

ROOF/CEILING, FLOOR/CEILING, BEAM & COLUMN ASSEMBLIES

NORDIC ENGINEERED WOOD - Dorval, PQ CANADA

▼ GENERAL INFORMATION

Nordic Engineered Wood fire design listings are based on, and supported by, proprietary test reports which have been reviewed and evaluated by Intertek. The test reports further define proprietary design details which make these listings applicable only to the specified products manufactured by Nordic Engineered Wood.

The following fire resistant assembly designs are listed in accordance with ASTM-E119 (Fire Tests of Building Construction and Materials), CAN/ULC-S101 (Standard Methods of Fire Endurance Tests of Building Construction and Materials), NFPA-251 (Fire Tests of Building Construction and Materials), UBC-7-1 (formerly UBC-43-1), (Uniform Building Code Standard).

GENERAL INFORMATION APPLICABLE TO ALL NORDIC DESIGNS

1. FLOOR TOPPING: Subject to design and project limitations, these systems may be augmented with a lightweight floor topping mix containing perlite or vermiculite aggregate or a proprietary gypsum based topping.

2. SUB-FLOORING: Sub-floor panels to conform to one of the following:

Material	Canadian Standard	U.S. Standard
Douglas Fir Plywood	CAN/CSA-0121	PS-1-07 Grp 1 struct.
Softwood Plywood	CAN/CSA-0151	PS-1-07 Grp III C-D
Poplar Plywood	CAN/CSA-0153	PS-1-07 Grp III C-D
Waferboard & Strandboard	CAN-0437.0	
Sheathing	CAN/CSA - 0325.0	PS-2-04

NOTE: All panel products are to be produced with adhesive qualified as interior use/exterior grade (exposure 1) or better.

Unless otherwise noted, panels are T & G, maximum width 48" with long dimensions installed perpendicular to joists. End joists are staggered Minimum 24" and butted over joists.

Unless otherwise noted, Minimum nominal thickness of sub-flooring is:

Maximum Joists Spacing (in/mm)	Plywood & O-2 Waferboard and Strandboard (in/mm)	Waferboard and Strandboard R-1 & O-1 Grade (in/mm)
16 (400)	5/8 (15.9)	5/8 (15.9)
19.2 (500)	3/4 (19.0)	3/4 (19.0)
24 (600)	3/4 (19.0)	3/4 (19.0)

3. SUB-FLOORING FASTENING: Minimum length of fastener for sheathing and subfloor attachment for thickness from 5/8" (15.9mm) to 3/4" (19mm) thick is: a) Common or Spiral Nail: 2" (51mm) (Canada); 8d (0.131" dia. x 2.5" long) (US) b) Ring Thread Nail: 1-3/4" (45mm) (Canada); 6d (0.120" dia. x 2" long) (US) Nail spacing shall be 6" (150mm) oc along butt edges of panel and 12" (300mm) (Canada) and 10" (US) oc along intermediate support.

4. STRUCTURAL MEMBERS: Listed fire designs are based on systems designed for structural and functional performance in accordance with Nordic procedures. All designs are tested in unrestrained configuration. Joists have a minimum depth of 9-1/4" and spaced up to a maximum of 24" oc for floor/ceiling systems. The following products are eligible for use in the designs. Limitations are indicated in individual designs. All of the joist products stated below are eligible for use in Table A-9.10.3.1B of the National Building Code of Canada 2005, as followed:

- A. No fire resistant rating; Assemblies F3, F4, F12, F13, F16, F17
- B. 45 Minute fire resistance; Assemblies F5, F8, F10, F14, F18, F20
- C. 60 Minute fire resistance; Assemblies F6, F7, F8, F9, F10, F11, F14, F15, F19, F20, F21

Series	Depths
NI-20	9-1/4", 9-1/2", 11-1/4", 11-7/8"
NI-40	9-1/2", 11-7/8", 14", 16"
NI-40x	9-1/4", 9-1/2", 11-1/4", 11-7/8", 14", 16"
NI-60	9-1/2", 11-7/8", 14", 16", 18"
NI-70	9-1/2", 11-7/8", 14", 16"
NI-80	9-1/4", 9-1/2", 11-1/4", 11-7/8", 14", 16"
NI-80x	18", 20", 22", 24"
NI-90x	11-7/8", 14", 16"

5. RESILIENT CHANNEL: Can be used in all cases, directly applied to joists. Minimum requirements is 26 gauge galvanized steel. Unless otherwise noted, maximum spacing is 24" oc, perpendicular to joists and fastened to each joist with one 1-1/4" Type S drywall screw. Double rows of furring channels at each gypsum wall board joint (at least 3" apart), such that each board end rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges.

6. GYPSUM BOARD: All Gypsum Board is listed 5/8" (15.9mm) Type X, unless otherwise noted. In certain cases, as noted, it may be specific proprietary type with other designations identified in

conjunction with the manufacturer's name. Maximum width is 48" and unless otherwise noted, all exposed joints are taped and finished with two additional coats of joint compound. Screw heads are covered with two coats of joint compound.

7. BLOCKING: Where required, I-joist sections may be used for blocking, fastened to top and bottom chords of joists, and to be spaced at 7' oc maximum.

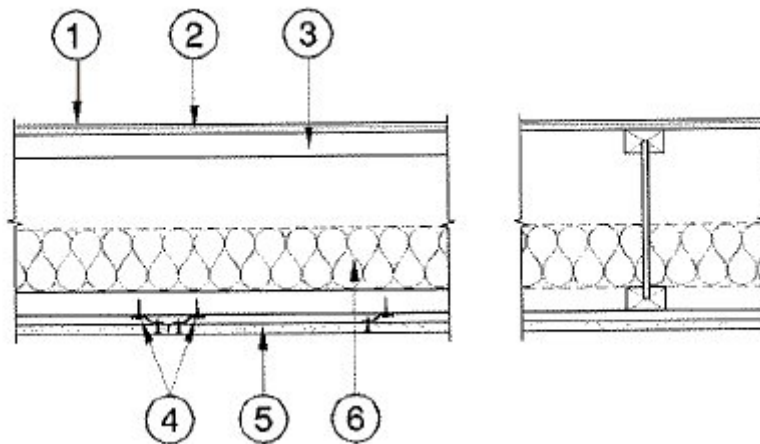
8. INSULATION: All batts are to be placed between bottom joist flanges and supported by metal furring channels. In assemblies where metal furring channels are not utilized, support insulation batts on nominal 1" x 3" wood furring strips spaced 16" oc along the top side of the bottom flange. Equivalent methods that retain insulation above joist bottom flange are acceptable. All butt joints shall be over furring channels.

Items that may be added to the assemblies to increase IIC Ratings:

- a. Adding a second 5/8" sub-floor.....adds 2 points
- b. Adding 5/8" sub-floor plus 1/16" building paper.....adds 3 points
- c. Adding Vinyl floor covering.....adds 2 points
- d. Adding Hardwood floor covering.....adds 2 points
- e. Adding Carpet & Underlay.....adds 20 points.

▼ **DESIGN NO. NEW/FCA 45-01**

**DESIGN NO. NEW/FCA 45-01
ASSEMBLY RATING: 45 MINUTES
FLOOR/CEILING ASSEMBLY**

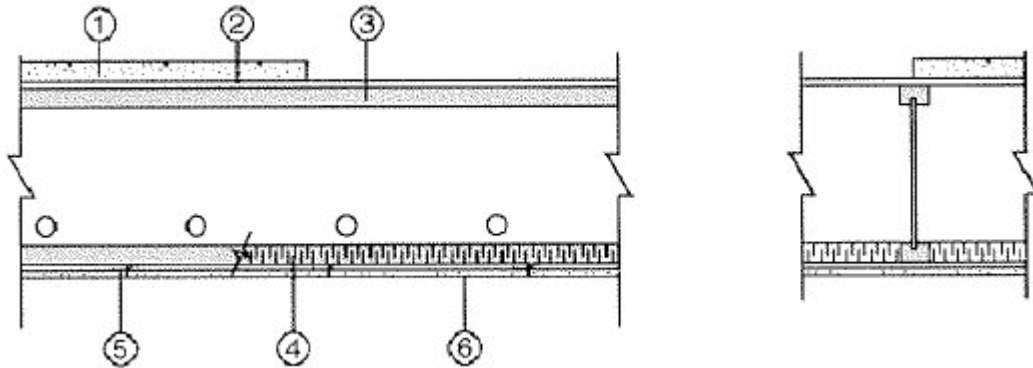


1.	Topping (Optional): Lightweight concrete or proprietary topping.
2.	Sub-Flooring: Minimum 5/8" plywood or oriented strandboard (OSB), when topping is used, and joist spacing is 20" or less, otherwise 3/4" thickness is required. Plywood installed perpendicular to joists, with end joints staggered, fastened in accordance with Code requirements.
3.	Structural Members: Nordic I-joists, minimum joist depth 9-1/4", minimum flange dimension 1-1/8" x 2", installed at 24" oc maximum.
4.	Resilient Channels: Nominal 24 gauge galvanized steel channels installed perpendicular to joist and spaced 16" oc maximum. Additional channels required at gypsum wallboard end joints such that each board end rests on its own channel. These additional channels shall extend to the next joist

	on each side of the board edges. Channels fastened with 1-5/8" long Type W screws at each joist intersection.
5.	Gypsum Board: One layer of 5/8" Type C gypsum wallboard installed perpendicular to channels with end joints staggered 48". Boards to be fastened to channels with minimum 1-1/8" Type S screws located 7" oc. Screws shall be minimum 1-1/2" from board edges and 3/4" from board ends. Gypsum wallboard shall be taped and filled. Screw heads shall be filled with gypsum joint compound.
6.	Insulation (Optional): 3-1/2" fiberglass batt insulation or 2" rock wool insulation, nominal 2.5 PCF density, friction fit between flanges.

▼ **DESIGN NO. NEW/FCA 60-01**

**DESIGN NO. NEW/FCA 60-01
ASSEMBLY RATING: 1 HOUR
FLOOR/CEILING ASSEMBLY**

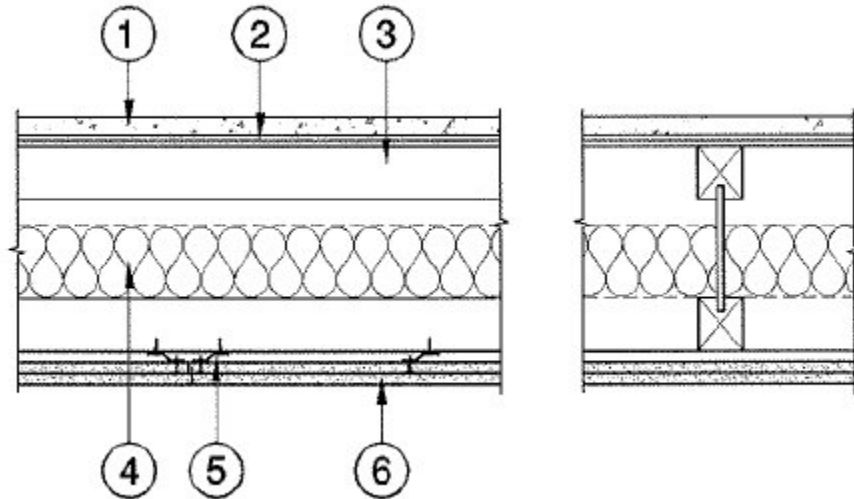


1.	Topping (Optional): Lightweight concrete or proprietary topping.
2.	Sub-Flooring: Minimum 5/8" plywood or oriented strandboard (OSB) when topping is used, otherwise 3/4" thickness is required. Plywood installed perpendicular to joists with end joints staggered, fastened in accordance with Code requirements.
3.	Structural Members: Nordic I-joist, minimum joist depth 9-1/4", minimum flange dimension 1-1/2" by 3-1/2", installed at 24" oc maximum.
4.	Insulation: 1-1/2" rock wool insulation, nominal 2.5 pcf density, friction fit between flanges.
5.	Resilient Channels: Nominal 24 gauge galvanized steel channels installed perpendicular to joists and spaced 16" oc maximum. Additional channels required at gypsum wallboard end joints such that each board end rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges. Channels fastened with 1-5/8" long Type W screws at each joist intersection.
6.	Gypsum Board: One layer of 5/8" Type C gypsum wallboard installed perpendicular to channels with end joints staggered 48". Boards to be fastened to channels with minimum 1-1/8" Type S screws located 7" oc. Screws shall be minimum 1-1/2" from board edges and 3/4" from board ends. Gypsum wallboard shall be taped and filled. Screw heads shall be filled with gypsum joint compound.

▼ **DESIGN NO. NEW/FCA 60-02**

**DESIGN NO. NEW/FCA 60-02
ASSEMBLY RATING: 1 HOUR**

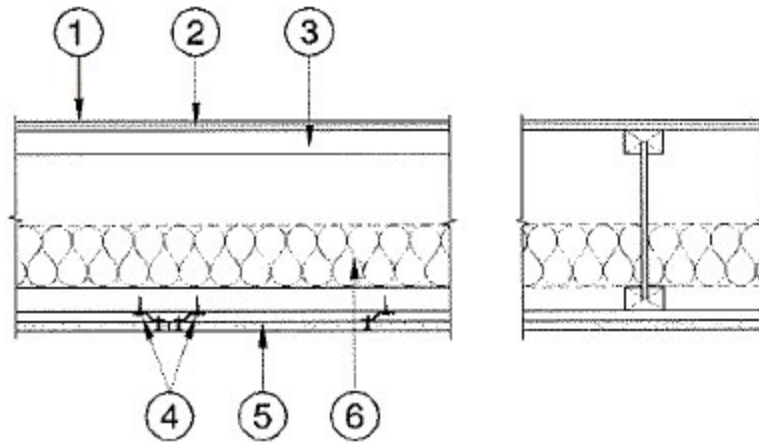
FLOOR/CEILING ASSEMBLY



1.	Topping (Optional): Lightweight concrete or proprietary topping.
2.	Sub-Flooring: Minimum 5/8" plywood or oriented strandboard (OSB) when topping is used, otherwise 3/4" thickness is required. Plywood installed perpendicular to joists with end joints staggered, fastened in accordance with Code requirements.
3.	Structural Members: Nordic I-joist, minimum joist depth 9-1/4", minimum flange dimension 1-1/2" by 2-1/2", installed at 24" oc maximum.
4.	Insulation (Optional): 3-1/2" fiberglass batt insulation, friction fit between flanges and webs.
5.	Resilient Channels: Nominal 24 gauge galvanized steel channels installed perpendicular to joists and spaced 16" oc maximum. Additional channels required at gypsum wallboard end joints such that each board end rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges. Channels fastened with 1-5/8" long Type W screws at each joist intersection.
6.	Gypsum Board: Two layers of 1/2" Type X gypsum wallboard. Base layer to be installed with long dimensions perpendicular to supports with end joints butted over supports and staggered 24" minimum. 1-1/8" Type S screws are spaced 12" oc at the joints and in the field. Face layer installed with long dimension perpendicular to supports and edges, staggered 24" from base layer end joints. 1-5/8" Type S screws are placed minimum 12" oc on intermediate supports, 1-1/2" Type W screws 8" oc at butt joints.

▼ **DESIGN NO. NEW/FCA 60-03**

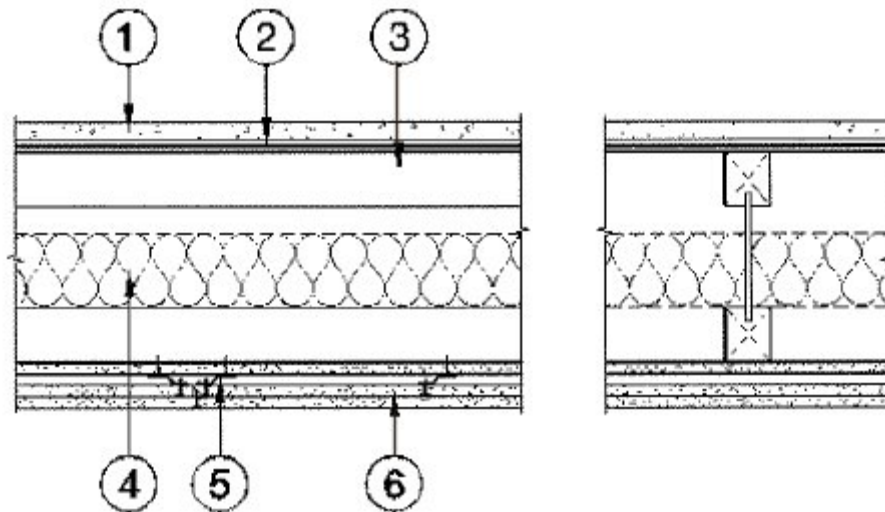
**DESIGN NO. NEW/FCA 60-03
ASSEMBLY RATING: 1 HOUR
FLOOR/CEILING ASSEMBLY
FINISH RATING: 24 MINUTES**



1.	Topping (Optional): Lightweight concrete or proprietary topping.
2.	Sub-Flooring: Minimum 5/8" plywood or oriented strandboard (OSB) when topping is used, otherwise 3/4" thickness is required. Plywood installed perpendicular to joists with end joints staggered, fastened in accordance with Code requirements.
3.	Structural Members: Nordic I-joist, minimum joist depth 9-1/4", minimum flange dimension 1-1/2" by 2-1/2", installed at 24" oc maximum.
4.	Resilient Channels: Nominal 24 gauge galvanized steel channels installed perpendicular to joists and spaced 16" oc maximum. Additional channels required at gypsum wallboard end joints such that each board end rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges. Channels fastened with 1-5/8" long Type W screws at each joist intersection.
5.	Gypsum Board: One layer of 5/8" Type C gypsum wallboard installed perpendicular to channels with end joints staggered 48". Boards to be fastened to channels with minimum 1-1/8" Type S screws located 7" oc. Screws shall be minimum 1-1/2" from board edges and 3/4" from board ends. Gypsum wallboard shall be taped and filled. Screw heads shall be filled with gypsum joint compound.
6.	Insulation: 2" rock wool insulation, nominal 3.5 pcf density, friction fit between flanges, resting on wood furring strips.
7.	Wood Furring Strip (Not Shown): Nominal 1" x 4" wood furring strip installed under each bottom flange, centered on flange, fastened with 1-1/4" Type W screws located 24" oc.

▼ **DESIGN NO. NEW/FCA 120-01**

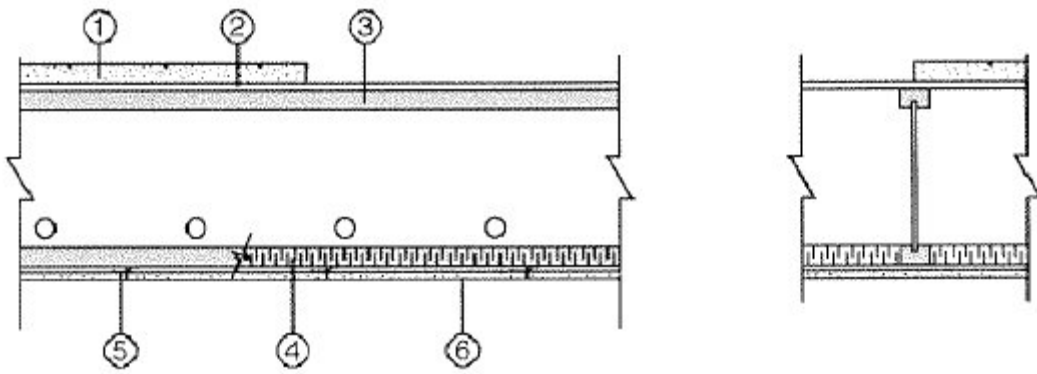
**DESIGN NO. NEW/FCA 120-01
ASSEMBLY RATING: 2 HOUR
FLOOR/CEILING ASSEMBLY**



1.	Topping (Optional): Lightweight concrete or proprietary topping.
2.	Sub-Flooring: Minimum 5/8" plywood or oriented strandboard (OSB) when topping is used, otherwise 23/32" thickness is required. Plywood installed perpendicular to joists with end joints staggered, fastened in accordance with Code requirements.
3.	Structural Members: Nordic I-joist, minimum joist depth 9-1/4", minimum flange dimension 1-1/8" by 2", installed at 24" oc maximum.
4.	Insulation (Optional): Max. 6" fiberglass or rockwool batt insulation, friction fit between flanges or webs and supported using wires every 16".
5.	Resilient Channels: Nominal 25 gauge galvanized steel resilient channels installed perpendicular to joists and spaced 16" oc maximum. Additional channels required at gypsum wallboard end joints such that each board end rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges. Channels fastened with two 1-5/8" long Type S screws at each joist intersection.
6.	Gypsum Board: Three layers of 5/8" Type C gypsum wallboard. Base layer applied directly to joists, installed with long dimensions perpendicular to joists with end joints butted over joists and staggered 24" minimum. Base layer fastened with 1-5/8" Type S screws, spaced 12" oc at the joints and in the field. Middle & Face layer installed over channels with long dimension perpendicular to resilient channels and edges, staggered 24" from base layer end joints. Middle layer fastened with 1" Type S screws located 12" oc at the joints and in the field. Face layer fastened with 1-7/8" Type S screws are placed 8" oc at joints and in the field. (Screw lengths are minimums).

▼ **DESIGN NO. NEW/RCA 60-01**

DESIGN NO. NEW/RCA 60-01
ASSEMBLY RATING: 1 HOUR
ROOF/CEILING ASSEMBLY



1.	Roof Covering System: Insulation and roof covering materials intended for built-up covering which provides Class A, B, C covering on combustible wood decks for fire resistant assemblies equivalent to this assembly.
2.	Sheathing: Minimum 1/2" square edge plywood or orientstrandboardrd (OSB). Sheathing installed perpendicular to joists, with end joints staggered, fastened in accordance with Code requirements.
3.	Structural Members: Nordic I-joist, minimum joist depth 9-1/4", minimum flange dimension 1-1/2" by 3-1/2", installed at 24" oc maximum.
4.	Insulation: 1-1/2" rock wool insulation, nominal 2.5 pcf density, friction fit between flanges.
5.	Resilient Channels: Nominal 24 gauge galvanized steel channels installed perpendicular to joists and spaced 16" oc maximum. Additional channels required at gypsum wallboard end joints such that each board end rests on its own channel. These additional channels shall extend to the next joist on each side of the board edges. Channels fastened with 1-5/8" long Type W screws at each joist intersection.
6.	Gypsum Board: One layer of 5/8" Type C gypsum wallboard installed perpendicular to channels with end joints staggered 48". Boards to be fastened to channels with minimum 1-1/8" Type S screws located 7" oc. Screws shall be minimum 1-1/2" from board edges and 3/4" from board ends. Gypsum wallboard shall be taped and filled. Screw heads shall be filled with gypsum joint compound.

▼ **Evaluated to the following...**

Design listings are based on, and supported by, proprietary test reports. The test reports further define proprietary design details which make these listings applicable only to the specified products manufactured by the listed manufacturer.

Unless otherwise noted, the assemblies in this section have been evaluated for conformance to the following standards:

ASTM-E119, Standard Methods of Fire Tests of Building Construction & Material

CAN/ULC-S101, Standard Methods of Fire Endurance Tests of Building Construction & Materials

NFPA-251, Fire Tests of Building Construction & Materials

UBC-7-1 (formerly 43-1), Uniform Building Code Standard - Fire Tests of Building Construction Materials

UL-263, Fire Tests of Building Construction & Materials.

Designs listed are minimum construction requirements to achieve fire ratings. Specifiers should obtain detailed specifications for the listed assemblies from the manufacturer of the listed components.

Labeled components are identified with the WHI Certification Mark, embossed on the component or Certification Mark and design numbers on component or packaging.

