# City of Palo Alto (ID # 5005)

## Architectural Review Board ARB Staff Report

**Report Type: New Business** **Meeting Date: 8/7/2014**

**Summary Title: Petra Solar Test Project**

**Title: 250 Hamilton Avenue [14PLN-00228]: Request by Omer Tzoore on behalf of the Sate of California Department of Transportation for Architectural Review of the six month long Petra Solar Test Project that includes the temporary installation of nine electricity generating solar photovoltaic modules on nine existing City light poles on El Camino Real.**

**From: Amy French**

**Lead Department: Architectural Review Board**

## RECOMMENDATION

Staff recommends the Architectural Review Board (ARB) recommend approval of the proposed six-month long solar module test project to the Director of Planning and Community Environment (Director), based upon the ARB Approval Findings in Attachment A and the Conditions of Approval in Attachment B.

## BACKGROUND

Previous Review

On April 3, 2014 the City of Palo Alto signed a project agreement with Petra Solar for an Emerging Technology Innovation and Demonstration Program project that includes the installation of nine photovoltaic systems and associated monitoring services on utility and streetlight poles in order to evaluate the merits of such systems to provide electrical energy and associated benefits on a wider scale in the City. The Emerging Technology Innovation and Demonstration Program approved by City Council was created to provide a test bed platform for individuals and companies that want to evaluate, test, and implement innovative emerging technologies, with the goal of finding and nurturing creative concepts to help customers manage their usage of electricity, gas, water, and/or fiber optics services.

Site Information

The project site consists of nine existing City street light poles along the east side of El Camino Real between Embarcadero Road and Park Boulevard. El Camino Real is a State Highway and falls under the jurisdiction of the State of California Department of Transportation (Cal Trans). Cal Trans has provided an encroachment permit to authorize the project (attachment D). The

City has a maintenance agreement with the State such that the City is responsible for the street lights in the public rights-of-way, which necessitates the City's approval of the proposed solar module installation.

Project Description

The project proposal consists of the installation of nine Petra Systems Smart Energy Modules (SEM). A SEM is a module that contains a solar photovoltaic (PV) panel that absorbs sunlight and converts it into electrical energy. The modules would be connected to micro inverters that are wired inside the street light poles that would provide power into the electric grid. The nine SEMs of the test project would be mounted upon nine City owned street light poles on El Camino Real. One SEM would be mounted on each pole. The system is composed of three components including a micro inverter, a solar module, and a mounting bracket. The modules would be mounted at least 15 feet above the sidewalk, to avoid any interference with pedestrians and the use of the sidewalk.

The nine modules would be in place for only a six month period, at which point they would be removed. During the test period, the applicant would conduct outreach to get the public's feedback on the solar installations, while at the same time the applicant would gather information on the PV systems performance. For public feedback, the applicant intends to label the poles with a brief explanation of the project and a link to additional information. They will also send notices to adjacent residents inviting them to comment on the installed units, provide website information, and provide public access to the project's portal where the clean energy generated by the modules can be viewed and monitored. The purpose of the test project is to gather feedback from the City and the community on this concept before considering a larger city wide installation. Petra Systems is interested in applying to the Council-approved Palo Alto CLEAN feed-in tariff program for a larger city-wide installation of the smart energy module. The applicant has provided a project description letter (Attachment C).

## DISCUSSION

Comprehensive Plan

The project design is in general conformance with the Comprehensive Plan and is supported by Policy N-48, which encourages the appropriate use of alternate energy technologies. This proposal provides solar power, which is an alternative and environmentally friendly means of energy production. The ARB is asked to comment on whether or not they believe the proposed solar modules are an "appropriate use" of this alternate energy technology. The visual impact to the community should be considered for this specific application and in relation to the potential for the broader implementation of this technology throughout the City.

## ENVIRONMENTAL REVIEW

Pursuant to the requirements of the California Environmental Quality Act (CEQA), the Project is categorically exempt from CEQA, per CEQA Guidelines Section 15301.

**COURTESY COPIES**

Omer Tzoore, Applicant
Cal Trans, Owner

Prepared by: Russ Reich, Senior Planner

Approved by: Amy French, Chief Planning Official, AICP

**Attachments:**

- Attachment A: ARB Findings (DOC)
- Attachment B: Conditions of Approval (DOC)
- Attachment C: Applicant's Project Description (PDF)
- Attachment D: Cal Trans Encroachment Permit (PDF)

**ATTACHMENT A**
**DRAFT FINDINGS FOR APPROVAL**
**ARCHITECTURAL REVIEW BOARD STANDARDS FOR REVIEW**
**250 Hamilton Avenue / File No. 14PLN-00228**

The design and architecture of the proposed project, as conditioned, complies with the Findings for Architectural Review as required in PAMC Chapter 18.76.

(1) *The design is consistent and compatible with applicable elements of the Palo Alto Comprehensive Plan.* This finding can be made in the affirmative in that the project complies with the policies of the Comprehensive plan as outlined in the staff report. The City supports the use of alternative technologies such as solar power.

(2) *The design is compatible with the immediate environment of the site.* This finding can be made in the affirmative in that the Petra solar modules are small and relatively innocuous. They are set high enough on the light poles that they are not likely to hinder any normal activities.

(3) *The design is appropriate to the function of the project.* This finding can be made in the affirmative in that the modules provide solar power without overwhelming the structure they are located upon.

(4) *In areas considered by the board as having a unified design character or historical character, the design is compatible with such character.* This finding is not applicable to this project in that roadway and sidewalk area does not have a unified design or historic character. It should be noted that the adjacent property, which is Palo alto High Scholl, is a Historic Category 2 property. The modules, located upon the street lights in front of the school property, would not impact the character defining features of the resource.

(5) *The design promotes harmonious transitions in scale and character in areas between different designated land uses.* This finding is not applicable to this project.

(6) *The design is compatible with approved improvements both on and off the site.* This finding can be made in the affirmative in that the project's design is intended to be small and unobtrusive so as not to conflict with existing development in the area.

(7) *The planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors and the general community*. This finding is not applicable to this project.

(8) *The amount and arrangement of open space are appropriate to the design and the function of the structures.* This finding can be made in the affirmative in that the proposal includes small solar modules that are appropriately sized relative to the existing light poles that they would be mounted upon.

(9) *Sufficient ancillary functions are provided to support the main functions of the project and the same are compatible with the project's design concept.* This finding in not applicable to this project.

(10) *Access to the property and circulation thereon are safe and convenient for pedestrians, cyclists and vehicles.* This finding can be made in the affirmative in that the proposed modules are located 15 feet or more above the sidewalk to ensure safe pedestrian and bicycle access.

(11) *Natural features are appropriately preserved and integrated with the project.* This finding can be made in the affirmative in that no trees will be impacted as a result of the installation of the modules.

(12) *The materials, textures, colors and details of construction and plant material are appropriate expression to the design and function.* This finding can be made in the affirmative in that design of the modules is consistent with the materials of the light poles.

(13) *The landscape design concept for the site, as shown by the relationship of plant masses, open space, scale, plant forms and foliage textures and colors create a desirable and functional environment.* This finding is not applicable to this project.

(14) *Plant material is suitable and adaptable to the site, capable of being properly maintained on the site, and is of a variety which would tend to be drought-resistant to reduce consumption of water in its installation and maintenance.* This finding is not applicable to this project.

(15) *The project exhibits green building and sustainable design that is energy efficient, water conserving, durable and nontoxic, with high-quality spaces and high recycled content materials. The following considerations should be included in site and building design:*

- *Optimize building orientation for heat gain, shading, daylighting, and natural ventilation;*
- *Design landscaping to create comfortable micro-climates and reduce heat island effects;*
- *Design for easy pedestrian, bicycle and transit access;*
- *Maximize on site stormwater management through landscaping and permeable paving;*
- *Use sustainable building materials;*
- *Design lighting, plumbing and equipment for efficient energy and water use;*
- *Create healthy indoor environments; and*
- *Use creativity and innovation to build more sustainable environments.*

This finding can be made in the affirmative in that the project would provide sustainable energy to the City.

(16) *The design is consistent and compatible with the purpose of architectural review as set forth in subsection 18.76.020(a).* This finding can be made in the affirmative in that the project design promotes visual environments that are of high aesthetic quality and variety.

**ATTACHMENT B**
**DRAFT CONDITIONS OF APPROVAL**
**250 Hamilton Avenue/ File No. 14PLN-00228**

## Planning Division

1. The ARB approval letter shall be printed on the plans submitted for building permit.

2. The project shall be built in substantial conformance with plans submitted and received by the City on June 24, 2014, except as modified by these conditions of approval.

3. All noise producing equipment shall not exceed the allowances specified in Section 9.10 Noise of the Palo Alto Municipal Code.

4. The solar modules shall be permitted for a period not to exceed six months, after which time the modules shall be removed by the applicant and the light poles shall be restored to their pre-project condition.

5. To the extent permitted by law, the Applicant shall indemnify and hold harmless the City, its City Council, its officers, employees and agents (the "indemnified parties") from and against any claim, action, or proceeding brought by a third party against the indemnified parties and the applicant to attack, set aside or void, any permit or approval authorized hereby for the Project, including (without limitation) reimbursing the City for its actual attorneys' fees and costs incurred in defense of the litigation. The City may, in its sole discretion, elect to defend any such action with attorneys of its own choice.

6. Construction hours shall be limited to 8:00am to 6:00pm Monday through Friday and 9:00am to 6:00pm on Saturdays. No construction is allowed on Sundays or Holidays as specified in Title 9 of the Municipal Code.

7. The applicant shall coordinate with the Public Works Engineering Department to acquire an encroachment permit (if required) for the location of the modules on the City light poles and for any work in the public right-of-way prior to building permit issuance.

## Electric Utilities Department

8. Petra Solar must submit their load calculations certified by a professional "Structural Engineering" registered in the State of California. Engineer must consider relevant parameters of street lighting pole including inclement weather conditions for ensuring that additional loading does not impact structural integrity of the poles.

9. Utilities will not permit Petra Solar to tap the power from street lighting pole unless otherwise agreed upon. Also, Petra Solar must design the system (with protective devices – fuses/breakers etc.) such that any malfunctioning or fault on their side of the equipment does

not affect or trip our street lighting circuits. Utilities will allow Petra Solar to tap the power from the nearest secondary box at the available voltage. Any additional substructure that is required to provide power to "Solar Panels" shall be installed by Petra Solar per City's standards & specifications.

10. Petra Solar will install the solar modules/panels only on the street lighting poles that have been identified during field investigation. Petra Solar shall obtain all the required permits from City/County/State prior to installation.

Attachment C

3) PROJECT DESCRIPTION

Petra Systems Inc. has applied to the Palo Alto City Council-approved Emerging Technology Innovation and Demonstration Program for a six month test of the Petra Systems Smart Energy Module (SEM) to be mounted on nine City-owned light poles. Each solar PV module will connect to a micro-inverter and then wired inside the street light pole, providing power into the electric grid including wireless communication equipment. Staff will be able to use an online portal to verify power production and data related to grid status at the point of connection.

The goal of the test is to gather information on the solar PV system performance and to solicit feedback from the City and community on the project before considering a larger installation. Petra Systems is interested in applying to the Council-approved Palo Alto CLEAN feed-in tariff program for a larger city-wide installation of the Smart Energy Module.

EXISTING AND PROPOSED USE

Currently poles are as used as the structure for street lights. The proposed test use doesn't alter the current use, it adds a smart energy module (SEM) which attaches to the pole at 15' or higher above ground level and generates electric power to the grid utilizing the pole's tube as conduit.

THE PURPOSE OF THE PROPOSED CHANGES

Petra Systems Inc. has applied to the Palo Alto City Council-approved Emerging Technology Innovation and Demonstration Program for a six month test of the Petra Solar Smart Energy Module (SEM) to be mounted on nine City-owned light poles. Petra System is interested in applying to the Council-approved Palo Alto CLEAN feed-in tariff program for a larger city-wide installation of the Smart Energy Module.

MATERIALS, COLORS, AND CONSTRUCTION METHODS TO BE USED

The system is composed from three components. The components are assembled off site to form the SEM (smart energy module) unit. The components are Petra System's microinverter, Sunpreme 60 cell frameless solar module and a mounting system. The microinverter is a 12" X 10" polished aluminum case that attaches to the back of the solar module and converts direct current electricity to alternating current. The Sunpreme module is a solar module that has no frame; instead, it has two glass panels attached together with silicon cells laminated between. The mounting system is a hardware made of aluminum that attaches the solar module and the microinverter together to the street light pole. The SEM is installed on the base (main tube) of the street light (not on the extended arm that usually the light is hanging from) and therefore it is never in the path of traffic. The SEM is installed 15ft or higher above the ground (side walk), allowing traffic clearance, although, traffic isn't expected to be directly below.

Attachment D

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

# ENCROACHMENT PERMIT

TR-0120

| | |
|---|---|
| Permit No. | 0414-6SV 0891 |
| Dist/Co/Rte/PM | 04-SCL-82 24.7/25.45 |
| Date | June 5, 2014 |
| Fee Paid | $ 656 |
| Deposit | $ |
| Performance Bond Amount (1) | |
| Payment Bond Amount (2) | |
| Bond Company | |
| Bond Number (1) | |
| Bond Number (2) | |

In compliance with (*Check one*):

☒ Your application of May 05, 2014

☐ Utility Notice No. _____ of _____

☐ Agreement No. _____ of _____

☐ R/W Contract No. _____ of _____

**TO:** Petra Systems
3551 Greer Road
Palo Alto, CA 94303

Attn: Omer Tzoore
Phone: (732) 589-4646

, **PERMITTEE**

RECEIVED
JUN 12 2014
Department of Community Planning & Environment

and subject to the following, **PERMISSION IS HEREBY GRANTED** to:

Perform a six-month test of Petra Solar Smart energy module on nine (9) City-owned Light Poles on State Highway 04-SCL-82, Post Miles 24.7 to 25.45, in Santa Clara County.

A minimum of one week prior to the start of work under this permit, notice shall be given and advance approval of construction detail, operation, public safety and traffic control shall be obtained from State Representative, Jim Wong, 500 Queens Lane, San Jose 95112, (408) 452 7131, weekdays, between 7:30 AM and 4:00 PM .

All permitted work requires the permittee to apply for and obtain a work authorization number prior to the start of work. See the attached "Encroachment Permit Project Work Scheduling Procedures" and the attached "Permit Project Work Scheduling Request Form". Additional time beyond the minimum seven day advanced notice required in the above paragraph may be required for obtaining approval.

The following attachments are also included as part of this permit (*Check applicable*):

| | | |
|---|---|---|
| ☒ Yes | ☐ No | General Provisions |
| ☒ Yes | ☐ No | Utility Maintenance Provisions |
| ☒ Yes | ☐ No | Storm Water Special Previsions |
| ☐ Yes | ☒ No | A Cal-OSHA permit required prior to beginning work: # _____ |

In addition to fee, the permittee will be billed actual costs for:

| | | |
|---|---|---|
| ☒ Yes | ☐ No | Review |
| ☒ Yes | ☐ No | Inspection |
| ☒ Yes | --------- | Field Work |

*(If any Caltrans effort expended)*

☐ Yes ☒ No The information in the environmental documentation has been reviewed and considered prior to approval of this permit.

This permit is void unless the work is completed before December 31, 2014

This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.
No project work shall be commenced until all other necessary permits and environmental clearances have been obtained.

MP
CC: Bob Salazar (2), J.Wong, MM
Dist. Traffic Manager/P. Chan
TMC/ J. Richardson

**APPROVED:**

**BIJAN SARTIPI, District Director**

**BY:**

**DAVID SALLADAY, District Permit Engineer**

NAME: Petra Systems
PERMIT#: 0414-6SV 0891

In addition to the attached General Provisions, form TR-0045 (REV. 05/07); the following Special Provisions are applicable:

The City of Palo Alto shall maintain all new Petra Solar Smart energy modules under this permit indefinitely and the cost shall be borne by the City.

The permittee must contact the State Representative for a pre-construction meeting if necessary before starting any work within the State right-of-way.

When approved, traffic control performed under this permit shall be in accordance with the appropriate State Standard Plans T-10 through T-14.Where required by the plan; the use of a flashing arrow-board is MANDATORY. Traffic control is authorized with one lane closure only, between 9:00 AM and 3:00 PM, Monday through Friday, holidays excepted. See attached Standard Plans T-10 and T-11. For shoulder closure, use Standard Plan T-10.

The site of the work shall be enclosed by suitable barricades, signs and lights, as approved by State's representative, to warn and protect traffic effectively.

All utility work must comply with the attached "Encroachment Permits Utility and Tree Trimming Special Provisions" (Rev. 03/2013) (available at http://www.dot.ca.gov/hq/traffops/developserv/permits/), which includes "Encroachment Permit General Provisions" (TR-0049, Rev. 05/2007).

When operations are conducted, the permittee must furnish, place, and maintain signs and safety equipment per Part 6, Temporary Traffic Control, of the "California Manual on Uniform Traffic Control Devices" (CA MUTCD (available at http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd2012/Part6.pdf).

All the permittee's personnel must wear appropriate and approved personal protective equipment per Chapter 12 of Caltrans "Safety Manual" (available at http://www.dot.ca.gov/hq/opo/safety/safetymanual/Chap_12-Sept2012.pdf), including hard hats and bright-colored vests, shirts or jackets with retro-reflective material, while on State right-of-way.

Caltrans is not a member of to Underground Service Alerts (USA). The Permittee shall identify all existing State facilities prior to any operation. Any damage to existing facilities, landscaping or irrigation, traffic loops within the State's Right of Way shall be replaced in kind by the permittee at permittee's expense.

All Permittee's personnel shall wear appropriate personal protective equipment, including hard hats and bright-colored vests, shirts or jackets with retro-reflective material while on State highway right-of-way.

Notwithstanding General Provision N0.4, your contractor is required to apply for and obtain an encroachment permit prior to starting work. A fee of $492.00 is required at the time of application. Permittee's contractor shall be billed for any additional inspection cost at the current Caltrans rate of $82.00 per hour.

At completion of the project, the permittee shall be responsible for removing all equipment and any trash left at the study sites.

If feasible, monuments should not be set within the traveled way. All monuments that must be set or perpetuated in paved areas, shall be constructed in accordance with Caltrans Standard Specification Section 81, 'Monuments' and Standard Plan A74, Type D, or equal with prior approval of the District Surveys Engineer.

Electrical power sharing is not allowed under this permit.

If an accident or other incident (related or not related to the permitted activity) occurs within or close to the permitted activity, the permittee must immediately stop work and remove traffic controls from the highway unless public health, welfare and safety is endangered by unfinished work. Only traffic control to protect open excavations may remain in place. After free traffic flow is restored, work per the conditions of the permit may be returned.

SURVEY WORK IS PROHIBITED ON FREEWAYS.

All survey operations shall be conducted off the traveled way except where necessary to cross pavements and medians.

**Immediately following completion of the work permitted herein, the permittee shall fill out and mail the notice of completion attached to this permit.**