

STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

**15-002**

## t. State Building Code to be Amended:

0 International Building Code

0 ICC ANSI All7.1 Accessibility Code

0 International Existing Building Code International Residential Code

0 International Fire Code

0 Uniform Plumbing Code

0 State Energy Code

0 International Mechanical Code

0 International Fuel Gas Code

0 NFPA 54 National Fuel Gas Code

0 NFPA 58 Liquefied Petroleum Gas Code

0 Wildland Urban Interface Code

Section(s):

WAC 51-51-2300 Section M2302

Title:

Section M2302--Pbotovoltaic solar energy systems.

1. Proponent Name (Specific local government, organization or individual): Proponent: Washington PUD Assoc., A-Vista, REA Coop Assoc., and PSE Title:

Date:

1. Designated Contact Person: Name: David Hanson

Title: Representing: Washington PUD Association *I* Benton PUD Address: 2326 S Kent St

Office Phone: 509-539-6395

Cell: 509-539-6395

## E-Mail address: [hansondwh@msn.com](mailto:hansondwh@msn.com)

January 7, 2015

1. Proposed Code Amendment. Reproduce the section to be amended by underlining all added language. striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system or the code. I r more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code additional pages may be attached . (Examples on the SBCC website )

Code(s)WAC 51-51-2300

energy systems.

Section(s) Section M2302- Photovoltaic solar

Amend section to read as follows:

M2302.2 Requirements. The installation , inspection , maintenance , repair and replacement of photovoltaic systems and all system components shall compl y w ith the m anufacturer 's instructions, sections M2303.2.1 through M2302.2.3, NFPA 70, WAC 296-46B-705 and the IFC as amended by Washington state .

1. Briefly explain your proposed amendment, including the purpose, benefits and problems addressed.

Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

The electric utilities need to be notified when a photovoltaic system is installed on a premises connected to the electric distribution system so they can be aware of a potential back feed condition on their system. This is especially important in a power outage condition where line crews are restoring power, and isolated generators/photovoltaic systems may still be generating into the system

- a condition known as "islanding." This requirement may require an addition notification to the utility at the time a building permit is issued.

WAC 296-46b-705 reads as follows:

"Interconnected electric power production sources.

### For utility interactive systems, any person making interconnections between a power production source

and the utility distribution network must consult the serving utility and is required to meet all additional utility standards. n

1. Specify what criteria this proposal meets. You may select more than one.

l:gj The amendment is needed to address a critical life/safety need.

0The amendment is needed to address a specific state policy or statute.

0 The amendment is needed for consistency with state or federal regulations.

DThe amendment is needed to address a unique character of the state.

0 The amendment corrects errors and omissions.

1. Is there an economic impact: 0 Yes l:gj No Explain:

If there is an economic impact, use the Table below to estimate the costs and savings of the proposal on construction practices, users and/or the public, the enforcement community, and operation and maintenance. If preferred, you may submit an alternate cost benefit analysis.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Building Type | Construction 1 | | Enforcemenr | | Operations & Maintenance ·' | |
| Costs | Benefits4 | Costs | Benefits | Costs | Benefits4 |
| Residential |  |  |  |  |  |  |
| Single family |  |  |  |  |  |  |
| Multi-family |  |  |  |  |  |  |
| Com mere ia 1/Retai I |  |  |  |  |  |  |
| Industrial |  |  |  |  |  |  |
| Institutional |  |  |  |  |  |  |

Please send your completed proposal to: [sbcc@ga.wa.gov](mailto:sbcc@ga.wa.gov)

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.

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1 $/ square foot of floor area or other cost. Attach data. Construction co Is are costs prior to occupancy, and include both design and direct construction costs

that impact the total cost of the construct ion to the owner/consumer.

1 Cost per project plan . Attach data. Enforcement costs include governmental review of plans, field inspection, and other action required for enforcement.

'Cost to build ing owner/tenants over the life of the project.

' Measumble ben efit.

* LOW Engineering, leonard D. Whalen, P.E.*425-891-9926 /eonard .wha/en@gmai/.eom*
* Parker Messana & Associates, Jacob V. Rovinsky, P.E.253-926-0884 [*www.pma-enq.com*](http://www.pma-enq.com/)
* Picatti Bros. Inc., David J. Picatti, P.E. 509-248-2540 [*davidp@picatti.com*](mailto:davidp@picatti.com)
* Picatti Bros. Inc., James M. Smith, P.E. 509-248-2540 [*jsmith@picatti.com*](mailto:jsmith@picatti.com)
* Power Science Engineering, C. (Sank) Sankaran, P.E.206-306-6745 *www.power -sci.com*
* Talos Engineering Inc., Jason Merrick, P.E. 509-893-5799 ext. 1001[*jme"ick@talosenqineerinq.com*](mailto:ick@talosenqineerinq.com)

# Interconnected Electric Power Production Sources- Point of Connection Part 3, Busbar Connections- NEC® 705.12(0)(2)(3)

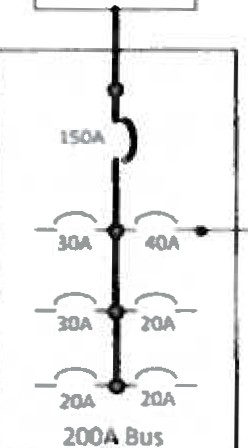
This is the third article in a series about point of connection requirements for interconnected electric power production sources. *October's article* discussed supply side connections .*November's article* discussed connections to feeders. In this edition, we will discuss methods for making interconnections to busbars.

When the output of a utility interactive inverter is connected to a load center or panelboard, the possibility of overloading exists because two sources of power are supplying the same busbar. To avoid overloading busbars, one of the following four methods in NEce 705.12(0)(2)(3) must be used to determine the ratings of busbars in panelboards that have both utility and alternate sources connected to them:

* 705.12(D)(2)(3)(a) -100 percent rule: The sum of 125 percent of the inverter(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed the ampacity of the busbar (See Figure 1).

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| --- | --- | --- |
| Fil"'" I  N rc• 7o5.12(DJt21l3ll•l  0 | | f i&ure 2  NEC" 705 ll(0)(21(3)(b)  0 |
| (3211 x 12S"J• 150A- 190A | *$* 2001\ OK! | ZOo\ ==  200A Bus  (32A X 125%1 + lOOA = 240A |

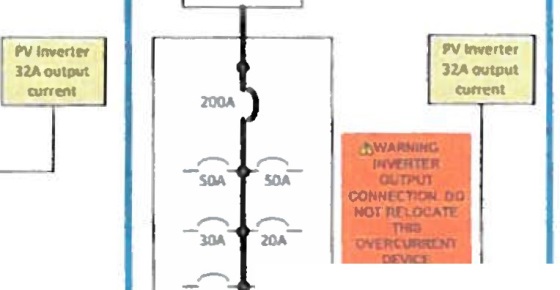
* 705.12(D)(2)(3)(b) - 120 percent rule: Where the inverter output is connected on the opposite end of



the busbar from the utility supply,the sum of 125% of the inverter(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampaci of the busbar. A permanent warning label in accordance with NEce 110.21(B) shall be installed adjacent to the backfed breaker from the inverter

thatstates:WARNING:INVERTEROUTPUTCONN­

ECTION;DO NOT RELOCATE THIS OVERCURRENT DEVICE (See Figure 2).



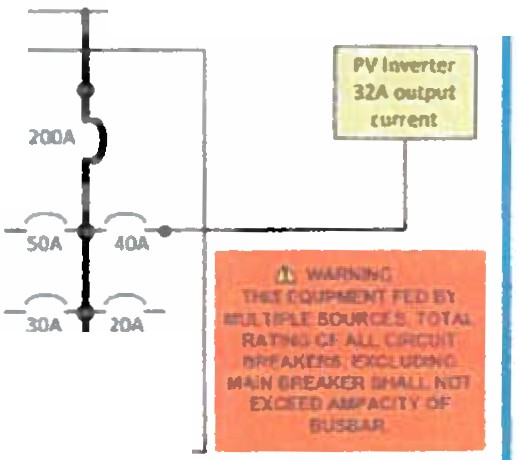
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N(C' 705.12(0)(2)(31\ C)

load and supply devices, except for the overcurrent device protecting the

* 705.12(D)(2)(3)(c)- The sum of all overcurrent devices in the panelboard, both



busbar shall not exceed the rating of the busbar . A permanent warning label in accorda nce with 110.21(8) shall be installed that states:WARNING :THIS EQUIPMENT FED BY MULTIPLE SOURCES.TOTAL RATING OF A LL OVERCURRENT DEVICES,EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR .(See Figure 3)

* 705.12( D)(2)(3)(d) Connections shall be permitted on multiple-ampacity busba rs or center-fed panelboards where designed under engineering supervision that includes fa ult studies and busbar load calculations.

# Answer to Question of the Month:

Beca use they *ca n't* remember the words. / ][ /

Best wishes to all for a safe and happy holiday season !

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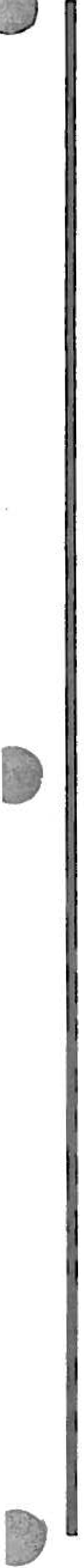
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BUILDING PLANNING

R324.7 Access and pathways. Roof access, pathways and spacing requirements shall be provided in accordance with Sections R324.7.l through R324.7.2.5.

Exceptions:

1. Detached garages and accessory structures to one­ and two-family *dwellings* and *townhouses,* such as parking shade structures, carports, solar trellises and similar structures.
2. Roof access, pathways and spacing requirements need not be provided where an alternative ventilation method *approved* by the code official has been pro­ vided or where the code official has determined that vertical ventilation techniques will not be employed.

R324.7.1 Roof access points. Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires or signs.

R324.7.2 Solar pbotovoltaic systems. Solar photovoltaic systems shall comply with Sections R324.7.2.1 through R324.7.2.5.

R324.7.2.1 Size of solar pbotovoltaic array. Each photdvoltaic array shall be limited to 150 feet by 150 feet (45 720 by 45 720 nun). Multiple arrays shall be separated by a clear access pathway not less than 3 feet (914 mm) in width.

R324.7.2.2 Hip roof layouts. Panels and modules installed on *dwellings* with hip roof layouts shall be located in a manner that provides a clear access path­ way not less than 3 feet (914 mm) in width from the eave to the ridge on each roof slope where panels and modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.

Exception: These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units hori­ zontal (16.6 percent) and less.

R324.7.2.3 Single ridge roofs. Panels and modules installed on *dwellings* with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels or modules are located.

Exception: This requirement shall not apply to roofs with slopes of 2 units vertical in 12 units hori­ zontal (16.6 percent) and less.

R324.7.2.4 Roofs with hips and vaUeys. Panels and modules installed on *dwellings* with roof hips or valleys shall not be located less than 18 inches (457 mm) from a hip or valley where panels or modules are to be placed on both sides of a hip or valley. Where panels are to be

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located on one side only of a hip or valley that is of equal length, the 18-inch (457 nun) clearance does not apply.

Exception: These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units hori­ zontal (16.6 percent) and less.

R324.7.2.5 Allowance for smoke ventllation opera­ tions. Panels and modules installed on dwellings shall not be located less than 3 feet (914 nun) below the roof ridge to allow for fire department smoke ventilation oper­ ations.

Exception: Where an alternative ventilation method approved by the code official has been provided or where the code official has determined that vertical ventilation techniques will not be employed, clear­ ance from the roof ridge is not required.

SECTION R325

MEZZANINES

R32S.l General. Mezzanines shall comply with Section R325.

R325.2 Mezzanines. The clear height above and below mezza­ nine floor construction shall be not less than 7 feet (2134 mm).

R325.3 Area limitation. The aggregate area of a mezzanine or mezzanines shall be not greater than one-third of the floor area of the room or space in which they are located. The enclosed portion of a room shall not be included in a determi­ nation of the floor area of the room in which the *mezzanine* is located.

R325.4 Means of egress. The means of egress for mezzanines shall comply with the applicable provisions of Section R311.

R32S.S Openness. Mezzanines shall be open and unob­ structed to .the room in which they are located except for walls not more than 42 inches (1067 nun) in height, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which they are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the mezzanine area.
2. In buildings that are not more than two stories above *grade plane* and equipped throughout with an auto­ matic sprinkler system in accordance with NFPA 13R or NFPA 130, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

SECTION R326

SWIMMING POOLS,SPAS AND HOT TUBS

R326.1 General. The design and construction of pools and spas shall comply with the *International Swimming Pool and Spa Code.*

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BUILDING PLANNING

walls that are designed to brellk away under flood loads; and

* 1. Are constructed with insect screening or open lat­

tice; or

* 1. Are designed to brenk away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Such walls, framing

B and connections shall have a resistance of not less than 10 (479 Pa) and not more than 20 pounds per

square foot (958 Pa) as detennined using allowable stress design; or

* 1. Where wind loading values of this code exceed 20 pounds per square foot (958 Pa), the *construction documents* shall include documentation prepared and sealed by a registered *design professional* that:
     1. The walls and partitions below the design flood elevation have been designed to col­ lapse from a water load Jess than that which would occur during the base flood.
     2. The elevated portion of the building and sup­ porting foundation system have been designed to withstand the effects of wind and tlood loads acting simultaneously on struc­ tural and nonstructural building components. Water-loading values used shall be those associated with the design flood. Wind-load ­ ing values shall be those required by this code.
  2. Walls intended to break away under flood loads as specified in Item 3 or 4 have flood openings that meet the criteria in Section R322.2.2, Item 2.
  3. In Coastal A Zones, walls shall be provided with flood openings that meet the criteria of Section R322.2.2.

R322.3.5 Enclosed areas below design flood elevation. Enclosed areas below the design flood elevation shall be used solely for parking of vehicles, building access or stor­ age.

R322.3.5.1 Protection of building envelope. An exte­ rior door that meets the requirements of Section R609 shall be installed at the top of stairs that provide access to the building and that are enclosed with walls designed to break away in accordance with Section R322.3.4.

R322.3.6 Construction documents. The *construction documents* shall include documentation that is prepared and sealed by a registered *design professional* that the design and methods of construction to be used meet the applicable criteria of this section.

R322.3.7 Tanks. Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood. Above-ground tanks shall be installed at or above the elevation required in Section R322.3.2. Where elevated on platforms, the platforms shall be cantilevered from or knee braced to the building

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or shall be supported on foundations that conform to the I

requirements of Section R322.3.

SECTION R323 STORM SHELTERS

R323.1 General. This section applies to storm shelters where constructed as separate detached buildings or where con­ structed as safe rooms within buildings for the purpose of providing refuge from storms that produce high winds, such as tornados and hurricanes . In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

-+ SECTION 324 ¢-

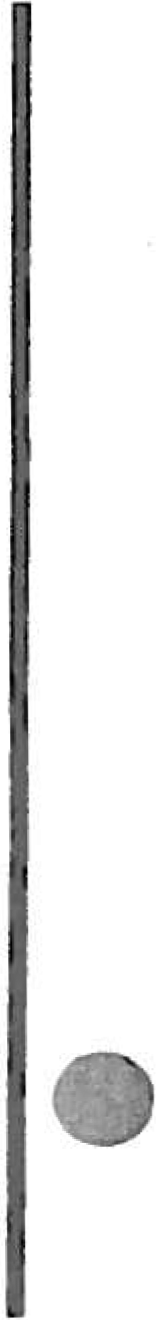
SOLAR ENERGY SYSTEMS

R324.1 General. Solar energy systems shall comply with the provisions of this section.

R324.2 Solar thermal systems. Solar thermal systems shall be designed and installed in accordance with Chapter 23 and the *International Fire Code.*

R324.3 Photovoltaic systems. Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.l through R324.7.2.5 and NFPA 70. Inverters shall be *listed* and *labeled* in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

R324.3.1 Equipment listings. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703.

R324.4 Rooftop-mounted photovoltaic systems. Rooftop­ mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

R324.4.1 Roof live load. Roof structures that provide sup­ port for photovoltaic panel systems shall be designed for applicable roof live load. The design of roof structures need not include roof live load in the areas covered by photovoltaic panel systems. Portions of roof structures not covered by photovoltaic panels shall be designed for roof live load. Roof structures that provide support for photo­

voltaic panel systems shall be designed for live load, La.

for the load case where the photovoltaic panel system is

not present.

. R324.S Building-integrated photovoltaic systems. Build­ ing-integrated photovoltaic systems that serve as roof cover­ ings shall be designed and installed in accordance with Section R905.

R324.5.1 Pbotovoltaic shingles. Photovoltaic shingles shall comply with Section R905.16.

R324.6 Ground-monnted pbotovoltaic systems. Ground­ mounted photovoltaic systems shall be designed and in­ stalled in accordance with Section R301.

R324.6.1 Fire separation distances. Ground-mounted photovoltaic systems shall be subject to the*.fire separation distance* requirements determined by the local *jurisdic­ tion.*

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