



Green Verification Report

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PWI Joists
Pacific Woodtech Corporation

GR-L262
Revised December 5, 2022

Products: PWI I-joists
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1. Basis of the green verification report:
 - 2020, 2015, 2012, and 2008 National Green Building Standard, ICC 700
 - LEED v4 for New Construction and Major Renovations
 - 2009 LEED for New Construction and Major Renovations
 - 2009 LEED Canada for New Construction and Major Renovations
 - ASTM D5055-16, D5055-13e1, D5055-13, D5055-09, and D5055-05 recognized by the 2021 International Building Code (IBC) and International Residential Code (IRC), 2018 IBC and IRC, 2015 IBC and IRC, 2012 IBC and IRC, respectively
 - DOC PS 2-18, Performance Standard for Wood Structural Panels
 - CSA O325-21 Construction Sheathing
 - APA PRI-400, Performance Standard for Residential I-Joists
 - APA W210, Green Verification Checklist – ICC 700-2020
 - APA T415, Green Verification Checklist – ICC 700-2015
 - APA Q415, Green Verification Checklist – ICC 700-2012
 - APA L410, Green Verification Checklist – ICC 700-2008
 - APA L415, Green Verification Checklist – LEED
 - APA R415, Green Verification Checklist – LEED v4
 - APA Product Report PR-L262
 - Documentation supporting green product verification
2. Product description:

PWI I-joists are made with either lumber or laminated veneer lumber (LVL) flanges and OSB webs in accordance with the in-plant manufacturing standard approved by APA. The binder adhesives used to manufacture the web materials meet the requirements of DOC PS 2 and CSA O325, and contain no added urea-formaldehyde. The adhesives used to manufacture PWI I-joists are exterior-type adhesives meeting the requirements of ASTM D5055 and contain no added urea-formaldehyde. PWI I-joists are certified under PEFC International Standard – Chain of Custody of Forest Based Products – Requirements (PEFC ST 2002:2010) and Sustainable Forestry Initiative® (SFI) Chain of Custody.
3. Green product verification:

PWI I-joists listed in this report are qualified for green construction with points specified in Tables 1, 2, 3, 4, 5, and 6, as independently verified by APA as meeting pertinent criteria of the referenced standards shown in Section 1.
4. Limitations:
 - a) PWI I-joists shall be designed in accordance with principles of mechanics using the design properties specified in APA Product Report PR-L262.
 - b) PWI I-joists are limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16%.
 - c) PWI I-joists are produced at the Pacific Woodtech Corporation manufacturing plants located in Burlington, Washington, and Red Bluff, California, under a quality assurance program audited by APA.

d) This report is subject to re-examination in one year.

5. Identification:

The PWI I-joists described in this report are identified by a label bearing the manufacturer's name (Pacific Woodtech) and/or trademark, the APA assigned plant number (1048 for the Burlington, WA plant and 1069 for the Red Bluff, CA plant), the I-joist depth and series, the APA logo, the report number GR-L262, and a means of identifying the date of manufacture.

Table 1. 2020 National Green Building Standard ICC 700-2020

Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	608.1 Resource-efficient materials: Products containing fewer materials are used to achieve the same end-use requirements as conventional products	3 for each material	9
✓	901.4(5) Wood materials: A minimum of 85% of material within a product group is manufactured from composite wood products that contain no added urea-formaldehyde or are in accordance with the CARB	4 for each product group	10

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	601.2 Material usage: Structural systems are designed or construction techniques are implemented that reduce and optimize material usage. (1) Minimum structural member or element sizes in accordance with advanced framing techniques or structural design standards are selected, (2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and sizes are reduced accordingly, (3) Performance-based structural design is used to optimize lateral force-resisting systems	3 for each system or framing technique	9
✓	606.1(1) Biobased products: Two types of biobased materials are used, each for more than 0.5% of the project's projected building material cost	3	8
✓	606.1(2) Biobased products: Two types of biobased materials are used, each for more than 1% of the project's projected building material cost	6	
✓	606.1(3) Biobased products: For each additional biobased material used for more than 0.5% of the project's projected building material cost	1 each with 2 max	

Table 1. 2020 National Green Building Standard ICC 700-2020 (Continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	606.2(2) Wood-based products^(a): A minimum of 2 certified wood-based products are used in major components of the building	4	4
✓	609.1 Regional materials: Regional materials are used for (1) major and/or (2) minor components of the building with a minimum of 75% of all products in that component category being sourced regionally	2 for each major component and 1 for each minor component	10
✓	610.1 Life cycle assessment: A life cycle analysis (LCA) tool is used to select environmentally preferable products or assemblies, or LCA is conducted on the entire building 610.1.1 Whole-building life cycle assessment: A whole-building LCA is performed in conformance with ASTM E2921 using ISO 14044 compliant life cycle assessment 610.1.2 Life cycle assessment for a product or assembly: An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies	2 to 3 for each product LCA, 3 to 10 for each assembly LCA	15 for whole-building LCA and product and product or assembly LCA (15 for whole-building or 10 for product or assembly)

^(a) The wood certificates apply to the Burlington, WA plant only.

Table 1. 2020 National Green Building Standard ICC 700-2020 (Continued)
 Eligible points that are conditional on construction application

	Section/Criteria		Eligible Points	Possible Maximum Points
✓	613.2 Resilient Construction – Minimum structural requirements (base design): The building is designed and constructed in compliance with structural requirements in the IBC or IRC as applicable		2	Declaration from the engineer of record
✓	613.3 Resilient Construction – Enhanced resilience (10% above base design): Design and construction practices are implemented to enhance the resilience and durability of the structure by designing and building to forces generated by flooding, snow, wind, or seismic (as applicable) that are 10% higher than the base design		3	
✓	613.4 Resilient Construction – Enhanced resilience (20% above base design): Design and construction practices are implemented to enhance the resilience and durability of the structure by designing and building to forces generated by flooding, snow, wind, or seismic (as applicable) that are 20% higher than the base design		5	
✓	613.5 Resilient Construction – Enhanced resilience (30% above base design): Design and construction practices are implemented to enhance the resilience and durability of the structure by designing and building to forces generated by flooding, snow, wind, or seismic (as applicable) that are 30% higher than the base design		10	
✓	613.6 Resilient Construction – Enhanced resilience (40% above base design): Design and construction practices are implemented to enhance the resilience and durability of the structure by designing and building to forces generated by flooding, snow, wind, or seismic (as applicable) that are 40% higher than the base design		12	
✓	613.7 Resilient Construction – Enhanced resilience (50% above base design): Design and construction practices are implemented to enhance the resilience and durability of the structure by designing and building to forces generated by flooding, snow, wind, or seismic (as applicable) that are 50% higher than the base design		15	

Table 2. 2015 National Green Building Standard ICC 700-2015
 Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	608.1 Resource-efficient materials: Products containing fewer materials are used to achieve the same end-use requirements as conventional products	3 for each material	9
✓	901.4(5) Wood materials: A minimum of 85% of material within a product group is manufactured from composite wood products that contain no added urea-formaldehyde or are in accordance with the CARB	4 for each product group	10

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	601.2 Material usage: Structural systems are designed or construction techniques are implemented that reduce and optimize material usage. (1) Minimum structural member or element sizes in accordance with advanced framing techniques or structural design standards are selected, (2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and sizes are reduced accordingly, (3) Performance-based structural design is used to optimize lateral force-resisting systems	3 for each system or framing technique	9
✓	606.1(1) Biobased products: Two types of biobased materials are used, each for more than 0.5% of the project's projected building material cost	3	8
✓	606.1(2) Biobased products: Two types of biobased materials are used, each for more than 1% of the project's projected building material cost	6	
✓	606.1(3) Biobased products: For each additional biobased material used for more than 0.5% of the project's projected building material cost	1 each with 2 max	
✓	606.2(2) Wood-based products^(a): A minimum of 2 certified wood-based products are used in major components of the building, such as walls, floors or roof	4	4
✓	609.1 Regional materials: Regional materials are used for major and/or minor components of the building with a minimum of 75% of all products in that component category being sourced regionally	2 for each major component and 1 for each minor component	10

^(a) The wood certificates apply to the Burlington, WA plant only.

Table 2. 2015 National Green Building Standard ICC 700-2015 (continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>610.1 Life cycle assessment: A life cycle analysis (LCA) tool is used to select environmentally preferable products or assemblies, or LCA is conducted on the entire building</p> <p>610.1.1 Whole-building life cycle assessment: A whole-building LCA is performed in conformance with ASTM E2921 using ISO 14044 compliant life cycle assessment</p> <p>610.1.2 Life cycle assessment for a product or assembly: An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies</p>	<p>2 to 3 for each product LCA, 3 to 10 for each assembly LCA</p>	<p>15 for whole-building LCA and product or assembly LCA (15 for whole-building or 10 for product or assembly)</p>

Table 3. National Green Building Standard ICC 700-2012

Points that have been verified by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	608.1 Resource-efficient materials: Products containing fewer materials are used to achieve the same end-use requirements as conventional products	3 for each material	9
✓	901.4(5) Wood materials: A minimum of 85% of material within a product group is manufactured from composite wood products that contain no added urea-formaldehyde or are in accordance with the CARB	4 for each product group	10

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	601.2 Material usage: Structural systems are designed or construction techniques are implemented that reduce and optimize material usage. (1) Minimum structural member or element sizes in accordance with advanced framing techniques or structural design standards are selected, (2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and sizes are reduced accordingly, (3) Performance-based structural design is used to optimize lateral force-resisting systems	3 for each system or framing technique	9
✓	606.1(1) Biobased products: Two types of biobased materials are used, each for more than 0.5% of the project's projected building material cost	3	8
✓	606.1(2) Biobased products: Two types of biobased materials are used, each for more than 1% of the project's projected building material cost	6	
✓	606.1(3) Biobased products: For each additional biobased material used for more than 0.5% of the project's projected building material cost	1 each with 2 max	
✓	606.2(2) Certified wood^(a): A minimum of 2 certified wood-based products are used in major elements of the building such as walls, floors or roof	4	4
✓	609.1 Regional materials: Regional materials are used for major elements or components of the building	2 for each material	10

^(a) The wood certificates apply to the Burlington, WA plant only.

Table 3. National Green Building Standard ICC 700-2012 (continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>610.1 Life cycle analysis: A life cycle analysis (LCA) tool is used to select environmentally preferable products or assemblies, or LCA is conducted on the entire building</p> <p>610.1.1 Whole-building life cycle analysis: A whole-building LCA is performed using a life cycle assessment and data compliant with ISO 14044 or other recognized standards</p> <p>610.1.2 Life cycle analysis for a product or assembly: An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies</p>	<p>2 to 3 for each material, 3 to 10 for each assembly, or 15 for whole-building LCA</p>	<p>10 for each product or assembly, or 15 for whole-building</p>

Table 4. National Green Building Standard ICC 700-2008

Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	607.1 Resource-efficient materials: Products containing fewer materials are used to achieve the same end-use requirements as conventional products	3 for each material	9
✓	609.1 Life cycle analysis: A more environmentally preferable product or assembly is selected for an application based upon the use of a Life Cycle Assessment (LCA) tool compliant with ISO 14044 or other recognized standards that compare the environmental impact of building materials, assemblies, or the whole building	3 per product system comparison or 15 for whole building LCA	15
✓	901.4(5) Wood materials: A minimum of 85% of material within a product group is manufactured from composite wood products that contain no added urea-formaldehyde or are in accordance with the CARB	4 for each product group	10

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	601.2 Material usage: Building-code-compliant structural systems or advanced framing techniques are implemented that optimize material usage	3 for each system or framing technique	9
✓	606.1(1) Biobased products: Two types of biobased materials are used, each for more than 0.5% of the project's projected building material cost	3	8
✓	606.1(2) Biobased products: Two types of biobased materials are used, each for more than 1% of the project's projected building material cost	6	
✓	606.1(3) Biobased products: For each additional biobased material used for more than 0.5% of the project's projected building material cost	1 each with 2 max	
✓	606.2(2) Certified wood^(a): A minimum of 2 certified wood-based products are used for major elements of the building such as walls, floors or roof	4	4

^(a) The wood certificates apply to the Burlington, WA plant only.

Table 5. LEED v4 for New Construction and Major Renovations
 Points Verified by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>Low Emitting Materials. Composite wood evaluation Structural wood I-joists are considered compliant if they are made with moisture resistant adhesives meeting ASTM 2559, have no surface treatments with added urea-formaldehyde resins or coatings, and if they are certified according to Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists (ASTM D5055-13), referenced in ID# LI 10466 LEM Composite Wood (www.usgbc.org/leedaddenda/10466). No further VOC emissions testing is required to meet the Low Emitting Materials credit criteria.</p>	See LEED v4 for calculation methods	3

Table 5. LEED v4 for New Construction and Major Renovations (continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>Building life-cycle impact reduction. Option 4: Whole-building lifecycle assessment</p> <p>For new construction (buildings or portions of buildings), conduct a lifecycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories listed below, one of which must be global warming potential. No impact category assessed as part of the lifecycle assessment may increase by more than 5% compared with the baseline building.</p> <p>The baseline and proposed buildings must be of comparable size, function, orientation, and operating energy performance as defined in EA Prerequisite Minimum Energy Performance. The service life of the baseline and proposed buildings must be the same and at least 60 years to fully account for maintenance and replacement. Use the same lifecycle assessment software tools and data sets to evaluate both the baseline building and the proposed building, and report all listed impact categories. Data sets must be compliant with ISO 14044.</p> <p>Select at least three of the following impact categories for reduction:</p> <ul style="list-style-type: none"> • global warming potential (greenhouse gases), in CO₂e; • depletion of the stratospheric ozone layer, in kg CFC11; • acidification of land and water sources, in moles H⁺ or kg SO₂; • eutrophication, in kg nitrogen or kg phosphate; • formation of tropospheric ozone, in kg NO_x, kg O₃ eq, or kg ethene; and • depletion of nonrenewable energy resources, in MJ 	3	3

Table 5. LEED v4 for New Construction and Major Renovations (continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>Building product disclosure and optimization – environmental product declarations. Option 1: Environmental Product Declaration Use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below.</p> <ul style="list-style-type: none"> • Product-specific declaration: Products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit achievement calculation • Environmental Product Declarations which conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope: <ul style="list-style-type: none"> ▪ Industry-wide (generic) EPD -- Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator are valued as one half (1/2) of a product for purposes of credit achievement calculation. ▪ Product-specific Type III EPD -- Products with third-party certification (Type III), including external verification in which the manufacturer is explicitly recognized as the participant by the program operator are valued as one whole product for purposes of credit achievement calculation. • USGBC approved program – Products that comply with other USGBC approved environmental product declaration frameworks. <p>For credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.</p>	1/4 - 1	1

Table 5. LEED v4 for New Construction and Major Renovations (continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>Building product disclosure and optimization – sourcing of raw materials. Option 2: Leadership extraction practice^(a) Use products that meet the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project.</p> <ul style="list-style-type: none"> • Biobased materials. Biobased products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Biobased raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material. Products meeting biobased materials criteria are valued at 100% of their cost for the purposes of credit achievement calculation. • Wood products. Wood products must be certified by the Forest Stewardship Council or USGBC-approved equivalent. Products meeting wood products criteria are valued at 100% of their cost for the purposes of credit achievement calculation. • Pilot Alternative Compliance Path – Legal Wood. Wood products from Certified Sources as defined by ASTM D7612-10 are valued at 100% of their cost for purposes of credit achievement calculation if the following two conditions are also met: <ul style="list-style-type: none"> ▪ 100% of all wood is verified to be from Legal (non-controversial) Sources as defined by ASTM D7612-10. These components include at a minimum, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. and <ul style="list-style-type: none"> ▪ 70% (based on cost) of all wood used on the project is from Responsible Sources as defined by ASTM D7612-10. These components include at a minimum, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. <p>For credit achievement calculation, products sourced (extracted, manufactured, and purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost. For credit achievement calculation, the base contributing cost of individual products compliant with multiple responsible extraction criteria is not permitted to exceed 100% its total actual cost (before regional multipliers) and double counting of single product components compliant with multiple responsible extraction criteria is not permitted and in no case is a product permitted to contribute more than 200% of its total actual cost. Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.</p>	1	1

^(a) The wood certificates apply to the Burlington, WA plant only.

Table 5. LEED v4 for New Construction and Major Renovations (continued)

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	<p>Building product disclosure and optimization – material ingredients. Option 1: Material ingredient reporting</p> <p>Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm)</p> <ul style="list-style-type: none"> • Manufacturer Inventory • Health Product Declaration • Cradle to Cradle • USGBC approved program <p>Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.</p>	1	1
✓	<p>Building product disclosure and optimization – material ingredients. Option 2: Material ingredient optimization</p> <p>Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project.</p> <ul style="list-style-type: none"> • GreenScreen v1.2 Benchmark • Cradle to Cradle Certified • International Alternative Compliance Path – REACH Optimization • USGBC approved program <p>For credit achievement calculation, products sourced (extracted, manufactured, purchased) within 100 miles (160 km) of the project site are valued at 200% of their base contributing cost.</p> <p>Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.</p>	1	1

Table 6. 2009 LEED for New Construction and Major Renovations and 2009 LEED Canada for New Construction and Major Renovations

Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	IEQ 4.4: Low Emitting Materials: Structural wood I-joists are considered compliant if they are made with moisture resistant adhesives meeting ASTM 2559, have no surface treatments with added urea-formaldehyde resins or coatings, and if they are certified according to Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists (ASTM D5055-13), referenced in ID# LI 10466 LEM Composite Wood (www.usgbc.org/leedaddenda/10466). No further VOC emissions testing is required to meet the Low Emitting Materials credit criteria.	1	1

Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	MR 5: Regional Materials: Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20%, based on cost, of the total material value	1 point for 10% and 2 points for 20%	2
✓	MR 7: Certified Wood^(a): Use a minimum of 50% (based on cost) of wood-based materials and products that are certified in accordance with the FSC principles and criteria, for wood building components <ul style="list-style-type: none"> • Pilot Alternative Compliance Path – Legal Wood. Wood products from Certified Sources as defined by ASTM D7612-10 are valued at 100% of their cost for purposes of credit achievement calculation if the following two conditions are also met: <ul style="list-style-type: none"> ▪ 100% of all wood is verified to be from Legal (non-controversial) Sources as defined by ASTM D7612-10. These components include at a minimum, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. and <ul style="list-style-type: none"> ▪ 70% (based on cost) of all wood used on the project is from Responsible Sources as defined by ASTM D7612-10. These components include at a minimum, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. 	1	1

^(a) The wood certificates apply to the Burlington, WA plant only.

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