Green Verification Report

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Nordic Lam™ **GR-L294**
Nordic Structures Revised April 30, 2021

Products: Nordic Lam™
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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
   - ANSI A190.1-2017, ANSI A190.1-2012, and ANSI/AITC A190.1-2007 recognized by the 2021 and 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
   - 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 R415, Green Verification Checklist – LEED v4
   - APA L415, Green Verification Checklist – LEED-2009
   - APA Product Report PR-L294
   - Documentation supporting green product verification

2. Product description:
   Nordic Lam™ is a Black Spruce structural glued laminated timber (glulam) manufactured in accordance with layup combinations developed in accordance with the principle of ASTM D3737. Nordic Lam is used as beams, headers, rafters, purlins, columns, studs, and decking, and is manufactured in nominal widths ranging from 1-1/2 to 12 inches, a variety of depths, and lengths up to 80 feet, in accordance with the in-plant manufacturing standard approved by APA and APA Product Report PR-L294. The adhesives used to manufacture the glulam products are exterior-type adhesives meeting the requirements of ASTM D2559 and containing no added urea-formaldehyde. The laminating lumber is certified under Forest Stewardship Council Standard FSC-STD-40-004.

3. Green product verification:
   Nordic Lam glulam products listed in this report are qualified for green construction with points specified in Tables 1 through 6, as independently verified by APA as meeting pertinent criteria of the referenced standards shown in Section 1.

4. Limitations:
   a) Nordic Lam glulam products shall be designed in accordance with the code using the design properties specified in ANSI 117 and APA Product Report PR-L294.
   b) Nordic Lam glulam products are produced at Nordic Structures' facilities in Chibougamau, Quebec, under a quality assurance program audited by APA.
   c) This report is subject to re-examination in one year.

5. Identification:
   Nordic Lam glulam products described in this report are identified by a label bearing the manufacturer's name (Nordic Structures) and/or trademark, the APA assigned plant number

(1057), the product standard (ANSI A190.1), the APA logo, the combination symbol, the report number GR-L294, 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
✓	**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(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 minimum of 2 certified wood-based products are used in major components of the building	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)

(a) Nordic Lam glulam products treated with preservatives meeting AWPA standards or manufactured with naturally decay resistive species may be eligible for points in accordance with Section 602.1.6 of ICC 700.

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

	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
✓	**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(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 2. 2015 National Green Building Standard ICC 700-2015 (Continued)
Eligible points that are conditional on construction application[(a)]

	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 or assembly LCA (15 for whole-building or 10 for product or assembly)

[(a)] Nordic Lam glulam products treated with preservatives meeting AWPA standards or manufactured with naturally decay resistive species may be eligible for points in accordance with Section 602.1.6 of ICC 700.

Table 3. National Green Building Standard ICC 700-2012
Points that have been verified 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[(a)]

	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 3. National Green Building Standard ICC 700-2012 (Continued)
Eligible points that are conditional on construction application[(a)]

	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

[(a)] Nordic Lam glulam products treated with preservatives meeting AWPA standards or manufactured with naturally decay resistive species may be eligible for points in accordance with Section 602.1.6 of ICC 700.

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
✓	**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[(a)]

	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 for major elements of the building such as walls, floors or roof	4	4

[(a)] Nordic Lam glulam products treated with preservatives meeting AWPA standards or manufactured with naturally decay resistive species may be eligible for points in accordance with Section 602.8 of ICC 700.

Table 5. 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** Structural glued laminated timbers are considered compliant if they are made with moisture resistant adhesives meeting ASTM D2559, have no surface treatments with added urea-formaldehyde resins or coatings, and if they are certified according to Structural Glued Laminated Timber (ANSI A190.1-2012), 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. Nordic Lam is manufactured with adhesives that comply with ASTM D2559.	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
✓	**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 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
✓	**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 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
✓	**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. LEED v4 for New Construction and Major Renovations (Continued)

	Section/Criteria	Eligible Points	Possible Maximum Points
✓	**Building product disclosure and optimization – material ingredients. Option 1: Material ingredient reporting** 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) • Manufacturer Inventory • Health Product Declaration • Cradle to Cradle • Declare • ANSI/BIFMA e3 Furniture Sustainability Standard • Cradle to Cradle Material Health Certificate • Product Lens Certification • Facts - NSF/ANSI 336 • USGBC approved program Structure and enclosure materials may not constitute more than 30% of the value of compliant building products.	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 glued laminated timbers are considered compliant if they are made with moisture resistant adhesives meeting ASTM D2559, have no surface treatments with added urea-formaldehyde resins or coatings, and if they are certified according to Structural Glued Laminated Timber (ANSI A190.1-2012), 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. Nordic Lam is manufactured with adhesives that comply with ASTM D2559.	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 20% or 30%, based on cost, of the total material value[(a)]	1 point for 20% and 2 points for 30%	1 point for 20% and 2 points for 30%
✓	**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.

APA – The Engineered Wood Association is an approved national standards developer accredited by American National Standards Institute (ANSI). APA publishes ANSI standards and Voluntary Product Standards for wood structural panels and engineered wood products. APA is an accredited certification body under ISO/IEC 17065 by Standards Council of Canada (SCC), an accredited inspection agency under ISO/IEC 17020 by International Code Council (ICC) International Accreditation Service (IAS), and an accredited testing organization under ISO/IEC 17025 by IAS. APA is also an approved Product Certification Agency, Testing Laboratory, Quality Assurance Entity, and Validation Entity by the State of Florida, and an approved testing laboratory by City of Los Angeles.

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