

Philip Raine Safety Roadside Rest Area



Tul-99

First Caltrans LEED designed Project

What is LEED?

L EADERSHIP in
E NERGY &
E NVIRONMENTAL
D ESIGN

- A Green Building Rating System
- Developed and administered by the USGBC

LEED and Green Buildings

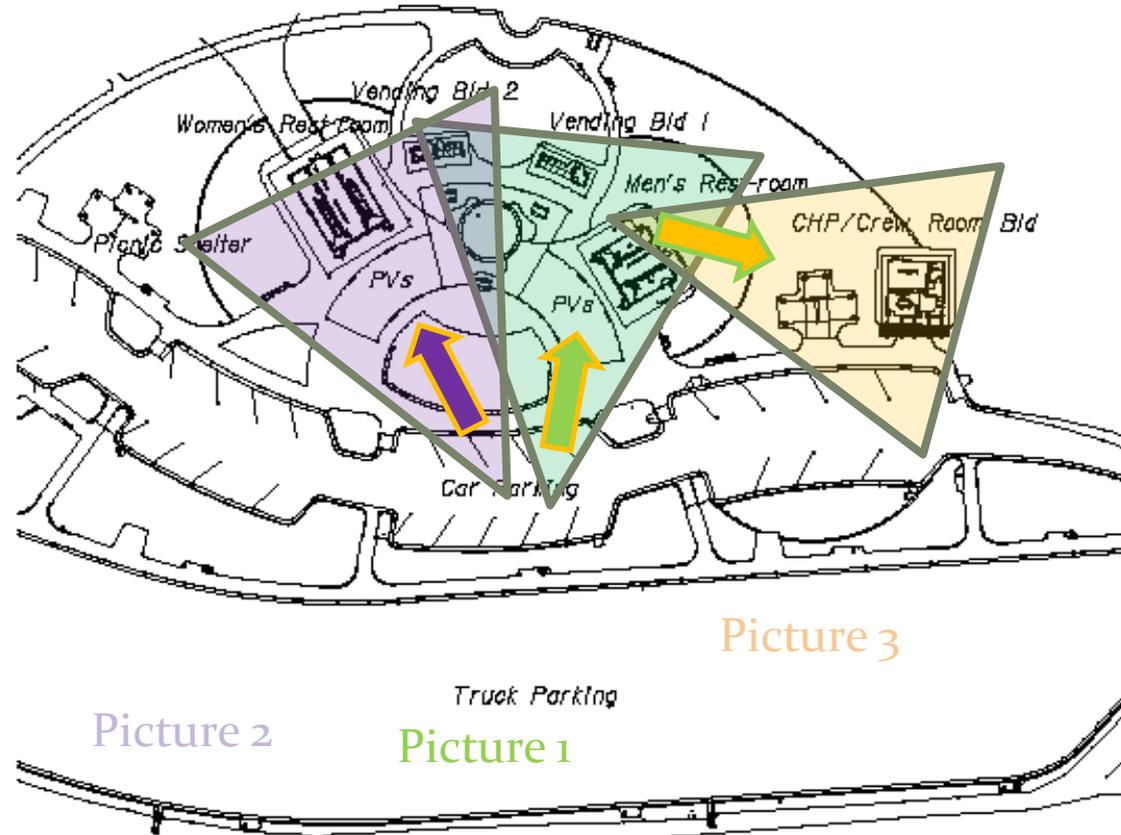
- Is a whole-building approach encouraging a collaborative design and construction process
- Four levels of LEED-NC certification:
 - Certified Level 26 - 32 points
 - Silver Level 33 - 38 points
 - Gold Level 39 - 51 points
 - Platinum Level 52+ points (69 possible)

Version 2.2 points

Sustainable push at Philip Raine?

- **Governors Executive Order S-20-04** : (2004)
 - LEED Silver design
 - Evaluate clean on-site Power
 - Increased energy efficiencies required
- Philip Raine as **"Green Stop"** of the Future
 - Local Community Promoted Design Contest
 - District liked sustainable features in Winning Entries
- **LEED added to Project report and design begins**

SB Site Plan



Entrance

Philip Raine SRRA



Men's Rest-room

Vending Blds

Philip Raine SRRA

Women's Rest-room



Philip Raine SRRA



Philip Raine SRRA

Women's Rest-room

Men's Rest-room

CHP/Crew
Building

Picnic Shelter

Vending
Buildings



Philip Raine SRRA

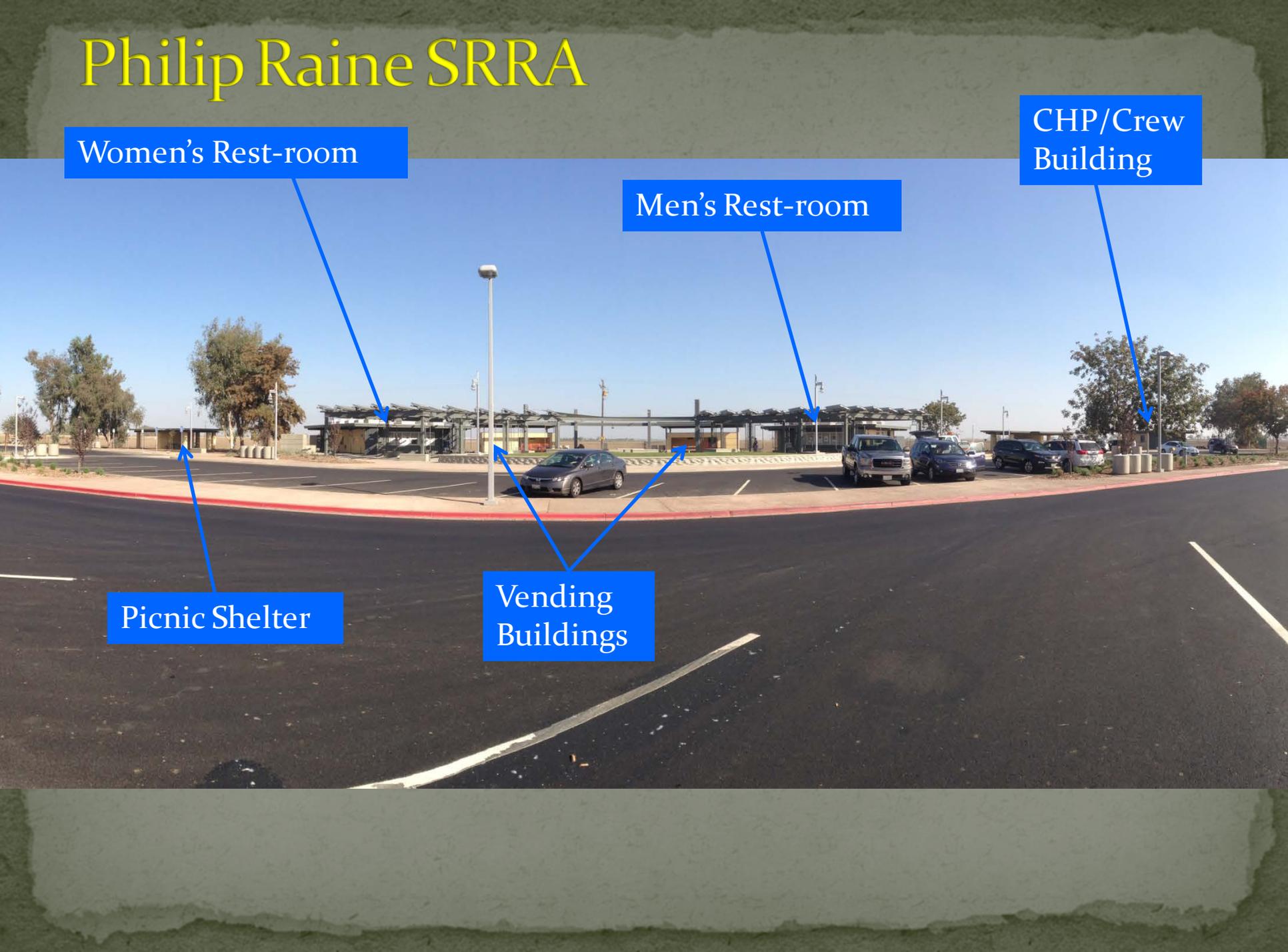
Women's Rest-room

Men's Rest-room

CHP/Crew Building

Picnic Shelter

Vending Buildings



LEED NC- Program Breakdown

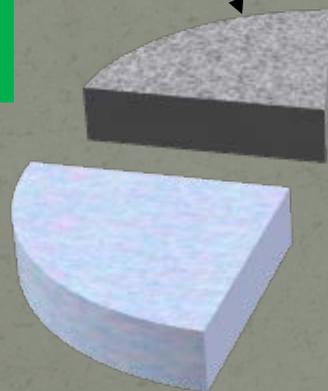
69 Points Possible (Version 2.0)

33-38 pts for Silver Rating

Materials & Resources 13 pts

Water Efficiency 5 pts

Innovation and Design 5 pts



Indoor Environmental Quality 15 pts

Sustainable Sites 14 pts

Energy & Atmosphere 17 pts

LEED Credit Checklist for PR

3	1	4	Sustainable Sites		14 Points	Yes	?	No	Materials & Resources		13 Points
Y	?	No	Prereq 1	Construction Activity Pollution Prevention	Required	7	0	6	Prereq 1	Storage & Collection of Recyclables	Required
1	0	0	Credit 1	Site Selection	1	Y			Credit 1.1	Building Reuse, Maintain 75% of Existing Walls, Floors & Roof	1
	0	1	Credit 2	Development Density & Community Connectivity	1	0	0	1	Credit 1.2	Building Reuse, Maintain 100% of Existing Walls, Floors & Roof	1
1	0		Credit 3	Brownfield Redevelopment (If Asbestos or Hazardous Mat)	1	0		1	Credit 1.3	Building Reuse, Maintain 50% of Interior Non-Structural Elements	1
	0	1	Credit 4.1	Alternative Transportation, Public Transportation Access	1	0		1	Credit 2.1	Construction Waste Management, Divert 50% from Disposal	1
	0	1	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1	1		0	Credit 2.2	Construction Waste Management, Divert 75% from Disposal	1
1			Credit 4.3	Alternative Transportation, Low-Emitting & Fuel-Efficient Vehicles	1	1		0	Credit 3.1	Materials Reuse, 5%	1
1			Credit 4.4	Alternative Transportation, Parking Capacity	1	0	0	1	Credit 3.2	Materials Reuse, 10%	1
1	0		Credit 5.1	Site Development, Protect or Restore Habitat -SRRA?	1	0		1	Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	1
1	0		Credit 5.2	Site Development, Maximize Open Space - SRRA?	1	1	0	0	Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	1
1	0		Credit 6.1	Stormwater Design, Quantity Control	1	1		0	Credit 5.1	Regional Materials, 10% Extracted, Proc'd & Manuf'd locally (500mi)	1
1	0	0	Credit 6.2	Stormwater Design, Quality Control	1	1	0		Credit 5.2	Regional Materials, 20% Extracted, Proc'd & Manuf'd locally (500mi)	1
	0	1	Credit 7.1	Heat Island Effect, Non-Roof	1	1		0	Credit 6	Rapidly Renewable Materials	1
1	0		Credit 7.2	Heat Island Effect, Roof	1		0	1	Credit 7	Certified Wood	1
0	1		Credit 8	Light Pollution Reduction	1	1					
Yes	?	No				Yes	?	No			
4	0	1	Water Efficiency		5 Points	12	0	3	Indoor Environmental Quality		15 Points
1			Credit 1.1	Water Efficient Landscaping, Reduce by 50%	1	Y			Prereq 1	Minimum IAQ Performance	Required
	0	1	Credit 1.2	Water Efficient Landscaping, No Potable Use or No	1	Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
1	0		Credit 2	Innovative Wastewater Technologies	1	0		1	Credit 1	Outdoor Air Delivery Monitoring	1
1	0		Credit 3.1	Water Use Reduction, 20% Reduction	1	0		1	Credit 2	Increased Ventilation	1
1	0		Credit 3.2	Water Use Reduction, 30% Reduction	1	1	0		Credit 3.1	Construction IAQ Management Plan, During Construction	1
15	1	1				1	0		Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
Y			Prereq 1	Fundamental Commissioning of the Bid Energy Systems	Required	1			Credit 4.1	Low-Emitting Materials, Adhesives & Sealants	1
Y			Prereq 2	Minimum Energy Performance	Required	1		0	Credit 4.2	Low-Emitting Materials, Paints & Coatings	1
Y			Prereq 3	Fundamental Refrigerant Management	Required	1		0	Credit 4.3	Low-Emitting Materials, Carpet Systems	1
10	0	0	Credit 1	Optimize Energy Performance (2 Points Minimum)	1 to 10	1	0		Credit 4.4	Low-Emitting Materials, Composite Wood & Agrifiber Products	1
				10.5% New Buildings or 3.5% Existing Building Renovations	1	0	0	1	Credit 5	Indoor Chemical & Pollutant Source Control	1
				14% New Buildings or 7% Existing Building Renovations	2	1	0	0	Credit 6.1	Controllability of Systems, Lighting	1
				17.5% New Buildings or 10.5% Existing Building Renovations	3	1	0		Credit 6.2	Controllability of Systems, Thermal Comfort	1
				21% New Buildings or 14% Existing Building Renovations	4	1	0		Credit 7.1	Thermal Comfort, Design	1
				24.5% New Buildings or 17.5% Existing Building Renovations	5	1	0		Credit 7.2	Thermal Comfort, Verification	1
				28% New Buildings or 21% Existing Building Renovations	6	1		0	Credit 8.1	Daylight & Views, Daylight 75% of Spaces	1
				31.5% New Buildings or 24.5% Existing Building Renovations	7	1	0		Credit 8.2	Daylight & Views, Views for 90% of Spaces	1
				35% New Buildings or 28% Existing Building Renovations	8						
				38.5% New Buildings or 31.5% Existing Building Renovations	9	Yes	?	No	Innovation & Design Process		5 Points
				42% New Buildings or 35% Existing Building Renovations	10	5	0	0	Credit 1.1	Innovation In Design: Innovative WW Tech 100%	1
3	0	0	Credit 2	On-Site Renewable Energy - Bond Program Locations?	1 to 3	1	0	0	Credit 1.2	Innovation In Design: Water Use Reduction (40%+)	1
				2.5% Renewable Energy	1	1	0		Credit 1.3	Innovation In Design: Optimize Energy Performance over 45.5	1
				7.5% Renewable Energy	2	1	0		Credit 1.4	Innovation In Design: Renewable Energy over 17.5%	1
				12.5% Renewable Energy	3	1			Credit 2	LEED® Accredited Professional	1
0	1		Credit 3	Enhanced Commissioning	1	Yes	?	No			
1	0		Credit 4	Enhanced Refrigerant Management	1	52	2		Project Totals (pre-certification estimates)		69 Points
0		1	Credit 5	Measurement & Verification	1	Certified: 26-32 points, Silver: 33-38 points, Gold: 39-51 points, Platinum: 52-69 points					
1	0		Credit 6	Green Power	1						

9 points

4 points

7 points

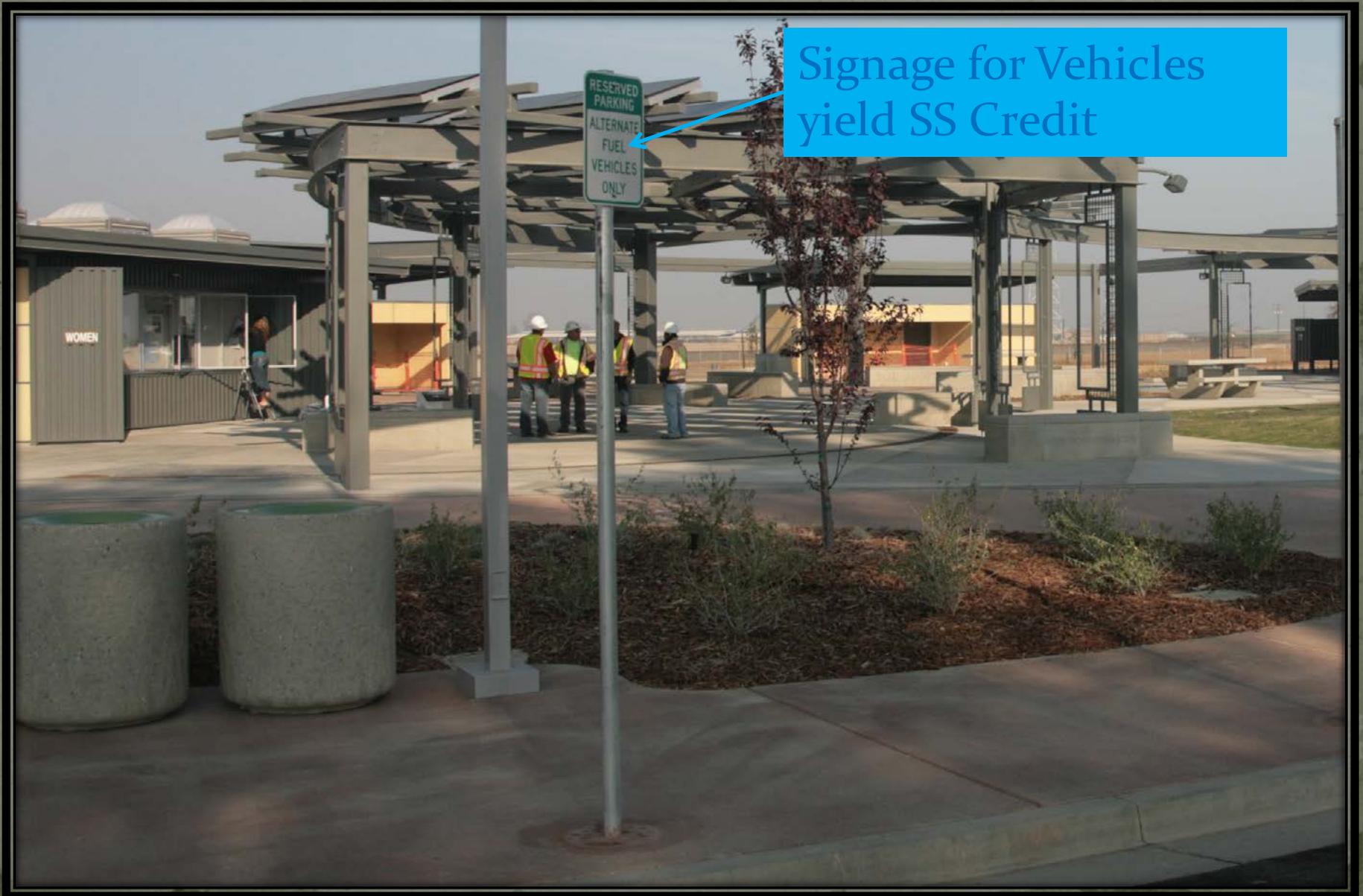
12 points

15 points

5 points

52 Points on track for Platinum

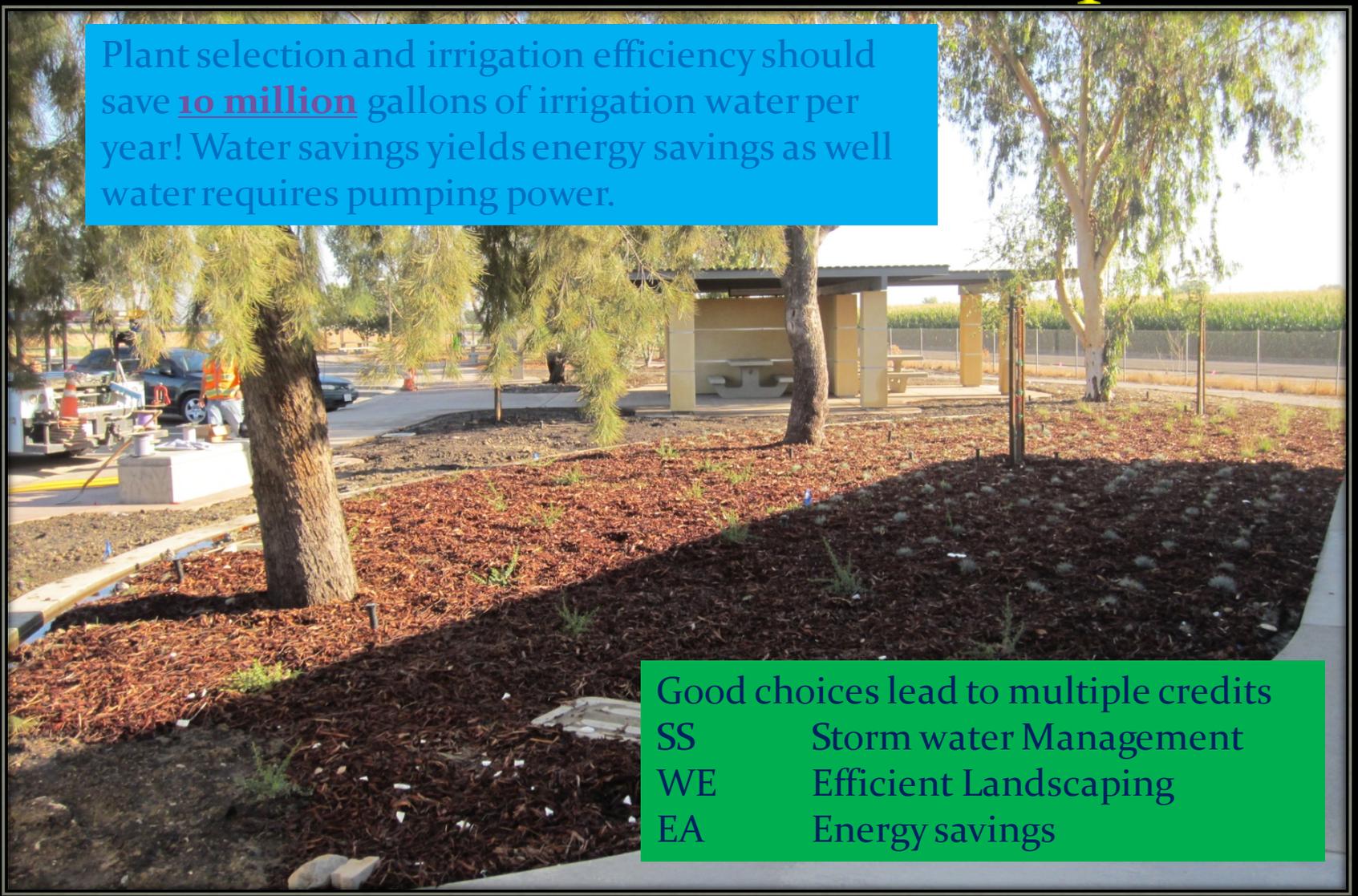
Parking Signage



Signage for Vehicles
yield SS Credit

Picnic Shelter and Landscape

Plant selection and irrigation efficiency should save **10 million** gallons of irrigation water per year! Water savings yields energy savings as well water requires pumping power.



Good choices lead to multiple credits
SS Storm water Management
WE Efficient Landscaping
EA Energy savings

Plaza



Concrete has
recycled and
regional content

Women's Restroom

All steel has recycled content which was tracked throughout construction



Building Graphic



Colorful Graphics reinforce the agricultural theme of the facility (metal backing gives recycled content)

Men's Restroom



Existing walls were re-skinned - New wall treatments give a new look to the facility while saving on demolition efforts/waste and construction materials.

Automatic sensor controls on low water use fixtures
– should save approximately 1.9 million gals per year



Wastewater is pumped to ponds so saving water saves power at the facility.

Restroom Interior



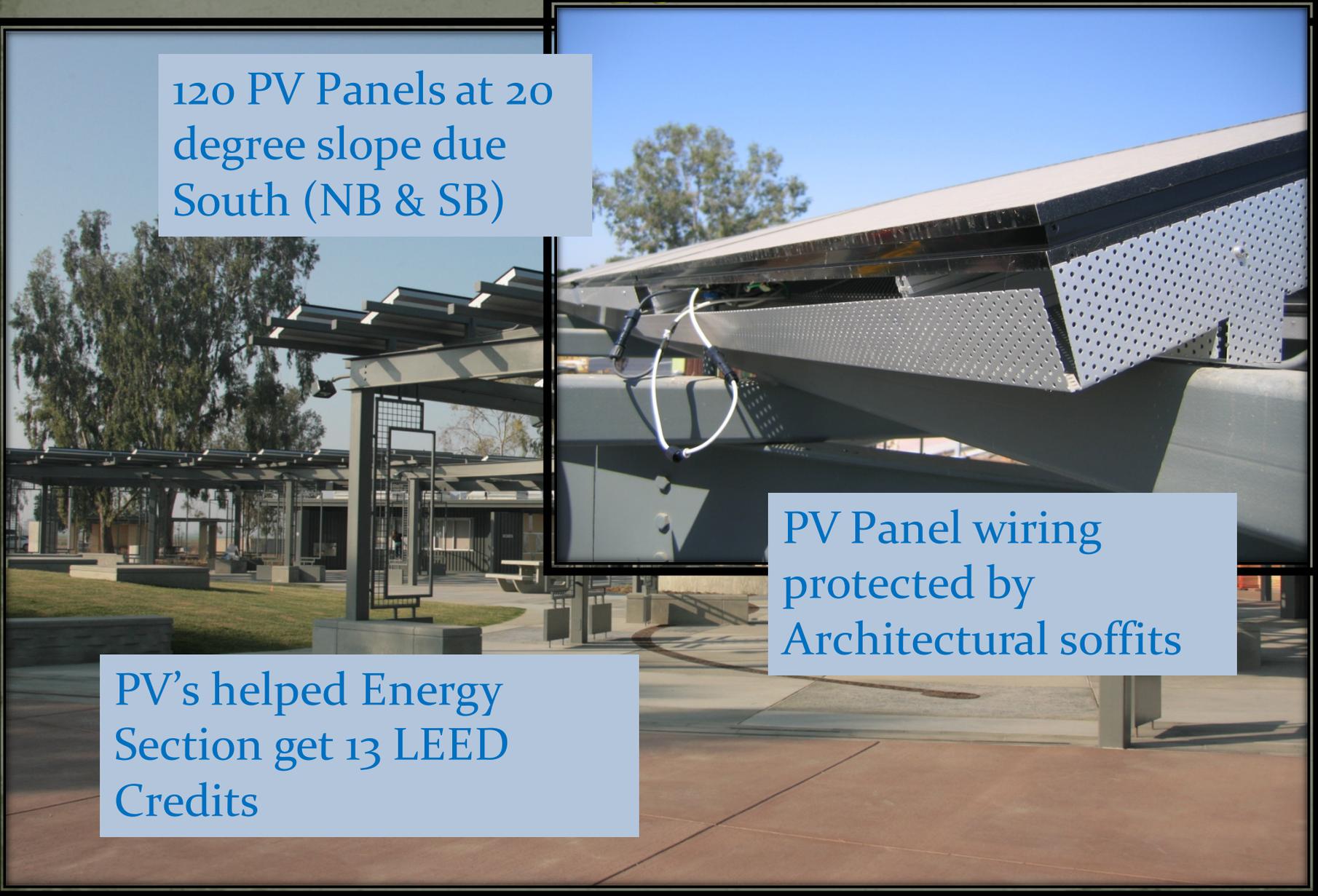
Design included skylights and automatic controls to switch lights off when not needed

Photovoltaic Canopy

120 PV Panels at 20 degree slope due South (NB & SB)

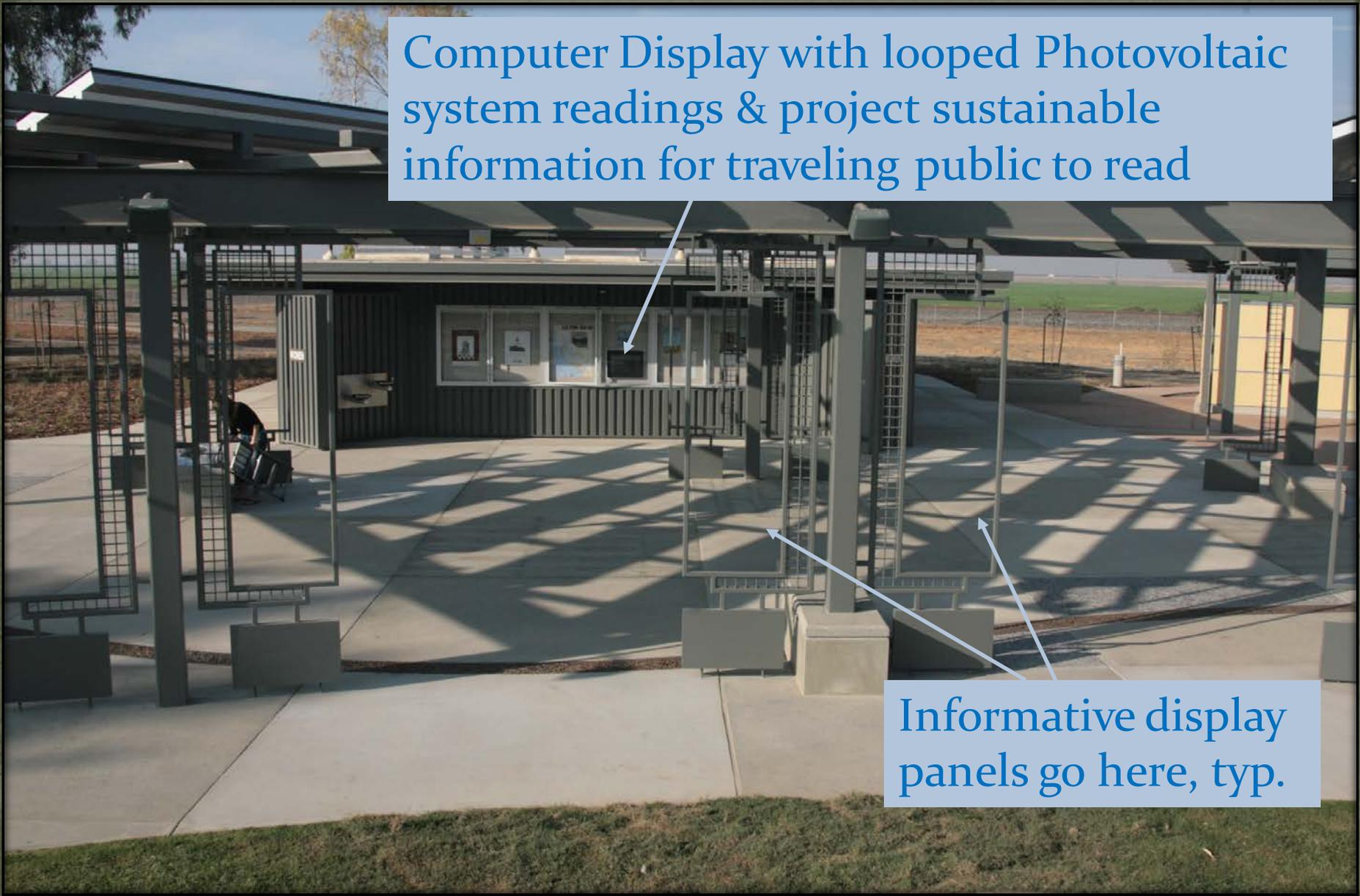
PV Panel wiring protected by Architectural soffits

PV's helped Energy Section get 13 LEED Credits



Computer Display with looped Photovoltaic system readings & project sustainable information for traveling public to read

Informative display panels go here, typ.



Design Challenges

- Selecting Credits for Silver rating SRRA
- Can PDT incorporate LEED features in Design?
- Engaging District early in PID process
- Formal Commissioning requirements
 - Create design documents
 - Track/enforce Construction efforts
- Will Complex design overburden Construction?

Design Lessons Learned

- Select Credits – Charette and VTC meetings
- Robust Specifications - Created by consultant (and they have helped on later projects)
- Commissioning - Consultant started and CT continued
- Construction – Specifications required “LEED Manager” to track all LEED efforts
- Project currently on track for 37 design credits and possibly 52 overall (Platinum)

Teamwork and Communication

Construction Challenges

- Regional and Recycled content credits
 - Submittals to include % of R & R items
 - **Tracking receipts** of material % and costs
- Construction waste management (CWM)
 - Sort waste and haul to recycler
 - **Track all receipts**
- **Materials Volatile Organic Compound restrictions**
- Pervious paving installation difficult
- Complex Lighting Controls
- Commissioning (Cx) Checklists and testing

Construction Lessons Learned

- Regional and Recycled content credits
- Construction waste management (CWM)

Competent LEED Manager assisted with these items

- Pervious paving installation difficult – 28% replaced
- Materials VOC's Contractor warned pre sub's

Talented Field personnel handled these issues

- Commissioning pin pointed lighting controls issues and saved on inspections

Initial Public Feedback

- They like it!
 - Photovoltaics on canopy
 - Concrete work
 - Artwork
 - Overall Work Quality
- Nice rest stop

Questions?



More
Pictures?

Go

Want more information?

Informative display panels – designed by Landscape Architects



The Age of Rail Railroads and Streetcars



Wildlife At Home in the Valley



Crew room and CHP office



High efficiency heat pump used for conditioning these spaces

Lights automatically shut off in all non-public areas when no one is present

Pervious Paving Sidewalk



Walking surfaces have history of the area - designed by
Landscape Architects



Father Garces arrives near Bakersfield, 1776

Spanish expedition into the San Joaquin Valley and Tulare Lake, 1772

Photovoltaic Inverters



Proper signage installed
after field inspection

Informative Seating



Concrete has recycled
and regional content
and additional
regional information

