Large Concentrated Loads on Rim Board (14,350+ lb)

Load development within a structure often results in large, concentrated loads on floor framing from columns or built-up studs. Sufficient support (e.g. rim board or squash blocks) is required for the bottom wall plate and floor sheathing to facilitate transfer of the concentrated loads around the floor framing. Inadequate support may induce crushing of the floor framing.

When design loads exceed the rim board capacity, the designer has several options for transferring the load to prevent failure of the floor framing members, including:

- Specify higher capacity rim board (i.e., vary material type, thickness, and/or quantity).
- Extend post through floor framing cavity.
- Add squash blocks.

This document provides solutions utilizing Weyerhaeuser engineered wood products (EWP) when large, concentrated loads exceed the capacity of typical floor framing support details. When utilizing Weyerhaeuser Javelin® software, squash blocks will be called out if rim board concentrated load capacities are exceeded. The squash blocks (CS Detail) are good for up to a 14,350 lb load. For loads exceeding the 14,350 lb limit, Javelin® will place a hex detail at the location indicating a special design is required. The tables in this document provide supplemental reinforcement solutions for this limitation.

Conditions That May Need Supplemental Reinforcement

Figures 1 through 3 represent typical conditions that may require supplemental reinforcement.

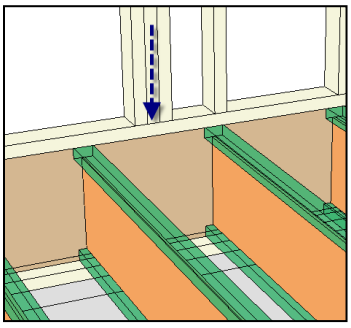

Figure 1: Point load with framing perpendicular to rim board.

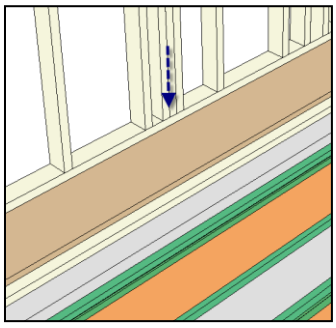

Figure 2: Point load with framing parallel to rim board.

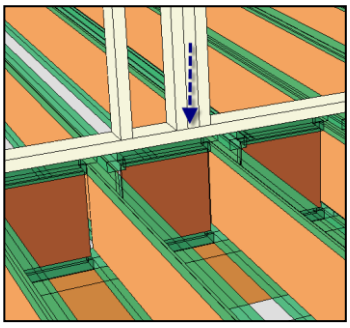

Figure 3: Point load at framing interior support.

Supplemental Reinforcement

The simplest procedure to support large point loads over 14,350 lb is to build up the specified rim board with similar material as shown in Figure 4 and Figure 5. Various built-up rim board assembly options, and capacities, are given in Tables 1 through 3. Supplemental reinforcement must have a minimum length of 12″ and should be placed along the length of the rim board, centered below the concentrated load.

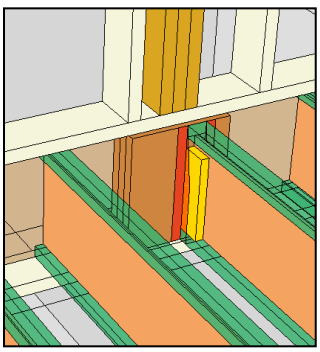

Figure 4: Supplemental reinforcement

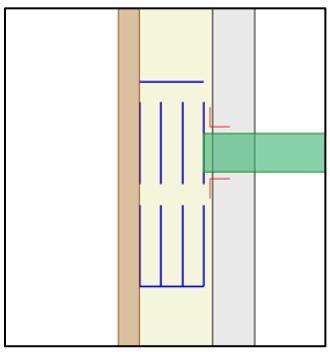

Figure 5: Rim assembly (plan view)

TABLE 1: MAXIMUM FACTORED COMBINED CONCENTRATED AND UNIFORM LOAD (lb) – 2X6 WALL

9½" to 11⅞" Floor Depth

Rim Assembly (Rim + Reinforcement)	Plies	2x6 Wall Plate Species (Supporting Column)							
		SPF				DF/TimberStrand® LSL			
		Column Width				Column Width			
		4.5"	5.25"	7"	9"	4.5"	5.25"	7"	9"
1⅛" TJ® Rim Board	3	-	15,635	17,970	17,970	-	15,635	17,970	17,970
	4	16,490	18,160	22,600	23,960	19,085	20,845	23,960	23,960
1¼" TimberStrand® LSL	3	15,905	17,375	19,965	19,965	15,905	17,375	19,965	19,965
	4	16,490	18,160	22,600	26,620	21,205	23,165	26,620	26,620
1½" TimberStrand® LSL	3	16,490	18,160	22,600	23,960	19,085	20,845	23,960	23,960
3½" TimberStrand® LSL	1	14,845	16,215	18,635	18,635	14,845	16,215	18,635	18,635

14" to 16" Floor Depth

Rim Assembly (Rim + Reinforcement)	Plies	2x6 Wall Plate Species (Supporting Column)							
		SPF				DF/TimberStrand® LSL			
		Column Width				Column Width			
		4.5"	5.25"	7"	9"	4.5"	5.25"	7"	9"
1⅛" TJ® Rim Board	3	-	14,790	14,790	14,790	-	14,790	14,790	14,790
	4	16,490	18,160	19,720	19,720	19,085	19,720	19,720	19,720
1¼" TimberStrand® LSL	3	15,905	17,375	18,490	18,490	15,905	17,375	18,490	18,490
	4	16,490	18,160	22,600	24,650	21,205	23,165	24,650	24,650
1½" TimberStrand® LSL	3	16,490	18,160	22,600	23,960	19,085	20,845	23,960	23,960
3½" TimberStrand® LSL	1	14,845	16,215	18,635	18,635	14,845	16,215	18,635	18,635

18" Floor Depth

Rim Assembly (Rim + Reinforcement)	Plies	2x6 Wall Plate Species (Supporting Column)							
		SPF				DF/TimberStrand® LSL			
		Column Width				Column Width			
		4.5"	5.25"	7"	9"	4.5"	5.25"	7"	9"
1¼" TimberStrand® LSL	3	15,905	16,045	16,045	16,045	15,905	16,045	16,045	16,045
	4	16,490	18,160	21,395	21,395	21,205	21,395	21,395	21,395
1½" TimberStrand® LSL	3	16,490	18,160	22,600	23,590	19,085	20,845	23,590	23,590
3½" TimberStrand® LSL	1	14,845	16,215	18,635	18,635	14,845	16,215	18,635	18,635

How to use this chart:

1. Add the concentrated load to the total uniform load over the 12" long reinforcement to determine a combined load.
2. Find the table that matches the thickness of the wall above and the depth of the floor system.
3. Identify the table section that matches the species of the wall plate.
4. Find the appropriate table column that is equal to or less than the column width above the rim assembly.
5. Scan down until the value is equal to or greater than the value determined in (1), and then scan horizontally to determine the rim assembly type.
6. 3½" thick sections of TimberStrand® LSL reinforcement may be used adjacent to the rim provided the combined width does not exceed the support material. Otherwise, cut rim to accommodate material.

General Notes:

- Bottom plate is a continuous 2x member.
- SPF = 768.7 psi, DF = 1015.3 psi, 1.3E TimberStrand® LSL = 1,215 psi, 1.5E TimberStrand® LSL = 1,355 psi.
- "-" indicates capacity is less than 14,350 lb.
- The wall framing below the supplemental reinforcement must be an equivalent species and equal to or wider than the wall above.
- Concentrated loads must be tracked to ensure a continuous vertical load path through the entire structure.
- Duration of load increases are not permitted.

TABLE 2: MAXIMUM FACTORED COMBINED CONCENTRATED AND UNIFORM LOAD (lb) – 2X8 WALL

9½" to 11⅞" Floor Depth

Rim Assembly (Rim + Reinforcement)	Plies	2x8 Wall Plate Species (Supporting Column)							
		SPF				DF/TimberStrand® LSL			
		Column Width				Column Width			
		4.5"	5.25"	7"	9"	4.5"	5.25"	7"	9"
1⅛" TJ® Rim Board	3	-	15,635	17,970	17,970	-	15,635	17,970	17,970
	4	19,085	20,845	23,960	23,960	19,085	20,845	23,960	23,960
	5	21,735	24,215	29,950	29,950	23,855	26,060	29,950	29,950
1¼" TimberStrand® LSL	3	15,905	17,375	19,965	19,965	15,905	17,375	19,965	19,965
	4	21,205	23,165	26,620	26,620	21,205	23,165	26,620	26,620
	5	21,735	24,215	30,135	33,280	26,510	28,955	33,280	33,280
1½" TimberStrand® LSL	3	19,085	20,845	23,960	23,960	19,085	20,845	23,960	23,960
	4	21,735	24,215	30,135	31,945	25,450	27,795	31,945	31,945
3½" TimberStrand® LSL	1	14,845	16,215	18,635	18,635	14,845	16,215	18,635	18,635
	2	21,735	24,215	30,135	37,270	28,630	31,895	37,270	37,270

14" to 16" Floor Depth

Rim Assembly (Rim + Reinforcement)	Plies	2x8 Wall Plate Species (Supporting Column)							
		SPF				DF/TimberStrand® LSL			
		Column Width				Column Width			
		4.5"	5.25"	7"	9"	4.5"	5.25"	7"	9"
1⅛" TJ® Rim Board	3	-	14,790	14,790	14,790	-	14,790	14,790	14,790
	4	19,085	19,720	19,720	19,720	19,085	19,720	19,720	19,720
	5	21,735	24,215	24,650	24,650	23,855	24,650	24,650	24,650
1¼" TimberStrand® LSL	3	15,905	17,375	18,490	18,490	15,905	17,375	18,490	18,490
	4	21,205	23,165	24,650	24,650	21,205	23,165	24,650	24,650
	5	21,735	24,215	30,135	30,815	26,510	28,955	30,815	30,815
1½" TimberStrand® LSL	3	19,085	20,845	23,960	23,960	19,085	20,845	23,960	23,960
	4	21,735	24,215	30,135	31,945	25,450	27,795	31,945	31,945
3½" TimberStrand® LSL	1	14,845	16,215	18,635	18,635	14,845	16,215	18,635	18,635
	2	21,735	24,215	30,135	37,270	28,630	31,895	37,270	37,270

How to use this chart:

1. Add the concentrated load to the total uniform load over the 12" long reinforcement to determine a combined load.
2. Find the table that matches the thickness of the wall above and the depth of the floor system.
3. Identify the table section that matches the species of the wall plate.
4. Find the appropriate table column that is equal to or less than the column width above the rim assembly.
5. Scan down until the value is equal to or greater than the value determined in (1), and then scan horizontally to determine the rim assembly type.
6. 3½" thick sections of TimberStrand® LSL reinforcement may be used adjacent to the rim provided the combined width does not exceed the support material. Otherwise, cut rim to accommodate material.

General Notes:

- Bottom plate is a continuous 2x member.
- SPF = 768.7 psi, DF = 1015.3 psi, 1.3E TimberStrand® LSL = 1,215 psi, 1.5E TimberStrand® LSL = 1,355 psi.
- "-" indicates capacity is less than 14,350 lb.
- The wall framing below the supplemental reinforcement must be an equivalent species and equal to or wider than the wall above.
- Concentrated loads must be tracked to ensure a continuous vertical load path through the entire structure.
- Duration of load increases are not permitted.

TABLE 2 (CONT.): MAXIMUM FACTORED COMBINED CONCENTRATED AND UNIFORM LOAD (lb) – 2X8 WALL

18″ Floor Depth

Rim Assembly (Rim + Reinforcement)	Plies	2x8 Wall Plate Species (Supporting Column)							
		SPF				DF/TimberStrand® LSL			
		Column Width				Column Width			
		4.5″	5.25″	7″	9″	4.5″	5.25″	7″	9″
1¼″ TimberStrand® LSL	3	15,905	16,045	16,045	16,045	15,905	16,045	16,045	16,045
	4	21,205	21,395	21,395	21,395	21,205	21,395	21,395	21,395
	5	21,735	24,215	26,745	26,745	26,510	26,745	26,745	26,745
1½″ TimberStrand® LSL	3	19,085	20,845	23,590	23,590	19,085	20,845	23,590	23,590
	4	21,735	24,215	30,135	31,455	25,450	27,795	31,455	31,455
3½″ TimberStrand® LSL	1	14,845	16,215	18,635	18,635	14,845	16,215	18,635	18,635
	2	21,735	24,215	30,135	37,270	28,630	31,895	37,270	37,270

How to use this chart:

1. Add the concentrated load to the total uniform load over the 12″ long reinforcement to determine a combined load.
2. Find the table that matches the thickness of the wall above and the depth of the floor system.
3. Identify the table section that matches the species of the wall plate.
4. Find the appropriate table column that is equal to or less than the column width above the rim assembly.
5. Scan down until the value is equal to or greater than the value determined in (1), and then scan horizontally to determine the rim assembly type.
6. 3½″ thick sections of TimberStrand® LSL reinforcement may be used adjacent to the rim provided the combined width does not exceed the support material. Otherwise, cut rim to accommodate material.

General Notes:

- Bottom plate is a continuous 2x member.
- SPF = 768.7 psi, DF = 1015.3 psi, 1.3E TimberStrand® LSL = 1,215 psi, 1.5E TimberStrand® LSL = 1,355 psi.
- "-" indicates capacity is less than 14,350 lb.
- The wall framing below the supplemental reinforcement must be an equivalent species and equal to or wider than the wall above.
- Concentrated loads must be tracked to ensure a continuous vertical load path through the entire structure.
- Duration of load increases are not permitted.

Perpendicular Floor Framing at Supplemental Reinforcement

If perpendicular floor framing is present at the location of supplemental reinforcement, additional checks are required:

- Verify the floor framing member will have sufficient bearing after installation of supplemental reinforcement.
- If the member does not have sufficient bearing, a hanger will be required.
  - **Note:** The reaction of the floor framing member must also be included in the combined axial load plus 12″ of uniform load when selecting the rim assembly.

Connections

Connect each ply of reinforcement to the other as follows:

- **1⅛″ TJ® Rim Board, 1¼″ TimberStrand® LSL:** Six (6) 6d (0.113″ x 2″) nails.
- **1½″ and 1¾″ TimberStrand® LSL:** Six (6) (0.131″ x 3″) nails.
- **3½″ TimberStrand® LSL:** Six (6) (0.131″ x 3″) nails; connect through specified rim (≤ 1¾″) into larger section.
- **(2-ply) 3½″ TimberStrand® LSL:** Four (4) SDS, WS, or SDW22 proprietary wood screws (min. 5″ length).

If you have any questions, please contact your Weyerhaeuser representative.