

# DAVIS APPLIED TECHNOLOGY COLLEGE MAIN BUILDING PHOTOVOLTAIC PROJECT

550 EAST 300 SOUTH, KAYSVILLE, UTAH 84037

## DFCM PROJECT #10224220

SPARANO + MOONEY  
ARCHITECTURE



511 WEST 200 SOUTH #130  
SALT LAKE CITY, UT 84101  
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MAY 9, 2011 BID SET

### PROJECT TEAM

#### OWNER:



State of Utah—Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION  
AND MANAGEMENT

4110 State Office Building/Salt Lake City, Utah 84114/538-3018

#### ARCHITECT:

SPARANO + MOONEY ARCHITECTURE, INC.  
511 WEST 200 SOUTH SUITE 130  
SALT LAKE CITY, UT 84101  
(801) 746-0234

#### ELECTRICAL ENGINEER:

ELECTRICAL CONSULTING ENGINEERS, INC.  
939 SOUTH WEST TEMPLE  
SALT LAKE CITY, UT, 84101  
(801) 521-8007  
CONTACT: WILLIE OVIEDA



VICINITY MAP

NOT TO SCALE

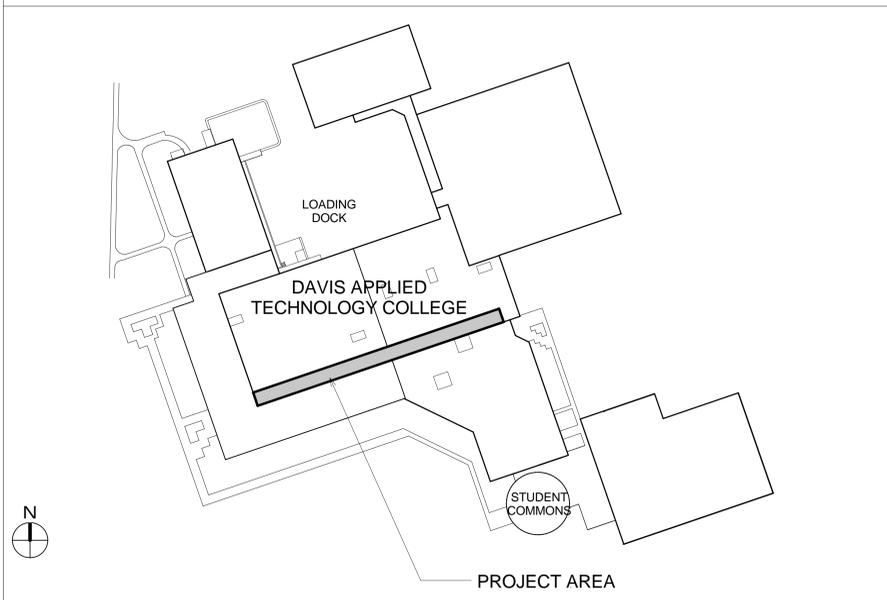


PROJECT LOCATION  
KAYSVILLE, UTAH



PROJECT LOCATION MAP

SCALE: 1" = 80'-0"



PROJECT AREA

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DAVIS APPLIED TECHNOLOGY COLLEGE  
MAIN BUILDING PHOTOVOLTAIC PROJECT

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CONSULTANT

SEAL



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SCALE REDUCED ACCORDINGLY

KEY PLAN

COVER SHEET

DFCM PROJECT # 10224220 SHEET NO.

SMA PROJECT# 1180

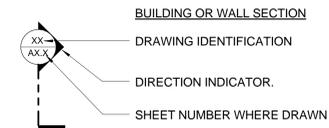
DRAWN BY: SS

DATE: MAY 9, 2011

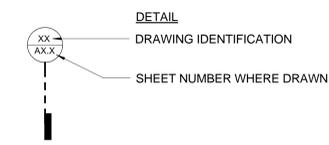
G0.10

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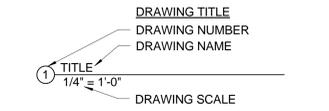
**DRAWING SYMBOLS**



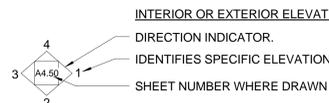
**BUILDING OR WALL SECTION**  
 DRAWING IDENTIFICATION  
 DIRECTION INDICATOR  
 SHEET NUMBER WHERE DRAWN



**DETAIL**  
 DRAWING IDENTIFICATION  
 SHEET NUMBER WHERE DRAWN



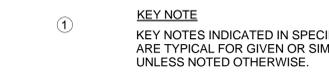
**DRAWING TITLE**  
 DRAWING NUMBER  
 DRAWING NAME  
 DRAWING SCALE



**INTERIOR OR EXTERIOR ELEVATION**  
 DIRECTION INDICATOR  
 IDENTIFIES SPECIFIC ELEVATION  
 SHEET NUMBER WHERE DRAWN



**ELEVATION REFERENCE**  
 ELEVATION IDENTIFICATION  
 ELEVATION HEIGHT



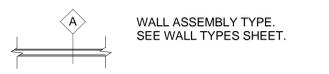
**KEY NOTE**  
 KEY NOTES INDICATED IN SPECIFIC DETAILS ARE TYPICAL FOR GIVEN OR SIMILAR CONDITIONS UNLESS NOTED OTHERWISE.



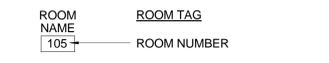
**GRID LINE**  
 GRID BUBBLE  
 GRID ALPHANUMERIC ANNOTATION  
 GRID LINE



**CLEAR FINISH DIMENSION**



**WALL ASSEMBLY TYPE**  
 SEE WALL TYPES SHEET.



**ROOM TAG**  
 ROOM NUMBER



**DOOR TAG**



**WINDOW TAG**



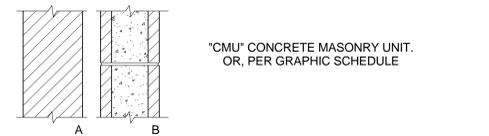
**CEILING HEIGHT**

**GRAPHIC SYMBOLS**

**DESCRIPTION**



CONCRETE OR CEMENTITIOUS MATERIAL



"CMU" CONCRETE MASONRY UNIT, OR, PER GRAPHIC SCHEDULE



PLYWOOD



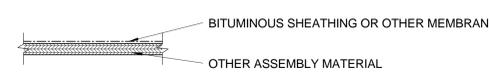
CEMENT PLASTER



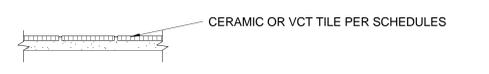
STEEL



FIBER BOARD



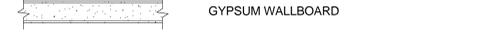
RIGID INSULATION



BITUMINOUS SHEATHING OR OTHER MEMBRANE



OTHER ASSEMBLY MATERIAL



CERAMIC OR VCT TILE PER SCHEDULES



INSULATION: THERMAL OR SOUND AS REQUIRED BY ASSEMBLY DETAIL



GYPSUM WALLBOARD



CONTINUOUS WOOD MEMBER



WOOD MEMBER INTERRUPTED AT SHORT INTERVALS OR BLOCKING



STEEL STUDS (DRAWINGS AT LARGER SCALES)



TRACK



STEEL STUD

**ARCHITECTURAL ABBREVIATIONS**

A.B.	ANCHOR BOLT	ELEV.	ELEVATOR	L.A.	LANDSCAPE AREA	SGL.	SINGLE
ABV.	ABOVE	E.O.C.	EMERGENCY OPERATIONS CENTER	L.A.M.	LAMINATED	SHTG.	SHEATHING
A.C.	ASPHALTIC CONCRETE	EQ.	EQUAL	L.A.V.	LAVATORY	SHLV.	SHELVING
ACOUS.	ACOUSTICAL	EQUIP.	EQUIPMENT	L.B.S.	POUNDS	SHT.	SHEET
A.C.T.	ACOUSTICAL CEILING TILE	ETC.	ETCETERA	LIB.	LIBRARY	SIM.	SIMILAR
ADJ.	ADJUSTABLE, ADJACENT	E.W.C.	ELECTRIC WATER COOLER	L.P.	LOW POINT	SL.	SLOPE
A.F.	ACCESS FLOORING	EXH.	EXHAUST	LTG.	LIGHTING	S.M.	SHEET METAL
A.F.F.	ABOVE FINISH FLOOR	EXP.D.	EXPOSED	M.B.	MACHINE BOLT	S.M.D.	SEE MECHANICAL DRAWINGS
ALUM.	ALUMINUM	EXT.	EXTERIOR	MAT.L.	MATERIAL	S.P.D.	SEE PLUMBING DRAWINGS
ANOD.	ANODIZED	F.D.	FLOOR DRAIN	MAX.	MAXIMUM	SPEC.	SPECIFICATIONS
A.P.	ACCESS PANEL	F.E.	FIRE EXTINGUISHER	MDL.	MODEL	S.Q.	SQUARE
ARCH.	ARCHITECTURAL	F.E.C.	FIRE EXTINGUISHER CABINET	MECH.	MECHANICAL	S.R.F.	SHEET RUBBER FLOORING
ASPH.	ASPHALT	F.F.	FINISH FLOOR	MED.	MEDIUM	S.S.	STAINLESS STEEL
A.W.P.	ACOUSTICAL WALL PANEL	F.G.	FINISH GRADE	MFR.	MANUFACTURER	S.S.D.	SEE STRUCTURAL DRAWINGS
		F.H.C.	FIRE HOSE CABINET	MFRD.	MANUFACTURED	ST.	STONE
BD.	BOARD	FIN.	FINISH	MIN.	MINIMUM	STD.	STANDARD
BLDG.	BUILDING	FIXT.	FIXTURE	MOUNT.	MOUNTED	STL.	STEEL
BLK.	BLOCK OR BLOCKING	FL.	FLOOR	M.R.G.B.	MOISTURE RESISTANT GYP BD	STN.	STAIN
BM.	BEAM	F.O.	FACE OF	M.S.	MAGNETIC SWITCH	STOR.	STORAGE
BRKT.	BRACKET	F.O.C.	FACE OF CONCRETE	MTL.	METAL	STRUCT.	STRUCTURAL
B.U.R.	BUILT UP ROOF	F.O.S.	FACE OF STUD	N.	NORTH	SUSP.	SUSPENDED
BOT.	BOTTOM	FRAM.G.	FRAMING	N/A	NOT APPLICABLE	SW.	SWITCH
C.	CARPET	F.S.	FINISH SURFACE	N/C	NOT IN CONTRACT	T.	TREAD
CAB.	CABINET	FT.	FOOT OR FEET	N-R	NON-RATED	T & B	TOP & BOTTOM
C.B.	CATCH BASIN	FTG.	FOOTING	O/	OVER	T.C.	TOP OF CURB
CEM.	CEMENT	FURR.	FURRING	O.C	ON CENTER	TEL.	TELEPHONE
C.I.	CAST IRON	G.	GAS LINE	OCCUP.	OCCUPANCY	TEMP.	TEMPERED
C.I.P.	CAST IN PLACE	G.A.	GAUGE	O.D.	OUTSIDE DIAMETER	T & G	TONGUE & GROOVE
C.J.	CONTROL JOINT	GALV.	GALVANIZED	O.P.P.	OPPOSITE	T.G.	TREE GRATE
C.L.	CHAIN LINK	G.C.	GENERAL CONTRACTOR	O.T.S.	OPEN TO STRUCTURE	THK.	THICK
CLG.	CEILING	G.I.	GALVANIZED IRON	PL.	PLATE	TJI	TRUSS JOIST
CLR.	CLEAR	GL.	GLASS	PL. CEM.	PLASTER CEMENT	T.O.	TOP OF
CLOS.	CLOSET	GLZ.	GLAZING	P.LAM.	PLASTIC LAMINATE	T.O.C.	TOP OF CONCRETE
C.M.U.	CONCRETE MASONRY UNIT	GYP.	GYPSUM	PLAS.	PLASTIC	T.O.P.	TOP OF PARAPET
COL.	COLUMN	GWB	GYPSUM WALLBOARD	PLY.	PLYWOOD	T.O.PL.	TOP OF PLATE
COMM.	COMMUNICATION	H.	HIGH	P.P.	POWER POLE	T.P.	TOILET PARTITION
COMPTR.	COMPUTER	H.C.	HOLLOW CORE OR HANDICAPPED	PR.	PAIR	TYP.	TYPICAL
CONC.	CONCRETE	H.D.	HOT DIPPED GALVANIZED	PRE.	FACTORY PREFINISHED	TS	TUBE STEEL
CONST.	CONSTRUCTION	H.D.G.	HOT DIPPED GALVANIZED	PROJ.	PROJECTION	U.B.C.	UNIFORM BUILDING CODE
CONT.	CONTINUOUS, CONTROL	HDR.	HEADER	PT.	PAINT	U.N.O.	UNLESS NOTED OTHERWISE
CORR.	CORRIDOR	H.D.W.	HARDWOOD	PTD.	PAINTED	U.O.C.	UNLESS OTHERWISE CALLED
C.P.	CONTROL POINT	HDWR.	HARDWARE	PVMT.	PAVEMENT	U.O.N.	UNLESS OTHERWISE NOTED
C.T.	CERAMIC TILE	H.M.	HOLLOW METAL	R.	RADIUS	V.C.T.	VINYL COMPOSITION TILE
C.T.B.	CERAMIC TILE BASE	HORIZ.	HORIZONTAL	R.A.	RETURN AIR	VCP.	VITRIFIED CLAY PIPE
DEPT.	DEPARTMENT	H.P.	HIGH POINT	R.B.	RUBBER BASE	VERT.	VERTICAL
DET.	DETAIL	HR.	HOUR	R.C.P.	REFLECTED CEILING PLAN	VEST.	VESTIBULE
D.F.	DRINKING FOUNTAIN	HT.	HEIGHT	RE.	REFER TO	V.P.	VENEER PLASTIC
DIA.	DIAMETER	HTR.	HEATER	REF.	REFRIGERATOR	W.	WEST
DIAG.	DIAGONAL	HYDR.	HYDRAULIC	REINF.	REINFORCING	W.AINS.	WAINSCOT
DIM.	DIMENSION	IN.	INCHES	REQD.	REQUIRED	W.C.	WATER CLOSET
DIV.	DIVISION(S)	INSUL.	INSULATION	REV.	REVISION	WD.	WOOD
DN.	DOWN	INT.	INTERIOR	RI.	RISER	W/H	WATER HEATER
DR.	DOOR	JAN.	JANITOR	RM.	ROOM	WDW.	WINDOW
DS.	DOWNSPOUT	JST.	JOIST	R.R.	RUBBER FLOORING W/ PROFILE RINGS	W.M.	WIRE MESH
DWGS.	DRAWINGS	KITCH.	KITCHEN	R.T.	RUBBER TREAD/RISER	WP.	WEATHERPROOF
EA.	EACH			S.	SOUTH	W/	WITH
E.	EAST			S.A.	SUPPLY AIR	W.R.	WATER RESISTANT
(E)	EXISTING			S.A.Q.D.	SEE AQUATICS DRAWINGS	W.R.G.B.	WATER RESISTANT GYPSUM BOARD
EXIST.	EXISTING			S.C.	SOLID CORE	W.W.M.	WELDED WIRE MESH
EXTG.	EXPANSION JOINT			SCHED.	SCHEDULE	#	DIAMETER
EL.	ELEVATION			SEAL.	CONCRETE OR STONE SEALER	Q &	POUND OR NUMBER
ELEC.	ELECTRICAL			SECT.	SECTION	@	CENTERLINE
				S.E.D.	SEE ELECTRICAL DRAWINGS		AND
				SERV.	SERVER		AT
				S.F.	SQUARE FEET		

**GRAPHIC NOTES**

- DIMENSIONS:**  
 NOTE: DIMENSIONS IN THESE DRAWINGS ARE GENERALLY PLACED AS INDICATED BELOW, UNLESS NOTED OTHERWISE.
- MASONRY: TO UNFINISHED FACE (NOTE @ SPLIT FACE CONDITION THESE DRAWINGS ASSUME STANDARD 8" OR 12" WIDE BLOCK)
  - CONCRETE: TO UNFINISHED FACE
  - STRUCTURAL: TO STEEL OR TUBING FACE OR CENTER LINE
  - COLUMNS: CENTER LINE
  - NONBEARING PARTITIONS: TO FACE OF STUD. SEE NOTE 9 BELOW
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL ARCHITECTURAL DIMENSIONS TO ASSURE PROPER PLACEMENT OF ALL PARTS AND MATERIALS IN CONJUNCTION WITH ALL OTHER DISCIPLINES REPRESENTED IN THESE DOCUMENTS, PRIOR TO COMMENCING WORK.
  - VERIFY ALL DIMENSIONS INCLUDING SITE CONDITIONS BEFORE STARTING WORK.
  - WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALE.
  - DIMENSION GRAPHICS:
- 
- 'CLR.' MEANS THE DIMENSIONS REQUIRED AFTER ALL FINISHES HAVE BEEN APPLIED TO THE SUBJECT SURFACES

**SPARANO + MOONEY ARCHITECTURE**

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CONSULTANT

SEAL

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KEY PLAN

**SYMBOLS & ABBREVIATIONS**

DFCM PROJECT # 10224220 SHEET NO.  
 SMA PROJECT# 1180 GO.20  
 DRAWN BY: SS  
 DATE: MAY 9, 2011

KEYNOTE LEGEND

- ① (E) ROOFING TO REMAIN. PROTECT.
- ② (E) STANDING SEAM METAL ROOFING PANEL SYSTEM TO REMAIN. PROTECT.
- ③ (E) PIPE SUPPORT STRUCTURE TO REMAIN. PROTECT.
- ④ (E) EXPANSION JOINT.
- ⑤ (E) PARAPET TO REMAIN. PROTECT.
- ⑥ (N) PHOTOVOLTAIC PANELS MOUNTED ON STANDING SEAM CLAMP SYSTEM. SEE ELECTRICAL DWG'S AND SPECIFICATIONS.

GENERAL NOTES

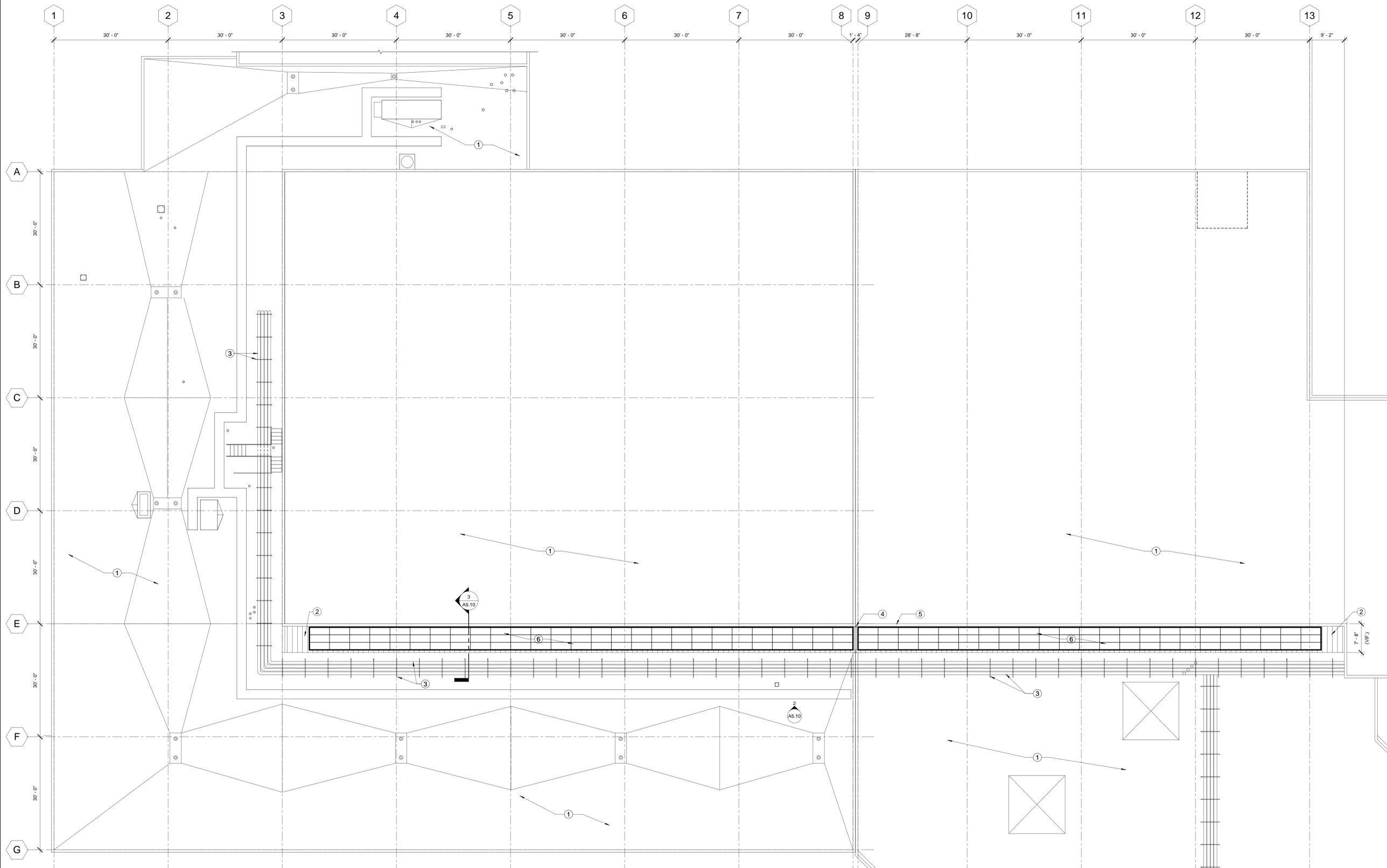
- 1. GENERAL CONTRACTOR TO REVIEW ALL SITE CONDITIONS PRIOR TO BIDDING.
- 2. GENERAL CONTRACTOR IS RESPONSIBLE FOR REPLACEMENT AND/OR REPAIR OF EXISTING SITE AND BUILDING IMPROVEMENTS DAMAGED DURING DEMOLITION AND CONSTRUCTION. THESE IMPROVEMENTS INCLUDE, BUT ARE NOT LIMITED TO, EXTERIOR CLADDING SYSTEM, LANDSCAPE, ASPHALT, CONCRETE SIDEWALK, CURB AND GUTTER, ETC...
- 3. GENERAL CONTRACTOR IS RESPONSIBLE FOR KEEPING THE BUILDING WATERTIGHT THROUGHOUT ALL PHASES OF DEMOLITION AND CONSTRUCTION. ANY DAMAGE TO BUILDING OR BUILDING CONTENTS AS A RESULT OF REROOFING WILL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

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① ROOF PLAN  
1" = 10'-0"

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KEY PLAN

SOLAR PANEL ROOF PLAN

DFCM PROJECT #	10224220	SHEET NO.	
SMA PROJECT#	1180		A1.01
DRAWN BY:	SS		
DATE:	MAY 9, 2011		

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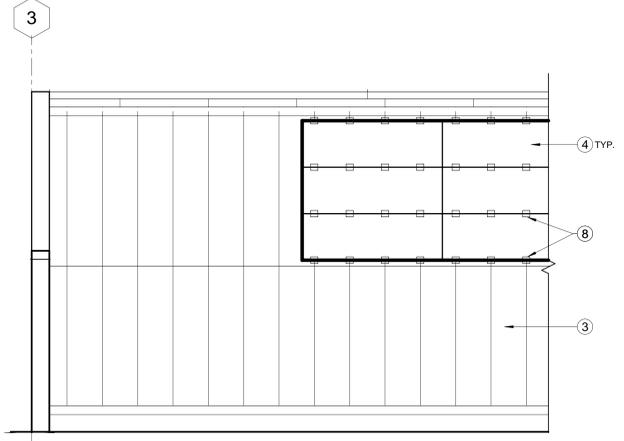
KEY PLAN

ELEVATION, SECTION & DETAILS

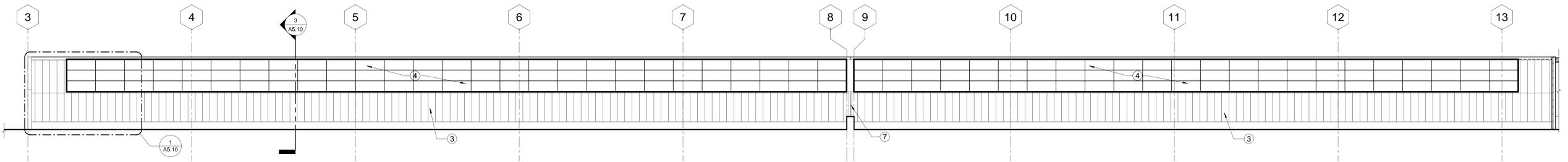
DFCM PROJECT #	10224220	SHEET NO.	
SMA PROJECT#	1180		A5.10
DRAWN BY:	SS		
DATE:	MAY 9, 2011		

KEYNOTE LEGEND

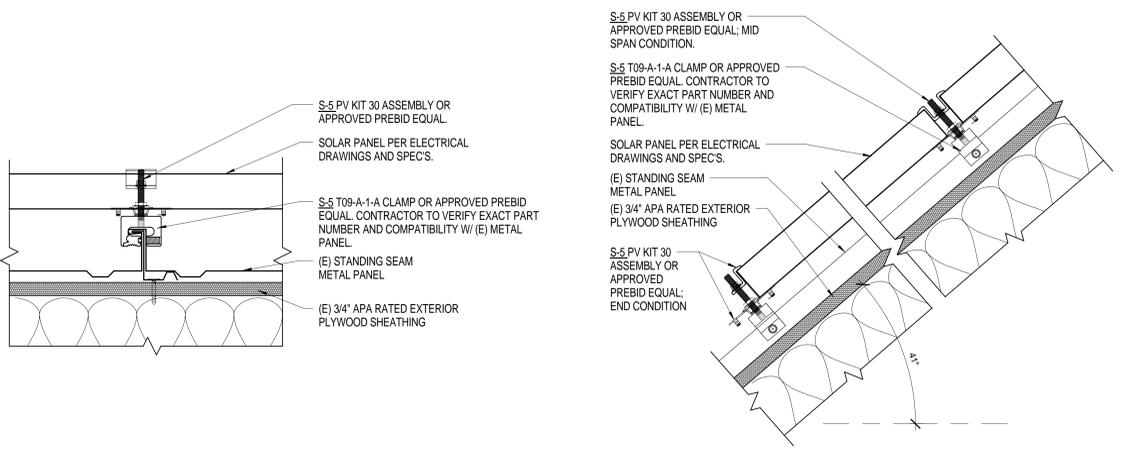
- ① (E) ROOFING TO REMAIN. PROTECT.
- ② (E) C.M.U. WALL.
- ③ (E) STANDING SEAM METAL ROOF PANELS.
- ④ (N) PHOTOVOLTAIC PANELS MOUNTED ON STANDING SEAM CLAMP SYSTEM. SEE ELECTRICAL DWGS AND SPECIFICATIONS.
- ⑤ 6" STEEL STUD WALL FRAMING W/ R19 BATT INSULATION.
- ⑥ (E) STANDING SEAM METAL ROOFING PANEL SYSTEM TO REMAIN. PROTECT.
- ⑦ (E) EXPANSION JOINT.
- ⑧ SOLAR PANEL CLAMP AT EACH STANDING SEAM.



① ENLARGED PARTIAL ELEVATION  
3/8" = 1'-0"

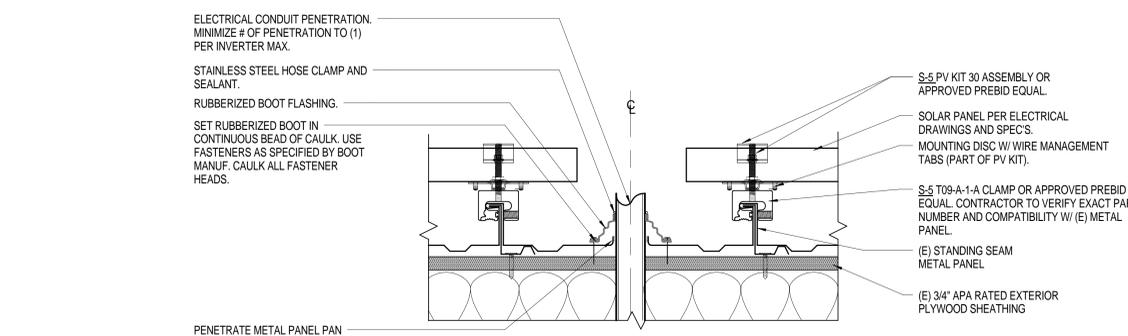


② ELEVATION  
1/8" = 1'-0"



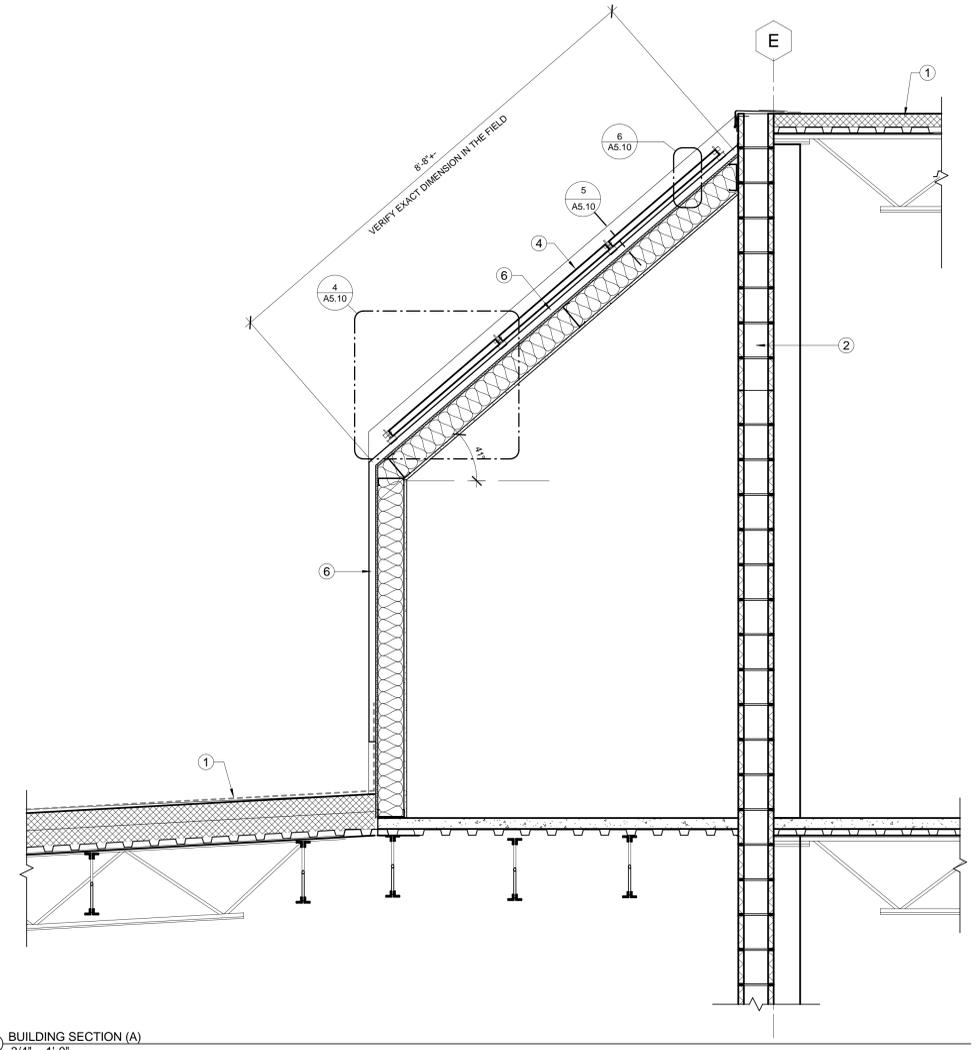
⑤ SOLAR PANEL CLAMP - FRONT  
3" = 1'-0"

④ SOLAR PANEL CLAMP - SIDE  
3" = 1'-0"



⑥ PIPE/CONDUIT PENETRATION  
3" = 1'-0"

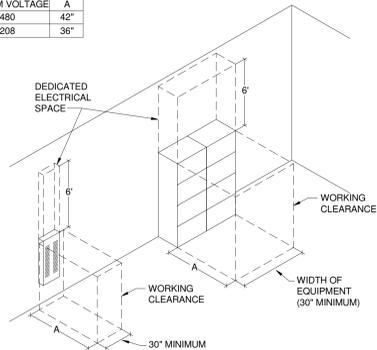
NOTE:  
1. (E) STANDING SEAM METAL ROOFING WARRANTY MUST BE MAINTAINED. ALL WORK ASSOCIATED WITH THE CONDUIT PENETRATIONS IS TO BE COORDINATED DIRECTLY WITH THE ROOFING CONTRACTOR WHO ORIGINALLY INSTALLED THE METAL ROOFING.  
2. SEE ELECTRICAL DRAWINGS FOR PENETRATION LOCATIONS.  
3. CONTRACTOR IS RESPONSIBLE FOR ALL PATCH AND REPAIR OF INTERIOR GYPSUM BOARD SURFACES WHERE CONDUIT PENETRATIONS OCCUR.



③ BUILDING SECTION (A)  
3/4" = 1'-0"

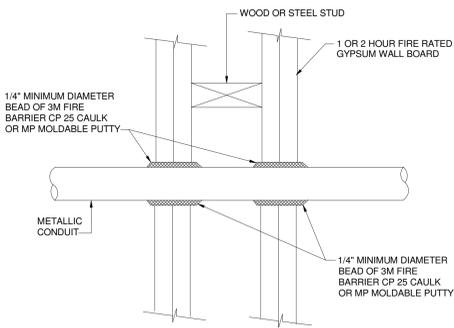
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SYSTEM VOLTAGE	A
480	42"
208	36"



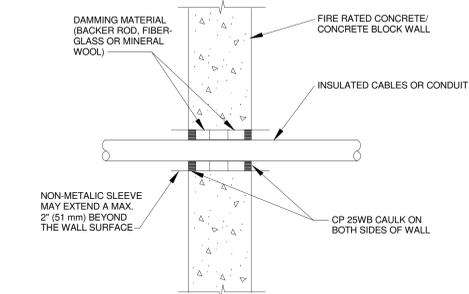
- NOTE:
- IF THE CEILING DECK IS LESS THAN 6'-0" ABOVE ELECTRICAL EQUIPMENT THEN AREA FROM EQUIPMENT TO CEILING DECK SHALL BE DEDICATED ELECTRICAL SPACE (LAY-IN DROP CEILING ARE NOT CONSIDERED AS CEILING DECK.)
  - IF THERE ARE EXPOSED LIVE PARTS ON BOTH SIDES OF WORKING SPACE, THE MINIMUM CLEAR DISTANCES FOR 151-600V TO GROUND SHALL INCREASE FROM 42" TO 48".

SCALE: N.T.S. TYPICAL PANELBOARD CLEARANCE REQUIREMENTS



NOTE:  
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

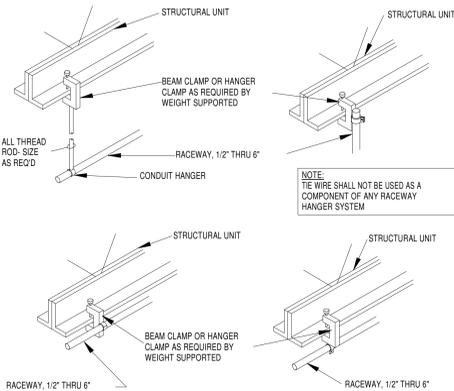
SCALE: N.T.S. FIRESTOP FOR METAL CONDUIT THROUGH GYPSUM WALL BOARD



NOTE:  
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

UL SYSTEM #49

SCALE: N.T.S. TYPICAL FIRESTOP FOR CABLES/CONDUIT THROUGH CONCRETE WALLS



NOTE:  
THE WIRE SHALL NOT BE USED AS A COMPONENT OF ANY RACEWAY HANGER SYSTEM

SCALE: N.T.S. TYPICAL RACEWAY SUPPORT METHODS DETAIL

DISCONNECTS/CIRCUIT BREAKER SYMBOL LIST

SYMBOL	DESCRIPTION
[Symbol]	NON FUSED DISCONNECT SWITCH - SIZE AS REQUIRED
[Symbol]	FUSED DISCONNECT SWITCH - SIZE AS REQUIRED
[Symbol]	COMBINATION STARTER/FUSED DISCONNECT SWITCH - SIZE AS REQUIRED
[Symbol]	CIRCUIT BREAKER DISCONNECT - SIZE AS REQUIRED
[Symbol]	FUSE - SIZE AS REQUIRED
[Symbol]	MOTOR LOCATION
[Symbol]	ELECTRICAL PANEL LOCATION
[Symbol]	ELECTRICAL METER LOCATION

CONDUITS SYMBOL LIST

SYMBOL	DESCRIPTION
[Symbol]	CONDUITS CONCEALED IN FLOOR OR BELOW GRADE
[Symbol]	CONDUITS CONCEALED IN CEILING AND WALLS
[Symbol]	ARROWS INDICATE HOME RUNS

ABBREVIATIONS SYMBOL LIST

SYMBOL	DESCRIPTION
W.P.	INDICATES WEATHER PROOF EQUIPMENT
AMP.	AMPERAGE
C	CONDUIT

ELECTRICAL EQUIPMENT LIST

SYMBOL	DESCRIPTION
[Symbol]	SOLAR PANEL
[Symbol]	INVERTER

GENERAL NOTES:

- PRIOR TO SUBMITTING A BID THE ELECTRICAL CONTRACTOR SHALL INSPECT THE SITE AND INCLUDE IN HIS BID PACKAGE ALL CHARGES DUE TO EXISTING CONDITIONS. SHOP DRAWINGS ARE REQUIRED. ALL LABOR, MATERIAL AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF 1 YEAR FROM THE DATE OF ACCEPTANCE BY THE TENANT. REPLACE OR REPAIR ALL DEFECTS DURING THE GUARANTEED PERIOD.
- THE CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES FOUND BETWEEN THE INTENDED FUNCTION OF EQUIPMENT AND EQUIPMENT SPECIFIED IN THE CONTRACT DOCUMENTS A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL BID. FAILURE TO REPORT ANY DISCREPANCY (CATALOG NUMBERS, DISCONTINUED ITEMS, ETC.) DOES NOT RELIEVE THE CONTRACTOR FROM PROVIDING EQUIPMENT WHICH SHALL CONFORM TO AND FULFILL THE INTENT OF THE CONTRACT DOCUMENTS, NOR SHALL IT BE USED AS A CONDITION TO OBTAIN ADDITIONAL FUNDS FROM THE OWNER AFTER THE CONTRACT IS AWARDED. THE CONTRACTOR SHALL REQUEST ALL CLARIFICATIONS OF CONTRACT DOCUMENT REQUIREMENTS IN WRITING TO THE ARCHITECT/ENGINEER A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL BID.
- MINIMUM SIZE OF CONDUIT TO BE 3/4". ALUMINUM CONDUITS SHALL NOT BE USED.
- USE RIGID STEEL SET SCREW TYPE FITTINGS ONLY. DIE CAST FITTINGS SHALL NOT BE USED.
- RUN A NEUTRAL CONDUCTOR FOR EACH PHASE CONDUCTOR (EACH CIRCUIT) IN A CONDUIT. NOT MORE THAN THREE (3) CIRCUITS IN A CONDUIT. THREE (3) PHASE CONDUCTORS, THREE (3) NEUTRAL CONDUCTORS (ONE FOR EACH PHASE) AND ONE (1) GROUND CONDUCTOR FOR A TOTAL OF SEVEN (7) CONDUCTORS.
- THE MINIMUM SIZE OF THE CONDUCTORS ARE TO BE #12 AWG THIN COPPER, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- ALL J-BOXES SHALL HAVE MINIMUM DEPTH OF 2-1/8" UNLESS OTHERWISE SPECIFIED. SECURE ALL J-BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER MUD RINGS.
- ALL NEW EXPOSED CONDUIT MUST RUN AGAINST THE WALLS OR CEILINGS. DO NOT PENDANT MOUNT ANY CONDUIT FROM THE CEILING.
- SEAL AROUND ALL CONDUIT PENETRATIONS THROUGH FIRE RATED WALLS AND CEILINGS WITH FIRE RATED MATERIAL. 3M IS AN APPROVED MANUFACTURER.
- ALL ELECTRICAL WIRING MUST BE IN CONDUIT (ROMEX AND MC CABLE NOT PERMITTED).
- FLEXIBLE CONDUITS CAN ONLY BE USED FOR SHORT RUNS (6' MAXIMUM).
- NO CONDUITS SHALL RUN IN DUCT WORK.
- THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
- USE NO. 10 THIN CONDUCTORS FOR CONDUCTOR LENGTH OVER 100 FEET. NO. 8 THIN OVER 200 FEET. NO. 6 THIN OVER 300 FEET AND NO. 4 THIN OVER 400 FEET LENGTH.
- ALL CONDUITS EXPOSED TO THE WEATHER AND SHALL BE GALVANIZED RIGID STEEL, UNLESS OTHERWISE NOTED.
- ALL PANELBOARDS SHALL HAVE HALF SIZE ISOLATED NEUTRAL AND GROUND COPPER BUS BARS.
- USE EPOXY ANCHORS TO SUPPORT THE ELECTRICAL EQUIPMENT. EXPANSION ANCHOR BOLTS ARE NOT ACCEPTED.
- ALL PANELS SHALL HAVE COPPER BUSES AND SHALL BE BRACED FOR A MINIMUM OF 10,000 AIC OR AS SPECIFIED.
- PANELBOARDS SHALL BE FIELD MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. THE MARKING SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF THE EQUIPMENT. LABOR SHALL BE PER NEC 110-16 & NEC 70E.
- A SIGN SHALL BE PLACED AT THE SERVICE ENTRANCE EQUIPMENT, INDICATING TYPE AND LOCATION OF ONSITE POWER GENERATING SOURCES.
- PROVIDE UPDATED, TYPED WRITTEN, DATED PANEL SCHEDULES FOR NEW AND EXISTING PANELBOARDS SHOWING CIRCUIT CHANGES MADE DURING THIS PROJECT.
- ALL DISCONNECTS, J-BOXES AND CONDUITS EXPOSED TO THE OUTSIDE WEATHER SHALL BE NON-CORROSIVE, WEATHER PROOF TYPE.
- ALL DISCONNECTS SHALL BE HEAVY DUTY TYPE.
- ALL NEW WORK MUST MEET THE CURRENT ADOPTED NATIONAL ELECTRICAL CODE.
- ALL MATERIALS USED IN THIS INSTALLATION SHALL BE U.L. APPROVED AND NEW.
- TEMPORARY ELECTRICAL SERVICE IS TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR AND REMOVED BY THE ELECTRICAL CONTRACTOR.
- DETAILS ARE SHOWN ON DIFFERENT SHEETS. THE CONTRACTOR SHALL REFER TO THOSE DETAILS WHETHER OR NOT CALLED IN REFERENCE NOTES.
- CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE OVER SHOP DRAWINGS UNLESS SPECIFICALLY NOTED OTHERWISE.
- ELECTRICAL CONTRACTOR SHALL HAVE PRE-CONSTRUCTION MEETING WITH ELECTRICAL SHOP SUPERVISOR.



DATE	DESCRIPTION
DEC. 13, 2010	CONSTRUCTION DOCUMENTS

DAVIS APPLIED TECHNOLOGY COLLEGE  
MAIN BUILDING PHOTOVOLTAIC PROJECT

550 EAST 300 SOUTH, KAYSVILLE, UTAH 84037

CONSULTANT



IF THIS SHEET IS LESS THAN 30"x42" IT IS A REDUCED PRINT, SCALE REDUCED ACCORDINGLY

KEY PLAN

GENERAL NOTE & SYMBOLS LIST

DFCM PROJECT #	10224220	SHEET NO.	
ECE PROJECT#	4013		
DRAWN BY:	RS		E0.01
DATE:	DEC. 13, 2010		

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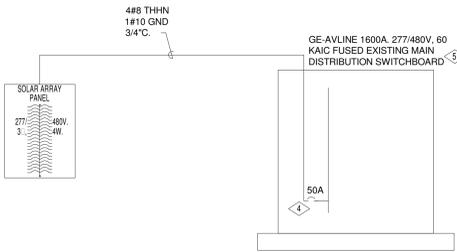
PANEL		"SOLAR ARRAY"										AIC RATING		22K		AMPS	
PHASE WIRE		3/4"										RATING		277/480		VOLTS	
MAIN BUS		100 AMPS										SUBFEED LUGS				NO	
MAIN BREAKER												COMMENT					
DXT	LOCATION	RECEPT	LTG	OTHER	POLE	SIZE	PHASE	SIZE	POLE	OTHER	LTG	RECEPT	LOCATION	DXT			
1	SA-1			6450	1	30	A	30	1			SPARE	2				
3	SA-2			6450	1	30	B	30	1			SPARE	4				
5	SA-3			6450	1	30	C	30	1			SPARE	6				
7	SA-4			6450	1	30	A	30	1			SPARE	8				
9	SA-5			6450	1	30	B	30	1			SPARE	10				
11	SPARE						C	30	1			SPARE	12				

VA	VA	VA	AMPS	KVA	VA	VA	VA
0	0	12000	A	46.57	A	12.900	A
0	0	12000	B	46.57	B	12.900	B
0	0	6450	C	23.29	C	6.450	C
0	0	32250		38.79	TOTAL	32.25	

**NOTES:**

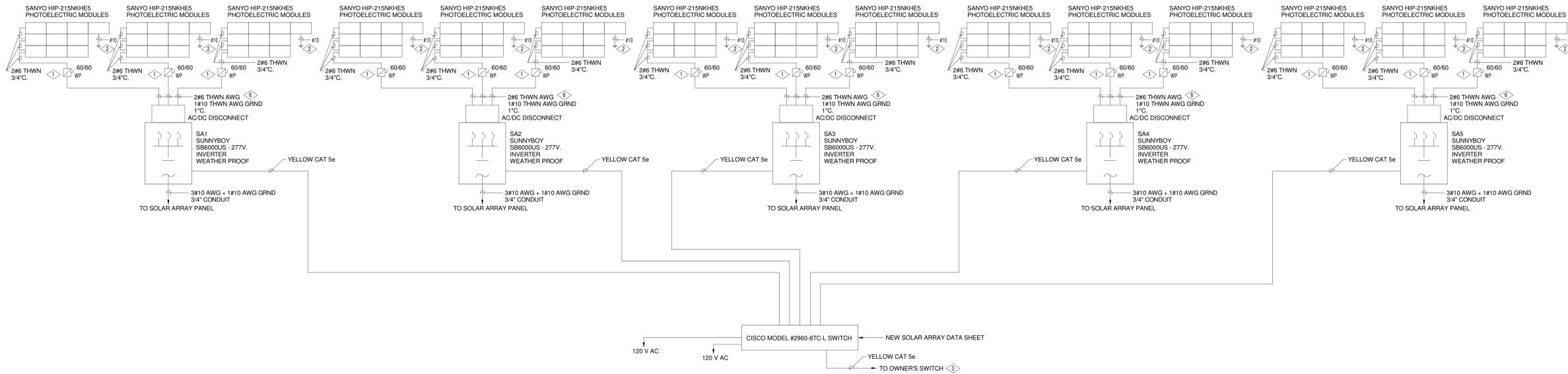
- FURNISH AND INSTALL THE PHOTOVOLTAIC SYSTEM PER NEC'S ARTICLE 690.
- PHOTOVOLTAIC CIRCUITS SHALL RUN SEPARATE FROM ANY OTHER SYSTEM WIRING OR RACEWAY.
- PROVIDE GEAR LISTED FOR USE WITH PHOTOVOLTAICS.
- FURNISH AND INSTALL DC GROUND FAULT PROTECTION PER NEC 690.5.
- ALL CONDUCTORS SHALL BE IN CONDUIT OR RACEWAY PER NEC 690.31.
- THE PANELS SHALL BE INSTALLED AT AN ANGLE OF 41° OF INCLINATION AND SHALL BE FACING SOUTH.
- PROVIDE ALL SUPPORTS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL ROOF PENETRATIONS, FLASHING, SEALING, ETC. NECESSARY FOR A COMPLETE AND FUNCTIONING INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR MORE DETAILS, EXACT LOCATIONS AND ELEVATIONS.
- PROVIDE A TWO YEAR PARTS AND LABOR WARRANTY. THE WARRANTY SHALL COVER ALL PHOTOELECTRIC MODULES, INVERTERS, MONITORS, ELECTRONICS, RACEWAYS, CONDUCTORS, SWITCHGEAR, LABOR, ETC.
- GRID CONNECTED INVERTERS SHALL HAVE THE FOLLOWING CHARACTERISTICS:
  - INVERTERS SHALL BE PROVIDED WITH A BUILT-IN HTTP SERVER AND WEB PAGE. THE SERVER SHALL PROVIDE THE FOLLOWING INFORMATION: INSTANTANEOUS POWER VOLTAGE AN AMPERAGE PRODUCTION. A MINIMUM OF TWO YEAR HISTORY OF POWER VOLTAGE AND AMPERAGE PRODUCTION INSTANTANEOUS AND HISTORICAL DATA OF CARBON EMISSIONS SAVED. SOLAR PANEL PRODUCTION EFFICIENCY.
  - INVERTERS SHALL BE UL 1741 - 2005 AND IEEE 1547-2003 COMPLIANT.
  - INVERTERS SHALL HAVE A MINIMUM EFFECTIVENESS OF 96%.
  - SUBJECT TO COMPLIANCE WITH THE CONTRACT DOCUMENTS THE CONTRACTOR SHALL PROVIDE GRID CONNECTED INVERTERS BY MANUFACTURERS INCLUDING BUT NOT LIMITED TO:
    - FRONIUS
    - SMA
    - PROPOWERED
 PROVIDE A MINIMUM 10 YEAR WARRANTY.
- ALL SYSTEM COMPONENTS SHALL BE MADE IN THE U.S.A. AND SHALL COMPLY WITH THE ARRA 2009 AND BUY AMERICAN ACTS.
- SYSTEM SHOWN IS A BASE OF DESIGN. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL AND VERIFICATION OF COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF THE SYSTEM WITH ALL TRAILS. THE CONTRACTOR SHALL PROVIDE SPECIFIC DESIGN DRAWINGS FOR THE PROPOSED SYSTEM.
- ALL DATA CABLING FOR PV ARRAY SYSTEM SHALL BE YELLOW. PLENUM RATED CABLE.
- PHOTOVOLTAIC PANELS SHALL HAVE THE FOLLOWING CHARACTERISTICS:
  - MINIMUM PEAK WATT RATING OF 215 WATTS PER MODULE AT AN NOCT OF 41° CELSIUS.
  - MONOCRYSTALLINE SILICON CELLS.
  - IP 65 RATED.
  - 25 YEARS LINEAR OUTPUT WARRANTY.
  - TEMPERED GLASS COVER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE PANEL SIZE WITH THE PROJECT CONSTRAINTS.
- CONTRACTOR SHALL MAKE ANY MODIFICATIONS NECESSARY AT NO ADDITIONAL COST TO THE OWNER, ARCHITECT OR ENGINEER.
- SUBJECT TO COMPLIANCE WITH THE CONTRACT DOCUMENTS CONTRACTOR SHALL PROVIDE PHOTOVOLTAIC PANELS BY MANUFACTURERS INCLUDING BUT NOT LIMITED TO:
  - SHARPUSA
- ALL CONDUITS FOR PV-ARRAY SHALL BE MARKED WITH 2" PURPLE TAPE EVERY 6 FEET.
- PROVIDE AT LEAST 4 HOURS OF TRAINING ON THE SYSTEM FOR THE OWNER.



**PARTIAL POWER SINGLE LINE DIAGRAM**  
SCALE: N.T.S.

**REFERENCE NOTES:**

- LABEL THE DISCONNECTS FOR THE PHOTOVOLTAIC SYSTEM PER FUNCTION AND CIRCUIT THAT IT SERVES. THE DISCONNECT SHALL ALSO READ "WARNING. ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION."
- THE EACH SOLAR PANEL FRAME TO GROUND THROUGH ITS MOUNTING STRUCTURE PER MANUFACTURERS INSTRUCTIONS AND NEC 250.
- COORDINATE STATIC I.P. ADDRESSING WITH THE OWNER.
- PROVIDE A NEW 50A CIRCUIT BREAKER THAT IS COMPATIBLE AND OF THE SAME AIC RATINGS AS THE SWITCHBOARD. LABEL THE BREAKER PER FUNCTION WITH AN ORANGE ENGRAVED LABEL. PROVIDE A LABEL WITH 2" HIGH RED LETTERS READING "THE SWITCHBOARD IS SERVICED BY MORE THAN ONE SOURCE. IDENTIFY AND DISCONNECT ALL SOURCES PRIOR TO PERFORMING ANY WORK".
- PROVIDE A LABEL AT THE SWITCHBOARD UTILITY BREAKER. PROVIDE A LABEL WITH 2" HIGH RED LETTERS READING "THE SWITCHBOARD IS SERVICED BY MORE THAN ONE SOURCE. IDENTIFY AND DISCONNECT ALL SOURCES PRIOR TO PERFORMING ANY WORK".
- RUN CABLING IN THE PROVIDED CABLE MANAGEMENT SYSTEM. REFER TO ARCHITECTURAL FOR MORE REQUIREMENTS.



**SOLAR ARRAY SYSTEM SINGLE LINE DIAGRAM**  
SCALE: N.T.S.

CONSULTANT



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KEY PLAN

**SOLAR RISER DIAGRAM**

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ECE PROJECT#	4013		E0.02
DRAWN BY:	RS		
DATE:	DEC. 13, 2010		

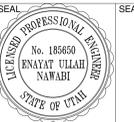
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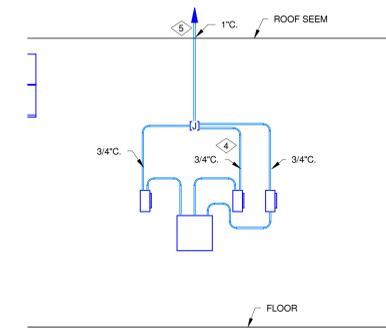
KEY PLAN

ROOF PLAN AND SITE PLAN - ELECTRICAL

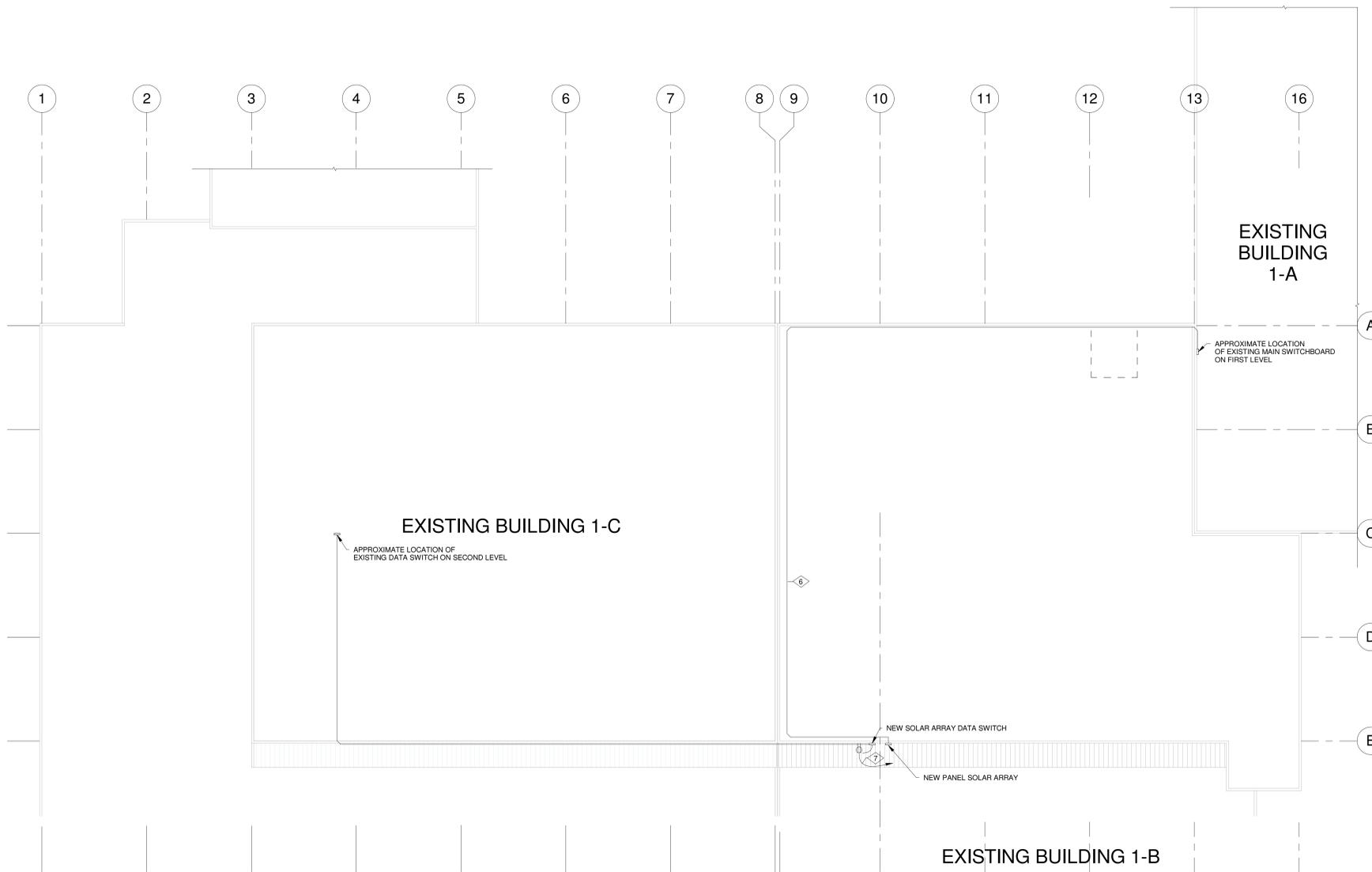
DFCM PROJECT #	10224220	SHEET NO.
ECE PROJECT#	4013	E1.01
DRAWN BY:	RS	
DATE:	DEC. 13, 2010	

REFERENCE NOTES:

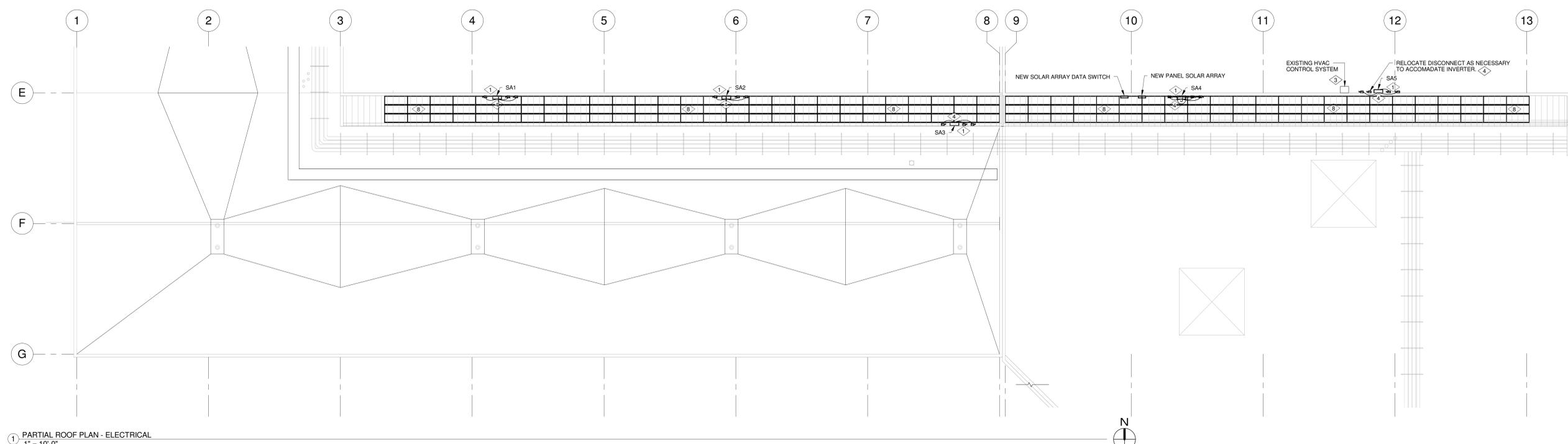
- COORDINATE THE EXACT LOCATION AND MOUNTING OF THE INVERTERS WITH THE OWNER. ALL ROOF PENETRATIONS SHALL OCCUR ON VERTICAL SURFACES.
- MAINTAIN THE CIRCUIT INTEGRITY OF THE EXISTING HVAC CONTROL CABINET.
- RELOCATE THE EXISTING DISCONNECT TO ACCOMMODATE THE INSTALLATION OF THE INVERTER. COORDINATE ALL OUTAGES WITH THE OWNER.
- RUN THE CONDUCTORS FOR ALL THE STRINGS FROM A SINGLE INVERTER IN ONE CONDUIT THROUGH THE ROOF PER ARCHITECT'S PENETRATION DETAIL. RUN ALL WIRING TO EACH PANEL THROUGH THE WIRE MANAGEMENT SYSTEM PROVIDED WITH THE PANEL SUPPORT SYSTEM. REFER TO THE TYPICAL INVERTER CONDUIT SYSTEM FOR MORE INFORMATION.
- REFER TO ARCHITECTURAL FOR PENETRATION DETAIL.
- RUN THE CONDUIT ATTACHED TO THE BUILDING'S STRUCTURE FROM THE NEW "SOLAR ARRAY" PANEL TO THE EXISTING DISTRIBUTION SWITCHBOARD. DO NOT PENETRATE THE BUILDING'S ROOF DECK. REFER TO THE PARTIAL POWER SINGLE LINE DIAGRAM AND THE TYPICAL RACEWAY SUPPORT METHODS DETAIL FOR MORE REQUIREMENTS.
- TIE THE OUTLET TO A SPARE 120V, 20A CIRCUIT BREAKER IN THE CLOSEST PANEL WITH AVAILABLE CAPACITY.
- FURNISH AND INSTALL SOLAR PANELS ON THE ROOF. REFER TO SINGLE LINE DIAGRAM, SPECIFICATION AND ARCHITECTURAL FOR MORE REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE MOUNTING OF THE SOLAR PANELS WITH THE PANEL SUPPORT SYSTEM.



2 TYPICAL INVERTER CONDUIT SYSTEM  
1/4" = 1'-0"



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



1 PARTIAL ROOF PLAN - ELECTRICAL  
1" = 10'-0"

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