

# Solar System and Master Planning

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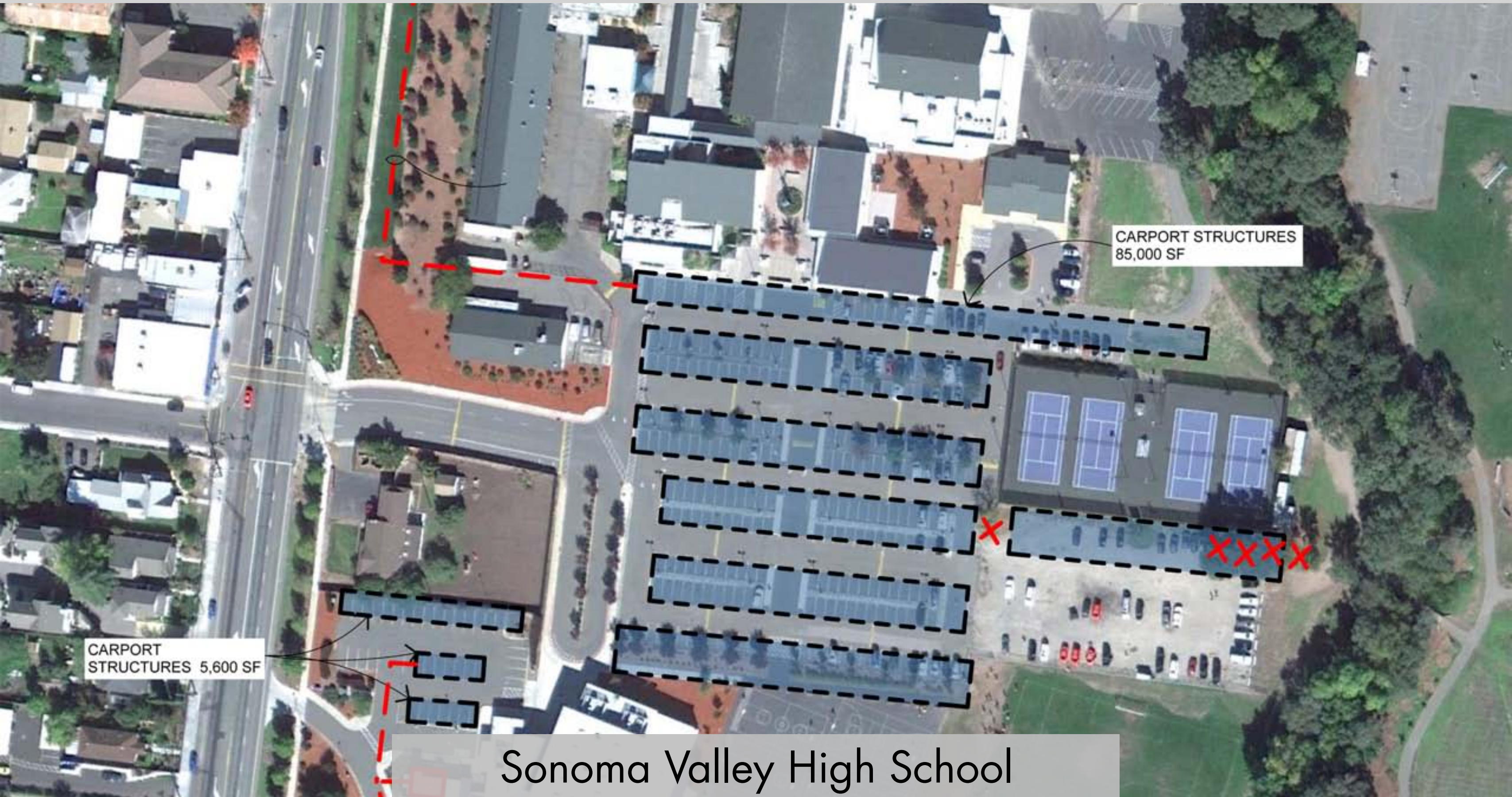
Sonoma Valley Unified School District

# Solar Design Process

- Detailed review of energy bills to determine required system size
- Site Analysis to determine ideal locations at each school site
- Review of Preliminary Designs with District and School Site Staff
- Review of proposed designs with PG&E to determine any additional requirements
- Prepare Preliminary Design Documents for Request for Proposals







CARPORT STRUCTURES  
85,000 SF

CARPORT  
STRUCTURES 5,600 SF

Sonoma Valley High School





CARPORT STRUCTURES 5,600 SF

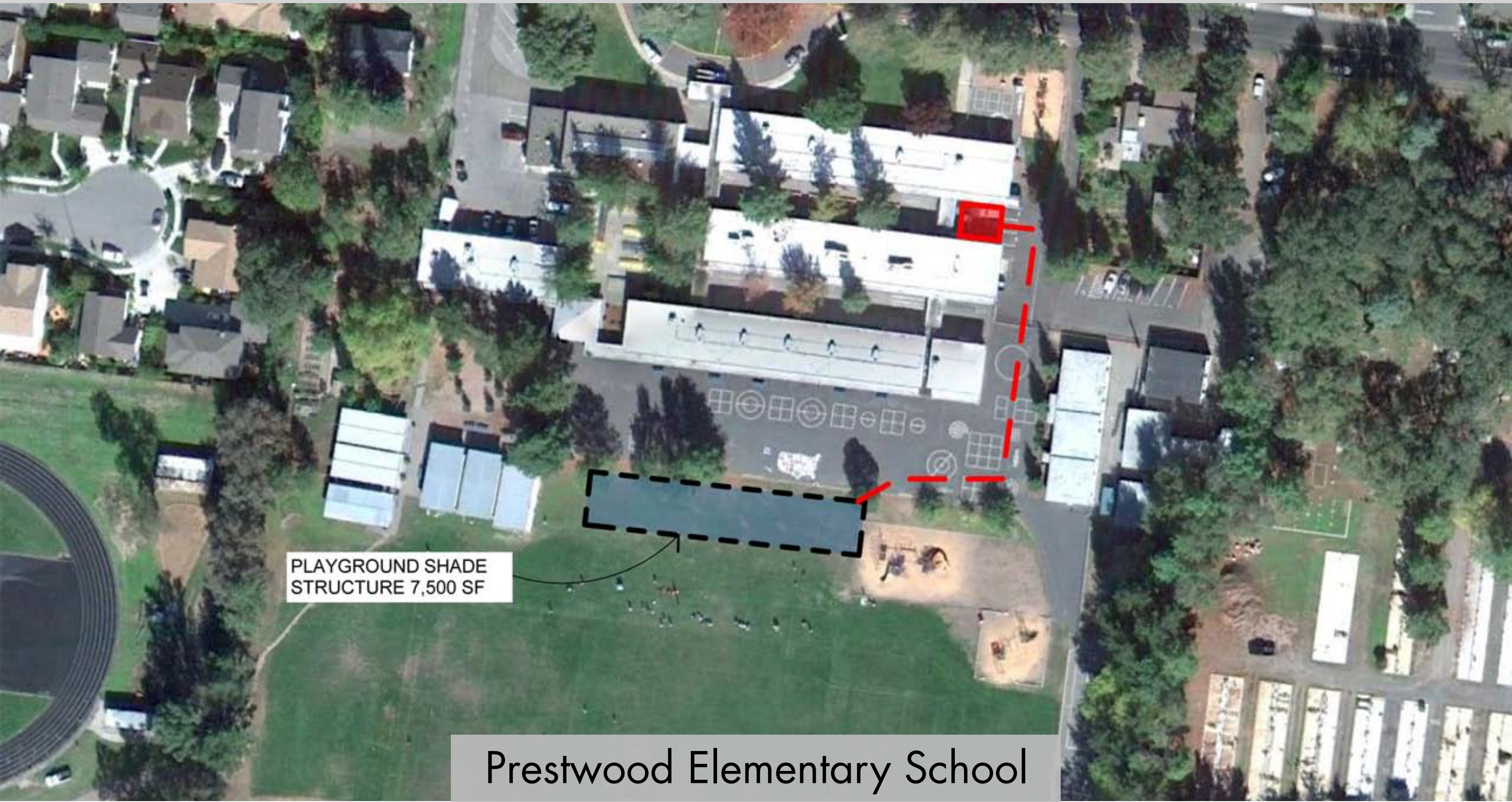
GROUND MOUNTED ARRAY 8000 SF

Marcy Ct

oadway

Adele Harrison Middle School

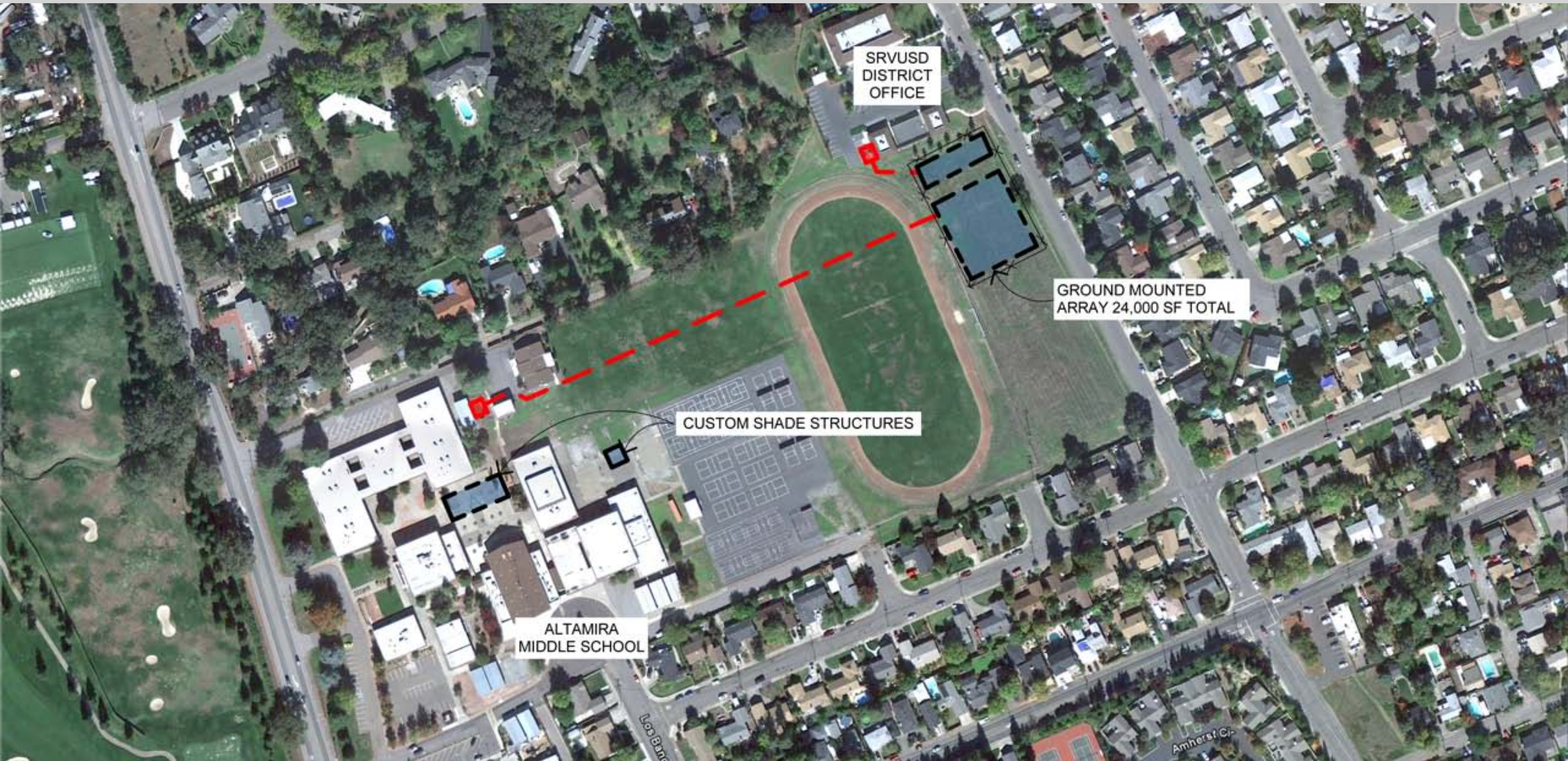




PLAYGROUND SHADE  
STRUCTURE 7,500 SF

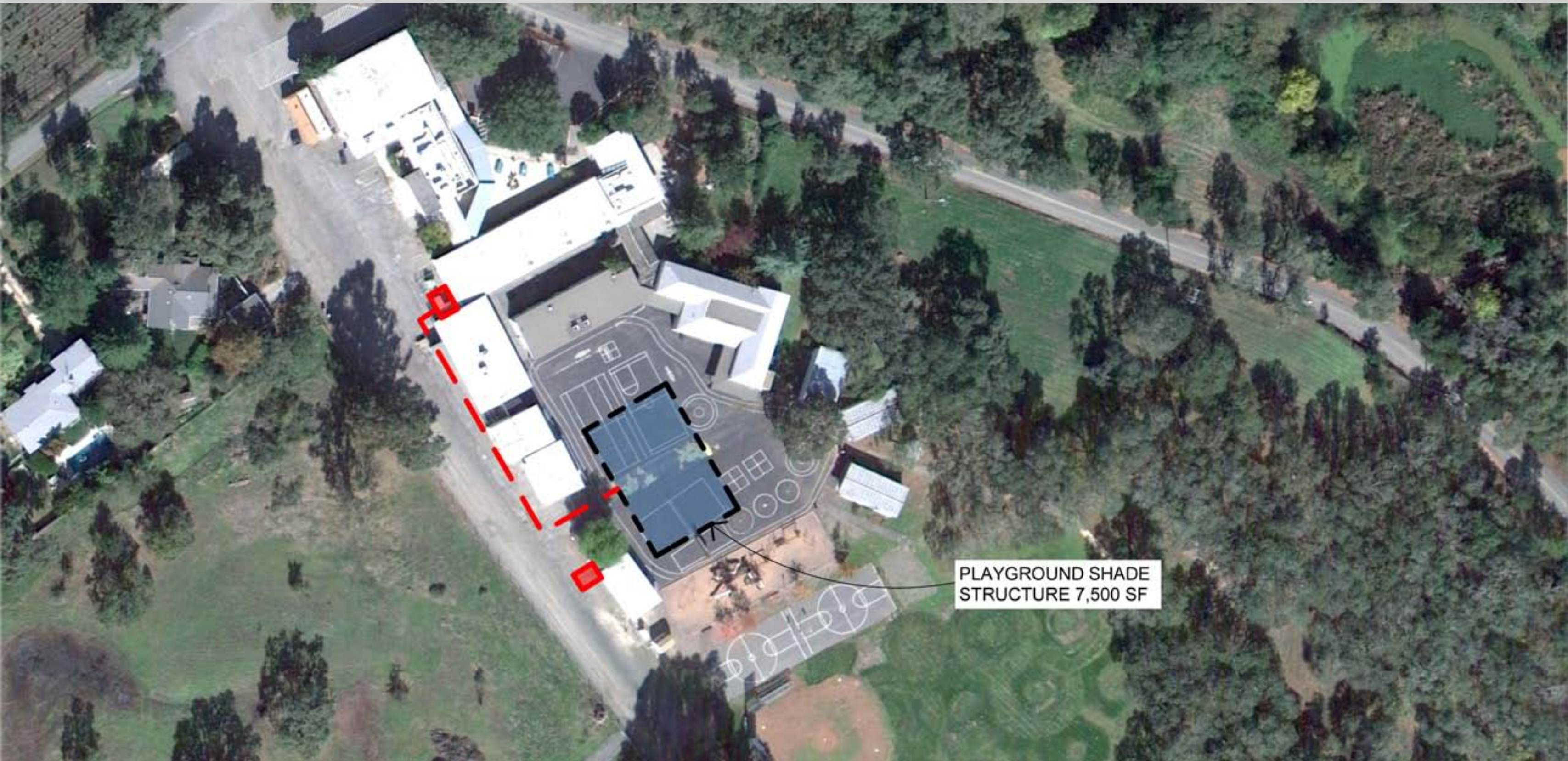
Prestwood Elementary School





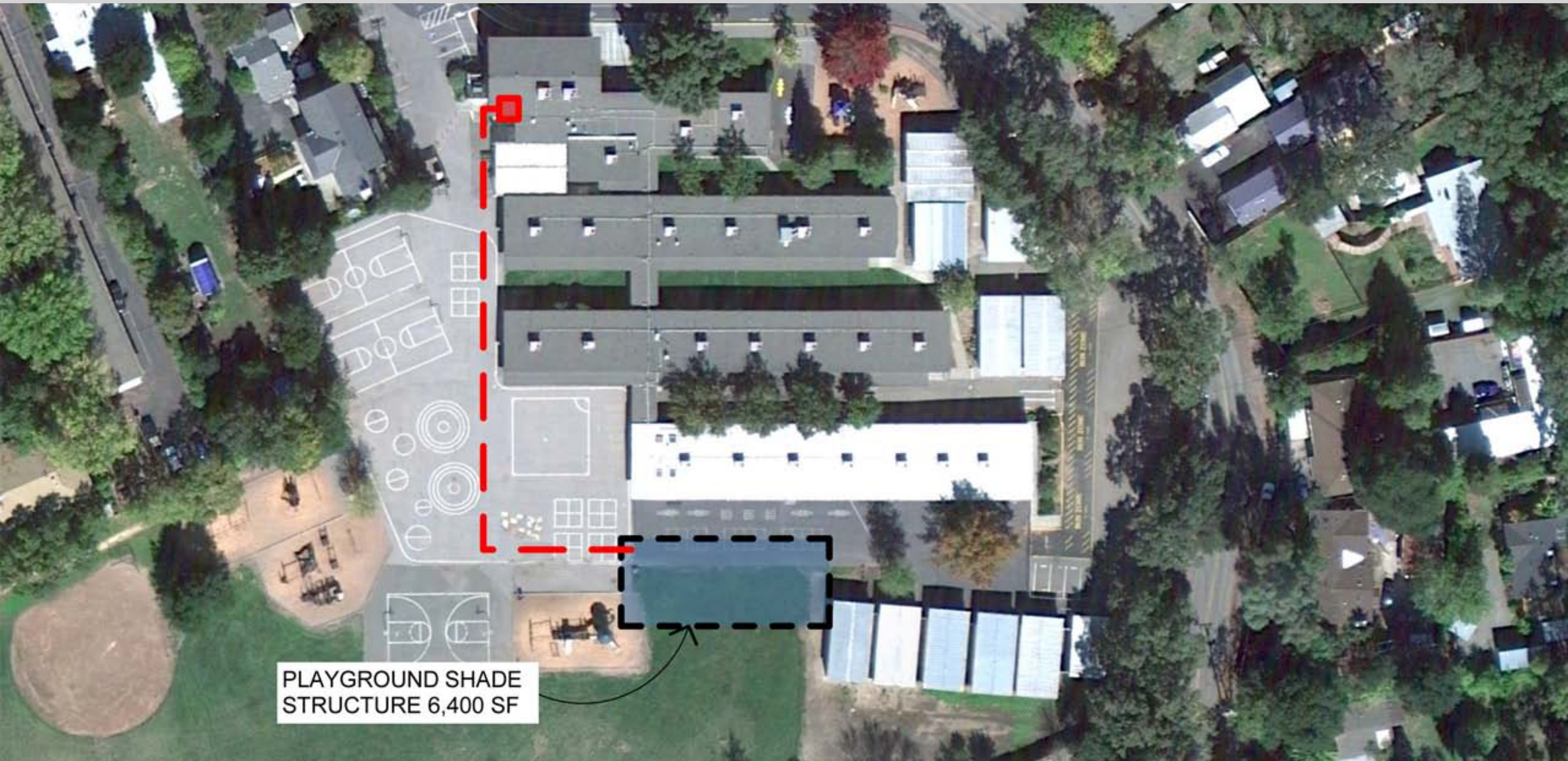
Altimira Middle School and District Office





Dunbar Elementary School

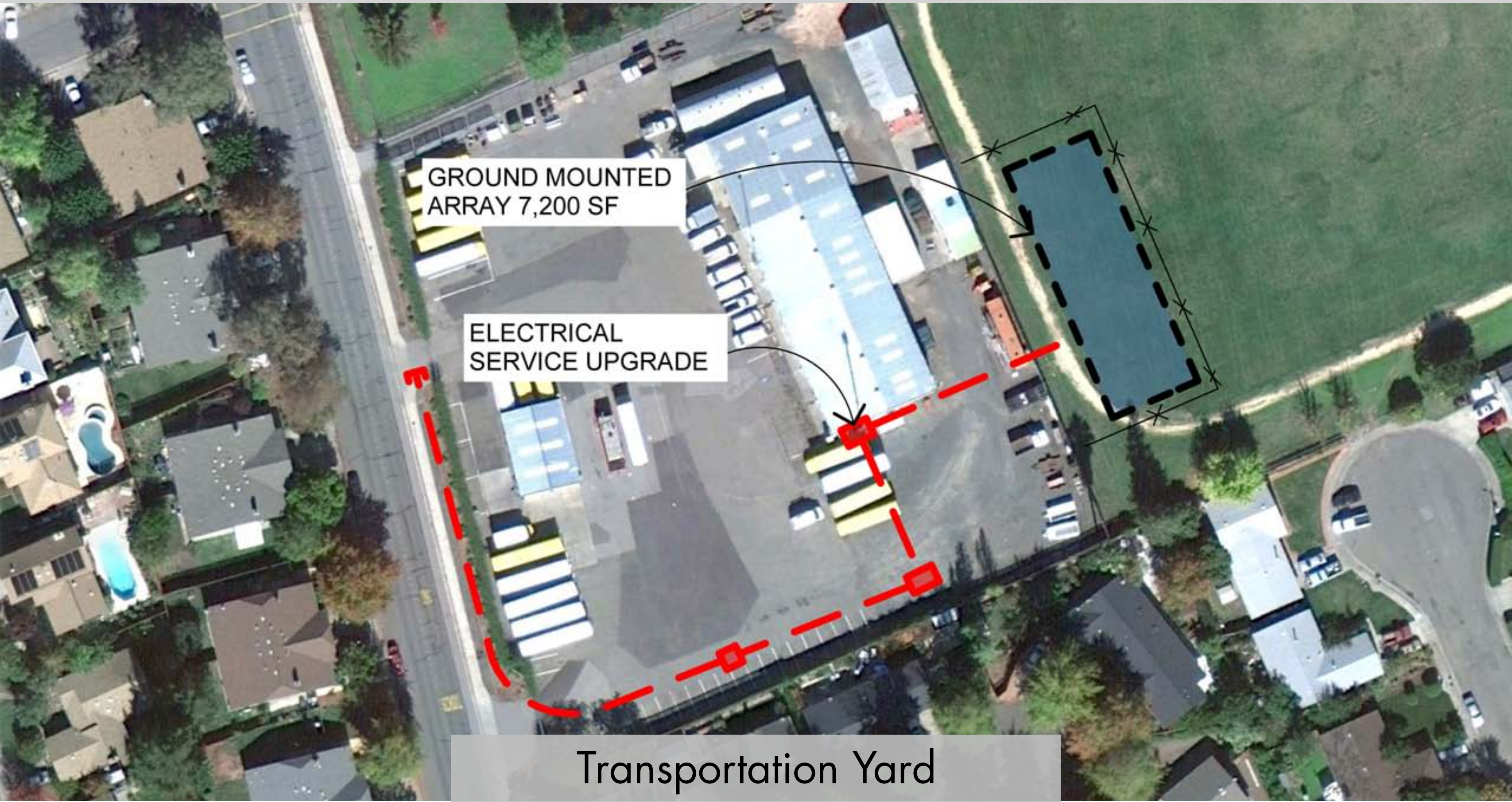




PLAYGROUND SHADE  
STRUCTURE 6,400 SF

# El Verano Elementary School



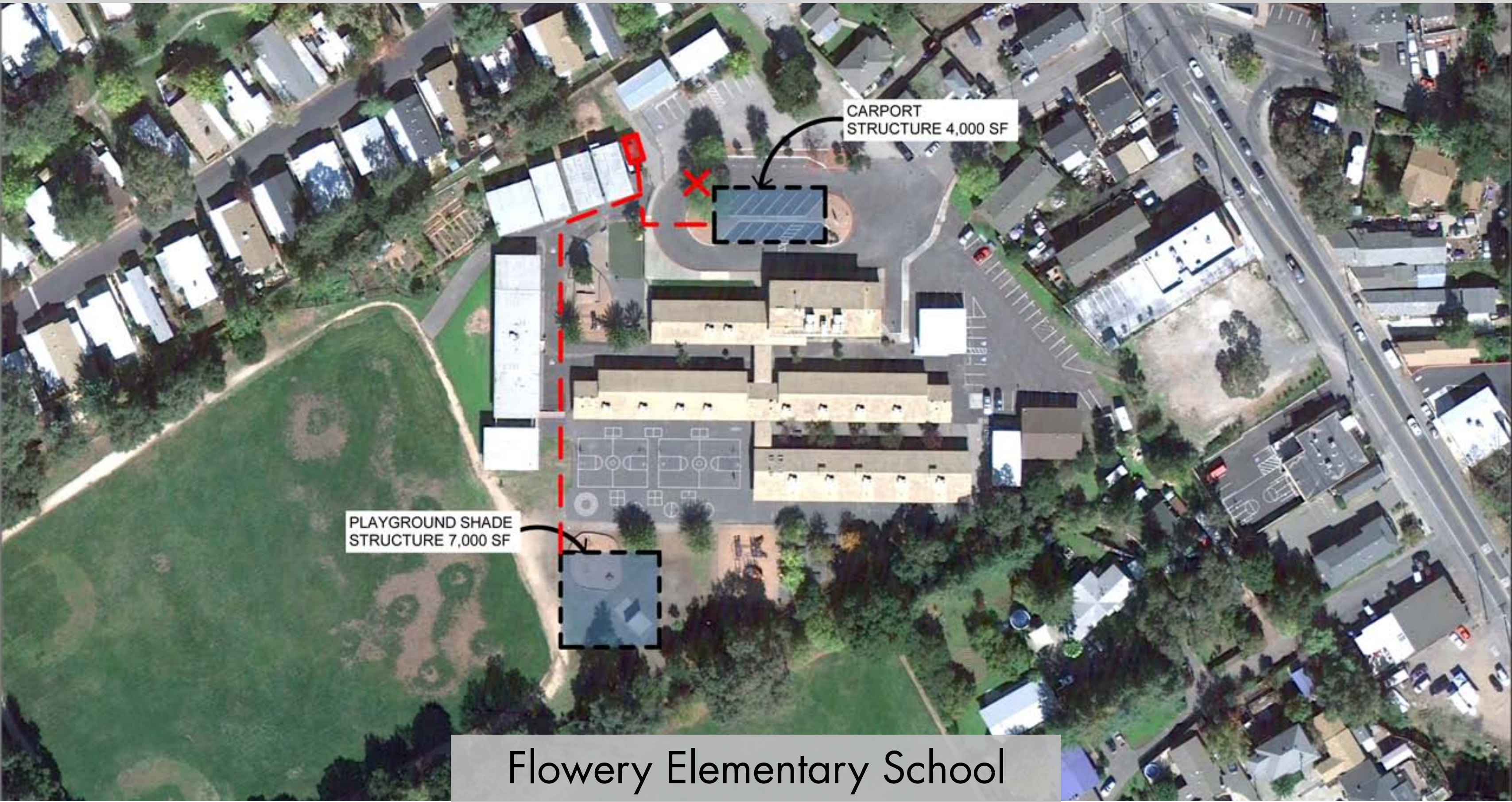


GROUND MOUNTED  
ARRAY 7,200 SF

ELECTRICAL  
SERVICE UPGRADE

Transportation Yard





CARPORT  
STRUCTURE 4,000 SF

PLAYGROUND SHADE  
STRUCTURE 7,000 SF

# Flowery Elementary School

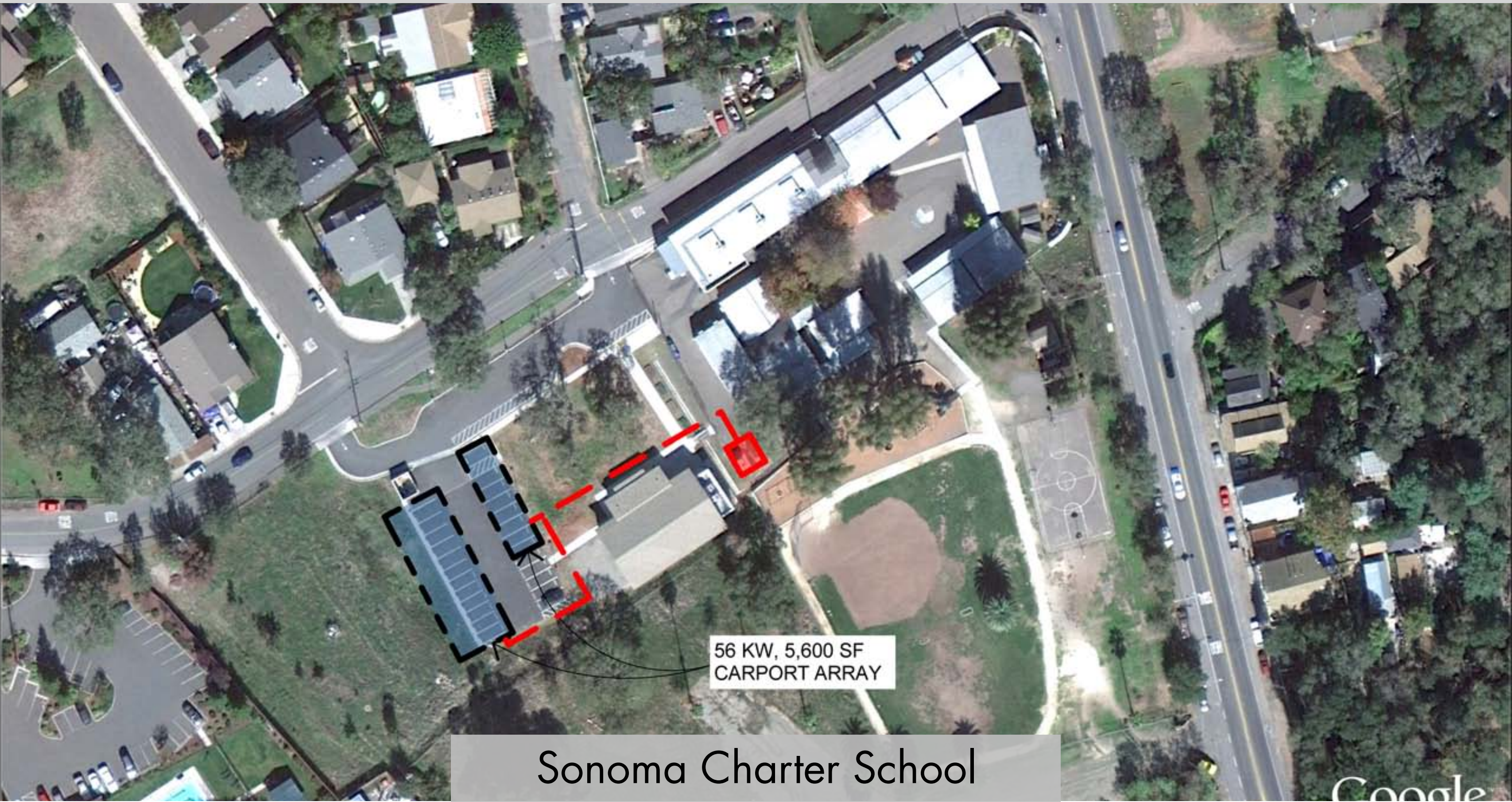




CARPORT STRUCTURE  
12,000 SF

Sassarini Elementary School





56 KW, 5,600 SF  
CARPORT ARRAY

# Sonoma Charter School



# Shade Structures

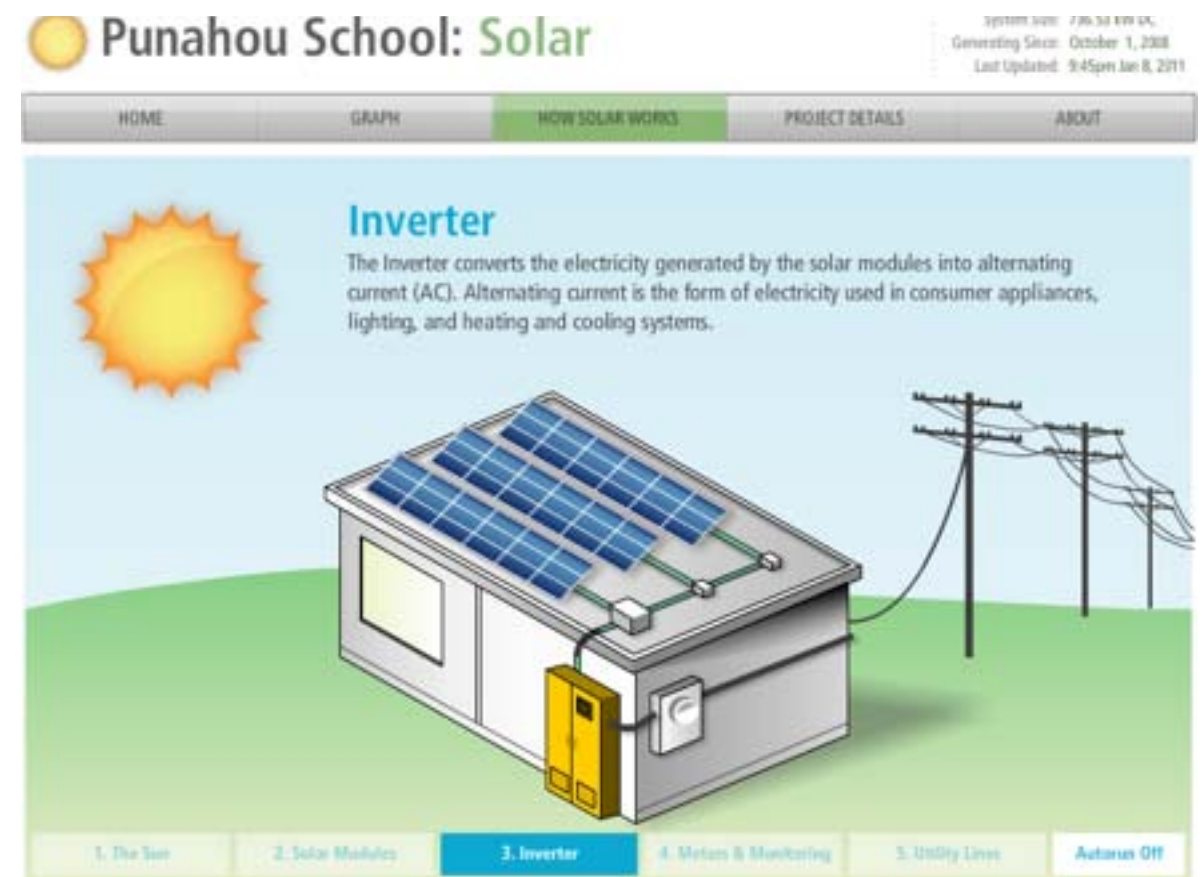
- Steel Structures designed specifically to support solar panels over parking lots and other areas
- DSA Pre-Approval means the system can be on-line 4-6 months earlier
- Typically come in 20 and 40 foot widths
- Steel structure is galvanized and painted
- Metal deck is provided under the panels at playgrounds to provide rain protection





# Monitoring System

- Live Data on energy production and use is available at a kiosk at each school
- Data also available on-line for use by the community and in the classroom
- Significant educational resource for math and science curriculum at many grade levels





# Contractor Selection Process

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- Request for Proposals issued to competitively select the Contractor which presents best value to the District
- 10 year Performance Guarantee and Maintenance Contract included
- 46 Companies were invited and RFP was advertised in local papers
- 28 Companies Attended the Mandatory Site Visit
- 5 Complete Proposals were submitted
- Selection Criteria:
  - Cost, Production and total savings delivered
  - Experience with similar projects
  - Financial strength of the company
  - Performance guarantee
  - Local Workforce
  - American made equipment
  - Project Management Experience
  - Monitoring Systems
  - Educational resources



<b>Vendor / Feature</b>	<b>Borrego Solar / One Sun / National Carport Industries</b>	<b>Chevron Energy Solutions / Atlas- Pellizzari / BEI / MBL / One Sun / Pacific Structures / Steele Energy</b>	<b>Natural Power / Parsons / Solarcraft / One Sun / M Bar C / Valley Carports</b>	<b>Roebbelen / Emard / Baja</b>	<b>Stellar Energy / Baja / M Bar C / Northern Electric / Vince Sigal Electric / Affinity Solar / ZFA Structural</b>
SVUSD annual electricity usage (kWh)	3,288,149	3,288,149	3,288,149	3,288,149	3,288,149
Proposed module	SolarWorld 245	Trina 280	Kyocera 235	SolarWorld 230	SolarWorld 245
Inverters	Satcon Powergate	Satcon	PV Powered / Enphase	Satcon	AE / PV Powered
# modules	8,498	7,854	10,183	9,303	8,848
Size (DC kW)	2,082	2,199	2,393	2,140	2,168
System Size (AC kW)	1,792	1,923	2,045	1,830	1,875
Derating	86%	87%	85%	86%	86%
Year 1 kWh Production	3,119,952	3,175,505	3,420,206	3,174,069	3,181,966
10-year cumulative kWh Production	30,506,809	31,050,005	33,442,685	29,883,860	31,113,181
10-year <b>guaranteed</b> cumulative kWh Production	27,456,128	29,497,505	28,426,282	29,883,860	28,001,862
Percent guaranteed	90%	95%	85%	100%	90%
25-year cumulative kWh Production	73,493,438	74,802,041	80,566,206	70,400,850	74,954,236
% electricity usage offset in 1st year	95%	97%	104%	97%	97%
Total cost of system	\$12,316,985	\$11,579,587	\$12,826,480	\$9,609,909	\$11,713,789
Unsubsidized cost per DC kW (lower is better)	\$5,916	\$5,266	\$5,360	\$4,491	\$5,404
<b>25-year unsubsidized cost per kWh (lower is better)</b>	<b>\$0.168</b>	<b>\$0.155</b>	<b>\$0.159</b>	<b>\$0.137</b>	<b>\$0.156</b>
Office location	Berkeley	San Francisco	Arizona	Sacramento area	Rohnert Park
American made module?	Yes	No	Yes	Yes	Yes
DSA Experience	Extensive	Extensive	Minimal	Extensive	Minimal
PV Installation Experience	Extensive	Extensive	Sufficient	Sufficient	Sufficient
Local Content	Sufficient	High	Sufficient	Sufficient	High
Monitoring	Fat Spaniel or equiv.	Utility Vision	Enphase / Deck	Deck or equiv.	SolarMagic / Draker
Kiosks included?	Yes	Yes	not mentioned	Yes	Yes
Curriculum Support?	Extensive	Extensive	Solar Schools	Yes	Yes
Security	Gridlock	Proprietary	not mentioned	Gridlock	Gridlock



# Proposal Analysis



## Roebbelen / Emard

- Large General Contractor and Electrical Contractor with a combined 85 years in business and solid reputation
- Experience working on school campuses, managing multi-site projects and installing solar power systems
- Significant advantage in construction cost and overall cost translates to greater value for the District
- Promise to employ a minimum of 50% of workforce locally



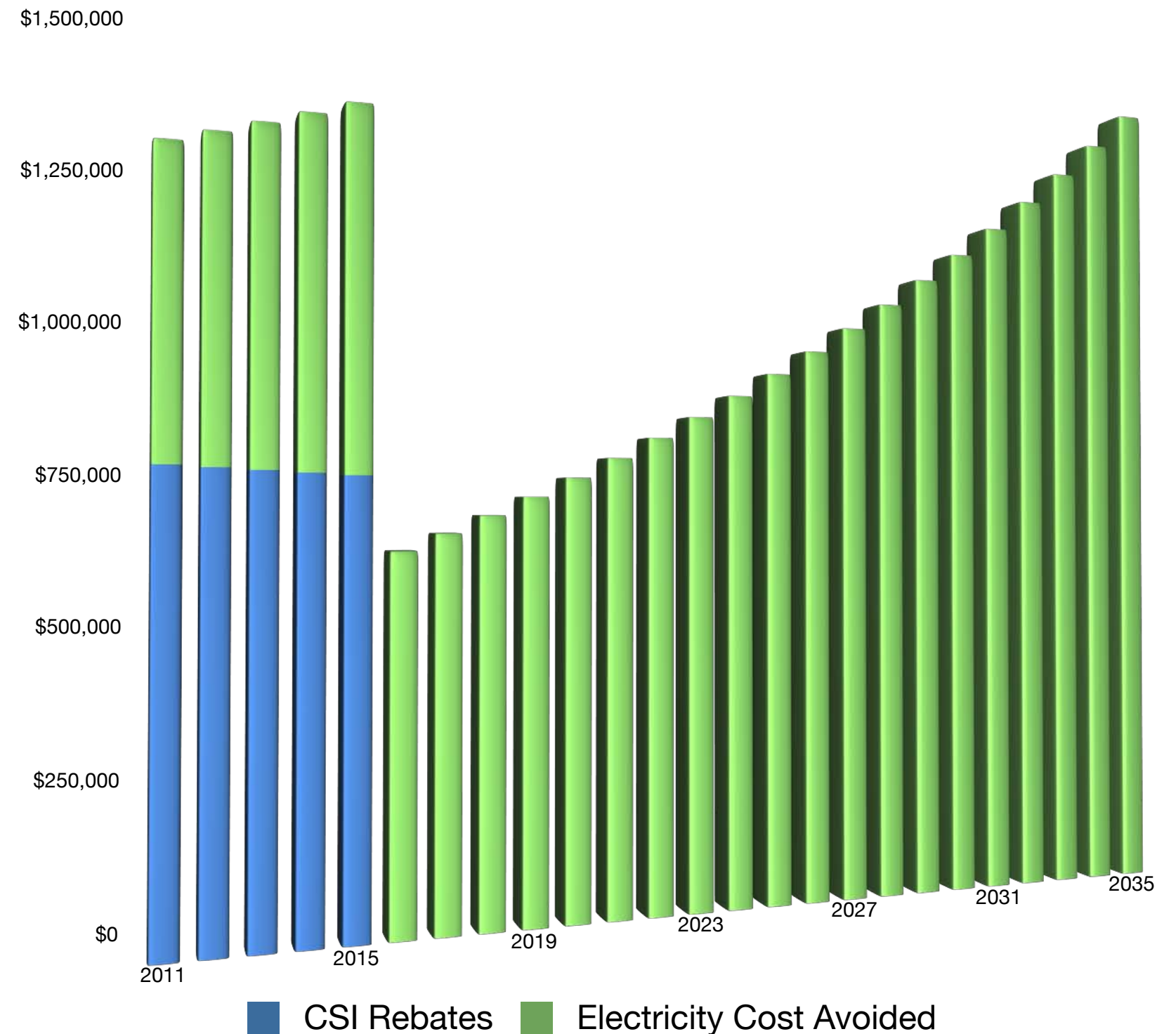
**EMARD ELECTRIC**  
"BRINGING VALUE, DELIVERING QUALITY"



# Financial Summary

- System Cost: \$9,609,909
- Percent of Energy offset: 96%
- CSI Rebates Generated: \$750,000 annually for the first 5 years
- Electricity cost saved in first year: \$500,000
- Total Savings to the General Fund over 25 Years: \$26,000,000

## Annual Impact to General Fund





# Master Planning Process

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# Master Planning Goals

- Develop a 25 year vision for each school campus' facilities which addresses:
  - Facilities needs of changes in Education Program
  - Modernization needs
  - Code compliance and safety issues
  - Sustainable design opportunities
  - Flexibility to meet future changes





# Community Participation

- Schools are Community Facilities
- Design Committees at each school represent all stakeholders:
  - Site Administration
  - Teachers
  - Maintenance Staff
  - District Administration
  - Parents
  - Neighbors
  - Students
- Design Committee represents the Community throughout the process





# Process Overview

- Identify Facility Needs
- Prioritize Facility Needs
- Develop Preliminary Master Plan Concepts
- Finalize Master Plan
- Create Financial Master Plan including estimated costs and potential funding
- Coordinate all campus Master Plans into District Master Plan
- Present District Master Plan to the Board for Approval



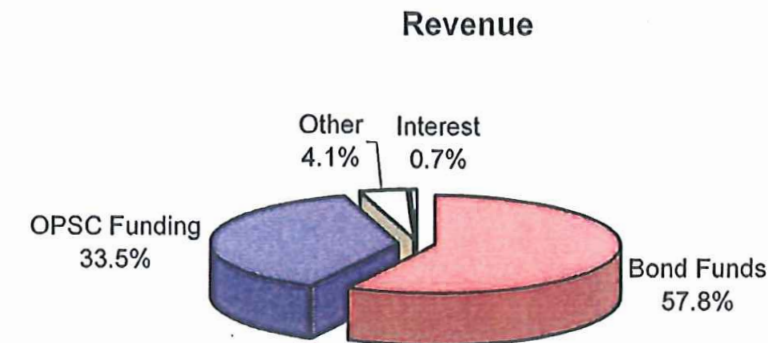


# Deliverables

- Summary of process, goals and overall vision for the District
- Master Plan for each Campus
- Prioritized list of projects grouped by campus with estimated construction cost
- Funding Master Plan incorporating Measure H Funds and State Funding
- Master Plan Schedule
- All bound and published as a record document

## REVENUE SUMMARY

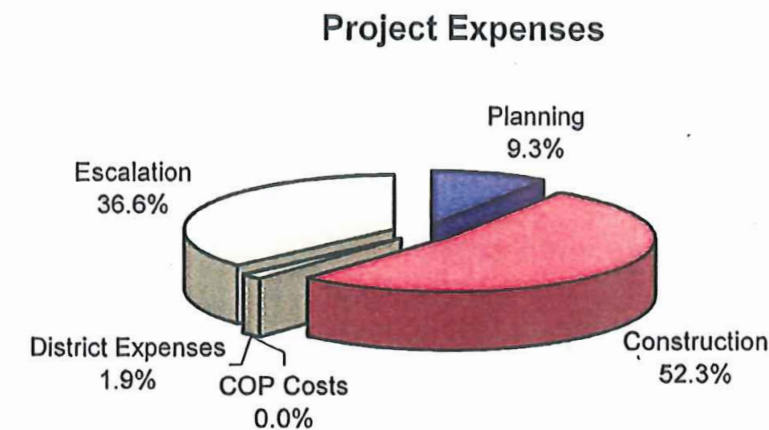
Bond Proceeds - excludes principal amount of COP loans	\$36,920,000	57.8%
OPSC Modernization & Extreme Hardship/ Facility Funding	\$23,883,463	37.4%
Developer Fees & Other Revenue	\$2,650,000	4.1%
Interest Income	\$428,311	0.7%
<b>Total All Revenues</b>	<b>\$63,881,774</b>	<b>100%</b>



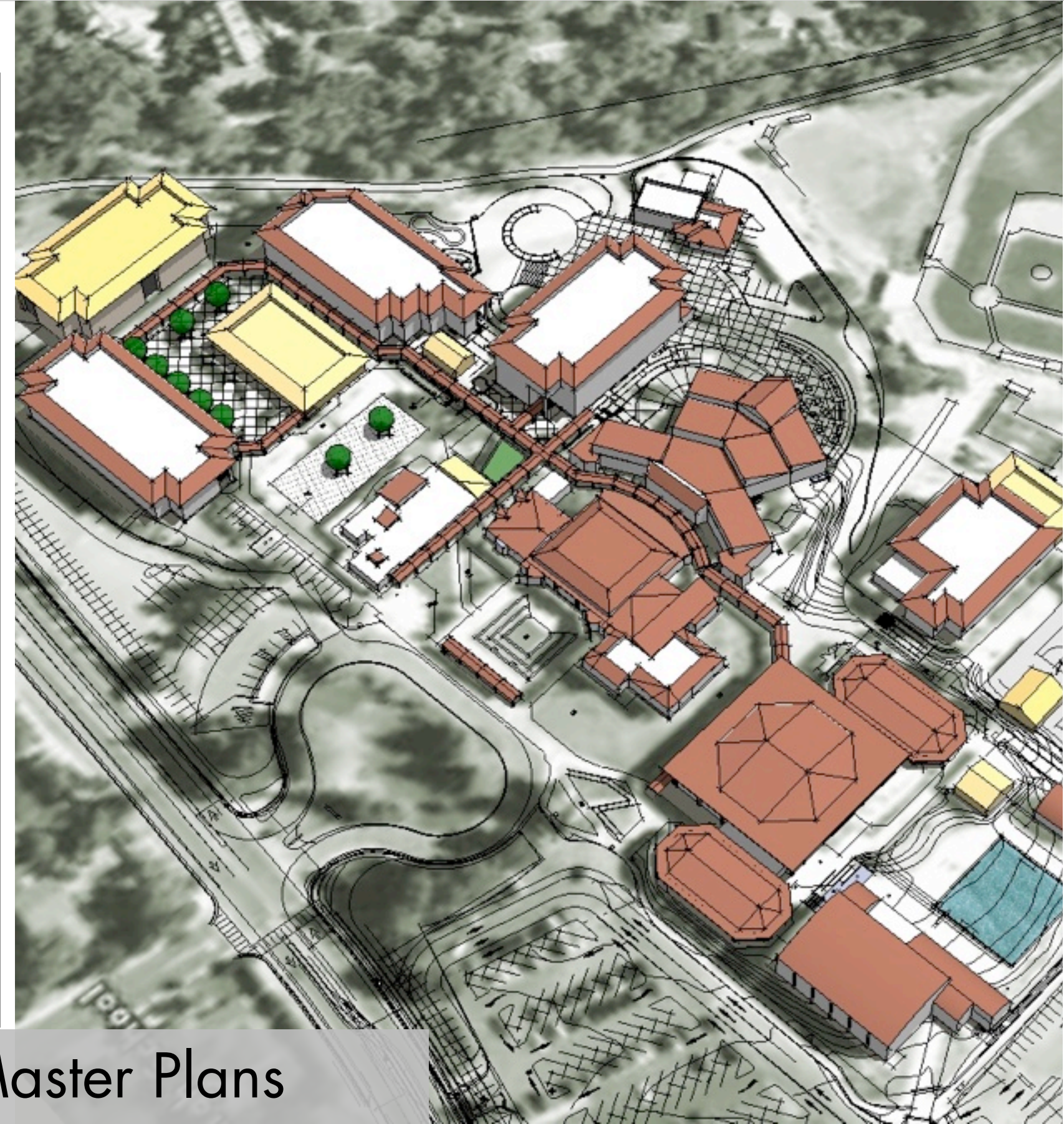
## EXPENSE SUMMARY

Planning Costs	\$5,819,726	9.3%
Construction Total - Including Testing & Inspection Less Escalation	\$32,746,811	52.3%
Other District Expenses	\$1,162,301	1.9%
Cost of COP's - Interest & Issuance Costs	\$0	0.0%
Approximate Escalation Expenses	\$22,922,768	36.6%
<b>Total All Expenses</b>	<b>\$62,651,606</b>	<b>100%</b>

**Balance Remaining at End of Year Thirteen**      **\$1,230,167**







Example Master Plans



# Questions

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