Green Verification Report

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Nordic Joist™
Nordic Structures

GR-L274
Revised January 23, 2017

Products: NI-20, 40, 40x, 60, 70, 80, 80x, and 90x Prefabricated Wood I-Joists

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1. Basis of the green verification report:
   - 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 D5055-13, D5055-09, and D5055-05 recognized by the 2015 IBC and IRC, 2012 IBC and IRC, and 2009 IBC and IRC, respectively
   - DOC PS2-10, Performance Standard for Wood-Based Structural-Use Panels
   - CSA O325-07(R2012) Construction Sheathing
   - APA PRI-400, Performance Standard for APA EWS I-Joists
   - APA Product Report PR-L274
   - Documentation supporting green product verification

2. Product description:
   Nordic I-joists are made with lumber flanges and OSB webs in accordance with the in-plant manufacturing standard approved by APA and APA Product Report PR-L274. The binder adhesives used to manufacture the web materials meet the requirements of DOC PS2 and CSA O325, and contain no added urea-formaldehyde. The adhesives used to manufacture Nordic I-joists are exterior-type adhesives meeting the requirements of ASTM D5055 and contain no added urea-formaldehyde. The flange and web materials used in Nordic I-joists are certified under Forest Stewardship Council Standard FSC-STD-40-004 and FSC-STD-40-005.

3. Green product verification:
   Nordic I-joists listed in this report are qualified for green construction with points specified in Tables 1 through 4, as independently verified by APA as meeting pertinent criteria of the referenced standards shown in Section 1.

4. Limitations:
   a) Nordic I-joists shall be designed in accordance with principles of mechanics using the design properties specified in APA Product Report PR-L274 or provided by the manufacturer.
   b) Nordic I-joists are limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16 percent.
   c) Nordic I-joists are produced at the Nordic Engineered Wood, Chibougamau, Québec facilities under a quality assurance program audited by APA.
   d) This report is subject to re-examination in one year.

5. Identification:
   The Nordic Joist described in this report is identified by a label bearing the manufacturer's name (Nordic Engineered Wood) and/or trademark, the APA assigned plant number (1052),

the I-joist series, the APA logo, the report number GR-L274, and a means of identifying the date of manufacture.

Table 1. 2015 National Green Building Standard ICC 700-2015
Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**606.3 Manufacturing energy**: Materials manufactured using a minimum of 33% of the primary manufacturing process energy derived from (1) renewable sources, (2) combustible waste sources, or (3) renewal energy credits (RECs) are used for major components of the building	2 for each material	6
✓	**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(1) Wood materials**: A minimum of 85% of material within a product group (i.e., wood structural panels) is manufactured in accordance with PS 1 or PS 2	Mandatory	NA
✓	**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. 2015 National Green Building Standard ICC 700-2015 (Continued)
Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**606.2(2) Wood-based products**: A minimum of 2 certified wood-based products are used in major components of the building, such as walls, floors or roof	4	4
✓	**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)

Table 2. 2012 National Green Building Standard ICC 700-2012
Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**606.3 Manufacturing energy**: Materials manufactured using a minimum of 33% of the primary manufacturing process energy derived from (1) renewable sources, (2) combustible waste sources, or (3) renewal energy credits (REC's) are used for components of the building	2 for each material	6
✓	**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 minimum of 2 certified wood-based products are used in major elements of the building such as walls, floors or roof	4	4

Table 2. 2012 National Green Building Standard ICC 700-2012 (Continued)
Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**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; **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; **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	2 to 3 for each material, 3 to 10 for each assembly, or 15 for whole-building LCA	10 for each product or assembly, or 15 for whole-building

Table 3. 2008 National Green Building Standard ICC 700-2008
Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**606.3 Manufacturing energy**: Materials are used for major components of the building that are manufactured using a minimum of 33% of the primary manufacturing process energy derived from renewable sources, combustible waste sources, or renewal energy credits (REC's)	2 for each material	6
✓	**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 minimum of 2 certified wood-based products are used in major elements of the building such as walls, floors or roof	4	4

Table 4. LEED v4 for New Construction and Major Renovations
Points that have been verified as eligible by APA

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**Low Emitting Materials. Composite wood evaluation** Composite wood as defined by the California Air Resources Board, Airborne Toxic Measure to Reduce Formaldehyde Emissions from Composite Wood Products Regulation, must be documented to have low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins.	See LEED v4 for calculation methods	3

Table 4. LEED v4 for New Construction and Major Renovations (Continued)
Eligible points that are conditional on construction application

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**Building life-cycle impact reduction. Option 4: Whole-building lifecycle assessment** 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. 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. Select at least three of the following impact categories for reduction: • 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 NOx, kg O3 eq, or kg ethene; and • depletion of nonrenewable energy resources, in MJ	3	3

Table 4. LEED v4 for New Construction and Major Renovations (Continued)

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**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. • 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: ▪ 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. 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.	1/4 - 1	1

Table 4. LEED v4 for New Construction and Major Renovations (Continued)

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**Building product disclosure and optimization – sourcing of raw materials. Option 2: Leadership extraction practice** 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. • 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. 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.	1	1

Table 5. 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:** Composite wood products used on the interior of the building (i.e., inside the weatherproofing system) must contain no added urea-formaldehyde resins	1	1

Eligible points that are conditional on construction location and 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[(a)]	1 point for 10% and 2 points for 20%	1 point for 10% and 2 points for 20%
✓	**MR 7: Certified Wood:** 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	1	1

[(a)] Applicable to the 2009 LEED Canada for New Construction and Major Renovations only.

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