



LETTER OF AGREEMENT BETWEEN
SAN FRANCISCO PUBLIC UTILITIES COMMISSION /
POWER ENTERPRISE
AND
THE DEPARTMENT OF PUBLIC WORKS /
BUREAU OF BUILDING REPAIR
FOR
DAVIES SYMPHONY HALL
182 kW SOLAR ELECTRIC PROJECT

This LETTER OF AGREEMENT (LOA) between the SAN FRANCISCO PUBLIC UTILITIES COMMISSION'S POWER ENTERPRISE (**POWER**), and the DEPARTMENT OF PUBLIC WORKS BUREAU OF BUILDING REPAIR (**DPW/BBR**), formalizes the roles and responsibilities, project scopes, costs, and other terms associated with the CONSTRUCTION SERVICES to be provided by DPW/BBR to POWER for the above named project.

The purpose of this LOA is for POWER to secure project management, construction, and procurement services from DPW/BBR to support the construction phase of the project as is further defined below, for the 182kW solar electric project to be located at Davies Symphony Hall (DSH). DPW/BBR shall become the construction entity on behalf of the project owner, POWER.

RECITALS

The "Davies Symphony Hall Solar Electric Project" is a clean distributed generation resource to be developed on DSH's property; promoting sustainability and good stewardship of our resources. This project will put to good use the available roof space at DSH to generate cost effective renewable energy in accordance with the Mayor's Executive Directive 05-107 (Roof Tops for Municipal Solar), dated October 26, 2005.

The resulting renewable greenhouse gas-free electric energy will serve the City's municipal loads as served by POWER.

And whereas,

1. POWER oversees energy policy and energy trading and strives to increase the City's Renewables Portfolio Standard (RPS) qualifying energy generation; and, as such, typically funds, develops, and owns renewable generation projects, and;
2. POWER has, at the date of execution of this LOA, sufficient funding in place to cover project development, design engineering, and construction.
3. Whereas the essence of the agreement between DPW/BBR and POWER is:
 - a. POWER will fully fund the solar electric plant.

Edwin M. Lee
Mayor

Art Torres
President

Vince Courtney
Vice President

Ann Moller Caen
Commissioner

Francesca Vietor
Commissioner

Anson Moran
Commissioner

Harlan L. Kelly, Jr.
General Manager



- b. POWER will plan, design, permit, and provide project engineering support for the project.
- c. DPW/BBR will perform all aspects of the construction of the project.
- d. POWER shall retain ownership of the project, and the energy benefits, i.e. capacity, energy, and renewable energy certificates, per the Memorandum of Understanding (MOU) between the San Francisco Public Utilities Commission (SFPUC) and San Francisco War Memorial and Performing Arts Center (SFWMPAC).

ROLES AND RESPONSIBILITIES OF PARTIES

Roles and responsibilities of the parties shall be in accordance with the Project Scope of Services (see **Attachment A -- Scope of Services, October 18, 2013**). Attachment A spells out the detailed plan for the project.

More generally,

- SFPUC shall be considered the Project Owner, and POWER the Project Manager, and shall perform design engineering, permitting, and project engineering support.
- DSH shall be considered the Host with its primary focus on design and construction activity approval.
- DPW/BBR shall be considered the General Contractor for construction, with assistance from POWER in providing project engineering and technical support.

SCOPES OF WORK AND BUDGETS

The Cost for DPW/BBR construction services to be provided herein shall not exceed \$213,431.94. Funds will be transferred from the SEA Civic Center Solar Project (CUH988 03). The services are explained, estimated, and itemized per **DPW/BBR Service Order – 431418 (Attachment B)** and are based on the Scope of Services document, Attachment A. Any change orders to the cost proposal, as submitted by DPW/BBR, shall be reviewed and approved by POWER prior to any work being performed. DPW/BBR shall submit its Change Order Request with the scope of services described, cost estimate, and reason for change or deviation from the original scope of work.

POWER may also submit a Change Order Request to DPW/BBR for work requested by POWER which is a change from the base scope of work. DPW/BBR will submit its proposal for this requested change with cost, schedule, and other information to POWER for approval prior to proceeding with the work.

PROJECT SCHEDULE

The project schedule is provided in **Attachment C, Davies Symphony Hall Forecasted Schedule**. Construction activities will occur starting Friday, October 18, 2013 and be complete by Friday, November 15, 2013. It will be incumbent upon the parties to work diligently toward this goal, yet necessary adjustments from unforeseen or uncontrolled influences may extend the schedule. DSH has schedule and noise constraints since the Symphony Hall is in its Fall Season. Any disruption/cancellation of rehearsals or performances as a result of DPW/BBR's performance of the work will result in the following liquidated damages:

LIQUIDATED DAMAGES

DPW/BBR acknowledges that during performance of the Work under this LOA, regularly scheduled rehearsals and performances will continue at Davies Symphony Hall. As set forth in

the MOU between SFPUC and SFWMPAC, DPW/BBR must coordinate its Work to avoid the disruption, delay, and cancellation of such rehearsals and performances.

It is understood and agreed by and between DPW/BBR and POWER that in accordance with the MOU between SFPUC and SFWMPAC the SFWMPAC will suffer financial loss if rehearsals or performances are cancelled resulting from, arising out of, or connected with DPW/BBR's performance of the Work. Accordingly, DPW/BBR agrees that as liquidated damages (but not as a penalty), DPW/BBR shall pay SFWMPAC the following amounts:

1. *For each rehearsal at Davies Symphony Hall cancelled resulting from, arising out of, or connected with DPW/BBR's performance of the Work — \$20,000*
2. *For each performance at Davies Symphony Hall cancelled resulting from, arising out of, or connected with DPW/BBR's performance of the Work — \$100,000*

The total amount of SFWMPAC Liquidated Damages payable under this LOA shall not exceed \$500,000.

TERM

This LOA shall become effective on the date of execution by all parties. However, due to unforeseen circumstances, DPW/BBR has begun work prior to an execution date. Termination of this LOA shall be upon the completion of the solar electric plant and project acceptance by POWER as defined in the Scopes of Services, Attachment A.

MISCELLANEOUS

A. Communication: The parties shall communicate at all times to support the work effectiveness of the project team. A POWER and DPW/BBR organization chart and a list of all staff / project team personnel with roles and contact information shall be developed at the start of the work and updated as necessary.

Routine progress reports shall be shared and project and progress meetings held.

B. Documentation Control: DPW/BBR shall follow typical POWER documentation control procedures and requirements in the execution of this work. Details will be worked out between the parties at the beginning of the project.

C. Payment: SFPUC will establish an interdepartmental reallocation for the project based on the following payment schedule:

- a. Project Initiation (Executed LOA) 40% Contract Labor Value and 100% Materials and Equipment Rental Value
- b. Payment #2 – 20% Contract Value
- c. Payment #3 – 20% Contract Value
- d. Payment #4 – 20% Contract Value

Changes in cost shall be approved prior to any work being performed. DPW/BBR shall provide bi-weekly project reports covering labor hours expended to date, tasks accomplished, costs expended, and updated schedule. DPW/BBR shall charge to that account as needed. However, should the project work stop or be canceled by POWER, POWER may request

DPW/BBR to itemize and calculate actual work completed, and reimburse POWER the unspent balance whether or not remaining in the project reallocation index fund.


D. Notices: All notices and principal communications shall be directed to the following:

SFPUC – Power Enterprise:
Jamie Seidel, Project Manager
SFPUC – Power Enterprise
525 Golden Gate Avenue, 7th Floor
San Francisco, CA 94103

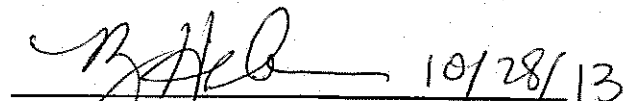
DPW/ BBR:

Sue Black, Superintendent
DPW/BBR
2323 Cesar Chavez Street
San Francisco, CA 94124

RECOMMENDED BY:

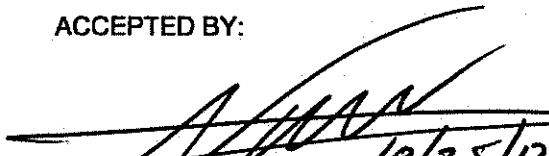


Sue Black
Superintendent
San Francisco Department of Public Works
Bureau of Building Repair
Date 10/29/13




Barbara Hale
Assistant General Manager
San Francisco Public Utilities Commission
Power Enterprise
Date 10/28/13


ACCEPTED BY:




Mohammed Nuru
Director
San Francisco Department of Public Works
Date 10/25/13



Harlan L. Kelly, Jr.
General Manager
San Francisco Public Utilities Commission
Date 10/31/13



Jocelyn Quintos
Acting Deputy Director
San Francisco Department of Public Works
Date 10/25/13



Todd Rydstrom
Chief Finance Officer
San Francisco Public Utilities Commission
Date 10-25-13



San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

ATTACHMENT A Davies Symphony Hall 182 kW Solar Electric Project Scope of Services October 18, 2013

Attached Documents:

- Appendix A – Power Enterprise Solar Material
- Appendix B – Davies Symphony Hall -- PV Project Design Drawings
– DBI Permit Set

1. SUMMARY OF PROJECT

The goal and intent of this Scope of Services is for the Department of Public Works – Bureau of Building Repair (DPW/BBR) to provide project management, procurement, construction, and commissioning services for the 182kW solar electric system (the “PV System”) to be installed at Davies Symphony Hall (DSH) located at 201 Van Ness Avenue – San Francisco, CA. DPW/BBR shall project manage, procure, construct, and commission such measurers in accordance with the design drawings and bill of materials provided by the San Francisco Public Utilities Commission – Power Enterprise – Renewables (Power).

This Scope of Services is the controlling document for all matters relating to the specific work and services to be provided by the DPW/BBR in accordance with the terms and conditions of the Letter of Agreement (LOA). DPW/BBR will perform this work and provide these services in a good and workmanlike manner, to the satisfaction of Power. The DPW/BBR shall furnish all labor, and any incidental materials and equipment not provided by Power in its design drawings and bill of materials. Costs and fees shall be included in the agreed upon Contract Sum for the Scope of Services delineated in this attachment and such work and services shall be provided within the Contract Time.

2. SCOPE OF WORK

The scope of work responsibilities will be shared between three parties: Power, DPW/BBR, and the Roofing Contractor.

Power will provide design engineering, procurement of solar materials (modules, inverter, racking, etc.), electrical materials, and project management. See specific details in Section 2.B.

The scope of work for the Roofing Contractor will include the roofing recover project, protective sheet installation, seismic stanchion attachment, and flashing. See specific details in Section 2.C.

DPW/BBR will be responsible for the items detailed below in Section 2.A

2.A – WORK AND SERVICES BY DPW/BBR

DPW/BBR shall furnish all labor, incidental materials not yet identified and not provided by Power, tools, transportation, and equipment not yet identified to perform work as listed herein, as shown on drawings and all work related to provide the specified structure, ready for inspection and acceptance by Power and other Authorities having jurisdiction. This includes but is not limited to, the following list of work items.

DPW/BBR must thoroughly read all notes on drawings and build accordingly.

DPW/BBR must coordinate and schedule work with all other trades on job site.

DPW/BBR will provide Power with a thorough and detailed list of activities, project progress meetings, and timeline as soon as possible.

Provide appropriate staging and lifting equipment, and qualified operating, rigging, and traffic control personnel to remove debris and excess materials at the end of construction activities. Power will pay for required crane service and will coordinate with DPW/BBR to determine schedule. DPW will issue the PO for the crane.

All wires installed and/or terminated by DPW/BBR shall be properly labeled.

All coring has been completed by others.

If roof is damaged in any way, DPW/BBR will notify Power.

DPW/BBR must red line any changes to construction drawings.

Complete all work required to layout and construct the solar racking system, including but not limited to:

- Coordinate with Roofing Contractor for stanchion/baseplate flashing
- Construct SunLink racking system per drawings and manufacturer instructions
- Power to arrange for adequate training of personnel by SunLink for proper installation of racking system
- Mount solar modules per drawings

Complete all work required for array wiring (solar modules to string inverters), including but not limited to:

- Install wire tray and conduit for homerun routes
- Make Multi-contact (MC) connections and assemble homerun wires

- Label homeruns in color sequence accordingly
- Array grounding per drawings
- Install safety signage

Complete all electrical work from string inverters to tie-in point (electrical room), including but not limited to:

- Install rooftop string inverters, disconnects, & load center per drawings
- Make wire terminations at string inverters
- Install conduit and wire from string inverters to tie-in point (electrical room)
- Perform tie-in to existing to DSH switchboard designated in drawings
- Install and wire inverters, disconnect switches, meter cabinet and socket as per drawings and test for proper operation
- Install safety signage

Arrange for and be on-site during electrical inspection of the system.

- Install equipment
- Install Weather Station

Startup system, including tests for open circuit voltage, amperage, temperature, meggering, phase rotation, and utility compatibility.

At such time as DPW/BBR determines that the project is completed, notification shall be given to Power for the scheduling of the final inspection and testing of the system.

Remove from the site all construction materials.

- Crane lift for material removal to be coordinated with Power
- DPW/BBR to unpackage "crates" containing individual panels, reducing damage as much as possible and remove from site for transport to Power designated location
- Power to arrange for transportation and pay for any associated costs of "crate" packaging

Conduct initial Operations and Maintenance training.

Clean site and prepare for turnover to Power.

Schedule a final inspection meeting.

Testing of the PV Solar System shall include the following:

- System testing of installed PV array shall be performed on all strings of modules, including open circuit voltage, DC amperage, and meggering. This data will then be recorded in the Operation and Maintenance manual (provided by Power) in a clear tabular format.
- Each voltage measurement will include the following ancillary data: the date, time of day, sample panel temperature, ambient temperature, and the solar irradiation at the time in coordination with Power staff.
- After inverter startup, current shall be recorded for each string, each sub-array, and the entire array. Each current measurement will also include the same ancillary data as taken above during voltage measurements.

2.B – WORK AND SERVICES BY POWER

- Construction drawings and engineering design
- Roofing Contractor through Job Order Contract
- PG&E Interconnection Agreement
- PG&E Shut Down and Coordination
- Technical Support
- Special Inspection
- Refer to Section 3 – Material Procurement for material to be supplied by Power
- Crane services for removing items from roof, DPW will issue the PO and schedule the crane lift, Power will reimburse DPW for costs.
- Transportation of packaging "crates"

2.C – WORK AND SERVICES BY JOC CONTRACTORS

- Roofing Recover
- Stanchion Attachment and Flashing

3. MATERIAL PROCUREMENT

All material required for the Work, except those materials specifically designated as furnished by Power or the Roofing Contractor, regardless of whether or not it is specifically mentioned herein or listed on the Drawings, shall be furnished by DPW/BBR. DPW/BBR will be reimbursed for any materials or equipment purchased for project. DPW/BBR will submit material and/or equipment needs for prior approval by Power before purchasing or acquiring same. DPW/BBR will not be responsible for materials and/or equipment already purchased and supplied by Power for this project should they not meet the project requirements.

Power-Supplied Materials:

Solar Modules/Racking
Solar Inverters
Additional Solar Material:
See Appendix A – Power Solar and Electrical Material
(Bid Sheet)

Roofing Contractor-Supplied Materials:

Flashing material for roof penetrations
Roof Recover material

DPW/BBR-Supplied Materials:

DPW/BBR-Supplied Material – As Needed: all orders to be approved by SFPUC – Power Enterprise prior to orders being placed.

DPW/BBR shall review packing slips for all Power supplied materials loaded on to roof by others to determine any non-conforming or missing items as soon as possible. Upon review of Power supplied packing slips and conducting an inventory of materials and equipment, DPW/BBR will accept materials and diligently work with Power to resolve any field discrepancies to move the project forward and meet the construction schedule. DPW/BBR shall be responsible for all such material and equipment once accepted by DPW/BBR and DPW taking control of the job site beginning Monday, October 21, 2013. DPW/BBR shall take all necessary precautions to ensure its safe handling, storage and installation at the Site.

DPW/BBR shall be responsible for coordinating all shipments of DPW/BBR-supplied equipment and materials.

DPW/BBR shall take delivery of Power-supplied materials and equipment and Roofing Contractor-supplied materials, as well as its own materials. Materials and equipment shall be inspected and signed for, with any damage listed and reported without undue delay after October 21, 2013..

DPW/BBR shall provide all required general tools and materials for its work. Power will reimburse DPW/BBR for any materials not previously provided by Power at cost and with Power's prior approval before purchase.

4. QUALITY OF WORK

DPW/BBR shall furnish and perform the work to the highest quality standard. All work shall conform to the detailed requirements specified herein. Where specific instructions are not given, the work shall be performed to the best practices known to the trade. All Work shall be done by skilled and experienced workers for the appropriate trade, and shall be of the highest possible caliber throughout. DPW/BBR shall adhere to equipment manufacturer's instructions and recommendations.

5. SYSTEM INSPECTION AND TESTING

Power will inspect the work regularly.

At various stages of completion, DPW/BBR shall ask Power to inspect and review the work. Additionally, Power may wish to inspect the work at any time during construction. DPW/BBR shall allow reasonable time for Power to perform work inspections.

DPW/BBR shall work in coordination with the Authority having jurisdiction (Department of Building Inspection -- DBI) to obtain final approvals.

Any work found to be not satisfactory to the inspector, and within the responsibility of DPW/BBR unless performed in accordance to the project requirements and drawings, shall be redone at DPW/BBR's sole expense.

6. PROTECTION OF EXISTING FACILITY, EQUIPMENT, AND PERSONNEL

The work is to be performed at Davies Symphony Hall, and DPW/BBR shall exercise extreme caution at all times to avoid damage to existing facilities and landscaping or to jeopardize their safety or continuity of operation

Power reserves the right to require DPW/BBR to modify or eliminate any construction techniques or methods, which may endanger personnel or adversely affect any existing infrastructure and or equipment.

7. CLEAN UP

During the Work, DPW/BBR shall be responsible, on a daily basis, for the sanitary and physical cleanliness of the area affected by its work. All debris, tools, hoses, ladders, and unused construction materials shall be gathered up by the end of each shift and/or stored in proper areas or receptacles. DPW/BBR's work areas should be kept continuously clean and orderly to prevent accidents or unwarranted use of material, tools, etc. that are for use in the Work. Upon completion of the Work, DPW/BBR's area shall be cleared of all equipment, surplus material, and debris. The Roofing Contractor is responsible for clearing all of its equipment, surplus materials, and debris. Such material shall be disposed of in a manner acceptable to Power and SFWMPAC. DPW/BBR's work shall be subject to stoppage by Power if DPW/BBR does not correct any of its "housekeeping" deficiencies or violations to the satisfaction of Power within 24 hours of receipt from Power of a non-conformance report identifying such deficiencies or violations.

8. INFORMATION REQUIRED AFTER COMPLETION OF WORK

Following completion of the work, DPW/BBR shall provide red line notes and field changes from the original drawings.

These noted changes shall include, but not be limited to, changes in location, changes in elevation, changes in size, changes in adjustments or settings, changes in equipment, and changes in materials

DRAWINGS

The engineering and construction drawings (here in referred to as the drawings – Appendix B of Attachment A) are incorporated into and made part of this Scope of Services by this reference.

Where there are any apparent conflicts between the drawings, this Scope of Services , specifications and latest applicable codes, standards and specifications, provisions specifically set forth in the contract shall generally govern. However, DPW/BBR shall bring the matter to the attention of Power for resolution.

TECHNICAL SPECIFICATIONS

9. REFERENCE STANDARD

This PV System project shall be designed and constructed in accordance with the applicable codes including but not limited to the following list of codes and standards. The codes and standards utilized shall be the latest editions in effect on the date of this proposal.

A.	American Concrete Institute	ACI
B.	American Institute of Steel Construction	AISC
C.	American National Standards Institute	ANSI
D.	American Society for Testing Materials	ASTM
E.	American Society of Mechanical Engineers	ASME
F.	American Welding Society	AWS
G.	Division of State Architect	DSA
H.	Institute of Electrical & Electronic Engineers IEEE	
I.	Instrument Society of America	ISA
J.	National Electric Code	NEC
K.	Occupation Safety and Health Administration	OSHA
L.	National Fire Protection Agency	NFPA
M.	Uniform Building Code	UBC
N.	City and County of San Francisco Administrative Code	
O.	City and County of San Francisco Building Code	
P.	City and County of San Francisco Plumbing Code	
Q.	City and County of San Francisco Electrical Code	
R.	City and County of San Francisco Mechanical Code	
S.	California Building Code	
T.	Concrete Reinforcing Steel Institute	CRSI
U.	PG&E Power Producers Handbook Requirements	

10. SYSTEM SPECIFICATION

Circuit Disconnects Switches and Enclosures:

- Enclosures shall be surface mounted type, unless otherwise noted, and of NEMA type 4X stainless steel, waterproof.

- Disconnect switches shall be heavy duty, AC or DC-rated as required and with appropriate ampere ratings. They shall be UL listed and of NEMA type 4X stainless steel, waterproof, meet proper AIC requirements, and be "load-break" capable.
- Disconnects and enclosures must be properly supported and braced to Seismic Zone 4 requirements, where required.
- All mounting hardware (strut), fasteners, and miscellaneous parts shall be high grade stainless steel. Roof-mounted conduit supports to be UV resistant and use recycled rubber.
- When used for disconnecting, disconnects for branch circuit protection shall be located as near as practical to the supply end of the conductors being protected.
- Power will provide the meter cabinet specification.

Fuses:

- All fuses for disconnects must be current limiting UL Ccs J, RK1, or RK5 and of the appropriate voltage, delay or non-delay characteristic, and current rating to provide both complete short circuit and overload protection per NEC sections regarding component protection.
- Fuses in the combiner boxes protecting PV string branch circuits must be UL Class CC midget-type, be in "touch safe" type fuse holders, providing load break disconnect capabilities when changing fuses. Midget fuses and fuse holders used in these circuits must be fully DC-rated, have adequate DC short circuit withstand capability, and must be provided for all power situations including "back-fed" conditions.
- All fuses and other protective devices and holders must be engineered to safely protect system components under "worst case" expected field conditions including temperature extremes. Appropriate temperature derate factors must be used.
- PV panel strings must be individually protected from short circuit conditions that may originate within the panels themselves.

Wiring and Connectors:

- Wire shall be copper and sizes referred to on the drawings refer to copper wire sizes.
- For conductors 600V or less, the minimum size shall be #12AWG.
- Insulation types are as follows:
 - Use "PV-WIRE", #12 or appropriate size for DC exposed locations for wiring of modules to combiner boxes.

- #12 to #1AWG: THWN or XHHW for wet or underground locations and THHN or XHHW for dry locations.
 - #1/0 through #4/0AWG: XHHW, THHN, or THWN.
 - #250MCM and larger, XHHW, THHN, or THWN.
 - When installed in underground conduits, use THWN or THWN-2.
- For signal and communications circuits, use wires and cables as shown in manufacturer's specifications.
 - Install copper wires, cables, and connection devices in accordance with the manufacturer's instructions and CEC-2001, Part 3. Do not bend cables to a smaller radius than is recommended by the manufacturer.
 - Quick connect, multi-contact connectors will be used where appropriate and all DC wiring including PV strings in the combiner boxes shall be clearly labeled.
 - Voltage drop must be limited to 2% on main AC circuit and 2% on DC circuits.

Raceways:

- Outdoor conduit shall be RGC
- Indoor conduit shall be EMT

Connections to Existing Circuit Breakers:

- Circuit breakers of the appropriate phase and voltage with the required AIC rating (rms symmetrical amperage short circuit rating) shall be utilized and this breaker rating along with the available short circuit available at the breaker bus bar shall be noted on the one line diagram.

Grounding:

- Provide driven ground rod and provide green equipment ground conductors sized in accordance with NEC on main AC power circuit and DC collector circuits. Ground rods shall be copper-clad steel 3/4-inch x 10 feet unless otherwise indicated on one-line diagram.
- In the case of roof-mounted inverters, the proper size ground wire shall be used to connect to the ground system per NEC and manufacturer guidelines.
- Appropriate tie in and grounding of the entire PV system, including roof-mounted components, shall be per NEC-250 requirements.

Operational Identification and Warnings:

- Install engraved signs for instruction or warning identifying that a solar PV system is operational on the premises at appropriate locations and that there are potentially multiple power sources on the premises.
- Provide identification of all DC power circuits on switches and clearly identify individual module strings in DC combiner boxes. Use appropriate wire color codes (i.e. Red & Black) for negative and positive circuits.
- PV panels must include serial numbers on the frame and be easily viewed from the topside of the panel.
- Install any additional signage as required by code or PG&E.

Signage:

- Install signage as required by the PG&E Interconnection Application such as, but not limited to the following:
 - If the AC Disconnect Switch location is not near Point of Common Coupling, permanent signage must be installed providing a clear description of the location of the device. Switchgear must be accessible.
 - The location of the AC Disconnect Switch is acceptable as long as it is accessible 24/7. If the revenue meter is inside a locked room, install one sign on the pad mount transformer and one sign on the door to the electrical room identifying the presence of a generator and describing with a map the location of the AC Disconnect Switch.
 - The AC Disconnect Switch signs are as follows (Letter size, etc. should be ½-inch engraved on plastic sign with a red background):
 - At the AC Disconnect Switch: "**GENERATOR DISCONNECT SWITCH**"
 - On the electric room door and at the transformer: "**PV GENERATOR DISCONNECT SWITCH LOCATED _____**"
- The AC Disconnect Switch should only de-energize PV units. The AC Disconnect Switch should not be the "main breaker" and de-energize applicant's resident load. A single AC Disconnect Switch should isolate all the PV units.
- Install signage identified on the Commissioning Checklist, including but limited to the following signs and locations:
 - "Data Acquisition System (DAS)" sign posted on the outside of the enclosure.
 - "Meter – High Voltage Inside" sign posted.
- Signs shall be maintained in good condition for the duration of the Agreement. Signs shall be promptly cleaned of graffiti and other

defacements, cleaned semi-annually of dirt and grime, and replaced if damaged or stolen.



APPENDIX A - POWER ENTERPRISE MATERIAL

↳ TO ATTACHMENT A

201 Van Ness Avenue
183kW Solar Electric Project
BID SHEETS

ITSF14000079/CD
APPENDIX 1

APPENDIX 1 - PV PANELIZED RACKING							
The following items are parts for the PV Panelized Racking as specified in Attachment B - V.A. Bidder must submit bid prices on all bid line items. Failure to enter a bid price on each bid line item will deem bidder's bid as non-responsive. If there is a discrepancy between the Bid Unit and the Extend Price, the Bid Unit Price shall prevail. For Bid Alternate please use Appendix 1.A							
Item #		Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price
1	PHOTOVOLTAIC RACKING COMPONENTS -- SunLink Precision RMS Roof Mount Assembly 1700 (or Equivalent)						
1.1	P-RMS Assy Long Beam, 55.00in Length	SunLink	630-000125	377	EA.	\$5.67	\$2,137.97
1.2	Hex Flange Nut, Serrated, 5/16"-18	SunLink	09-00002-01	772	EA.	\$0.15	\$114.56
1.3	5/16-18 x 0.75 Carriage Bolt	SunLink	09-00121-01	772	EA.	\$0.22	\$172.84
1.4	3/16 x 1.75 SS Roll Pin	SunLink	09-00126-01	388	EA.	\$0.15	\$115.23
1.5	5/16-18 Distorted Thread Hex Locknut	SunLink	09-00132-01	772	EA.	\$0.29	\$226.95
1.6	5/16-18 x 2.00 Hex Bolt	SunLink	09-00133-01	772	EA.	\$0.14	\$261.86
1.7	Long Beam, 55.00in Length	SunLink	63-0001-125	377	EA.	\$18.62	\$7,021.12
1.8	Yoke	SunLink	64-0001-001	752	EA.	\$3.01	\$2,279.76
1.9	Angle Strut, 8.0in	SunLink	64-0003-013	377	EA.	\$3.36	\$1,266.80
1.10	Custom Configuration Jig Assembly East	SunLink	690-000006	5	EA.	\$125.18	\$625.89
1.11	Custom Configuration Jig Assembly West	SunLink	690-000007	5	EA.	\$125.18	\$625.89

201 Van Ness Avenue
183kW Solar Electric Project
BID SHEETS

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Item #		Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price
1	PHOTOVOLTAIC RACKING COMPONENTS -- SunLink Precision RMS Roof Mount Assembly 1700 (or Equivalent)						
1.12	Hex Flange Nut, Serrated, 1/4"-20	SunLink	09-00001-01	2,296	EA.	\$0.14	\$316.80
1.13	Hex Flange Nut, Serrated, 5/16"-18	SunLink	09-00002-01	2,348	EA.	\$0.15	\$346.66
1.14	Hex Head Cap Screw 3/4"-10 x 1.75"	SunLink	09-00004-01	87	EA.	\$3.26	\$283.39
1.15	Hex Nut 3/8"-16	SunLink	09-00005-01	1,697	EA.	\$0.11	\$177.76
1.16	Flat Washer for 3/4" Screw	SunLink	09-00008-01	87	EA.	\$0.75	\$65.93
1.17	5/16-18 x 0.75 Carriage Bolt	SunLink	09-00121-01	762	EA.	\$0.22	\$169.62
1.18	3/8 Lock Washer	SunLink	09-00127-01	1,697	EA.	\$0.05	\$88.85
1.19	5/16-18 x 2.00 Hex Bolt	SunLink	09-00133-01	390	EA.	\$0.34	\$132.29
1.20	5/16-18 x 1.00" T-Stud	SunLink	09-00139-01	1,201	EA.	\$0.65	\$765.53
1.21	3/8-16 x 1.50 Hex Bolt	SunLink	09-00140-01	1,697	EA.	\$0.37	\$622.17
1.22	Button Head Cap Screw 5/16in-18 x 1.0in, SS	SunLink	09-00145-01	10	EA.	\$0.18	\$1.80

201 Van Ness Avenue
183kW Solar Electric Project
BID SHEETS

TTSF14000079/CD
APPENDIX 1

APPENDIX 1 -- PV PANELIZED RACKING							
The following items are parts for the PV Panelized Racking as specified in Attachment B -- V.A. Bidder must submit bid prices on all bid line items. Failure to enter a bid price on each bid line item will deem bidder's bid as non-responsive. If there is a discrepancy between the Bid Unit and the Extend Price, the Bid Unit Price shall prevail. For Bid Alternate please use Appendix 1.A							
Item #		Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price
1	PHOTOVOLTAIC RACKING COMPONENTS -- SunLink Precision RMS Roof Mount Assembly 1700 (or Equivalent)						
1.23	Button Head Cap Screw 1/4 in-20 x 1.0in. SS	SunLink	09-00146-01	2,296	EA.	\$0.11	\$252.56
1.24	Spar. 123.50in Length	SunLink	61-0001-059	74	EA.	\$18.16	\$1,343.84
1.25	Spar. 185.50in Length	SunLink	61-0001-183	200	EA.	\$57.77	\$11,554.00
1.26	Spar. 247.50in Length	SunLink	61-0001-307	94	EA.	\$77.07	\$7,244.62
1.27	Foot Base	SunLink	62-0001-001	429	EA.	\$5.12	\$2,196.48
1.28	Foot Bracket	SunLink	62-0002-001	850	EA.	\$5.69	\$4,838.50
1.29	Pivot Block	SunLink	64-0002-001	377	EA.	\$2.41	\$907.17
1.30	Strut Bracket	SunLink	64-0004-001	377	EA.	\$2.09	\$787.23

201 Van Ness Avenue
183kW Solar Electric Project
BID SHEETS

ITSF14000079/CD
APPENDIX I

APPENDIX 1 -- PV PANELIZED RACKING							
The following items are parts for the PV Panelized Racking as specified in Attachment B -- V.A. Bidder must submit bid prices on all bid line items. Failure to enter a bid price on each bid line item will deem bidder's bid as non-responsive. If there is a discrepancy between the Bid Unit and the Extend Price, the Bid Unit Price shall prevail. For Bid Alternate please use Appendix 1.A							
Item #		Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price
1	PHOTOVOLTAIC RACKING COMPONENTS -- SunLink Precision RMS Roof Mount Assembly 1700 (or Equivalent)						
1.31	Lateral Link	SunLink	64-0005-001	220	EA.	\$5.11	\$1,168.71
1.32	Arm. Connector	SunLink	66-0001-001	78	EA.	\$20.06	\$1,564.71
1.33	Clamp Plate, Connector	SunLink	66-0002-001	156	EA.	\$6.99	\$1,089.72
1.34	U-Plate, Connector	SunLink	66-0003-001	78	EA.	\$12.76	\$964.05
1.35	Connector Flashable Post Anchor 7.0in. Concrete 1	SunLink	66-0006-001	78	EA.	\$18.48	\$1,441.28
1.36	Ballast Basket 24in	SunLink	67-0003-001	139	EA.	\$47.70	\$6,630.30
1.37	Ballast Brace Type 1	SunLink	67-0004-001	278	EA.	\$11.77	\$3,270.95
1.38	Ballast Pad	SunLink	67-0006-001	556	EA.	\$1.13	\$630.62
1.39	Extruded Washer	SunLink	68-0001-001	1,989	EA.	\$0.47	\$927.67
1.40	Module Clip, 1/4-20in	SunLink	68-0003-001	2,319	EA.	\$0.60	\$1,391.34
1.41	Tilt Support Strut	SunLink	69-0007-001	8	EA.	\$19.08	\$152.64

201 Van Ness Avenue
183kW Solar Electric Project
BID SHEETS

ITSE14000079/CD
APPENDIX 1

APPENDIX 1 – PV PANELIZED RACKING							
The following items are parts for the PV Panelized Racking as specified in Attachment B – V.A. Bidder must submit bid prices on all bid line items. Failure to enter a bid price on each bid line item will deem bidder's bid as non-responsive. If there is a discrepancy between the Bid Unit and the Extend Price, the Bid Unit Price shall prevail. For Bid Alternate please use Appendix 1.A							
Item #		Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price
1	PHOTOVOLTAIC RACKING COMPONENTS -- SunLink Precision RMS Roof Mount Assembly 1700 (or Equivalent)						
1.42	Panelization	SunLink	PANELIZATION	1	EA.	\$10,556.54	\$10,556.54
1.43	12' Wire Tray Sections	SunLink	030-1001	36	EA.	\$67.25	\$2,421.00
1.44	Wire Tray Joint Assembly	SunLink	030-2003	30	EA.	\$1.71	\$51.30
1.45	Wire Tray Covers - 2' length	SunLink	030-1003	36	EA.	\$2.51	\$90.36
1.46	Wire Tray Hinge Assembly	SunLink	030-2101	99	EA.	\$1.36	\$134.64
PV PANELIZED RACKING EXTENDED TOTAL							\$12,153.74
NOTE: Total extended price from Appendix 1 must be shown on Bid Line 001							

201 Van Ness Avenue
 183kW Solar Electric Project
 BID SHEETS

ITSF14000079/CD
 APPENDIX 2

APPENDIX 2 -- PV STRING INVERTERS							
The following items are parts for six string inverters as specified in Attachment B -- V.B. Bidder must submit bid prices on all bid line items. Failure to enter a bid price on each bid line item will deem bidder's bid as non-responsive. If there is a discrepancy between the Bid Unit and the Extend Price, the Bid Unit Price shall prevail. For Bid Alternate please use Appendix 2.A							
Bid Line #		Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price
2	PHOTOVOLTAIC STRING NVERTERS						
2.1	Power-One TRIO-27.6 3-Phase Grid-Tied Inverters	Power-One	TRIO-27.6-TL-OUTD-S1-US-480	6	EA.	\$6,126.00	\$36,756.00
	27.6kW, 480VAC, 60Hz, 1000VDC, with DC Disconnect Switch, DC Input Fuses (Two Dual 4x15A fused inputs), 2 MPPT, 15 year warranty, ungrounded, RS485, NEMA 4X Enclosure						
2.2	Power-One . Kit for handling TRIO inverters during installation	Power-One	TRIO-LIFTING-KIT	1	EA.	\$36.00	\$36.00
	Includes four handles for manual lifting and two eyebolts for lifting with winch/crane.						
PV STRING INVERTER EXTENDED TOTAL							\$36,792.00
NOTE: Total extended price from Appendix 2 must be shown on Bid Line 002							

201 Van Ness Avenue
 183kW Solar Electric Project
 BID SHEETS

ITSF14000079/CD
 APPENDIX 3

APPENDIX 3 – ELECTRICAL COMPONENTS								
	The following items are parts for six string inverters as specified in Attachment B – V.C. Bidder must submit bid prices on all bid line items. Failure to enter a bid price on each bid line item will deem bidder's bid as non-responsive. If there is a discrepancy between the Bid Unit and the Extend Price, the Bid Unit Price shall prevail. For Bid Alternate please use Appendix 3.A							
Bid Line #								
3	PHOTOVOLTAIC - ELECTRICAL COMPONENTS	Manufacturer	Part #	Qty.	Unit	Unit Price	Extended Price	
3.1	Square D Panel Board (for AC tie-in of the six (6) TRIO inverters)	Square D	NF430L2C with MH38WUPSSUL NF	1	EA.	\$3,741.00	\$3,741.00	
	Panel Board with 250A bus, 480/277V 3 phase, 3 wire, MLO (Main Lugs Only), with NEMA 4X (Stainless Steel) Enclosure							
3.2	Square D Panel Board Circuit Breaker (one for each inverter to allow individual AC isolation; breakers to be installed in Square D Panel board included in parts list)	Square D	EJB34050LC	6	EA.	\$259.00	\$1,554.00	
	50A 3P 480V Bi-directional circuit breaker, with 65kA interrupt rating, with Copper lugs							
3.3	Square D AC Disconnect (Visible AC disconnect required for PV system by PG&E)	Square D	HU365DS	1	EA.	\$2,716.00	\$2,716.00	
	400 amp AC disconnect, non-fusible, heavy duty, rated 600V AC/DC; Enclosure Finish: NEMA 4X Stainless Steel							
		ELECTRICAL COMPONENT EXTENDED TOTAL						\$8,011.00

201 Van Ness Avenue
183kW Solar Electric Project
BID SHEETS

ITSF14000079/CD
APPENDIX 3

		NOTE: Total extended price from Appendix 3 must be shown on Bid Line 003				
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Davies Symphony Hall - 201 Van Ness Avenue
Photovoltaic Project - Parts List
FOR USG - Utility Services Group

Item #	Description			Est. Qty.	Add Spares	Final Qty.	Unit	Unit Price	Extended Price
	Item	Manufacturer	Model# / Item#						
	BALLAST BLOCKS/PAVERS RELATED								
1	Ballast Blocks / Pavers : Required for placement in SunLink ballast baskets to secure PV racking Minimum Paver Size (inches): 12" x 12" x 2.38". Required Min. Ballast Paver Weight (lbs): 26			1647	13	1,660			
	MC4 CONNECTORS RELATED								
2	MC4 connector with Boot (Female) - connector for +ve PV lead MC4 connector with Boot for 5.5 to 9 mm OD - for #12 PV Wire (1000 V), Female (+)			175	25	200			
3	MC4 connector with Boot (Male) - connector for -ve PV lead MC4 connector with Boot for 5.5 to 9 mm OD - for #12 PV Wire (1000 V), Male (-)			175	25	200			
	GROUNDING RELATED: DC CONDUITS, CABLE TRAYS, AC CONDUITS, SUNLINK RACKING								
4	Ground bushing on DC and AC conduits Parts for grounding SunLink wire trays (see SunLink Fig.16 in Wire Mgmt. manual)						EA.		
5	Grounding lug (to be installed on SunLink cable trays)			36	4	40	EA.		
6	#10 Stainless Steel Screw, 3/4" length (also purchase 1/2" length - see note to the right)			36	4	40	EA.		
7	Stainless Steel Star Washer (for use with #10 Stainless Steel screw)			36	4	40	EA.		
8	#10 Stainless Steel Nut Parts for grounding SunLink racking arrays (See SunLink Assembly Instructions for Precision RMS, Part V)			36	4	40	EA.		
9	1/4-20 x 1.50" Stainless Steel Hex Head Cap Screw			100		100	EA.		
10	18-8 Stainless Steel Flat Washer for 1/4" Screw size, 0.05"-0.08" thick			100		100	EA.		
11	18-8 Stainless Steel External Tooth Lock Washer 1/4" Screw Size, 0.51"OD, 0.02"-0.03" thick			50	50	100	EA.		
12	SunLink Extruded Washer								
13	1/4" Direct Burial Grounding Lug (tin-plated Copper)			6	4	10	EA.		
14	18-8 Stainless Steel Hex Nut 1/4-20, 7/16" width, 3/16" height			100		100	EA.		
	CONDUIT RELATED ITEMS:								
15	Galvanized Rigid Conduit 1 1/2": - for conduit runs to route PV DC string home runs from SunLink wire trays to Inverters (exterior runs on the roof)						LF		
16	Galvanized Rigid Conduit 1": - for conduit runs to route AC output from Inverters to AC lay-in wire way; for 1" spare conduit for future SFPUC communication use (from inverters vicinity to inside MO2, near MCC-F; Exterior run portion)						LF		
17	Galvanized Rigid Conduit 2": - for conduit run from AC lay-in wire way to AC Load Center LC-1						LF		
18	Galvanized Rigid Conduit 3":						LF		

Notes/Comments:

based upon SunLink calcs, Rev 4.

#12 PV Wire (1000V) had outside diameter = 6.05 mm; need the MC4 female and male cable connectors to build longer jumper wires to tie PV modules in series per string diagram.

USG to select and estimate qty. based upon take-offs

for the 36 x 12' SunLink wire tray sections (will use fewer if SunLink confirms that the wire tray joints are UL rated to serve as grounding conductor)

Note: Consider purchasing 1/2" length screws too; prefer to use shorter screw, if it works to secure the grounding lug to the wire trays.

Note: Ground additional SunLink foot brackets to sync up with the SunLink wire tray grounding

Note: Part# in SunLink install manual under Part V Grounding Recommendations is incorrect - material is not S.S.

USG to estimate qty. based upon take-offs

USG to estimate qty. based upon take-offs

USG to estimate qty. based upon take-offs

USG to estimate qty. based upon take-offs

Davies Symphony Hall - 201 Van Ness Avenue
Photovoltaic Project - Parts List
FOR USG - Utility Services Group

Item #	Description	Manufacturer	Model# / Item#	Est. Qty.	Add. Spares	Final Qty.	Unit	Unit Price	Extended Price	Notes/Comments:
	Item									
	- for conduit runs from AC Local Center LC-1 to SFPUC Meter Socket, from Meter Socket to Visible PG&E AC Disconnect, and from AC Disconnect to MCC-E in room MO2 (Exterior run per drawing)									
19	Conduit Supports (Recycled Rubber) --- to support rigid conduits on roof	Cooper B-Line	Dura-Block --- item #s listed by USG				EA			USG to estimate qty, based upon take-offs
20	Conduit Clamps --- to secure conduits to conduit supports	USG to select					EA			USG to estimate qty, based upon take-offs
21	Electro metallic Tubing 3" --- interior run for AC conduit from entry into MO2 to MCC-E	USG to select					LF			USG to estimate qty, based upon take-offs
22	Electro metallic Tubing 1" --- interior run of spare 1" conduit from entry into MO2 to suitable location near MCC-E	USG to select					LF			USG to estimate qty, based upon take-offs
23	Electro metallic Tubing fittings - as required. (Note: use compression fittings)	USG to select					EA			
24	PULL BOX: to be wall-mounted inside Room MO2 for routing AC output conduit (wires in 3" conduit) towards MCC-E for electrical tie-in	USG to select	USG to select	1	0	1	EA			
	WIRING RELATED ITEMS:									
25	Ground Wire #6G: from arrays to inverters, for grounding SunLink foot brackets to cable trays; for grounding conduits to cable trays; for grounding conduits to inverter ground bus; from LC-1 to PG&E Visible AC Disconnect; from AC Disconnect to MCC-E	USG to select								USG to estimate qty, based upon take-offs
26	Ground Wire #10G: from inverters to LC-1	USG to select								USG to estimate qty, based upon take-offs
27	Photovoltaic Copper Conductor/Wire - for DC string home runs, jumpers for connecting PV panels #12 AWG PV wire, rated for 1000 V	Enavire Wire Corporation or equal								USG to estimate quantity based upon take-offs from drawings
28	AC wire, #8 --- from inverters to LC-1	USG to select								USG to estimate qty, based upon take-offs
29	AC wire, 250KCMIL --- from LC-1 to Meter Socket, PG&E AC Disconnect and MCC-E (in room MO2)	USG to select								USG to estimate qty, based upon take-offs
	CORING RELATED ITEMS:									
30	Include materials as required for coring and flashing /sealing conduit penetrations through exterior parapet wall into MO2. See electrical drawing E7.1, detail 4	USG to select per drawing E7.1 Detail 4 requirements								
	MCC-E: PV AC TIE-IN RELATED ITEMS:									
31	24" bucket for 250A breaker with door for Westinghouse 5 Star MCC	Eaton	FSJ1S18Z1 with 24" bucket	1		1	EA			
32	250A molded-case circuit breaker, circuit breaker type JGH250, # of poles: 3, 480V, 65KAIC. Note: Breaker to be factory-installed in the new 24" bucket (noted above) being ordered for the Westinghouse 5 Star MCC	Eaton	JGH250 - 3 poles, 480V, 65KAIC	1		1	EA			
	AC WIREWAY RELATED ITEMS:									
	Lay-in NEMA Type 3R Wire way, 4.00" x 4.00", J4 rating galvanized steel	Hoffman								
33	12" Straight Section	Hoffman	F4T3R12							
34	60" Straight Section	Hoffman	F4T3R60							
35	Universal U-Connector	Hoffman	F4T3RUC							
36	Closure Plate	Hoffman	F4T3RCP	2		2	EA			
37	30-Degree Sweep Elbow	Hoffman	F4T3R30SE							Note: might require this part if wire-way needs to follow curved parapet wall
	METER RELATED ITEMS:									
38	Meter Socket --- for installation of SFPUC revenue meter	Milbank	U7594-X	1	0	1	EA			Note: USG: Please confirm acceptability of specified meter socket for SFPUC metering requirements prior to ordering.
	MilBank, 320 amp, 7 terminal, ringless, 3 phase 4 wire									

Contact Thomas Atkins Jr., District Inside Sales Engineer, EATON Corp. - Electrical Sector; email: thomasatkins@eaton.com; tel# (925)-454-3750 to re-confirm and coordinate for ordering. Confirm breaker will be factory-installed in the new bucket.

USG to determine qty, based upon its plan to construct unitruct racking to mount inverters, disconnect, AC panel and meter per suggested layout on sheet E7.1

Note: might require this part if wire-way needs to follow curved parapet wall

Davies Symphony Hall - 201 Van Ness Avenue
 Photovoltaic Project - Parts List
 FOR USG - Utility Services Group

Item #	Description			Est. Qty.	Add Spares	Final Qty.	Unit	Unit Price	Extended Price
	Item	Manufacturer	Model# / Item#						
	UNISTRUT ITEMS:								
39	Unistrut components to build support frame on curved parapet wall to mount inverters, AC load panel, meter socket, AC disconnect and lay-in wire way; also support home-run conduits and output conduits towards M02								
TOTAL:									\$0.00

EA = EACH; LF = LINEAR FOOT

END OF ATTACHMENT ____

Notes/Comments:

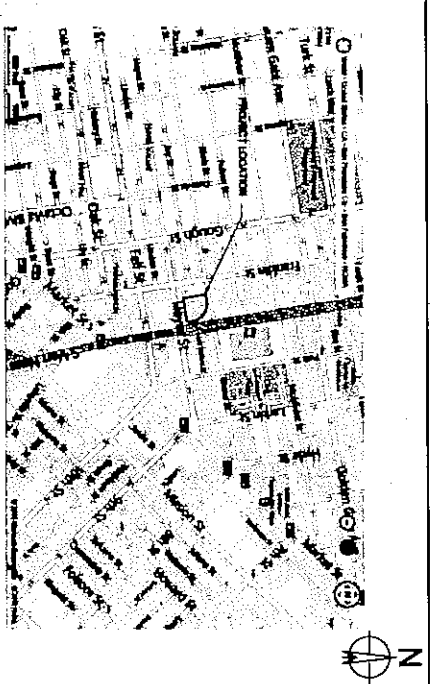
USG to determine optimal layout of unistrut frame to support components. Use Sheet E7.1 for suggested layout.



APPENDIX B - PV PROPOSED CONNECTIONS UNWINDING
 Lp TO ATTACHMENT A

DAVIES SYMPHONY HALL PHOTOVOLTAIC (PV) PROJECT 201 VAN NESS AVENUE, SAN FRANCISCO, CA 94102

LOCATION MAP



SCOPE OF WORK

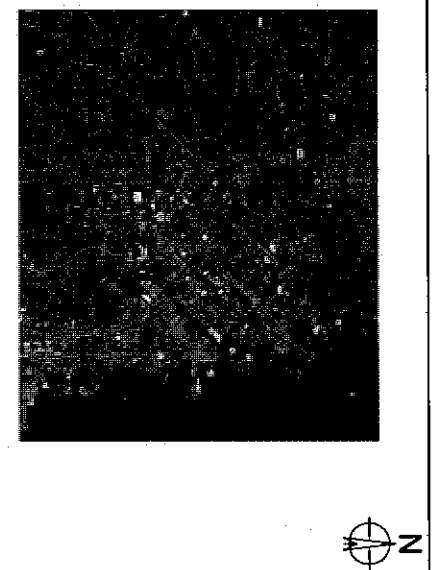
PROJECT TO INSTALL A 50KW PV PHOTOVOLTAIC (PV) SYSTEM AT 201 VAN NESS AVENUE - DAVIES SYMPHONY HALL.

THE PV INSTALLATION WILL BE ON THE SOUTH FACED ROOF OF BUILDING 101. NEW STRUCTURAL SUPPORTS FOR THE PV MODULES WILL BE PROVIDED BY THE CONTRACTOR. THE PV SYSTEM WILL BE INSTALLED ON THE SOUTH FACED ROOF OF BUILDING 101. THE PV SYSTEM WILL BE INSTALLED ON THE SOUTH FACED ROOF OF BUILDING 101. THE PV SYSTEM WILL BE INSTALLED ON THE SOUTH FACED ROOF OF BUILDING 101.

DRAWING INDEX

- GENERAL
 - 01 SITE PLAN
 - 02 SITE PLAN
- ARCHITECTURAL
 - 01 PV PANEL ARRAY INSTALLATION
 - 02 PV PANEL ARRAY INSTALLATION
 - 03 PV PANEL ARRAY INSTALLATION
 - 04 PV PANEL ARRAY INSTALLATION
 - 05 PV PANEL ARRAY INSTALLATION
 - 06 PV PANEL ARRAY INSTALLATION
 - 07 PV PANEL ARRAY INSTALLATION
- ELECTRICAL
 - 01 ELECTRICAL GENERAL NOTES, SPECIFICATIONS
 - 02 SPECIFICATIONS
 - 03 RENEWABLE ENERGY SYSTEM
 - 04 RENEWABLE ENERGY SYSTEM
 - 05 RENEWABLE ENERGY SYSTEM
 - 06 RENEWABLE ENERGY SYSTEM
 - 07 RENEWABLE ENERGY SYSTEM

SITE MAP



APPLICABLE CODES AND STANDARDS

1. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUMES 1, 2 AND 3
2. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUME 1, TITLE 24, CDS
3. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUME 1, TITLE 24, CDS
4. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUME 1, TITLE 24, CDS
5. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUME 1, TITLE 24, CDS
6. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUME 1, TITLE 24, CDS
7. 2015 CALIFORNIA ELECTRICAL CODE (CEC), VOLUME 1, TITLE 24, CDS

PROJECT TEAM

- OWNER**
- 1) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 2) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 3) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 4) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 5) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 6) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 7) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 8) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 9) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
 - 10) SAN FRANCISCO PUBLIC WORKS & ENGINEERING DEPARTMENT
- DESIGNER**
- 1) ARUP CONSULTANTS, LLC
 - 2) ARUP CONSULTANTS, LLC
 - 3) ARUP CONSULTANTS, LLC
 - 4) ARUP CONSULTANTS, LLC
 - 5) ARUP CONSULTANTS, LLC
 - 6) ARUP CONSULTANTS, LLC
 - 7) ARUP CONSULTANTS, LLC
 - 8) ARUP CONSULTANTS, LLC
 - 9) ARUP CONSULTANTS, LLC
 - 10) ARUP CONSULTANTS, LLC
- INSTALLER**
- 1) TRS
 - 2) TRS
 - 3) TRS
 - 4) TRS
 - 5) TRS
 - 6) TRS
 - 7) TRS
 - 8) TRS
 - 9) TRS
 - 10) TRS

**DAVIES SYMPHONY HALL
 PHOTOVOLTAIC (PV) PROJECT
 201 Van Ness Ave. San Francisco, CA 94102**

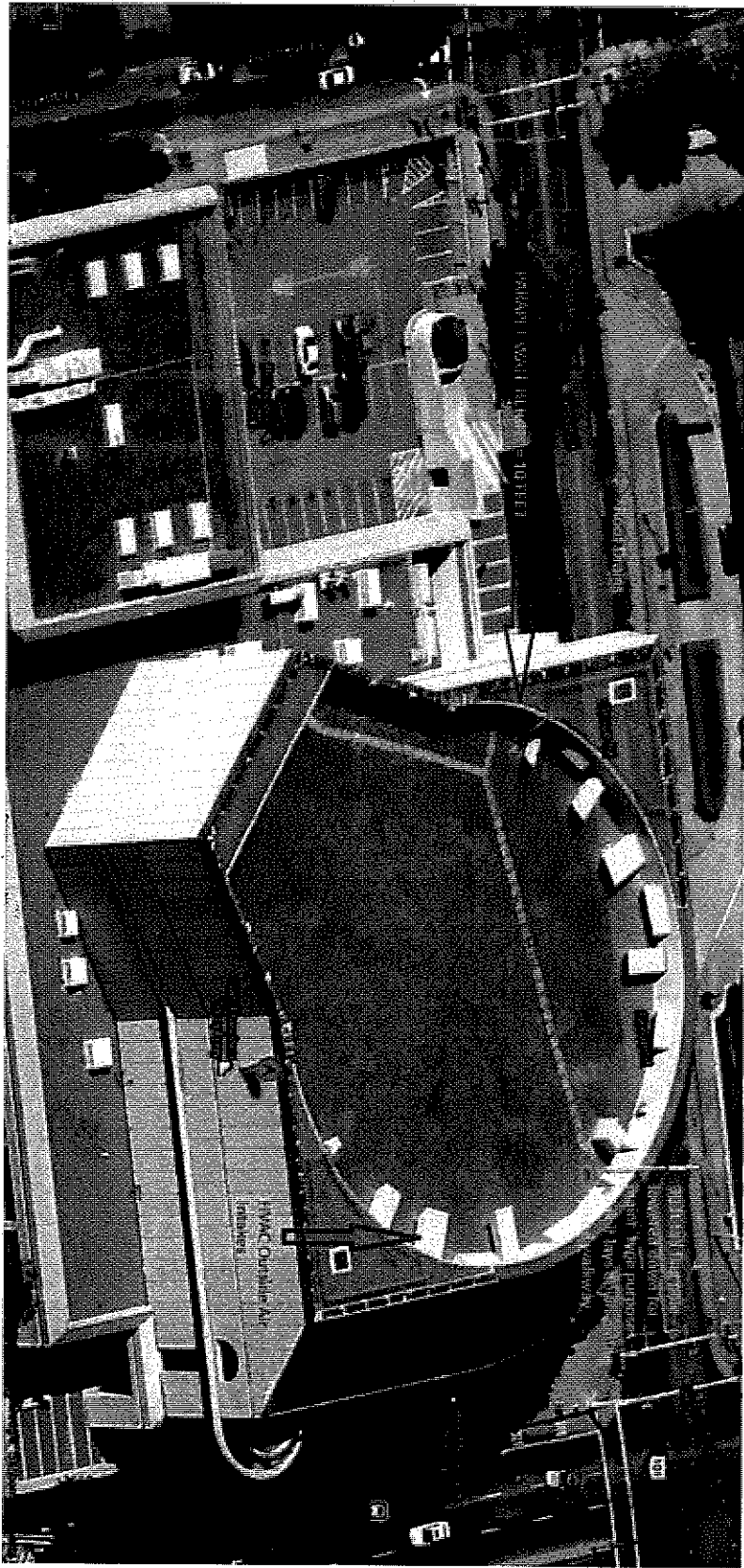
DATE: 4/2/2015

PROJECT: 201VANS

SCALE: AS SHOWN

TITLE SHEET

T0.1



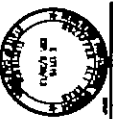
SITE PLAN
SCALE: N.T.S.



T0.2

SITE PLAN

DATE	01/11/11
BY	LANDIS
PROJECT	DAVIES SYMPHONY HALL
NO.	01/11/11
SCALE	N.T.S.
DATE	01/11/11
BY	LANDIS



DATE	01/11/11
BY	LANDIS
PROJECT	DAVIES SYMPHONY HALL
NO.	01/11/11
SCALE	N.T.S.
DATE	01/11/11
BY	LANDIS

**DAVIES SYMPHONY HALL
PHOTOVOLTAIC (PV) PROJECT**
201 Van Ness Ave. San Francisco, CA 94102



ELECTRICAL SYMBOLS (NOT ALL SYMBOLS APPLICABLE)

- CONSTRUCTION NOTE**
- ☐ LIGHT FIXTURE IDENTIFICATION TAG
 - LOWER CASE LETTER = SWITCH LEG
 - D = DIMMER SWITCH
 - DL = DATA/LOG SWITCH
 - K = KEY SWITCH
 - M = MOTOR RATED SWITCH
 - TS = DIGITAL TIMER SWITCH
 - OS = OCCUPANCY SENSOR SWITCH
 - 3 = 3 WAY SWITCH, 4 = 4 WAY SWITCH
 - POWER OUTLET SEE DRAWING FOR RATING & TYPE (1PH)
 - POWER OUTLET SEE DRAWING FOR RATING & TYPE (3PH)
 - RECEPTACLE, DUPLEX 20A, 125V, 16, STRAIGHT BLADE, NEMA 5-20R
 - CEILING MOUNTED DUPLEX AND DUAD RECEPTABLES
 - RECEPTACLE, DOUBLE DUPLEX 20A, 125V, 16, STRAIGHT BLADE, NEMA 5-20R
 - DUPLEX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER WHERE INDICATED ABOVE COUNTER, INSTALL AT 4" ABOVE COUNTER, UON.
 - FLUSH FLOOR BOX WITH DUPLEX RECEPTACLE AND COMPARTMENT FOR 2-DATA OUTLETS.
 - RECESSED PANELBOARD
 - SURFACE PANELBOARD
 - DISTRIBUTION PANELBOARD OR SWITCHBOARD
 - LIGHTING CONTROL PANEL
 - ELECTRIC CONDUIT RUN EXPOSED OR CONCEALED IN WALLS OR ABOVE CEILING WHERE WALLS AND CEILING PERMIT.
 - LOW VOLTAGE WIRING (50V OR BELOW)
 - GROUND GRID
 - CONDUIT RUN BELOW GRADE OR FLOOR
 - CONDUIT UP/DOWN
 - CONDUIT STUBBED OUT AND CAPPED
 - EVS EXPLOSION PROOF FITTING
 - FLEX CONDUIT
 - HAND HOLE
 - MAN HOLE
 - JUNCTION OR OUTLET BOX WITH BLANK COVER - 4S UNLESS OTHERWISE NOTED
 - PA-10 DESTINATION (PANEL-CIRCUIT NO) CONDUIT (3/4" MIN U.O.N)
 - GROUND CONDUCTOR #12 WIRE U.O.N
 - NEUTRAL CONDUCTOR #10 EACH MARKS INDICATE HOT CONDUCTORS
 - DISCONNECT SWITCH (LOCKABLE), NON-FUSED/FUSED, FUSE SIZE, NEMA 1-C-0
 - FUSE SIZE, 10 FOR NON-FUSE
 - DISCONNECT RATING
 - POLE
 - COMBINATION MOTOR STARTER WITH NON-FUSED/FUSED CIRCUIT BREAKER (DISCONNECT, LOCKABLE)
 - FUSE SIZE, 10 FOR NON-FUSE
 - DISCONNECT RATING
 - POLE
 - VFD
 - VFD WITH BYPASS
 - GROUND ROD
 - TEST WELL
 - AIR TERMINAL - 1/2"x24" ø/CENTER SUPPORT

GENERAL ELECTRICAL NOTES

- C1 ALL WORK SHALL COMPLY WITH THE NEC 2008/CEC 2010 OR LATEST EDITION OF THE ELECTRICAL CODE AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL CODES. WHERE THE PLANS SHOW MORE RESTRICTIVE REQUIREMENTS, THE PLANS SHALL GOVERN. BUT NOTHING ON THESE PLANS SHALL BE INTERPRETED AS AUTHORITY TO VIOLATE ANY CODE OR REGULATION.
 - C2 ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BEAR THE UNDERWRITERS' LABORATORY LABEL (UL) AND SHALL BE INSTALLED IN THE MANNER FOR WHICH THEY ARE DESIGNED AND APPROVED.
 - C3 UNLESS OTHERWISE NOTED, ALL WIRE SHALL BE COPPER, STRANDED ONLY, LIL LISTED, RATED FOR 600 VOLTS, TYPE THHN/THWN, NO. 12 AND MINIMUM FOR POWER AND #14 AND MINIMUM FOR CONTROL. USE THHN TYPE FOR #8 OR LARGER. USE 1000V PVC CABLES FOR STRONG WIRING EXPOSED TO SUN AND OTHER CABLE TRAYS.
 - C4 PROVIDE RGC UP TO 6' AFF WHERE EXPOSED AND INDOORS, EMT CONDUIT TYPE FOR ALL OTHER AREAS LOCATED INDOORS. IN ADDITION USE RGC FOR OUTDOORS ABOVE GRADE AND PVC SCHEDULE 40 FOR OUTDOORS UNDERGROUND. IN ADDITION, OUTDOOR UNDERGROUND CONDUIT RISERS AND NO USE BENDS CONDUITS SHALL BE RGC. UNDERGROUND RGC SHALL BE WRAPPED WITH 20 MIL TAPE AND EXTEND 12" ABOVE GRADE FOR RISERS. USE MIN 3/4" CONDUIT, U.O.N.
 - C5 THE CONTRACTOR SHALL INSTALL ALL CONDUITS AND WIRES WITH A MINIMUM NUMBER OF BENDS AND IN SUCH A MANNER AS TO CONFORM TO THE STRUCTURE AND OBSTRUCTIONS. PRESERVE HEAD ROOM, KEEP OPENINGS AND PASSAGEWAYS CLEAR, AND MEET ALL STRUCTURAL CODE REQUIREMENTS.
 - C6 NOT USED.
 - C7 THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES. ALL CONDUIT RUNS SHALL INCLUDE A CODE SIZED GROUND WIRE WHETHER OR NOT SO INDICATED.
 - C8 ALL BRANCH CIRCUITS SHALL INCLUDE A CODE SIZED GROUND WIRE. ISOLATED/DEDICATED BRANCH CIRCUITS SHALL INCLUDE A SEPARATE GROUND WIRE CONNECTED TO THE DEDICATED SINGLE POINT GROUND FOR EACH DUPLEX OUTLET ON A CIRCUIT.
 - C9 CERTAIN FEEDER AND BRANCH CIRCUIT WIRE SIZES HAVE BEEN OVERSIZED TO COMPENSATE FOR VOLTAGE DROP. WIRE SIZES TO COMPENSATE SIZES FOR DEFORMATION ADJACENT TO EQUIPMENT CONNECTION AS REQUIRED. SEPARATE WIRING OF CABLE STRAND NOT ALLOWED.
 - C10 ALL TERMINATION POINTS WILL HAVE SCREW-IN CLAMP-TYPE CONNECTIONS, UNLESS OTHERWISE PRIOR APPROVAL IS GIVEN BY ENGINEER.
 - C11 THE ENTIRE WIRING SYSTEM TO BE TESTED FOR SHORT CIRCUITS, GROUNDS, AND INSULATION RESISTANCE BETWEEN CONDUCTORS AND TO GROUND.
 - C12 THE CONTRACTOR SHALL PROVIDE SUPPORT FOR ALL ELECTRICAL EQUIPMENT TO COMPLY WITH THE SEIZING REQUIREMENTS OF THE UNIFORM BUILDING CODE AND ALL LOCAL ORDINANCES.
 - C13 PROVIDE A NAMEPLATE FOR EACH INDIVIDUALLY MOUNTED CIRCUIT BREAKER OR DISCONNECT SWITCH ELECTRICAL PANELS, TRANSFORMERS, DISTRIBUTION BOARDS, ETC. FULL BOX, WHITE RECEPTACLE, AND FOR ANY OTHER CONTROL DEVICE OR MAJOR ITEM OF ELECTRICAL EQUIPMENT AS FOLLOWS:
 - 1 --- PROVIDE LAMINATED NAMEPLATES ENGRAVED IN 1/4" HIGH LETTERS TO CORRESPOND WITH THE DESIGNATION ON THE DRAWINGS. PROVIDE OTHER OR ADDITIONAL INFORMATION ON NAMEPLATES WHERE INDICATED. ORANGE FOR 480V.
 - 2 --- ATTACH NAMEPLATES TO EQUIPMENT WITH NUTS, BOLTS, OR APPLICABLE SHEET METAL SCREWS. GULF-ON TYPES AND POP-NUTS TYPE ARE NOT ACCEPTABLE.
- LABEL ALL RECEPTABLES, OUTLETS, JUNCTION BOXES, WITH DIAM-TYPE EMBOSSED TAPE AS FOLLOWS:
- 1 --- RECEPTABLES AND JUNCTION BOXES PANEL AND CIRCUIT NUMBER.
 - 2 --- USE BLACK TAPE FOR 240V AND LESS.
 - 3 --- USE ORANGE TAPE FOR 277V AND ABOVE.
- INDICATE ON THE DEVICE IF THE CIRCUIT IS DEDICATED OR ISOLATED.
- C14 THE ELECTRICAL DRAWINGS ARE DIAGNOMATIC AND DO NOT SHOW ALL OFFSETS, BENDS, FITTINGS, JUNCTION BOXES, PULL BOXES, AND EXPANSION FITTINGS REQUIRED TO MEET FIELD CONDITIONS. CONTRACTOR SHALL DETERMINE ACTUAL MATERIAL AND HARDWARE REQUIREMENTS AND VERIFY ALL DIMENSIONS.
 - C15 CONTRACTOR SHALL PROVIDE PULL LINE IN ALL EMPTY CONDUITS.
 - C16 FUNCTIONALLY TEST THE ELECTRICAL INSTALLATION FOR PROPER OPERATION AND ROTATION.
 - C17 PURNISH AND INSTALL ALL CONDUITS, WIRES, BOXES, SWITCHES, LIGHT FIXTURES (WITH LAMPS), RECEPTABLES, SERVICE DEVICES, PANELBOARDS AND OTHER EQUIPMENT SHOWN ON THE DRAWINGS AS REQUIRED FOR A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM.

C18 PROVIDE COLOR CODING AS SHOWN. COLOR CODE WILL BE CARRIED THROUGHOUT ALL BRANCHES ON A SINGLE CIRCUIT.

APPLICATION	COLOR CODING
1 3-PHASE - 480/277 VOLT	A = BROWN B = ORANGE C = YELLOW NEUTRAL = GREY GROUND = GREEN
2 3-PHASE - 120/208 VOLT	A = BLACK B = RED C = BLUE NEUTRAL = WHITE GROUND = GREEN
3 1-PHASE - 120 VOLT PRELATED CIRCUIT (ORANGE RECEPTACLE ONLY)	HOT = ORANGE NEUTRAL = WHITE GROUND = GREEN
4 1-PHASE - 120 VOLT CIRCUIT	HOT = BLACK, RED, OR BLUE DEPENDENT ON PHASE NEUTRAL = WHITE

- C19 SUBMIT TO THE ENGINEER SHOP DRAWINGS, MANUFACTURER'S DATA AND CERTIFICATES FOR EQUIPMENT, MATERIALS AND FINISH, AND FURNISH DETAILS FOR EACH SYSTEM SPECIFIED. OBTAIN APPROVAL BEFORE PROCUREMENT, FABRICATION OR DELIVERY OF THE ITEMS TO THE JOB SITE. PARTIAL SUBMITTALS ARE NOT ACCEPTABLE AND WILL BE RETURNED WITHOUT REVIEW.
- C20 ALL ELECTRICAL EQUIPMENT INSTALLED OUTDOORS SHALL BE WEATHERPROOF. MINIMUM OF NEMA 3R RATING, UON. EXTERIOR CONDUIT RUNS INTO BUILDINGS SHALL BE INSTALLED WITH FLASHING, CAULKED AND SEALED. CONDUITS FOR EXTERIOR ELECTRICAL DEVICES SHALL BE RUN INSIDE BUILDING, UON.

GROUNDING NOTES

- G01 ALL GROUND GRID CONDUCTORS ARE #10 SOFT DRAWN BARE COPPER.
- G02 GROUND RODS SHALL BE MIN 10 FEET IN LENGTH, 3/4" DIAMETER, AND COPPER CLAD.
- G03 CONNECTIONS TO GROUND RODS SHALL BE EXOTHERMIC TYPE. TEST WELLS CONNECTIONS SHALL BE BOLTED TYPE.
- G04 THE CONTRACTOR SHALL MAKE GROUND RESISTANCE MEASUREMENTS AS REQUIRED BY THE LATEST EDITION OF LEI, DOCUMENT THE READINGS AND REPORT THEM TO THE ENGINEER.
- G05 MAJOR EQUIPMENT SHALL BE CONNECTED TO THE GROUND GRID BY TWO CONNECTIONS FROM DIFFERENT PARALLEL MAIN GRID CONDUCTORS.
- G06 WHEN AN EXPOSED GROUND CABLE IS RUN IN METAL CONDUIT OR PROTECTED BY A METAL GUARD, THE GROUND CABLE SHALL BE BONDED AT BOTH ENDS TO THE CONDUIT OR THE GUARD.
- G07 UNLESS OTHERWISE NOTED, BURIED GROUNDING CONDUCTORS SHALL HAVE A MINIMUM OF TWO FEET OF COVER (24").
- G08 ALL JUNCTIONS MADE ABOVE GROUND OR IN TEST WELLS SHALL BE BOLTED CONNECTIONS, EXCEPT THOSE AT BUILDING COLUMNS WHICH MAY BE EITHER BOLTED OR EXOTHERMIC TYPES.

ELECTRICAL ABBREVIATIONS

- A AMPERE
- ATF/AFS ABOVE FINISHED FLOOR/ABOVE FINISHED GRADE
- AVR AUDIO VISUAL
- ATS AUTOMATIC TRANSFER SWITCH
- BLDG. BUILDING
- C CONDUIT
- CAT CATEGORY
- CATV CATV
- CB CIRCUIT BREAKER
- CKT CIRCUIT
- CLG CEILING
- CO CONDUIT ONLY
- COMM COMMUNICATION
- CJ COPPER
- DIST DISTRIBUTION
- DWG DRAWING
- (E) EXISTING
- (ERL) EXISTING TO BE RELOCATED
- ELECTR ELECTRICAL
- EMT ELECTRIC METALLIC TUBING
- EPF EXPLOSION PROOF
- EXTD TO REMAIN EXTENDING TO REMAIN
- F FUSED
- FA FIRE ALARM
- FACP FIRE ALARM CONTROL PANEL
- FIX FUTURE
- FLA FULL LOAD AMPERES
- FLEX FLEXIBLE
- FSS FUSED SAFETY SWITCH
- FT FOOT OR FEET
- G. GND GROUNDING
- GFCI GROUND FAULT CIRCUIT INTERRUPTER
- HH HAND HOLE
- HOA HAND-OFF AUTOMATIC
- HP HORSEPOWER
- HT HEIGHT
- IMC INTERMEDIATE METAL CONDUIT
- IND INTERMEDIATE DISTRIBUTION FRAME
- JB JUNCTION BOX
- KANS KANSAS INTERRUPTING CAPACITY IN THOUSANDS
- LCP LIGHTING CONTROL PANEL
- LEL LOWER EXHAUSTION LEVEL
- LDA LIGHTING DESIGN ALLOWANCE
- LTC(L) LIGHTING
- MH MAN HOLE
- MCB MAIN CIRCUIT BREAKER
- MDF MAIN DISTRIBUTION FRAME
- MECH MECHANICAL
- MIN MINIMUM
- MLO MAIN LUGS ONLY
- MWB MAIN SWITCHBOARD
- MOLD MOLDED
- (N) NEW
- NE NON ELECTRICAL
- NEUT NEUTRAL
- NEC NATIONAL ELECTRICAL CODE
- NL NIGHT LIGHT
- NRSS NON RESISTIVE SAFETY SWITCH
- NTS NOT TO SCALE
- OC ON LEADER
- OS OCCUPANCY SENSOR
- P POLE
- PRL PANEL
- PVC POLYVINYL CHLORIDE
- RECEPT RECEPTACLE
- REF REFERENCE
- (R) RELOCATED
- RGC RIGID GALVANIZED STEEL CONDUIT
- RIG RIGID
- REQ REQUIRED
- RM ROOM
- SC SHORT CIRCUIT
- SH MANUAL MOTOR SWITCH
- SPACE SPACE
- SPEC SPECIFICATION(S)
- SPR SPARE
- SWGR SWITCHGEAR
- SWBD SWITCHBOARD
- TCP TEMPERATURE CONTROL PANEL
- TCL TELEPHONE
- TBT TELEPHONE TERMINAL BACKBOARD
- TYP TYPICAL
- TVS TRANSIENT VOLTAGE SURGE SUPPRESSOR
- UON UNLESS OTHERWISE NOTED
- UPS UNINTERRUPTIBLE POWER SUPPLY
- UTY UTILITY
- VFD VARIABLE FREQUENCY DRIVE
- W WITH
- WP WEATHERPROOF
- XTMR/TR TRANSFORMER



DAVES SYMPHONY HALL
 PHOTOVOLTAIC (PV) PROJECT
 201 Van Ness Ave. San Francisco, CA 94102

DATE	REVISION	BY	CHKD



SHEET INFORMATION	
DATE	2/22/13
NO.	SPEC-12120
DATE	NOTE
NO.	525
DATE	AK

ELECTRICAL SYMBOLS, GENERAL NOTES, ABBREVIATIONS

E0.1

ELECTRICAL SECTION 15000

1501 CONDUIT, EMBLEM, ELECTRICAL CONDUIT, STEEL CONDUIT
 1.01 CONDUIT SHALL BE STEEL OR ALUMINUM CONDUIT AS SPECIFIED IN THE SCHEDULE. CONDUIT SHALL BE MANUFACTURED BY THE FOLLOWING MANUFACTURERS:
 1.02 CONDUIT SHALL BE MANUFACTURED BY THE FOLLOWING MANUFACTURERS:
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1502 ELECTRICAL CONDUIT, ALUMINUM CONDUIT, STEEL CONDUIT
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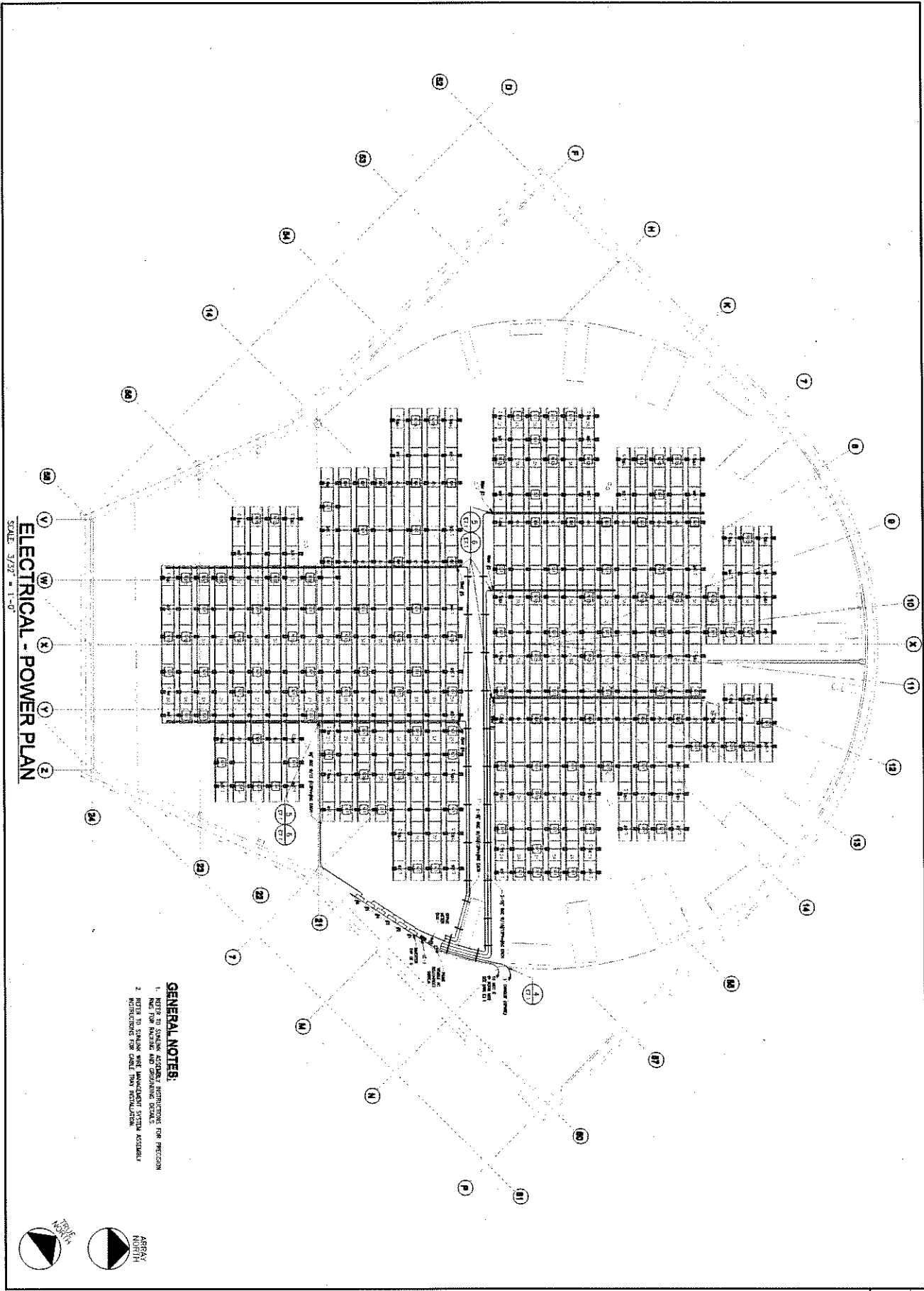
1504 ELECTRICAL CONDUIT, ALUMINUM CONDUIT, STEEL CONDUIT
 1.01 CONDUIT SHALL BE MANUFACTURED BY THE FOLLOWING MANUFACTURERS:
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DAVIES SYMPHONY HALL PHOTOVOLTAIC (PV) PROJECT
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ELECTRICAL SPECIFICATIONS
 SHEET 002
 DATE: 07/11/13
 NO: 9713-1130
 NAME: 502
 QUANT: 1

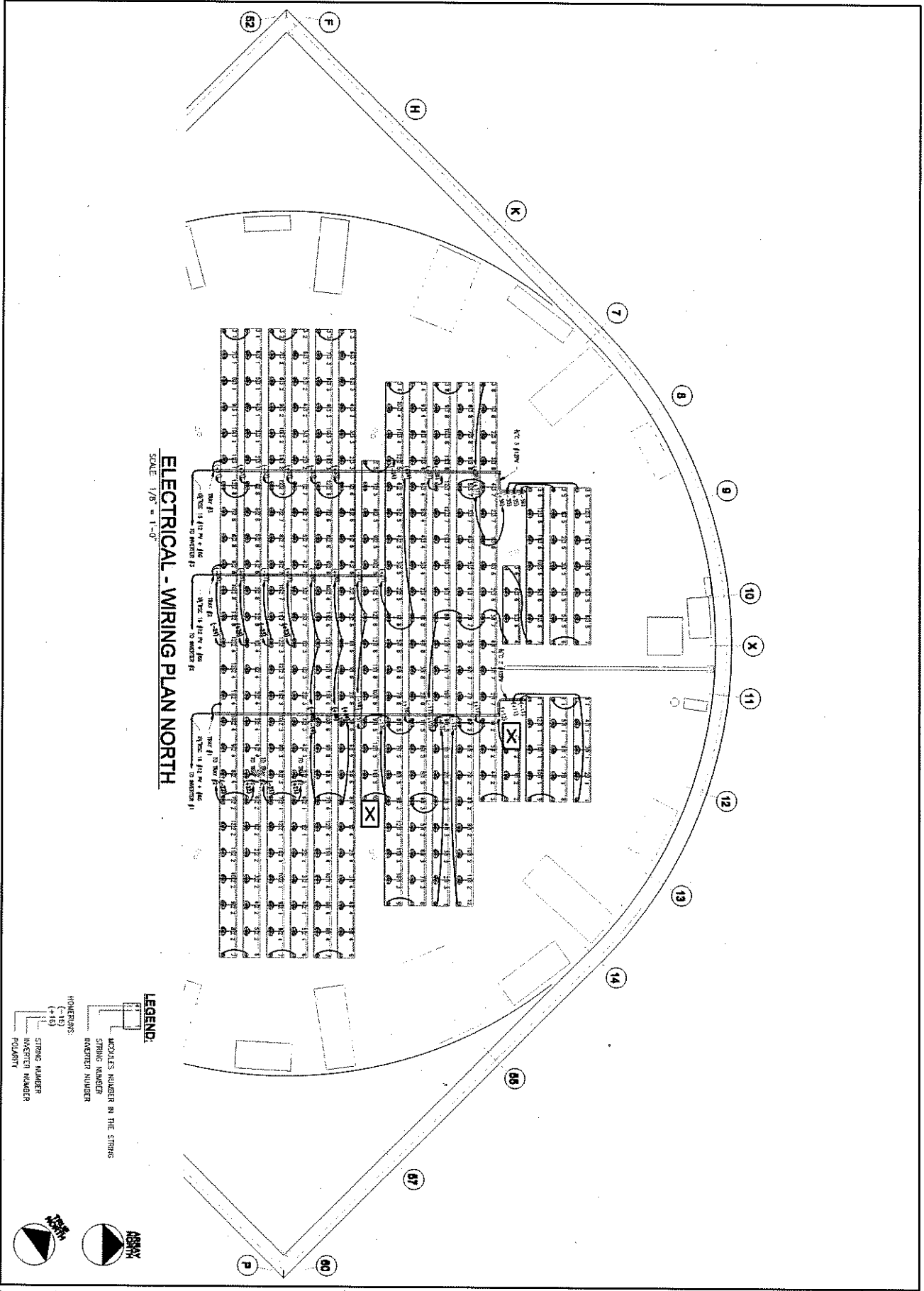


ELECTRICAL - POWER PLAN
SCALE: 3/8" = 1'-0"

- GENERAL NOTES:**
1. REFER TO SHEET 03 FOR PRECISION NOTES AND CONDUIT SIZES
 2. REFER TO SHEET 04 FOR CONDUIT SIZES
 3. REFER TO SHEET 05 FOR CONDUIT SIZES
 4. REFER TO SHEET 06 FOR CONDUIT SIZES
 5. REFER TO SHEET 07 FOR CONDUIT SIZES
 6. REFER TO SHEET 08 FOR CONDUIT SIZES
 7. REFER TO SHEET 09 FOR CONDUIT SIZES
 8. REFER TO SHEET 10 FOR CONDUIT SIZES
 9. REFER TO SHEET 11 FOR CONDUIT SIZES
 10. REFER TO SHEET 12 FOR CONDUIT SIZES
 11. REFER TO SHEET 13 FOR CONDUIT SIZES
 12. REFER TO SHEET 14 FOR CONDUIT SIZES
 13. REFER TO SHEET 15 FOR CONDUIT SIZES
 14. REFER TO SHEET 16 FOR CONDUIT SIZES
 15. REFER TO SHEET 17 FOR CONDUIT SIZES
 16. REFER TO SHEET 18 FOR CONDUIT SIZES
 17. REFER TO SHEET 19 FOR CONDUIT SIZES
 18. REFER TO SHEET 20 FOR CONDUIT SIZES
 19. REFER TO SHEET 21 FOR CONDUIT SIZES
 20. REFER TO SHEET 22 FOR CONDUIT SIZES
 21. REFER TO SHEET 23 FOR CONDUIT SIZES
 22. REFER TO SHEET 24 FOR CONDUIT SIZES

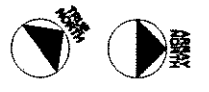


<p>ABPC GROUP, LLC Architectural, Planning & Construction Group, Inc. 1000 Market Street, Suite 1000 San Francisco, CA 94102 Tel: 415.774.2200 Fax: 415.774.2201 www.abpcgroup.com</p>	<p>TM The McGraw-Hill Companies 1221 Avenue of the Americas New York, NY 10020-1095 Tel: 212.512.2000 Fax: 212.512.2001 www.mcgraw-hill.com</p>	<p>TRIS The TRIS Group, Inc. 1000 Market Street, Suite 1000 San Francisco, CA 94102 Tel: 415.774.2200 Fax: 415.774.2201 www.trisgroup.com</p>	<p>DAVIES SYMPHONY HALL PHOTOVOLTAIC (PV) PROJECT 201 Van Ness Ave. San Francisco, CA 94102</p>	<p>DATE: 12/23/15 SCALE: 3/8" = 1'-0"</p>	<p>E1.1</p>



ELECTRICAL - WIRING PLAN NORTH
SCALE: 1/8" = 1'-0"

LEGEND:
ACORN'S NUMBER IN THE STRINGS
STRING NUMBER
REVERTER NUMBER
HOMERUN:
(-)16
(+)16
STRING NUMBER
INVERTER NUMBER
POLARITY



DAVIES SYMPHONY HALL
PHOTOVOLTAIC (PV) PROJECT
201 Van Ness Ave. San Francisco, CA 94102

ARRC Group, LLC
TM
TRIS
10/1/2019

SHEET INFORMATION
DATE: 10/1/2019
PROJECT: DAVIES SYMPHONY HALL
DRAWING NO: E1.2
REVISION: 0
SCALE: 1/8" = 1'-0"
E1.2

REVISIONS

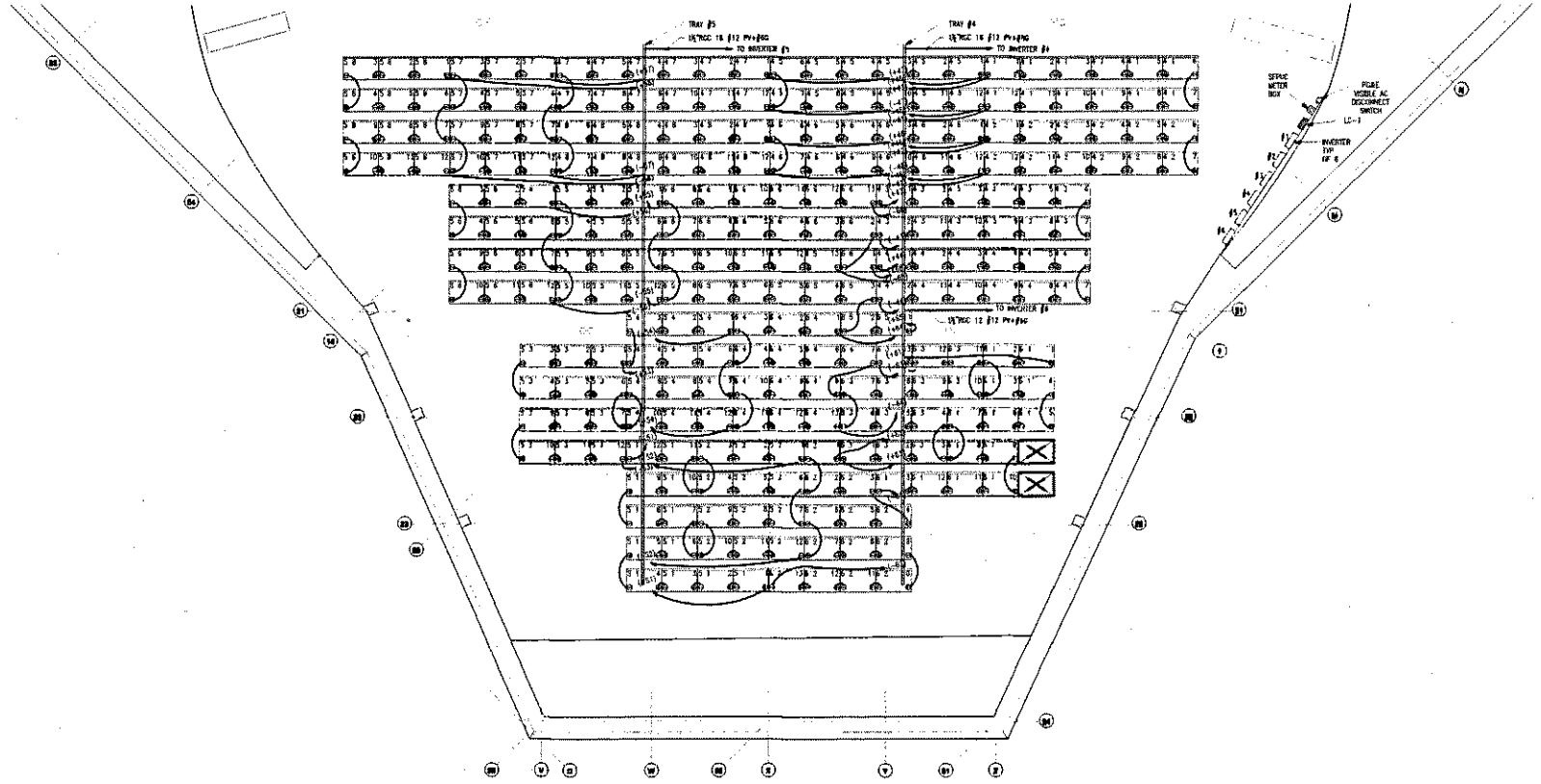
NO.	DATE	DESCRIPTION

SHEET INFORMATION

NO.	DATE

**ELECTRICAL
 WIRING PLAN
 SOUTH**

E1.3



ELECTRICAL -WIRING PLAN SOUTH
 SCALE: 1/8" = 1'-0"

LEGEND:

- MODULE NUMBER IN THE STRING
- STRING NUMBER
- INVERTER NUMBER
- HOMERUNS:
 (-G1)
 (+G1)
- STRING NUMBER
 INVERTER NUMBER
 POLARITY



ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE NOTED.

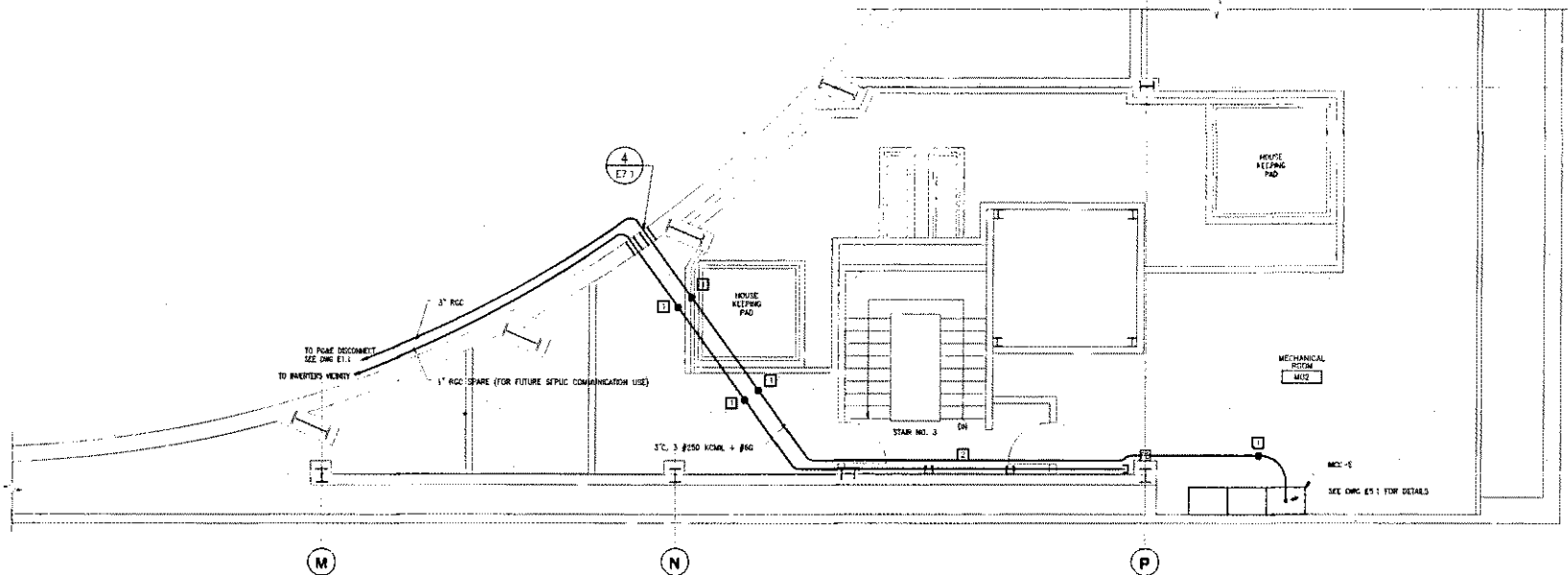
DATE	REVIEW	BY
9/12/13	9/12/13	JD

SHEET INFORMATION

NO.	DATE	BY
01	09/12/13	JD
02	09/12/13	JD
03	09/12/13	JD
04	09/12/13	JD
05	09/12/13	JD

ELECTRICAL ENLARGED MECHANICAL ROOM PLAN

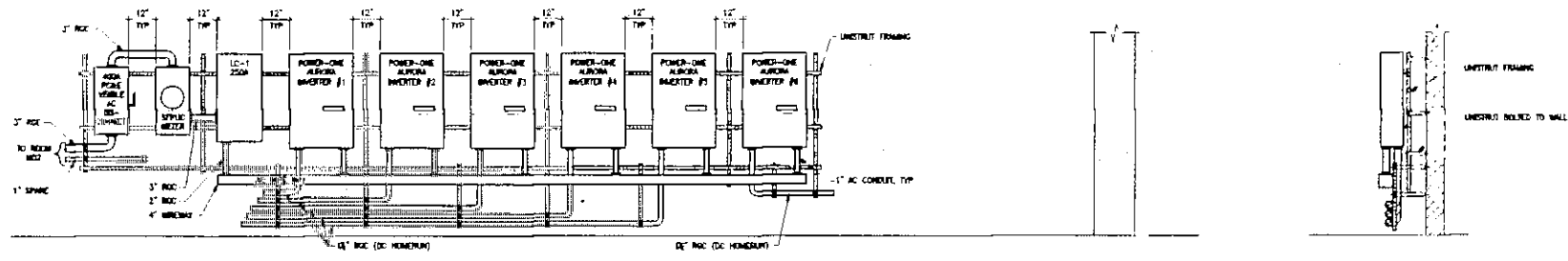
E2.1



ELECTRICAL - MECHANICAL ROOM PLAN
SCALE: 1/4" = 1'-0"

- SHEET NOTES:**
- 1 USE PIPE HANGER TO SUPPORT THE 3" CONDUIT AND 1" CONDUIT (SPACE).
 - 2 ROUTE CONDUIT ALONG THE WALL, SUPPORT CONDUIT USING UNISTRUT F1000 CHANNEL BOLTED TO WALL.



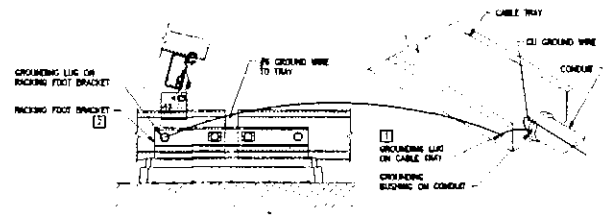


INVERTER ELEVATION
SCALE: NONE

2

INVERTER SECTION
SCALE: NONE

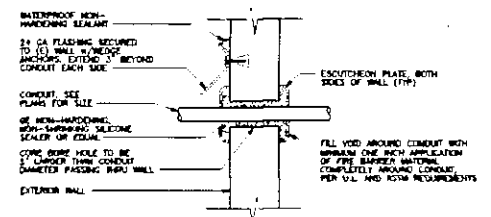
1



DETAIL NOTES
 1 REFER TO SUNLUM CABLE TRAY GROUNDING DETAILS AND PART NUMBERS BY WIRE MANAGEMENT SYSTEM INSTRUCTIONS.
 2 REFER TO SUNLUM RACKING ASSEMBLY INSTRUCTIONS FOR PRECISION PRO FOR GROUNDING DETAILS AND PART NUMBERS.

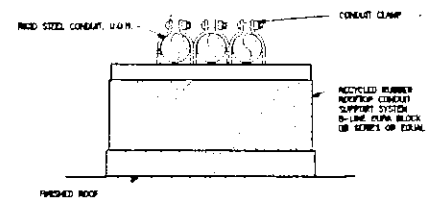
GROUNDING DETAIL
SCALE: NONE

6



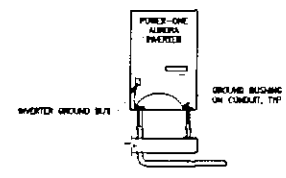
CONDUIT THRU EXTERIOR WALL
SCALE: NONE

4



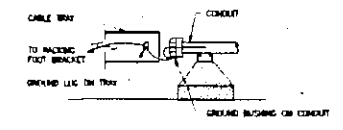
CONDUIT ON RUBBER SUPPORT ON ROOF
SCALE: NONE

5



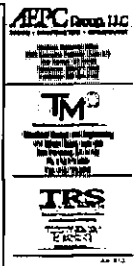
CONDUIT TO INVERTER GROUNDING
SCALE: NONE

7



CONDUIT TO TRAY GROUNDING
SCALE: NONE

8



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PHOTOVOLTAIC (PV) PROJECT**
201 Van Ness Ave. San Francisco, CA 94102

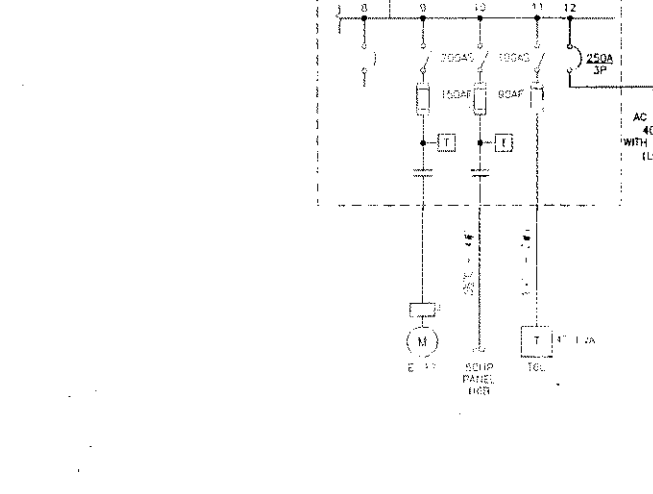
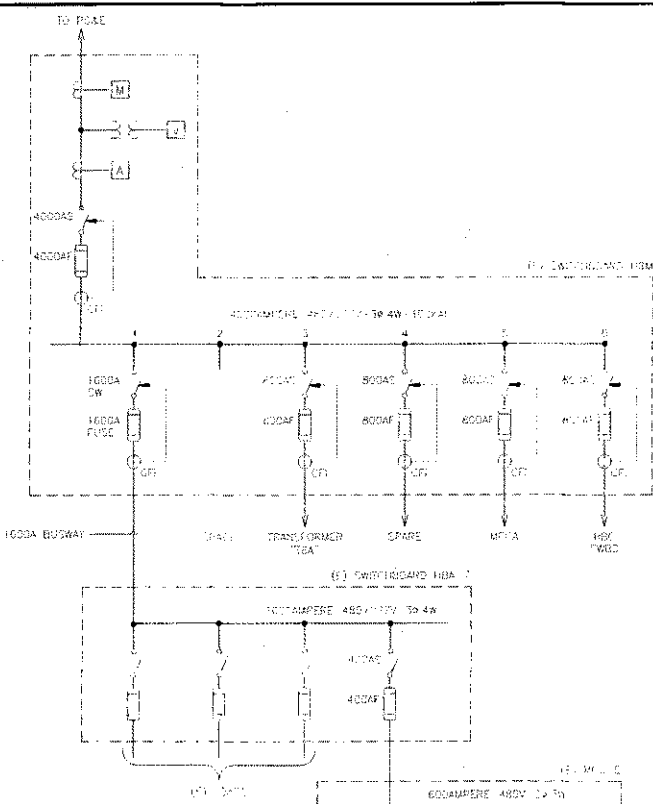
DATE	REVISION



SHEET NO. 1000000000
 PROJECT NO. 1000000000
 DATE 10/10/00

DETAILS

E7.1



ELEVATION - (E) MCC-E
(LOCATED IN ROOM MCC)

5-6	E-13	E-17
5-10	5-9	PANEL HGB
E-6	E-8	TRANSFORMER T6C
E-10	E-18	SPACE
INCOMING	SPACE	SPACE

POWER-ONE INVERTER #1 THRU #5
STRING CALCULATIONS

PV MODULE	620-327-LOW
NUMBER OF MODULES PER STRING	12
VOLTAGE PER MODULE (VMP) (1)	54.7 VDC
OPEN CIRCUIT VOLTAGE (VOC) (1)	64.9 VDC
VOLTAGE CORRECTION FACTOR (VDC-NEC TABLE 690.7) OR VOC TEMP COEFFICIENT	1.176-MV/°C
SHORT CIRCUIT CURRENT PER MODULE (ISC) (1)	6.46A
MAX CIRCUIT CURRENT PER STRING (NEC 690.8.1)	6.46x1.25
REQUIRED CONDUCTOR AMPACITY (NEC 690.8.1)	8.08x1.25
FUSE SIZE	10/10A
CONDUCTOR CHOSEN	#12 PV CABLE (1000V RATED)
CONDUCTOR TEMPERATURE	90°
CONDUCTOR AMPACITY	30A
AMBIENT TEMP DE-RATING (NEC TABLE 310.16) (2)	0.91
CONDUCTOR DERATED AMPACITY	27.3A
LONGEST STRING DISTANCE (WORST CASE)	300 FT
WARMEST DAY VOLTAGE (12 MODULES x VMP) (3)	656.4 VDC
CORRECTED DAY VOLTAGE (12 MODULES x VDC x VCF) (4)	649.8 VDC
WORST CASE VOLTAGE DROP	1.48%

(1) BASED ON PANEL MANUFACTURER PUBLISHED DATA
(2) BASED UPON RECORD HIGH AMBIENT TEMP (1)
(3) BASED UPON RECORD LOW AMBIENT TEMP (1)
(4) NOTE WEATHER DATA OBTAINED FROM WEATHER.COM

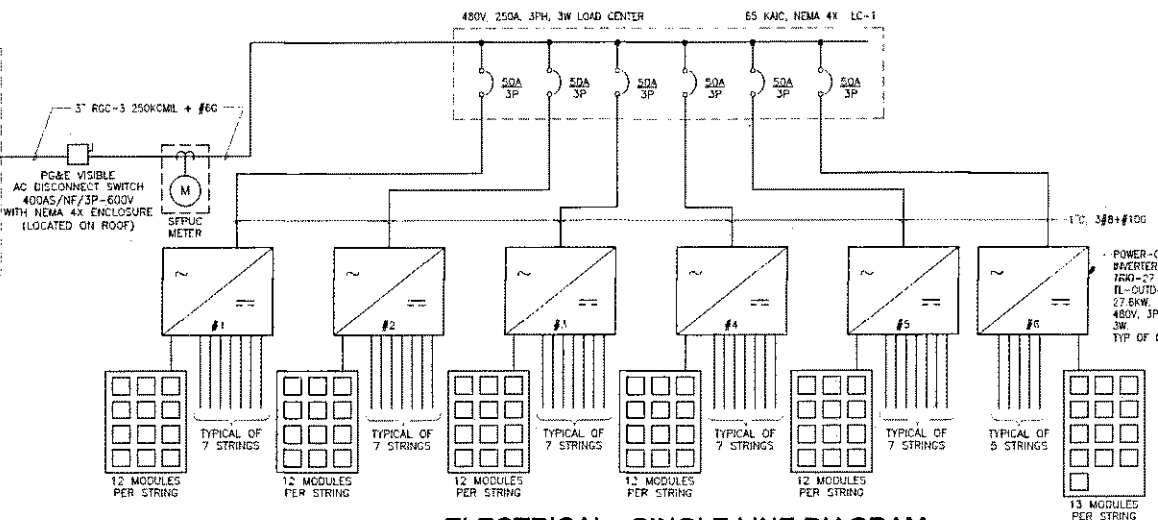
POWER-ONE INVERTER #6
STRING CALCULATIONS

PV MODULE	620-327-LOW
NUMBER OF MODULES PER STRING	12
VOLTAGE PER MODULE (VMP) (1)	54.7 VDC
OPEN CIRCUIT VOLTAGE (VOC) (1)	64.9 VDC
VOLTAGE CORRECTION FACTOR (VDC-NEC TABLE 690.7) OR VOC TEMP COEFFICIENT	1.176-MV/°C
SHORT CIRCUIT CURRENT PER MODULE (ISC) (1)	6.46A
MAX CIRCUIT CURRENT PER STRING (NEC 690.8.1)	6.46x1.25
REQUIRED CONDUCTOR AMPACITY (NEC 690.8.1)	8.08x1.25
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WORST CASE VOLTAGE DROP	1.48%

(1) BASED ON PANEL MANUFACTURER PUBLISHED DATA
(2) BASED UPON RECORD HIGH AMBIENT TEMP (1)
(3) BASED UPON RECORD LOW AMBIENT TEMP (1)
(4) NOTE WEATHER DATA OBTAINED FROM WEATHER.COM

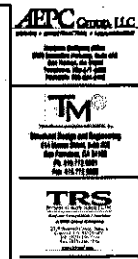
SHEET NOTES:

- 1 RELOCATE (E) MOTOR STARTER/BUCKET TO THE SPACE SHOWN. EXTEND (E) 5-6 WIRING AS NECESSARY TO ACCOMMODATE NEW LOCATION.
- 2 PROVIDE NEW 250A-3P CIRCUIT BREAKER WITH COVER DOOR IN THIS SPACE FOR CONNECTION TO NEW PV AC OUTPUT FEEDER.



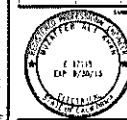
ELECTRICAL - SINGLE LINE DIAGRAM

SCALE: NONE



DAVIDS SYMPHONY HALL
PHOTOVOLTAIC (PV) PROJECT
201 Van Ness Ave. San Francisco, CA 94102

SFPUC REVIEW 9/22/15 10



PROJECT NO: 150115
DATE: 07/22/15
SFPUC: 151155
NAME:
FUC:
PLOT

**ELECTRICAL
SINGLE LINE
DIAGRAM**

E5.1

PRECISION ROOF MOUNT SYSTEM FOR PHOTOVOLTAIC ARRAY AT
Davies Symphony Hall
 201 Van Ness Avenue, San Francisco, CA 94102

Array Quantities:

Roof COMPONENT BY SUBARRAY	Module	DC (Power)	3:1 Panels	4:1 Panels	Omni Modules	Feet	Long Beams	Connector Long Beams	Column Lines	Bolts @ 1'	Power	Connectors C1	Longers	Outgoing
1	288	12	64	28	2	812	197	0	108	68	818	38	1	0
2	270	24	48	21	0	212	185	0	148	73	846	33	3	0
Total	558	36	112	47	2	1024	372	0	256	141	1664	71	4	0

General Notes:

- These drawings show the required location of SunLink Precision RPS components to be placed. The layout is based on existing conditions information provided to SunLink by the customer and has not been verified by SunLink. Verify key dimensions and existing conditions in the field prior to beginning installation.
- Obtain SunLink approval before modifying the layout shown, or relocating, cutting, or modifying any SunLink components. Detail of SunLink components per the latest edition of the SunLink assembly instructions available at www.sunlink.com.
- Any additional installation requirements, such as sealing protection, electrical components, waterproofing, and contractor attachment, are not by SunLink. Refer to other project documents.
- The installer is responsible for worker safety and for maintaining a safe worksite.
- Roofing is calculated by SunLink based on information provided by the customer on Drawing 32nd of project notes.
- For array weight and roof loading information, refer to the SunLink Structural Engineering Load Advisory provided for this project.
- SunLink required dimensions are as follows:
 Connector between components on different sub-array: 1"
 Connector between entry components and other rooftop equipment: 6"
 Wire slack - between sub-arrays: 18"
 Wire slack - between sub-arrays and other equipment: 18"

Design Loads:

Design conforms to the San Francisco Building Code, 2010 Edition.

3 sec. Mean Speed (ASCE 7.05 Figure 6-1) Wind 80 mph
 Wind Resistance Factor (ASCE 7.05 Table 6-1) 1 = 1.0
 Wind Exposure Category (ASCE 7.05 Section 6.6.3.2) C = 1
 Temperature Factor (ASCE 7.05 Section 6.3.2.2) 1 = 1
 Ground Snow Load (ASCE 7.05 Figure 7-1) S_g = 0 psf
 Snow Exposure Factor (ASCE 7.05 Table 7-2) E = 1
 Snow Importance Factor (ASCE 7.05 Table 7-3) I = 1
 Required Attachment, Short Period (ASCE 7.05, Section 11.4.1) S_s = 1.5 g
 Design Response, Short Period (ASCE 7.05, Section 11.4.4) R_s = 1 g
 Seismic Design Category (ASCE 7.05, Table 11.6-1) D
 Seismic Component Importance Factor (ASCE 7.05, Section 12.1.2) I = 1
 Risk Classification (ASCE 7.05, Table 12.3-1) I

Reference Analysis Procedures: Check latest code editions
 Analysis/Design: LUSAS SAP2000 computer software

Building Information:

Site Location, Latitude 37° 47' 38" N
 Site Location, Longitude 122° 37' 14.2" W
 Occupancy Category (ASCE 7.05, Table 1-1) B1
 Roof Height (ft) 67
 Roof Area (sq ft) -
 Maximum Roof Slope (%) 2.1
 Roofing Contact Surface PVC

Array Information:

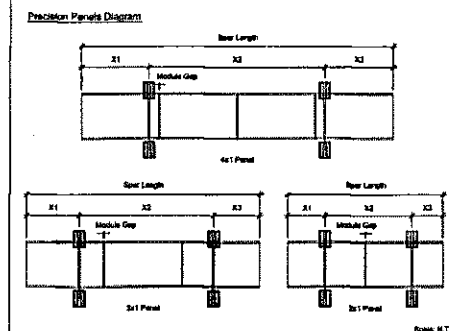
Module Number 71-105-02-008
 Tilt Angle (°) 10
 Row Spacing (ft) 5.0
 Row Pitch Spacing (ft) 5.0
 Feet Row (ft) 14.30 x 11.00

Component Material Specifications:

Foot Brackets: Aluminum Extrusion 8061-T6 or 6065A-70
 Feet: Cast Recycled Rubber
 Rail: Aluminum Extrusion 8061-T6 or 6065A-70
 Tube: Aluminum Extrusion 8061-T6 or 6065A-70
 Long Beams: Aluminum Extrusion 8061-T6 or 6065A-70
 Lower LWB: Aluminum Extrusion 8061-T6 or 6065A-70
 Rail Mount: Aluminum Extrusion 8061-T6 or 6065A-70
 Rail Stud: Aluminum Extrusion 8061-T6 or 6065A-70
 Plug Bolt: 1/4" Stainless Steel
 Fasteners: Type 304 Stainless Steel
 Bolted Bracket: Cast Recycled Rubber
 Connector Post: Aluminum Sheet 5052-H32 0.237 Thick
 Connector Arm: Aluminum Extrusion 8061-T6 0.237 Thickness
 Connector Arm: Type 304 Stainless Steel
 Connector U-Plate: Type 304 Stainless Steel
 Connector Clamp: Type 304 Stainless Steel

Aerial View

Z:\Projects\Prospect\Hot Prospects\AEPCC Group LLC\Aerial Images\Davies Hall Rotated.jpg



Panel ID	Panel Size	X1 (ft)	X2 (ft)	X3 (ft)	Panel Count
4A	4x1	24-34	14-18	34-34	38
3A	3x1	27-38	111-19	37-38	38
3B	3x1	44-12	88-12	48-12	2
3C	3x1	27-18	88-78	48-12	8
4A	4x1	48-12	148-12	48-12	47

Ballast Information:

Material	System	Special Star (ft)	No. of Panels	Assembly Number
B1	1	24	18	878-800002
B2	-	-	-	-
B3	-	-	-	-

Maximum Power Star (ft) 12 x 11 x 2.28
 Required Min. Ballast Power Weight (lb) 28

Abbreviations:

C1: Existing
 M: Module
 LWB: Lower Beam
 RPS: Roof Mount System
 RC: Rail
 RB: Rail Bracket
 V.F.: Verify in field
 DC: Direct Current
 CCW: Counter Clockwise
 Typ: Typical
 LWB: Lower Beam
 F.P.S.: Field Power System
 H.T.S.: Hot Taps
 W.C.: Wet Cell

Connector Information:

Connector	Symbol	Height (ft)	Base Plate	Assembly Number
C1	1	7	Concrete 1	880-800001
C2	-	-	-	-

Array Plan Symbol Legend:

1: Module
 2: Connector
 3: Long Beam
 4: Lower Beam
 5: Foot
 6: Rail Bracket
 7: Connector

Item	Description	Qty	Drawn By	Checked By
01	Connectors	71	AK	AK
02	Long Beams	112	AK	AK
03	Lower Beams	47	AK	AK
04	Modules	558	AK	AK
05	Feet	1024	AK	AK
06	Connectors C1	71	AK	AK
07	Longers	4	AK	AK
08	Outgoing	0	AK	AK

SUNLINK CORPORATION
 8418 G STREET, SUITE 408
 SAN RAFAEL, CA 94901
 (714) 882-8888 (97) 411-8222
 WWW.SUNLINK.COM

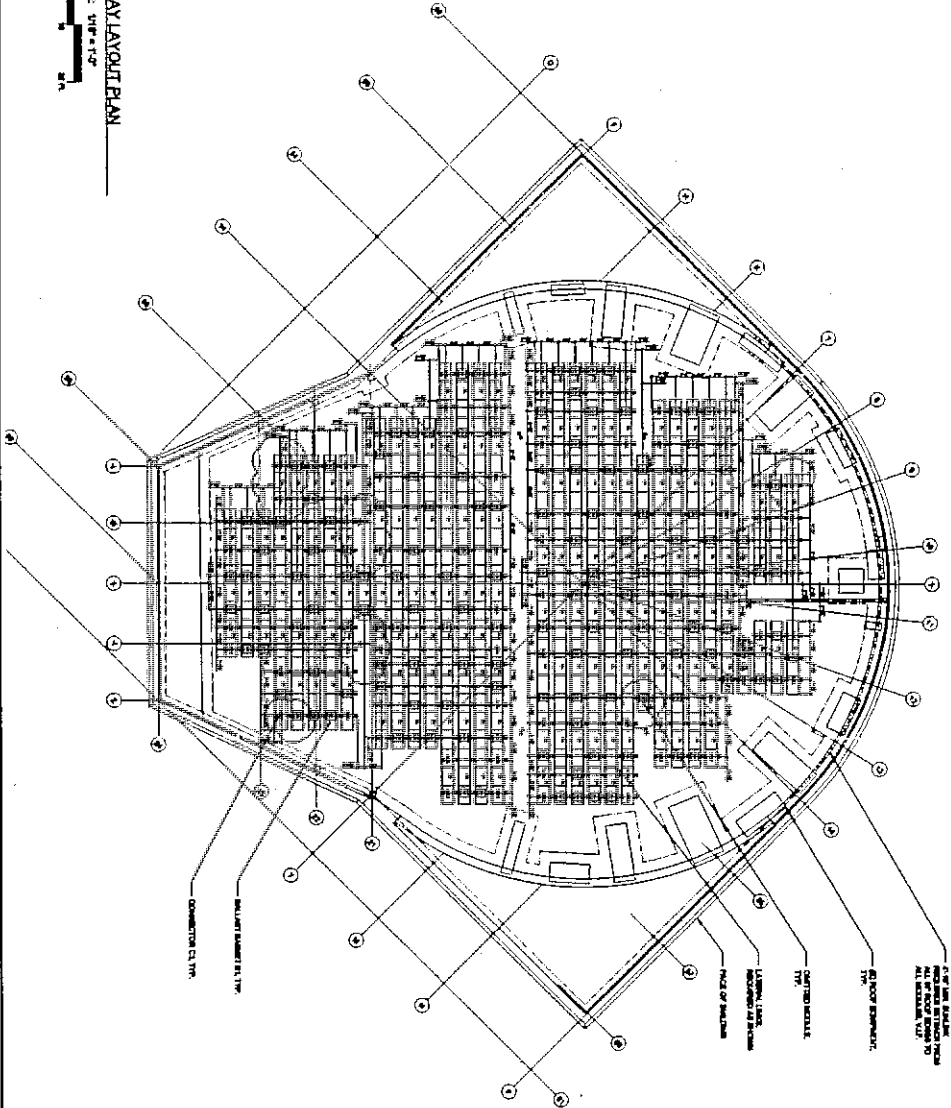
Customer: AEPCC Group LLC
Project: Davies Symphony Hall
Location: 201 Van Ness Avenue, San Francisco, CA 94102

PRECISION ROOF MOUNT SYSTEM
 Sunpower E20-327-COM
 Tilt Angle: 10°
 Voltage: 327
 No. of Modules: 558
 DC String Length: 12 & 13
 No. of Strings: 70
 Per. Output (DC): 182.47 kW

Cover Sheet
 Sheet Title: 100981
 Sheet No.: 0.1.20
 Scale Reference No.: 8.0-4
 Date Order No.:
 Sheets: 1 of 5
 Issues: R0
 Sheet Number: 01.0



ARRAY LAYOUT PLAN
SCALE 1/8" = 1'-0"

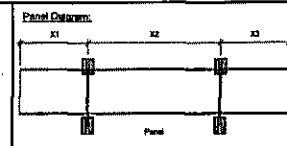
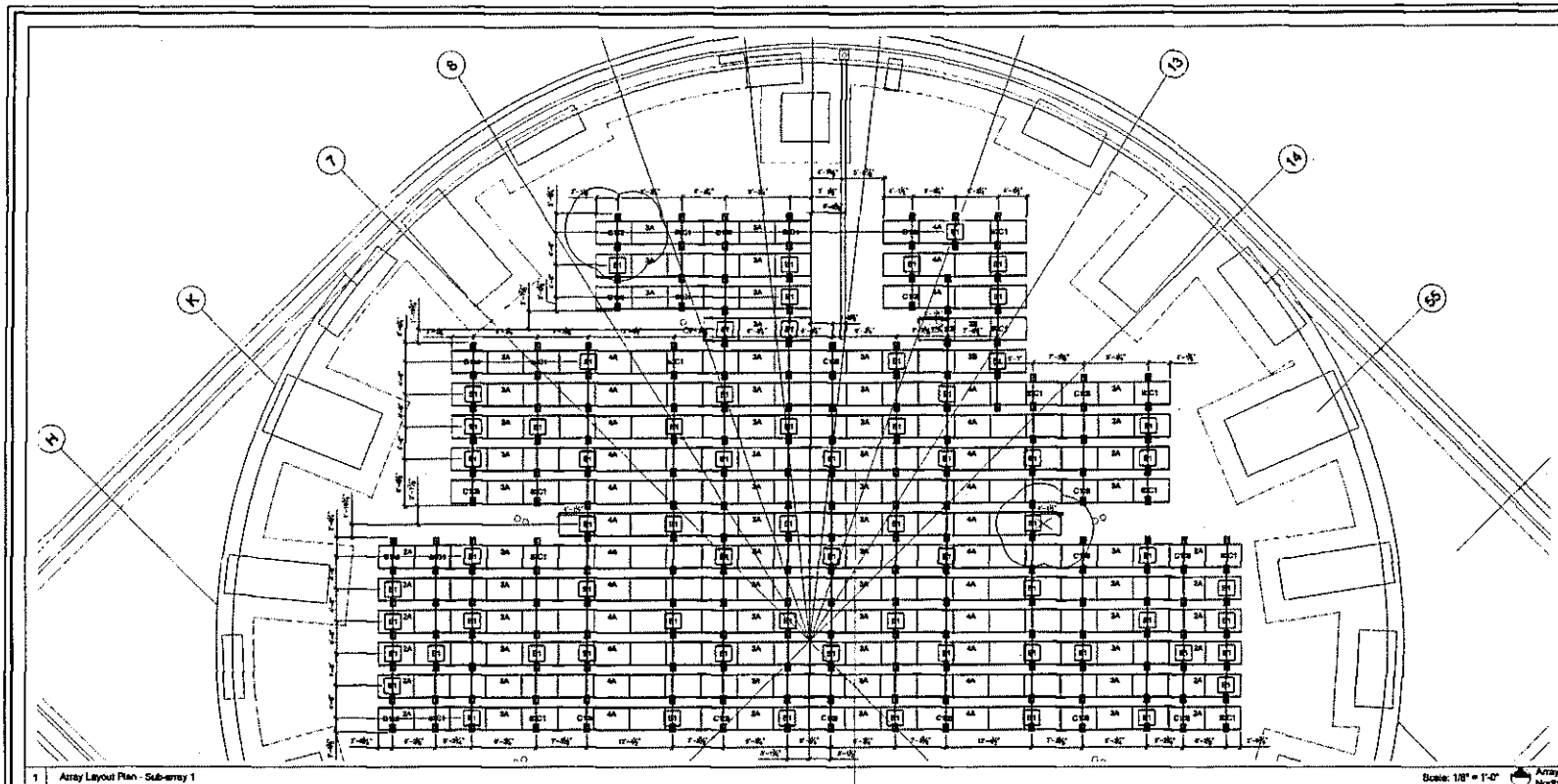


SEE ARRAY 1

SEE ARRAY 2



SUNLINK RSTAL CONFIDENCE		Precision Roof Mount System 1000001	Array Layout Plan 3 of 3	Date: 08/10
Client: AEPIC Design LLC Project: Dallas Freeway Mall Location: 201 Van Hook Avenue San Francisco, CA 94102	Precision Roof Mount System 1000001	1000001	Array Layout Plan	Date: 08/10



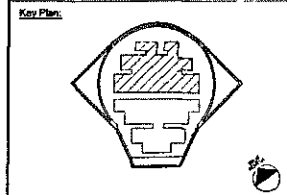
SUB-ARRAY 1

Panel ID	Panel Size	X104	X274	X399	Panel Count
2A	2x1	24-26	74-76	24-26	15
3A	2x1	37-39	111-113	37-39	15
3B	2x1	49-51	86-88	49-51	3
4A	4x1	49-51	143-145	49-51	20

Qty	Module	Diode	String	Balance	Connectors
20	200	2	10	6A	30

Array Plan Symbol Legend

	Module		Foot
	Offset Module		Offset Spacer
	Long Span		Connector
	Lateral Line		



1 Array Layout Plan - Sub-array 1 Scale: 1/8" = 1'-0" Array (North)

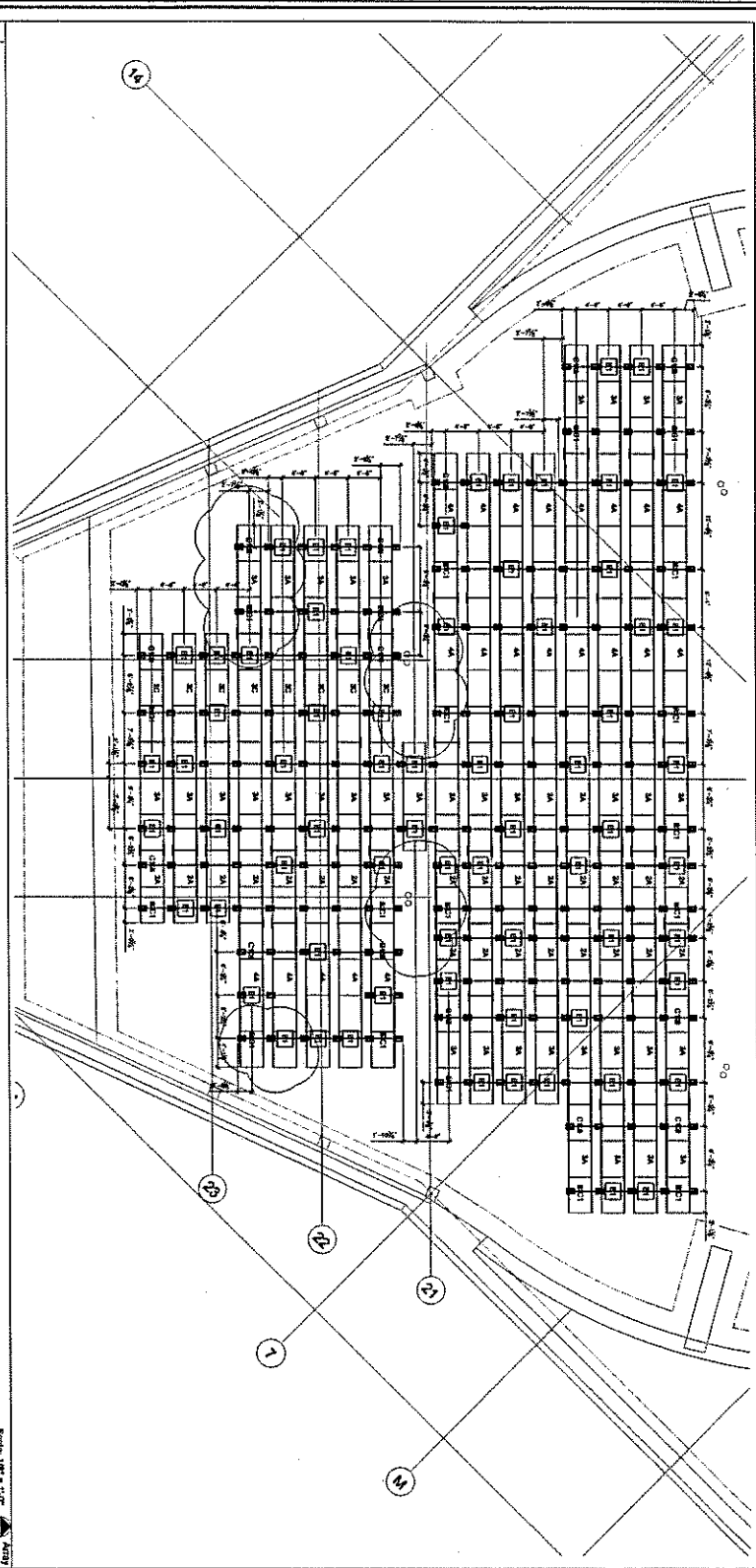
Issue	Description	Date	Drawn By	Checked By
01	Issued for construction	03-20-15	LAS	
02	Revised to add notes and dimensions	04-24-15	LAS	
03	Revised to add notes and dimensions	06-15-15	LAS	
04	Revised to add notes and dimensions	08-14-15	LAS	
05	Revised to add notes and dimensions	09-24-15	LAS	
06	Revised to add notes and dimensions	10-21-15	LAS	
07	Revised to add notes and dimensions	11-19-15	LAS	
08	Revised to add notes and dimensions	12-10-15	LAS	

SUNLINK CORPORATION
 1979 B STREET, SUITE 405
 SAN RAFAEL, CA 94901
 (7) 415.455.0000 (7) 415.322.8338
 WWW.SUNLINK.COM



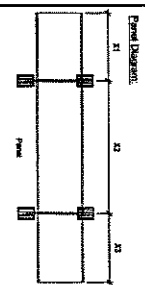
Client: AEPIC Group LLC
 Project: Davies Symphony Hall
 Location: 221 Van Ness Avenue
 San Francisco, CA 94102

PRECISION ROOF MOUNT SYSTEM		Module Sunpower E20-327-COM	
Tilt Angle	10°	Wattage	327
Quality Reference No.	1005061	No. of Modules	658
Order Qty	3 of 5	DC String Length	70
Panel Qty	3 of 5	No. of Strings	70
Panel Power	152.47 kW	Power Output (DC)	152.47 kW



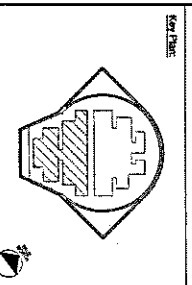
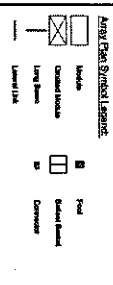
1 Array Layout Plan - Sub-array 2

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

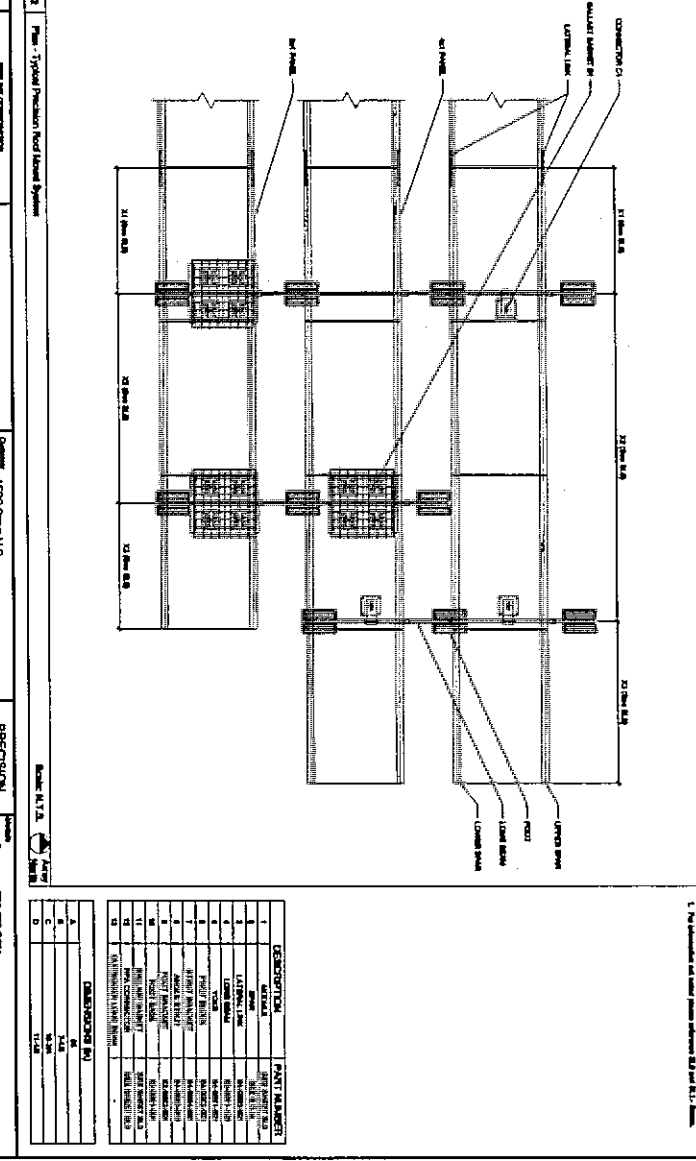
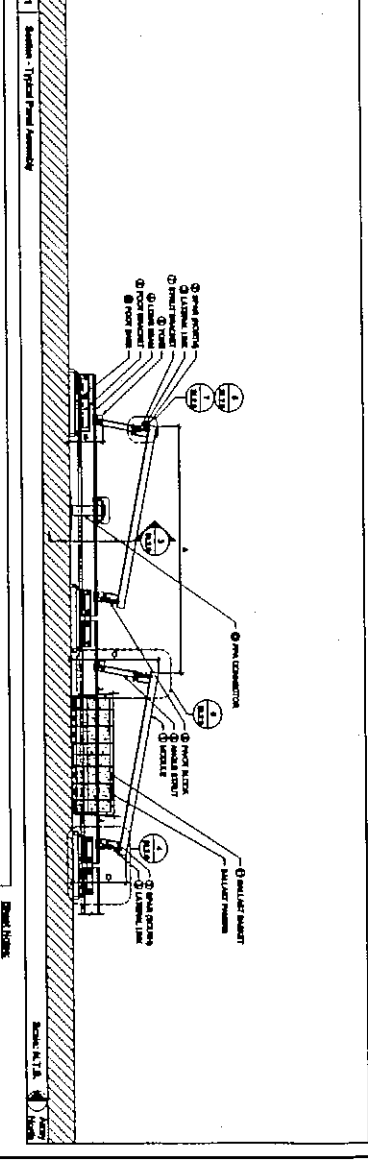
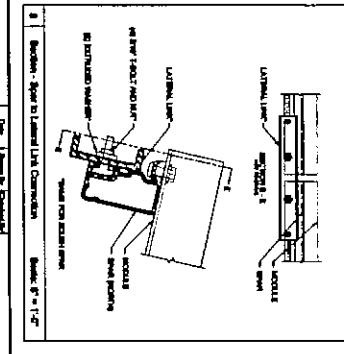
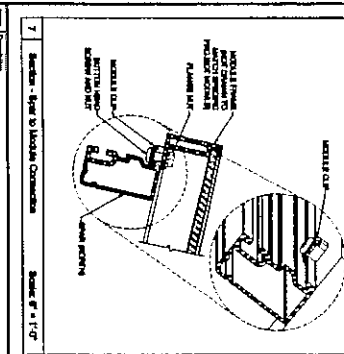
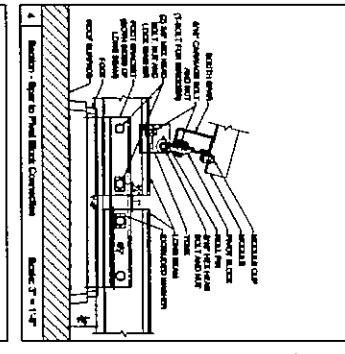
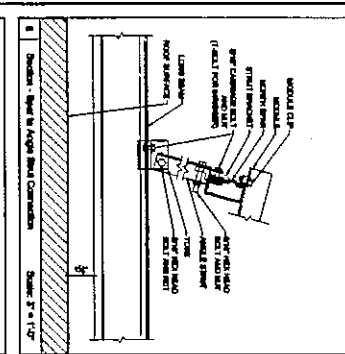
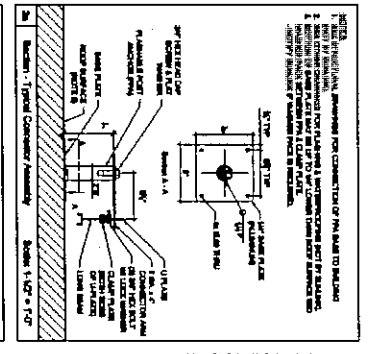
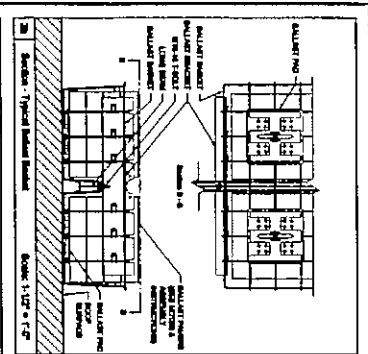


SUB-ARRAY 2

Panel ID	Panel Area	21041	22043	23045	Panel Area
2A	24.24	24.24	24.24	24.24	24
2B	24.24	24.24	24.24	24.24	24
2C	24.24	24.24	24.24	24.24	24
2D	24.24	24.24	24.24	24.24	24
2E	24.24	24.24	24.24	24.24	24
2F	24.24	24.24	24.24	24.24	24
2G	24.24	24.24	24.24	24.24	24
2H	24.24	24.24	24.24	24.24	24
2I	24.24	24.24	24.24	24.24	24
2J	24.24	24.24	24.24	24.24	24
2K	24.24	24.24	24.24	24.24	24
2L	24.24	24.24	24.24	24.24	24
2M	24.24	24.24	24.24	24.24	24
2N	24.24	24.24	24.24	24.24	24
2O	24.24	24.24	24.24	24.24	24
2P	24.24	24.24	24.24	24.24	24
2Q	24.24	24.24	24.24	24.24	24
2R	24.24	24.24	24.24	24.24	24
2S	24.24	24.24	24.24	24.24	24
2T	24.24	24.24	24.24	24.24	24
2U	24.24	24.24	24.24	24.24	24
2V	24.24	24.24	24.24	24.24	24
2W	24.24	24.24	24.24	24.24	24
2X	24.24	24.24	24.24	24.24	24
2Y	24.24	24.24	24.24	24.24	24
2Z	24.24	24.24	24.24	24.24	24



<p>PRECISION ROOF MOUNT SYSTEM</p> <p>Model: Precision RM-1000</p> <p>Capacity: 100000 lbs</p> <p>Wind Speed: 150 mph</p> <p>Temperature: 4 d 5</p> <p>Panel: 81.2</p>	<p>SUNLINK</p> <p>INSTALL CONFIDENCE.</p>	<p>Customer: AEP Group LLC</p> <p>Project: Idaros Symphony Hall</p> <p>Location: 201 Van Ness Avenue San Francisco, CA 94102</p>	<p>Contractor: SUNLINK CORPORATION</p> <p>1514 STREET, SUITE 400</p> <p>1714 SHERMAN ST, SUITE 100</p> <p>WWW.SUNLINK.COM</p>
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SUNLINK
INITIAL CONFERENCE

Customer: ABC Company LLC
Project: Delta Building Unit
Location: 301 Van Ness Avenue, San Francisco, CA 94102

Product: PRECISION ROOF MOUNT SYSTEM
Model: 1000-100
Material: Aluminum
Finish: Anodized

Manufacturer: Sunlink Inc.
Address: 1234 Main Street, San Francisco, CA 94102
Phone: (415) 555-1234
Fax: (415) 555-5678
Website: www.sunlink.com

DESCRIPTION	PART NUMBER
CONDENSER	1000-100
WALL BRACKET	1000-101
INSULATION	1000-102
GASKET	1000-103
SEALANT	1000-104
FRAME	1000-105
WINDOW	1000-106



Department of Public Works
Operations
Estimate Report (Detail): Service Order 431418
Internal Report Name: EST_CHECKV2_PARAM



OTHER COSTS

OTHER	TOTAL
No Other Cost Reported	\$0.00
Total	\$0.00

TOTALS

Total Labor Cost	\$213,431.94
Total Material Cost	\$0.00
Total Other Cost	\$0.00
TOTAL ESTIMATE COST	\$213,431.94

APPROVALS

Deputy Director Approval

Date

Deputy Director Signature (optional if Approved in CMMS)

Bureau Approval

Date

Bureau Head Signature (optional if Approved in CMMS)

Client Approval

Date

Client Approver Signature (optional if Approved in CMMS)

NOTE: This estimate does not include the cost of abatement and/or removal of any hazardous materials that may present at your facility or job site unless otherwise indicated. If asbestos or other hazardous material are discovered, delays in completion of project may occur, and additional abatement costs will be the responsibility of the requesting agency.

*Contingency funds will not be expended without client department approval. Unexpended contingency funds to be credited back to client department.

**On project work supervision is required and listed accordingly.

*** Mark-up sales tax and freight charges are included

This proposal expires on

ATTACHMENT B



**Department of Public Works
Operations
Estimate Report (Detail): Service Order 431418
Internal Report Name: EST_CHECKV2_PARAM**

Date Sent
Valid Until
Revision
Project Name Reissue: DAVIES SYMPHONY HALL, SOLAR PROJECT
Project Location 201 Van Ness Ave, San Francisco, 94102

Requestor's Department PUC
Requested By Jaimie Seidel (415) 554-1537
Site Contact

Estimator
Bureau Lead
DPW Lead WILLIAM CABRERA 415-695-2053
Maintenance Dept DPW-BBR

Priority 4 - Non Urgent
Problem Code ELECTRIC
Requested Start Date

SCOPE OF WORK

City & County of San Francisco Department of Public Works
Location: Davies Symphony Hall 201 Van Ness Ave

DPW-BBR Electric Shop Scope:

- 1) Mobilize crew layout of solar project.
- 2) Inventory materials provided by PUC.
- 3) Verify PUC's layout of array locations.
- 4) Layout stanchion anchor points per AEPC engineered drawings.
- 5) Layout PUC provided Sunlink solar rack and panels per AEPC engineered drawings.
- 6) Layout and install PUC provided solar inverter and load center per AEPC engineered drawings.
- 7) Setup of jig template for Sunlink rack connections.
- 8) Install solar inverters and load center per AEPC engineered drawings.
- 9) Install PUC provided Sunlink wire way onto rack system per AEPC engineered drawings.
- 10) Install 250 amp breaker assembly into existing MCC per AEPC engineered drawings.
- 11) Furnish and install 1" RGC for spare from roof to room MO2 per AEPC engineered drawings.
- 12) Pull branch PV wires to solar panels from inverters per AEPC engineered drawings.
- 13) Pull feeders from load center to MCC per AEPC engineered drawings.
- 14) Terminate PV wires and jumpers for solar panels per AEPC engineered drawings.
- 15) Terminate feeders into MCC and load center per AEPC engineered drawings.
- 16) Test and megger all conductors.
- 17) Commission and test solar system.

NOTE: Per agreement with SFPUC, DPW will proceed without having any materials budget. Once we identify what is missing and required, we will submit a change order request accordingly.

ESTIMATES BY PHASE

PHASE	LABOR COST	MATERIAL COST	TOTAL COST
	\$0.00		\$0.00
00 NONE	\$213,431.94	\$0.00	\$213,431.94
Totals	\$213,431.94	\$0.00	\$213,431.94

ESTIMATE BY PHASE AND SHOP

PHASE	SHOP	LABOR COST	MATERIAL COST	TOTAL COST
00 NONE	ELE	\$187,408.65	\$0.00	\$187,408.65
	ENG	\$0.00	\$0.00	\$0.00
00 NONE	ENG	\$26,023.29	\$0.00	\$26,023.29
Totals		\$213,431.94	\$0.00	\$213,431.94

IN HOUSE COSTS

PHASE	DESCRIPTION	RATE	QUANTITY	TOTAL
00 NONE	ELE(01)-Electrician Supervisor II (7276) - City Normal Rate	\$155.86	40	\$6,234.51
	ELE(02)-Electrician Supervisor I (7238) - City Normal Rate	\$140.06	100	\$14,005.98
	ELE(03)-Electrician (7345) - City Normal Rate	\$124.01	1,348	\$167,168.16
	ENG(06)-General Laborer (7514) -City Normal Rate	\$81.32	320	\$26,023.29

OTHER COSTS

ATTACHMENT C

ID	Task Name	Duration	Start	Finish	Oct 20, '13	Oct 27, '13	Nov 3, '13	Nov 10, '13	Nov 17, '13	Nov 24, '13	Dec 1, '13	Dec 8, '13																		
					F	S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S	M	T	W	T	F	S
1	200kW – Davies Symphony Hall – Forecasted Schedule	265 days	Mon 1/14/13	Fri 1/17/14	[Gantt bars for the entire schedule]																									
2	Project Development Phase	90 days	Mon 1/14/13	Fri 5/17/13	[Gantt bar]																									
16	Design Phase	106 days	Mon 1/14/13	Fri 6/7/13	[Gantt bar]																									
33	Permit Phase	35 days	Mon 5/20/13	Fri 7/5/13	[Gantt bar]																									
39	Purchasing Phase	115 days	Mon 3/4/13	Fri 8/9/13	[Gantt bar]																									
45	Interconnection Agreement	105 days	Mon 4/1/13	Fri 8/23/13	[Gantt bar]																									
58	Construction Phase	110 days	Mon 7/8/13	Fri 12/6/13	[Gantt bar]																									
59	RE-ROOF PHASE	40 days	Mon 7/8/13	Fri 8/30/13	[Gantt bar]																									
60	Construction Kick Off Meeting	5 days	Mon 7/8/13	Fri 7/12/13	[Gantt bar]																									
61	Construction Mobilization	5 days	Mon 7/15/13	Fri 7/19/13	[Gantt bar]																									
62	RE-ROOF	30 days	Mon 7/22/13	Fri 8/30/13	[Gantt bar]																									
63	RE-ROOF COMPLETE	0 days	Fri 8/30/13	Fri 8/30/13	[Gantt bar]																									
64	SOLAR PHASE	40 days	Mon 10/14/13	Fri 12/6/13	[Gantt bar]																									
65	Jobsite Mobilization – Array Layout	4 days	Mon 10/14/13	Thu 10/17/13	[Gantt bar]																									
66	Lift Materials (Crane)	1 day	Fri 10/18/13	Fri 10/18/13	[Gantt bar]																									
67	Module/Rack – Array Layout	10 days	Mon 10/21/13	Fri 11/1/13	[Gantt bar]																									
68	Array Wiring & Combiner Boxes	10 days	Mon 10/28/13	Fri 11/8/13	[Gantt bar]																									
69	Solar Array Construction Complete	0 days	Fri 11/8/13	Fri 11/8/13	[Milestone diamond]																									
70	Conduit Run – Combiners--> Electrical Room	10 days	Mon 10/21/13	Fri 11/1/13	[Gantt bar]																									
71	Inverter & Electrical Room Layout	10 days	Mon 10/28/13	Fri 11/8/13	[Gantt bar]																									
72	Inverter Wiring	5 days	Mon 11/11/13	Fri 11/15/13	[Gantt bar]																									
73	Electrical Tie In	5 days	Mon 11/11/13	Fri 11/15/13	[Gantt bar]																									
74	DBI Final Inspection	5 days	Mon 11/18/13	Fri 11/22/13	[Gantt bar]																									
75	PG&E Interconnection Inspection	10 days	Mon 11/25/13	Fri 12/6/13	[Gantt bar]																									
76	Substantial Completion – System Online	0 days	Fri 12/6/13	Fri 12/6/13	[Milestone diamond]																									
77	Close Out	30 days	Mon 12/9/13	Fri 1/17/14	[Gantt bar]																									

Project: Davies – Forecasted Schedule
Date: Mon 10/28/13

Task: [Pattern] Milestone: [Diamond] Rolled Up Task: [Pattern] Rolled Up Progress: [Pattern] External Tasks: [Pattern] Group By Summary: [Pattern]

Progress: [Pattern] Summary: [Pattern] Rolled Up Milestone: [Diamond] Split: [Pattern] Project Summary: [Pattern] Deadline: [Pattern]

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