AND COPPER CABLES AND PATCH PANEL CONNECTIONS. THE SHOP DRAWINGS SHALL CLEARLY SHOW LOCATION OF ALL PATCH PANELS, SIZE, QUANTITY, AND PORT USAGE. PROVIDE ADDITIONAL RACKS AND OTHER ACCESSORIES REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
3. CONTRACTOR SHALL LABEL ALL PATCH PANELS, CABLES AND TERMINATION LOCATIONS. LABELS SHALL BE TYPEWRITTEN. REFER TO SPECIFICATIONS FOR LABELING REQUIREMENTS.
4. ALL CABLES SHALL BE PLENUM RATED.
5. FIBER SHALL BE FUSION SPLICED TO FACTORY ASSEMBLED PIGTAILS IN FIBER OPTIC PATCH PANEL. PIGTAIL COLOR SHALL MATCH FIBER STRAND COLOR.
6. SC CONNECTORS SHALL BE DIFFERENT COLORS TO DIFFERENTIATE BETWEEN SINGLE MODE AND MULTIMODE. CONTRACTOR SHALL USE YELLOW FOR SINGLEMODE AND ORANGE FOR MULTIMODE.

NOTES

(1) SINGLE-MODE, 24 STRAND, 8-10/125um, OFNP, INDOOR/OUTDOOR FIBER OPTIC CABLE. INSTALL IN YELLOW (PLENUM) INNERDUCT.

(2) MULTI-MODE, 36 STRAND, 50/125um, OM3, OFNP, INDOOR FIBER OPTIC CABLE. INSTALL IN ORANGE (PLENUM) INNERDUCT.

(3) NOT USED.

(4) 50 PAIR CAT5E CABLE. TERMINATE ON 48 PORT PATCH PANEL LABELED TELEPHONE AT RACK AND ON 110 PUNCH DOWN BLOCK ON WALL. TERMINATE 1 PAIR PER PORT. PORTS 1-23 & 25-47. TERMINATE TWO (2) PAIR ON PORTS 24 & 48.

(5) 100 PAIR CAT5E CABLE. TERMINATE ON 48 PORT PATCH PANEL LABELED TELEPHONE EACH END. TERMINATE (2) PAIRS PER PORT 1 - 23 & 25-47. TERMINATE (4) PAIR ON PORTS 24 & 48.

(6) (24) CAT6 CABLES. TERMINATE ON 24 PORT PATCH PANEL EACH END.

(7) (48) CAT6 CABLES. TERMINATE ON 48 PORT PATCH PANEL EACH END.

(8) 1/2" PLENUM TRUNK, 75 OHM COAXIAL CABLE (COMMSCOPE 2312K OR EQUAL.) TERMINATE IN 20" X 24" X 6" HINGED COVER WALL BOX. PROVIDE TYPE F TERMINATION.

(9) SEE COMMUNICATIONS RACK/CABINET ELEVATIONS ON SHEET ET501.

1 ET606 **COMMUNICATION RISER**
SCALE: NTS

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DESIGNED BY: BA

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SHEET TITLE

COMMUNICATION RISER

SHEET NUMBER

ET606

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DULUTH AIRPORT PAGING SYSTEM DRAWINGS

DRAWING LIST

PG000	PAGING SYSTEM TITLE SHEET NOTES AND SYMBOLS
PG001	PAGING SYSTEM EQUIPMENT SCHEDULE AND SYMBOLS
PG110	PAGING SYSTEM FIRST LEVEL FLOOR PLAN – FACILITY
PG111	PAGING SYSTEM FIRST LEVEL FLOOR PLAN – FACILITY
PG112	PAGING SYSTEM SECOND LEVEL FLOOR PLAN – FACILITY
PG113	PAGING SYSTEM SECOND LEVEL FLOOR PLAN – FACILITY
PG114	PAGING SYSTEM THIRD LEVEL FLOOR PLAN – FACILITY
PG115	PAGING SYSTEM THIRD LEVEL FLOOR PLAN – FACILITY
PG210	PAGING SYSTEM FIRST LEVEL RCP – FACILITY
PG210A	PAGING SYSTEM FIRST LEVEL RCP – FACILITY
PG211	PAGING SYSTEM FIRST LEVEL RCP – FACILITY
PG211A	PAGING SYSTEM FIRST LEVEL RCP – FACILITY
PG212	PAGING SYSTEM SECOND LEVEL RCP – FACILITY
PG213	PAGING SYSTEM SECOND LEVEL RCP – FACILITY
PG214	PAGING SYSTEM THIRD LEVEL RCP – FACILITY
PG215	PAGING SYSTEM THIRD LEVEL RCP – FACILITY
PG310	PAGING SYSTEM FIRST LEVEL FLOOR PLAN – INFRASTRUCTURE
PG311	PAGING SYSTEM FIRST LEVEL FLOOR PLAN – INFRASTRUCTURE
PG312	PAGING SYSTEM SECOND LEVEL FLOOR PLAN – INFRASTRUCTURE
PG313	PAGING SYSTEM SECOND LEVEL FLOOR PLAN – INFRASTRUCTURE
PG314	PAGING SYSTEM THIRD LEVEL FLOOR PLAN – INFRASTRUCTURE
PG315	PAGING SYSTEM THIRD LEVEL FLOOR PLAN – INFRASTRUCTURE
PG410	PAGING SYSTEM FIRST LEVEL RCP – INFRASTRUCTURE
PG410A	PAGING SYSTEM FIRST LEVEL RCP – INFRASTRUCTURE
PG411	PAGING SYSTEM FIRST LEVEL RCP – INFRASTRUCTURE
PG411A	PAGING SYSTEM FIRST LEVEL RCP – INFRASTRUCTURE
PG412	PAGING SYSTEM SECOND LEVEL RCP – INFRASTRUCTURE
PG413	PAGING SYSTEM SECOND LEVEL RCP – INFRASTRUCTURE
PG414	PAGING SYSTEM THIRD LEVEL RCP – INFRASTRUCTURE
PG415	PAGING SYSTEM THIRD LEVEL RCP – INFRASTRUCTURE
PG500	ENLARGED ROOM PLANS
PG600	DETAILS
PG601	DETAILS
PG700	PAGING SYSTEM SIGNAL FLOW DIAGRAM(S)

CABLING NOTES

1. CABLES RUNNING IN PLENUM AREAS WITHOUT CONDUIT SHALL BE PLENUM RATED CABLE, AND MATCH THE SPECIFIED CABLE ABOVE. IT IS THE RESPONSIBILITY OF THE TECHNOLOGY CONTRACTOR TO INSPECT THE ELECTRICAL DRAWINGS, AND VERIFY IN WHAT SPACES PLENUM CABLE SHALL BE USED.
2. PROVIDE DESIGNATION LABELS FOR ALL TERMINATION BLOCKS, PATCH PANELS AND ALL TECHNOLOGY CABLES AT BOTH ENDS. ALL WIRES AND CABLES SHALL BE LABELED WITHIN 6" OF FINAL TERMINATION. ALL LABELS SHALL BE MACHINE PRINTED OR STENCILED.
3. INSTALL EACH CABLE SET INDICATED BY THE SYMBOLS LIST FROM THE OUTLET LOCATION BACK TO THE RESPECTIVE SERVING TELECOM CLOSET (UON)
4. ALL WIRING, CABLING, SYSTEM DEVICES AND SYSTEM CONTROLS SHALL BE INSTALLED IN COMPLIANCE WITH ALL CODE REQUIREMENTS AND MANUFACTURER'S INSTRUCTIONS AND PRACTICES UNLESS WRITTEN DIRECTION TO THE CONTRARY IS PROVIDED.

ABBREVIATIONS

AFC	–	ABOVE FINISHED CEILING
AFF	–	ABOVE FINISHED FLOOR
AFP	–	ABOVE FINISHED PLATFORM
AS	–	ABOVE SLAB
A/V	–	AUDIOVISUAL
BFC	–	BELOW FINISHED CEILING
CLG	–	CEILING
EC	–	EMPTY CONDUIT
GND	–	GROUND
IDF	–	INTERMEDIATE DISTRIBUTION FRAME
MC	–	MAIN CROSS-CONNECT
MCS	–	MULTIMEDIA COMMUNICATION SYSTEM
MDF	–	MAIN DISTRIBUTION FRAME
MMOF	–	MULTI-MODE OPTICAL FIBER
NIC	–	NOT IN CONTRACT
OC	–	ON CENTER
OD	–	OUTSIDE DIAMETER
OFE	–	OWNER FURNISHED EQUIPMENT
OSP	–	OUTSIDE PLANT CABLE
PB	–	PULLBOX
PBX	–	PRIVATE BRANCH EXCHANGE
PR	–	PAIR
RW	–	RACEWAY
SMOF	–	SINGLE-MODE OPTICAL FIBER
TEMP	–	TEMPORARY
TGB	–	TELECOMMUNICATIONS GROUNDING BUSBAR
TSER	–	TELECOMMUNICATIONS SERVICE ENTRANCE ROOM
TYP	–	TYPICAL
UON	–	UNLESS OTHERWISE NOTED
UPS	–	UNINTERRUPTED POWER SUPPLY
UTP	–	UNSHIELDED TWISTED PAIR
WS	–	WORK STATION
WW	–	WIREWAY

GENERAL NOTES

1. WHERE EXACT DIMENSIONS ARE NOT INDICATED, THE SCALE OF THIS DRAWING IS SUFFICIENTLY ACCURATE FOR DETERMINING THE LOCATION OF EQUIPMENT, JUNCTION BOXES, OUTLET BOXES, WIREWAYS, PANELS, ETC. WHERE EXACT DIMENSIONS ARE INDICATED, THE REFERENCE SURFACE SHALL BE THE FINAL FINISHED SURFACE INCLUDING ANY ACOUSTICAL TREATMENT. ROOM DIMENSIONS ON THE DRAWINGS HAVE BEEN TAKEN FROM PRELIMINARY ARCHITECTURAL DRAWINGS. ALL DIMENSIONS MUST BE VERIFIED AND ANY DEVIATIONS CAUSING CHANGES EXCEEDING 3 INCHES MUST BE COORDINATED WITH THE ARCHITECT AND SHEN MILSOM & WILKE, INC.
2. DIMENSIONS SHOWN ARE SUGGESTED PLACEMENTS AND ARE PROVIDED FOR INFORMATION ONLY. COORDINATE ALL ELECTRICAL DEVICES AND DIMENSIONED LOCATIONS WITH ARCHITECTURAL AND ENGINEERING DRAWINGS. FOR TECHNOLOGY DEVICES, LIGHTING AND SWITCH LOCATIONS REFER TO THE ARCHITECTURAL DRAWINGS.
3. DRAWINGS ARE NOT TO BE USED FOR ARCHITECTURAL OR ENGINEERING PURPOSES. DRAWINGS SHOULD ONLY BE USED FOR TECHNOLOGY SYSTEM INSTALLATION & COORDINATION WITH OTHER CONTRACTORS AND SYSTEMS. COORDINATE PATHWAYS FOR ALL TECHNOLOGY RELATED DEVICES WITH ARCHITECTURAL AND ELECTRICAL PLANS.
4. ALL TECHNOLOGY DEVICES SHALL BE SECURELY MOUNTED PLUMB AND STRAIGHT TO WALLS, FLOORS, OR RACKS, PER THE MANUFACTURER'S RECOMMENDED MOUNTING PRACTICE.
5. ALL EQUIPMENT SHOWN IN PHANTOM IS FOR REFERENCE ONLY. SUCH EQUIPMENT WILL BE PROVIDED AND INSTALLED BY THE TECHNOLOGY TRADE CONTRACTOR.
6. INSTALL FIRESTOP TO ALL SLAB AND WALL PENETRATIONS PROVIDED FOR THE INSTALLATION OF CABLE AS REQUIRED TO MAINTAIN FIRE RATING OF SLAB OR WALL. REVIEW ARCHITECT'S PLAN FOR PARTITION TYPES.
7. THE METHOD OF INSTALLATION OF BOXES IN WALLS, AND THE METHOD OF PASSAGE OF CONDUIT AND WIREWAYS THROUGH ACOUSTICALLY SENSITIVE WALLS, SHALL BE COORDINATED WITH THE ACOUSTICAL CONSULTANT OR ARCHITECT.
8. ALL ELECTRICAL FOR TECHNOLOGY SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL ELECTRICAL CODE AND SEISMIC REQUIREMENTS.
9. REFER TO ELECTRICAL SPECIFICATION FOR INSTALLATION INSTRUCTIONS FOR FLOORBOXES, JUNCTION BOXES, PLYWOOD PANELS, GROUNDING CONDUCTORS, BUSBARS, CONDUITS, CABLE TRAYS IN CORRIDORS, METALLIC ENCLOSURES, ELECTRICAL PANELBOARDS AND CIRCUITING. FIRE PROOFING SYSTEMS USED FOR ALL PENETRATIONS MUST BE APPROVED BY APPLICABLE AUTHORITIES PRIOR TO INSTALLATION.
10. ELECTRICAL FEEDS ARE NOT TO BE RUN PARALLEL WITH VIDEO AND/OR AUDIO LINES OR RACEWAYS. IF ELECTRICAL FEEDS MUST BE RUN PARALLEL TO AUDIO/VIDEO LINES, A MINIMUM OF 4'-0" OF SEPARATION MUST BE MAINTAINED.
11. POWER BREAKER PANELS ARE SIZED AND SPECIFIED BY THE ELECTRICAL ENGINEER; REFER TO ELECTRICAL DRAWINGS. ALL CIRCUITS SHALL BE PROTECTED BY 120VAC, 20 AMP BREAKERS UNLESS OTHERWISE NOTED.
12. POWER RECEPTACLES SHOWN ON TECHNOLOGY DRAWINGS ARE DEDICATED TO SPECIFIC TECHNOLOGY EQUIPMENT AND ARE SHOWN FOR REFERENCE ONLY. THESE RECEPTACLES SHOULD BE ISOLATED GROUND/COMMON PHASE. REFER TO ELECTRICAL DRAWINGS FOR ADDITIONAL UTILITY POWER RECEPTACLES.
13. WHERE POWER CIRCUITS ARE SHOWN TERMINATING INTO JUNCTION BOXES WITHOUT RECEPTACLES, THE WIRES SHALL BE TAPED AND THE BOXES COVERED. THESE CIRCUITS WILL BE CONNECTED BY OTHERS DURING INSTALLATION OF THE TECHNOLOGY SYSTEM EQUIPMENT.
14. GROUND ALL CONDUITS, CABLE TRAYS AND JUNCTION BOXES PER THE MANUFACTURER'S RECOMMENDATIONS AND PER ALL APPLICABLE CODES.
15. ALL EMPTY CONDUIT SHALL BE REAMED, CLEANED, CAPPED (WHERE APPROPRIATE), TAGGED, AND FURNISHED WITH PULL WIRES.
16. INSTALL CABLE TRAY FOR TELECOMMUNICATION WIRING TO MAINTAIN A MINIMUM OF 5" SEPARATION FROM FLUORESCENT LIGHTING.
17. THERE SHALL BE A MINIMUM OF ONE PULL BOX FOR EVERY 100' OF STRAIGHT EMPTY CONDUIT AND/OR ONE PULL BOX FOR MORE THAN TWO 90° BENDS OR LESSER BENDS TOTALING 180° IN A CONDUIT RUN.
18. MAINTAIN MINIMUM BEND RADIUS OF 10X OD FOR ALL CONDUITS.
19. STUB UP CONDUIT SLEEVES THROUGH SLABS 3" ABOVE FINISHED FLOORS, EXCEPT IN THE CASE OF ACCESS FLOORS, IN WHICH CASE STUB UPS SHALL TERMINATE UNDER THE ACCESS FLOOR.
20. ALL CABLE TRAY THAT IS SURFACE MOUNTED ON SLAB BELOW RAISED FLOOR SHALL BE SECURELY FASTENED TO SLAB. THESE TRAYS SHALL BE LEFT OPEN AND NOT PROVIDED WITH COVERS.
21. PROVIDE CONNECTION HARDWARE, GROUNDING LUGS AND STRAPS, THERMAL EXPANSION PLATES, SUPPORT BRACKETS, SPLICE HARDWARE, TERMINATION KITS, END SUPPORT KITS, CEILING SUPPORT HARDWARE, RUNWAY DROPOFFS AND 7" CABLE RETAINING POSTS FOR ALL CABLE TRAY LOCATIONS PER MANUFACTURERS RECOMMENDATIONS AND PER APPLICABLE CODES.
22. ALL POWER CONDUIT, POWER WIREWAYS, AND POWER JUNCTION BOXES ARE TO BE REVIEWED BY THE ELECTRICAL ENGINEER FOR CODE COMPLIANCE.
23. EMPTY CONDUIT RUNS ON THE TECHNOLOGY DRAWINGS SHOW ONLY INTERCONNECTION BETWEEN THE TERMINATION POINTS. THE EXACT PATH OF CONDUIT ARE TO BE DETERMINED BY THE ELECTRICAL ENGINEER AND FIELD CONDITIONS.
24. ALL CABLES ARE TO BE IN CONDUIT IN NON-ACCESSIBLE SPACES. THIS INCLUDES BOTH HORIZONTAL AND VERTICAL RUNS. CABLE IN ACCESSIBLE SPACES, HORIZONTAL RUNS ONLY, TO BE PLENUM-RATED CABLE.
25. NOTIFY OWNER'S REPRESENTATIVES OF ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE TECHNOLOGY DRAWINGS. OBTAIN CLARIFICATION BEFORE PRECEDING WITH WORK.
26. TECHNOLOGY SYSTEMS CONTRACTOR SHALL RESTORE CEILINGS AND WALLS AND ANY OTHER SURFACES AFFECTED BY ITS WORK UPON COMPLETION OF WORK, WITH LIKE MATERIALS TO MATCH EXISTING CONSTRUCTION.
27. THE FINISHES FOR ALL JUNCTION BOX FACEPLATES, SPEAKER GRILLES, TABLE BOXES, FLOOR BOXES AND WALL BOXES SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO PROCUREMENT. ALL ELECTRICAL BOXES SHALL HAVE THE APPROPRIATE COVERS AND SCREWS INSTALLED BY THE ELECTRICAL CONTRACTOR TO MATCH THE FIT AND FINISH SPECIFIED BY THE ARCHITECT.
28. IT SHALL BE THE RESPONSIBILITY OF THE TECHNOLOGY CONTRACTOR TO VERIFY SIGNAL/CONDUIT PATHWAYS WITH THE ELECTRICAL ENGINEERS DRAWINGS.

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 08-23-11
REVIEWED BY: **BTC**
DRAWN BY: **RZ**
DESIGNED BY: **BTC**

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SHEET TITLE

PAGING SYSTEM DRAWING LIST NOTES AND SYMBOLS LIST

SHEET NUMBER

PG000

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG000.dwg Plotted on: 8/22/2011 3:40 PM Plotted by: Tim Adams

EQUIPMENT SCHEDULE (EQS)

NO.	LOCATION	EQUIPMENT TYPE	DETAIL SHEET	MOUNTING	NOTES
AS–01	CEILING	AMBIENT NOISE MICROPHONE	AV600/01	FLUSH	COORDINATE MOUNTING WITH ARCHITECT
AUX–01	WALL	AUXILIARY INPUT PLATE	AV600/02	FLUSH	VERIFY LOCATION OF AV EQUIPMENT RACK (BY OTHERS) WITH OWNER/TENANT BEFORE INSTALLATION
CS–01	CEILING	SPEAKER	AV601/01	FLUSH	FOR GYP BD AND METAL PAN CEILINGS
CS–02	CEILING	SPEAKER	AV601/04	FLUSH	FOR ACT CEILINGS
CS–03	CEILING	SPEAKER	AV600/03	FLUSH	FOR CONFERENCE ROOMS AND TENANT FIT–OUT AREAS – VERIFY LOCATION WITH OWNER/TENANT BEFORE INSTALLATION
CS–04	CEILING	LINEAR SPEAKER	AV600/04	FLUSH	FOR BLADE CEILINGS – COORDINATE MOUNTING WITH ARCHITECT
CS–05	CEILING	LINEAR SPEAKER	AV601/04	FLUSH	HIGH OUTPUT FOR HIGH CEILING AREAS – COORDINATE MOUNTING WITH ARCHITECT
CS–06	CEILING	PENDANT SPEAKER	AV601/04	SUSPENDED	FOR OPEN CEILING AREAS
ER–01	FLOOR	EQUIPMENT RACK	AV600/05	FREESTANDING	
PS–01	MILLWORK	PAGING STATION	AV601/06	RECESSED	COORDINATE MOUNTING WITH ARCHITECT
PS–02	WALL	PAGING STATION	AV601/05	SURFACE	COORDINATE MOUNTING WITH ARCHITECT
PS–03	DESKTOP	PAGING STATION	AV601/06	FREESTANDING	COORDINATE LOCATION WITH ARCHITECT
PS–04	MILLWORK	FUTURE PAGING STATION	AV600/07	RECESSED	FUTURE EQUIPMENT
PS–05	WALL	FUTURE PAGING STATION	AV600/08	SURFACE	FUTURE EQUIPMENT
WS–01	WALL	SPEAKER	AV601/07	SURFACE	OUTDOOR TYPE – NOTE: SHOWN ON FLOORPLANS (NOT ON REFLECTED CEILING PLANS)
WS–02	WALL	SPEAKER (HORN)	AV601/08	SURFACE	NOTE: SHOWN ON FLOORPLANS (NOT ON REFLECTED CEILING PLANS)
VC–01	WALL	PROGRAMMABLE VOLUME CONTROL	AV601/09	SURFACE	LOCATE ADJACENT TO LIGHT SWITCH BANK AS APPLICABLE, COORDINATE WITH ARCHITECTURAL PLANS

AUDIO VISUAL SYMBOL LIST

SYMBOL (FLOOR MOUNTED)	DESCRIPTION	NOTES
FB FLOOR BOX	MULTI USE FLOOR BOX.	REFER TO FLOOR BOX SCHEDULE
SYMBOL (WALL MOUNTED)	**DESCRIPTION**	**NOTES**
XX YY TECHNOLOGY DEVICE	WALL BOX MOUNTED FLUSH WITH FINISHED SURFACE AT LOCATION SHOWN ON AV DRAWINGS. REFER TO TECHNOLOGY DEVICE BOX LEGEND BELOW FOR BOX TYPE AND SIZE.	–
X DATA OUTLET	DATA OUTLET REQUIRED FOR AV EQUIPMENT. REFER TO DATA DRAWINGS FOR INFRASTRUCTURE REQUIREMENTS.	SUB–NUMBER "X" INDICATES CABLE DROP QUANTITY
DUPLEX RECEPTACLE	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AT BUILDING STANDARD OUTLET HEIGHT UNLESS NOTED OTHERWISE	–
QUADPLEX RECEPTACLE	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AT BUILDING STANDARD OUTLET HEIGHT UNLESS NOTED OTHERWISE	–
SG SINGLE RECEPTACLE WITH SUPPLEMENTAL GROUND	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AT BUILDING STANDARD OUTLET HEIGHT UNLESS NOTED OTHERWISE. DEVICE TO UTILIZE SUPPLEMENTAL GROUND	–
SG DUPLEX RECEPTACLE WITH SUPPLEMENTAL GROUND	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AT BUILDING STANDARD OUTLET HEIGHT UNLESS NOTED OTHERWISE. DEVICE TO UTILIZE SUPPLEMENTAL GROUND	–
SG QUADPLEX RECEPTACLE WITH SUPPLEMENTAL GROUND	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AT BUILDING STANDARD OUTLET HEIGHT UNLESS NOTED OTHERWISE. DEVICE TO UTILIZE SUPPLEMENTAL GROUND	–
R/L RAISE/LOWER SWITCH	SINGLE GANG OUTLET MOUNTED AT BUILDING STANDARD SWITCH HEIGHT UNLESS NOTED OTHERWISE	–
SYMBOL (CEILING MOUNTED)	**DESCRIPTION**	**NOTES**
XX YY TECHNOLOGY DEVICE	CEILING MOUNTED BOX MOUNTED ABOVE ACCESSIBLE CEILING UNLESS OTHERWISE NOTED. REFER TO TECHNOLOGY DEVICE BOX LEGEND BELOW FOR BOX TYPE AND SIZE.	–
X DATA BOX	DATA DROP REQUIRED FOR AV EQUIPMENT MOUNTED ABOVE ACCESSIBLE CEILING. REFER TO DATA DRAWINGS FOR INFRASTRUCTURE REQUIREMENTS.	SUB–NUMBER "X" INDICATES CABLE DROP QUANTITY
PROJECTION SCREEN MOTOR	MOUNT FLUSH IN FINISHED CEILING (UON). REFER TO DRAWING FOR AUDIOVISUAL CONDUIT SIZE.	
PS PROJECTION SCREEN RELAY BOX	MOUNT ON SLAB ABOVE FINISHED CEILING (UON). REFER TO DRAWING FOR AUDIOVISUAL CONDUIT SIZE.	SUPPLY LOW–VOLTAGE INTERFACE WITH SCREEN, BY ELECTRICAL CONTRACTOR. MAINTENANCE ACCESS TO BOX SHALL BE PROVIDED BY ARCHITECT.
DUPLEX RECEPTACLE	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED IN FINISHED CEILING UNLESS NOTED OTHERWISE	–
QUADPLEX RECEPTACLE	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AIN FINISHED CEILING UNLESS NOTED OTHERWISE	–
SG SINGLE RECEPTACLE WITH SUPPLEMENTAL GROUND	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED IN FINISHED CEILING UNLESS NOTED OTHERWISE. DEVICE TO UTILIZE SUPPLEMENTAL GROUND	–
SG DUPLEX RECEPTACLE WITH SUPPLEMENTAL GROUND	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED IN FINISHED CEILING UNLESS NOTED OTHERWISE. DEVICE TO UTILIZE SUPPLEMENTAL GROUND	–
SG QUADPLEX RECEPTACLE WITH SUPPLEMENTAL GROUND	ELECTRICAL POWER REQUIRED FOR AV EQUIPMENT MOUNTED AT BUILDING STANDARD OUTLET HEIGHT UNLESS NOTED OTHERWISE. DEVICE TO UTILIZE SUPPLEMENTAL GROUND	–
SYMBOL (OTHER)	**DESCRIPTION**	**NOTES**
XXX / XXX AV EQUIPMENT	AV EQUIPMENT DESIGNATION, REFER TO EQUIPMENT SCHEDULE FOR INFORMATION	–
1 SHEET NOTE	REFER TO SHEET NOTES	–
SPEAKER ZONE	INDICATES INTENDED PAGING SPEAKER ZONE	–

TECHNOLOGY DEVICE BOX LEGEND

BOX DESIGNATION ("XX") (XX YY)

BOX DESIGNATIONS ("XX") FOR THE TECHNOLOGY DEVICE BOXES SHOWN ABOVE ARE DEFINED USING THE FOLLOWING DEFINITIONS:

- A – AMBIENT NOISE MICROPHONE BACKBOX
- AV – AUDIO VISUAL BACKBOX
- S – SPEAKER BACKBOX

BOX TYPE ("YY") (XX YY)

BOX TYPE ("YY") FOR THE DEVICE SYMBOLS SHOWN ABOVE ARE DEFINED USING THE FOLLOWING SUB–NUMBER DESIGNATIONS:

GANG BOX DEFINITIONS	SCREW COVER BOX DEFINITIONS	SPECIALTY BACKBOX DEFINITIONS
1G – SINGLE GANG 2G – TWO GANG 3G – THREE GANG 4G – FOUR GANG 5G – FIVE GANG 6G – SIX GANG STUD PARTITIONS TO UTILIZE 3–1/2" DEEP BOXES WITH APPROPRIATE EXTENSION RING MASONRY BOXES TO BE 3–1/2" DEEP FIELD GANGABLE BOXES ARE NOT APPROVED COVER SCREWS MOUNTED TOP AND BOTTOM, UNLESS NOTED OTHERWISE	SC6 – 6"Wx6"Hx4"D SC12 – 12"Wx12"Hx4"D SC15 – 15"Wx15"Hx4"D SC18 – 18"Wx18"Hx4"D SC24 – 24"Wx24"Hx4"D ADDITIONAL BOX DEFINITIONS CAN BE DEFINED IN THE FOLLOWING CONVENTION SCAXBXC A=WIDTH, B=HEIGHT, C=DEPTH KNOCK OUT CONFIGURATION TO BE DETERMINED BASED ON FIELD CONDITIONS. COVERPLATE SCREWS TO BE MOUNTED TOP AND BOTTOM UNLESS NOTED OTHERWISE	SP"X"– REFER TO SPECIALTY BACKBOX SCHEDULE FOR INFORMATION "X" – DESIGNATES TYPE BOXES TO BE INSTALLED PER MANUFACTURERS INSTRUCTIONS.

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NO.	DESCRIPTION	DATE

DATE ISSUED: 08–23–11
REVIEWED BY: **BTC**
DRAWN BY: **RZ**
DESIGNED BY: **BTC**

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE

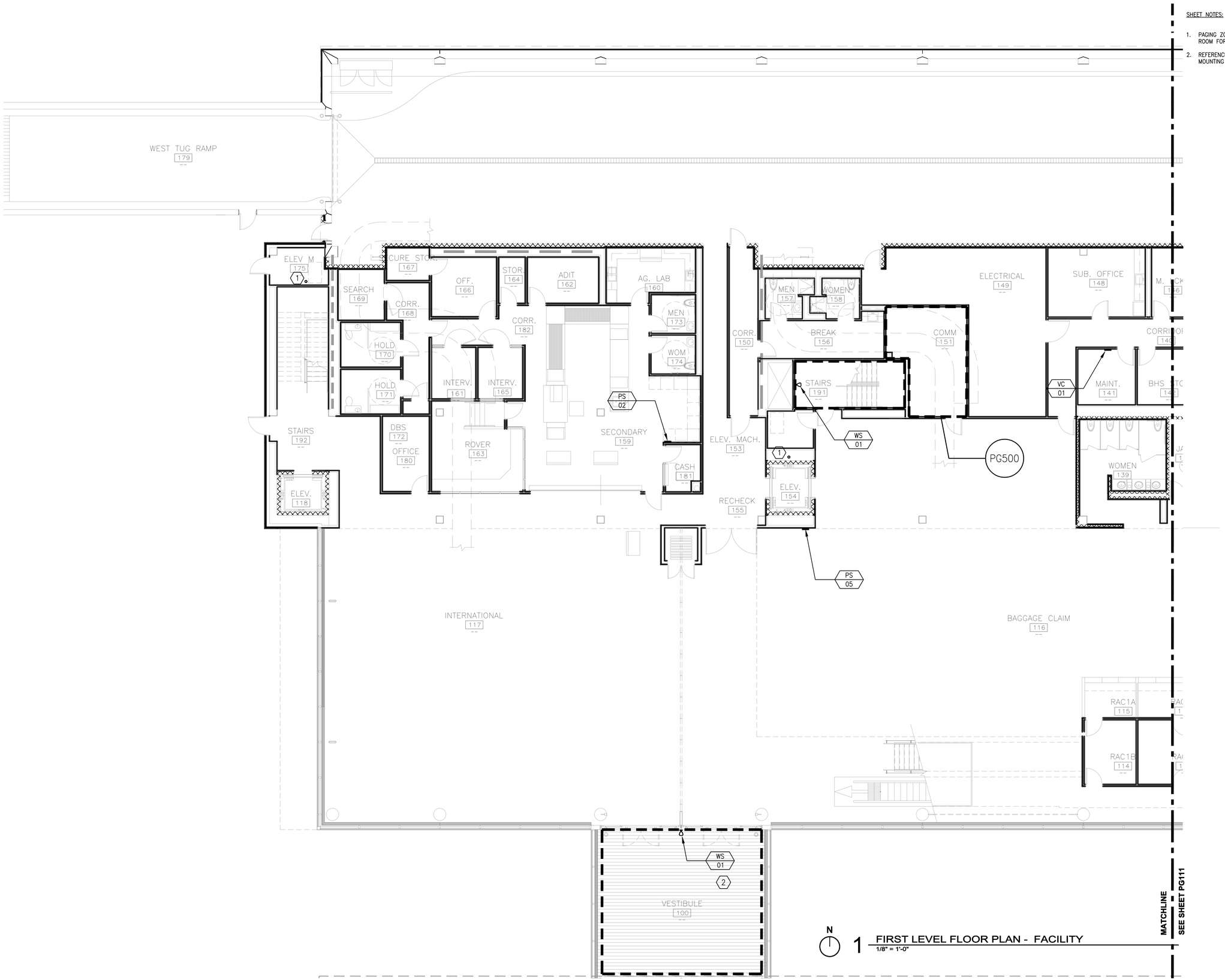
PAGING SYSTEM DRAWING LIST NOTES AND SYMBOLS LIST

SHEET NUMBER

PG001

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG001.dwg Plotted on: 8/22/2011 3:40 PM Plotted by: Tim Adams



SHEET NOTES: (#)

1. PAGING ZONE INPUT AT ELEVATOR MACHINE ROOM FOR ELEVATOR CAR SPEAKER
2. REFERENCE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAILS

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SHEET TITLE

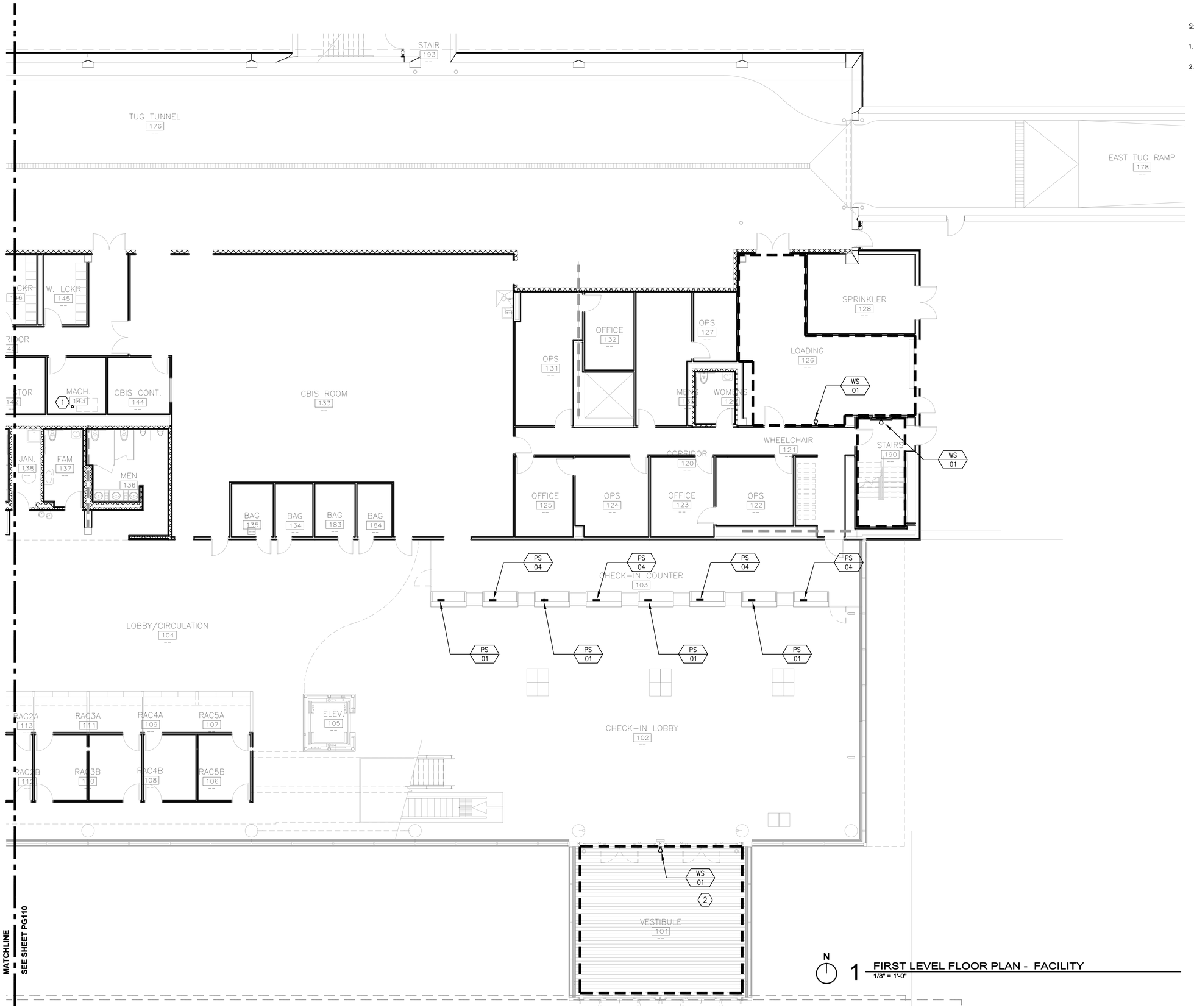
PAGING SYSTEM FIRST FLOOR PLAN - FACILITY

SHEET NUMBER

PG110

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG110.dwg Plotted on: 8/22/2011 3:41 PM Plotted by: Tim Adams



N

1 FIRST LEVEL FLOOR PLAN - FACILITY

1/8" = 1'-0"

SHEET NOTES: (#)

1. PAGING ZONE INPUT AT ELEVATOR MACHINE ROOM FOR ELEVATOR CAR SPEAKER
2. REFERENCE ARCHITECTURAL DRAWINGS FOR MOUNTING DETAILS

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SHEET TITLE

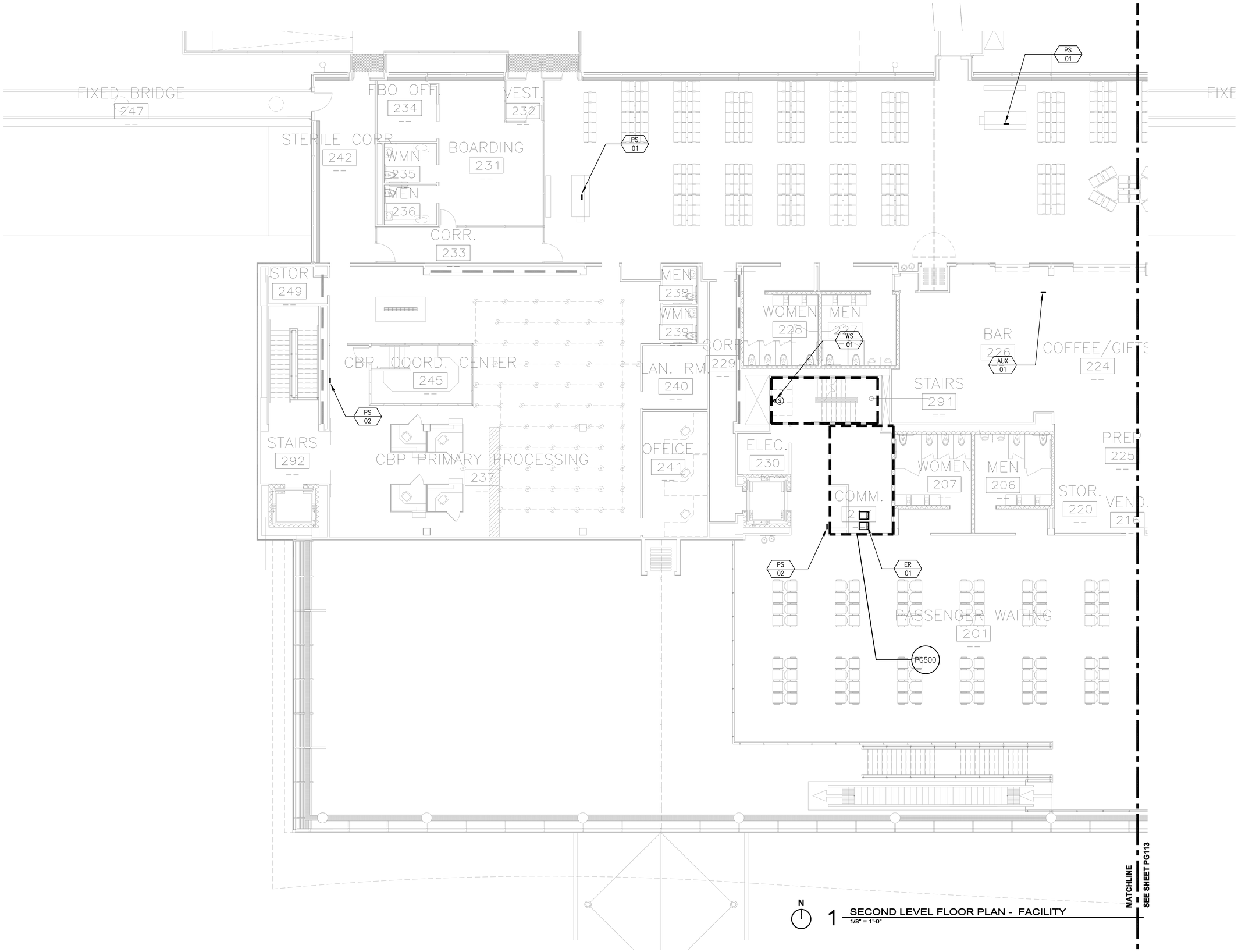
PAGING SYSTEM FIRST FLOOR PLAN - FACILITY

SHEET NUMBER

PG111

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG111.dwg Plotted on: 8/22/2011 3:41 PM Plotted by: Tim Adams



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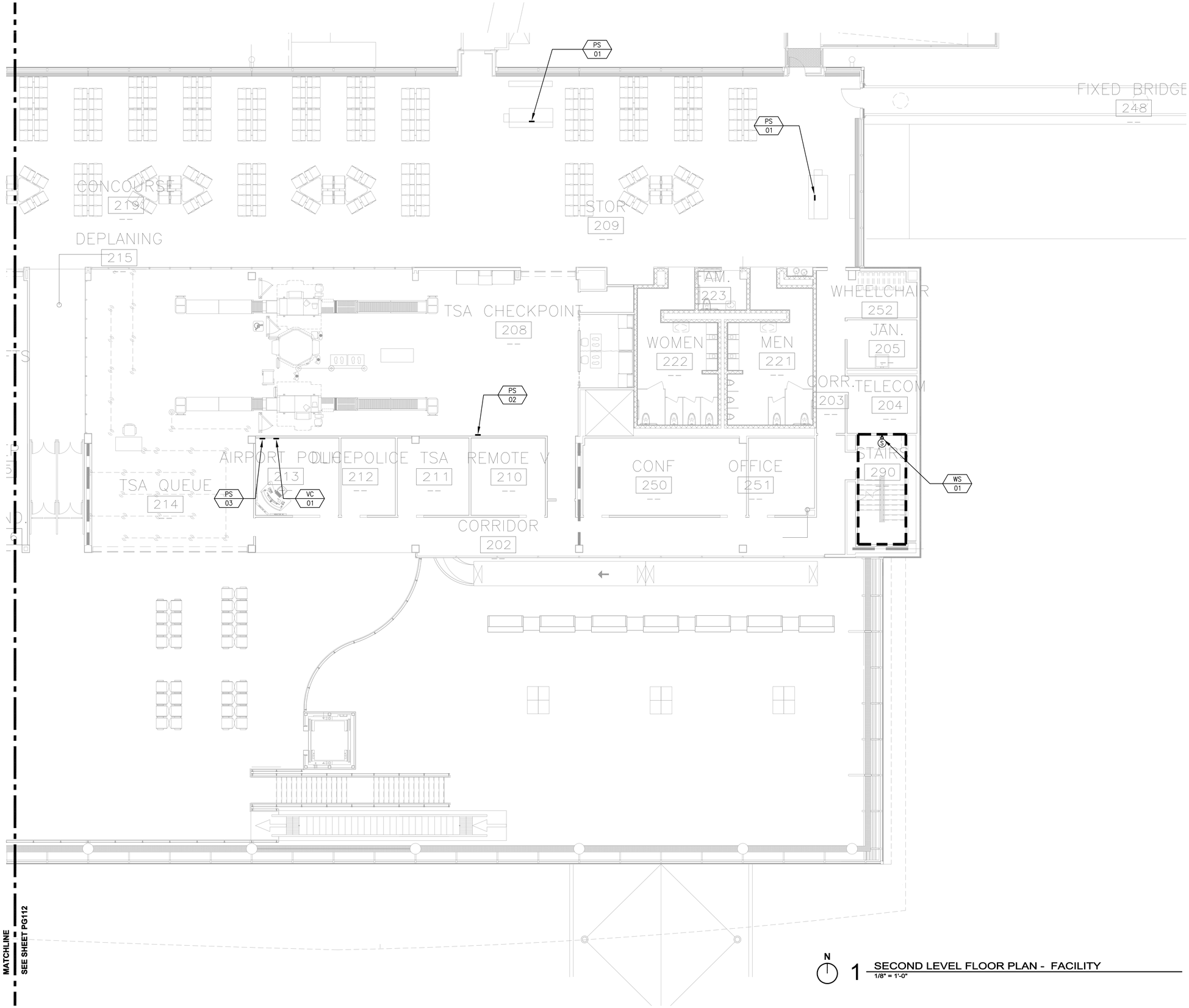
PAGING SYSTEM SECOND FLOOR PLAN - FACILITY

SHEET NUMBER

PG112

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG112.dwg Plotted on: 8/22/2011 3:41 PM Plotted by: Tim Adams



N

1 SECOND LEVEL FLOOR PLAN - FACILITY
1/8" = 1'-0"

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Landscaping Consultants:
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TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 08-23-11
REVIEWED BY: BTC
DRAWN BY: RZ
DESIGNED BY: BTC

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

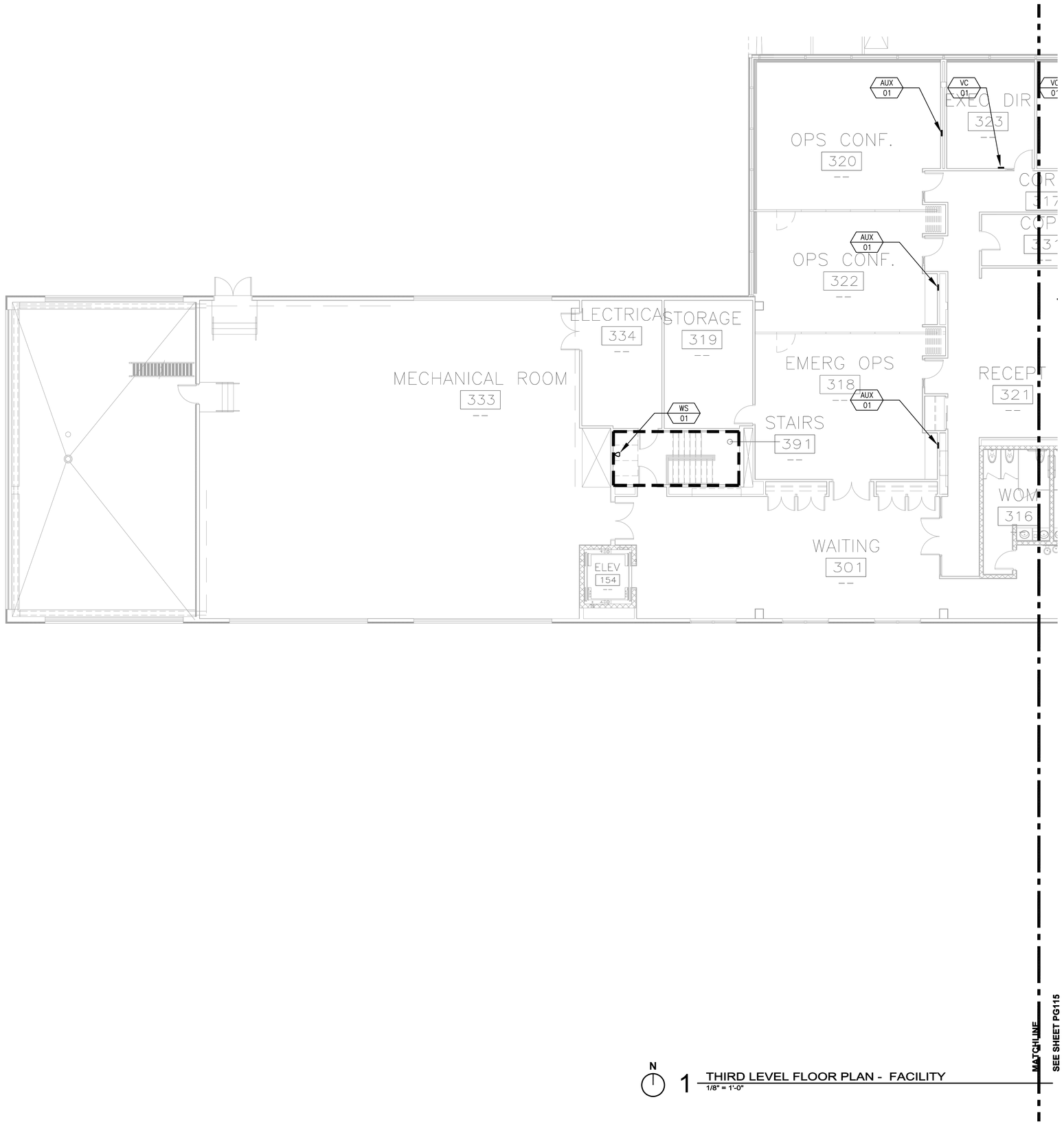
PAGING SYSTEM SECOND PLAN - FACILITY

SHEET NUMBER

PG113

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG113.dwg Plotted on: 8/22/2011 3:42 PM Plotted by: Tim Adams



N

1 THIRD LEVEL FLOOR PLAN - FACILITY

1/8" = 1'-0"

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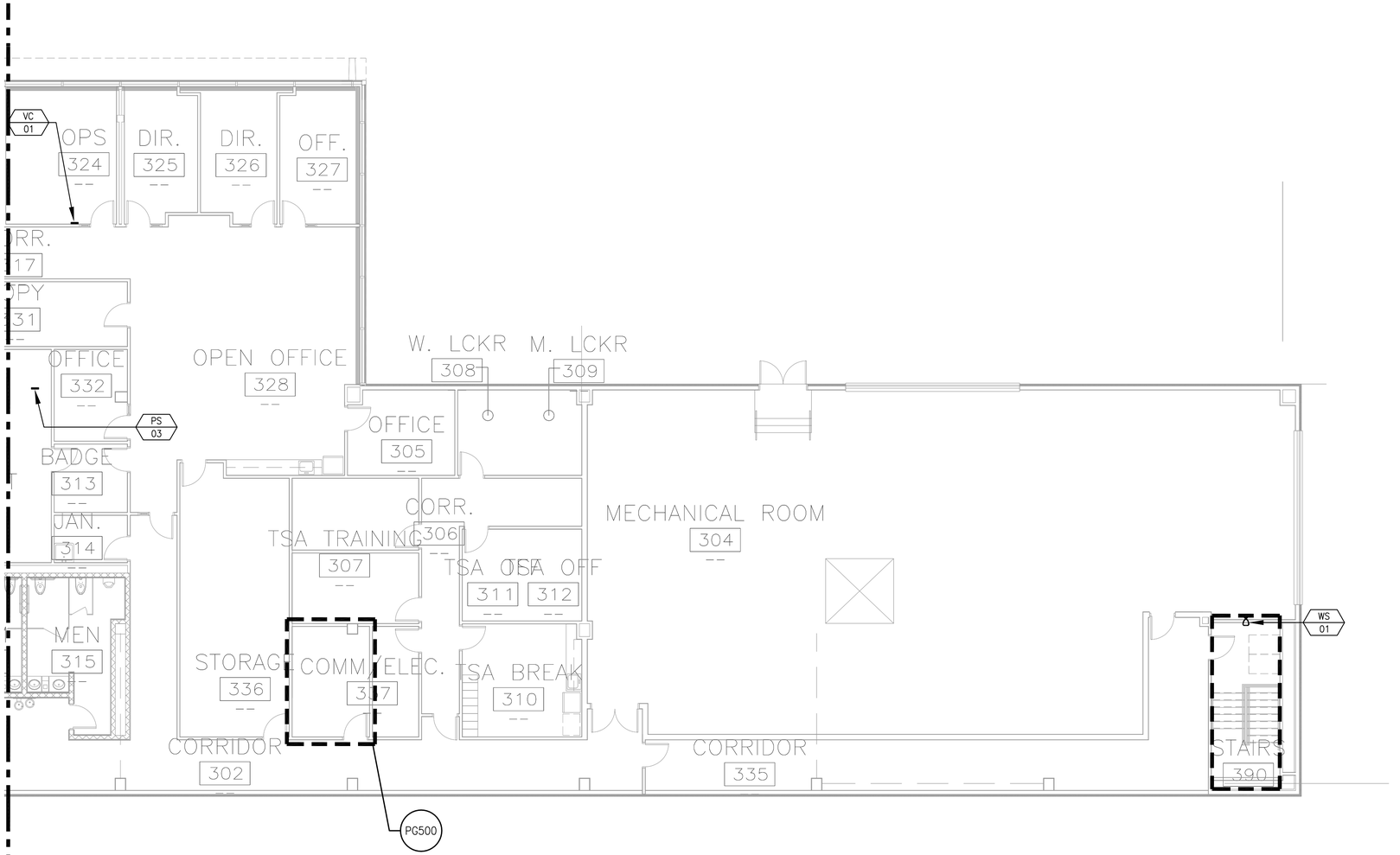
PAGING SYSTEM THIRD FLOOR PLAN - FACILITY

SHEET NUMBER

PG114

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG114.dwg Plotted on: 8/22/2011 3:42 PM Plotted by: Tim Adams



MATCH LINE
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SHEET TITLE

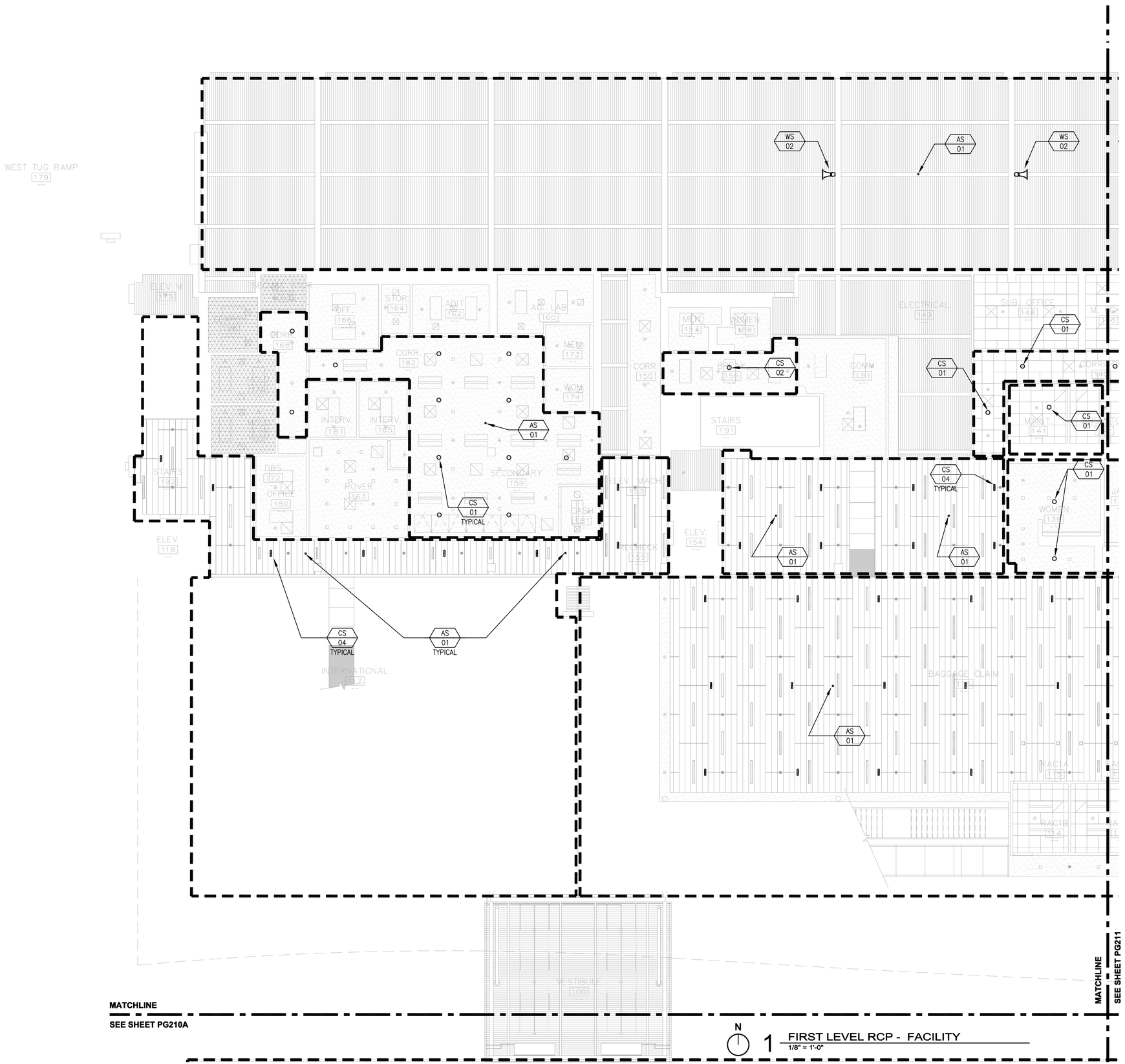
PAGING SYSTEM THIRD FLOOR PLAN - FACILITY

SHEET NUMBER

PG115

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG115.dwg Plotted on: 8/22/2011 4:07 PM Plotted by: Tim Adams



1 FIRST LEVEL RCP - FACILITY
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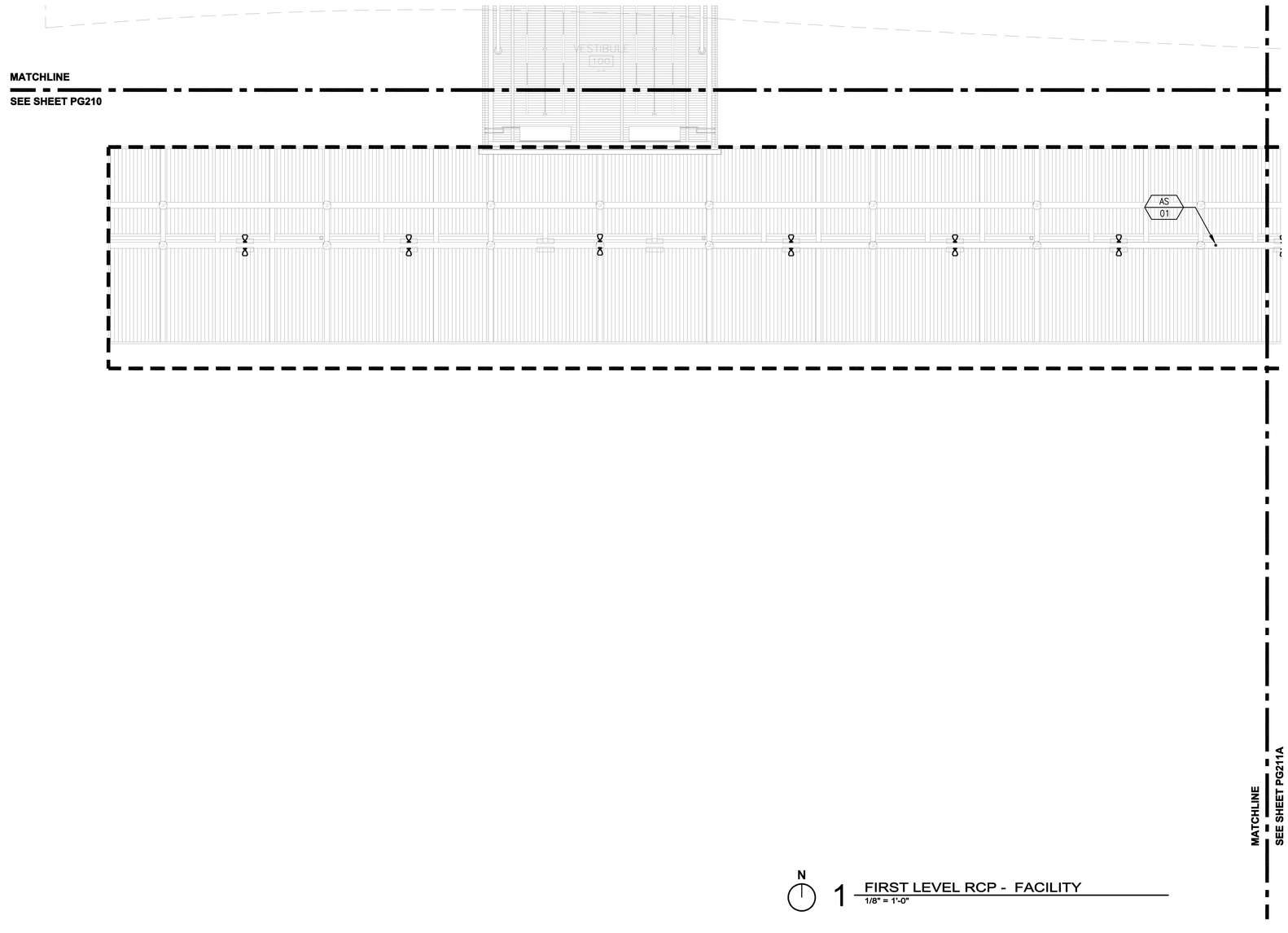
PAGING SYSTEM FIRST FLOOR RCP - FACILITY

SHEET NUMBER

PG210

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG210.dwg Plotted on: 8/22/2011 3:42 PM Plotted by: Tim Adams



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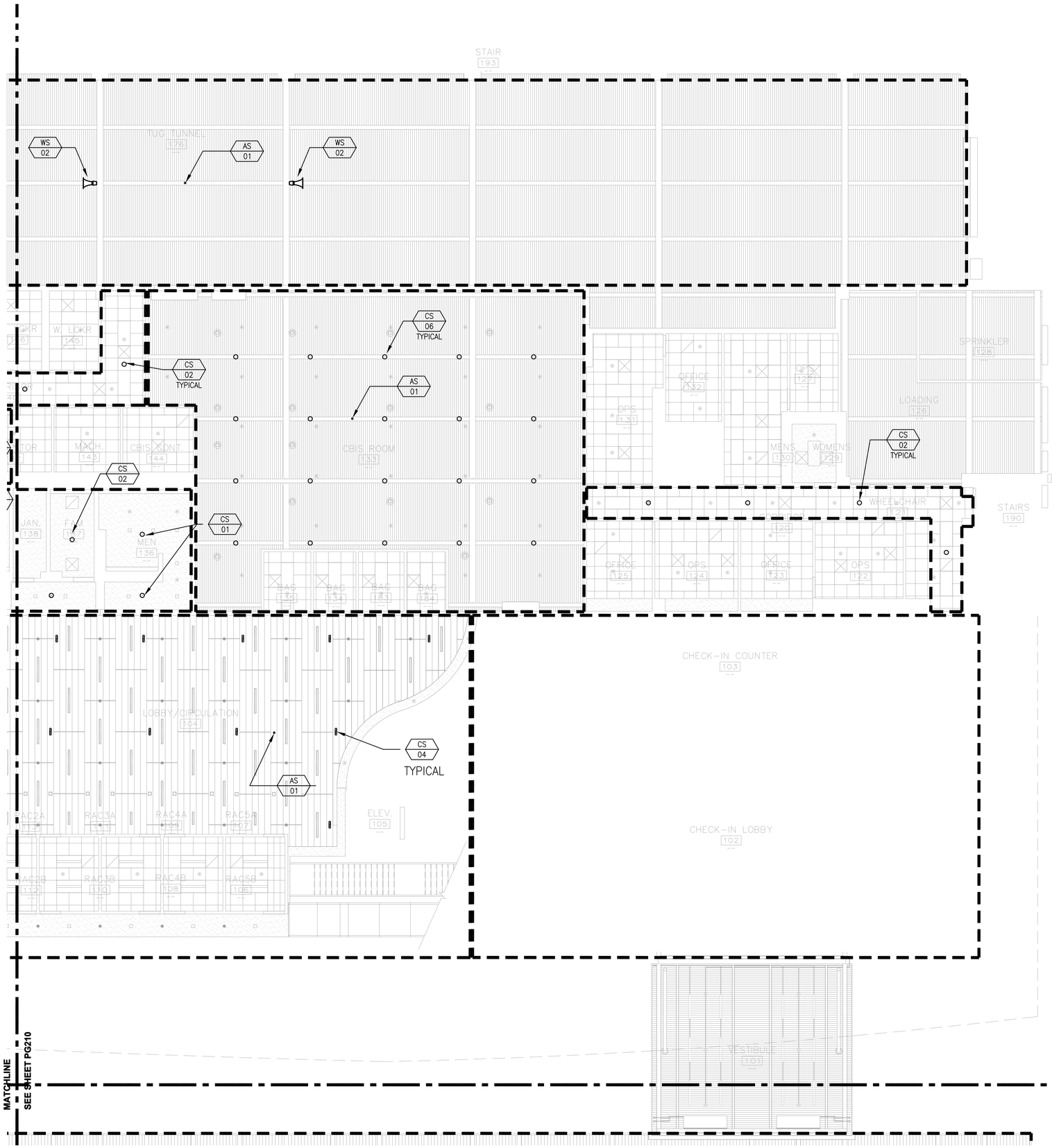
PAGING SYSTEM FIRST FLOOR RCP - FACILITY

SHEET NUMBER

PG210A

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG210A.dwg Plotted on: 8/22/2011 3:43 PM Plotted by: Tim Adams



N

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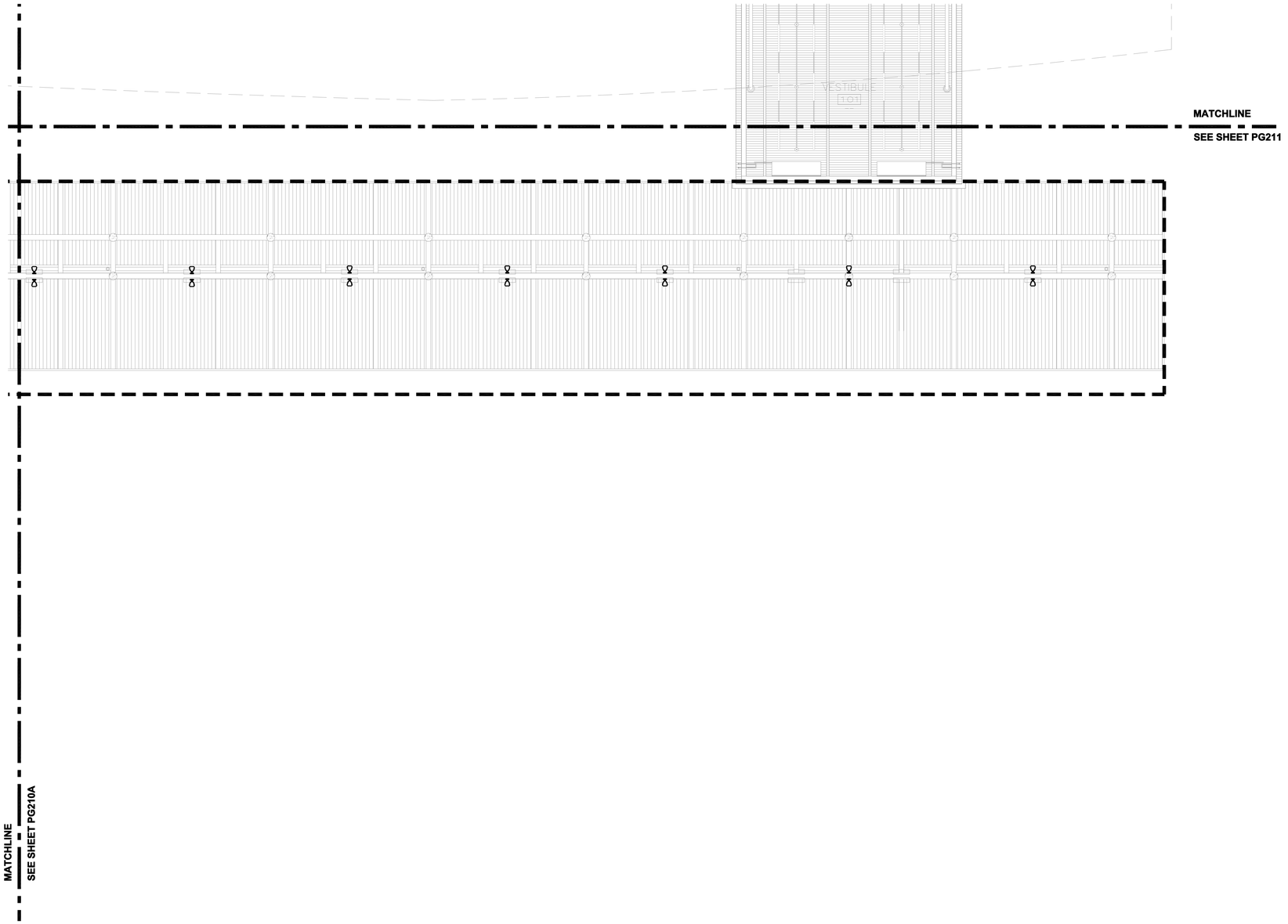
PAGING SYSTEM FIRST FLOOR RCP - FACILITY

SHEET NUMBER

PG211

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG211.dwg Plotted on: 8/22/2011 3:43 PM Plotted by: Tim Adams



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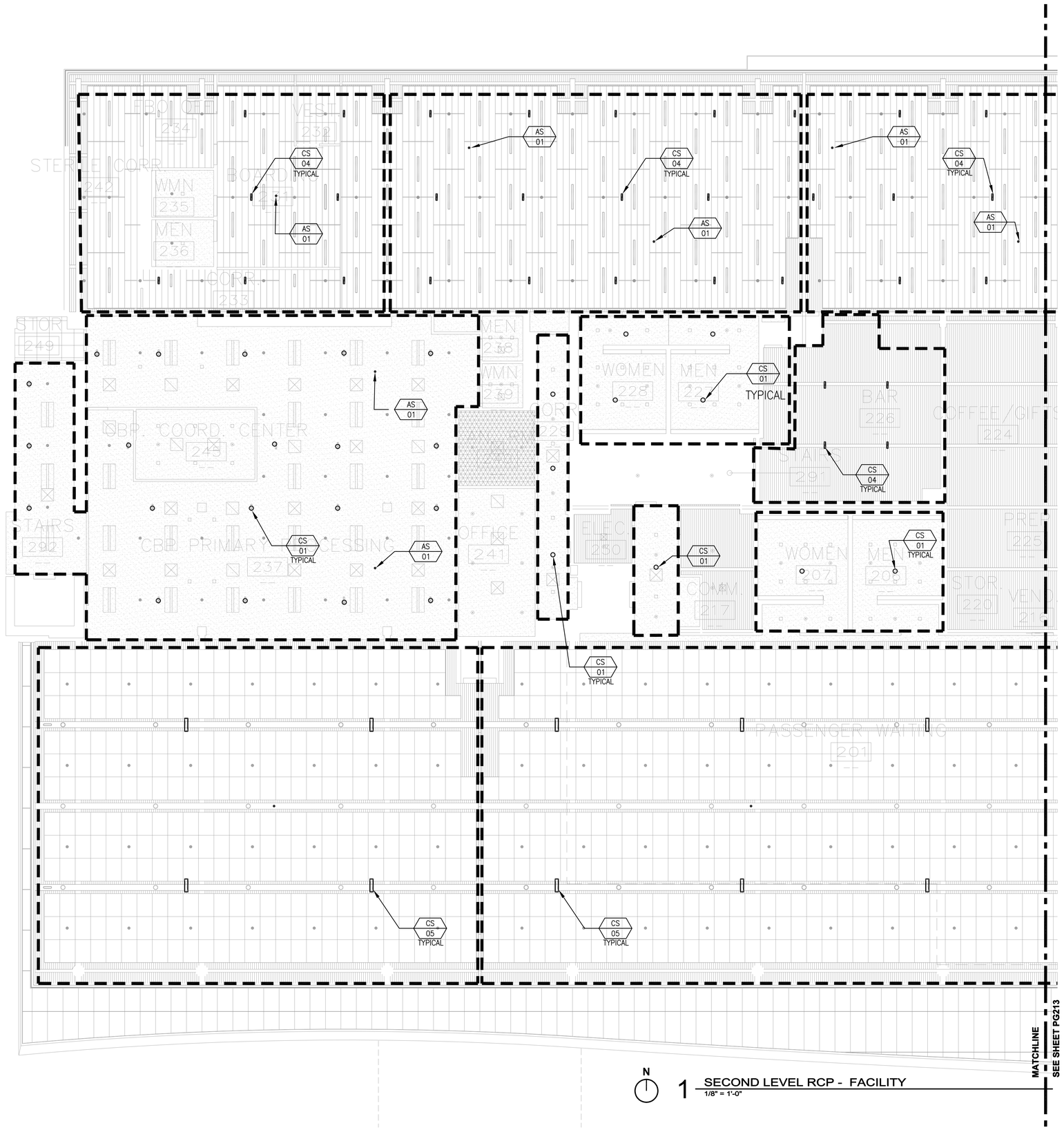
PAGING SYSTEM FIRST FLOOR RCP - FACILITY

SHEET NUMBER

PG211A

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG211A.dwg Plotted on: 8/22/2011 3:43 PM Plotted by: Tim Adams



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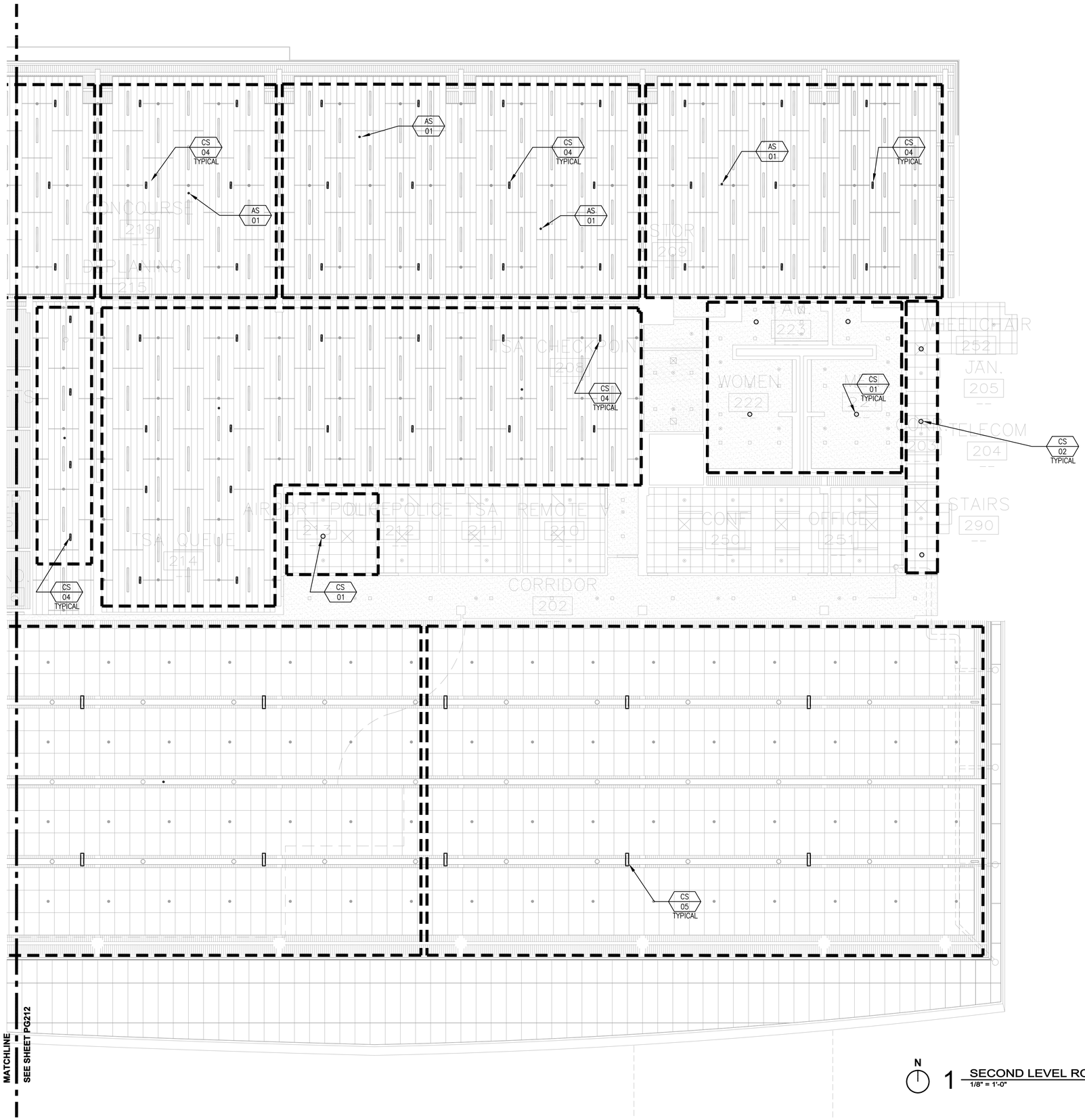
PAGING SYSTEM SECOND FLOOR RCP - FACILITY

SHEET NUMBER

PG212

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG212.dwg Plotted on: 8/22/2011 3:43 PM Plotted by: Tim Adams



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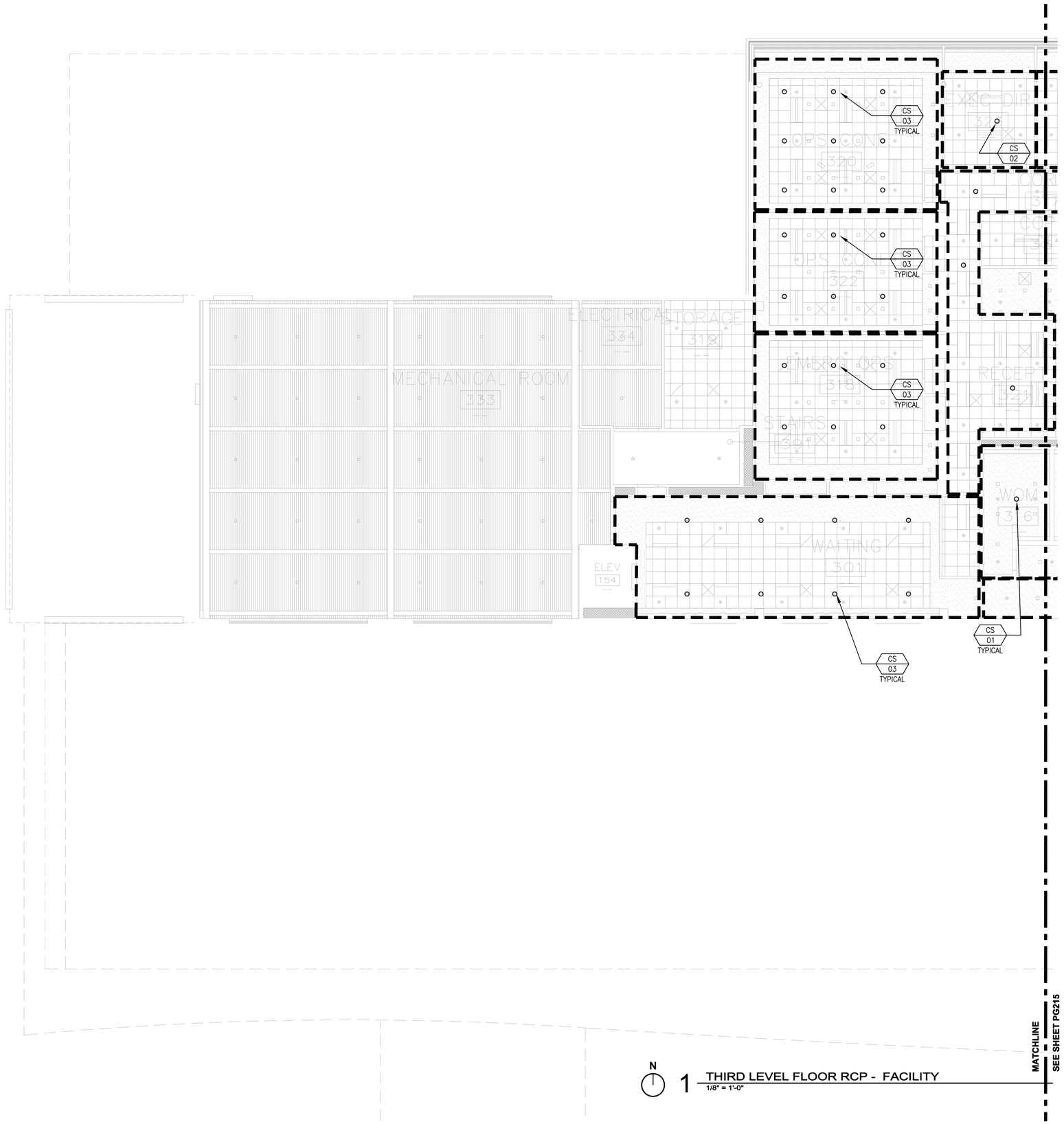
PAGING SYSTEM SECOND FLOOR RCP - FACILITY

SHEET NUMBER

PG213

BID PACKAGE 2B
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Drawing: S:\2010\10064\AV\10064_PG213.dwg Plotted on: 8/22/2011 3:44 PM Plotted by: Tim Adams



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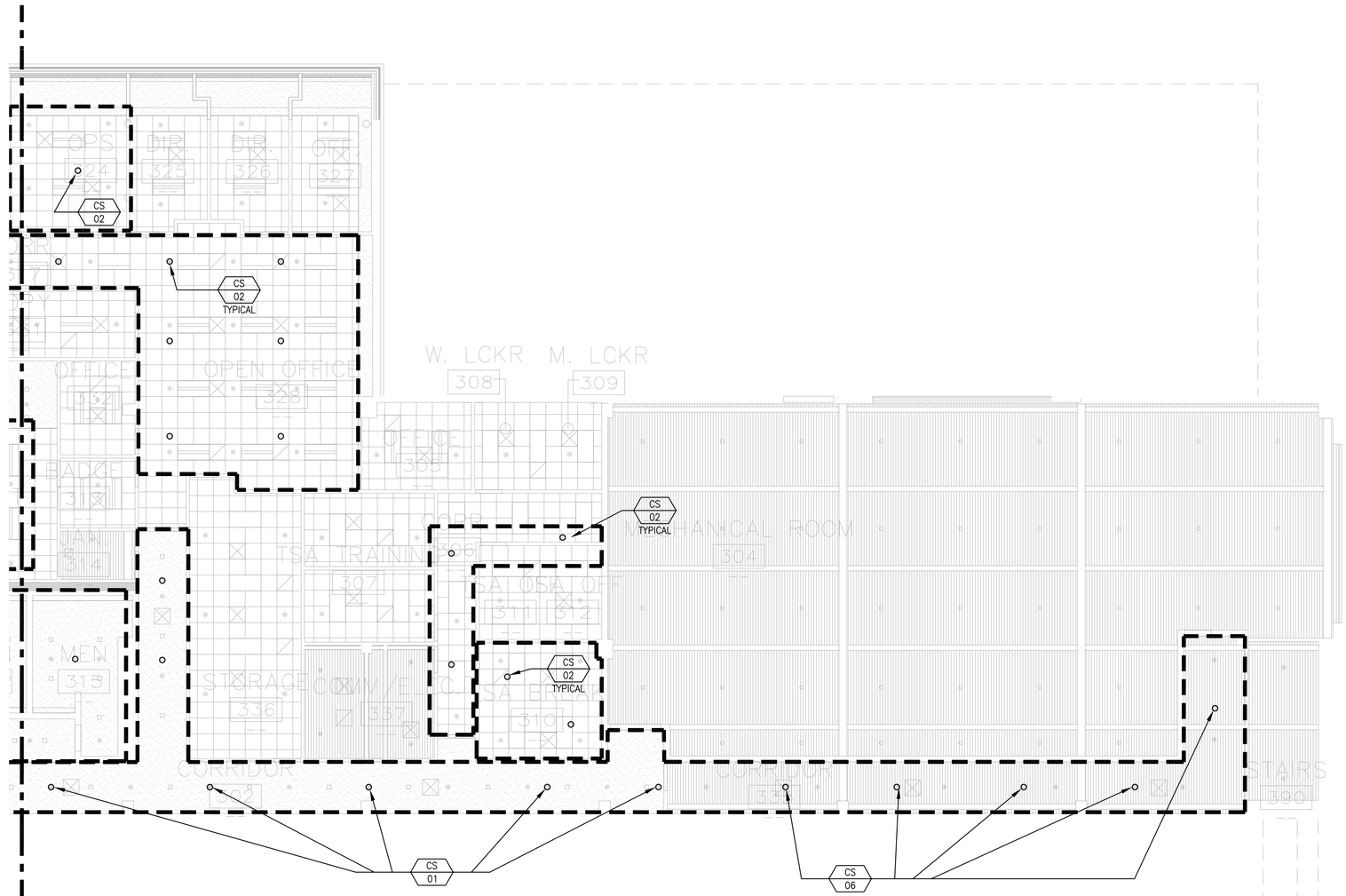
PAGING SYSTEM THIRD FLOOR RCP - FACILITY

SHEET NUMBER

PG214

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG214.dwg Plotted on: 8/22/2011 3:44 PM Plotted by: Tim Adams



MATCHLINE
SEE SHEET PG214

N

1 THIRD LEVEL FLOOR RCP - FACILITY
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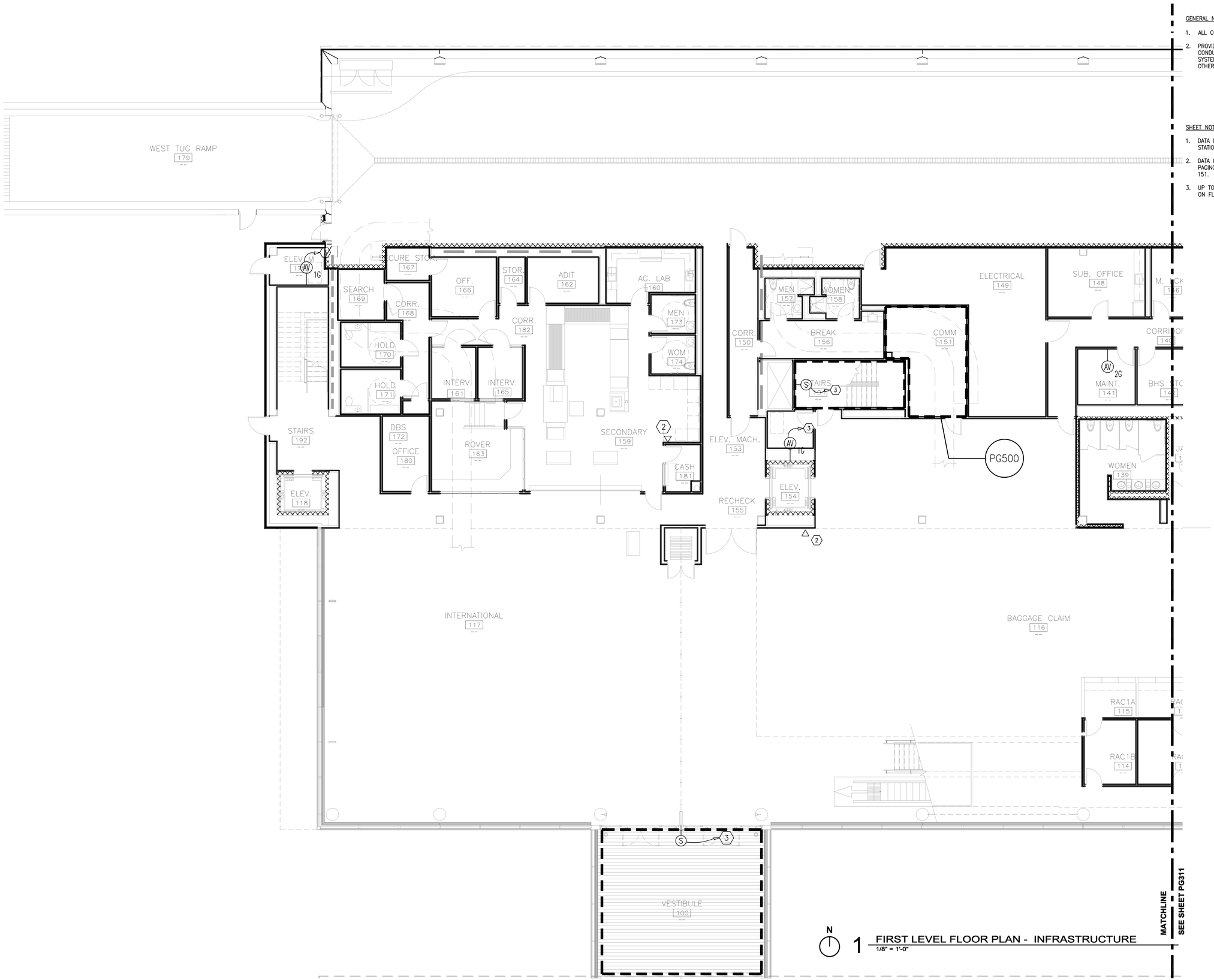
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SHEET TITLE
PAGING SYSTEM THIRD FLOOR RCP - FACILITY

SHEET NUMBER
PG215

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG215.dwg Plotted on: 8/22/2011 3:44 PM Plotted by: Tim Adams



GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES: (#)

1. DATA DROP TERMINATED AT DESKTOP PAGING STATION. CABLING RUNS TO TELE-COM 151.
2. DATA DROP TERMINATED AT WALL MOUNTED PAGING STATION. CABLING RUNS TO TELE-COM 151.
3. UP TO EQUIPMENT RACK ER-01 IN COMM 217 ON FLOOR ABOVE.

N

1 FIRST LEVEL FLOOR PLAN - INFRASTRUCTURE
1/8" = 1'-0"

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NEW PASSENGER TERMINAL

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Structural Engineers:
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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

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 08-23-11
REVIEWED BY: BTC
DRAWN BY: RZ
DESIGNED BY: BTC

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

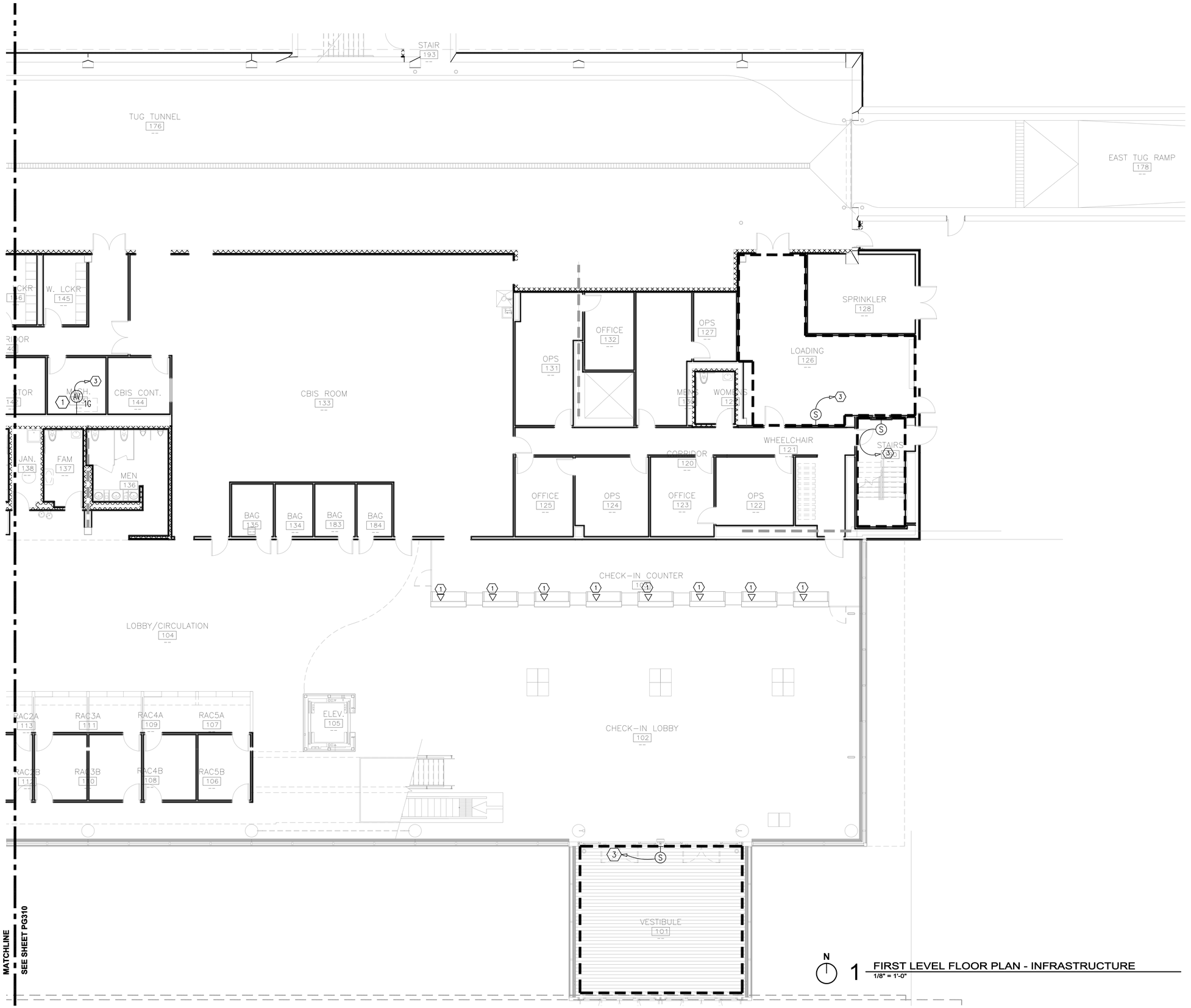
PAGING SYSTEM FIRST FLOOR PLAN - INFRASTRUCTURE

SHEET NUMBER

PG310

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG310.dwg Plotted on: 8/22/2011 3:44 PM Plotted by: Tim Adams



N

1 FIRST LEVEL FLOOR PLAN - INFRASTRUCTURE
1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES: (#)

1. DATA DROP TERMINATED AT DESKTOP PAGING STATION. CABLING RUNS TO TELE-COM 151.
2. DATA DROP TERMINATED AT WALL MOUNTED PAGING STATION. CABLING RUNS TO TELE-COM 151.
3. UP TO EQUIPMENT RACK ER-01 IN COMM 217 ON FLOOR ABOVE.

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SHEET TITLE

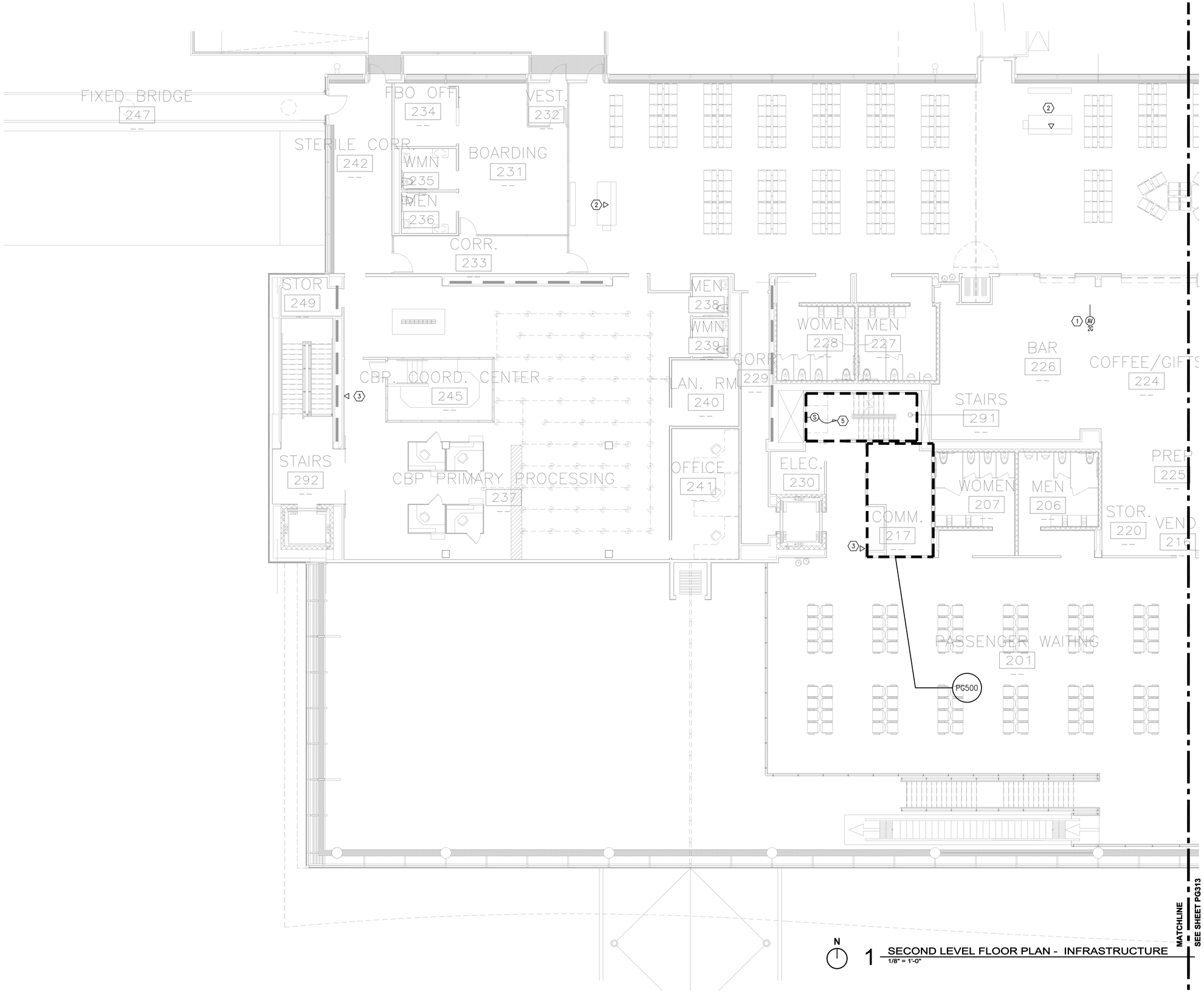
PAGING SYSTEM FIRST FLOOR PLAN - INFRASTRUCTURE

SHEET NUMBER

PG311

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG311.dwg Plotted on: 8/22/2011 3:45 PM Plotted by: Tim Adams



GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES: (#)

1. OUTLET LOCATED BEHIND AV EQUIPMENT RACK (BY OTHERS) TO FACILITATE AV SYSTEM OUTPUT TO THE PAGING SYSTEM. VERIFY LOCATION WITH OWNER/TENANT BEFORE INSTALLATION.
2. DATA DROP TERMINATED AT DESKTOP PAGING STATION. CABLING RUNS TO COMM 217.
3. DATA DROP TERMINATED AT WALL MOUNTED PAGING STATION. CABLING RUNS TO COMM 217.
4. DATA DROP AT BUILDING STANDARD RECEPTACLE HEIGHT TO SERVE DESKTOP PAGING STATION. CABLING RUNS TO COMM 217. PATCH CABLE WILL BE PROVIDED BY PAGING CONTRACTOR.
5. TO EQUIPMENT RACK ER-01 IN COMM 217 ON THIS FLOOR.

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AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

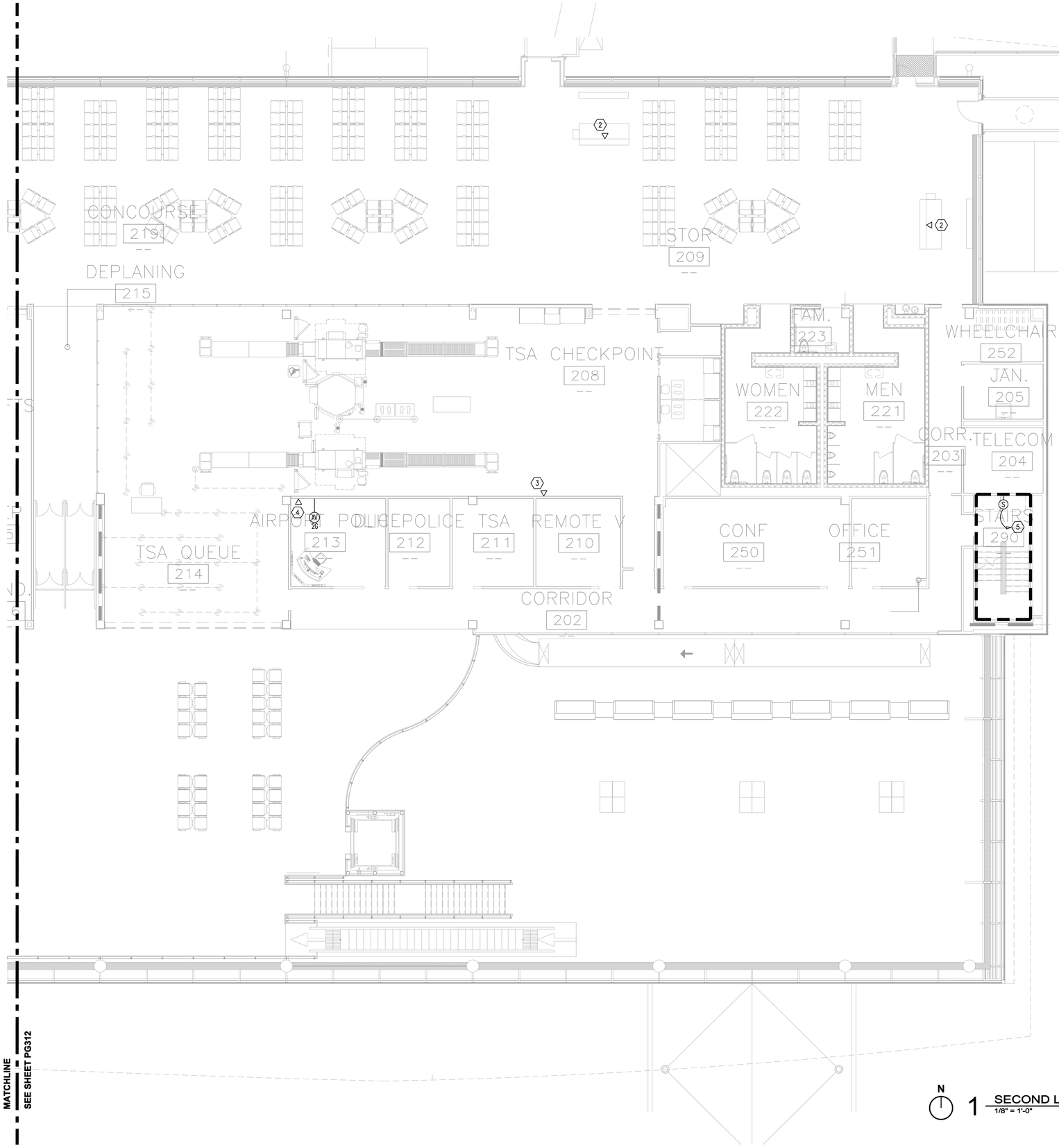
PAGING SYSTEM SECOND FLOOR PLAN - INFRAST.

SHEET NUMBER

PG312

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG312.dwg Plotted on: 8/22/2011 3:45 PM Plotted by: Tim Adams



N

1 SECOND LEVEL FLOOR PLAN - INFRASTRUCTURE
1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES: (#)

1. OUTLET LOCATED BEHIND AV EQUIPMENT RACK (BY OTHERS) TO FACILITATE AV SYSTEM OUTPUT TO THE PAGING SYSTEM. VERIFY LOCATION WITH OWNER/TENANT BEFORE INSTALLATION.
2. DATA DROP TERMINATED AT DESKTOP PAGING STATION. CABLING RUNS TO COMM 217.
3. DATA DROP TERMINATED AT WALL MOUNTED PAGING STATION. CABLING RUNS TO COMM 217.
4. DATA DROP AT BUILDING STANDARD RECEPTACLE HEIGHT TO SERVE DESKTOP PAGING STATION. CABLING RUNS TO COMM 217. PATCH CABLE WILL BE PROVIDED BY PAGING CONTRACTOR.
5. TO EQUIPMENT RACK ER-01 IN COMM 217 ON THIS FLOOR.

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DRAWN BY: RZ
DESIGNED BY: BTC

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

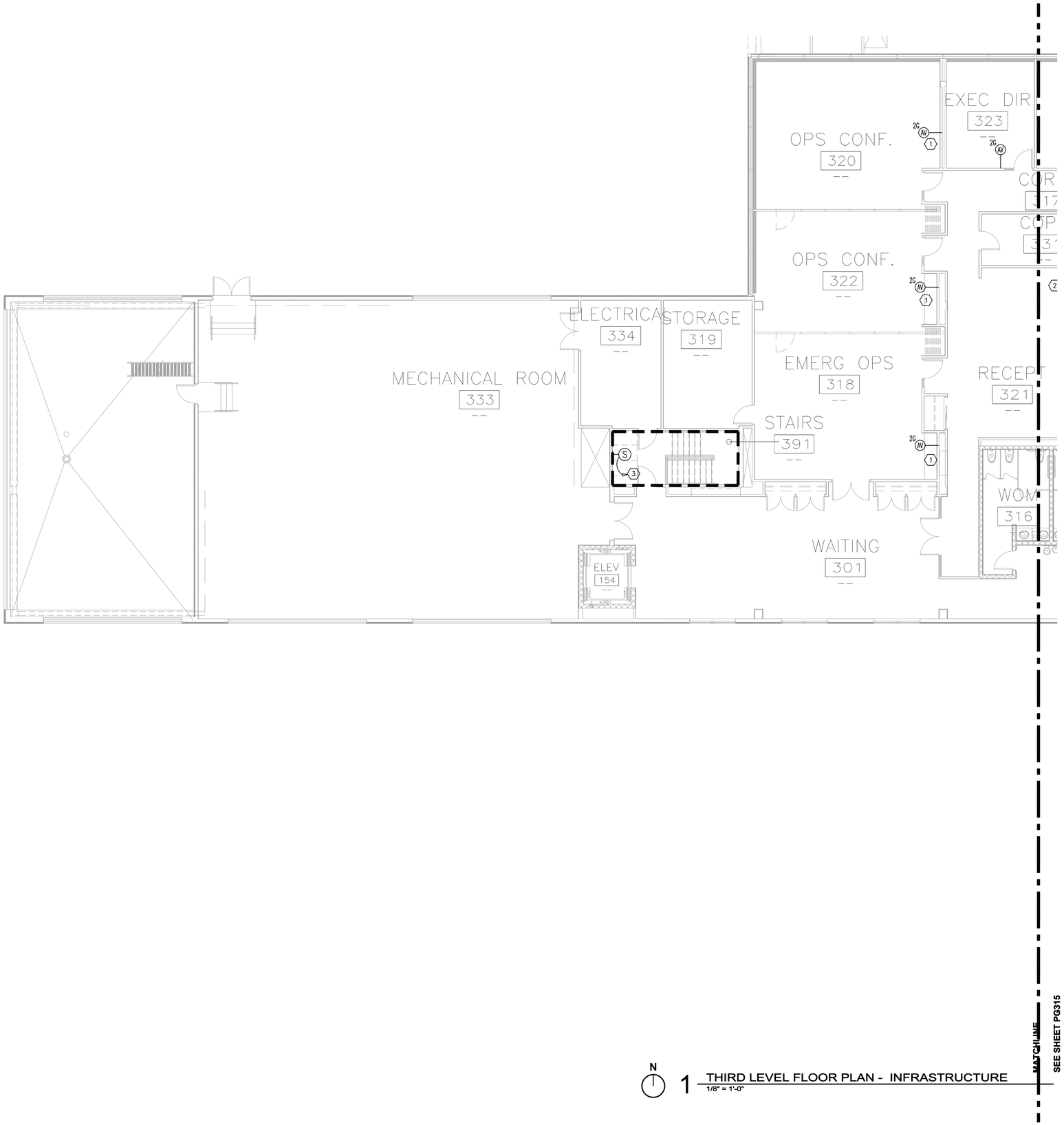
PAGING SYSTEM SECOND PLAN - INFRASTRUCTURE

SHEET NUMBER

PG313

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG313.dwg Plotted on: 8/22/2011 3:45 PM Plotted by: Tim Adams



MATCHLINE
SEE SHEET PG315

N

1 THIRD LEVEL FLOOR PLAN - INFRASTRUCTURE
1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES: (#)

1. OUTLET LOCATED BEHIND AV EQUIPMENT RACK (BY OTHERS) TO FACILITATE AV SYSTEM OUTPUT TO THE PAGING SYSTEM. VERIFY LOCATION WITH OWNER/TENANT BEFORE INSTALLATION.
2. DATA DROP AT BUILDING STANDARD RECEPTACLE HEIGHT TO SERVE DESKTOP PAGING STATION. CABLING RUNS TO COMM/ELEC 337. PATCH CABLE WILL BE PROVIDED BY PAGING CONTRACTOR.
3. TO EQUIPMENT RACK ER-01 IN COMM 217 ON FLOOR BELOW.

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REVISIONS

NO.	DESCRIPTION	DATE

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DRAWN BY: RZ
DESIGNED BY: BTC

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

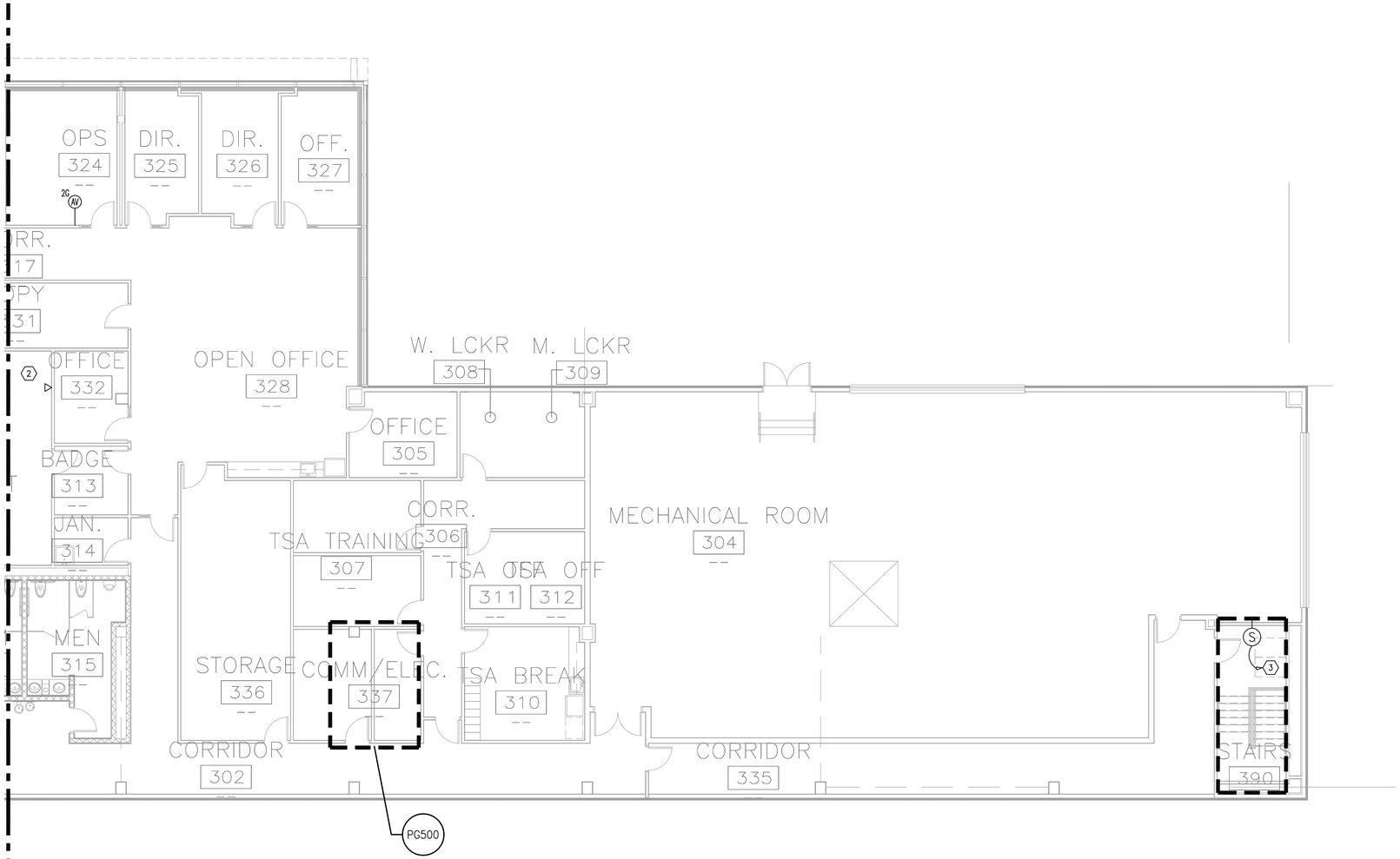
PAGING SYSTEM THIRD FLOOR PLAN - INFRASTRUCTURE

SHEET NUMBER

PG314

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG314.dwg Plotted on: 8/22/2011 3:45 PM Plotted by: Tim Adams



MATCH LINE
SEE SHEET PG314

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES: (#)

1. OUTLET LOCATED BEHIND AV EQUIPMENT RACK (BY OTHERS) TO FACILITATE AV SYSTEM OUTPUT TO THE PAGING SYSTEM. VERIFY LOCATION WITH OWNER/TENANT BEFORE INSTALLATION.
2. DATA DROP AT BUILDING STANDARD RECEPTACLE HEIGHT TO SERVE DESKTOP PAGING STATION. CABLING RUNS TO COMM/ELEC 337. PATCH CABLE WILL BE PROVIDED BY PAGING CONTRACTOR.
3. TO EQUIPMENT RACK ER-01 IN COMM 217 ON FLOOR BELOW.

N

1 THIRD LEVEL FLOOR PLAN - INFRASTRUCTURE
1/8" = 1'-0"

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DULUTH, MN

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SHEET TITLE

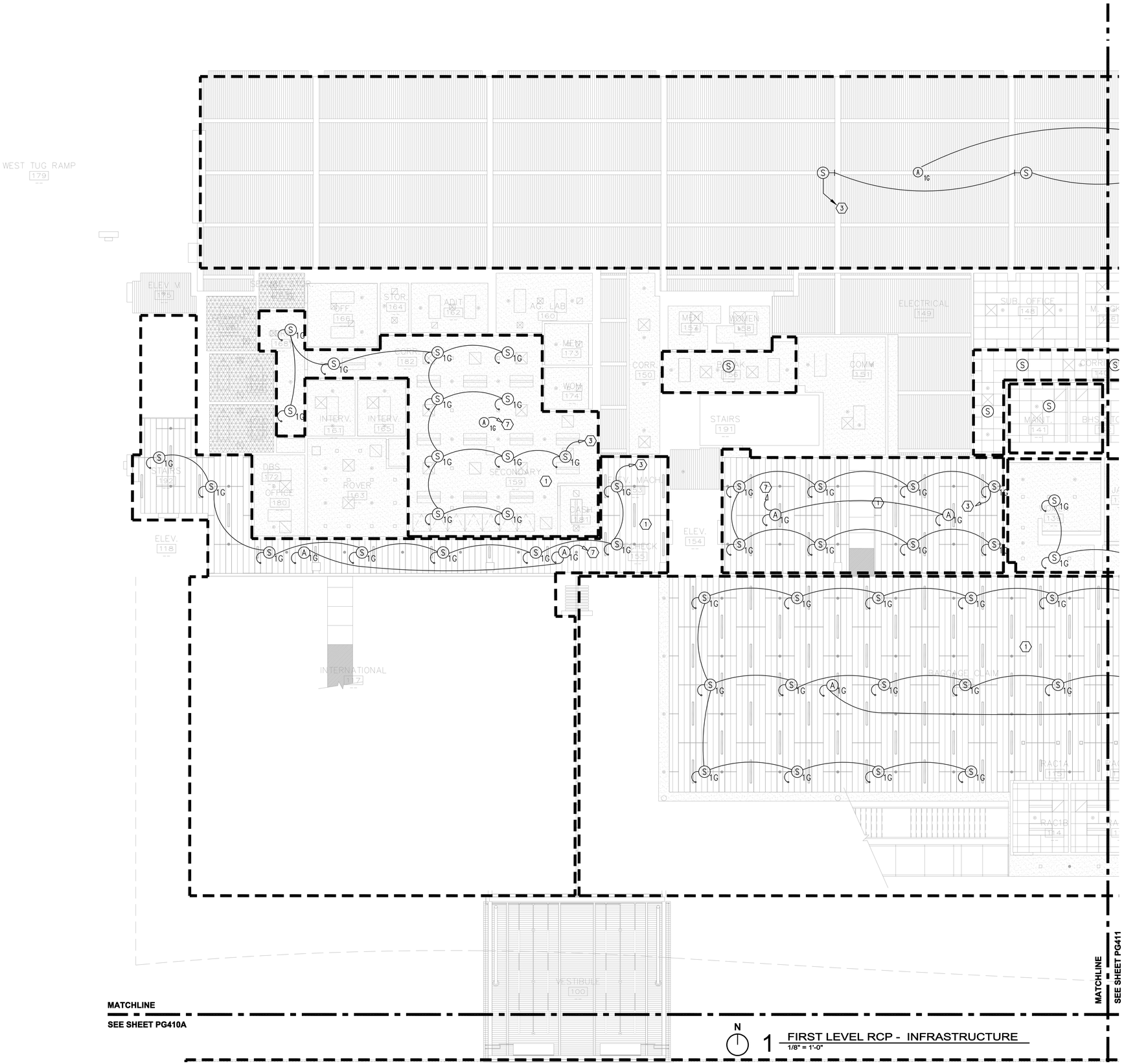
PAGING SYSTEM THIRD FLOOR PLAN - INFRASTRUCTURE

SHEET NUMBER

PG315

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG315.dwg Plotted on: 8/22/2011 3:46 PM Plotted by: Tim Adams



GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. NOT USED
3. UP TO EQUIPMENT RACK ER-01 IN COMM 217 ON FLOOR ABOVE.
4. NOT USED
5. NOT USED
6. NOT USED
7. TO COMM 151, THIS FLOOR.
8. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.

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SHEET TITLE

PAGING SYSTEM FIRST FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG410

BID PACKAGE 2B
ISSUED FOR BID

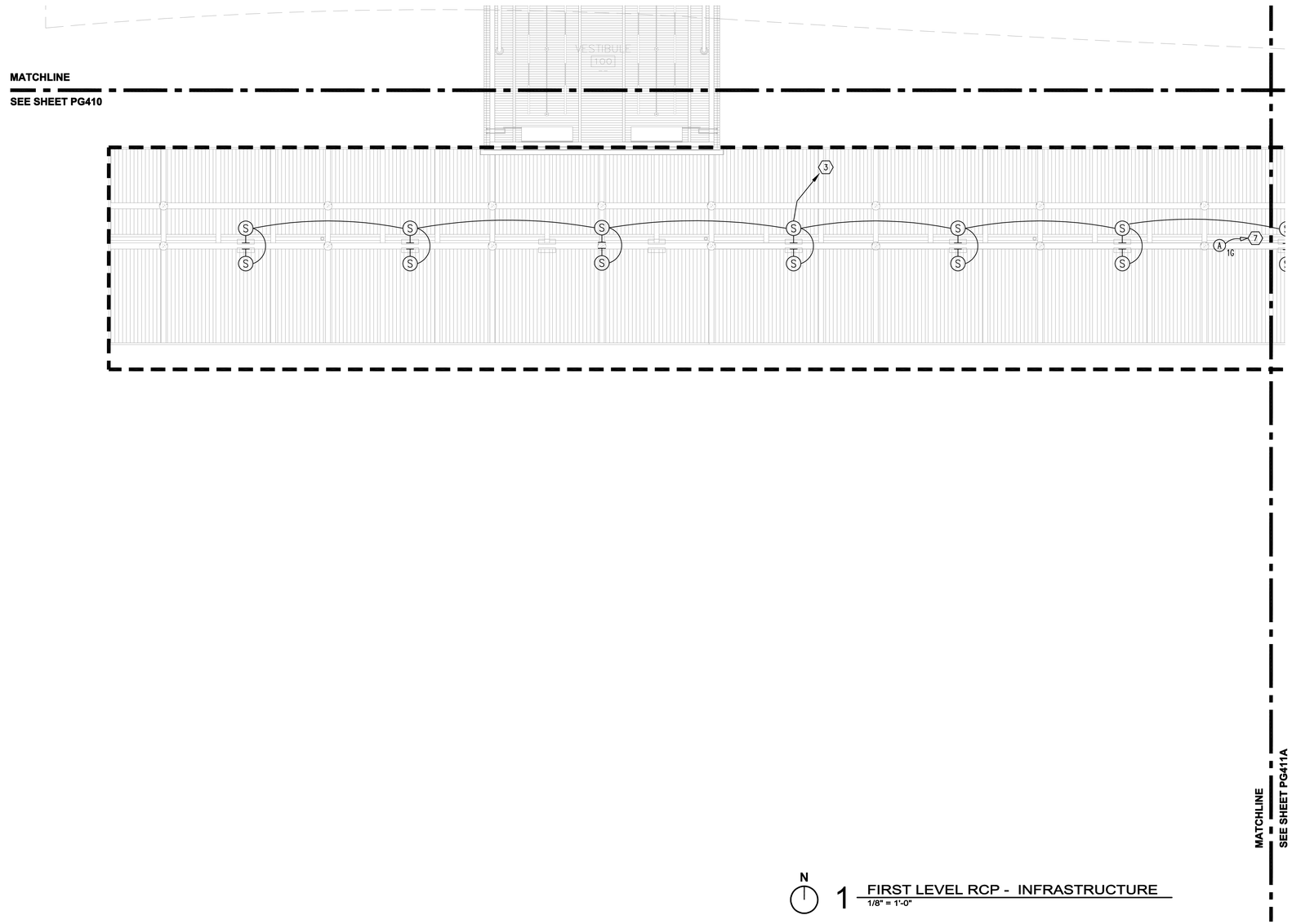
Drawing: S:\2010\10064\AV\10064_PG410.dwg Plotted on: 8/22/2011 3:46 PM Plotted by: Tim Adams

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. NOT USED
3. UP TO EQUIPMENT RACK ER–01 IN COMM 217 ON FLOOR ABOVE.
4. NOT USED
5. NOT USED
6. NOT USED
7. TO COMM 151, THIS FLOOR.
8. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.



1 FIRST LEVEL RCP - INFRASTRUCTURE
1/8" = 1'-0"

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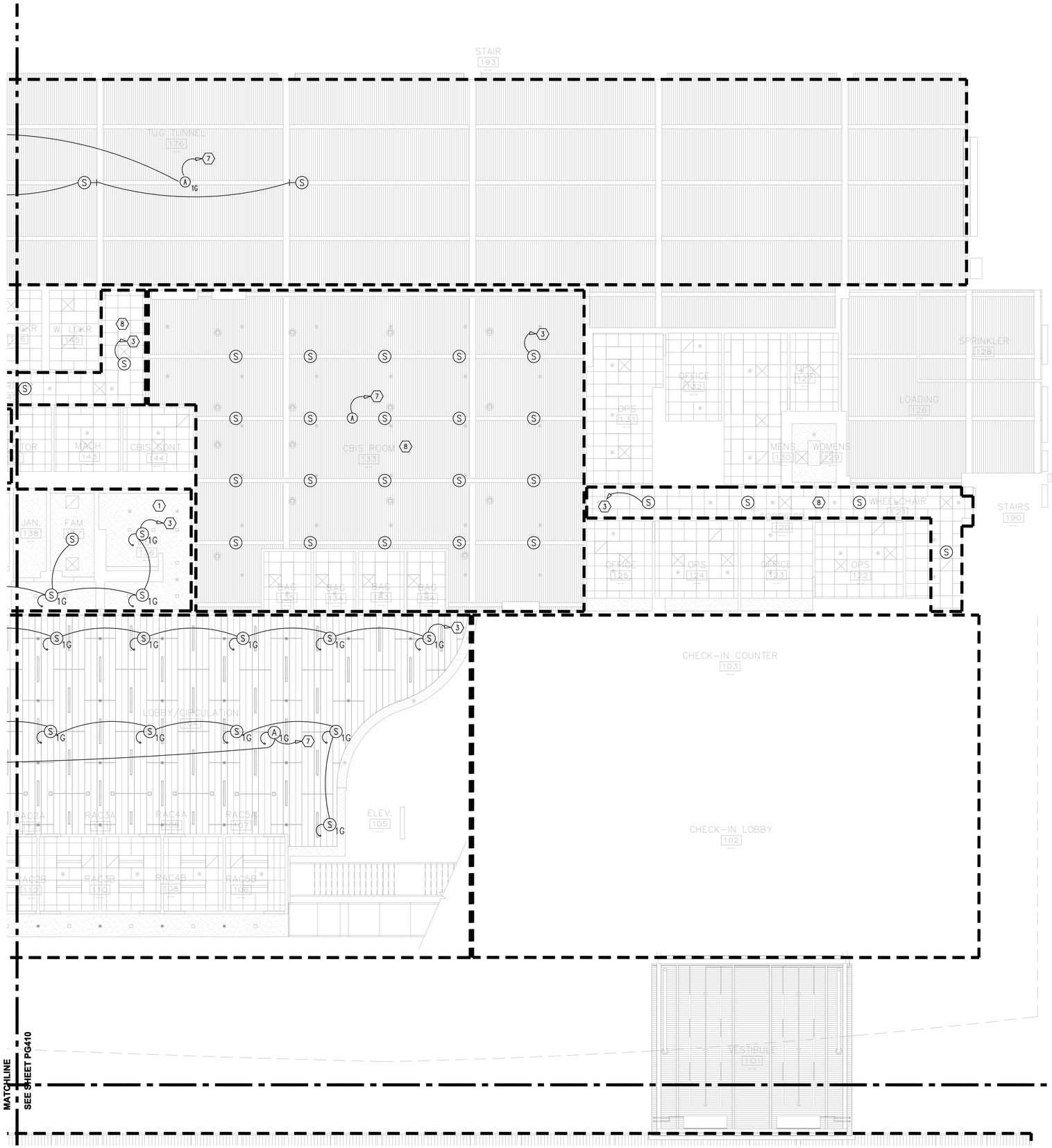
PAGING SYSTEM FIRST FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG410A

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG410A.dwg Plotted on: 8/22/2011 3:46 PM Plotted by: Tim Adams



GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. NOT USED
3. UP TO EQUIPMENT RACK ER-01 IN COMM 217 ON FLOOR ABOVE.
4. NOT USED
5. NOT USED
6. NOT USED
7. TO COMM 151, THIS FLOOR.
8. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.

N

1 FIRST LEVEL RCP - INFRASTRUCTURE
1/8" = 1'-0"

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Landscaping Consultants:
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TEL: (218) 591-5079

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 08-23-11
REVIEWED BY: BTC
DRAWN BY: RZ
DESIGNED BY: BTC

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

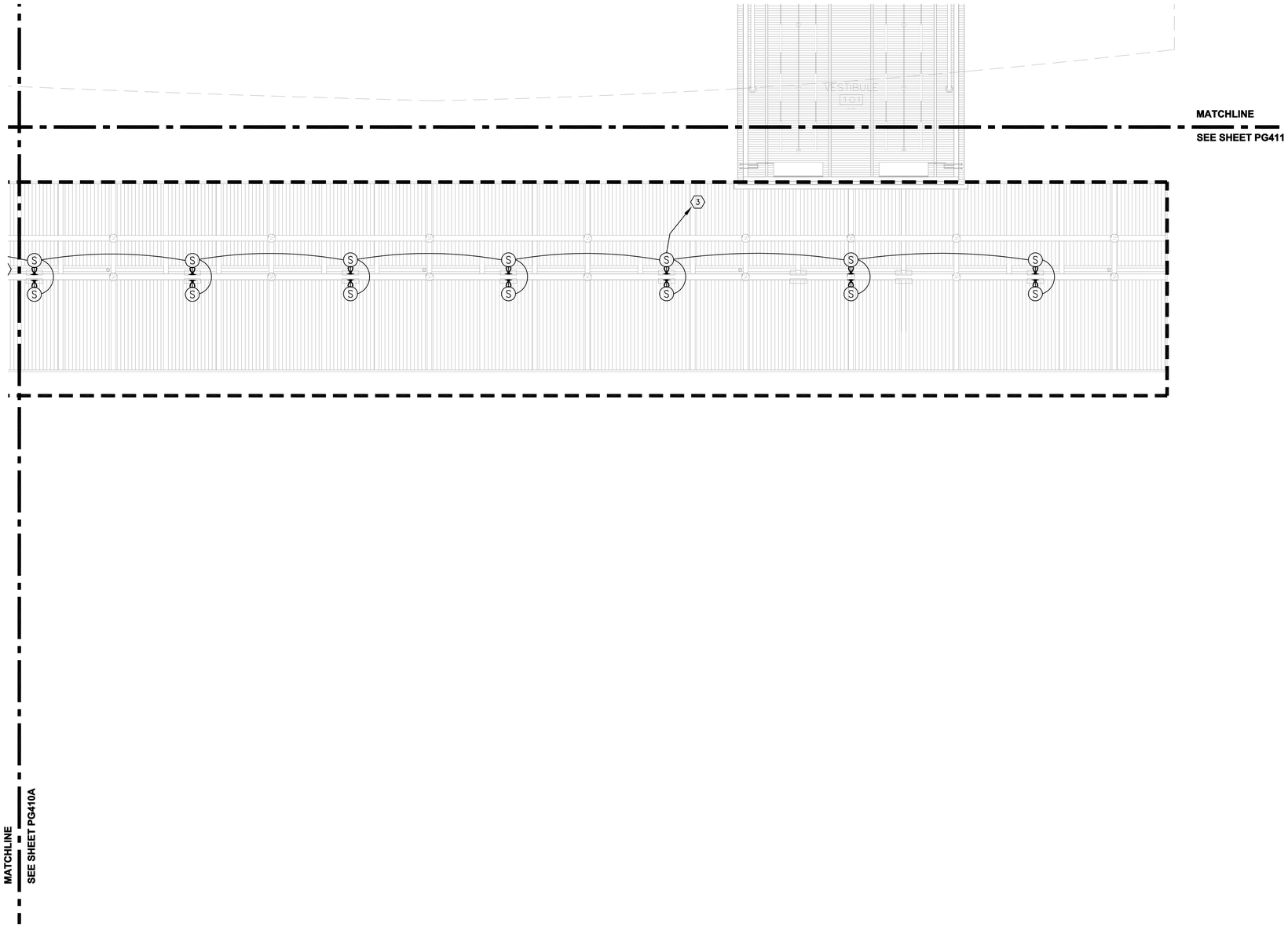
PAGING SYSTEM FIRST FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG411

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG411.dwg Plotted on: 8/22/2011 3:46 PM Plotted by: Tim Adams



GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

SHEET NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. NOT USED
3. UP TO EQUIPMENT RACK ER–01 IN COMM 217 ON FLOOR ABOVE.
4. NOT USED
5. NOT USED
6. NOT USED
7. TO COMM 151, THIS FLOOR.
8. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.

N

1 FIRST LEVEL RCP - INFRASTRUCTURE
1/8" = 1'-0"

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SHEET TITLE

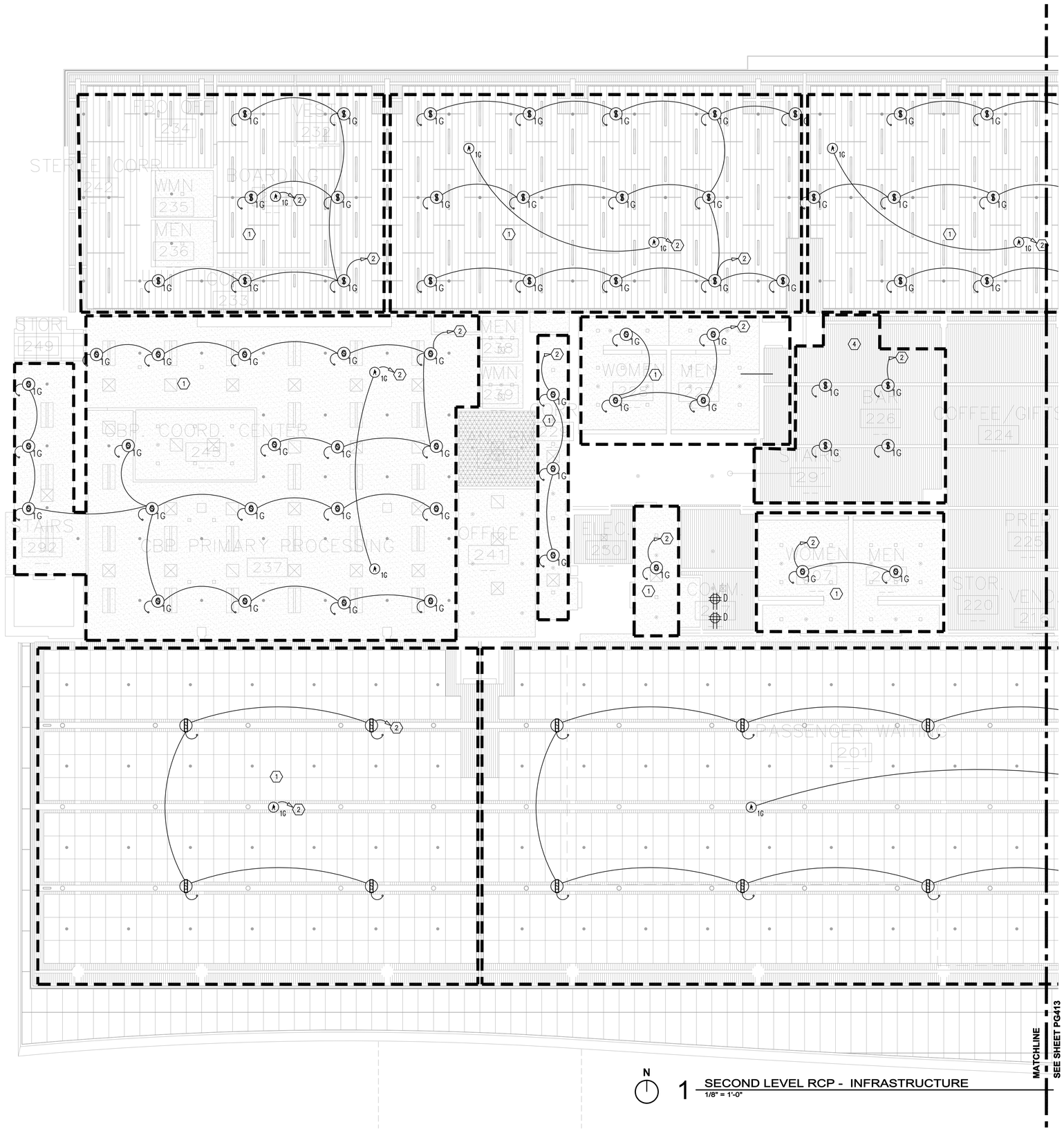
PAGING SYSTEM FIRST FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG411A

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG411A.dwg Plotted on: 8/22/2011 3:47 PM Plotted by: Tim Adams



N

1 SECOND LEVEL RCP - INFRASTRUCTURE
1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

PLAN NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. TO EQUIPMENT RACK ER–01 IN COMM 217 ON THIS FLOOR.
3. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.
4. COORDINATE FINAL SPEAKER LOCATION AND CEILING MOUNTING/CONDUIT REQUIREMENTS WITH TENANT/OWNER BEFORE INSTALLATION.

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SHEET TITLE

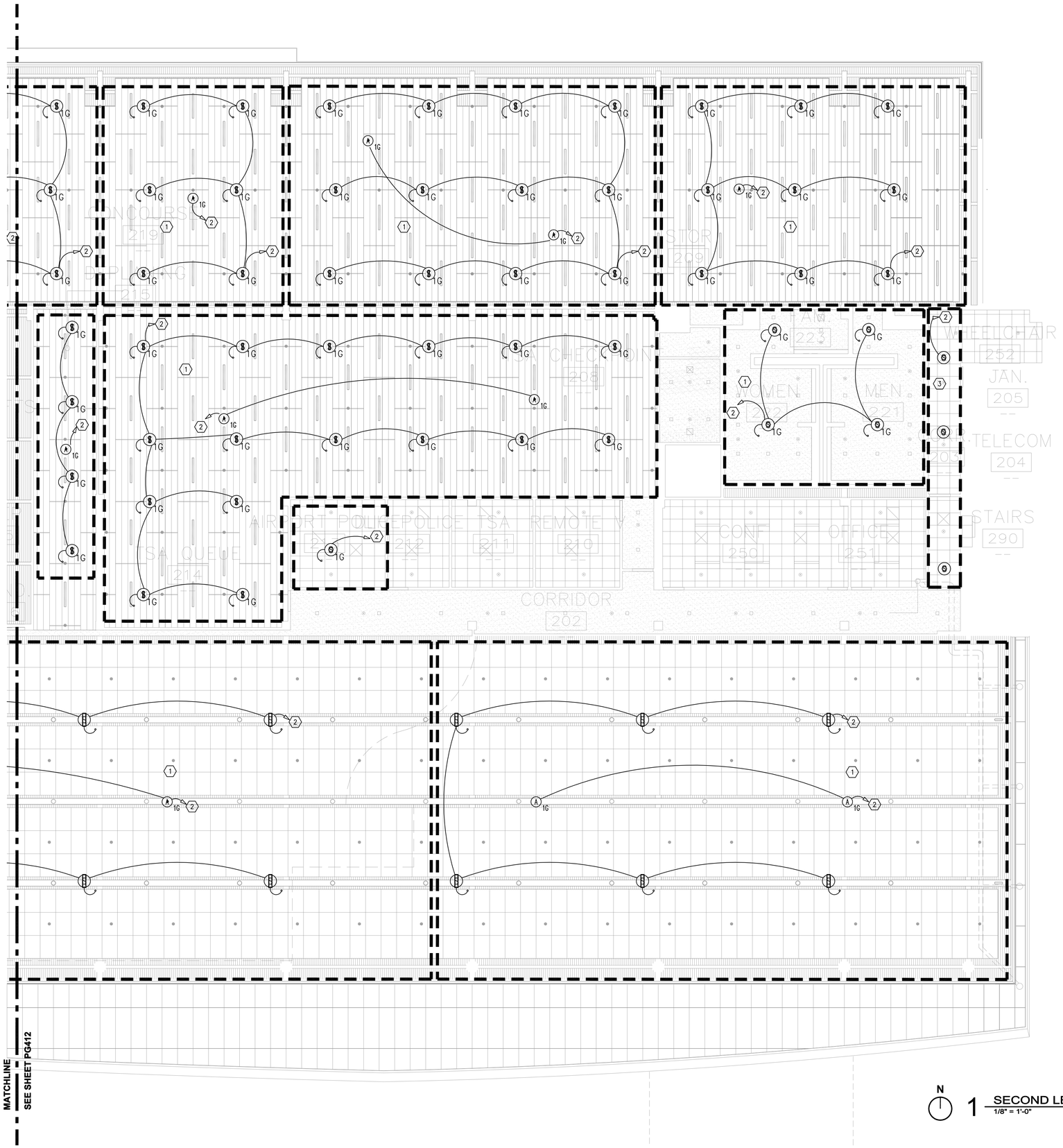
PAGING SYSTEM SECOND FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG412

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG412.dwg Plotted on: 8/22/2011 3:47 PM Plotted by: Tim Adams



N

1 SECOND LEVEL RCP - INFRASTRUCTURE
1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

PLAN NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. TO EQUIPMENT RACK ER-01 IN COMM 217 ON THIS FLOOR.
3. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.
4. COORDINATE FINAL SPEAKER LOCATION AND CEILING MOUNTING/CONDUIT REQUIREMENTS WITH TENANT/OWNER BEFORE INSTALLATION.

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SHEET TITLE

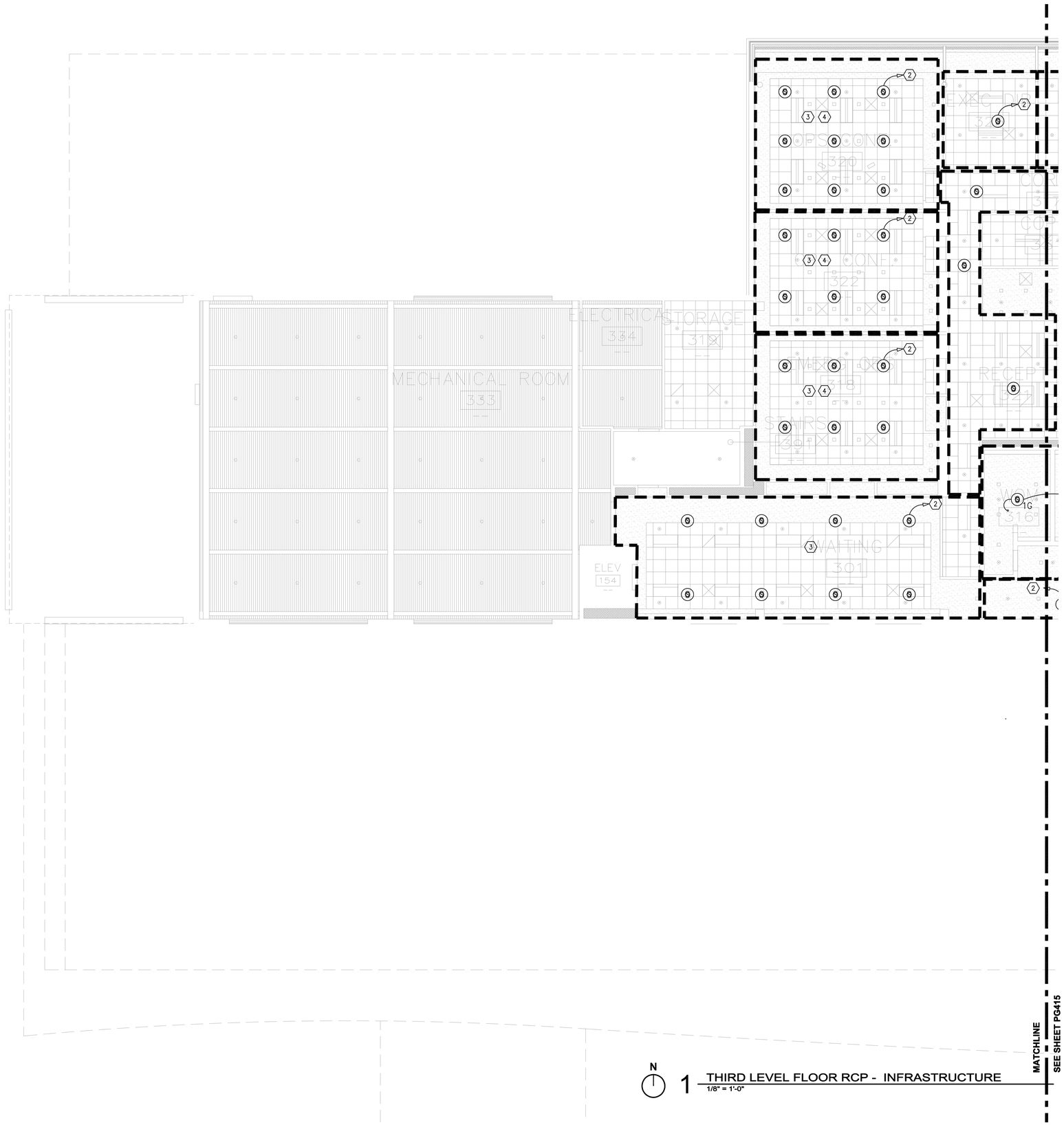
PAGING SYSTEM SECOND FLOOR RCP - INFRAST.

SHEET NUMBER

PG413

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG413.dwg Plotted on: 8/22/2011 3:47 PM Plotted by: Tim Adams



N

1 THIRD LEVEL FLOOR RCP - INFRASTRUCTURE

1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

PLAN NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. TO EQUIPMENT RACK ER1 IN COMM 217 ON FLOOR BELOW.
3. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.
4. COORDINATE FINAL SPEAKER LOCATION AND CEILING MOUNTING/CONDUIT REQUIREMENTS WITH TENANT/OWNER BEFORE INSTALLATION.
5. STUB CONDUIT 12" INTO ACCESSIBLE CEILING SPACE.

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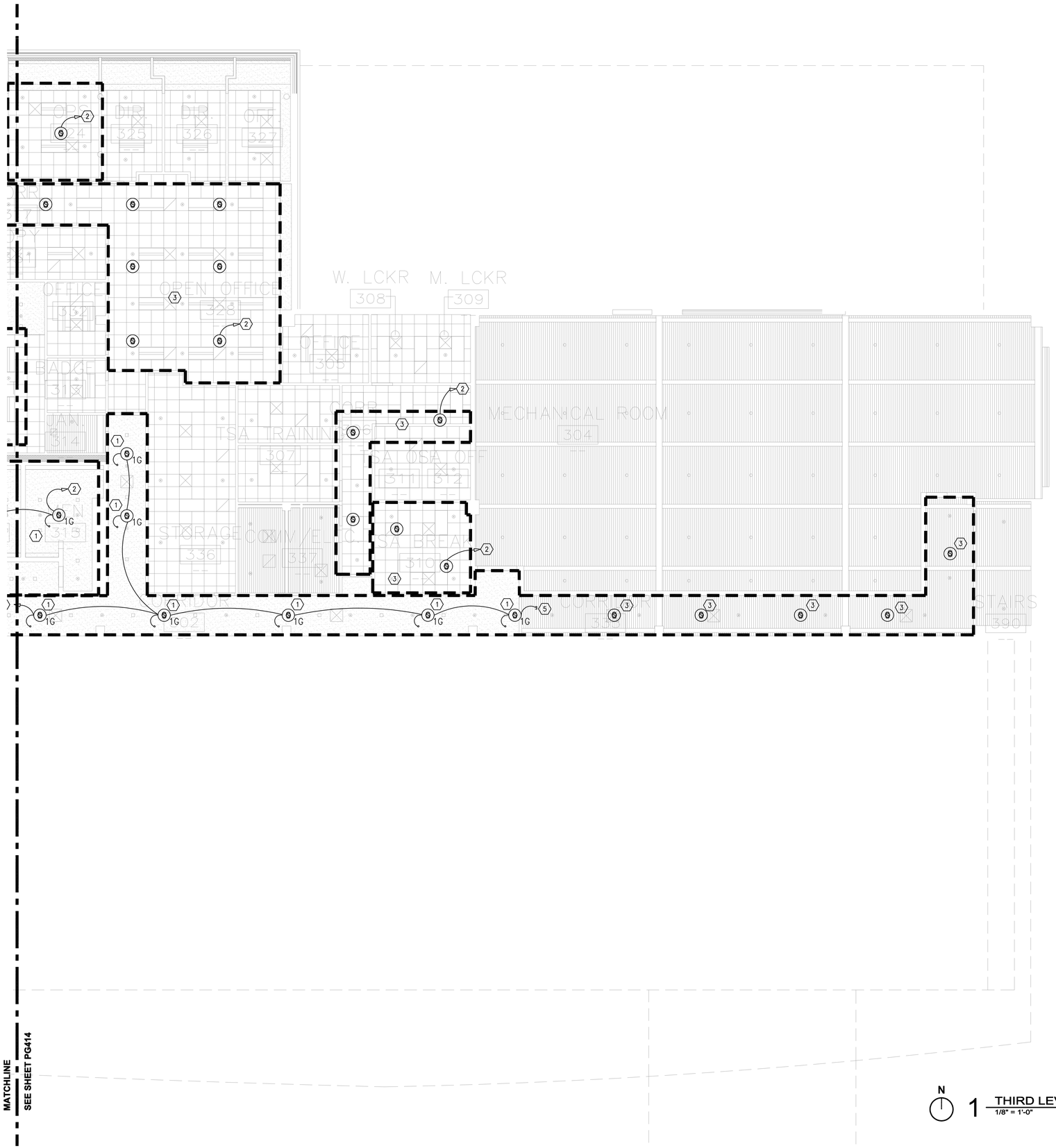
PAGING SYSTEM THIRD FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG414

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG414.dwg Plotted on: 8/22/2011 3:47 PM Plotted by: Tim Adams



MATCHLINE
SEE SHEET PG414

N

1 THIRD LEVEL FLOOR RCP - INFRASTRUCTURE
1/8" = 1'-0"

GENERAL NOTES:

1. ALL CONDUIT 3/4" UNLESS OTHERWISE NOTED.
2. PROVIDE APPROPRIATELY SIZED PULLBOXES AND CONDUITS AS REQUIRED TO DISTRIBUTE PAGING SYSTEM CABLING ON THIS FLOOR AND TO OTHER FLOORS AS REQUIRED.

PLAN NOTES (#)

1. TYPICAL FOR ALL SPEAKERS IN ZONE – 1/2" FLEXIBLE WHIP DOWN TO LOUDSPEAKER ENCLOSURE. PROVIDE LENGTH TO EXTEND 24" BELOW FINISHED CEILING WITH MALE ADAPTOR AND LOCKNUT. CONNECTION TO ENCLOSURE BY PAGING CONTRACTOR.
2. TO EQUIPMENT RACK ER1 IN COMM 217 ON FLOOR BELOW.
3. UTILIZE PLENUM CABLE TO INTERCONNECT SPEAKER/AMBIENT SENSORS PER APPLICABLE CODES.
4. COORDINATE FINAL SPEAKER LOCATION AND CEILING MOUNTING/CONDUIT REQUIREMENTS WITH TENANT/OWNER BEFORE INSTALLATION.
5. STUB CONDUIT 12" INTO ACCESSIBLE CEILING SPACE.

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SHEET TITLE

PAGING SYSTEM THIRD FLOOR RCP - INFRASTRUCTURE

SHEET NUMBER

PG415

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG415.dwg Plotted on: 8/22/2011 3:48 PM Plotted by: Tim Adams

ROOM SPACE	PEAK		QUIESCENT		NOTES
	kVA	sBTU/Hr	kVA	sBTU/Hr	
COMM 217	0.5	150	0.4	135	
TELE-COM 151	3.54	13,269	0.78	2637	
COMM/ELEC 325	0.5	150	0.4	135	

NOTES:

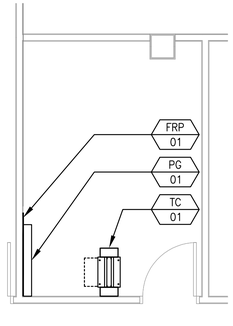
kVA ESTIMATED HEAT LOAD:
THE kVA ESTIMATES LISTED ABOVE RELATE TO MAXIMUM POWER REQUIRED. NOT TYPICAL DEMAND. THESE FIGURES INCLUDE THE POWER FOR THE VIDEO, AUDIO, AND PROJECTION EQUIPMENT. THEY DO NOT INCLUDE POWER FOR THE GENERAL LIGHTING OR CONVENIENCE RECEPTACLES.

HVAC ESTIMATES:
THE HVAC ESTIMATES LISTED ABOVE ARE BASED ON SENSIBLE HEAT LOADS GENERATED BY THE VIDEO, AUDIO, AND PROJECTION EQUIPMENT. THEY DO NOT INCLUDE LOADS GENERATED BY PERSONNEL, GENERAL LIGHTING SYSTEMS, OR SOLAR HEAT GAIN. COOLING (DIVERSITY) FACTORS HAVE BEEN APPLIED TO ACCOUNT FOR ALL CASES, INCLUDING, BUT NOT LIMITED TO, INTERMITTENT AND PARTIAL-AREA USE OF THE FACILITY. THE AREAS LISTED SHALL BE PROVIDED WITH INDIVIDUAL THERMOSTAT CONTROLS TO MAINTAIN TEMPERATURES BETWEEN 68 AND 75 DEGREES F.

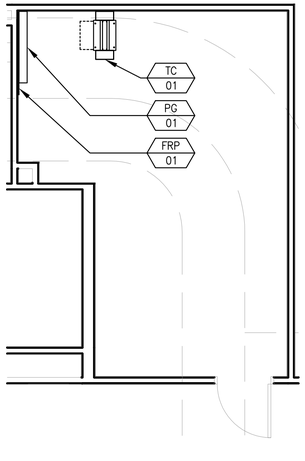
5 COMM ROOM POWER AND HEAT LOADS
NTS

EQUIPMENT SCHEDULE (EQS)					
NO.	LOCATION	EQUIPMENT TYPE	DETAIL SHEET	MOUNTING	NOTES
PG-01	WALL	WALL MOUNTED PAGING EQUIPMENT	TBD	SURFACE	COORDINATE EXACT LOCATION WITH ARCHITECT
ER-01	FLOOR	AV EQUIPMENT RACK	TBD	FREESTANDING	FOR PAGING SYSTEM HEADEND EQUIPMENT
FRP-01	WALL	4' X 8' X 3/4" FIRE RATED PLYWOOD (PROVIDED BY OTHERS)	TBD	SURFACE	PROVIDED BY OTHERS - COORDINATE EXACT LOCATION WITH ARCHITECT
TC-01	FLOOR	OPEN FRAME TELECOMMUNICATIONS EQUIPMENT RACK (BY OTHERS)	TBD	FREESTANDING	PROVIDED BY OTHERS - COORDINATE EXACT LOCATION WITH ARCHITECT

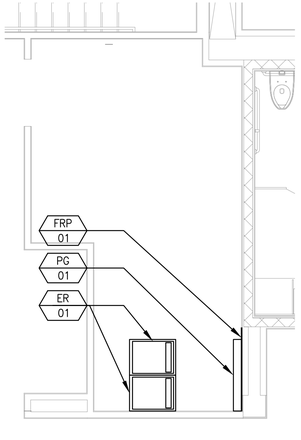
4 ENLARGED COMM ROOM FLOORPLANS EQUIPMENT SCHEDULE
NTS



3 COMM/ELEC 325 ENLARGED ROOM PLAN - FACILITY
1/4" = 1'-0"



2 TELE-COMM 151 ENLARGED ROOM PLAN - FACILITY
1/4" = 1'-0"



1 COMM 217 ENLARGED ROOM PLAN - FACILITY
1/4" = 1'-0"

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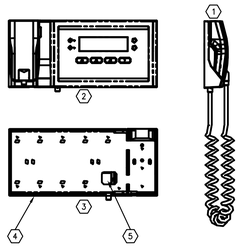
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SHEET TITLE
PAGING SYSTEM ENLARGED FLOOR PLANS

SHEET NUMBER
PG500

BID PACKAGE 2B
ISSUED FOR BID

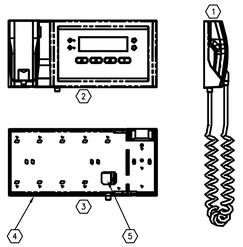
Drawing: S:\2010\10064\AV\10064_PG500.dwg Plotted on: 8/22/2011 4:05 PM Plotted by: Tim Adams



DETAIL NOTES:

1. SECTION VIEW OF PAGING STATION ASSEMBLY/MICROPHONE
2. ELEVATION VIEW OF PAGING STATION ASSEMBLY/MICROPHONE
3. ELEVATION VIEW OF PAGING STATION MOUNTING PLATE.
4. BLOCKING REQUIRED BEHIND MOUNTING PLATE. ANY VISIBLE HOLES CAN BE USED TO SECURE PLATE. COORDINATE MILLWORK INTEGRATION WITH ARCHITECT.
5. DATA JACK MOUNTED BEHIND MOUNTING PLATE

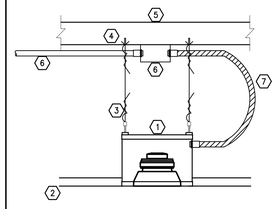
08 PAGING STATION 05 (PG-05) DETAIL
SCALE: NTS



DETAIL NOTES:

1. SECTION VIEW OF PAGING STATION ASSEMBLY/MICROPHONE
2. ELEVATION VIEW OF PAGING STATION ASSEMBLY/MICROPHONE
3. ELEVATION VIEW OF PAGING STATION MOUNTING PLATE.
4. BLOCKING REQUIRED BEHIND MOUNTING PLATE. ANY VISIBLE HOLES CAN BE USED TO SECURE PLATE. COORDINATE MILLWORK INTEGRATION WITH ARCHITECT.
5. DATA JACK MOUNTED BEHIND MOUNTING PLATE

06 PAGING STATION 01 (PG-01) DETAIL
SCALE: NTS

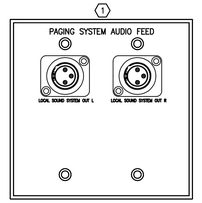


DETAIL NOTES:

1. SPEAKER ASSEMBLY INCLUDING A LOUDSPEAKER, ENCLOSURE, GRILL AND MOUNTING BRACKET
2. FINISHED WOOD SLAT CEILING
3. PROVIDE SUPPORT WIRES AT FOUR LOCATIONS
4. SUPPORT HARDWARE, UTILIZE PROPER TYPE
5. BUILDING STRUCTURE
6. INFRASTRUCTURE RACEWAY AND J-BOX PER AV INFRASTRUCTURE PLANS
7. FLEXIBLE RACEWAY TO SPEAKER ENCLOSURE

SECTION VIEW

04 CEILING SPEAKER 04 (CS-04) DETAIL
SCALE: NTS

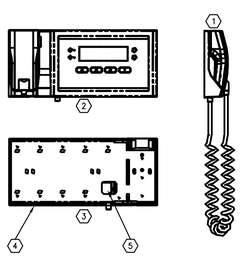


DETAIL NOTES:

1. TWO GANG CUSTOM PLATE – REFER TO TITLE SHEET AND FLOOR PLANS FOR INFRASTRUCTURE INFORMATION

ELEVATION VIEW

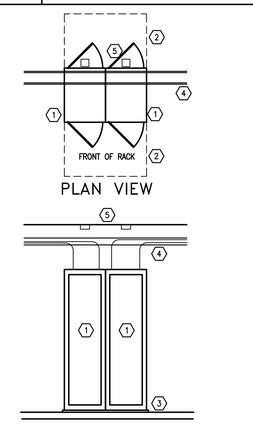
02 AUXILIARY INPUT PLATE (AUX-01) DETAIL
SCALE: NTS



DETAIL NOTES:

1. SECTION VIEW OF FUTURE PAGING STATION ASSEMBLY/MICROPHONE
2. ELEVATION VIEW OF FUTURE PAGING STATION ASSEMBLY/MICROPHONE
3. ELEVATION VIEW OF FUTURE PAGING STATION MOUNTING PLATE.
4. BLOCKING REQUIRED BEHIND MOUNTING PLATE. ANY VISIBLE HOLES CAN BE USED TO SECURE PLATE.
5. DATA JACK MOUNTED BEHIND FUTURE MOUNTING PLATE

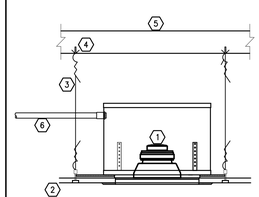
07 PAGING STATION 04 (PG-04) DETAIL
SCALE: NTS



DETAIL NOTES:

1. STATIONARY EQUIPMENT RACK(S)
2. 1 METER WORK SPACE
3. ISOLATION MATERIAL
4. CABLE MANAGEMENT
5. ELECTRICAL RECEPTACLE(S) SERVING RACK

05 EQUIPMENT RACK (ER-01) DETAIL
SCALE: NTS

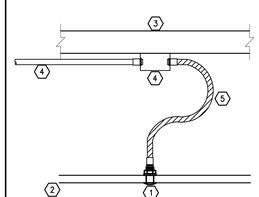


DETAIL NOTES:

1. SPEAKER ASSEMBLY INCLUDING A LOUDSPEAKER, ENCLOSURE, GRILL AND TILE BRIDGE
2. FINISHED CEILING
3. PROVIDE SUPPORT WIRES AT THREE LOCATIONS
4. SUPPORT HARDWARE, UTILIZE PROPER TYPE
5. BUILDING STRUCTURE
6. INFRASTRUCTURE RACEWAY PER INFRASTRUCTURE PLANS

SECTION VIEW

03 CEILING SPEAKER 03 (CS-03) DETAIL
SCALE: NTS



DETAIL NOTES:

1. CEILING MICROPHONE ASSEMBLY
2. FINISHED CEILING
3. BUILDING STRUCTURE
4. INFRASTRUCTURE RACEWAY AND J-BOX PER INFRASTRUCTURE PLANS
5. FLEXIBLE RACEWAY TO MICROPHONE

SECTION VIEW

01 AMBIENT NOISE MICROPHONE (AS-01) DETAIL
SCALE: NTS

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REVISIONS

NO.	DESCRIPTION	DATE

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DRAWN BY: RZ
DESIGNED BY: BTC

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213-1882-091

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SHEET TITLE

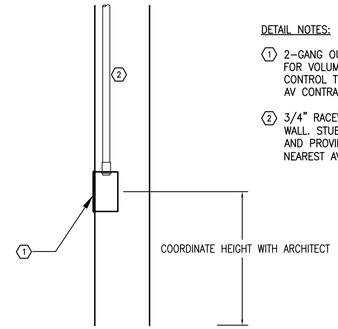
PAGING SYSTEM DETAILS

SHEET NUMBER

PG600

BID PACKAGE 2B
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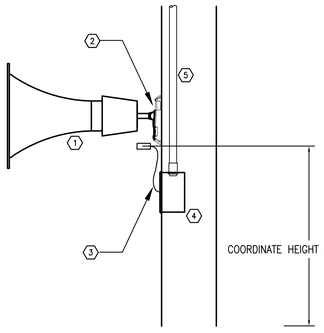
Drawing: S:\2010\10064\AV\10064_PG600.dwg Plotted on: 8/22/2011 3:48 PM Plotted by: Tim Adams



DETAIL NOTES:

1. 2-GANG OUTLET BOX PROVIDED FOR VOLUME CONTROL. VOLUME CONTROL TO BE PROVIDED BY AV CONTRACTOR.
2. 3/4" RACEWAY CONCEALED IN WALL. STUB UP TO CEILING AND PROVIDE PATHWAY TO NEAREST AV/IT CLOSET.

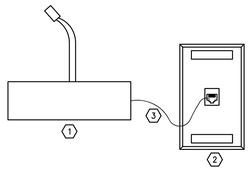
09 PROGRAMMABLE VOLUME CONTROL (VC-01)
SCALE: NTS



DETAIL NOTES:

1. WALL MOUNTED HORN
2. MOUNTING HARDWARE
3. SPEAKER CABLE CONCEALED BEHIND LOUDSPEAKER
4. OUTLET BOX CONCEALED BEHIND LOUDSPEAKER
5. RACEWAY CONCEALED IN WALL

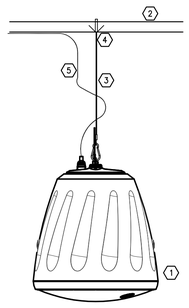
08 WALL SPEAKER 02 (WS-02) DETAIL
SCALE: NTS



DETAIL NOTES:

1. DESKTOP PAGING STATION
2. WALL MOUNTED DATA JACK
3. PATCH CABLE

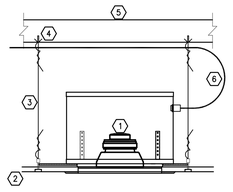
06 PAGING STATION 03 (PG-03) DETAIL
SCALE: NTS



DETAIL NOTES:

1. SPEAKER ASSEMBLY
2. BUILDING STRUCTURE
3. SUSPENSION CABLE
4. SUPPORT HARDWARE, UTILIZE PROPER TYPE
5. SPEAKER CABLING (PER APPLICABLE CODES)

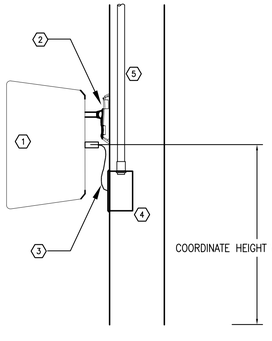
04 CEILING SPEAKER 06 (CS-06) DETAIL
SCALE: NTS



DETAIL NOTES:

1. SPEAKER ASSEMBLY INCLUDING A LOUDSPEAKER, ENCLOSURE, GRILL AND TITLE BRIDGE
2. FINISHED CEILING
3. PROVIDE SUPPORT WIRES AT THREE LOCATIONS
4. SUPPORT HARDWARE, UTILIZE PROPER TYPE
5. BUILDING STRUCTURE
6. PLENUM CABLING (PER APPLICABLE CODES)

02 CEILING SPEAKER 02 (CS-02) DETAIL
SCALE: NTS

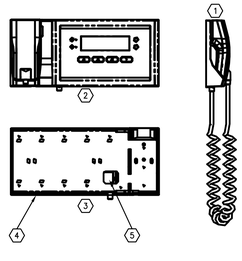


DETAIL NOTES:

1. WALL MOUNTED LOUDSPEAKER
2. MOUNTING HARDWARE
3. SPEAKER CABLE CONCEALED BEHIND LOUDSPEAKER
4. OUTLET BOX CONCEALED BEHIND LOUDSPEAKER
5. RACEWAY CONCEALED IN WALL

COORDINATE HEIGHT WITH ARCHITECT

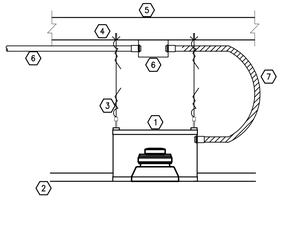
07 WALL SPEAKER 01 (WS-01) DETAIL
SCALE: NTS



DETAIL NOTES:

1. SECTION VIEW OF PAGING STATION ASSEMBLY/MICROPHONE
2. ELEVATION VIEW OF PAGING STATION ASSEMBLY/MICROPHONE
3. ELEVATION VIEW OF PAGING STATION MOUNTING PLATE.
4. BLOCKING REQUIRED BEHIND MOUNTING PLATE. ANY VISIBLE HOLES CAN BE USED TO SECURE PLATE.
5. DATA JACK MOUNTED BEHIND MOUNTING PLATE

05 PAGING STATION 02 (PG-02) DETAIL
SCALE: NTS

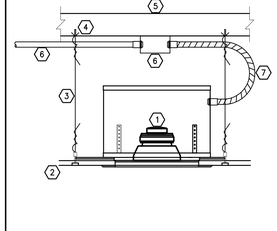


SECTION VIEW

DETAIL NOTES:

1. SPEAKER ASSEMBLY INCLUDING A LOUDSPEAKER, ENCLOSURE, GRILL AND MOUNTING BRACKET
2. FINISHED WOOD SLAT CEILING
3. PROVIDE SUPPORT WIRES AT FOUR LOCATIONS
4. SUPPORT HARDWARE, UTILIZE PROPER TYPE
5. BUILDING STRUCTURE
6. INFRASTRUCTURE RACEWAY AND J-BOX PER AV INFRASTRUCTURE PLANS
7. FLEXIBLE RACEWAY TO SPEAKER ENCLOSURE

03 CEILING SPEAKER 05 (CS-05) DETAIL
SCALE: NTS



SECTION VIEW

DETAIL NOTES:

1. SPEAKER ASSEMBLY INCLUDING A LOUDSPEAKER, ENCLOSURE, GRILL AND CEILING SUPPORT BACKING PLATE
2. FINISHED CEILING
3. PROVIDE SUPPORT WIRES AT THREE LOCATIONS
4. SUPPORT HARDWARE, UTILIZE PROPER TYPE
5. BUILDING STRUCTURE
6. INFRASTRUCTURE RACEWAY AND J-BOX PER INFRASTRUCTURE PLANS
7. FLEXIBLE RACEWAY TO SPEAKER ENCLOSURE

01 CEILING SPEAKER 01 (CS-01) DETAIL
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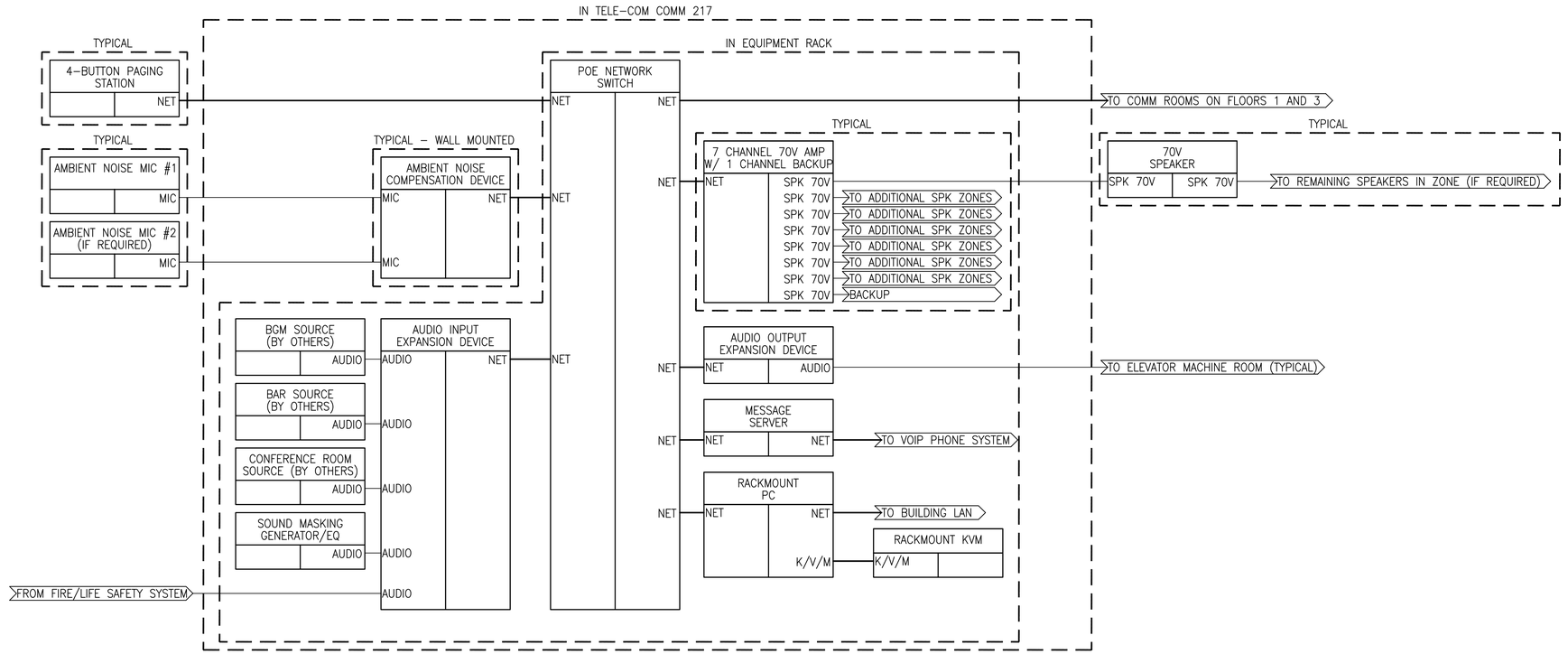
PAGING SYSTEM DETAILS

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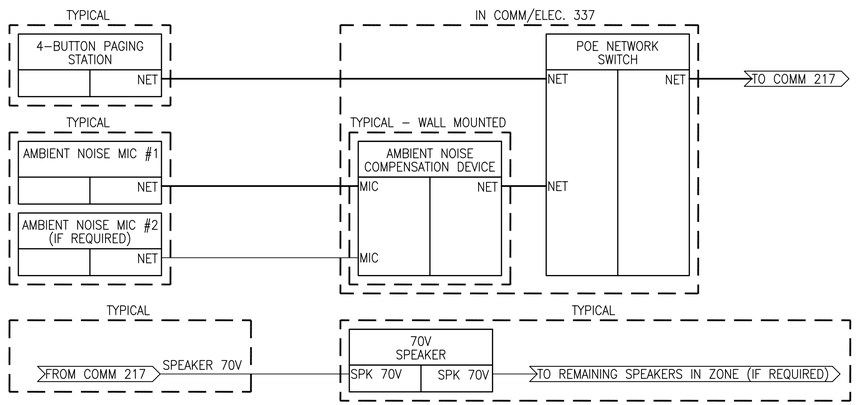
PG601

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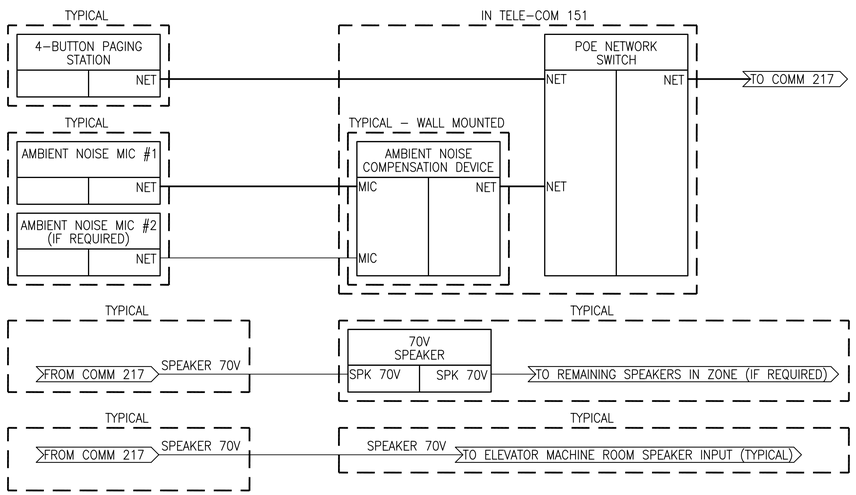
Drawing: S:\2010\10064\AV\10064_PG601.dwg Plotted on: 8/22/2011 3:49 PM Plotted by: Tim Adams



2 2ND FLOOR PAGING SYSTEM SIGNAL FLOW DIAGRAM
NTS



3 3RD FLOOR PAGING SYSTEM SIGNAL FLOW DIAGRAM
NTS



1 1ST FLOOR PAGING SYSTEM SIGNAL FLOW DIAGRAM
NTS

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SHEET TITLE

PAGING SYSTEM SIGNAL FLOWS

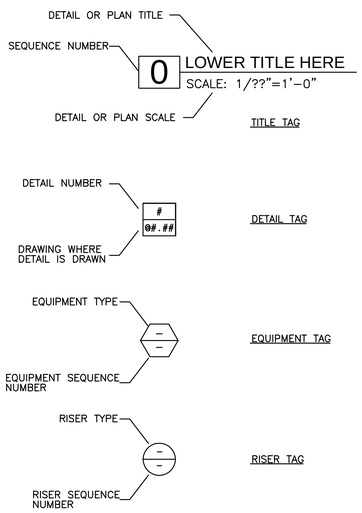
SHEET NUMBER

PG700

BID PACKAGE 2B
ISSUED FOR BID

Drawing: S:\2010\10064\AV\10064_PG700.dwg Plotted on: 8/22/2011 3:49 PM Plotted by: Tim Adams

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

			DATE													
Sheet No.	Filename (proj.#5528)	DRAWING TITLE	11/20/09 ISSUED FOR DD	03/26/10 60% REVIEW	06/28/10 90% REVIEW	08/09/10 100% CD	09/17/10 BID PACK 1 ISSUED FOR BID	09/03/10 FOUNDATION PERMIT	09/16/10 ADDENDUM #2	10/08/10 CONFORMANCE SET	09/09/10 BUILDING PERMIT	01/24/11 BID PACKAGE 2A	05/02/11 BP2A CONFORMANCE SET	08/23/11 BID PACKAGE 2B	
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	●	●	●	●	●	●		●	●	●	●	●	●

NOTE:

NO BEAM CLAMP HANGERS ALLOWED IN EXPOSED PUBLIC AREAS.

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2528.00 Duluth Airport\5.0 CADD\(5.6) Plumbing\Dwgs\5528_P001.dwg Plotted on: 8/17/2011 1:13 PM Plotted by: Tolliver, Ferld

FOR CONTINUATION SEE BELOW

4"UP TO FLR. CLEAN-OUT (TYP.)

ROLL DN TO MATCH THE DIFFERENT ELEVATION, SEE STRUC. FOUNDATION PLAN

4"UP TO TD

I.E=(-)1'-6"

I.E=(-)1'-7 1/4"

SLEEVE

I.E=(-)2'-3 3/8"

TRENCH DRAIN

I.E=(-)5'-1 1/2"
OIL SEPARATOR
35 GL FT. CAPACITY
PROVIDE WATERTIGHT SEAL

3"V UP

4"UP TO FCO

SLEEVE SEAL TIGHT (TYP)

6" ST UP (3591 SF)

ROLL DN

I.E=(-)2'-6 1/4"

15" (33645 SF) 2"V UP

I.E=(-)7'-4"

I.E=(-)7'-4"

6" SAN CONNECT TO EXISTING SEWER PER SEWER DEPARTMENT REQUIREMENTS FOR CONTINUATION SEE CIVIL DWGS. I.E.=(-)7'-0" TOP OF THE PIPE BELOW GRADE

I.E=(-)7'-6"

I.E=(-)5'-0 3/8"

FLOW CONTROL VALVE

I.E=(-)7'-2"

SLEEVE

2" V UP

GI-1

I.E=(-)4'-9 1/4"

GREASE INTERCEPTOR BELOW NORMAL FROST LINE

2"EXTERIOR GREASE INTERCEPTOR VENT UP

6"ø GAS UP

HIGH PRESSURE NATURAL GAS SERVICE (SEE CIVIL). COORDINATE INSTALLATION WITH GAS UTILITY PROVIDER.

12" (30054 SF) 4" SAN UP

1/2" CW TO TRAP PRIMER

12" (30054 SF)

ROLL DN

I.E=(-)4'-6"

1 1/2"ø HWWS UP ABOVE SLAB TO FIN FLOOR

12" ST UP (30054 SF)

4"UP TO FLR. CLEAN-OUT (TYP.)

ALL CLEAN-OUTS IN TERAZZO FLOORS SHALL HAVE TERAZZO RECESS. (TYPICAL)

PIPING TO BE ROUTED ABOVE DUCT (TYP)

UNDERGROUND DUCTWORK, PITCH CONTINUOUSLY BACK TO RISER.

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

SCOPE NOTE:

ALL UNDERGROUND WORK IS PART OF A SEPARATE BID PACKAGE AND IS NOT IN CONTRACT. INFORMATION IS SHOWN FOR COORDINATION PURPOSES ONLY.

5" ST UP (3185 SF)

3"W UP TO SH

1/2" CW TO TRAP PRIMER

4"UP TO FD

4"SAN UP

4" W UP TO O.S.D.

2"V UP

2"W UP

4"KW UP

2"V UP 4"SAN UP

1/2" CW TO TRAP PRIMER

4"UP TO JMB

4"W UP TO FD-1

2"UP TO OHD

1/4" / 1'-0" PITCH

PROVIDE ACCESSIBLE SUMP AT BASE OF RISER. MATERIAL SHALL BE CI UNDERGROUND DUCTWORK. PROVIDE GASKETED ACCESS DOOR IN SHEET METAL PORTION ABOVE SLAB. UNDERGROUND SUMP SHALL MATCH CROSS-SECTIONAL DIMENSION OF UNDERGROUND DUCT MAIN AT MINIMUM. DUCT OFFSET ABOVE SLAB.

1 1/2"W UP

I.E=(-)7'-1 5/8"

I.E=(-)7'-2 1/4"

I.E=(-)6'-4 5/8"

I.E=(-)6'-3 3/8"

I.E=(-)5'-9 3/4"

I.E=(-)5'-7 3/4"

I.E=(-)1'-8"

I.E=(-)1'-6"

I.E=(-)1'-8"

2"W UP

4"W UP TO SH

4"UP TO FD

4"SAN UP

2"V UP

(2) 2"V UP

1/2" CW TO TRAP PRIMER

4"W UP TO FD

2"W UP

4"W UP TO O.S.D.

2"V UP

4"

8"

4"SAN UP

2"V UP

4"SAN UP

1/2" CW TO TRAP PRIMER

4"UP TO JMB

4"W UP TO FD-1

2"UP TO OHD

1/4" / 1'-0" PITCH

1 1/2"W UP

PP 1

BOD -2 1/2"

ECC REDUCER (BOTTOM

BOTTOM OF DUCT (BOD)

1 1/2"ø HHWS/R UP

1 1/2"ø HWWS UP ABOVE SLAB TO FIN FLOOR

2"ø HHWS/R UP

UNDERGROUND DUCTWORK, PITCH CONTINUOUSLY BACK TO RISER.

ACCESS DOOR IN SHEET METAL PORTION ABOVE SLAB.

2"ø HWWS UP ABOVE SLAB

1 1/2"ø HHWS UP ABOVE SLAB TO FIN FLOOR

DFU 8
DFU 458
DFU 2
DFU 480
DFU 27
DFU 2
DFU 2
DFU 402
DFU 93
DFU 66
DFU 57
DFU 252
DFU 219
DFU 2
DFU 2

MATCHLINE - SEE SHEET P101

MATCHLINE - SEE SHEET P102

FOR CONTINUATION SEE PLAN BELOW
SCALE: 1/8" = 1'-0"

FOR CONTINUATION SEE PLAN ABOVE
SCALE: 1/8" = 1'-0"

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

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

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REVISIONS

NO.	DESCRIPTION	DATE
	RFP 017	9.24.10
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BID PACKAGE 1 RFP 91	04.08.11
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	BID PACKAGE 2B	8.23.11

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DRAWN BY: SA
DESIGNED BY: SA

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SHEET TITLE

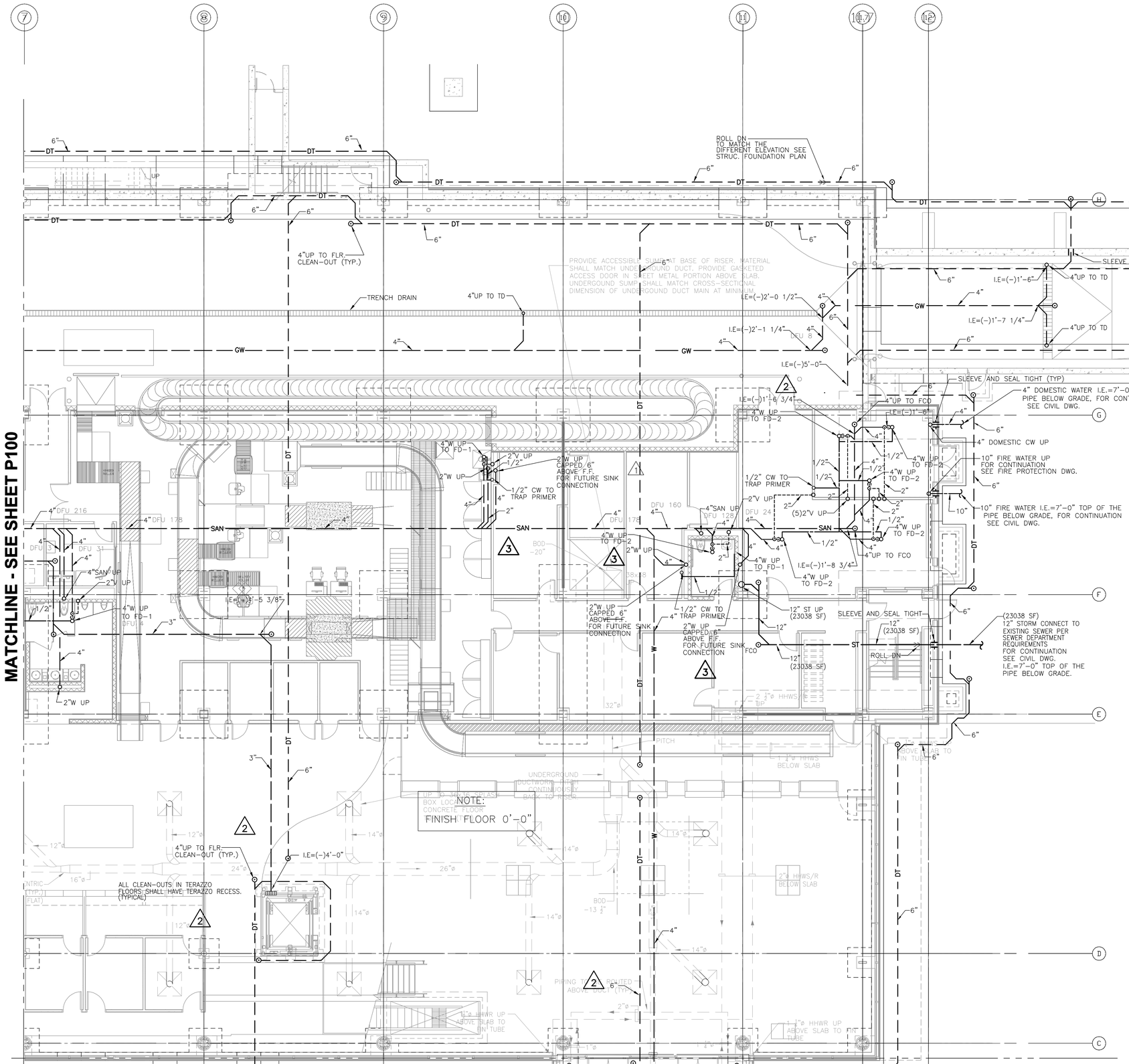
ENLARGED UNDERGROUND PLUMBING PLAN AREA A

SHEET NUMBER

P100

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.0) Plumbing\Dwgs\2008_P100.dwg Plotted on: 8/17/2011 1:15 PM Plotted by: Tolga, Ferid



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

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

SCOPE NOTE:

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REVISIONS

NO.	DESCRIPTION	DATE
	RFP 017	9.24.10
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	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
2	BID PACKAGE 1 RFP 91	04.08.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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REVIEWED BY: RDJ
DRAWN BY: SA
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213-1882-091

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SHEET TITLE

ENLARGED UNDERGROUND PLUMBING PLAN AREA B

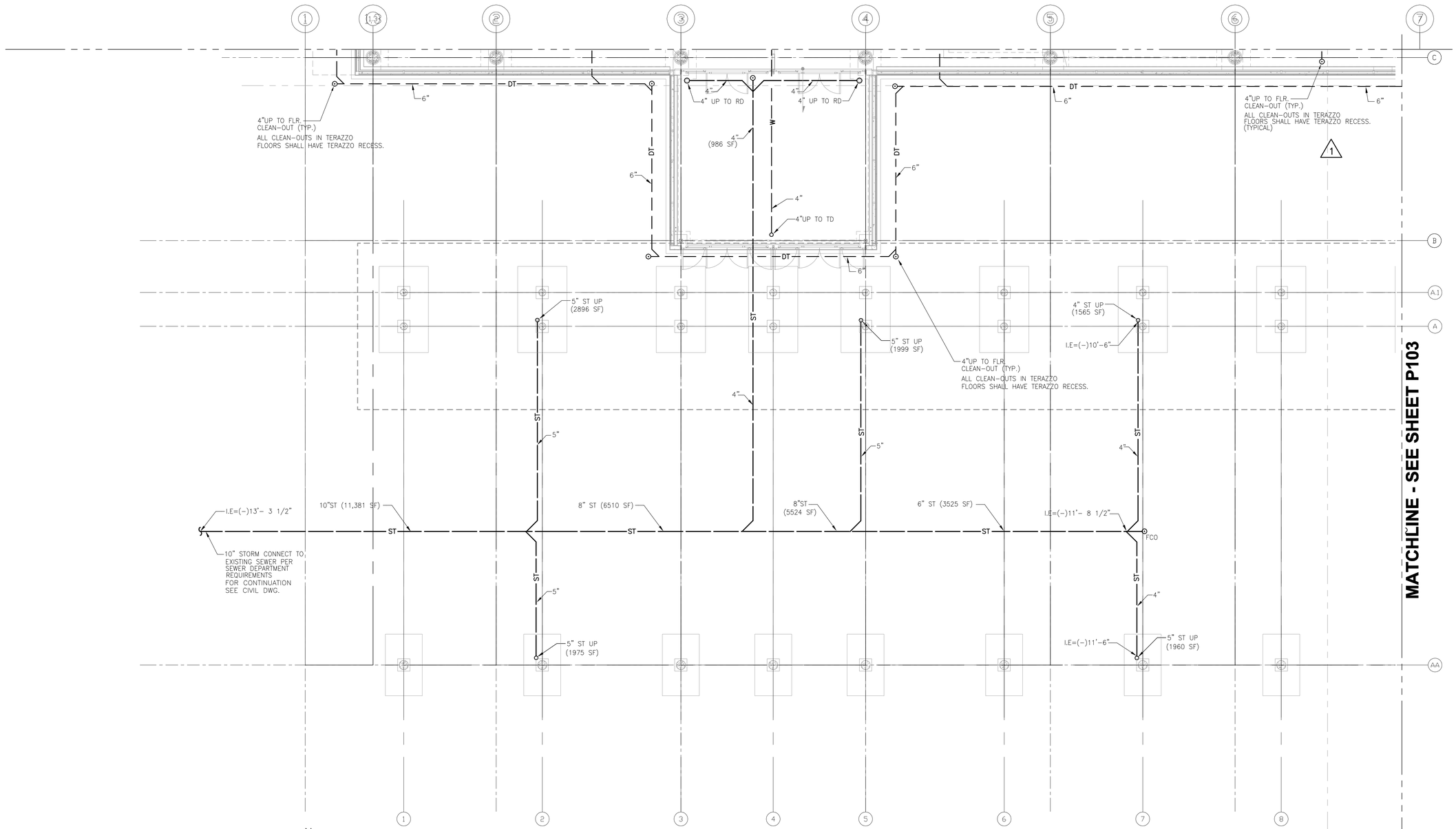
SHEET NUMBER

P101

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2008_P101.dwg Plotted on: 8/17/2011 1:17 PM Plotted by: Tolljes, Ferd

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"

MATCHLINE - SEE SHEET P103

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BID PACKAGE 1 RFP 91	04.08.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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DRAWN BY: SA
DESIGNED BY: SA

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SHEET TITLE

ENLARGED UNDERGROUND PLUMBING PLAN AREA A

SHEET NUMBER

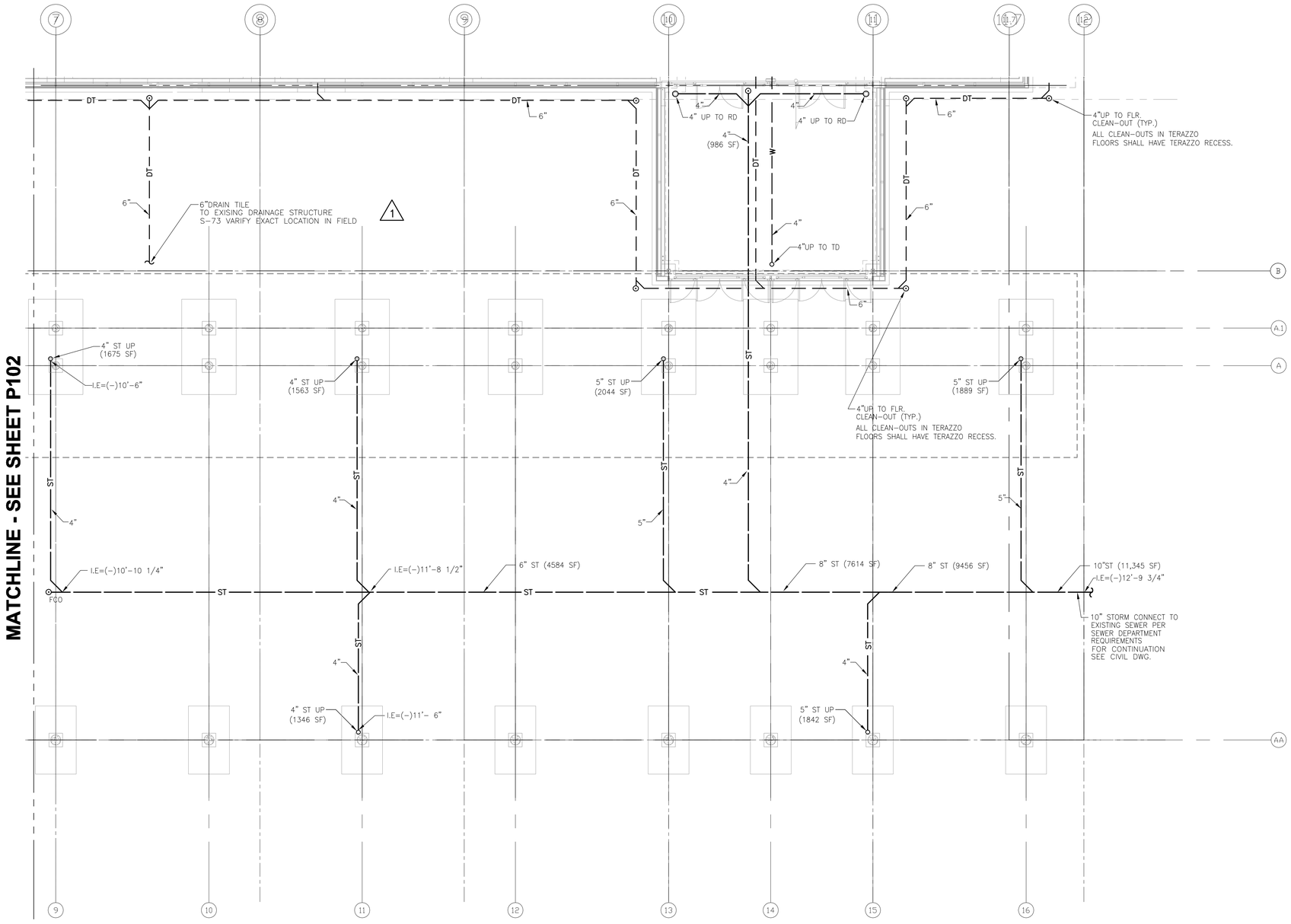
P102

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2028.00 Duluth Airport\5.0 CADD\(5.6) Plumbing\Dwgs\2028_P102.dwg Plotted on: 8/17/2011 1:20 PM Plotted by: Tolpa, Ferd

MATCHLINE - SEE SHEET P101

MATCHLINE - SEE SHEET P102



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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SHEET TITLE

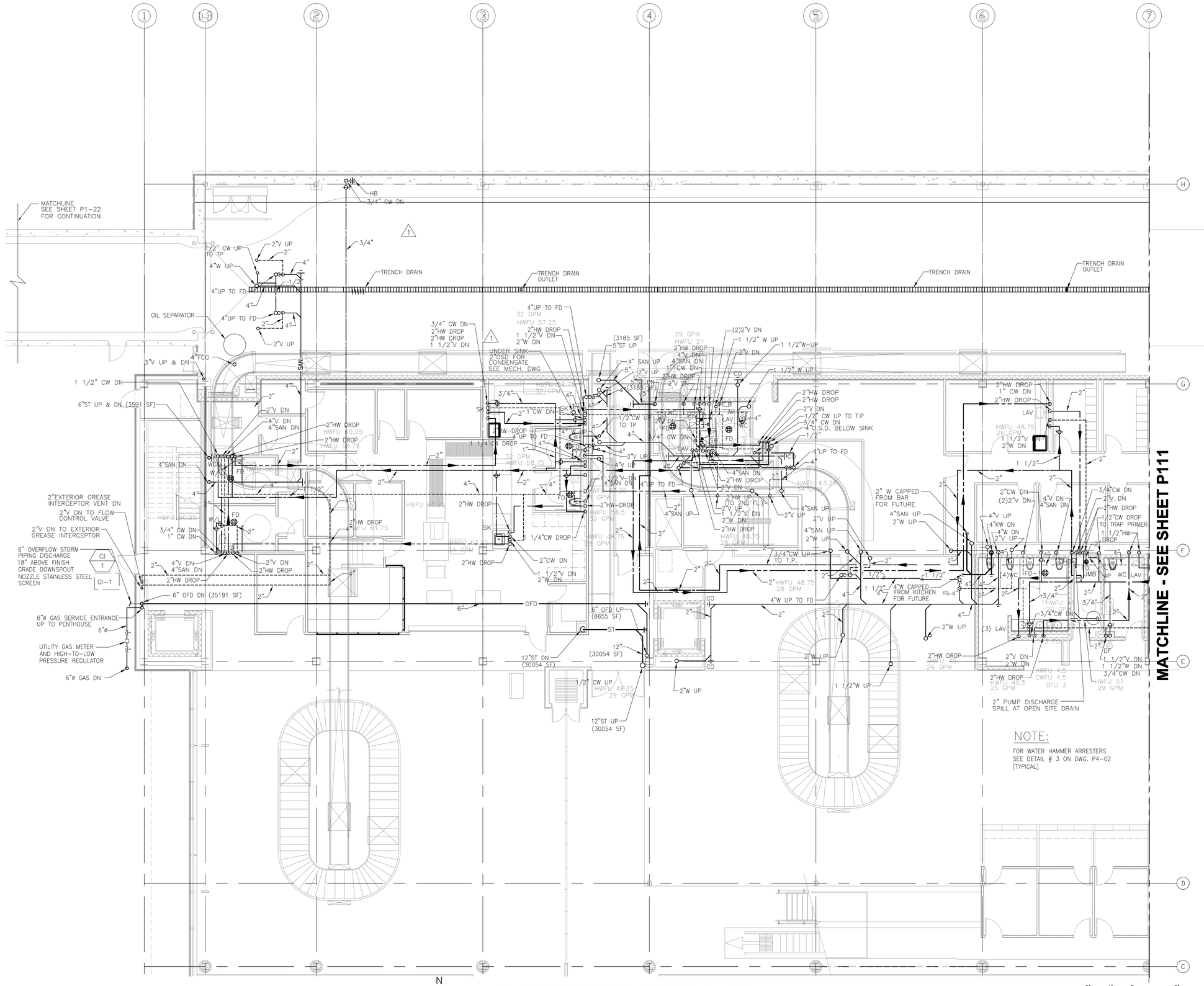
ENLARGED UNDERGROUND PLUMBING PLAN AREA B

SHEET NUMBER

P103

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P103.dwg Plotted on: 8/17/2011 1:21 PM Plotted by: Tolga, Ferid



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\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P110.dwg Plotted on: 8/17/2011 1:23 PM Plotted by: Tolga, Ferid

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REVISIONS

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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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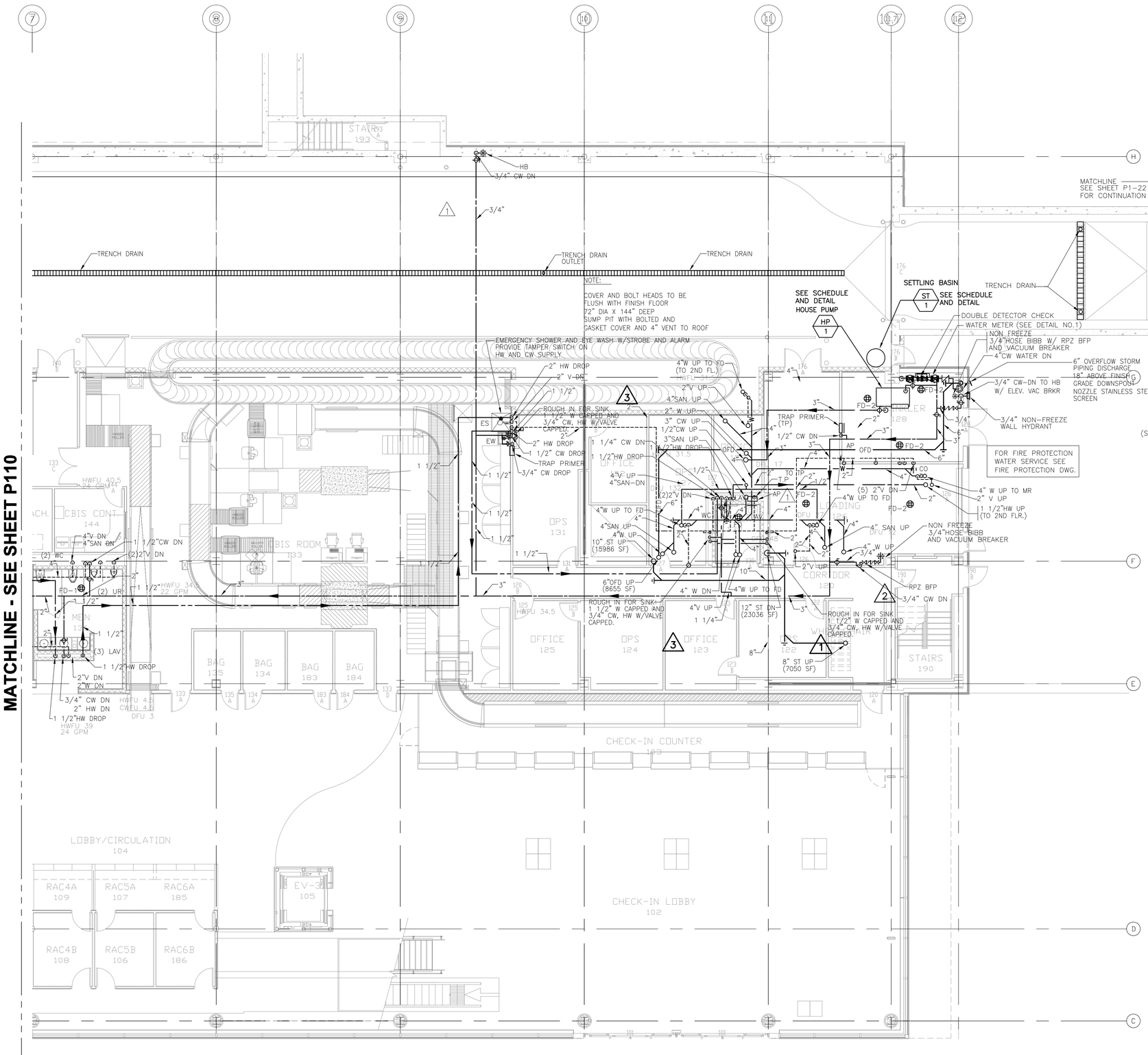
AEP PROJECT NUMBER
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SHEET TITLE
ENLARGED FIRST FLOOR PLUMBING PLAN AREA A

SHEET NUMBER
P110

BID PACKAGE 2B
ISSUED FOR BID



DETAIL NO.1
NOT TO SCALE

N

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

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

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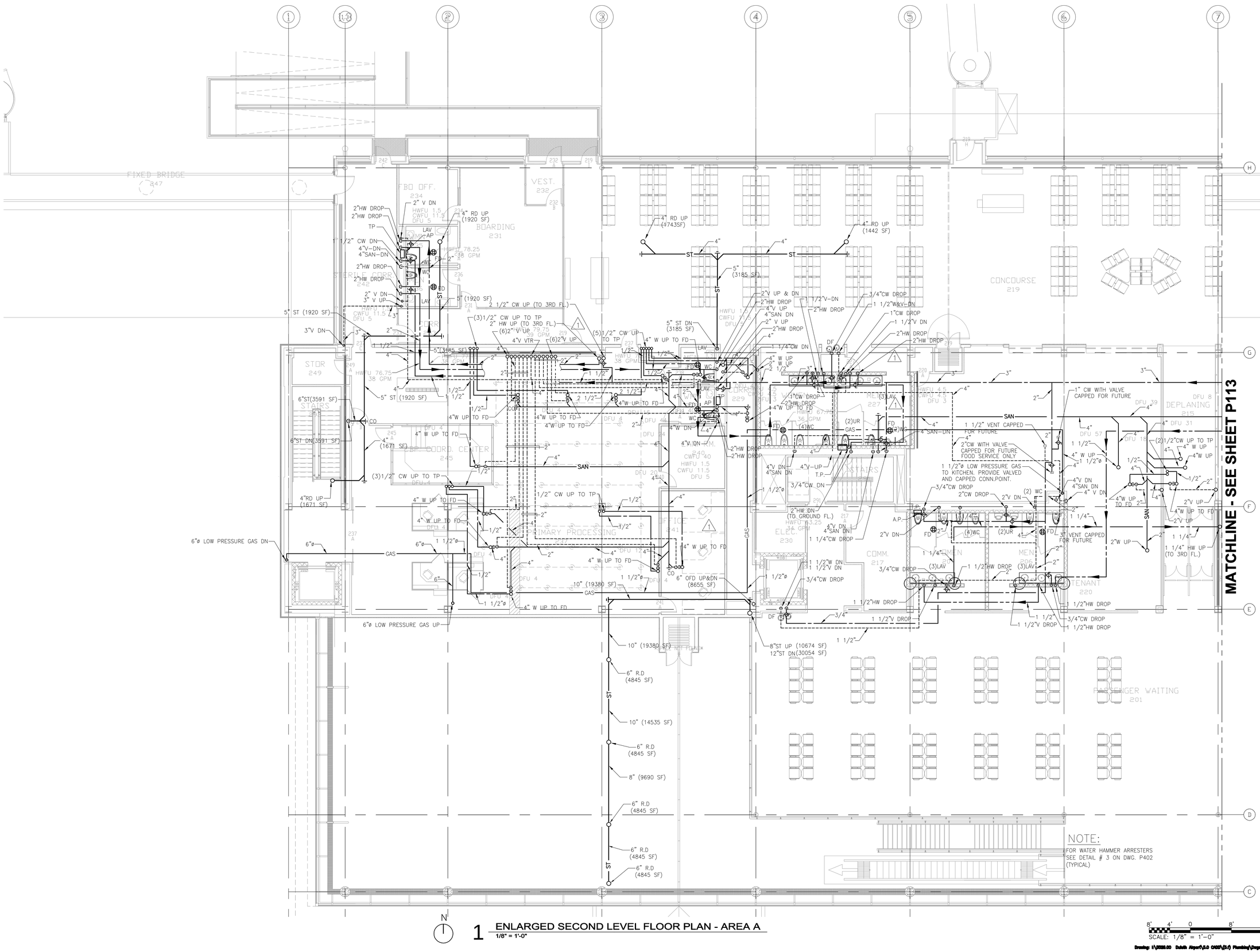
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SHEET TITLE
ENLARGED FIRST FLOOR PLUMBING PLAN AREA B

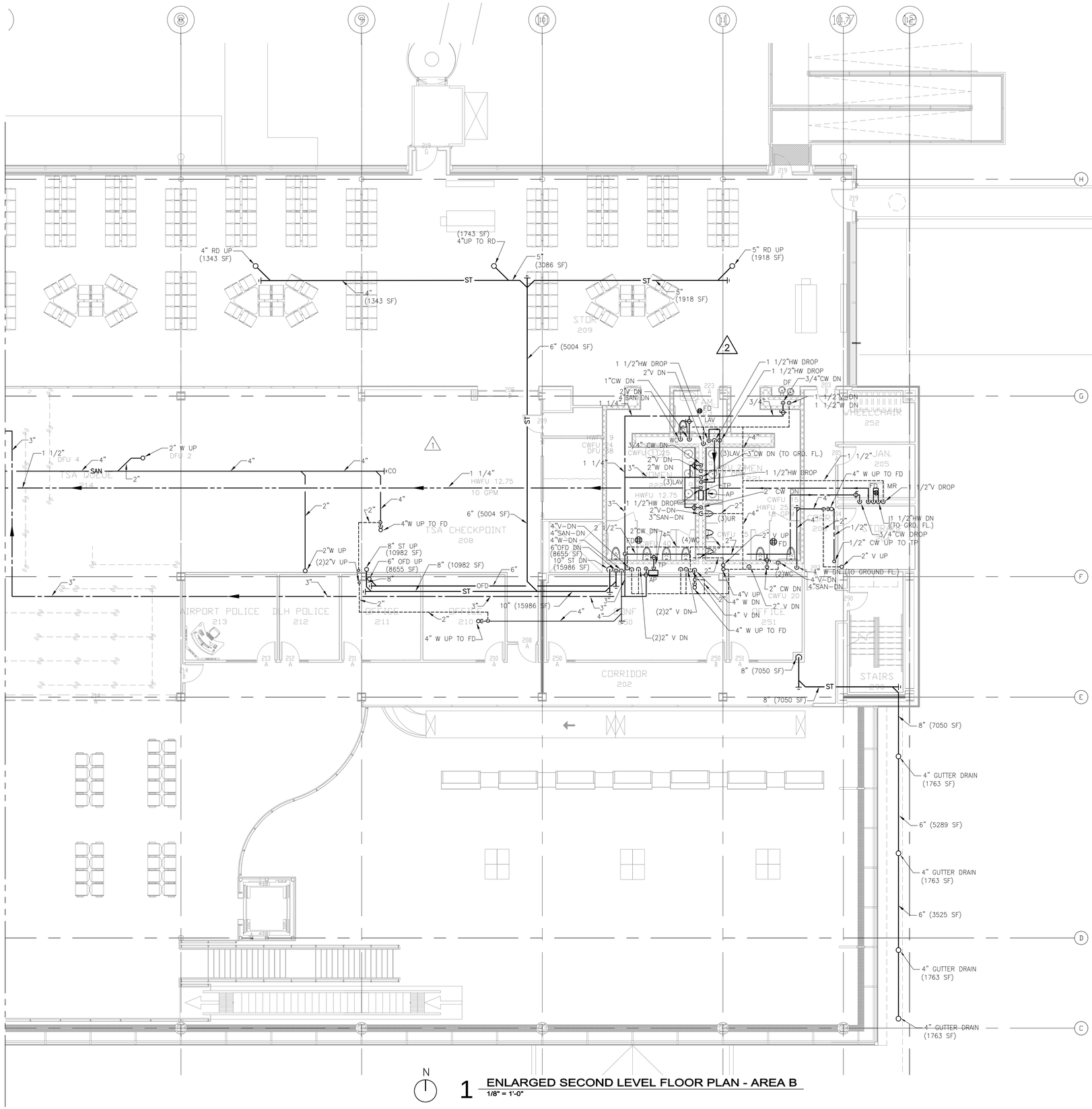
SHEET NUMBER
P111

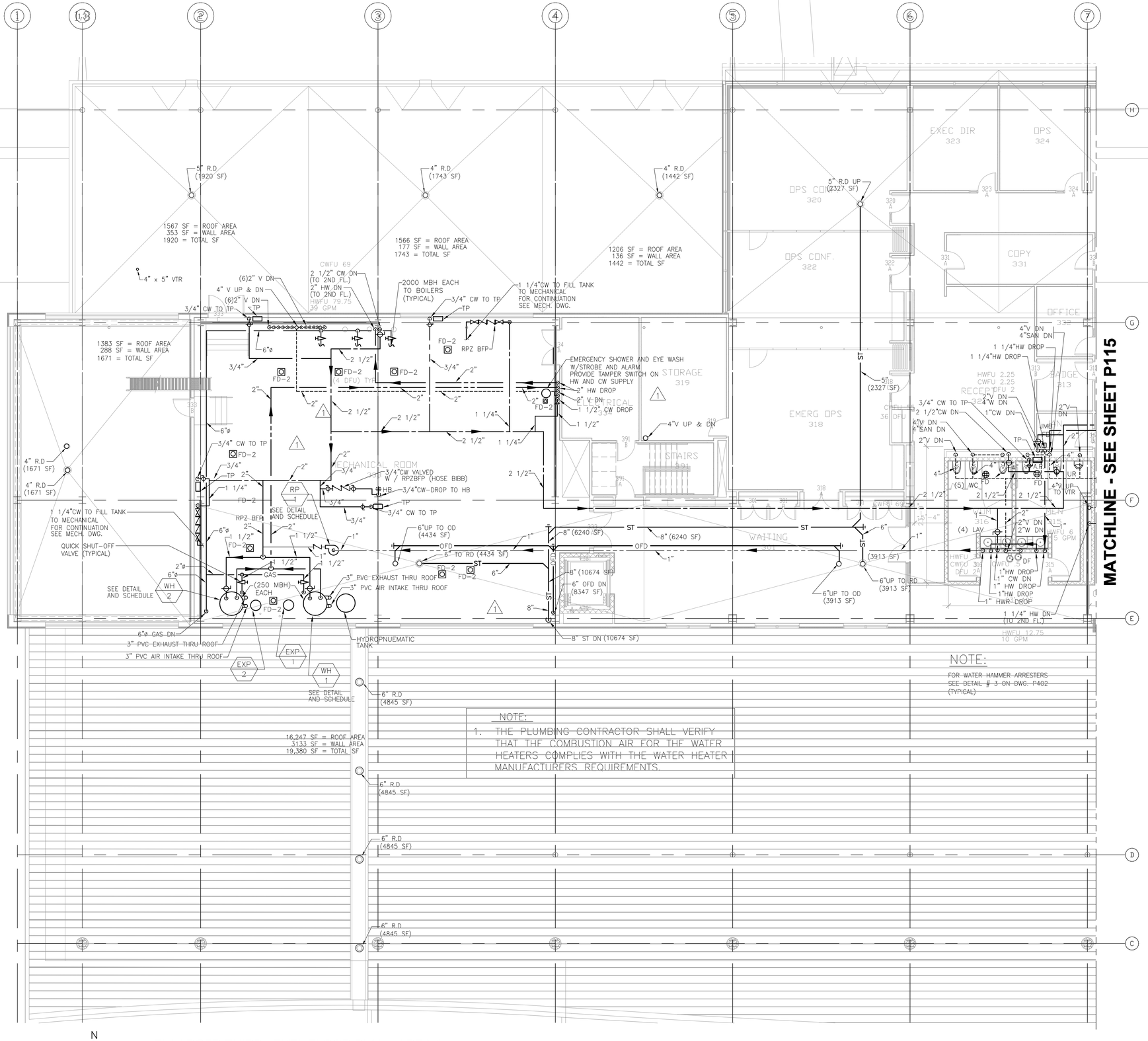
BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(8.6) Plumbing\Dwgs\2008_P111.dwg Plotted on: 8/17/2011 1:25 PM Plotted by: Tokyo, Ford


1
1.3
2
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F
G
H
E
D
C
FIXED BRIDGE
247
FBO OFF.
234
VEST.
232
BOARDING
231
CONCOURSE
219
STOR
249
STAIRS
229
STAIRS
227
PRIMARY PROCESSING
241
OFFICE
240
ELEC.
230
COMM.
217
MEN
206
TENANT
220
PASSENGER WAITING
201
DEPLANING
215
2" V DN
2"HW DROP
2"HW DROP
TP
LAV
AP
4" RD UP
(1920 SF)
HWFU 1.5
CWFU 11.5
DFU 5
1" 1/2" CW DN
4"V-DN
4"SAN-DN
2"HW DROP
2"HW DROP
2" V DN
3" V UP
5" (1920 SF)
2 1/2" CW UP (TO 3RD FL.)
3"V DN
5" ST (1920 SF)
(3)1/2" CW UP TO TP
2" HW UP (TO 3RD FL.)
(6)2"V UP
4"V VTR
(6)2"V UP
5"(3185 SF)
HWFU 76.75
38 GPM
6"ST(3591 SF)
STAIRS
6"ST DN(3591 SF)
4"RD UP
(1671 SF)
5" ST (1920 SF)
4" W UP TO FD
DFU 4
(3)1/2" CW UP TO TP
4" W UP TO FD
4" W UP TO FD
6"ø LOW PRESSURE GAS DN
6"ø
GAS
6"ø
1 1/2"ø
4" W UP TO FD
6"ø LOW PRESSURE GAS UP
1 1/2"ø
4" W UP TO FD
4" W UP TO FD
4" W UP TO FD

MATCHLINE - SEE SHEET P112


4" RD UP (1343 SF)
(1743 SF) 4"UP TO RD
5" (3086 SF)
5" RD UP (1918 SF)
4" (1343 SF)
5" (1918 SF)
ST
6" (5004 SF)
1 1/2"HW DROP
2"V DN
1"CW DN
2"V DN
4"SAN DN
3/4"CW DN
1 1/2"HW DROP
1 1/2"HW DROP
3/4"CW DN
1 1/2"V DN
1 1/2"W DN
1 1/4"
3/4" CW DN
3"
2"V DN
2"W DN
(3)LAV
3"CW DN (TO GRD. FL.)
1 1/2"HW DROP
1 1/2"
JAN.
205
4" W UP TO FD
1 1/2"V DROP
1 1/4" HWFU 12.75 10 GPM
2" W UP
DFU 2
2" W UP
(2)2"V UP
4"W UP TO FD
8" ST UP (10982 SF)
6" OFD UP (8655 SF)
8" (10982 SF)
OFD
10" ST DN (15986 SF)
10" (15986 SF)
4"V-DN
4"SAN-DN
4"W-DN
6"OFD DN (8655 SF)
10" ST DN (15986 SF)
(4)WC
2" V UP
1 1/2"HW DN (TO GRD FL.)
3/4"CW DROP
1 1/2" CW UP TO TP
2" V UP
4" W DN (TO GROUND FL.)
4"V-DN
4"SAN-DN
(2)WC
2" CW DN
2" V DN
4"V UP
4" W DN
4" V DN
(2)2" V DN
4" W UP TO FD
8" (7050 SF)
4" GUTTER DRAIN (1763 SF)
6" (5289 SF)
4" GUTTER DRAIN (1763 SF)
6" (3525 SF)
4" GUTTER DRAIN (1763 SF)
4" GUTTER DRAIN (1763 SF)
TSA QUEUE
TSA CHECKPOINT
208
AIRPORT POLICE
213
DLH POLICE
212
OFFICE
211
OFFICE
210
INF
250
CORRIDOR
202
OFFICE
251
STAIRS
WHEELCHAIR
252
STOR
209
FAM.
223
MEN
222
WOMEN
221
CWFU 20
DFU 10
CWFU 25
DFU 25
HWFU 12.75
10 GPM
HWFU 25
18 GPM
CWFU 40
DFU 20
CWFU 20
DFU 10
CWFU 24
DFU 25
CWFU 20
DFU 10
CWFU 20
DFU 10
CWFU 20
DFU 10



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\(5.0) Plumbing\Dwgs\2008_P114.dwg Plotted on: 8/17/2011 1:30 PM Plotted by: Tolga, Ferid

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV/SA
DESIGNED BY: SA

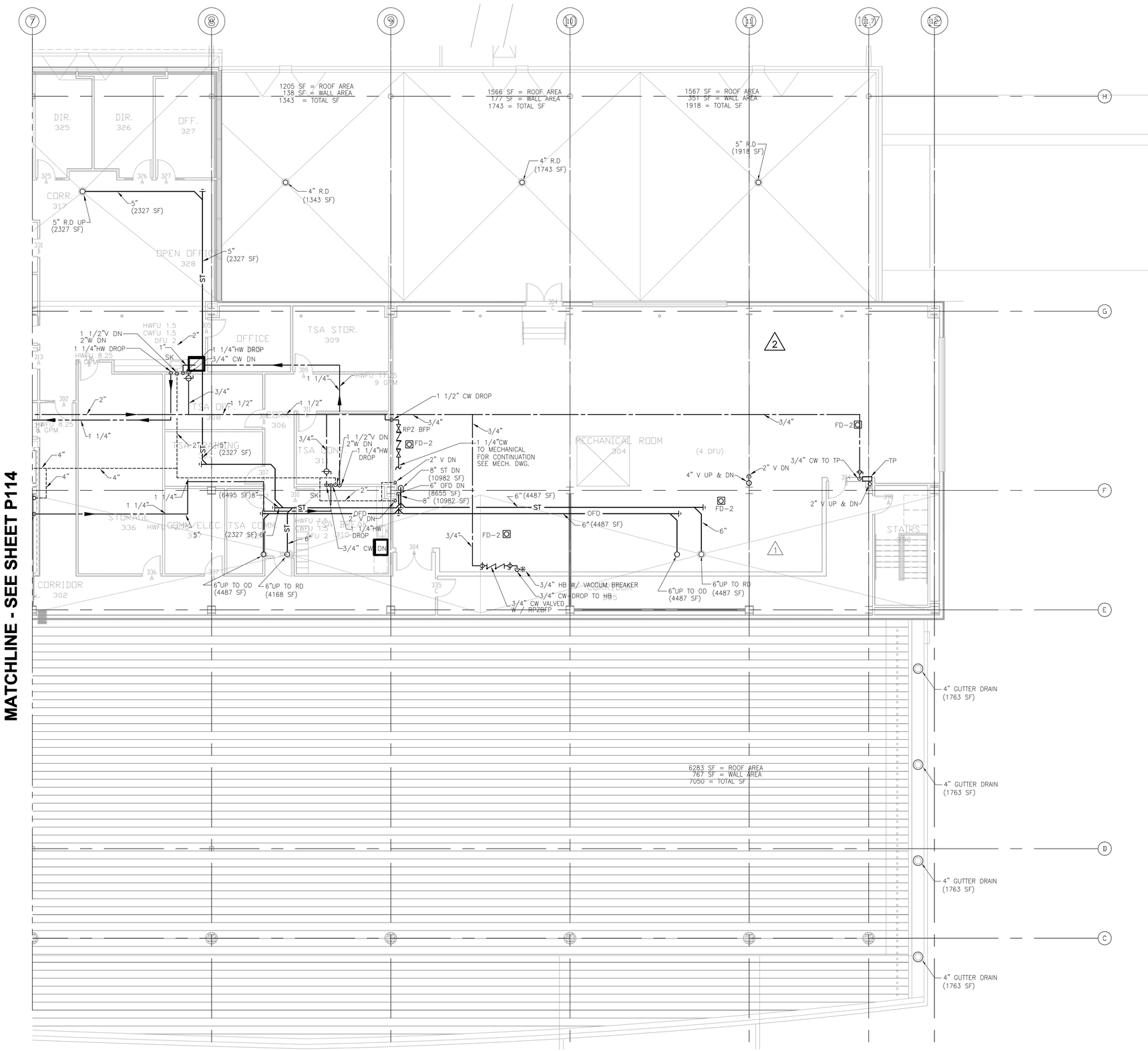
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED THIRD FLOOR PLUMBING PLAN AREA A

SHEET NUMBER
P114

BID PACKAGE 2B
ISSUED FOR BID



N

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

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

Drawing: L:\2035.00 Duluth Airport\5.0 CADD\(5.6) Plumbing\Dwgs\2035_P115.dwg Plotted on: 8/17/2011 1:32 PM Plotted by: Tallyn, Ferd

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NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
2	BID PACKAGE 1 RFP 91	04.08.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV/SA
DESIGNED BY: SA

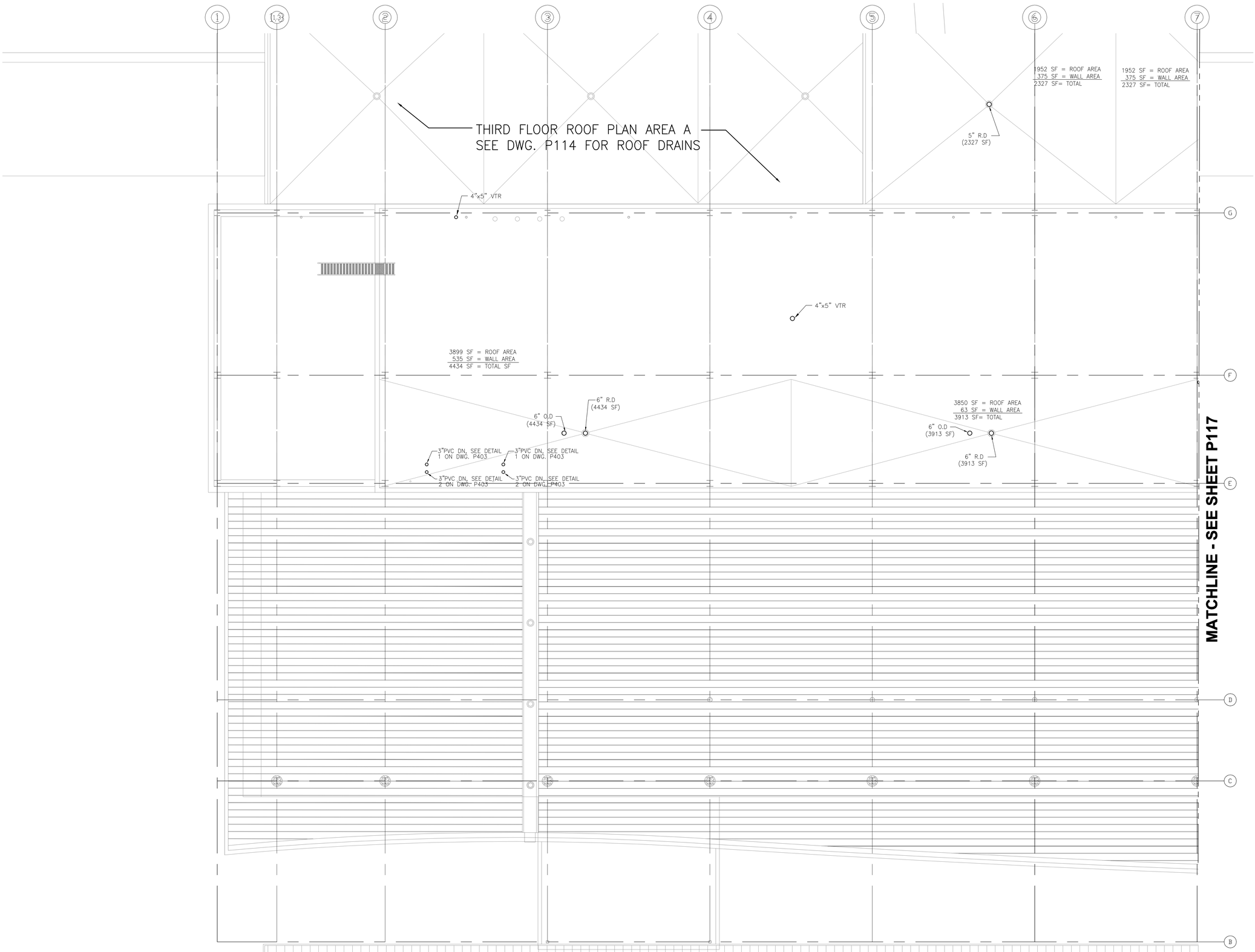
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED THIRD FLOOR PLUMBING PLAN AREA B

SHEET NUMBER
P115

BID PACKAGE 2B
ISSUED FOR BID



Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2008_P116.dwg Plotted on: 8/17/2011 1:34 PM Plotted by: Tolga, Ferit

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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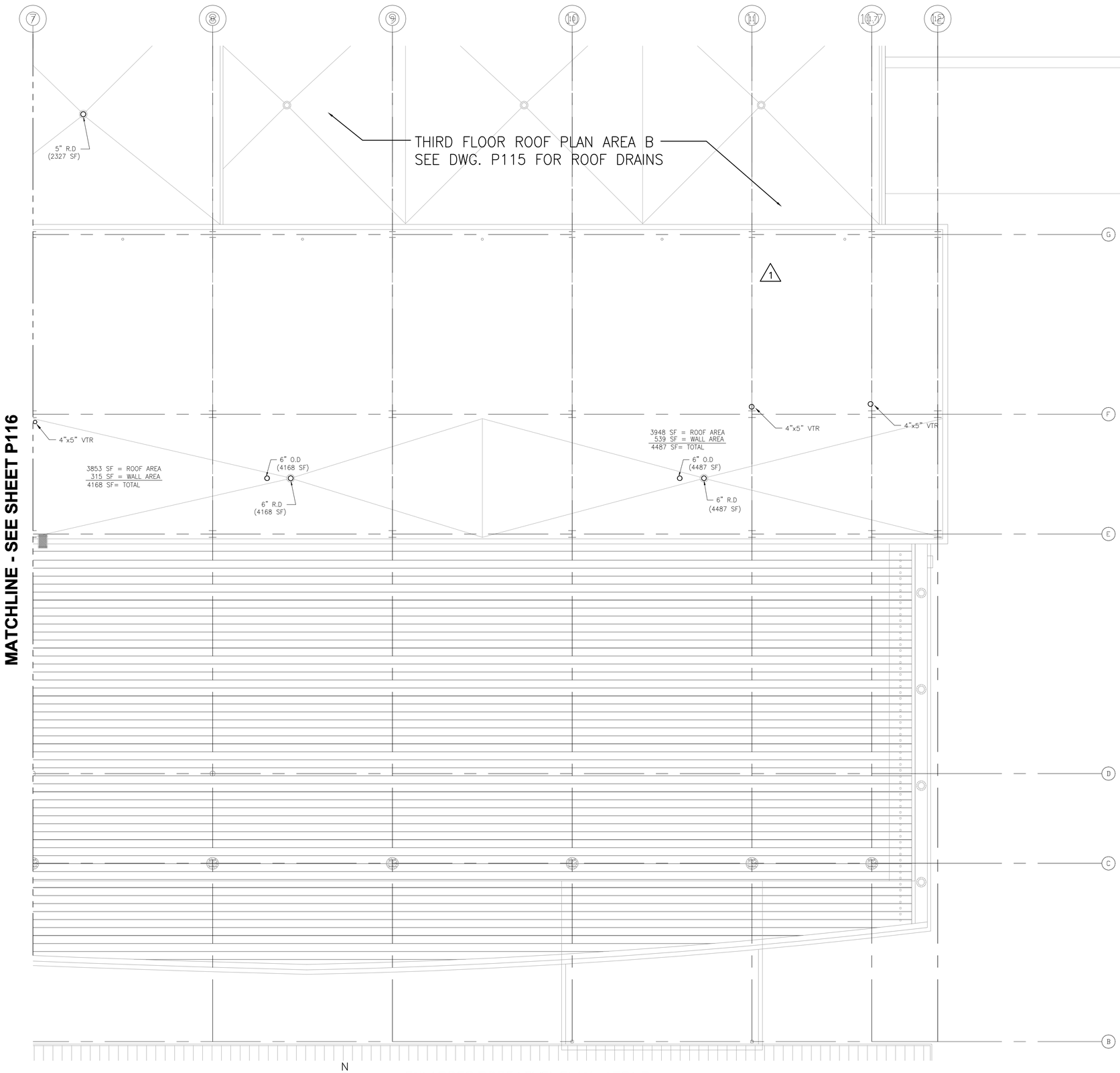
SHEET TITLE

ENLARGED ROOF LEVEL PLUMBING PLAN AREA A

SHEET NUMBER

P116

BID PACKAGE 2B
ISSUED FOR BID



N

1 ENLARGED ROOF LEVEL PLAN - AREA B

1/8" = 1'-0"

8' 4' 0 8' 16'

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

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BID PACKAGE 1 RFP 91	04.08.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV
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SHEET TITLE

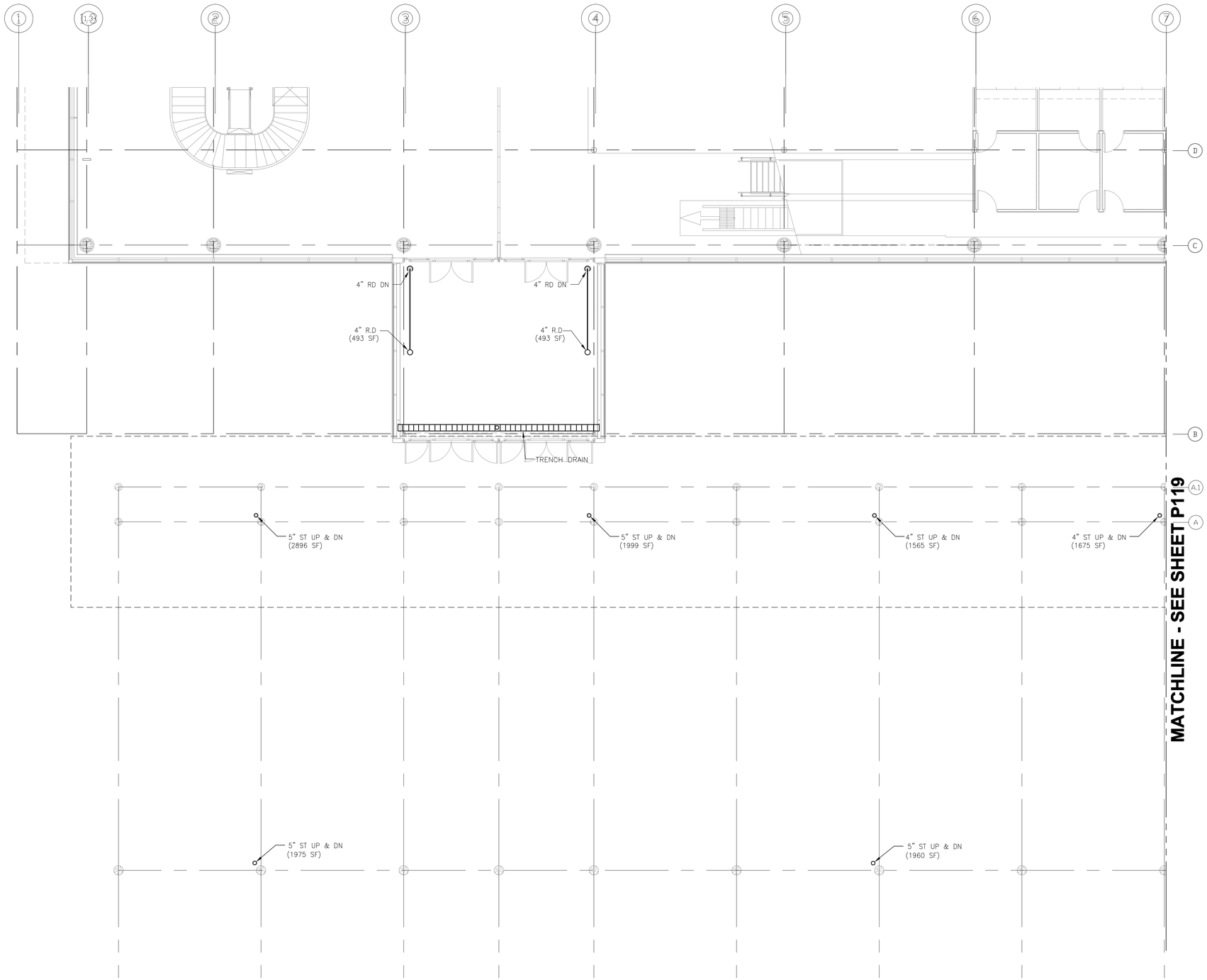
ENLARGED ROOF LEVEL PLUMBING PLAN AREA B

SHEET NUMBER

P117

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2028.00 Duluth Airport\5.0 CADD\(5.1) Plumbing\Dwgs\2028_P117.dwg Plotted on: 8/17/2011 1:35 PM Plotted by: Tolpa, Ferd



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\8.0 CADD\(8.6) Plumbing\Dwgs\2008_P118.dwg Plotted on: 8/17/2011 1:28 PM Plotted by: Tolga, Ferit

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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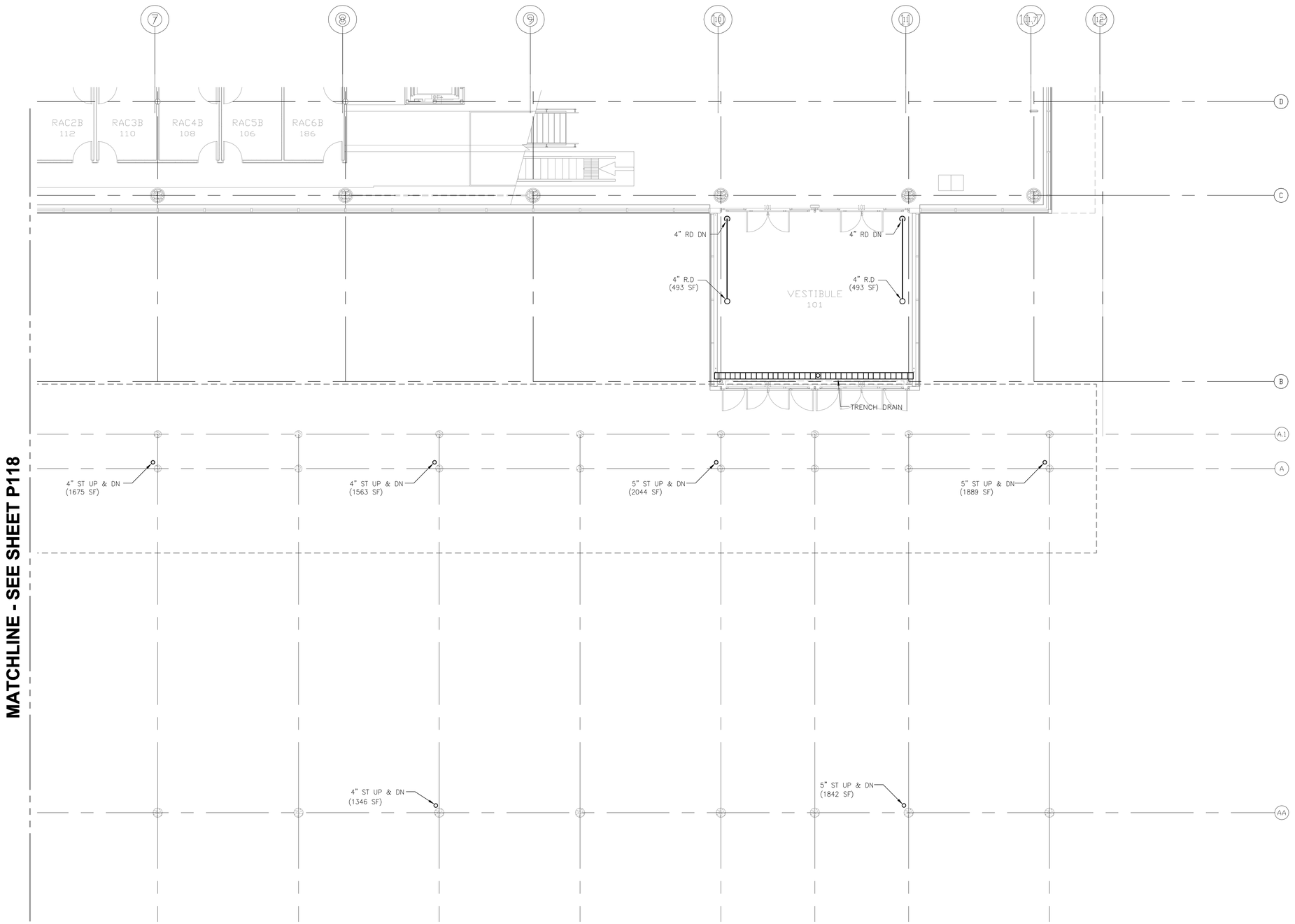
SHEET TITLE

ENLARGED FIRST FLOOR PLUMBING PLAN AREA A CANOPY

SHEET NUMBER

P118

BID PACKAGE 2B
ISSUED FOR BID



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:\2008.00 Duluth Airport\5.0 CADD\(5.0) Plumbing\Dwgs\2008_P119.dwg Plotted on: 8/17/2011 1:39 PM Plotted by: Tolga, Farid

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
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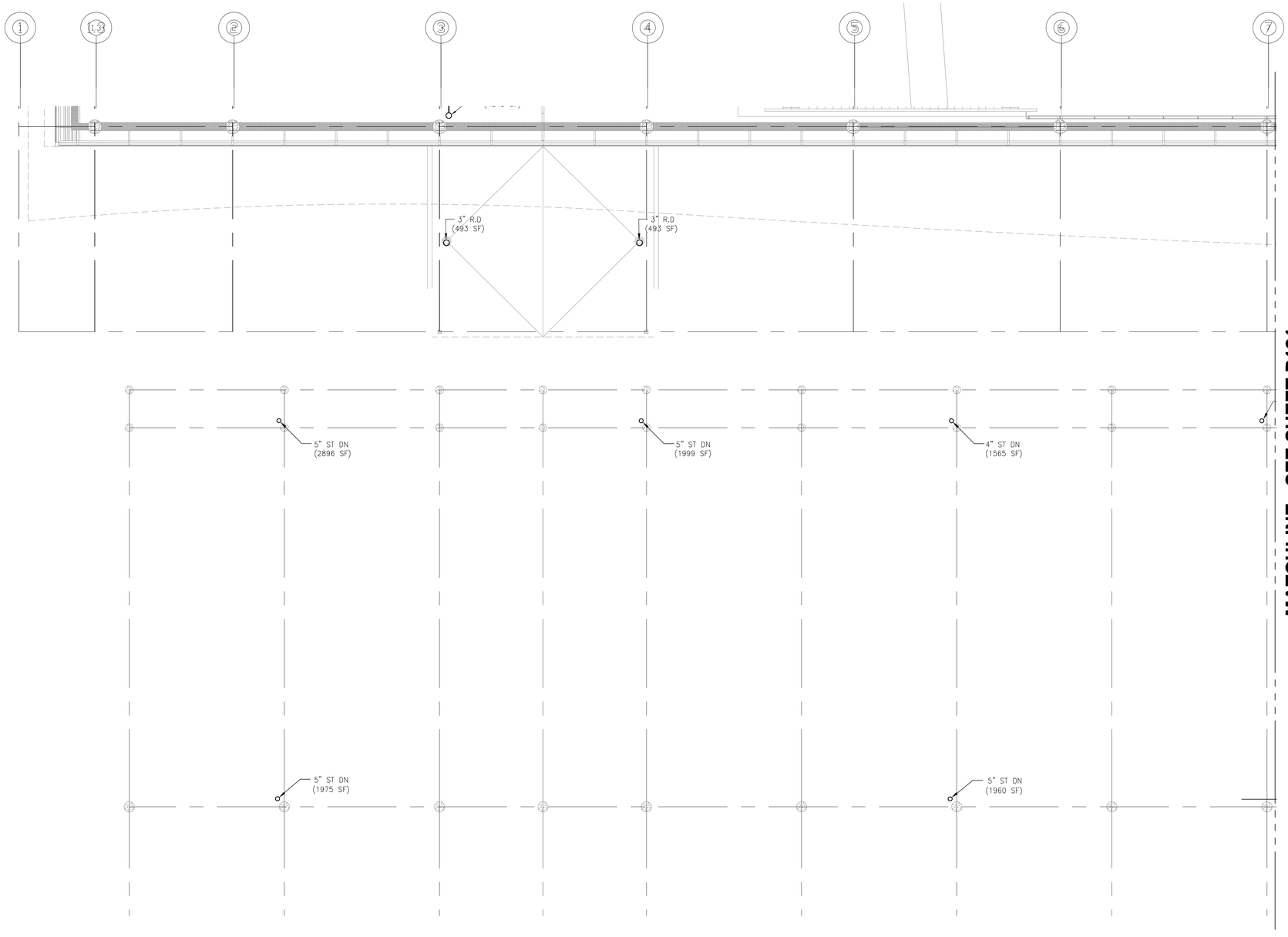
SHEET TITLE

ENLARGED FIRST FLOOR PLUMBING PLAN AREA B CANOPY

SHEET NUMBER

P119

BID PACKAGE 2B
ISSUED FOR BID



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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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

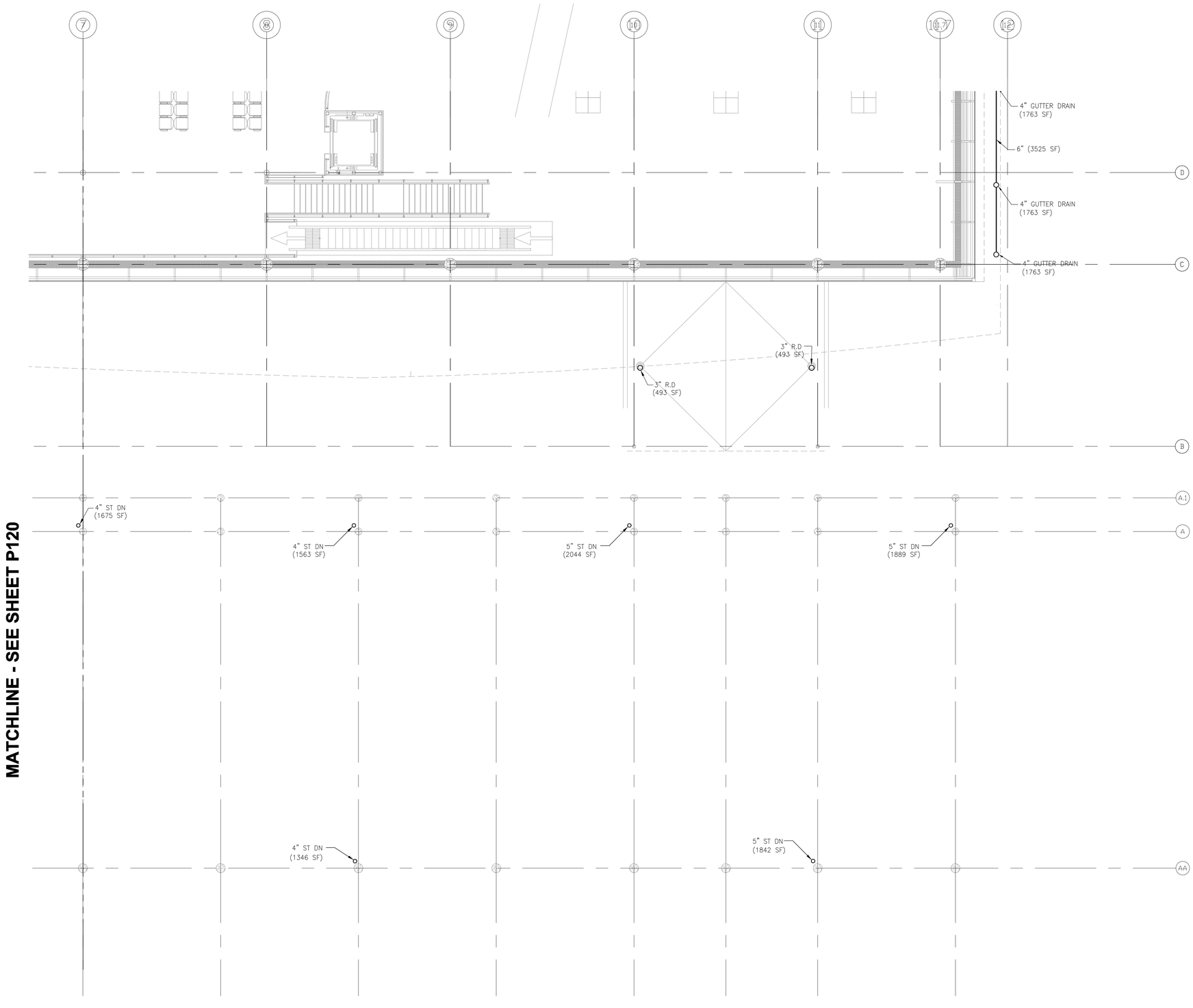
ENLARGED SECOND FLOOR PLUMBING PLAN AREA A CANOPY ROOF

SHEET NUMBER

P120

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CAD\(2.f) Plumbing\Dwgs\2008_P120.dwg Plotted on: 8/17/2011 1:40 PM Plotted by: Tolpa, Ferd



MATCHLINE - SEE SHEET P120

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 CAD\(2.0) Plumbing\Dwgs\2008_P121.dwg Plotted on: 8/17/2011 1:42 PM Plotted by: Tallyn, Field

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

REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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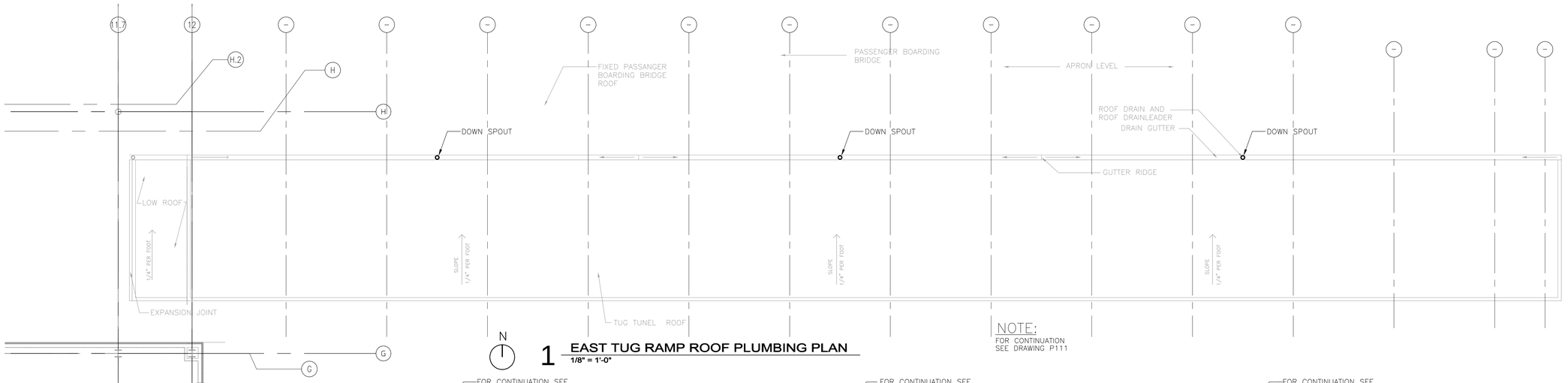
SHEET TITLE

ENLARGED SECOND FLOOR PLUMBING PLAN AREA B CANOPY ROOF

SHEET NUMBER

P121

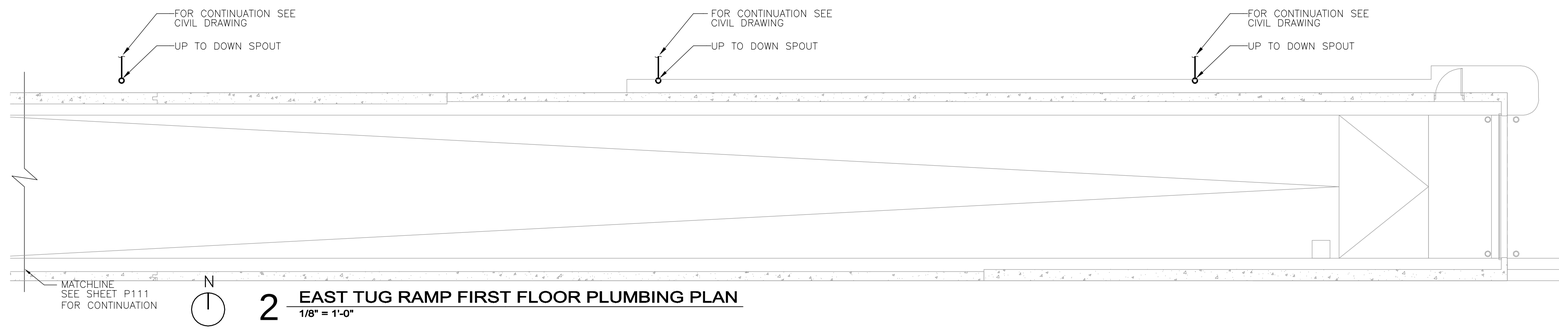
BID PACKAGE 2B
ISSUED FOR BID



N

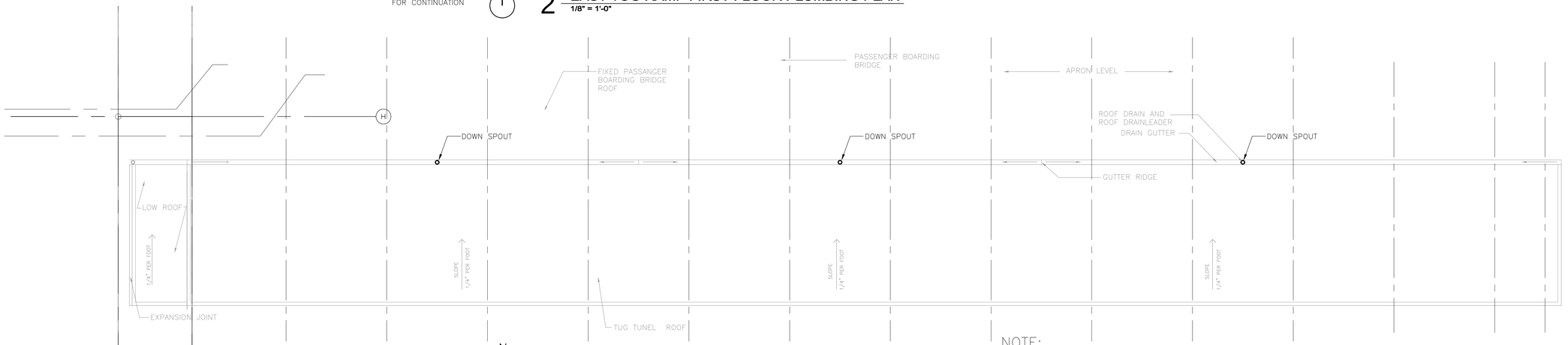
1 EAST TUG RAMP ROOF PLUMBING PLAN
1/8" = 1'-0"

NOTE:
FOR CONTINUATION
SEE DRAWING P111



N

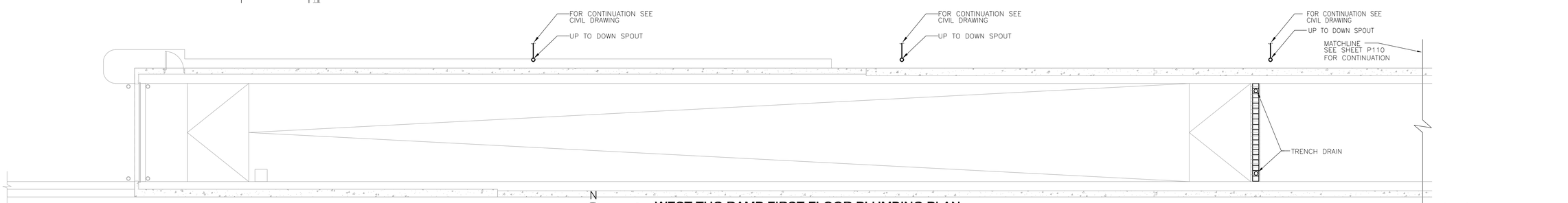
2 EAST TUG RAMP FIRST FLOOR PLUMBING PLAN
1/8" = 1'-0"



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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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

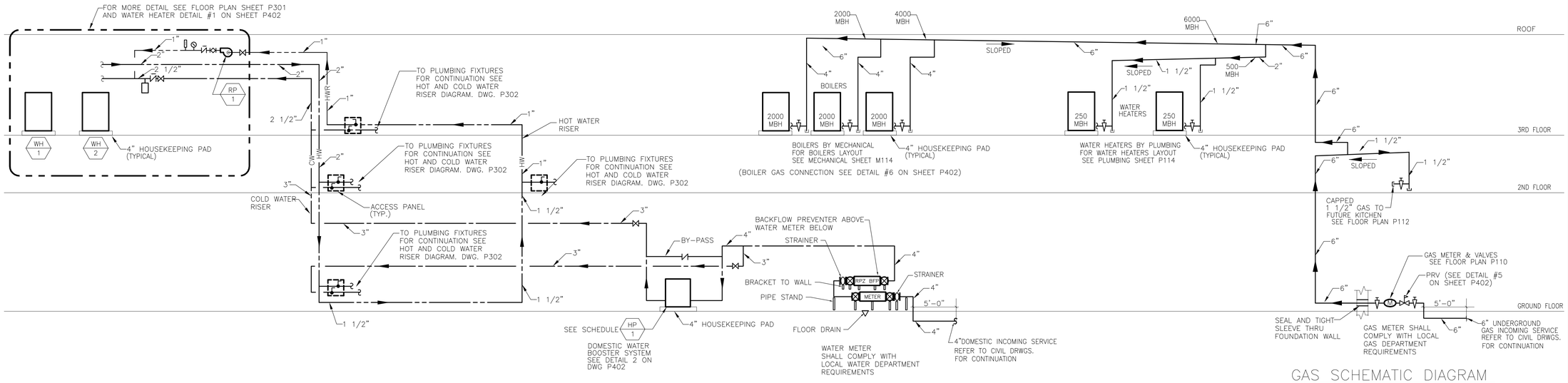
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SHEET TITLE
TUG RAMP ROOF PLUMBING PLAN

SHEET NUMBER
P122

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.6) Plumbing\Dwgs\2008_P122.dwg Plotted on: 8/17/2011 1:43 PM Plotted by: Tolliver, Ferld

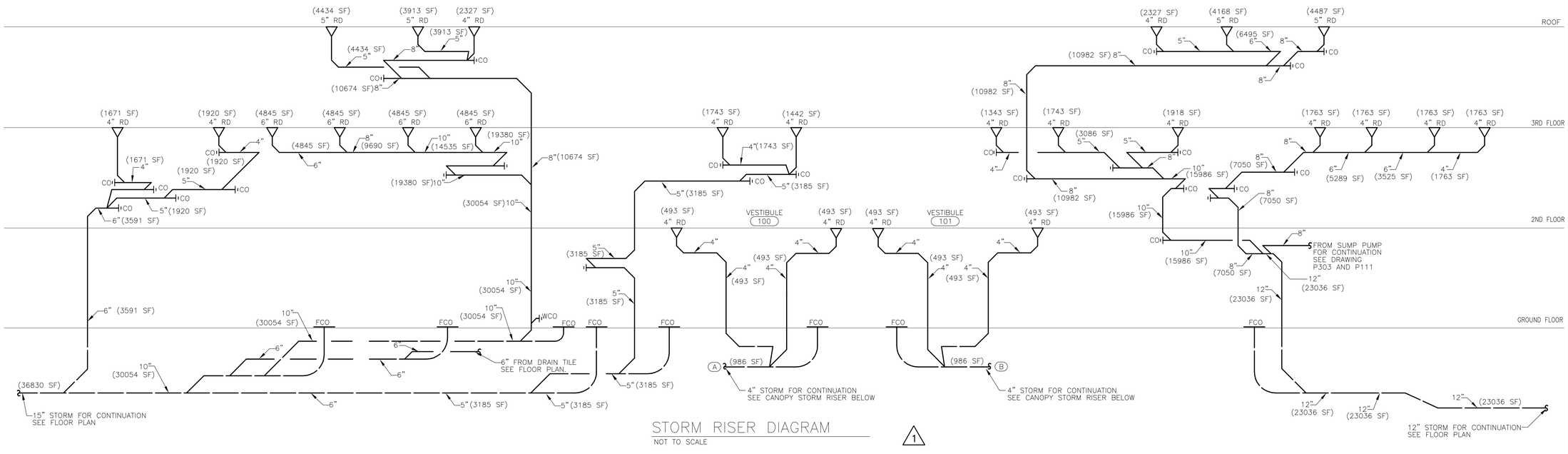


WATER SCHEMATIC DIAGRAM

NOT TO SCALE

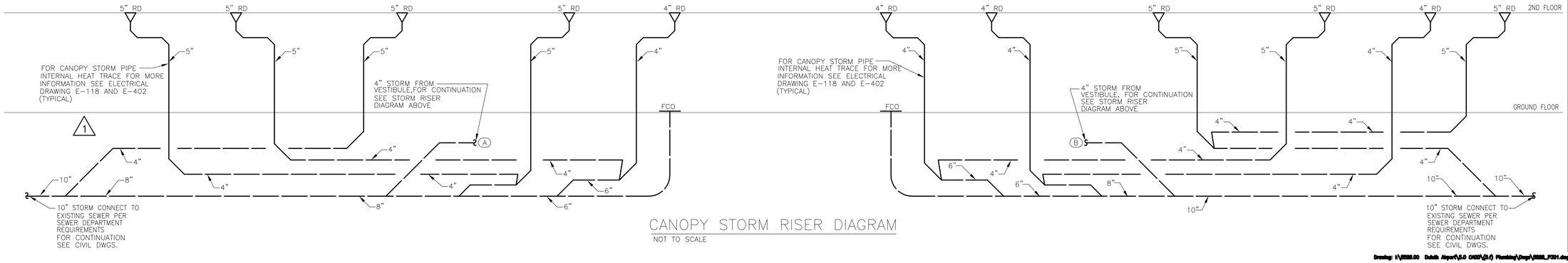
GAS SCHEMATIC DIAGRAM

NOT TO SCALE



STORM RISER DIAGRAM

NOT TO SCALE



CANOPY STORM RISER DIAGRAM

NOT TO SCALE

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

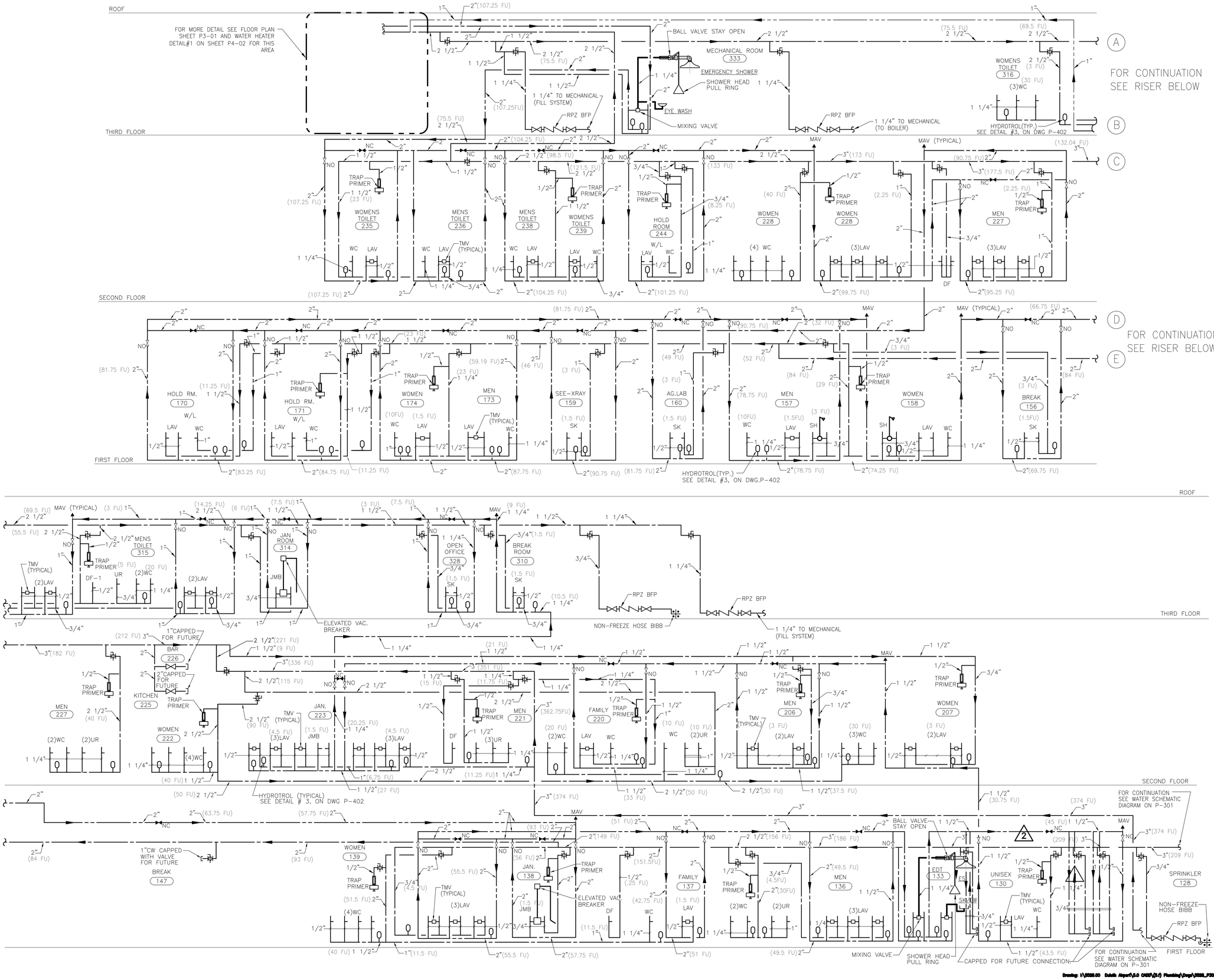
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SHEET TITLE
WATER SCHEMATIC, GAS SCHEMATIC AND STORM RISER DIAGRAM

SHEET NUMBER
P301

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2038.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2038_P301.dwg Plotted on: 8/17/2011 1:01 PM Plotted by: Tolpa, Ferd



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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV/SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

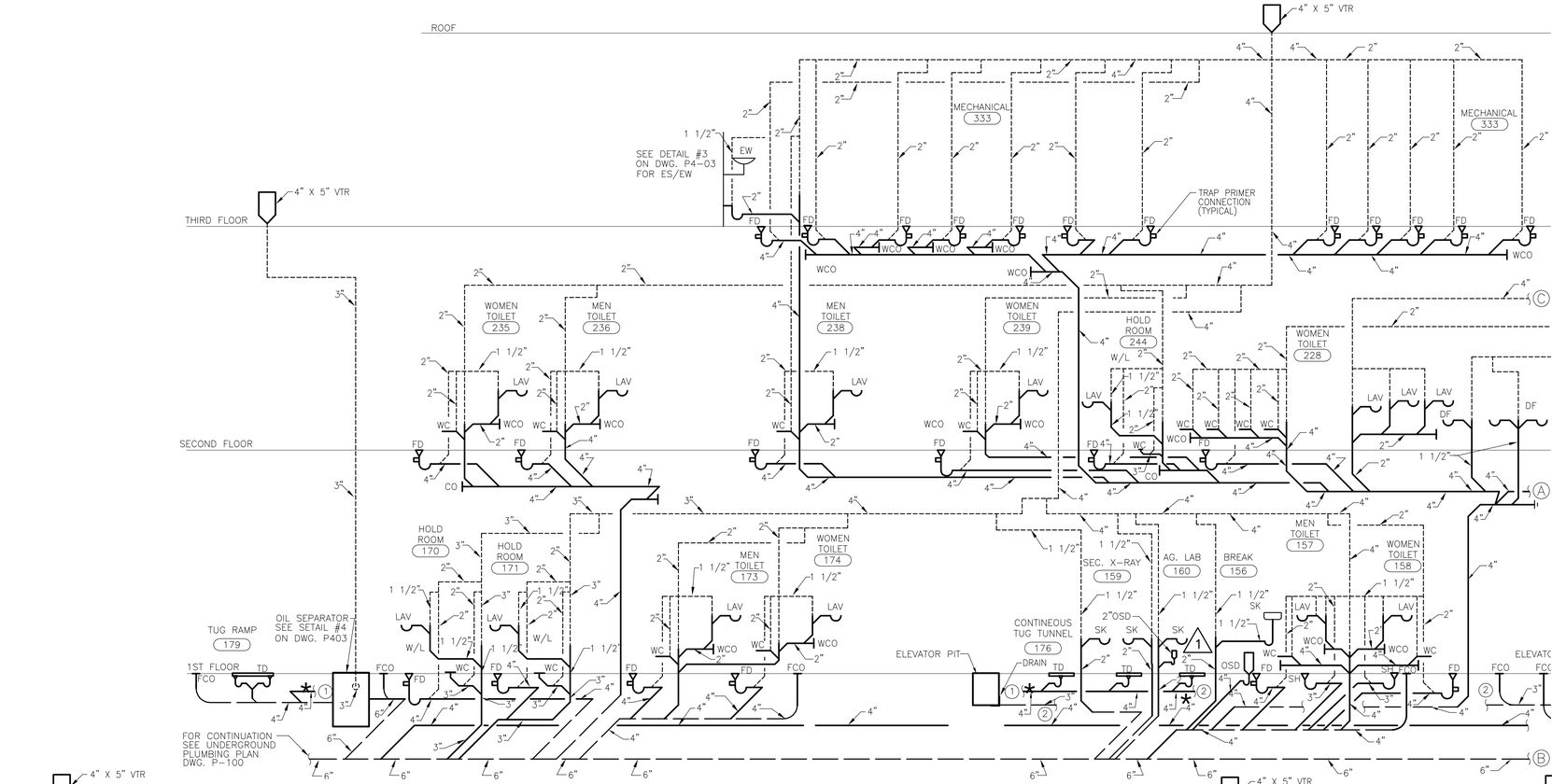
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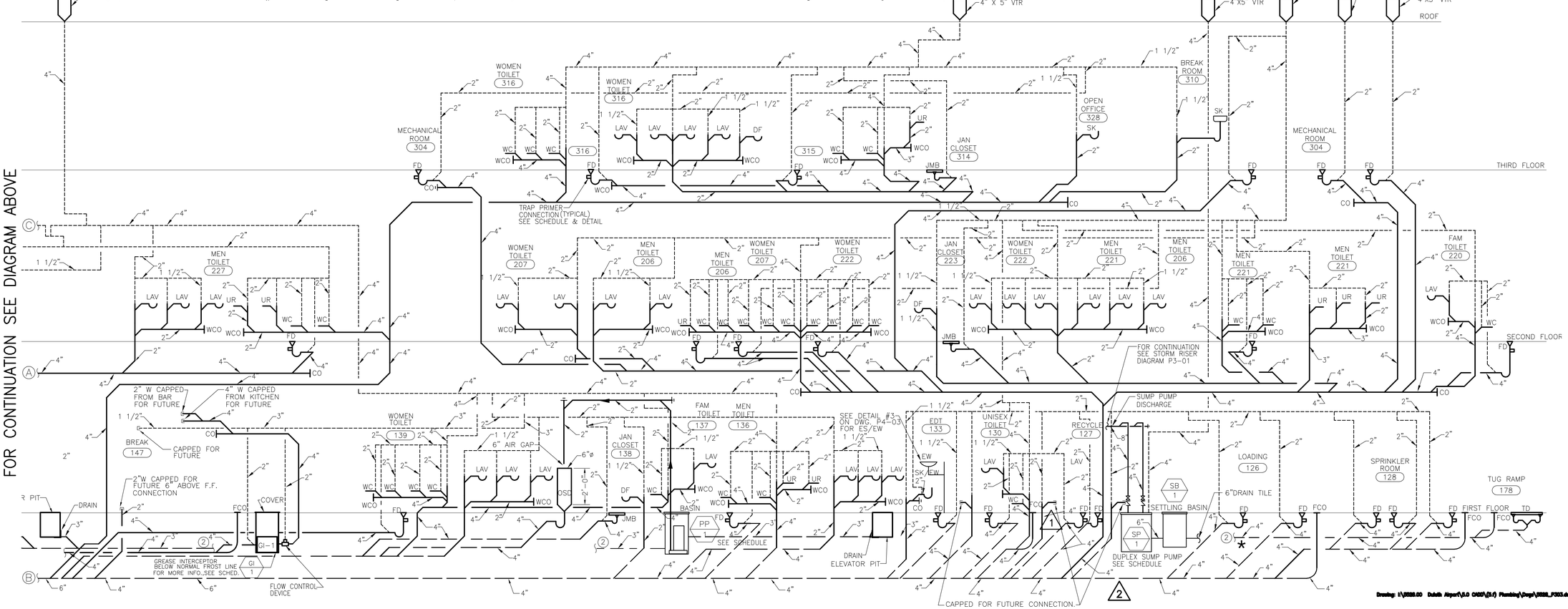
SHEET TITLE
COLD & HOT WATER RISER DIAGRAM

SHEET NUMBER
P302

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2255.00 Duluth Airport\5.0 CADD\(5.6) Plumbing\Dwgs\2255_P302.dwg Plotted on: 8/17/2011 1:53 PM Plotted by: Tollyn, Ferld





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REVISIONS

NO.	DESCRIPTION	DATE
	RFP 017	9.24.10
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV/SA
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE

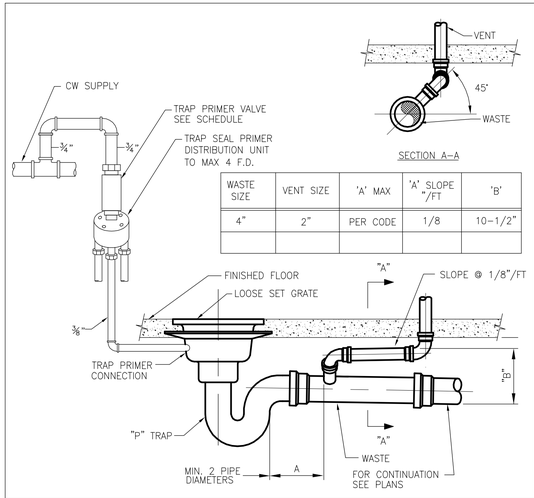
WASTE AND VENT RISER DIAGRAM

SHEET NUMBER

P303

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\5.0 CADD\(5.0) Plumbing\Dwgs\2008_P303.dwg Plotted on: 8/17/2011 1:54 PM Plotted by: Tolpa, Ferd

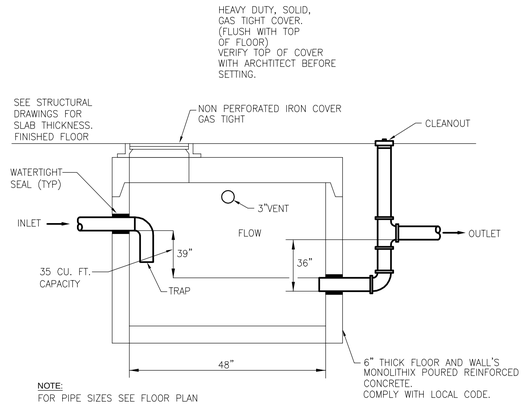


WASTE SIZE	VENT SIZE	'A' MAX	'A' SLOPE "/FT	'B'
4"	2"	PER CODE	1/8	10–1/2"

10 FLOOR DRAIN DETAIL WITH TRAP PRIMER

SCALE: NONE

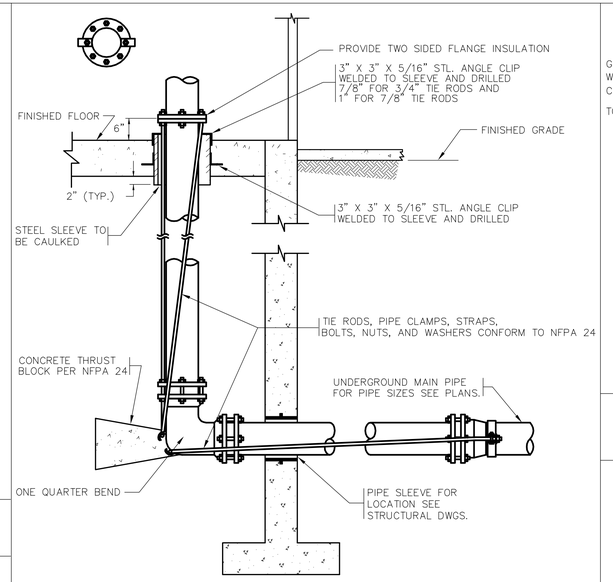
NOTE: DIMENSION 'B' DOES NOT INCLUDE FALL DUE TO SLOPE, ADD FALL DUE TO VENT SLOPE TO OBTAIN INVERT ELEVATION.



NOTE:
FOR PIPE SIZES SEE FLOOR PLAN

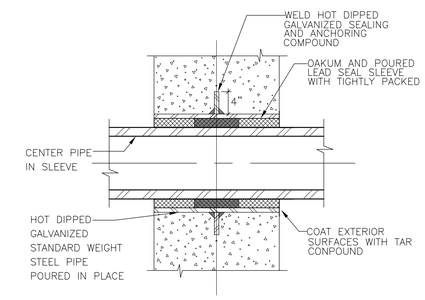
8 OIL SEPARATOR SETTLING BASIN DETAIL

SCALE: NONE



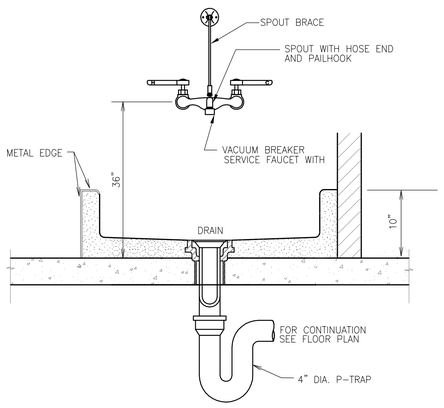
5 WATER MAIN ENTRANCE DETAIL

SCALE: NONE



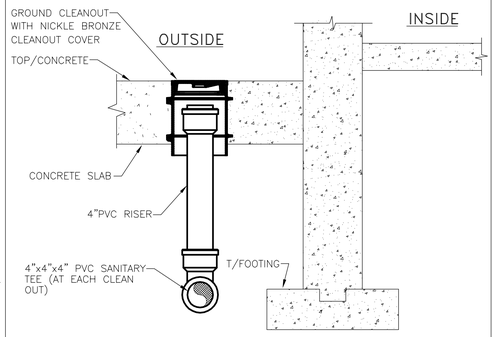
6 WATERTIGHT SLEEVES (WT SLV) THRU CONCRETE FOUNDATION WALLS

SCALE: NONE



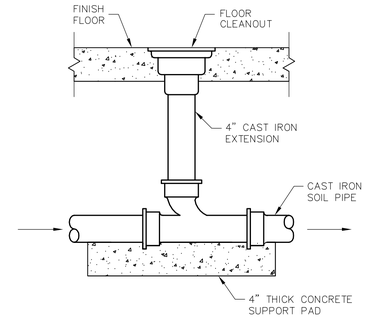
7 MOP SINK DETAIL

SCALE: NONE



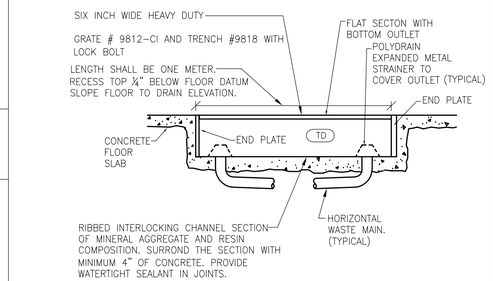
1 EXTERIOR SUB-SOIL DRAIN GROUND CLEANOUT DETAIL (GCO)

SCALE: NONE



2 CLEANOUT DETAIL

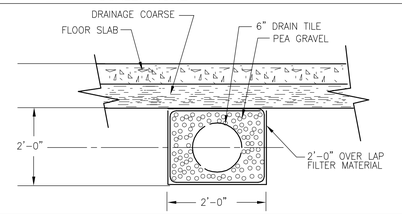
SCALE: NONE



SYSTEM SHALL BE BY POLYDRAIN.
INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

3 TRENCH DETAIL

SCALE: NONE



4 DRAIN TILE DETAIL

SCALE: NONE

1

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	BID PACKAGE 2A	01.24.11
1	BID PACKAGE 1 RFP 91	04.08.11
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	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
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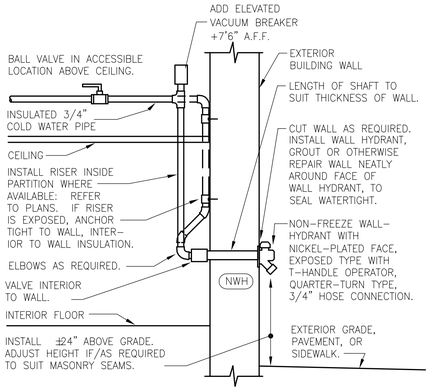
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SHEET TITLE
PLUMBING DETAILS

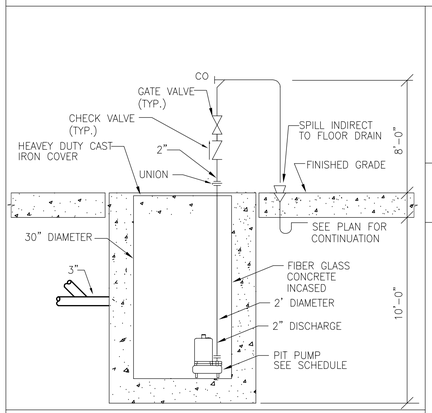
SHEET NUMBER
P401

BID PACKAGE 2B
ISSUED FOR BID

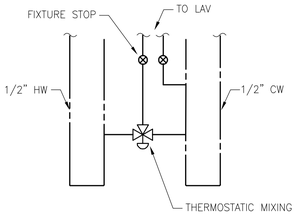
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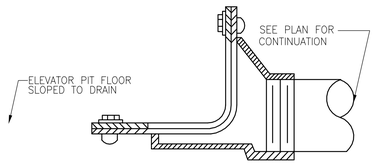
10 NON-FREEZE WALL HYDRANT
SCALE: NONE



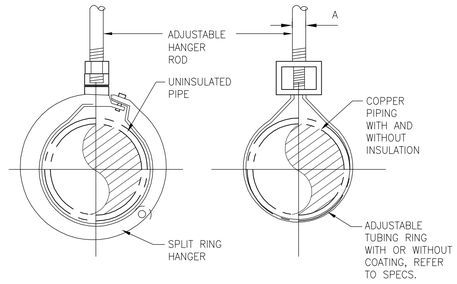
11 ELEVATOR SUMP PUMP PIPING DETAIL
SCALE: NONE



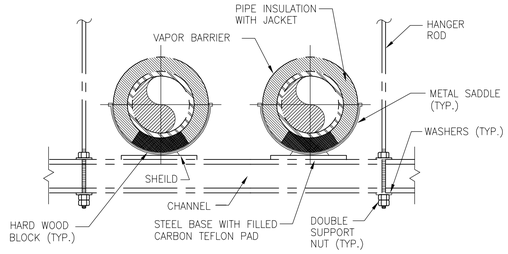
12 THERMOSTATIC MIXING VALVE AT LAV
SCALE: NONE



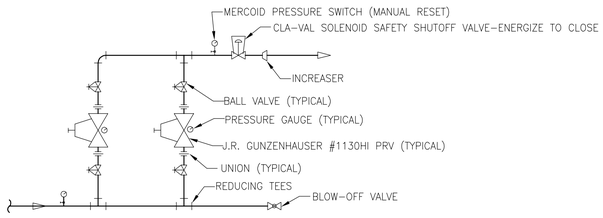
13 ELEVATOR PIT DRAIN DETAIL
SCALE: NONE



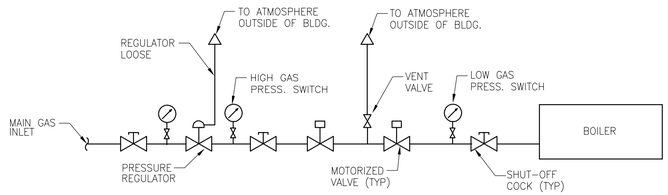
5 PIPE HANGER DETAIL
SCALE: NONE



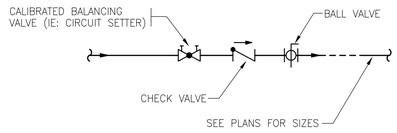
6 TRAPEZE HANGER DETAIL
SCALE: NONE



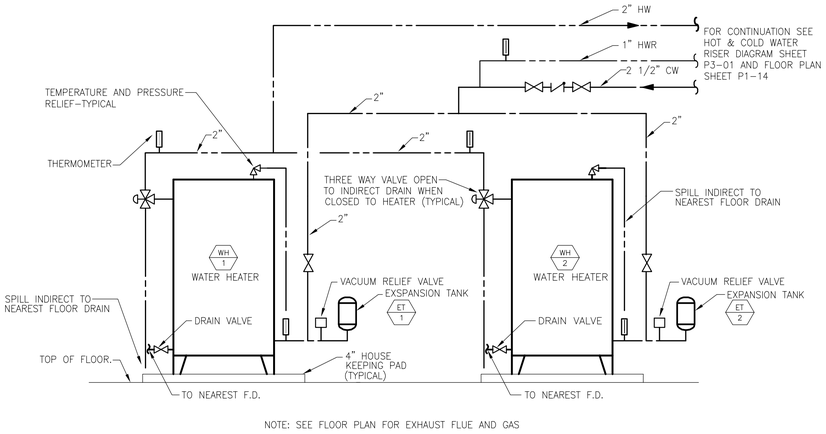
7 TRAPEZE HANGER DETAIL
SCALE: NONE



8 GAS TRAIN DIAGRAM
SCALE: NONE

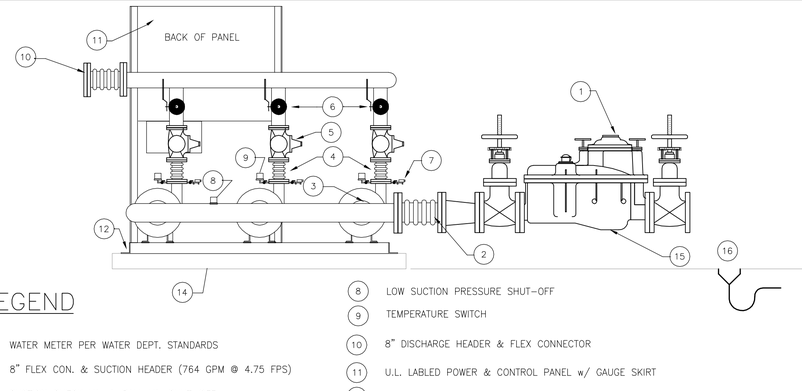


9 BALANCING VALVE DETAIL
SCALE: NONE



NOTE: SEE FLOOR PLAN FOR EXHAUST FLUE AND GAS

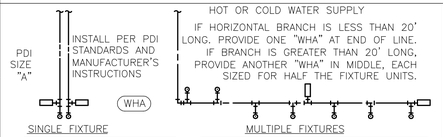
1 GAS FIRED HOT WATER HEATER DETAIL (WH 1, WH 2)
SCALE: NONE



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

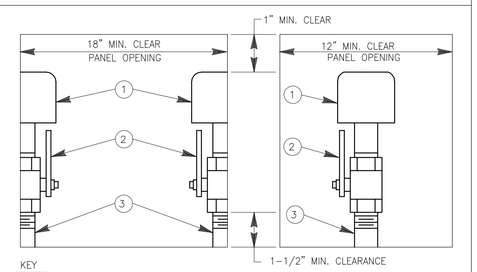
PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

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)

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REVISIONS

NO.	DESCRIPTION	DATE
	RFP 017	9.24.10
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

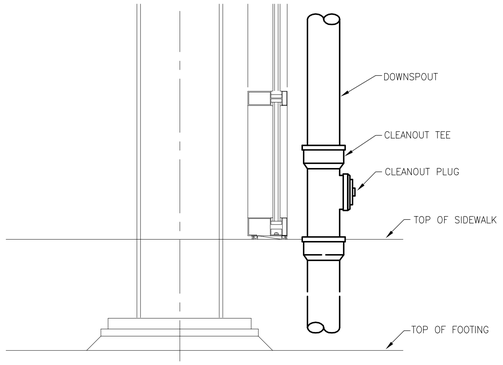
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SHEET TITLE
PLUMBING DETAILS

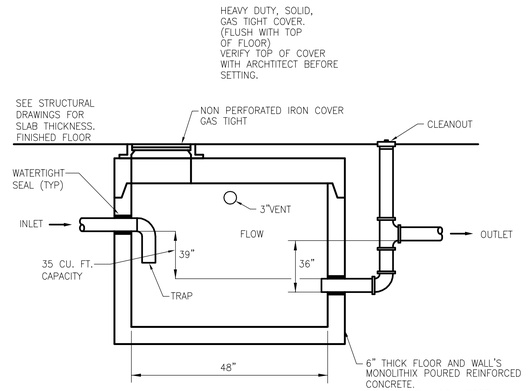
SHEET NUMBER
P402

BID PACKAGE 2B
ISSUED FOR BID

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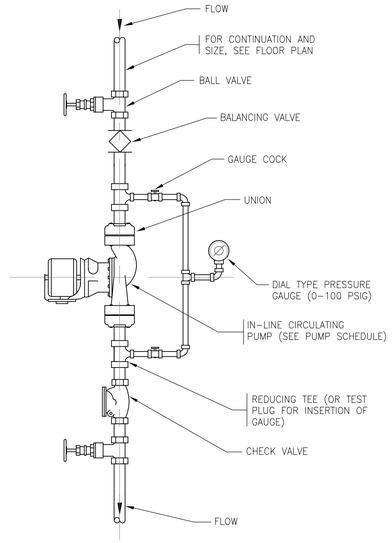


7 DOWNSPOUT DETAIL
SCALE: NONE

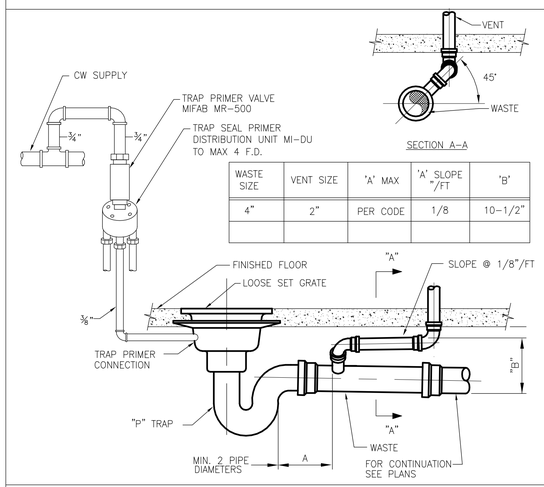


NOTE:
FOR PIPE SIZES SEE FLOOR PLAN

4 OIL SEPARATOR SETTLING BASIN
SCALE: NONE



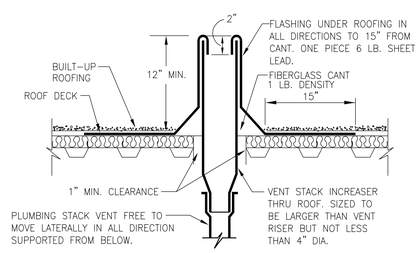
1 CIRCULATING PUMP DETAIL
SCALE: NONE



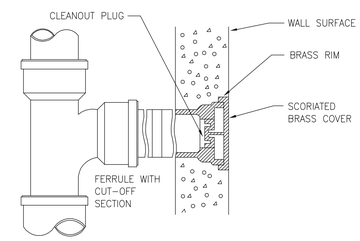
WASTE SIZE	VENT SIZE	'A' MAX	'A' SLOPE "/FT	'B'
4"	2"	PER CODE	1/8	10–1/2"

5 FLOOR DRAIN DETAIL WITH TRAP PRIMER
SCALE: NONE

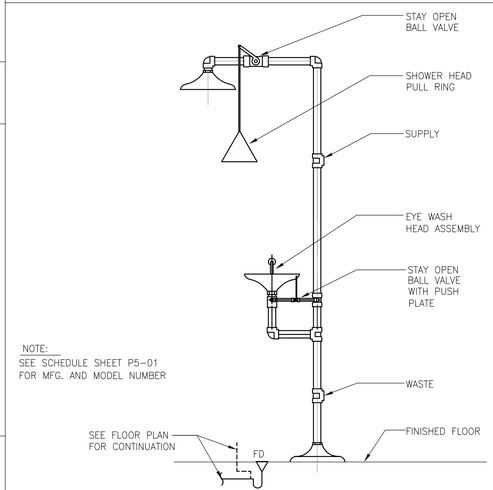
NOTE: DIMENSION 'B' DOES NOT INCLUDE FALL DUE TO SLOPE, ADD FALL DUE TO VENT SLOPE TO OBTAIN INVERT ELEVATION.



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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SHEET TITLE
PLUMBING DETAILS

SHEET NUMBER
P403

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2038.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2038_P403.dwg Plotted on: 8/17/2011 1:59 PM Plotted by: Tadge, Ferd

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
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
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	
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 CAULKED JOINTS w\ LEAD & OAKUM FS QQ-C-40	2"-15" dia.	*	*	*			*	*			
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.				*						
CAST IRON NO HUB PIPE AND FITTINGS ASTM A888-07a	2 1/2" AND LARGER	*	*	*	1						
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	ELEC.	MFG.	FLOW RATE	1 MODEL SEE SPEC	REMARKS
WATER CLOSET	WC-1	-	1 1/4"	-	1"	4"	2"	120V	SEE SPEC.	1.28 GPF		WALL HUNG, ELONGATED BOWL, OPEN FRONT SEAT, NO COVER HEAVY DUTY CHAIR CARRIER, SENSOR TYPE FLUSH VALVE, HARD WIRED TO TRNSFORMER
WATER CLOSET (ADA)	WC-2	-	1 1/4"	-	1"	4"	2"	120V	SEE SPEC.	1.28 GPF		WALL HUNG, ELONGATED BOWL, OPEN FRONT SEAT, NO COVER HEAVY DUTY CHAIR CARRIER, SENSOR TYPE FLUSH VALVE, HARD WIRED TO TRANSFORMER
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 SPEC.	0.5 GPF		ELECTRONIC FAUCET AND SOAP DISPENSOR H&C MIXING FAUCET
URINAL	UR-1	-	1"	-	3/4"	2"	1 1/2"	120V	SEE SPEC.	0.125 GPF		WALL HUNG, HEAVY DUTY CARIER, SENSOR TYPE FLUSH VALVE HARD WIRED TO TRANSFORMER
URINAL (ADA)	UR-2	-	1"	-	3/4"	2"	1 1/2"	120V	SEE SPEC.	0.125 GPF		WALL HUNG, HEAVY DUTY CARIER, SENSOR TYPE FLUSH VALVE HARD WIRED TO TRANSFORMER
SINK	SK-1	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	-	SEE SPEC.	1.1 GPM		1
SINK		3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	-	SEE SPEC.	1.1 GPM		
SINK	SK-2	3/4"	3/4"	1/2"	1/2"	2"	1 1/2"	-	SEE SPEC.	1.1 GPM		
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.	1.1 GPM		
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.	1.5 GPM		

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	VOLTS	PH	RPM	MANUFACTURER & MODEL	REMARKS
HP-1	HOUSE PUMP	GROUND FLOOR	145	92	73	5	460	3	3450	SYNCROFLO 55TA354V-VFD	TRIPLEX BOOSTER SYSTEM U.L./C-U.L. SYSTEM FLOW 145 GPM BOOST PRESSURE 40 PSIG INCLUDING A SUCTION PRESSURE OF 38 PSIG MIN.
				92	73	5	460	3	3450		
				92	37	3	460	3	3450		
RP-1	120° HOT WATER RECIRCULATING PUMP	THIRD FLOOR	6	31		1/6	115		3300	B&G PL-36	IN-LINE
PP-1	ELEVATOR PIT PUMP	GROUND FLOOR	34	20	-	1/2	208	1		ZOELLER PUMP CO, 4282	SUBMERSIBLE, SUMP PUMP SEE DETAIL #11 ON DWG. P402 W/ OIL MINDER ON EMERGENCY POWER

2 (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		
FD-4	ELEVATOR DRAIN	CAST IRON WITH FLASHING CLAMP	1520	WADE OR ZURN

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REVISIONS

NO.	DESCRIPTION	DATE
	RFP 017	9.24.10
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
2	BID PACKAGE 1 RFP 91	04.08.11
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DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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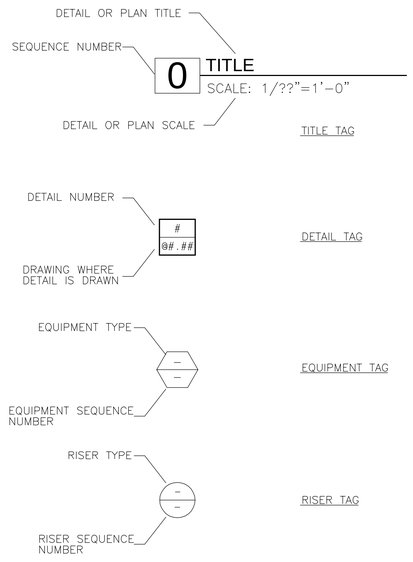
SHEET TITLE
PLUMBING SCHEDULES

SHEET NUMBER
P501

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2238.00 Duluth Airport\8.0 CADD\(8.6) Plumbing\Dwgs\2238_P501.dwg Plotted on: 8/17/2011 2:01 PM Plotted by: Tolpa, Ferd

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 ISO-DETAILS DD	03/29/10 60% REVIEW	05/07/10 90% REVIEW	08/10/10 BUILDING PERMIT SET 1	09/24/10 100% REVIEW	01/24/11 BID PACKAGE 2A	05/03/11 BP2A CONFORMANCE SET	08/23/11 BID PACKAGE 2B
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.
5. NO BEAM CLAMP HANGERS ALLOWED IN EXPOSED PUBLIC AREAS.

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DULUTH, MN

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REVISIONS

NO.	DESCRIPTION	DATE
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	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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DRAWN BY: HV
DESIGNED BY: SA

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SHEET TITLE

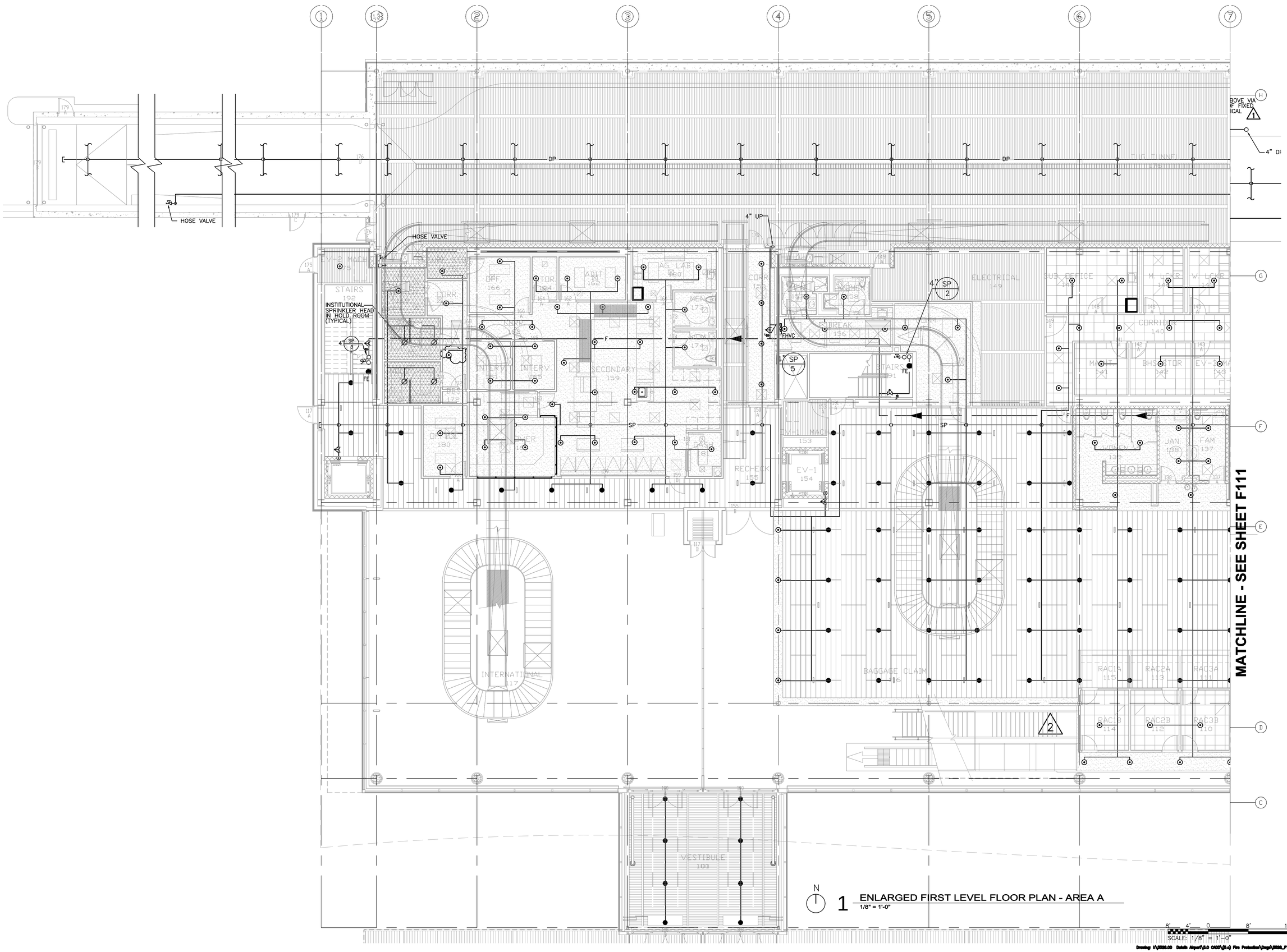
FIRE PROTECTION SYMBOL LIST, ABBREVIATIONS AND DRAWING INDEX

SHEET NUMBER

F001

BID PACKAGE 2B
ISSUED FOR BID

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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:\2035.00 Duluth Airport\8.0 CADD\(8.e) Fire Protection\Dwgs\2035_F110.dwg Plotted on: 8/17/2011 2:05 PM Plotted by: Tadjo, Ferd

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	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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DESIGNED BY: SA

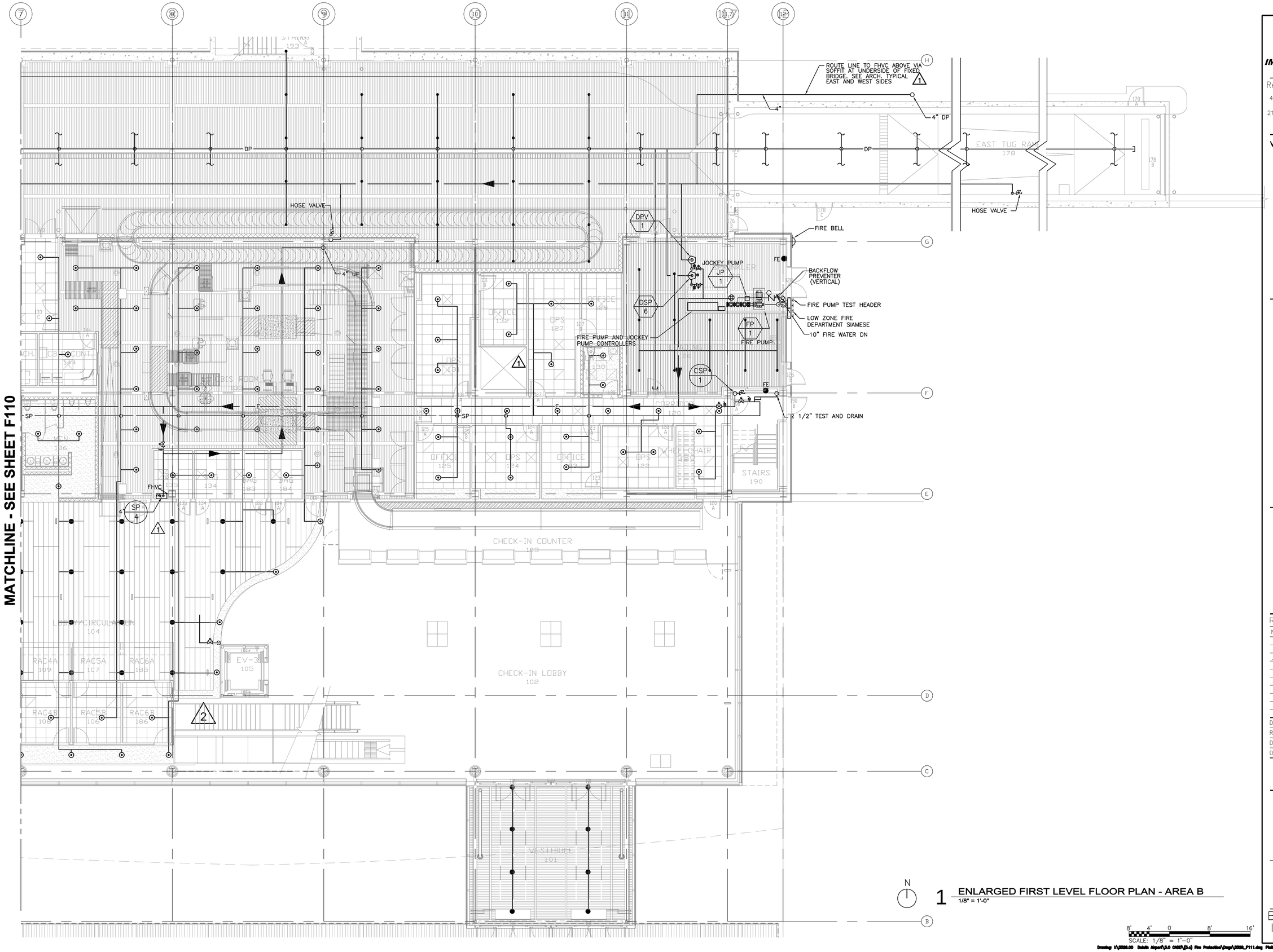
AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER
F110

BID PACKAGE 2B
ISSUED FOR BID



Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2008_F111.dwg Plotted on: 8/17/2011 2:09 PM Plotted by: Tolpo, Ferd

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REVISIONS

NO.	DESCRIPTION	DATE
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	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

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REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

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SHEET TITLE

ENLARGED FIRST FLOOR FIRE PROTECTION PLAN AREA B

SHEET NUMBER

F111

BID PACKAGE 2B
ISSUED FOR BID

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

SEE ARCHITECT RCP FOR EXACT SPRK. HEAD LOCATION

FIRE SUSPRESSION DRY AGENT EQUIPMENT ROOM

BACK-UP TANK

35LB CYLINDER FILLED W/ 33LBS. FE-227

20 LB DRY CHEM.

4" UP

UPRIGHT SPRINKLER HEADS WITH ASSOCIATE SPRINKLER PIPING ABOVE METAL CEILING (TYPICAL)

PENDENT SPRINKLER HEADS BELOW METAL CEILING (TYPICAL)

MATCHLINE - SEE SHEET F113

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 CADD\(8.4) Fire Protection\Dwgs\2008_F112.dwg Plotted on: 8/17/2011 2:12 PM Plotted by: Tolpa, Ferd

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1	BP2A ADDENDUM 1	2.25.11
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	BID PACKAGE 2B	8.23.11

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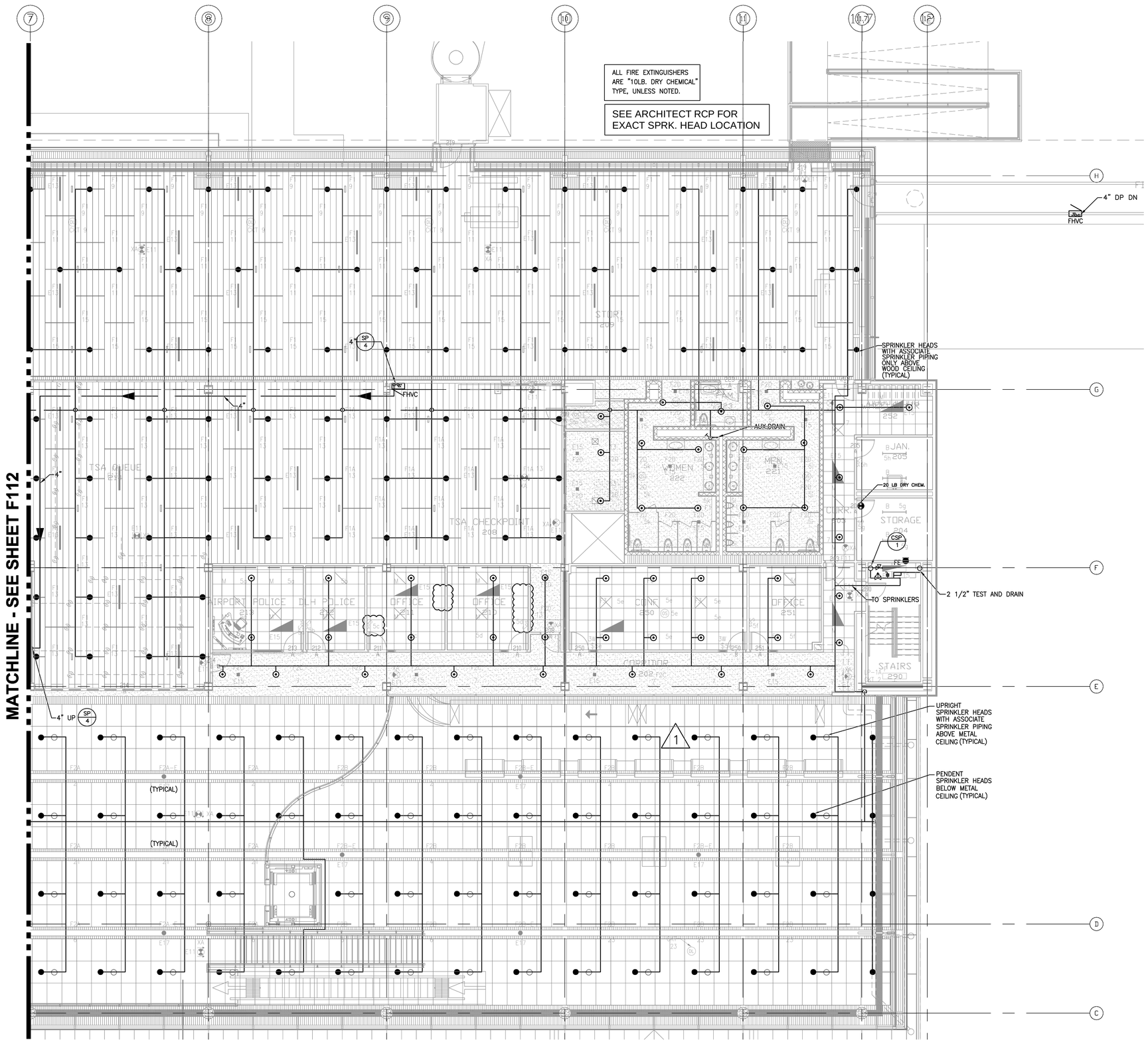
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ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER

F112

BID PACKAGE 2B
ISSUED FOR BID



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

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

Drawing: I:\2528.00 Duluth Airport\8.0 CADD\(D.c) Fire Protection\Dwgs\2528_F113.dwg Plotted on: 8/17/2011 2:15 PM Plotted by: Tallyn, Ferld

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	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
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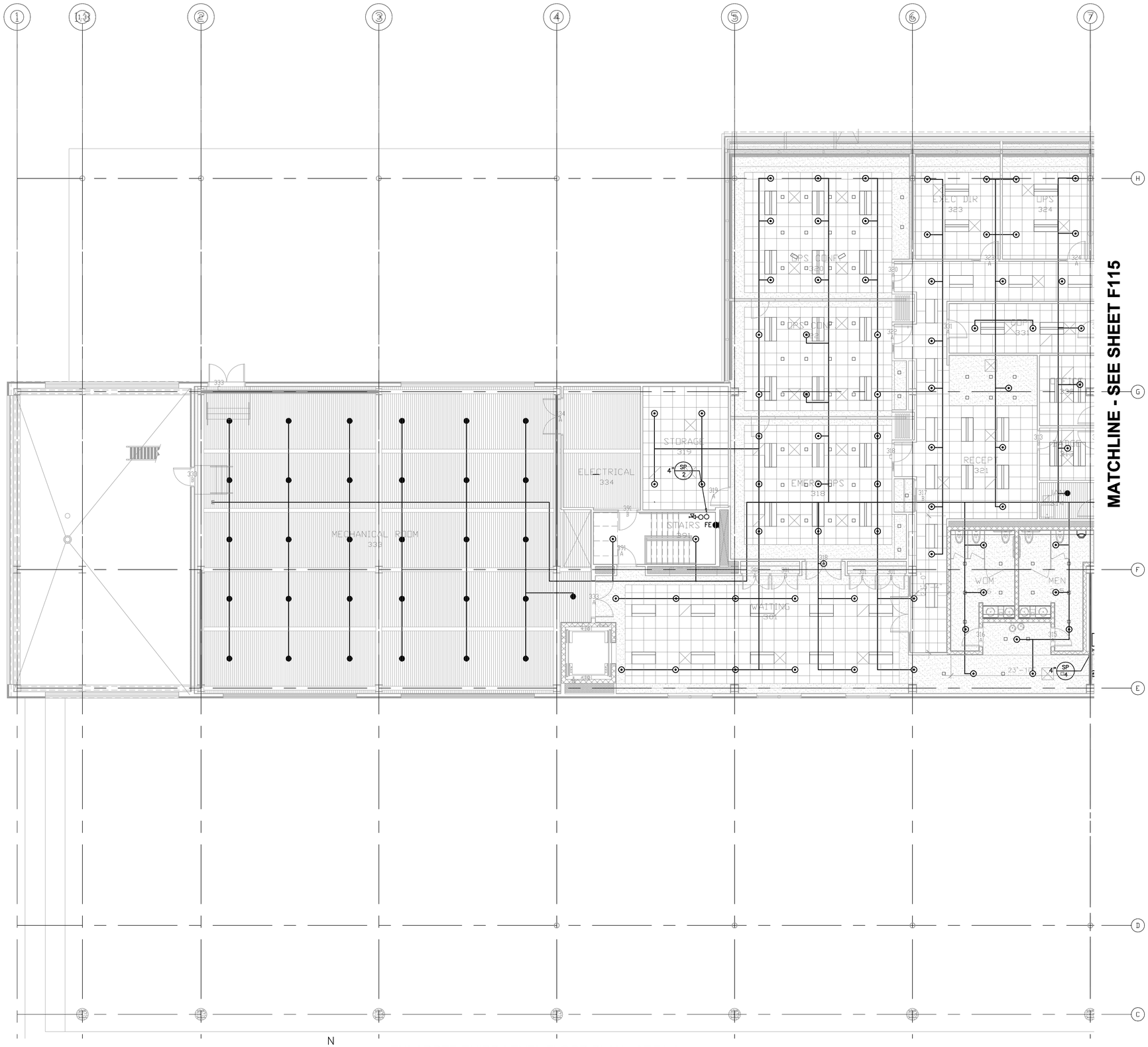
AEP PROJECT NUMBER
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SHEET TITLE
ENLARGED SECOND FLOOR FIRE PROTECTION PLAN AREA B

SHEET NUMBER
F113

BID PACKAGE 2B
ISSUED FOR BID



1 ENLARGED THIRD LEVEL FLOOR PLAN - AREA A

1/8" = 1'-0"

8' 4' 0 8' 16'

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

Drawing: I:\2035.00 Duluth Airport\8.0 CADD\[8.e] Fire Protection\Dwgs\2035_F114.dwg Plotted on: 8/17/2011 2:19 PM Plotted by: Tolga, Ferit

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SHEET TITLE

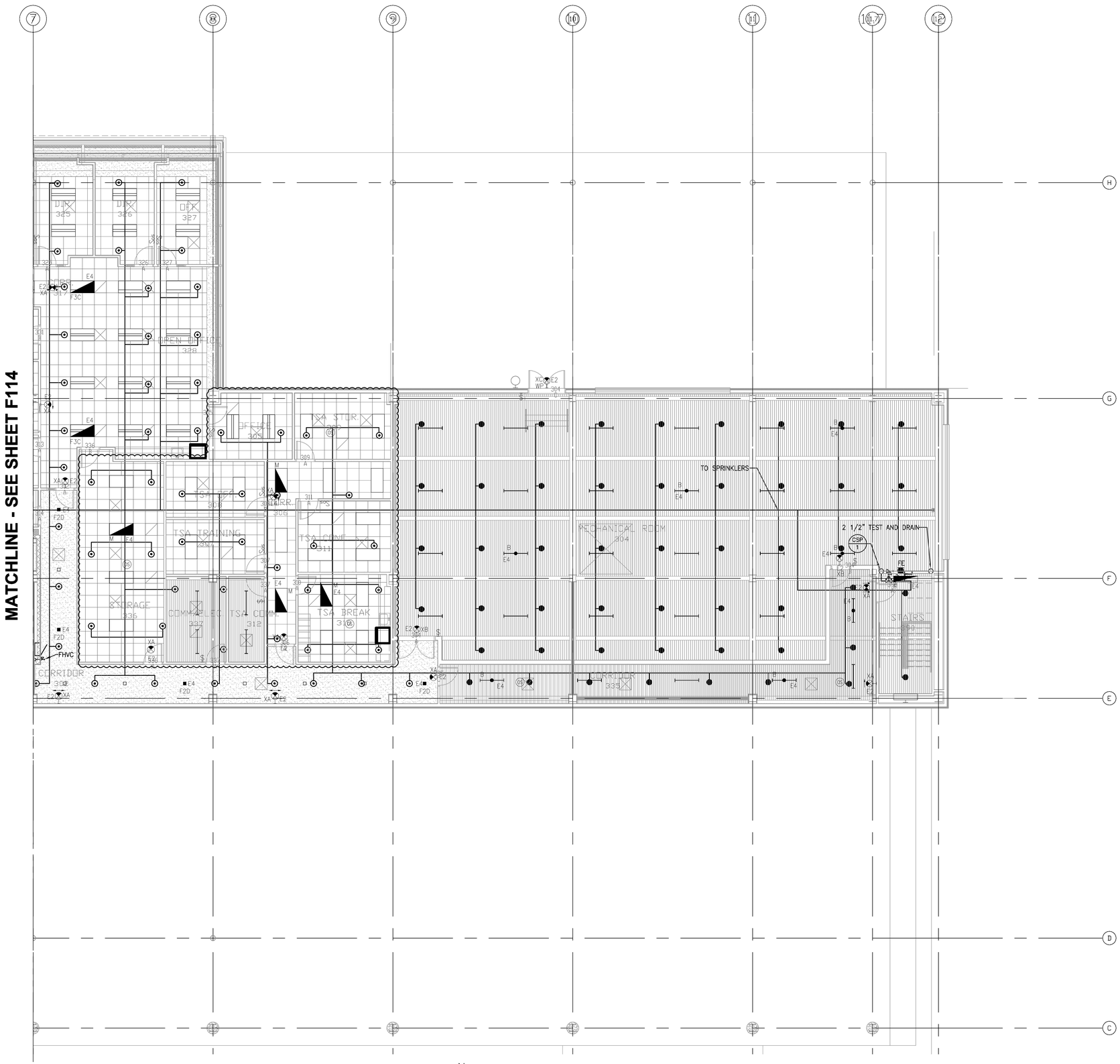
ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA A

SHEET NUMBER

F114

BID PACKAGE 2B
ISSUED FOR BID

MATCHLINE - SEE SHEET F114



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

N

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

Drawing: I:\2035.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2035_F115.dwg Plotted on: 8/17/2011 2:21 PM Plotted by: Tallyn, Farid

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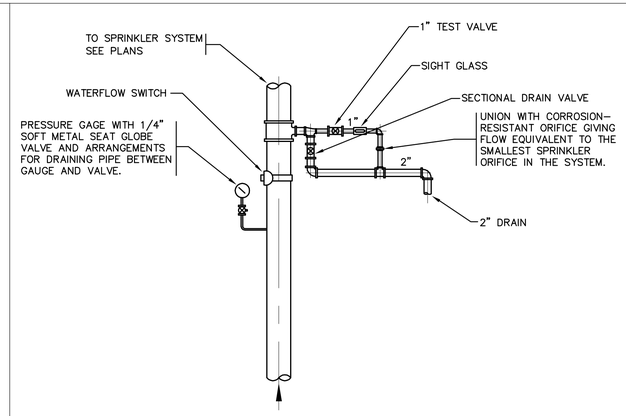
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ENLARGED THIRD FLOOR FIRE PROTECTION PLAN AREA A

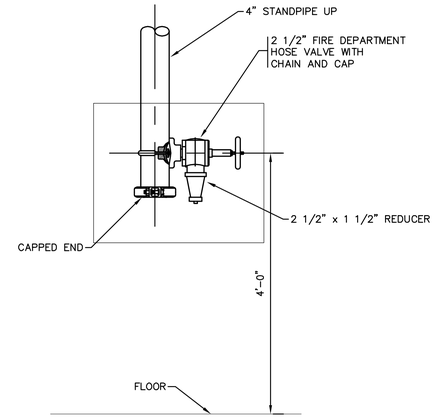
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F115

BID PACKAGE 2B
ISSUED FOR BID



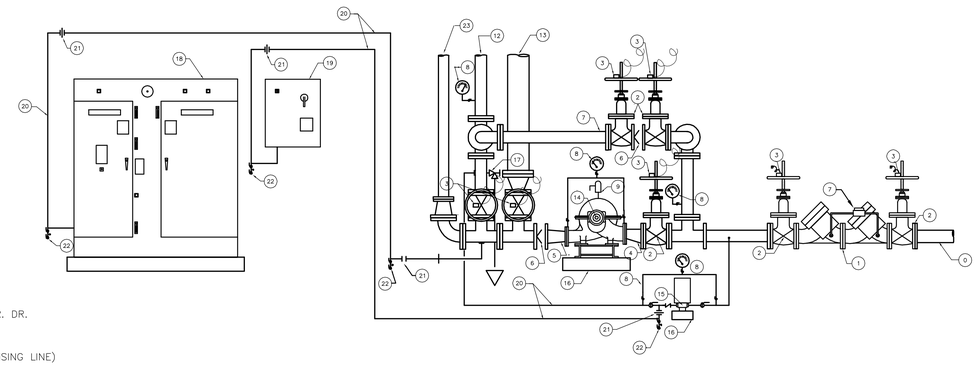
4 INSPECTOR'S TEST CONNECTION DETAIL
SCALE: NONE



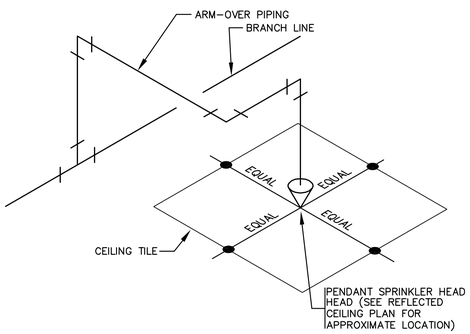
1 FIRE DEPARTMENT VALVE DETAIL
SCALE: NONE

LEGEND

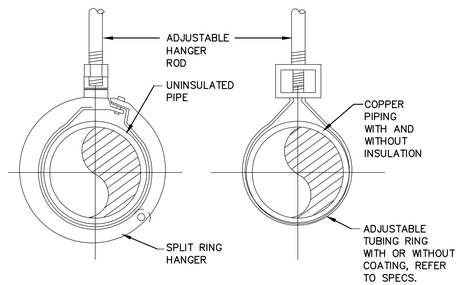
0. INCOMING WATER SERVICE FROM STREET MAIN
1. DOUBLE DETECTOR CHECK VALVE ASSY.
2. GATE VALVE
3. TAMPER SWITCH (TYP.)
4. ECCENTRIC REDUCER
5. CONCENTRIC REDUCER
6. NON-SLAM CHECK VALVE
7. BY-PASS
8. PRESSURE GAUGE (TYP.)
9. AIR RELEASE VALVE
10. VOID
11. VOID
12. TO SPRINKLER SYSTEMS
13. TO FIRE PUMP 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



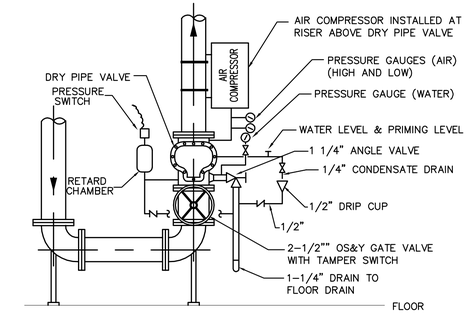
5 FIRE PUMP / JOKEY PUMP / CONTROLLERS ARRANGEMENT
SCALE: NONE



2 TYPICAL SPRINKLER HEAD LOCATION
SCALE: NONE



6 PIPE HANGER DETAIL
SCALE: NONE



3 DRY PIPE VALVE DETAIL
SCALE: NONE

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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

REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08-23-11
REVIEWED BY: XXX
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213-1882-091

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SHEET TITLE
FIRE PROTECTION DETAILS

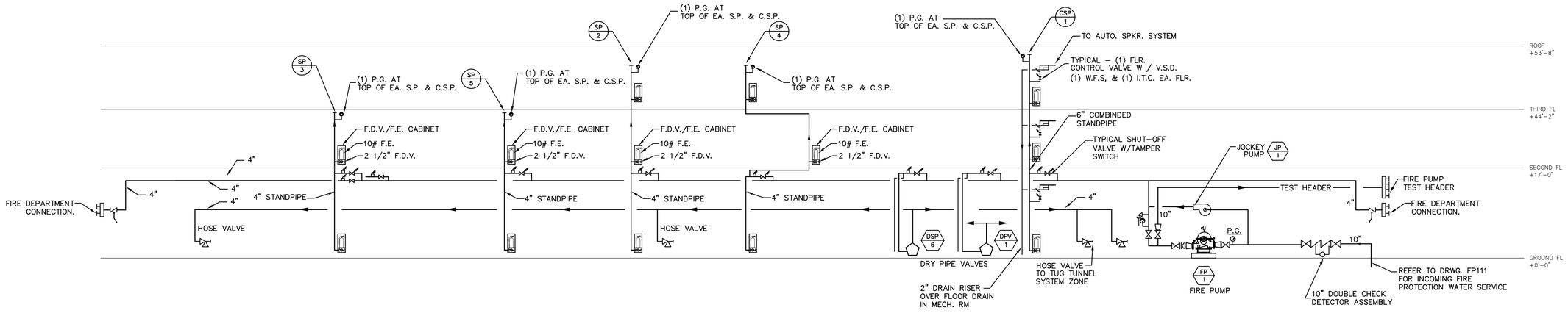
SHEET NUMBER
F401

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2528.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2528_F401.dwg Plotted on: 8/17/2011 2:25 PM Plotted by: Tolpa, Ferld

PUMP SCHEDULE

PUMP TAG	SERVICE	LOCATION	GPM EACH PUMP	BOOST PSI	SHUT OFF PSI	MOTOR DATA				MANUFACTURER	REMARKS
						HP	VOLTS	PH	RPM		
FP–1	FIRE PUMP	GROUND FLOOR	1250	115	130	125	480	3	3550	PEERLESS MODEL # 6AEF10	130 PSI CHURN
JP–1	JOCKY PUMP	GROUND FLOOR	7			10	480	3			
				1							



1 FIRE PROTECTION RISER DIAGRAM
SCALE: NONE

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REVISIONS

NO.	DESCRIPTION	DATE
	100% REVIEW	12.17.10
	BID PACKAGE 2A	01.24.11
1	BP2A ADDENDUM 1	2.25.11
	BP2A CONFORMANCE SET	5.02.11
	BID PACKAGE 2B	8.23.11

DATE ISSUED: 08–23–11
REVIEWED BY: RDJ
DRAWN BY: HV
DESIGNED BY: SA

AEP PROJECT NUMBER
213–1882–091

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SHEET TITLE
FIRE PROTECTION SCHEDULES AND RISER DIAGRAM

SHEET NUMBER
F501

BID PACKAGE 2B
ISSUED FOR BID

Drawing: I:\2008.00 Duluth Airport\8.0 CADD\(8.4) Fire Protection\Dwgs\2008_F501.dwg Plotted on: 8/17/2011 2:27 PM Plotted by: Tolpa, Ferid