CHE POWER STRUCTURES

SIMPLE SOLAR
SMART ENERGY • SINCE 2006

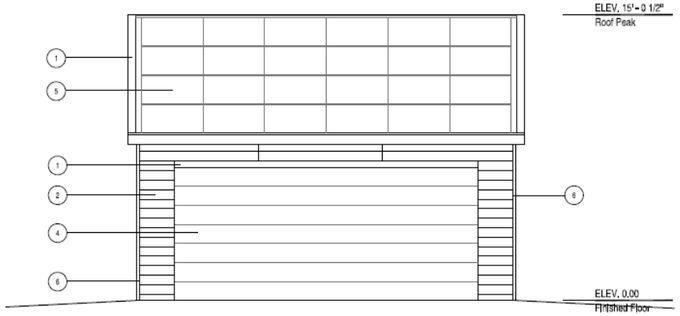
20’ X 20’ Solar Garage

Visit us at www.chepowerstructures.com for a free estimate.
Claim your $5,000 grant and apply for a zero-interest loan from the federal government.

Visit Canada Greener Homes Grant at:
https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-grant/canada-greener-homes-grant/23441

Visit Canada Greener Homes Loan at:
https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-loan/24286

- Founded in 2016, CHE is the exclusive Canadian partner of IRFTS, now part of Edilians Group, and Europe’s leading building integrated solar-PV (BIPV) provider.
- Simple Solar is an experienced solar solutions company with an impressive portfolio of successfully completed projects.
- With a total installed capacity of 8.16kW your CHE Solar Garage will generate ~10,000 kilowatts-hour (kWh) of clean electricity per year (South-facing orientation - Calgary, AB).

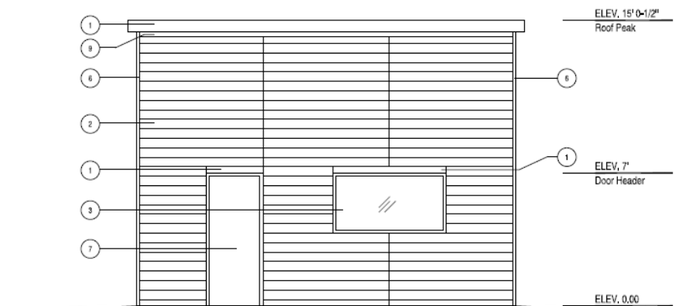


1 4.01 **South Elevation**

1/4"=1'

DRAWING NOTES

1. All labour, materials and products to comply with requirements of the Alberta Building Code (ABC) 2012 and all other applicable codes, standards and by-laws,
2. Read, check and compare all drawings, notify the architect of any/all discrepancies. All drawings to be read in conjunction with other consultant drawings,
3. Verify all dimensions and elevations before fabrication / construction of any component.
4. Dimensions are from finished face of new wall unless noted otherwise.
5. Provide solid blocking in walls for all wall mounted benches, bicycle hooks and racks, fixtures, millwork and door stops.
6. Contractor to provide transition strips at all floor finish transitions and changes in level,

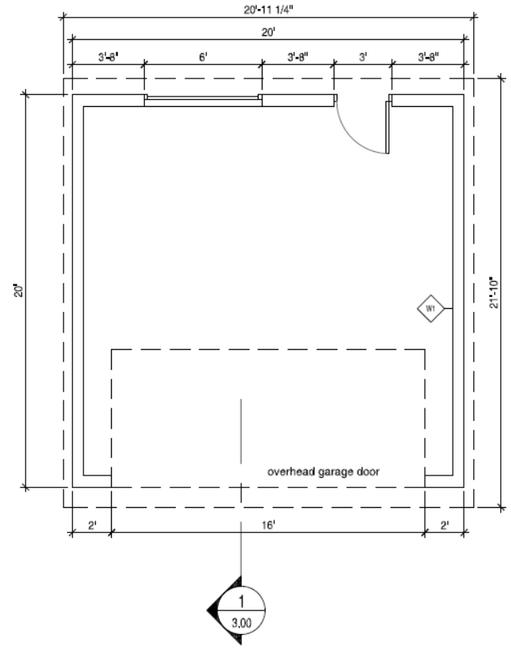


2 4.01 **North Elevation**

1/4"=1'

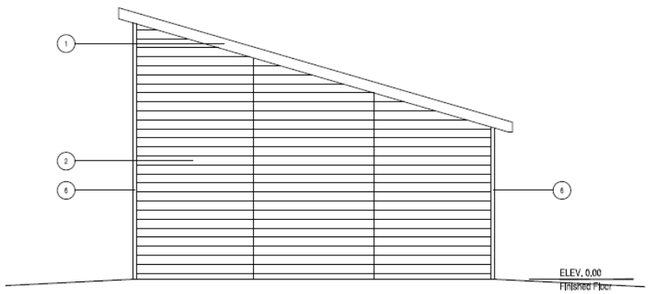
CONSTRUCTION ASSEMBLY

W1 — TYPICAL WALL ASSEMBLY
- Horizontal 4" cementitious lap siding c/w typ. custom metal corner (shop paint finish from custom colour range)
- ¾ P.T. Strapping
- Building wrap / Building paper
- 2" x 6" stud framing
- R20 Batt Insulation (Optional for Insulated garage)
- Poly vapour barrier
- ½" gypsum wall board - paint finish



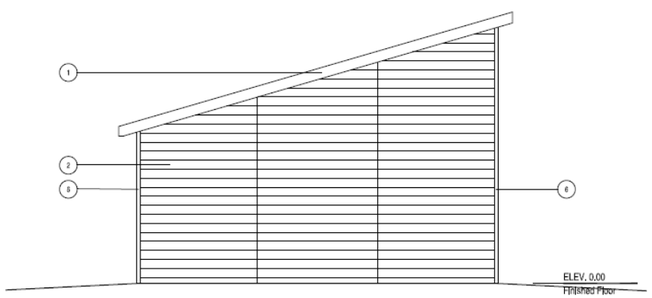
1 2.0 **Floor Plan**

1'= 1/4"



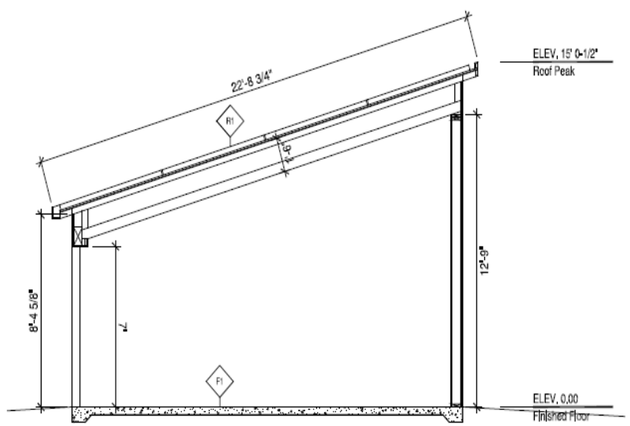
1 4.00 **West Elevation**

1/4"=1'



2 4.00 **East Elevation**

1/4"=1'



1 3.00 **Typical Section**

1'=1/4"

ROOF ASSEMBLY

CONSTRUCTION ASSEMBLY

R1 — ROOF ASSEMBLY - OPTION 1 (INTEGRATED PANEL)
- Canadian Solar solar panel system (65" x 39" x 3⅝")
(weight: 18.2kg, 5400 Pa load)
- Integration Frame
- 1"x4" Intermittent wood strapping
- Ice + water shield membrane
- ⅝" Plywood sheathing
- Timber roof truss

* special note; plywood and truss member sizes to be confirmed

FLOOR ASSEMBLY

CONSTRUCTION ASSEMBLY

F1 — FLOOR ASSEMBLY
- 4" concrete slab
- 10mil polyethylene vapour barrier overlap 12" and tape
- 2" rigid insulation around 18" perimeter only (optional for insulated garage)
- Sub-grade material (gravel)

integration

IRFTS
SOLAR SOLUTIONS

CHE
POWER STRUCTURES

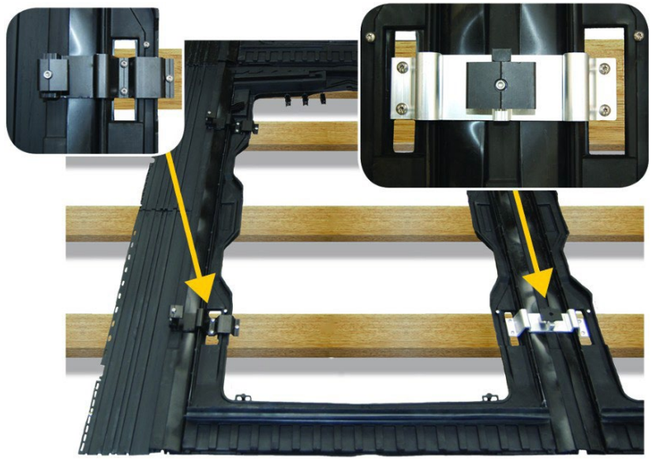
Parts act independently to ensure WATERTIGHTNESS and MECHANICAL function.

Universal Fixing parts

Watertightness guaranteed

Adjustable frames that can accommodate different PV-panel sizes.

This is achieved by keeping the thermal expansion unlocked.



durability

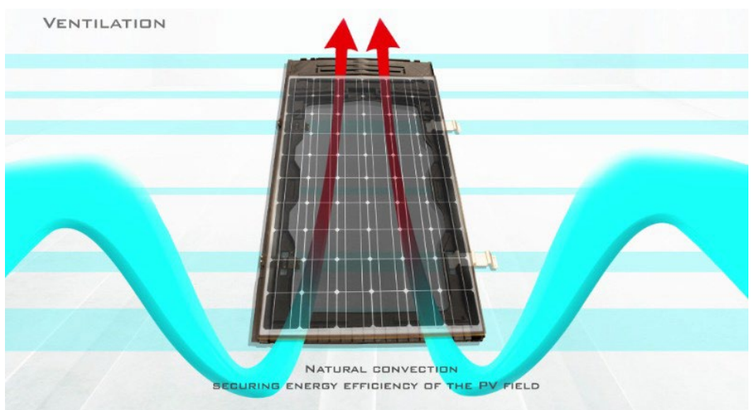
IRFTS® SOLAR SOLUTIONS

CHE POWER STRUCTURES

A highly resistant material

Optimised ventilation

EASY ROOF EVOLUTION is fully ventilated to maximize the efficiency of the solar-PV array.



reliability

IRFTS® SOLAR SOLUTIONS

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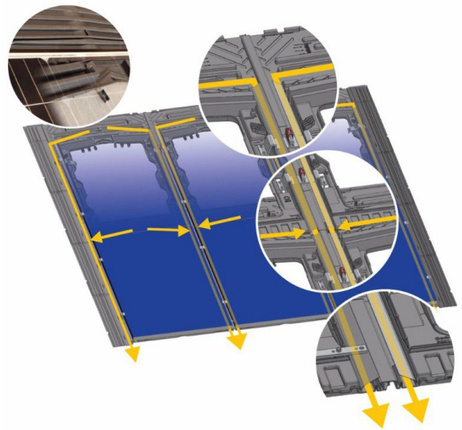
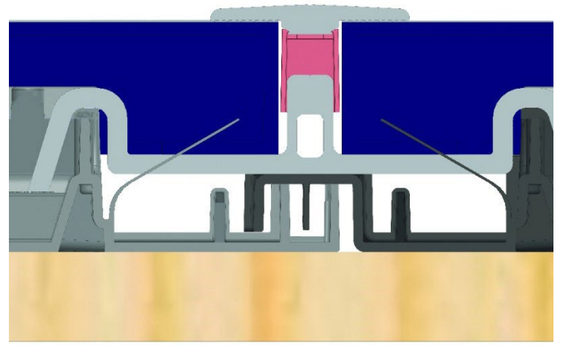
Rainwater management

Walls and water channels provide perfect water drainage for highest levels of rainwater.

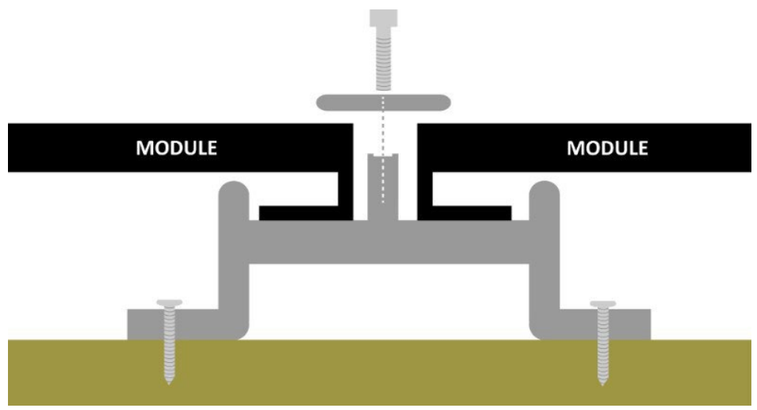


Unequalled interlocking and overlapping frameworks provide 100% watertightness.



Ease of maintenance

Each solar-PV module is interchangeable throughout the life of the installation without upsetting or removing the strong aluminum brackets.



Technical Data

- Dimensions:
  - Footprint 20’X20’ (6,096 X 6,096 mm)
  - Front height 8’-4 5/8” (2,554 mm)
  - Back height 15’ (4,572 mm)
  - Roof pitch 17º
- Structure:
  - *Concrete pad and apron (supplied by others)*
  - Walls: stick-frame with 2”X6” studs and ½” plywood/OSB
  - Roof: RL-24 trusses (or similar) and ½” plywood/OSB
- Finishes:
  - Exterior walls: PVC siding (hardy board can be provided at an extra cost)
  - Interior walls: uninsulated/unfinished (insulation and drywall can be provided at an extra cost)
- Doors and Windows:
  - 16’X8’ garage door and garage door opener (metal/PVC)
  - 8’X3’-6” access door (PVC)
  - 4’X3’ window (PVC)
- Building-integrated Photovoltaic Roof:
  - Non-slippery, peel & stick, self-healing underlayment Titanium PSU30, or similar
  - 24 X 1705X1005mm IRFTS Easy Roof Evolution polypropylene frames and installation hardware (portrait configuration)
  - 24 X 1700X992X35mm Canadian Solar HiDM CS1H-340W solar modules, or similar
  - CHE perimeter coated-steel flashing min. gauge 28 (0.014’ = 0.36mm)
- Solar-PV Electrical
  - 1 X Solar Edge SE7600H-US EV charger/inverter and EV charger cable
  - 24 X Solar Edge power optimizers P505W
  - All required wiring and grounding
- Garage Electrical
  - 1 X 100A distribution panel interconnected to home main panel *(trench and conduit by others)*
  - 2 X LED light fixtures
  - 1 X light switch
  - 3 X power receptacles
  - All required conduit, wiring and circuit breakers.
- Included:
  - Building/electrical permit drawings and permit fees
  - Processing of Net Metering permit *(fees charged by the Utility as well as the cost of installing a bidirectional meter are excluded)*
- Excluded:
  - *Concrete foundation/slab*
  - *Trenching and conduit to connect garage with main electrical panel.*
  - *Power storage system (battery)*
  - *Insulation and interior finishes*

Snow and Wind Load Compliance

In Canada, the CHE BIPV system is mechanically attached to the roofing deck by six (6) brackets per frame/solar-PV module and uses locking bars parallel to the slope of the roof and

snow deflectors installed perpendicular to the slope of the roof.
When fully locked in place with solar-PV modules, the IRFTS Easy Roof Evolution system can withstand a snow load of between 3.0 and 7.5kPa (from most unfavourable to most favourable bracket location).
Example based on NBC 2015 for Vancouver, BC:
For the ultimate snow load of 2.7kPa and using the average system capacity of 5.25kPa yields 5.25kPa>2.7kPa and a resulting in an average safety factor of 1.94.
When fully locked in place with solar-PV modules, the IRFTS Roof Evolution system can withstand a wind load [downward (+) / uplift (-)] of between 3.8 and 9.75kPa (from most unfavourable to most favourable bracket location).
Example based on NBC 2015 for Vancouver, BC:
For the ultimate wind load of 1.0kPa and using the average system capacity of 6.8kPa yields 6.78Pa>1.0kPa and the resulting in an average safety factor of 6.8.
Extensive testing has been undertaken by IRFTS to confirm the strength of the support bracket connection to the underlying roof deck. The table below shows the ultimate downward (snow/wind) and upward (wind) resistance of individual bracket connections to the roof deck.

Roof Deck		Ultimate Downward Force on the Most Susceptible Bracket Before Failure (kPa)	Ultimate Upward Force on the Most Susceptible Bracket Before Failure (kPa)
OSB	9mm	3.00	3.86
	12mm	3.17	6.29
	15mm	3.32	6.80
Plywood	9mm	3.74	5.89
	12mm	5.80	7.63
	15mm	7.57	9.75

Modern PV modules are made with strong anodized aluminum alloys and impact-resistant 3mm clear glass and are designed for 5.0kPa snow loads and a 2.5kPa wind loads.
PV modules sold in North America are tested against hail in accordance with UL 1703 and UL 61703 standards. Lab technicians drop a two-inch (50mm) solid steel sphere from a height of 51 inches (1295mm) onto the surface of the PV module, the energy equivalent of a hail stone measured at one inch and three-eighths in diameter (35mm) falling at terminal velocity through the sky.

Warranties

- Structure, finishes and electrical installation: one year
- Roofing warranty: standard 5 years
- Titanium PSU 30 roofing underlayment: Lifetime limited warranty
- IRFTS Easy Roof Evolution PV support frames: 10 years
- PV modules (materials and workmanship): 10 years
- PV modules (linear performance warranty): 25 years
- Inverter/EV charger: 12 years (extendable to 25 years)
- Power optimizers: 25 years

Product Certifications

Product	Bran/Model	Certifications
Roof Underlayment	Titanium PSU30	ASTM D1970, ICC ES, ASTM E108, CAN/CSA A220.1
PV Support Frames	IRFTS Easy Roof Evolution	TÜV Rheinland, MCS012, Avis Technique Nº 21/14-48 V4, BRE and Green Book Line
PV Modules	Canadian Solar HiDM CSIH-340W	IEC61215/IEC 61730, UL1703/IEC 61215, UL 1703: CSA/IEC 61701/IEC 62716
Single Phase EV Charger Inverter	Solar Edge SE7600H-US	UL 1741, UL 1699B, CSA C22.2, UL 1741 AS, IEEE1547 Rule 21, Rule 14, FCC Part 15 Class B UL 2594, UL 2231-1, UL 2231-2, NEC Art 625, SAE J1772-2009
Power Optimizers	Solar Edge P505W	FCC Part 15 Class B, IEC 61000-6-2, IEC 61000-6-3, IEC 62109-1, UL 1741

CHE BIPV System - CSA/UL Compliance Tests by Intertek Labs

Test	Standard	Result
Bonding Path Resistance Test	UL 2703 Ed. 1	Pass
Humidity Freeze Test	UL 2703 Ed. 1	Pass
Bonding Conductor Test	UL 2703 Ed. 1	Pass
Mechanical Load Test	CSA LTR AE-001:2012	Pass
Fire Test	UL 2703 Ed. 1	Pass

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Performance and Installation Videos:

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