



Annex A - Detailed information on PV sites

Table of Contents

1.	G1.....	5
1.1	G1-RT1	5
1.2	G1-CP1	7
1.3	G1-RT2	9
1.4	G1-RT3	14
1.5	G1-CP2	21
2.	G2.....	23
2.1	G2-RT1	23
2.2	G2-RT2	31
2.3	G2-RT3	34
3.	G3.....	37
3.1	G3-RT1	38
3.2	G3-CP1	42
3.3	G3-RT2	43
3.4	G3-RT3	48
3.5	G3-CP2	54

Table 1. Summary of rooftop installations

	G1-RT1	G1-RT2	G1-RT3	G2-RT1	G2-RT2	G2-RT3	G3-RT1	G3-RT2	G3-RT3
Village	Sapota	Sapota	Sapota	Fein	Fein	Fein	Mesa	Mesa	Mesa
Name	Elementary school	Sapote Protestant Church	High school	Sacred Heart Catholic Church	Old Church	Parish Hall	Elementary School A	Municipal Office	Holy Family Catholic Church
Structure type	Gable roof	Gable roof	Gable roof	Gable roof with 2 towers	Gable roof	Hip	Gable roof	Hip	Gable roof
Year construction / refurbishment	<i>no info</i>	1989	1996	1990	<i>no info</i>	1980's	<i>no info</i>	renovated in 2017	<i>no info</i>
Tilt	15°	15°	10°	10°	10°	10°	15°	20°	
Azimuth (South = 0°, West = -90°)	-80° / 100°	-130° / 50°	-160° / 20°	-35° / 145°	-155° / 25°	-10° / 170°	-140° / 40°	-10° / 170°	-15° / 165°
Purlin material	Wood	Wood	Wood	Steel IPN	Wood	Wood	Wood	Wood	Wood
purlins numbers	11 per slope	10 per slope	14 per slope	9 per slope	16 per slope	7 per slope	10 per slope	9 per slope	See picture
Purlin Spacing	10'	2'	2'	5'	2'	4'	2'	2'	See picture
Purlin size	<i>no info</i>	2"x4"x16'	2"x4"x14'	2"x6"	2"x4"	2"x4"x84'	2"x4"x16'	2"x4"x16'	2"x4"
Rafter material	Wood	Wood	Wood	Steel IPN	Steel	Wood	Wood	Wood	Wood
Rafter Spacing	5'	8'	6'	20'	10'	7'	2'	5'	8'
Rafter size	2"x6"	2"x8"	<i>no info, see picture</i>	18" x 6", thick. 1/4 inch	<i>no info, see picture</i>	2"x6"	2"x6"	2"x6"	2"x6"
Rafter number	24 per slope	10 per slope	11 per slope	4 steel + 2 smaller rafter at edges	9 per slope	10 per slope	39 per slope	8 per slope	See picture
Wall	Hollowblock 8" with concrete poured inside	Hollowblock 8" with concrete poured inside	Hollowblock 8" with concrete poured inside	Reinforced concrete, 6.5 inches thick	Concrete 6'	Hollowblock 6" with concrete poured inside	Hollowblock 8" with concrete poured inside	6'/2" Plywood and Hollowblock 6" with concrete poured inside	See picture
Metal sheet to be changed ?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rain gutter	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions	To replace if in bad conditions
Safety	Safety line on top	Safety line on top	Safety line on top	Safety line on top	Safety line on top	Safety line on top	Safety line on top	Safety line on top	Safety line on top
Structural Reinforcement	Tbd	Tbd	Tbd	Tbd	Only purlins should be replaced	Rooftop structure needs to be rebuilt	Tbd	Tbd	Tbd
Min PV Capacity (kWp)	79.2	47.6	63.4	122	50.2	38.7	68	23.8	44.8
Comments	Trees on North side will be trimmed by CPUC to avoid shading	Good wooden structure, with a few impacts of water leaks at the edge	Current installation will be removed by CPUC	Concrete columns (20x27") around vertical part of rafters. Towers exceeds the roof by 15 m, a shading analysis will have to be performed.	Rooftop is made out of a good-quality metal truss. Purlins needs to be replaced.	Has a good-quality concrete beams, with a few damages at the base. The wooden roof structure has got to be completely redone.	Some trees will be trimmed by CPUC to avoid shading	Building recently refurbished	Main entrance might be replaced by the canopy

Table 2. Summary of canopy installations

Label	G1-CP1	G1-CP2	G3-CP1	G3-CP2
Village	Sapota	Sapota	Mesa	Mesa
Name	Elementary School	Sapore Protestant Church	Elementary School A	Holy Family Catholic Church
Structure type	Canopy	Canopy	Canopy	Canopy
Tilt	10°	10°	10°	10°
Azimuth (South = 0°, West = -90°)	-80° / 100°	-40° / 140°	-140° / 40°	-15° / 165°
Height on lowest point (m/Foot)	5m/16'	3.2/11'	3.2/11'	3.2/11'
Min PV Capacity (kWp)	60.7	58.1	95	18.5
Comments	On Basketball court, in order to provide shelter from rain and sun	Current small wooden canopy can be removed, for the new canopy. The canopy should be installed as close as possible to the church's entrance to provide enough clearance to the road.	The water table is around 4-5 feet deep	The canopy shall be closer to the church, by dismantling the existing entrance for community activities and give clearance at the road level

1. G1



Figure 1. Top-view of PV array locations in G1

1.1 G1-RT1

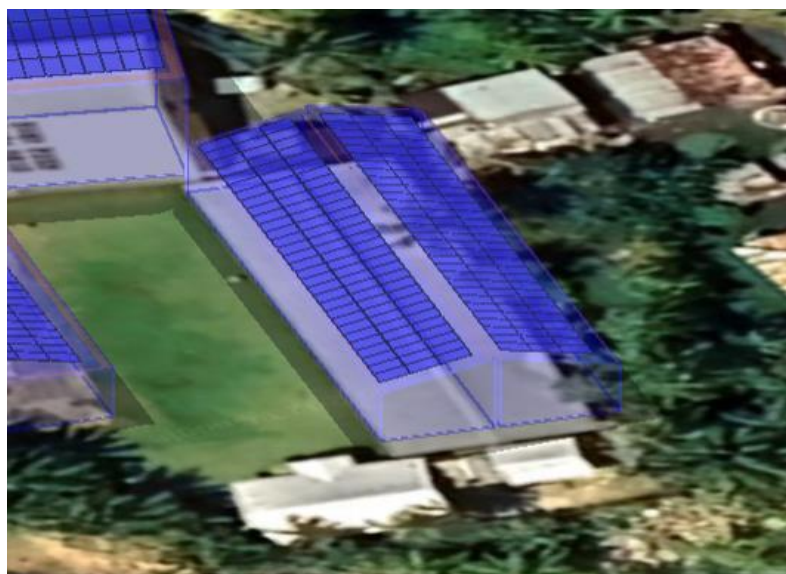


Figure 2. 3D model of PV array for G1 -RT1



Figure 3. Edge of the Sapota 1-storey elementary school roof



Figure 4. Edge of the Sapota 1-storey elementary school roof 2



Figure 5. West part of the Sapota 1-storey elementary school roof



Figure 6. Sapota 1-storey elementary school interior. No visible leakage

1.2 G1-CP1

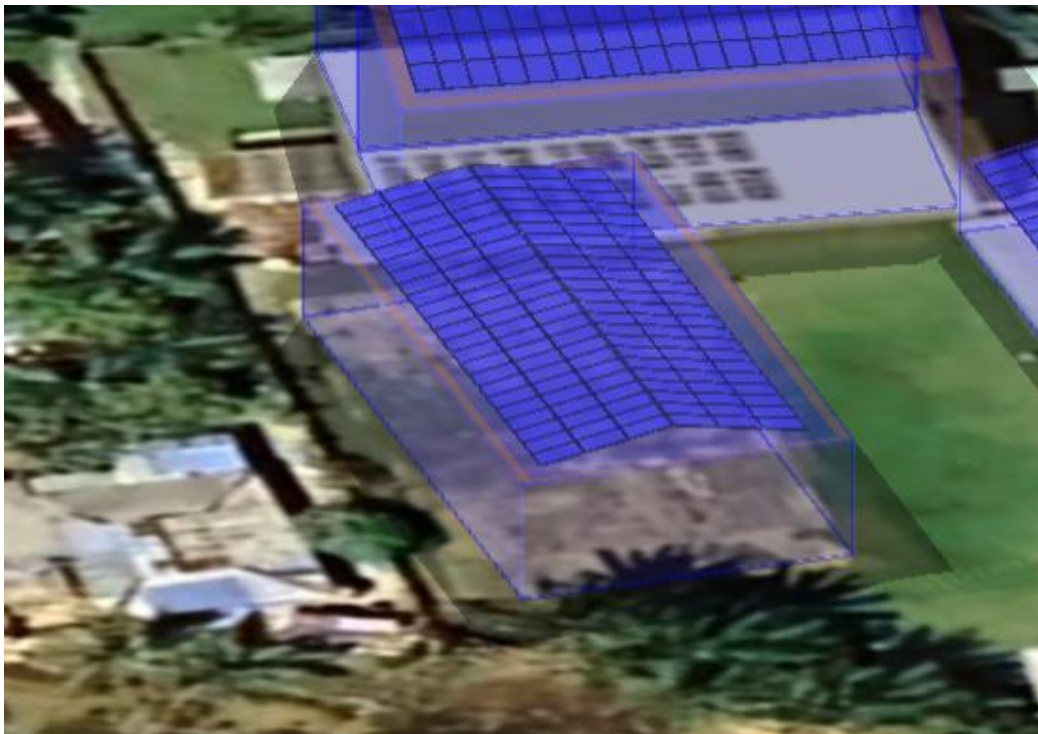


Figure 7. 3D model of PV array for G1 -CP1



Figure 8. Sapota plot, basketball court (back-left) and 2-storey elementary school from the 1-storey elementary school



Figure 9. Second view (from Eastern roof) from the Sapota 1-storey elementary school

1.3 G1-RT2

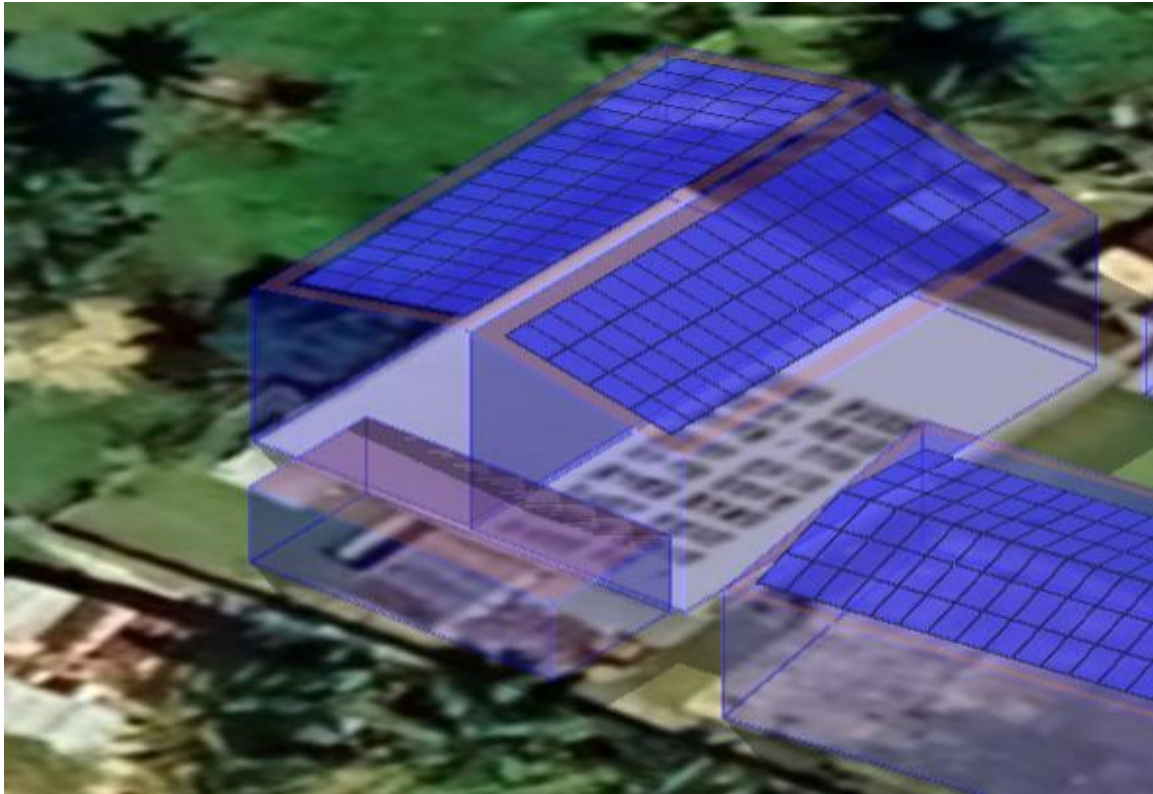


Figure 10. 3D model for PV array for G1 -RT2



Figure 11. Roof structure of the Sapota 2-storey elementary school



Figure 12. Figure 11. roof structure of the Sapota 2-storey elementary school 2



Figure 13. Roof structure details of the Sapota 2-storey elementary school 2



Figure 14. Sapota current technical house for the solar system. It will be emptied such as the small warehouse in order to leave the space for the brand new technical building



Figure 15. Sapota current solar system, that will be removed and placed somewhere else by CPUC



Figure 16: wall and roof structure of the technical building (current)



Figure 17. Edge of the current warehouse, to be reused or demolished and rebuilt by the contractor



Figure 18. Sapota current warehouse (left), 2-storey high school (middle), 1-storey elementary school (right) and basketball court (bottom)



Figure 19. Same view of Sapota 2-storey high school. The concrete blocks on the grass are not connected to a sewage system or tubes.

1.4 G1-RT3



Figure 20. 3D model of PV array for G1-RT3



Figure 21. Drone front elevated view of roof in G1-RT3



Figure 22. Front of the Sapota church. At the left is the existing canopy and the community building at its back.



Figure 23. View of existing canopies

These existing small canopies can be removed to accommodate the new canopy (to be supplied and installed by the Contractor) closer to the buildings, in order to avoid any future issues of coastal erosion and waves impacts. The available plot should not step further on the church's entrance.



Figure 24. community building and church (right) roofs. Antenna to be removed



Figure 25. Community building roof



Figure 26. Trees at the south of the community building, to be trimmed by the community



Figure 27. Church and community building (right) roofs, with metal rebars coming out of the structure.



Figure 28. Sapota church roof structure



Figure 29. Sapota church structure 2



Figure 30. Slightly damaged edge of the Sapota church roof



Figure 31. Edge of the Sapota church



Figure 32. Inside the Sapota church



Figure 33. Cracks and humidity on the ceiling of the community building



Figure 34. Current water collection

1.5 G1-CP2

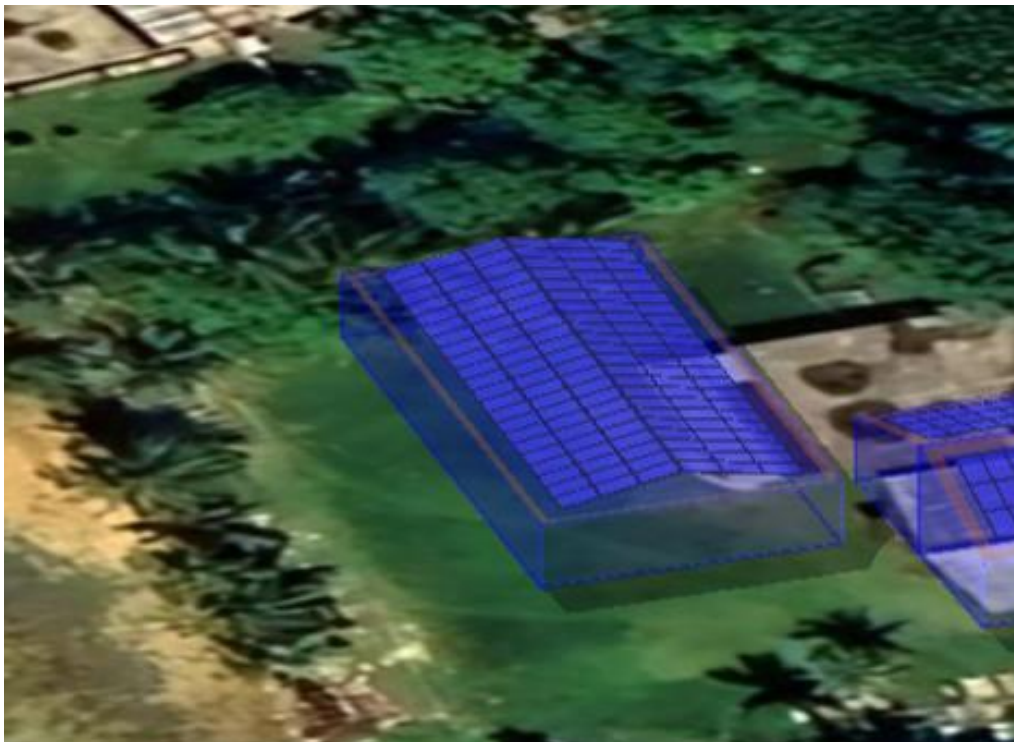


Figure 35. 3D model of PV array for G1-CP2



Figure 36. Aerial view of plot of land available to install canopy. Picture taken before installation of existing canopy.

2. G2



Figure 37. Top-view of PV array locations in G2

2.1 G2-RT1

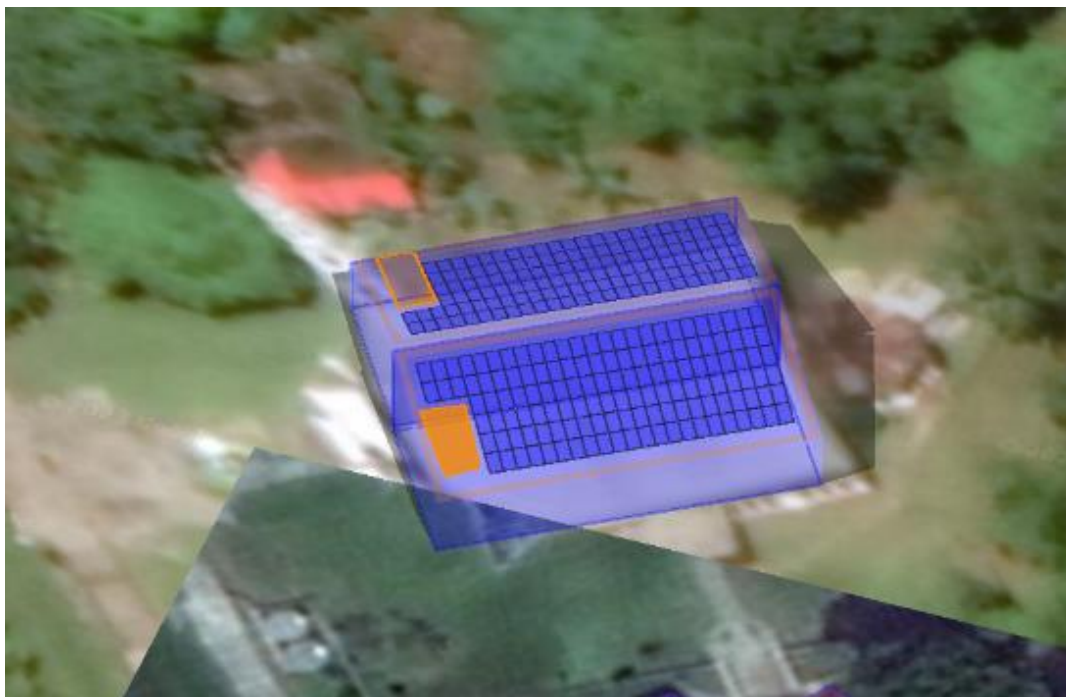


Figure 38. 3D model of PV array for G2- RT1



Figure 39. Drone footage of roof in G2-RT1

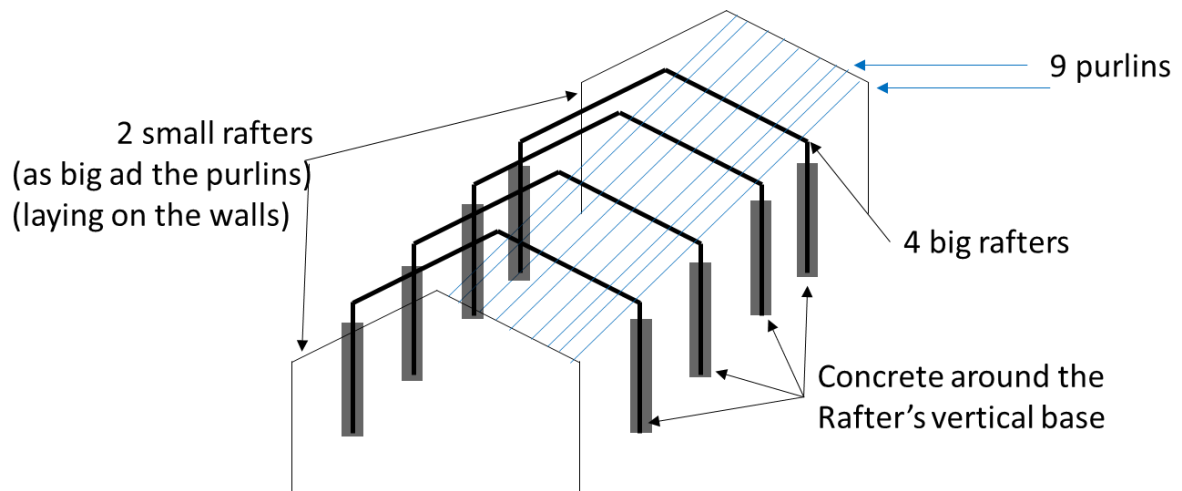


Figure 40. Details on structural elements for G2-RT1



Figure 41. View on jetty next to G2-RT1



Figure 42. Jetty close to G2-RT1, approximately 100 yards to its North



Figure 43. Side view of the new Fein church from the East



Figure 44. View of roof edge in G2-RT1



Figure 45. View of one of the two towers of Fein new church



Figure 46. View inside Fein new church



Figure 47. Leaks inside of Fein new church



Figure 48. Concrete base of the trusses of Fein new church



Figure 49. Junction main trusses-purlins of Fein new church



Figure 50. View of truss and purlins of Fein new church



Figure 51. Steel purlins of Fein new church



Figure 52. Footings of the Fein new church. no damage, only slightly on the plaster



Figure 53. Footings of the Fein new church. No damage, only slightly on the plaster 2

2.2 G2-RT2

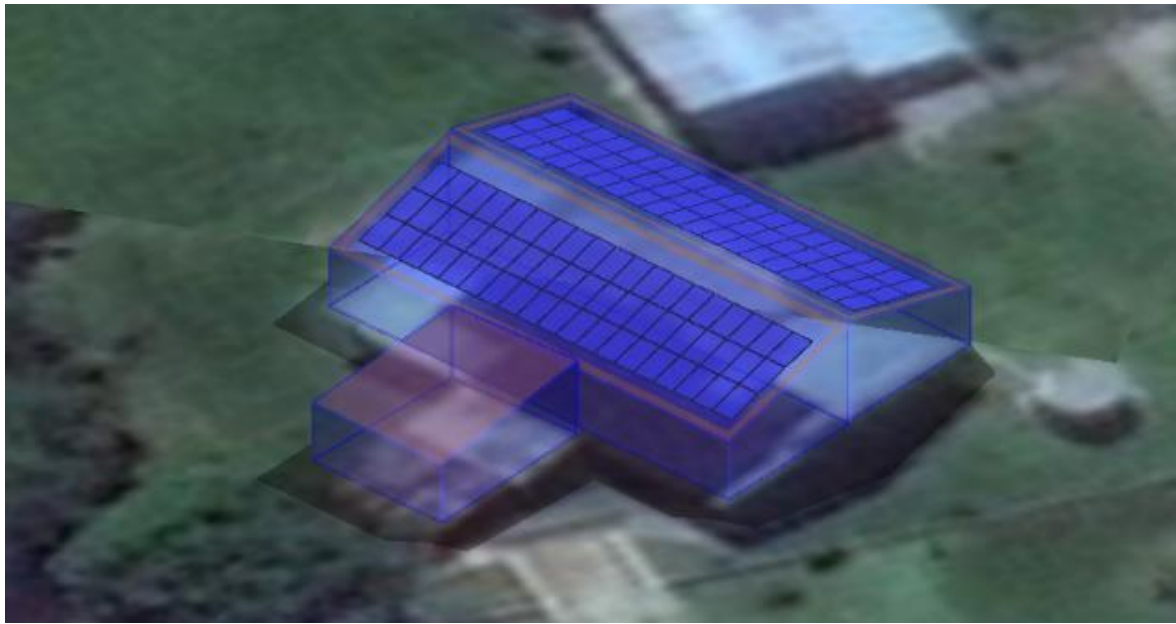


Figure 54. 3D model of PV array for G2- RT2



Figure 55. Aerial view of G2-RT2 roof



Figure 56. Side view of the old church of Fein



Figure 57. Roof edge of the Fein old church



Figure 58. Interior view of the Fein old church



Figure 59. Steel structures of the old church's roof (truss)

2.3 G2-RT3

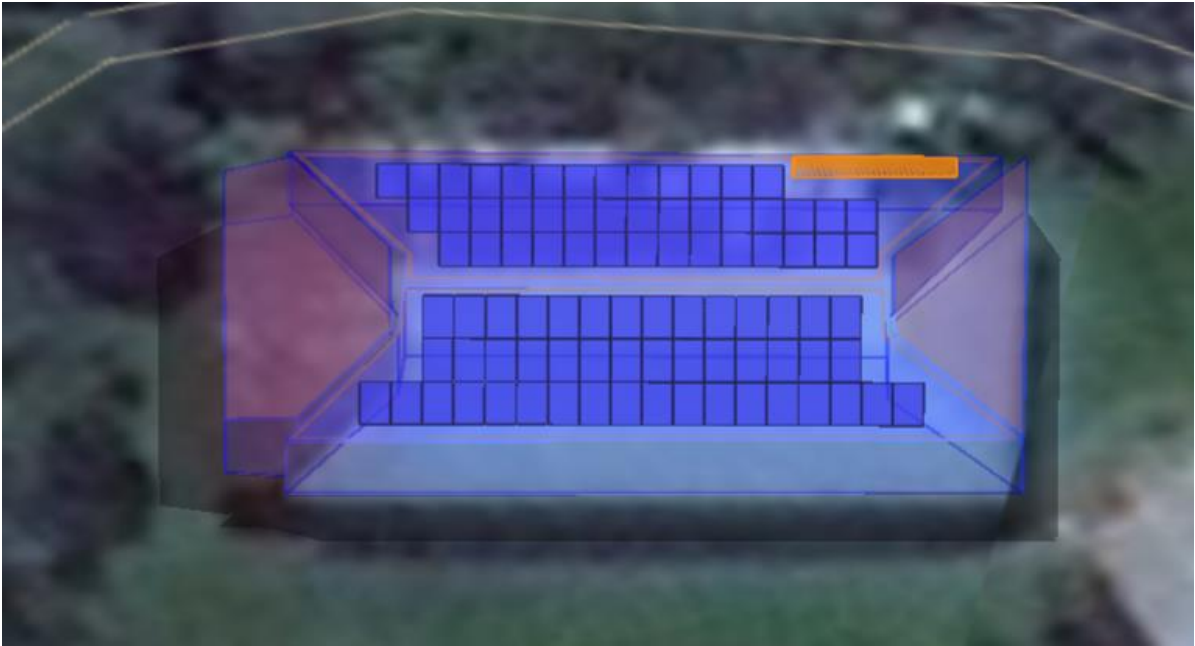


Figure 60. 3D model of PV array for G2- RT3



Figure 61. Drone view of roof in G2-RT3



Figure 62. Parish hall damaged wooden structure



Figure 63. Parish hall wooden structure



Figure 64. Parish hall roof edge



Figure 65. Parish hall damage on outside wall structure.

3. G3



Figure 66. Top-view of PV array locations in G3

3.1 G3-RT1

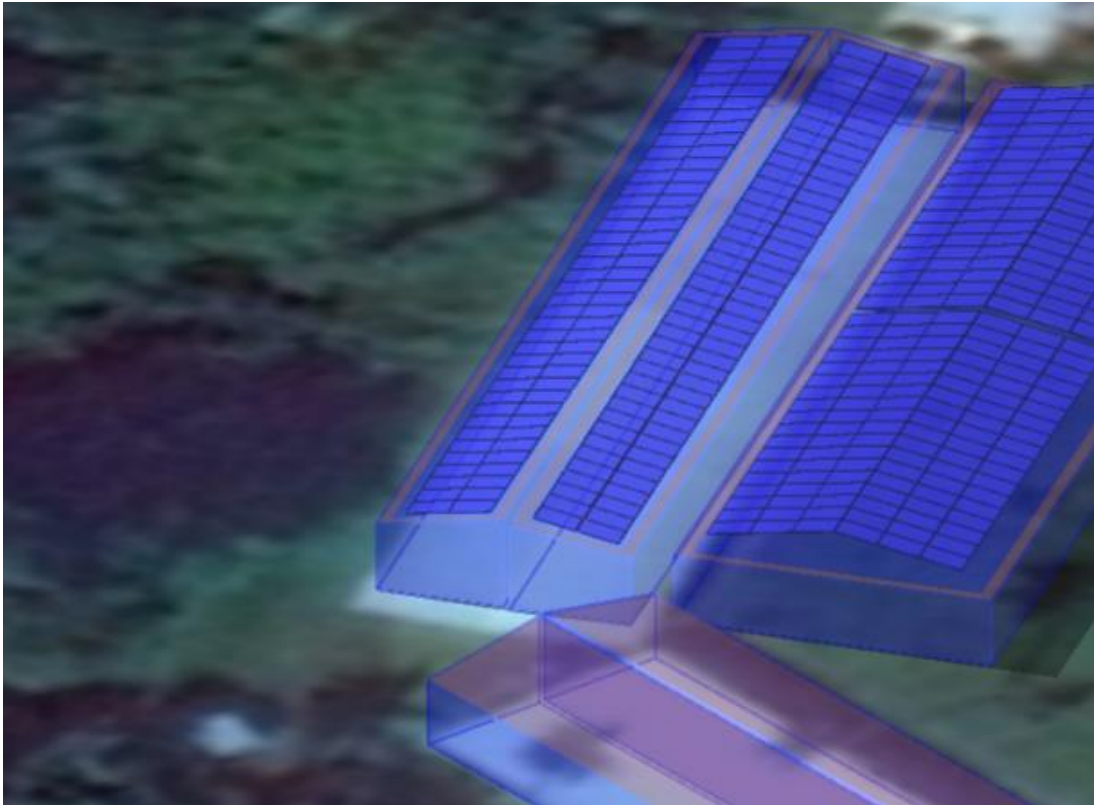


Figure 67. 3D model of PV array for G3-RT1



Figure 68. Distant view of roof for G3 - RT1



Figure 69. North-Western edge of the Mesa plot(Left-Elementary school. Middle-Space for the AC cabinet Right-Municipal office)



Figure 70. View of the Mesa elementary school



Figure 71. Mesa elementary school roof



Figure 72. Wooden structure of the Mesa elementary school



Figure 73. Ceiling of the Mesa elementary school



Figure 74. Leak inside the Mesa elementary school



Figure 75. Leak inside the Mesa elementary school 2



Figure 76. Water collection of the Mesa elementary school

3.2 G3-CP1

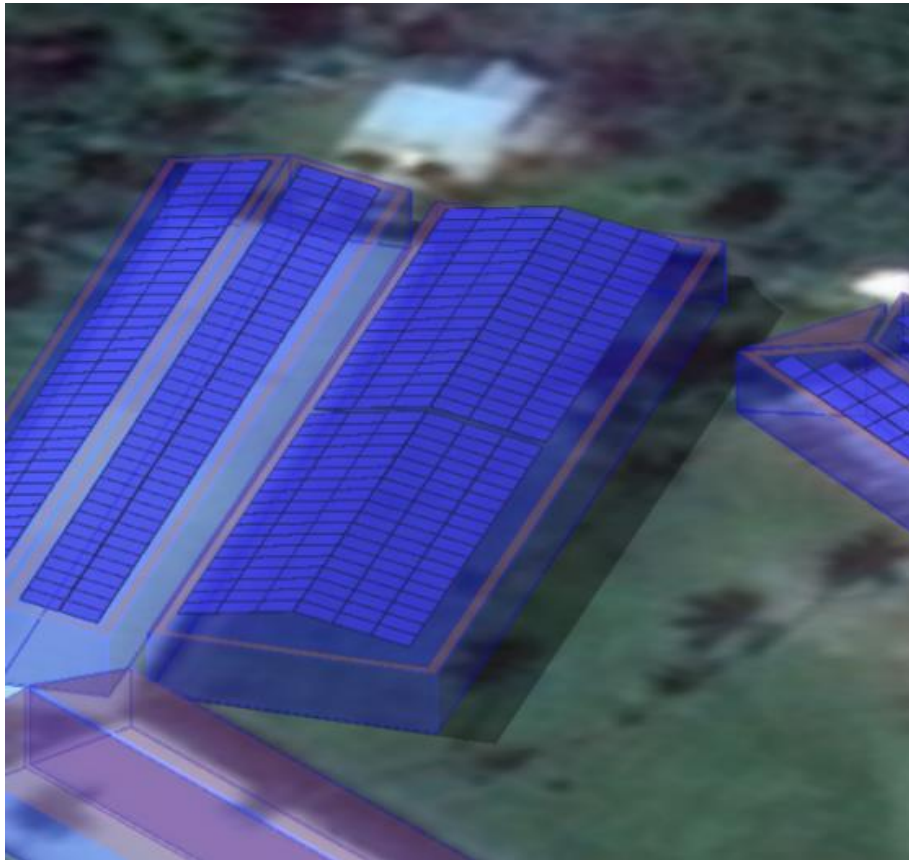


Figure 77. 3D model of PV array for G3-CP1



Figure 78. View of land plot for installation of Canopy

3.3 G3-RT2

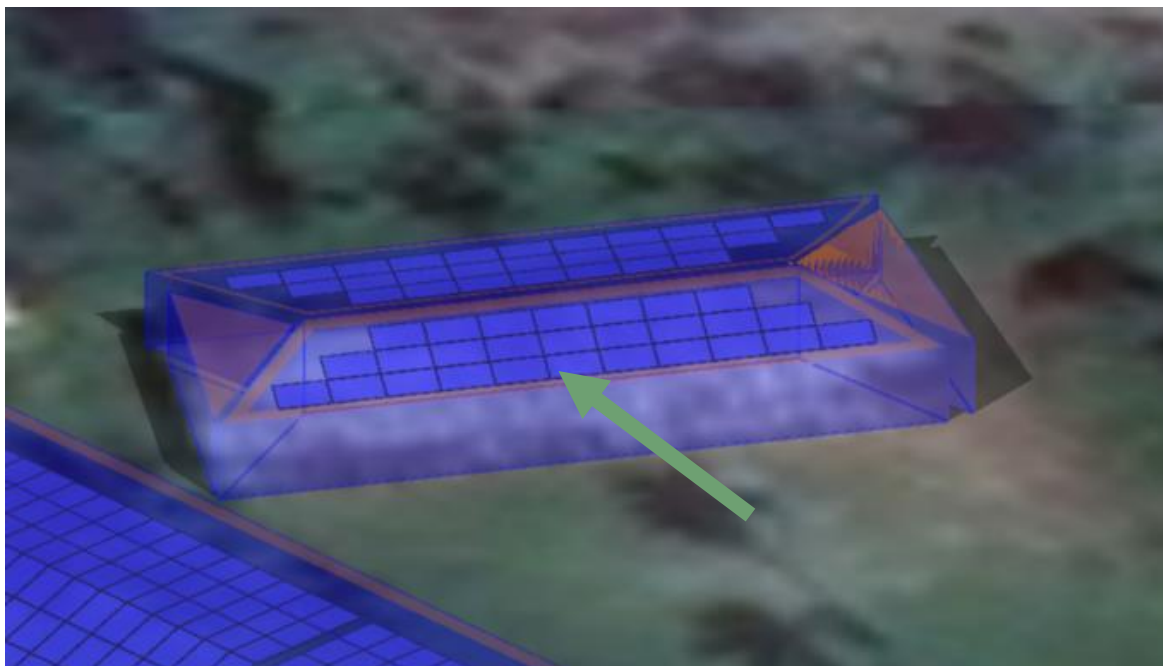


Figure 79. 3D model of PV array for G3-RT2



Figure 80. View of municipal office



Figure 81. View of the municipal office



Figure 82. Side of the Mesa Municipal office displaying rain gutter



Figure 83. Overhang of the Mesa municipal office



Figure 84. Roof of the Mesa municipal office



Figure 85. Interior of the Mesa municipal office (solid concrete structure with no leaks)



Figure 86. Edge roof of the Mesa municipal office



Figure 87. Rusty nails of the Mesa municipal office



Figure 88. Path to the Mesa municipal office, after the small creek



Figure 89. Small creek at Mesa, the concrete pipe is 77cm high

3.4 G3-RT3

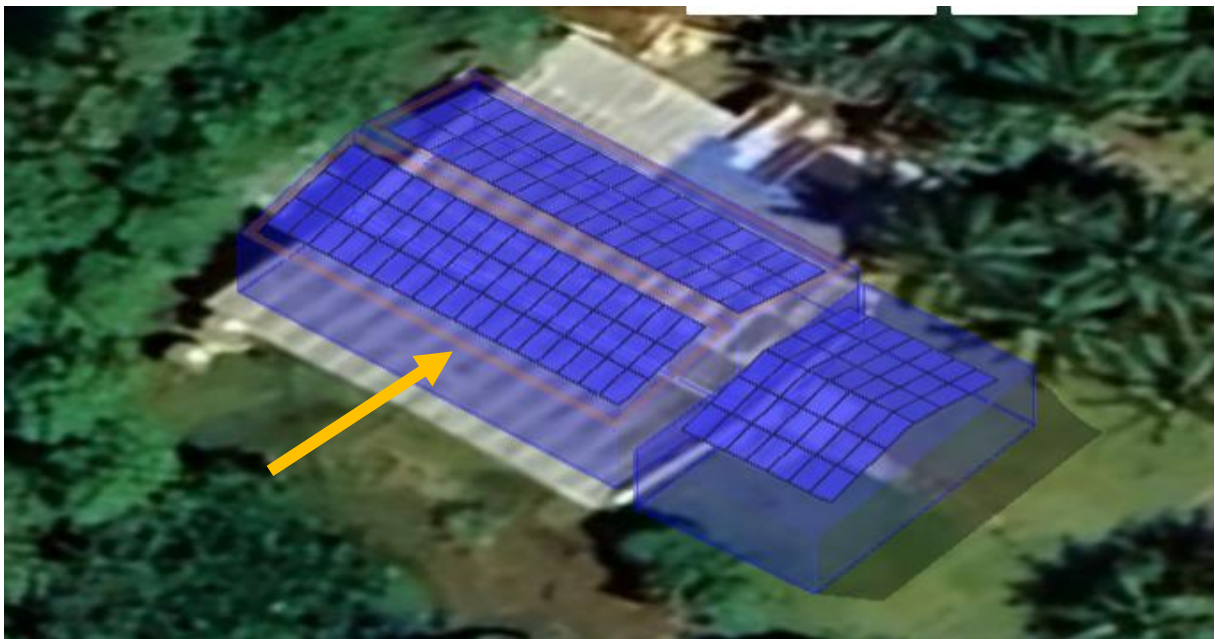


Figure 90. 3D model of PV array for G3-RT3



Figure 91. Back view of church building



Figure 92: Mesa church and plot for the future canopy, from the road. The entrance could be removed.



Figure 93. Mesa church side and water tanks



Figure 94. Mesa church overhang



Figure 95. Mesa church rafters-structure fastening, tied to a steel bar coming out of the wall



Figure 96. Mesa church roof nails



Figure 97. Mesa church roof



Figure 98. Mesa church roof 2 and edge (Eastern view)



Figure 99. Western view of the Mesa church roof and trees to be trimmed by the community



Figure 100. Mesa church interior. No leak



Figure 101. Mesa road and a small creek (Concrete pipe for road crossing in the middle of the picture)

3.5 G3-CP2

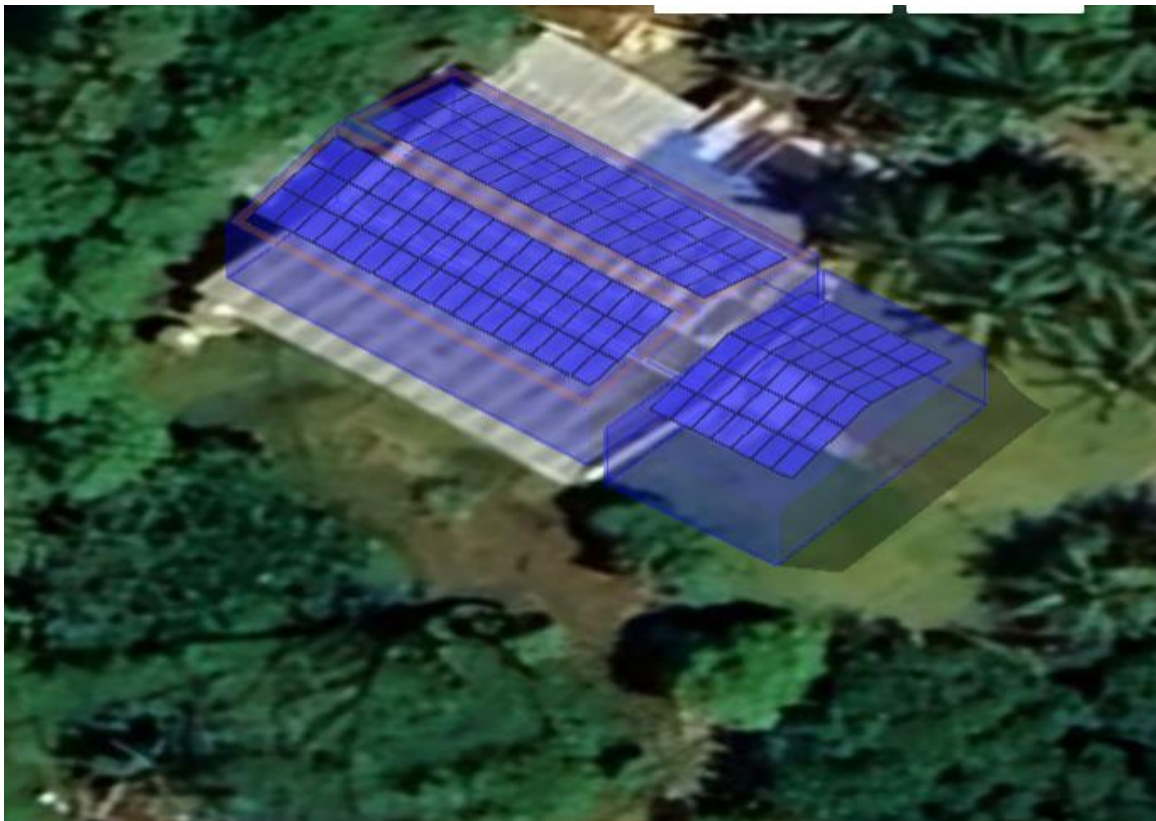


Figure 102. 3D model of PV array for G3-CP2



Figure 103. View of available land plot for installation of canopy



Figure 104. Mesa church entrance