

**APPENDIX A:
CHANNEL ISLANDS
TELECOMMUNICATIONS PROJECT
REVISED PROJECT APPLICATION**

Appendix A: Channel Islands Telecommunication Project Revised Project Application

Introduction

The Channel Islands Telephone Company (CITC) is proposing to install telecommunication facilities at up to 15 locations within the Channel Islands National Park. These new telecommunication facilities would serve to improve the currently limited telecommunication capabilities on the five islands, and would allow for private and government cellular phone and Internet service between the five islands and the mainland.

Purpose and Need

The proposed project is needed because National Park Service (NPS) and National Oceanic and Atmospheric Administration (NOAA) staff currently have limited ability to communicate between locations within the Channel Islands National Park and with personnel and other contact points on the mainland. The islands have a very high frequency radio system that allows communication among radio-equipped ranger stations on the five islands, as well as from handheld radios. Satellite Internet service is also available at some ranger stations that allows secure access to government Internet provider addresses on the mainland. NPS personnel also possess cellular telephones; however, cellular service is unreliable because the islands are at the outer limit of the cellular service area. The location of the islands makes cellular telephone service unreliable on some parts of the islands and wholly absent on others. Recreational visitors to the islands have no landline telephone access and little to no cellular telephone reception.

The proposed project would provide cellular telephone and landline service at all ranger stations, campgrounds, residences of the five islands, and the Santa Rosa Island and San Miguel Island airstrips, as well as on all portions of the islands within an approximately 0.5-mile radius of each of the up to 15 proposed facility locations. The new service is intended to be consistent and reliable with a reliability of available service of 99.99999 percent. The new service would provide telecommunication capabilities to both Channel Islands National Park staff and visitors, including service for personal cellular telephone communications.

The purpose of the proposed telephone service is to provide:

- Improved communication for NPS and NOAA staff, researchers, NPS residents, and recreational visitors among the five islands, as well as between the islands and the mainland
- Communication in the case of an emergency or accident to allow for swifter emergency response
- Improved real-time reporting of weather data to allow for more accurate travel predictions, which will reduce unnecessary and/or aborted boat and aircraft trips to and from the islands for both NPS and commercial/recreational vehicles

Project Location

CITC proposes to install cellular telecommunication infrastructure at 15 locations on the following four Channel Islands:

- San Miguel Island
- Santa Barbara Island
- Santa Cruz Island
- Santa Rosa Island

The 15 project locations are listed in Table 1 and are shown on Figures 1 through 8. The project originally included 18 project locations, but locations 2, 8, and 13 have been removed from the project and are not analyzed in this application.

All but two of the 15 proposed project locations are under the sole jurisdiction of NPS. The two exceptions are locations 3 and 4. Locations 3 and 4 are on San Miguel Island, which is owned by the U.S. Navy. In addition, the existing facilities at location 4 were built by NOAA. Installation of the proposed telecommunication facilities at locations 3 and 4 would require approval of the U.S. Navy.

Table 1: Site Locations for Telecommunication Infrastructure Installation	
No.	Location Name
1	Santa Barbara Island Ranger Station
2	Deleted from the proposed project
3	San Miguel Island Ranger Station
4	San Miguel Island Marine Mammal Research Facility
5	Santa Cruz Island Scorpion Housing Area
6	Santa Cruz Island Scorpion Ranch
7	Santa Cruz Island Prisoners Harbor Day Use Area
8	Deleted from the proposed project
9	Santa Cruz Island Smugglers Adobe
10	Santa Cruz Island Smugglers Kiosk
11	Santa Rosa Island Main Ranch
12	Santa Rosa Island Campground
13	Deleted from the proposed project
14	Santa Rosa Island Maintenance Office
15	Santa Rosa Island Johnson's Lee
16	Santa Rosa Island Housing
17	Santa Rosa Island Power Station
18	Santa Rosa Island Ranch Residence

Figure 1: Proposed Project Site Locations

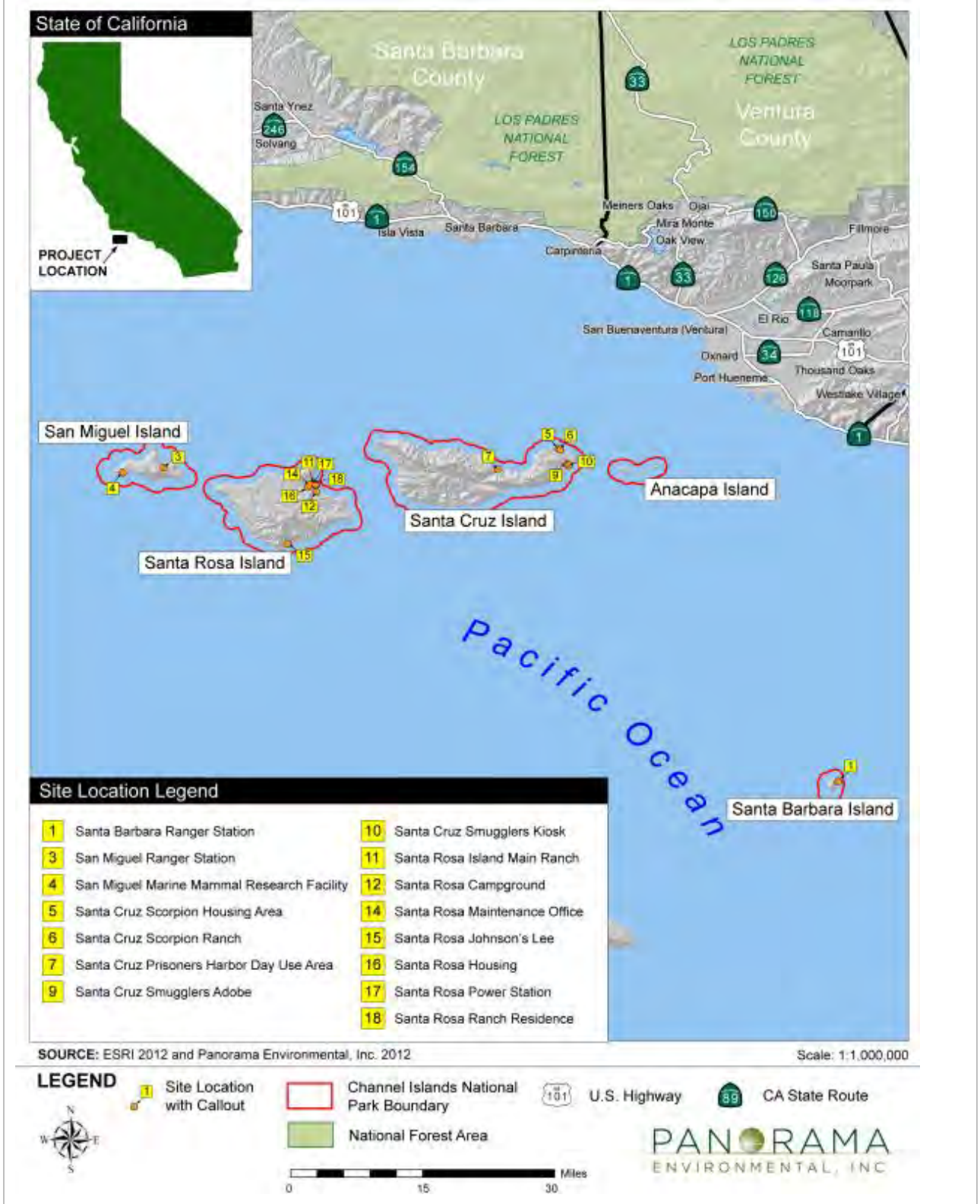


Figure 2: Proposed Project Site Location 1



Figure 3: Proposed Project Site Location 3



SOURCE: ESRI 2012, U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009, and Panorama Environmental, Inc. 2012

LEGEND

● Proposed Site Location



0 1,000 2,000 3,000 4,000 5,000 Feet

PANORAMA ENVIRONMENTAL, INC.

Figure 4: Proposed Project Site Location 4



Figure 5: Proposed Project Site Locations 5, 6, 9, and 10



SOURCE: ESRI 2012, U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009, and Panorama Environmental, Inc. 2012

LEGEND

● Proposed Site Location



0 1,000 2,000 3,000 4,000 5,000 Feet

PANORAMA
ENVIRONMENTAL, INC.

Figure 6: Proposed Project Site Location 7



Figure 7: Proposed Project Site Locations 11, 12, 14, 16, 17, and 18



SOURCE: ESRI 2012, U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009, and Panorama Environmental, Inc. 2012

Figure 8: Proposed Project Site Location 15



SOURCE: ESRI 2012, U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009, and Panorama Environmental, Inc. 2012

LEGEND

● Proposed Site Location



0 1,000 2,000 3,000 4,000 5,000 Feet

PANORAMA
ENVIRONMENTAL, INC.

Project Elements

PROPOSED TELECOMMUNICATION FACILITIES

Project Locations 1, 9, and 17

Proposed project locations 1, 9, and 17 would include installation of the standard telecommunication facilities listed below. All of these facilities would be painted as appropriate to minimize visual impacts, with color selection and painting coordinated with NPS.

- A Very Small Aperture Terminal (VSAT) two-way satellite dish antenna, either roof-mounted or ground-mounted, approximately 4 feet in diameter, and painted to minimize visual intrusion
- One of the following two types of antennas:
 - A new omni-directional antenna, a cylindrically-shaped antenna approximately 20 inches long and 2 inches in diameter, typically roof- or pole-mounted, and painted to minimize visual intrusion
 - A new dual-band Yagi antenna, a triangularly-shaped antenna approximately 15.5 inches long and 10.5 inches wide at the base, typically roof- or pole-mounted, and painted to minimize visual intrusion
- Up to 20 new solar panels (including ten replacement panels for the NPS solar energy system and ten panels for the new CITC solar energy system)
 - High-efficiency photovoltaic modules composed of poly-crystalline cells
 - Each tempered, low-reflection, and glass-covered solar panel would measure approximately 39 inches wide by 65 inches long by 2 inches thick and would produce 240 watts
 - Ground-mounted on new aluminum solar panel frameworks with four cement footings that would require excavation approximately 14 inches wide by 36 inches deep
- New, higher capacity, 240-watt solar panels to replace existing, lower capacity, 55-watt NPS solar panels (if requested by NPS)
- An electrical system completely independent of existing NPS power systems
- Cables to connect the various telecommunication facilities
- One or more Global System for Mobile Communication (GSM) wireless phones
- A ground-mounted equipment cabinet that would measure approximately 69 inches tall, 72 inches wide, and 44 inches deep, painted a cream color, that would not require a foundation but would be placed on a 5-foot by 3-foot patch of cleared and level ground
- The following items would be stored in the equipment cabinet:
 - 16 solar panel batteries, each of which would measure approximately 6.5 inches wide by 13.5 inches long by 11 inches tall

- A new pico¹ cell telecommunication box containing an inverter and controller for the telecommunications system, measuring approximately 13 inches long, 11 inches wide, and 2 inches thick
- A 6,000-British Thermal Unit (BTU) air conditioner to maintain optimal temperatures for the batteries and pico cell telecommunication box
- Safety signs that would be visible on all of the telecommunication equipment

Location 1 would also include the installation of an upgraded weather station, which would include a wind sensor, barometric pressure sensor, and humidity sensor. Manufacturer's specifications for each of the proposed project elements are included in this appendix.

All proposed telecommunication equipment at locations 1, 9, and 17 would be mounted using screws and brackets on existing poles, exterior walls, or roofs of existing structures wherever possible. Cables to connect the various telecommunication facilities would be run along the surface of existing structures where feasible, or would be installed in either aboveground or underground conduit. The length of cable conduit to be installed at each project location would not exceed approximately 10 feet. Solar panels would be installed in new frame structures, either on existing roofs or on the ground. Alternatively, if NPS requests replacement of existing solar panels for the independent NPS power system, and if such replacement of existing solar panels frees up space for the proposed CITC solar panels, then the proposed solar panels would be mounted on existing frame structures.

Project Locations 3, 4, 5, 6, 7, 14, 15, and 16

Proposed project locations 3, 4, 5, 6, 7, 14, 15, and 16 would include the installation of an all-in-one unit. Each of these project locations currently contains a site of cleared, packed, and level earth that would be a suitable site for the proposed all-in-one unit, and no ground disturbance, vegetation clearing, or earthwork would be required. The all-in-one unit would contain all of the project elements listed for locations 1, 9, and 17, but all of these project elements would be contained in one ground-mounted unit. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted² VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment

¹ A pico cell is a wireless communication system typically covering a small area, such as in-building (e.g., offices, shopping malls, and train stations).

² Installation of ground-mounted equipment would not require any ground-disturbing activities, as the equipment would sit on the ground surface.

- Fencing around the perimeter of the all-in-one unit to screen the unit from view; this fencing would be compatible with any existing fencing in the proximity of the all-in-one unit and would be reviewed and approved by NPS prior to installation

The all-in-one units would serve the identical functions as the equipment proposed for locations 1, 9, and 17; however, because the all-in-one units would have fewer solar panels than the solar panel arrays at locations 1, 9, and 17, the batteries for the all-in-one units would take longer to charge to full capacity. The project locations using all-in-one units may, therefore, experience reductions in service capacity during periods of prolonged inclement weather. The capacity for emergency communications would have the highest priority among the communication services provided by the proposed project, and the capacity for emergency communications would be maintained at all times.

GSM Phones

GSM wireless phones could be placed anywhere within the signal radius of the proposed telecommunication equipment. The signal radius would vary according to topography and other conditions at each proposed location, but would generally be within an approximately 0.5-mile radius around the telecommunication equipment. One or more solar-powered GSM payphones would be installed at a majority of the project locations with the exception of locations 9, 11, and 14. These payphones may be wall-mounted on existing structures. Alternatively, where use of existing structures is not practical or feasible, GSM payphones may be mounted either aboveground on concrete block requiring no digging or ground disturbance, or on new poles inserted in the ground.

Location 11 would include the installation of GSM handheld phones and GSM wireless desk phones instead of a GSM payphone. The GSM desk phones would be installed inside the existing structures at location 11. The GSM wireless desk phones are shown at the end of this revised project application under the heading Proposed Telecommunication Equipment.

Installation and Construction Methods

TRANSPORTATION TO PROJECT LOCATIONS

Installation of the proposed telecommunication equipment would require bringing teams of installation crews, telecommunication equipment, and tools to each of the 15 project locations. Equipment and materials would be shuttled from the mainland to the intended island via boat or helicopter, depending on the site location. The applicant intends to shuttle all materials from the mainland to the islands using normally scheduled boat trips from the park concessionaire³. The applicant would use a privately chartered boat in the event that park concessionaire boats are not running at desired dates or times, are unavailable, or additional trips are needed beyond typically scheduled boat trips. All private charter trips would need to be approved and permitted by NPS.

³ Total weight of the standard telecommunication system with batteries is approximately 1,800 pounds; weight of the rack is approximately 120 pounds; and weight of the solar GSM payphone with stand is approximately 200 pounds.

As a third option, the applicant may also use normally scheduled NPS boat trips to shuttle construction workers and equipment to the various islands; however, NPS boats do not travel to each island on a daily basis, nor do these boats always have space available to accommodate the transport of construction crews and materials. Use of NPS transportation to and from the islands would be performed on a cost reimbursement basis. NPS vehicles would be used in most cases to convey the materials from the boat landing site to the installation sites. Use of NPS vehicles would be on a cost reimbursement basis. A helicopter would be chartered to carry the materials from either the mainland to the installation site or from the boat landing site to the installation site in those cases where NPS vehicles are not available or where there are no roads to the installation site. All helicopter access would need to be approved and permitted by NPS. It is anticipated that NPS vehicles would be available to access most installation sites and that helicopter use would be rare.

Accommodations are not available on the islands for the installation crews except in cases of emergency, such as when inclement weather prevents a return trip to the mainland. Temporary overnight accommodations can be provided at most of the ranger stations on the five islands in such circumstances. Construction crews would return to the mainland at the end of each day under most circumstances; however, if nearby camping accommodations are available and NPS approves of their use, then construction crews would camp overnight at such accommodations. The applicant would pay all necessary park fees to use these campsites.

The uncertainty of available boat trips could affect the size of installation crews. A two-person installation crew would typically be used for equipment installation at each location. A three-person crew would be used for equipment installation over a shorter time period if the boat schedules were to restrict the time available at a given site due to logistical reasons.

STAGING AREAS

Project construction and installation would require a temporary staging area for equipment at each project site. Each temporary staging area would need to be approximately 16 square feet in area, and would be used for a maximum of 48 hours. These temporary storage areas would ideally be located within 10 feet of the site of equipment installation. All temporary storage areas would need to be reviewed and approved by NPS staff prior to use. Proposed staging areas for each of the 15 project locations are shown in figures included in this appendix.

Cleared areas that are paved, covered with gravel, or covered with packed and cleared earth are available for equipment staging at each location. These cleared areas are considered fully disturbed areas and part of existing NPS facilities. All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation. No ground disturbance would be required for the staging of telecommunication equipment.

INSTALLATION CREW AND SCHEDULE

Each of the 15 sites would require between 2 and 2.5 working days for a two- or three-person crew to complete equipment installation. The hours of installation may vary each day due to boat

transportation schedules, but would be approximately 8 hours a day. Installation crew members would typically return to the mainland at the end of each day, and return to the island on the next available boat the following day to continue or finish installation at each site. Therefore, the entire installation process would require between 30 and 37.5 work days to complete using only two-person crews. Installation may require fewer days to complete if construction crews are able to stay on the islands overnight at the various camping areas. Installation activities would be conducted over approximately four months due to the irregular schedule of boat transportation and the likelihood of schedule interruptions due to inclement weather.

INSTALLATION EQUIPMENT

Installation equipment would include a ladder and hand tools, including battery-operated power tools. The majority of the proposed telecommunication facilities, as previously described, would be mounted on existing structures using screws and brackets.

Some of the installation sites may require limited ground disturbance for preparation of temporary equipment storage areas and installation of telecommunications equipment such as solar panel racks, equipment storage cabinets, and pole-mounted pay phones. Additional temporary ground disturbance may be required at select locations (i.e., locations 1, 9, and 17) for underground conduit installation. Archaeological clearance by NPS or oversight by an on-site archaeological monitor would be required for all ground-disturbing activities.

Equipment installed at locations within the Scorpion, Prisoners Harbor, and Smugglers drainages (i.e., locations 6, 7, 9, and 10) would be placed above historical flood levels in consultation with Channel Islands NPS staff. Plans would be submitted to NPS showing the orientation of the equipment in relation to the floodplain for NPS review and approval.

A Spill Prevention, Control, and Countermeasure (SPCC) plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment.

To protect the islands from spread of invasive species, the following measures would be taken:

- All plants or seeds used to revegetate any areas disturbed during project installation activities would be native plants.
- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

GROUND-DISTURBING ACTIVITIES

Equipment installation that requires ground disturbance would be avoided to the extent possible. Ground mounting of equipment, where equipment would be placed on the ground surface and no ground-disturbing activities would be required, would be the preferred option. Ground-mounted equipment would be placed on paved areas or previously disturbed ground wherever possible.

Where ground-mounting of equipment is not possible and ground-disturbing activities would be required, cement would be used for foundations and water for cement mixing would either come from local sources or would be transported from the mainland as directed by NPS staff. All ground-disturbing and excavation activities would be performed by hand tools brought to the site by the two- or three-person construction crew. Vegetation removal for installation of ground-mounted equipment and foundations would be avoided to the extent possible, and would not involve the removal or trimming of any trees or bushes.

Operation and Maintenance

CITC would conduct routine maintenance of new telecommunication facilities as needed. Maintenance would be performed if telecommunication equipment is damaged or a customer reports a service problem. Maintenance workers would likely access facilities via regularly scheduled concessionaire boat trips to the islands. A private helicopter may be chartered to bring maintenance personnel to and from the islands if maintenance to the communication link is considered vital by NPS and repairs must be performed in an expedient manner. CITC would notify all subscribers of any expected service outage due to scheduled maintenance. Subscribers would be called after repairs to verify that service has been restored.

Descriptions of Specific Project Locations

LOCATION 1: SANTA BARBARA ISLAND RANGER STATION

CITC would replace a portion of the NPS 55-watt solar panels with 240-watt solar panels. This would provide more power for NPS along with dedicated solar panels for use by CITC without co-mingling power with NPS. Below are the calculations expressing this.

NPS Current Power utilizing 20 panels:

NPS Solar panels: 55 watts X 20 panels = 1,100 watts

Proposed Power: Using same number of panels providing more power for NPS

NPS Power replaced with: 240 watts X 10 panels = 2,400 watts

CITC Power provided by: 240 watts X 10 panels = 2,400 watts

**Utilizing existing space *No additional visual Intrusion at Maintenance Shop house *Separated Power*

Two separate electrical systems would be in place. This alternative would increase the park service's capacity by 1,300 watts. The VSAT antenna can be mounted to building or ground-mounted, hidden from ocean view.

GSM Payphone Options:

CITC can place a standalone GSM payphone near the campground.

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- Solar panels – 20 new solar panels
- VSAT/Antenna – 1 VSAT and 1 Antenna
- Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- Safety signs visible on all telecommunication equipment
- Weather station upgrade – wind sensor, barometric pressure sensor, and humidity sensor
- GSM payphone – Standalone facility or wall-mounted

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

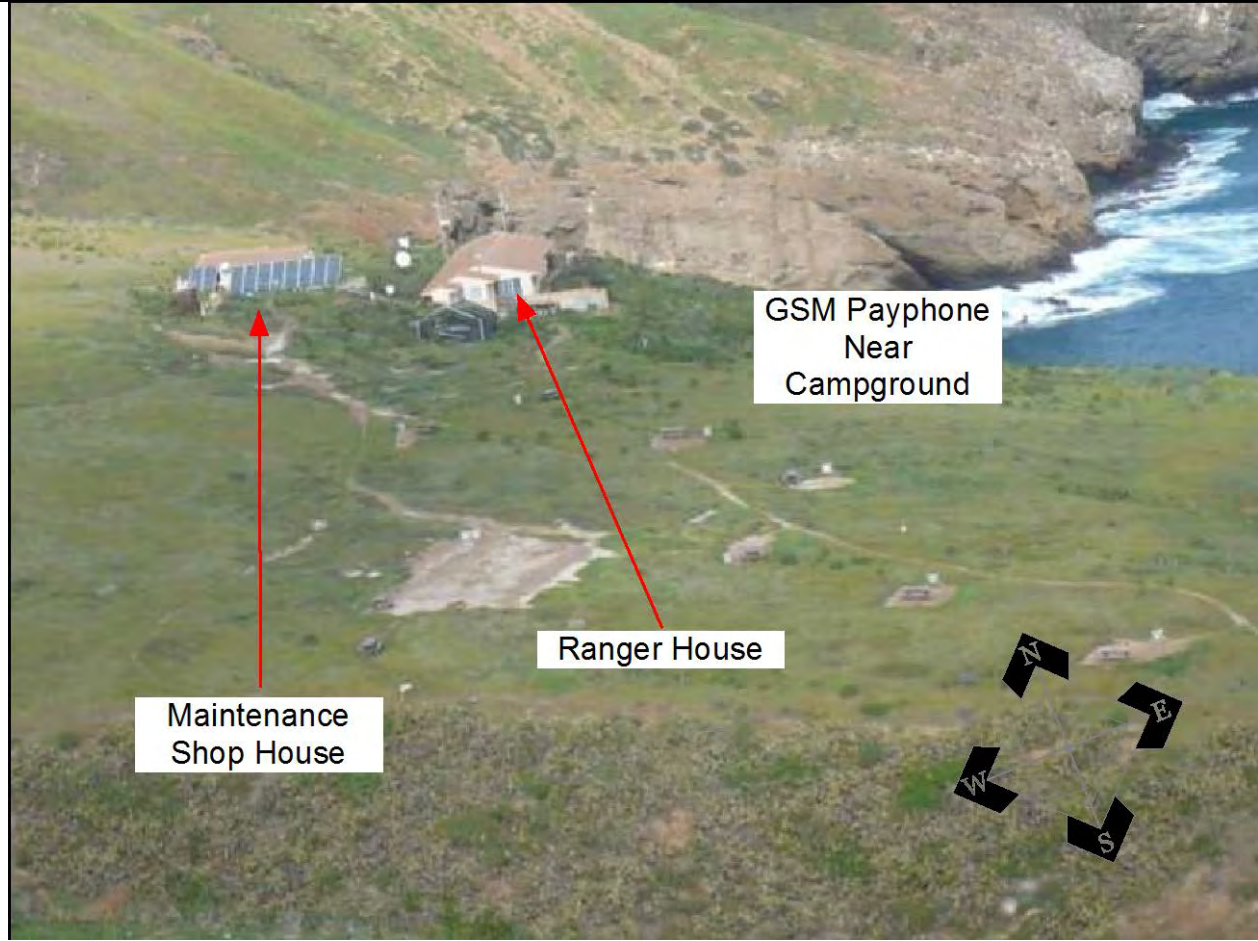
Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service.

General Public Users Provided

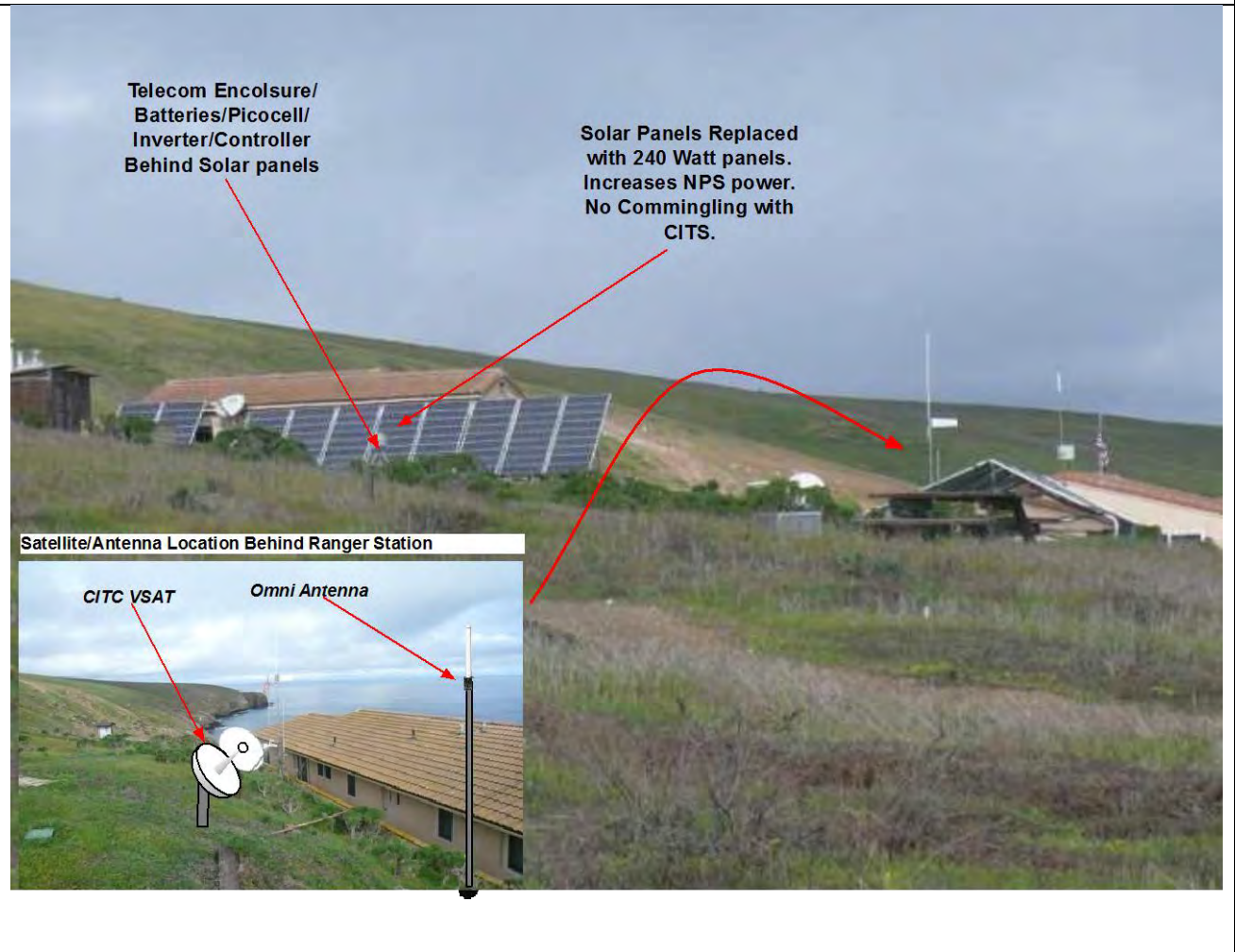
- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service.

Figure 1.1: Santa Barbara Island Ranger Station Aerial View showing Ranger House and Maintenance Shop House. The GSM payphone would be placed near the campground as a standalone facility.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 1.2: Santa Barbara Island Ranger Station Aerial View.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 1.3: Santa Barbara Island Ranger Station Staging.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 1.4: Santa Barbara Island Ranger Station Wiring. An aboveground conduit can be used to take the wiring from the CITC solar panels and telecom enclosure at the front of the Maintenance Shop to the back of the Ranger House where the antenna and CITC VSAT would be located. Alternatively, the conduit could be run underground alongside existing NPS conduit.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Staging Figure 1.5: Santa Barbara Island Ranger Station Staging.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 2: ANACAPA ISLAND RANGER STATION

This location has been removed from the project and is therefore not analyzed in this application.

LOCATION 3: SAN MIGUEL ISLAND RANGER STATION

CITC can place a portable all-in-one unit anywhere around the San Miguel Ranger Station. Suggested staging areas for the all-in-one unit are shown on Figure 3.5. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep, and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment
- Fencing can be constructed around the all-in-one unit to provide visual shielding. The fencing would fully enclose the telecommunications unit and be tall enough to block sightlines to the solar panels, cabinet, and VSAT satellite from ground level vantage points at various locations throughout selected area.

A suitable site can be located that contains a site of cleared, packed and level earth, requiring no ground disturbance, vegetation clearing, or earthwork.

The GSM payphone will be mounted on the front of the San Miguel Ranger Station as shown on Figure 3.1. If preferred a standalone GSM payphone can be installed anywhere near the San Miguel Island Ranger Station similar to the all-in-one solution. The suggested location for a standalone GSM payphone would be near the campground.

GSM Payphone Mounting Options:

Mounted to Ranger Station:

CITC can place a GSM payphone near the front of the Ranger Station as shown on Figure 3.1, mounting the phone to the Ranger Station structure.

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- GSM payphone – Standalone facility or mounted to ranger station
- Web camera – Optionally placed on the telecom enclosure and connected to NPS network allowing remote log-on by NPS personnel.

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service
- Web camera allowing remote log-on viewing

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 3.1: San Miguel Island Ranger Station Photograph Front view showing GSM payphone location and southwest view of building.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 3.2: San Miguel Ranger Station Aerial view. Provides view of buildings identifying two possible all-in-one unit installation locations.



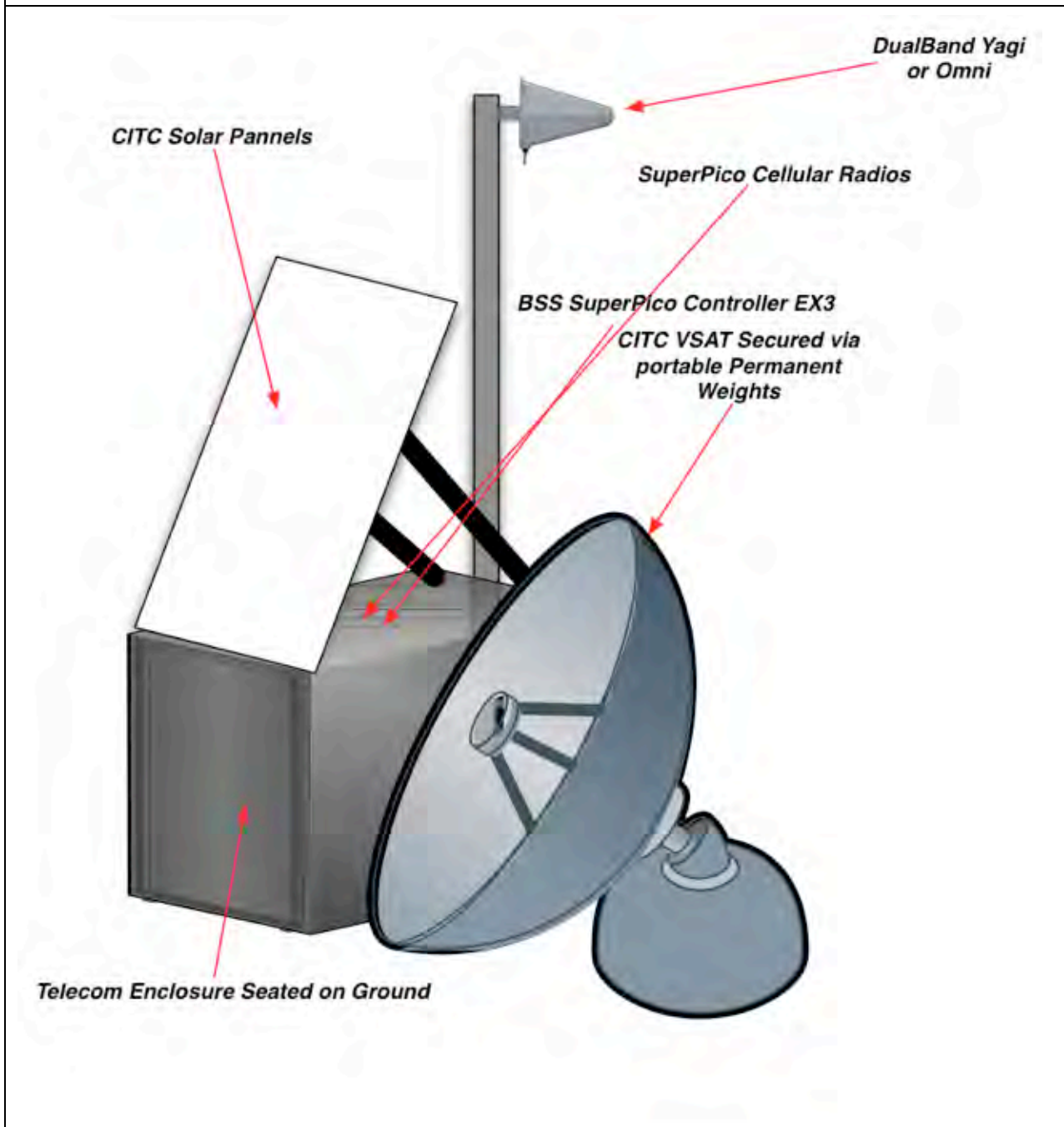
Source: GOOGLE EARTH IMAGERY WITH CITC ANNOTATION.

Figure 3.3: San Miguel Island Ranger station suggested staging areas for all-in-one solution placement.



Source: GOOGLE EARTH IMAGERY WITH CITC ANNOTATION

Figure 3.4: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 4: SAN MIGUEL ISLAND MARINE MAMMAL RESEARCH FACILITY

CITC can place a portable all-in-one solution anywhere around the San Miguel Marine Mammal Research facility. Suggested staging areas for the all-in-one unit are shown on Figure 4.2 along with suggested placement of the all-in-one unit. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep, and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment
- Fencing can be constructed around the all-in-one unit to provide visual shielding. The fencing would fully enclose the telecommunication unit and be tall enough to block sightlines to the solar panels, cabinet, and VSAT satellite from ground level vantage points at various locations throughout selected area.

A suitable site can be located and selected by NPS that contains an area of cleared, packed and level earth, requiring no ground disturbance, vegetation clearing, or earthwork.

The GSM payphone will be mounted on the front of the San Miguel Marine Mammal Research facility shed as in option 1. If preferred a standalone GSM payphone can be installed anywhere near the San Miguel Marine Mammal Research facility as in option 1.

GSM Payphone Mounting Options:

Mounted to San Miguel Island Marine Mammal Shed:

CITC can place a GSM payphone near the front of the Ranger Station as shown on Figure 3.1, mounting the phone to the Ranger Station structure.

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- GSM payphone – Standalone facility or mounted to research shed
- Web camera – Optionally placed on the telecom enclosure and connected to NPS network allowing remote log-on by NPS personnel

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service
- Web camera remote log-on viewing

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 4.1: San Miguel Island Marine Mammal Research Facility Photograph. Showing all-in-one proposed location and GSM payphone location.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 4.2: San Miguel Marine Mammal Research Staging area.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

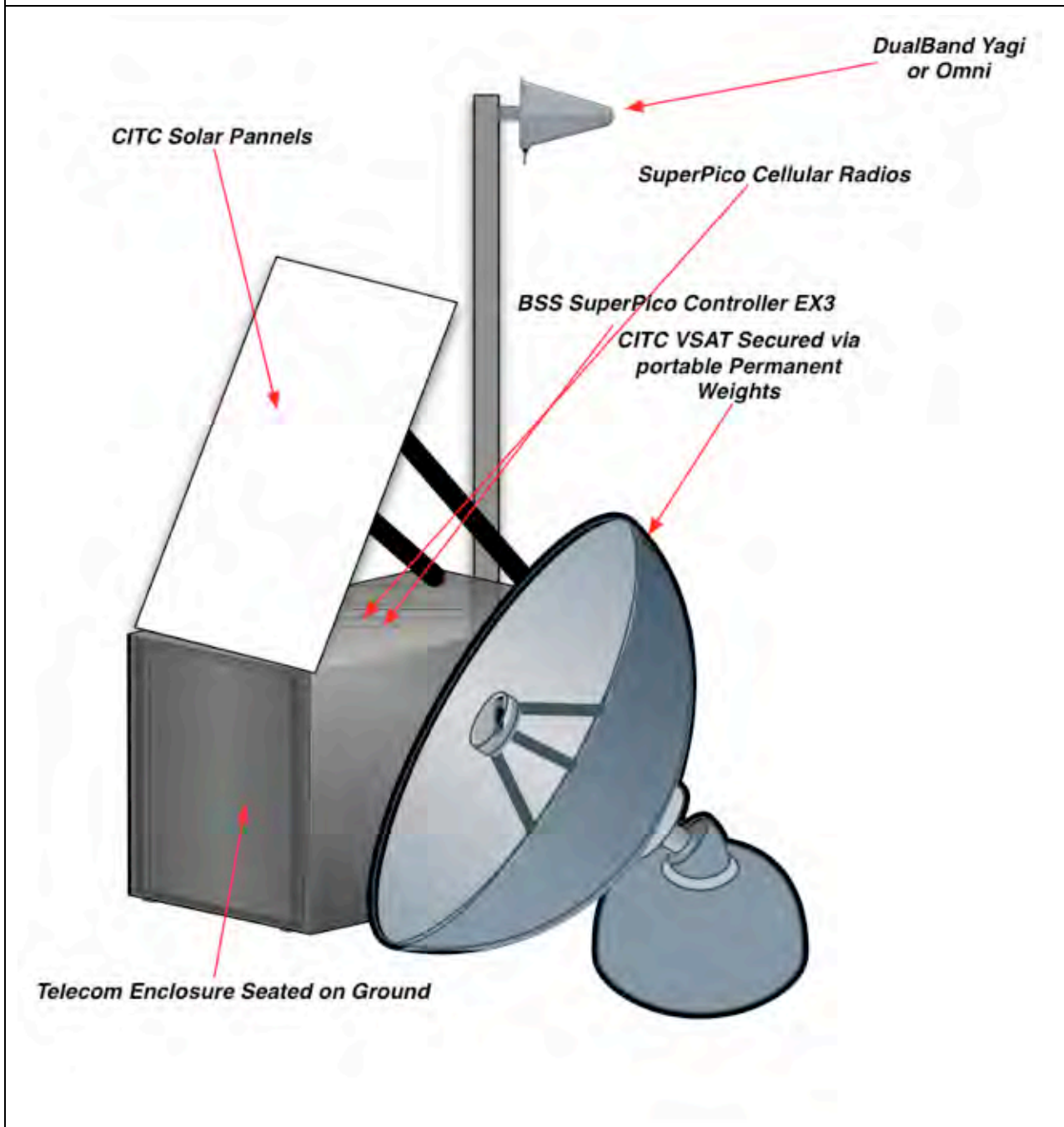
Figure 4.3: San Miguel Island Marine Mammal Research Facility Photograph. Showing area around research facility available for all-in-one solution placement.

Alternative site for portable all-in-one solution can be selected from available area if suggested location is not desired.



Source: Channel Islands Telephone Company Telecommunications Grant Application

Figure 4.4: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 5: SANTA CRUZ ISLAND SCORPION HOUSING AREA

CITC can place a portable all-in-one solution anywhere around the Santa Cruz Island Scorpion Housing area. Suggested staging areas for the all-in-one unit are shown on Figure 5.3 along with suggested placement of the all-in-one unit. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep, and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment
- Fencing can be constructed around the all-in-one unit to provide visual shielding. The fencing would fully enclose the telecommunications unit and be tall enough to block sightlines to the solar panels, cabinet, and VSAT satellite from ground level vantage points at various locations throughout selected area.

A suitable site can be located and selected by NPS that contains an area of cleared, packed and level earth, requiring no ground disturbance, vegetation clearing, or earthwork.

GSM Payphone Mounting Options:

CITC can place a GSM payphone on or in the kitchen/living room building. The GSM payphone would not be a standalone structure and, therefore, no ground disturbance would be required for installation of the GSM payphone.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- GSM payphone –mounted to exterior or placed in interior of the kitchen/living room building

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

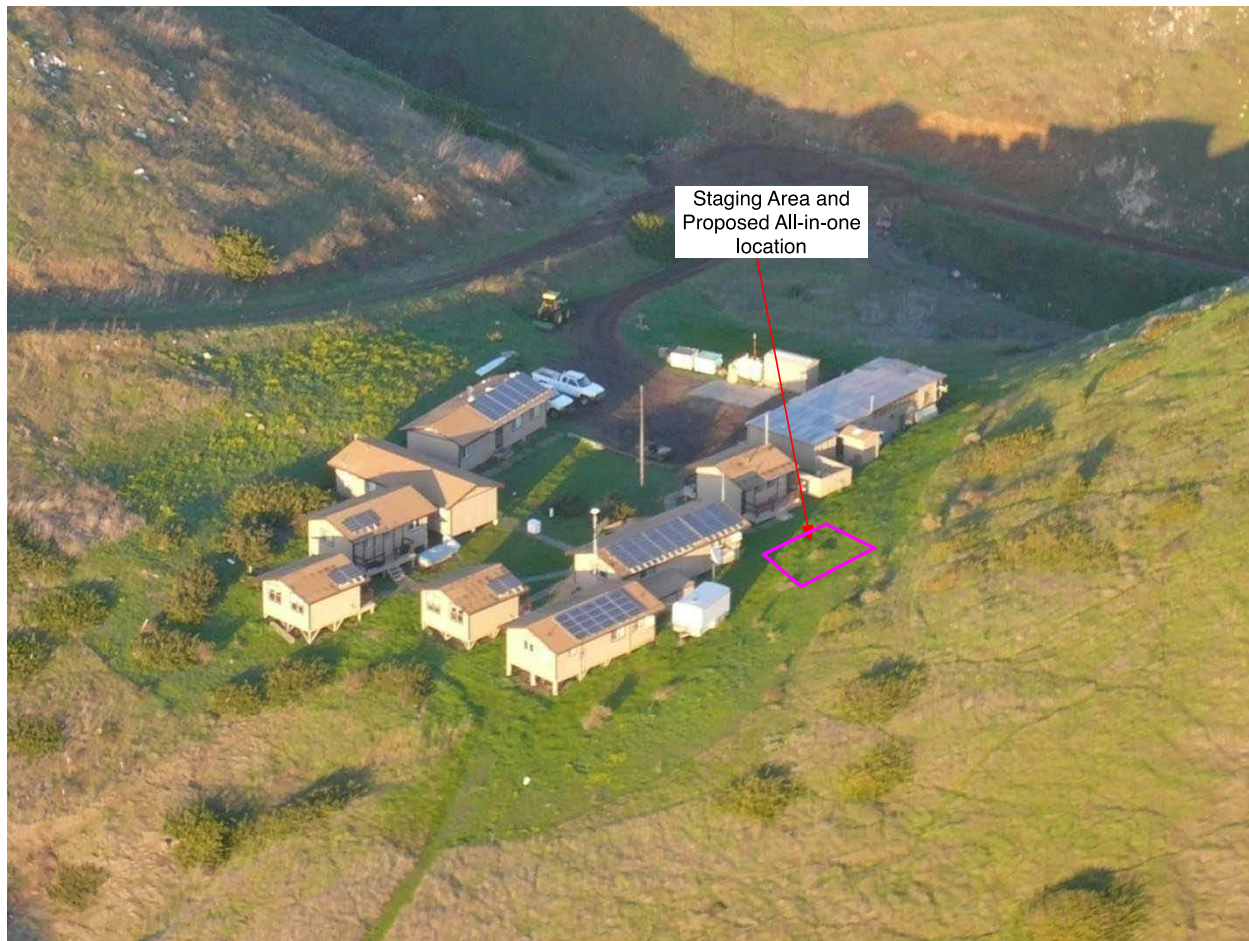
- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 5.1: Santa Cruz Island Scorpion Housing Area Overview Photograph.



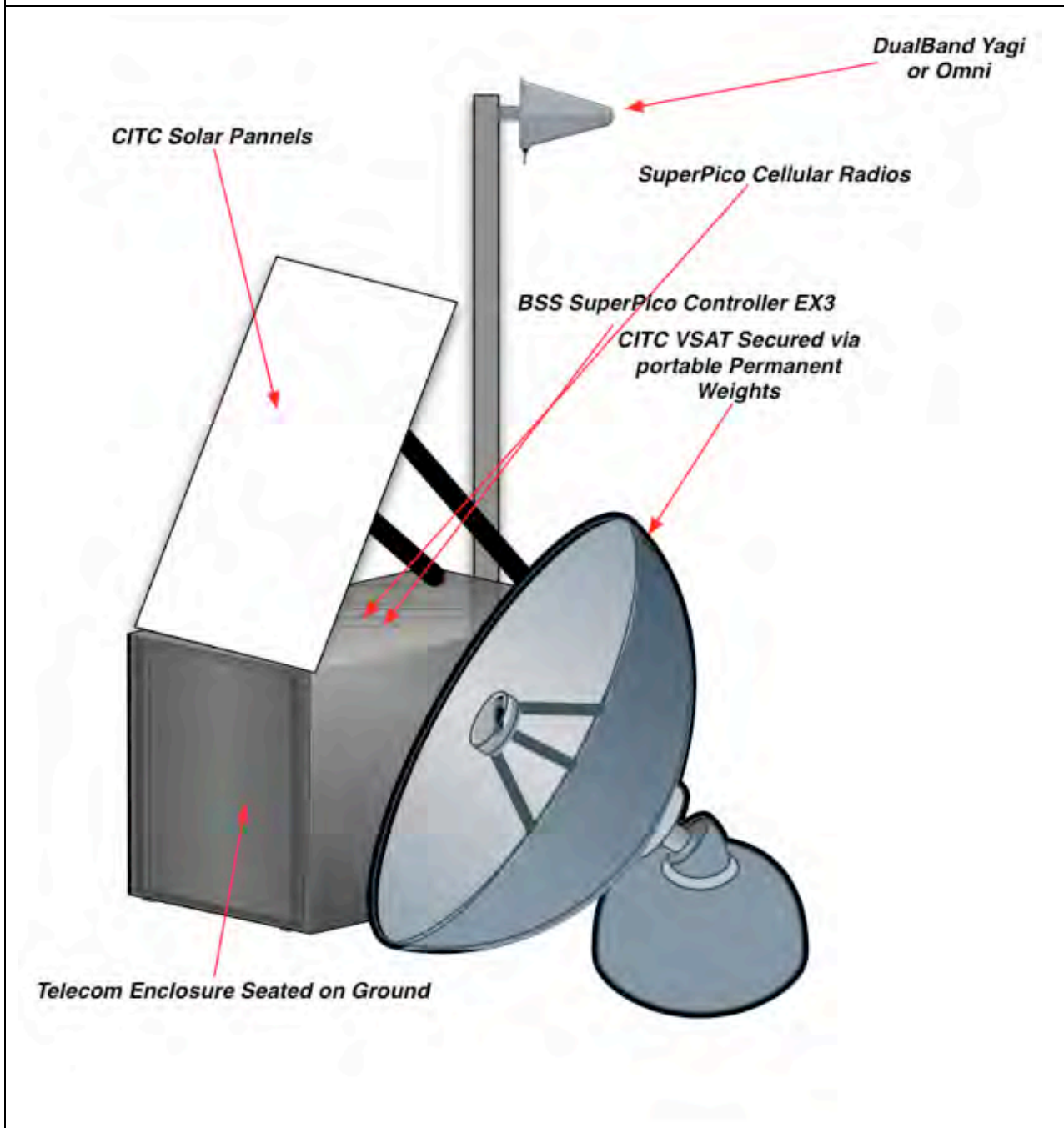
SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 5.2: Santa Cruz Island Scorpion housing staging areas and suggested all-in-one facility area. No digging or trenching required for wiring all equipment in close proximity. Installation requires no wire suspension, aboveground conduit, or trenching to connect equipment; since the telecom enclosure, CITC VSAT, antenna and solar panels are all seated on or around the structure. All wiring will be affixed to the structure using cable mounts. All-in-one solution would be self-contained with nothing affixed to existing structures.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 5.3: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 6: SANTA CRUZ ISLAND SCORPION RANCH

CITC can place a portable all-in-one solution near the Santa Cruz Island Scorpion Ranch Corral and maintenance area. Suggested staging areas for the all-in-one unit are shown on Figure 6.2 along with suggested placement of the all-in-one unit. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep, and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment
- Fencing can be constructed around the all-in-one unit to provide visual shielding. The fencing would fully enclose the telecommunications unit and be tall enough to block sightlines to the solar panels, cabinet, and VSAT satellite from ground level vantage points at various locations throughout selected area.

A suitable site can be located and selected by NPS that contains an area of cleared, packed and level earth, requiring no ground disturbance, vegetation clearing, or earthwork.

GSM Payphone Options:

CITC can place a standalone GSM payphone near the existing corral.

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - Solar panels – 10 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna

- Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- GSM payphone – Standalone facility or mounted to restroom.

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

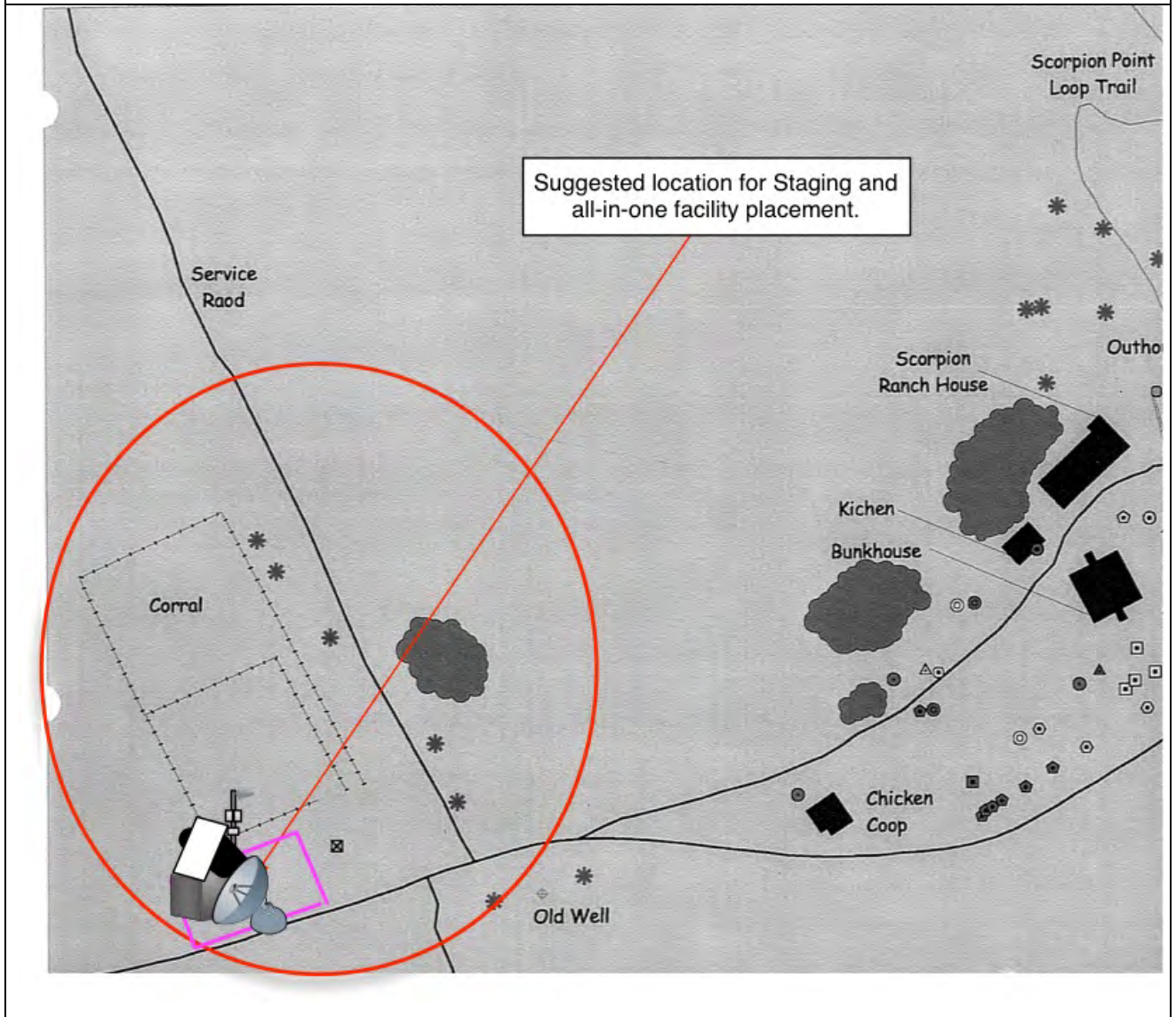
- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 6.1: Santa Cruz Island Scorpion Ranch Photograph #1.



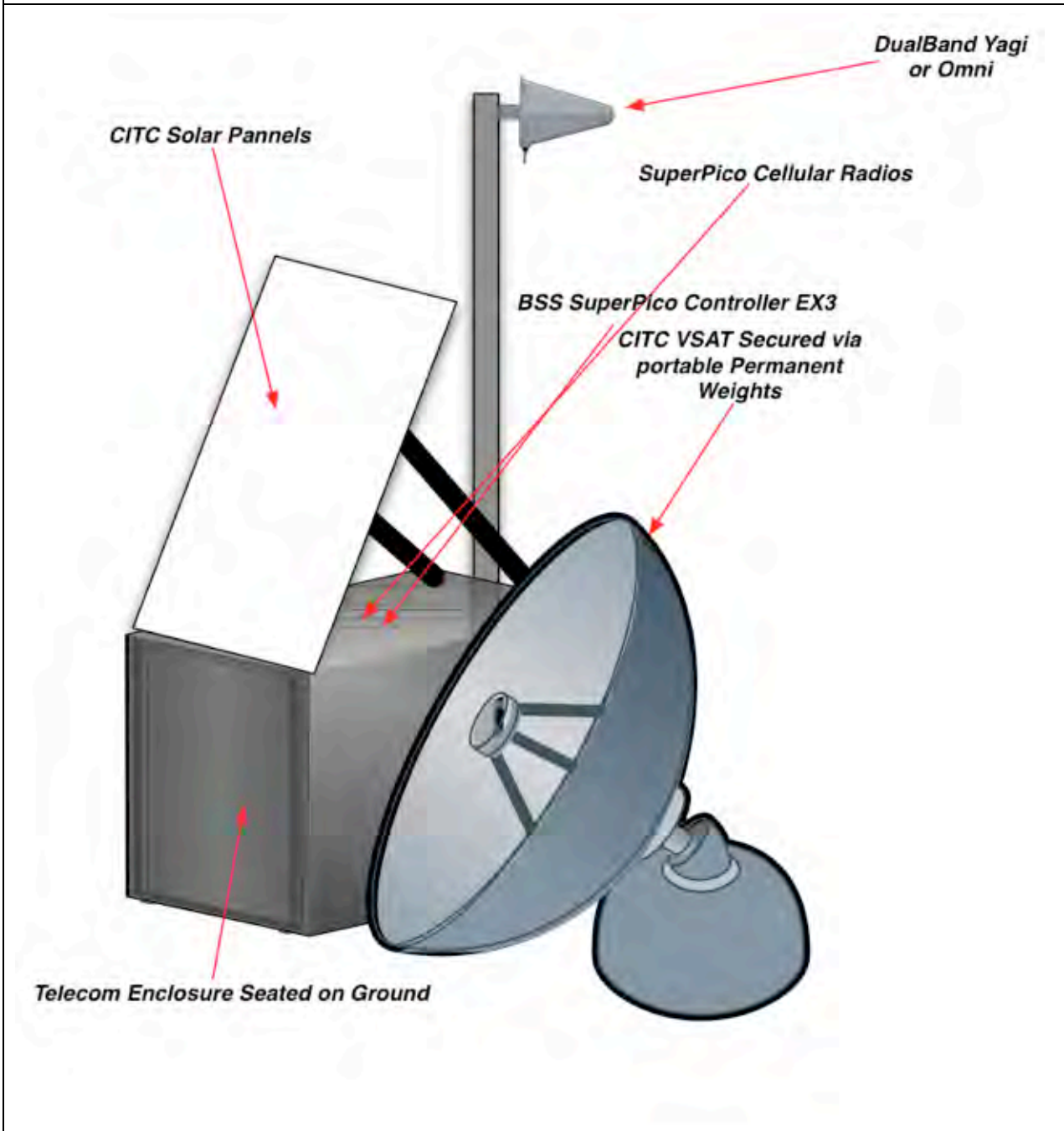
SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 6.2: Santa Cruz Island Scorpion Ranch Site Map #3 showing suggested all-in-one facility placement and staging area near corral and maintenance area.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 6.3: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 7: SANTA CRUZ ISLAND PRISONERS HARBOR DAY USE AREA

CITC would place an all-in-one solution near the well and maintenance lot as shown on Figure 7.3. A suggested staging area for the all-in-one unit is shown on Figure 7.3, along with suggested placement of the all-in-one unit. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep, and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment
- Fencing can be constructed around the all-in-one unit to provide visual shielding. The fencing would fully enclose the telecommunications unit and be tall enough to block sightlines to the solar panels, cabinet, and VSAT satellite from ground level vantage points at various locations throughout selected area.

A suitable site can be located and selected by NPS that contains an area of cleared, packed and level earth, requiring no ground disturbance, vegetation clearing, or earthwork in the parking lot.

A standalone GSM payphone can be installed anywhere around the Santa Cruz Island Prisoners Harbor area. A suitable site can be located and selected by NPS. The suggested location is shown on Figure 7.2.

GSM Payphone Mounting Options:

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- GSM payphone – Standalone facility.

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

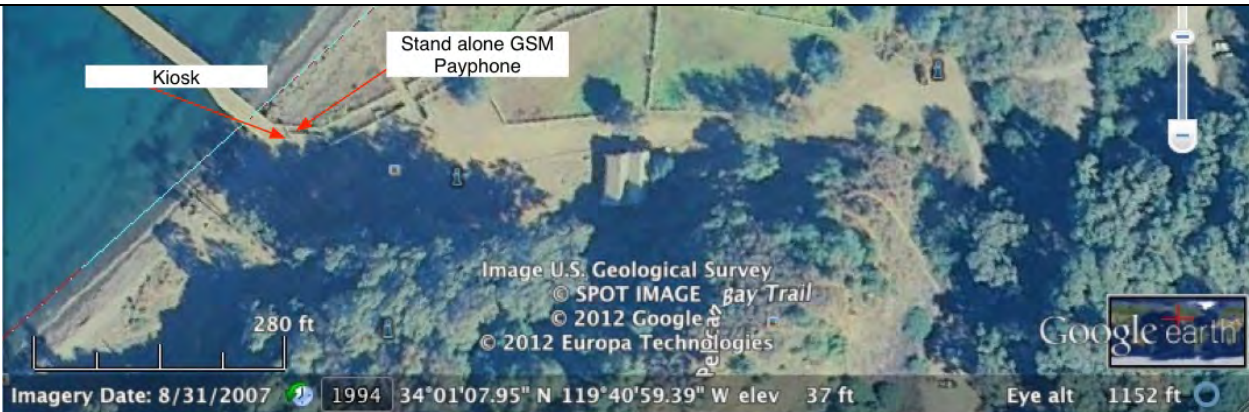
- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 7.1: Santa Cruz Island Prisoners Harbor Day Use Area Aerial View.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 7.2: Santa Cruz Island Prisoners Harbor Day Use Area Parking Lot Aerial View.



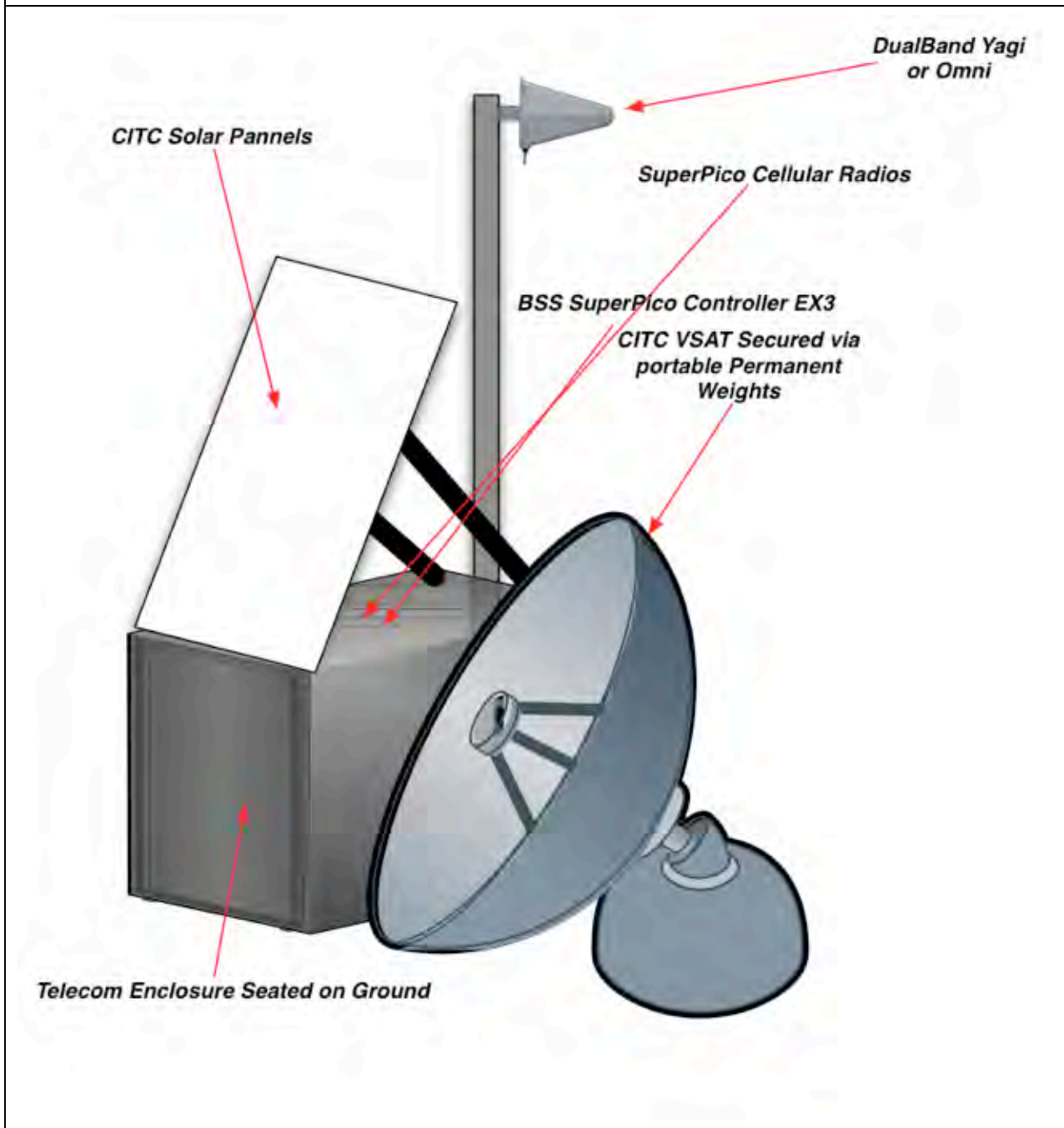
SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 7.3: CITC suggested all-in-one unit site and staging area. NPS recommended placement of an all-in-one unit at the Prisoners Harbor Well and Maintenance site shown below. A view of the Prisoners Harbor well site in perspective to the Prisoners Harbor parking lot (top). A view of the Prisoners Harbor well site zoomed in (bottom).



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 7.4: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 8: SANTA CRUZ ISLAND DEL NORTE RANCH

This location has been removed from the project and is therefore not analyzed in this application.

LOCATION 9: SANTA CRUZ ISLAND SMUGGLERS ADOBE

CITC would replace the NPS 55-watt solar panels with 240-watt solar panels. This would provide more power for NPS along with dedicated solar panels for use by CITC without co-mingling power with NPS. Below are the calculations expressing this new power system.

NPS Current Power utilizing 10 panels:

NPS Solar panels: 55 watts X 10 panels = 550 watts

Proposed Power: Using same number of panels providing more power for NPS

NPS Power replaced with: 240 watts X 5 panels = 1,200 watts

CITC Power provided by: 240 watts X 5 panels = 1,200 watts

**Utilizing existing space *No additional visual Intrusion *Separated Power*

Two separate electrical systems would be in place. This alternative would increase the park service's capacity by 650 watts. New VSAT and Yagi antennas would be installed at this site. The VSAT antenna would be ground-mounted behind the restroom facilities. The foundation for the VSAT antenna would require excavation of a hole approximately 14 inches wide and 36 inches deep. The proposed site for the VSAT antenna is on cleared ground; therefore, no vegetation would be disturbed for the installation of this antenna. The Yagi antenna would be roof-mounted on the eave at the rear of the restroom facilities.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- Solar panels – 10 new solar panels
- VSAT/Antenna – 1 VSAT and 1 Antenna
- Telecom Enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- Safety signs visible on all telecommunication equipment

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 9.1: Santa Cruz Island Smugglers Adobe Overview Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 9.2: Santa Cruz Island Smugglers Adobe Photograph #1 with Existing NPS Solar Panels.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 9.3: Santa Cruz Island Smugglers Adobe Photograph #2 with Existing Condition (left) and with Proposed VSAT Dish and Yagi Antenna Added (right).



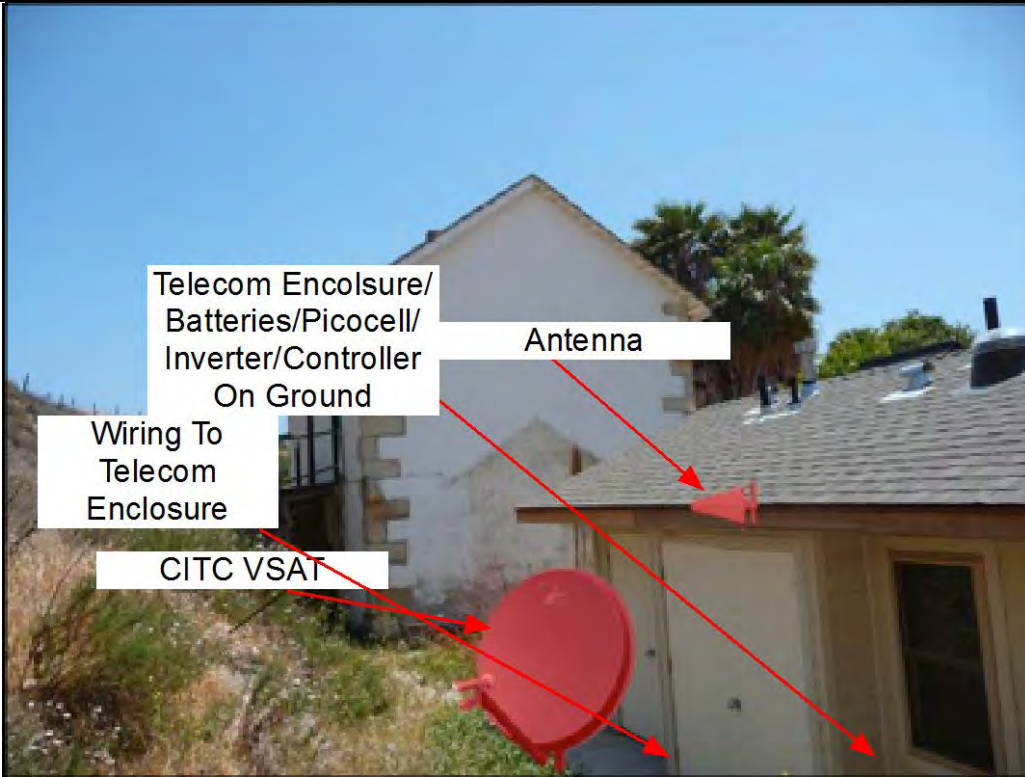
SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 9.4: Santa Cruz Island Smugglers Adobe staging area. Staging done on side of restroom on clear and level ground.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 9.5: Santa Cruz Island Smugglers Adobe wiring run from VSAT to telecom enclosure shown. Requires aboveground conduit to connect VSAT to telecom enclosure. The remaining equipment telecom enclosure, antenna, and solar panels wiring will be affixed to structure. Because remaining equipment is all seated on or around the structure requiring no wire suspension, aboveground conduit or trenching to connect it not required.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 10: SANTA CRUZ ISLAND SMUGGLERS KIOSK

CITC would install a GSM standalone payphone as shown on Figure 10.1.

GSM Payphone Mounting Options:

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- GSM payphone – Standalone facility

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 10.1: Staging area for GSM payphone.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 11: SANTA ROSA ISLAND MAIN RANCH

Note: GSM handheld and GSM desk phones will work throughout the historic district area. A GSM signal would be provided by the VSAT and antenna placed at location 17. GSM desk phone installations would be determined by NPS. Additionally any private or government GSM cell phones will be capable of connecting to the GSM signal provided at the location.

Figure 11.1: Santa Rosa Island Main Ranch Aerial View Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 12: SANTA ROSA ISLAND CAMPGROUND

CITC will install a GSM standalone payphone as shown on Figure 12.1.

GSM Payphone Mounting Options:

Aboveground 2X2 block of concrete:

CITC will place a standalone GSM payphone mounted to a 2X2 block of concrete seated on the ground. No trenching will be required for this option.

Belowground concrete:

CITC can alternatively mount the GSM payphone to a belowground concrete pad. This would require a 3-foot-deep by 30-inch-diameter hole. This would allow the payphone to be anchored to the concrete with little to no concrete visible aboveground. This option allows for less visual disturbance by exposing a smaller amount of concrete than the aboveground concrete slab.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- GSM payphone – Standalone facility

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

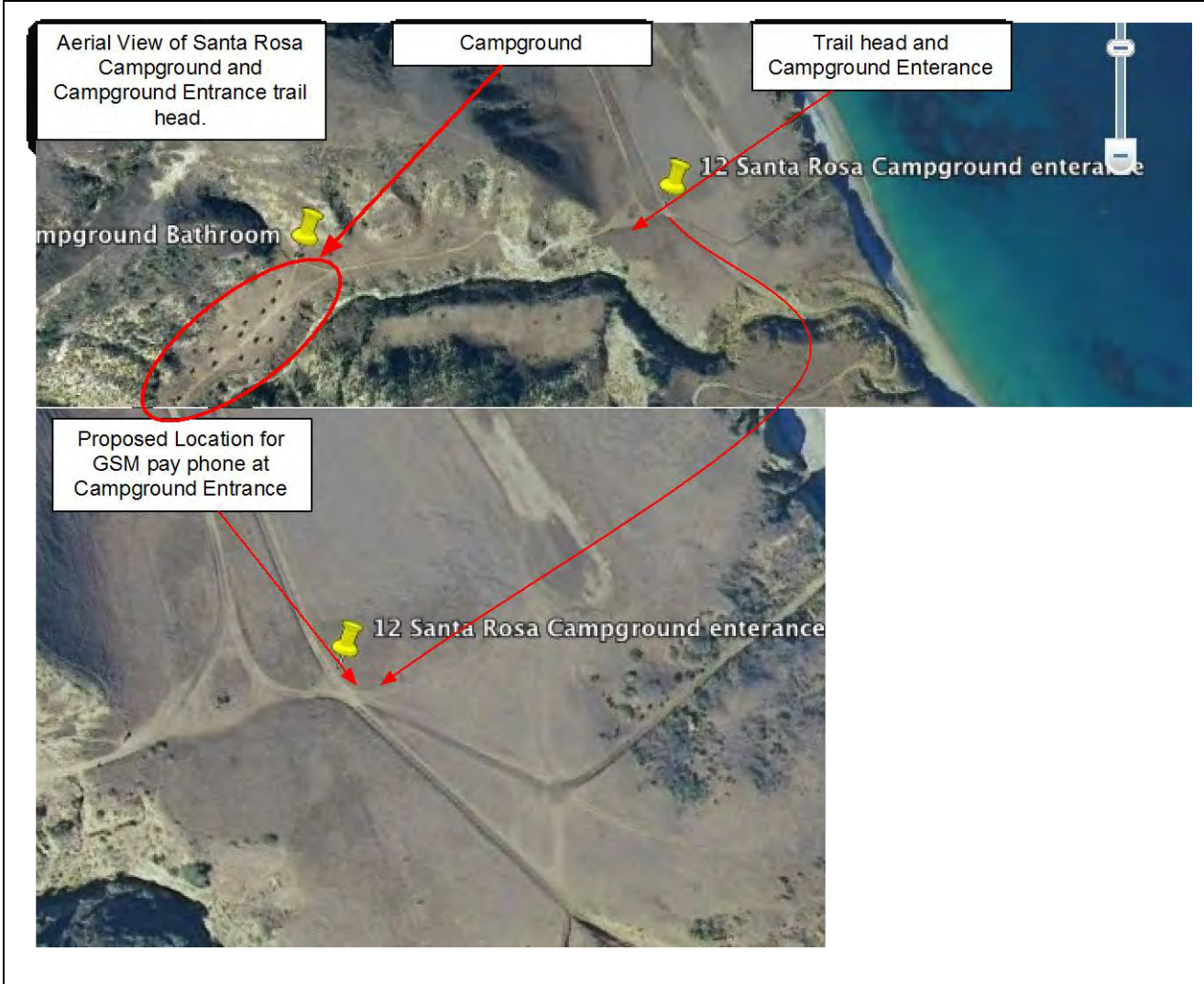
Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 12.1: Santa Rosa Campground Entrance trail head and campground aerial view. As suggested by NPS proposed location for standalone GSM payphone at campground entrance.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 13: SANTA ROSA ISLAND AIR QUALITY SHED

This location has been removed from the project and is therefore not analyzed in this application.

LOCATION 14: SANTA ROSA ISLAND MAINTENANCE OFFICE

CITC would place an all-in-one unit behind the maintenance office. A suggested staging area for the all-in-one unit is shown on Figure 14.1, along with suggested placement of the all-in-one unit. This all-in-one unit would occupy an 8-foot by 8-foot area, and would not require a foundation, as the all-in-one unit would sit flat on the ground. The all-in-one unit would include the following facilities:

- A ground-mounted VSAT antenna secured by portable permanent weights
- An omni-directional or Yagi antenna pole-mounted on an 8-foot-tall pole
- A cabinet measuring approximately 69 inches tall, 72 inches wide, and 44 inches deep, and containing 16 batteries and a pico cell telecommunication box
- Four solar panels mounted on top of the new cabinet
- Safety signs visible on all of the telecommunication equipment
- The fencing would fully enclose the telecommunications unit and be tall enough to block sightlines to the solar panels, cabinet, and VSAT satellite from ground level vantage points at various locations throughout the area.

A suitable site can be located and selected by NPS that contains an area of cleared, packed and level earth, requiring no ground disturbance, vegetation clearing, or earthwork near the maintenance office.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
 - Safety signs visible on all telecommunication equipment

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

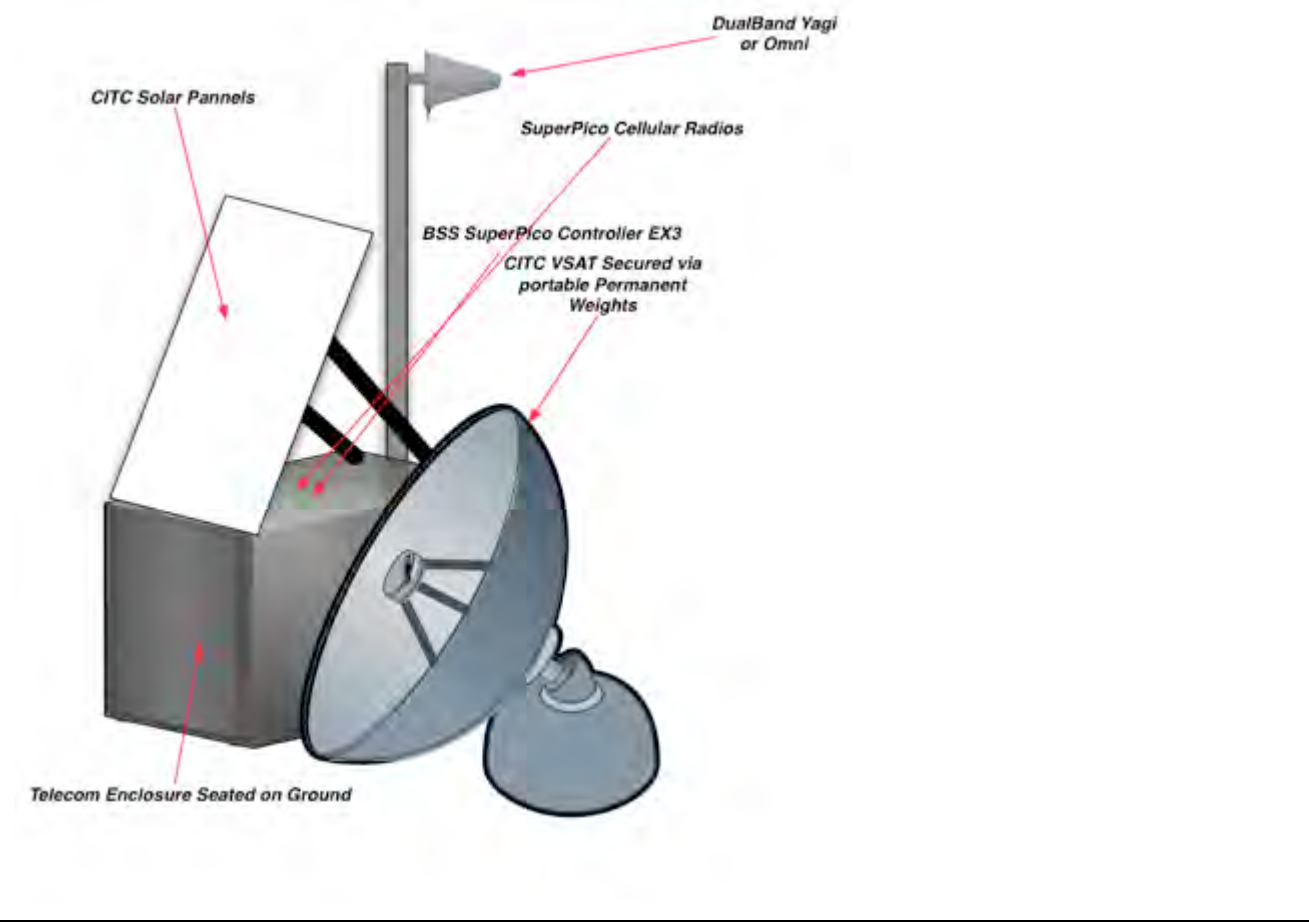
- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 14.1: Santa Rosa Island Maintenance Office Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 14.2: Santa Rosa Island Maintenance Office with all-in-one solution.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 14.3: Maintenance office staging area. No digging required for wiring. All options require no wire suspension, aboveground conduit, or trenching to connect equipment because the telecom enclosure, CITC VSAT, antenna, and solar panels are all seated on the all-in-one solution or structure. All wiring would be affixed to the structure using cable mounts.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 15: SANTA ROSA ISLAND JOHNSON'S LEE

CITC can place an all-in-one unit near the Johnson's Lee in an 8-foot X 8-foot area. All equipment would be attached to the telecom enclosure and seated on the ground. A suggested location for the all-in-one solution is shown on Figure 15.3. Safety signs would be visible on equipment to minimize accidental exposure.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
 - Safety signs visible on all telecommunication equipment
- GSM payphone – wall-mounted GSM payphone

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

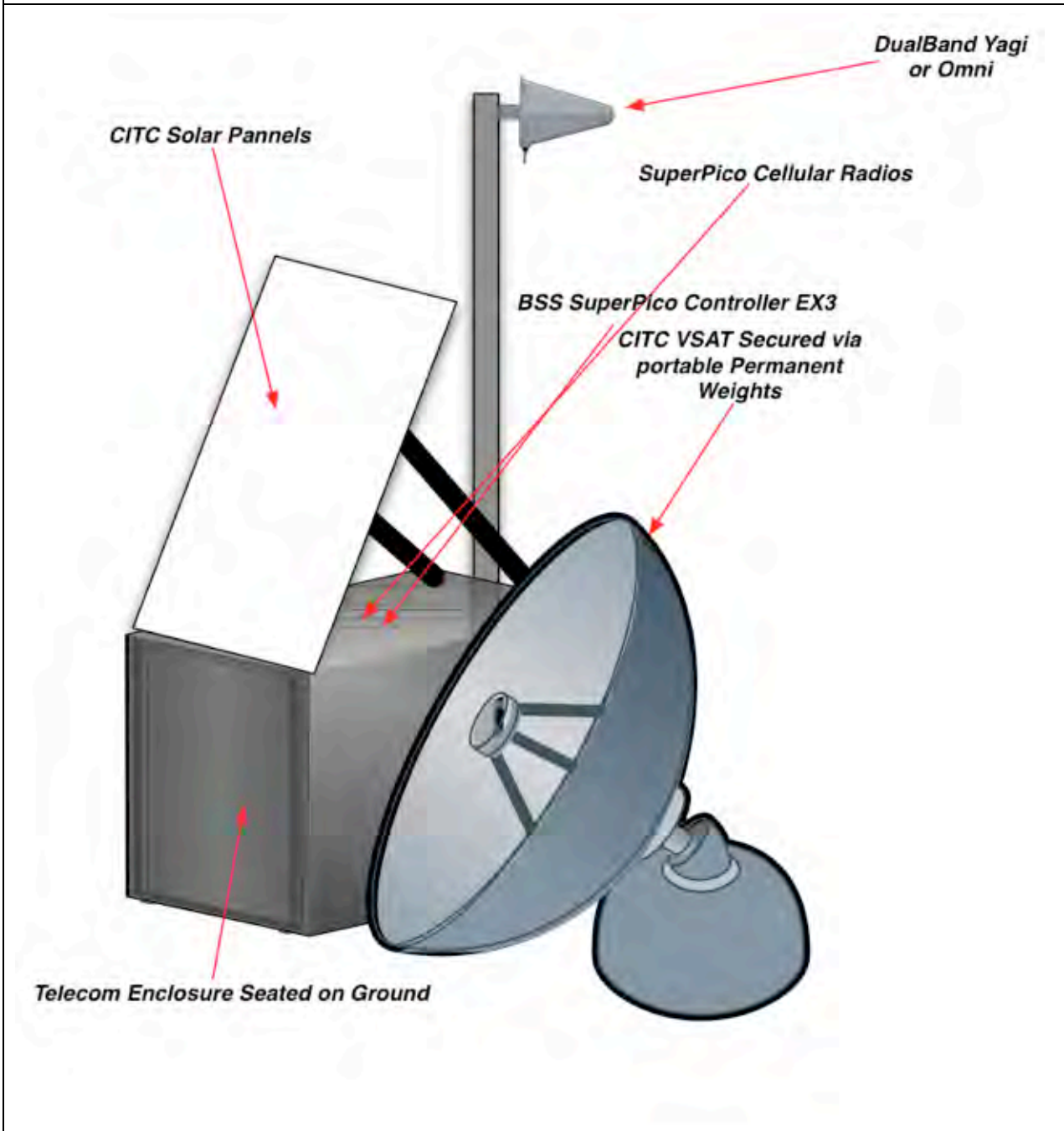
Note: No GSM desk phones are proposed for this location at this time, and all equipment at this location would be installed at CITC's expense.

Figure 15.1: Santa Rosa Island Johnson's Lee Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 15.2: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 15.3: Johnson's Lee Staging area. No digging required for wiring on either option. Requires no wire suspension, aboveground conduit, or trenching to connect equipment because the telecom enclosure, CITC VSAT, antenna, and solar panels are all seated on the all-in-one solution. All wiring would be affixed to the structure using cable mounts.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 16: SANTA ROSA ISLAND HOUSING

CITC can place an all-in-one unit behind the housing building in an 8-foot X 8-foot area. All equipment would be attached to the telecom enclosure and seated on the ground as shown on Figure 16.3. Safety signs would be visible on equipment to minimize accidental exposure.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- All-In-One Solution Containing:
 - Solar panels – 4 new solar panels
 - VSAT/Antenna – 1 VSAT and 1 Antenna
 - Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
 - Safety signs visible on all telecommunication equipment
- GSM payphone – wall-mounted GSM payphone

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

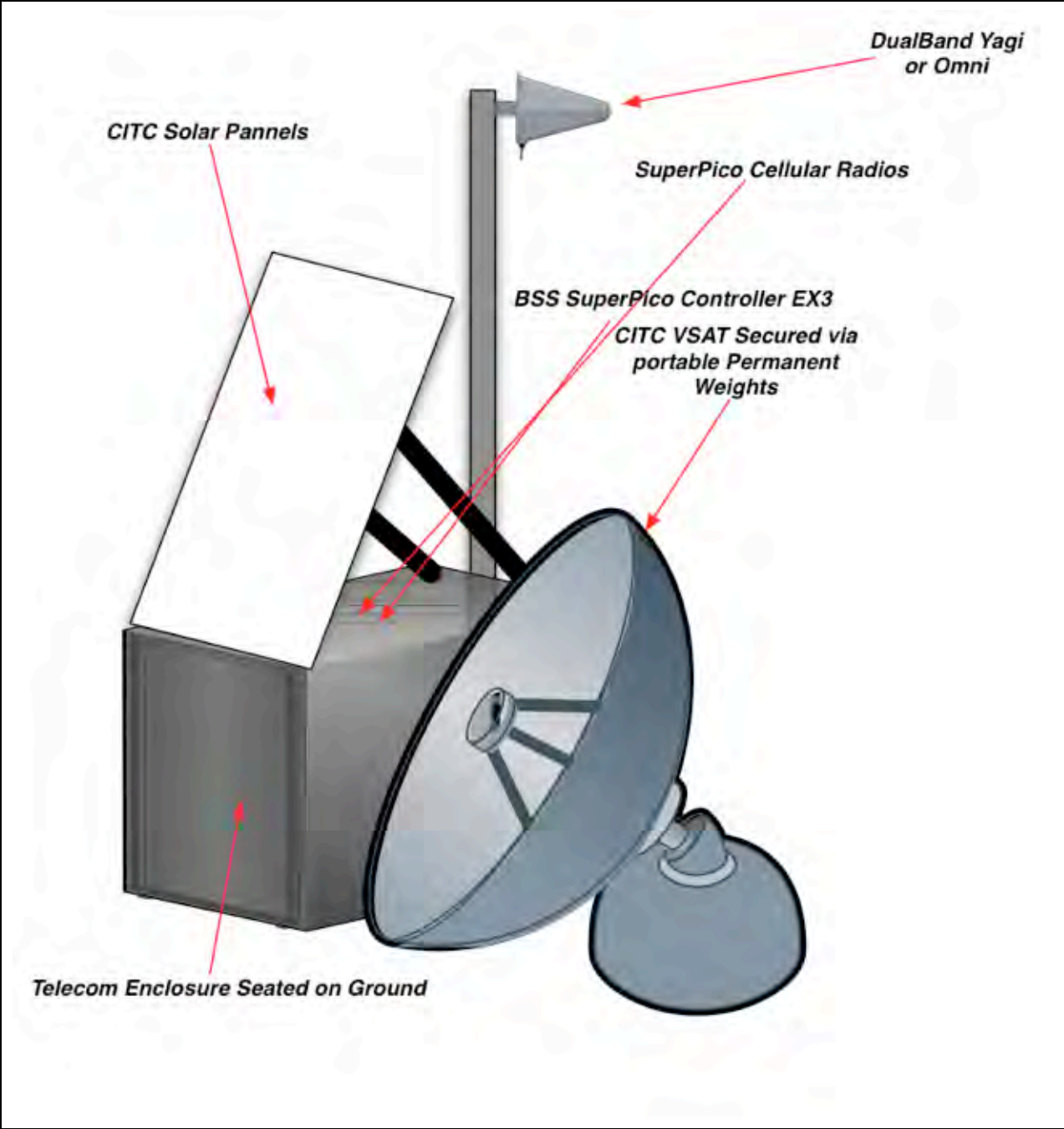
- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 16.1: Santa Rosa Island Housing Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 16.2: CITC all-in-one unit. All equipment affixed to telecom enclosure and seated on ground in 8-foot by 8-foot area. Safety signs visible on equipment to minimize accidental exposure.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 16.3: Santa Rosa Island Housing staging area. No digging required for wiring on either option. All options require no wire suspension, aboveground conduit, or trenching to connect equipment because the telecom enclosure, CITC VSAT, antenna, and solar panels would all be seated on the all-in-one solution or structure. All wiring would be affixed to the structure using cable mounts. Suggested all-in-one solution location shown.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 17: SANTA ROSA ISLAND POWER/GENERATOR STATION

CITC would replace a portion of the NPS 55-watt solar panels with 240-watt solar panels. This would provide more power for NPS along with dedicated solar panels for use by CITC without co-mingling power with NPS. Below are the calculations expressing this.

NPS Current Power utilizing 20 panels:

NPS Solar panels: 55 watts X 20 panels = 1,100 watts

Proposed Power: Using same number of panels providing more power for NPS

NPS Power replaced with: 240 watts X 10 panels = 2,400 watts

CITC Power provided by: 240 watts X 10 panels = 2,400 watts

**Utilizing existing space *No additional visual Intrusion *Separated Power*

Two separate electrical systems would be in place. This alternative would increase the park service's capacity by 1,300 watts. The antenna can be mounted to the power station as shown on Figure 17.2. The telecom enclosure would be placed behind the building with the CITC VSAT placed on the ground a few feet in front of the CITC solar panels.

GSM Payphone Mounting Options:

Mounted to Power Station Building:

CITC can place a GSM payphone near the front of the power house. This is shown on Figure 17.2.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- Solar panels – 20 new solar panels
- VSAT/Antenna – 1 VSAT and 1 Antenna
- Telecom enclosure – 16 Batteries, 1 Pico cell, 1 Inverter, 1 Controller, 1 BTU AC
- Safety signs visible on all telecommunication equipment
- GSM payphone – wall-mounted

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.

- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 17.1: Santa Rosa Island Power/Generator Station Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 17.2: Santa Rosa Island Power/Generator Station Photograph.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

Figure 17.3: Power station staging area. No digging required for wiring. All options require no wire suspension, aboveground conduit, or trenching to connect equipment because the telecom enclosure, CITC VSAT, antenna, and solar panels are all seated on or around the structure. All wiring would be affixed to the structure using cable mounts.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

LOCATION 18: SANTA ROSA ISLAND RANCH RESIDENCE

CITC would place a GSM solar-powered payphone mounted to the house, no longer requiring installation of the solar panels, CITC VSAT, telecom enclosure, or omni antenna. GSM service would be provided by an installation at location 17.

Installation:

All tools, equipment, and materials required for project installation would be staged on paved or cleared areas. Cleared areas may be covered with gravel or bare earth but, in all cases, would be fully disturbed and free of vegetation.

Equipment ([Refer to Specifications for Equipment Dimensions](#)):

- GSM payphone – wall-mounted

Applicant Proposed Mitigation:

An SPCC plan would be developed and implemented prior to the commencement of installation activities. The purpose of the plan would be to address minor fuel leaks and spills from equipment. To protect the islands from spread of invasive species, the following measures would be taken:

- All equipment and materials brought to the islands would be free of invasive species.
- Workers would wash boots, tools, and supplies of attached soils or dust prior to entry into the Channel Islands National Park.
- No cardboard boxes would be brought onto the islands unless they contain new, unopened equipment or supplies.

Service Usage:

Government Users Provided

- Internet/Data
- Phone/Voice
- Government cell phones will be capable of obtaining service

General Public Users Provided

- Internet/Data
- Phone/Voice
- Private cell phones will be capable of obtaining service

Figure 18.1: Ranch Residence staging area. No digging required for wiring. All options require no wire suspension, aboveground conduit, or trenching to connect equipment because the telecom enclosure, CITC VSAT, antenna, and solar panels are all seated on or around the structure. All wiring would be affixed to the structure using cable mounts.



SOURCE: Channel Islands Telephone Company Telecommunications Grant Application

PROPOSED TELECOMMUNICATION EQUIPMENT

SATELLITE DISH EQUIPMENT



1.2 Meter Standard Antenna

ALL BAND CELLULAR OMNIDIRECTIONAL ANTENNA



Specifications:

Product Code:
OMNI-A0069

N-type female connector

Electrical:

Gain (max)	4.6 dBi in 800MHz band 6.3 dBi in 1.8GHz band
Gain (min over the band)	2.1 dBi in 800MHz band 5.5 dBi in 1.8GHz band
Frequency	860-960 MHz 1710-2170 MHz
VSWR	< 2.5:1
Feed power handling	10 W
E-plane 3 dB beamwidth	25° (± 5°)
H-plane 3 dB beamwidth	360°
Front to back (F/B ratio)	N/A
Nominal input impedance	50 Ohm
Polarisation	Linear

Environmental:

Wind Loading	160 km/h
Temperature Range	- 20° C to +70° C
Shock	40G at 10 msec
Thermal Shock	- 20° C to +70° C : 10 cycles
Water Ingress Rating	IP65 (NEMA 4X)

Mechanical:

Dimensions (l x w x d)	500 mm x 50 mm x 50 mm
Weight	930 g (including bracket)
Mounting	Stainless steel brackets for up to 50 mm poles

DUAL BAND YAGI ANTENNA



Features:

- Covers Cellular/PCS (US and worldwide) and WiFi frequencies
- Consistent 9dBi gain across all frequencies
- Pole or wall mountable
- Light gray attractive UV protected housing
- Vertical or horizontal polarization
- DC grounded for lightning protection

Applications:

- Cellular, PCS or WiFi repeaters
- Indoor Cellular, PCS or WiFi extenders
- WISP equipment
- Non-line of sight

Requires:

- Cable: This antenna includes no cable
- [Phone Adapter Cable](#) if connecting directly to a cellular phone

Cable:

The antenna includes no cable. For a short run of 20' you can use our [20' RG-58 coax extension](#) which has the appropriate connections for the Yagi. Please note that our other RG-58 cables can not be directly connected to the Yagi antenna.

For longer runs, we suggest using one of the below lengths of [Ultra Low Loss LMR-400 Cable](#). This cable is fairly stiff so if you plan on connecting the Yagi directly to your phone with an [antenna adapter](#) we suggest you also include an [5' RG-58 extension](#). The below cables may also be connected together using the [N-Female to N-Female barrel connector](#). The primary difference between RG-58 and LMR-400 is the dB signal loss. RG-58 loses approximately 12dB/100' while LMR-400 loses about 4dB/100' (which is a big difference).

IP WEB PANASONIC BB-HCM735



General	
Operating temperature	BB-HCM735: Operation: -20 °C (-4 °F) to +50 °C (+122 °F) Storage: -25 °C (-13 °F) to +60 °C (+140 °F)
Operating humidity	BB-HCM735: Operation: 20 %-90 % (no condensation) Storage: 20 %-90 % (no condensation)
Dimensions(H x W x D)	100 mm * 100 mm * 74 mm (3 15/16 inches * 3 15/16 inches * 2 15/16 inches)
Weight (Main Unit Only)	BB-HCM735: 340 g (0.75 lb)
Power supply	Optional AC adaptor (Model No. BB-HCA7A) Input 100-120 V AC, 50/60 Hz Output 12 V DC, 750 mA Optional AC adaptor (Model No. BB-HCA7CE/BB-HCA7E) Input 100-240 V AC, 50/60 Hz Output 12 V DC, 750 mA PoE PoE standard IEEE802.3af-2003
Power Consumption	When Using an Optional AC Adaptor (Model No. BB-HCA7A) About 3.3 W (7.5 W during pan/tilt scan) When Using an Optional AC Adaptor (Model No. BB-HCA7CE/ BB-HCA7E) About 3.3 W (7.5 W during pan/tilt scan) When Using PoE About 3.3 W (7.5 W during pan/tilt scan)

Server	
Image compression	JPEG (Motion JPEG), MPEG-4, H.264
Video resolution	1280 x 960, 640 x 480, 320 x 240 (default), 192 x 144
Image quality	JPEG (favor clarity, standard, favor motion), MPEG4
Frame rate *1	Max. 30 frames/second (1280 x 960, 640 x 480*2, 320 x 240, 192 x 144)
Security	User ID/Password/SSL
Supported protocols	IPv4/IPv6 Dual-Stack IPv4: TCP, UDP, IP, HTTP, FTP, SMTP, DHCP, DNS, ARP, ICMP, POP3, NTP, UPnP™, SMTP Authentication, RTP, RTSP*3, RTCP, HTTPS, SSL, TLS IPv6: TCP, UDP, IP, HTTP, FTP, SMTP, DNS, ICMPv6, POP3, NDP, NTP, RTP, RTSP, RTCP, HTTPS, SSL, TLS
User access limit	Max. 30 simultaneous accesses (Max. 8 accesses while accessing HTTPS site in HTTPS communication; max 3 accesses in H.264/MPEG-4 mode)
Buffered images *4	About 1290 frames (320 x 240, standard image quality) with time display (when SD memory card is not inserted)
Image transfer method	SMTP *5, FTP, HTTP
Image buffer/ transfer triggers	Alarm, timer or motion detection
Network camera	
Zoom	6x zoom (2x Ex zoom, 3x digital zoom)
Viewing angle	Horizontal:69 (total 174°), vertical:51° (total 105°)
Pan (horizontal direction)	Pan : -52° up to +52°
Tilt (vertical direction)	Tilt : -45° up to +8°
Sensor type	1/3 inch MOS sensor, approx. 1,300,000 pixels MAICOVICON
Lens focal point	Fixed (focal range: 0.5 m to infinity)
Lens brightness	F2.4
Illuminance	At 640 x 480: 0.3 to 100,000 lux (in Color Night View mode: 0.04 to 100,000 lux) At 1280 x 960: 0.6 to 100,000 lux (in Color Night View mode: 0.07 to 100,000 lux) Screen brightness, white balance: automatic/manual setting (in color night view mode: 0.09 to 100,000 lux)

WEATHER STATION EQUIPMENT

The weather station will consist of the following hardware:

- Arduino Uno R3 Microcontroller
- Inspeed Vortex Windspeed
- Inspeed Vortex II
- BMP085 Barometric Pressure Sensor
- SHT11 Digital Humidity Sensor
- Arduino Ethernet Shield
- Arduino Project Enclosure
- Connectors (2x)
- Protoboards

The station with all components will be approximately 6-feet by 6-feet with a pole ground-mounted 14 inches wide by 36 inches deep 8 feet high, containing all instruments affixed to the pole. Power will be supplied by the nearby telecom enclosure containing the batteries for that location. If a telecom enclosure is not near the weather station one will be placed at that location fitting into the 6-feet by 6-feet area seated on the ground. The microcontroller that will be stored in the telecom enclosure will connect to the existing GSM network providing data feeds to a server on the main land that can be accessed remotely to determine conditions prior to flight to the Channel Islands location.

Arduino Uno R3 Microcontroller

Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.

Arduino can sense the environment by receiving input from a variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators. The microcontroller on the board is programmed using the Arduino programming language (based on Wiring) and the Arduino development environment (based on Processing). Arduino projects can be standalone or they can communicate with software running on a computer (e.g. Flash, Processing, MaxMSP).

Description

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16-MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version [R2](#)) programmed as a USB-to-serial converter. [Revision 2](#) of the Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode. [Revision 3](#) of the board has the following new features:

- 1.0 pinout: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V. The second one is a not connected pin, that is reserved for future purposes.
- Stronger RESET circuit.
- Atmega 16U2 replace the 8U2.

Specifications

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by

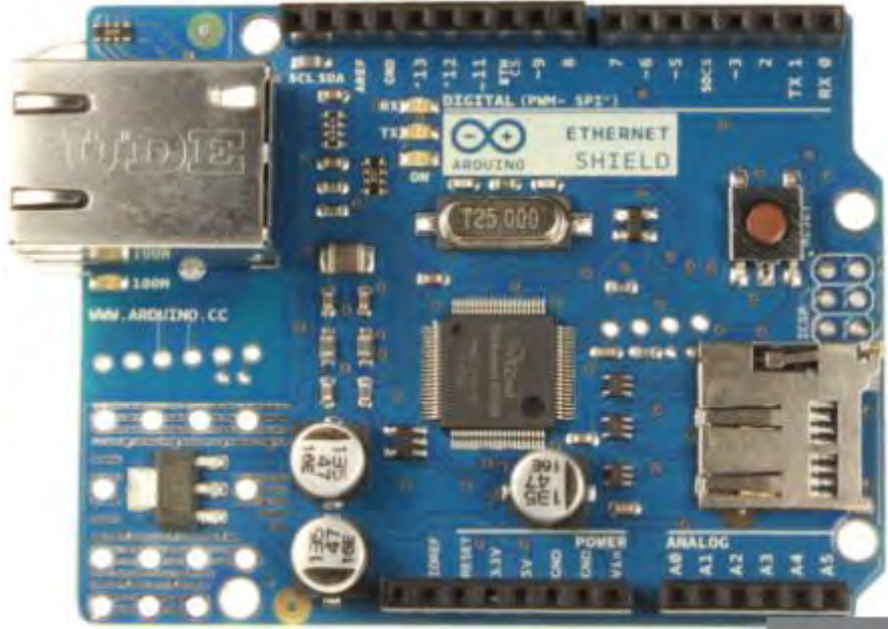
	bootloader
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

Price

- around \$30

References

- <http://arduino.cc/en/Main/ArduinoBoardUno>
- <http://www.sparkfun.com/products/11021>
- <http://arduino.cc/en/Main/Software>
- <http://openws.googlecode.com/svn/trunk/docs/hardware/microcontrollers/arduino/arduino-uno-rev3-schematic.pdf>
- <http://openws.googlecode.com/svn/trunk/docs/hardware/microcontrollers/arduino/atmega328p.pdf>



Inspeed Vortex Wind Sensor

Rugged wind sensor handles speeds from 5 to over 125 mph. Reed switch/magnet provides one pulse per rotation. Comes with exterior grade wire (click add to cart to see standard wire lengths), custom lengths available on request. The VORTEX wind sensor is great for do-it-yourself projects, replacement, or additional parts. Mounting pole not included.

Description

The Vortex Wind Sensor is a rugged, proven anemometer. Supplied without any electronics, the Vortex sensor is ideal for "do-it-yourself" projects of all kinds.

The Vortex Wind Sensor includes the following major items:

- a high quality 3-cup rotor pressed on a stainless steel shaft
- a rugged Delrin body with bronze and Rulon bushings
- a flat aluminum mounting bracket with 2 holes
- reed switch and magnet providing one pulse per rotation
- 25 feet of exterior grade wire (more available on request)

Converting pulses to wind speed is simple using the following formula:

2.5 mph per Hz (1 Hz = 1 pulse/second)

The Vortex Wind Sensor has been tested successfully on various electronic devices with over 1,500 feet (500 m) of wire.

Specifications

SENSOR TYPE	3-Cup rotor Reed switch/magnet provide 1 pulse per rotation
OUTPUT for D2 Rotor (Shown in photo)	1 pulse per rotation 2.5 mph per Hz
ROTOR DIAMETER	approx. 5 in (~125 mm)
SPEED RANGE	approx. 3 mph to 125+ mph (~5 kph to over 200 kph)
MOUNTING BRACKET	Supplied with an aluminum mounting bracket with 2 holes for screws Designed to be mounted on top of a pole or bracket Custom brackets available up request (offset, for example)
WIRE	Standard length is 25 feet (8m) Custom lengths available upon request - tested OK to over 1,500 feet The wire is provided stripped and unterminated 2 small wire nuts provided to connect to the display once installed
DISPLAY	None provided with the sensor only Formula for converting pulses to speed: 2.5 mph per Hz (2.5 mph per pulse/second)
POWER	No power required

Price

- around \$55

References

http://www.inspeed.com/anemometers/Vortex_Wind_Sensor.asp



Inspeed e-Vane Wind Direction Sensor

This electronic wind vane represents the latest technology in wind sensing: a balanced wind direction vane with a near-zero friction bearing and a high accuracy magnetic angle sensor to provide precision wind direction. Unique locking feature allows you to easily set "North" regardless of mounting orientation (see below). Input 5VDC; output: 0.25V to 4.75V proportional to angular position.

Description

The active element is a sealed Hall effect sensor. Wind direction is provided by a magnet attached to the vane, and which hovers over the sensor. The E-Vane requires an input of 5 VDC and provides an analog output of 0.25 - 4.75VDC.

It represents a number of advantages over potentiometer vanes, including:

- Zero dead band. Many potentiometer wind vanes have a dead spot of several degrees. This device has no dead band at all.
- Near-zero friction. Since the magnet is not in contact with the Hall sensor, there is no friction from the sensor.
- Virtually infinite life. Unlike potentiometers that wear out, the magnetic Hall sensor is non-contacting and should theoretically last forever.

The E-Vane requires 5 volts DC for power. It has three wires: ground, power, and signal. CAUTION: some power supplies - even regulated - can generate spikes that will destroy the Hall sensor. Make sure your power supply (if you provide your own) does not produce spikes - especially when plugging/unplugging them.

The Inspeed e-Vane includes a new locking feature which we should have patented but didn't so we could get it to market sooner. It is a way to lock the sensor so you can twist the vane and set "North" (or zero output) to where-ever you wish. That means that the offset bracket can be pointed in any direction you want, unlike other manufacturers that force you to point the bracket to North so

it will read correctly. With the e-Vane, just mount the vane, lock the sensor when the software (or your device) says North, twist the vane until it points North, then release the sensor so it is free to rotate. Simple!

Specifications

SENSOR TYPE	Balanced wind vane connected to an active, non-contact, zero friction Hall Effect sensor Sealed magnetic Hall Effect sensor. Magnet hovers over the sensor to provide ~0-5VDC output
SENSOR RANGE	Full 360 degrees , zero deadband
ACCURACY/LINEARITY	+/-0.3 to 0.5% of signal range
RESOLUTION	12 bit or 0.025 degrees
ELECTRICAL	3 wire flying leads Supply voltage 4.5 to 5.5 VDC Current 15 mA typical Output 5% to 95% of input voltage (0.25 to 4.75VDC) Length of wire: optional (standard lengths provided - click to order to view options)
MOUNTING	The E-Vane is provided with an offset aluminum bracket with 2 mounting holes. The mounting is compatible with Inspeed Vortex Wind Sensors (the 2 holes match).
DIMENSIONS	Directional Vane approximately 8 inches
COMPATIBILITY	The Inspeed e-Vane is compatible with Inspeed WindWorks It is not compatible with Inspeed Windware software (which provides wind speed only)

Price

- around \$130

References

- http://www.inspeed.com/wind_speed_direction/Vane.asp
- <http://openws.googlecode.com/svn/trunk/docs/hardware/sensors/wind/inspeed-e-vane-instructions-091200.pdf>



Barometric Pressure Sensor - BMP085 Breakout

Description

This is a simple breakout board for the BMP085 high-precision, low-power barometric pressure sensor. The BMP085 offers a measuring range of 300 to 1100 hPa with an absolute accuracy of down to 0.03 hPa. It's based on piezo-resistive technology for EMC robustness, high accuracy and linearity as well as long term stability. This sensor supports a voltage supply between 1.8 and 3.6VDC. It is designed to be connected directly to a micro-controller via the I²C bus

This breadboard-friendly board breaks out all pins of the BMP085 to a 6-pin 0.1" pitch header. The analog and digital supplies (VDDD and VDDA) of the BMP085 are tied together and broken out to a single pin. We've also put two 4.7k pull-up resistors on the I2C lines.

Specifications

- Digital two wire (I2C) interface
- Wide barometric pressure range
- Flexible supply voltage range
- Ultra-low power consumption
- Low noise measurement
- Fully calibrated
- Temperature measurement included
- Ultra-flat, small footprint
- Dimensions: 0.65 x 0.65" (16.5 x 16.5 mm)

Price

- around \$20

References

- <http://www.sparkfun.com/products/9694>
 - <http://openws.googlecode.com/svn/trunk/docs/hardware/sensors/pressure/bmp085-flyer.pdf>
 - <http://openws.googlecode.com/svn/trunk/docs/hardware/sensors/pressure/bmp085-breakout.pdf>
 - <http://openws.googlecode.com/svn/trunk/docs/hardware/sensors/pressure/bmp085-datasheet.pdf>
 - <http://www.sparkfun.com/tutorials/253>
 - <http://bildr.org/2011/06/bmp085-arduino/>
 - <http://mbed.org/users/tkreyche/notebook/bmp085-pressure-sensor/>
- <http://mbed.org/users/okini3939/notebook/barometric-pressure-sensor-bmp085/>

SHT11 - Digital Humidity Sensor

Description

SHT11 digital humidity and temperature sensor is the all-round version of the reflow solderable humidity sensor series that combines decent accuracy at a competitive price. The capacitive humidity sensor is available up to high volumes and as every other sensor type of the SHTxx family, it is fully calibrated and provides a digital output.

Through a two-wire serial interface, both temperature and humidity can be read with excellent response time and accuracy. Parallax has simplified the use of the SHT11 by mounting it in a user-friendly 8-pin DIP module. The module includes a data-line pull-up and series limiter making it possible to connect directly to the BASIC or Javelin Stamp.

Specifications

Energy consumption:	80uW (at 12bit, 3V, 1 measurement / s)
RH operating range:	0 – 100% RH
T operating range:	-40 – +125°C (-40 – +257°F)
RH response time:	8 sec (tau63%)
Output:	digital (2-wire interface)

Price

- around \$45

References

- http://www.sensirion.com/en/01_humidity_sensors/02_humidity_sensor_sht11.htm
- <http://www.robotshop.com/ca/parallax-sensirion-temperature-humidity-sensor-1.html>
- <http://openws.googlecode.com/svn/trunk/docs/hardware/sensors/humidity/sht1x-datasheet.pdf>
- <http://openws.googlecode.com/svn/trunk/docs/hardware/sensors/humidity/sht11-kit-documentation.pdf>



Arduino Ethernet Shield

Description

The Arduino Ethernet Shield allows an Arduino board to connect to the internet. It is based on the Wiznet W5100 ethernet chip providing a network (IP) stack capable of both TCP and UDP. The Arduino Ethernet Shield supports up to four simultaneous socket connections. Use the Ethernet library to write sketches which connect to the internet using the shield.

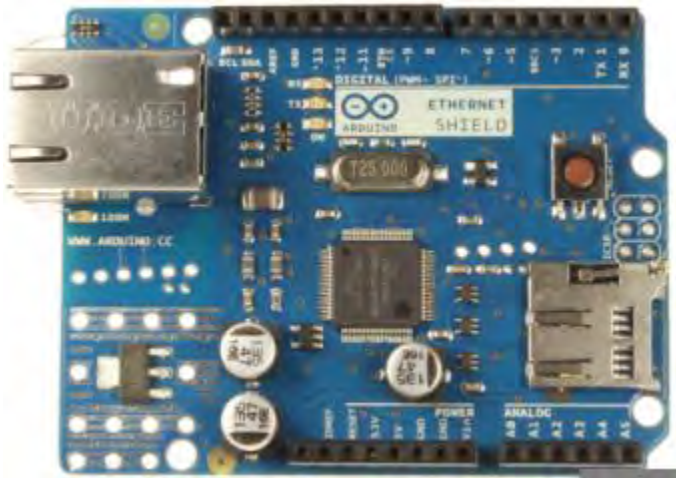
Specifications

Price

- around \$45.00

References

- <http://arduino.cc/en/Main/ArduinoEthernetShield>
 - <http://www.sparkfun.com/products/9026>
- <http://openws.googlecode.com/svn/trunk/docs/hardware/microcontrollers/arduino/arduino-ethernet-shield-06-schematic.pdf>



Arduino Project Enclosure

Description

The Arduino enclosure allows you to easily enclose your Arduino main board, Arduino Mega, or some of the other board that fits the Arduino foot print. It simply presses shut, so you don't have to worry about screws or fasteners.

It has room internally for an Arduino and a shield. It even has a removable tab mated for use with an Ethernet shield. It also has a snap-in compartment in the back for accessing switches or connections or battery access.

Specifications

- Dimensions: 87x64x28mm

Price

- around \$12

References

- <http://www.sparkfun.com/products/10088>



4 Pins Molded Electrical Connector

Description

Specifications

Price

- around \$9

References

- http://ca.binnacle.com/p1357/GENERAL-4-PIN-MOLDED-ELECTRICAL-CONNECTOR/product_info.html



SHARP ND-240QCJ 240 WATT SOLAR PANEL

ELECTRICAL CHARACTERISTICS	
Maximum Power (Pmax)*	240 W
Tolerance of Pmax	+5%/-0%
PTC Rating	216.4 W
Type of Cell	Polycrystalline silicon
Cell Configuration	60 in series
Open Circuit Voltage (Voc)	37.5 V
Maximum Power Voltage (Vpm)	29.3 V
Short Circuit Current (Isc)	8.75 A
Maximum Power Current (Ipm)	8.19 A
Module Efficiency (%)	14.7%
Maximum System (DC) Voltage	600 V
Series Fuse Rating	15 A
NOCT	47.5°C
Temperature Coefficient (Pmax)	-0.485%/°C
Temperature Coefficient (Voc)	-0.36%/°C
Temperature Coefficient (Isc)	0.053%/°C

*Illumination of 1 kW/m² (1 sun) at spectral distribution of AM 1.5 (ASTM E892 global spectral irradiance) at a cell temperature of 25°C.

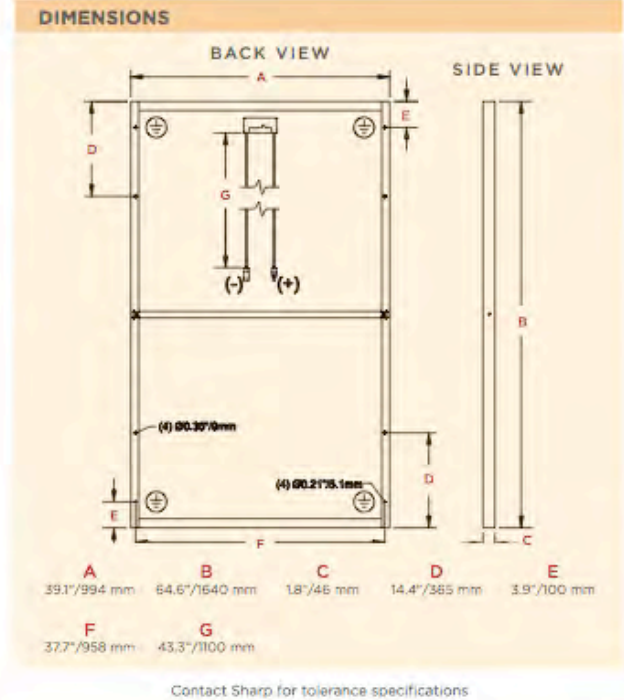
MECHANICAL CHARACTERISTICS	
Dimensions (A x B x C to the right)	39.1" x 64.6" x 1.8"/994 x 1640 x 46 mm.
Cable Length (G)	43.3"/1100 mm
Output Interconnect Cable	12 AWG with SMK Locking Connector
Weight	41.9 lbs / 19.0 kg
Max Load	50 psf (2400 Pascals)
Operating Temperature (cell)	-40 to 194°F / -40 to 90°C

**PV Wire per UL Subject 4703

QUALIFICATIONS	
UL Listed	UL 1703
Fire Rating	Class C



WARRANTY	
25-year limited warranty on power output	
Contact Sharp for complete warranty information.	



"BUY AMERICAN"

Sharp solar modules are manufactured in the United States and Japan, and qualify as "American" goods under the "Buy American" clause of the American Recovery and Reinvestment Act (ARRA).

GSM PAYPHONE STANDALONE



Features

ATL1001 Single Phone booth

1. High Quality Mild steel construction design for indoor and outdoor use.
2. Stainless Steel pedestal ensures protection against corrosion
3. Coated Mild steel side panels are able to withstand severe impact, resist corrosion, under extreme temperature conditions, heat ...etc.
4. Appealing main booth in blue and steel gray
5. Painted mild steel User friendly Writing shelf
6. Interior booth light kit (option)

H2100xW600xD450mm

Net Weight: 85 kgs

Dimensions: 12 inches by 12 inches

GSM PAYPHONE



Dimensions: 12 inches by 12 inches

GSM WIRELESS PHONES



VOICE Features:

- WCDMA module embedded
- Large LCD display
- CLIP (Call Line Identification Presentation)
- Voice mail and Short Message Service
- Call hold, call waiting, call forward, call transfer, call barring
- Three party conferencing
- Speed dialing
- SIM lock, network lock, cell lock
- Emergency call without SIM card
- High gain antenna
- Powerful phone book
- Backup poly-li battery
- Incoming call reminder
- Hands Free Available
- Call Records
- USB interface for high speed data transfer

DATA Features:

- USB interface for data
- Multimode operation –HSUPA/HSDPA/UMTS/EDGE/GPRS/GSM
- Triple-band HSPA/UMTS 850/1900/2100 MHz
- Quad-band EDGE/GPRS/GSM 850/900/1800/1900 MHz
- HSUPA uplink up to 2.0 Mbps
- HSDPA downlink up to 7.2 Mbps
- WCDMA (UMTS) uplink data rate up to 384 kbps
- EDGE data up to 237 Kbps DL and 118Kbps UL, 3GPP Release4, class 12
- GPRS data up to 85.6 Kbps DL and 42.8 Kbps UL

TELECOM ENCLOSURE 20D-50DDC-POP2-1



General

Weight

- 500 Lbs. assembled
- 605 Lbs. shipping weight

Doors

- 4, secured by three point locking system
- Locks via customer supplied padlocks
- Sealed with .875" aluminum filled gaskets

Material

- .125" Alumiflex™
- Finish: Painted cream
- RF properties: Non-ferrous

Vents

- 30 bottom louvers per door
- 12 top louvers – In top cover-under Alumishield™
- One removable filter panel per door
- 12 fixed bug screens in top cover

Handles

- Stainless steel, padlocking

Lifting Hooks

- 6, standard

Racking Specifications

Rails

- Four sets standard (for additional rails see accessories)
- Alodine coated
- Holes tapped for 10-32 threads
- Each rail supported by three R-STRUTS™
- .125" Material (Alumiflex™)

Spacing

- 19" or 23" Racking available

Useable Height

- 50"

Useable Depth

- Maximum: 30.5" Minimum: 28.75"

Inside Clearance - Less Rails

Height

- 50"

Width

- 27.625" each side

Depth

- See racking specifications
- Useable depth

Ratings

NEMA Class Types available

- Class 250 Type 4X

Paint Tested

- 1000 Hour salt spray (textured)
- 1000 Hour immersion

Door Opening Clearance

Height

- 46"

Width

- 23.625"

Exterior Cabinet Dimensions

Main Body

- Height: 50.23"
- Width: 59"
- Depth: 34"

Alumishield™

- Hang down height: 1.75"
- Width: 62.875"
- Depth: 36.5"

Handles

- Protrude 1.875"

Total Space Occupied

- Total Height: 68.835"
- Cabinet Height: 50.855"
- Battery Box: 16.98"
- Width: 71.1875"
- Depth: 43.5625"

POP2-1 Enclosures Come With:

- LC-100 100 Amp Main Load Center w/ (4) 4-Square Outlets, (1) 220V Outlets
- 2 Fluorescent Lights
- Lifting Hooks
- Door Windlocks
- Door Alarms
- 2 - 6000 BTU Air Conditioner 220 Volts with 800 Watts Total Fan Heaters (12K Total BTU)
- Spool-Up Side Box – 26"H X 22"W X 10"D

	*Section Starting & Ending Points	Vertical Height Per section.	Effective Depth For Each Section
Top	46.75" – 50.23"	3.25"	30.50"
	46.57" – 46.75"	.18"	29.50"
	31.00"- 46.57"	15.57"	30.50"
Center	19.00"-31.00"	12.00"	28.75"
	3.43" – 19.00"	15.57"	30.50"
	3.25" – 3.43"	.18"	29.50"
Bottom	0.00" – 3.25"	3.25"	30.50"

**APPENDIX A:
CHANNEL ISLANDS
TELECOMMUNICATIONS PROJECT
REVISED PROJECT APPLICATION**