



- Compliance with International Codes
- Compliance to State/Regional Codes

# ICC-ES Evaluation Report

## ESR-3376

Reissued May 2023

This report is subject to renewal April 2025.

**DIVISION: 05 00 00—METALS**  
**Section: 05 21 99—Open Web Steel Joist Framing**

### REPORT HOLDER:

NEW MILLENNIUM BUILDING SYSTEMS, LLC

### EVALUATION SUBJECT:

WN-SERIES OPEN WEB STEEL JOISTS

## 1.0 EVALUATION SCOPE

### Compliance with the following codes:

- 2021, 2018, and 2015 International Building Code (IBC)

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LABDS), see [ESR-3376 LABC Supplement](#).

### Properties evaluated:

- Structural

## 2.0 USES

The New Millennium Building Systems, LLC WN-Series Open Web Steel Joists are used to support a variety of loads and load combinations as specified by the building design professional. This report deals specifically with the strength and performance of WN-Series Open Web Steel Joists under gravity loads.

## 3.0 DESCRIPTION

### 3.1 General:

The WN-Series Open Web Steel Joists consist of wood nailers (WN) attached to the top chords of the steel joists with screws at the manufacturing facility. The holes in the top chord of the joists are punched, blown, drilled or cut into the joist's top chord.

The format for specifying WN-Series Open Web Steel Joists is ddWNt/l, where:

- dd is the joist nominal depth in inches, including wood-nailer thickness
- t is the maximum uniformly distributed downward total load per ASD (or total factored downward total load for LRFD) applied to the joist top chord based on strength.
- l is the uniformly distributed live load for deflection checks

For example, a 24-inch deep steel joist with a 2<sup>1</sup>/<sub>2</sub>" wood nailer, a 200 plf total design load and 100 plf live load would be designated as a 26.5WN200/100.

### 3.2 Materials:

**3.2.1 Open Web Joist:** The Open Web Steel Joists conform to American National Standard SJI 100-2020, Section 3, Materials. The joists are manufactured from either ASTM A529 Grade 50 hot rolled angle or bar, or cold-formed from ASTM A1011 HSLAS 50 Class 2 and ASTM A1018 HSLAS 50 Class 2 steel coils.

The specific members of the joists and its connections must be determined by New Millennium Building Systems, LLC in accordance with their approved design procedures and quality control manual.

**3.2.2 Wood Nailers:** The wood nailers are 2 or 2<sup>1</sup>/<sub>2</sub> inches thick, conforming to the American Wood Council (AWC) 2018 National Design Specification for Wood Construction, as Grade 2 Douglas Fir lumber. The wood nailer width matches the steel top chord width and is continuous along the entire length of the top chord.

**3.2.3 Screws:** The screws used to attach the wood nailer to the steel top chord are 1/4-10 x 2-inch long indented hex washer head type 17 self-drilling point screws of C10B21 material, or equivalent. The screws are spaced in accordance with the project specific design, but at not greater than 12 inches on center and staggered (24 inches on-center on each side).

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The WN-Series Open Web Steel Joists are designed as simply supported trusses to support uniformly distributed gravity loads (as well as other design loads) specified by the building design professional. The joists are designed such that the bottom chord and end webs are in tension under gravity loads. The bottom chords and end webs are designed to govern the capacity based on strength.

Table 1 provides joist weight, stiffness, and top chord width for a variety of depths, spans and uniform design loads, to aid in selection.

### 4.2 Installation:

The WN-Series Open Web Steel Joists must be installed in accordance with this report, New Millennium Building

Systems, LLC published installation guidelines and instructions, and the applicable code. If there is a conflict, this report governs.

## 5.0 CONDITIONS OF USE

The WN-Series Open Web Steel Joists described in this report complies with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The evaluation report is limited to the structural design of simply supported Tension-Controlled Open Web Steel Joists under gravity load combinations, which cause the bottom chord and end webs to be in tension.
- 5.2 For structures incorporating the WN-Series Open Web Steel Joists, structural calculations and engineering plans, prepared by a registered design professional, shall comply with the code requirements and this evaluation report, and shall be submitted to and approved by the code official.
- 5.3 Non-structural elements, such as interior finishes and fire-resistance ratings, are outside of the scope of the evaluation report, and shall comply with applicable code provisions.
- 5.4 The specific members of the WN-Series Open Web Steel Joists and their connections must be determined by New Millennium Building Systems, LLC in accordance with their approved design procedures and quality control manual.

## 6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Tension-controlled Open Web Steel Joists (AC449), dated June 2013 (editorially revised June 2021).

## 7.0 IDENTIFICATION

- 7.1 The joists are identified by a legible label (tag), indicating the manufacturer's name, the report holder's name, the mark number, and the job number. The job number and mark number cross reference the specific piece to the applicable joist erection drawing. A Product Certificate, included on the joist erection drawing, notes the ICC-ES evaluation report number (ICC-ES ESR-3376), provides notice of any product installation limitations, and includes the job number and all mark numbers.
- 7.2 The report holder's contact information is the following:

**NEW MILLENNIUM BUILDING SYSTEMS, LLC**  
**8200 WOOLERY WAY**  
**FALLON, NEVADA 89406**  
**(870) 722-4100**  
[www.newmill.com](http://www.newmill.com)

TABLE 1A - STANDARD WEIGHT TABLE FOR LOAD/LOAD WN-SERIES JOISTS

Joist Span [ft]	Bare Steel Joist Depth [in]	Wood Nailer Overall Joist Depth [in]	Total Uniformly Distributed Joist Load in Pounds per Linear Foot										
			LRFD (plf)	150	300	450	600	750	900	1050	1200	1350	1500
24	24	26.5	ASD (plf)	100	200	300	400	500	600	700	800	900	1000
			Wt.(lb/ft)	9.4	9.7	9.6	10.2	11.0	11.6	12.7	14.3	15.4	15.7
			w240 (plf)	772	794	772	794	915	1014	1186	1296	1466	1528
			Ix (in <sup>4</sup> )	183	188	183	188	217	240	281	307	347	362
			Nailer Width (in)	5	5	5	5	5	5	5	5	5	5
30	24	26.5	Wt.(lb/ft)	9.1	9.3	10.2	11.3	12.5	14.6	16.2	18.0	20.7	21.4
			w240 (plf)	390	390	424	526	600	757	851	962	1113	1150
			Ix (in <sup>4</sup> )	182	182	198	245	280	353	396	448	519	536
			Nailer Width (in)	5	5	5	5	5	5	5	5	5	5
	26	28.5	Wt.(lb/ft)	9.2	9.4	9.9	11.1	12.1	13.7	15.3	16.5	18.7	21.0
			w240 (plf)	459	459	500	590	657	776	896	1007	1141	1320
			Ix (in <sup>4</sup> )	214	214	233	275	306	362	417	469	531	615
			Nailer Width (in)	5	5	5	5	5	5	5	5	5	5
	28	30.5	Wt.(lb/ft)	9.0	9.2	9.7	11.4	12.4	13.5	15.1	17.0	18.7	19.8
			w240 (plf)	534	534	534	700	765	905	1045	1177	1334	1447
			Ix (in <sup>4</sup> )	249	249	249	326	357	422	487	548	622	674
			Nailer Width (in)	5	5	5	5	5	5	5	5	5	5
	30	32.5	Wt.(lb/ft)	9.3	9.4	9.5	11.3	12.2	13.7	15.3	16.9	17.7	19.8
			w240 (plf)	615	615	615	807	853	997	1207	1360	1448	1673
			Ix (in <sup>4</sup> )	287	287	287	376	398	465	562	633	675	780
			Nailer Width (in)	5	5	5	5	5	5	5	5	5	5

For SI: 1 inch = 25.4 mm; 1 foot = 0.3048 m; 1 lb = 4.45 N

Notes for Tables 1A through 1D.

1. Since joist designations are a function of joist depth and job specific loading, no joist designations are shown in the tables. The tables show typical joist weights, stiffness, and nailer width, based on span, depth, and loading.
2. The total uniformly distributed downward applied to the top chord is based on strength only. The Wt. of the joists have not been deducted from these values.
3. w240 is the total uniformly distributed joist load based on a deflection limit of 1/240 of the joist span. The deflection calculation includes a 1.15 factor for shear deflection, The Wt. of the joists have not been deducted from these values.



**TABLE 1C - STANDARD WEIGHT TABLE FOR LOAD/LOAD WN-SERIES JOISTS**

Joist Span [ft]	Bare Steel Joist Depth [in]	Wood Nailer Overall Joist Depth [in]	Total Uniformly Distributed Joist Load in Pounds per Linear Foot										
			LRFD	150	300	450	600	750	900	1050	1200	1350	1500
50	24	26.5	ASD	100	200	300	400	500	600	700	800	900	1000
			Wt.(lb/ft)	10.5	14	18.4	23.5	28.8	33.8	39.5	46	50.2	55.5
			w240 (plf)	93	151	208	275	337	414	477	550	610	678
			Ix (in <sup>4</sup> )	201	330	454	602	736	904	1042	1203	1333	1482
	Nailer Width (in)	5	5	5	7	7	7	8	9	9	9	9	
	26	28.5	Wt.(lb/ft)	9.2	11.7	17.2	20.3	26.6	30.5	34.9	40.0	48.4	50.5
			w240 (plf)	98	155	243	291	381	444	506	590	725	755
			Ix (in <sup>4</sup> )	214	338	531	636	832	972	1106	1290	1586	1650
			Nailer Width (in)	5	5	5	5	7	7	8	8	9	9
	28	30.5	Wt.(lb/ft)	9.1	11.4	15.6	19.9	25.1	29.6	34.2	37.6	42.0	48.8
			w240 (plf)	114	172	251	329	407	491	574	636	723	851
			Ix (in <sup>4</sup> )	249	377	548	720	891	1074	1255	1390	1581	1861
			Nailer Width (in)	5	5	5	5	7	7	7	8	8	9
	30	32.5	Wt.(lb/ft)	9.1	10.9	14.9	19.8	25.0	27.4	32.5	35.1	39.0	44.9
			w240 (plf)	131	182	276	381	441	515	630	686	768	889
			Ix (in <sup>4</sup> )	287	398	603	833	964	1126	1378	1499	1679	1943
			Nailer Width (in)	5	5	5	5	7	7	7	8	8	9
	32	34.5	Wt.(lb/ft)	9.2	10.9	14.2	17.9	22.6	27.0	30.6	34.1	37.8	40.9
			w240 (plf)	150	208	294	377	463	590	651	761	844	918
			Ix (in <sup>4</sup> )	327	454	643	823	1013	1289	1422	1663	1846	2007
			Nailer Width (in)	5	5	5	5	7	7	7	7	8	8
	36	38.5	Wt.(lb/ft)	9.7	13.3	14.4	17.7	20.7	25.0	28.8	32.5	34.9	37.4
			w240 (plf)	190	238	353	450	559	666	755	870	953	1044
			Ix (in <sup>4</sup> )	416	521	772	984	1222	1457	1650	1902	2084	2283
			Nailer Width (in)	5	5	5	5	5	7	7	7	8	8
	40	42.5	Wt.(lb/ft)	9.9	12.7	15.7	17.7	19.8	27.0	30.3	32.4	35.5	39.8
			w240 (plf)	236	281	402	560	638	853	937	1058	1230	1275
			Ix (in <sup>4</sup> )	515	614	879	1224	1395	1864	2049	2312	2690	2788
Nailer Width (in)			5	5	5	5	5	7	7	8	8	8	
44	46.5	Wt.(lb/ft)	12.0	12.4	15.2	18.0	21.9	26.0	28.4	30.5	35.2	37.1	
		w240 (plf)	286	311	466	595	778	925	1051	1140	1290	1449	
		Ix (in <sup>4</sup> )	625	681	1019	1301	1700	2022	2298	2492	2820	3168	
		Nailer Width (in)	5	5	5	5	5	7	7	7	8	8	
48	50.5	Wt.(lb/ft)	13.4	14.0	17.5	20.7	24.9	28.4	32.8	35.5	38.2	41.8	
		w240 (plf)	419	427	608	794	1006	1194	1320	1501	1645	1718	
		Ix (in <sup>4</sup> )	916	934	1330	1736	2200	2609	2886	3282	3596	3755	
		Nailer Width (in)	5	5	5	5	7	7	8	8	8	9	

**TABLE 1D - STANDARD WEIGHT TABLE FOR LOAD/LOAD WN-SERIES JOISTS**

Joist Span [ft]	Bare Steel Joist Depth [in]	Wood Nailer Overall Joist Depth [in]	Total Uniformly Distributed Joist Load in Pounds per Linear Foot										
			LRFD	150	300	450	600	750	900	1050	1200	1350	1500
			ASD	100	200	300	400	500	600	700	800	900	1000
60	28	30.5	Wt.(lb/ft)	11.2	16.5	22.9	28.9	34.2	39.9	50.2	52.3	59.2	65.7
			w240 (plf)	84	146	211	269	331	383	491	511	588	663
			Ix (in <sup>4</sup> )	317	552	798	1021	1255	1450	1861	1936	2230	2512
			Nailer Width (in)	5	5	7	7	7	8	9	9	9	9
	30	32.5	Wt.(lb/ft)	10.2	14.5	20.3	26.7	32.1	37.5	42.0	50.6	54.6	58.0
			w240 (plf)	87	148	220	297	363	425	483	592	633	682
			Ix (in <sup>4</sup> )	330	562	833	1126	1378	1610	1832	2245	2400	2587
			Nailer Width (in)	5	5	5	7	7	8	8	9	9	9
	32	34.5	Wt.(lb/ft)	9.8	14.3	20.1	24.9	30.7	35.2	40.3	49.0	51.1	57.8
			w240 (plf)	94	170	252	311	397	453	529	653	680	784
			Ix (in <sup>4</sup> )	356	643	955	1179	1506	1718	2007	2477	2577	2971
			Nailer Width (in)	5	5	5	7	7	8	8	9	9	9
	36	38.5	Wt.(lb/ft)	9.6	13.4	18.5	23.1	27.8	33.0	38.3	41.5	49.1	51.4
			w240 (plf)	110	187	278	354	435	533	624	679	839	873
			Ix (in <sup>4</sup> )	416	708	1053	1342	1650	2020	2367	2573	3182	3311
			Nailer Width (in)	5	5	5	7	7	7	8	8	9	9
	40	42.5	Wt.(lb/ft)	9.9	13.4	17.8	22.2	27.2	30.9	35.9	38.9	45.7	49.8
			w240 (plf)	136	221	323	411	515	598	724	779	942	1049
			Ix (in <sup>4</sup> )	515	838	1224	1557	1953	2267	2743	2953	3571	3975
			Nailer Width (in)	5	5	5	7	7	7	8	8	9	9
	44	46.5	Wt.(lb/ft)	10.2	13.0	18.3	21.5	25.6	30.3	35.0	37.8	41.3	45.3
			w240 (plf)	165	243	394	490	583	693	836	916	989	1096
			Ix (in <sup>4</sup> )	625	921	1492	1857	2211	2628	3168	3471	3750	4153
			Nailer Width (in)	5	5	5	5	7	7	8	8	8	9
48	50.5	Wt.(lb/ft)	10.7	12.8	16.7	20.3	24.7	29.2	36.9	36.2	42.5	45.0	
		w240 (plf)	227	273	410	537	638	787	1005	1001	1202	1254	
		Ix (in <sup>4</sup> )	859	1035	1556	2036	2419	2983	3810	3795	4556	4752	
		Nailer Width (in)	5	5	5	5	7	7	8	8	9	9	

TABLE 1E - STANDARD WEIGHT TABLE FOR LOAD/LOAD WN-SERIES JOISTS

Joist	Joist	Wood Nailer	Total Uniformly Distributed Joist Load in Pounds per Linear Foot										
Span	Bare Steel Depth	Overall Joist Depth	LRFD	150	300	450	600	750	900	1050	1200	1350	1500
[ft]	[in]	[in]	ASD	100	200	300	400	500	600	700	800	900	1000
70	34	36.5	Wt.(lb/ft)	12.4	18.1	25.1	30.4	37.7	45.1	51	58	64.6	
			w240 (plf)	100	157	222	283	348	420	486	560	632	
			Ix (in <sup>4</sup> )	604	944	1342	1710	2098	2535	2932	3381	3812	
			Nailer Width (in)	5	5	7	7	8	9	9	9	9	
	36	38.5	Wt.(lb/ft)	12.4	17.6	24.3	29.4	35.3	45.1	50.9	55.5	62.0	
			w240	113	164	240	302	365	474	549	587	670	
			Ix	679	989	1449	1820	2200	2861	3311	3541	4043	
			Top Chord Width	5	5	7	7	8	9	9	9	9	
	38	40.5	Wt.(lb/ft)	12.6	16.7	23.3	29.2	33.2	40.5	49.1	51.6	58.6	64.8
			w240	126	173	249	338	395	478	591	615	710	800
			Ix	759	1041	1504	2037	2383	2883	3567	3712	4282	4830
			Top Chord Width	5	5	7	7	7	8	9	9	9	9
	40	42.5	Wt.(lb/ft)	12.5	16.7	22.7	27.0	32.2	38.0	45.5	51.1	55.9	62.4
			w240	140	192	268	340	417	489	592	686	733	838
			Ix	842	1158	1616	2054	2517	2953	3571	4137	4425	5054
			Top Chord Width	5	5	7	7	7	8	9	9	9	9
	42	44.5	Wt.(lb/ft)	12.5	16.2	22.3	26.3	32.2	38.0	45.4	49.5	55.7	62.5
			w240	147	192	284	359	462	542	656	730	813	928
			Ix	886	1159	1714	2167	2786	3270	3957	4405	4905	5602
			Top Chord Width	5	5	7	7	7	8	9	9	9	9
	44	46.5	Wt.(lb/ft)	12.3	16.0	22.3	26.3	31.1	37.0	44.2	49.4	55.4	59.0
			w240	161	211	313	395	479	575	688	805	896	967
			Ix	974	1276	1886	2386	2889	3471	4153	4857	5409	5834
			Top Chord Width	5	5	7	7	7	8	9	9	9	9
	46	48.5	Wt.(lb/ft)	12.6	15.6	20.6	25.0	31.2	36.7	40.2	46.1	51.7	56.5
			w241	177	221	312	399	525	608	682	793	920	984
			Ix	1066	1335	1882	2407	3167	3669	4114	4786	5550	5937
			Top Chord Width	5	5	5	7	7	8	8	9	9	9
48	50.5	Wt.(lb/ft)	13.2	16.3	20.2	25.1	29.4	35.2	40.4	46.3	52.1	56.2	
		w240	203	253	341	436	522	629	745	867	1005	1076	
		Ix	1222	1526	2055	2628	3147	3795	4495	5231	6067	6491	
		Top Chord Width	5	5	5	7	7	8	8	9	9	9	

**DIVISION: 05 00 00—METALS**

Section: 05 21 99—Open Web Steel Joist Framing

**REPORT HOLDER:**

NEW MILLENNIUM BUILDING SYSTEMS, LLC

**EVALUATION SUBJECT:**

WN-SERIES OPEN WEB STEEL JOISTS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that WN-Series Open Web Steel Joists, described in ICC-ES evaluation report ESR-3376, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

**Applicable code editions:**

- 2020 *City of Los Angeles Building Code* (LABC)

**2.0 CONCLUSIONS**

The WN-Series Open Web Steel Joists, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report ESR-3376, comply with the LABC Chapter 22, and are subject to the conditions of use described in this supplement.

**3.0 CONDITIONS OF USE**

The WN-Series Open Web Steel Joists described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-3376.
- The design, installation, conditions of use and identification of the *WN-Series Open Web Steel Joists* are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the ICC-ES evaluation report ESR-3376.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued May 2023.



**DIVISION: 05 00 00—METALS**

Section: 05 21 99— Open Web Steel Joist Framing

**REPORT HOLDER:**

NEW MILLENNIUM BUILDING SYSTEMS, LLC

**EVALUATION SUBJECT:**

WN-SERIES OPEN WEB STEEL JOISTS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the WN-Series Open Web Steel Joists, described in ICC-ES evaluation report ESR-3376, have also been evaluated for compliance with the code noted below.

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

**Applicable code edition:**

- 2019 *California Building Code* (CBC)

**2.0 CONCLUSIONS**

The WN-Series Open Web Steel Joists, described in Sections 2.0 through 7.0 of the evaluation report ESR-3376, comply with CBC Chapter 22. The design and installation must be in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17, as applicable.

**2.1 OSHPD:** The applicable OSHPD Sections of the CBC are beyond the scope of this supplement.

**2.2 DSA:** The applicable DSA Sections of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued May 2023.

**DIVISION: 05 00 00—METALS**

Section: 05 21 99—Open Web Steel Joist Framing

**REPORT HOLDER:**

NEW MILLENNIUM BUILDING SYSTEMS, LLC

**EVALUATION SUBJECT:**

WN-SERIES OPEN WEB STEEL JOISTS

**1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that WN-Series Open Web Steel Joists, described in ICC-ES evaluation report ESR-3376, have also been evaluated for compliance with the codes noted below.

**Applicable code editions:**

- 2019 Oregon Structural Specialty Code (OSSC)

**2.0 CONCLUSIONS**

The WN-Series Open Web Steel Joists, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report ESR-3376, comply with the OSSC Chapter 22, and are subject to the conditions of use described in this supplement.

**3.0 CONDITIONS OF USE**

The WN-Series Open Web Steel Joists described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-3376.
- The design, installation, conditions of use and identification of the *WN-Series Open Web Steel Joists* are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the ICC-ES evaluation report ESR-3376.
- The design, installation and inspection are in accordance with additional requirements of OSSC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued May 2023.