

APPENDIX 4

Service Provider Comments



Your Ref: 13246

22 January 2019

Philip Barrett
McCracken Surveys
P O Box 19182
HAMILTON

Dear Philip

RE: PROPOSED SUBDIVISION – G & S SINGELTON HERITAGE LTD, 635 WHATAWHATA ROAD, DINSDALE

Thank you for your enquiry regarding the power availability for the proposed subdivision of Lot 1 & 2 DPS 12627 on Whatawhata Road.

We have investigated the electricity supply requirements for the above proposed subdivision and we are able to supply the electrical reticulation.

At present Lot 8 & 9 have a power supply available at the boundary. In order for us to give clearance to the Waikato District Council for the balance of the lots it will be necessary for the power to be extended to the boundary of Lot 1-7 & 10.

A private easement will be required over the existing service line supplying Lot 8 -10 if they cross each other lot.

An easement will be required in favour of WEL Networks Ltd over any electrical reticulation installed along private right of ways. The requirement for this will be confirmed at time of design.

WEL will prepare the easement but any costs associated with this, the survey, LINZ registration fees, and landowner legal fees will be the developer's responsibility.

Please advise if this project is likely to proceed and we will arrange for the necessary easement documents to be forwarded for signing.

If you wish us to proceed with pricing for the installation of the electrical reticulation please contact us at www.wel.co.nz/get-connected/subdivision.

We thank you for your enquiry. If you have any further queries or require additional information, please do not hesitate to contact me.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Miranda McLean'.

Miranda McLean
PROJECT MANAGER

Chorus Network Services

PO Box 9405
Waikato Mail Centre
Hamilton 3200
Telephone: 0800 782 386
Email: tsg@chorus.co.nz

CHORUS

29 January 2019

G & S Singleton Heritage Limited

Chorus Ref #: FJN50072

Your Ref #: 13246

Attention: **Philip Barrett**

Dear Sir / Madam

SUBDIVISION RETICULATION – FJN: 635 Whatawhata Road, Whatawhata. 10 Lots (Lots 1-10) - Estimate

Thank you for your enquiry regarding the above subdivision.

Chorus is pleased to advise that, as at the date of this letter, we would be able to provide ABF telephone reticulation for this subdivision. In order to complete this reticulation, we require a contribution from you to Chorus' total costs of reticulating the subdivision. Chorus' costs include the cost of network design, supply of telecommunications specific materials and supervising installation. At the date of this letter, our estimate of the contribution we would require from you is \$47,943.50 (including GST).

We note that (i) the contribution required from you towards reticulation of the subdivision, and (ii) our ability to connect the subdivision to the Chorus network, may (in each case) change over time depending on the availability of Chorus network in the relevant area and other matters.

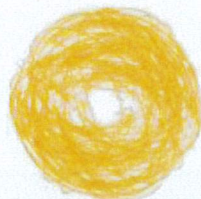
If you decide that you wish to undertake reticulation of this subdivision, you will need to contact Chorus (see the contact details for Chorus Network Services above). We would recommend that you contact us at least 3 months prior to the commencement of construction at the subdivision. At that stage, we will provide you with the following:

- confirmation of the amount of the contribution required from you, which may change from the estimate as set out above;
- a copy of the Contract for the Supply and Installation of Telecommunications Infrastructure, which will govern our relationship with you in relation to reticulation of this subdivision; and
- a number of other documents which have important information regarding reticulation of the subdivision, including - for example - Chorus' standard subdivision lay specification.

Yours faithfully



Reid McKenzie
Property Development Coordinator



SKYSOLAR

Remote Solar Power Systems

Reliable

Expandable

Moderate to High Energy Usage: 11kWh / Day Average Consumption.

Specifications.





Stand Alone Solar Power System Basic Components.

AC Coupled System using Selectronics and Fronius Electronics and Lead Carbon Super-capacitor Battery Storage without Optional Standby Generator.



PV Solar Panels

Start small and increase if and as required.

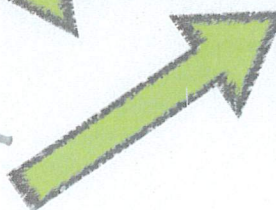
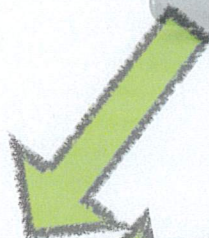
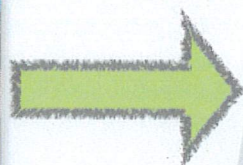
MPPT Solar
Inverter
Highest efficiency and
expandable.



Batteries
Shoto Extreme Lead
Carbon Battery /
Super-Capacitor
combination



230VAC Power to Property
Pure and Reliable.



Generator.

Auto or Manual Start
Backup Power for Poor Weather.
(Generator not supplied in this quotation
as the customer may wish to supply
this. Please enquire for Generator
pricing if desired.)



Power Inverter
Reliable, Powerful,
Programmable and
on-line for remote
support.



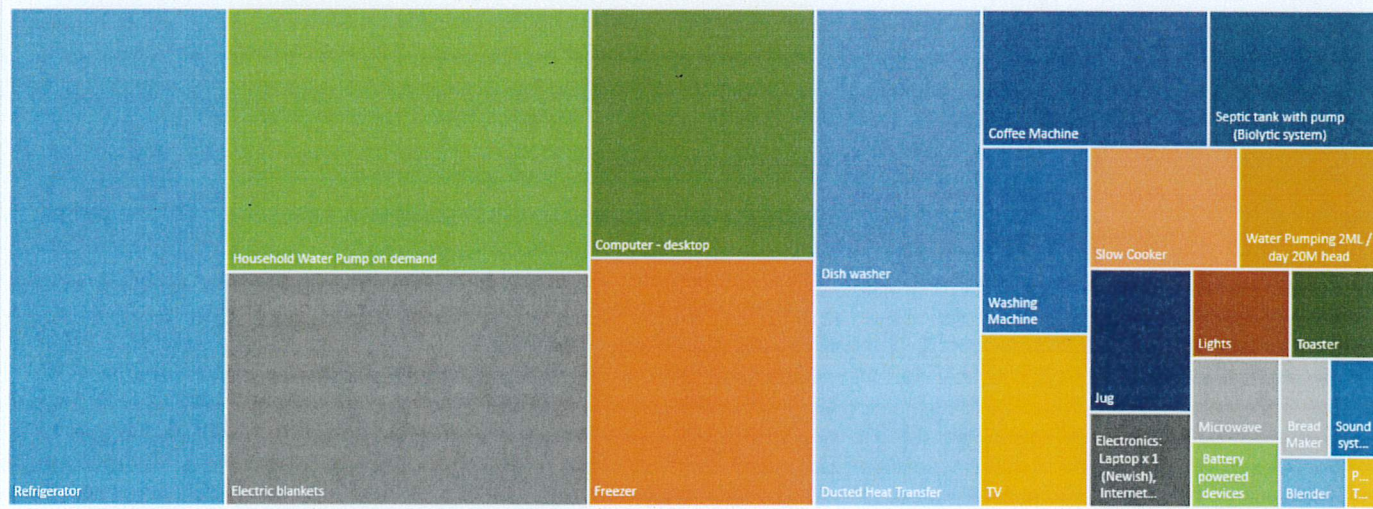
Your power requirements (Stage 2 House Build Completion):

The requirements below are based on customer supplied load list.
Design and pricing is based upon this information and discussions.
Deviation from this list will affect performance of the system to some degree depending on overall average usage.



General Load List and Energy Usage

- | | |
|---|--|
| ■ Refrigerator | ■ Freezer |
| ■ Microwave | ■ TV |
| ■ Washing Machine | ■ Household Water Pump on demand |
| ■ Septic tank with pump (Biolytic system) | ■ Lights |
| ■ Electronics: Laptop x 1 (Newish), Internet Router, Phone Charger ... etc. | ■ Fan Light unit in Bathroom. |
| ■ Jug | ■ Toaster |
| ■ Blender | ■ Slow Cooker |
| ■ Bread Maker | ■ Power Tools (calc peak only unless used regularly every day) |
| ■ Dish washer | ■ Battery powered devices |
| ■ Sound system | ■ Electric Oven |



Your power requirements:

The requirements below are based on customer supplied information.
Design and pricing is based upon this information. Deviation from this list will affect performance of the system to some degree.

Customer Requirements:

Off-grid system to support estimated household and farm loads of 11kWh per day as per supplied load sheet. Fluctuations in loads are expected. System design to account for starting with a smaller system to run the farm and supply power for the house build. Then increasing the system PV in the future to allow for additional household loads.

Panels will be "flat-to-roof" mounted onto shed W/WWN facing 20 degree roof.

Based on the customer discussions and understanding the levels of expected loadings with one dwelling and a shed on the property to begin with I have designed a system that will allow for 12 kWh per day of load support throughout the winter and 20 - 30kWh per day in the summer months.

Customer specific requests:

- The system be large and robust enough not to worry about the system under normal household living.
- Appliances such as the Ovens, Induction Hobs, Welder along with general household appliances without overloading the System.
 - 3 Phase Well Pump will run directly from customer-supplied solar pumping solution.
 - The Irrigation loads are calculated at 2M3/day at 20M head.
- Future possible purchase of an Electric Spa Pool is accounted for in the expandability of the System's PV Array.
- Water Heating by Element and/or HWHP to be controlled by Solar Main Inverter to avoid placing too much demand on the batteries overnight but also ensure enough heat is maintained in the tank under high usage periods.

Designer comments:

Main battery inverter to be mounted inside near the battery location. From this location your electrician will run the mains cable to your main switchboard.

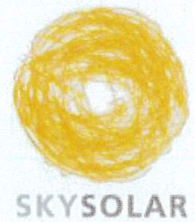
A Generator may occasionally be required to recharge the system batteries. Supply of Generator is NOT included in this design as discussed with customer. During periods of lengthy poor weather the system will notify users to start the generator in ample time to avoid shutdown.

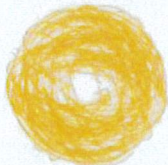
Your Electricians will wire the house as per the usual but instead of connecting to the meterboard as mentioned above they will run and connect his submain to our inverter (we can instruct him on how to do this.) They will complete the rest of the installation as per a normal grid-connected, MEN, AS/NZS3000 compliant installation.

We are happy to run through the physical design of the Solar Power system with your electrician for future support if required OR we are happy to support your system using our own local support agents. Generally all the support is easily managed over the phone using the data from the system's on-line connection.

A 25mm conduit can be run from the house to the shed with 4 x cat5e Data cables (Three for us and one for your internet or future use.)

Please discuss these specifications with your system designer if desired.





SKYSOLAR

Your Off Grid Solar Power System:

Appliances/Loads Required to Run:

As discussed and listed on previous page. Total average daily usage between 11 and 14 kWh/day during the Winter.

Performance Estimates:

Energy per 24hr (Winter)
Energy per 24hr (Summer)
Energy Overnight average:
Battery Technology:
Battery Size:

12kWh/day average
Up to 30kWh/day in good weather
8.4kWh to 17% DOD (Depth of Discharge*) 12kWh to 24% DOD
Shoto Patented Lead Carbon Extreme Supercapacitor
48.7 kWh Nominal C100 (100 hour discharge rating)

Monitoring and Management:
Hot Water Diversion:

Yes – Selectronics EMAXX remote Monitoring.
Yes – 1 Cylinder HWHP (Hot Water Heat Pump)
direct from inverter output.

Equipment Specified:

12 kWp, 40 x 300W Panels High Efficiency Trina
Fronius 8.2kW PV inverter (Over PV due to Bearing and Angle).
7.55kW (11.2kW for 30min) Selectronics Battery inverter
48.7kWh Shoto Lead Carbon Extreme Battery
EMMAXX Monitoring System
Sundry items for balance of system

Fully Installed Cost:

\$TBA Incl. GST
Including Installation, Certification, Commissioning
and Customer Training.
Stage 1 start with just 10 Panels: **\$TBA Incl. GST**



SHIFTING THE LIMITS



The System Specifications Lead Times and Pricing above may vary based on specific requirements and product availability.
Please Contact Your SkySolar System Designer to discuss options, pricing and sizing to ensure your system suits your application. This document is a quotation.



Estimated Performance Capability:

| Month | Solar Radiation (kWh / m ² / day) | AC Energy (kWh) |
|-----------|---|----------------------|
| January | 6.70 | 1,935 |
| February | 5.72 | 1,509 |
| March | 5.01 | 1,467 |
| April | 3.88 | 1,119 |
| May | 2.78 | 834 |
| June | 2.46 | 722 |
| July | 2.60 | 790 |
| August | 3.12 | 954 |
| September | 4.51 | 1,331 |
| October | 4.94 | 1,482 |
| November | 5.73 | 1,667 |
| December | 6.15 | 1,817 |
| Annual | 4.47 | 15,627 |

Mid Winter Monthly
Production Potential.

Daily Average Producti
on Potential = 24kWh.

Accounting for poor
weather events this
figure is halved to
12kWh/day

Location and Station Identification

| | |
|---------------------|------------------------------------|
| Requested Location | pukekohe |
| Weather Data Source | (INTL) AUCKLAND, NEW ZEALAND 14 mi |
| Latitude | 37.02° S |
| Longitude | 174.8° E |

PV System Specifications (Residential)

| | |
|---------------------|-------------------|
| DC System Size | 12 kW |
| Module Type | Standard |
| Array Type | Fixed (open rack) |
| Array Tilt | 20° |
| Array Azimuth | 45° |
| System Losses | 14.08% |
| Inverter Efficiency | 96% |
| DC to AC Size Ratio | 1.2 |

The System Specifications and Daily Performance estimates are derived from NREL PV Watts Website. Performance estimates are a maximum possible figure and will often not be reached due to batteries being fully charged and lower load demand than the system can support.

Equipment Information:
Please click on a tile for more detail.



| Home | Products | Applications | Services | Support | News | Projects | Contact |
|--------------|----------|--------------|-----------------|--------------|------|----------|---------|
| Solar Hybrid | Grid Tie | Off Grid | Mobile / Marine | Grid Support | | | |

🏠 > Applications > Solar Hybrid

Solar Hybrid: On Grid Inverters with Battery Backup



A solar hybrid system allow you to take control of your power by adding battery storage to your solar power while still remaining connected to the electricity grid.

A solar hybrid system is made up of the following components:

1. Solar Panels
2. AC grid tie inverter or a DC charge controller
3. Multi-mode inverter charger (an SP PRO or SP PRO GO)
4. Battery bank



SHOTO HEL-C series lead-carbon battery is the latest product in the SHOTO battery family. This product has been specially designed for Renewable Energy Sources such as solar and wind power storage system, based on international advanced lead-carbon technology.

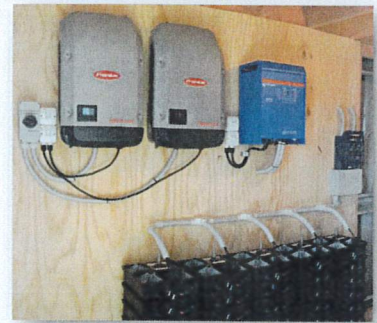
/ Perfect Welding / Solar Energy / Perfect Charging

FRONIUS PRIMO

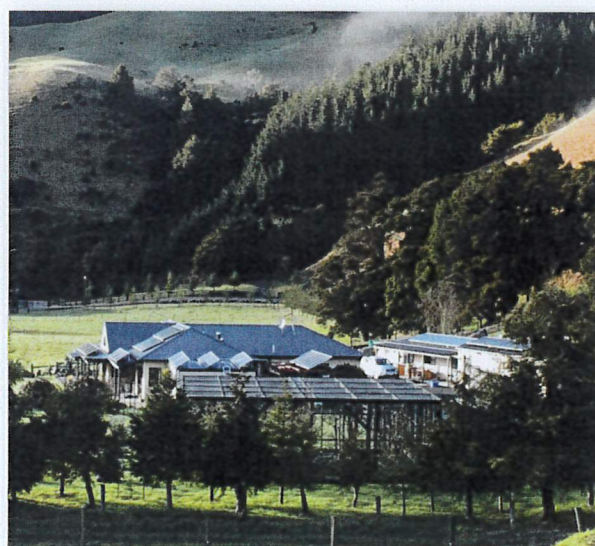
/ Optimised energy management.

/ The Fronius Primo in power categories from 3.0 to 8.2 kW perfectly completes the new SnapInverter generation. This single-phase device is the ideal inverter for residential systems. Its innovative SuperFlex Design provides maximum flexibility in system design, while the SnapInverter mounting system makes installation and maintenance easier than ever before. The included communication package, with WLAN, energy management, several interfaces and much more, allows the Fronius Primo to communicate with the user, the PV system and the grid.

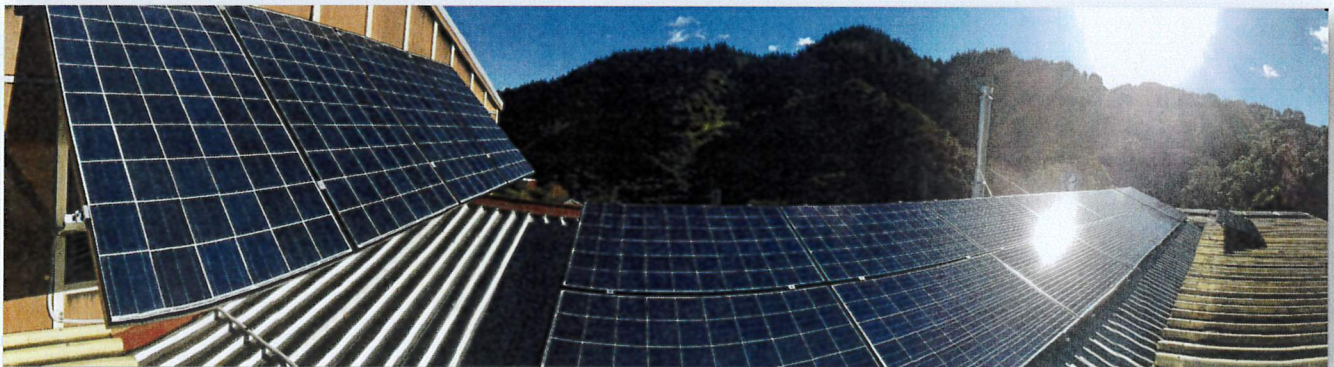
Some System Photos:



Some More System Photos:



Ok, just a few more!



Contact Details:

0800 Sky Solar
0800 759 765

www.SkySolar.co.nz



Ben Stanton
021750024
ben@skysolar.co.nz

All design and pricing is based on customer-supplied information, is valid for 30 days and may be subject to change outside our control. Please confirm availability of equipment and expected performance prior to placing any orders.