

Wall: Back
(North,)

Span.: 54 ft.
House load: 1200 lbs/ft.

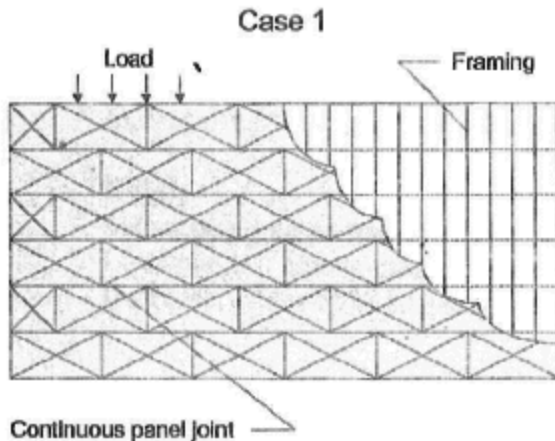
Stud Design Ht.: 9.54 ft.

Backfill ht.: 0 ft.

Soil: SC (85 lbs/ft/ft)

	<u>Force</u>	<u>Actual</u>	<u>Allowable</u>	<u>Pass?</u>
Top Plate: 2x8 #2 SYP	compression (psi)	14	509	Yes
Sheathing: 5/8" treated plywood mounted perpendicular to studs.	bending (in-lbs/ft)	605		
	across 1 or 2 spans:		0	Yes
	across 3 spans:		0	Yes
Blocking: 16ft of this wall is blocked with 3" Od ss bos. f every 4" (includes 7/16" OSB interior sheathing, perpendicular to studs, fastened every 4" with 3 x 0.12" ss Bos. F)	shear (lbs/ft)	414	432	Yes
	racking (lbs/ft)	0		Yes
Backfill: 0 ft avg this side and 7.25 ft avg on opposing side	top reaction (lbs/ft)	0	4,016	Yes
Floor Bottom Chord: 2x4 1650 SPF, 24"o.c.	compression (psi)	0	383	Yes
	shear (psi)	0	122	Yes
Thrust Plate: 2x4 #2 SPF thrust plate	max. bending moment	0	28,930	Yes
	deflection (in.)	0.0000	0.02 (L/360)	Yes
	shear (psi)	0	158	Yes
	max. bending moment	0	113,535	Yes
Stud: 2x8 #2 SYP spaced 8" o.c.	deflection (in.)	0 (H/0)	0.03 (H/240)	Yes
	shear (lbs/ft)	414	440	Yes
Panel-to-Panel Fasteners: 44 3x0.131" ss Bos. H	compression (psi)	15	509	Yes
Bottom Plate: 2x8 #2 SYP	bottom reaction (lbs/ft)	0	3,100	Yes
Footing: bottom plate and studs set 3.5" into concrete key	shear (lbs/ft)	0	230	Yes

Floor Diaphragm: 5/8"5-ply sheathing paneled as APA* Case 1 below (no unblocked panel edges or continuous joints parallel to load) at least 18 ft back from this wall, with 2.5 x 0.131" bos. hq2 every 6" at supported edges and 12" along intermediate members. The orientation of the sheet in the diagram(s) below is not relevant; it is the blocking and the relationship of the load to continuous panel joints which is specified.



Wall: Back

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
4. ICC Evaluation Service Report ESR-1785: AdvanTech (AT-Series) Engineered Panels, December 2009.
5. Bostitch GA1381, Fasteners: A Complete Guide, 2008, and private correspondence with Bostitch representatives.
6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Window: 1	Span: 4 ft	Sill height: 4 ft	Backfill height: 0 ft		
		Force	Actual	Allowable	Pass?
Sill: 2x8 #2 SYP		deflection (in.)	0	0.13 (L/360)	Yes
2 3x0.12" ss Bos. F		shear (lbs)	0	107	Yes
1-ply neighboring studs		deflection (in.)	0	0.32 (H/360)	Yes
Header: 2x8 #2 SYP		deflection (in.)	0.068	0.13 (L/360)	Yes
1-ply carrying studs		compression (psi)	55	1,550	Yes
Window: 2	Span: 2 ft	Sill height: 4 ft	Backfill height: 0 ft		
		Force	Actual	Allowable	Pass?
Sill: 2x8 #2 SYP		deflection (in.)	0	0.07 (L/360)	Yes
2 3x0.12" ss Bos. F		shear (lbs)	0	107	Yes
1-ply neighboring studs		deflection (in.)	0	0.32 (H/360)	Yes
Header: 2x8 #2 SYP		deflection (in.)	0.0043	0.07 (L/360)	Yes
1-ply carrying studs		compression (psi)	28	1,550	Yes
Window: Door	Span: 6 ft	Sill height: 0 ft	Backfill height: 0 ft		
		Force	Actual	Allowable	Pass?
Sill: 2x8 #2 SYP		deflection (in.)	0	0.2 (L/360)	Yes
2 3x0.12" ss Bos. F		shear (lbs)	0	107	Yes
1-ply neighboring studs		deflection (in.)	0	0.32 (H/360)	Yes
Header: 2-ply 2x8 #2 SYP		deflection (in.)	0.1722	0.2 (L/360)	Yes
1-ply carrying studs		compression (psi)	83	1,550	Yes

Wall: Back

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
4. ICC Evaluation Service Report ESR-1785: AdvanTech (AT-Series) Engineered Panels, December 2009.
5. Bostitch GA1381, Fasteners: A Complete Guide, 2008, and private correspondence with Bostitch representatives.
6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Wall: Front left
(South,)

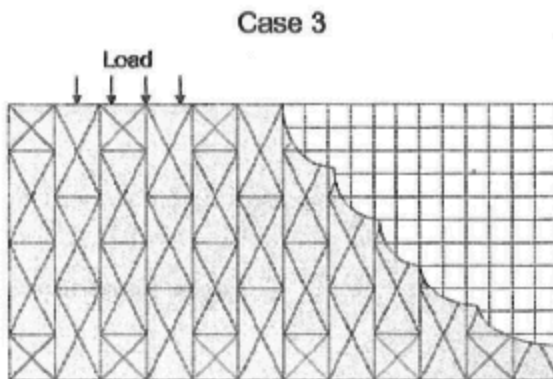
Span.: 26 ft.
House load: 1200 lbs/ft.

Stud Design Ht.: 9.54 ft.

Backfill ht.: 7.25 ft.

Soil: GC (45 lbs/ft/ft)

	<u>Force</u>	<u>Actual</u>	<u>Allowable</u>	<u>Pass?</u>
Top Plate: 2x8 #2 SYP	compression (psi)	14	509	Yes
Sheathing: 5/8" treated plywood mounted perpendicular to studs.	bending (in-lbs/ft)	605		
	across 1 or 2 spans:		456	Yes
	across 3 spans:		365	Yes
Blocking: 8ft of this wall is blocked with 3" Od ss bos. f every 4" (includes 7/16" OSB interior sheathing, perpendicular to studs, fastened every 4" with 3 x 0.12" ss Bos. F)	shear (lbs/ft)	414	432	Yes
	racking (lbs/ft)	300		Yes
Backfill: 7.25 ft avg this side and 0 ft avg on opposing side	top reaction (lbs/ft)	300	4,016	Yes
Floor Bottom Chord: 2x4 1650 SPF, 24"o.c.	compression (psi)	10	383	Yes
	shear (psi)	86	122	Yes
Thrust Plate: 2x4 #2 SPF thrust plate	max. bending moment	1,798	28,930	Yes
	deflection (in.)	0.0029 (L/4174)	0.03 (L/360)	Yes
	shear (psi)	97	158	Yes
	max. bending moment	1,415	113,535	Yes
Stud: 2x8 #2 SYP spaced 12" o.c.	deflection (in.)	0.0171 (H/6679)	0.05 (H/240)	Yes
	shear (lbs/ft)	414	436	Yes
Panel-to-Panel Fasteners: 30 3.5x0.162" ss Bos. L	compression (psi)	15	509	Yes
Bottom Plate: 2x8 #2 SYP	bottom reaction (lbs/ft)	883	4,650	Yes
Footing: bottom plate and studs set 3.5" into concrete key	shear (lbs/ft)	300	342	Yes
	Floor Diaphragm: 5/8"5-ply sheathing paneled as APA* Case 3 below at least 13.5 ft back from this wall, with 2.5 x 0.131" bos. hq2 every 4" at boundary and continuous panel edges parallel to load and 6" at other panel edges. The orientation of the sheet in the diagram(s) below is not relevant; it is the blocking and the relationship of the load to continuous panel joints which is specified.			



Wall: Front left

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
4. ICC Evaluation Service Report ESR-1785: AdvanTech (AT-Series) Engineered Panels, December 2009.
5. Bostitch GA1381, Fasteners: A Complete Guide, 2008, and private correspondence with Bostitch representatives.
6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Wall: Front middle
(West,)

Span.: 6 ft.
House load: 1200 lbs/ft.

Stud Design Ht.: 9.54 ft.

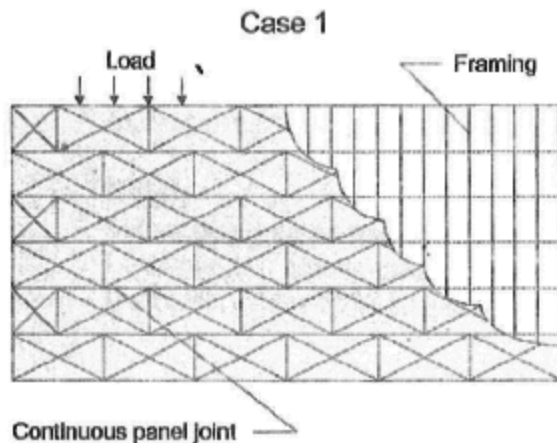
Backfill ht.: 7.25 ft.

Soil: SC (85 lbs/ft)

	<u>Force</u>	<u>Actual</u>	<u>Allowable</u>	<u>Pass?</u>
Top Plate: 2x10 #2 SYP	compression (psi)	11	509	Yes
Sheathing: 5/8" treated plywood mounted perpendicular to studs.	bending (in-lbs/ft)	605		
	across 1 or 2 spans:		861	Yes
	across 3 spans:		689	Yes
Blocking: 6ft of this wall is blocked with 3" Od ss bos. f every 4" (includes 7/16" OSB interior sheathing, perpendicular to studs, fastened every 4" with 3 x 0.12" ss Bos. F)	shear (lbs/ft)	426	432	Yes
	racking (lbs/ft)	390		Yes
Backfill: 7.29117673986098 ft avg this side and 5 ft avg on opp	top reaction (lbs/ft)	566	4,016	Yes
Floor Bottom Chord: 2x4 1650 SPF, 24" o.c.	compression (psi)	18	383	Yes
	shear (psi)	86	122	Yes
Thrust Plate: 2x4 #2 SPF thrust plate	max. bending moment	1,798	28,930	Yes
	deflection (in.)	0.0029 (L/4174)	0.03 (L/360)	Yes
	shear (psi)	134	158	Yes
Stud: 2x10 #2 SYP spaced 12" o.c.	max. bending moment	2,673	161,713	Yes
	deflection (in.)	0.0156 (H/7344)	0.05 (H/240)	Yes
Panel-to-Panel Fasteners: 30 3.5x0.162" ss Bos. L	shear (lbs/ft)	426	436	Yes
	compression (psi)	11	509	Yes
Bottom Plate: 2x10 #2 SYP	bottom reaction (lbs/ft)	1,668	4,500	Yes
	shear (lbs/ft)	566	584	Yes

Footing: bottom plate and studs set 3.5" into concrete key

Floor Diaphragm: 5/8" 5-ply sheathing paneled as APA* Case 1 below at least 8.5 ft back from this wall, with 2.5 x 0.131" bos. hq2 every 2" at diaphragm boundary and 3" at other panel edges. The orientation of the sheet in the diagram(s) below is not relevant; it is the blocking and the relationship of the load to continuous panel joints which is specified.



Wall: Front middle

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
4. ICC Evaluation Service Report ESR-1785: AdvanTech (AT-Series) Engineered Panels, December 2009.
5. Bostitch GA1381, Fasteners: A Complete Guide, 2008, and private correspondence with Bostitch representatives.
6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Wall: Front right
(South,)

Span.: 28 ft.
House load: 1200 lbs/ft.

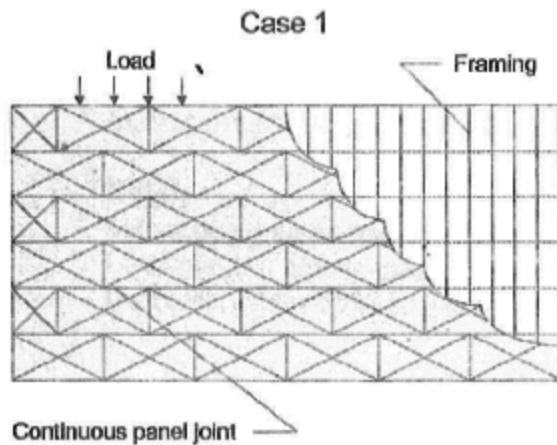
Stud Design Ht.: 9.54 ft.
Soil: GC (45 lbs/ft/ft)

Backfill ht.: 7.25 ft.

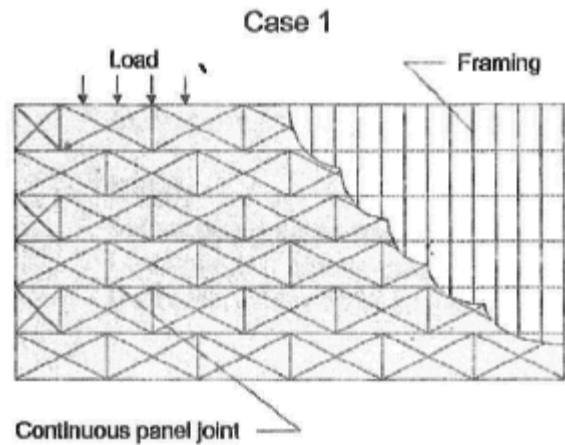
	Force	Actual	Allowable	Pass?
Top Plate: 2x8 #2 SYP	compression (psi)	14	509	Yes
Sheathing: 5/8" treated plywood mounted perpendicular to studs.	bending (in-lbs/ft)	605		
	across 1 or 2 spans:		456	Yes
	across 3 spans:		365	Yes
Blocking: 8ft of this wall is blocked with 3" Od ss bos. f every 4" (includes 7/16" OSB interior sheathing, perpendicular to studs, fastened every 4" with 3 x 0.12" ss Bos. F)	shear (lbs/ft)	414	432	Yes
	racking (lbs/ft)	300		Yes
Backfill: 7.25 ft avg this side and 0 ft avg on opposing side	top reaction (lbs/ft)	300	4,016	Yes
Floor Bottom Chord: 2x4 1650 SPF, 24"o.c.	compression (psi)	10	383	Yes
	shear (psi)	86	122	Yes
Thrust Plate: 2x4 #2 SPF thrust plate	max. bending moment	1,798	28,930	Yes
	deflection (in.)	0.0029 (L/4174)	0.03 (L/360)	Yes
Stud: 2x8 #2 SYP spaced 12" o.c.	shear (psi)	97	158	Yes
	max. bending moment	1,415	113,535	Yes
Panel-to-Panel Fasteners: 30 3.5x0.162" ss Bos. L	deflection (in.)	0.0171 (H/6679)	0.05 (H/240)	Yes
	shear (lbs/ft)	414	436	Yes
Bottom Plate: 2x8 #2 SYP	compression (psi)	15	509	Yes
Footing: bottom plate and studs set 3.5" into concrete key	bottom reaction (lbs/ft)	883	4,650	Yes
	shear (lbs/ft)	300	342	Yes

Floor Diaphragm:

5/8"5-ply sheathing paneled as APA* Case 1 below at least 13.5 ft back from this wall, with 2.5 x 0.131" bos. hq2 every 4" at diaphragm boundary and 6" at other panel edges. The orientation of the sheet in the diagram(s) below is not relevant; it is the blocking and the relationship of the load to continuous panel joints which is specified.



Basement ceiling paneled with " sheathing at least 18ft back from wall and with x " every 6" at supported edges per diagram below, and 12" along intermediate framing members.



Wall: Front right

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
4. ICC Evaluation Service Report ESR-1785: AdvanTech (AT-Series) Engineered Panels, December 2009.
5. Bostitch GA1381, Fasteners: A Complete Guide, 2008, and private correspondence with Bostitch representatives.
6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Wall: Garage
(West,)

Span.: 28 ft.
House load: 1200 lbs/ft.

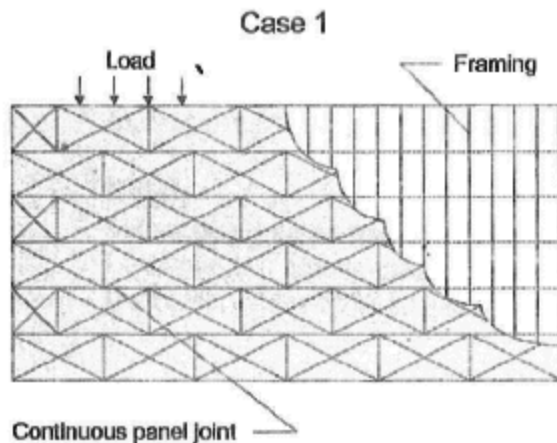
Stud Design Ht.: 9.54 ft.

Backfill ht.: 7.3 ft.

Soil: GC (45 lbs/ft/ft)

	<u>Force</u>	<u>Actual</u>	<u>Allowable</u>	<u>Pass?</u>
Top Plate: 2x8 #2 SYP	compression (psi)	14	509	Yes
Sheathing: 5/8" treated plywood mounted perpendicular to studs.	bending (in-lbs/ft)	605		
	across 1 or 2 spans:		459	Yes
	across 3 spans:		367	Yes
Blocking: 28ft of this wall is blocked with 3" Od ss bos. f every 4" (includes 7/16" OSB interior sheathing, perpendicular to studs, fastened every 4" with 3 x 0.12" ss Bos. F)	shear (lbs/ft)	426	496	Yes
	racking (lbs/ft)	206		Yes
Backfill: 7.29117673986098 ft avg this side and 5 ft avg on opp	top reaction (lbs/ft)	306	4,016	Yes
Floor Bottom Chord: 2x4 1650 SPF, 24" o.c.	compression (psi)	10	383	Yes
	shear (psi)	87	122	Yes
Thrust Plate: 2x4 #2 SPF thrust plate	max. bending moment	1,835	28,930	Yes
	deflection (in.)	0.0029 (L/4089)	0.03 (L/360)	Yes
	shear (psi)	98	158	Yes
Stud: 2x8 #2 SYP spaced 12" o.c.	max. bending moment	1,437	113,535	Yes
	deflection (in.)	0.0174 (H/6564)	0.05 (H/240)	Yes
	shear (lbs/ft)	426	508	Yes
Panel-to-Panel Fasteners: 35 3.5x0.162" ss Bos. L	compression (psi)	15	509	Yes
Bottom Plate: 2x8 #2 SYP	bottom reaction (lbs/ft)	893	4,650	Yes
Footing: bottom plate and studs set 3.5" into concrete key	shear (lbs/ft)	306	342	Yes

Floor Diaphragm: 5/8" 5-ply sheathing paneled as APA* Case 1 below at least 8.5 ft back from this wall, with 2.5 x 0.131" bos. hq2 every 4" at diaphragm boundary and 6" at other panel edges. The orientation of the sheet in the diagram(s) below is not relevant; it is the blocking and the relationship of the load to continuous panel joints which is specified.



Wall: Garage

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
4. ICC Evaluation Service Report ESR-1785: AdvanTech (AT-Series) Engineered Panels, December 2009.
5. Bostitch GA1381, Fasteners: A Complete Guide, 2008, and private correspondence with Bostitch representatives.
6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Wall: Right side
(East,)

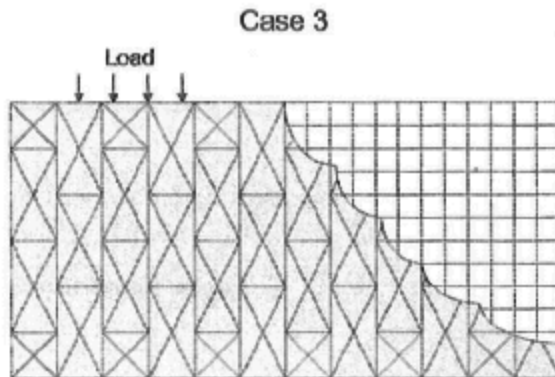
Span.: 34 ft.
House load: 1200 lbs/ft.

Stud Design Ht.: 9.54 ft.

Backfill ht.: 5 ft.

Soil: GC (45 lbs/ft/ft)

	<u>Force</u>	<u>Actual</u>	<u>Allowable</u>	<u>Pass?</u>
Top Plate: 2x8 #2 SYP	compression (psi)	14	509	Yes
Sheathing: 5/8" treated plywood mounted perpendicular to studs.	bending (in-lbs/ft)	605		
	across 1 or 2 spans:		304	Yes
	across 3 spans:		243	Yes
Blocking: 4ft of this wall is blocked with 3" Od ss bos. f every 4" (includes 7/16" OSB interior sheathing, perpendicular to studs, fastened every 4" with 3 x 0.12" ss Bos. F)	shear (lbs/ft)	426	432	Yes
	racking (lbs/ft)	0		Yes
Backfill: 5 ft avg this side and 7.29117673986098 ft avg on opp	top reaction (lbs/ft)	98	4,016	Yes
Floor Bottom Chord: 2x4 1650 SPF, 24" o.c.	compression (psi)	3	383	Yes
	shear (psi)	28	122	Yes
Thrust Plate: 2x4 #2 SPF thrust plate	max. bending moment	590	28,930	Yes
	deflection (in.)	0.0009 (L/12725)	0.03 (L/360)	Yes
	shear (psi)	47	158	Yes
Stud: 2x8 #2 SYP spaced 12" o.c.	max. bending moment	583	113,535	Yes
	deflection (in.)	0.0061 (H/18743)	0.05 (H/240)	Yes
Panel-to-Panel Fasteners: 30 3.5x0.162" ss Bos. L	shear (lbs/ft)	426	436	Yes
Bottom Plate: 2x8 #2 SYP	compression (psi)	15	509	Yes
Footing: bottom plate and studs set 3.5" into concrete key	bottom reaction (lbs/ft)	464	4,650	Yes
	shear (lbs/ft)	98	171	Yes
Floor Diaphragm: 5/8" 5-ply sheathing paneled as APA* Case 3 below at least 11.33 ft back from this wall, with 2.5 x 0.131" bos. hq2 every 6" at supported edges and 12" along intermediate members. The orientation of the sheet in the diagram(s) below is not relevant; it is the blocking and the relationship of the load to continuous panel joints which is specified.				



Wall: Right side

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
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6. ICC Evaluation Service Report ESR-1472: Simpson Strong-Tie WSNTL Wood Screws, September 2009.
7. Wood Diaphragm Applications, Simpson Strong-Tie Quik Drive WSNTL Series #8 head. www.strongtie.com, 2010.

Window: 1

Span: 2 ft

Sill height: 4 ft

Backfill height: 1 ft

	<u>Force</u>	<u>Actual</u>	<u>Allowable</u>	<u>Pass?</u>
Sill: 2x8 #2 SYP	deflection (in.)	.0001 (L/406519)	0.07 (L/360)	Yes
2 3x0.12" ss Bos. F	shear (lbs)	2	107	Yes
1-ply neighboring studs	deflection (in.)	0 (H/2465741)	0.32 (H/360)	Yes
Header: 2x8 #2 SYP	deflection (in.)	0.0043 (L/5646)	0.07 (L/360)	Yes
1-ply carrying studs	compression (psi)	28	1,550	Yes

Wall: Right side

Notes:

1. Basements with complex footprints are not covered by these calculations.
2. All PWF wood is .060 foundation grade material except very top plate.

References:

1. Permanent Wood Foundation Design Specification (ANSI/AFPA PWF-2007), American Forest Paper Association, American Wood Council.
2. material specs, American Wood Council, American Plywood Association
3. ICC Evaluation Service Report ESR-1539: Power-Driven Staples and Nails, October 2009
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