

Common Photovoltaic System Corrections

Ambient Temperature	Ontario's average ambient outdoor temperature is 98°F/37°C. Wiring methods located under the eaves or on exterior walls must have their ampacity adjusted with factor 0.91
Attachment detail	Provide on the plans a structural detail of construction for the connections and attachments of the proposed supports, rails systems, flashing and roof structure.
Attic Ambient Temp	The ambient temperature for attic space is 145°F/63°C; Wires' ampacity must be adjusted with 0.65 factor when in attics.
Bundling conductors adjustments	Must apply the adjustment factors for more than 3-current carrying conductors in conduits or cable assemblies per CEC Table 310.15(B)(3)(a)
B-vent termination	Existing B-vent terminations, for fuel burning appliances, where adjacent to the proposed modules, must be extended 12" above the modules' top surface to comply with CMC 802.6.2(1) & CPC 509.6.2(1)
Cable protection 310.15(c)	Conduits with open ends shall be provided with a fitting to protect the cables/wires from abrasion CEC 300.15(C)
Cable protection 300.4	Cables/wires that are not under the modules must be protected from physical damage per CEC 300.4
Cantilever length	Indicate the maximum length of the rails cantilever
Center-fed	"center-fed and off-set switchboards & panelboards are <b>not</b> recognized to meet the requirements of CEC 705.12(D)(7)"
Code updates	Code editions and references must be updated to current applicable codes and standards.
Contractor signature	For design build plans, the contractor's license classification, license number, and signature must be included on each sheet.
DC GFI AFCI Disconnect	On the single line diagram, show and identify the required DC ground-fault, GFI, protection; DC arc-fault circuit interrupter, AFCI, protection; and DC disconnect per CEC 690.5, 690.11. & 690.13.
DC raceways beneath the roof	The location of DC raceways beneath the roof, must be not closer than, and must run perpendicular to, 10" of the roof deck as required by CEC 690.31(D)(1)
DC raceways markings	The markings, "WARNING: PHOTOVOLTAIC POWER SOURCE", for DC raceways and cable assemblies must be @ 10' o.c.; within 1' of turns or bends, above or below penetrations of roof and ceilings, & walls or barriers per CEC 690.31(E)(4), CFC 605.11.1.4 & CRC R331.2.4
Directory plaques	Provide directory plaques as per CEC 690.4(H), 690.56(B), & 705.10
DWV vent terminations	Existing DWV plumbing vent terminations that are located closer than 12" horizontally from the proposed modules, must be rerouted or extended 6" minimum above the top surface of the modules to comply with CPC 906.1
Electrical ampacity calculations	Submit electrical ampacity calculations for all the proposed AC & DC wiring methods to include all applicable adjustment factors.
Electrical Bonding	For electrical service replacements, provide bonding to the metal pipes of natural gas, hot water, and cold water per CEC 250.104
Electrical Service location	The proposed location of electrical service replacement to be approved by S.C.E.
Engineer stamp & signature	Each structural sheet must include the engineer's stamp and signature.
Ex elect service amp rating	Indicate the Amp rating of existing electrical service to be removed

Common Photovoltaic System Corrections

Expansion fittings 300.7(E)	Provide calculations for, and show on the roof plans the locations of, the raceway expansion fittings as required by CEC 300.7(E)
GEC continuous	<b>The G.E.C. must be continuous as per CEC 690.47(A) &amp; 250.64(C)</b>
ICC ESR for supports	Submit copies of ICC ESR or similar reports for the proposed supporting systems to verify codes and standards evaluation criteria, capacities, properties, limitations, special provisions, etc.
Lag screw amount	<b>Callout the amount of lag screws per roof attachment.</b>
Lag screw embedment	<b>Indicate the lag screws minimum embedment into the roof framing member</b>
Line Utility side warning label	A warning label suitable & durable for the environment where locate, shall be place on the raceway at each end and at each change of direction and at a minimum spacing of 4' on center. The label shall be placed where it is clearly visible on the raceway at a minimum of two sides of the raceway. The label shall read "WARNING: ELECTRIC SHOCK HAZARD. THIS CONDUIT CONTAINS CONDUCTORS THAT ARE CONTINUOUSLY ENERGIZED AND CANNOT BE DE-ENERGIZED WITH THE SERVICE DISCONNECTING MEANS". The label shall be yellow in color and have text in black of sufficient size and contrast to the label back ground color to be highly visible.
Line Utility side wires in load side space	<b>Add note: The conductors within this space are constantly energized by the electrical utility company without the benefit of disconnecting means. They must be contained in a suitable space so as to be isolated from load conductors and so as to not be exposed to contact when in space of load conductors.</b>
NRTL labels n listing	All AC & DC electrical equipment shall be labeled and listed by a nationally recognized testing laboratory
OCP change cal signature & pasting	The electrical load calculation for the change of the main circuit breaker must be pasted/incorporated in the plans; and must include the designer's signature, and license number & classification
OCP change load calculation	<b>The proposed change of the main circuit breaker must be justified; service/feeder electrical load calculations must be submitted.</b>
PNLBRDS 120% rule	<b>Must show math for, and must check for 120% rule of ratings and ampacities of busbars and conductors for panelboards/switchboards per CEC 705.12(D) &amp; 705.12(D)(2)</b>
Raceways locations	On the electrical roof layout plan, show and <b>identify</b> the locations, (underground, in attic, on roof top, under the modules, on the exterior walls, inside the building, etc...), of the raceways and boxes; to verify the temperature and wiring methods as required by CEC.
Rails span	To verify the proposed span lengths of the rails, submit engineered calculations justifying the rail spans; or submit copies of the rail manufacturer tables with highlighted roof slopes, wind roof zones, wind speed of 110-mph Exposure C, and span lengths.
Roof plan	Show & identify on the roof plan the (ex): DWV vents, fans, skylights, chimneys, attic air vents, gas vents, etc; to verify that they are <b>NOT</b> blocked by the proposed photovoltaic system.
Roof sheathing inspection	Roof sheathing inspection is required by the City of Ontario Building Inspector prior to the installation of roofing underlayment when changing roofing materials .in areas under the modules

### Common Photovoltaic System Corrections

Roof structure info	Indicate the existing roof structure members' sizes, spacing, species, grades, and spans.
Roofing layers	Callout the number of (ex) roofing layers; <i>structural calculations must be provided when more than one (1) layer exists.</i>
Supply side connectin field evaluation	The supply side connection is a modification of the existing listed equipment and must be field evaluated and labeled by an evaluating testing laboratory that is recognized by the City of Ontario.
TileSlate roof eng calcs	Submit engineered calculations to justify the loads of the existing tile/slate roofing materials plus the new loads of the proposed PV system on the existing roof structure.
Ungrounded conductors Color	The color of <b>ungrounded</b> conductors shall be other than for grounded,(neutral), conductors, (solid white, gray, or with 3-white stripes, 200.6, 200.7, & 400.22), and grounding conductors, (bare wire without covering, green, or green with yellow stripes, 250.119 & 400.23), as per 310.110(C)
Ungrounded PV-wire 690.35(D)	Exposed wires must be PV-Wire type in ungrounded DC systems per CEC 690.35(D)
Ungrounded type	On the diagram, identify the DC system as grounded or ungrounded type.
Voc calculation	Provide voltage calculations for each different size of DC circuit based on the recorded low temperature of 30°F/-1°C as required by CEC 690.7
Warning labels	Provide warning labels as required by CEC 690.5(C), 690.35(F), 690.31(E)(3), 705.12(D)(7), & CRC R331.2.2