



**ADDENDUM #2 – AMENDED RFP (clean version, no mark-ups shown)**

**REQUEST FOR PROPOSAL**

**FOR**

**MUNICIPAL PHOTOVOLTAIC SOLAR POWER PURCHASE AGREEMENT**

**CITY ADMINISTRATION  
CITY OF HUNTINGTON BEACH**

**RFP Released on JULY 8, 2010  
Addendum Released on AUGUST 5, 2010**



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## **SECTION 1 BACKGROUND & OPPORTUNITY**

### **1.1 Purpose of RFP**

The City of Huntington Beach (City) has been examining the possibility of installing a number of photovoltaic (PV) systems across the City. The purpose of this Request for Proposals (RFP)<sup>1</sup> is to solicit bids for qualified Developers to design, construct, install, own, operate and maintain PV systems at sites identified by the City. The City will purchase electricity from the privately-owned and operated PV projects under a 20-year Power Purchase Agreement (PPA). This RFP lists the City facilities included under the scope of the PV project, the design criteria to be met by the proposed project and the concept design which has been developed and has or is shortly expected to complete its passage through the City entitlement process.

Each site is discussed further in Section 1.4 below and in Appendix B. Concept design documents are attached separately as Appendix E. Concept design documents estimate that the aggregate PV capacity that can be developed at all City facilities is approximately 2.75 MW (STC DC).

### **1.2 City's Contributions**

The City will undertake several steps to facilitate the successful development of the proposed projects. One of the major contributions is the City's allocation of Recovery Zone Facility Bonds (RZFB) that it will make available to the project. The City's current allocation of these bonds that can be used for the PV projects is \$7,128,000. The details of the RZFB's are explained in Section 3.5.1.

Construction of projects on City premises requires complying with a variety of requirements that include consideration of architectural compatibility with adjacent structures, landscaping, tree removal restrictions and replacement policies, lighting, signage, security and surveillance, and fire protection requirements, all of which are reviewed during the City's entitlement process prior to issuance for a permit to construct. The City has already developed a conceptual design document for each of the project sites for which PV development is planned in compliance with these requirements. The entitlement process is presently ongoing and is expected to be complete for the Phase-1 project sites prior to the bid due date. The same concept design documents are also the basis for proceeding forward with the California Environmental Quality Act (CEQA) documentation.

It is expected that these preparatory activities will facilitate the selected bidder to fully develop the approved and entitled concept design into 100% construction phase drawings and proceed expeditiously to meet the required timelines for the utilization of RZFB's. Material deviations and changes to the entitled concept design are discouraged since it

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<sup>1</sup> Appendix A contains a list of all acronyms and abbreviations used in the RFP.

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could trigger a re-processing of the project approval through the entitlement process, causing potential delays. Appendix B provides information on accessing the concept design documents.

In addition, the City will pay for all make-up and supplemental electricity subject to the performance guarantees in this RFP.

Finally, the City will assume the risk that SCE's future electricity tariffs may vary from expected forecasts and that savings from the PV systems will therefore be reduced.

The successful Developer will be responsible for 100% of the cost to design, procure and construct the solar plant(s) including the Developer's transaction costs and the cost of financing during the construction period. If the proposed project's design differs from the concept design that has been the basis for the entitlement process and if in the City's opinion the design changes warrant a reevaluation by the City's review and permitting agencies, the Developer will be responsible for resubmitting the proposed design through the entitlement process.

The Developer will be responsible for all costs to finance the project, subject to the City's agreement to facilitate financing from the RZFB's. Because the project is being developed at existing City facilities, the project shall include exterior lighting, security, signage, tree removal and replacement, landscaping and associated irrigation as well as signage work as it relates to normal use and operation of facilities at each existing site.

The Developer will also be responsible for applying at its sole cost for any other subsidies, rebates and subsidized financing including without limitation applications for each site under the California Solar Initiative (CSI). The Developer and/or owner of the Projects shall be responsible for any and all costs to operate, maintain and repair the PV plants during the term of the PPA.

### **1.3 20-Year PPA**

The City will enter a PPA with a term of 20 years. The arrangement would be similar to that used at other public sites and similar to the arrangement illustrated in Appendix C.

The PPA would set forth the responsibilities of the parties and include the terms and provisions for the sale of energy from the owner to the City. The pricing for energy sales will be in accordance with the formulas presented by the winning Proposer(s) in its response to this RFP. Appendix D outlines the major terms for the PPA.

### **1.4 Available Sites and Allowable Capacity**

The City proposes project development in two phases. Phase-1 are sites which are currently going through the entitlement. Phase-2 are sites that are subject to voter approval as described below. The six sites that fall under Phase-1 are as indicated in

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Table 1.1 and can be developed as soon as the procurement process is completed and the PPA is executed.

Phase-2 development involves two sites: (1) the Murdy Park Community Center and (2) Sports Complex.

The Murdy Park Community Center PV development is subject to Measure C and cannot be developed until the voters approve revisions to the city charter (November 2010) or specifically approve its development in a subsequent vote of the people.

The Sports Complex PV development is also subject to voter approval, and the design considerations at that site are more complex than at the other sites.

All proposals **must** include projects at each site listed in Table 1.1. The project at each site is required to satisfy the minimum output requirements for the first contract year as indicated in Table 1.1 and discussed below. Each proposer is encouraged to submit a proposal for the Phase 2 sites in Table 1.2 below. The proposals may specify a price for electricity sales for the Phase 2 projects that differs from the price for the Phase 1 projects.

**Table 1.1  
Characteristics of Required Sites for Phase 1**

<b>Locations</b>	<b>Site Description</b>	<b>Min Usage kWh/yr</b>	<b>Max Usage kWh/yr</b>
Civic Center Complex and the Police Corporation Yard	Combination of building rooftop and parking lots with mono/poly crystalline panels	2,900,000	3,870,000
Central Library	Mono/poly crystalline panels in Parking lots	1,850,000	2,470,000
Water Yard (January –March 2011 construction window)	Thin film application on rooftops and mono/poly crystalline panels in Parking lots	130,000	170,000
City Yard	Thin film application on rooftops and mono/poly crystalline panels in Parking lots	300,000	400,000
Edwards Reservoir	Mono/poly crystalline panels on top of water reservoir	130,000	180,000
Peck and Springdale Reservoir	Thin film application on top of water reservoir	80,000	110,000
Total system kWh/yr		5,390,000	7,200,000

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Each bidder is required to include in its proposal a project for each of the above sites. The price for electricity sales must be the same for all electricity sold to the City for each site in Table 1.1.

The minimum and maximum limits on outputs in Table 1.1 apply to the first full year (12 months) of operations. The “maximum” is established based on potential energy efficiency measures that could reduce the historical usage. Proposers shall install sufficient capacity to satisfy the “minimum” kWh at each site (applies to the first 12-months of operation). Proposers may install capacity at a given site that would result in net output in excess of the maximum in Table 1.1, but the Proposer does so at its own risk. The City will commit to purchase amounts up to maximum shown in Table 1.1. The City will not pay for electricity above those annual limits if the City cannot obtain the economic benefit of such electricity either through direct use or net metering.

Each bidder at its option may include a proposal for the two sites in Table 1.2, subject to the same provision in the immediately preceding paragraph.

**Table 1.2  
Characteristics of Optional Sites for Phase 2**

<b>Locations</b>	<b>Site Description</b>	<b>Min Usage kWh/yr</b>	<b>Max Usage kWh/yr</b>
Murdy Community Center	Mono/poly crystalline panels in parking lot	120,000	160,000
Sports Complex	Mono/poly crystalline panels in parking lot	2,100,000	2,800,000
Total system kWh/yr		2,220,000	2,960,000

The City will decide whether to proceed with Phase 2 no later than December 1, 2010. Proposers that include Phase 2 must agree to hold the prices bid for Phase 2 firm until that date and for a reasonable period of negotiations after that date. For pricing electricity sales under its proposal, each Proposer should assume that \$2,000,000 of additional RZFB’s will be available for the Phase 2 projects.

Although the City determined that it is feasible to develop PV at all sites listed in Tables 1.1 and 1.2 above, the final assessment, design, selection of materials and equipment and construction, maintenance and operation are the sole responsibility of the Developer.

Appendix B contains instructions to receive the concept design documents for each site.

## **1.5 Design Elements**

The City has identified a number of factors and requirements that affect the construction of each site. The requirements are listed in Appendix E.

Each Proposer must conform to the requirements in Appendix E in all material respects or the Proposal must indicate all areas where it does not materially conform to Appendix E. Material deviation from the proposed design concept will require review of the project through the City's entitlement process. Proposer must agree to bear 100% of the costs of any modifications to the City's permitting and entitlement process, including cost impact of any construction delays that may result from such a review.

## **1.6 The City's Costs**

To mitigate the costs the City will incur during the project, the winning Proposer will reimburse the City a total of \$150,000. The reimbursement amount is fixed, and the City takes the risk that its costs may be higher. The \$150,000 reimbursement will be paid in two installments; \$75,000 upon the signing of the PPA and \$75,000 on the date of commercial operation of the first plant completed.

## **1.7 Selection Process**

The City will evaluate all Proposals and select a single Developer for all the sites in Phase 1 based on criteria set forth in Section 3 and Section 4 of this RFP. The City will enter into negotiations with the selected Developer to develop this project as set forth herein.

If the City proceeds with Phase 2 after the elections in November 2010, the City will select a single Proposer for those 2 sites based on the criteria in Section 3 and Section 4 of this RFP. The City will enter into negotiations with the selected Developer to develop this project as set forth herein.

## **1.8 Organization of RFP**

This RFP is organized as follows:

- Section 1: Background & Opportunity
- Section 2: RFP Rules & Procedures
- Section 3: Submittal Requirements
- Section 4: Evaluation Process

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**SECTION 2  
RFP RULES & PROCEDURES**

**2.1 RFP Rules and Conditions**

**2.1.1 Invitation**

The City is issuing this RFP to select a firm or consortia to design, finance, construct, maintain and operate PV solar energy plants at designated sites across the city.

**2.1.2 General Conditions**

The Developer will be granted a license to access the plant sites for the term of the PPA. The Developer will own and operate the plant and will sell electricity to the City.

**2.1.3 Submission of Responses**

Each submittal shall consist of: (a) an original printed proposal, (b) ten printed copies of text, (c) six copies of the drawings, and (d) an electronic version of the entire proposal in a PDF format copied onto one or more CD's as required. All proposal material shall be delivered in sealed package(s) marked "Proposal Municipal Photovoltaic Solar Project, City of Huntington Beach, July 2010." Proposals must be submitted no later than 3:00 p.m. PDT on 30 August 2010 to:

Carrie Gonzalez  
City of Huntington Beach - Civic Center  
2000 Main Street  
PO Box 190  
Huntington Beach, California 92648

Responses received after 3:00 P.M. on 30 August 2010 may be rejected at the City's sole discretion.

**2.1.4 Site Conference**

There will be a mandatory site conference as described under Section 2.2.2 below at which time Proposers will have the opportunity to inspect the sites as part of an escorted tour. Questions received at the site conference will be answered in writing and mailed to all attendees. Failure to attend the site conference may, at the City's sole discretion, result in disqualification of the Proposer.

**2.1.5 Communications**

Proposers will have the opportunity to raise questions regarding the intent or the content of the RFP either at the site conference or at any time until one week before the due date for submitting Proposals hereunder. Except at the site conference, all inquiries must be in

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writing and should be directed to Jim Slobojan at the address above. All questions will be responded to in writing and distributed to all attendees to the site conference. In no event may oral communications of any type by any representative of the City be deemed an official response to an inquiry. **If a Proposer requires a clarification, the request and response must be in writing.**

### **2.1.6 Addenda and Extensions**

The City may modify the RFP prior to submission of the responses by issuing an addendum to all parties who have been issued the RFP. The submission date may be extended if the City believes an extension is warranted.

### **2.1.7 Rejection**

The City does not solicit Proposals without a bona fide intention to proceed with the project. However, the City reserves the right to reject any or all Proposals for any reason.

### **2.1.8 Short-list**

In its sole discretion, the City may establish a short-list of qualified Proposers for further follow-up or for negotiations.

### **2.1.9 Interviews**

The City may interview each Proposer before making its final evaluation. Such interviews may lead to further clarifications and modifications of Proposals, and the City may extend the time for revisions and modifications to Proposals.

### **2.1.10 Disposition of Proposals**

All materials submitted in response to this RFP will become the property of the City. Proposals will be returned upon the written request of the Proposer and at the Proposer's expense.

One copy of the Proposal will be retained for official City files.

### **2.1.11 Accuracy of Maps, Data, and Forecasts**

The City has in good faith provided Proposers with information and data in this RFP and its attachments. The City cannot assure the accuracy, validity, or reliability of these maps, data, or forecasts, and the City assumes no responsibility for these data or forecasts except and to the extent specifically provided otherwise in this RFP.

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### 2.1.12 Proposer's Costs

Each Proposer must bear all costs of preparing the Proposal, attending the site conference, answering follow-up questions, oral interviews, contract negotiations and all other costs associated with this RFP or the subsequent development of the project.

### 2.1.13 Acknowledgement

By submitting a Proposal in response to this RFP, each Proposer is deemed to have read and understand the terms and conditions of this RFP including all addenda issued and to be bound in accordance with said terms. Any entity that does not so agree should not submit a Proposal.

### 2.1.14 Proprietary Data

If a Proposer includes proprietary information in its Proposal which it does not want disclosed, the Proposer shall identify such information on every page where it appears. The City will use reasonable care to prevent accidental disclosure.

The staff members assigned to this project may be required to sign a departmental non-disclosure statement. However, proposals are subject to the Freedom of Information Act, and the City cannot protect proprietary data submitted in proposals.

### 2.1.15 City Procurement Rules

All Proposers must adhere to the general City contract and purchase provisions, which can be found at the following link:

[http://www.huntingtonbeachca.gov/government/charter\\_codes/](http://www.huntingtonbeachca.gov/government/charter_codes/)

### 2.1.16 Acceptance of Proposal

The selection of a Developer to enter final negotiations with the City does not mean that all aspects of the Developer's Proposal are acceptable and is not tantamount to awarding a contract. If the City and Developer are unable to finalize negotiations within a mutually agreeable timeframe, not to exceed sixty (60) days, the City may terminate negotiations and, at its sole election, commence negotiations with the next-highest-ranked Proposer, rebid the RFP or defer or cancel the planned project.

## 2.2 RFP Schedule, Site Conference

### 2.2.1 RFP Schedule

RFP Issued	7 July 2010
Site Conference	13 July 2010

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Proposals Due	August 26, 2010
Oral Interviews	9-10 September 2010
Final Responses	20 September 2010
Final Selection	24 September 2010

### 2.2.2 Site Conference

A mandatory site conference will be held on Tuesday, 13 July 2010 beginning at 9:30 a.m. at the City of Huntington Beach Civic Center, 2000 Main Street, Huntington Beach, California 92648. Prospective Developers who intend to submit a proposal are required to (a) register their interest to potentially bid the project, and (b) confirm their attendance for the site conference at the city's website:

[http://www.huntingtonbeachca.gov/business/bids\\_rfps/vendor\\_application.cfm](http://www.huntingtonbeachca.gov/business/bids_rfps/vendor_application.cfm)

no later than **3 P.M. on 12 July 2010 to register and indicate the name(s) and title(s) of individuals who will be attending the site conference.**

The site conference will be structured as follows:

Introductions and overview	9:30 - 9:45 AM
Question and Answer Session	9:45 - 10:15 AM
Site Tours	10:15 - 12:15 AM
Lunch	12:15 - 1:00 PM
Site Tours	1:00 - 3:00 PM
Follow-up Questions	3:00 - 3:30 PM

Questions raised at the Site Conference will be responded to in writing and the information will be mailed to all attendees no later than 13 August 2010. Safety glasses are recommended in electrical rooms for individuals attending site tours.

### 2.2.3 Contract Negotiations

As soon as practical after its selection of the successful Proposer, the City will issue a letter of intent (LOI) to enter contract for the project subject to council approval. The parties will have sixty (60) days to finalize the contracts and documentation necessary to proceed with the development of the project. If the parties cannot negotiate the necessary contracts and agreements within such 60 days, the City reserves the sole right to terminate negotiations with the designated Proposer and either commence negotiations with the next highest Proposer or abandon negotiations.

## SECTION 3 SUBMITTAL REQUIREMENTS

### 3.1 Two Part Proposal

The City wants clear and concise Proposals. Proposers must submit their Qualifications and Technical Proposals (as further described in this Section) separately from their Economic Proposals. Proposer must submit Proposal in two sealed envelopes or packages, each one clearly labeled on the outside as:

**Sealed Package #1:** Qualifications & Technical Proposal of (*insert Proposer name*)

**Sealed Package #2:** Economic Proposal of (*insert Proposer name*)

The Qualifications and Technical Proposal shall consist of the following sections:

- A. A transmittal letter signed by the individual who be responsible for negotiating final agreements with the City. The transmittal letter shall acknowledge that the bidder has received and reviewed all addenda issued related to this RFP.
- B. An executive summary of the Proposal limited to three pages
- C. The team's qualifications and experience
- D. The technical Proposal
- E. Evidence of insurance, bonding and financing

The requirements for each item are set forth below.

### 3.2 Qualifications and Experience

#### 3.2.1 Team

Provide a list of team members by organization and indicate their responsibilities and reporting relationships. Clearly indicate:

- A. Individual charged with overall project responsibility
- B. Individual that is authorized to negotiate and sign the agreements with the City
- C. Individual(s) responsible for design and installation of the project
- D. Individual that will be responsible for operations and maintenance during the term of the 20-year agreement
- E. History of past projects that the team members have worked on together
- F. Organizational chart
- G. Identify any subcontractors the Proposer intends to employ in execution of the program and discuss their role including information on subcontractors' experience performing similar work

#### 3.2.2 Resumes

Provide a résumé for each key individual listed above limited to two pages per person.

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### 3.2.3 Disputes and Litigation

Indicate whether any member of the team is or has been involved in a dispute leading to arbitration or litigation concerning any existing, proposed or terminated projects.

### 3.2.4 Existing Plants

Provide a list of facilities previously installed that are similar to the one proposed to be installed at the City and provide the information indicated in Table 3.1 below for each.

**Table 3.1  
Installations**

	<b>Plant 1</b>	<b>Plant 2</b>	<b>Plant 3</b>	<b>Plant 4</b>
Address				
Date installed				
Panel manufacture/type				
Tracker or fixed tilt				
Roof, open field, or other (describe)				
Capacity in kW (AC)				
Net AC kWh in 2009				
Current status				
Name & phone of client reference				

Proposers are not limited to four plants and the preceding table may be extended or modified as necessary.

The City prefers that any supplemental information be limited to one page per plant.

### 3.2.5 Longevity

Indicate the two longest running plants that you have developed that are currently operating. If not included in Table 3.1 above, please provide the same information as required in Table 3.1.

## 3.3 Technical Proposal

### 3.3.1 Site Development

Proposers must propose to construct at plant at each of the six sites listed in Table 1.1 of Section 1.4 of this RFP. Proposer may also include projects at the two sites for Phase 2 in Table 1.2 as further discussed in Section 3.10 below.

### **3.3.2 Equipment Design and Configuration**

For each site, the Proposer shall provide design documents and narrative that communicate the following information:

- System description
- Equipment details, description and specifications
- Layout of installation
- Drawing, altered photo, etc. showing a clear visual of the system
- Performance of equipment components, subsystems, specific site projects
- Integration of PV system with existing electrical system(s)
- Electrical interconnection requirements with the City
- Identify an appropriate location for the solar photovoltaic inverter equipment and its related components and environmental control systems
- Note deviations, if any, from the concept design
- Exceptions, if any, to the design criteria listed in the RFP as well as the concept design and conditional approval documents related to the entitlement design documents

### **3.3.3 Technical Description**

Proposers shall provide the following technical description proposed for installation at each specific site:

- Power capacity (DC kW), measured at the inverter(s) input
- Power capacity (AC kW), measured at the electrical interconnection point
- Expected net AC kWh production by month for the first full year; Summer on-peak, mid-peak, and winter peak hours must be explained with some detail of assumptions and performance criteria based on seasonal sunlight availability and variable weather conditions
- Expected photovoltaic panel degradation rate over a 20-year period
- Photovoltaic array materials
- Inverters
- Inverter enclosure type (building, chain link fence, etc.)
- Structural materials
- Balance of system components
- Configuration including, flat-mounted versus tilt-mounted system
- Structural requirements, including if roof penetration is necessary
- Typical useful life of significant components including photovoltaic array and inverters
- Benefits specific to the system proposed
- Any product or warranty enhancements being offered
- Provide a single-line drawing of each proposed plant
- Provide renderings, including the footprint and height of the plant
- Number and types of new trees provided as replacement to those removed

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- Exterior lighting provided
- Security and surveillance systems
- Fire protection systems and devices including remote disconnects (Note: Fire extinguishers need not be provided in the project per latest City Fire Department determination.) Fire Department expectation is for a 30 minute fire protection barrier between combustible materials (vehicles) and Photovoltaic panels. Fire Department to review any and all specifications brought forward by bidders for approval at or before plan check. Darin Maresh is available at 714-536-5531 to discuss this expectation. This feature shall be reported by bidders as an incremental cost.
- Number of existing parking lot poles removed

### 3.3.4 Plant Performance

For the first 20 years of operation, indicate the aggregate performance for all the plants in your Proposal for Phase 1 indicating the kWh delivered to the City in a format similar to Table 3.2 below. Provide a similar table for the performance of the plants in Phase 2. In each instance, the tables should commence with the first full operating year.

**Table 3.2  
System Performance**

Contract Year	Net kWh Delivered to the City	
	Expected	Guaranteed
<b>1</b>		
<b>2</b>		
<b>3</b>		
<b>4</b>		
<b>5</b>		
<b>6</b>		
<b>7</b>		
<b>8</b>		
<b>9</b>		
<b>10</b>		
<b>11</b>		
<b>12</b>		
<b>13</b>		
<b>14</b>		
<b>15</b>		
<b>16</b>		
<b>17</b>		
<b>18</b>		
<b>19</b>		
<b>20</b>		
<b>Totals</b>		

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The delivered solar power shall be quoted on an AC power basis and connected to the City's primary AC power system at each respective site. The term "kW" as used in this RFP means kilowatts (kW) of AC capacity measured as productive solar output delivered to the City site. The term "kWh" as used in this RFP means kilowatt-hour (kWh) of AC electricity delivered to the City.

Proposers should indicate the expected rate of annual degradation in output.

Proposers should also indicate the source of information and describe the process for arriving at the expected net outputs to the City in Table 3.2.

### **3.3.5 Maintenance Plan and Schedule**

Summarize your annual maintenance plan including planned monthly, quarterly, semiannual and annual maintenance and inspections. Indicate and explain any other periodic maintenance.

### **3.3.6 Monitoring and Control Systems**

Describe the monitoring and control systems for the plant, including:

- Emergency shutdown
- Remote disconnects
- Equipment requirements
- Data output and periodic reports to the City
- Real time monitoring
- Maintenance and operation requirements including calibration frequency
- Demonstration and display features for educational use
- Indicate how those will integrate with the City's control systems.

### **3.3.7 Obsolescence**

The Proposal should identify any components that are unique to the Proposer and that may be exposed to the risk of obsolescence or for which replacement parts could potentially be unavailable during the first 20 years of operation. The proposal should indicate any mitigation contemplated.

### **3.3.8 Management and Staffing Plan**

Each Proposer shall also be responsible for developing a Management and Staffing plan which illustrates the management approach to performing the Work and the required staff including the key personnel along with their identified time commitments required to perform the Work plan.

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The Management and Staffing Plan must indicate all staff required to complete the Work through all phases. Each Proposer must submit a staffing schedule tied to the Proposed Schedule showing the time commitment of each individual identified under the key personnel item herein.

### **3.3.9 Milestone Schedule**

The Proposers shall provide an overview of the development schedule for the project. Proposers shall:

- A. Include a milestone schedule for design and construction -- all dates should be referenced from the due date of this Proposal
- B. Indicate which tasks will be on the critical path
- C. Where design deviates from the concept design, include estimated time for City's entitlement process (no less than 45 days)
- D. Provide estimated commercial operation date for each of the locations identified in Table 1.1 (Phase 1) and Table 1.2 (Phase 2).
- E. Discuss any opportunities to accelerate the development schedule which are peculiar to the site
- F. Discuss any obstacles to the timing which are peculiar to the City

Proposers that are bidding Phase 2 should include a similar schedule for the Phase 2 project assuming that the City will announce the winning Proposer for Phase 2 and will start final negotiations for Phase 2 as of November 30, 2010.

Proposers should be aware that the City must spend the proceeds from the Recovery Zone Facility Bonds within the requirements of the law which is commonly within two years of issuance.

### **3.3.10 Phase 2 Submittal**

Proposers that want to submit a proposal for the Phase 2 sites shall replicate the information in Sections 3.2, 3.3 and 3.4 above for each of those two sites pending voter approval.

### **3.4 Insurance, Bonding and Financing**

#### **3.4.1 Evidence of Insurance and Bonding**

Provide a letter from your broker(s) indicating that the Developer will have insurance coverages and bonding capacity consistent with the City's requirements. The City's insurance and other requirements may be downloaded from the City website at:

[http://www.huntingtonbeachca.gov/files/users/admin\\_services/HB%20Insurance%20Matrix%20as%20of%20Resolution%202008-63.pdf](http://www.huntingtonbeachca.gov/files/users/admin_services/HB%20Insurance%20Matrix%20as%20of%20Resolution%202008-63.pdf)

[http://www.huntingtonbeachca.gov/business/License\\_Permit\\_Codes/business\\_license.cfm](http://www.huntingtonbeachca.gov/business/License_Permit_Codes/business_license.cfm)

#### **3.4.2 Evidence of Financing**

The Proposal shall identify potential sources of both construction and long-term financing anticipated for this project. The Proposal shall include a letter from at least one source of financing that states at a minimum the following:

- (a) the financial institution is familiar with the financial condition of the Proposer,
- (b) the institution has reviewed both the Technical Proposal and the Economic Proposal submitted including the pricing provisions and the projected cash flows over the 20-year term,
- (c) the institution is familiar with this type of financing and the various income tax considerations including, but not limited to, the provisions under sections 50(b)(4) and 7701(e) of the Internal Revenue Code,
- (d) the institution has reviewed the provisions and requirements of the RZFB's that will be used for part of the financing for this project, and
- (e) the institution believes that the project is financeable as proposed and the institution has a strong interest in providing the financing for this project.

The preceding letter is obviously short of a firm financing commitment but provides evidence that a potential financier has played a role in reviewing the Proposal and, based on that limited review, believes the project is financeable. This letter may be provided by an affiliate of the Proposer provided that such affiliate routinely finances projects of this nature as part of its normal business.

### **3.5 Economic Proposal (Under Separate Cover)**

In addition to the Qualifications and Technical Proposal, Proposers shall complete and submit a separate Economic Proposal as required pursuant to this Section 3.5. The Proposal shall include:

- a transmittal letter signed by the individual who will execute the PPA with the City

## City of Huntington Beach

- responses to all questions in this Section 3.5
- completion of a cash flow exhibit similar in all material respects to that in Appendix F

### 3.5.1 Financing Sources

The City (or a public agency on behalf of the City, such as CSCDA) will serve as a conduit issuer of \$7,128,000 of Recovery Zone Facility Bonds (RZFB) for Phase 1 of the project.<sup>2</sup> The City's plan of issuance was accepted by CDLAC in early 2010. The bonds will most likely be issued in October 2010. The proceeds will be used to help finance the construction of the project. Funds from the proceeds will be disbursed to the selected Proposer on a percentage-of-completions basis and pari passu with other construction financing funds provided solely by the Proposer. The disbursements of the proceeds will be subject to normal construction progress documentation by an independent engineer and each disbursement will be subject to a 5.0% holdback that will be paid upon the completion of projects and the Proposer's completion of all punch-list items and commencement of commercial operation at a capacity level in conformance with design intent and to the City's reasonable satisfaction. For the benefit of proposers who chose to work with CSCDA, Piper Jaffray has been looked at as the underwriter for this effort. Please see Addendum # 5 for additional information.

The Proposer will be fully and solely responsible for the repayment of principal and interest when due. For purposes of establishing the Proposer's price for electricity sales in the Economic Proposal, the Proposer should make the following Base Case Assumptions (see Section 4.2 of this RFP for further Base Case Assumptions):

- the bond term will be 20 years from November 1, 2010
- payments will be quarterly based on level amortization
- the first payment will be due May 1, 2011 regardless of the completion date of any project
- the face interest rate of the bonds will be 6.000% (tax exempt)
- the bonds will be issued at par equal to 100% of the face amount

It is possible that the terms of the RZFB's will differ from the Base Case Assumptions above. If so, the City and Proposer will renegotiate the energy price under the PPA in a manner that leaves the Proposer whole over the term of the PPA on a NPV basis using an after-tax discount rate of 8.50%. However, each Proposer must use the assumptions set forth above in pricing its proposal in order to assure a level playing field for evaluation.

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<sup>2</sup> It is anticipated that an additional \$2,000,000 will be issued for Phase 2.

## City of Huntington Beach

Proposers are not required to use these bonds. Any proposer that can demonstrate a lower price of electricity to the City may include its own financing plan in its Proposal, provided that all the other requirements in this RFP are satisfied.

The Project will also qualify for California Solar Initiative (CSI) rebates through SCE. The Developer is expected to apply for CSI rebates as part of the financing plan and is solely responsible for all costs associated with applying for and obtaining CSI rebates.

The Proposal shall indicate the types and amounts of financing required for balance of the costs for this project in at least the following detail:

**Table 3.3 A – Phase 1  
Sources of Financing**

<u>Component</u>	<u>Dollar Amount</u>
Subsidies, rebates and incentives	\$ _____
Equity investment	\$ _____
Recovery Zone Facility Bonds	\$ 7,128,000
Other term loan	\$ _____
Total	\$ _____

**Table 3.3 B – Phase 2  
Sources of Financing**

<u>Component</u>	<u>Dollar Amount</u>
Subsidies, rebates and incentives	\$
Equity investment	\$
Recovery Zone Facility Bonds	\$ Assume \$2.0 million will be available under same terms as in Phase-1
Other term loan	\$
Total	\$

For sources other than RZFB's, the proposal must identify the source and amount of each subsidy, rebate and incentive that is assumed in Table 3.3.

### 3.5.2 Turnkey Costs

## **City of Huntington Beach**

Confirm that the total sources above is equal to your total estimated turnkey cost to design and construct the project including all carrying and financing costs. Cost presentation shall include all costs to construct the project and place the same in commercial operation in full compliance with the entitled design concept and CEQA documentation which shall be made available to registered bidders.

### **3.5.3 PPA and Energy Pricing**

The parties will enter into a PPA for a 20-year term. That PPA will provide all the terms and conditions between the parties including the price of energy delivered and sold to the City. Appendix D indicates the major terms of the PPA.

Proposer should clearly indicate the formula for pricing electricity sales to the City clearly defining each factor in a manner that the City can easily replicate its expected costs under the PPA for the 20-year term. The bid price for sales of electricity to the City must be the same for all sites in Phase 1. The pricing for sites in Phase 2 may differ from the pricing for the sites in Phase 1 but must be the same for both projects in Phase 2.

Every component of pricing must be based solely on the amount of net kWh energy delivered to the City. Proposals that contain other cost components or charges that do not vary based on the quantities actually delivered to the City will be deemed to be non-responsive and will not be considered further.

The City intends to receive one or more bids with a price of less than \$0.14/kWh for the first full year with subsequent escalation of no more that 2.0% per year. If the City does not receive any bids that meet those objectives, the City may reject all bids or may, at the City's sole option, enter negotiations with the highest ranked Proposer using the evaluation methodology set forth herein.

### **3.5.4 Acceptance of Performance Risk; Minimum Guarantee**

As the private owner will assume all of the performance risk, The City will require only minimal performance guarantees for the annual kWh produced.

Each Proposer must state a quantity of expected electricity generation each year in the format shown in Table 3.2. Each Proposer must also be prepared to guarantee a minimum output performance from the solar photovoltaic system over the course of each calendar year, at a minimum level equal to 80% of the expected output. The guaranteed output should be indicated in Table 3.2. The annual kWh guaranteed in the PPA will be calculated on a cumulative basis from the inception of the PPA through the end of each contract year, which will serve to reduce the risk to the Project owner.

### **3.5.5 Other Economic Factors**

Other factors that may affect the pricing are solar grants, taxes, and "green tags".

## City of Huntington Beach

1. Taxes on Solar Power Sales. Proposers shall assume that City facilities will not pay city energy or utility user tax on solar energy purchased from the Proposers.
2. Renewable Energy Credits (REC's). The City will own any and all of the REC's, Green Tags, carbon credits or other similar credits. The Proposer's pricing should reflect that the all such benefits will be transferred to the City as part of the PPA and the Proposer will receive no additional compensation for these benefits.

The City shall be responsible for the following costs relative to the construction of the project:

- Permitting and entitlements provided that Proposer shall provide any additional required drawings and information at its own cost and shall be responsible for the costs of all modifications to the permits that are necessary due to the Proposal's failure to conform with material aspects of the City's permits
- The City's own transaction costs beyond the \$150,000 in Section 1.6 of this RFP.

### 3.5.6 Projected Cost Savings to the City

The Proposal must complete a table in the format provided in Appendix F indicating the total annual projected cost to the City. If the Proposal is for both Phase 1 and Phase 2, the Proposer must fill out a separate Appendix F for Phase 1 and for Phase 2.

The costs must use the Base Case Assumptions provided by the City as discussed in this Section 3 and Section 4.2 and as indicated in the top part of the table in Appendix F.

The City recognizes that actual conditions may ultimately differ from the Base Case provided in this RPF. These factors are, however, beyond the control of the City or any Proposer over the next twenty (20) years. The City has selected what it believes is a reasonable forecast for purposes of comparing all Proposals on a fair and level basis.

The project's performance and outputs in Appendix F must agree with guaranteed amounts in Table 3.2.

All Proposals must use the Base Case Assumptions as set forth in Table 3.4.

**Table 3.4  
Base Case Assumptions**

<b>Contract Year Starting in</b>	<b>CPI</b>	<b>CPI Index</b>	<b>Average SCE Retail Electricity Price (\$/kWh)</b>
<b>2011</b>	3.00%	1.000	\$0.140
<b>2012</b>	3.00%	1.030	\$0.144
<b>2013</b>	3.00%	1.061	\$0.149

## City of Huntington Beach

<b>2014</b>	3.00%	1.093	\$0.153
<b>2015</b>	3.00%	1.126	\$0.158
<b>2016</b>	3.00%	1.159	\$0.162
<b>2017</b>	3.00%	1.194	\$0.167
<b>2018</b>	3.00%	1.230	\$0.172
<b>2019</b>	3.00%	1.267	\$0.177
<b>2020</b>	3.00%	1.305	\$0.183
<b>2021</b>	3.00%	1.344	\$0.188
<b>2022</b>	3.00%	1.384	\$0.194
<b>2023</b>	3.00%	1.426	\$0.200
<b>2024</b>	3.00%	1.469	\$0.206
<b>2025</b>	3.00%	1.513	\$0.212
<b>2026</b>	3.00%	1.558	\$0.218
<b>2027</b>	3.00%	1.605	\$0.225
<b>2028</b>	3.00%	1.653	\$0.231
<b>2029</b>	3.00%	1.702	\$0.238
<b>2030</b>	3.00%	1.754	\$0.245

Base Case Assumptions also assume that the City cannot use more than the maximum kWh/year output listed in Table 1.1 in Section 1 of this RFP. Outputs from the project above those limits will not be counted or valued in the City's evaluation of proposals. I.e., excess outputs will be treated as no value to the City.

### **3.5.7 Obligation at Termination**

The Proposer must acknowledge its responsibility to remove all assets related to the solar plant(s) and reasonably restore the City's premises at the end of the PPA.

## **SECTION 4 EVALUATION PROCESS**

### **4.1 Evaluation Methodology**

The evaluation process will consist of both a qualitative assessment and a quantitative assessment of the Proposals submitted. The City will evaluate the Proposals based on each team's qualification and experience, the technical merit of the Proposal, the viability of the financing and contracting plan, the risk to the City, the overall quality of the Proposal and the relative economic benefits.

Proposals for Phase 2 projects will be evaluated separately from Phase 1 using the same procedures as set forth below. Bidders proposals for Phase-2 shall be valid at least until end of 2010, to allow approval of the project through Measure C ballot.

#### **4.1.1 Qualitative Assessment**

The qualitative evaluation will focus on the Qualifications and Technical Proposal and may include:

1. Qualifications and Ability to Perform the Work
  - Project Team Organization
  - Qualifications of Key Personnel
  - Relevant Past Project Experience
  - California Electrical Interconnection Experience
  - Total Installed PV Capacity (AC kW)
  - Total operating hours of existing plants and the track record of each
  - Project Management Capability
  - Reasonableness of Project Schedule
  - Management & Staffing Plan
  
2. PV System Design and Configuration
  - System Size
  - Technical Description
  - Guaranteed Power Capacity (DC)
  - Guaranteed Power Capacity (AC)
  - Performance and Efficiency
  - Conformance to design criteria and City's entitlement process
  - Minimum Guaranteed System Output (kWh/year)
  - Footprint and height of installation and its overall aesthetics
  - Control Systems
  - Integration with existing City and SCE facilities
  - Metering
  - Monitoring Plan

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- Warranties
3. Operation and Maintenance
    - O&M Procedures
    - Experience Providing O&M Services
    - List of O&M Personnel
  4. Financial / Business Strength of Team
    - Experience in arranging size and type of debt
    - Evidence that capital team members can secure debt / equity for proposed system
    - Credit Rating (S&P or Fitch's or Moody's)
  5. Client/Customer Reputation of Team (References)
  6. The Overall Quality of the Proposal
    - Completeness of the Proposal
    - Responsiveness of the Proposal
    - Organization and coherence of the Proposal

The City reserves the right to consider factors other than those listed above in its evaluation and qualitative assessment of the Proposals.

Failure to comply with all the requirements of this RFP may result in the disqualification of the Proposal at the sole discretion of the City.

### 4.1.2 Economic Assessment

The economic assessment will be based solely on the net benefit to the City.

The economics of each Proposal will be evaluated compared to the business as usual case (BAU Scenario) for the cost of electricity in the absence of the proposed plant(s). The BAU Scenario will price electricity purchases in accordance with the City's forecast of SCE's electricity prices from 2011 through 2030. These assumptions as to future energy prices are collectively referred to as the Base Case.

The Proposal with the highest net savings to the City will receive the maximum score as explained below. **Any Proposal that would not result in savings to the City compared to the BAU Scenario under Base Case Assumptions may be deemed non-responsive at the City's sole discretion and will not be considered further.**

The calculations will be based on the guaranteed levels of performance discussed in Section 3.3.4 and indicated in Table 3.2.

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### 4.1.3 Evaluation Formula

Final selection will be evaluated based on ‘best value’ to the City after consideration of both the Qualifications and Technical Proposal and the Economic Proposal.

The maximum possible points awarded a Proposal will be 100. The points will be allocated in accordance with Table 4.1.

**Table 4.1  
Allocation of Points**

<b>Evaluation Criteria</b>	<b>Maximum Points per Category</b>
Qualitative Factors:	
Ability to Perform the Work	15
PV System Design and Configuration	15
Operation and Maintenance	5
Financial / Business Strength of Team	10
Client/Customer Reputation of Team (References)	10
Overall Quality of Proposal	5
Economic Factors:	
Net Benefit to the City	40
Total Possible Points	100

### 4.2 Base Case Assumptions

The costs and savings of each Proposal will be estimated using the factors in the respective Proposal, the Base Case assumptions as set forth in Table 3.3 (and the top rows of the table in Appendix F) and any other factors that the City deems appropriate. Each Proposal will be compared to the BAU Costs for the City to produce or purchase the same amount of electricity in the absence of the plant(s) proposed under Base Case Assumptions.

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## APPENDIX A ACRONYMS AND ABBREVIATIONS

### Entities mentioned in the report:

- **SCE:** Southern California Edison
- **City:** The City of Huntington Beach

### Technical measurements and quantities:

- **AC:** Alternating Current, 3 Phase
- **DC:** Direct Current
- **kW:** kilowatt, a measure of instantaneous electricity demand
- **kWh:** kilowatt-hour, the amount of electricity consumed in one hour given 1 kW of sustained, instantaneous demand for that hour
- **MW:** megawatt, which is 1,000 kW
- **PV:** photovoltaic

### Other:

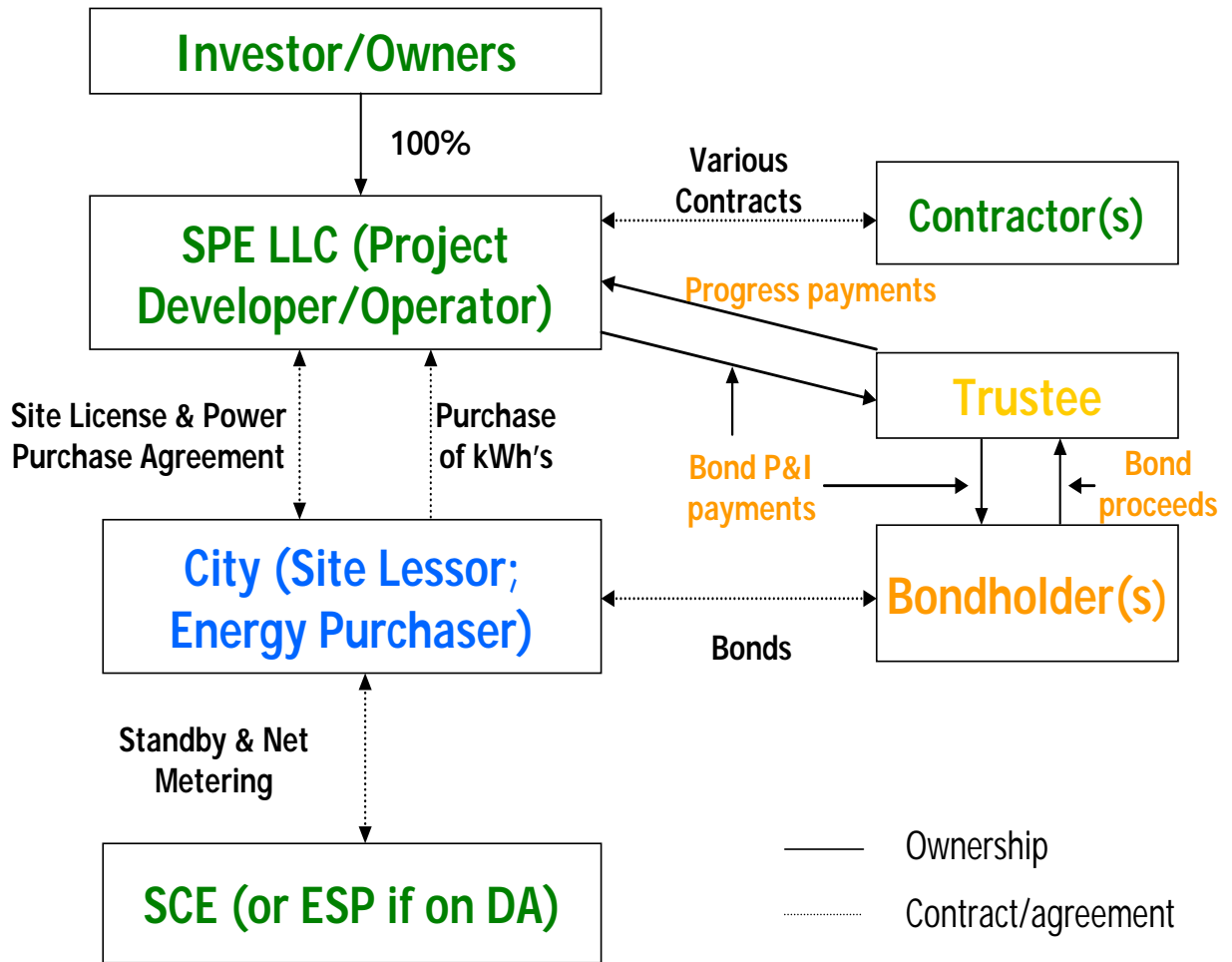
- **CEQA :** California Environmental Quality Act
- **CPI:** Consumer Price Index
- **LTSA:** Long Term Service Agreement
- **PPA:** Power Purchase Agreement
- **NPV:** net present value
- **RFP:** Request for Proposals
- **RZFB:** Recovery Zone Facility Bonds

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**APPENDIX B  
PV PLANT SITE DETAILS**

Concept PV Design Documents for each of the sites as well as current draft of CEQA documentation shall be made available to interested bidders via a FTP download site after the bidders register their interest to participate in potentially bidding the project. Please contact the individual noted in Section 2.2.2 of this RFP to register your interest to bid.

APPENDIX C  
TYPICAL PPA STRUCTURE<sup>3</sup>



<sup>3</sup> This example is provided for sake of illustration only. The structure shown would be acceptable. Other alternatives could be acceptable. There may or may not be a lender.

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**APPENDIX D  
MAJOR TERMS OF PPA AND SITE LICENSE  
(See Attachment-1 for Draft Contract)**

1. General Provisions

- 1.1 Definitions: Exhibit A
- 1.2 Premises: Exhibit B
- 1.3 Additional Areas: Exhibit C
- 1.4 Access: Quiet enjoyment, the City reasonable access
- 1.5 Condition of Premises: Developer/owner take as-is and are responsible to inspect and determine adequate & sufficient for project
- 1.6 Rent: \$/year
- 1.7 Term: 10 years plus construction period plus 90 days to remove at termination
- 1.8 Obligation to Remove & Restore: Developer/owner responsibility

2. Design and Construction

- 2.1 The City Responsibilities: Zoning, permits & approvals
- 2.2 Vendor Responsibilities: All other costs including any data or drawings necessary for 2.1
- 2.3 Specifications: per Project Manual
- 2.4 Utilities and Wastewater: the City will provide gratis up to specifications in PM
- 2.5 Prevailing Wages: Developer must pay prevailing wages for any work performed on site.
- 2.6 Insurance: Builders All Risk; AL/GL \$5kk; WC;
- 2.7 Milestones; Delays: Exhibit D milestones, reasonable delays allowed including force majeure

3. Operations and Maintenance

- 3.1 Performance Standards and Procedures: Exhibit E Operating Manual
- 3.2 Maintenance and Repairs: 100% developer & owner responsibility
- 3.3 Alterations: None allowed without City approval
- 3.4 Labor-management Relations: Pledge to maintain good relations
- 3.5 Fair Employment: Must comply
- 3.6 Utilities: the City to provide gratis up to specifications
- 3.7 Notice of Operating Schedule: Normal commercial standards
- 3.8 Laws and Regulations: Developer/owner must comply with all solely at their cost
- 3.9 Hazardous Materials and Waste: No HM allowed without the City's written permission; waste must be properly handled & disposed
- 3.10 Signage: Normal standards
- 3.11 Taxes: Developer/owner 100% liable
- 3.12 Insurance: Normal commercial standards
- 3.13 Liens: None allowed on Premises or any City property

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4. Purchase and Sale of Energy
  - 4.1 General provisions
  - 4.2 Electricity Sales: Formula per Proposal
  - 4.3 Thermal Sales: Formula per Proposal
  - 4.4 Invoicing and Payments: 30 day payment terms from invoice receipt
  - 4.5 Performance Standards: per Operating Manual
  - 4.6 Annual True-up: Guarantee per Appendix G of RFP
  - 4.7 Metering: normal commercial standards for installation, testing, calibration, errors; all solely cost of owner/developer
  - 4.8 Reports: Major outages; Annual performance/management report
5. Force Majeure: Reasonable and normal commercial terms
6. Breaches and Remedies
  - 6.1 Developer/Owner Failure to Perform
  - 6.2 Failure to Pay
  - 6.3 Remedies
  - 6.4 Involuntary Assignment
7. Indemnification: Indemnification except for gross negligence or misconduct of Indemnitee
8. City Non-Liability: Standard clause as follows

It is expressly understood and agreed that the City will be under no liability of any kind or character whatsoever for the payment of labor, materials or otherwise in connection with the construction and operation of the facility. Prior to the commencement of work under any contract for repair, construction or reconstruction of any part of the facility, developer and owner or their contractors shall provide a corporate guaranty, in a form reasonably satisfactory to the City, to assure lien free completion of such work
9. Transfer of Ownership
  - 9.1 City Approval Rights: applies to all transfers of ownership or operations, directly and indirectly
  - 9.2 Right of First Refusal: the City to have right of first refusal subject to reasonable standards
10. Representations: Normal representations for such agreements
11. Dispute Resolution
  - 11.1 Mediation: Either party can request
  - 11.2 Arbitration: Normal AAA rules, San Francisco, losing party pays all costs including attorney fees
  - 11.3 Injunctive Relief: Under normal & appropriate circumstances

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12. Miscellaneous (most are self explanatory)
  - 12.1 Relationship of Parties
  - 12.2 Mergers or Consolidations
  - 12.3 Books and Records
  - 12.4 Interest Rate
  - 12.5 Entire Agreement; Amendments
  - 12.6 Waiver
  - 12.7 Interpretation; Governing Law
  - 12.8 Section Headings
  - 12.9 Severability
  - 12.10 Successors and Assigns
  - 12.11 Dispute Resolution; Costs and Attorney Fees
  - 12.12 Notices
  - 12.13 Interest-rate
  - 12.14 Number and Gender
  - 12.15 Reservation of Oil, Gas and Mineral Rights
  - 12.16 Time is of the Essence

Exhibits:

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**APPENDIX E  
DESIGN CRITERIA AND REQUIREMENTS**

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**Proposers shall also review and indicate exceptions to the draft standard SPPA and SLA.**

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### 1. Architectural/General

- a. Compliance with Codes and Standards: The project design, construction and operation shall comply with all applicable current version of the City of Huntington Beach, State of California, and National Codes in each discipline. Products and systems provided shall meet standards of quality and performance established by professional industry organization and manufacturing associations. All construction activities shall comply with safety and environmental regulations and standards as established by Cal OSHA, Air Pollution Control District, State Air Resources Board, Regional Water Quality Control Board and the Environmental Protection Agency. Where there is knowledge of a more stringent code is in the making at any of the public agencies, as notified by the City of Huntington Beach, project shall comply with the more stringent code requirements.
- b. Overall project capacity: Concept design provides approximately 2 MW (STC DC) of aggregate capacity for Phase-1 sites and approximately 750 kW (STC DC) of aggregate capacity for Phase-2 sites. Degree of complexity for Phase-2 sites is expected to be greater due to the fact that (a) the Sports Complex is built over an old landfill and will require structural support columns that are probably 40 feet deep, and (b) Murdy community center is adjacent to a park that hosts baseball activities, requiring appropriate protection. Development of Phase-2 is subject to approval by citizen vote pursuant to Measure C.
- c. Layout: The photovoltaic modules shall be generally oriented towards an azimuth that is as close as possible to true South or Southwest to maximize energy generation. The modules shall be mounted such that the minimum tilt is 5 degrees. Flat mounting is not allowed. This requirement applies to all installations.
- d. Mix of Array Orientations: It is acceptable to have a given site to have mix of North-South and East-West oriented parking bays and array styles. However, along any given bay, all arrays must have the same orientation, elevation, and tilt. All modules at a given site shall be preferably of the same make, type and capacity.
- e. Limiting Width of Arrays: In parking lot applications, the PV arrays shall be arranged so that no part of the array or the structure that supports the array extends beyond the bounds of the parking spaces along both the width of the parking bay and length of the parking bay. The limit is the tip of the white stripe along the width and the extreme white stripes at the end of each parking bay consisting of multiple parking spaces. In rooftop applications and ground mount applications, the arrays and support structures shall maintain a clear 8 ft. space from the edge of the property.
- f. Minimum Clearance Height for Vehicles: In parking lot applications, a minimum clearance height of 13 ft. 6” shall be maintained between the ground and the bottom most part of the supporting structure to avoid potential interference from vehicles. No part of the signage, electrical systems or any other project component shall be

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mounted to reduce the above clearance within a boundary of 6 ft. from the edge of the structure.

- g. Sun light gaps: In parking lot applications where width of the array assembly exceeds 20 ft., array layout shall avoid a “barn” type appearance by ensuring that there is a natural gap between arrays or sub-arrays. In parking bays oriented along the East-West direction with a bay width exceeding 20 ft., a minimum gap of 4 ft. shall be maintained along the center axis of the PV arrays. In parking bays of any width, that are oriented along the North-South direction, the PV arrays shall be mounted in a saw-tooth configuration, with a minimum gap of 4 ft. or greater as necessary to minimize inter-array shadows, since the modules will be tilted at an angle of 5 degrees or greater while facing South or South west.
- h. No Loss of Parking Spaces: There shall be no loss of parking spaces as a result of the photovoltaic structure. Location of the structural columns shall be typically at the corner junction of adjoining parking spaces or at the extreme end of the first and last parking spots within a given bay, carefully selected so as to not encroach upon or interfere with parking of vehicles. In parking bays that have a central planter area or other open pavement area that separates one bay from an adjoining bay, the planter area or open pavement could be used to support the columns.
- i. Maintaining Clearances: Certain project sites (e.g., Civic Center Complex) have operating Oil Wells maintained by a third party. Project layout shall maintain sufficient clearances from existing oil drilling equipment to facilitate their periodic service. Consult with City on exact clearances required. Certain other project sites (e.g., Water Yard and Peck Reservoir) have existing propane storage tanks. Coordinate layout so that electrical equipment and are safely separated by at least 14 ft. (or otherwise required by code) from propane storage areas.
- j. Avoiding Potential of Shadows: The concept design documents identify potential areas that are suitable for PV installation and areas have been selected so that there is minimal or no interference from existing building structures. However, in all parking lot applications, existing light poles as well as signage of various types that need to be removed from the existing location to avoid shadows on the PV system. All new lighting shall be provided at the underneath of the new PV system in parking lot applications. New signage will also be provided as replacement to existing remove signage underneath the new PV system.
- k. Structural Style: The PV support structure needs to have an architecturally pleasing appearance. All steel, boxes, and conduits shall be painted and weather protected. The concept design shows a possible configuration involving a combination of the pedestal and curved steel column supports. As far as possible, all electrical system components, conduits, junction boxes and supports shall be designed to harmoniously blend with the structure and concealed as much as practical.

## City of Huntington Beach

- l. Enclosures for Equipment: All outdoor equipment like disconnects, inverters, etc. shall be enclosed for equipment security and public safety purposes in properly rated enclosures. The design concept proposes several types of inverter system enclosures to be used. Depending on the project location, the enclosure design elements will vary as shown. In some locations, landscape and planters may be required around the enclosures as noted in the concept design documents.
- m. Location of Inverter Enclosures: The location of the inverter enclosures is shown in concept design documents. The locations have been selected based on (a) visibility, (b) proximity to point of connection, (c ) available space limitations, and (d ) need for minimizing loss of parking spaces. Any material deviation from what is shown in the concept designs shall require City's approval.
- n. Color and Finish of Project Components: The color and finish of all Project components must match and be compatible with the existing City building walls and trims at which the project is located. The concept design proposes specific color and finish schemes for both the structure and the inverter enclosures. Deviations from the same will require a re-processing of the project through the City's Entitlement Process.
- o. General Signage: All existing signage removed to accommodate the PV system shall be replaced and installed in the new construction with any additional new signs put up.
- p. Roof level construction: City's standard for roofing is Garland Company. Any construction on roof including (i) installation of Mono/Polycrystalline PV panels, (ii) installation of thin-film solar laminates, (iii) installation of conduits and supports shall be done in accordance with the specifications and requirements of Garland Company. Design of installation and any penetrations shall not void or alter the existing warranty that the City has with the roofing vendor.
- q. Submittal Requirements during Detailed Design and Construction: These shall include layout, proposed kW capacity, plans, elevations, sections, single lines, 3-D rendering with color and finish of systems to be installed, project specifications including specific make and model of key project components. List of material deviations, if any, from the concept design. Submittal shall be made at the following phases of design: (a) Preliminary, (b) 50% CD, and (c) 100% CD.

## 2. Renewable Energy

- a. PV Modules UL Rating: All photovoltaic (PV) modules shall be tested and listed by UL and shall meet the requirements specified in UL 1703 to ensure compliance with applicable safety standards, including but not limited to safe operation and disconnection from the electrical distribution system in the event of internal equipment failure, or separation from the distribution system.

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- b. **Make and Model:** For each site, the PV modules shall be of the same manufacturer, same model number, same size, same shape, same open circuit voltage, same short circuit current, and same electrical resistance. The design in the concept design documents for PV Crystalline modules is based on the SolarWorld module SU-230 W. The Thin Film modules in the concept design are based on the Uni-Solar thin film product line (PVL-68 and PVL-144). However, other modules of similar size and equal or better performance characteristics that meet CEC certification may be proposed in the design subject to meeting all the requirements of this Section 2.
- c. **CEC Certification:** PV Modules shall be CEC Certified and shall meet all the requirements for being eligible for CSI Incentives.
- d. **Operating Experience for PV modules:** (a) The proposed Make and Model at any site must have a minimum of 1-year of successful operating history in commercial, institutional or utility scale projects in the United States with a combined operating capacity of at least 2 MW. (b) The manufacturer of the PV modules must have had at least 3-Years of successful operating experience in producing PV modules with an aggregate successful operating capacity of at least 10 MW. Manufacturer of the module shall be able to provide evidence of this qualification if requested by the City. The effective date for determining this experience is the date of issuance of this RFP.
- e. **PV Module Warranty:** All PV modules shall have a warranty period of 25-years from the date of start-up.
- f. **Labeling of Systems:** PV installation at a given site shall have complete labeling including (a) DC string level (at each array typically up to 600 V DC range), (b) combiner output (at each combiner), (c) Inverter DC input (at each inverter) and (d) Inverter AC output, and (e) Point of interconnection. All DC disconnects, Junction boxes, DC feeders rated at 80 Amp. Or greater and AC feeders and termination points shall be labeled. Labeling shall match the as-built plans or drawings provided at the completion of the project. Parking Lot bays as well as Inverter locations at a given site will be labeled and uniquely identified by a Alpha Numeric label.
- g. **Inverters Options Permitted**

General System Overview: Inverters shall be suitable for grid-connected photovoltaic arrays. The inverters output voltage shall match the service voltage that is supplying the facility that the PV system will be connected to. Fusible disconnects or switchgear shall be incorporated for the isolation and protection of the connected AC and DC power systems. The inverters shall be able to be configured in the factory or wired in the field to handle positive DC ground. Centralized inverter solar power systems shall be designed to use the minimum feasible number of inverters.

1. **Power Quality:** The inverter shall meet the IEEE-519 recommended limits for total harmonic current distortion.

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2. Safety: The inverter shall meet the UL-1741, IEEE 929, 1547 and ANSI 62.41 requirements to the performance, operation, testing, safety considerations and maintenance of inter-connection.

3. Self-Protective Features: The inverter shall have built-in protective features to prevent or limit damage to the photovoltaic system, the inverter, and the utility distribution system in the event of a component or system-level failure. These features shall provide for orderly system shutdown without the need for a great many external protective devices.

4. Device Protection: DC overvoltage, over current and over temperature functions shall be incorporated to protect system components. Set points for these functions shall be fixed at the time of factory test, and may be changed through the diagnostic port on the microprocessor controller inside the enclosure.

5. Utility Islanding Protection: Detection of islanding from the utility grid shall be achieved via AC over/undervoltage and over/under frequency functions. Set points and definite time delays for these functions shall be field settable through the operator interface on the door of the enclosure.

6. Additional Protection Required: Fast acting, semiconductor type, current-limiting fuses at the main bus bars to protect from utility short circuit, contribution AC current unbalance detection to prevent single-phasing due to blown fuses, MOV-type surge arrester on AC and DC terminals for overvoltage, protection from lightning-induced surges DC ground fault detection.

7. CEC Certification and Utility Interconnection: Inverters shall be CEC certified and shall be eligible for CSI incentives. They shall also comply with all utility interconnection requirements.

8. Inverter Operating Experience: The proposed make and model of the inverter shall have at least 1-year of successful operating history in projects installed in United States, with a cumulative capacity of 2 MW of greater. The manufacturer of the inverter must have had at least 3-years of successful operating experience in inverters, with a combined capacity of at least 10 MW.

### 9. Inverter Specification Summary

Continuous Output KW Capability	Up to 1MW, Best Configuration or as required
Configuration	3-Phase
Nominal Maximum Power Point range (Vdc) voltage Window	330V -600V
Nominal Inverter AC Voltage	208, 240, 480 VAC, 3-phase, 10%
Line Power Factor	Unity
Inverter Efficiency	> 94% at full load

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Operating Frequency	59.5-60.5 Hz, continuous tracking of utility frequency
AC Current Distortion	< 5% Total Harmonic Distortion at Full load
DC Ripple Current	< 5% at full load
Enclosure Environmental Rating	Seismic Zone 4, Outside: NEMA 3R, NEMA4
Ambient Temperature Range	-20 to 50 degree Centigrade

### h. Control and Instrumentation

1. **Operating Mode:** The inverter shall employ maximum power tracking to operate in a power maximization mode at all times there is sufficient irradiance to overcome inverter tare losses. Inverter wakeup shall be triggered when the open circuit DC input voltage rises above the preset minimum operating voltage. The inverter shall transition back to the idle state for nightly shutdown when tare losses exceed input power for a predetermined time period. The inverter shall not employ source circuit dumping contactors, crowbar circuits and similar unreliable schemes used for protections.

2. **Operator Interface:** The inverter shall provide access to protection, metering, control and status functions via an operator interface on the front of the inverter enclosure. Menu driven display shall allow the operator to interrogate the inverter for status and metering functions, with local control also available through this interface.

3. **Local Instrumentation:** the following parameters shall be accessible via the operator interface display:

- AC Voltage
- AC Output Current
- Output Power
- DC Input Current
- DC Input Voltage
- Inverter Status
- Protective Function Targets

4. **Local Control:** Local Control shall be implemented through an enable/disable switch, emergency stop button and cooperator interface keypad located on the door of the enclosure. Inverter reset following clearance of a system fault shall be done through the keypad.

5. **Remote Control/Instrumentation:** the microprocessor control unit shall have provisions for installation of an RS232, RS485 communication link, should future remote control and monitoring capability (by personal computer) be desired. All parameters, status indicators and targets accessible through the local operator interface shall be accessed remotely through these ports. The inverter shall be designed for optional analog outputs (0-5 VDC) for AC power, DC current, and DC

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voltage to interface with external data acquisition systems. The inverter shall also allow for optional contact inputs from an external SCADA RTU or other remote control device within the inverter enclosure for remotely disabling or resetting the unit.

6. AC and DC Interfaces: The DC input to the inverter shall be equipped with a manually operated isolation switch. The switch shall be of the non-load break type, but shall include an auxiliary micro switch to shut the inverter down prior to opening of the main switch contacts, providing, in effect, load-break capability. The switch shall be mounted on the side of the inverter enclosure in a separate NEMA 3R enclosure. Source circuit combinations shall be made external to this enclosure. The AC output of the inverter shall also be equipped with a manual disconnect switch. Both AC and the DC switches provide visible conductor separation, and may be padlocked in either the open or the closed position.

7. Isolation Transformer: An isolation transformer shall be required to allow grounding of the DC system per NEC Article 690, and to match the utilization voltage. A general-purpose dry type transformer will be suitable. The transformer shall have a 208 volt or 240 volt or 480 volt, DELTA or WYE winding to match the inverter as required by application.

- i. Inverter Room/Electrical Room Cooling Requirements: Inverter/Electrical Rooms when totally enclosed shall be equipped with needed cooling/heating/dehumidifying equipment to keep working conditions within electrical equipment operational conditions at all times. All inverters shall be rated for continuous operation in wet and dusty outside weather conditions.
- j. Proven Record of Performance: All materials and equipment provided for the renewable energy system shall be of a proven design and performance that successfully operated in commercially available systems.
- k. Estimated Potential Capacity by Site: All estimated potential capacities are attached to RFP. Contractor shall propose capacity equal or comparable to that specified by RFP document. Material changes to the installed capacity could trigger a renewed entitlement process through the City.
- l. Warranty Requirements: Inverter shall have a minimum 10-year warranty. Manufacturer shall provide additional warranty up to a total of 20-years if required for the inverters.
- m. Performance Evaluation Methodology: Indicate the type of methodology that is performed to evaluate PV site performance. At a minimum, the performance evaluation shall provide following data:
  - Annual solar energy production profile in kilowatt-hours AC
  - Source of solar radiation data used

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- Month-by-month breakout of the energy production
- Peak AC power output in kilowatts for each given month
- Assumed loss of power due to shading (from outside or inter-arrays)
- Land area or roof area dedicated to the solar power system, including any additional area dedicated to the balance of system.
- Ratio of annual energy per total area utilized, kilowatt-hours per square foot
- Ratio of peak power output per total area utilized, watts per square foot

The mathematical method for specifying PV system output in kWh must be typical system alternating current (AC) power rating of the proposed PV system using the National Renewable Energy Laboratories' (NREL) methodology.

Calculate the annual kWh for the system, using NREL's PVWatts web-based performance calculator, found at:

[http://rredc.nrel.gov/solar/codes\\_algs/PVWATTS/version1/](http://rredc.nrel.gov/solar/codes_algs/PVWATTS/version1/)

Specify annual degradation expected over 25 years (in percentage degradation per year).

n. Submittal Requirements during detailed design and construction:

1. Technology Overview:

- Provide a detailed description of the complete system proposed for each of the sites identified in this RFP.
- Indicate the specific location, dimensions, and “footprint” of each proposed system.
- Indicate system size in both kWp (dc) and kW (ac) terms, based on applicable CEC conventions.
- List key design and construction features of the systems to optimize performance and aesthetics on each site.
- Describe any identified issues or challenges and how you would address and/or resolve them.

2. System Components:

PV Modules

- Number of PV modules for each proposed site.
- PV module description and brand and model number
- PV module efficiency %; PV cell efficiency
- Provide manufacturing data sheets for the proposed PV modules
- Indicate the PTC ratings for the proposed PV modules
- Provide an explanation for your choice of PV module.

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### Inverters

- Number and size for each proposed system.
- Inverter brand (s), model(s), and efficiency (in %)
- Provide manufacturing data sheets for the proposed inverters.
- Provide an explanation for your choice of inverter.

### Parking Lot and Roof Mounting Systems

- Describe each type of mounting system proposed, and its features to optimize performance and to enhance aesthetics at each school site.
- For carport systems provide an artist's drawing, sample photo, or other visual material that will allow the City to discern the aesthetic features of the proposed design.
- Material finishes for structures and enclosures

## 3. Electrical

### a. Electrical Codes, References, and Standards

The most current adopted and published revision of each of these codes, standards, and references are incorporated into the requirements of this RFP by reference. All materials and equipment furnished under this contract shall conform to the codes, standards and references.

- California Electrical Code, (CEC 2010) Edition.
- California Public Utilities Commission (CPUC) Rule 21 Interconnection Requirements as adopted by SCE.
- Underwriters Laboratories (UL) 1703, Flat-Plate Photovoltaic Modules and Panels
- Underwriters Laboratories (UL) 1741, Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
- IEEE Standard 519-1992, Recommended Practices and Requirements for Harmonic Control in Electric Power Systems
- IEEE Standard 929-2000, Recommended Practice for Utility Interface of Residential and Intermediate Photovoltaic Systems
- IEEE Standard 1547-2003, Standard for Interconnecting Distributed Resources with Electric Power Systems
- American National Standard (ANSI) 62.41, Surge Voltages In Low-Voltage AC Power Circuits
- Code of Federal Regulation (CFR), Title 47, Part 15, (FCC) Radio Frequency Devices, Class B Devices
- National Electrical Manufacturers Association (NEMA) Standard 250, Enclosures for Electrical Equipment

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- CFC, California Fire Code with City of Huntington Beach Amendments and Ordinances (CFC 2010)
- California Building Code (CBC 2010)

### **b. DC side requirements**

- i. Exposed wiring: All wire that is exposed to the sun shall be USE-2 wet-rated and sunlight-resistant. Exposed wiring shall be generally minimized and solely limited to the wiring immediately below the PV arrays. USE-2 wiring shall terminate in J-boxes provided for each array.
- ii. Wiring in conduits: All wire that is to be used in each solar system shall be copper, THWN-2, or XHHW-2 90°C, wet-rated conductors. All wiring shall be accessible to service personnel.
- iii. Conduits and raceways above ground: Conduits and raceways color shall match that of PV support structure color. DC conduits and raceways associated with the PV system shall be marked at ten (10) foot intervals to alert individuals that DC power is present. Unless noted otherwise, all above ground conduits shall be IMC, hot dipped galvanized. In Inverter rooms, Rigid Metal Conduit shall be used for conduits mounted at elevations less than 8 ft. above the finished floor. Coordinate layout to minimize conduit runs and visible conduits on structures.
- iv. Conduit thermal expansion connections: expansion fittings shall be provided to compensate for thermal expansion and contraction, in accordance with the NEC 300.7(B), 352.44.
- v. Conduits and raceways below ground: All underground conduits shall be Schedule 80 PVC and installed a minimum of 36 inches below grade with a traceable identifier marker installed 12 inches above the top conduit. All underground conduits shall be sealed. Sealants must be listed for such use. Coordinate layout to minimize conduit bends. Transition to metallic conduit within 24 inches above grade. Protect above grade conduit from impact damage by installation of protective bollards. Perform underground utility surveys prior to finalizing the routing for underground conduits. Stay clear from existing oil pipes or gas pipes in the vicinity. Perform pull tension calculations for all conduit runs and add pull boxes where calculated pulling tensions are within 80% of manufacturer's published limit.
- vi. Conduit sealing requirements: For roof-top installations, seal all roof penetrations with weather tight UV resistant compounds as appropriate for the roofing system involved. For all underground conduits, inside of conduits at the point of exit from the ground shall be sealed in accordance with CEC 500 to prevent potential migration of hazardous gasses, vapors, or liquids into a building.

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- vii. Combiners: Combiner boxes shall be NEMA 3R enclosures, 600 VDC, and UL1741 listed. Combiner boxes shall be mounted within site of the sourced array to facilitate maintenance. All conductors entering and leaving shall be provided with a terminal point. Splicing of conductors inside the box is not acceptable.
- viii. Junction boxes: Junction boxes shall be NEMA 3R enclosures, 600 VDC, and UL1741 listed. J-Boxes shall be labeled to indicate the string to which they are connected.
- ix. Fuses: All series-connected PV modules must include a series fuse as required by UL and NEC to protect wiring and other system component.
- x. Remote disconnect relays/contacts: Provide combiner level remote disconnect to isolate the 100-Amp rated DC circuits completely from the DC wiring leading to the manual DC disconnects at the Inverter location. Provide a single manual Push-Button in the Inverter room and provide low voltage wiring to operate the Remote Disconnect (isolating the +ve side). This remote disconnect shall be used by the firemen in the event of a fire emergency. Provide wiring and connections so that a single push-button will disconnect all combiners associated with a given inverter.
- xi. Maximum DC voltage permitted: Max. System voltage = 600VDC
- xii. Location of DC disconnects: All DC Disconnects associated with a given inverter shall be situated in the same inverter room or enclosure. Disconnects shall be DC rated for both voltage and current and shall be 4-pole, with a loop of the +ve wire through two contacts to minimize arcing. Devices used to disconnect the PV system shall be lockable and accessible under all conditions and at all times to City of Huntington Beach qualified personnel.
- xiii. Signage: Format
  - Red background with white lettering
  - Minimum 3/8" letter height; all upper case letters
  - Arial or similar font; non-bold
  - Reflective, weather resistant material suitable for the environment (durable, adhesive materials may meet this requirement)
  - Comply with the more stringent of the Utility interconnection and City Fire department requirements

Locations:

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1. Direct Current Conduit, Raceways, Enclosures, Cable Assemblies, and Junction Boxes  
Marking should be placed on all interior and exterior DC conduit, raceways, enclosures, and cable assemblies, every 10 feet, at turns and above and/or below penetrations and at all DC combiner and junction boxes. Marking should read - "CAUTION: SOLAR CIRCUIT"
  2. DC Disconnect  
Signage should read - "PV SYSTEM - DC DISCONNECT"
  3. INVERTER:  
Signage should read - "PV SYSTEM - INVERTER - WARNING: ELECTRICAL SHOCK HAZARD"
  4. AC DISCONNECT:  
Signage should read - "PV SYSTEM - AC DISCONNECT"
  5. Permanent directory or plaque providing location of service disconnecting means and photovoltaic system disconnecting means, if not located at the same location.
- 
- xiv. Naming of arrays and circuits: All arrays and circuits shall follow methodical sign standard to ensure easy identification for safety and maintenance purposes.
  - xv. Monitoring of DC circuits: Contractor shall install an Internet web-based monitoring system to obtain accurate and reliable data relative to DC-side solar performance on combiner level and inverter level.
  - xvi. Grounding DC side: All modules shall have grounding clips so the ground wire can be attached to every module in the system. All disconnect switches, combiner boxes, junction boxes, inverters, AC panels and solar modules shall be grounded according to the NEC 2008. Photovoltaic system ground shall be installed and sized in accordance with Code and shall terminate at and be bonded to the building system AC grounding electrode, or, if the building has a grounding electrode system, at any convenient point on the grounding electrode system.
  - xvii. Inverters: Inverters shall be listed to UL1741. The Inverters shall be capable of completely automatic, unattended operation, including wake-up, synchronization, and disconnection. Inverters and other equipment located at grade outdoors shall be protected from damage by the installation of protective bollards.
  - xviii. AC Panels: All systems shall be furnished with an AC panel, which contains a minimum of 18 positions and they shall be UL listed.
  - xix. Balance of System (BOS): Other components not listed shall be provided to complete the function and safety of the PV system. All metal components

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shall be hot dipped galvanized and any joints that are fastened together shall be painted with galvanox.

### c. AC side requirements

- i. Wiring types: All wire that is to be used in each solar system shall be copper., THWN-2, or XHHW-2 90°C, wet-rated conductors. All wiring connections shall be accessible to service personnel.
- ii. Conduits and raceways above ground: Conduits and raceways color shall match that of exterior or interior of the building. Above ground exterior conduit shall be RMC. Interior conduit shall be IMC, or RMC. Liquidtight Flexible Metal Conduit (LFMC) may be used for connection to equipment where flexibility is required and in accordance with CEC 350.10(1). All above ground outdoor conduits in traffic areas shall be protected from impact damage by the installation of protective bollards.
- xx. Conduits and raceways below ground: All underground conduits shall be Schedule 40 PVC, installed 36 inches below grade, encased in red concrete with 3-inch cover all around. A traceable identifier marker tape shall be installed 12 inches above the encasement. The marker tape shall be yellow and state "Caution Electric Cable Below". Minimum depth to top of below grade conduit shall be 36-inches. All underground conduits shall be sealed at stub up locations. Sealants must be listed for such use. Coordinate layout to minimize the length of conduits runs and interference of conduit with other systems. Surface mounted conduits on structures shall be minimized and approved by the Owner. Perform underground utility surveys prior to finalizing the routing for underground conduits. Stay clear from existing pipes or other obstructions in the vicinity.
- xxi. Conduit sealing requirements: For roof-top installations, seal all roof penetrations with weather tight UV resistant compounds that are compatible and specified for the type of roofing system involved. For all underground conduits, inside of conduits at the point of exit from the ground shall be sealed to prevent potential migration of methane (as in landfill) into a building. Conduit seals shall be installed as required by CEC 500 in all areas known or identified by the Owner to be hazardous or contaminated with explosive gasses, vapors, or liquids.
- iii. Isolation transformers integrated with inverters: The inverters shall be interconnected to the grid by the use of a dry type, isolation transformer that provides both impedance and fault protection, and redundant protection against DC current injection to the Grid. The isolation transformer must provide the appropriate AC output power and voltage at the meter and be listed for outdoor use. The combined unit shall have a

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minimum rating of 95% efficiency including isolation transformers as listed on the CEC website.

- iv. Sub panels: The PV AC subpanel rating shall meet 690.64(B) requirements. Where located outdoors, subpanel enclosure shall be NEMA 3R.
- v. Switchboards: Where a new switchboard is provided, the switchboard shall be designed, manufactured and tested according to the latest applicable version of the following standards CEC, ANSI/NFPA 70, NEMA PB2, UL 891. Construction shall be NEMA 1 indoor, or NEMA 3R outdoor. Where an existing switchboard will be used to interconnect a PV system, only original manufacturer's components shall be used to match existing. The Contractor shall submit all proposed modifications to existing equipment to the City of Huntington Beach Building and Safety Department for approval. The Contractor shall retain and pay the expense for a City of Huntington Beach approved Third Party Field Evaluation Laboratory to inspect and test the modifications to the switchboard for compliance with the UL Standards and final City approval.
- vi. AC Disconnects: All AC disconnects shall be rated to interrupt the necessary voltage and load current as well as the available short circuit current for the application and be listed by a nationally recognized testing laboratory. Where located outdoors disconnects shall be NEMA 3R.
- vii. AC Meters: Project shall install a utility grade power meter with an Internet web-based remote monitoring system as part of the Solar Electric Generating System. This system shall provide utility grade accuracy and reliable data relative to the solar electric systems performance locally from the inverter with hard-wired connections and then transmit this data via the Internet to a centralized database for viewing on a designated Internet web-site. System Monitoring components shall be located within the Inverter cabinet. Each power meter shall have an Ethernet connection and be individually addressable for remote I/O applications. Contractor scope shall include the installation of communications raceways, cable and terminations complete from the nearest telecommunications closet or room to the switchboard and inverter meter locations included in this project. Coordinate the location of the telecommunications interconnection point with the Owner.
- viii. Breakers: The Proposer shall provide the appropriate size, make, and model circuit breaker for the specified AC interconnection switchgear. Breakers shall be properly rated for the application. For 480V/277V circuits, provide ground fault trip function on all feeder breakers that are installed at the customer service switchgear location or distribution switchboard that includes the PV equipment interconnection to the customer power system.

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- ix. Fuses: Provide and install only fast acting, semiconductor type, current-limiting fuses designed in compliance with NEC Article 690 for all PV system equipment circuits. Fuses rated 20 amperes and less shall be provided with “finger safe” fuse holders
- x. Grounding AC side: All grounding must be CEC compliant. An inverter grounding system shall be designed and installed for the solar system. The grounding system shall include a ground ring and bonding of equipment to provide personnel protection for step and touch potential in accordance with IEEE standard 80 (Safety in AC Substation Grounding). The system shall also be adequate for detection and clearing of ground faults.

### d. Utility interconnection

- i. The PV generation system shall not be interconnected with the Utility's distribution facilities until written authorization from the Utility Company has been obtained and all interconnection requirements are satisfied. Developer shall assist owner in preparation of the Edison rule 21 interconnection application and the Developer shall provide all design submittals and information required by SCE for review and approval.
- ii. Comply with CEC codes Section 690.64 regarding Point of Connection. Supply side connection of the PV output ahead of the customer main breaker shall comply with Article 230.82(6). Load side connection shall comply with provisions 690.64 (B) (1) and 690.64 (B) (2) and could require replacement of the existing switchboard that may not have sufficient ampacity to accommodate the added ampacity from the PV system.
- iii. Meters: Shall be easily accessible to City and Utility personnel for inspection. Meters shall be utility accuracy grade and record the PV project's AC output as measured on the AC side of the PV project's isolation transformer. Meter shall be separate from the utility billing meter, customer owned, and shall not interfere with utility billing or net-metering. Meters shall be a standard utility “revenue grade” meter that conforms to applicable American National Standards Institute (ANSI) C-12 standards and shall be installed on the AC output side of the PV projects inverter or isolation transformer; and shall have a visible display of cumulative energy produced by the PV project and be available for Periodic meter reading, testing and/or re-calibration. All instrument transformers including current and potential transformers shall be metering accuracy type. Three (3) current transformers, one per phase and three-phase, 4-wire potential connections shall be provided for each meter.

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A Net Metering System used by a Customer-generator must meet all applicable safety and power quality standards established by:

- (a) The California Electrical Code (CEC);
- (b) Underwriters Laboratories Inc. (UL); and
- (c) The Institute of Electrical and Electronic Engineers (IEEE).

- e. **Exterior Lighting:** LED bi-level lighting shall be provided under the parking carport structures as replacement to existing tall light poles. The bi-level lighting shall be based on occupancy detection. Selected LED bi-level lighting fixture shall be eligible for Utility rebates or incentives and shall be designed to provide IES standard illumination levels in the parking areas. Developer shall provide foot-candle distribution curves for the lighting level based on final spacing used in the design. Spacing shall be arranged to maximize uniformity in lighting level under the carports. Lighting levels shall comply with IES standards.
- f. **Inverter Enclosure Lighting:** Inverter enclosures: Lighting level in inverter enclosures may be provided using surface mounted LED fixtures or T8 lamp fixtures. Illumination level shall match that required by IES for electrical rooms.
- g. **Submittal requirements during detailed design:** Provide design and engineering drawings and documents for the City of Huntington Beach review prior to obtaining construction permits. The design package is to be submitted for City review at the 80% CD stage of completion and shall include the following:
  - Design standards and codes incorporated in the design, fabrication, supply and installation. Include local zoning, ordinances and codes applicable to this location.
  - Design calculations for equipment sizing, including short circuit and load calculations
  - Wire sizing calculations
  - Voltage drop calculations
  - Layout of the installation site.
  - Single line of the electrical interconnection
  - List of major equipment and schedules
  - List of fuses and spares
  - Routing of conduits and clearances from known interferences (underground piping)
  - Layout of the major equipment
  - Exterior fixture layout, and lighting foot candle contours
  - Remote disconnect design and location of the push-button for remote disconnect functionality
  - Coordination Study and Short Circuit Study

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- Arc Flash Study – Contractor shall perform an Arc Flash Study and provide Arc Flash labels for all equipment installed or modified for this project as required by CEC 110.16.

### 4. Fire Protection

- a. Codes and standards: The contractor shall adhere to all fire codes and standards as described by the City of Huntington Beach fire codes and the Office of State Fire Marshal.

<http://www.huntingtonbeachca.gov/government/departments/fire/>  
<http://osfm.fire.ca.gov>

- b. Fire extinguishers: The City Fire Department has determined that it is not necessary to include as part of this project fire extinguishers at each location as shown in the concept design documents.
- c. The City Fire Department expects at least a 30-minute rated fire barrier between the PV panels and the cars parked underneath the PV system in carport applications. There is flexibility in the choice of materials used to provide the required barrier so long as the same can be attached securely to the structure, and does not compromise the overall integrity of the installation including maintenance and operation. Fire Department to review any and all specifications brought forward by bidders for approval at or before plan check. Darin Maresh is available at 714-536-5531 to discuss this expectation. The incremental costs associated with this expectation shall be clearly quantified.
- d. Remote disconnect activation: Design shall allow firemen to remotely disconnect all the DC sources at the combiner level by a single push-button located in the inverter room. Where a site has multiple inverter locations, each inverter room shall be provided with its corresponding push-button to remotely disconnect all the associated combiners feeding the inverter.
- e. Access to Inverter enclosures and AC disconnects: Inverter enclosures and AC disconnects shall be secured within the inverter room or inverter enclosure. A common key shall be provided for all inverter rooms and enclosures for exclusive use by fire personnel.
- f. Signage: Adequate signage shall be provided on all photovoltaic equipment in accordance to the National Electric Code and National Fire Code. Size, color and content of signage shall be subject to approval of the City of Huntington Beach fire department.
- g. Roof level fusible skylights: For roof mount PV installations, array layout shall include cut outs for future installation of fusible skylights. There shall be a minimum of four feet clearance around all edges of the fusible skylight. The

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- fusible skylights could be approximately 4 ft. by 4 ft. in size and the number of such skylight cut outs shall be subject to review and approval by the City fire department.
- h. Excavation for conduits: An adequate underground utility survey shall be conducted prior to any excavation work. A minimum of 8 ft. clearance shall be maintained around all known fire related water piping system and hydrants.
  - i. During the detailed design phase, Developer shall arrange to have at least two meetings with the City fire department for each site to review all design elements related to fire protection and ensure that the overall design meets the City's fire related code requirements.

### 6. Security and Surveillance

- a. Inverter enclosures: Inverter enclosures shall be kept under lock and key at all times with signage as required by code. Surveillance cameras shall be mounted at each inverter enclosure to monitor and record conditions and all entrance doors and vicinity. The capacity and format of the recording medium as well as the type and number of display screens for real time display of observed data shall be subject to City of Huntington Beach Police Department review and approval.
- b. PV arrays: For Projects at the Civic Center site, Library and the Murdy Community Center, Surveillance cameras shall be mounted strategically under each parking bay to provide clear and unobstructed view of the entire area under each parking bay. The number of cameras and spacing between the cameras is a function of the camera's range of coverage. Cameras shall be designed to work with level of lighting of approximately 0.2 Foot Candles. The capacity and format of the recording medium as well as the type and number of display screens for real time display of observed data shall be subject to City of Huntington Beach Police Department review and approval.
- c. Signage of parking bays viewable from police helicopter: Each parking bay shall have a sky facing signage as shown in concept design documents. Each bay shall be uniquely labeled using an alphanumeric sequence within a given site. All signage will be installed with a consistent orientation at either end of each parking bay to enable convenient identification of the parking bay from a police helicopter flying a few hundred feet above ground.

## **6. STRUCTURAL**

### **a. Summary Description**

The Developer is required to provide a complete structural system that meets all the requirements of the Bridging Documents. The Developer shall be responsible for all the structural engineering construction documents, structural calculations, and coordination with other project disciplines. The Developer shall be responsible for obtaining approvals from all interested review agencies included the City of Huntington Beach Building Department.

### **b. Codes and Standards**

The following applicable codes and standards referenced therein shall apply to the structural design of all project structural systems.

- CBC 2007 - 2007 California Building Code and City Amendments
- ASCE 7-05 - Minimum Design Loads for Building and Other Structures
- ACI 318-05 - Building Code Requirements for Structural Concrete
- ACI 530-05 - Building Code Requirements for Masonry Concrete
- ACI 355.2-05 - Building Code Requirements for Structural Concrete
- AISC 360-05 - Specification for Structural Steel Buildings
- AISC 341-05 - Seismic Provisions for Structural Steel Buildings
- AISC 358-05 - Pre-qualified Connection for Special and intermediate Steel Moment Frames for Seismic Applications
- AWS D1.1-04 - Structural Welding Code - Steel
- AWS D1.4-98 - Structural Welding Code - Reinforcing Steel
- AWS D1.3-98 - Structural Welding Code – Sheet Steel
- RCSC Bolting - Specification for Structural Joints Using ASTM A325 or A490 Bolts, 2004
- AISI/COS/NASPEC 2001 - North American Specification for the Design of Cold-formed Steel Structural Members

### **c. Structural Design Criteria**

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- Wind
  - i. The allowed wind analysis procedure shall be Method 2 – Analytical Procedure or Method 3 – Wind Tunnel Procedure in accordance with ASCE 7-05 Chapter 6.
  - ii. Consider special wind regions in accordance with ASCE 7-05 Section 6.5.4.1.
  - iii. The wind exposure shall be determined in accordance with ASCE 7-05 Section 6.5.6.3. The minimum design wind exposure shall be Exposure ‘C’.
  - iv. The minimum wind design load shall be in accordance with ASCE 7-05 Section 6.1.4.
  
- Seismic
  - i. Seismic design criteria and analysis procedures shall be in accordance with ASCE 7-05 Chapters 11, 12, 13 and 15.
  - ii. For existing building photovoltaic system installations, the requirements of CBC 2007 Chapter 34 shall be applicable.
  - iii. Photovoltaic panels shall be anchored to the supporting structural system in accordance with CBC 2007 Section 1613, and ASCE Standard 7-05 Chapter 13.
  
- Roof Live Loads on Panels
  - i. The minimum live load applied on the photovoltaic panels shall be 10 pounds per square foot.
  - ii. The minimum live load on all other areas and members not covered with the photovoltaic panels shall be 20 pounds per square foot.
  
- Foundation
  - i. The Developer shall be responsible for obtaining a current geotechnical investigation report for each installation site.
  - ii. Consider in the design of footings, piles, piers, pile caps and connecting grade beams deformation (displacement) of supporting soils.
  
- Thermal Effects
  - i. Consider in the design of all structural elements thermal effects. The minimum design temperature delta shall be 70 degrees Fahrenheit.
  
- Corrosion Protection

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- i. All structural steel member, connectors, and fasteners shall be hot dipped galvanized or stainless steel.
  - ii. Galvanic corrosion or dissimilar metal corrosion shall be considered in the design.
- Fasteners
    - a. Fasteners subject to hydrogen embrittlement and brittle failure shall not be used.

### d. Photovoltaic Structural Systems

- Photovoltaic Panel Module System on Roof Frame Racks
  - i. The roof frame racks shall be designed and constructed to meet the requirements of the Codes and Standards section.
  - ii. Roof frame racks shall be structural steel construction, and shall be positively anchored to the existing roof structural system.
  - iii. Roof frame rack design shall consider the existing building roof construction, structural capacity, and other limitations.
  - iv. Aluminum frame roof rack construction in lieu of the structural steel frame roof rack construction is structurally acceptable.
- Photovoltaic Panel Module System on Parking Lot Frames
  - i. The parking lot photovoltaic system shall be designed and constructed to meet the requirements of the Codes and Standards section.
  - ii. The parking lot photovoltaic system support structure shall be structural steel construction.

### e. Photovoltaic Systems

- Thin Film System
  - i. Adhered photovoltaic panels shall have test and analysis data and quality control and assurance program demonstrating an equivalent level of safety as positive mechanical anchorage systems.
  - ii. Adhered photovoltaic panels adhesive shall be compatible with the existing roofing system.
- Panel Module System
  - i. The panels shall be designed and constructed to meet the requirements of the Codes and Standards section.

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- ii. The panels shall be positively anchored to the supporting structure. Friction type restraints are not allowed to resist wind and seismic forces.
- Ballast Panel Systems are not allowed.

### **f. Photovoltaic Balance of System (BOS) Equipment**

- All equipment
  - i. The BOS equipment shall be designed and constructed to meet the requirements of the Codes and Standards section.
  - ii. The BOS equipment shall be positively anchored to the supporting structures and foundations.

### **g. Photovoltaic Equipment Enclosure Structures**

- Chain-link Equipment Enclosure Structure
  - i. Chain-link structure enclosure shall be enclosed on all sides and top.
  - ii. Chain-link fabric shall be helically wound and woven with a 1-inch vinyl coated diamond mesh.
  - iii. Chain-link enclosure top shall be design for a minimum Live Load similar to building flat roofs.
- Masonry Enclosure Structure
  - i. Masonry enclosure walls shall be constructed of 8-inch minimum solid grouted reinforced concrete masonry units.
  - ii. The roof of the enclosure shall be constructed of 20 gage 1 ½ deep minimum metal deck construction supported by structural steel framing.

### **h. Submittal Requirements for each Project Site**

- i. Complete structural calculations.
- ii. Complete structural specifications.
- iii. Complete structural drawings.
- iv. Geotechnical investigation report.
- v. Construction documents shall be stamped and signed by the California licensed design professional.
- vi. Concrete mix designs.

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- vii. Reinforcing steel mill certification and shop drawings.
  - viii. Structural steel mill certification and shop drawings
  - ix. Anchor bolt certifications and shop drawings.
  - x. Product evaluation reports by International Code Council (I.C.C.).
- i. Quality Assurance**
- i. Testing and Inspection requirements/program.
  - ii. Structural observation requirements/program.
  - iii. Structural steel fabrication shop shall be City of Los Angeles or I.C.C. certified.
  - iv. Structural steel welder shall be City of Los Angeles or I.C.C. certified.
- 7. Civil**
- a. Type of asphalt and finish required in parking areas: Contractor shall repair or patch asphalt pavement, concrete pavement, curbs and gutters as needed. All repair and finish shall meet City standards of materials and construction as approved by Department of Public Works.
  - b. Performance Grades for asphalt shall be selected based City Public Works guidelines.
    - Prime Coat: Grade SC-70 liquid asphalt
    - Tack Coat: Emulsified asphalt grade SS-1h
    - Asphalt Paint: Conform to ASTM D41 or D43
    - Slurry Seal: Emulsified asphalt grade [SS-1h] [CSS-1h] and aggregate
    - Fog Seal: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.
  - c. Excavation for conduits and back fill after a trench is finished:
    - 1. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
    - 2. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches in any

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- dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
3. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
  4. Bedding Material: Shall be base materials with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve; or clean sand classified in accordance with ASTM D 2487.
  5. Excavation: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape sub-grade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.
    - i. For pipes or conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed sub-grade.
    - ii. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
  6. Backfilling: Backfilling of exterior utility trenches shall not be undertaken until Developer retained geotechnical engineer has received 24-hours notice, until required tests and inspections have been completed, and until as-built location notes have been furnished. Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Avoid damaging pipes and protective pipe coatings.
    - i. Place backfill material in accordance with code and achieve at least 90% of the maximum density. The top 12 inches of backfill in the building or paved areas shall be compacted to 95% of maximum density.
  7. Compaction by ponding or flooding will not be permitted. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  8. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18 inches of footings. Place concrete to level of bottom of footings.
  9. Provide 4-inch-thick concrete base slab support for piping or conduit with less than 2'-6" of cover below finish surface of roadways. After installation and

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- testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway base.
10. Place and compact initial backfill of satisfactory soil material or aggregate base material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit.
  11. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system. Coordinate backfilling with utilities testing.
  12. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed. Place and compact final backfill of satisfactory soil material to final sub-grade.
  13. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below sub-grade under pavements and slabs.
- d. Samples to be taken for any geo technical studies: The Developer shall provide a geotechnical investigation as an integral part of the design where existing studies are deemed inadequate or not available. City shall provide all readily available reports for the Developer's review during project design phase. The Developer shall evaluate subsurface conditions which will influence bearing capacities, expansiveness, and settlement potential. The level of effort involved shall be sufficient to ascertain significant over-excavation, backfill compaction, corrosion protection, seismic, and other special requirements, and provide design criteria for recommended for the project design. The awarded Contractor shall provide a soils report to the City for the project describing test methods, results, and conclusions.

Developer shall employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.

- e. Any concrete mix for pavements or walkways they need to construct;
1. Concrete Standards: Comply with provisions of the following standards, except where more stringent requirements are indicated.
    - American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
    - ACI 318, "Building Code Requirements for Reinforced Concrete."
    - Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
  2. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

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3. Concrete Testing Service: Engage a qualified independent testing agency to perform materials evaluation tests and to design concrete mixes.

4. Concrete Mix: Prepare design mixes for each type and strength of normal-weight concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use a qualified independent testing agency for preparing and reporting proposed mix designs. Do not use the Owner's field quality-control testing agency as the independent testing agency. Prepare mixes for integral colored concrete in accordance with color pigment manufacturer's instructions.

- Maximum Pigment Dosage Rate: 10 percent of the weight of cement.
- Use the same aggregate, brand and type of cement for all integral colored concrete.

5. Proportion mixes according to ACI 211.1 and ACI 301 to provide normal-weight concrete with the following properties:

- Compressive Strength (28-Day): 4000 psi.
- Compressive Strength (28-Day): 3500 psi.
- Compressive Strength (28-Day): 3000 psi.
- Minimum cement content: shall be 5-1/4 sacks per cubic yard.
- Maximum concrete slump: shall be 3 inches, plus or minus 1/2 inch, for all walks; and 4 inches, plus or minus 1 inch for all other Portland cement concrete paving, except for integral colored concrete paving maintain a slump of 3 inches.
- Water/Cement Ratio: shall be less than or equal to 0.5.
- Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.

f. Any parking lot restripes required after installation;

1. Material List: Provide an inclusive list of required coating materials, including primers and other surface preparation materials. Indicate each material and cross-reference specific coating and application. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

3. Source Limitations: Obtain each type of pavement marking material from one source and by a single manufacturer.

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4. Installer Qualifications: Engage an experienced installer who has completed pavement marking similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance of at least 5 years.

5. Pre-Application Field Testing: Prepare a sample marking of each different paint formulation on asphalt substrates for the purpose of establishing quality of application, adherence of paint to the substrate, compatibility of the paint with the asphalt, and to determine whether a primer will be necessary if not otherwise required by the manufacturer.

### 6. Pavement Marking Material

- i. Pavement-Marking Paint: Lead free latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952, and suitable for use on both hot-mix asphalt and portland cement concrete paving. Provide material having a volatile organic compound (VOC) content of 250 g/L, or less.
  - ii. Colors:
    - White (for all parking stalls other than disabled access parking, for traffic and lane marking, and for painted text).
    - Yellow, where indicated.
    - Red (for "No Parking" areas as shown).
    - Blue (for pavement markings identifying disabled access parking).
  - iii. Gloss: Flat or eggshell with gloss at 30 percent or less when measured at a 60-degree meter.
  - iv. Primer: Type recommended by the marking paint manufacturer.
  - v. Surface Cleaning Material: Cleaning agent or agents suitable for removing grease, oil, and other contaminants that will not damage asphalt or portland cement concrete paving and are acceptable to pavement marking paint manufacturer.
- g. Any retaining wall to be provided

Retaining walls shall be designed to resist the lateral pressure of the retained material determined in accordance with accepted engineering principles. The soil characteristics and design criteria necessary for such a determination shall be obtained through investigation, subsurface exploration, analyses and report by a soils engineer, subject to the City's approval.

- h. Any wall/enclosure foundation requirement

The foundation for any wall/enclosure shall be designed by a registered engineer and in accordance with the guidance of the manufacturer. The concrete for the foundation

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shall have a minimum compressive strength of 4,000 psi and may be precast or cast onsite. Concrete strength and consistency shall be in accordance with the code and manufacturer's established guidelines.

i. Work related to sports complex

This site is constructed over an old and abandoned landfill and will require extra measures including (a) deeper (40 ft.) foundation or column supports, (b) preservation of methane barrier, and (c) compliance with Orange County Sanitation District that governs the construction of any improvements on existing landfills, and (d) removal of a large number of light poles to accommodate the solar car ports. Selected Developer shall be provided all readily available documentation during the design and construction phase to enable proceeding with 100% design documents.

### **8. Landscape**

- a. General Requirements: The City requires minimizing any adverse impact on the City's landscape resulting from the installation of the PV system. The concept design has been carefully formulated to minimize the number of trees that need to be trimmed and the number of trees that may need to be removed. Under the proposed concept design, PV systems are intentionally not installed under tall and mature trees to avoid poor performance resulting from extensive shadows. Likewise, as far as possible, concept design minimizes encroaching upon landscaped areas. Where it is inevitable to locate inverter equipment in landscaped areas, the inverter enclosure is designed to blend harmoniously with the existing landscape. Planters and shrubs/creepers are to be provided around the enclosure to minimize any adverse visual impact resulting from new construction.
- b. Tree trimming limits: The conditional approvals which are part of the City's Entitled documents state the requirements and bounds for tree trimming. Where a tree can not be trimmed in conformance with the Conditional Approval requirements, they shall be replaced based on a 2:1 City Policy (i.e., two new trees for every tree removed. See item c below.).
- c. Tree removal and replacement: The City landscape ordinances require that for every tree that is permanently removed from a given location, the project has to provide two new trees as replacement at a different location. Developer shall identify possible types and location of new trees in consultation with the City Public Works during the final design phase.
- d. Restoration of landscape: During the construction activities, no material shall be temporarily placed on existing landscape. Should any part of the landscape be damaged during construction activities, Developer shall be responsible for restoration of all landscape to its original condition.

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- e. Irrigation: For any new landscape or trees provided, Developer shall provide new or extend existing irrigation systems as required to irrigate the new systems. Any damage to existing irrigation systems during construction activities shall be promptly repaired by the Developer.
- f. Submittal requirements during detailed design:
  - Site plan showing trees to be trimmed
  - Site plan showing trees to be remove and replaced
  - Specific species of trees being removed and replaced
  - Documented recommendations from certified tree arborist
  - Design of new or extended irrigation systems

### 9. Construction Time Coordination

- a. Site Preparation: Developer shall conduct a thorough investigation of each site in order to plan storage requirements for new materials, storage space for construction debris, site access and security requirements, and construction phasing requirements. Developer shall meet with the City officials as required to ensure that all site-specific material delivery, storage, and construction phasing approaches are reviewed and approved prior to any construction activity on site.
- b. Overall Project Phasing Plan: The CEQA process requires that overall dust and air emissions during the construction phase be minimized. Developer shall limit heavy concurrent and simultaneous construction activities (such as excavation, trenching, diesel powered fork lift and crane related material handling) to a maximum of 3-sites at a time.
- c. No Outages Allowed: Developer shall conduct construction activities such that the City does not experience any outage of its basic utilities or oil production operations at any time. Should an outage be absolutely essential during an electrical interconnection, it shall be carefully planned for weekends and holidays only with a minimum written notice of 14-days to the City indicating reason for requested outage, duration of outage and emergency contact who is available to the City during the requested outage period. City may direct modifications to the proposed outage plan based on the activities currently planned at the City facilities.
- d. Material Delivery Responsibility: Developer shall coordinate all material deliveries on site. City shall not be responsible for coordinating or providing labor and equipment related to material deliveries.
- e. Material Storage: Developer shall provide a detailed material storage plan for City's approval prior to receiving any material or storing any material on site. All new material shall be neatly stored in secure 25 Cubic yard (or other capacity approved by the City) lockable storage bins. Large material that will not fit within

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- a lockable storage bin (e.g., structural steel) will be stored on wooden pallets that are neatly secured in a fenced area to be constructed by the Developer. All debris resulting from construction activity shall be stored in disposal bins that are hauled away from site on a daily basis. In no event shall the Developer let debris sit at a site for more than 3-calendar days. Location of debris disposal bins shall also be pre-approved by the City. All storage bins, including those used for disposal of debris shall be stored in areas that will not adversely impact traffic, safety and normal operation of the City's premises.
- f. **Site Survey and Investigations:** Developer shall arrange underground utility surveys as required at each site prior to any excavation. A minimum of 4 ft. clearance shall be maintained between any new pipes and conduits and existing utilities. Developer shall also arrange to have geo-technical investigations as required to confirm structural design assumptions and make necessary changes to the design as required.
  - g. **Restoration of Premises:** Developer shall make best efforts to avoid damages to existing City facilities and infrastructure including parking spaces, roadways, and landscaping. Any damage to these systems shall be promptly reported and areas restored to the original condition as soon as possible.
  - h. **Lighting and Security for temporary storage areas:** Developer shall provide all required lighting and security systems required for any temporary storage areas that are constructed. City shall not be responsible for providing any of these services.
  - i. **Temporary Power & Water:** All temporary power and water services that may be needed for construction activities may be requested. Developer shall submit estimated monthly quantities of water and electricity that may be required at each Facility. City may provide such services so long as (a) Developer reimburses the City for any costs incurred, and (b) Developer assumes sole responsibility for providing all required metering and labor services required for any temporary utility.
  - j. **Parking for Construction team:** Developer shall provide an estimate of the number of parking spaces required by the Construction crew during project construction. City cannot guarantee that parking spaces shall be available and any cost associated with parking outside the public parking spaces is Developer's responsibility.
  - k. **Temporary Restrooms:** Developer shall make its own arrangements for portable toilets for the construction team. The location and number of portable toilets shall be subject to City review and approval prior to commencement of construction. These shall be promptly serviced on a daily basis and removed within 3-days following completion of construction activities.

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- l. Use of Trailer for Office Space: The City does not have any space available in existing sites for the location of a construction trailer. Developer shall make off site arrangements for locating any office trailer.
- m. Signage: All signage, including design, content, location, and mounting details proposed to be used by the Developer during construction and operation of the project shall be subject to City review and approval. Signage larger than 24" x 36" may not be permitted. Multiple signage at any given site may not be permitted.
- n. Construction Contact: Developer shall provide a job-site contact for every site during the construction phase. This individual will have knowledge of site material and workflow logistics at each site and shall be available for any questions by cell phone and email.
- o. Availability of Project Site Foreman during Construction: Developer shall ensure that during the construction phase, the City has 24x7 access to the project site foreman in case of an emergency. Developer shall provide a daytime contact cell phone contact as well as a nights and weekend cell phone contact for the Site foreman who may be reached by the City Project Manager, City Police Department or the City Fire Department.
- p. Job site emergencies: Developer shall thoroughly familiarize itself with the location and address of local hospitals and medical care facilities should there be a medical emergency on site at any time. All emergency situations shall be logged and job safety records shall be available for inspection by the City and public entities as required.
- q. Construction Phasing: Since much of the PV installation work is in parking lots in operating facilities, Developer shall follow a phasing plan to ensure that at any time, at least 75% of the parking lot bays are safely usable by the City employees and visitors. Until construction is complete in a given parking bay (i.e., structure installed, PV panels installed, electrical systems installed, lighting and fire protection installed, security systems installed, signage installed, and all structural and electrical components are finish painted and labeled, electrical system (DC side tested) the affected parking bay(s) will remain closed for parking.
- r. Safety during System electrical testing: Developer shall follow prudent safety practices during inverter and electrical system connection to the grid and system energization. As necessary, affected areas in both parking lots and inverter enclosure areas shall be taped off and isolated with warning signs and yellow tapes.
- s. City's Rights to Project Inspection: The City reserves the right to review and inspect ongoing construction activities at any time during construction. The inspection shall be generally conducted to ensure that the project meets the terms

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of this RFP and any subsequent agreement that may be executed between the City and the Developer. City may take exceptions to the activities and all such exceptions and comments shall be conveyed to the Project Site Foreman appointed by the Developer. The Developer shall make reasonable attempts to resolve the issues expeditiously.

- t. City's Punch List: City shall provide a punch list of items to be completed related to the PV installation at a give site. Punch list could include items that the Developer needs to promptly correct related to the project construction. The PV System shall be deemed incomplete until the punch list issued by the City is fully resolved.
- u. As-Built Documentation: The Developer shall provide a copy of the Final As-Built documentation and Operating and Maintenance Manual for the City's reference during operation of the project. Since the projects are constructed on City premises and closely interface with City's existing infrastructure, City will need access to the plans as soon as they are available.

**10. City's Entitlement Process**

The following matrix presents the solar development sites included in this RFP, the associated zoning and the processing procedure. Any new design or design that is materially different from what has been previously approved by the City has to be reprocessed through the Entitlement process summarized below. Submittals shall generally include updated design documents and material pallets.

Currently, processing is underway for each of the sites included in this RFP. It is expected that processing will be complete by August based on the concept design documents presented in this RFP. Any change in design resulting from the City's review through the entitlement process will be issued as an Addendum to the bidders/selected Developer prior to project detailed design and construction.

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Summary of Entitlement Process by Site  
(Phase-1 sites; entitlement in process, to be complete by mid August, 2010)

Estimated combined PV Capacity (STC DC): 2 MW +

Site #	Description	Zoning Designation	Installation Type	Processing Procedure
Site 1: 2000 Main Street	The Huntington Beach Civic Center and Police Facility	PS (Public-Semi-Public)	Carports covering existing parking lots, police building and jail rooftop	DRB (HBZSO Ch. 244)
Site 2: 7111 Talbert	The Huntington Beach Central Library	OS-PR (Open Space-Public Recreation)	Carports in existing parking lots	CUP by the Zoning Administrator (ZA) (HBZSO Chapter 213.06) and DRB (HBZSO Ch. 244)
Site 4: 17371 Gothard Street	The Huntington Beach City Yard	PS-FP2 (Public- Semi-Public-Flood Zone A)	Carports covering existing parking lot and existing rooftop	Design Review Board (DRB -HBSZO Chapter 244)
Site 5: 14627 Springdale	Peck and Springdale Reservoirs	IL (Industrial Light) and SP11 (McDonnell Centre Specific Plan)	On existing reservoir rooftop	IL Permitted, DRB (HBZSO Ch. 244). SP11 requires Site Plan Review
Site 6: 6401 Overlook Dr.	Edwards Reservoir	SP9 (Holly-Seacliff Specific Plan) Planning Area I - Planning Unit 1-2 - Residential Low Density 1	On existing reservoir rooftop	SP9: HBZSO, Minor Utility uses permitted within R zones, DRB (HBZSO Ch. 244)
Site 7: 19001 Huntington Street	Water Yard	PS (Public-Semi-Public)	Carports covering existing parking lots and existing rooftop of facility building	DRB (HBZSO Ch. 244)

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Summary of Entitlement Process by Site  
(Phase-2 sites; Subject to Measure C – expected by November/December 2010)

Estimated combined PV Capacity (STC DC): 750 kW +/-

Site #	Description	Zoning Designation	Installation Type	Processing Procedure
Site 3: 18120 Goldenwest Street	Sports Complex,	OS-PR (Open Space- Public Recreation)	Carports covering existing parking lots,	CUP by ZA (HBZSO Ch. 213.06), DRB (HBZSO Ch. 244)
Site 8 Murdy Community Center 7000 Norma Drive	Murdy Community Center	OS-PR (Open Space- Public Recreation)	Carports in existing parking lots	CUP by ZA (HBZSO Ch. 213.06), DRB (HBZSO Ch. 244)

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### 11. Important Web Links

1. City of Huntington Beach  
<http://www.huntingtonbeachca.gov/>
2. City of Huntington Beach – Planning/Building/Construction
  - a. Planning and Construction  
<http://www.huntingtonbeachca.gov/services/planning-construction.cfm>
  - b. Planning and Building  
<http://www.huntingtonbeachca.gov/Government/Departments/planning-building/>
  - c. Permits  
[http://www.huntingtonbeachca.gov/government/departments/building\\_safety/](http://www.huntingtonbeachca.gov/government/departments/building_safety/)
  - d. Municipal Code  
[http://www.huntingtonbeachca.gov/government/elected\\_officials/city\\_clerk/municipal\\_code/](http://www.huntingtonbeachca.gov/government/elected_officials/city_clerk/municipal_code/)
  - e. Zoning Code  
[http://www.huntingtonbeachca.gov/government/elected\\_officials/city\\_clerk/zoning\\_code/](http://www.huntingtonbeachca.gov/government/elected_officials/city_clerk/zoning_code/)
  - f. Forms and Applications  
[http://www.huntingtonbeachca.gov/government/departments/building\\_safety/forms\\_bulletins](http://www.huntingtonbeachca.gov/government/departments/building_safety/forms_bulletins)
3. City of Huntington Beach – Planning/General Plan
  - a. Community Development
  - b. Infrastructure and Community Services
  - c. Natural Resources
  - d. Hazard
  - e. Maps  
<http://www.huntingtonbeachca.gov/government/departments/planning/gp/>
4. City of Huntington Beach – Public Works  
[http://www.huntingtonbeachca.gov/Government/Departments/Public\\_Works/](http://www.huntingtonbeachca.gov/Government/Departments/Public_Works/)
5. City of Huntington Beach – Police Department  
<http://www.huntingtonbeachca.gov/Government/Departments/PD/>
6. City of Huntington Beach – Fire Department  
<http://www.huntingtonbeachca.gov/Government/Departments/Fire/>
  - a. Minimum Standards for Fire Apparatus Access  
<http://www.huntingtonbeachca.gov/files/users/fire/401.pdf>
  - b. Additional Specifications  
[http://www.huntingtonbeachca.gov/government/departments/Fire/fire\\_prevention\\_code\\_enforcement/fire\\_dept\\_city\\_specifications.cfm](http://www.huntingtonbeachca.gov/government/departments/Fire/fire_prevention_code_enforcement/fire_dept_city_specifications.cfm)
7. City of Huntington Beach – Water & Sewage  
<http://www.huntingtonbeachca.gov/services/water-sewage.cfm>
8. City of Huntington Beach – Trash Waste & Recycling  
<http://www.huntingtonbeachca.gov/services/trash-waste-recycling.cfm>
9. City of Huntington Beach – Frequently Called Numbers

## City of Huntington Beach

[http://www.huntingtonbeachca.gov/Government/frequently\\_called\\_phone\\_numbers.cfm](http://www.huntingtonbeachca.gov/Government/frequently_called_phone_numbers.cfm)

10. City of Huntington Beach – Licenses, Permits & Codes

[http://www.huntingtonbeachca.gov/business/License\\_Permit\\_Codes/](http://www.huntingtonbeachca.gov/business/License_Permit_Codes/)

## **12. Operations and Maintenance Criteria**

Landscape and Trees: City shall maintain the landscape and new or replacement trees provided by the Project

Bi-level, occupancy sensing LED/Induction Lighting systems: City shall maintain the new lighting system provided under the carports. Developer is required to properly commission the system and demonstrate its functionality.

Security and Surveillance systems: City shall maintain the new security and surveillance systems provided as part of the project under carports. Developer is required to properly commission the system and demonstrate its functionality.

Remote Disconnects: Developer shall routinely inspect and maintain the devices.

Fire extinguishers: No longer required to be provided as part of the Project.

All parts of the PV system including cleanliness of PV modules, operability of disconnects, metering and inverter equipment, routine electrical safety inspections: Developer shall maintain the system

Underground electrical systems: Developer shall maintain, unless City damages the same, in which case City shall reimburse the cost of repairs.

Possible bird's nests under PV structure: Developer shall maintain

Future trimming of trees in the vicinity of installation: City shall provide these services

Painting and finish on structure and building enclosures: Developer shall maintain

Structure corrosion protection: Developer shall periodically inspect and maintain

Electrical safety inspections: Developer shall arrange for the same

General Signage: City shall maintain

PV Related signage on electrical systems: Developer shall maintain

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**City of Huntington Beach**  
**APPENDIX F – Phase 1**  
**PROJECTED COSTS FOR PV PROJECT (BASE CASE)**

	<u>NPV</u> <u>@</u> <u>6%</u>	<u>Totals</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>
<b>Base Case Assumptions</b>																						
CPI			3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
CPI index			1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	1.344	1.384	1.426	1.469	1.513	1.558	1.605	1.653	1.702	1.754
Average SCE electricity price			0.140	0.144	0.149	0.153	0.158	0.162	0.167	0.172	0.177	0.183	0.188	0.194	0.20	0.206	0.212	0.218	0.225	0.231	0.238	0.245
<b>Expected PV System Performance</b>																						
Net kWh delivered to City																						
<b>Projected Costs to City</b>																						
Electricity sales to City																						
Proposed price/kWh																						
Cost to City (price x quantity)																						
Other electricity billing costs																						
<b>Total Costs To City Per Proposal</b>																						
<b>BAU Costs for Same Quantities of Energy</b>																						
Electricity Base Case SCE price (above) Quantities delivered from PV system per above																						
<b>Total avoided BAU costs</b>																						
<b>Savings from PV system proposal</b>																						

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**City of Huntington Beach**  
**APPENDIX F – Phase 2**  
**PROJECTED COSTS FOR PV PROJECT (BASE CASE)**

	<u>NPV</u> <u>@</u> <u>6%</u>	<u>Totals</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>
<b>Base Case Assumptions</b>																						
CPI			3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
CPI index			1.000	1.030	1.061	1.093	1.126	1.159	1.194	1.230	1.267	1.305	1.344	1.384	1.426	1.469	1.513	1.558	1.605	1.653	1.702	1.754
Average SCE electricity price			0.140	0.144	0.149	0.153	0.158	0.162	0.167	0.172	0.177	0.183	0.188	0.194	0.20	0.206	0.212	0.218	0.225	0.231	0.238	0.245
<b>Expected PV System Performance</b>																						
Net kWh delivered to City																						
<b>Projected Costs to City</b>																						
Electricity sales to City																						
Proposed price/kWh																						
Cost to City (price x quantity)																						
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Electricity Base Case SCE price (above) Quantities delivered from PV system per above																						
<b>Total avoided BAU costs</b>																						
<b>Savings from PV system proposal</b>																						