



# DULUTH INTERNATIONAL AIRPORT

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

FAA AIP No. - 3-27-0024-51-11  
RS&H PROJ. No. - 213.1882.110  
CITY OF DULUTH BID No. - 11-4402

## DULUTH AIRPORT AUTHORITY BOARD OF DIRECTORS

- President: John Eagleton
- Vice President: Robert Pearson
- Secretary: Michael Lundstrom
- Conrad Firling
- Roy Niemi
- Sue Ross
- Roger Wedin



## NEW PASSENGER TERMINAL VALE PROGRAM DESIGN

JUNE 9, 2011



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



Architects and Civil Engineers:  
**REYNOLDS, SMITH & HILLS, INC.**  
4525 Airport Approach Road,  
Duluth MN 55811  
TEL: (218) 722-1227 / FAX: (218) 722-1052

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

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

**MATERIALS LEGEND**

ITEM	DESIGNATION	ITEM	DESIGNATION	ITEM	DESIGNATION
CRUSHED ROCK GRAVEL	EARTH UNGLAZED	TERRA COTTA UNGLAZED	TERRA COTTA UNGLAZED	TERRA COTTA UNGLAZED	TERRA COTTA UNGLAZED
EARTH UNDISTURBED	ALUMINUM AND OTHER METALS	BRONZE BRASS	SEALANT AND BACKER ROD	WATERPROOFING MEMBRANE	GLASS MIRRORS
EARTHWORK COMPACTED FILL	STEEL	SHEET METAL AND ALL METALS	GLASS ELEVATION MIRRORS ELEVATION	GLASS ELEVATION MIRRORS ELEVATION	GLASS ELEVATION MIRRORS ELEVATION
SAND	PARTICLEBOARD WOODWORK ARCHITECTURAL	PLYWOOD	PLASTER FINISH	PLASTER FINISH	PLASTER FINISH
BRICK COMMON/FACE	WOOD BLOCKING SHIM	WOOD FINISH	WOOD FINISH	WOOD FINISH	WOOD FINISH
CMU	WOOD FRAMING CONTINUOUS	TERRAZZO FINISH	TERRAZZO FINISH	TERRAZZO FINISH	TERRAZZO FINISH
CONCRETE	GASKET FIREPROOFING	ACOUSTICAL CEILING	ACOUSTICAL CEILING	ACOUSTICAL CEILING	ACOUSTICAL CEILING
GRANITE STONE	INSULATION LOOSE FILL	WOOD FLOORING	WOOD FLOORING	WOOD FLOORING	WOOD FLOORING
GROUT					
LIMESTONE					
MARBLE STONE					
STONE CAST					

**SYMBOLS LEGEND**

ITEM	SYMBOL	ITEM	SYMBOL WITH SHEET DESIGNATION
DRAWING TITLE	<b>1</b> DWG LABEL_1 X" = 1'-0"	PARTIAL BUILDING SECTION	
ROOM NUMBER	ROOM NAME XXX	FULL BUILDING SECTION	
ROOM NUMBER WITH KT/BT	ROOM NAME XXX XX XXX	EXTERIOR ELEVATION	
MATERIAL CHANGE	XX XX FLR FLR	INTERIOR ELEVATION	
F F & E	XXX	DETAIL	
ELEVATION CHANGE			
INTERIOR ELEVATION	CLG HT XX'-XX" AFF		
SPOT ELEVATION	XX'-XX"		
ELEVATION REFERENCE VERTICAL	FLOOR NAME EL XX'-XX"		
DOOR NUMBER	ROOM NUMBER XXX XXX		
WINDOW/ GLAZING NUMBER	DOOR IDENTIFIER		
NOTE NUMBER	XXX		
WALL TYPE	XX		
NORTH ARROW	N		

**DRAWING LIST**

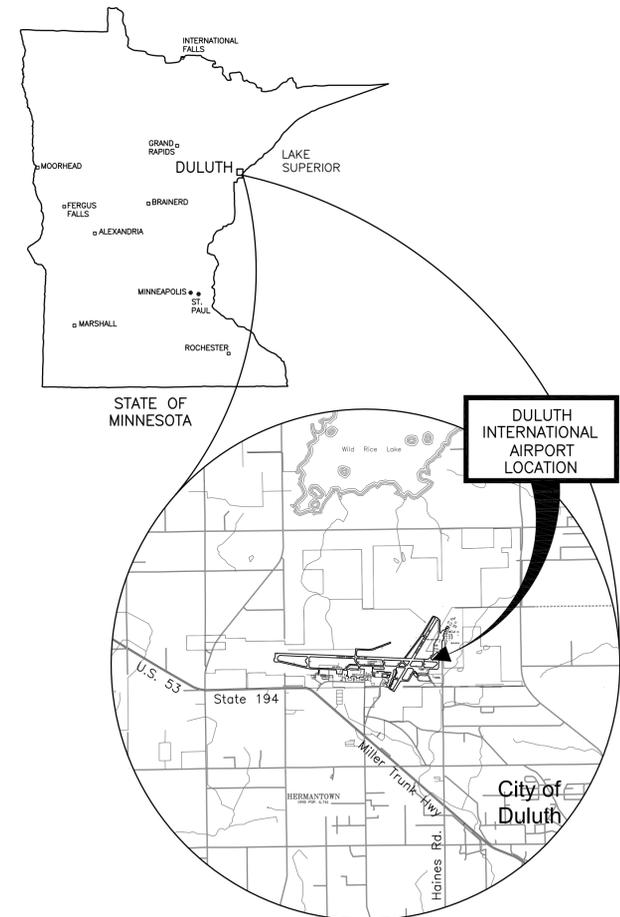
CIVIL	MECHANICAL
G101 DRAWING LIST, GENERAL NOTES, SYMBOLS AND ABBREVIATIONS	M001 MECHANICAL LEGEND
C211 FENCING LAYOUT SITE PLAN AND NOTES	M002 MECHANICAL SYMBOLS AND ABBREVIATIONS
C212 FENCING AND GATE DETAILS	M100 OVERALL GEOTHERMAL SITE PLAN
C214 FENCING AND GATE DETAILS	M101 GEOTHERMAL SITE MECHANICAL PARTIAL PLAN
C407 EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS	M102 GEOTHERMAL SITE MECHANICAL PARTIAL PLAN
C408 EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS	M110 ENLARGED FIRST FLOOR MECHANICAL PLAN - AREA A
C409 EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS	M111 ENLARGED FIRST FLOOR MECHANICAL PLAN - AREA B
C410 EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS	M114 ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA A
	M115 ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA A
	M116 ENLARGED ROOF LEVEL MECHANICAL PLAN - AREA A
	M117 ENLARGED ROOF LEVEL MECHANICAL PLAN - AREA B
	M301 HEATING HOT WATER FLOW DIAGRAM
	M302 CHILLED WATER FLOW DIAGRAM
	M304 EVACUATED TUBE SOLAR COLLECTOR FLOW DIATRAM
	M401 MECHANICAL EQUIPMENT SCHEDULES
	M501 MECHANICAL DETAILS
	ELECTRICAL
	E001V ELECTRICAL SYMBOLS
	E100V PARTIAL THIRD FLOOR POWER PLAN
	E101V PARTIAL THIRD FLOOR LIGHTING PLAN
	E102V ELECTRICAL ROOF PLAN AND PV LAYOUT
	E103V PARTIAL SECOND FLOOR POWER PLAN
	E300V PV RISER DIAGRAM & PANEL SCHEDULES
	E301V BUILDING POWER RISER DIAGRAM
	E302V PANEL SCHEDULES
	PLUMBING
	P001 SYMBOLS, SCHEDULES, ABBREVIATIONS AND DRAWING INDEX
	P112 ENLARGED SECOND FLOOR PLUMBING PLAN - AREA A
	P114 ENLARGED THIRD FLOOR PLUMBING PLAN - AREA A
	P116 ENLARGED ROOF LEVEL PLUMBING PLAN - AREA A
	FIRE PROTECTION
	F001 SYMBOLS, SCHEDULES, ABBREVIATIONS AND DRAWING INDEX
	F114 ENLARGED THIRD FLOOR FIRE PROTECTION - AREA A
	STRUCTURAL
	S002 GENERAL STRUCTURAL NOTES
	S003 GENERAL STRUCTURAL NOTES
	S114 THIRD LEVEL FRAMING PLAN - AREA A
	S116 ROOF LEVEL FRAMING PLAN - AREA A
	S121 SOLAR PANEL FRAMING PLANS AND DETAILS
	S122 VALE DETAILS
	S701 STRUCTURAL DETAILS

**ABBREVIATIONS**

A.F.F.	ABOVE FINISHED FLOOR	EA.	EACH	LAM.	LAMINATED	R.	RADIUS
A.C.T.	ACOUSTIC CEILING TILE	ELEC.	ELECTRICAL	LAV.	LAVATORY	RECT.	RECTANGULAR
ADJ.	ADJACENT	E.W.C.	ELECTRICAL WATER COOLER	L.F.	LINEAR FEET	REINF.	REINFORCEMENT
A.E.S.S.	ARCH. EXPOSED STL. STRUCT.	EL.	ELEVATION	L. PT.	LOW POINT	REQU.	REQUIRED
A.H.U.	AIR HANDLER UNIT	ENCL.	ENCLOSURE	M.O.	MASONRY OPENING	REV.	REVISION
ALT.	ALTERNATE	EQ.	EQUAL EQUIPMENT	MAX.	MAXIMUM	R.H.	RIGHT HAND
ALUM.	ALUMINUM	EXP. JT.	EXPANSION JOINT	MECH.	MECHANICAL	R.D.	ROOF DRAIN
APPROX.	APPROXIMATE	EXP.	EXPOSED	M.H.	MAN HOLE	RM.	ROOM
ARCH.	ARCHITECTURAL	EXT.	EXTERIOR	MTL.	METAL	SC.	SCALE
ASPH.	ASPHALT	FIN.	FEET	MIN.	MINIMUM	SCHED.	SCHEDULE
AUTO.	AUTOMATIC	F.T.	FIRE EXTINGUISHER CABINET	MISC.	MISCELLANEOUS	SECT.	SECTION
		F.E.C.	FIRE EXTINGUISHER CABINET	MULL.	MULLION	SHT.	SHEET
		F.H.C.	FIRE HOSE CABINET	M.U.F.I.D.	MULTIPLE USE FLIGHT INFORMATION DISPLAY	SIM.	SIMILAR
		F.H.R.	FIRE HOSE RACK	NOM.	NOMINAL	SQ. FT.	SQUARE FEET
		FIXT.	FIXTURE	N.I.C.	NOT IN CONTRACT	S.S.	STAINLESS STEEL
		F.I.D.	FLIGHT INFORMATION DISPLAY	N.T.S.	NOT TO SCALE	STD.	STANDARD
		FL.	FLOOR	NO.	NUMBER	STA.	STATION
		F.D.	FLOOR DRAIN	O.C.	ON CENTER	STL.	STEEL
		F.LUOR.	FLUORESCENT	OPG.	OPPOSITE	STRUCT.	STRUCTURAL
		FR.	FRAME	OPP.	OPPOSITE	SUSP.	SUSPENDED
		GA.	GAUGE	O.Z.	OUNCE	SYM.	SYMBOL
		GALV.	GALVANIZED	O.D.	OUTSIDE DIAMETER	TEL.	TELEPHONE
		GYP.BD.	GYPSUM BOARD	O.A.	OVERALL	THK.	THICKNESS
				O.W.S.J.	OPEN WEB STEEL JOIST	TSR	TRANSPORTATION SECURITY ADMINISTRATION
				PR.	PAIR	TYP.	TYPICAL
				P.J.	PANEL JOINT	U.L.	UNDERWRITERS LABORATORIES
				PLAS.	PLASTER	U.O.N.	UNLESS OTHERWISE NOTED
				PL.	PLATE	V.B.	VAPOR BARRIER
				PLMBG.	PLUMBING	VERT.	VERTICAL
				PLYWD.	PLYWOOD	V.C.T.	VINYL COMPOSITION TILE
				P.V.C.	POLYVINYLCHLORIDE	V.W.C.	VINYL WALL COVERING
				PT.	POINT	VOL.	VOLUME
				P.SI.	POUNDS PER SQUARE INCH	W.H.I.	WARNOCK HERSEY INTERNATIONAL
				P.T.	PRESSURE TREATED	W.C.	WATER CLOSET
				PRPTY.	PROPERTY	WT.	WEIGHT
				QTY.	QUANTITY	W.W.F.	WELDED WIRE FABRIC
				Q.T.	QUARRY TILE	WD.	WOOD
						W.P.	WORKING POINT
						XA	EXIT SIGN

**PROJECT GENERAL NOTES:**

- ALL WORK SHALL CONFORM TO ALL APPLICABLE CODES, STANDARDS AND GOVERNING AUTHORITIES.
- REFER TO CIVIL, ARCHITECTURAL, MECHANICAL, PLUMBING, STRUCTURAL AND ELECTRICAL DRAWINGS FOR COORDINATION OF WORK.
- EACH TRADE CONTRACTOR SHALL VISIT THE SITE AND BECOME KNOWLEDGEABLE OF CONDITIONS THEREIN. EACH TRADE CONTRACTOR SHALL INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL THE REQUIREMENTS OF THE PROJECT AND SHALL NOTIFY THE ARCHITECT AND OWNER OF ANY CONDITIONS REQUIRING INFORMATION BEFORE PROCEEDING WITH THE WORK. EXISTING BUILDING DRAWINGS ARE AVAILABLE FROM THE OWNER FOR REVIEW. THE DOCUMENTS AVAILABLE MAY NOT BE REPRESENTATIVE OF ALL AS-BUILT CONDITIONS.
- THE TRADE CONTRACTORS SHALL PROTECT ALL EXISTING SITE ELEMENTS FROM DAMAGE DUE TO ALTERATION AND CONSTRUCTION OPERATIONS AND REPAIR OR REPLACE ELEMENTS DAMAGED DURING THE PROJECT.
- ANY UTILITY SHUT-OFFS AS REQUIRED BY THE CONTRACTOR FOR COMPLETION OF THE WORK SUCH AS ELECTRICAL, WATER, SEWER, TELEPHONE, GAS ETC. MUST BE SCHEDULED WITH THE OWNER 72 HOURS PRIOR TO COMMENCING THE WORK. ALL WORK TO BE DONE IN OFF HOURS OR AT LOW-USE HOURS AS APPROVED BY THE OWNER.
- DRAWINGS ARE TO BE ISSUED TO THE SUBCONTRACTORS IN COMPLETE SETS SO THAT THE EXTENT AND COORDINATION OF THE WORK IS MADE POSSIBLE.
- DETAILS SHOWN ARE INTENDED TO BE INDICATIVE OF THE PROFILES AND TYPE OF DETAILING REQUIRED FOR THE WORK. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE DETAILED.
- WHERE SPECIFIC DIMENSIONS, DETAILS AND DES NOT BE DETERMINED, NOTIFY THE ARCHITECT IN WRITING BEFORE PROCEEDING WITH ANY WORK IN QUESTION.
- DIMENSIONS SHALL GOVERN. DO NOT SCALE DR. CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES, OMISSIONS AND/OR CONFLICT.
- ALL DIMENSIONS SHALL BE VERIFIED ON THE SITE BEFORE PROCEEDING WITH THE WORK. NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES.
- UNLESS NOTED OTHERWISE, ALL WALLS AND PARTITIONS ARE DIMENSIONED TO THE FINISH FACE OF THE METAL FRAMING OR FACE OF C.M.U.
- UNLESS NOTED OTHERWISE, ALL FASTENERS AND FASTENING DEVICES ARE TO BE CONCEALED IN ALL FINISHED SPACES.
- ANY PIPING, DUCTS, CONDUITS, ETC. THAT PENETRATE FIRE-RATED WALLS SHALL BE INSTALLED IN A MANNER THAT WILL PRESERVE THE FIRE INTEGRITY OF THE FLOOR OR WALL. FIRE STOP RATINGS OF WALLS WHERE PENETRATIONS OCCUR, PROVIDE FIRE DAMPERS IN DUCTS PENETRATING FIRE-RATED WALLS TO MEET THE APPLICABLE BUILDING CODES. REFER TO ALL DRAWINGS FOR EXTENT AND FIRE RATING REQUIREMENTS. THE FIRE RATING OF THE FIRESTOP MUST BE EQUAL TO OR GREATER TO THE MINIMUM RATING OF THE FLOOR, ROOF OR WALL ASSEMBLY. ALL FIREPROOFING REPLACEMENT OR INSTALLATION TO BE COMPLETED BY CONTRACTOR PERFORMING THE PENETRATION.
- ALL JOINTS OF ANY ELEMENT OF CONSTRUCTION WHICH ARE REQUIRED TO HAVE A FIRE-RESISTANCE RATING SHALL BE INSTALLED PER THE MANUFACTURER'S PUBLISHED TESTED ASSEMBLIES, SHALL BE TIGHT AND SHALL PREVENT THE PASSAGE OF SMOKE AND FLAME.
- WHERE THE FIRE RATING OF WALLS ARE NOTED ON THE DRAWINGS, THE FIRE RATING SHALL APPLY TO THE ENTIRE PERIMETER ENCLOSURE OF THE ROOM OR SPACE FOR THE FULL LENGTH AND HEIGHT OF AREAS BEING SEPARATED, EXTENDING TO THE UNDERSIDE OF THE FLOOR OR ROOF DECK.
- ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER BY GASKETS OR COATINGS OR BOTH TO AVOID GALVANIC CORROSION ACTION.
- ALL FERROUS METAL WORK LOCATED ON THE EXTERIOR OR IN NON CONDITIONED SPACES (INTERIOR) SHALL BE HOT-DIPPED GALVANIZED (MINIMUM G-90 COATING).
- THE EXTENT OF THE WORK SHOWN ON THE PLANS AND DETAILS REFLECTS THE BEST JUDGMENT OF THE ARCHITECT/ENGINEER. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AND ADVISE THE ARCHITECT IN WRITING OF ANY SITUATION THAT WOULD NOT ALLOW HIM TO PROCEED ON THE BASIS OF THESE DOCUMENTS.
- THE ARCHITECT/ENGINEER SELECTION OF MATERIALS AND DETAILS DOES NOT RELIEVE THE CONTRACTOR FROM VERIFYING WITH THE MATERIAL SUPPLIERS THAT THE PROPOSED MATERIALS ARE CORRECT AND PROPER FOR THE INTENDED APPLICATION AND USE.
- THE CONTRACTOR SHALL COORDINATE THE FINAL LOCATIONS OF THE POWER/DATA/COMMUNICATION OUTLETS.
- ALL WORK SHALL CONFORM WITH MINNESOTA CODE AND THE IAC (SECTIONS 400.310(s) AND 400.310(u)).



**1** LOCATION MAP  
N.T.S.



**Reynolds, Smith and Hills, Inc.**  
4525 Airport Approach Rd, Ste A  
Duluth, Minnesota 55811  
218-722-1227 Fax: 218-722-1052  
www.rsandh.com



**DULUTH INTERNATIONAL AIRPORT DULUTH, MN**

**NEW PASSENGER TERMINAL VALE PROGRAM**

**CONSULTANTS**

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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

**DATE ISSUED: 06-06-11**  
**REVIEWED BY: SBS/TC**  
**DRAWN BY: MKG/MI**  
**DESIGNED BY: SBS/TC**  
**AEP PROJECT NUMBER**  
**213-1882-110**  
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**SHEET TITLE**  
**DRAWING LIST**

**SHEET NUMBER**  
**G101**

**VALE PROGRAM BID PACKAGE**







REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 06-06-11  
REVIEWED BY: JEH  
DRAWN BY: RDRE  
DESIGNED BY: JEH

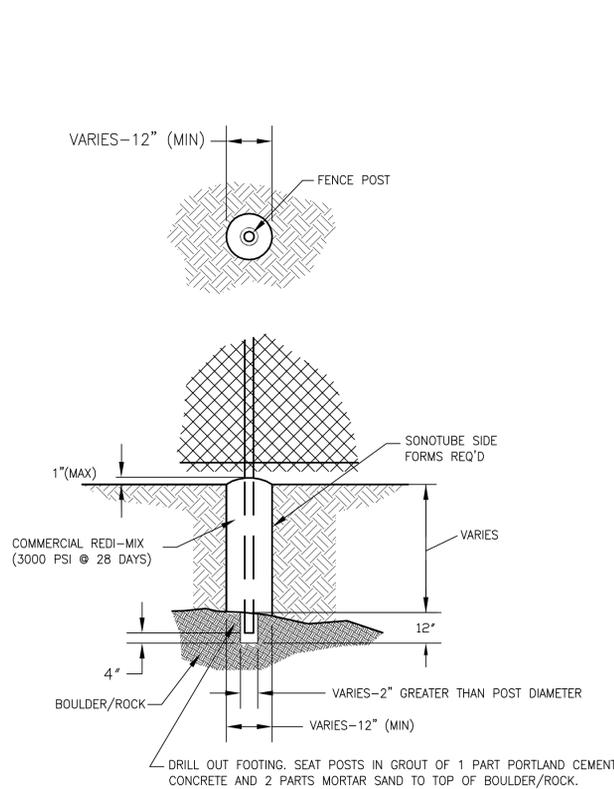
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SHEET TITLE  
**FENCING  
AND GATE  
DETAILS  
(SHEET 1 OF 3)**

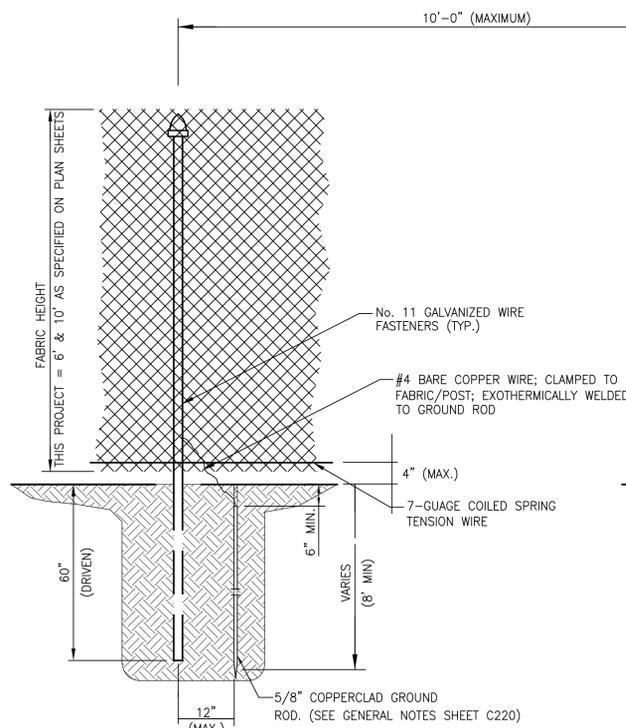
SHEET NUMBER

**C212**

**VALE PROGRAM  
BID PACKAGE**



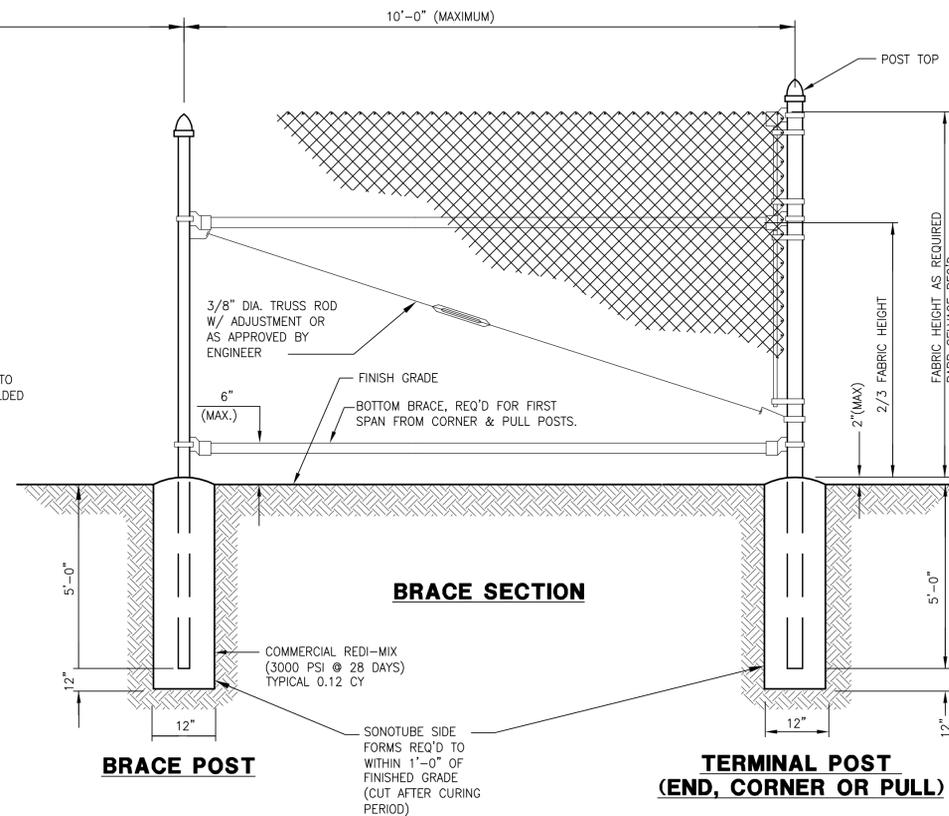
**BOULDER/ROCK FOOTING DETAIL**



**TURF LINE POST (INTERMEDIATE)**

**POST NOTES:**

1. SEE TABLE THIS SHEET FOR POST DIMENSIONS AND UNIT WEIGHT PER FOOT REQUIREMENT.



**BRACE POST**

**TERMINAL POST  
(END, CORNER OR PULL)**

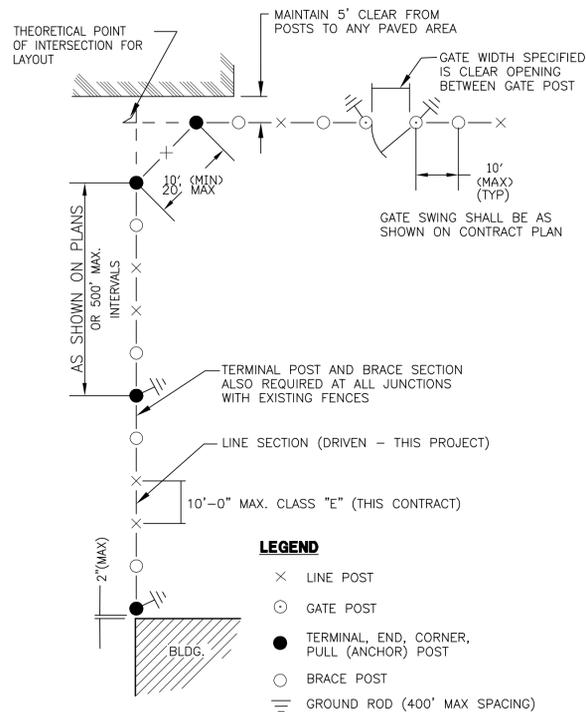
**CHAIN LINK FENCE, CLASS E, FAA SPEC. F-162**

NTS

TYPICAL CHAIN LINK FENCE MEMBERS, DIMENSIONS & WEIGHTS			
DESCRIPTION	SECTION	STEEL FRAME	
		OUTSIDE DIMENSION (INCHES)	WEIGHT (LBS./FT.)
CORNER, BRACE, END AND PULL POSTS FABRIC HEIGHTS 6 ft AND LESS	○	2.375	3.65
	□	2.00	3.60
FABRIC HEIGHTS OVER 6 ft	○	2.875	5.79
	□	2.5	5.70
ALL HEIGHTS	ROLL FORM	3.5x3.5	5.10
GATE POSTS GATE LEAF WIDTH 6 ft AND LESS	○	3 OR 4	5.79
	□	2.5	5.70
	ROLL FORM	3.5x3.5	5.10
GATE WIDTH OVER 6 ft THRU 13 ft GATE LEAF WIDTH OVER 13 ft THRU 18 ft GATE LEAF WIDTH OVER 18 ft THRU 23 ft	○	4.0	9.11
	○	6.625	18.97
	○	8.625	24.70
LINE POSTS FABRIC HEIGHTS 6 ft AND LESS FABRIC HEIGHTS OVER 6 ft	○	1.90	2.72
	○	2.375	3.65
RAILS & BRACES	○	1.660	1.806
	ROLL FORM	1.625x1.250	1.35

**NOTES:**

- GALVANIZED STEEL PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F 1083.
- POLYMER-COATED STEEL PIPE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 569. POLYMER COATING SHALL BE IN ACCORDANCE WITH ASTM F 1234, TYPE B.
- THE STEEL USED IN ALL STRUCTURAL SHAPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 572, GRADE 45, AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM F 1234, TYPE A.
- ROLL-FORMED SECTIONS SHALL BE FABRICATED FROM MATERIAL MEETING THE REQUIREMENTS OF ASTM A 570, GRADE 45, AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A 123, OR COATED WITH ZINC-5% ALUMINUM MISCHMETAL ALLOY IN ACCORDANCE WITH ASTM F 1234, TYPE C.

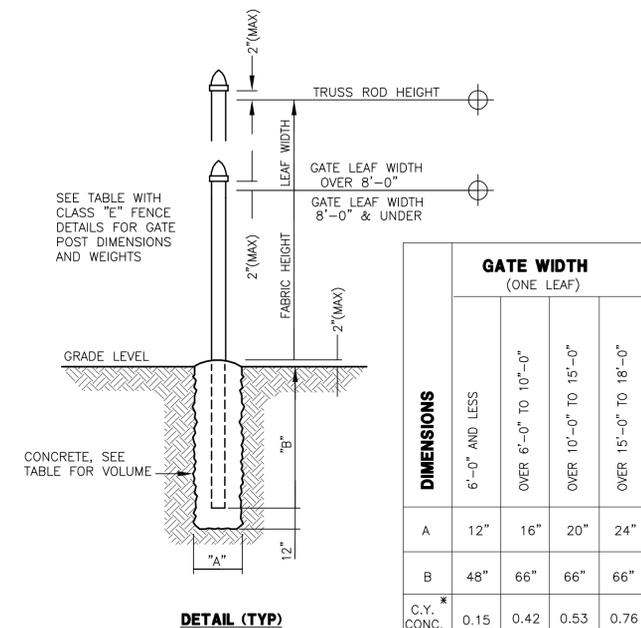


**TYPICAL FENCE LAYOUT**

ALL CLASSES

**LEGEND**

- × LINE POST
- GATE POST
- TERMINAL, END, CORNER, PULL (ANCHOR) POST
- BRACE POST
- ≡ GROUND ROD (400' MAX SPACING)



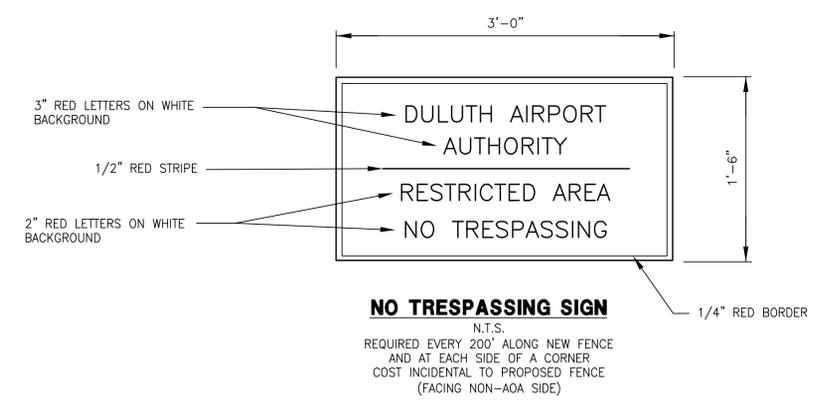
**DETAIL (TYP)**

**GATE POST & CONCRETE BASE**

DIMENSIONS	GATE WIDTH (ONE LEAF)			
	6'-0" AND LESS	OVER 6'-0" TO 10'-0"	OVER 10'-0" TO 15'-0"	OVER 15'-0" TO 18'-0"
A	12"	16"	20"	24"
B	48"	66"	66"	66"
C.Y. CONC.	0.15	0.42	0.53	0.76

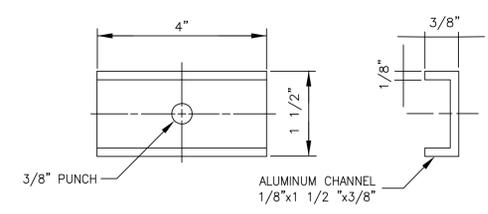
\* COST OF FURNISHING & PLACING CONCRETE INCIDENTAL TO COST OF EACH GATE

**SCHEDULE**



**SIGN DETAILS**

SIGNS TO BE ALUMINUM OR GALVANIZED STEEL WITH A MINIMUM THICKNESS OF 0.08".  
 REFLECTORIZED MEDIA TO BE USED.  
 COST OF SIGNS SHALL BE CONSIDERED INCIDENTAL TO ASSOCIATED ITEMS REQUIRING SIGNS.  
 ALL SIGNS TO BE MOUNTED USING A MINIMUM OF 2 BRACKETS.



**MOUNTING BRACKET**  
 2 REQ'D EACH SIGN



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 DULUTH, MN

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**REVISIONS**

NO.	DESCRIPTION	DATE

DATE ISSUED: 06-06-11  
 REVIEWED BY: JEH  
 DRAWN BY: RDRE  
 DESIGNED BY: JEH

AEP PROJECT NUMBER  
**213-1882-110**  
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SHEET TITLE  
**FENCING AND GATE DETAILS**  
**(SHEET 3 OF 3)**

SHEET NUMBER  
**C214**

**VALE PROGRAM BID PACKAGE**



**REVISIONS**

NO.	DESCRIPTION	DATE

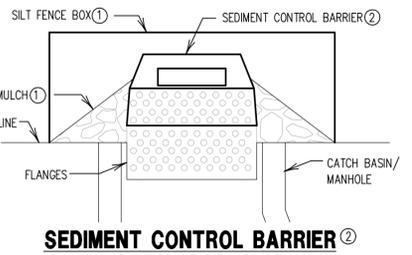
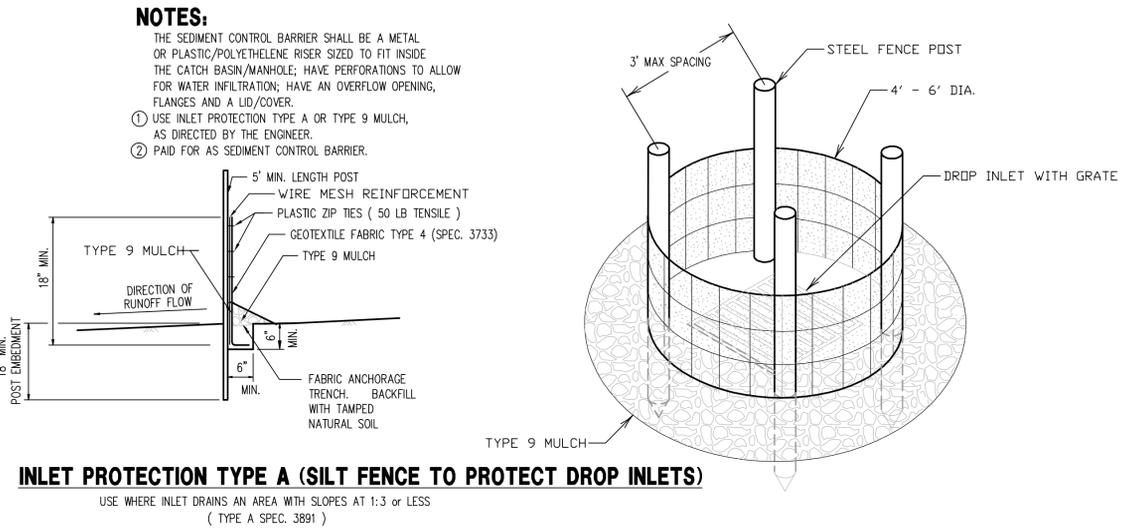
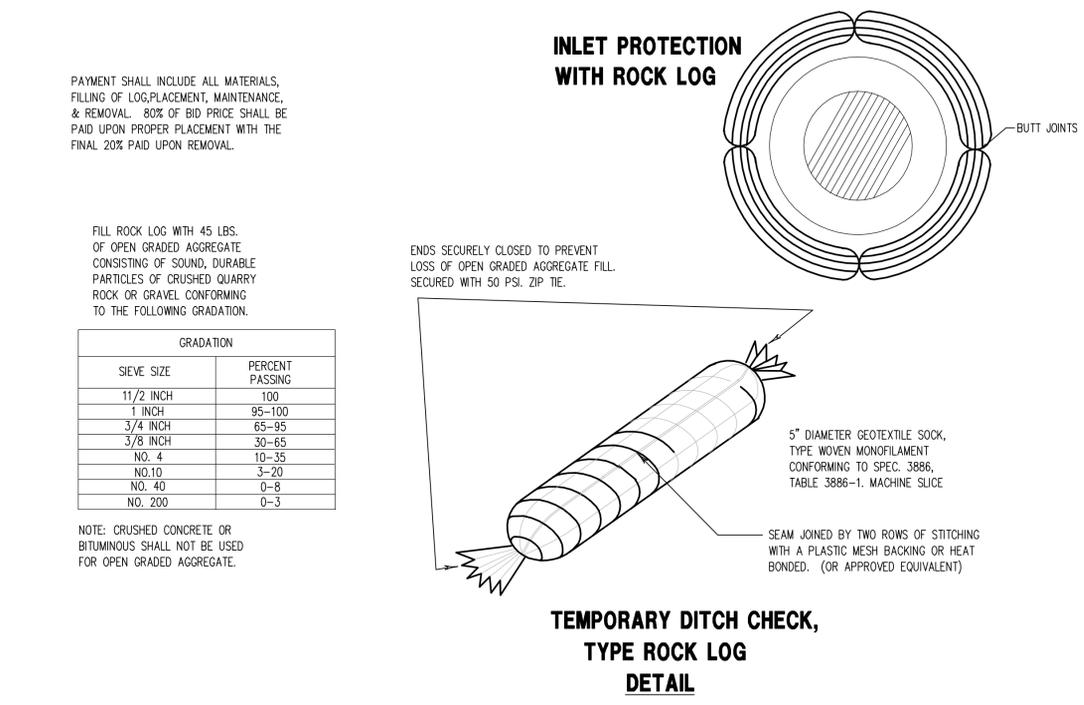
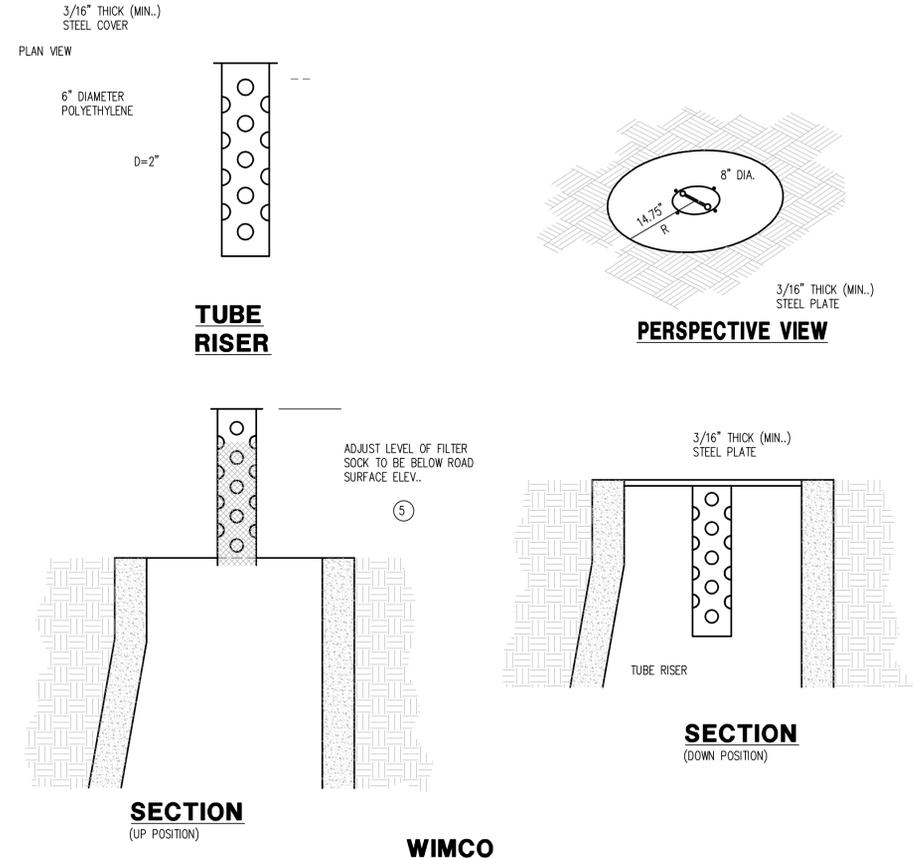
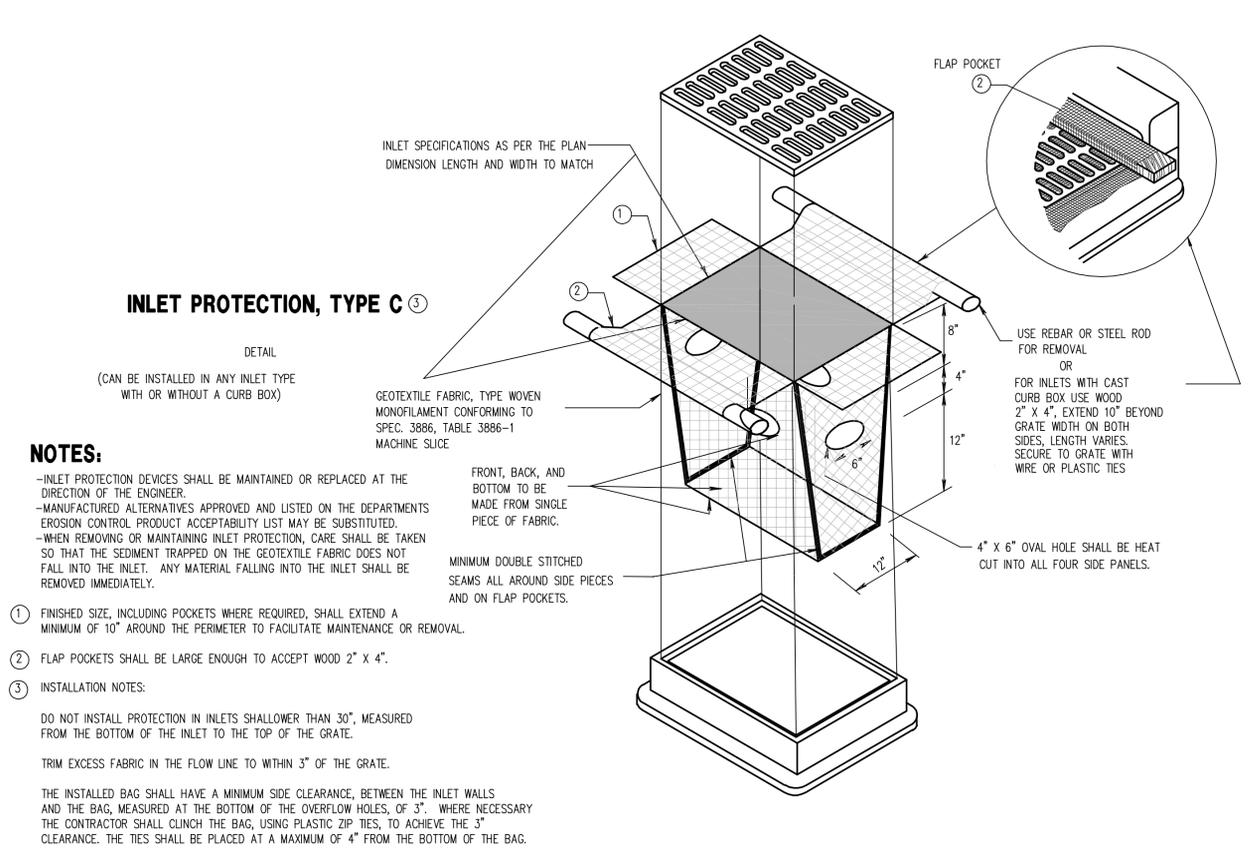
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**SHEET TITLE  
EROSION, AND  
SEDIMENTATION  
CONTROL NOTES  
AND DETAILS  
(SHEET 2 OF 4)**

SHEET NUMBER

**C408**

**VALE PROGRAM  
BID PACKAGE**

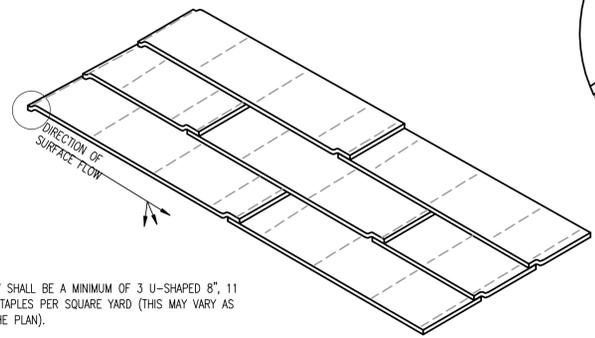


**NOTES:**

- INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.
- MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENTS EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.
- WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

ANCHOR TRENCH (SEE DETAIL AND NOTES TO THE RIGHT)

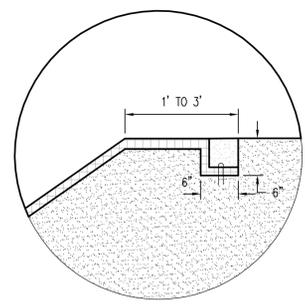
OVERLAP END JOINTS MINIMUM OF 6" AND STAPLE OVERLAP AT 1.5' INTERVALS.



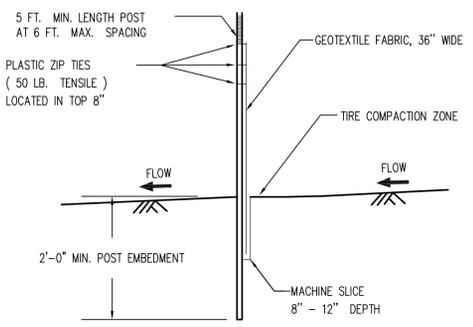
STAPLE DENSITY SHALL BE A MINIMUM OF 3 U-SHAPED 8", 11 GAUGE METAL STAPLES PER SQUARE YARD (THIS MAY VARY AS DIRECTED BY THE PLAN).

OVERLAP LONGITUDINAL JOINTS MINIMUM OF 6"

**EROSION BLANKET INSTALLATION**

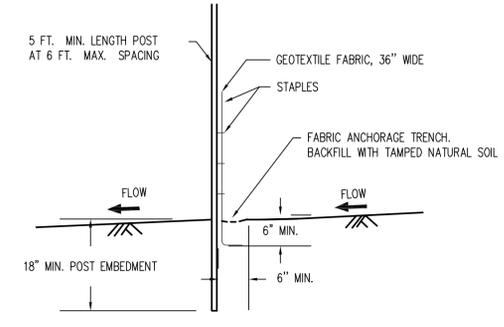


- ANCHOR TRENCH**
1. DIG 6" X 6" TRENCH
  2. LAY BLANKET IN TRENCH
  3. STAPLE AT 1.5' INTERVALS
  4. BACKFILL WITH NATURAL SOIL AND COMPACT
  5. BLANKET LENGTH SHALL NOT EXCEED 100' WITHOUT AN ANCHOR TRENCH



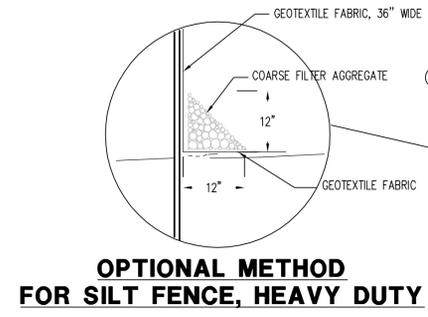
**SILT FENCE, MACHINE SLICED**

DESIGN GUIDELINES:  
TO PROTECT AREAS FROM SHEET FLOW.  
MAXIMUM CONTRIBUTING AREA: 1 ACRE.

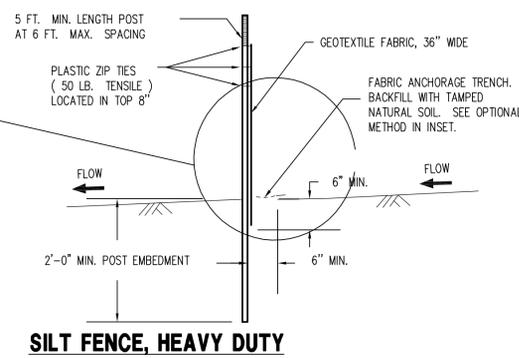


**SILT FENCE, PREASSEMBLED**

DESIGN GUIDELINES:  
TO PROTECT AREAS FROM SHEET FLOW.  
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



**OPTIONAL METHOD FOR SILT FENCE, HEAVY DUTY**



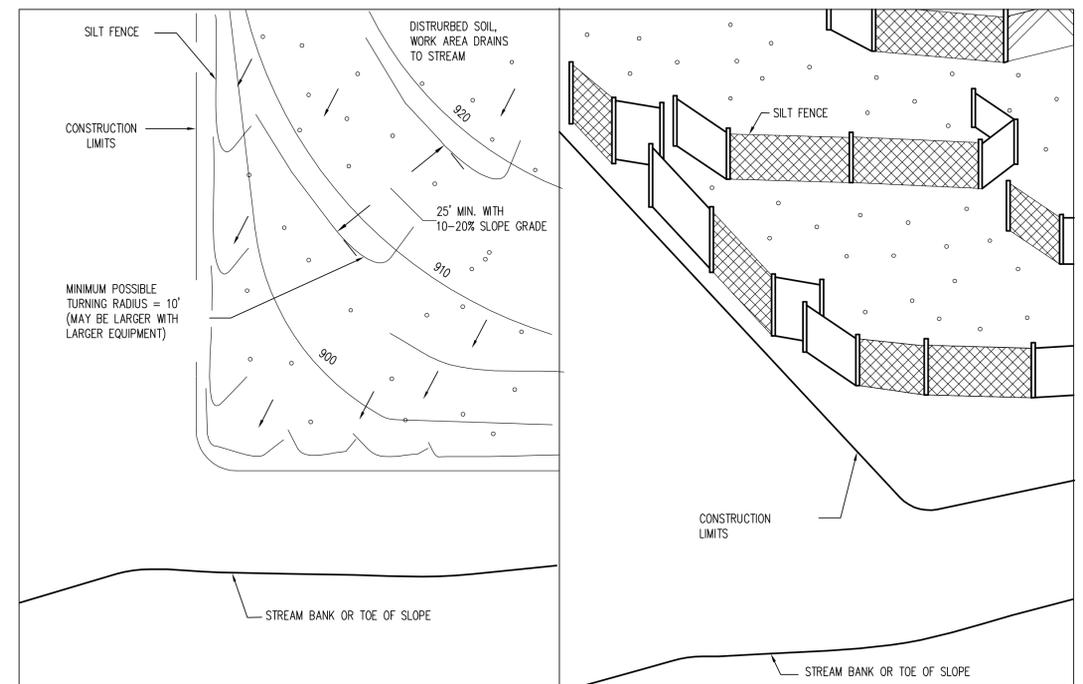
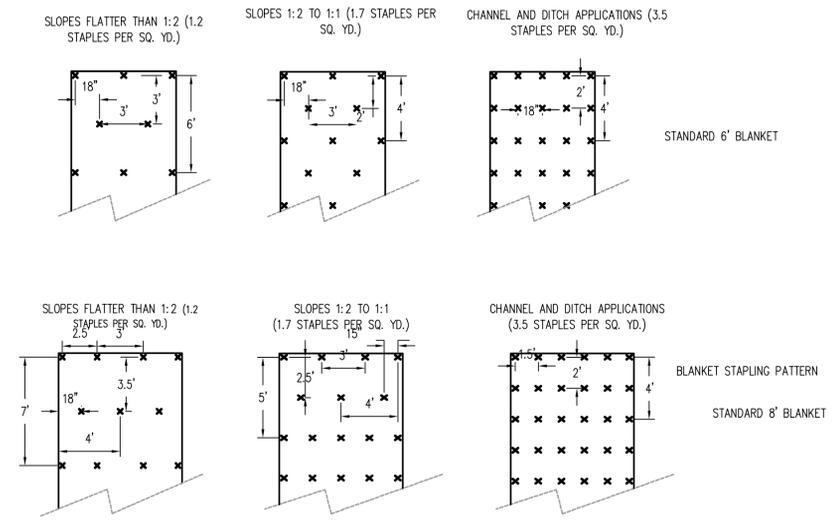
**SILT FENCE, HEAVY DUTY**

(HAND INSTALLED)

DESIGN GUIDELINES:  
TO PROTECT AREAS FROM SHEET FLOW.  
MAXIMUM CONTRIBUTING AREA: 1 ACRE.

**NOTES:**

- SEE SPECS. 2573, 3149 & 3886.  
① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.



**REVISIONS**

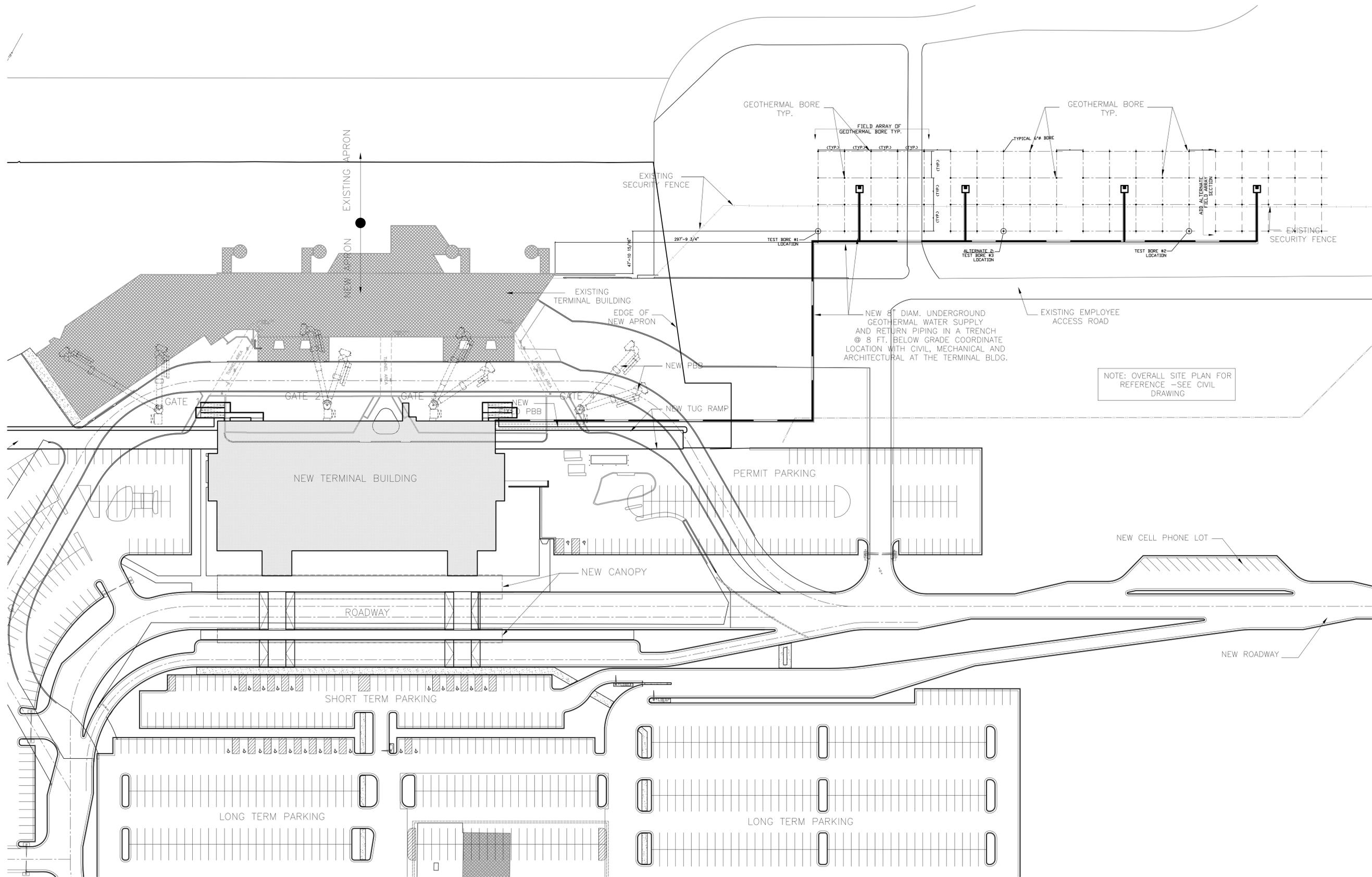
NO.	DESCRIPTION	DATE

DATE ISSUED: 06-06-11  
REVIEWED BY: JEH  
DRAWN BY: RDRE  
DESIGNED BY: JEH  
AEP PROJECT NUMBER  
213-1882-110  
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SHEET TITLE  
**EROSION, AND  
SEDIMENTATION  
CONTROL NOTES  
AND DETAILS  
(SHEET 3 OF 4)**

SHEET NUMBER  
**C409**  
**VALE PROGRAM  
BID PACKAGE**





NOTE: OVERALL SITE PLAN FOR REFERENCE -SEE CIVIL DRAWING



1 SITE PLAN  
1" = 50'-0"

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: 06-06-11  
REVIEWED BY: SBS/TC  
DRAWN BY: MKG/MI  
DESIGNED BY: SBS/TC

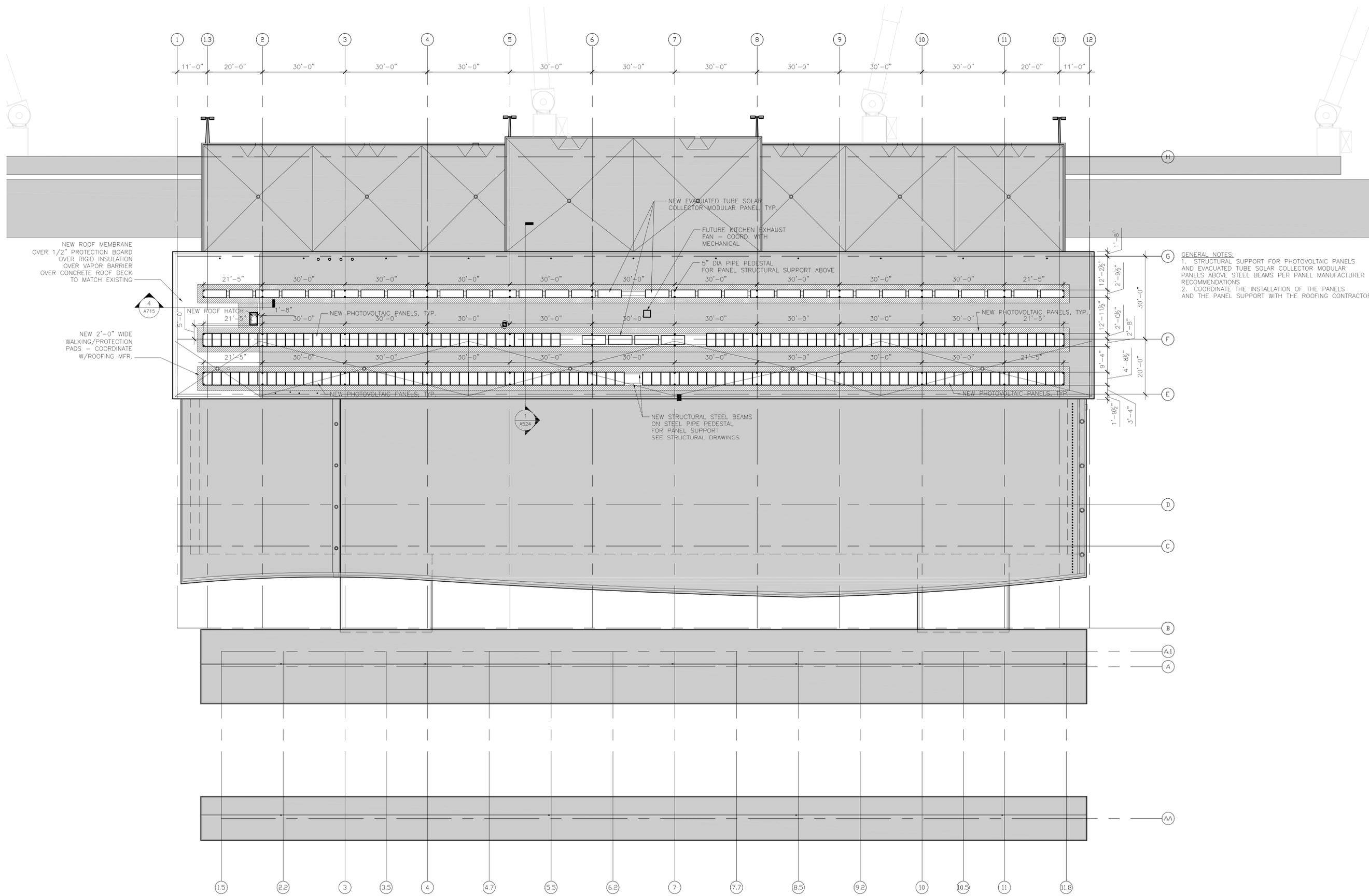
AEP PROJECT NUMBER  
**213-1882-110**  
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SHEET TITLE  
**OVERALL  
SITE PLAN**

SHEET NUMBER

**AS102**

**VALE PROGRAM  
BID PACKAGE**



NEW ROOF MEMBRANE OVER 1/2" PROTECTION BOARD OVER RIGID INSULATION OVER VAPOR BARRIER OVER CONCRETE ROOF DECK TO MATCH EXISTING

NEW 2'-0" WIDE WALKING/PROTECTION PADS - COORDINATE W/ROOFING MFR.

**GENERAL NOTES:**  
 1. STRUCTURAL SUPPORT FOR PHOTOVOLTAIC PANELS AND EVALUATED TUBE SOLAR COLLECTOR MODULAR PANELS ABOVE STEEL BEAMS PER PANEL MANUFACTURER RECOMMENDATIONS  
 2. COORDINATE THE INSTALLATION OF THE PANELS AND THE PANEL SUPPORT WITH THE ROOFING CONTRACTOR

**REVISIONS**

NO.	DESCRIPTION	DATE

DATE ISSUED: 06-06-11  
 REVIEWED BY: SBS/TC  
 DRAWN BY: MKG/MI  
 DESIGNED BY: SBS/TC

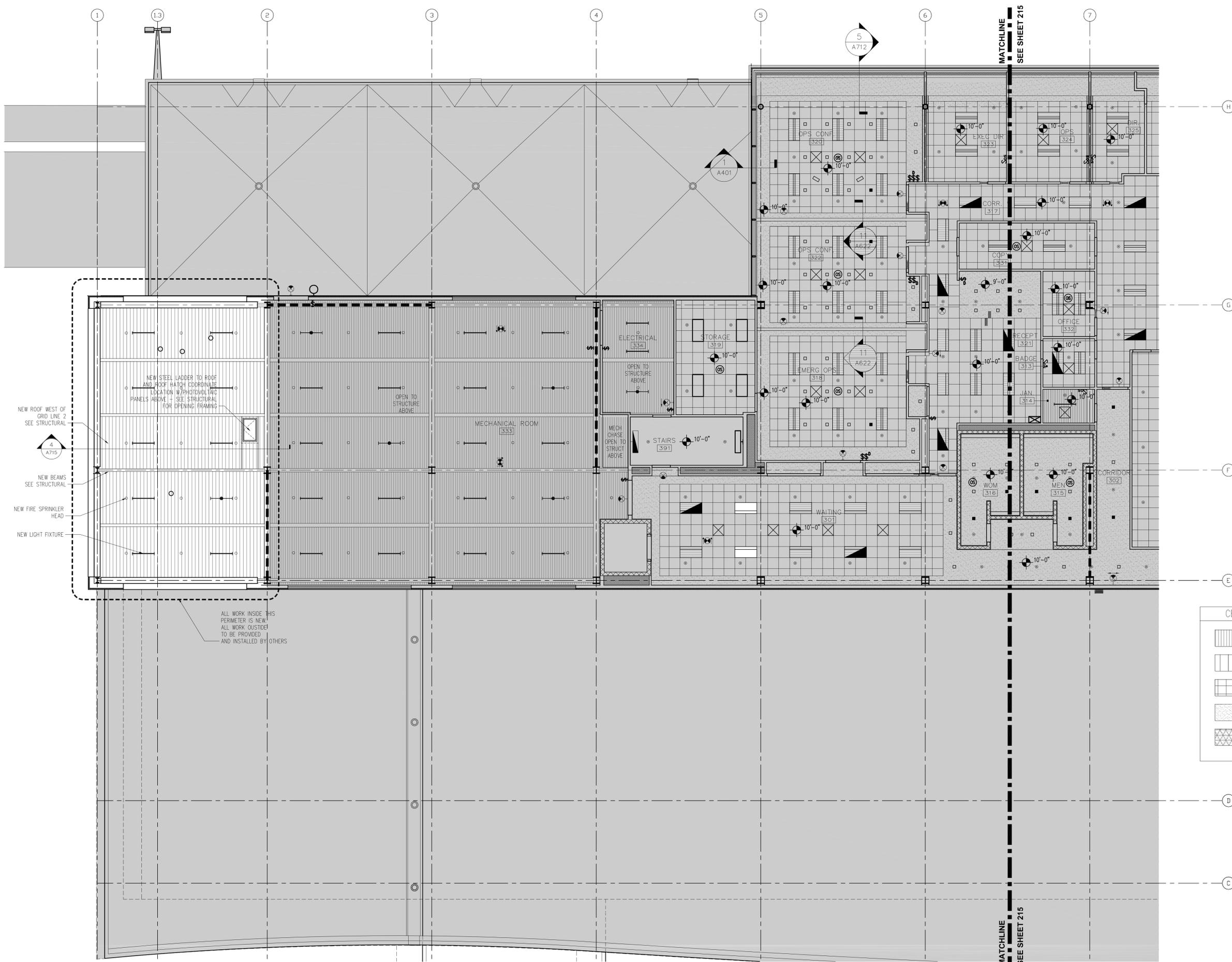
AEP PROJECT NUMBER  
**213-1882-110**  
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**SHEET TITLE**  
**OVERALL ROOF PLAN**

**SHEET NUMBER**  
**A104**  
**VALE PROGRAM BID PACKAGE**

**1 ROOF PLAN**  
 1/16" = 1'-0"





NEW ROOF WEST OF GRID LINE 2 SEE STRUCTURAL

NEW STEEL LADDER TO ROOF AND ROOF HATCH COORDINATE LOCATION W/ PHOTOVOLTAIC PANELS ABOVE - SEE STRUCTURAL FOR OPENING FRAMING

NEW BEAMS SEE STRUCTURAL

NEW FIRE SPRINKLER HEAD

NEW LIGHT FIXTURE

ALL WORK INSIDE THIS PERIMETER IS NEW. ALL WORK OUTSIDE TO BE PROVIDED AND INSTALLED BY OTHERS

**CEILING FINISH LEGEND**

	OPEN TO STRUCTURE ABOVE
	SUSPENDED WOOD PANEL GRILLES
	2'-0"x2'-0" LAY-IN CEILING
	GYP. BD. CEILING
	SECURED GYP. BD. CEILING W/ EXPANDED METAL MESH

**1** ENLARGED THIRD FLOOR REFLECTED CEILING PLAN - AREA A  
1/8" = 1'-0"

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Reynolds, Smith and Hills, Inc.  
4825 Airport Approach Rd, Ste A  
Duluth, Minnesota 55811  
218-722-1227 Fax: 218-722-1052  
www.rsandh.com

**DULUTH AIRPORT AUTHORITY**

**DULUTH INTERNATIONAL AIRPORT  
DULUTH, MN**

**NEW PASSENGER TERMINAL VALE PROGRAM**

**CONSULTANTS**

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

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

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: *Mark Ip*

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

**REVISIONS**

NO.	DESCRIPTION	DATE

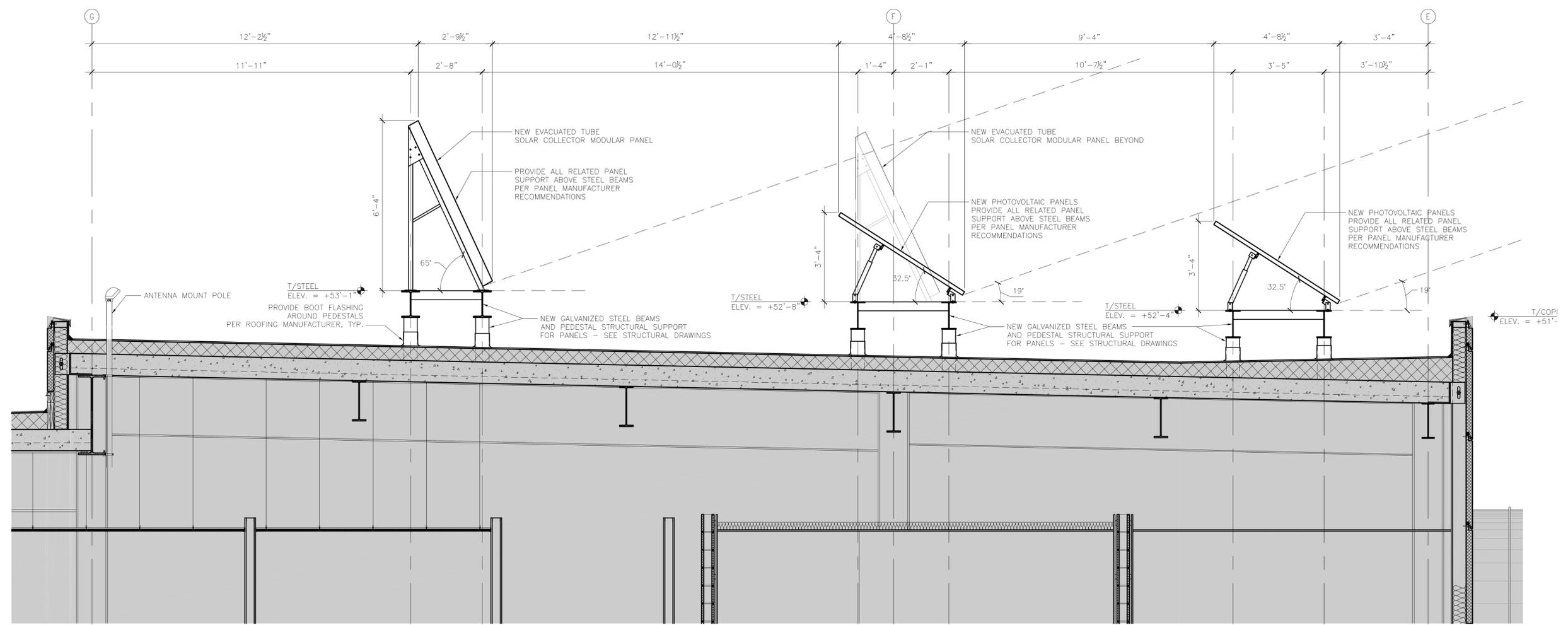
DATE ISSUED: 06-06-11  
REVIEWED BY: SBS/TC  
DRAWN BY: MKG/MI  
DESIGNED BY: SBS/TC

A&P PROJECT NUMBER  
**213-1882-110**  
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SHEET TITLE  
**ENLARGED THIRD FLOOR REFLECTED CEILING PLAN AREA A**

SHEET NUMBER  
**A214**

VALE PROGRAM BID PACKAGE



**GENERAL NOTES:**  
-COORDINATE EXACT NORTH/SOUTH LOCATION OF STEEL PEDESTALS AND BEAMS WITH PHOTOVOLTAIC AND WATER VACUUM TUBE PANEL MANUFACTURERS AND PANEL STRUCTURAL SUPPORT REQUIREMENTS

**1 ROOF SECTION DETAIL**  
1/2" = 1'-0"

**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: *[Signature]*

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

**REVISIONS**

NO.	DESCRIPTION	DATE

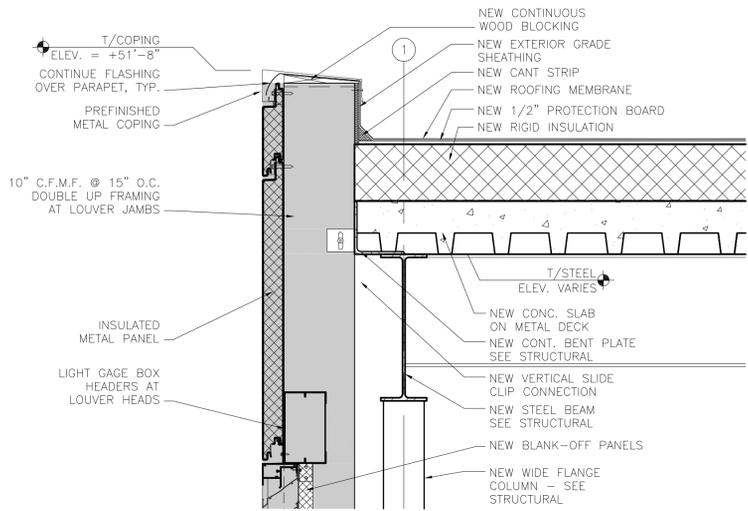
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REVIEWED BY: SBS/TC  
DRAWN BY: MKG/MI  
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AEP PROJECT NUMBER  
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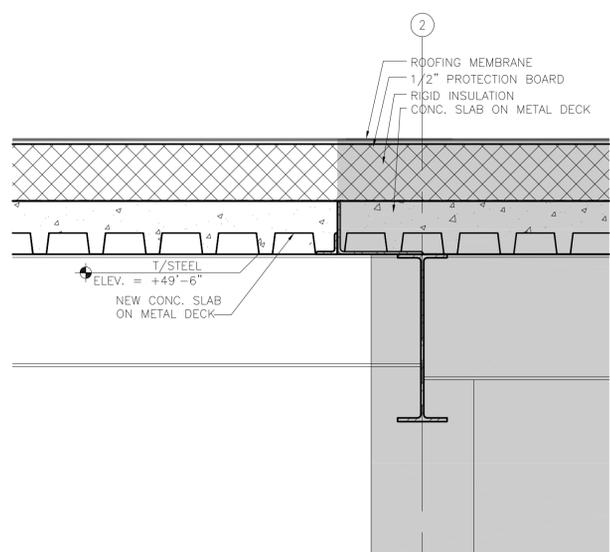
SHEET TITLE  
**ROOF DETAILS**

SHEET NUMBER  
**A524**

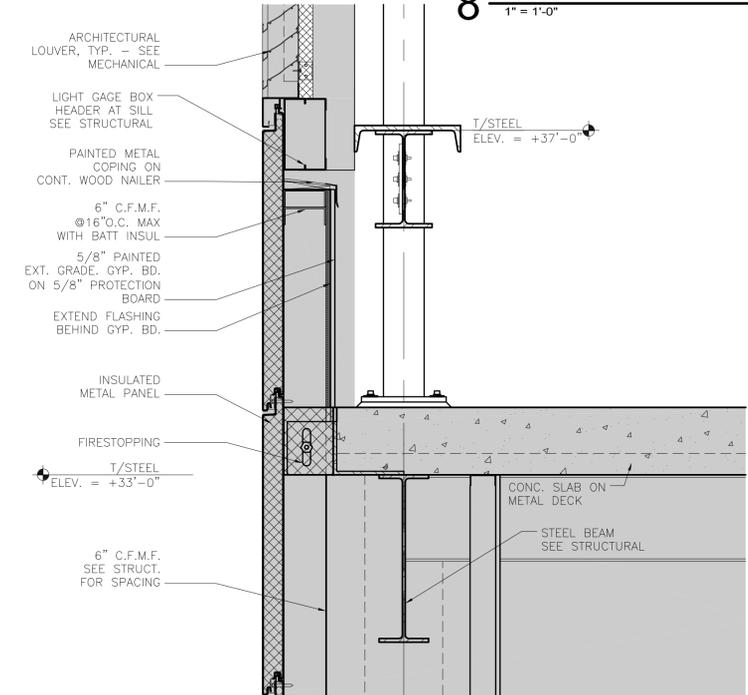
**VALE PROGRAM BID PACKAGE**



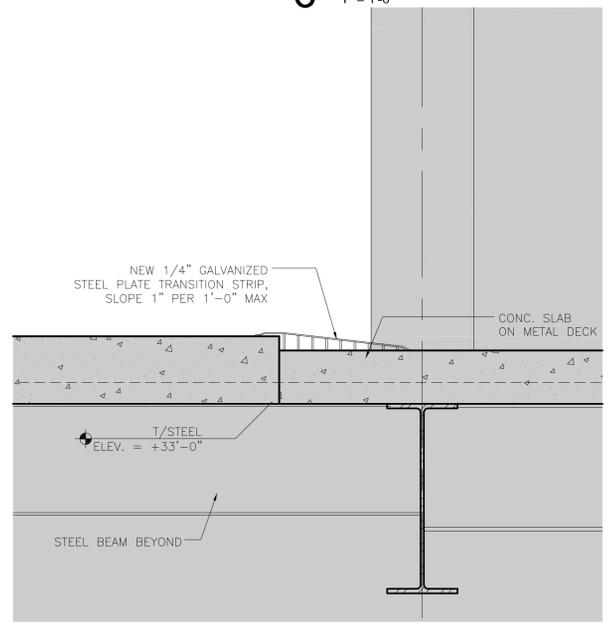
**8 SECTION DETAIL**  
1" = 1'-0"



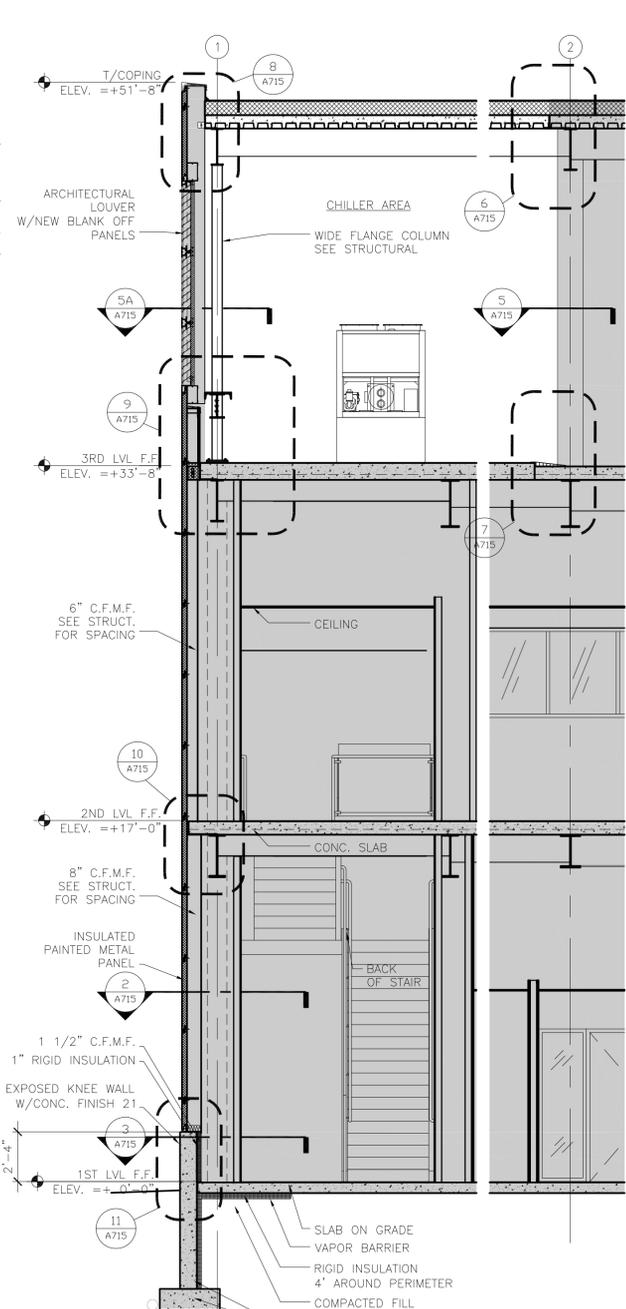
**6 SECTION DETAIL**  
1" = 1'-0"



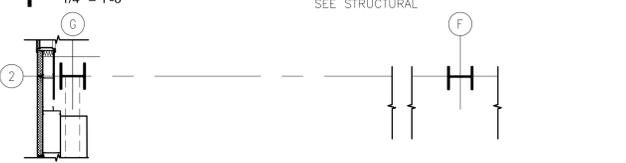
**9 SECTION DETAIL**  
1" = 1'-0"



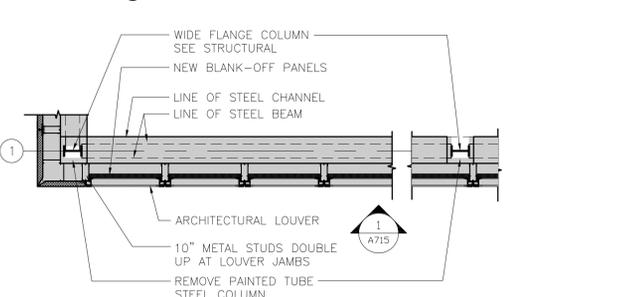
**7 SECTION DETAIL**  
1" = 1'-0"



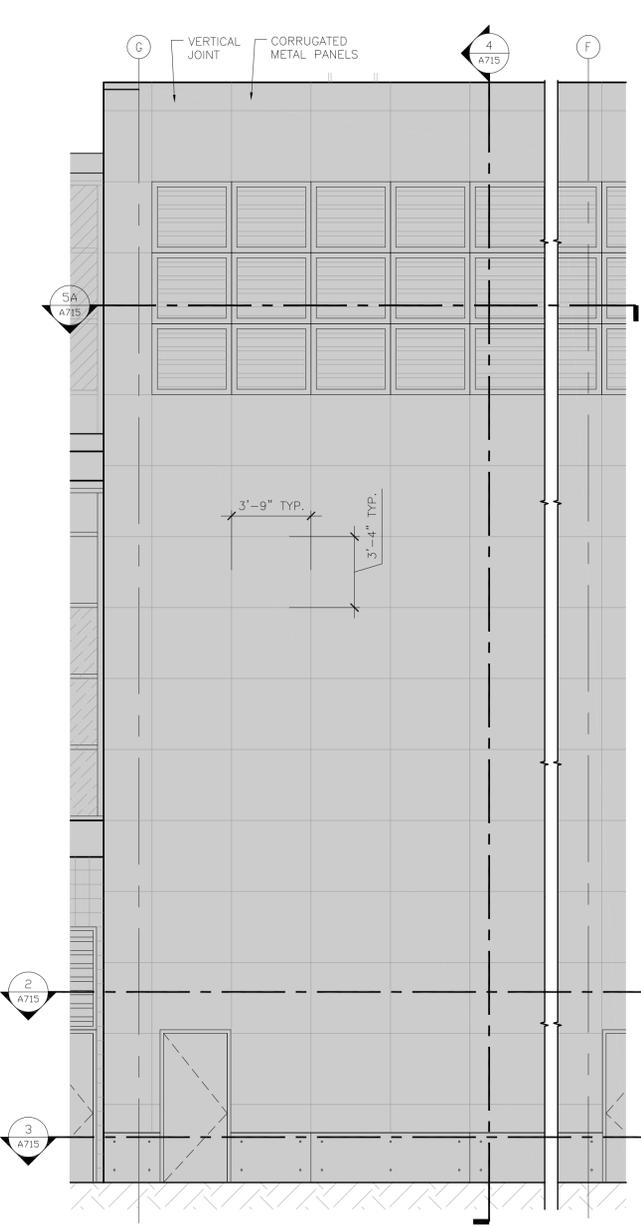
**4 WALL SECTION**  
1/4" = 1'-0"



**5 PARTIAL 3RD LEVEL FLOOR PLAN**  
1/4" = 1'-0"



**5A PARTIAL 3RD LEVEL FLOOR PLAN**  
1/4" = 1'-0"



**1 PARTIAL WEST ELEVATION**  
1/4" = 1'-0"

NOTE: BASE BUILDING CONSTRUCTION SHADED

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Print Name: Mark Ip  
Signature: *[Signature]*

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

**REVISIONS**

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.11.10
1	ADDENDUM 1	6.11.10
2,3	NOT CHANGED	
	CONFIRMANCE SET	7.12.10
	BUILDING PERMIT	8.16.10
4	BUILDING PERMIT REVISIONS	11.12.10
	100% REVIEW	12.15.10
	BID PACKAGE 2A	1.24.11

DATE ISSUED: 06-06-11  
REVIEWED BY: SBS/TC  
DRAWN BY: MKG/MI  
DESIGNED BY: SBS/TC

AEP PROJECT NUMBER  
**213-1882-110**  
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**SHEET TITLE**  
**EXTERIOR SYSTEMS CORE WALL**

**SHEET NUMBER**  
**A715**  
**VALE PROGRAM BID PACKAGE**

#### TYPICAL NOTES:

These notes specify the requirements for the design represented in these documents. The construction and materials shall comply with all the pertinent codes and references, plans, and details, including (but not limited to) those shown in architectural, civil, mechanical and electrical drawings.

The contractor shall verify all dimensions and existing conditions in the field that affect construction prior to commencing work on the affected element or shop drawing submittals. Resolve any discrepancies with the architect prior to construction.

The contract structural drawings and specifications represent the completed structure. The contractor is responsible for bracing and shoring (without overstressing) all structural elements as necessary at any stage of construction until completion of the project. The Structural Engineer is not responsible for the contractor's means, methods, sequences or procedures of construction. Contractor shall recognize and consider effects of thermal movements of structural elements during construction period.

The contractor is solely responsible for site safety including all temporary precautionary measures and safety programs. Site observation visits by the Structural Engineer do not include review of the contractor's safety precautions.

Refer to architectural, mechanical and electrical drawings for locations, elevations, dimensions, and details of sleeves, inserts, openings, recesses, curbs, housekeeping pads, etc. that are not shown on the structural drawings and do not damage structural members.

Information shown in the structural drawings regarding existing conditions represents the current and general field conditions related to the new work, to the best of our knowledge. Report all discrepancies to the Architect for resolution prior to performing related new work.

Requests for information shall be submitted in writing and shall reference the part of the construction documents that is in question.

#### SPECIAL INSPECTIONS:

Contractor shall read and understand their duties in the specification and under the building code for special inspections and coordinate as necessary the owner's responsibilities.

The special inspectors shall be provided and shall only use approved shop drawings.

Special inspection reports are to be submitted immediately to the SER, Architect, and Contractor daily when inspections are performed.

The general contractor shall provide timely notice to the special inspector and sufficient time for the inspector to perform their inspection.

#### SHOP DRAWINGS:

All engineering design provided by others and submitted for review shall bear the certification stamp and signature of a qualified professional engineer who is licensed in the state of Minnesota.

Submit shop drawing schedule with construction schedule that includes consideration for review period. See specification for additional information.

#### DEFERRED SUBMITTALS:

The following items shall be issued as deferred submittals per IBC: Steel Connections

#### Light gage metal framing

All items issued as deferred submittals shall be issued a minimum of 30 days prior to installation and shall not be installed until their design and submittal documents have been reviewed for general conformance to the drawings by the general contractor, the engineer of record and the building official. A copy of the deferred submittal shall be forwarded to the city after the engineer of record has reviewed the documents and prior to erection of the deferred submittal items.

DESIGN CODES AND STANDARDS:  
Minnesota State Building Code, MSBC 2007

2006 International Building Code, as amended and adopted by the MSBC 2007

ACI 318-05 Building Code Requirements for Reinforced Concrete

ACI 530-05 Building Code Requirements for Masonry Structures, Allowable Stress Design

ACI 530.1-05 Masonry Structures

AISC 360-05 Specification for Structural Steel Buildings

AISI NAS-01 North American Specification for the design of Cold-Formed Steel Structural Members including 2004 supplement.

ASCE 7-05 Minimum design loads for buildings and other structures including supplement NO. 1 and excluding Chapter 14 and Appendix 11A.

ASCE 3-01 Structural Design of Composite Slabs

#### MATERIAL PROPERTIES:

Reinforcing Steel (Fy):		
Typical	60,000 psi	ASTM A615 Grade 60
Weldable	60,000 psi	ASTM A706 Grade 60

#### Cast-in-Place Concrete (f'c) at 28 days, UNO:

Controlled Low Strength Material (CLSM)	1,200 psi (at 5 days)	Maximum
Footings	500 psi (at 5 days)	Minimum
Piers and Walls	4,000 psi	
Columns	4,000 psi	
Concrete placed over Metal Floor Deck Slabs on Grade	4,000 psi	
Exterior Concrete	4,000 psi	
Masonry Corefill Concrete	3,000 psi	
All Concrete not otherwise noted	4,000 psi	

#### Concrete Masonry- Prism (fm):

Typical Units:	2,000 psi
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#### Structural Steel (Fy):

Wide Flanges	50,000 psi	ASTM A992
Angles, Channels	36,000 psi	ASTM A36
Grade B Rectangular HSS	46,000 psi	ASTM A500
Grade B Round HSS	42,000 psi	ASTM A500
Grade B Steel Pipe	35,000 psi	ASTM A53
Plates, Bars	50,000 psi	ASTM A572 or A36 as indicated

#### Structural Fasteners:

Typical High-Strength Bolts	92,000 psi	ASTM A325
High-Strength Bolts as noted on plan	150,000 psi	ASTM A490
Grade 36 Anchor Rods, UNO	36,000 psi	ASTM F1554
Threaded Rods	36,000 psi	ASTM A36
Direct -Tension Indicator Washers as noted on plan		ASTM F959

Cold-Formed Light Gauge Metal Framing (Fy):		
Studs, Joists, Braces-16 ga. and heavier	50,000 psi	ASTM A653
Studs, Joists, Braces-18 ga. and lighter	33,000 psi	ASTM A653
Tracks, Channels and Accessories	33,000 psi	ASTM A653

#### DESIGN LOADS:

##### LATERAL LOADS:

Primary Frame Wind Data:		
Basic Wind Speed:	90 mph	
Wind Importance Factor:	1.15	
Exposure:	1.1	C

Primary Seismic Data: No design required

##### Component Loads:

Exterior Component/Cladding: Supplier to develop based on MSBC 2007 and to indicate on shop drawings.

##### GRAVITY LOADS:

Roof Snow Load:		
Ground Snow Load, Pg:	60 psf	
Flat-Roof Snow Load, P <sub>f</sub> :	46 psf	
Snow Exposure Factor, Ce:	0.70	
Snow Load Importance Factor, I:	1.1	
Unbalanced/Drift Snow Load:	As required by ASCE 7	

##### Floor Loads:

Live Load:	100 psf (not reducible)
Hanging loads at underside of 2nd floor:	40 psf superimposed

Stairs, Corridors and Lobbies:	100 psf (not reducible)
Stair Tread Concentrated Load:	300 lbs

Mechanical Rooms:	150 psf (not reducible)
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Light Storage:	125 psf (not reducible)
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##### Exterior Site Surcharge Loads:

Fire Trucks:	250 psf
Sidewalk:	250 psf
North terminal retaining wall and north tug tunnel retaining wall:	HS20-44 axle load as defined by IBC 2006 table 1607.6 at a distance of 5 feet from the north wall edge.

##### Provisions For Future Expansion:

Design for additional 30' bay (3 story) between grids "E" and "G", east of grid 12 and west of grid 1.

Design for one story expansion of 3rd floor office space north of grid "G".

##### FOUNDATIONS:

Refer to Geotechnical report number AET #07-04216.2 by American Engineering Testing, Inc., dated October 14, 2009 and the subsequent addendum (AET project #07-04216.3) dated January 29, 2010.

The contractor shall verify the location of all existing and new underground utilities and tanks prior to beginning excavation and contact Gopher State One Call.

The minimum dimension from exterior grade to bottom of footing and foundation shall be 72" in unheated areas.

For underground utilities adjacent to foundations and through foundations reference drawings for detail showing step footings below utilities as required to avoid undermining of structure by utilities.

See geotechnical report for water table elevations. Contractor to make adequate provisions for dewatering as required.

##### CONVENTIONAL FOOTINGS:

Footings are designed for a maximum allowable soil bearing pressure of 8000 pounds per square foot on undisturbed native soil or lean mix concrete/controlled low strength material fill. Soil bearing pressure is to be verified in the field during construction by a qualified Geotechnical Engineer.

All topsoil, fill, organic swamp deposits, and/or other unsuitable bearing material shall be removed below the footings and/or within the building area to the depths indicated in the geotechnical engineering report and extent of removal shall be field verified by the Geotechnical Engineer.

All excavations shall be observed by a qualified geotechnical engineer to verify removal of unsuitable material and confirm the proper preparation of bearing conditions.

For footings that do not bear on natural undisturbed soil, extend engineered fill laterally beyond bottom edge of footing for a distance equal to the depth of engineered fill. Reference drawings for details.

Foundation and retaining walls shall be back filled with free draining fill approved by the Geotechnical Engineer. Provide drain tile required by the contract documents and verify with architect and civil engineer.

Backfill equally on both sides of foundation walls to prevent overturning or lateral wall movement, or temporarily brace as necessary until permanent bracing elements are complete and cured to design strength.

All temporary bracing, cribbing, shoring or underpinning not fully designed or detailed on these drawings shall be designed by a licensed specialty engineer engaged directly by the contractor.

For stepping of wall footings reference drawings for detail.

##### REINFORCED CONCRETE:

The detailing, fabrication and erection of all reinforcing shall be done in accordance with the latest edition of ACI-315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures and ACI-318, "Building Code Requirements for Structural Concrete."

All reinforcing bars are deformed and continuous, unless noted otherwise. Refer to drawings for reinforcing lap length schedule.

Provide suitable wire spacers, chairs, etc. for support of reinforcing steel in proper position while placing concrete. All bars shall be tied to prevent displacement while placing concrete. All chairs and slab bolsters shall be plastic or steel with plastic tips. When reinforcing steel is epoxy coated or p/t tendons are fully encapsulated, all chairs and slab bolsters shall be epoxy coated or plastic and all support bars shall be epoxy coated. Chairs are to be stable and resist tipping. Acceptable products are GTI or approved equal.

The fabricator shall submit a complete list of accessories and placing details with the shop drawings.

No horizontal construction joints shall be placed in beams, joists, or slabs, unless shown on drawings.

Locate vertical construction joints in beams and slabs at central one third of span. Refer to drawings for details. Submit proposed construction joint locations to the Structural Engineer of Record for review prior to placement of concrete. Where new concrete is placed against existing concrete, the existing concrete shall be roughened to a minimum 1/4" amplitude.

Refer to drawings and ACI 318 Chapter 6 for placement guidelines of embedded pipes, sleeves, and conduits. Conduits are not permitted in slabs 3 inches or less in thickness. The maximum size of conduits within any slab shall be 1 1/4" outside diameter and shall be spaced no closer to each other or any reinforcing steel than 4" unless prior approval is obtained from the structural engineer. Additional reinforcing steel and chairs may be required to support embedded conduit. All conduit shall be placed in the middle 1/3 of the slab thickness above the metal deck, typical. Conduit may not be tied to parallel reinforcing steel. Conduit may not be paced in deck flutes. Conduit may not cross within slabs 5" or less in thickness. Conduit placement drawings may be required in areas of high conduit concentration.

Provide a 3/4 inch chamfer for all exposed concrete corners. See Architectural drawings for details and additional requirements.

The general contractor shall notify the Special Inspector a sufficient period in advance of placing concrete to allow required inspections and testing to occur in a timely fashion.

Formwork and all shoring for flatwork shall be left in place until the concrete reaches at least 75 percent of the 28-day compressive strength. Design of shoring and reshoring is the responsibility of the contractor and shall conform to ACI 347R-88.

Aluminum conduit, aluminum sleeves and aluminum embeds are not permitted in concrete.

Exterior concrete to have 6% +/- 1% entrained air.

Calcium chloride is not permitted as a concrete additive.

Concrete Cover on Reinforcing:

Topping Slab:	3/4" clear top. See drawings for cover at composite slabs
Slab on Grade:	3" bottom

Footings: 3" clear bottom and sides

2" clear top	
Walls:	#5 and smaller 1 1/2" clear earth or weather face
	#6 and greater 2" clear earth or weather face
	3/4" interior face

Columns and Beams:	1 1/2" clear to ties or stirrups
--------------------	----------------------------------

##### CONCRETE SLABS ON GRADE:

Slabs on grade shall be placed in lane fashion.

The control or construction joints shall be placed as shown on the drawings. The joints shall align with the column grids and be spaced as noted below:

Exterior slabs	24 times slab thickness, maximum;
Interior slabs	36 times slab thickness, maximum;
Interior slabs	48 times slab thickness, maximum, with carpeting

The panels formed by control or construction joints shall not be "L" shaped and a rectangular panel's aspect ratio shall not exceed 1.5.

Refer to the drawings for the typical slab on grade construction and saw cut control joint detail. Control and construction joints must be continuous and not offset.

Refer to drawings for detail of isolation diamonds or circles at columns.

Refer to drawings for reinforcing at re-entrant corners. Bend bars as necessary at obstructions.

Refer to the specification for the existence, type, and thickness of interior ground vapor retarder. Locate a vapor retarder directly beneath the slab on grade on top of a 6 inch compactable granular base. Refer to the specification for requirements for the compactable granular base.

Mechanically vibrate concrete around trench drains, floor ducts, construction joint dowels, loading docks, architectural features and other embedded items.

Refer to the specification for slab on grade pre-placement meeting.

Refer to the specification for acceptable methods of curing the concrete.

Refer to flooring manufacturer's specification for levelness, flatness and curing of concrete slabs on grade to receive special architectural floor finishes.

##### REINFORCED MASONRY:

All masonry units are placed in running bond fashion. Corners shall have a standard bond by overlapping units.

Special shapes shall be provided for jambs, columns, pilasters, control joints, corners, and lintels.

All masonry walls shall have horizontal joint reinforcing spaced at 16" o.c. Horizontal joint reinforcing shall be truss style and fabricated with galvanized nine-gauge wire and shall include corner and intersecting wall pieces. Provide minimum 6" laps at all splices.

Vertical reinforcing shall be held in place by rebar positioners, crossties, chairs, or tying to every other layer of horizontal reinforcing steel. Refer to the detail in the drawings for vertical reinforcing bar location in a core.

Provide concrete cover of minimum 1/2" to face shell.

Refer to detail in the drawings for reinforcing bar lap lengths.

Extend vertical reinforcing from footings to 2" clear top of wall or to beam bearing. Extend vertical reinforcing into the next level of construction and lap in accordance with the lap schedule.

When typical vertical wall reinforcing is interrupted by long wall openings, provide typical vertical wall reinforcing above and below opening, and extend into horizontal bond beams. Refer to the schedule on the drawings, for masonry wall opening lintels. Refer to the detail in the drawings for masonry openings minimum jamb reinforcing.

Provide vertical reinforcing at the ends of walls and at wall intersections to match specified reinforcing. Run reinforcing full height of walls.

All masonry units shall be placed with full face shell mortar coverage on horizontal and vertical face shells. Webs shall also have full mortar coverage around all grouted cells.

Fill block core at vertical reinforcing (8" minimum length along wall) with concrete grout. Filling cores with mortar is not allowed. Vibrate in place. Rodding and puddling are not allowed.

Maximum lift height is four feet. For concrete core fill pour height up to maximum 8'-0", provide cleanouts if pour height exceeds 5'-0".

Masonry cement mortar is not allowed.

Calcium chloride or admixtures containing chloride shall not be used in mortar or grout.

For reinforced masonry bond beams, provide bent corner bars at corners and intersections that match reinforcing. Step bond beams as necessary to match roof slopes. Lap reinforcing bars per schedule.

For construction of masonry control joints refer to detail in drawings.

Unless noted otherwise on the drawings place control joints in masonry walls such that no straight run of wall exceeds 24'-0" and within 4'-0" of corners. Do not place control joints within 48 inches of a masonry opening jamb or a steel bearing plate.

Place bond beam reinforcing continuously through control joints. Do not splice bond beam reinforcing within 6'-0" of a control joint.

Provide bond beam with reinforcing at all floor lines, roof lines, and top of walls. Refer to details in the drawings.

Grout below steel bearing plate and refer to the drawings for additional information.

Refer to drawings for reinforcing schedule, top of wall bracing, thickened bearing slab and lintel schedule for non-bearing masonry walls. Refer to Architectural drawings for location and extent.

##### MASONRY BEAMS (HIGH-LOW BOND BEAMS):

For all masonry beams use lintel blocks.



Masonry beams are to bear 8" minimum at jambs. Extend vertical reinforcing through masonry beam bearing.

Extend horizontal reinforcing full length.

Grout masonry beams solid. Mechanically vibrate grout in place.

##### EXPANSION AND ADHESIVE ANCHORS:

Anchor in concrete or concrete masonry when not exposed to earth, weather, or corrosive environment shall be as noted below:

Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633.

Threaded anchor rod for adhesive anchors in concrete shall be ASTM A193, Grade B7, or ASTM A36, as noted in the drawings. The adhesive used for anchors shall be a structural grade, two part epoxy or acrylic material that meets the requirement of ASTM C-881 Types I, II, IV, and V, Grade 3, Classes B and C as noted on plans.

Holes shall be drilled with a bit and cleaned using a method that complies with the manufacturer's guidelines, and specifications. Do not cut or damage reinforcing steel or P-T tendons.

Upon the request of the structural engineer the anchors shall be proof tested by the manufacturer to verify capacity of anchors that do not meet the conditions in the construction documents.

Minimum embedment depths in concrete and concrete masonry for expansion and adhesive anchors shall be as noted below:

Concrete base material:  
For 1/2", 5/8", and 3/4" diameter expansion anchors provide 4 3/4" embed, UNO on plan.

For 1/2" and 5/8" diameter adhesive anchors provide 5" embed. For 3/4" diameter adhesive anchors provide 7" embed, UNO on plan.

Grouted solid concrete masonry unit material:  
For 1/2", 5/8", and 3/4" diameter expansion anchors provide 4 3/4" embed, UNO on plan.

For adhesive anchors refer to the product's ICBO Report.

Pre-approved manufacturer are as follows: HILTI, ITWR Ramset/Redhead, Powers Fasteners, and Simpson Strong-Tie. For review of alternate products, submit manufacture's product data and product's current ICBO report prior to construction.

Anchors in concrete or concrete masonry when exposed to earth, weather, or corrosive environment shall be manufactured from AISI 304/316 Stainless Steel.

##### STRUCTURAL STEEL:

Structural steel shall be detailed, fabricated and erected in compliance with AISC Specification for the design, fabrication, erection of structural steel for building, and Code of standard practice, and OSHA steel erection standards.

All beams and girders shall be cambered at mid-span as indicated on the structural drawings. The cambers indicated shall be present in the beam in its erected position after completion of the end connections and shall be verified prior to placing concrete. Cambering tolerances shall be (-0", +1/4"). No center point cambering allowed.

Splicing structural members where not detailed on the drawings is prohibited without prior approval of the structural engineer.

Modification of structural steel members in the field is not allowed without written approval by the structural engineer.

All composite beams using the concrete slab as a compression flange are designed for unshored construction unless noted otherwise.

Anchor rods shall be minimum 3/4" diameter or as detailed in drawings.

##### STRUCTURAL STEEL CONNECTIONS:

All steel connections shall be designed by the steel fabricator for the criteria indicated on the drawings unless noted or detailed otherwise. Connection design shall conform to the requirements of the AISC Specifications for the design, fabrication, erection of structural and OSHA regulations. Submit calculations certified by a Professional Engineer who is licensed in the state of Minnesota. All loads indicated on the drawings are unfactored, working loads.

Non-composite beams: Unless noted otherwise, design simple beam shear connections per the AISC Manual connection tables. The required end reaction shall be based on the reactions indicated on the plans. Design connections for the reactions indicated on plan or for the minimum connection requirements indicated in the Connection Schedule, whichever provides the greater capacity.

Composite beams: Design simple composite beam shear connections per the AISC Manual connection tables UNO. Design connections for the reactions indicated on the plans or the minimum connection requirements indicated in the Connection Schedule, whichever provides the greater capacity.

Unless detailed otherwise, beam shop connections may be welded or bolted and field connections are to be bolted. Bolts shall be a minimum 3/4" diameter for connections specified or detailed in the drawings. The fabricator may submit an alternate connection with the calculations that is certified by a professional engineer who is licensed in the state of Minnesota.

All beam web copes must be made to a 1 inch minimum radius.

Welded connections shall be made in accordance with ANSI/AWS D1.1 Structural Welding Code using E70XX electrodes unless noted otherwise. Weld sizes not shown or controlled by the required forces shall be AWS code minimum size. Welds shall be visually inspected for compliance with the AWS code visual inspection criteria. Welders shall be qualified in accordance with ANSI/AWS D1.1 and shall be experienced in weld in structural steel.

Full penetration welds shall be tested using NDT methods such as ultrasonic, magnetic particle or other methods referenced in the AWS code. Welds subject to NDT methods shall also have been found compliant with the AWS visual inspection criteria.

##### STRUCTURAL STEEL STAIRS:

Structural steel stair stringers, components, railings, posts, hangers, and connections to be designed by the fabricator's Qualified Professional Engineer for the loads indicated in the specifications. Configuration of stringers and railings shall be as indicated on the architectural drawings. Channel stringers to have a minimum 12" depth and a minimum 1 1/2" flange width.

##### STEEL ROOF DECK:

Manufacturer shall be a current member of the Steel Deck Institute (SDI).

Detail, manufacture and install steel roof deck and accessories in accordance with the SDI specifications and codes and OSHA requirements.

Steel roof deck shall be as noted on plan.

Welding shall be in accordance with AWS D1.3. Welders shall be qualified in accordance with AWS D1.3.

Where spray-on fireproofing of the deck is required, the contractor shall verify that the deck finish is compatible with the proposed fireproofing material to ensure proper bonding of the fireproofing. Coordinate fireproofing locations and requirements with the architect.

All steel deck shall span a minimum of three spans, unless otherwise approved by the engineer. Deck ends are to be lapped over supports.

Contractor shall verify the location and extent of acoustical steel deck with the architectural drawings.

Reference drawings for detail on steel roof deck fastening requirements unless noted otherwise. Powder actuated or pneumatically driven fasteners are not allowed.

Provide reinforcement or frames for deck openings as indicated on the drawings.

##### LIMITATIONS ON M/E SUPPORT FROM PRIMARY STRUCTURE:

All M/E systems shall be supported from the primary structural frame, unless noted otherwise. Do not connect to roof deck, floor slabs, or secondary members unless specifically allowed on the structural construction documents.

All M/E support systems, hangers, brackets and connections to the primary structural frame shall be designed, provided and installed by the M/E contractor, unless noted otherwise on the structural construction documents.

All M/E supports and connections for loads in excess of 300 lbs shall be designed by a structural engineer licensed in the state of Minnesota and engaged by the M/E contractor.

##### COMPOSITE STEEL FLOOR DECK:

Manufacturer shall be a current member of the Steel Deck Institute (SDI). Composite steel floor deck shall be as noted on plan.

Detail, manufacture and install composite steel floor deck and accessories in accordance with the SDI specifications, codes and OSHA steel erection standards.

Refer to drawings for composite steel floor deck fastening requirements unless noted otherwise. Powder actuated or pneumatically driven fasteners are not allowed.

Provide and install pour stops, column closures, end closures, cover plates and girder fillers and other accessories as required by the SDI unless otherwise indicated or detailed.

Where spray-on fireproofing

Reynolds, Smith and Hills, Inc.

4525 Airport Approach Rd. Ste A  
Duluth, Minnesota 55811  
218-722-1227 FAX 218-722-1052  
www.rsandh.com



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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: Paul A. Johnson

Signature:

Date: . Reg. No.: 20379

**REVISIONS**

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11

**DATE ISSUED:** 06-06-11  
**REVIEWED BY:** PAJ / CWB  
**DRAWN BY:** SJL  
**DESIGNED BY:** CWB

AEP PROJECT NUMBER

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**SHEET TITLE  
GENERAL  
STRUCTURAL  
NOTES**

SHEET NUMBER

**S003**

**VALE PROGRAM  
BID PACKAGE**

**NON-COMPOSITE STEEL FLOOR DECK:**  
Manufacturer shall be a current member of the Steel Deck Institute (SDI).

Non-composite steel floor deck shall be as noted on plan.

Detail, manufacture and install non-composite steel floor deck and accessories in accordance with the SDI specifications and codes and OSHA steel erection standards.

Refer to drawings for non-composite steel floor deck fastening requirements. Powder actuated or pneumatically driven fasteners are not allowed.

Where spray-on fireproofing of the deck is required, the contractor shall verify that the deck finish is compatible with the proposed fireproofing material to ensure proper bonding of the material. Coordinate locations and requirements with the architect.

Provide reinforcement or frames for deck openings as indicated on the drawings.

**LIGHT GAUGE METAL FRAMING:**

The design and connection detailing of all light gage material including, but not limited to exterior studs, bearing studs, headers, jamps, joists, rafters and anchorage shall be by the Light Gauge Supplier. The design for systems other than bearing framing shall meet the following criteria:

Stud in exterior walls shall be minimum 600S162-43 (6"-18 gauge) studs at 16" OC. See architectural for additional spacing requirements at exterior finishes.

Studs shall be cold rolled steel, galvanized, C shape, with minimum 1 5/8" flange and minimum 1/2" return. They are to be punched for utility access and galvanized to G60 coating per ASTM 525.

At all openings in exterior and bearing walls provide a minimum two studs full wall height each side of opening and a minimum one additional stud each side for lintel bearing.

Anchor bottom track to concrete or masonry with minimum 5/32" x 1 1/4" power driven fasteners at 16" OC.

Top and bottom tracks shall be cold rolled or break formed steel, galvanized U shaped and minimum 18 gauge and as noted on the drawings.

Light gauge metal framing fasteners shall be minimum #10 self-drilling sheet metal screws, 16 threads per inch, with low profile head. Provide a minimum of two screws per connection unless noted otherwise.

Fasten light gage framing to wood with minimum #10 x 1 7/8" bugle head wood screws. Pre-drill holes in metal studs. Provide a minimum of two screws per connection unless noted otherwise.

All framing components shall be squarely cut for attachment to perpendicular members. Stud ends must seat tightly into tracks for all bearing applications.

At all wall elements, provide 1 1/2"-16 gauge horizontal channel bridging to prevent stud rotation. For all axial loaded walls, space bridging at 4'-0" OC. For all non-load bearing exterior walls, space bridging at 5'-0" OC.

Wall stud deflection criteria:

For wall studs providing lateral support to masonry veneer and cementitious stucco, provide L/600.

For wall studs providing lateral support to other materials, provide L/360.

Joist and rafter deflection criteria:

Live Load Deflection is L/360.

Total Load Deflection is L/240.

An additional joist shall be provided under parallel non-load bearing partition walls.

The light gauge supplier shall submit certified shop drawings and design calculations prepared by a qualified Professional Engineer registered in the state of Minnesota. See project specification manual for additional submittal requirements.

All light gauge designations are in accordance with the Steel Stud Manufacturers Association (SSMA).

Refer to architectural drawings and specification for size, minimum gage, extent, and location of interior non-bearing light gage framing not shown on the structural drawings. Interior light gauge framing is to be designed for 5 psf lateral pressure by the light gauge supplier.

Temporary bracing shall be furnished by the light gauge supplier and framing installer and maintained until permanent systems providing lateral stability are in place.

Welding shall conform to the American Welding Society (AWS) "Structural Welding Code - Sheet Steel, D1.3 - Current Edition." Welders shall be qualified in accordance with AWS D1.3 and shall be experienced in light gage welding.

All light gage material to be welded must be nominal 16 gauge or thicker.

Touch up all light gage material at welds with zinc-rich paint.

Align load bearing wall studs with floor or roof joists.

Splices in studs, joists, and headers, are not permitted, unless approved in writing by the structural engineer.

Framing components may be pre-assembled into panels prior to erecting. Prefabricated panels shall be square, with components attached in a manner that prevents racking.

**SPECIAL INSPECTION SCHEDULE:**

**SPECIAL INSPECTIONS REQUIRED OF STRUCTURAL ELEMENTS (PER IBC 2006, CHAPTER 17):**

	Continuous	Periodic	Not Req'd	See Arch.	
1. Steel *					Table 1704.3
1.1 Welding	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.2 Details	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.3 High-strength Bolts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Concrete					Table 1704.4
2.1 Reinforcing steel including Prestressing tendons	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.2 Bolts installed in concrete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.3 Required design mix	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.4 Sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.5 Shotcrete	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.6 Curing techniques	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2.7 Prestressed concrete forces and grouting	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.8 Erection of precast concrete members	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2.9 Verification of IN-SITU concrete strength	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Masonry					
3.1 Level 1 Special Inspection *	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1704.5.1, 1704.5.2, Table 1704.5.1
					1704.5.3, Table 1704.5.3
3.2 Level 2 Special Inspection	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1704.6
4. Wood	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1704.7
5. Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1704.8
6. Pile Foundations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1704.9
7. Pier Foundations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1704.10
8. Wall Panel and Veneers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1704.11
9. Sprayed Fire-Resistant Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1704.12
10. Exterior Insulation and Finish Systems (EIFS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1704.13
11. Special Cases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1704.14
12. Smoke Control Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

\* Please see referenced tables for exceptions.

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: Paul A. Johnson

Signature: \_\_\_\_\_

Date: \_\_\_\_\_ Reg. No.: 20379

**REVISIONS**

NO.	DESCRIPTION	DATE
BID PACKAGE 1		5.12.10
FOUNDATION PERMIT		6.4.10
1	ADDENDUM 1	6.11.10
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	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
4	BUILDING PERMIT REVISIONS	11.12.10
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6	VALE PROGRAM	04.29.11

DATE ISSUED: 06-06-11

REVIEWED BY: PAJ / CWB

DRAWN BY: SJL

DESIGNED BY: CWB

AEP PROJECT NUMBER

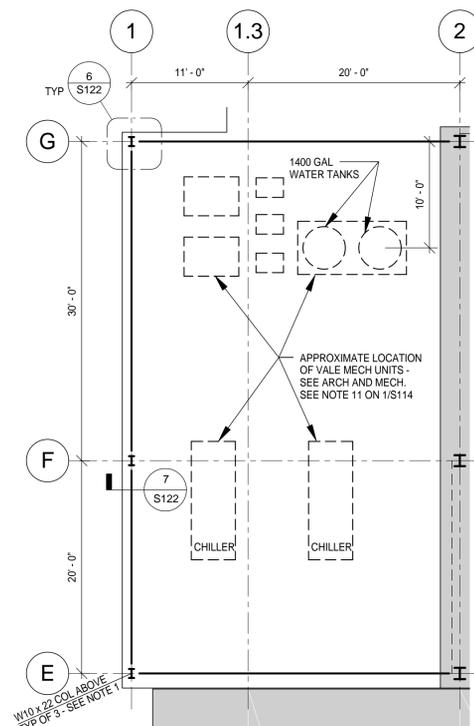
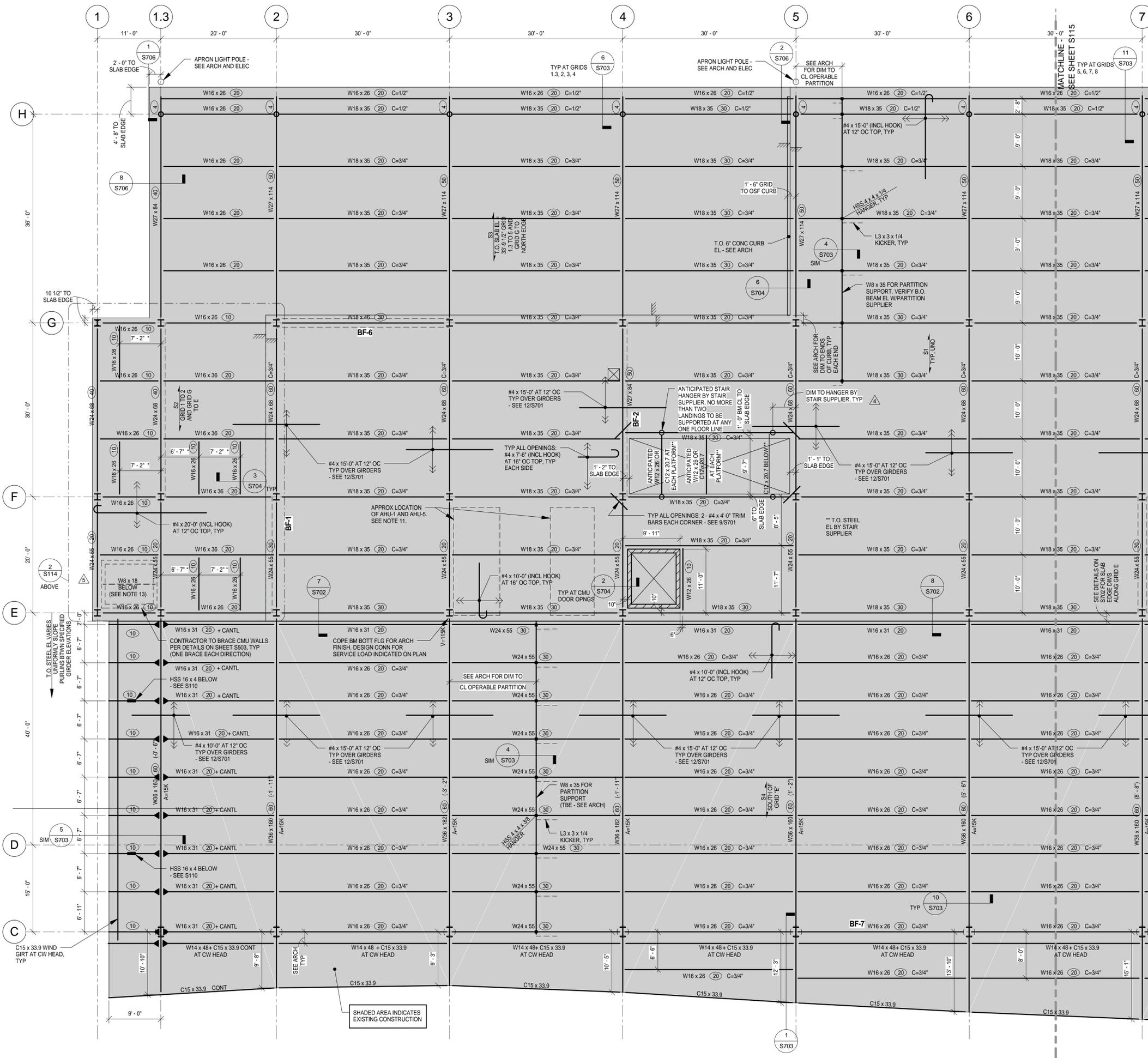
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**SHEET TITLE  
THIRD LEVEL  
FRAMING PLAN -  
AREA A**

SHEET NUMBER  
**S114**

**VALE PROGRAM  
BID PACKAGE**



**2 VALE PARTIAL THIRD FLOOR FRAMING PLAN**  
1/8" = 1'-0"

NOTES:  
1. FABRICATOR/ERECTOR MAY OPT TO FIELD MODIFY AND RE-USE PREVIOUSLY INDICATED HSS COLUMNS.

APPROXIMATE AHU WEIGHTS (VERIFY WMECH)	
MARK	WEIGHT (POUNDS)
AHU-1	5,000
AHU-2	12,000
AHU-3	6,200
AHU-4	6,200
AHU-5	5,000
CHILLER	14,800
WATER TANK	14,500

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

- TYPICAL PLAN NOTES:
- TOP OF SLAB ELEVATION = 33'-7 1/2", UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED FLOOR ELEVATION.
  - TOP OF BEAM ELEVATION = 33'-0" TYPICAL, UNLESS NOTED OTHERWISE. TOP OF BEAM ELEVATIONS ARE REFERENCED TO 1'-0" FROM ELEVATION 33'-0".
  - REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
  - BF1 ON PLAN INDICATES BRACED FRAME MARK, REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
  - S1 ON PLAN INDICATES SLAB ON METAL DECK MARK, D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE ON SHEET S701.
  - DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
  - VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
  - SEE PLAN AND SCHEDULES FOR COLUMN, WALL, AND PIER INFORMATION.
  - HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-8" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S702 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
  - ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
  - PROVIDE HOUSEKEEPING PADS FOR MECHANICAL EQUIPMENT AS INDICATED (MAXIMUM 6" THICKNESS) ON MECHANICAL DRAWINGS. REINFORCE PADS WITH #4 BARS AT 12" OC EACH WAY, CENTERED IN SLAB.
  - SEE ARCHITECTURAL DRAWINGS FOR ALL PARTITION WALL LOCATIONS. SEE SHEET S503 FOR ALL CMU NON-LOAD BEARING WALL REINFORCING AND CONNECTION INFORMATION.
  - W8 STEEL SAFETY BEAM\* DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. AAA 28020BD (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. BEAR ON BEARING PLATE 1/2" x 8" x 0'-8" WITH 3/4" DIAMETER x 4" LONG HSA EACH END OVER FULLY GROUTED CELL. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

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4	BUILDING PERMIT REVISIONS	10.15.10
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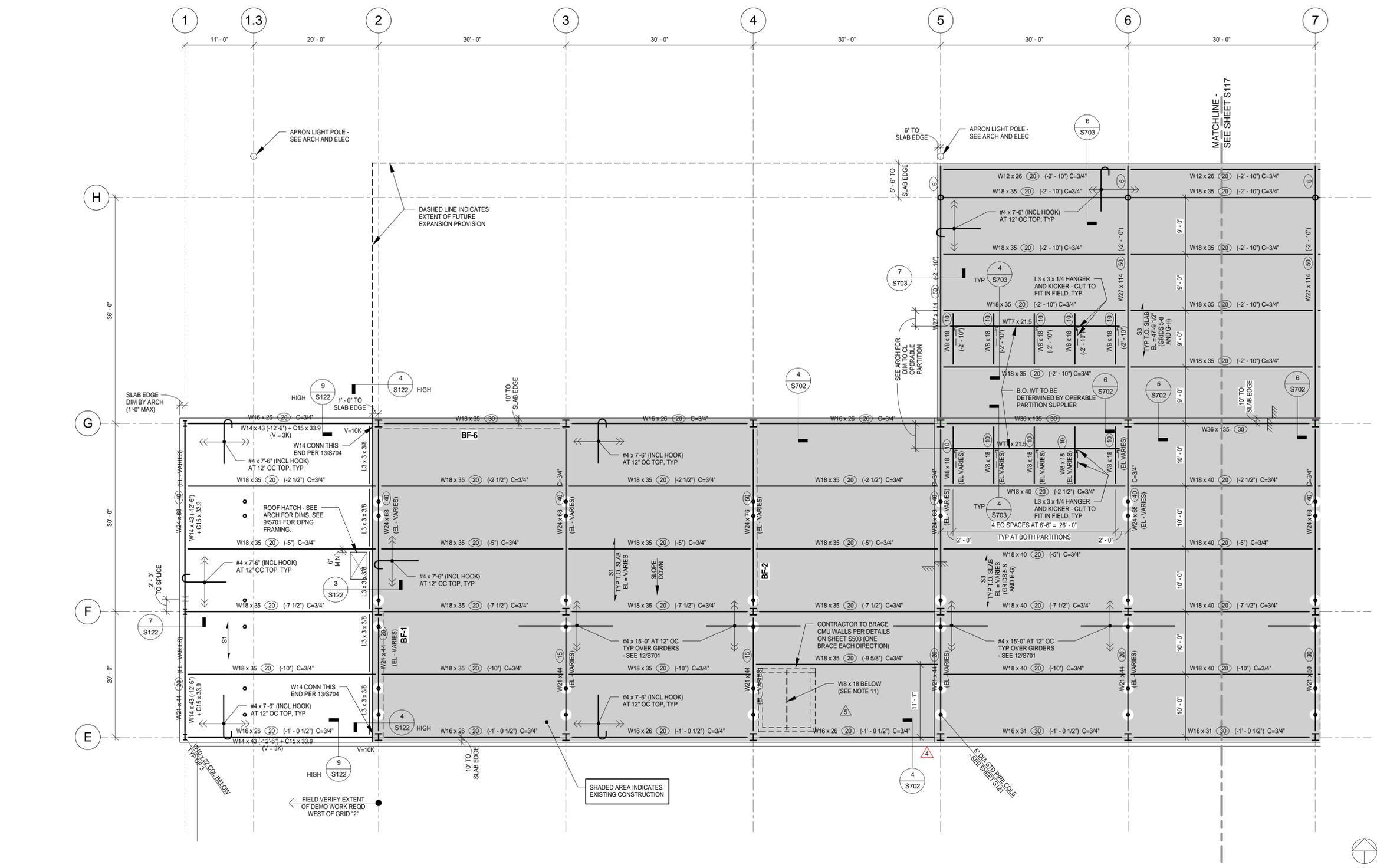
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**SHEET TITLE  
ROOF LEVEL FRAMING PLAN -  
AREA A**

SHEET NUMBER  
**S116**

**VALE PROGRAM  
BID PACKAGE**



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

- TYPICAL PLAN NOTES:
- TOP OF STEEL BEAM ELEVATION IS REFERENCED (+ OR -) FROM ELEVATION 49'-6". TOP OF STEEL BEAM = 49'-6" UNLESS NOTED OTHERWISE.
  - TOP OF SLAB ELEVATION VARIES. SEE PLAN.
  - REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL DIMENSIONS, ELEVATIONS, ANGLES AND LOCATION OF WORK POINTS. SEE SHEET S001 FOR TYPICAL ABBREVIATIONS AND S002 AND S003 FOR GENERAL STRUCTURAL NOTES.
  - BF1 ON PLAN INDICATES BRACED FRAME MARK. REFER TO S301 FOR BRACED FRAME ELEVATIONS, NOTES AND ADDITIONAL DETAIL.
  - S1 ON PLAN INDICATES SLAB ON METAL DECK MARK. D1 ON PLAN INDICATES ROOF DECK MARK. SEE SCHEDULE ON SHEET S701.
  - DO NOT CUT CONTROL JOINTS IN SLABS ON METAL DECK.
  - VERIFY EXACT SIZE, LOCATION AND QUANTITY OF REQUIRED OPENINGS THROUGH THE FLOOR AND/OR ROOF WITH ARCHITECTURAL AND OTHER CONSULTANT DRAWINGS AS NECESSARY. COORDINATE REQUIRED OPENINGS WITH ALL TRADES THAT REQUIRE THEM. MINOR OPENINGS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
  - SEE PLAN AND SCHEDULES FOR COLUMN, WALL AND PIER INFORMATION.
  - HEADED STUDS ON PLAN ARE THUS: 3/4" DIAMETER x 0'-5" LONG. SEE GENERAL STRUCTURAL NOTES AND DETAILS ON SHEETS S701 AND S122 FOR PLACEMENT REQUIREMENTS ON BEAMS AND GIRDERS.
  - ON PLAN INDICATES DIMENSION TO BE VERIFIED BY THE CONTRACTOR WITH SUPPLIERS, MANUFACTURERS, AND ALL ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS AS NECESSARY PRIOR TO CONSTRUCTION.
  - W8 "STEEL SAFETY BEAM" DESIGNED USING RECOMMENDED 5,000 POUND NET LIVE LOAD PER OTIS DRAWING NO. 444 2802050 (NO DATE). TOP OF BEAM ELEVATION TO BE COORDINATED WITH REQUIRED ELEVATOR CLEAR HEIGHT. BEAR ON BEARING PLATE 1/2" x 8" x 0'-8" WITH 3/4" DIAMETER x 4" LONG HSA EACH END OVER FULLY GROUTED CELL. VERIFY SAFETY BEAM REQUIREMENTS WITH ELEVATOR SUPPLIER PRIOR TO FABRICATION.

- V.A.L.E. NOTES:**
- BEAM DESIGN INCLUDES 40 PSF HANGING LOAD ALLOWANCE.
  - SEE SHEET S121 AND S122 FOR SOLAR PANEL FRAMING LAYOUT, DETAILS AND NOTES.

**CONSULTANTS**

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

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

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: Paul A. Johnson

Signature: \_\_\_\_\_

Date: \_\_\_\_\_ Reg. No.: 20379

REVISIONS		
NO.	DESCRIPTION	DATE
1	VALE PROGRAM	04.29.11

DATE ISSUED: 06-06-11

REVIEWED BY: PAJ / CWB

DRAWN BY: SJL

DESIGNED BY: CWB

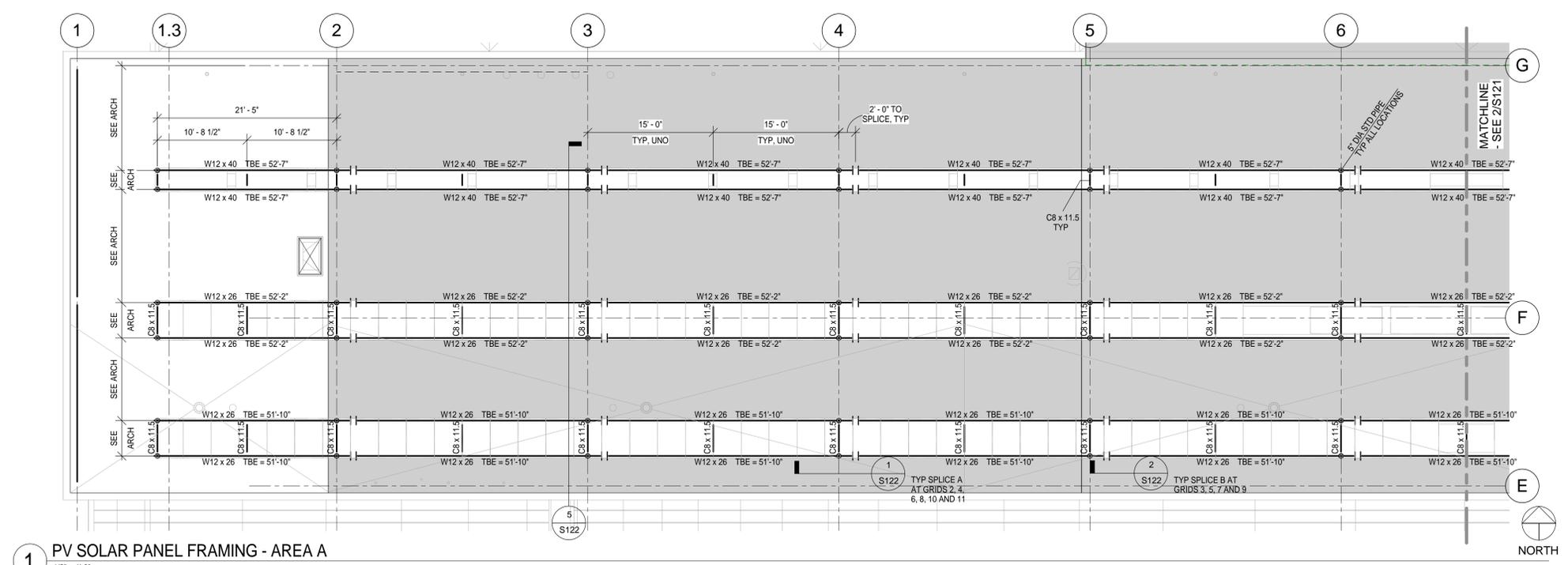
AEP PROJECT NUMBER  
213-1882-110

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SHEET TITLE  
**SOLAR PANEL  
FRAMING PLANS  
AND DETAILS**

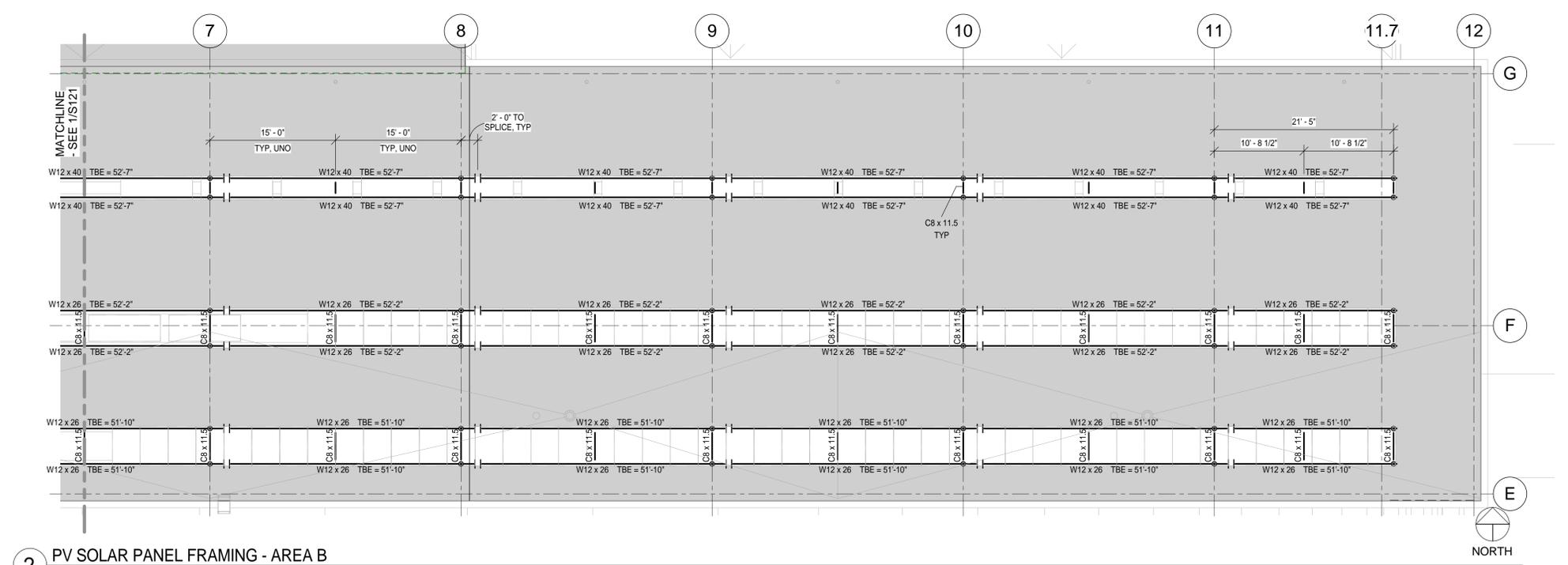
SHEET NUMBER  
**S121**

**VALE PROGRAM  
BID PACKAGE**



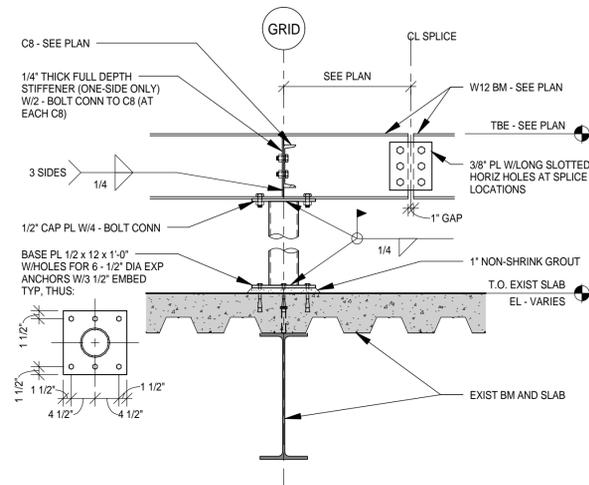
**1 PV SOLAR PANEL FRAMING - AREA A**

1/8" = 1'-0"  
NOTES:  
1. ALL SOLAR PANEL SUPPORT STEEL TO BE GALVANIZED.

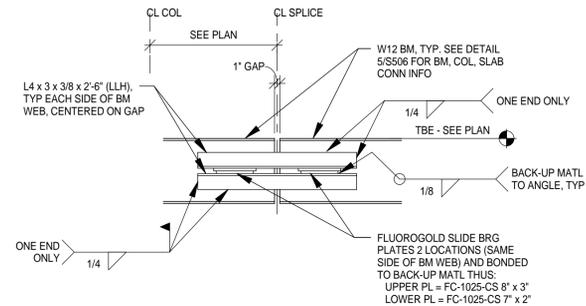


**2 PV SOLAR PANEL FRAMING - AREA B**

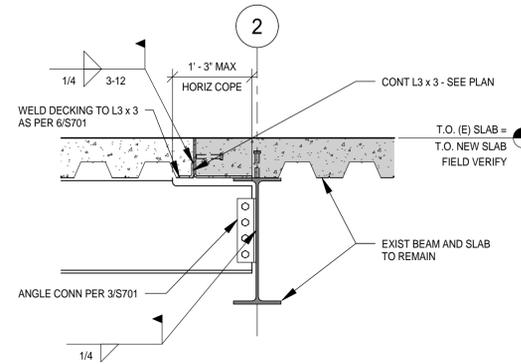
1/8" = 1'-0"  
NOTES:  
1. ALL SOLAR PANEL SUPPORT STEEL TO BE GALVANIZED.



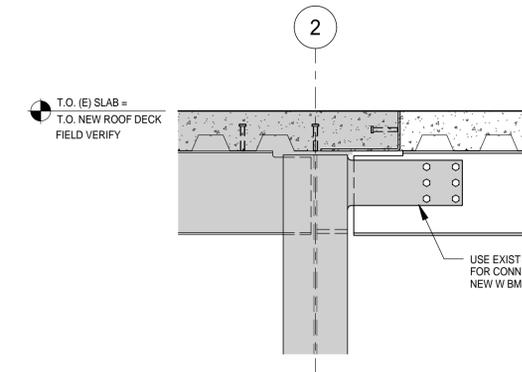
1 SECTION - SPLICE A  
3/4" = 1'-0"



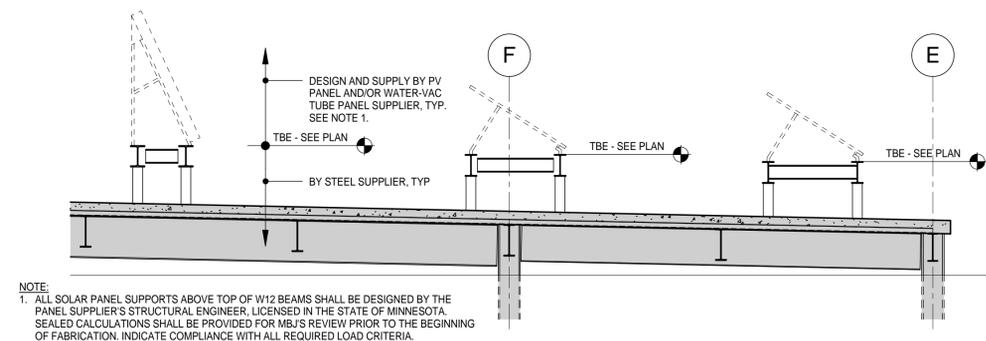
2 SECTION - SPLICE B  
3/4" = 1'-0"



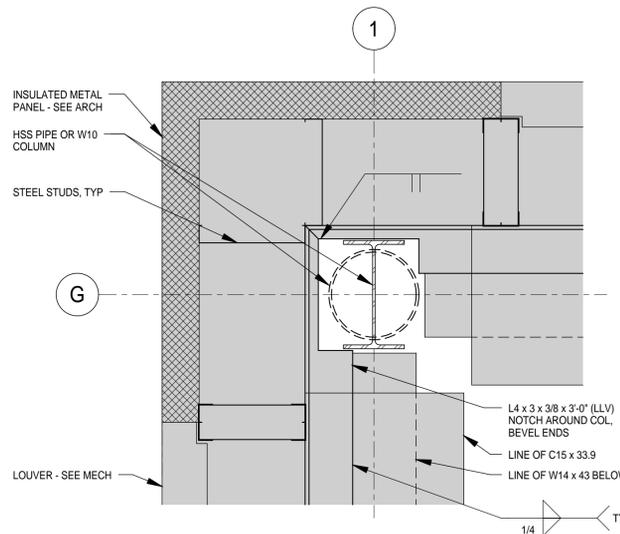
3 SECTION  
3/4" = 1'-0"



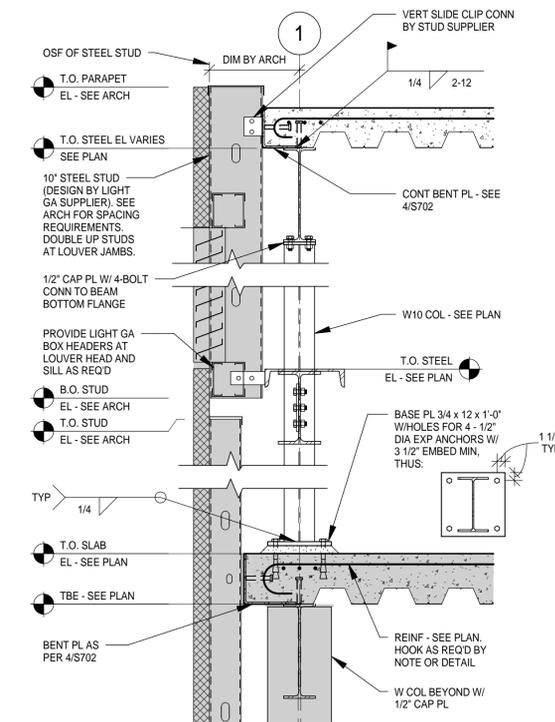
4 VALE CONNECTION AT G-2, E-2  
3/4" = 1'-0"



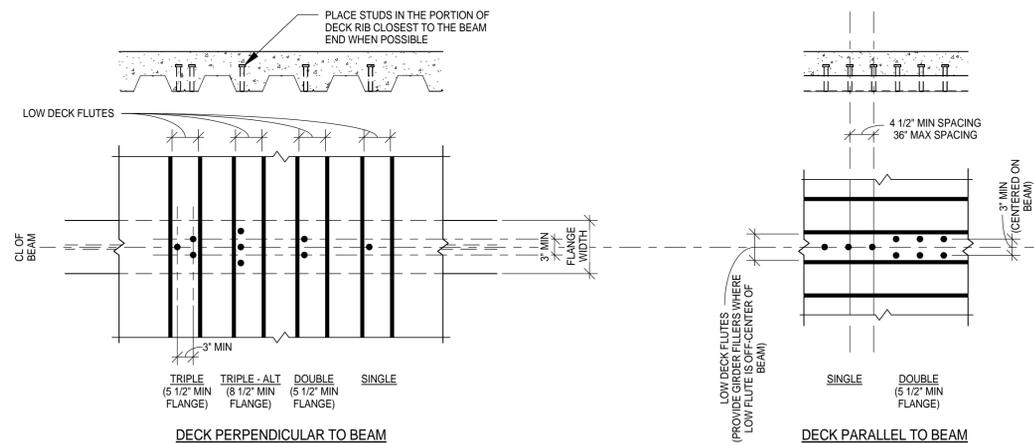
5 SECTION  
1/4" = 1'-0"



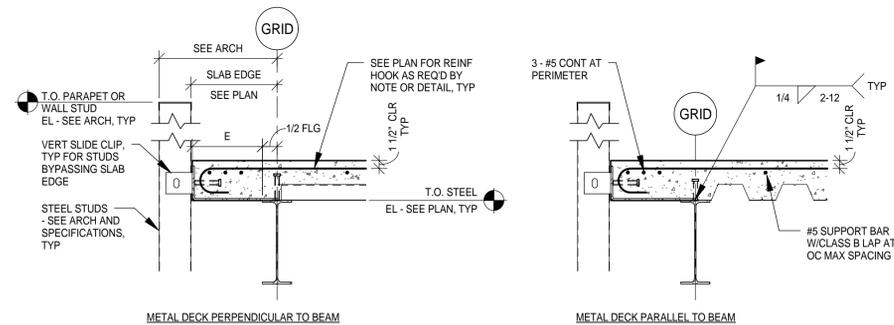
6 PLAN DETAIL AT CHILLER ENCLOSURE  
1 1/2" = 1'-0"



7 SECTION  
3/4" = 1'-0"



8 TYPICAL HEADED STUD PLACEMENT DETAIL  
NO SCALE



9 TYPICAL SLAB EDGE DETAIL  
NO SCALE

**CONSULTANTS**

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**MBJ CONSULTING ENG.**  
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Print Name: Paul A. Johnson

Signature:

Date: Reg. No.: 20379

**REVISIONS**

NO.	DESCRIPTION	DATE
1	VALE PROGRAM	04.29.11

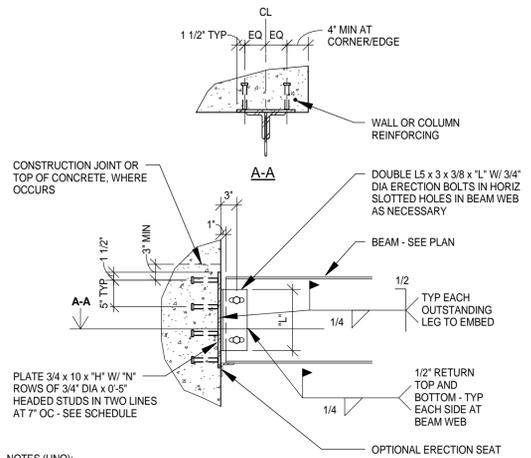
DATE ISSUED: 06-06-11  
REVIEWED BY: PAJ / CWB  
DRAWN BY: SJL  
DESIGNED BY: CWB

AEP PROJECT NUMBER  
213-1882-110  
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**SHEET TITLE  
VALE DETAILS**

SHEET NUMBER  
**S122**

**VALE PROGRAM  
BID PACKAGE**



NOTES (UNO):  
 1. SEE SCHEDULE FOR NOTES AND ADDITIONAL INFORMATION.  
 2. PROVIDE ERECTION SEAT AS NECESSARY.

1 TYPICAL EMBED PLATE - DOUBLE ANGLE CONNECTION  
 3/4" = 1'-0"

TYPICAL EMBED PLATE SCHEDULE				
MARK	STEEL BEAM SIZE	STUD ROWS	PLATE LENGTH	MIN ANGLE LENGTH
EP-1	W12, W14	3	13"	8 1/2"
EP-2	W16	4	18"	11 1/2"
EP-3	W33	8	38"	24"
EP-4	HSS 5 x 5	3	13"	NA

NOTES (UNO):  
 1. PROVIDE EMBED PLATES CORRESPONDING TO BEAM SIZES IN SCHEDULE, UNLESS NOTED OTHERWISE ON PLANS OR DETAILS.  
 2. PROVIDE HOLES AS NECESSARY FOR PLATE ATTACHMENT TO FORMWORK (5/16" DIA MAX).  
 3. COORDINATE CONCRETE REINFORCING BAR PLACEMENT WITH HEADED STUDS.  
 4. FIELD VERIFY EMBED PLATE PLACEMENT PRIOR TO BEAM ERECTION.  
 5. AT EP-4, PROVIDE 3" DIAMETER HOLE CENTERED ON HSS FOR CONDUIT ACCESS.

2 TYPICAL EMBED PLATE SCHEDULE  
 1:1

STEEL BEAM SIZE	SINGLE SHEAR CONNECTION FOR BEAMS SUPPORTING DECK ONLY		DOUBLE SHEAR CONNECTION FOR BEAMS SUPPORTING OTHER BEAMS	
	MIN ROWS OF BOLTS	MIN DESIGN SERVICE CAPACITY (KIPS)	MIN ROWS OF BOLTS	MIN DESIGN SERVICE CAPACITY (KIPS)
W8, W10	2	12	2	24
W12	3	23	3	46
W14	3	23	3	46
W16	4	35	4	70
W18	5	45	4	70
W21	6	55	5	90
W24	7	65	6	110
W27	7	65	6	110
W30	8	75	7	130
W33	8	75	7	130
W36	9	85	8	150

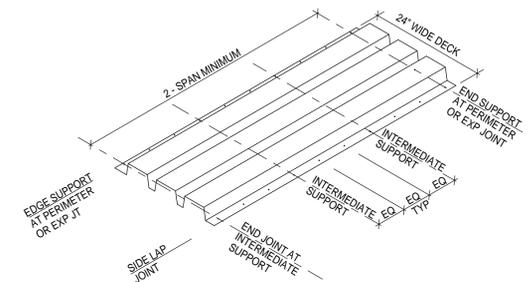
NOTES (UNO):  
 1. CONTRACTOR/FABRICATOR SHALL DESIGN TYPICAL SHEAR CONNECTIONS FOR THIS PROJECT. CONNECTION TYPES SHALL CONFORM TO AISC STANDARD SHEAR CONNECTIONS. SUBMIT PROPOSED CONNECTION TYPES FOR APPROVAL BEFORE STARTING SHOP DRAWINGS.  
 2. PROVIDE BEAM CONNECTIONS FOR END REACTIONS INDICATED ABOVE OR AS SHOWN ON PLAN OR DETAIL, WHICHEVER IS GREATER. BEAM TO BEAM CONNECTIONS MAY BE SINGLE OR DOUBLE SHEAR, AS REQUIRED TO PROVIDE THE SPECIFIED CONNECTION CAPACITY WITHIN THE AVAILABLE CONNECTION GEOMETRY. ALL BEAM TO COLUMN CONNECTIONS SHALL BE DOUBLE SHEAR.  
 3. ALL BOLTS SHALL BE 3/4" DIAMETER A325-N OR 1" DIAMETER A490-N, UNLESS NOTED OTHERWISE.  
 4. SHOP CONNECTIONS MAY BE WELDED (WITH CAPACITY AS NOTED HEREIN) OR BOLTED.  
 5. VALUES SHOWN ASSUME 1/4" BEAM WEB THICKNESS, MINIMUM.  
 6. USE TWO ANGLE CONNECTION TO ALL BEAMS FRAMING INTO CONCRETE EMBED PLATES.

3 BEAM SHEAR CONNECTION SCHEDULE  
 1" = 1'-0"

MARK	DECK TYPE	CONCRETE TOPPING		COMMENTS
		THICKNESS	REINFORCING	
S1	3" - 19 GA COMPOSITE DECK	4 1/2" NORMAL WT	STRUX 90/40 SYNTHETIC FIBER	5.0 LBS/CU YD
S2	3" - 19 GA COMPOSITE DECK	6 1/2" NORMAL WT	#5 AT 12" OC EACH WAY	1 1/2" TOP COVER
S3	3" - 19 GA COMPOSITE DECK	6 1/2" NORMAL WT	STRUX 90/40 SYNTHETIC FIBER	5.0 LBS/CU YD
S4	3" - 20 GA COMPOSITE DECK	3" NORMAL WT	STRUX 90/40 SYNTHETIC FIBER	5.0 LBS/CU YD
D1	3" - 20 GA TYPE N ROOF DECK	NA	NA	NA
D2	3 1/2" - 16 GA ROOF DECK OR 4 1/2" - 18 GA ROOF DECK	NA	NA	NA
D3	1 1/2" - 20 GA TYPE N ROOF DECK	NA	NA	NA

NOTES (UNO):  
 1. SEE TYPICAL DETAILS FOR DECK ATTACHMENT DETAILS.  
 2. SEE GENERAL STRUCTURAL NOTES FOR CONCRETE STRENGTH.  
 3. CONCRETE TOPPING THICKNESS IS FROM TOP OF DECK TO TOP OF CONCRETE.  
 4. SEE PLANS AND DETAILS FOR ADDITIONAL REINFORCING AND REINFORCING PLACEMENT AT CONCRETE SLABS ON METAL DECK.  
 5. SEE SPECIFICATIONS FOR SYNTHETIC FIBERS.  
 6. ALL COMPOSITE DECK IS GALVANIZED. REFER TO SPECIFICATIONS FOR ROOF DECK FINISH.

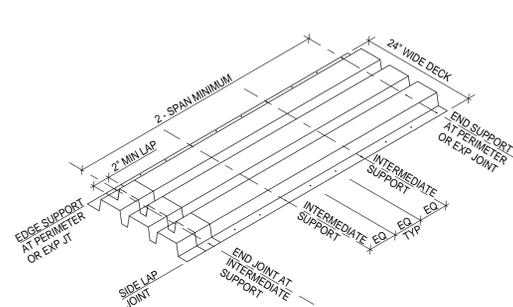
4 FLOOR AND ROOF DECK SCHEDULE  
 NO SCALE



DECK SUPPORT CONDITION	DECK ATTACHMENT
END SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
EDGE SUPPORT	PUDDLE WELDS AT 12" OC
INTERMEDIATE SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
END JOINT AT INT SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE, EACH SIDE
SIDE LAP JOINT	#10 TEK SCREWS OR 1 1/2" SEAM WELD AT 36" OC MAX

NOTES (UNO):  
 1. ALL PUDDLE (ARC-SPOT) WELDS SHALL BE 5/8" DIAMETER.  
 2. PROVIDE DECK ATTACHMENTS AT SPACING SHOWN UNLESS NOTED OTHERWISE ON DRAWINGS.  
 3. DECK SHEETS SHALL BE BUTTED AT END JOINTS. PROVIDE 2 1/2" MINIMUM BEARING. GAPS UP TO 1" ARE ACCEPTABLE AT BUTT JOINTS.  
 4. HEADED STUD INSTALLED THROUGH THE DECK MAY BE SUBSTITUTED FOR PUDDLE WELD.

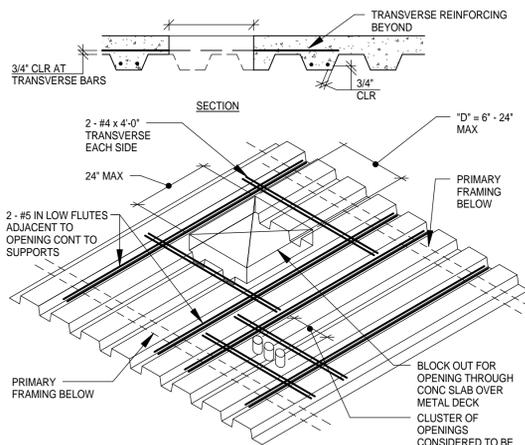
5 TYPICAL 3" COMPOSITE STEEL DECK ATTACHMENT DETAIL  
 NO SCALE



DECK SUPPORT CONDITION	DECK ATTACHMENT
END SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
EDGE SUPPORT	PUDDLE WELDS AT 12" OC
INTERMEDIATE SUPPORT	PUDDLE WELDS AT EACH LOW FLUTE
END LAP JOINT	PUDDLE WELDS AT EACH LOW FLUTE
SIDE LAP JOINT	#10 TEK SCREWS PER SPAN

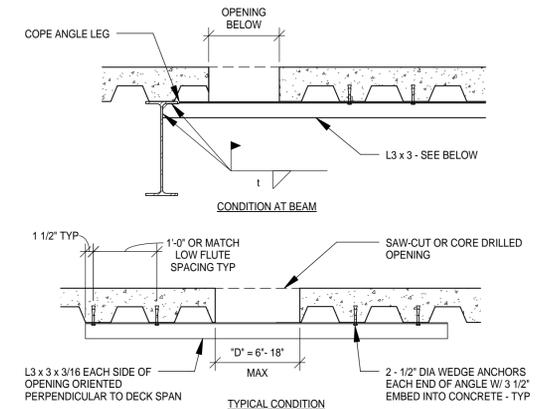
NOTES (UNO):  
 1. ALL PUDDLE (ARC-SPOT) WELDS SHALL BE 5/8" DIAMETER.  
 2. PROVIDE DECK ATTACHMENTS AT SPACING SHOWN UNLESS NOTED OTHERWISE ON DRAWINGS.  
 3. AT END LAP CONDITIONS, PUDDLE WELDS SHALL PROVIDE FUSION THROUGH ALL DECK LAYERS.

6 TYPICAL 3" STEEL ROOF DECK ATTACHMENT DETAIL  
 NO SCALE



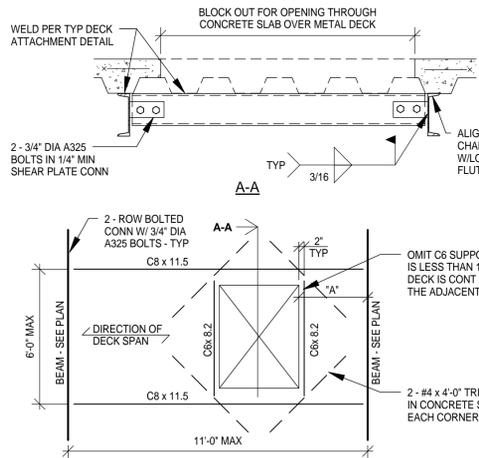
NOTES (UNO):  
 1. DO NOT CUT DECK AT OPENINGS UNTIL CONCRETE HAS ATTAINED ITS SPECIFIED COMPRESSIVE STRENGTH.  
 2. PROVIDE 2 TIMES 'D' CLEAR DISTANCE BETWEEN OPENING EDGES. 'D' IS LARGEST OF ADJACENT OPENING DIMENSIONS.

7 TYPICAL FRAMING AT FLOOR OPENINGS (6"-32" MAX)  
 NO SCALE



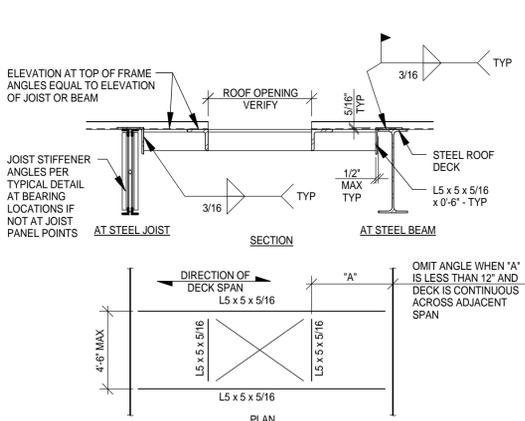
NOTES (UNO):  
 1. DO NOT OVER CUT CORNERS OF SQUARE OR RECTANGULAR OPENINGS.  
 2. CLUSTER OF OPENINGS CONSIDERED TO BE ONE OPENING. PROVIDE SUPPORT ANGLES IF OPENINGS LOCATED WITH LESS THAN TWO TIMES 'D' CLEAR BETWEEN OPENING EDGES. 'D' IS LARGEST OF ADJACENT OPENING DIMENSIONS.

8 TYPICAL OPENING (6"-24" MAX) THROUGH SLAB OVER METAL DECK  
 NO SCALE



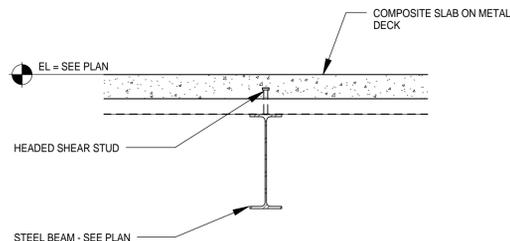
NOTES (UNO):  
 1. DO NOT CUT DECK AT OPENINGS UNTIL CONCRETE HAS ATTAINED ITS SPECIFIED COMPRESSIVE STRENGTH.  
 2. VERIFY OPENING DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND MECHANICAL TRADES.

9 TYPICAL FLOOR OPENING FRAME (OVER 32")  
 NO SCALE



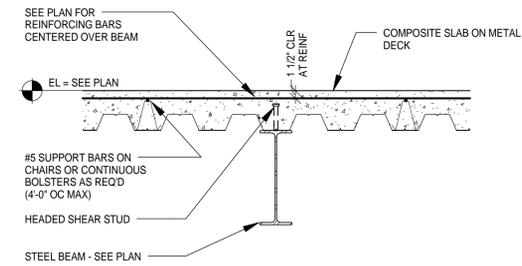
NOTES (UNO):  
 1. VERIFY OPENING SIZES AND LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO FABRICATION.  
 2. WELD DECK AT OPENING AT EACH FLUTE WITH PUDDLE WELDS, PER THE TYP DECK ATTACHMENT DETAIL.  
 3. DO NOT CUT OPENING IN DECK UNTIL NECESSARY. CONTRACTOR TO COORDINATE.  
 4. THIS ROOF OPENING FRAME IS NOT DESIGNED TO SUPPORT THE WEIGHT OF ROOF TOP MECHANICAL EQUIPMENT WEIGHING OVER 400 LBS. EQUIPMENT SHALL BE SUPPORTED ON A STRUCTURAL CURB DESIGNED BY THE SUPPLIER TO SPAN TO THE PRIMARY STRUCTURAL FRAMING.

10 TYPICAL ROOF OPENING FRAME FOR 3" DECK  
 NO SCALE



NOTES (UNO):  
 1. SEE TYPICAL DETAILS FOR DECK ATTACHMENT AND HEADED STUD INFORMATION.

11 TYPICAL SECTION AT COMPOSITE DECK PERPENDICULAR TO BEAM  
 NO SCALE



NOTES (UNO):  
 1. CUT HIGH DECK FLUTE WHEN IT OCCURS AT BEAM AND PROVIDE GIRDER FILLER DECK PIECE AS NECESSARY.  
 2. SEE TYPICAL DETAILS FOR DECK ATTACHMENT AND HEADED STUD INFORMATION.

12 TYPICAL SECTION AT COMPOSITE DECK PARALLEL TO BEAM  
 NO SCALE

Reynolds, Smith and Hills, Inc.  
 4525 Airport Approach Rd. Ste A  
 Duluth, Minnesota 55811  
 218-722-1227 FAX 218-722-1052  
 www.rsandh.com



**DULUTH INTERNATIONAL AIRPORT**  
 DULUTH, MN

**NEW PASSENGER TERMINAL VALE PROGRAM**

**CONSULTANTS**

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

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Print Name: Paul A. Johnson

Signature: \_\_\_\_\_

Date: \_\_\_\_\_ Reg. No.: 20379

**REVISIONS**

NO.	DESCRIPTION	DATE
	BID PACKAGE 1	5.12.10
	FOUNDATION PERMIT	6.4.10
1,2,3	NOT CHANGED	
	CONFORMANCE SET	7.12.10
	BUILDING PERMIT	8.6.10
5	100% REVIEW	12.15.10
	BID PACKAGE 2A	01.24.11

DATE ISSUED: 06-06-11  
 REVIEWED BY: PAJ / CWB  
 DRAWN BY: SJL  
 DESIGNED BY: CWB

AEP PROJECT NUMBER  
 213-1882-110

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**STRUCTURAL DETAILS**

SHEET NUMBER  
**S701**

**VALE PROGRAM BID PACKAGE**



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
	FLOW MEASURING DEVICE
	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
	BALANCING VALVE
	VENT LINE
	CONDENSATE DRAIN
	FUEL OIL SUPPLY
	CHILLED WATER SUPPLY
	CHILLED WATER RETURN
	HOT WATER SUPPLY
	HOT WATER RETURN
	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

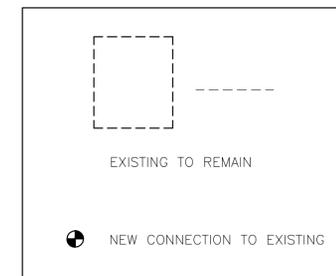
C	COMMON
CCP	CENTRAL CONTROL PANEL
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FS	FLOW SWITCH
LLR	LOW LIMIT RELAY
LP	LOCAL PANEL
OPER	OPERATION
PI	PRESSURE INDICATOR
RC	RECEIVER CONTROLLER
SAV	SOLENOID AIR VALVE
SPT	STATIC PRESSURE TRANSMITTER
TC	TIME CLOCK
TI	TEMPERATURE INDICATOR
TT	TEMPERATURE TRANSMITTER
VIB	VIBRATION
VPT	VELOCITY PRESSURE TRANSMITTER
	COMPRESSED AIR PIPING
	DAMPER END SWITCH
	DEVICE WITH AVERAGING SENSING DEVICE
	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
	THERMOSTAT
	DUCT SMOKE DETECTOR
	HUMIDISTAT
	CARBON DIOXIDE SPACE SENSOR

HVAC ABBREVIATIONS

ACCU	AIR COOLED CONDENSING UNIT
AC	AIR CONDITIONING
AD	ACCESS DOOR
AH	AIR HANDLING SYSTEM
AL	ACOUSTICAL LINING
APPROX.	APPROXIMATE
AVG	AVERAGE
ABV	ABOVE
AS	AIR SEPARATOR
B	BOILER
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BI	BLACK IRON
BOD	BOTTOM OF DUCT
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CA	COMPRESSOR AIR
CC	COOLING COIL
CCW	COUNTER CLOCKWISE
CD	CONDENSATE DRAIN
CF	CUBIC FEET
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CH	CHEMICAL TREATMENT TANK
CI	CAST IRON
CL	CENTER LINE
CLG	CEILING
C.O.	CLEAN OUT
CO	CARBON MONOXIDE
CO2	CARBON DIOXIDE
COT	COMPRESSION TANK
CONC	CONCRETE
COND. DR. CONN.	CONDENSATE DRAIN (COIL. PAN DRAIN) CONNECTION
CR	CEILING REGISTER
CT	COOLING TOWER
CW	CLOCKWISE
CY	CYCLE
DB	DRY BULB TEMPERATURE
DD	DUCT SMOKE DETECTOR
DFN	DEFLECTION
DG	DOOR GRILLE

DIA	DIAMETER
DIFF	DIFFUSER
DX	DIRECT EXPANSION
DN	DOWN
DWG.	DRAWING
EF	EXHAUST FAN
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ED	EXHAUST DISCHARGE
EE	ELECTRICAL ROOM EXHAUST
EFF	EFFICIENCY
EH	EXHAUST HEAD
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC.	ELECTRIC
ELEV.	ELEVATOR
EOAT	ENTERING OUTSIDE AIR TEMPERATURE
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
F	FILTER
FA	FREE AREA
FD	FIRE DAMPER
F/SD	FIRE SMOKE DAMPER
FHE	FUME HOOD EXHAUST
FL	FLOOR
FLEX.	FLEXIBLE
FMD	FLOW MEASURING DEVICE
FO	FILTER ON OUTSIDE AIR
FP	FAN POWER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FR	FILTER ON RETURN AIR
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT
FTR	FINNED TUBE RADIATOR
FLGD	FLANGED
GA	GAGE OR GAUGE
GC	GENERAL CONTRACTOR
GD	GRAVITY DAMPER
GE	GENERAL EXHAUST
GR	GRILLE
GALV	GALVANIZED
GWS/R	GEOTHERMAL WATER SUPPLY & RETURN
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
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
VWS/R	EVACUATED TUBE WATER SUPPLY & RETURN
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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NEW PASSENGER TERMINAL  
 VALE PROGRAM

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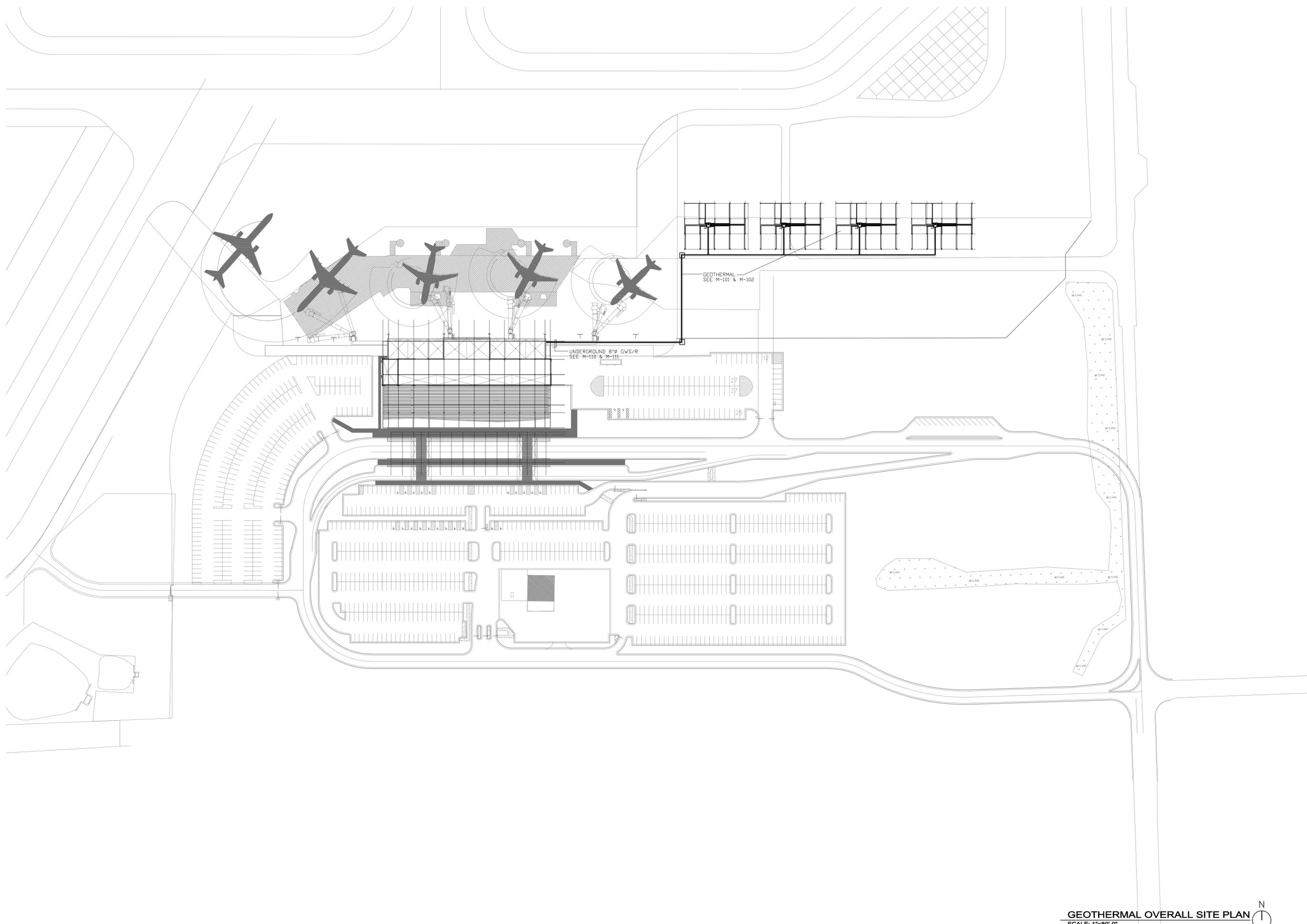
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 SHEET TITLE

MECHANICAL SYMBOLS & ABBREVIATIONS

SHEET NUMBER

M002

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SHEET TITLE  
**OVERALL  
 GEOTHERMAL  
 SITE PLAN**

SHEET NUMBER

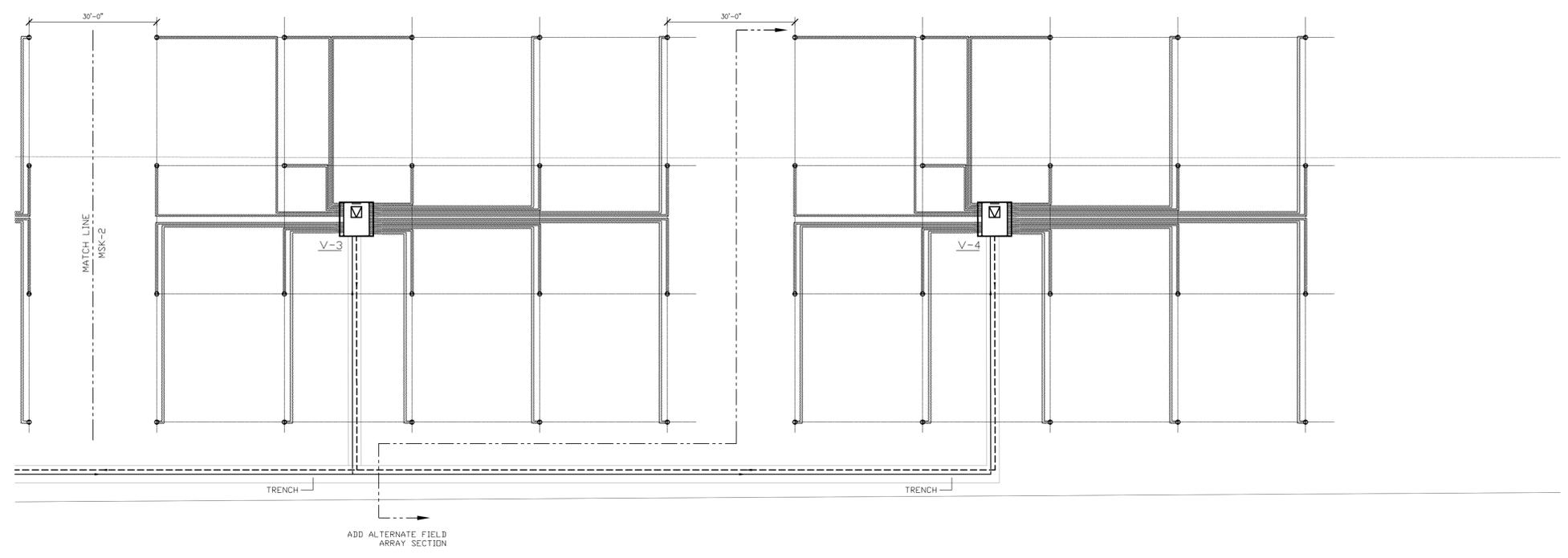
**M-100**

VALE PROGRAM  
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**GEOTHERMAL OVERALL SITE PLAN**  
 SCALE: 1"=80'-0"







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SHEET TITLE  
**GEOHERMAL  
SITE MECHANICAL  
PARTIAL PLAN**

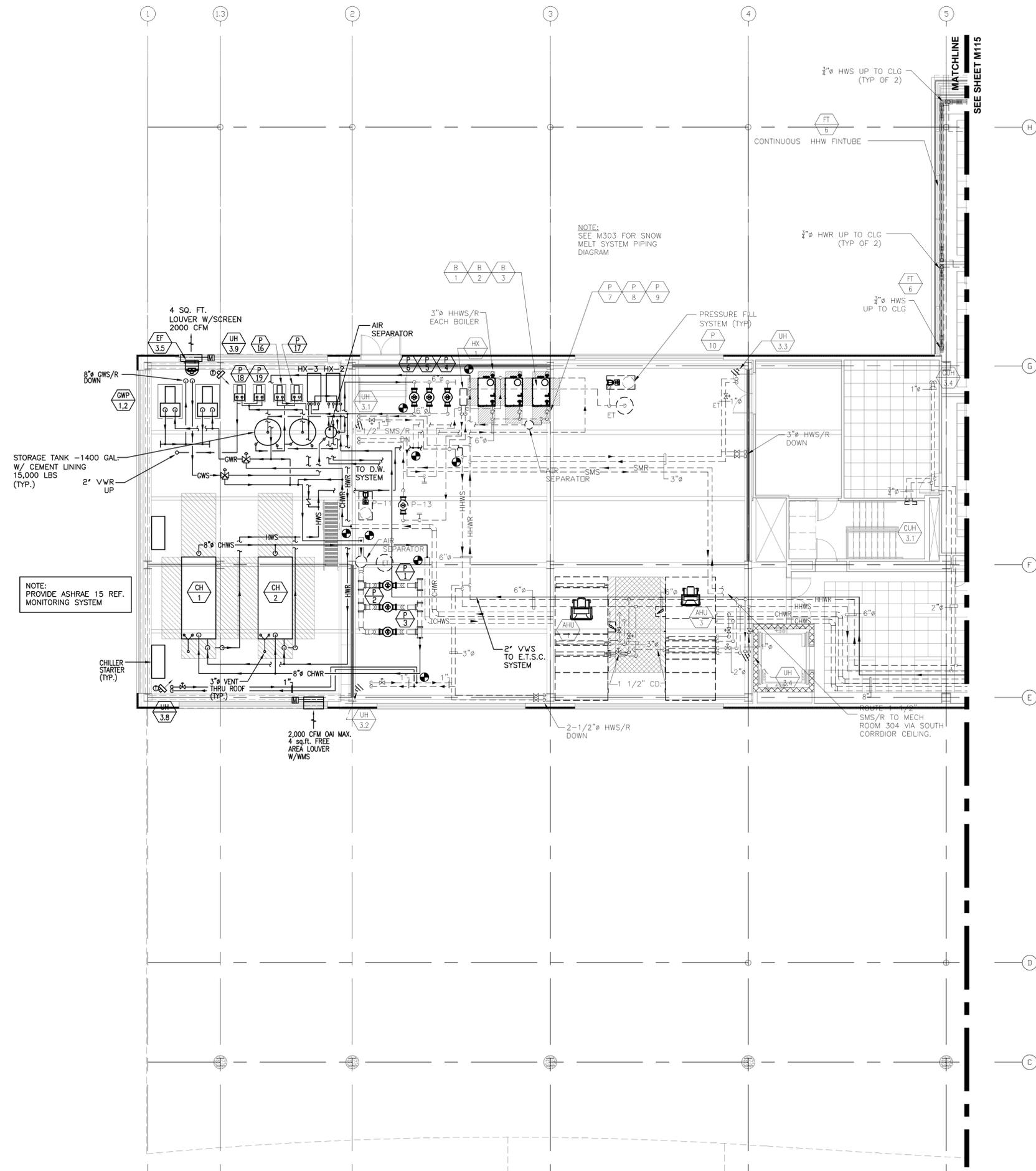
SHEET NUMBER

**M-102**

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4 SQ. FT. LOUVER W/SCREEN 2000 CFM

STORAGE TANK -1400 GAL. W/ CEMENT LINING 15,000 LBS (TYP.)

2" VWR UP

NOTE: PROVIDE ASHRAE 15 REF. MONITORING SYSTEM

NOTE: SEE M303 FOR SNOW MELT SYSTEM PIPING DIAGRAM

MATCHLINE SEE SHEET M115



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



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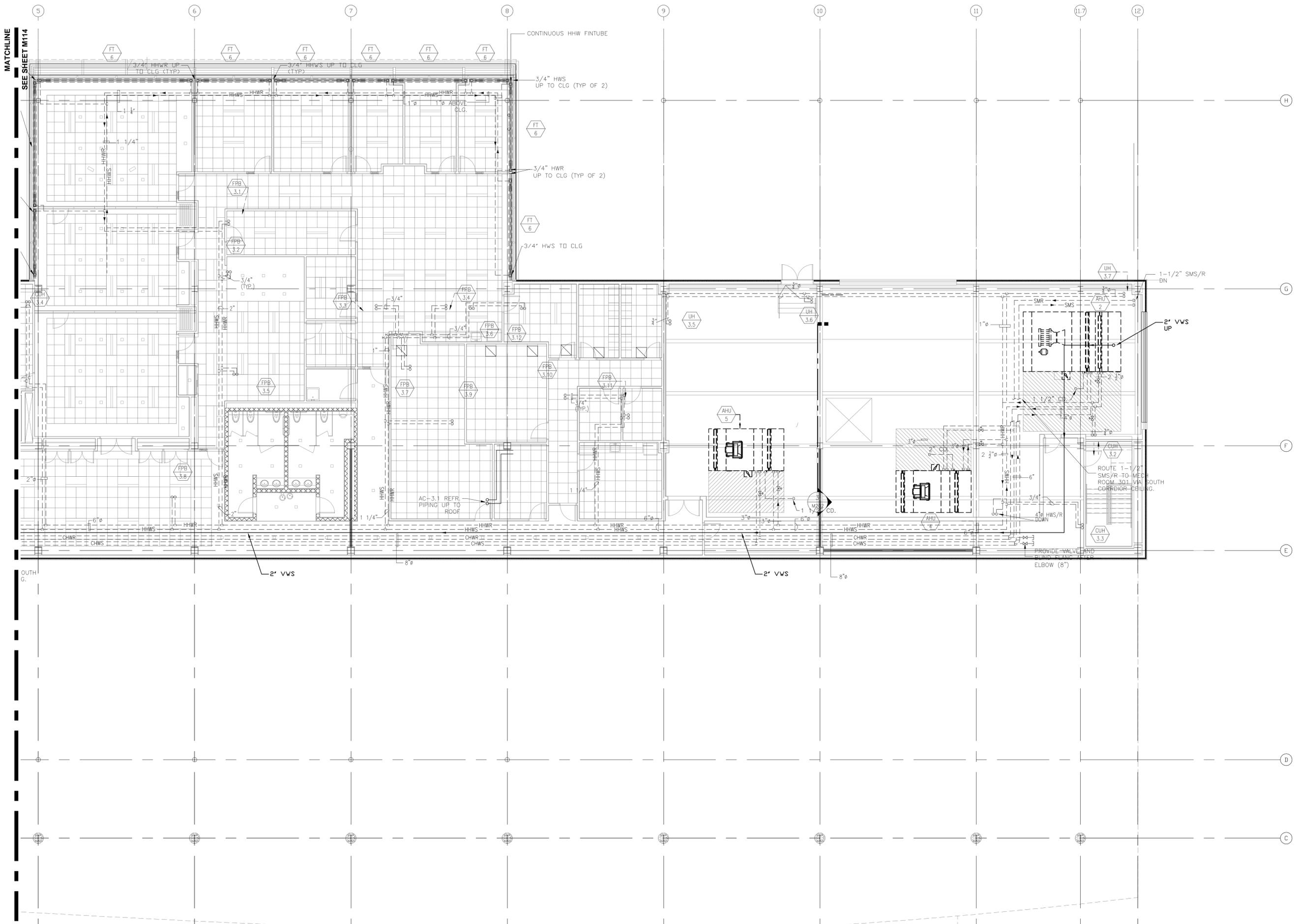
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SHEET TITLE  
**ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA A**

SHEET NUMBER  
**M114**

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MATCHLINE  
SEE SHEET M114



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SHEET TITLE  
**ENLARGED THIRD FLOOR MECHANICAL PIPING PLAN - AREA B**

SHEET NUMBER  
**M115**

VALE PROGRAM BID PACKAGE



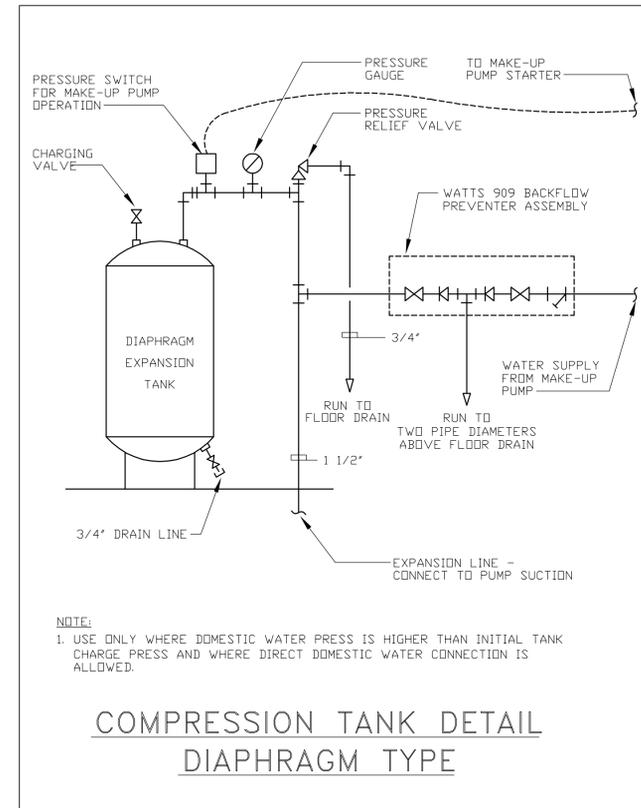
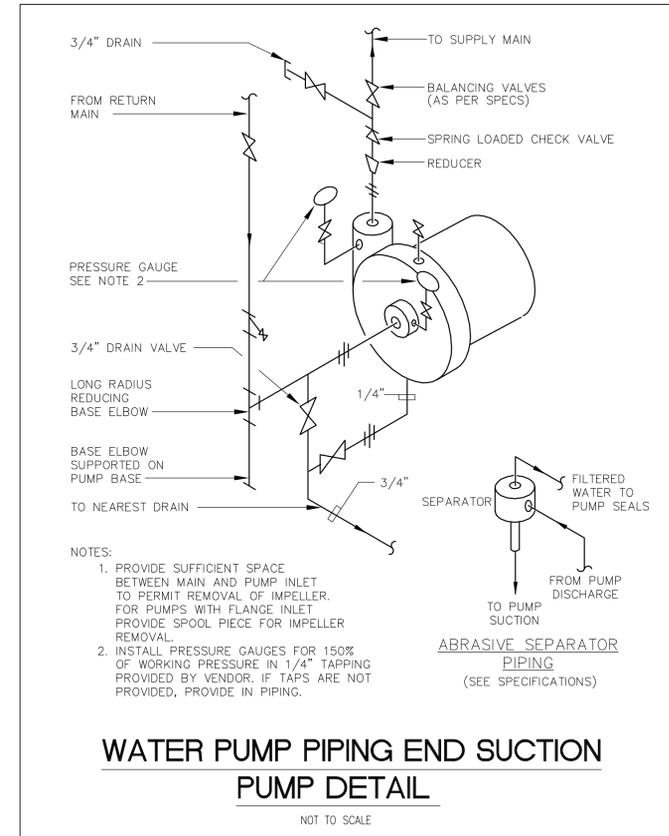
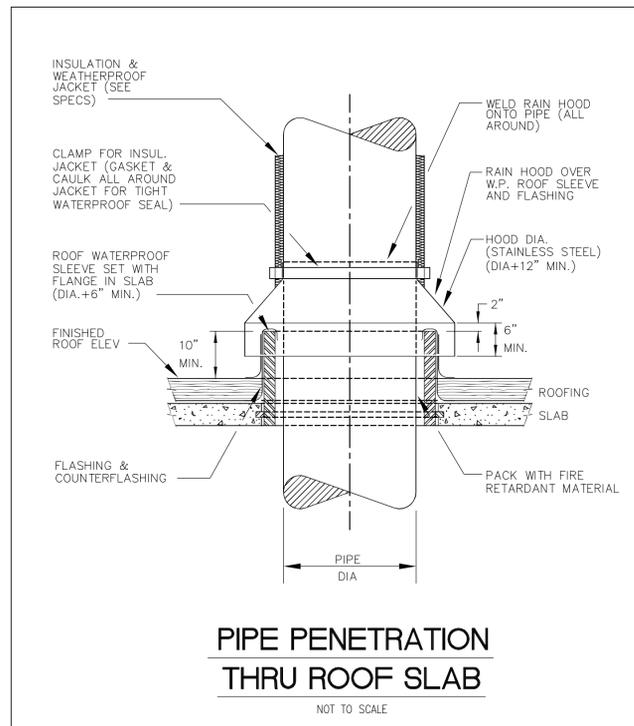
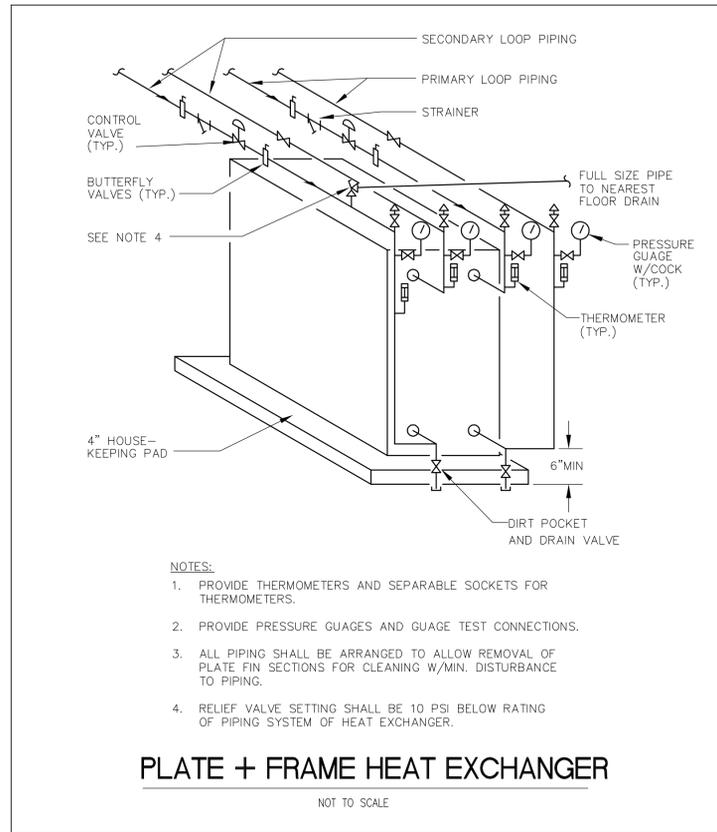
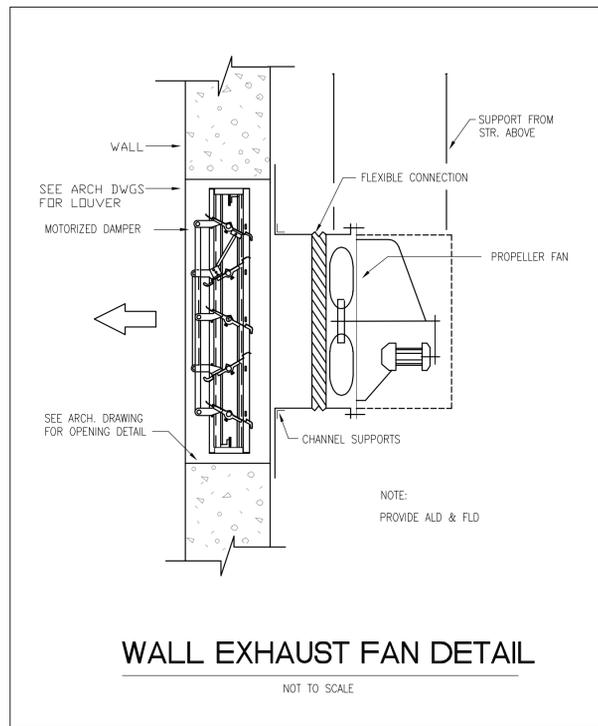
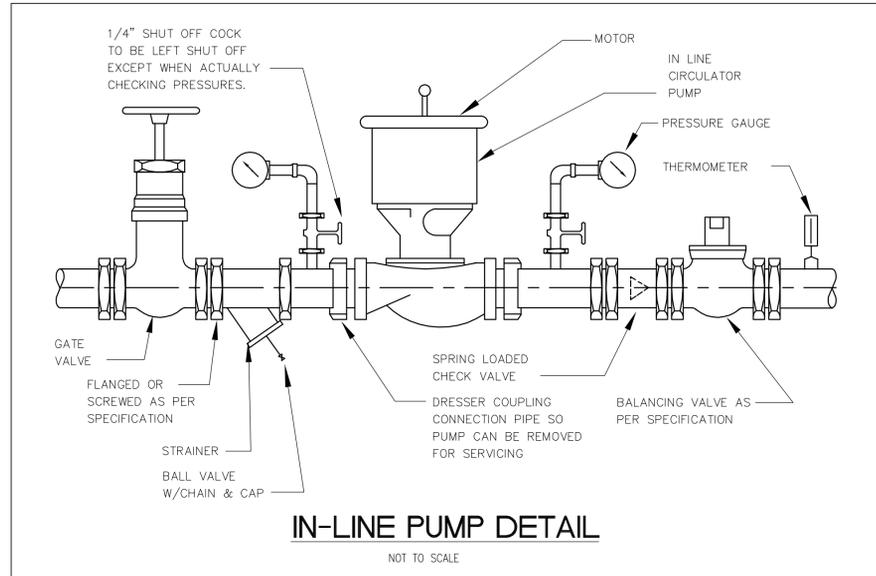
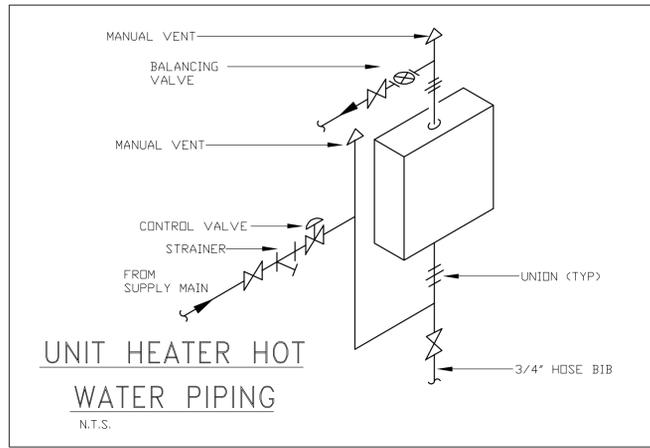












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**MECHANICAL DETAILS**

SHEET NUMBER

**M501**

VALE PROGRAM BID PACKAGE

SYMBOL	DESCRIPTION	NOTES
<b>LIGHTING FIXTURES</b>		
	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  INDICATES EMERGENCY LIGHTING:
	WALL MOUNTED LIGHTING FIXTURES	CIRCUITRY FOR EMERGENCY LIGHTING AND EXIT SIGNS ARE DESIGNATED WITH "E" BEFORE THE CIRCUIT NUMBER.
	FLOOR MOUNTED LIGHTING FIXTURE	
<b>EXIT SIGNS</b>		
	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.
<b>JUNCTION AND PULL BOXES -- SECONDARY LIGHT AND POWER WIRING</b>		
	PULL BOX OR JUNCTION BOX--OUTLET BOX TYPE WALL MOUNTED	
	PULL BOX OR JUNCTION BOX--OUTLET BOX TYPE MOUNTED AT CEILING	
	JUNCTION BOX	
<b>SECONDARY FEEDERS</b>		
	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	
<b>FIRE PROTECTIVE ALARM SYSTEMS SOUNDING AND VISUAL DEVICES</b>		
	SPEAKER	SUBSCRIPT -P- DENOTES PRESIGNAL SIGNAL SUBSCRIPT -T- DENOTES TROUBLE SIGNAL
	SPEAKER w/ VISUAL ALARM DEVICE	SYMBOLS AS SHOWN REPRESENT CLG MOUNTED DEVICES--CIRCUMSCRIBED CIRCLES THUS-
	VISUAL ALARM DEVICE	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
<b>FIRE PROTECTIVE ALARM SYSTEMS BASIC ITEMS</b>		
	CENTRAL EQUIPMENT OF SYSTEM	
	OUTLYING ANNUNCIATOR	

SYMBOL	DESCRIPTION	NOTES
<b>FIRE PROTECTIVE ALARM SYSTEM ACTUATING DEVICES</b>		
	MANUAL FIRE ALARM ACTUATING DEVICE OR STATION	SUBSCRIPT -K- DENOTES STRAP KEY STATION  SUBSCRIPT NUMBERS INDICATE ZONE OR CIRCUIT
	SPRINKLER ALARM ACTUATING DEVICE	SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:-  a--main alarm valve waterflow detector  W--WATERFLOW DETECTOR  T--TAMPER SWITCH  F--FLOAT SWITCH  FR--FIRE PUMP RUNNING ALARM RELAY CONTACTS  fp--fire pump power available alarm relay contacts  P--AIR PRESSURE SWITCH  DF--DRY PIPE AIR COMP. power failure  DP--DRY PIPE air comp. low air comp
	VALVE SUPERVISOR SWITCH	"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.
	AUTOMATIC FIRE DETECTION ALARM ACTUATING DEVICES SMOKE DETECTOR	SUBSCRIPT UPPER CASE LETTERS DENOTE THE FOLLOWING:-  SUBSCRIPT UPPER CASE LETTERS IN PARENTHESIS DENOTE DEVICE FUNCTION THUS:- (TE)--TOCCC (FE)--FLOOR EVACUATION
	DUCT SMOKE DETECTOR	-RT-FIRESTATION RATE OF RISE PLUS FIXED TEMPERATURE TYPE  -FT-FIRESTATION FIXED TEMPERATURE TYPE
	HEAT DETECTOR	
	BEAM TYPE SMOKE DETECTOR	
	INDICATES TRANSMITTER	
	INDICATES RECEIVER	
	ELECTRIC DOOR LOCK	SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING FIRESTATS DENOTE EXCEPTIONS TO SPECIFIED STANDARD TEMPERATURE SETTINGS
	DATA TRANSMISSION UNIT	SUBSCRIPT NUMBERS IN PARENTHESIS AT SYMBOLS REPRESENTING PNEUMATIC TUBE DIAPHRAGM SWITCHES DENOTE LENGTH OF ASSOCIATED TUBING
SYMBOL	DESCRIPTION	NOTES
<b>WIRING DEVICES</b>		
	WIRING DEVICE TYPE SWITCH	WITHOUT SUBSCRIPT NUMBER SYMBOL DENOTES "SINGLE POLE"  SUBSCRIPT NUMBERS DENOTE -2 POLE-, -3 WAY-, -4 WAY-, ETC.
	SWITCH WITH THERMAL OVERLOAD PROTECTION FOR 120V FRACTIONAL HP MOTORS	SUBSCRIPT UPPER CASE LETTERS DENOTE NON STANDARD TYPE REFERENCE TO SCHEDULE OF NON STANDARD WIRING DEVICES.
	KEY OPERATED SWITCH	SUBSCRIPT LETTERS IN PARENTHESIS THUS:-  (PL)
	AREA OF RESCUE ASSISTANCE INTERCOM STATION	INDICATE SEPARATE PILOT LIGHT.

SYMBOL	DESCRIPTION	NOTES
<b>WIRING DEVICES (CONT)</b>		
	WALL DUPLEX CONVENIENCE RECEPTACLE	SHADING OF SYMBOL THUS--  "D" INDICATES DEDICATED RECEPTACLE
	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	
	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	
	QUAD RECEPTACLE PENDANT MOUNTED FROM CEILING	
	CEILING DUPLEX RECEPTACLE	
	WALL SPECIAL PURPOSE POWER SUPPLY RECEPTACLE	
	FLOOR SPECIAL PURPOSE POWER SUPPLY RECEPTACLE	
	CEILING SPECIAL PURPOSE POWER SUPPLY RECEPTACLE	GANGING SYMBOL SHOWN IN CIRCUITRY RUN IN COMBINATION WITH ANY WIRING DEVICE SYMBOLS THUS-- DENOTES WIRING DEVICES WHICH ARE
	FLOOR BOX FOR ILLUMINATED SIGNS - COORDINATE WITH MANUFACTURER REQUIREMENTS FOR COMPONENTS.	
	WIRING DEVICE GANGING SYMBOL	TO BE GANGED IN A SINGLE COMMON PLATE OUTLET.
<b>MOTORS, PANELS, AND INDIVIDUALLY MOUNTED DEVICES AND EQUIPMENT - SECONDARY LIGHT AND POWER WIRING</b>		
	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	NOTES
<b>LIGHTING CONTROL - ALL LIGHTING CONTROL TO ACCOMMODATE 277V U.N.O.</b>		
	DESCRIPTION	MANUFACTURER/CAT. #
	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 DSSMT HUBBELL H-MOSS ADJ277W1
	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 DSSMD HUBBELL WS1277W2
	DIMMING SWITCH	
	INDOOR DAYLIGHTING SENSOR, CEILING MOUNTED.	SQUARE D C-BUS LIGHT LEVEL SENSOR
	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 DSC10-HDV HUBBELL DM1-DT-2000

SYMBOL	DESCRIPTION	NOTES
<b>TAG SYMBOLS</b>		
	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 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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SHEET TITLE  
**ELECTRICAL SYMBOLS**

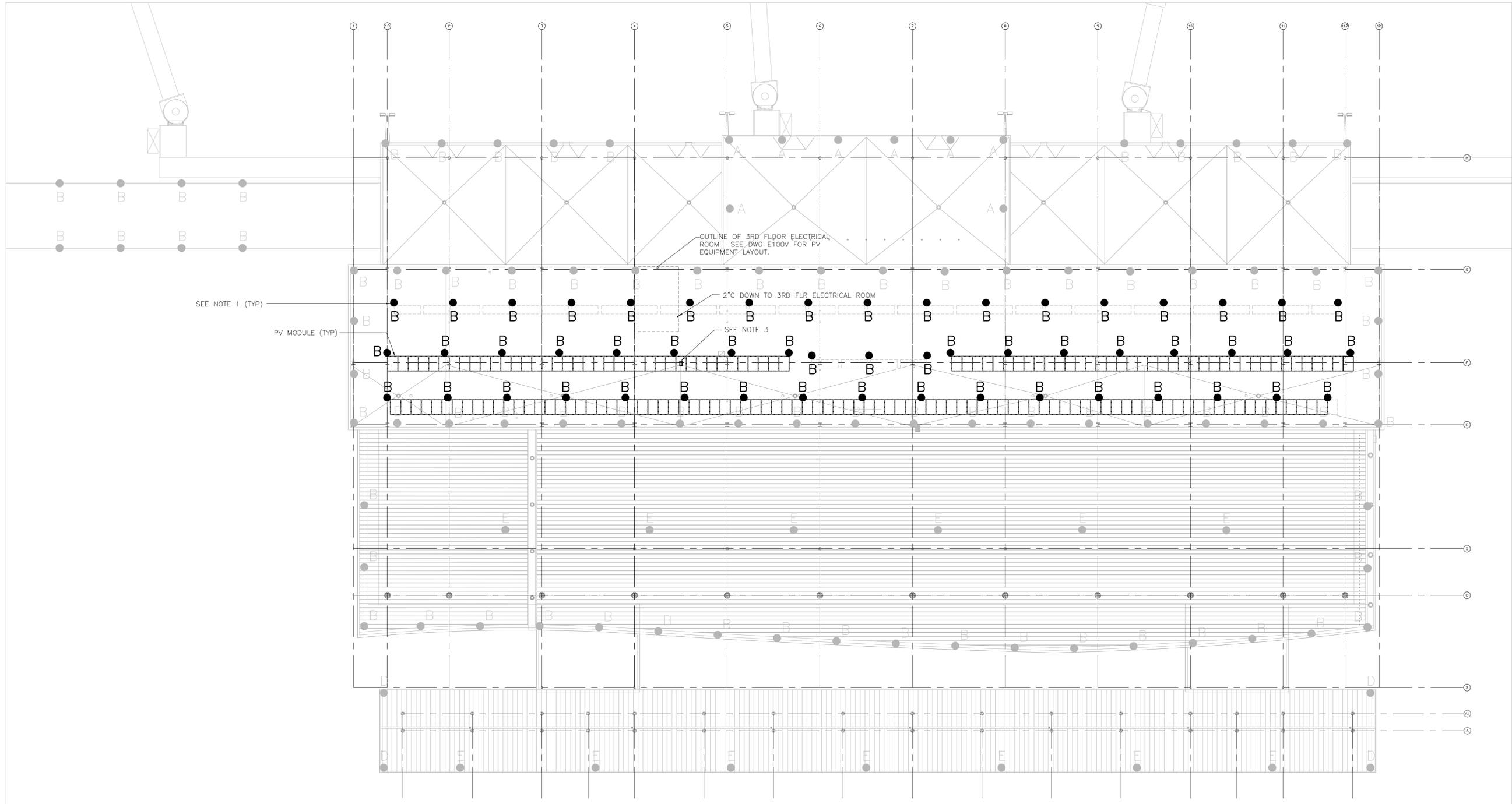
SHEET NUMBER  
**E001V**

VALE PROGRAM  
BID PACKAGE





- NOTES:**
- 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. EXISTING TO REMAIN AIR TERMINALS ARE SHOWN IN HALF TONE. NEW TERMINALS LOCATED NEAR PV EQUIPMENT ARE SHOWN ON DARKER LAYER. NOTE AIR TERMINALS SHALL BE INSTALLED 10" ABOVE PV ROOF MOUNTED EQUIPMENT. SEE DRAWING E300V FOR AIR TERMINAL DETAIL.
  - PROVIDE GROUNDING PROVISIONS FOR PV SYSTEM IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
  - LOCATION OF COMBINER WITH INTEGRAL DC DISCONNECT. COMBINER SHALL BE LOCATED UNDERNEATH PV MODULES ON TOP OF STRUCTURAL SUPPORT SYSTEM.
  - "L" FEET OF THE PV RACKING SHALL BE FIELD ATTACHED OR WELDED TO THE STRUCTURAL WIDE FLANGE BEAM.



N  
 1 **ELECTRICAL ROOF PLAN**  
 1/16" = 1'-0"



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NEW PASSENGER TERMINAL VALE PROGRAM

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REVISIONS

NO.	DESCRIPTION	DATE

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 DRAWN BY: JK  
 DESIGNED BY: JK

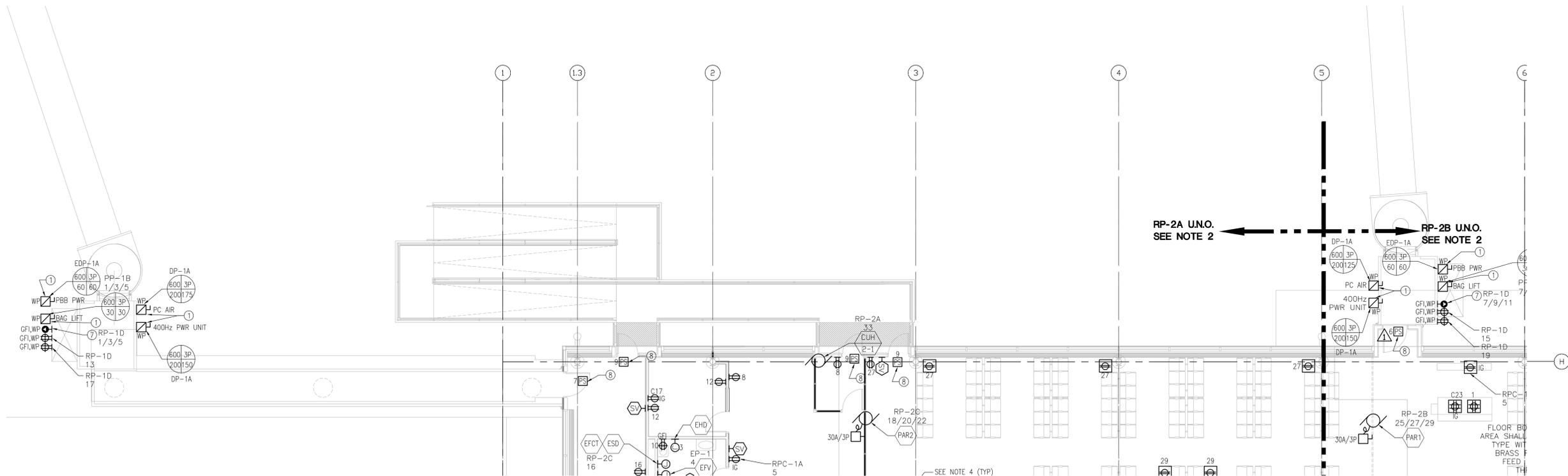
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SHEET TITLE  
**ELECTRICAL ROOF PLAN AND PV LAYOUT**

SHEET NUMBER

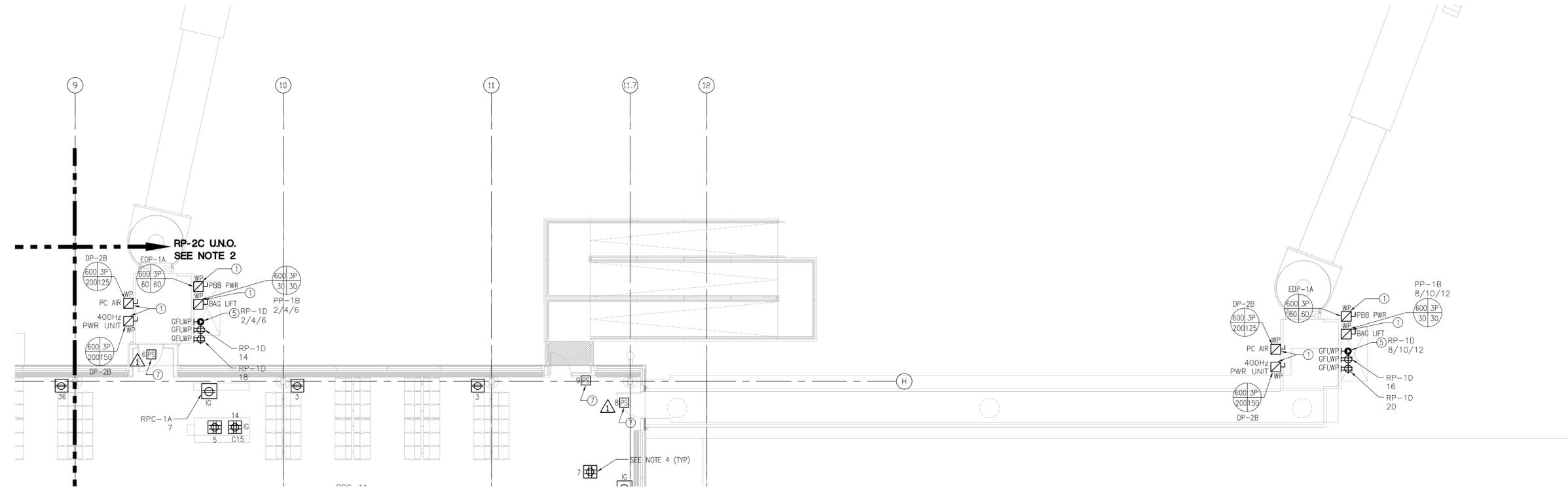
**E102V**

VALE PROGRAM  
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**2ND FLOOR PARTIAL ELECTRICAL PLAN**

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



**2ND FLOOR PARTIAL ELECTRICAL PLAN**

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

**DWG E103V NOTE:**

ONLY "PC AIR" AND "400Hz PWR UNIT" DISCONNECTS AND WORK ASSOCIATED WITH PROVIDING POWER FOR THIS EQUIPMENT IS CONSIDERED NEW WORK ON THIS DRAWING. OTHER DEVICES SHOWN ARE EXISTING TO REMAIN.

**KEYED NOTES:**

① VERIFY POWER REQUIREMENTS WITH MANUFACTURER OF EQUIPMENT FOR PASSENGER BRIDGE (PBB PWR), BAG LIFT, PC AIR AND 400Hz POWER UNIT. COORDINATE LOCATION OF POWER CONNECTION AND MOUNTING PROVISIONS WITH OWNER.



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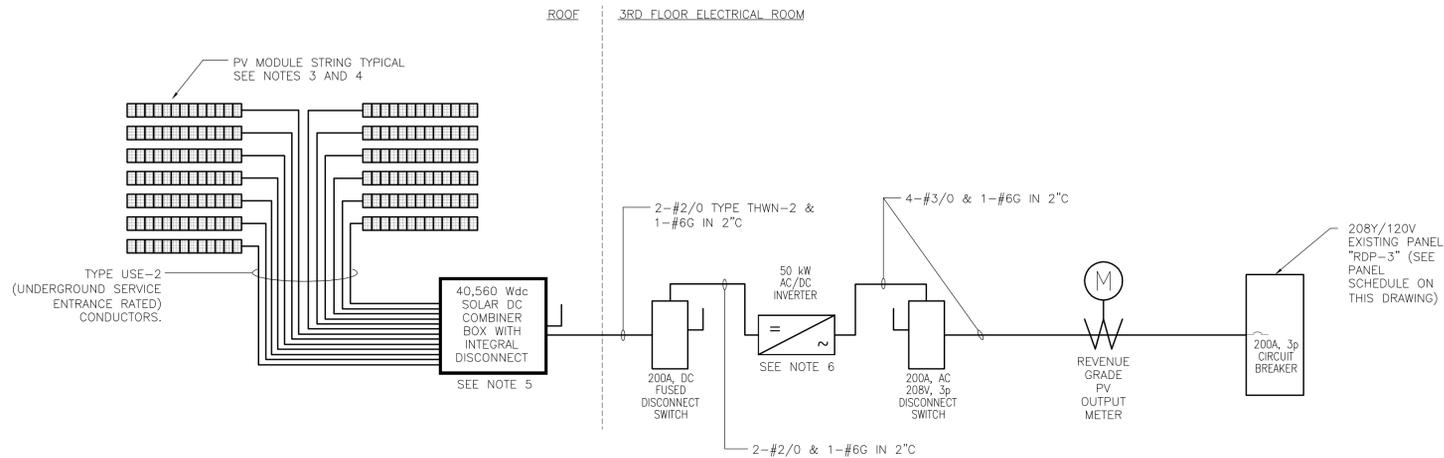
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DESIGNED BY: JK

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SHEET TITLE  
**PARTIAL 2ND FLOOR POWER PLAN**

**SHEET NUMBER**

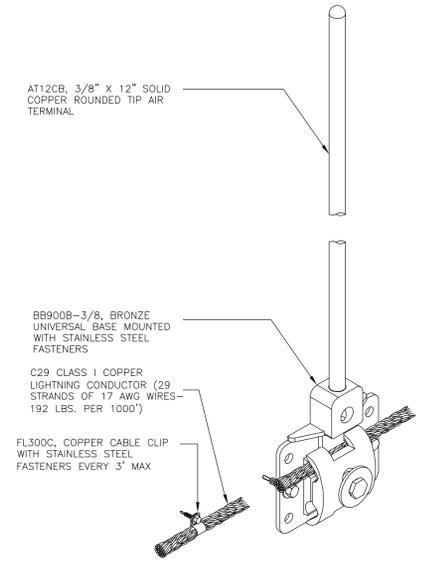
**E103V**  
OF  
**VALE PROGRAM BID PACKAGE**



**PV SYSTEM SINGLE LINE DIAGRAM**

NOT TO SCALE

- SINGLE LINE DIAGRAM NOTES:**
- USE COPPER CONDUCTORS THROUGHOUT.
  - TO PURCHASE ALL PRODUCTS RELATED TO THE PV SYSTEM, PLEASE CONTACT: GEXPRO, ANDY LYNCH, ENERGY SOLUTIONS SPECIALIST, MIDWEST. DIRECT: 630-718-6565, MOBILE: 630-935-1747, FAX: 630-718-6515, EMAIL: Andy.Lynch@gexpro.com
  - PROVIDE #6 CONTINUOUS GROUND BETWEEN PV MODULES AND RACKING.
  - EACH PV MODULE IS SOLARWORLD SW 240 MONO MODULE. THE ASSOCIATED RACKING IS SOLAR MOUNT TILT RAIL SYSTEM. RACKING SHOULD BE TILTED SOUTH AT A FIXED 30 DEGREES.
  - DC COMBINER BOX WITH INTEGRAL DISCONNECT SWITCH IS BY COOPER CROUSE-HINDS, MODEL #CCBS14 DS200 TYPE 3R.
  - INVERTER IS BY SATCON, MODEL #PVS-50(208V).



**AIR TERMINAL DETAIL "B"**

NOT TO SCALE

PANEL DISTRIBUTION: RDP-3 (EX. PNL)					
SERVICE: 208/120V, 3PH, 4W + GND					
BUS SIZE: 250A		LOAD:		NOTES:	
MAIN DEVICE: 250A		CONN	LOAD (kVA)	CIRCUIT BREAKER PNL	
		DEM.	41.0		
		DEM.	113.9		
FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN. DEM.	DEVICES (A) CB	REMARKS	
1	PANEL "RP-3A"	19.0 19.0	150		
2	PANEL "RP-3B"	22.0 22.0	150		
3	PV SYSTEM	0.0 0.0	200	NEW CIRCUIT BREAKER	

PANELBOARD: EP-3 (EXISTING PNL)										
SERVICE: 480/277V, 3PH, 4W + GND										
BUS SIZE: 200A		LOAD:		NOTES:						
MAIN DEVICE: 150A		CONN	LOAD (kVA)	FUSIBLE SWITCH PANEL						
		DEM.	75.8	1 - PROVIDE NEW SWITCH/FUSE						
		DEM.	91.2	2 - PROVIDE NEW FUSE						
CKT #	SW/FUSE POLE	CONNECTED LOAD (VA)			CIRCUIT DESCRIPTION	SW/FUSE POLE	CKT #			
		PHASE A	PHASE B	PHASE C				PHASE A	PHASE B	PHASE C
1		0	2,106				2			
3	30A/30AF			0	2,106		4			
5	3P					0	6			
7		0	2,106				8			
9	60A/40AF			0	2,106		10			
11	3P					0	12			
13		0	2,106				14			
15	30A/			0	2,106		16			
17	3P					0	18			
19		7,482	0				20			
21	60A/40AF			7,482	0		22			
23	3P					7,482	24			
25		3,048	942				26			
27	30A/20AF			3,048	942		28			
29	3P					3,048	30			
31		7,482	0				32			
33	60A/40AF			7,482	0		34			
35	3P					7,482	36			
37		0	0			0	38			
39	30A/			0	0		40			
41	3P					0	42			
TOTAL CONNECTED LOADS:		18,012	7,260	18,012	7,260	18,012	7,260			

PANELBOARD: PP-3C (NEW PNL)										
SERVICE: 480/277V, 3PH, 4W + GND										
BUS SIZE: 225A		LOAD:		NOTES:						
MAIN DEVICE: 225A		CONN	LOAD (kVA)	CIRCUIT BREAKER PANEL						
		DEM.	80.1							
		DEM.	80.1							
		DEM.	96.4							
CKT #	TRIP/ POLE	CONNECTED LOAD (VA)			CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #			
		PHASE A	PHASE B	PHASE C				PHASE A	PHASE B	PHASE C
1		11,085	11,085				2			
3	80/3						4			
5							6			
7		942	942				8			
9	15/3						10			
11							12			
13		1,330	1,330				14			
15	15/3						16			
17							18			
19							20			
21							22			
23							24			
25							26			
27							28			
29							30			
31							32			
33							34			
35							36			
37							38			
39							40			
41							42			
TOTAL CONNECTED LOADS:		13,357	13,357	13,357	13,357	13,357	13,357			

PANEL SCHEDULES NOTE:  
ALTHOUGH PANELS ARE EXISTING, PROVIDE NEW OVERCURRENT PROTECTION DEVICES WHERE INDICATED ON SCHEDULES.

SWBD DISTRIBUTION: SB-3 (EX. PNL)					
SERVICE: 480/277V, 3PH, 4W + GND					
BUS SIZE: 2000A		LOAD:		NOTES:	
MAIN DEVICE: 2000A		CONN	LOAD (kVA)	CIRCUIT BREAKER PNL	
		DEM.	1038.0		
		DEM.	1249.1		
FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN. DEM.	DEVICES (A) CB	REMARKS	
1	CHILLER "CH-1"	310.0 310.0	500		
2	CHILLER "CH-2"	310.0 310.0	500		
3	SPARE		400		
4	PNL "PP-3C"	80.0 80.0	225	NEW CIRCUIT BREAKER	
5	PNL "DP-3"	338.0 338.0	600		

PANELBOARD: RP-3A (EXISTING PANEL)										
SERVICE: 208/120V, 3PH, 4W + GND										
BUS SIZE: 225A		LOAD:		NOTES:						
MAIN DEVICE: 150A		CONN	LOAD (kVA)	CIRCUIT BREAKER PANEL						
		DEM.	21.7	1 - CONFIRM OCP SIZE WITH EQUIP. MANUFACTURER						
		DEM.	21.7	2 - PROVIDE NEW CIRCUIT BREAKER						
CKT #	TRIP/ POLE	NOTES	CONNECTED LOAD (VA)			CIRCUIT DESCRIPTION	TRIP/ POLE	CKT #		
			PHASE A	PHASE B	PHASE C			PHASE A	PHASE B	PHASE C
1	15/1	"UH-3.1"	528	528		"UH-3.8"	2	15/1	2	
3	15/1	"UH-3.2"		528	528	"UH-3.9"	2	15/1	4	
5	15/1	"UH-3.5"			528	1,200			6	
7	15/1	"UH-3.3"	528	720					8	
9	20/1	REC-MECH RM		1,440	720				10	
11	20/1	REC-MECH-ELEC RM			720	180			12	
13	20/1	REC-GENERAL	720	0					14	
15	20/1	WTR HTR "WH-1"		240	0				16	
17	20/1	WTR HTR "WH-2"			240	360			18	
19	20/1	REC-WASHRMS	360	300					20	
21	20/1	REC-GENERAL		360	300				22	
23	15/1	"CUH-3.4"			528	300			24	
25	15/1	"CUH-3.1"	528	0					26	
27	15/1	"EF-3.1"		528	0				28	
29	15/1	"EF-3.2"			528	0			30	
31	15/1	"EF-3.3"	528	864					32	
33	20/1	1 WASHRM-ELEC DRYER		1,500	864				34	
35	20/1	1 WASHRM-ELEC DRYER			1,500	50			36	
37	20/1	1 WASHRM-ELEC DRYER	1,500	0					38	
39	20/1	1 WASHRM-ELEC DRYER		1,500	0				40	
41	20/1	SPARE			0	0			42	
TOTAL CONNECTED LOADS:		4,692	2,412	6,096	2,412	4,044	2,090			

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DESIGNED BY: JK

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SHEET TITLE  
**PV RISER DIAGRAM & PANEL SCHEDULES**

SHEET NUMBER  
**E300V**  
OF  
VALE PROGRAM BID PACKAGE



PANEL DISTRIBUTION: DP-1A (EX. PNL)						
SERVICE: 480/277V, 3PH, 4W + GND						
BUS SIZE: 1200A		LOAD:		NOTES		
MAIN DEVICE: 1200A		CONN	787.0 kVA	1-REVISE CB SIZE AS SHOWN		
		DEM.	779.0 kVA			
		DEM.	937.4 Amps			
FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEVICES (A) DEM.	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	PC AIR-GATE #1	116.0	116.0	175	NOTE 1	
5	400Hz PWR UNIT-GATE #1	111.0	111.0	150		
6	PC AIR-GATE #2	76.0	76.0	125	NOTE 1	
7	400Hz PWR UNIT-GATE #1	111.0	111.0	150		

PANEL "DP-1A" NOTE:

PREVIOUS PANEL SCHEDULE INDICATED (2) 150A/3P CIRCUIT BREAKERS LABELED "FUT. LOAD SHED" AND (1) 100A/3P LABELED AS "SPARE" - THESE SHOULD BE REMOVED (AS NOW IN SCHEDULE ABOVE)

PANEL DISTRIBUTION: DP-2A (NEW PNL)						
SERVICE: 480/277V, 3PH, 4W + GND						
BUS SIZE: 800A		LOAD:		NOTES		
MAIN DEVICE: 800A		CONN	374.0 kVA			
		DEM.	374.0 kVA			
		DEM.	450.1 Amps			
FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEVICES (A) DEM.	CB	REMARKS	
1	PC AIR-GATE #3	76.0	76.0	125		
2	400Hz PWR UNIT-GATE #3	111.0	111.0	150		
3	PC AIR-GATE #4	76.0	76.0	125		
4	400Hz PWR UNIT-GATE #4	111.0	111.0	150		
5	SPARE			200		

SWGR DISTRIBUTION: MSG-1A W/TVSS						
SERVICE: 480/277V, 3PH, 4W + GND						
BUS SIZE: 2000A		LOAD:		EXISTING		
MAIN DEVICE: 2000A		CONN	1534.0 kVA	SWITCHGEAR		
		DEM.	1534.0 kVA			
		DEM.	1846.0 Amps			
FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEVICES (A) DEM.	CB	AF	AT
1	SWITCHBOARD "SB-3"	1038.0	1038.0	2000	2000	
2	"ATS-1" (EM LTG)	23.0	23.0	800	150	
3	PNL "DP-2A"	374.0	374.0	800	800	NEW 800AT
4	PNL "DP-ELEV"	99.0	99.0	800	200	
5	SPARE			800		

PANEL/SWITCHGEAR SCHEDULE NOTE:

ALTHOUGH PANELS AND SWITCHGEAR ARE EXISTING U.N.O., PROVIDE NEW OVERCURRENT PROTECTION DEVICES AND FEEDERS WHERE INDICATED ON SCHEDULES.

SWGR DISTRIBUTION: MSG-1B W/TVSS						
SERVICE: 480/277V, 3PH, 4W + GND						
BUS SIZE: 2000A		LOAD:		EXISTING		
MAIN DEVICE: 2000A		CONN	1635.0 kVA	SWITCHGEAR		
		DEM.	1627.0 kVA			
		DEM.	1957.9 Amps			
FEEDER No:	FEEDER CONTROLLED	LOAD (kVA) CONN.	DEVICES (A) DEM.	CB	AF	AT
1	PNL "DP-1A"	787.0	779.0	1200	1200	
2	"ATS-4" (CRITICAL)	633.0	633.0	1200	1200	
3	"ATS-3" (CRITICAL)	134.0	134.0	800	350	
4	PNL "LDP-1A"	81.0	81.0	800	400	
5	SPARE			800		



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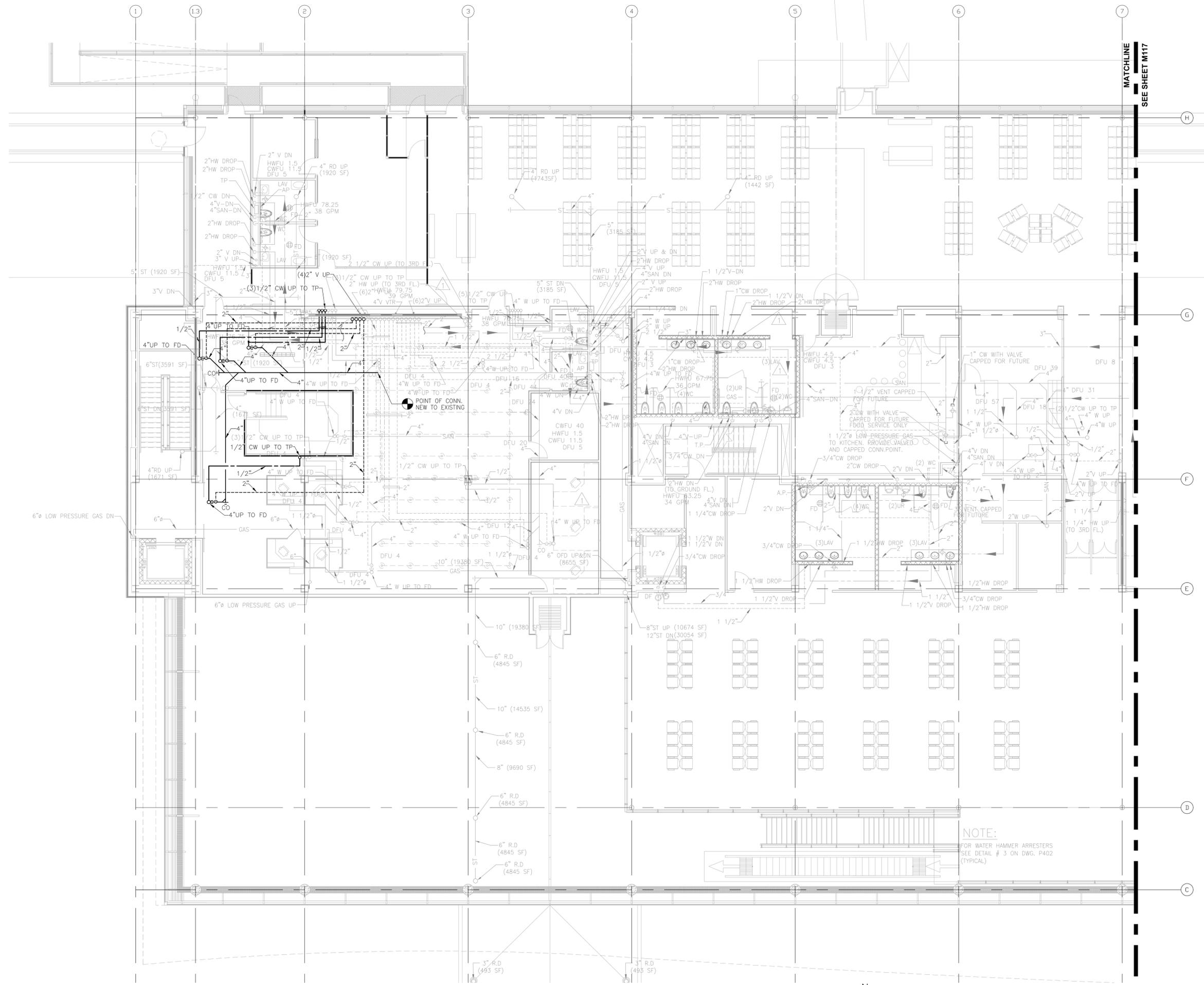
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SHEET TITLE  
**PANEL SCHEDULES**

SHEET NUMBER

**E302V**  
OF  
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SHEET TITLE  
**ENLARGED SECOND FLOOR PLUMBING PLAN AREA A**

SHEET NUMBER  
**P112**

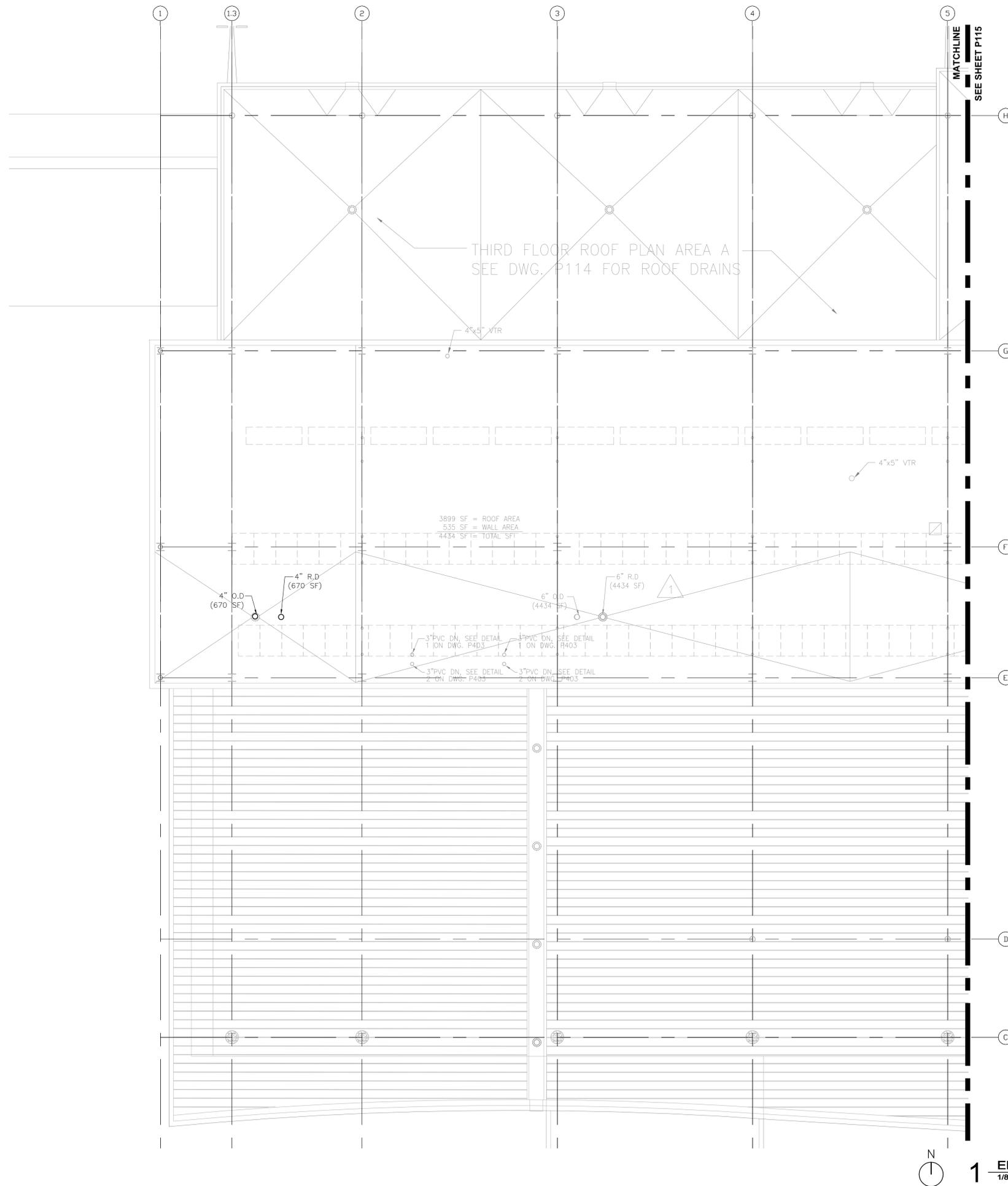
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NOTE:  
 FOR WATER HAMMER ARRESTERS  
 SEE DETAIL # 3 ON DWG. P402  
 (TYPICAL)



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





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



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SHEET TITLE  
**ENLARGED ROOF LEVEL PLUMBING PLAN - AREA A**

SHEET NUMBER  
**P116**

VALE PROGRAM  
BID PACKAGE





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SHEET TITLE  
**ENLARGED  
THIRD FLOOR  
FIRE PROTECTION  
PLAN - AREA A**

SHEET NUMBER  
**F114**

VALE PROGRAM  
BID PACKAGE



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