Canadian Solar Developers Ltd.

Draft Design and Operations Report

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Project Name
Draft Design and Operations Report
Proposed Groundmount Solar Facility L.P #9
1572 Story Road, Midhurst, ON
OPA FIT Program: FIT-FGBG6GF

Project Number
V00002250-00

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Canadian Solar Developers Ltd.

Draft Design and Operations Report

Prepared for:

Canadian Solar Developers Ltd.

Ground Mount Solar PV Power Project – L.P #9

October 4, 2012

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Version Control

Issue	Issue Date	Summary
1.0	September 14, 2012	Draft Report to Simcoe County & Township of Springwater
2.0	October 4, 2012	Draft Report to Ministry Natural Resources

Legal Notification

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Executive Summary

Canadian Solar Developers Ltd. is the proponent for the development of a 100 kilowatt solar power project in the County of Simcoe, Township of Springwater, at 1572 Story Road. An application has been made for the site L.P#9 and a file opened under the OPA FIT Program (FIT-FGBG6GF). **Exp** Services Inc is completing all REA-related reports and will be representing Canadian Solar Developers Ltd during the application and approval process.

The Design and Operations Report (DOR) has been prepared as part of an application for a Class 3 Solar Facility under O.Reg.359/09 Renewable Energy Approval (REA) under Part V.0.1 of the Ontario Environmental Protection Act as amended by O.Reg. 521/10 and O.Reg. 231/11.

This report follows the protocols and procedures set out for REA projects. A detailed Facility Site Plan, Facility Design Plan, Facility Operational Plan, and Environmental Effects Monitoring Plan have been prepared. In addition, an outline specifying the requirements for an Emergency Response Plan with an Emergency Communications Plan to facilitate the municipal ERP has been presented.

The site plan shows the layout of the solar array field, the associated electrical components, topographical features and other amenities within the study area. This layout has been designed to minimize the footprint and the potential environmental effects, yet maximize the system capability for power generation. The setting is an open field 0.5 km west of a residence on the same property. A second solar facility is planned to the east on the same property.

The DOR is supported by several background studies that have assessed the potential impacts of the proposed works on the environment / natural heritage, as well as other social and cultural aspects of the site. The environmental impacts during the construction, operation and decommissioning phases have been determined to be able to be mitigated and/or manageable. There are no provincial parks, ANSIs or water bodies within 120 metres of the proposed solar array field. There are natural features (woodlands and a small pond with an associated amphibian movement corridor) within the prescribed limit that are deemed to be significant. An environmental impact assessment study (EIS) has been completed of these natural features. The EIS recommended the construction timing window be after the breeding season of July 1st. The acoustical assessment determined that all MOE requirements are met or exceeded. The Stage 1 archaeological property inspection did not exhibit any archaeological potential due to the extent of disturbance. Neither the surface water nor groundwater is impacted by the development. There is no requirement to change the Land Use for the Project. Post-decommissioning, the land can revert back to an agricultural usage.

The solar facility relies on sunshine to produce electricity and therefore operates only during daylight hours. It will operate year-round. A schedule of inspection, maintenance and repair has been set out. No security measures are proposed.

An outline for an Emergency Response Plan (ERP) along with an Emergency Communications Plan has been noted. Key contact information for early responders (police, ambulance and fire) will be identified in addition to coordination requirements with the local Township or other designated agency. An ERP will be prepared and formalized with the local authorities.

Regular contact with stakeholders apprising them of the Project status and a public consultation protocol for all future phases has been identified. This includes mail outs as required, notices in local newspapers, and public information meetings.

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1. Introduction

As part of an application for a Renewable Energy Approval (REA) from the Ontario Ministry of Environment (MOE), any renewal energy projects are required to submit a Design and Operations Report (DOR). The DOR is prepared in accordance with the March 1, 2010 draft of Technical Bulletin Two: Chapter 6, Guidance for preparing the Design and Operations Report as part of an application under O.Reg.359/09 Renewable Energy Approval (REA) under Part V.0.1 of the Ontario Environmental Protection Act as amended by O.Reg. 521/10 and O.Reg. 231/11. This report describes the project activities to be undertaken during the permanent facility construction and their operation, and discusses the potential for environmental effects within 300 metres of the project location. This DOR is to be consistent with information presented in the Project Description Report, and will address and describe the following in relation to the proposed solar power project:

- Detailed Site Plan
- Facility Design Plan
- Facility Operational Plan
- Environmental Effects Mitigation and Monitoring Plan
- Emergency Response Plan and Emergency Communications Plan (from construction to and including decommissioning)

A Project Description Report (PDR) for the Ground Mount Solar PV Power Project – L.P #9 was prepared on November 16th, 2011, and was available for viewing at the proponent's website (www.futuresolardevelopments.com). An application was made for the site L.P#9 and a file opened under the OPA FIT Program (FIT-FGBG6GF).

2. General Information

2.1 Project Name, Applicant and Location

The proposed solar power project is named Ground Mount Solar PV Power Project – L.P #9 (the Project). It is being initiated by Canadian Solar Developers Ltd., based in Barrie, Ontario. **Exp** Services Inc is completing all REA-related reports and will be representing Canadian Solar Developers Ltd during the application and approval process.

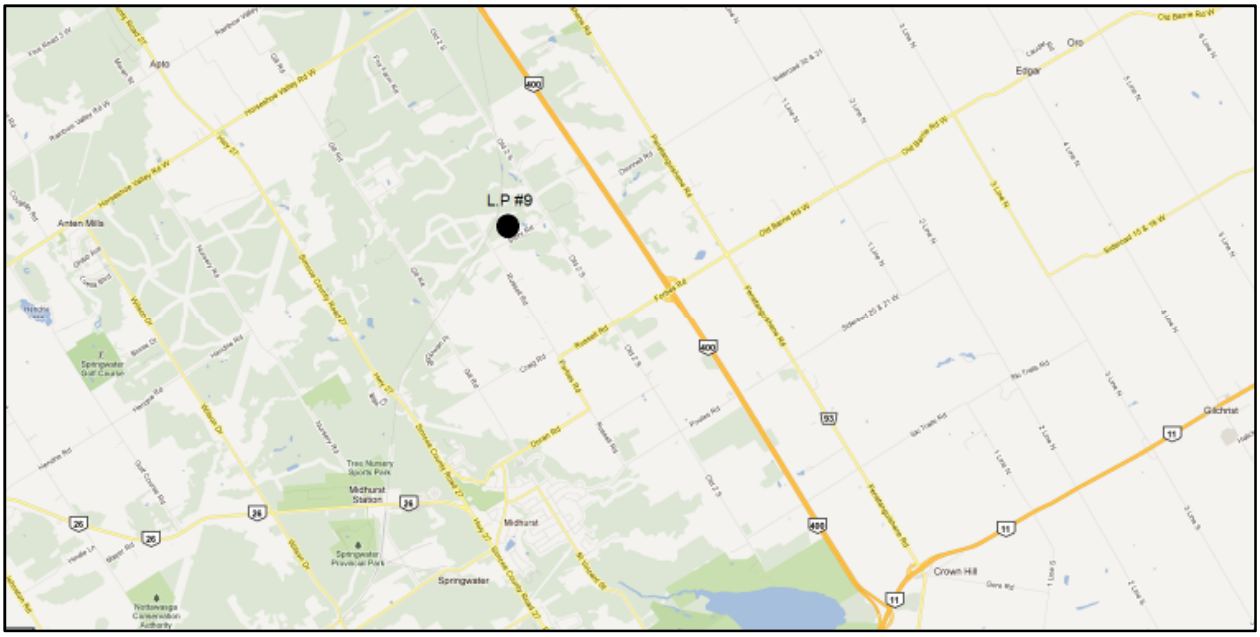
The Project is located in the County of Simcoe, Township of Springwater, and is approximately 8 km north of the City of Barrie. The project address is L.P #9, 1572 Story Road (R.R.#1), Midhurst, Ontario, L0L 1X0. The Project area and local road maps are illustrated in Figures 1 and 2.

The closest arterial road is Highway No. 400. To drive to the site, from the intersection with Hwy 11, take Hwy 400 north 6 km to the Russell Road turnoff. Travel west on Russell Road (Regional Road #11) 2 km and continue on Russell Road north 2 km to Story Road. The site is at the northeast corner of the intersection of Russell and Story Roads.

The solar array is located in a vacant field that was formerly a quarry. For the Project, the existing access off Story Road immediately east of the intersection will be used. An overhead service will be constructed along the west side of Russell Road to a connection point 120 metres to the south. The land at the solar array facility is moderately sloping northward.

Figure 1: Aerial Photo of the Project Location

Figure 2: Project Location Road Map



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The project website and electronic copies of this Design and Operations Report (DOR) and supporting documents are available at: www.futuresolardevelopments.com/projects.

2.2 Energy Source, Nameplate Capacity and Class of Facility

The project will consist of a ground mounted, solar panel array used to convert solar energy into electricity using photovoltaic panels (PV). The maximum name plate capacity will be 100 kW. The facility is classified as a Class 3 solar facility. The electricity generated will be connected to the electrical distribution system of Ontario Power Authority (Hydro One Networks Inc.).

2.3 Other Approvals and Consultation

The project has received the Feed-In-Tariff approval (FIT-FGBG6GF). A contract between Canadian Solar and the Ontario Power Authority (OPA) for the sale of electricity generated by this renewable facility under the FIT program has been received. Permits are being obtained as necessary from the Township of Springwater for temporary and permanent works and any service installation within their road right-of-way. The draft Design and Operations Report (DOR) is being made available for public review and comment to the requirements of O.Reg. 359/09 prior to final REA submission to the Ontario Ministry of Environment (MOE).

Other consultation that has been or will be undertaken as the project progresses is as follows:

- Complete First Nation and Aboriginal consultation.
- Meet with Ontario Ministry of Natural Resources (MNR) to discuss the natural heritage features and confirm requirements, review results and then obtain a letter confirming their agreement with methodology and results (pending).
- Complete consultation with the Township of Oro-Medonte, and any service boards in accordance with the consultation form provided by MOE (pending).
- Determine which natural heritage features are within the setbacks identified in Ontario Regulation 359/09 and complete site investigations, if required.
- Complete a public consultation process including the first and second public information session in the area of the project (pending).

2.3.1 Stakeholder and Public Communications – Design Phase

Public consultation and stakeholder engagement activities will continue through all phases of the Project. The contact list identified during the first public information meeting for the Project

Description Report (PDR) will be updated. The stakeholders including regulatory agencies, landowners, Aboriginal communities and other interested parties will be notified of upcoming meetings through newspaper advertisements and direct letters where required. In addition, reports and other key documents will be made available on the proponent's website (www.futuresolardevelopments.com). The following communications / consultation is being presently planned:

- Publish second newspaper notice announcing the second public meeting;
- Hold second public meeting;
- Post final copies of REA application (including study reports) on the proponent's website;
- Provide notice of application to MOE and posting this on the EBR;
- Assimilate and respond to communications received from the agencies and public throughout the MOE technical review;
- Formalize the completion of the MOE review and the related Notice to Proceed by placing a notice on the proponent website;
- Identify construction dates on the proponent website; and
- Maintain communications with public through periodic updates of work progress on the proponent website and direct communications as required.

Communications received during the REA process and prior to submission to the MOE will be formally documented (typically electronically) and made part of the submission package for the REA regarding project consultation. Communications received after the MOE submission and prior to application approval will similarly be documented and provided as an addendum. Responses will be formalized and provided in a timely manner.

2.3.2 Public Communications – Construction, Operation and Decommission Phases

Public and stakeholder consultation will continue during the construction, operation and decommission phases. The stakeholder contact will likely be to apprise the parties of the status of the work and emergency issues.

The public may have specific concerns and/or incidents that require a response. A formal approach will be taken to document and address these communications, including:

- Noting name and address of party and other relevant contact information;
- Documenting time and date of contact;
- Identifying nature of issue and whether a formal response is required;
- Responding directly to the party related to the issue or concern and documenting; and
- Following-up further as deemed necessary.

2.4 Supporting Documentation

Supporting documentation of the draft Design and Operations Report includes:

- Project Description Report (PDR);
- Construction Plan Report (CPR);

- Decommissioning Plan Report DPR);
- Acoustic Assessment Report (Noise);
- Natural Heritage Assessment Record Review Report;
- Natural Heritage Site Investigation Report;
- Natural Heritage Evaluation of Significance Report;
- Natural Heritage Environmental Impact Study;
- Water Assessment Records Review Report;
- Water Assessment Site Investigation Report; and
- Archaeological Assessment Report (Stage 1).

2.5 Land Ownership

Canadian Solar Developers Ltd. has entered into a long term lease agreement with the landowner.

3. Facility Site Plan

The facility is located in the County of Simcoe, Township of Springwater, at 1572 Story Road. The site is at the northeast corner of the intersection of Russell and Story Roads (see Site Plan, Appendix 1). Another facility is planned on the same property 0.5 km to the east on Story Road (L.P#10).

3.1 Buildings and Structures

There are no new buildings associated with the facility. There is no indication of any powerline serving this property. The buried service from the solar array facility will connect to a new overhead powerline situated along the west side of Russell Road. This service will extend southward for 120 metres to connect to the feeder service of the Midhurst DS. Electrical structures related to the solar array field will be situated in a small area west and south of the array panels, and consist of: inverters; a weatherproof enclosure with station service disconnect switch, splitter and revenue meter; and a pad-mounted transformer.

3.2 Roads and Access

Story Road will be used for the site access for all construction equipment. It is a short distance (30 metres) from this road to the westerly limit of the solar array. The existing triangle formed by the two main roads and the south limit of the solar facility can be used as a staging area as required. No heavy earthmoving equipment is envisioned for the solar array assembly. As the site is located in an open field, there are no trees or shrubs in the work area. Topsoil will be stripped at the access to and in the area of the electrical system (inverters; station service disconnect switch, splitter and revenue meter; and transformer). A small dozer or excavator can remove the topsoil and stockpile it in a ridge along the southerly limit of the site. The stockpile will be placed as not to restrict surface drainage. A gravel base approximately 0.25 metres deep will be placed for the access road (5 metres wide) and at the area for the electrical equipment.

3.3 Groundwater and Surface Water

The predominant drainage direction is to the north. There are no watercourses or other drainage features in the immediate area. There is a small man-made reservoir (dugout) 0.2 ha in size immediately north of the array field. This pond provides habitat for amphibians and is part of a connecting corridor to the woodlands to the north. A borehole was placed at the development site as part of the geotechnical investigation. No monitoring well was installed. Wet soil conditions were identified at a 1.0 metre depth in a zone of sand and gravel. The Preliminary Geotechnical Investigation report concluded that there would be no major groundwater problems for construction.

The footprint of the array and associated works is 0.4 ha. The array sheds precipitation to the ground below. The existing topography is not being changed as no grading of the site is planned. A review of existing residential wells in the area was not undertaken. No impact is envisaged to the water balance of infiltration and runoff. Due to the estimated minimal impact on the water balance, a hydrogeotechnical study does not need to be undertaken.

The Waterbody Assessment Records Review report undertaken as part of the Natural Heritage study did not note any streams within the development setback. The databases of the Ministry Natural Resources (MNR), the Nottawasaga Valley Conservation Authority (NVCA) and County of Simcoe noted there were local wetland complexes beyond 120 metres of the array field. The development of the site is not anticipated to impact these wetland features.

3.4 Stormwater Facilities

A new access to the site will be constructed off the existing road / laneway. There are no defined drainage works along the road. No constructed works to address surface drainage (ditches and culverts) are required. Precipitation falling on the solar panels is not impacted environmentally. This runoff does not need to be collected for treatment at a stormwater facility. The site is being vegetated with a low maintenance ground cover including any topsoil stockpile. The access to the array will be gravelled. Site erosion will not be an issue.

3.5 Archaeology, Cultural Heritage, Natural Heritage and Water Bodies

A Stage 1 archaeological assessment study has been undertaken by a licensed archaeologist and was conducted in accordance with the Ontario Heritage Act and using the Ministry of Tourism and Sport's Draft Standards and Guidelines for Consultant Archaeologists (2011). The reports are being submitted to the Ministry of Tourism, Culture and Sports. The findings of the Stage 1 archaeological property inspection noted there was little archaeological potential due to the previous land usage as a quarry. This recommendation is subject to MTCS approval.

A cultural heritage self-assessment was completed for this site, which included correspondence with the local municipality and online heritage-related searches. The self-assessment indicated that there is low potential for heritage resources at the project location. Appendix 3 presents the completed self-assessment form, correspondence with the municipality, and results of online searches.

The Natural Heritage report, from a review of OMNR Records, noted that there were no natural features present in the immediate area. The databases of MNR, Nottawasaga Valley Conservation Authority (NVCA) and County of Simcoe noted provincially significant wetland complexes beyond the 120 metre setback distance of the array field. There are no significant water bodies within the development setback of 120 metres of the array field. A small 0.2 ha

pond is situated to the north of the solar array field. The Natural Heritage reports and Environmental Impact Study (EIS) noted that wooded areas are present within the centre and to the north of the property. These woodlands are considered significant for breeding habitat of amphibians. The pond also provides amphibian habitat and is part of an animal movement corridor. The layout for the array field is within the 120 metre setback requirement of these defined natural features.

3.6 Land Use and Land Use Plans

The surrounding land use is designated as Agriculture (A). Zoning maps have been included in Appendix 1. Given the existing Project site land use, and the land use in the surrounding area, the Project is considered to be in a rural environment. The solar facility is situated in an open field.

3.7 Transformer

The existing site does not appear to have an electrical supply. The nearest service is the powerline 120 metres to the south on the west side of Russell Road. A new pad mounted single phase transformer will take the 240V electrical power from the inverters and step it up to 4.8kV. The electrical power will then be fed through an underground cable along the site access to the road. An overhead powerline will be installed to deliver the electricity to the hydro service to the F2 feeder service at Russell Road.

3.8 Noise Receptors

An Acoustic Assessment Report has been prepared for L.P #9. The noise assessment conducted was based on MOE guidance documentation ("Basic Comprehensive Certificates of Approval (Air) – User Guide", MOE, 2004).The study focused on the potential environmental noise producers, being the transformer and the inverter. The critical noise receptors (points of reception – POR) within 1 km of the site were identified as permanent residences. As the area is zoned agriculture, new development and hence future PORs within the environmental zone were not considered. A second solar facility (L.P#10) with transformer is located 0.5 km to the east on the same property.

The operating load and hence ambient noise production of the transformer and inverter is at its greatest during daylight hours when the solar panels are receiving maximum sunlight. For the noise evaluation, it was assumed that full power production was being produced continuously (24 hours). As the calculated worst predictable case noise impacts are significantly lower than the applicable MOE exclusionary limits of 45 / 40 / 40 dBA for daytime / evening /nighttime periods respectively, it was concluded that the proposed facility would be in compliance with MOE noise criteria.

4. Facility Design Plan

The components of the solar array facility will be operated and maintained for the life of the project. Manufacturer technical component data sheets are provided in Appendix 2 for the main electrical items of the facility.

As noted in Section 3, Site Plan, the site access will be constructed from the existing driveway entrance off Story Road. The site does not require any special grading other the small length of access road. No drainage or stormwater management facilities are required. Although the

operation of the solar facility will produce some environmental noise, it has been determined that the noise level will not impact residents (PORs) identified within the study area. No noise barriers or other containment will be required. The solar facility will not generate air emissions or sewage, or discharge any air contaminants. Fencing around the electrical inverters and other works will be discussed with the landowner.

4.1 Facility Components

The solar facility will consist of ground mounted solar panels, transformer, and direct buried cable to a new overhead service which connects this facility to the feeder line at Penetanguishene Road (see Site Plan, Appendix 1). Table 1 below summarizes the facility components and their operational details.

Table 1: Facility Specifications and Details

Specification	Details
Generator connection	Single Phase
Connection point type and name	Feeder, F1
Connection point location	Latitude: 44.486 Longitude: -79.726
Connection voltage level	4.8 kV
Name of transformer station near feeder	Midhurst DS
Nearest roads	Russell and Story Roads
Distribution lines, poles, support structures	New Overhead Connection to Feeder F2 at Russell Road
Solar Array	Panel Type – Canadian Solar CS6P-230 Frame & Mounting – UNIRAC ISYS Ground System with concrete block pedestals
Transformers	240V/4.8 kV single phase
Other electrical conversion, metering and protection equipment	20-5kW, 240V 1 phase Aurora Photovoltaic Inverter; NEMA 3 weatherproof enclosure with station service disconnect switch, splitter & revenue meter; HV Interrupter & Isolation Switch

4.1.1 Solar Modules / Array and Mounting System

The solar electric generating facility consists of 507 modules of photovoltaic (PV) panels in strings of 13 modules installed on a fixed racking structure. Solar panels typically produce between 200 and 300 watts of direct current (DC) electricity. It is anticipated that the supplier of the panels will be Canadian Solar and the panel model will be CSP-230, which produces 230 watts (Appendix 2). These panels may come to the site partially pre-assembled.

The panels will be mounted on a rigid racking frame of strings in 5 and 6 rows (to create an array) with the rows facing due south to maximize the sun exposure. The frame is set off the ground approximately 0.3 to 0.5 metres using concrete blocks. This ensures there is no interference of sunlight reaching the solar panel by the vegetation. These blocks secure the array to the ground to address wind loads. Each racking frame is separated by a distance of 3 metres to aid in assembly and maintenance. A typical manufacturer / supplier of frame and mounting equipment is UNIRAC and their ISYS Ground System (Appendix 2). The design of the frame will be based on the final layout of the panel arrays and foundation support and anchorage. The mounting frame will be designed and produced under the direction of the contractor. The contractor will assemble the frame on site.

The foundation supports are based on a ground mount system and will consist of concrete blocks approximately 0.5m in diameter and 0.3m high with a steel plate mounted to threaded rods cast into the concrete. The plate will be able to be adjusted to provide a level and/or inclined plane as necessary for the frame installation. These blocks will be produced by a concrete manufacturer under the direction of the contractor. There will be approximately 30 supports per assembled unit (13 panels per row / 5 to 6 rows). It is envisaged that the supports will be placed on the grassed surface as the bearing pressure of the concrete block is minimal. The geotechnical report notes that the topsoil should be stripped to the subsoil. Should the design of the foundation supports result in a significantly larger block, the requirements of the geotechnical report will be followed. Similarly, should the contractor prefer an alternate system such as a screw mount anchor, the soil conditions noted and the design parameters set out in the Preliminary Geotechnical Investigation report will be followed.

4.1.2 Inverters, Transformers and Electrical Collection System

Direct current (DC) electricity generated from each panel is transmitted through interconnecting panel wiring in each string to 20 5kW 240V Aurora Inverters or equivalent (Appendix 2). These inverters convert the DC current to single phase alternating current (AC) and will be situated next to the west limit of the solar array.

The electricity is then fed to a weatherproof enclosure (NEMA 3R) housing the station service disconnect switch, splitter and revenue meter. This steel box will be mounted on a concrete pad resting on a gravel base near the Inverters. The power from the splitter will be fed to the 240V to 4.8kV – 100kVA single phase transformer (Cooper Power Systems or equivalent) and then to the pad-mounted high voltage (HV) interrupter and isolation switch. An underground cable to the road / laneway will be installed by trench excavation. A new overhead powerline will be constructed on the west side of the road to connect to the existing powerline on this same road.

4.1.3 Temporary Construction Activities

The existing site is grassed with a combination of alfalfa and Kentucky bluegrass. Arrangements will be made with the landowner to take off any crop prior to construction. A grassed surface is to be maintained at the solar array field. Should it be necessary, the landowner will be requested to plough and till the field in preparation for seeding of a continuous ground cover (see section 4.3 Landscape Plan). There will be no stripping of topsoil or grading of sub-soils in the area of the solar array. Erosion control measures will be installed at the north limit of the work area to mitigate the potential for sediment transport to the existing pond.

All landmarks, access roads, transmission cables and construction area boundaries will be identified and marked using surveying equipment and tied to UTM coordinates. Locates for underground utilities will be requested. Buried infrastructure, such as gas lines and electrical and communication cables will also be located and marked including at any laydown areas. The work area will be laid out with tall wood stakes set at the corners.

Site preparation will include system component layout, creating access points for installing foundation supports, frames and panels, identifying and preparing the route for the electrical installations and any other features required for construction of the facility. The aboveground electrical components will be installed at the west limit of the solar array. The electrical service connection will be buried within the field and markers placed to identify the cable location. All solar array materials will be trucked to site on flat bed trailers. The overhead powerline to the F2 feeder will be constructed on the west side of Russell Road within the road right-of-way by Hydro One. One hydro pole will be installed. No special access is required for the pole with cable installation.

The existing entrance from Story Road to the site will be the primary access for all construction materials and equipment. It is a short distance (30 metres) from the road to the limit of the array. The site access will be constructed with a gravel base, including at the west end of the array field where the electrical components are situated. The existing triangle formed by the two roads and the solar facility can be used as a temporary staging area. No heavy equipment is envisaged for the solar array assembly. For construction, service and decommissioning, a working area of 5m to 10m will be taken around the perimeter of the array field. This area will be kept grassed. For operation and maintenance, vehicles can use the constructed access.

Once construction has been completed, all construction equipment and vehicles will be removed from the site. Debris and waste will be collected and disposed of at an approved location. Where possible, materials such as gravel will be diverted from landfill and be recycled. Topsoil that has been stockpiled will be stabilized by seeding with a native grass. Any gravel surface will be bladed with a cross fall to not impede surface drainage. Disturbed areas will be seeded by broadcasting as necessary.

4.2 Water Assessment

Section 3.3 described the groundwater and surface water at the Project site and stated that there would be no impact to the water balance of infiltration and runoff. No scheduled cleaning of the solar panel is undertaken nor are there any site water supply and waste facilities planned. The surface drainage / topography of the site is generally not changed. Runoff (sheet flow) is not impeded. The solar panels direct precipitation to the ground surface. The environmental `water' footprint of the solar array field is related to the foundation supports. It is estimated that these supports equate to approximately 2% of the surface area of the array field. The impact on infiltration would not be measurable. Further, the proposed vegetation will capture runoff to a greater degree and enhance infiltration. The access to the array field is gravel which is generally placed to the same depth as the topsoil. The gravel is semi-pervious and could be considered to have the same permeability as the topsoil. The materials identified for the design and the construction methodology will not have a demand on the local water resources, and will not impact the groundwater.

4.3 Landscape Plan

The existing site is a grassed (uncultivated) field. There is no permanent vegetation (trees) in the area that will be impacted by the temporary and permanent works. A detailed landscaping plan is not considered necessary. Should the existing ground cover of grasses be deemed to be discontinuous and sparse, the ground at the site will be tilled and be mechanically seeded with a low maintenance short native grass prior to construction and the seed allowed to germinate. Construction activities will take place on this hardy vegetation.

5. Facility Operational Plan

The solar panels are unattended electricity producing units. They operate year round (365 days a year), given adequate sun exposure. Therefore, operational hours depend on the length of day, which varies throughout the year.

5.1 Equipment Operation and Maintenance

The site will require periodic inspection possibly monthly by a trained technician. This will be undertaken in daylight hours. The system will have remote monitoring capability to indicate loss of performance (power production). Periodic maintenance will likely take place quarterly. This will require repairs to or replacement of electrical components, confirming electrical connections are sound, and replacing photovoltaic panels as necessary. The transformer will be checked for leaks and repaired immediately. Adjustments to the elevation of the support frame may need to be made as a result of soil movement (settlement). Cleaning of the panel is generally not required. The system self monitors and identifies any issues with the solar panels as a result of lost electrical production. There will be no cutting of the vegetation (grass) although higher vegetation such as weeds will be removed. Any erosion points will be addressed by placing topsoil and seed. Should the potential for more severe erosion be present, bio-filter socks (organic media in a bio-degradable filter tube) with seed can be installed at areas of concentrated flow.

The system is self-contained. There will be no hazardous materials stored on site. Pull sheets of the various electrical components will be stored on site at the meter location along with a data log record of inspection and maintenance. The local utility and other governing bodies will be apprised of the status of the site.

5.2 Post - Installation Activities

All decommissioning and restoration activities will adhere to provincial, federal and municipal requirements and permits. The decommissioning and restoration process will comprise the following:

- Removal of ground structures including all gravel;
- Removal of below ground structures;
- Replacement of topsoil to bring the site back to pre-construction condition.

Materials will be salvaged and recycled to the greatest extent possible.

6. Environmental Effects Monitoring Plan (EEMP)

The Ministry of Environment has released a draft Technical Bulletin for Preparing the Design and Operations Report which sets out the requirement that the environmental effects monitoring plan show how the negative environmental effects will be mitigated and monitored to comply with O. Reg. 359/09.

The Technical Bulletin notes that:

- A summary of all potential negative environmental effects caused by the project as given in the description of negative environmental effects in the Project Description Report (PDR) be provided.
- For each potential negative effect, performance objectives are to be stated where possible such that in achieving the objective the negative environmental effect will be mitigated.
- A description of all mitigation strategies planned to achieve performance objectives be identified.
- If there is an on-going risk of potential negative environmental effects, a description be included as to how the project will be monitored to ensure that mitigation strategies are meeting performance objectives.
- Contingency measures are to be provided should monitoring reveal that negative effects are continuing to occur.

The EEMP is to:

- Provide instruction regarding measures to protect the environment and minimize the potential negative environmental effects;
- Document environmental concerns along with protection / mitigation measures and strategies;
- Identify monitoring activities; and
- Be kept current and be updated through all phases of the work.

Given the nature of solar power generation, few if any effects are expected during the operations period. The associated Project reports for the L.P #9 solar array facility have documented and studied the potential environmental effects of construction activities and system operations within their respective geographical area. The construction of the proposed Project could impact the environment relating to: topography, soils, surface water, groundwater, aquatic habitats/biota, vegetation, terrestrial wildlife and air quality. In addition to this, certain social environments and cultural features could be affected, and are not limited to: local traffic, municipal roadways, public safety, sound levels, land use, archaeological resources and cultural heritage resources.

The potential negative environmental effects for each component are further summarized in Table 2, along with performance objectives, mitigation strategies, residual and long term effects that may occur, and a monitoring plan for each environmental component.

Table 2: Environmental and Social Effects Summary

Component		Potential Negative Effect	Performance Objectives	Mitigation Strategy/ Measures	Residual Effects	Monitoring Plan/ Contingency Measures
Natural Environment	Topography	During construction, grading and minor alteration to topography could occur	Minimize change to site topography	Disturbed areas will be re-graded to match surrounding topography as closely as possible	Minor long term topographical changes may occur as a result of construction	No monitoring plan required / No contingency measures required.
	Soils	Soil compaction, erosion, loss of quality as a result of accidental spills during construction	Minimize soil disturbance; no long-term increase in erosion beyond existing conditions; no long-term environmental effects due to toxic spills	Use construction best management practices & mitigation measures.	No residual effects if proper mitigation is implemented.	Daily equipment inspection during construction; Report spills to MOE Spills Action Centre; containment; Monthly site inspection of site conditions / Undertake repairs quickly
	Surface Water	As a result of construction, water turbidity could increase, along with contamination from spills	No long-term increase in runoff turbidity; no long-term environmental effect due to toxic spills	The solar array will be minimum 20m from any surface water. Sediment filtration measures will be used during construction. Soil erosion will be repaired.	No residual effects if proper mitigation is implemented.	Check condition of vegetation monthly during growing season; look for soil erosion / Undertake repairs immediately. Maintain a record of site conditions.
	Groundwater	May be contaminated by accidental spills during construction.	No long-term environmental effect due to toxic spills; minimize infiltration loss	Spill prevention and response measures will be implemented through the life of the Project.	No residual effects if proper mitigation is implemented.	Daily equipment inspection during construction / Reporting spills to MOE Spills Action Centre; containment.
	Aquatic Habitat/Biota	Potential negative effects due to construction and site alteration	No long-term environmental effect due to construction and site alteration	The solar panel will be 20m from any aquatic feature or habitat. An EIS has confirmed mitigation strategies. Surface water is protected (sediment control). BMP identifies construction post July 1.	No residual effects if proper mitigation is implemented.	Check condition of vegetation monthly during growing season; look for soil erosion / Undertake repairs immediately.
	Vegetation	While the project area is already cleared, some vegetation clearing could occur.	Minimize impact to existing vegetation during construction; site restoration to be compatible with existing land usage and vegetation	Clearing will be kept at a minimum and not extend beyond the construction perimeter. Replanting native species after construction.	No residual effects if proper mitigation is implemented.	Check condition of vegetation monthly during growing season; look for soil erosion / Undertake repairs immediately.

Component		Potential Negative Effect	Performance Objectives	Mitigation Strategy/ Measures	Residual Effects	Monitoring Plan/ Contingency Measures
	Terrestrial Wildlife	Loss of wildlife and wildlife habitat could occur during construction.	No long-term environmental effect due to construction and site alteration	Wildlife habitat clearing will be kept at a minimum. Best management practices with respect to work during breeding seasons will be implemented (post July 1).	Some disturbance of wildlife will occur during construction and operation.	Check for nesting activities during maintenance; avoid disturbance / No contingency plan required.
	Air Quality	Construction vehicles will cause reductions in air quality. Dust and emissions will increase during construction.	No long-term environmental effect due to construction and site alteration	The use of standard construction best management practices and mitigation measures will be implemented to reduce dust.	No residual effects if proper construction standards are followed.	No monitoring plan required / Discuss operational mitigation strategies during construction meetings.
Social Environment	Local Traffic	May increase due to construction vehicles. Temporary distributions in traffic routes and delays will occur during construction.	Elimination of risk to public	Effects will be minimized by designating and preparing transportation routes and facilitating traffic flows when necessary.	No residual effects if proper mitigation is implemented.	No monitoring plan required / Respond to any complaints and modify construction traffic where possible.
	Municipal Roadways	Damage to roads near the construction site could occur.	Elimination of risk to public	Any damage will be remediated to the satisfaction of the municipality.	No residual effects if proper mitigation is implemented.	Monitor haul roads daily / Notify municipality immediately.
	Public Safety	Construction will pose risk to the community and workforce.	Elimination of risk to public	Proper provincial and federal safety procedures will be adhered to during all phases of the project.	No residual effects if proper mitigation is implemented.	No monitoring plan required / Record any accidents and notify MOL.
	Waste Management and Disposal Sites	Construction will generate construction waste, hazardous waste and sanitary waste.	Maximize recycling potential of construction materials; hazardous and sanitary waste to be dealt with under existing regulations	Proper storage and disposal of wastes will be implemented.	No residual effects if proper management of waste is implemented.	No long-term monitoring plan required / Discuss waste management strategies during construction meetings and implement.

Component		Potential Negative Effect	Performance Objectives	Mitigation Strategy/ Measures	Residual Effects	Monitoring Plan/ Contingency Measures
	Visual Landscape	Installation of panels will be a permanent fixture and result in a change to the local landscape.	Elimination / reduction in visual disturbance	Aesthetic visual barriers may be considered if necessary.	Visual landscape will change for the duration of the Project.	No monitoring plan required / Repair erosion areas quickly.
	Sound Levels	During construction, disturbance to neighbouring residents will occur. Transformers and inverters may increase ambient sound levels.	Minimize noise emissions at nearby noise receptors to provincial guidelines; minimize environmental impact	A noise study will be conducted to ensure noise levels are within provincial standards.	No residual effects.	No monitoring plan required / Respond to noise complaints quickly.
	Land Use	Land use designation will change for the duration of the Project.	Maintain present land use to the greatest extent possible	The land use designation will remain unchanged.	A reduction in agricultural land for the duration of the Project.	No monitoring plan required / At decommissioning return site to original usage.
	Archaeological Resources	During construction, archaeological finds may be discovered.	Undertake assessment to regulatory requirements; mitigate impact to greatest extent possible	An Archaeological Assessment was completed to determine potential resources and mitigation requirements.	Construction will cease in the event archaeological evidence is found and the Ministry of Culture will be notified immediately.	No monitoring plan post-construction required / During construction be aware of potential artefacts; Notify regulatory agency and stop work.
	Cultural Heritage Resources	Construction could negatively affect cultural heritage landscapes.	Undertake assessment to regulatory requirements; mitigate impact to greatest extent possible	As required by the Ministry of Tourism and Culture, potential heritage resources will be determined and assessed.	Low potential for heritage resources on property. No residual effects if proper mitigation is implemented.	No monitoring plan post-construction required / At decommissioning return site to original usage.

7. Emergency Response Plan and Emergency Communication Plan

The operation of a solar facility is generally passive and consists of monitoring of the site and undertaking maintenance repairs occasionally. Emergency events are generally unlikely and are typically associated with construction activities during installation and decommissioning. The proponent will develop an emergency response plan and a communications plan to cover the entire life of the project including during the construction, operation and decommissioning phases. These plans will be provided to the local authorities and implemented prior to construction commencement. Plans will be kept current during the various phases and any updates will be circulated.

7.1 Emergency Response Plan (ERP)

The proponent will prepare an Emergency Response Plan (ERP) to the requirements of the local authorities including the County of Simcoe, Township of Springwater, and Nottawasaga Valley Conservation Authority if requested. The County of Simcoe has prepared an Emergency Response Plan in November 2008. The office for Emergency Planning is located at 1110 Hwy 26, Midhurst, L0L 1K0 (705-726-9300).

The proponent will request a meeting with the County Fire Department Administration (3375 Line 4N, Moonstone, L0L 2K0) and the County 9-1-1 Services and Emergency Planning Community Emergency Planning Coordinator prior to construction to discuss the details of the various phases of the work including any potential emergency scenarios that might arise. A draft Project ERP document will be prepared and circulated to the various authorities for review and comment. A final version of the Project ERP will be posted on the Project website and copies provided to MOE and other agencies as requested. The ERP will include:

- Communication procedures including the identification of a primary and secondary crisis manager to serve as the company spokesperson in the event of an emergency;
- Listing of site personnel designated and trained in first aid/ CPR including the contractor safety officer;
- Emergency and evacuation procedures for each type of emergency (fire personal injury, spill);
- Emergency phone numbers; and
- Name and direction to nearest hospital or medical aid facility.

The contractor will be provided a copy of this document with instructions to keep a copy on site at all times during the construction work, and to advise their safety officer and staff of the procedures and contact information.

7.2 Emergency Communications Plan (ECP)

As part of the Emergency Response Plan (ERP), an Emergency Communications Plan (ECP) will be included, identifying contact information for relevant responders, regulators, landowners and other stakeholders. The communications protocol between the proponent and the County's ERP coordinator for emergency scenarios at the Project will be set out. Emergency issues could include personal injury, fire and environmental spill. The contact information will be clearly posted at the construction site and with other key parties. In the event of an emergency at the Project site, contact (typically phone) will be made with key parties according to the communications protocol.

During the construction and decommissioning phases, the Contractor's Health and Safety officer or designate will take the lead and be the contact with the outside agencies. During the operation phase, the proponent or their designate will take this role. These trained staff will consider:

- The nature of the emergency;
- Potential risk of human injury;
- Potential risk to the environment;
- Potential risk to property; and
- Need for additional resources to respond to the incident.

This knowledgeable staff can identify potential action plans and assist with other communications / notifications to the public, stakeholders and first responders (fire department, medical - ambulance and police). Where the incident involves an environmental spill, the Ministry of Environment Spills Action Centre will be notified immediately (1-800-268-6060).

8. Conclusions

The Design and Operations Report (DOR) has been prepared as part of an application for a Class 3 Solar Facility under O.Reg.359/09 Renewable Energy Approval (REA) under Part V.0.1 of the Ontario Environmental Protection Act as amended by O.Reg. 521/10 and O.Reg. 231/11.

A site plan has been prepared showing the layout of the solar array field, the associated electrical components, topographical features and other amenities within the study area.

The environmental impacts during the construction, operation and decommissioning phases have been determined to be able to be mitigated and/or manageable.

There are no provincial parks, ANSIs or water bodies within 120 metres of the proposed solar array field. There are woodlands within the described setback and a small manmade pond that provides amphibian habitat. The EIS has established the construction season of post July 1 after the breeding season. This study has also confirmed the mitigation measures will address any potential negative impacts.

The acoustical assessment determined that all MOE requirements are met or exceeded.

The Phase 1 archaeological assessment indicated the site did not exhibit any archaeological potential. This recommendation is subject to MTCS approval.

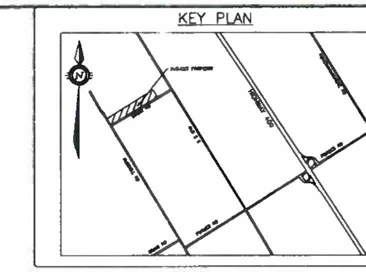
The cultural heritage self-assessment noted that there was low potential for heritage resources at the project location.

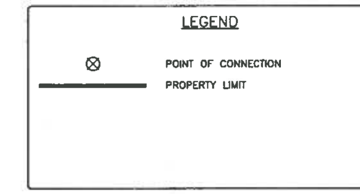
Neither the surface water nor groundwater is impacted by the development.

There is no requirement to change the Land Use for the Project. Post-decommissioning, the land can revert back to its agricultural usage.

An outline for an Emergency Response Plan (ERP) along with an Emergency Communications Plan has been noted. An ERP needs to be prepared and formalized with the local authorities.

Appendix 1 – Project Site Plan & Land Use Zoning





STATISTICS: SOLAR ARRAY

NUMBER OF MODULES: 507
NUMBER OF MODULES PER STRING: 13
NUMBER OF STRINGS: 39
PANEL TYPE: CANADIAN SOLAR CS6P-230
FEEDER NAME: F2
CONNECTION VOLTAGE: 4.8Kv

CONTRACT IDENTIFICATION # F-001254-SPV-130-505

FIT REFERENCE # FIT-FGBG6GF

HAMMERSCHLAG + JOFFE INC.

NOTES

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NO.	REVISION DESCRIPTION	DATE	BY	APPD
1	ISSUED FOR DOR REPORT	14/09/12	TB	MHN

SCALE: HORZ 1:1000, VERT 1:50

CLIENT: FUTURE SOLAR DEVELOPMENTS INC.
3400 PHARMACY AVE, SCARBOROUGH, ON

exp Services Inc.
• BUILDINGS • EARTH & ENVIRONMENT • ENERGY • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

BASEPLAN	K.H.
DESIGN	K.H.
CHECKED	G.B.
CAD	K.H.
PROJ. MAN	G.B.
APPROVED	G.B.

PROJECT: FUTURE SOLAR
1572 STORY ROAD, MIDHURST, ON

TITLE: SITE PLAN
LP9

PROJ NO.	WSL-2250
SURVEY	FBS
DATE	MAY 18, 2012
DRAWING NO.	SP 6

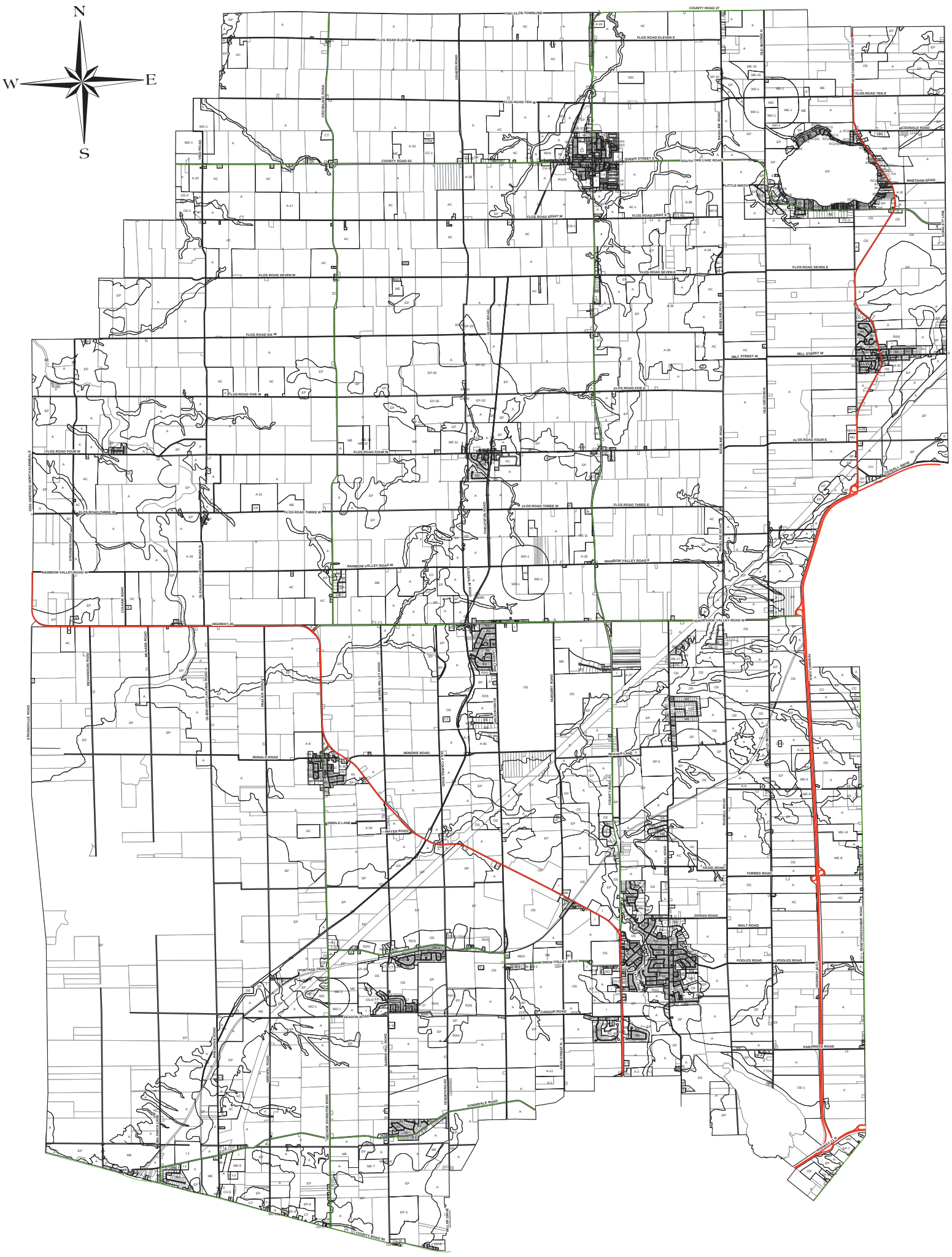
TOWNSHIP OF SPRINGWATER

DETAILED ZONING SCHEDULE 'A'

0 1 2 4 6 8 Kilometers

ZONE LEGEND	
R1	Residential
R2	Residential
R3	Residential
RE	Residential Estate
RR	Residential Rural
RS	Residential Seasonal
RC	Residential Conversion
CG	General Commercial
CH	Highway Commercial
CR	Rural Commercial
CT	Tourist & Recreational Commercial
CC	Campground Commercial
CPM	Park Model Trailer Commercial
CA	Adult Entertainment Commercial
K	Kennel
MI	General Industrial/Inside Storage
MO	General Industrial/Outside Storage
ME	Extractive Industrial
WD	Waste Disposal
I	Institutional
OS	Open Space
EP	Environmental Protection
A	Agricultural
AC	Agricultural Consolidation

N W E S



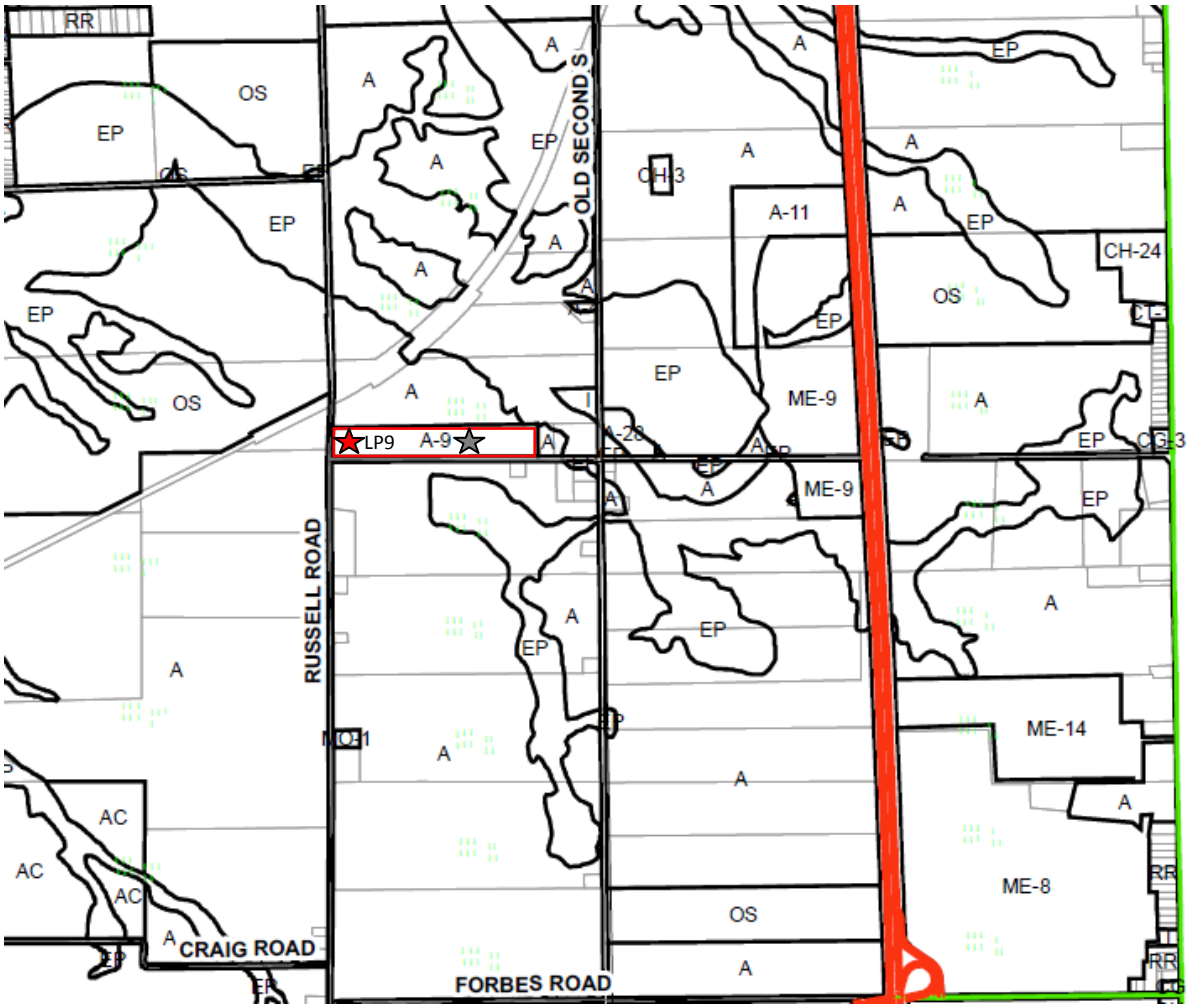
This is Schedule 'A' to By-law 5000-038 passed the 21st day of November, 2005

The Corporation of the Township of Springwater

Deputy Mayor Tony Guergis

Clerk Eleanor J. Rath

Revised October 27, 2005.



A = Agricultural
A-9 = Agricultural
EP = Environmental Protection
★ = location of LP9
★ = location of LP10

Exp Services Inc.
561 Bryne Drive, Barrie, Ontario L4N 9Y3
(705) 734-6222

Drawing Title: Zoning Map LP9
Prepared By: Rebecca Orth
Date: January 2012
Project No.: WSL-0002250-00

Acoustic Assessment, LP9
Future Solar Developments Inc.
8-3400 Pharmacy Ave.
Scarborough, Ontario M1W 3J8

Appendix 2 – Manufacturer Technical Components

CanadianSolar

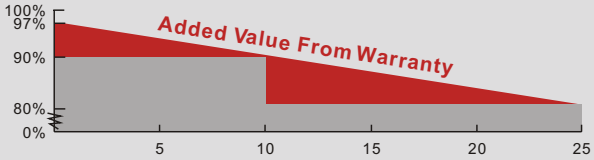
CS6P

235/240/245/250/255M

CS6P is a robust solar module with 60 solar cells. These modules can be used for on-grid solar applications. Our meticulous design and production techniques ensure a high-yield, long-term performance for every module produced. Our rigorous quality control and in-house testing facilities guarantee Canadian Solar's modules meet the highest quality standards possible.

Key Features

- High module efficiency up to 15.85%
- Positive power tolerance: 0 ~ +5W
- Robust frame to up to 5400 Pa load
- Anti-reflective with self-cleaning surface
- Outstanding performance at low irradiance
- High energy yield at Low NOCT
- **Backed By Our New 10/25 Linear Power Warranty Plus our added 25 year insurance coverage**



- 10 year product warranty on materials and workmanship
- 25 year linear power output warranty

Best Quality

- 235 quality control points in module production
- EL screening to eliminate product defects
- Current binning to improve system performance
- Accredited Salt mist/Ammonia resistant

Best Warranty Insurance

- 25 years worldwide coverage
- 100% warranty term coverage
- Providing third party bankruptcy rights
- Non-cancellable
- Immediate coverage
- Insured by 3 world top insurance companies

Comprehensive Certificates

- IEC 61215, IEC 61730, IEC61701ED2, UL1703, KEMCO, CEC Listed, CE, JET and MCS
- ISO9001: 2008: Quality Management System
- ISO/TS16949:2009: The automotive quality management system
- ISO14001:2004: Standards for Environmental management system
- QC080000 HSPM: The Certification for Hazardous Substances Regulations
- OHSAS 18001:2007 International standards for occupational health and safety
- Reach Compliance

www.canadiansolar.com

CS6P-235/240/245/250/255M

Electrical Data

STC	CS6P-235M	CS6P-240M	CS6P-245M	CS6P-250M	CS6P-255M
Nominal Maximum Power (Pmax)	235W	240W	245W	250W	255W
Optimum Operating Voltage (Vmp)	30.1V	30.2V	30.3V	30.4V	30.5V
Optimum Operating Current (Imp)	7.82A	7.95A	8.09A	8.22A	8.35A
Open Circuit Voltage (Voc)	37.2V	37.3V	37.4V	37.5V	37.7V
Short Circuit Current (Isc)	8.34A	8.46A	8.61A	8.74A	8.74A
Module Efficiency	14.61%	14.92%	15.23%	15.54%	15.85%
Operating Temperature	-40℃~+85℃				
Maximum System Voltage	1000V (IEC) /600V (UL)				
Maximum Series Fuse Rating	15A				
Application Classification	Class A				
Power Tolerance	0 ~ +5W				

Under Standard Test Conditions (STC) of irradiance of 1000W/m², spectrum AM 1.5 and cell temperature of 25℃

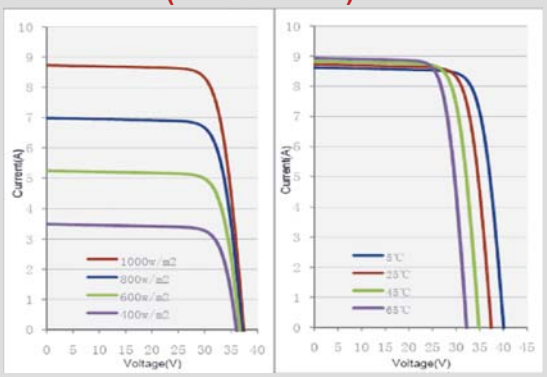
NOCT	CS6P-235M	CS6P-240M	CS6P-245M	CS6P-250M	CS6P-255M
Nominal Maximum Power (Pmax)	170W	173W	177W	180W	184W
Optimum Operating Voltage (Vmp)	27.5V	27.5V	27.6V	27.7V	27.8V
Optimum Operating Current (Imp)	6.18A	6.29A	6.40A	6.51A	6.62A
Open Circuit Voltage (Voc)	34.1V	34.2V	34.3V	34.4V	34.6V
Short Circuit Current (Isc)	6.75A	6.85A	6.97A	7.08A	7.18A

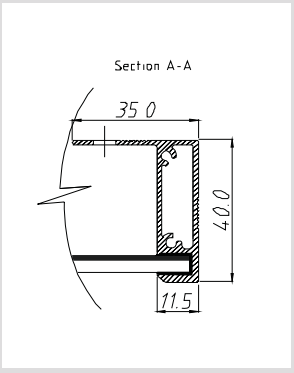
Under Normal Operating Cell Temperature, Irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20℃, wind speed 1 m/s

Mechanical Data

Cell Type	Mono-crystalline 156 x 156mm, 2 or 3 Busbars
Cell Arrangement	60 (6 x 10)
Dimensions	1638 x 982 x 40mm (64.5 x 38.7 x 1.57in)
Weight	19kg (41.9 lbs)
Front Cover	3.2mm Tempered glass
Frame Material	Anodized aluminium alloy
J-BOX	IP65, 3 diodes
Cable	4mm²(IEC)/12AWG(UL), 1000mm
Connectors	MC4 or MC4 Comparable
Standard Packaging (Modules per Pallet)	24pcs
Module Pieces per container (40 ft. Container)	672pcs (40'HQ)

I-V Curves (CS6P-250M)





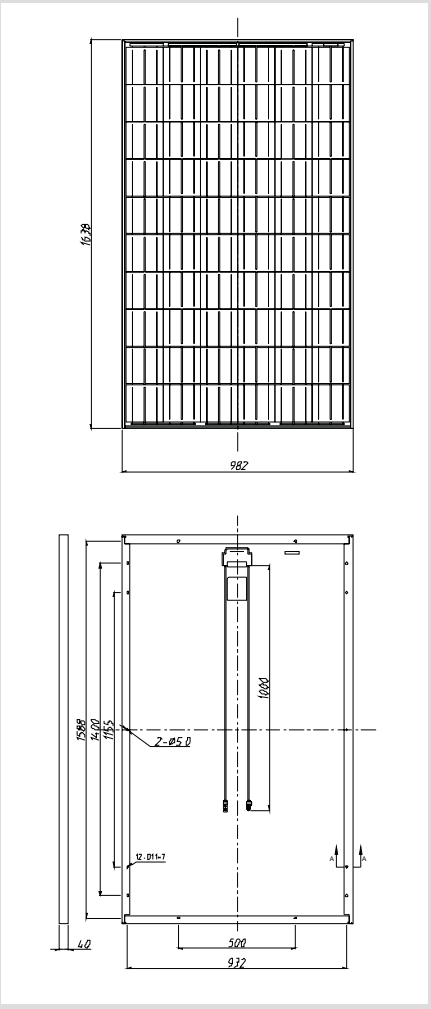
Temperature Characteristics

Temperature Coefficient	Pmax	-0.45%/℃
	Voc	-0.35 %/℃
	Isc	0.060 %/℃
Normal Operating Cell Temperature		45±2℃

Performance at Low Irradiance

Industry leading performance at low irradiation environment, +95.5% module efficiency from an irradiance of 1000w/m² to 200w/m² (AM 1.5, 25 ℃)

Engineering Drawings



*Specifications included in this datasheet are subject to change without prior notice.

About Canadian Solar

Canadian Solar Inc. is one of the world's largest solar companies. As a leading vertically-integrated manufacturer of ingots, wafers, cells, solar modules and solar systems, Canadian Solar delivers solar power products of uncompromising quality to worldwide customers. Canadian Solar's world class team of professionals works closely with our customers to provide them with solutions for all their solar needs.

Canadian Solar was founded in Canada in 2001 and was successfully listed on NASDAQ Exchange (symbol: CSIQ) in November 2006. Canadian Solar has module manufacturing capacity of 2.05GW and cell manufacturing capacity of 1.3GW.

Headquarters | 545 Speedvale Avenue West
Guelph | Ontario N1K 1E6 | Canada
Tel: +1 519 837 1881
Fax: +1 519 837 2550
inquire.ca@canadiansolar.com
www.canadiansolar.com

PVI-5000-OUTD / PVI-6000-OUTD

AURORA®
Photovoltaic Inverter

General Specifications
Outdoor models
PVI-5000-OUTD-AU / PVI-5000-OUTD-S-AU
PVI-6000-OUTD-AU / PVI-6000-OUTD-S-AU

AURORA BENEFITS

- Dual input section to process two strings with independent MPPT (6000W max models)
- High speed MPPT for real time power tracking and improved energy harvesting
- Transformerless operation for highest efficiency: up to 97% (96,5% Euro)
- Reverse polarity protection minimizes chance of damage due to mis-wiring
- High overload capability: works up to 6000W under most ambient conditions
- True Sine Wave Output
- Anti-islanding Protection
- LCD Display on the front to monitor the main parameters
- Standard DC Multi-Contact terminals, screw terminals option available

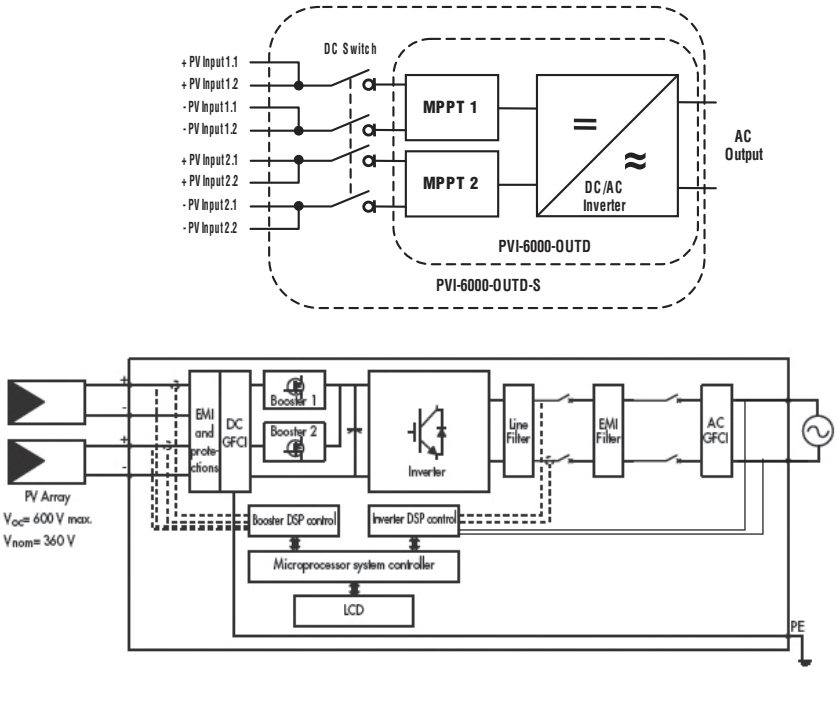
SMART CONTROLS

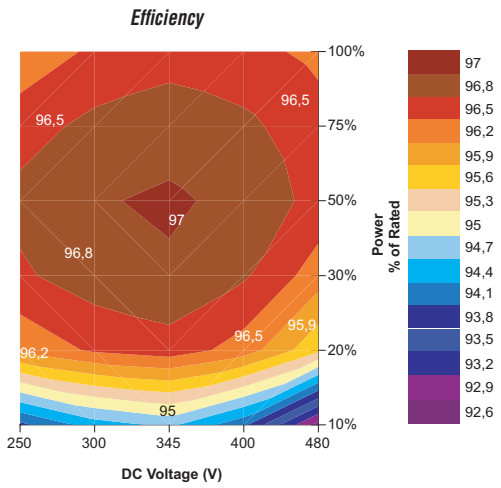
Aurora controls are DSP (Digital Signal Processor) based with sophisticated control and self-diagnostic algorithms.
A LCD display shows the main operational parameters. Three LED's indicate the operating status.

STANDARDS AND CODES

Aurora inverters comply with standards set for grid-tied operation, safety and electromagnetic compatibility including: AS/NZS 60950:2003 A1-3, AS/NZS 3100:2002, AS4777.2 and AS4777.3, VDE0126, CEI 11-20 IV ed, DK5940, IEC 61683, IEC 61727, EN50081, EN50082, EN61000, CE certification, El Real Decreto RD1663/2000 de España.

Block Diagram and typical efficiency





CHARACTERISTICS	PVI-5000-OUTD	PVI-6000-OUTD
INPUT PARAMETERS		
Nominal DC Power [kW]	4,8	6,2
Max. Recommended DC Power [kW]	5,75	6,9
Operating Input Voltage Range [V]	0,7xVstart - 580 (360 nominal)	
Full Power MPPT input voltage range (symmetrical load) [V]	140-530	180-530
Full asymmetrical load input voltage range [V]	220-530 (@ 4kW) / 90-530 (@ 0,8kW)	220-530 (@ 4kW) / 120-530 (@ 2,2kW)
Absolute Max. Input Voltage [V]	600	
Activation voltage "Vstart" [V]	200 nominal (adjustable within the range 120Vdc-350Vdc, independently/each input)	
No of independent MPPT trackers	2	
Max. Input Power, each MPPT [kW]	4	
No. of DC Inputs	4 (2 each MPPT)	
Max. DC Current, each MPPT [A]	18 (22 shortcircuit)	
DC Connection	8 x MultiContact Ø 4mm (4 male - positive input + 4 female - negative input) Mating cable connector included Conductor cross section: 4-6mmq/AWG12-10 - Cable Ø w/insulator: 3-6mm	
INPUT PROTECTION		
Reverse polarity protection	Yes	
Fuse rating, each input (-FS suffix versions only)	NA	NA
DC side varistors	4 (2 for each MPPT), thermally protected	
PV array Insulation Control	according to VDE0126-1-1	
DC Switch (-S/-FS suffix versions only)	Integrated (Rating: 600Vdc / 25Adc)	
OUTPUT PARAMETERS		
Nominal AC Power [up to 50°C, kW]	4,6	6
Max. AC Power [kW]	5	6
AC Grid Connection	single phase 230Vac 50Hz + PE	
Nominal AC Voltage [V]	230	
Maximum AC Voltage Range [V]	180-264	
Nominal AC Frequency [Hz]	50	
Max. AC Line Current [A]	25	30
AC Connection	Cage-clamp terminal block Conductor Cross Section: Solid: 0,5-16mmq / Stranded: 0,5-10mmq / AWG20-6 Cable Gland: M32 - Cable Ø: 13-21mm	
Line Power Factor	1	
AC Current Distortion [THD%]	<3,5% at rated power with sine wave voltage	
OUTPUT PROTECTION		
AC side varistors	2, plus gas arrester to ground	
Ground fault protection (AC + DC leakage current)	according to VDE0126-1-1	
CONVERSION EFFICIENCY		
Max. Efficiency	97%	
Euro Efficiency	96,40%	
ENVIRONMENTAL PARAMETERS		
Cooling	Natural cooling	
Ambient Temp. Range [°C]	-25 / +60 (output power derating above 50°C)	
Opertaing Altitude [m]	2000	
Acoustical Noise [dBA]	<50 @1mt	
Environmental IP Rating	IP65	
Relative Humidity	0-100% condensing	
MECHANICAL		
Dimensions [H x W x D]	740 x 325 x 208	
Weight [kg]	26	
OTHER		
Stand-By Consumption [W]	8	
Feed In Power Threshold [W]	10	
Night Time consumption [W]	0,3	
Isolation	No isolation, Transformer-less	
Display	YES (Alphanumeric 2 lines)	
Communication	RS485 (cage-clamp connector - Conductor cross section: 0,08-1,5mmq/AWG28-16); Usb (service only) Optional "Aurora Easy Control" remote monitoring system	
AVAILABLE PRODUCT VARIANTS		
Standard - no options	PVI-5000-OUTD	PVI-6000-OUTD
With DC switch	PVI-5000-OUTD-S	PVI-6000-OUTD-S

MODEL SUMMARY

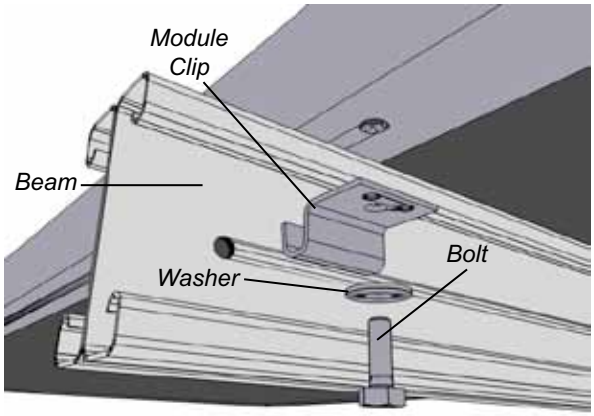
MODEL NUMBER	POWER
PVI-5000-OUTD	5000W
PVI-5000-OUTD-S	5000W with DC Switch
PVI-6000-OUTD	6000W
PVI-6000-OUTD-S	6000W with DC Switch

ISYS Roof 1.5 Technical Datasheet

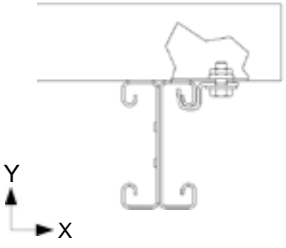
Pub 111115-1td • Rev. 2.0 • November 2011

ISYS Module Connection Hardware

ISYS Module Clip With Dimples
Drawing No. A62013



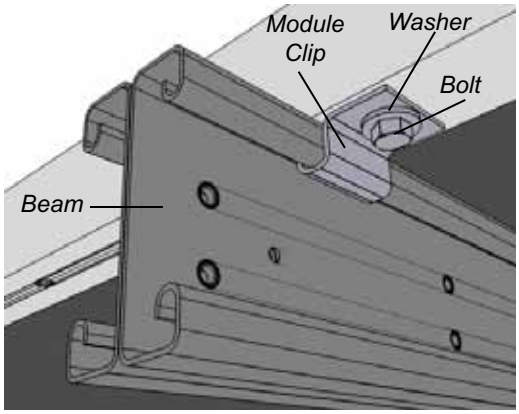
- **Module Clip Material:** ASTM A653 Grade 50 Galvanized (Min. G90) Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi
- **Module Clip weight:** 0.06 lbs (26g)
- Allowable and design loads are valid when components are assembled according to authorized Unirac documents.
- Clips are compatible with ISYS small series I-beams.
- Assemble with ¼-20 x ¾" SAE Grade 8 hex head bolt, ¼" ANSI B, N flat washer, and ¼-20 SAE Grade 8 serrated flange nut.
- Tighten to 10 ft-lbs of torque.
- Resistance factors are determined according to AISI S100 section F1.1.
- Safety factors are determined according to AISI S100 section F1.2.



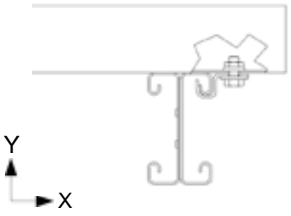
Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension, Y+	723 (3216)	298 (1326)	2.42	457 (2033)	0.63
Transverse, X±	1214 (5400)	486 (2162)	2.50	746 (3318)	0.61
Sliding, Z±	77 (343)	32 (142)	2.42	49 (218)	0.63
Conversion factor LRFD US to LSD Canada = 0.75					

ISYS Module Clip Without Dimples
Drawing No. A62142



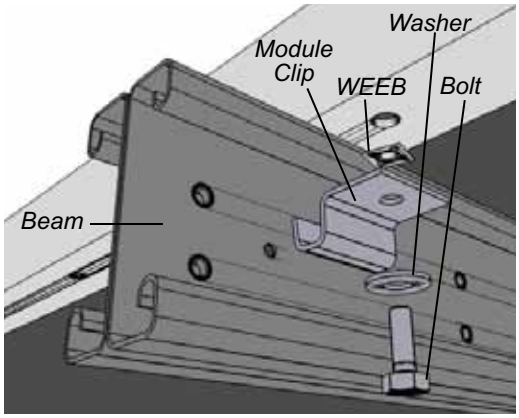
- **Module Clip Material:** ASTM A653 Grade 50 Galvanized (Min. G90) Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi
- **Module Clip weight:** 0.06 lbs (26g)
- Allowable and design loads are valid when components are assembled according to authorized Unirac documents.
- Clips are compatible with ISYS small series I-beams.
- Assemble with ¼-20 x ¾" SAE Grade 8 hex head bolt, ¼" ANSI B, N flat washer, and ¼-20 SAE Grade 8 serrated flange nut.
- Tighten to 10 ft-lbs of torque.
- Resistance factors are determined according to AISI S100 section F1.1.
- Safety factors are determined according to AISI S100 section



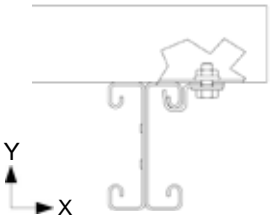
Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension, Y+	717 (3189)	329 (1463)	2.18	505 (2246)	0.70
Transverse, X±	1263 (5618)	481 (2140)	2.62	738 (3283)	0.58
Sliding, Z±	121 (538)	34 (151)	3.58	52 (231)	0.43
Conversion factor LRFD US to LSD Canada = 0.75					

ISYS Module Clip Without Dimples With WEEB
Drawing No. A62142
Wiley Electronics WEEB-UIR A62120



- **Module Clip Material:** ASTM A653 Grade 50 Galvanized (Min. G90) Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi
- **Module Clip weight:** 0.06 lbs (26g)
- Allowable and design loads are valid when components are assembled according to authorized Unirac documents.
- Clips are compatible with ISYS small series I-beams.
- Assemble with ¼-20 x ¾" SAE Grade 8 hex head bolt, ¼" ANSI B, N flat washer, and ¼-20 SAE Grade 8 serrated flange nut.
- Tighten to 10 ft-lbs of torque.
- WEEB-UIRs to be installed in accordance with Wiley Installation Guide-Installation Instructions for ISYS Roof Mount and Ground Mount (104-0404-000068-003).
- Resistance factors are determined according to AISI S100 section F1.1.
- Safety factors are determined according to AISI S100 section F1.2.



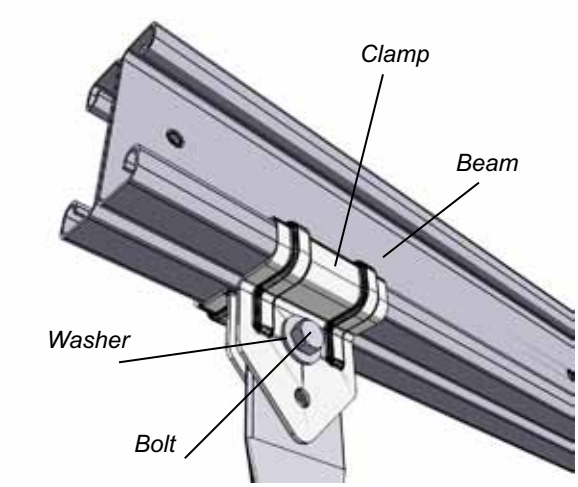
Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension, Y+	705 (3136)	291 (1294)	2.42	446 (1984)	0.63
Transverse, X±	1117 (4969)	435 (1935)	2.57	667 (2967)	0.60
Sliding, Z±	69 (307)	28 (125)	2.49	43 (191)	0.61
Conversion factor LRFD US to LSD Canada = 0.75					

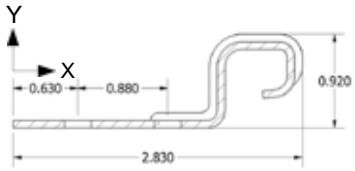
ISYS Beam Connection Hardware

ISYS Compression Clamp

Drawing No. A62008



- **Clamp Material:** ASTM A653 Grade 50 Galvanized (Min. G90) Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi
- **Compression Clamp Weight:** 0.18 lbs (81 g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents.
- Clamps are compatible with ISYS Small Series I-Beams
- Use two clamps per beam connection
- For east/west beams: assemble each set of two clamps with one ¼-20 x ¾ SAE Grade 8 hex head bolt, one ¼ ANSI, B, N flat washer, and one ¼-20 SAE Grade 8 serrated flange nut. The bolt must be assembled in the top most hole of the clamp
- For north/south beams: assemble each set of two clamps with two bolts, two washers, and two nuts
- Tighten to 10 ft-lbs of torque
- Resistance factors are determined according to AISI S100 section F1.1
- Safety factors are determined according to AISI S100 section F1.2

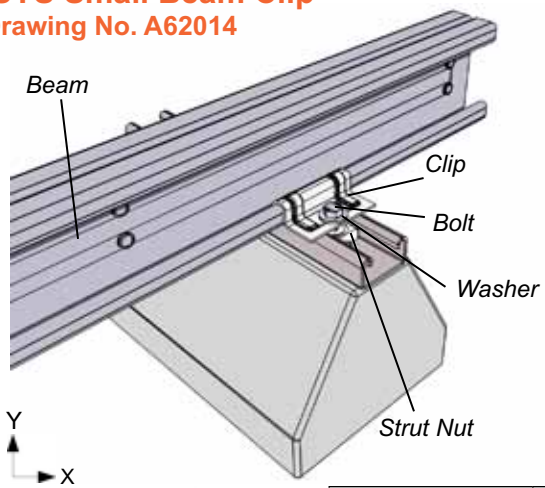


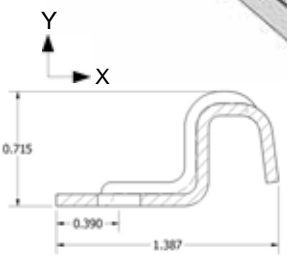
Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension, X+	2013 (8954)	803 (3572)	2.51	1167 (5191)	0.579
Compression, X-	3173 (14114)	1132 (5035)	2.80	1379 (6134)	0.430
Transverse, Y±	59 (262)	23 (102)	2.55	35 (156)	0.584
Sliding, Z±	200 (890)	81 (360)	2.44	120 (534)	0.600
Moment, M_z	97 ft-lbs (132 Nm)	49 ft-lbs (66 Nm)	2.00	78 ft-lbs (106 Nm)	0.800
Conversion factor LRFD US to LSD Canada = 0.75					

ISYS Small Beam Clip

Drawing No. A62014





Dimensions specified in inches unless noted

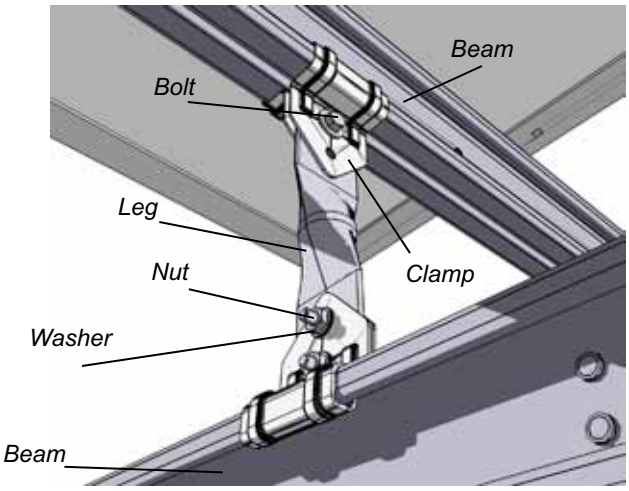
- **Small Beam Clip Material:** ASTM A653 Grade 50 Galvanized (Min. G90) Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi
- **Small Beam Clip Weight:** 0.11 lbs (50 g)
- **Strut Nut Weight:** 0.06 lbs (27 g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Clips are compatible with ISYS Small Series I-Beams
- Use two Small Beam Clips per beam connection
- Assemble each set of two Small Beam Clips with two ¼-20 x ¾ SAE Grade 8 hex head bolts, two ¼ ANSI, B, N flat washers, and two strut nuts
- Tighten to 6 ft-lbs of torque
- Resistance factors are determined according to AISI S100 section F1.1
- Safety factors are determined according to AISI S100 section F1.2

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension*, Y+	450 (2002)	255 (1134)	2.00	360 (1601)	0.800
Transverse, X±	213 (947)	91 (405)	2.34	128 (569)	0.601
Sliding, Z±	213 (947)	91 (405)	2.34	128 (569)	0.601
Conversion factor LRFD US to LSD Canada = 0.75					

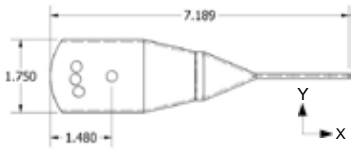
* Tension loads are for the clip to beam connection

ISYS Support Structure

ISYS Front Support Leg
Drawing No. A62000, A620001



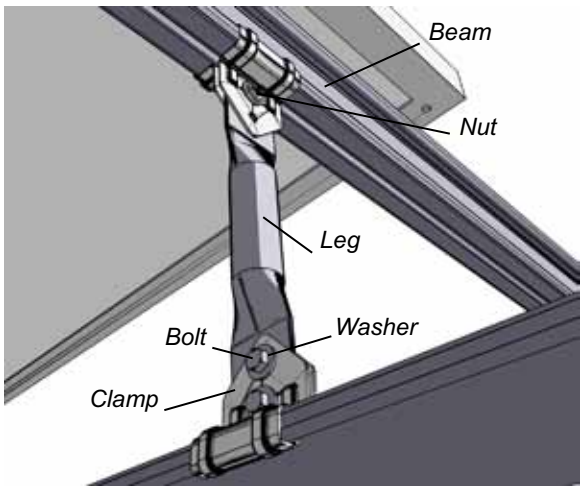
- **Front Support Leg Material:** 1” Galvanized electrical metallic tubing
  Ultimate tensile: 75 ksi; Yield: 30 ksi
- **Front Support Leg Weight:** 0.38 lbs (172 g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Front support legs are compatible with Compression Clamps
- Resistance factors are determined according to AISI S100 section F1.1
- Safety factors are determined according to AISI S100 section F1.2



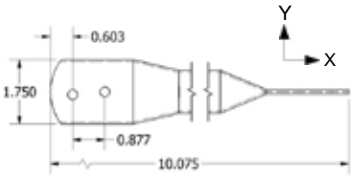
Dimensions specified in inches unless noted

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension, X+	2013 (8954)	803 (3572)	2.51	1282 (5703)	0.637
Compression, X-	2646 (11770)	1016 (4519)	2.60	1628 (7242)	0.615
Conversion factor LRFD US to LSD Canada = 0.75					

ISYS Rear Support Leg
Drawing No. A62002, A62003, A62004, A62005, A62006, A62007



- **Rear Support Leg Material:** 1” Galvanized electrical metallic tubing
  Ultimate tensile: 75 ksi; Yield: 30 ksi
- **Rear Support Leg Weight:** varies from 0.51 to 1.36 lb (231 to 617 g)
- Allowable and design loads are valid when components are assembled according to authorized UNIRAC documents
- Rear support legs are compatible with Compression Clamps
- Resistance factors are determined according to AISI S100 section F1.1
- Safety factors are determined according to AISI S100 section F1.2
- Compression loads apply to the leg only; check clamp capacities

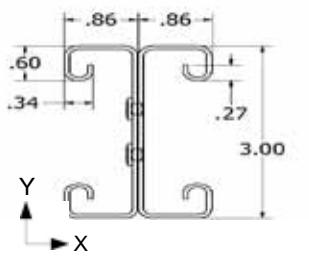


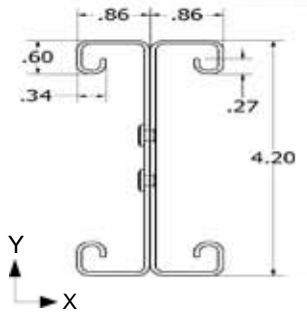
Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor, Ω	Design Load (LRFD US) lbs (N)	Resistance Factor, Φ
Tension, X+	2013 (8954)	803 (3572)	2.51	1282 (5703)	0.637
Compression, X-	2746 (12215)	1289 (5734)	2.13	1976 (8790)	0.720

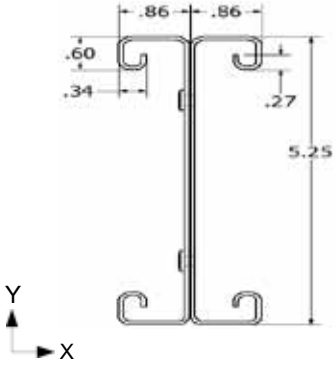
Dimensions specified in inches unless noted
Overall length varies from 10.075 to 26.234

ISYS Small Series I-Beam

MATERIAL: 16 GA STEEL, ASTM A653 Grade 50; Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi				
Properties	**Units**	**Beam Height (in)**		
		3.0	**4.20**	**5.25**
Approximate Weight (kips per linear ft)	k/ft	0.002403	0.002860	0.003260
Total Cross Sectional Area	in^2	0.707	0.840	0.959
Effective Area	in^2	0.635	0.654	0.663
Section Modulus (X-Axis)	in^3	0.569	0.941	1.316
Section Modulus (Y-Axis)	in^3	0.180	0.179	0.179
Moment of Inertia (X-Axis)	in^4	0.854	1.976	3.455
Moment of Inertia (Y-Axis)	in^4	0.155	0.154	0.154
Radius of Gyration (X-Axis)	in	1.099	1.534	1.898
Radius of Gyration (Y-Axis)	in	0.467	0.428	0.400
Single Member Weak Axis Centroid	in	0.333	0.283	0.252
Single Member Moment of Inertia (Y-Axis)	in^4	0.038	0.043	0.046
For Reference Only:				
Nominal Moment Capacity (X Axis)	*kip*ft*	*2.37*	*3.92*	*5.40*
Nominal Moment Capacity (Y Axis)	*kip*ft*	*0.75*	*0.75*	*0.75*
Nominal Tension Capacity	*kips*	*35.34*	*41.99*	*47.93*
Nominal Compression Capacity	*kips*	*31.77*	*32.68*	*47.94*
Nominal Shear Capacity (along X Axis)	*kips*	*3.87*	*3.68*	*3.68*
Nominal Shear Capacity (along Y Axis)	*kips*	*11.05*	*12.30*	*11.65*



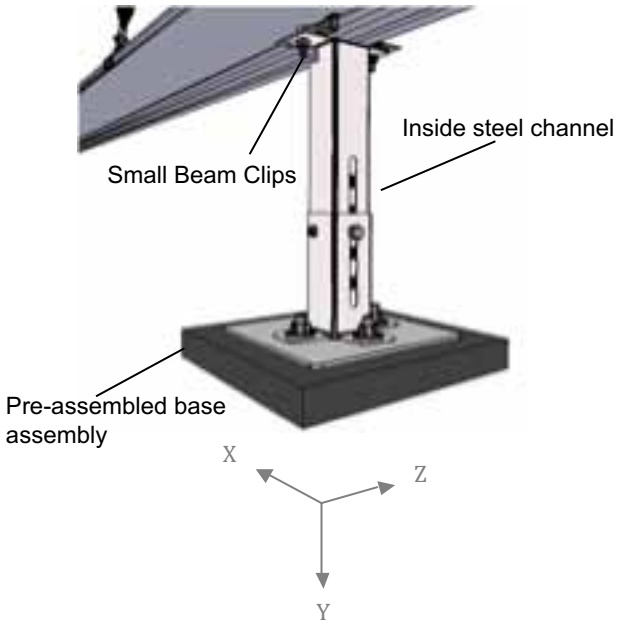




Dimensions specified in inches unless noted

ISYS Adjustable Roof Interface

Drawing No. A62102, A62103, A62104, A62105, A62106, A62143, A62252



- **Adjustable Roof Interface Material:**
  - **Channels:** ASTM A653 Grade 50 G90 Galvanized Minimum Tensile Strength: 60 ksi; Minimum Yield Strength: 50 ksi
  - **Baseplate:** ASTM A653 Grade 37 G90 Galvanized Minimum Tensile Strength: 52 ksi; Minimum Yield Strength: 37 ksi
  - **Rubber base:** 100% recycled rubber and pre-polymer binder system

Specific gravity	0.09-1.1 g/cm3
Durometer- Shore A	60-70
Tensile Strength (at break)	150psi
Elongation	100%
Low temperature limit	-50°F
Compression deformation @ 72° F	5% at 25psi 10% at 50 psi 15% at 100psi

- **Adjustable Roof Interface Weight (full height assembled):** 4.5 lbs (2047g)
- **Minimum height adjustment:** 5 ¼”
- **Maximum height adjustment:** 10 ¾”
- Allowable and design loads are valid when components are assembled according to authorized Unirac documents.
- Assemble base assembly to inside channel with 1x ¼-20 x ¾” SAE Grade 8 hex head bolt, ¼” ANSI B, N flat washer, and ¼-20 SAE Grade 8 serrated flange nut and 1 x #10-16 x ¾ self-tapping screw
- Tighten to 10 ft-lbs of torque.
- Resistance factors are determined according to AISI S100 section F1.1.
- Safety factors are determined according to AISI S100 section F1.2.

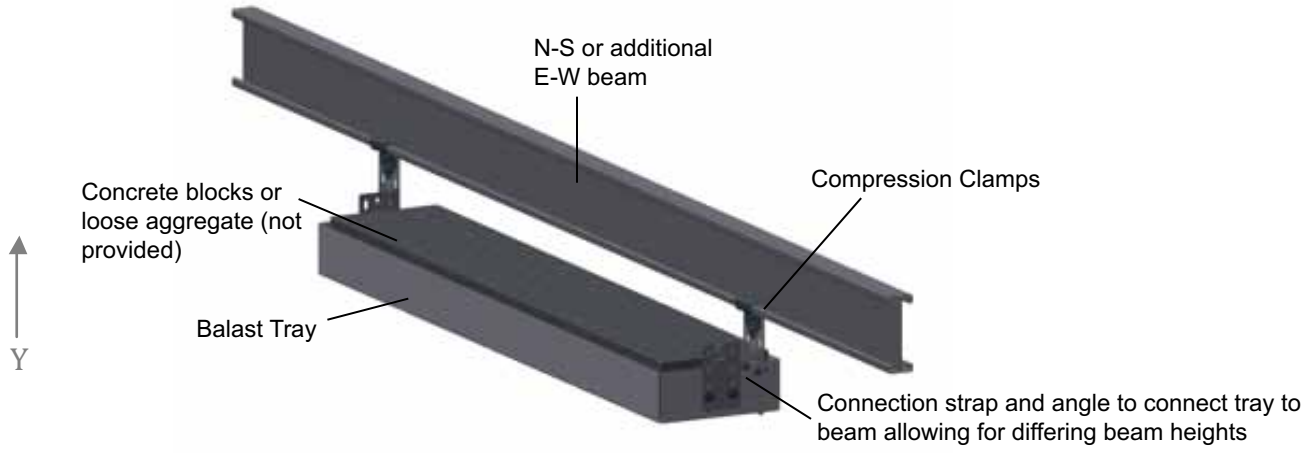
Allowable and Design Loads for Full Height Extension (10 ¾”)

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor	Design Load (LRFD US) lbs (N)	Resistance Factor	Design Load (LSD Canada) lbs (N)	Resistance Factor
Compression, Y+	1525 (6784)	638 (2838)	2.39	1001 (4453)	0.66	818 (3639)	0.54
Longitudinal, X±	104 (463)	20 (89)	2.63	42 (187)	0.8	34 (151)	0.64
Transverse, Z±	100 (445)	20 (89)	2.48	42 (187)	0.84	34 (151)	0.68

Allowable and Design Loads for 5 $^{5}/_{8}$” height extension

Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor	Design Load (LRFD US) lbs (N)	Resistance Factor	Design Load (LSD Canada) lbs (N)	Resistance Factor
Compression, Y+	2128 (9466)	764 (3398)	2.78	1172 (5213)	0.55	934 (4155)	0.44

ISYS Ballast Tray
Drawing No. A62109, A62110, A6212, A62252



- **Ballast Tray and connection strap and angle:** ASTM A653 Grade 50 G90 Galvanized Minimum Tensile Strength: 60 ksi; Minimum Yield Strength: 50 ksi
- **Ballast Tray Weight (full height assembled not including ballast):** 17.763lbs (8057g) - short strap length
  18.154lbs (8235g) - long strap length
- **Minimum height adjustment (roof surface to underside beam):** 5.25”
- **Maximum height adjustment (roof surface to underside of beam):** 18.65”
- **Capacity of ballast tray by volume:** 150lbs (depending on density and type of ballast used)
- **Permitted ballast types:** Concrete masonry blocks or loose aggregate (No. 2 or No. 4)
- Allowable and design loads are valid when components are assembled according to authorized Unirac documents.
- Assemble with ¼-20 x ¾” SAE Grade 8 hex head bolts, ¼” ANSI B, N flat washers, and ¼-20 SAE Grade 8 serrated flange nuts.
- Tighten all hardware to 10 ft-lbs of torque.
- Resistance factors are determined according to AISI S100 section F1.1.
- Safety factors are determined according to AISI S100 section F1.2.

Connection Capacity (loads per end connection assembly)

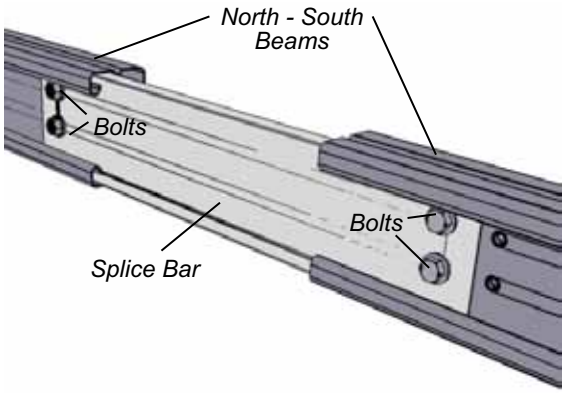
Applied Load Direction	Average Ultimate lbs (N)	Allowable Load (ASD) lbs (N)	Safety Factor	Design Load (LRFD US) lbs (N)	Resistance Factor	Design Load (LSD Canada) lbs (N)	Resistance Factor
Tension, Y+	316 (1405)	73 (325)	4.3	112 (498)	0.35	84 (374)	0.26

ISYS Splice Bar

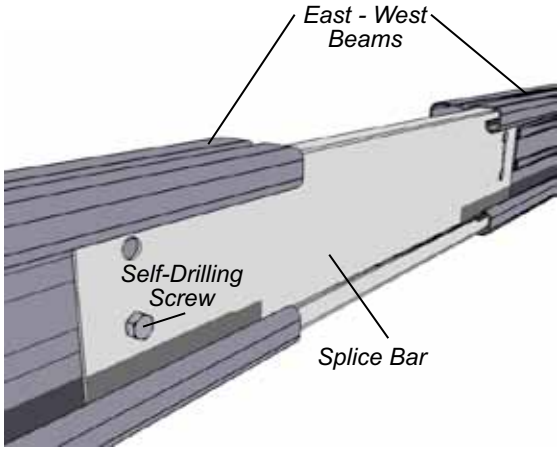
ISYS Splice Bar 3-14, 3-28, 4.2-14, 4.2-28, 5-14, 5-28

Drawing No. A62059, A62060, A62200, A62201, A62061 and A62062

North - South Beam Spliced



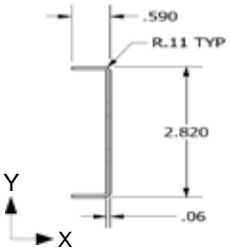
East - West Beam Spliced

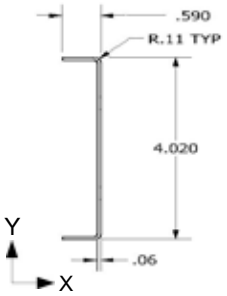


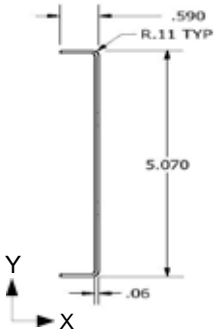
- **Splice Bar Material:** ASTM A653 Grade 50 Galvanized (Min. G90) Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi
- **Splice Bar Weight:**
  - 3-14 0.846 lbs (383.7g)
  - 3-28 1.692 lbs (767.5g)
  - 4.2-14 1.115 lbs (505.7g)
  - 4.2-28 2.231 lbs (1011.9g)
  - 5-14 1.351 lbs (612.8g)
  - 5-28 2.702 lbs (1225.6g)
- Splices are compatible with ISYS small series I-beams.
- **To splice north-south support beams:** Assemble with 2 x ¼-20 x 1" SAE Grade 8 hex head bolt, ¼" ANSI B, N flat washer, and ¼-20 SAE Grade 8 serrated flange nut at each end of splice. Tighten connections to snug tight compaction
- **To splice east-west support beams:** Assemble with 1 x HWH #10-16 x ¾ #3 point galvanized self-drilling screw at one end only. Splice bar must overlap support beams by a minimum of 3.5" at either end.

ISYS Splice Bars

MATERIAL: 16 GA STEEL, ASTM A653 Grade 50; Min. Tensile Strength: 60 ksi; Min. Yield Strength: 50 ksi				
Properties	**Units**	**Splice Bar**		
		3	**4.2**	**5**
Approximate Weight (per linear ft)	plf	0.725	0.956	1.158
Total Cross Sectional Area	in^2	0.213	0.281	0.341
Effective Area	in^2	0.186	0.197	0.203
Section Modulus (X-Axis)	in^3	0.147	0.257	0.370
Section Modulus (Y-Axis)	in^3	0.109	0.011	0.011
Moment of Inertia (X-Axis)	in^4	0.208	0.517	0.951
Moment of Inertia (Y-Axis)	in^4	0.005	0.006	0.006
Polar radius of Gyration	in	1.029	1.377	1.685
For Reference Only (fully braced capacities, no strength increase taken for cold work of forming):				
Nominal Moment Capacity (about X Axis)	*kip*ft*	*0.61*	*1.07*	*1.54*
Nominal Moment Capacity (about Y Axis)	*kip*ft*	*0.05*	*0.05*	*0.05*
Nominal Compression Capacity	*kips*	*9.31*	*9.86*	*10.13*
Nominal Tension Capacity	*kips*	*10.66*	*14.06*	*17.03*
Nominal Shear Capacity (along X Axis)	*kips*	*1.44*	*1.44*	*1.44*
Nominal Shear Capacity (along Y Axis)	*kips*	*4.22*	*5.39*	*5.39*







Dimensions specified in inches unless noted

COOPER Power Systems

Date: May 1, 2012

Item Details

Description:

kVA	100 kVA 1-Phase Pad-mount Transformer
Tank Style	Shrubline (ANSI II)
Core / Coil Design Type	Shell Type
Temperature rise	65
Cooling Class	ONAN
Frequency	60
Insulating fluid	Mineral Oil
Efficiency Standard	CSA C802.1
Primary Voltage	4800 Delta
BIL	75 kV
kV Class	15 kV
Primary Configuration	Radial Feed
Taps	2 - 2.5% taps above and 2 - 2.5% taps below nominal
Primary Bushings	200 amp, 15/25kV Cooper bushing well, w/Removable Studs(s) (Qty: 2)
Inserts	15 kV, 95 kV BIL Cooper load-break inserts (Qty: 2)
Expulsion fuses	Bayonet fuses (Qty: 2)
Bayonet Holder	Copper Bayonet Fuse Holder (Qty: 2)
Secondary voltage	240/120
BIL	30 kV
kV Class	1.2 kV
Secondary Bushings	1.0" Tri-Clamp Stud w/1.75" Reusable Thread (Qty: 3)
Secondary Bushings	1.0 AL 7 Hole Spade, Inline (Qty: 3)
Cabinet hardware	Penta-head cabinet door bolts
Cabinet Accessories	Temporary Service Entrance
Notifications	Mr Ouch Decal Danger-- English
Notifications	Mr. Ouch Decal Warning assembly--English
Notifications	Non-PCB decal
Gauges & Fittings	PRD, 50 SCFM
Tank accessories	Lifting Bolts (Qty: 2)
Tank accessories	Hold-down cleats (Mild Steel) (Qty: 2)
Tank accessories	Tank to Door Bonding
Packaging	Large Pallet
Cover	Welded
Special Accessories	CSA - Decal package, Nameplate

Item Number: 00003

PERFORMANCE DATA:	
Fluid Weight	452 lbs
Total Weight	1151 lbs
Fluid Volume	61 Gallons
Overall Height	30.00 inches
Overall Width	33.00 inches
Overall Depth	52.00 inches

LINE ITEM NOTES:
Technical
Cooper Power Systems has quoted the units in this bid without any specification. If any features or accessories are incorrect or missing, a revised quote shall be required and prices may be subject to change.

Clause 5.2.3: The top corners of the transformer tank shall have a minimum radius of 12 mm in lieu of 25 mm.

Appendix 3 – Cultural Heritage Self Assessment

Ontario

Ministry of Tourism, Culture and Sport

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

REA Checklist: Consideration of Potential for Heritage Resources

Applies to: Applicants for a renewable energy approval (REA) under the *Environmental Protection Act* who opt to consider the potential for heritage resources under subsection 23(2) of O. Reg. 359/09.

Screening Question

Is the project location situated on a parcel of land that:	**Yes**	**No**
1. Abuts any protected property as described in Column 1 of the Table in section 19?*	☐	☑
2. Is included on the Ministry of Tourism, Culture and Sport's list of provincial heritage properties?	☐	☑
3. Is listed on a register or inventory of heritage properties maintained by the municipality?	☐	☑
4. Is the subject of a municipality, provincial or federal plaque?	☐	☑
5. Is on or abutting a National Historic Site?	☐	☑
6. Is on or abutting a known burial site and/or cemetery?	☐	☑
7. Contains structures over forty years old? (Residential structures, farm buildings and outbuildings, industrial, commercial, institutional buildings and/or engineering works, etc.)	☐	☑

Is there Aboriginal or local knowledge or accessible documentation suggesting that the project location is situated on a parcel of land that:	**Yes**	**No**
8. Contains or is part of a cultural heritage landscape? (Aboriginal trail, park, relationship to a Canadian Heritage River, designed garden, historic road or rail corridor, etc.)	☐	☑
9. Is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?	☐	☑
10. Has special association with a community, person or historical event? (Aboriginal sacred site, traditional-use areas, battlefield, birthplace of an individual of importance to the community, etc.)	☐	☑

If **YES** to one or more of the above questions, there is potential for heritage resources at the project location.

If **uncertain** about the answer to one or more of the above questions, a heritage assessment is advised as additional research is required to determine whether there is potential for heritage resources in the project location.

if **NO** to all of the above questions, there is low potential for heritage resources at the project location. A summary of the information supporting the consideration of potential for heritage resources must be included in the design and operations report.

LP 9 and 10
1572 Story Rd, Springwater

*If the project is located on a protected property, written authorization must be obtained from the appropriate body and submitted to MOE as part of complete REA application under section 19 of O. Reg. 359/09.

Jean Louis Gaudet

From: Elaine Cairncross [Elaine.Cairncross@springwater.ca]
Sent: Friday, August 17, 2012 8:38 AM
To: Jean Louis Gaudet
Cc: Erin DeVreede
Subject: RE: Request for information - Renewable Energy Approval - Canadian Solar Developers (LP 9-10, 11)

Good morning. The requested structure information is as follows:

1572 Story Road – 1996
1216 Penetanguishene Road – the barns date from the 1880's while the house was built in the 1920's

Regards,

How did we do today? Help us enhance our service by completing the Springwater Customer Service Survey!

K. Elaine Cairncross, ACST
Planning & Development Coordinator
Township of Springwater
2231 Nursery Road
Minesing, ON L0L 1Y2
P. 705-728-4784 ext 2032
F. 705-728-2759
e-mail: elaine.cairncross@springwater.ca

From: Jean Louis Gaudet [mailto:jeanlouis.gaudet@exp.com]
Sent: Thursday, August 16, 2012 4:32 PM
To: Elaine Cairncross
Subject: RE: Request for information - Renewable Energy Approval - Canadian Solar Developers (LP 9-10, 11)

Hi Elaine,

May I ask one additional question? Do the Town's records indicate how old the buildings are on the sites?

Many thanks,

Jean-Louis

Jean-Louis Gaudet
Project Coordinator
t: +1.905.793.9809 x2344 | f: +1.905.793.0641
1595 Clark Boulevard
Brampton, ON L6T 4V1
Canada

From: Elaine Cairncross [mailto:Elaine.Cairncross@springwater.ca]
Sent: Thursday, August 16, 2012 1:18 PM
To: Jean Louis Gaudet
Subject: RE: Request for information - Renewable Energy Approval - Canadian Solar Developers (LP 9-10, 11)

Dear Mr. Gaudet:

The Deputy Clerk, Erin Devreede, was kind enough to provide the following responses to your inquiries.

As per Section 19(1) of *O. Reg. 359/09*, we request that for each property the municipality confirm whether:

- the property has been municipally designated as a heritage or protected property and/or is listed on the municipal heritage register or provincial register/list;***[edevreede]*** No. Neither property is designated or listed on the municipal heritage register. They are also not listed on a provincial register to my knowledge.
- a notice of intention to designate has been issued for the property;***[edevreede]*** No.
- the property is subject to a municipal easement agreement; or***[edevreede]*** No.
- the property is located within a designated Heritage Conservation District.***[edevreede]*** No.

Additionally, as per Section 20(1) of *O. Reg. 359/09* we request that the municipality confirm whether any of the above apply directly to lands abutting the property in question.

As listed in Appendix D of the new MTC guidance document (*Protected Properties, Archaeological and Heritage Resources – An Information Bulletin for Applicants Addressing the Cultural Heritage Component of Projects Subject to Ontario Regulation 359/09 Renewable Energy Approvals)*, it would be greatly appreciated if the municipality may also be able to provide information on whether:

- a municipal, provincial or federal plaque is on or related to the property;***[edevreede]*** No.
- there is a known burial site and/or cemetery on the property or abutting the property;***[edevreede]*** No.
- the property is within a Canadian Heritage River watershed;***[edevreede]*** No.
- the property or an abutting property is associated with a known architect, planner or builder;***[edevreede]*** No.
- the property or an abutting property is associated with a historic road or railroad;***[edevreede]*** Yes, LP#11 is located along the Penetanguishene Road although this portion of the road has not been designated.
- the property or an abutting property contains a park or planned/designated recreational or community space;***[edevreede]*** No.
- there is documentation to indicate built heritage or cultural heritage landscape potential; or***[edevreede]*** No.
- the property or an abutting property is associated with a person or event of historic interest.***[edevreede]*** No. The closest properties to LP#11 with historic significance that are listed on the Township Heritage Register are 1696 Penetanguishene Road and 1734 Penetanguishene Road.

Please let me know if you require further information.

How did we do today? Help us enhance our service by completing the Springwater Customer Service Survey!

K. Elaine Cairncross, ACST
Planning & Development Coordinator
Township of Springwater
2231 Nursery Road
Minesing, ON L0L 1Y2
P. 705-728-4784 ext 2032
F. 705-728-2759
e-mail: elaine.cairncross@springwater.ca

From: Jean Louis Gaudet [mailto:jeanlouis.gaudet@exp.com]
Sent: Friday, August 10, 2012 1:57 PM
To: Elaine Cairncross
Subject: Request for information - Renewable Energy Approval - Canadian Solar Developers (LP 9-10, 11)

Good afternoon,

Canadian Solar Developers Ltd is in the process of initiating renewable solar energy projects on long term leased properties located within the Township. The maximum name plate capacity of the projects will be 100 kW and are classified as Class 3 solar facilities. These projects will require a Renewable Energy Approval under *O. Reg. 359/09*. Attached you will find a map depicting the location of the projects.

The proposed project names, location and legal description of the projects located within the Township of Springwater are:

L.P. # 9 and #10:
1572 Story Road, Midhurst
Concession II, Lot 31 (Vespra Township)

L.P. #11:
1216 Penetanguishene Road, Barrie
Concession I, Lot 23 (Vespra Township)

As per Section 19(1) of *O. Reg. 359/09*, we request that for each property the municipality confirm whether:

- the property has been municipally designated as a heritage or protected property and/or is listed on the municipal heritage register or provincial register/list;
- a notice of intention to designate has been issued for the property;
- the property is subject to a municipal easement agreement; or
- the property is located within a designated Heritage Conservation District.

Additionally, as per Section 20(1) of *O. Reg. 359/09* we request that the municipality confirm whether any of the above apply directly to lands abutting the property in question.

As listed in Appendix D of the new MTC guidance document (*Protected Properties, Archaeological and Heritage Resources – An Information Bulletin for Applicants Addressing the Cultural Heritage Component of Projects Subject to Ontario Regulation 359/09 Renewable Energy Approvals)*, it would be greatly appreciated if the municipality may also be able to provide information on whether:

- a municipal, provincial or federal plaque is on or related to the property;
- there is a known burial site and/or cemetery on the property or abutting the property;
- the property is within a Canadian Heritage River watershed;
- the property or an abutting property is associated with a known architect, planner or builder;
- the property or an abutting property is associated with a historic road or railroad;
- the property or an abutting property contains a park or planned/designated recreational or community space;
- there is documentation to indicate built heritage or cultural heritage landscape potential; or
- the property or an abutting property is associated with a person or event of historic interest.

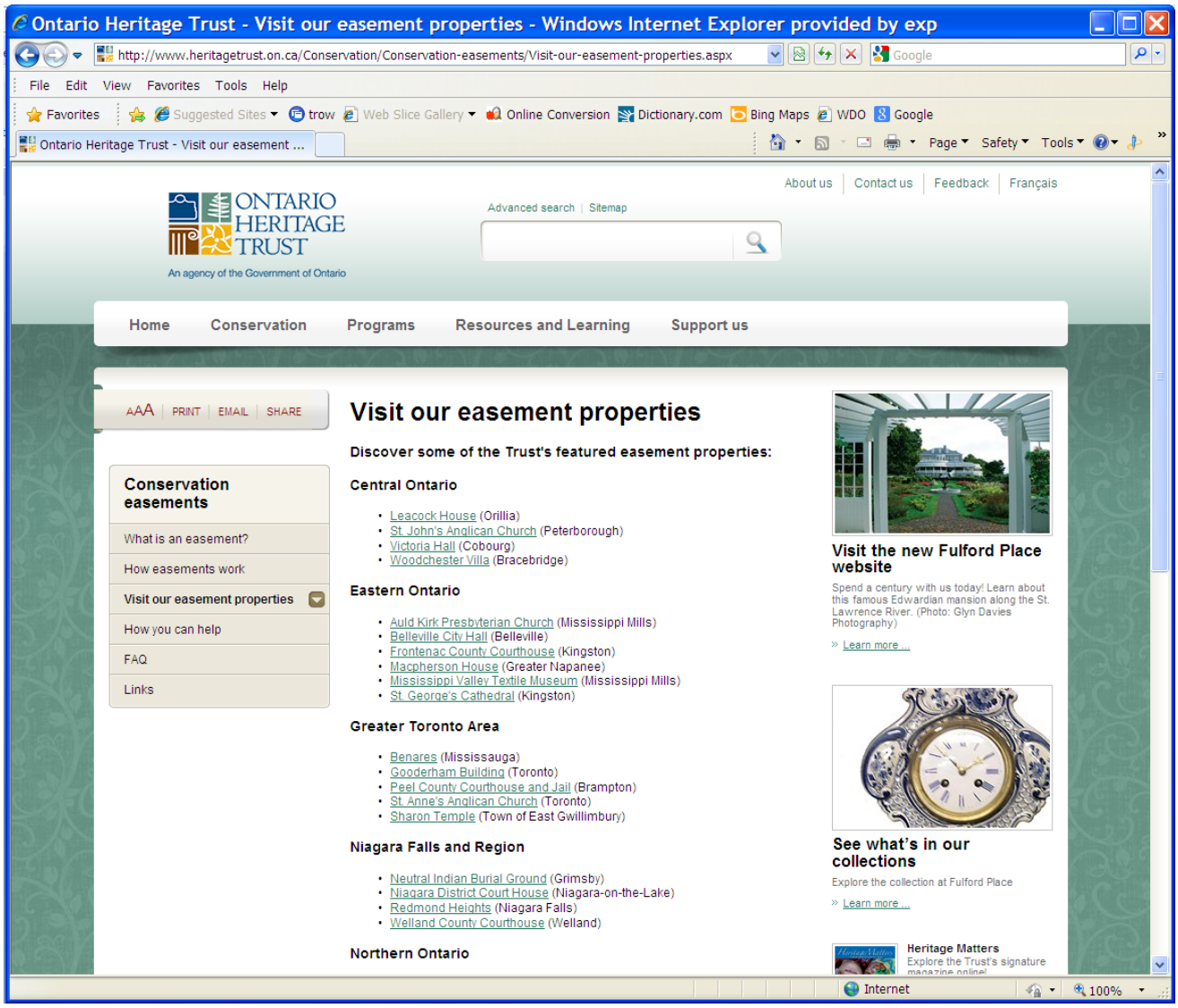
Thank you very much for your time.

Sincerely,

Jean-Louis Gaudet
jeanlouis.gaudet@exp.com

Jean-Louis Gaudet
Project Coordinator
t: +1.905.793.9809 x 2344
e: jeanlouis.gaudet@exp.com
1595 Clark Blvd.
Brampton, ON L6T 4V1
CANADA

Search Results of Ontario Heritage Trust Website (result – no Ontario Heritage Trust sites on project site)



Online Plaque search results on Heritage Trust Website. (result – no historic plaque on site)

Ontario Heritage Trust

Online Plaque search results

1 results have been returned in the order of relevance.

Willow Creek Depot

An important storage depot for supplies and trade goods during the War of 1812, Fort Willow was situated near the end of the Nine Mile Portage which connected the landing place at the headwaters of Kempenfelt Bay (today the site of Barrie) to Willow Creek.

Search Results on Parks Canada website (result – no historic sites or other designations on project site)

Parks Canada Parcs Canada

Canada

Home > Directory of Federal Heritage Designations > Search the Register > Search Results

Found 2 Results **Results Per Page:** 10 25 50 100

Ryerson, Reverend Adolphus Egerton National Historic Person (NHP)

Simcoe, Ontario

Methodist minister, established basis for school system in Ontario

Lynnwood/Campbell-Reid House National Historic Site of Canada (NHS)

Simcoe, Ontario

Lynnwood/Campbell-Reid House National Historic Site of Canada is an elegant modestly-sized brick house executed in the Neoclassical style located on a slight rise overlooking the Lynn River in the tow...

Previous Next

Date Modified : 2012-03-15