



Technical Evaluation Report

TO ASSIST WITH CODE COMPLIANCE

TECO Certified Rim Board in Fire-Rated Assemblies

TER No. 1005-01

Issue Date: May 28, 2010

Updated: January 3, 2014

Subject to Renewal: April 1, 2014

TECO

507 Matt Pass, Suite 2
Cottage Grove, WI 53527
608-403-4197
tecotested.com

DIVISION: 06 00 00 – WOOD AND PLASTICS

Section: 06 17 00 – Prefabricated Structural Wood

1. Product Evaluated:

- 1.1. TECO Certified Rim Board is available in two grades:
 - 1.1.1. Standard: 1" Rim Board (25 mm)
 - 1.1.2. Performance: 1¹/₈" Rim Board (29 mm)
- 1.2. TECO Certified Rim Board is qualified to the TECO Rim Board Product Standard (RB 133) and must be composed of wood. It may be in the form of oriented strand board¹ or other composite structural panels. Oriented strand lumber or laminated veneer lumber manufactured in accordance with *ASTM D5456-06* is also acceptable.
- 1.3. For the most recent version of this report, visit drjengineering.org.

2. Performance Evaluation:

- 2.1. The *International Building Code (IBC)*² and the *National Building Code of Canada (NBC)*³ allow for the component additive method (CAM) for calculating fire resistance ratings of protected wood-frame walls, floors, and roofs.

¹ Per RB 133, the base OSB panel must be qualified to US Dept. of Commerce Voluntary Product Standard PS2 or CSA O325.

² 2009 IBC Section 703.3 **Alternative methods for determining fire resistance** allows for calculations in accordance with Section 721.

³ Appendix D of the NBC details the "component additive method" to establish fire ratings of an assembly.

DrJ is a Professional Engineering Approved Source

Applying for ISO/IEC 17065 Accreditation

The *IBC* defines:

- **APPROVED SOURCE** – "An independent person, firm or corporation, *approved by the building official*, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses."

DrJ's building construction professionals meet the competency requirements as defined in the *IBC* and can seal their work. DrJ is regularly engaged in conducting and providing engineering evaluations of single-element and full-scale building systems tests. This TER is developed from test reports complying with *IBC* Section 104.11.1 Research reports, which states, "Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved sources*."

Technical Evaluation Report (TER)

2.2. Code References:

Code	Applicable Chapters/Sections
IBC 2009	Chapter 7, Section 703.3, and Section 721
IBC 2006	Chapter 7, Section 703.3, and Section 721
NBC 2005	Appendix D

3. Applications:

- 3.1. TECO Certified Rim Board is used to tie floor joists together in order to carry the lateral and vertical loads from the walls past the I-joist, truss, etc. system to the sill plate and foundation wall.

4. Fire-Resistant Rim Board Assembly Applications:

- 4.1. The rim board assemblies in [Figures 1-7](#) will achieve fire-resistance ratings of one hour. The assemblies listed are based on the char rates of TECO Certified Rim Board at the minimum specifications.

Assembly No. 1

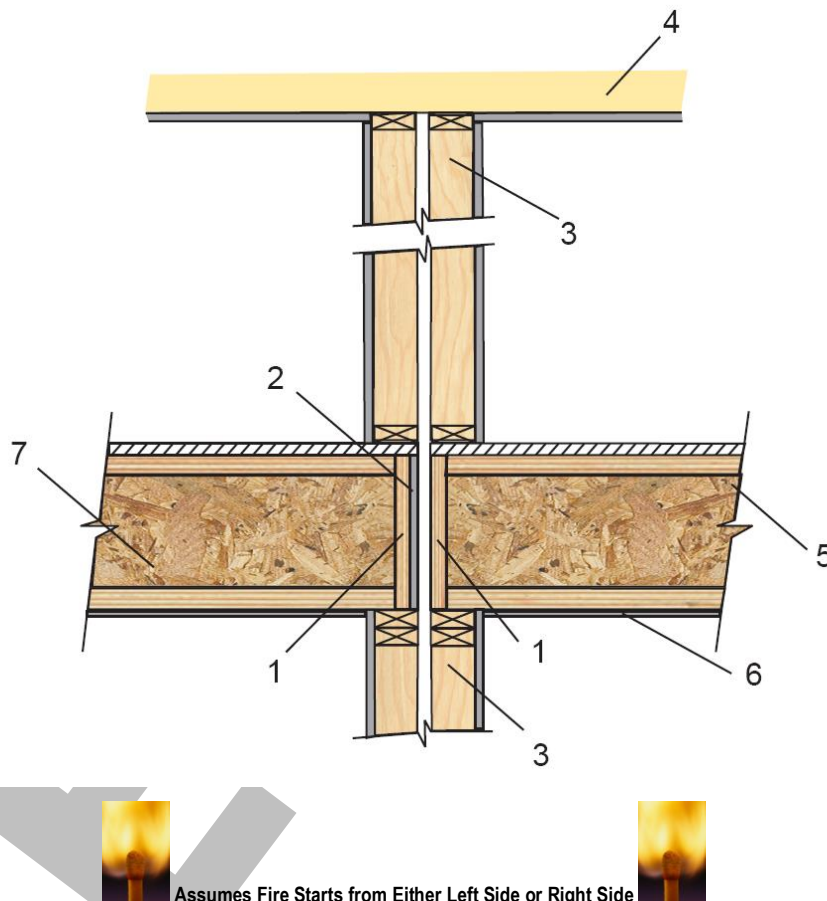


Figure 1: TECO Certified Rim Board One-Hour Assembly No. 1 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Upper Load Uniformly Distributed to Both Walls and Load is Transferred to Non-Fire-Exposed Wall When Rim Board Support on Fire-Exposed Wall is Lost to Fire.]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"
2. Continuous 1/2" Type X gypsum board fastened to rim board with 1 1/2" Type W screws 12" on center
3. One-hour-rated wall construction
4. Floor or roof/ceiling assembly for story above
5. Un-rated floor/ceiling assembly
6. 1/2" min. gypsum board ceiling, taped and filled
7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 1

Component	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)	
1/2" Gypsum	15	15
Rim Board	33.75	39.65
1/2" Type X Gypsum	25	25
	73.75	79.65

Assembly No. 2

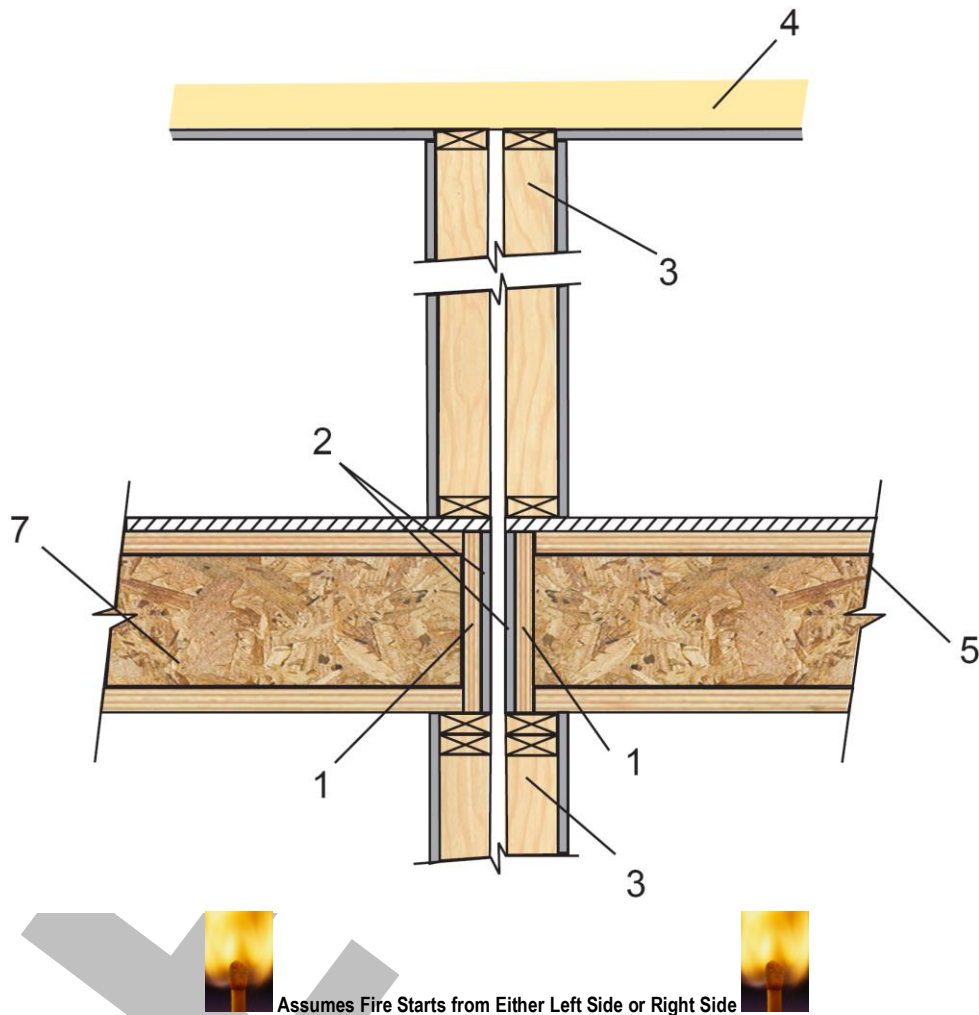


Figure 2: TECO Certified Rim Board One-Hour Assembly No. 2 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Upper Load Uniformly Distributed to Both Walls and Load is Transferred to Non-Fire-Exposed Wall When Rim Board Support on Fire-Exposed Wall is Lost to Fire.]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"
2. Continuous 1/2" Type X gypsum board fastened to rim board with 1 1/2" Type W screws 12" on center
3. 45-minute or one-hour-rated wall construction
4. Floor or roof/ceiling assembly for story above
5. Un-rated floor/ceiling assembly
6. –
7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 2

Component	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)	
Rim Board	33.75	39.65
1/2" Gypsum	15	15
1/2" Gypsum	15	15
	63.75	69.65

Assembly No. 3

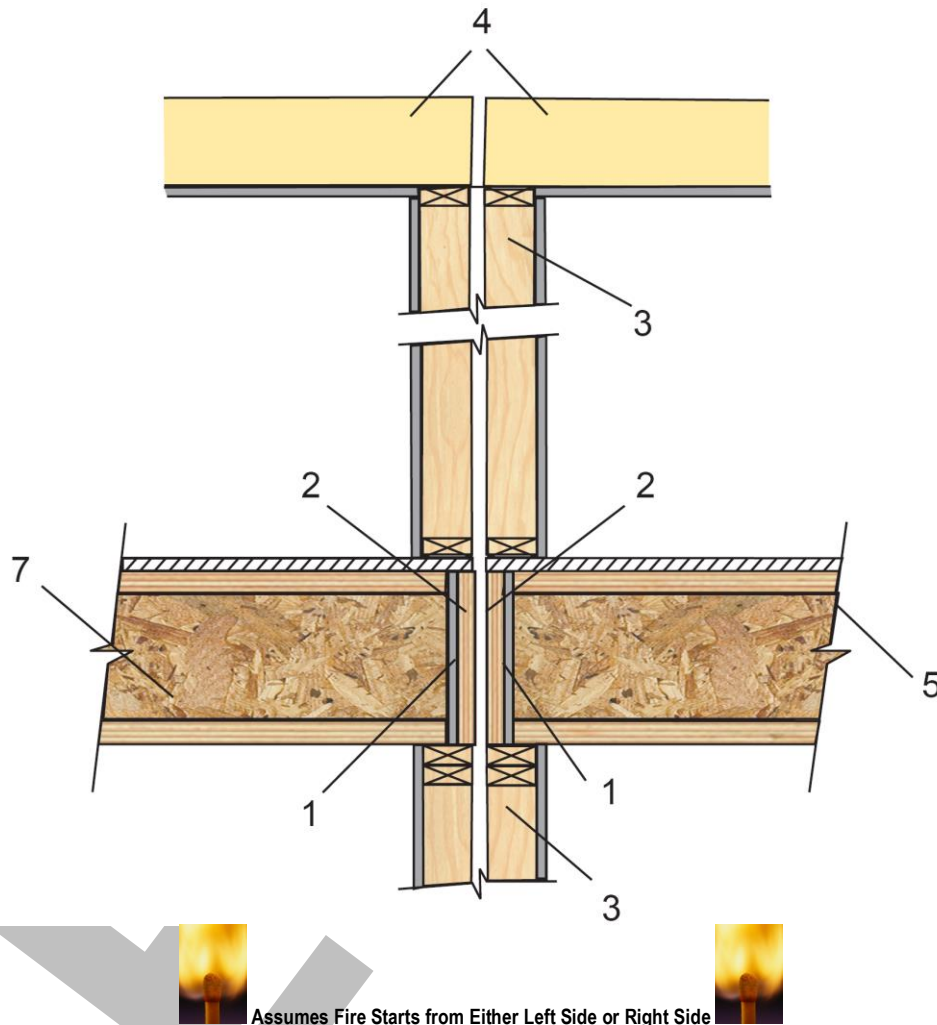


Figure 3: TECO Certified Rim Board One-Hour Assembly No. 3 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Upper Load Applied Individually to Each Wall – Load is Not Transferred to Non-Fire-Exposed Wall When Rim Board Support on Fire-Exposed Wall is Lost to Fire.]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"
2. Continuous 5/8" Type X gypsum board fastened to rim board with 1 1/2" Type W screws 12" on center
3. 45-minute or one-hour-rated wall construction
4. Floor or roof/ceiling assembly for story above
5. Un-rated floor/ceiling assembly
6. –
7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 3

Component	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)	
Rim Board	33.75	39.65
5/8" Type X Gypsum	40	40
	73.75	79.65

Assembly No. 4

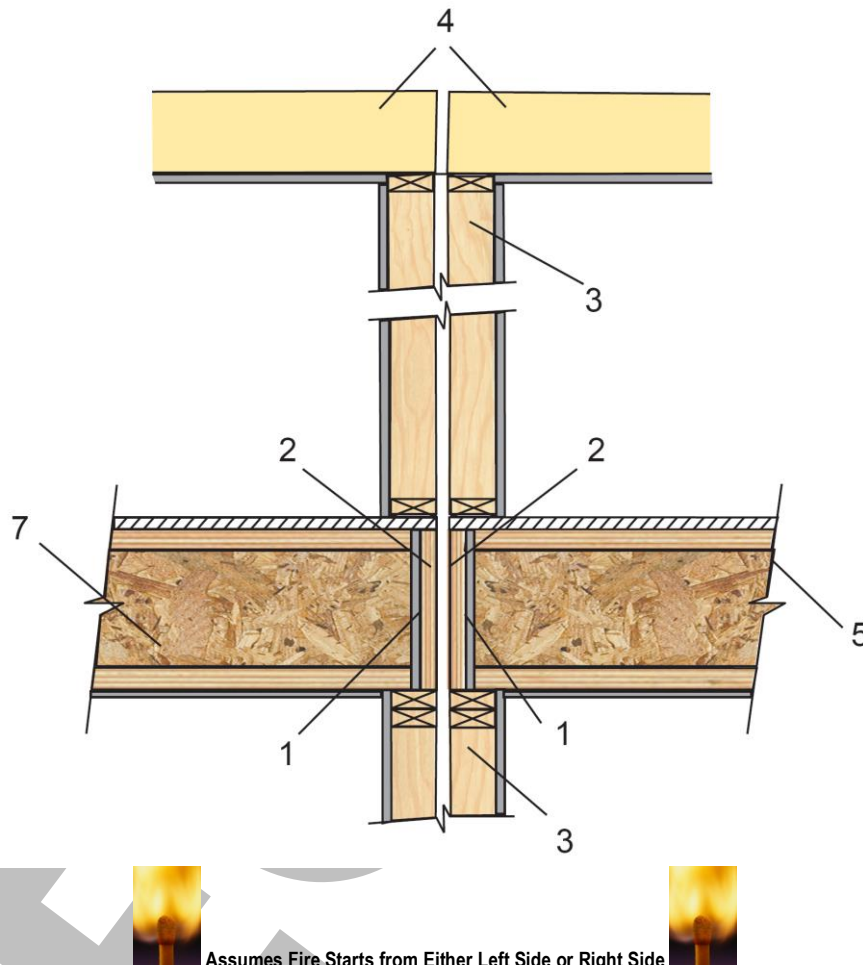


Figure 4: TECO Certified Rim Board One-Hour Assembly No. 4 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Upper Load Applied Individually to Each Wall – Load is Not Transferred to Non-Fire-Exposed Wall When Rim Board Support on Fire-Exposed Wall is Lost to Fire.]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"
2. Continuous 1/2" gypsum board fastened to rim board with 1 1/2" Type W screws 12" on center (optional)
3. 45-minute or one-hour-rated wall construction
4. Floor or roof/ceiling assembly for story above
5. 45-minute-rated floor/ceiling assembly
6. –
7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 4

Component	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)			
45 min. Rated Floor/Ceiling Assembly ⁴	45	45	45	45
1/2" Gypsum (optional)	–	–	15	15
Rim Board	33.75	39.65	33.75	39.65
	78.75	84.65	93.75	99.65

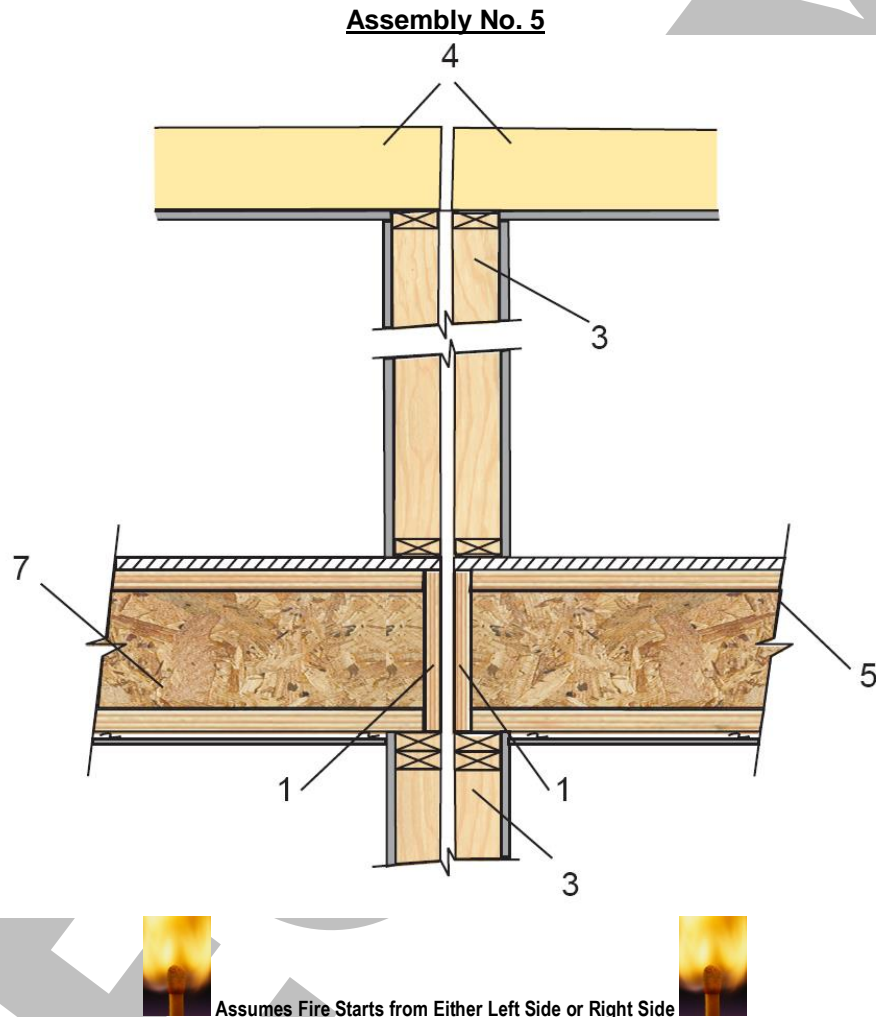


Figure 5: TECO Certified Rim Board One-Hour Assembly No. 5 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Upper Load Applied Individually to Each Wall – Load is Not Transferred to Non-Fire-Exposed Wall When Rim Board Support on Fire-Exposed Wall is Lost to Fire.]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"
2. –
3. 45-minute or one-hour-rated wall construction
4. Floor or roof/ceiling assembly for story above
5. One-hour-rated floor/ceiling assembly
6. –
7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

⁴ Since the walls are rated for 60 min. and the floor/ceiling assembly is rated for 45 min., the TECO Certified Rim Board only needs to provide at least 15 min. additional fire resistance.

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 5

Component	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)	
One-Hour-Rated Floor/Ceiling Assembly ⁵	60	60
Rim Board	33.75	39.65
	93.75	99.65

Assembly No. 6

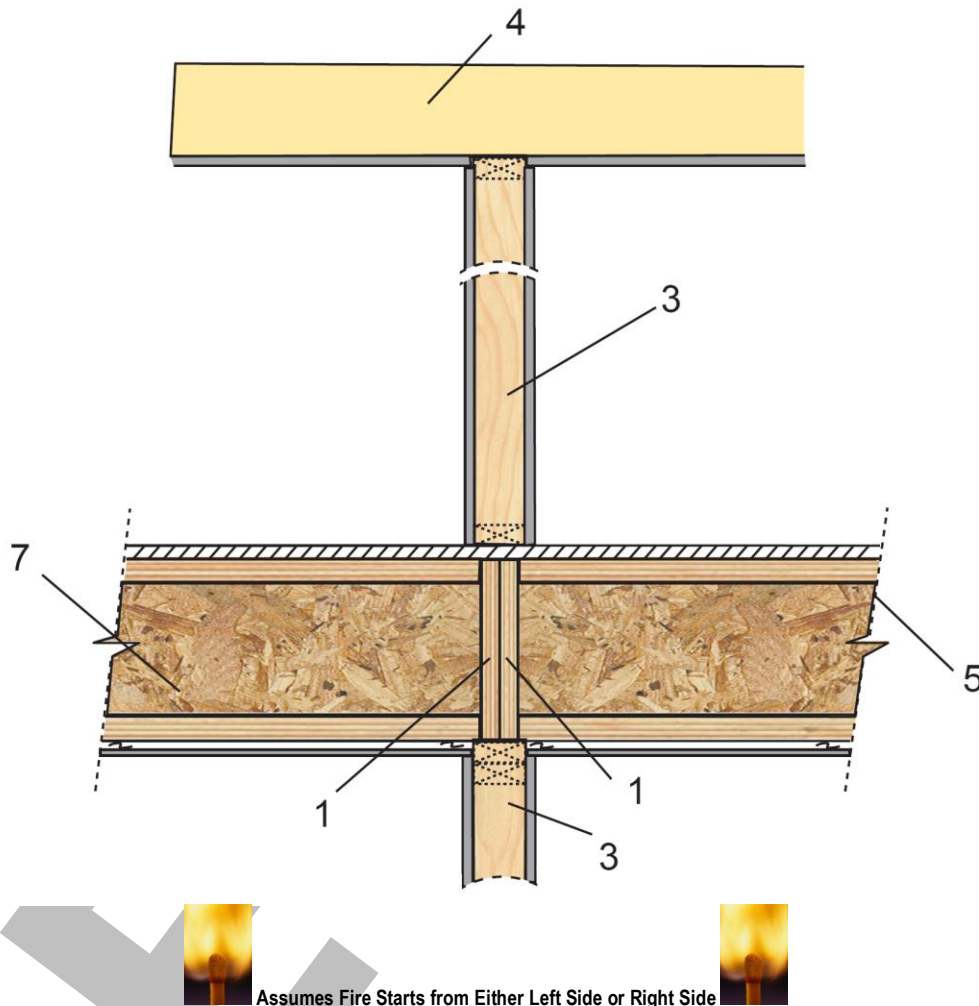


Figure 6: TECO Certified Rim Board One-Hour Assembly No. 6 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Single One-Hour-Rated Partition Wall]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"

2. –

3. One-hour-rated 2x6 wall construction

4. Floor or roof/ceiling assembly for story above

5. One-hour-rated floor/ceiling assembly

6. –

7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

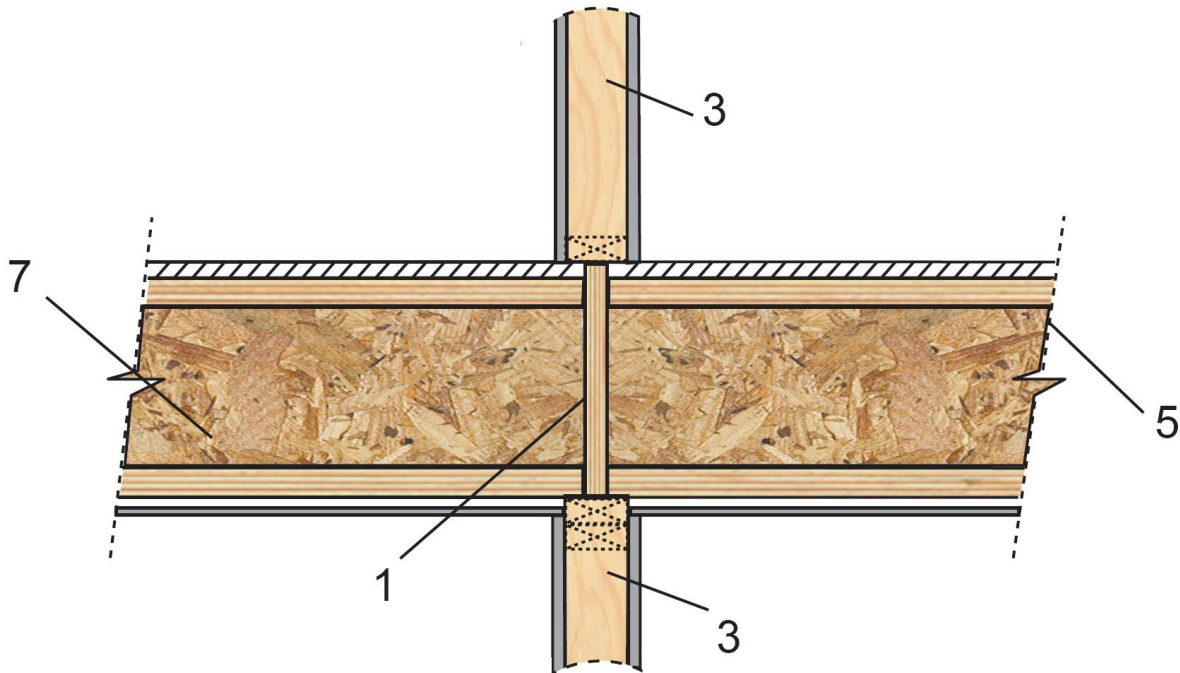
⁵ Since the walls are rated for 60 min. and the floor/ceiling assembly is rated for 60 min., the TECO Certified Rim Board does not need to provide any additional fire resistance to achieve a one-hour rating.

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 6

Component	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)	
One-Hour-Rated Floor/Ceiling Assembly ⁶	60	60
Rim Board	33.75	39.65
	93.75	99.65

Assembly No. 7



Assumes Fire Starts from Either Left Side or Right Side



Figure 7: TECO Certified Rim Board One-Hour Assembly No. 7 (Shown as I-Joist Perpendicular to Rim Board)

[Note: Single One-Hour-Rated Partition Wall]

1. Continuous TECO Certified Rim Board 1" or TECO Certified Rim Board 1 1/8"
2. –
3. One-hour-rated 2x6 bearing wall or 2x4 staggered on 2x6 plates
4. –
5. 45-minute or one-hour-rated floor/ceiling assembly
6. –
7. I-Joists are shown in this graphic but the structural element may be any structural element assembly applied as specified, with or without a fire-endurance-rated assembly

⁶ Since the walls are rated for 60 min. and the floor/ceiling assembly is rated for 60 min., the TECO Certified Rim Board does not need to provide any additional fire resistance to achieve a one-hour rating.

Technical Evaluation Report (TER)

Component Additive Calculation for Assembly No. 7

Component	45 min. Rated Floor/Ceiling Assembly ⁷		One Hour Rated Floor/Ceiling Assembly ⁸	
	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board	1" TECO Certified Rim Board	1 1/8" TECO Certified Rim Board
	Time (min.)			
Rated Floor/Ceiling Assembly	45	45	60	60
Rim Board	33.75	39.65	33.75	39.65
	78.75	84.65	93.75	99.65

5. Installation

- 5.1. TECO Certified Rim Board shall be installed in accordance with the Rim Board Design and Installation Guide – Canada⁹ or Rim Board Design and Installation Guide – United States¹⁰.

6. Conditions of Use:

- 6.1. The manufactured rim board must be TECO Certified Rim Board and comply with all of the requirements of RB 133.

7. Test and Engineering Substantiating Data:

- 7.1. Based on Calculated Fire Resistance Rating of TECO Certified Rim Board Assemblies by DrJ Engineering, Inc. dated May 28, 2010.
- 7.2. 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.
- 7.2.1. DrJ does not assume responsibility for the accuracy of data provided by testing facilities, but relies on each testing agency's accuracy and accepted engineering procedures, experience, and good technical judgment.
- 7.3. Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through the codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS*, etc.), to undertake the review of test data that is comparative or shows equivalency to an intended end-use application.
- 7.3.1. DrJ does not assume responsibility for the accuracy of any code-adopted design values but relies upon their accuracy for engineering evaluation.
- 7.3.2. DrJ also relies on the fact that manufacturers of code-adopted products stand behind the legally established design values that have been created by the associations that publish code-defined design values for a given commodity product.
- 7.3.3. DrJ evaluates all equivalency testing and related analysis using this code-defined engineering foundation.

⁷ Since the wall is rated for 60 min. and the floor/ceiling assembly is rated for 45 min., the TECO Certified Rim Board needs to provide an additional fire resistance of 15 min. to achieve a one-hour rating.

⁸ Since the wall is rated for 60 min. and the floor/ceiling assembly is rated for 60 min., the TECO Certified Rim Board does not need to provide any additional fire resistance to achieve a one-hour rating.

⁹ www.tecotested.com/techtips/pdf/rimboardguide_canada

¹⁰ www.tecotested.com/techtips/pdf/rimboardguide_us

Technical Evaluation Report (TER)

8. Identification:

- 8.1. TECO Certified Rim Board must be identified with the name of the manufacturer or the TECO mill number, TECO's registered Certification Mark, grade of the rim board, thickness, and RB 133 standard.
- 8.2. Example grade stamps are shown in [Figure 8](#).

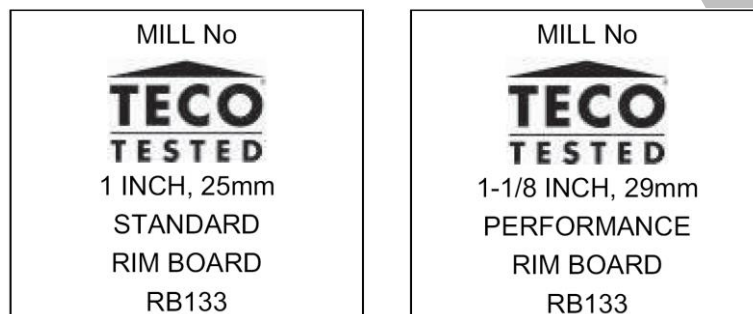


Figure 8: Example Grade Stamps for TECO Certified Rim Board per RB 133

9. Findings:

- 9.1. Calculations have been prepared by licensed engineers for the fire endurance performance of TECO Certified Rim Board that provide detailed and sufficient technical data to substantiate the proposed use of TECO Certified Rim Board in the assemblies and applications defined above.
- 9.1.1. Supporting data consisting of valid research reports from an *IBC/IRC*-approved source has been provided and meets *IBC* Section 17 requirements for a product application not specifically provided for in this code.
- 9.1.2. The evidence as submitted is satisfactory proof of performance for the use intended.
- 9.1.3. Any building official shall approve the use of TECO Certified Rim Board subject to the requirements of this code.
- 9.2. Data and engineering analysis review has found that the TECO Certified Rim Board Fire-Rated Assemblies as described in this TER conform with or are suitable alternates to that specified in the code references listed in [Section 2](#).

10. Report Date:

- 10.1. This TER is subject to periodic review and revision. For the most recent version of this report, visit drjengineering.org.
- 10.2. For information on the current status of this report, contact [DrJ](#).



Responsibility Statement

The information contained herein is a product, engineering or building code compliance research report performed in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering procedures, experience and good technical judgment. Product, design and code compliance quality control is the responsibility of the referenced company. Consult the referenced company for the proper detailing and application for the intended purpose. Consult your local jurisdiction or design professional to assure compliance with the local building code. DrJ (drjengineering.org) research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by DrJ, express or implied, as to any finding or other matter in this report or as to any product covered by this report.

Appendix A:

TERs Are Comparable to, Compatible with, and Equivalent to the Purpose of an ICC-ES ESR

1. Technical Evaluation Reports (TERs), drafted and maintained by DrJ (professional engineering firm and ISO/IEC 17065 applicant through ANSI/ACCLASS), assess how specific products comply with the provisions of the building code. DrJ is a code-defined “approved source,” and DrJ employs professional engineers and follows state professional engineering rules and regulations.
2. TERs are comparable to, compatible with, and equivalent to the purpose of an ICC Evaluation Service (ICC-ES) Evaluation Service Reports (ESRs).¹¹
 - 2.1. ICC Evaluation Service does not provide an engineer’s seal on any of its ESRs.
 - 2.2. Furthermore, the ICC-ES Evaluation Report Purpose is defined as follows¹²:



www.icc-es.org | (800) 423-6587 | (562) 699-0543 A Subsidiary of the International Code Council®

**ICC EVALUATION SERVICE, LLC,
RULES OF PROCEDURE FOR EVALUATION REPORTS**

1.0 PURPOSE

These rules set forth procedures governing ICC Evaluation Service, LLC (ICC-ES), issuance and maintenance of evaluation reports on building materials and products, methods of construction, prefabricated building components, and prefabricated buildings.

ICC-ES evaluation reports assist those enforcing model codes in determining whether a given subject complies with those codes. An evaluation report is not to be construed as representing a judgment about aesthetics or any other attributes not specifically addressed in the report, nor as an endorsement or recommendation for use of the subject of the report. Approval for use is the prerogative and responsibility of the Code Official; ICC-ES does not intend to assume, nor can ICC-ES assume, that prerogative and responsibility.

2.3. ICC ESR Disclaimer¹³:

ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.



¹¹ ICC Evaluation Service, LLC and the ICC-ES Evaluation Reports logo are registered trademarks of ICC-ES.

¹² See the “ICC-ES Rules of Procedure” at www.icc-es.org/pdf/rules_evalrpts.pdf.

¹³ Page 1 footer of each ICC-ES report that can be found at www.icc-es.org/reports/index.cfm.

Technical Evaluation Report (TER)

3. DrJ Sealed Engineering

- 3.1. DrJ engineers have undertaken the rigorous engineering and analysis work to determine the subject of this report's compliance with the codes and standards referenced in [Section 2](#).
- 3.2. DrJ work:
 - 3.2.1. Complies with accepted engineering procedures, experience and good technical judgment.
 - 3.2.2. Is the work of an independent person, firm or corporation who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.
- 3.3. A Technical Evaluation Report generated by DrJ is in all "code-compliance-evaluation-processing" respects equivalent to an ICC-ES ESR, as ICC-ES defines its approach, with one material difference.
 - 3.3.1. DrJ will seal all TERs, as needed, so that responsibility for the work is well-defined.
 - 3.3.2. The DrJ responsibility statement is identical to that provided in ICC-ES ESRs.

DrJ (drjengineering.org) research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by DrJ express or implied as to any finding or other matter in this report or as to any product covered by this report.

Appendix B: **Legal Aspects of Product Approval**

1. Product Approval

- 1.1.** In general, the model and local codes provide for the use of alternative materials, designs and methods of construction by having a legal provision that states something similar to:

The provisions of this code/law 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/law, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the compliance official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code/law, and that the material, design, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code/law.

- 1.2.** In concert with preserving “free and unfettered competition as the rule of trade”, should this alternative material, design or method of construction not be approved, the building official shall respond in writing, stating the specific reasons for non-code-compliance and/or for non-professional engineering regulation compliance.

Congress passed the first antitrust law, the Sherman Act, in 1890 as a “comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade.” In 1914, Congress passed two additional antitrust laws: the Federal Trade Commission Act, which created the FTC, and the Clayton Act. With some revisions, these are the three core federal antitrust laws still in effect today.

...Yet for over 100 years, the antitrust laws have had the same basic objective: to protect the process of competition for the benefit of consumers, making sure there are strong incentives for businesses to operate efficiently, keep prices down, and keep quality up....

The Sherman Act outlaws “every contract, combination, or conspiracy in restraint of trade,” and any “monopolization, attempted monopolization, or conspiracy or combination to monopolize.” For instance, in some sense, an agreement between two individuals to form a partnership restrains trade, but may not do so unreasonably, and thus may be lawful under the antitrust laws. On the other hand, certain acts are considered so harmful to competition that they are almost always illegal.

The penalties for violating the Sherman Act can be severe. Although most enforcement actions are civil, the Sherman Act is also a criminal law, and individuals and businesses that violate it may be prosecuted by the Department of Justice.¹⁴

2. Legal Validity of this TER

- 2.1.** This TER is a code-defined (e.g., 2009 IBC and [IBC Section 104.11.1](#) and 2009 [IBC Section 1703.4.2](#)) “research report” that provides supporting data to assist in the approval of materials, designs or assemblies not specifically provided for in this code.
- 2.2.** Therefore, this TER is a valid research report from a professional engineering company that complies with the code definition of “approved source.” If required by the authority having jurisdiction, this TER can also be sealed to comply with professional engineering laws and regulations.

¹⁴ http://www.ftc.gov/bc/antitrust/antitrust_laws.shtm