SkinnyBraces **TER No. 1711-02**

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DIVISION: 05 12 00 – Structural Steel Framing
Section: 05 12 23 – Structural Steel for Buildings

DIVISION: 13 48 00 – Sound, Vibration, and Seismic Control
Section: 13 48 63 – Fabricated Seismic Control Components

1. Product Evaluated:

1.1. SkinnyBraces

1.1.1. Size A - See Section 4 for description.

1.1.2. Size AX - See Section 4 for description.

1.1.3. Size F – See Section 4 for description.

1.1.4. Size FX - See Section 4 for description.

1.2. For the most recent version of this Technical Evaluation Report (TER), visit drjengineering.org. For more detailed state professional engineering and code compliance legal requirements and references, visit drjengineering.org/statelaw. DrJ is fully compliant with all state professional engineering and code compliance laws.

1.3. This TER can be used to obtain product approval in any country that is an IAF MLA Signatory (all countries found here) and covered by an IAF MLA Evaluation per the Purpose of the MLA (as an example, see letter to ANSI from the Standards Council of Canada). Manufacturers can go to jurisdictions in the U.S., Canada and other IAF MLA Signatory Countries and have their products readily approved by authorities having jurisdiction using DrJ's ANSI accreditation.

1.4. Building code regulations require that evaluation reports are provided by an approved agency meeting specific requirements, such as those found in *IBC* Section 1703. Any agency accredited in accordance with ANSI ISO/IEC 17065 meets this requirement within ANSI's scope of accreditation. For a list of accredited agencies, visit ANSI's website. For more information, see drjcertification.org.

1.5. Requiring an evaluation report from a specific private company (i.e., ICC-ES, IAPMO, CCMC, DrJ, etc.) can be viewed as discriminatory and is a violation of international, federal, state, provincial and local anti-trust and free trade regulations.

1.6. DrJ's code compliance work:

1.6.1. Conforms to code language adopted into law by individual states and any relevant consensus based standard such as an ANSI or ASTM standard.

1.6.2. Complies with accepted engineering practice, all professional engineering laws and by providing an engineer's seal DrJ takes professional responsibility for its specified scope of work.

2. Applicable Codes and Standards:[1]

2.1. *2012*, *2015* and *2018 International Building Code* (*IBC*)

2.2. *2012*, *2015* and *2018 International Residential Code* (*IRC*)

2.3. *ASTM A194/ A194M – Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both*

2.4. *ASTM A563 – Standard Specification for Carbon and Alloy Steel Nuts*

2.5. *ASTM A572/572M – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel*

2.6. *ASTM A992/992M – Standard Specification for Structural Steel Shapes*

2.7. *ASTM D7989 – Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels*

2.8. *ASTM E2126 – Standard Test Methods of Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems of Buildings*

2.9. *ASTM F436/F436M – Standard Specification for Hardened Steel Washers Inch and Metric Dimensions*

2.10. *ASTM F844 – Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use*

2.11. *ASTM F959 – Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series*

2.12. *ASTM F3125 – Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions*

2.13. *ASCE/SEI 7 – Minimum Design Loads for Buildings and Other Structures*

2.14. *ASCE 31 – Seismic Evaluation of Existing Buildings*

2.15. *ASCE 41 – Seismic Rehabilitation of Existing Buildings.*

2.16. *FEMA P-807 – Seismic Evaluation and Retrofit of Multi-Unit Wood Frame Buildings with Weak First Stories*

2.17. *SAE J995 – Mechanical and Material Requirements for Steel Nut*

3. Performance Evaluation:

3.1. SkinnyBraces were evaluated to determine the following:

3.1.1. Structural performance under lateral load conditions for both wind and seismic loading for use with the *IBC* performance-based provisions, Section 2306.1 and 2306.3 for light-frame wood wall assemblies.

[1] Unless otherwise noted, all references in this code compliant technical evaluation report (TER) are from the 2018 version of the codes and the standards referenced therein, including, but not limited to, *ASCE 7*, *SDPWS* and *WFCM*. This product also complies with the 2000-2015 versions of the *IBC* and *IRC* and the standards referenced therein. As required by law, where this TER is not approved, the building official shall respond in writing, stating the reasons this TER was not approved. For variations in state and local codes, if any see Section 8.

3.1.1.1. Table 1 provides seismic design coefficients (SDC) that conform to the requirements in *ASCE 7-10* Section 12.2.1 and Table 12.2-1 for design of wall assemblies in buildings that require seismic design in accordance with *ASCE 7* (i.e., all seismic design categories).

3.1.1.2. The basis for equivalency testing is outlined in Section 12.2.1 of *ASCE 7*:

> Seismic force-resisting systems not contained in Table 12.2-1 are permitted provided analytical and test data are submitted to the authority having jurisdiction for approval that establish their dynamic characteristics and demonstrate their lateral force resistance and energy dissipation capacity to be equivalent to the structural systems listed in Table 12.2-1 for equivalent values of response modification coefficient, R, overstrength factor, Ω_o, and deflection amplification factor, C_d.

3.1.1.3. The SDC evaluation uses the approach found in documentation entitled "Equivalency Characteristics and Parameters for Proprietary Shearwalls Used in Wood Framed or Cold-formed Steel Construction"[2] using code-defined accepted engineering procedures, experience and technical judgment.

3.2. SkinnyBraces have been evaluated for lateral load only. Use for resisting gravity loads is out of scope of this TER and is not approved.

3.3. Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

4. Product Description and Materials:

4.1. General

4.1.1. SkinnyBraces are an assembly of materials intended for use in strengthening existing buildings located in areas subject to high seismic activity to enhance their earthquake resistance.

4.1.2. SkinnyBraces are made up of wide flange or other steel columns (see Item #12 in Detail 1) that include a sacrificial structural fuse connection between the top of the column and a connection to the building framing.

Figure 1: Example of structural fuse used in SkinnyBrace

4.2. Sizes

4.2.1. The minimum column sizes for the Size A SkinnyBrace are:

W8x35, W10x30 or HP8x36 (see Section 4.2.5)

4.2.2. The minimum column sizes for the Size AX SkinnyBrace are:

W8x67 or HP10x57 (see Section 4.2.5)

4.2.3. The minimum column sizes for the Size F SkinnyBrace are:

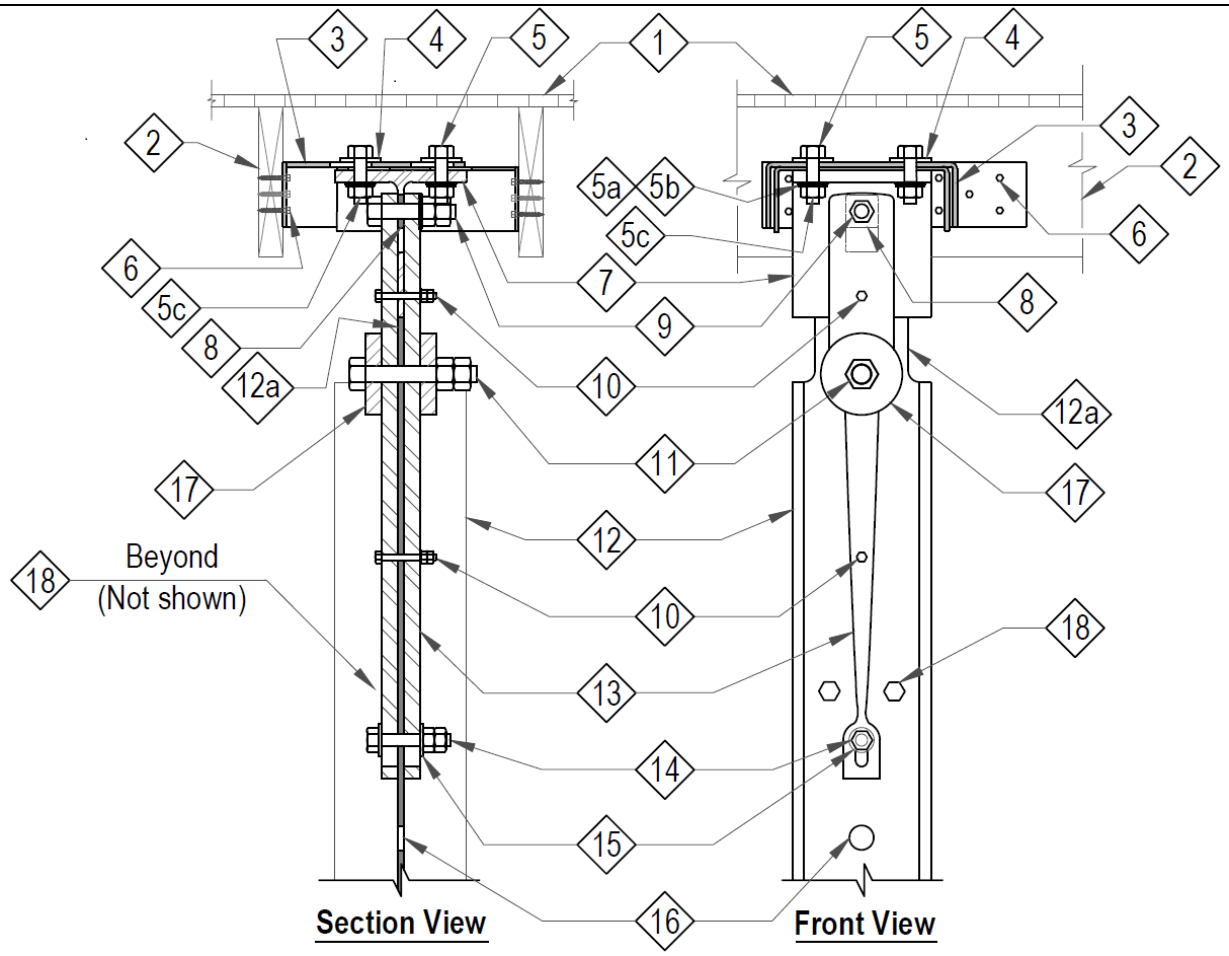
W12x65 or HP12x74 (see Section 4.2.5)

4.2.4. The minimum column size for the Size FX SkinnyBrace are:

W12x136, W14x109 or W16x89 (see Section 4.2.5)

4.2.5. Larger steel sections may be specified by the Engineer of Record (EOR) subject to compatibility with remaining manufactured components.

[2] http://www.structuremag.org/wp-content/uploads/2014/08/C-StructuralPerformance-Nelson-Aug081.pdf



Detail of SkinnyBrace and Connections to Floor Framing			
Item #	**Description**	**Item #**	**Description**
1	Floor Sheathing	9	Ceiling bolt through bushing and fuse plates, with double nuts
2	Floor Joists	10	Shear bolt(s), with double nuts; number, size and location varies with SkinnyBrace
3	Connector Channels	11	Top bolt in column, through fuse plates, bearing plates and column web, with double nuts
4	Square Washers	12	Column
5	Connection Bolts at Loading Tee	12a	Column web extension (column web and web extension shown shaded in section view)
5a	Direct Tension Indicating Washer	13	Fuse plates both sides of column
5b	Hardened Washer	14	Bottom bolt through column web and slotted holes in fuse plates, with double nuts
5c	Hardened Nut	15	Standard round washers against fuse plates at both ends of bolt
6	Structural Screws from Connector Channels to Joist	16	Hole provided in web for utilities
7	Loading Tee	17	Bearing plate on both sides
8	Square or Rectangular Bushing (concealed between Fuse Plates)	18	Guide bolts and spacers
1. Items 7 through 18 are pre-assembled. Installer must fasten the connector channels to the building framing and the loading tee to the connector channels.			

Detail 1: SkinnyBrace Assembly

4.3. Materials

4.3.1. Wide flange steel columns shall be of Type HSLA Grade 50 (Fy = 50 ksi) steel conforming to ASTM A992/A992M.

4.3.2. Bearing pile (HP) steel columns shall be of Type HSLA Grade 50 (Fy = 50 ksi) steel conforming to ASTM A572/A572M.

4.3.3. Structural Fuse Plates shall be of Type HSLA Grade 50 (Fy = 50 ksi) steel conforming to ASTM A572/A572M.

4.3.4. The base of the column (Item #12) is embedded in reinforced concrete or provided with a welded base plate to create a moment resisting connection in accordance with the detailed installation drawings.

4.3.5. SkinnyBraces are intended to provide equivalent resistance to lateral loads as compared to the existing lateral resisting system in the building.

4.3.6. A complete SkinnyBrace system includes the following:

4.3.6.1. Column – Designed to resist lateral loads and limit deflection to an acceptable level (see Item #12 in Detail 1).

4.3.6.2. Structural Fuses – Designed to resist lateral loads while allowing certain deflections within a specified range (see Item #13 in Detail 1).

4.3.6.3. Shear Bolt(s) – Provide increased stiffness to the system prior to a given load level (see Item #10 in Detail 1).

4.3.6.4. Steel Connector Channels – Connect the SkinnyBraces to the existing floor system of the building above the SkinnyBraces (see Item #3 in Detail 1).

4.3.6.5. Loading Tee – Transfers load from the column web extension (see Item #12a in Detail 1) to floor system.

4.3.6.6. Hardware and accessories shall be as follows (all items listed below are provided with the SkinnyBraces):

4.3.6.6.1. Structural Screws – Structural wood screws for attaching the steel channel to the floor joists shall be self-drilling structural wood screws used in accordance with a current code evaluation report (see Item #6 in Detail 1).

4.3.6.6.2. Bolts – High-strength *ASTM F3125*, Grade A325 bolts and *SAE J429*, Grade 2 and Grade 5 cap screws are used to make connections between the steel members (see Items #5, #9, #10, #11, and #14 in Detail 1).

4.3.6.6.3. Washers – Hardened round and square washers shall be in accordance with *ASTM F436*; standard round and square washers per *ASTM F844* (see Items #4, #5b, #8, #15 and #17 in Detail 1)

4.3.6.6.4. Direct-Tension-Indicating (DTI) Washers – DTI washers shall be in accordance with *ASTM F959* (see Item #5a in Detail 1).

4.3.6.6.5. Nuts – High-strength nuts shall be in accordance with *ASTM A563 DH* or *ASTM A194-2H;* Standard nuts shall be in accordance with *ASTM A563A* or *SAE J995*, Grade 2 (see Items #5c, #9, #10, #11, and #14 in Detail 1).

5. Applications:

5.1. General

5.1.1. SkinnyBraces have been tested in accordance with *ASTM E2126*, Method C. Seismic design parameters and allowable loads are determined using the test data analysis methods in accordance with *ASTM D7989*.

5.1.2. The testing was conducted to measure the load capacities and drift limits of the SkinnyBraces as a replacement or supplementation for the existing lateral load resisting system of construction containing soft story irregularities. In accordance with *ASCE 7*, Section 12.3.2, soft story irregularity is defined to

exist where there is a story in which the lateral stiffness is less than 70% of that in the story above or less than 80% of the average stiffness of the three stories above.

5.2. Structural Applications

5.2.1. The allowable seismic lateral load capacity and seismic design coefficients for the SkinnyBrace system are as described in Table 1.

Allowable Seismic Lateral Load Capacity & Seismic Design Coefficients for the SkinnyBrace System[1, 2]										
SkinnyBrace Size	Maximum Ceiling Height[3]	Allowable Lateral Load Capacity (lbf)[4]	Response Modification Coefficient, R[5]	Overstrength Factor, Ω_0[6,7]	Deflection Amplification Factor, C_d[8]	Structural System Limitations & Building Height (ft.) Limit				
						Seismic Design Category				
						B	C	D	E	F
A	8' – 5-¼"	2,400	6.5	3.0	4	NL[9]	NL[9]	65	65	65
AX	8' – 5-¼"	3,400	6.5	3.0	4	NL[9]	NL[9]	65	65	65
F	8' – 5-¼"	8,275	6.5	3.0	4	NL[9]	NL[9]	65	65	65
FX	8' – 5-¼"	11,750	6.5	3.0	4	NL[9]	NL[9]	65	65	65

1. The SkinnyBrace system shall be installed in accordance with Section 6 of this TER.
2. All seismic design parameters follow the equivalency as defined in Section 3 of this TER.
3. "Ceiling height" is measured from the top of the foundation grade beam, pedestal, or column base plate to the bottom of the framing members of the floor being braced with the SkinnyBrace. See Figure 2 for a detail showing how the ceiling height is measured.
4. Allowable lateral load capacity was selected to provide a minimum factor of safety of 2.5 and to meet the drift limit of 2.5% of the story height. A story height of 9 feet was used to determine the drift limit.
5. Response modification coefficient, R, for use throughout ASCE 7. Note: R reduces forces to a strength level, not an allowable stress level.
6. The tabulated value of the overstrength factor, Ω_0, is permitted to be reduced by subtracting one-half (0.5) for structures with flexible diaphragms.
7. Collectors and their connections, bearing and anchorage of the steel column, and the lateral load path to the SkinnyBrace shall be designed in accordance with the special load combinations of *ASCE 7* Section 12.4.3.
8. Deflection amplification factor, C_d, for use with *ASCE 7* Sections 12.8.6, 12.8.7, and 12.9.2.
9. NL = Not Limited. Heights are measured from the base of the structure as defined in *ASCE 7* Section 11.2.

Table 1: Allowable Seismic Lateral Load Capacity & Seismic Design Coefficients for the SkinnyBrace System

5.2.2. Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience and technical judgment.

5.2.3. If an alternative steel column section is specified in accordance with Section 4.2.5 the selected section shall be designed to resist the specified lateral loads and limit deflection to an allowable level.

5.2.3.1. The lateral loads shall be applied to the column at the location of the two pins connecting the fuse member to the column or an equivalent force system shall be determined to account for the moment generated by the span between the top of the column and the point of connection to the floor framing.

5.2.3.2. Required column strength shall be determined considering a lateral load equal to the value given in Table 1 as the Allowable Lateral Load Capacity for the SkinnyBrace size used, multiplied by the Overstrength Factor given in Table 1 (the Overstrength Factor may be reduced by 0.5 for structures with flexible diaphragms, in accordance with note 'g' in *ASCE 7* Table 12.2-1). The lateral load shall be considered to act on the column as described in Section 5.3.3.1.

5.2.3.3. The design story drift shall be calculated using the strength level seismic forces specified in *ASCE 7* Section 12.8 without reduction for allowable stress design. The allowable lateral load in Table 1 can be converted to a design strength level by dividing by 0.7.

5.2.3.4. Alternate column sections shall have a minimum design web thickness (t_w) and minimum clear distance between the flanges (T) as listed below:

5.2.3.4.1. For Size A: t_w = 0.300 in, T = 5-3/4"

5.2.3.4.2. For Size AX: t_w = 0.565 in, T = 5-3/4"

5.2.3.4.3. For Size F: t_w = 0.390 in, T = 9-1/8"

5.2.3.4.4. For Size FX: t_w = 0.525 in, T = 9-1/8"

5.2.3.5. For SkinnyBrace Size A, the deflection contribution of the SkinnyBrace components, other than the steel column, shall be taken as 0.277" at the design shear strength of 3,430 lbs. (2,400 lbs. / 0.7). This deflection may be reduced by the ratio of the lateral seismic force to the design shear strength. The deflection of the SkinnyBrace components shall be added to the calculated elastic deflection of the steel column at the strength level seismic forces to determine the total elastic deflection of the SkinnyBrace system. The design story drift shall be determined in accordance with *ASCE 7* Section 12.8.6 using the deflection amplification factor listed in Table 1.

5.2.3.6. For SkinnyBrace Size AX, the deflection contribution of the SkinnyBrace components, other than the steel column, shall be taken as 0.422" at the design shear strength of 4,857 lbs. (3,400 lbs. / 0.7). This deflection may be reduced by the ratio of the lateral seismic force to the design shear strength. The deflection of the SkinnyBrace components shall be added to the calculated elastic deflection of the steel column at the strength level seismic forces to determine the total elastic deflection of the SkinnyBrace system. The design story drift shall be determined in accordance with *ASCE 7* Section 12.8.6 using the deflection amplification factor listed in Table 1.

5.2.3.7. For SkinnyBrace Size F, the deflection contribution of the SkinnyBrace components, other than the steel column, shall be taken as 0.292" at the design shear strength of 11,821 lbs. (8,275 lbs. / 0.7). This deflection may be reduced by the ratio of the lateral seismic force to the design shear strength. The deflection of the SkinnyBrace components shall be added to the calculated elastic deflection of the steel column at the strength level seismic forces to determine the total elastic deflection of the SkinnyBrace system. The design story drift shall be determined in accordance with *ASCE 7* Section 12.8.6 using the deflection amplification factor listed in Table 1.

5.2.3.8. For SkinnyBrace Size FX, the deflection contribution of the SkinnyBrace components, other than the steel column, shall be taken as 0.430" at the design shear strength of 16,786 lbs. (11,750 lbs. / 0.7). This deflection may be reduced by the ratio of the lateral seismic force to the design shear strength. The deflection of the SkinnyBrace components shall be added to the calculated elastic deflection of the steel column at the strength level seismic forces to determine the total elastic deflection of the SkinnyBrace system. The design story drift shall be determined in accordance with *ASCE 7* Section 12.8.6 using the deflection amplification factor listed in Table 1.

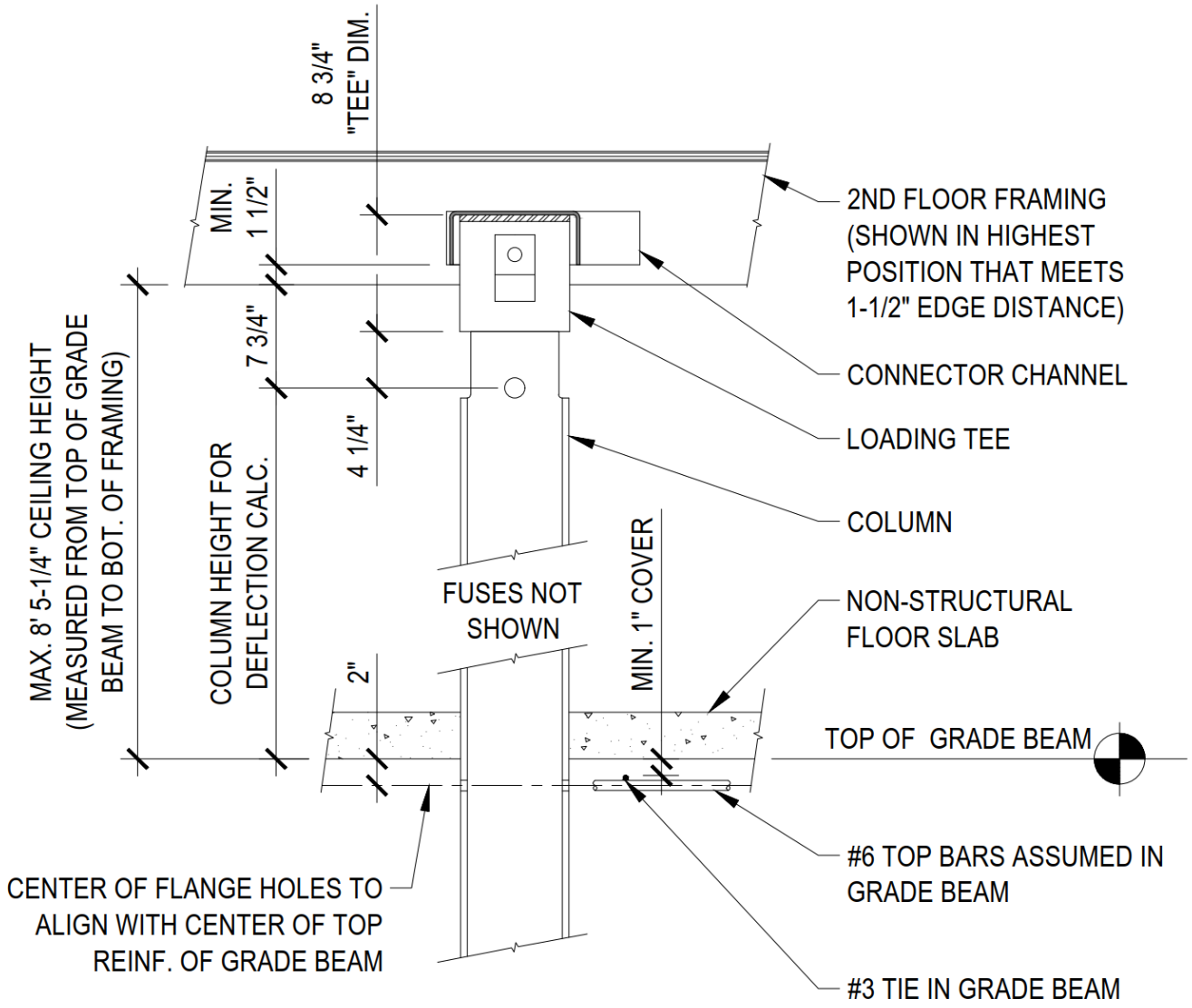


Figure 2: SkinnyBrace Ceiling Height Limits

6. Installation:

6.1. Installation shall comply with the manufacturer's installation instructions and this TER. In the event of a conflict between the manufacturer's installation instructions and this TER, the more restrictive shall govern.

6.2. All SkinnyBrace installations shall be accompanied by a complete set of detailed design drawings sealed by the EOR setting forth the components to be used for the installation and the requirements for installation. Consideration shall be given to the condition of the existing building and the ability to retrofit the building with the SkinnyBrace system to provide the alternate lateral load resisting system.

6.3. Sizing of the SkinnyBrace system components shall be such that the resistance provided exceeds the loading requirements of the building code in force in the jurisdiction where the SkinnyBrace is being installed.

6.4. The SkinnyBrace system shall also be designed to limit deflections and story drift to no more than those allowed in accordance with the adopted building code.

6.5. Collectors and their connections, bearing and anchorage of the steel column, and the lateral load path to the SkinnyBrace shall be designed in accordance with the special load combinations of *ASCE 7* Section 12.4.3.

6.6. Where connection to existing framing cannot be accomplished using the Connector Channels, the Building Designer shall design an alternative connection from the Loading Tee to the existing structure. The alternative connection shall provide for special load combinations of *ASCE 7* Section 12.4.3.

7. Tests and Engineering Substantiating Data:

7.1. Testing for SkinnyBraces Sizes A and AX is in accordance with *ASTM E2126* using CUREE protocols by CEMCO Engineering Laboratory, November 2017.

7.2. Testing for SkinnyBraces Sizes F and FX is in accordance with ASTM E2126 using CUREE protocols by Pacific Earthquake Engineering Research Center (PEER), June 2018.

7.3. "Structural Fuse" Connection Providing Ductility and Hysteretic Energy Dissipation with Easily Replaceable Elements to Reduce Earthquake Damage and Recovery Time, SEAOC Convention Proceedings, 2016

7.4. Test data analysis in accordance with *ASTM D7989*, DrJ Engineering, 2018

7.5. The product(s) evaluated by this TER fall within the scope of one or more of the model, state or local building codes for building construction. The testing and/or substantiating data used in this TER is limited to buildings, structures, building elements, construction materials and civil engineering related specifically to buildings.

7.6. The provisions of model, state or local building codes for building construction do not intend to prevent the installation of any material or to prohibit any design or method of construction. Alternatives shall use consensus standards, performance-based design methods or other engineering mechanics based means of compliance. This TER assesses compliance with defined standards, accepted engineering analysis, performance-based design methods, etc. in the context of the pertinent building code requirements.

7.7. Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate, as it undertakes its engineering analysis.

7.8. DrJ has reviewed and found the data provided by other professional sources are credible. The information in this TER conforms with DrJ's procedure for acceptance of data from approved sources.

7.9. DrJ's responsibility for data provided by approved sources conforms with *IBC* Section 1703 and any relevant professional engineering law.

7.10. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS, NDS, ACI, AISI, PS-20, PS-2*, etc.). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, concrete, etc.), DrJ relies upon grade/properties provided by the raw material supplier to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8. Findings:

8.1. When designed and installed in accordance with this TER and the manufacturers detailed installation drawings, the Quake Bracing, LLC's SkinnyBrace system is approved to replace or supplement the existing lateral resisting system.

8.2. *IBC* Section 104.11 (*IEBC* Section 104.11 similar) states:

> **104.11 Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code. … Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.

8.3. This product has been evaluated in the context of the codes listed in Section 2, and is compliant with all known state and local building codes. Where there are known variations in state or local codes that are applicable to this evaluation, they are listed here:

8.3.1. No known variations

8.4. This TER uses professional engineering law, the building code, ANSI/ASTM consensus standards and generally accepted engineering practice as its criteria for all testing and engineering analysis. DrJ's professional engineering work falls under the jurisdiction of each state Board of Professional Engineers, when signed and sealed.

9. Conditions of Use:

9.1. Where required by the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

9.2. Special inspection of each SkinnyBrace shall be conducted by a qualified third party inspector as required by the SkinnyBrace installation requirements and the jurisdiction where the SkinnyBrace is installed.

9.3. Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the code official for review and approval.

9.4. Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the Building Designer (e.g., Owner, Registered Design Professional, etc.).

9.5. SkinnyBraces have been evaluated for lateral load only and are not approved for carrying vertical loads.

9.6. Design

9.6.1. Building Designer Responsibility

9.6.1.1. Unless the AHJ allows otherwise, the Construction Documents shall be prepared by a Building Designer for the Building and shall be in accordance with *IRC* Section R106 and *IBC* Section 107.

9.6.1.2. The Construction Documents shall be accurate and reliable and shall provide the location, direction and magnitude of all applied loads and shall be in accordance with *IRC* Section R301 and *IBC* Section 1603.

9.6.2. Construction Documents

9.6.2.1. Construction Documents shall be submitted to the Building Official for approval and shall contain the plans, specifications and details needed for the Building Official to approve such documents.

9.7. Responsibilities

9.7.1. The information contained herein is a product, material, detail, design and/or application TER evaluated in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering practice, experience and technical judgment.

9.7.2. DrJ TERs provide an assessment of only those attributes specifically addressed in the Products Evaluated or Code Compliance Process Evaluated sections.

9.7.3. The engineering evaluation was performed on the dates provided in this TER, within DrJ's professional scope of work.

9.7.4. This product is manufactured under a third-party quality control program in accordance with *IRC* Section R104.4 and R109.2 and *IBC* Section 104.4 and 110.4.

9.7.5. The actual design, suitability and use of this TER, for any particular building, is the responsibility of the Owner or the Owner's authorized agent, and the TER shall be reviewed for code compliance by the Building Official.

9.7.6. The use of this TER is dependent on the manufacturer’s in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer’s instructions, the Building Official’s inspection and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10. Identification:

10.1. SkinnyBraces described in this TER is identified by a label on the Components or packaging material bearing the manufacturer’s name, product name, TER number, and other information to confirm code compliance.

11. Review Schedule:

11.1. This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjengineering.org.

11.2. For information on the current status of this TER, contact DrJ Engineering.

- Mission and Professional Responsibilities
- Product Evaluation Policies
- Product Approval – Building Code, Administrative Law and P.E. Law