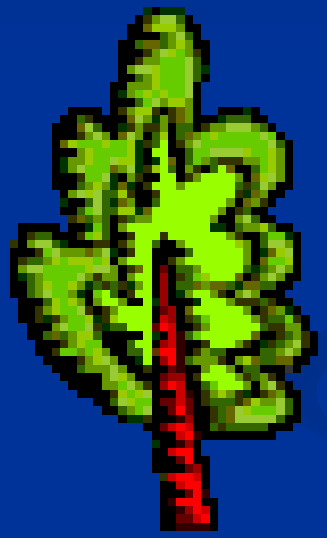
2009 CLASSIC WALL BRACING

WELCOME

Spotsylvania County Safety Dept.

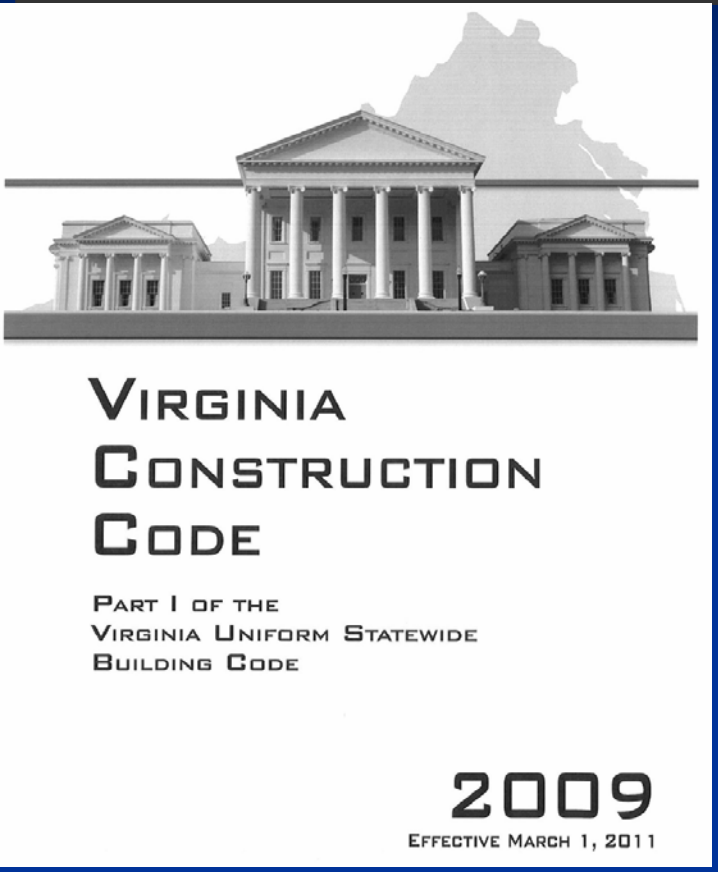


2009 International Residential Code

Wall Bracing Requirements

2009 CLASSIC WALL BRACING

WALL BRACING REQUIREMENTS IN USBC



The 2009 International Residential Code wall bracing requirements have been replaced in its entirety by USBC section R602.10

49. Replace Section R602.10, including all subsections, with the following:

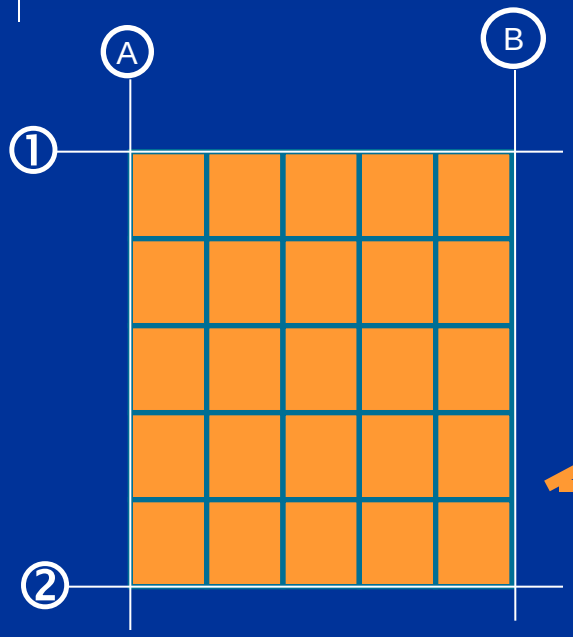
R602.10 Wall bracing. Buildings shall be braced in accordance with this section, or, when applicable, Section R602.12. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with Section R301.1.

2009 CLASSIC WALL BRACING

TWO BRACING METHODS: R602.10 & R602.12

Comparison of 2009 and 2006 wall bracing:

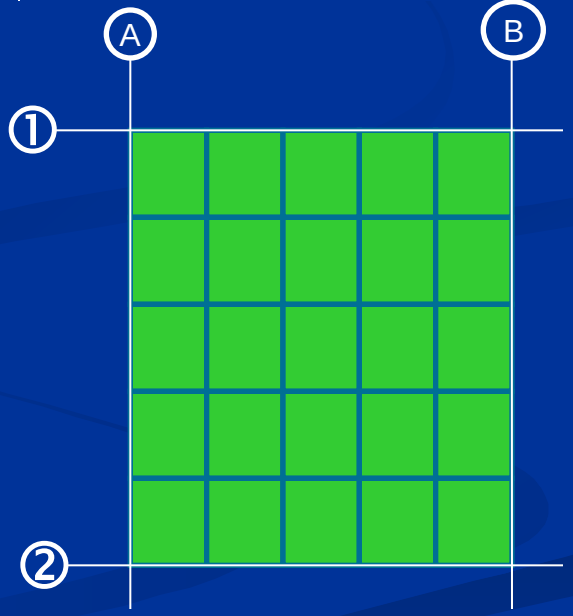
2009



"Classical" Method: Modified BWL

New "Simplified " Method

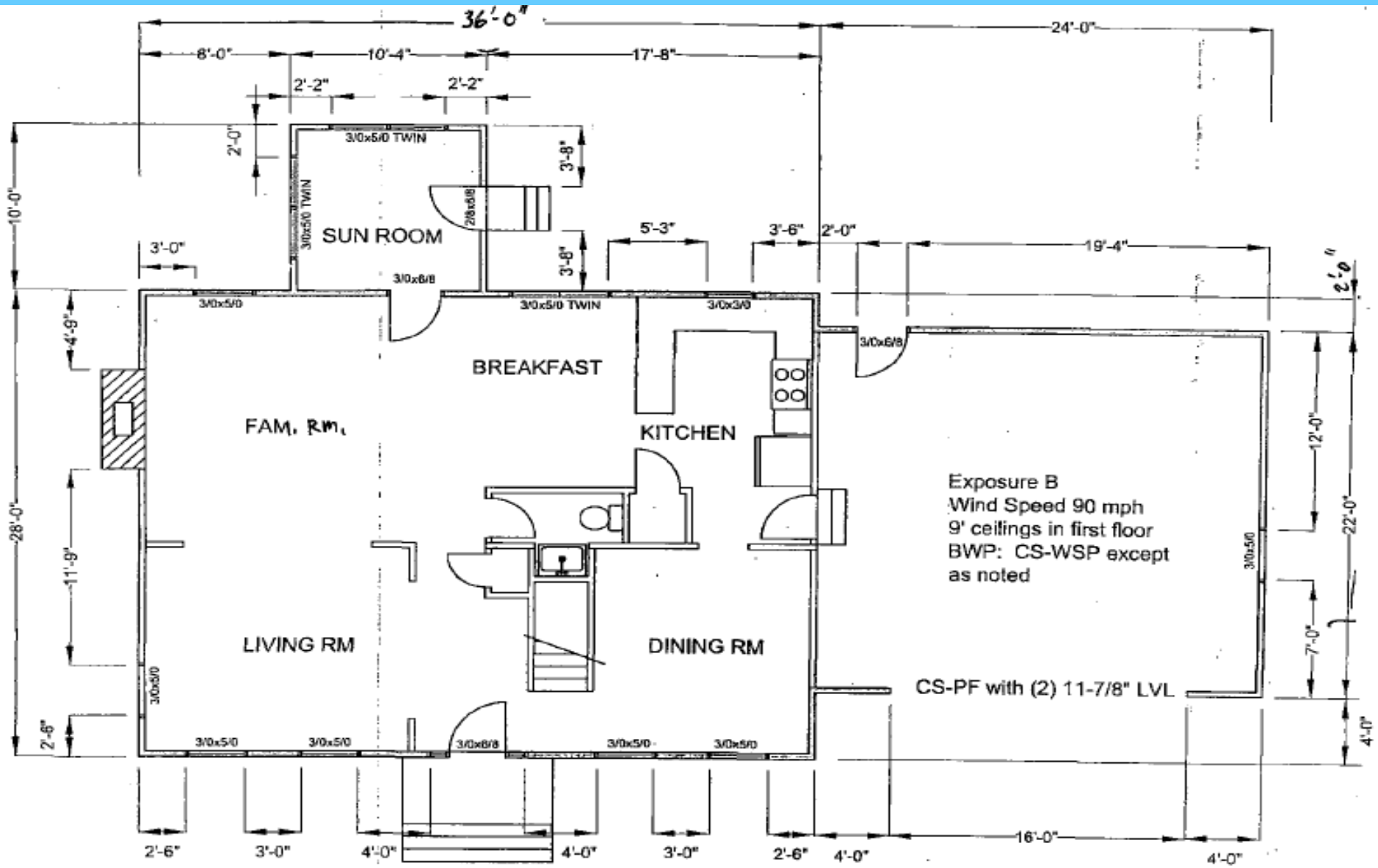
2006



"Braced Wall Line" Method

2009 CLASSIC WALL BRACING

FLOOR PLAN HANDOUT



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →																	
Story→ / Braced wall line criteria↓																	
Average spacing to next parallel BWL (ft)																	
Tabular required length of bracing (ft)																	
Adjust tabular value	Exposure factor (see table)	X		X		X		X		X		X		X		X	
	Roof eave-to-ridge height factor (see table)	X		X		X		X		X		X		X		X	
	Wall height factor (see table)	X		X		X		X		X		X		X		X	
	Number of BWLs factor (in plan direction) 2 BWLs = 1.0, 3 BWLs = 1.3, 4 BWLs = 1.45, ≥ 5 BWLs = 1.6	X		X		X		X		X		X		X		X	
	Omit interior finish material factor = 1.4	X		X		X		X		X		X		X		X	
	Interior gypsum board fastener spacing reduced to 4" o.c., factor = 0.7	X		X		X		X		X		X		X		X	
Adjusted required length of bracing (ft)→																	
Braced Wall Panels on Braced Wall Line	BWP↓	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)
Contributing length per Table R602.10.5	1																
Partial credit per Table R602.10.5.2 for intermittent methods only	2		+		+		+		+		+		+		+		+
	3		+		+		+		+		+		+		+		+
	4		+		+		+		+		+		+		+		+
	5		+		+		+		+		+		+		+		+
	6		+		+		+		+		+		+		+		+
	7		+		+		+		+		+		+		+		+
Total contributing length of wall bracing→																	
Total contributing ≥ adjusted required?		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
Spacing	BWPs spaced ≤ 20' edge-to-edge	Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA	
No. of BWPs	Length of BWL (ft)																
	BWL has min. 2 BWPs or BWL ≤ 16' has 1-48" BWP	Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
BWL ends	BWP at or begins within 10' of end	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
BWL compliance		Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail

2009 CLASSIC WALL BRACING

TABLE R602.10.3(1)

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 85		10	3.5	3.5	2.0	1.5
		20	6.0	6.0	3.5	3.0
		30	8.5	8.5	5.0	4.5
		40	11.5	11.5	6.5	5.5
		50	14.0	14.0	8.0	7.0
		60	16.5	16.5	9.5	8.0
		10	6.5	6.5	3.5	3.0
		20	11.5	11.5	6.5	5.5
		30	16.5	16.5	9.5	8.0
		40	21.5	21.5	12.5	10.5
		50	26.5	26.5	15.0	13.0
		60	31.5	31.5	18.0	15.5
		10	NP	9.0	5.5	4.5
		20	NP	17.0	10.0	8.5
		30	NP	24.5	14.0	12.0
		40	NP	32.0	18.0	15.5
		50	NP	39.0	22.5	19.0
		60	NP	46.5	26.5	22.5
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

TABLE R602.10.3(2)

TABLE R602.10.3(2)
WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)	APPLICABLE METHODS
Exposure category	One story structure	B	1.00	All methods
		C	1.20	
		D	1.50	
	Two-story structure	B	1.00	
		C	1.30	
		D	1.60	
	Three-story structure	B	1.00	
		C	1.40	
		D	1.70	
Roof eave-to-ridge height	Roof only	≤5 ft	0.70	
		10 ft	1.00	
		15 ft	1.30	
		20 ft	1.60	
	Roof + 1 floor	≤5 ft	0.85	
		10 ft	1.00	
		15 ft	1.15	
		20 ft	1.30	
	Roof + 2 floors	≤5 ft	0.90	
		10 ft	1.00	
		15 ft	1.10	
		20 ft	Not permitted	
Wall height adjustment	Any story	8 ft	0.90	
		9 ft	0.95	
		10 ft	1.00	
		11 ft	1.05	
		12 ft	1.10	
Number of braced wall lines (per plan direction)[c]	Any story	2	1.00	
		3	1.30	
		4	1.45	
		≥5	1.60	
Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c. at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

For SI: 1 foot = 305 mm, 1 pound force = 4.48 N.

a. Linear Interpolation shall be permitted.

b. The total adjustment factor is the product of all applicable adjustment factors.

c. The adjustment factor is permitted to be 1.0 when determing bracing amounts of intermediate braced wall lines provided the bracing amount on adjacent braced wall lines are based on a spacing and number that neglects the intermediate braced wall line.

2009 CLASSIC WALL BRACING

TABLE R602.10.5

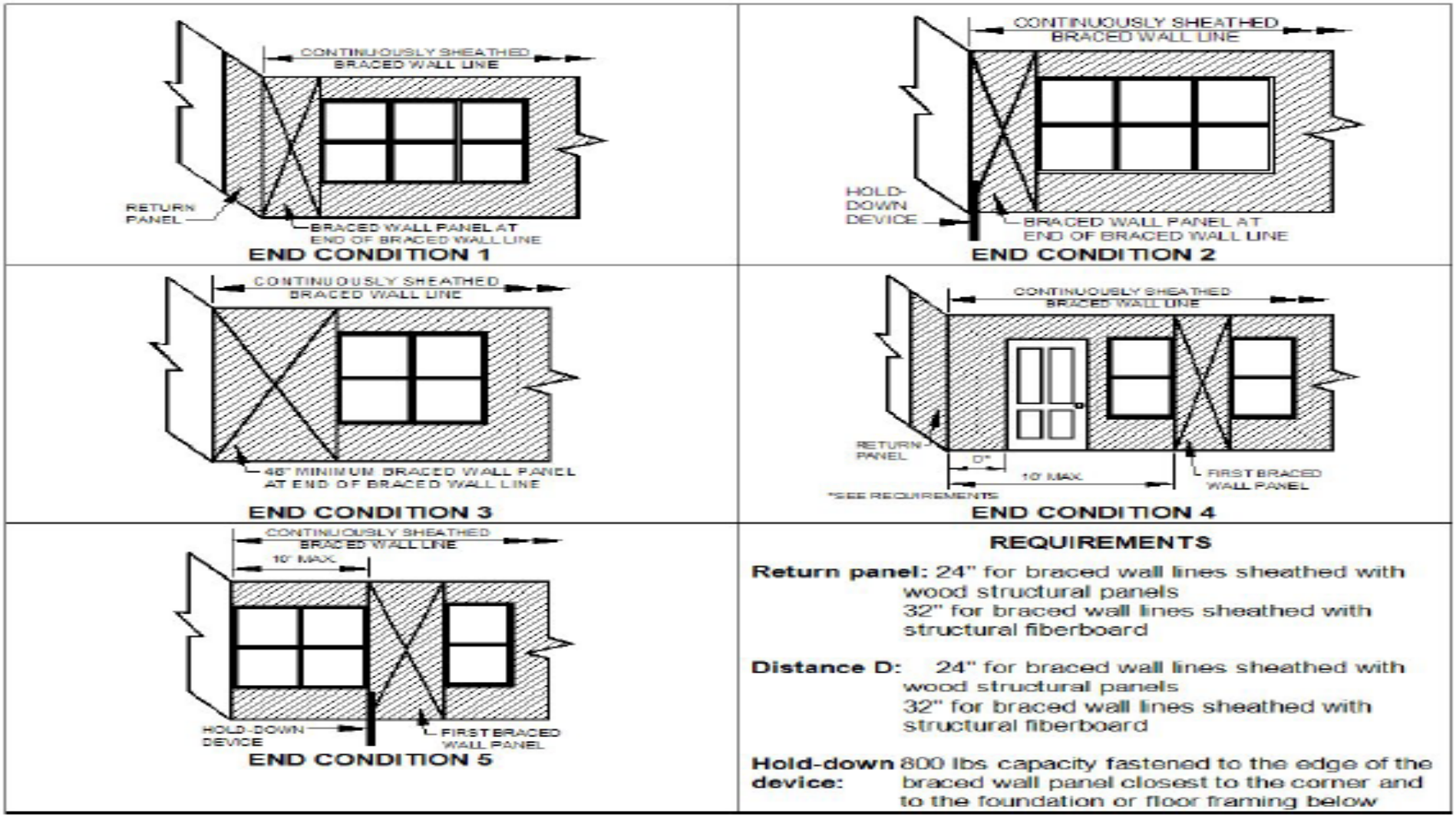
TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)		MINIMUM LENGTH[a] (in) Wall Height 8 ft	9 ft	10 ft	11 ft	12 ft	CONTRIBUTING LENGTH (in)
DWG, WSP, SFB, PBS, PCP, HPS		48	48	48	53	58	Actual[b]
GB		48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB		55	62	69	NP	NP	Actual[b]
ABW		28	32	34	38	42	48
PFH	Supporting roof only	16	16	16	18[c]	20[c]	48
	Supporting one story and roof	24	24	24	27[c]	29[c]	48
PFG		24	27	30	33[c]	36[c]	1.5 x Actual[b]
CS-G		24	27	30	33	36	Actual[b]
CS-PF		16	18	20	22[c]	24[c]	Actual[b]
CS-WSP, CS-SFB	Adjacent opening vertical dimension (in)						
	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

For SI: 1 inch = 25.4 mm
NP = Not permitted
a. Linear interpolation shall be permitted.
b. Use the actual length provided it is greater than or equal to the minimum length.
c. Maximum header height is 10'; however, wall height may be increased to 12' with a pony wall per Table R602.10.6.4.

2009 CLASSIC WALL BRACING

FIGURE R602.10.7



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound force = 4.48 N

FIGURE R602.10.7
END CONDITIONS FOR BRACED WALL LINES WITH CONTINUOUS SHEATHING

2009 CLASSIC WALL BRACING

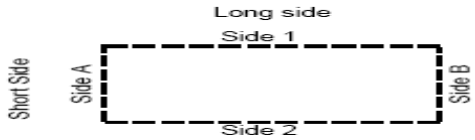
BRACING UNIT COMPLIANCE FORM

Permit Number / Project _____ **Date** _____

Prerequisites

Max 2 story	Y - N
Wall height ≤ 10'	Y - N
Eave to ridge ≤ 15'	Y - N
GB on inside of B.U.s	Y - N
Wind ≤ 90 mph	Y - N
Exposure B	Y - N
SDC A,B,C (no C townhouses)	Y - N
Cripple walls: one story building	Y - N
two story building	NP
Prerequisites Pass	Y - N

Circumscribed Rectangle



Include:
- Attached garages
- Sunrooms
- Enclosed Structures

Exclude:
- Decks/porches
- Chimneys
- Carports
- Open structures

Ratio of long side to short side:

$\frac{\text{Long Side}}{\text{Short Side}}$ = _____ ft. / _____ ft. = _____ ≤ 3.0

Required B.U.

Table R602.12.4; interpolation prohibited

Story Level	Eave-to-Ridge Ht.	Required B.U.s on each LONG Side — SHORT Side Dimension (A&B) (rounded-up) 10'	20'	30'	40'	50'	60'	Required B.U.s on each SHORT Side — LONG Side Dimension (1&2) (rounded-up) 10'	20'	30'	40'	50'	60'
	≤10'	1	2	2	2	3	3	1	2	2	2	3	3
		2	3	3	4	5	6	2	3	3	4	5	6
	≤15'	1	2	3	3	4	4	1	2	3	3	4	4
		2	3	4	5	6	7	2	3	4	5	6	7

Actual Wall Segments

B.U. wall length equivalents:
3' fully sheathed = 1 B.U.
4' intermittent = 1 B.U.

Methods B.U. equivalents:
PFH = 1 B.U.
PFG = 0.75 B.U.
CS-G = 0.5 B.U.
CS-PF = 0.5 B.U.

	Long Side 1		Long Side 2		Short Side A		Short Side B	
	method/length(ft)	B.U.s	method/length(ft)	B.U.s	method/length(ft)	B.U.s	method/length(ft)	B.U.s
Total actual B.U.s provided								
Actual B.U.s ≥ Required B.U.s	Y - N		Y - N		Y - N		Y - N	

Distribution

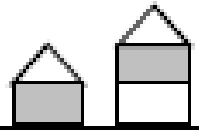
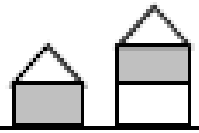
	Long Side 1	Long Side 2	Short Side A	Short Side B
Walls >8' have at least 1 B.U.	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA
B.U. within 12' of each corner	Y - N	Y - N	Y - N	Y - N
B.U. within 20' edge to edge	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA
PASS / FAIL	PASS FAIL	PASS FAIL	PASS FAIL	PASS FAIL

2009 CLASSIC WALL BRACING

TABLE R602.12.4

TABLE R602.12.4

MINIMUM NUMBER OF BRACING UNITS ON EACH SIDE OF THE CIRCUMSCRIBED RECTANGLE

STORY LEVEL	EAVE-TO RIDGE HEIGHT (FEET)	MINIMUM NUMBER OF BRACING UNITS ON EACH LONG SIDE[a, b]						MINIMUM NUMBER OF BRACING UNITS ON EACH SHORT SIDE[a, b]					
		Length of short side (ft)[c]						Length of long side (ft)[c]					
		10	20	30	40	50	60	10	20	30	40	50	60
	10	1	2	2	2	3	3	1	2	2	2	3	3
		2	3	3	4	5	6	2	3	3	4	5	6
	15	1	2	3	3	4	4	1	2	3	3	4	4
		2	3	4	5	6	7	2	3	4	5	6	7

For SI: 1 ft = 304.8 mm.

a. Interpolation shall not be permitted.

b. Cripple walls or wood-framed basement walls in a walk-out condition of a one-story structure shall be designed as the first floor of a two-story house.

c. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.

2009 CLASSIC WALL BRACING

TWO BRACING METHODS: R602.10 & R602.12

Today's Agenda:

Classic wall bracing method

- Modified version of old method
- Jump into an example and touch on the code changes

2009 CLASSIC WALL BRACING

TWO BRACING METHODS: R602.10 & R602.12

Today's Agenda:

Classic wall bracing method

- Modified version of old method
- Jump into an example and touch on the code changes

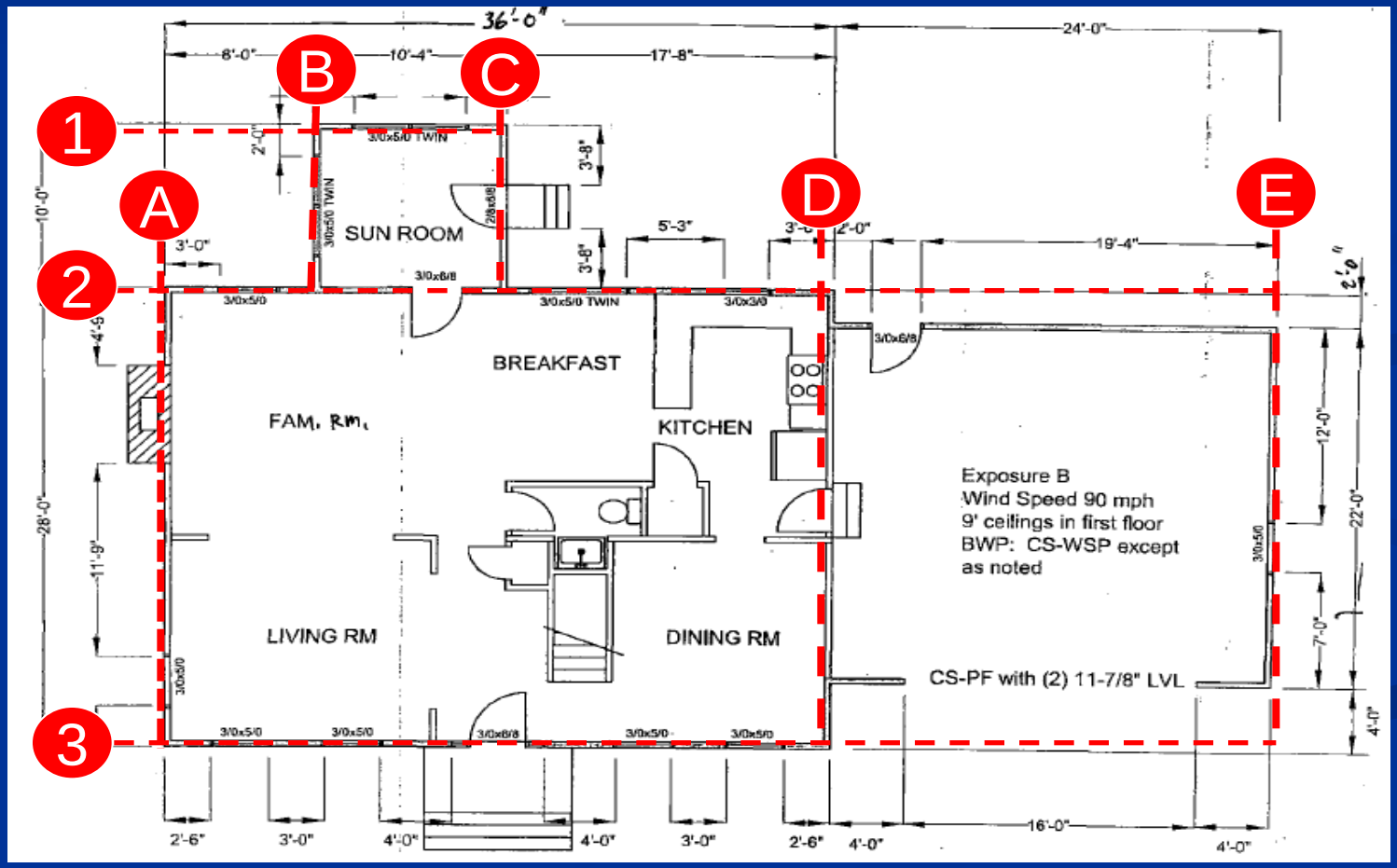
Simplified wall bracing method

- Brand new method
- Go through the code requirements first, then do an example

2009 CLASSIC WALL BRACING

R602.10

R602.10 Classic wall bracing method

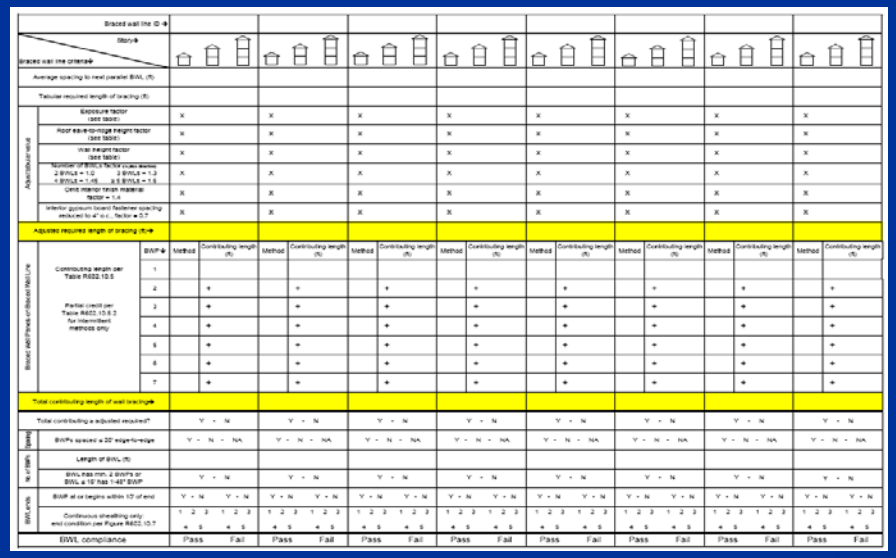


2009 CLASSIC WALL BRACING

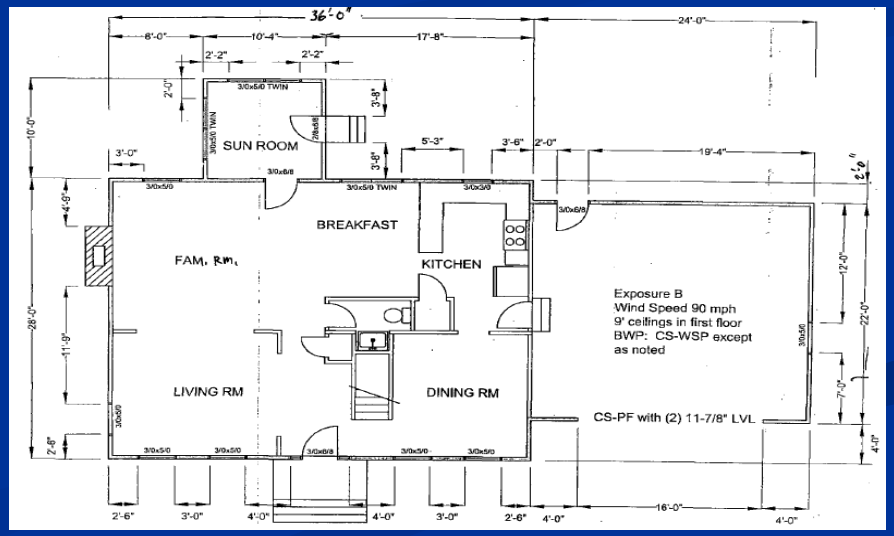
CHOOSE – ADJUST - COMPARE

Classic Wall Bracing in its simplest form is a 3 phase system:

Choose – Adjust - Compare



Braced wall line ID ➔																			
Story➔ / Braced wall line criteria➔																			
Average spacing to next parallel BWL (ft)																			
Tabular required length of bracing (ft)																			
Adjustable wind	Exposure factor (see table)	x		x		x		x		x		x		x		x		x	
	Roof eave-to-ridge height factor (see table)	x		x		x		x		x		x		x		x		x	
	Wall height factor (see table)	x		x		x		x		x		x		x		x		x	
	Number of BWLs factor (rules above) 2 BWLs = 1.0 3 BWLs = 1.3 4 BWLs = 1.45 ≥ 5 BWLs = 1.5	x		x		x		x		x		x		x		x		x	
	Omit interior finish material factor = 1.4	x		x		x		x		x		x		x		x		x	
	Interior gypsum board fastener spacing reduced to 4" o.c., factor = 0.7	x		x		x		x		x		x		x		x		x	
Adjusted required length of bracing (ft)➔																			
Braced wall lines and BWPs on Braced Wall Line	BWP➔	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)
	Continuous length per Table R602.10.5	1																	
		2		+		+		+		+		+		+		+		+	
	Partial credit per Table R602.10.5.3 for Intermittent methods only	3		+		+		+		+		+		+		+		+	
		4		+		+		+		+		+		+		+		+	
		5		+		+		+		+		+		+		+		+	
		6		+		+		+		+		+		+		+		+	
		7		+		+		+		+		+		+		+		+	
Total contributing length of wall bracing➔																			
Total contributing is adjusted required?		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
Spacing	BWPs spaced ≤ 20' edge-to-edge	Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA	
Length of BWL (ft)																			
No. of BWPs	BWL has min. 2 BWPs or BWL ≥ 10' has 1-48" BWP	Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
BWL ends	BWP at or begins within 10' of end	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
BWL compliance		Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail

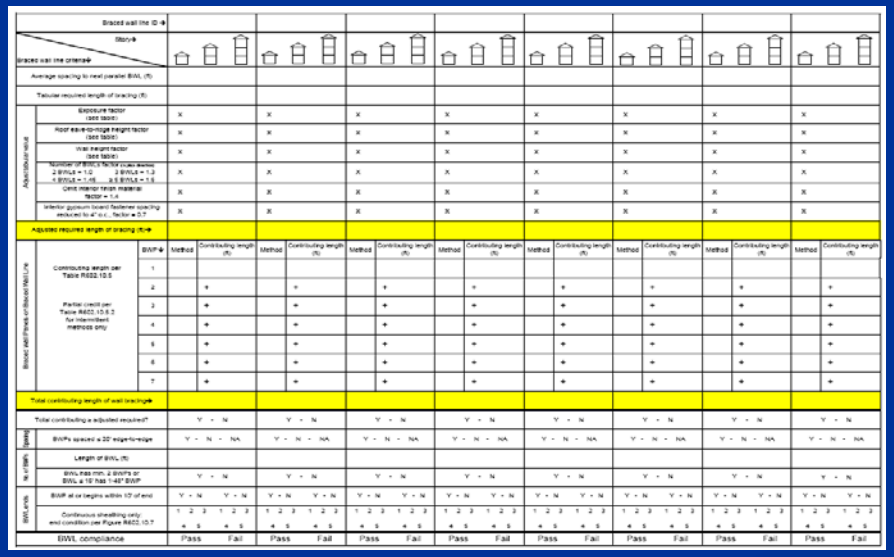


2009 CLASSIC WALL BRACING

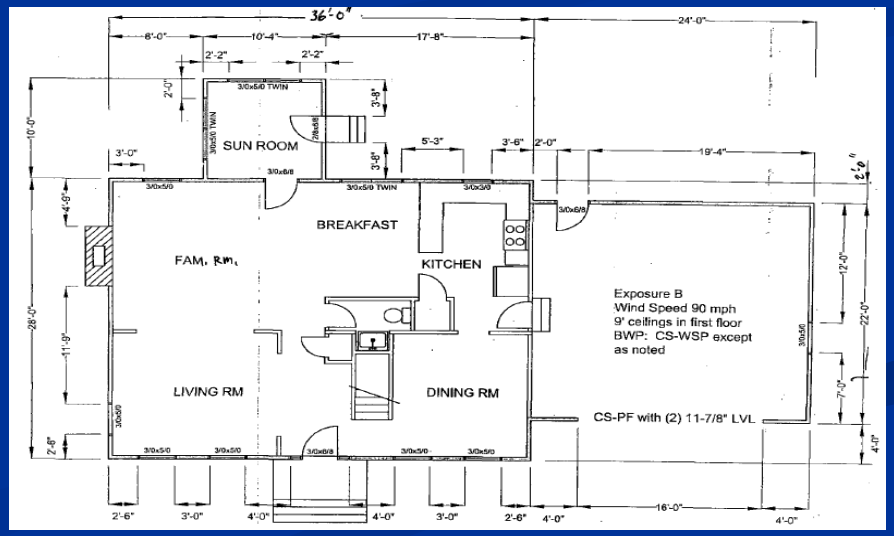
CHOOSE – ADJUST - COMPARE

Choose -

Choose the minimum total length of braced wall panels from Table R602.10.3(1)



Braced wall line ID																	
Story																	
Braced wall line criteria																	
Average spacing to next parallel BWL (ft)																	
Tabular required length of bracing (ft)																	
Adjustments	Exposure factor (see table)	x		x		x		x		x		x		x		x	
	Roof eave-to-ridge height factor (see table)	x		x		x		x		x		x		x		x	
	Wall height factor (see table)	x		x		x		x		x		x		x		x	
	Number of BWLs factor (see above) 2 BWLs = 1.0 3 BWLs = 1.3 4 BWLs = 1.45 ≥ 5 BWLs = 1.5	x		x		x		x		x		x		x		x	
	Omit interior finish material factor = 1.4	x		x		x		x		x		x		x		x	
	Interior gypsum board fastener spacing reduced to 4" o.c., factor = 0.7	x		x		x		x		x		x		x		x	
Adjusted required length of bracing (ft)																	
Braced wall lines and lengths	BWP	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)
	Contributing length per Table R602.10.5 1																
	2		+		+		+		+		+		+		+		+
	Partial credit per Table R602.10.5.3 for Intermittent methods only 3		+		+		+		+		+		+		+		+
	4		+		+		+		+		+		+		+		+
	5		+		+		+		+		+		+		+		+
	6		+		+		+		+		+		+		+		+
	7		+		+		+		+		+		+		+		+
Total contributing length of wall bracing																	
Total contributing & adjusted required?		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
Spacing	BWPs spaced ≤ 20' edge-to-edge	Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA	
Length of BWL (ft)																	
No. of BWPs	BWL has min. 2 BWPs or BWL ≥ 10' has 1-48" BWP	Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
BWL ends	BWP at or begins within 10' of end	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
BWL compliance		Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail

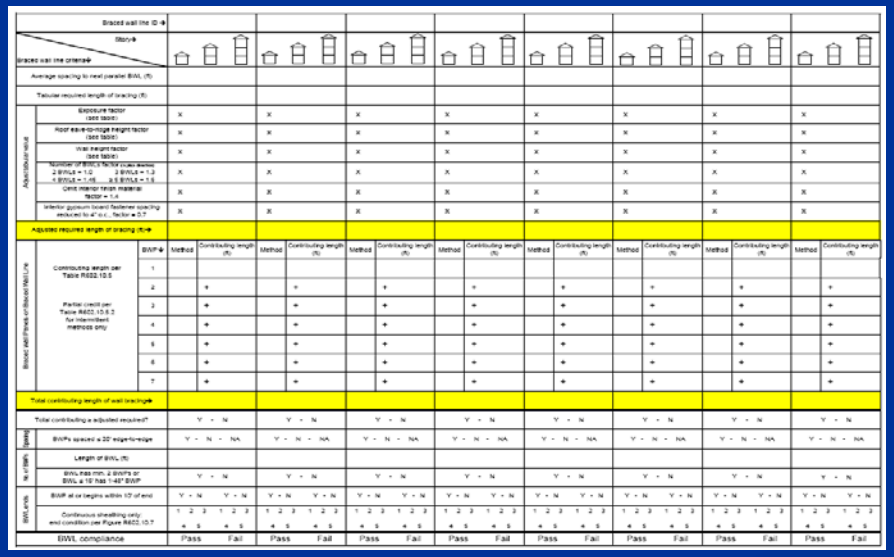


2009 CLASSIC WALL BRACING

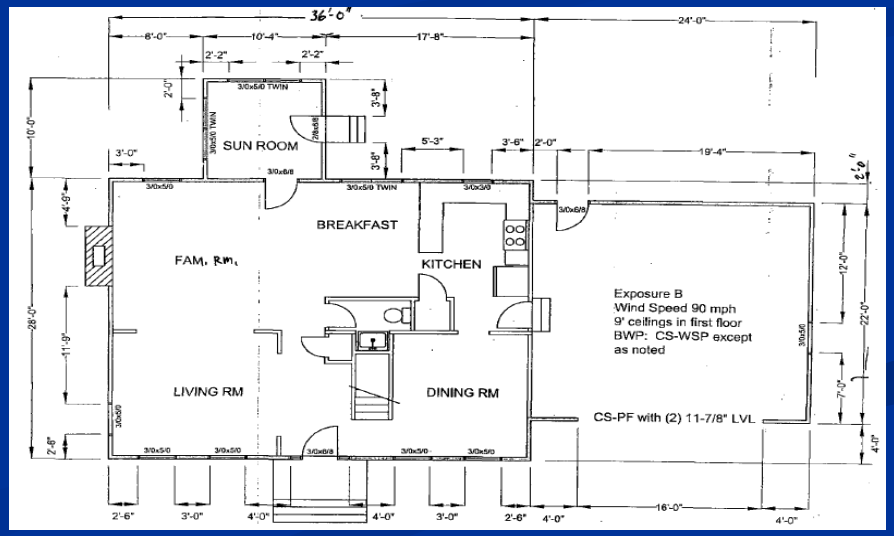
CHOOSE – ADJUST - COMPARE

Adjust –

Adjust the minimum total length from the table by applying adjustment factors



Braced wall line ID ➔																			
Story➔ / Braced wall line criteria➔																			
Average spacing to next parallel BWL (ft)																			
Tabular required length of bracing (ft)																			
Adjustments	Exposure factor (see table)	x		x		x		x		x		x		x		x		x	
	Roof eave-to-ridge height factor (see table)	x		x		x		x		x		x		x		x		x	
	Wall height factor (see table)	x		x		x		x		x		x		x		x		x	
	Number of BWLs factor (see above) 2 BWLs = 1.0 3 BWLs = 1.3 4 BWLs = 1.45 ≥ 5 BWLs = 1.5	x		x		x		x		x		x		x		x		x	
	Omit interior finish material factor = 1.4	x		x		x		x		x		x		x		x		x	
	Interior gypsum board fastener spacing reduced to 4" o.c., factor = 0.7	x		x		x		x		x		x		x		x		x	
Adjusted required length of bracing (ft) ➔																			
Braced wall lines adjacent to Braced Wall Line	BWP ➔	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)
	Contributing length per Table R602.10.5 / Partial credit per Table R602.10.5.3 for Intermittent methods only: 1																		
	2		+		+		+		+		+		+		+		+		+
	3		+		+		+		+		+		+		+		+		+
	4		+		+		+		+		+		+		+		+		+
	5		+		+		+		+		+		+		+		+		+
	6		+		+		+		+		+		+		+		+		+
	7		+		+		+		+		+		+		+		+		+
Total contributing length of wall bracing ➔																			
Total contributing is adjusted required?		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
Spacing	BWPs spaced ≤ 20' edge-to-edge	Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA	
Length of BWL (ft)																			
No. of BWPs	BWL has min. 2 BWPs or BWL ≥ 10' has 1-48" BWP	Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
BWL ends	BWP at or begins within 10' of end	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5	1 2 3 ◄ 5
BWL compliance		Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail

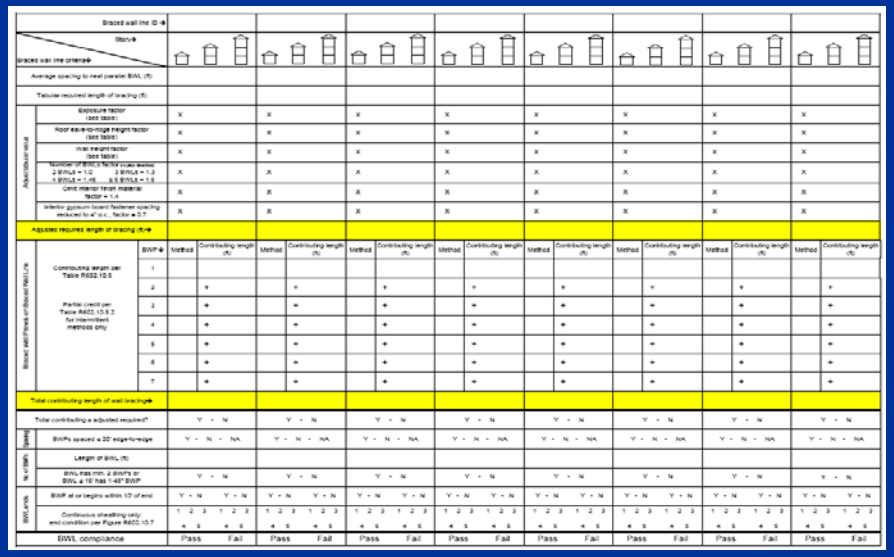


2009 CLASSIC WALL BRACING

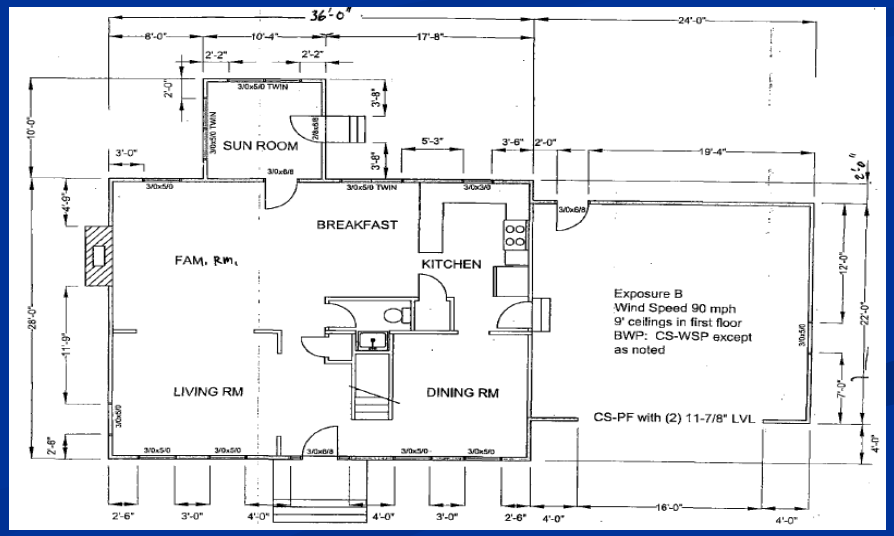
CHOOSE – ADJUST - COMPARE

Compare –

Compare the adjusted total length with the actual length of braced wall panels



Braced wall line ID ➔																			
Story ➔ / Braced wall line criteria ➔																			
Average spacing to next parallel BWL (ft)																			
Tabular required length of bracing (ft)																			
Adjustments	Exposure factor (see table)	x		x		x		x		x		x		x		x		x	
	Roof eave-to-ridge height factor (see table)	x		x		x		x		x		x		x		x		x	
	Wall height factor (see table)	x		x		x		x		x		x		x		x		x	
	Number of BWLs factor (see above) 2 BWLs = 1.0; 3 BWLs = 1.3; 4 BWLs = 1.45; ≥ 5 BWLs = 1.5	x		x		x		x		x		x		x		x		x	
	Omit interior finish material factor = 1.4	x		x		x		x		x		x		x		x		x	
	Interior gypsum board fastener spacing reduced to 4" o.c., factor = 0.7	x		x		x		x		x		x		x		x		x	
Adjusted required length of bracing (ft) ➔																			
Braced wall lines adjacent to Braced Wall Line	BWP ➔	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)
	Continuous length per Table R602.10.5 / Partial credit per Table R602.10.5.3 for Intermittent methods only: 1																		
	2		+		+		+		+		+		+		+		+		+
	3		+		+		+		+		+		+		+		+		+
	4		+		+		+		+		+		+		+		+		+
	5		+		+		+		+		+		+		+		+		+
	6		+		+		+		+		+		+		+		+		+
	7		+		+		+		+		+		+		+		+		+
Total contributing length of wall bracing ➔																			
Total contributing ≥ adjusted required?		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
Spacing	BWPs spaced ≤ 20' edge-to-edge	Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA		Y - N - NA	
No. of BWPs	Length of BWL (ft)																		
	BWL has min. 2 BWPs or BWL ≥ 10' has 1-48" BWP	Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N		Y - N	
BWL ends	BWP at or begins within 10' of end	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
BWL compliance		Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail

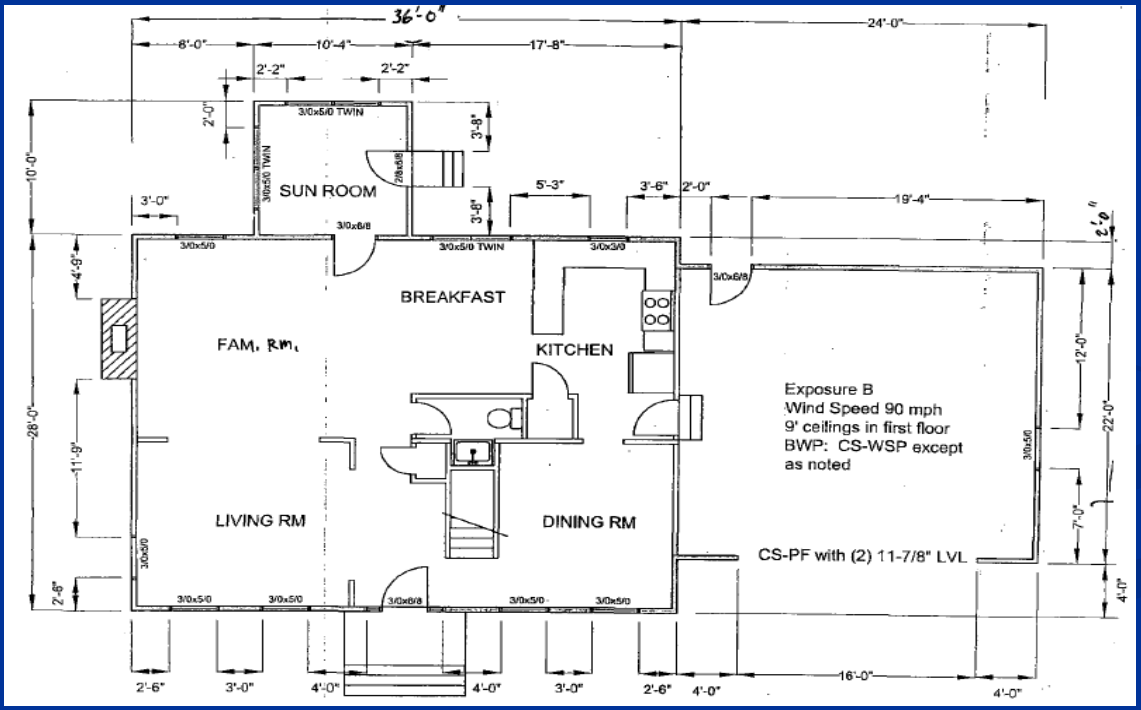


2009 CLASSIC WALL BRACING

WHAT DO WE DO FIRST?

Before we get to choose - locate the BWLs

R602.10.1.3 Spacing of braced wall lines. There shall be a minimum of two braced wall lines in both the longitudinal and transverse direction as shown in Figure R602.10.1.1. Intermediate braced wall lines through the interior of the building shall be permitted. The spacing between parallel braced wall lines shall be in accordance with Table R602.10.1.3.

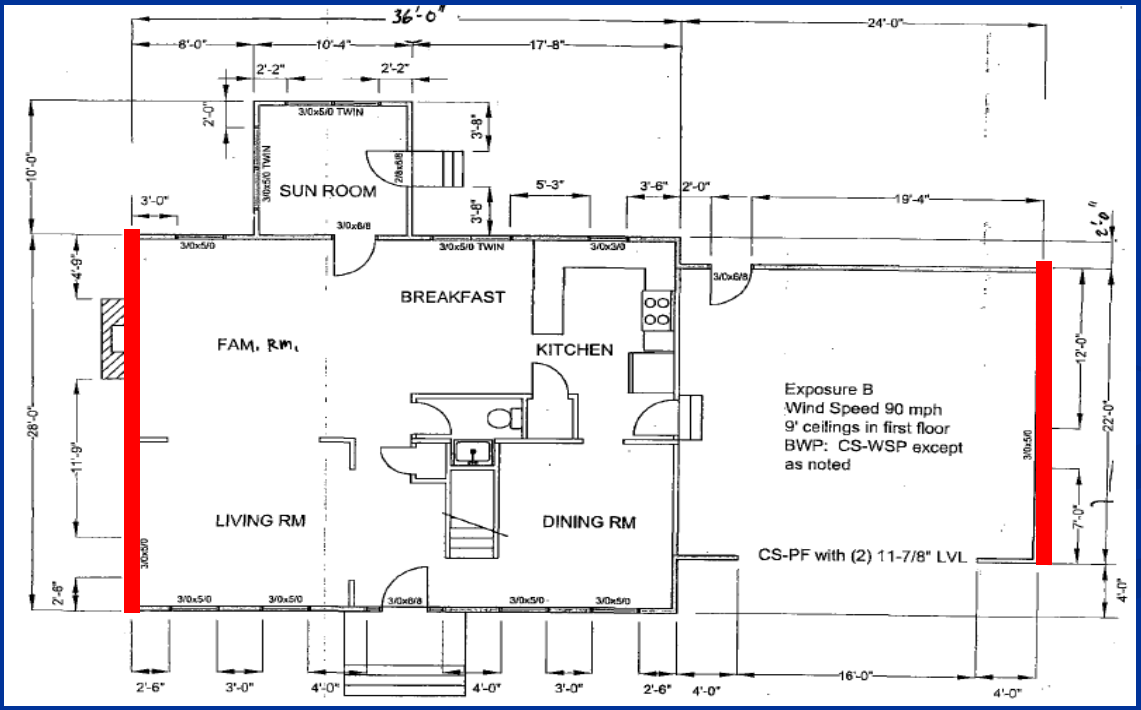


2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

Locate the braced wall lines in N-S direction

R602.10.1.3 Spacing of braced wall lines. There shall be a minimum of two braced wall lines in both the longitudinal and transverse direction as shown in Figure R602.10.1.1. Intermediate braced wall lines through the interior of the building shall be permitted. The spacing between parallel braced wall lines shall be in accordance with Table R602.10.1.3.



2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

Locate the braced wall lines in N-S direction

R602.10.1.3 Spacing of braced wall lines. There shall be a minimum of two braced wall lines in both the longitudinal and transverse direction as shown in Figure R602.10.1.1. Intermediate braced wall lines through the interior of the building shall be permitted. The spacing between parallel braced wall lines shall be in accordance with Table R602.10.1.3.

TABLE 602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING

Table 602.10.1.3 has two sections: Wind bracing and Seismic bracing

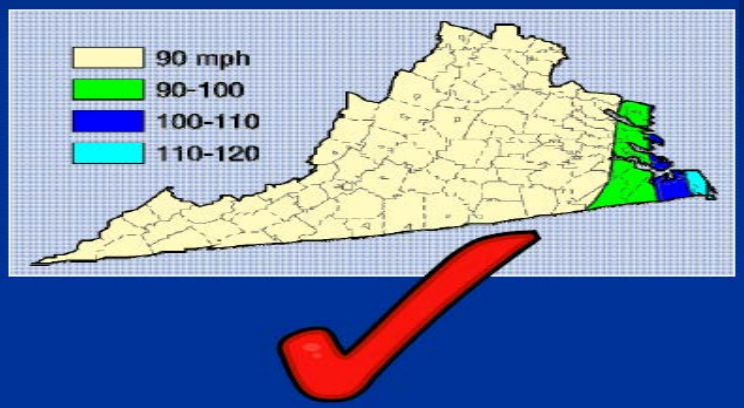
TABLE 602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING



This area is located within 90 mph region

TABLE 602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING

This area is located within Seismic Design Category B

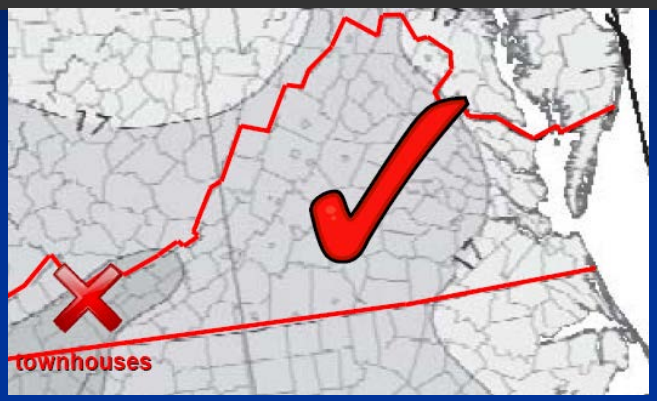


TABLE 602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING

This area is located within Seismic Design Category B

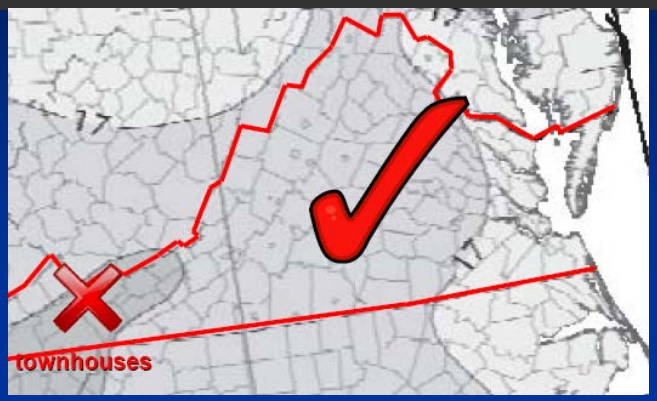


TABLE 602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
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Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING

NEW

2006 code only allowed 50’ maximum spacing

TABLE 602.10.1.3
BRACED WALL LINE SPACING

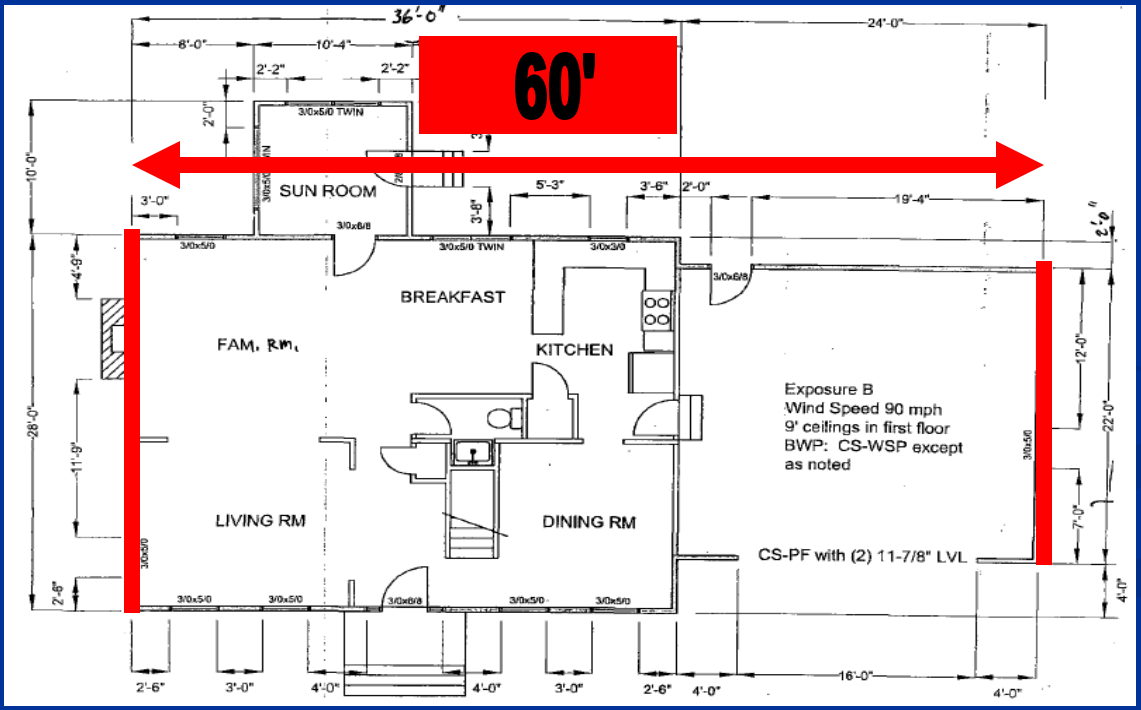
APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING

60’ Actual Spacing ≤ 60’ MAX. BWL Spacing ✓

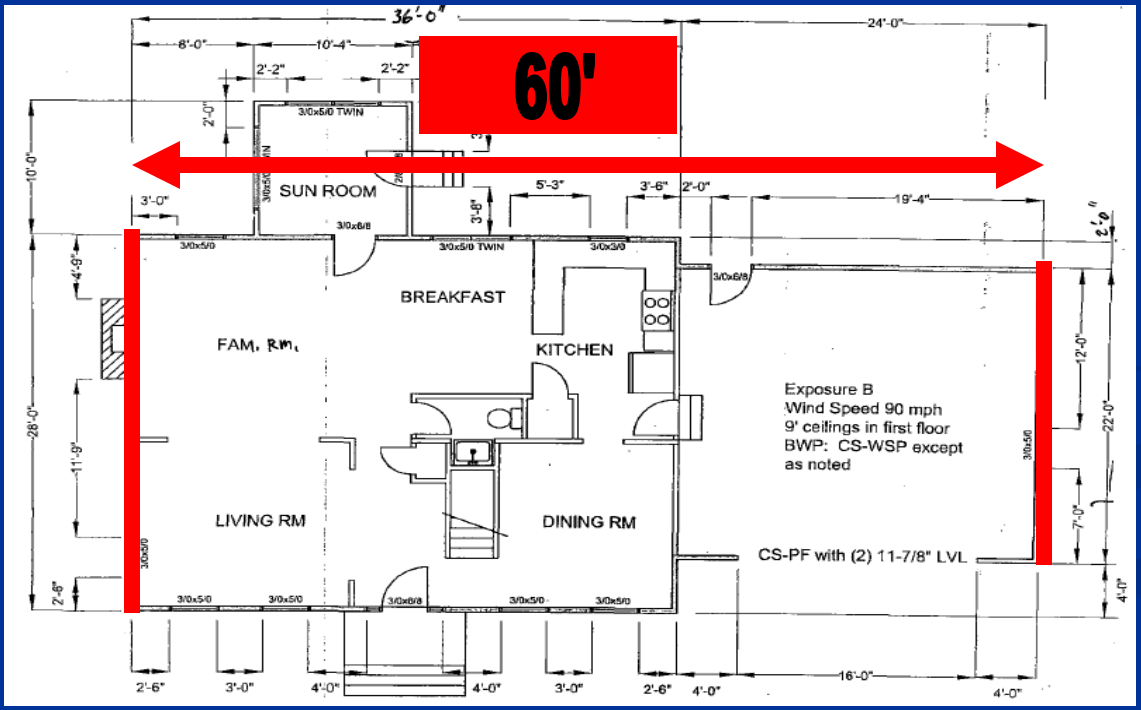


2009 CLASSIC WALL BRACING

MAXIMUM BWL SPACING

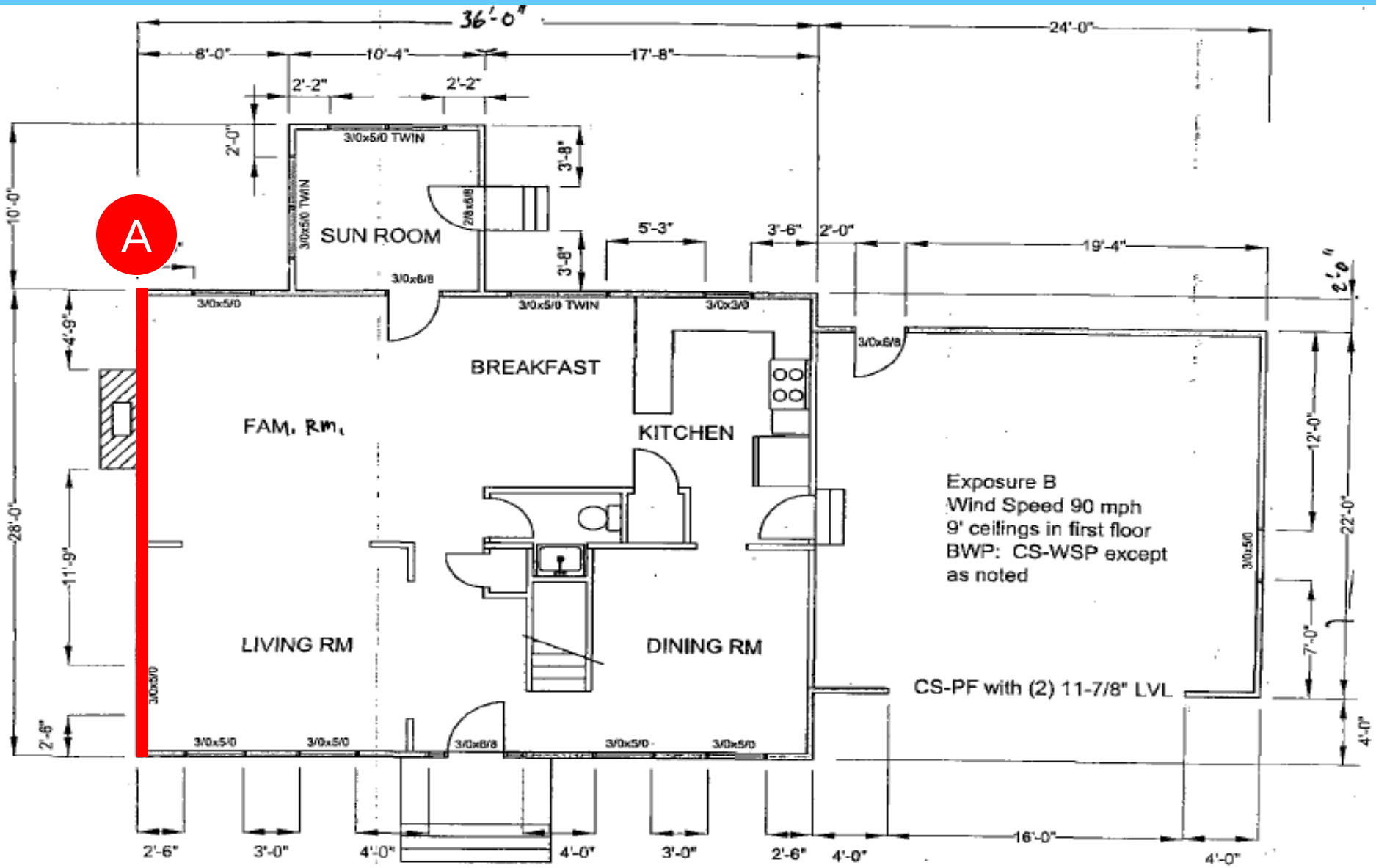
60’ Actual Spacing ≤ 60’ MAX. BWL Spacing

But we need the practice…….



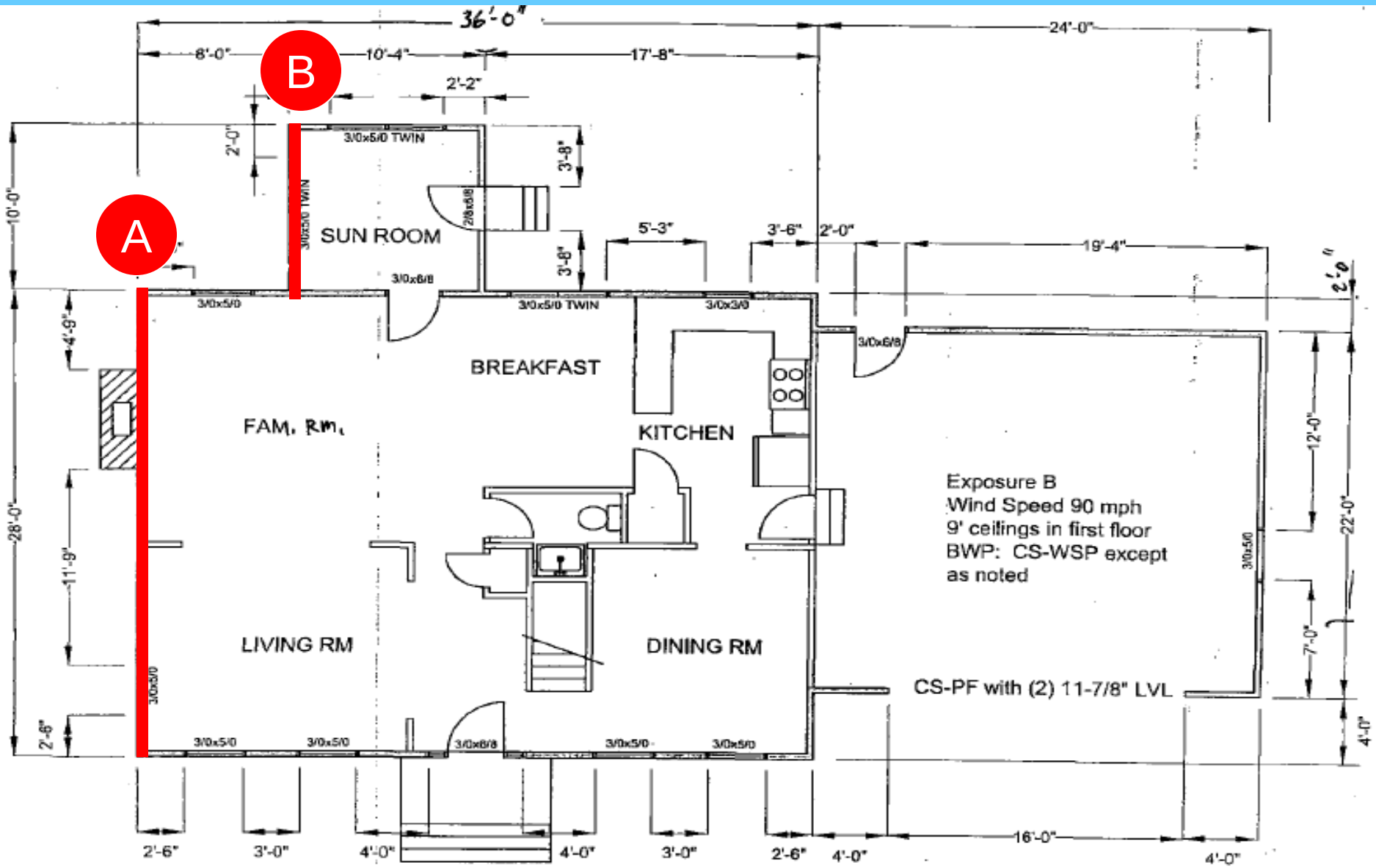
2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



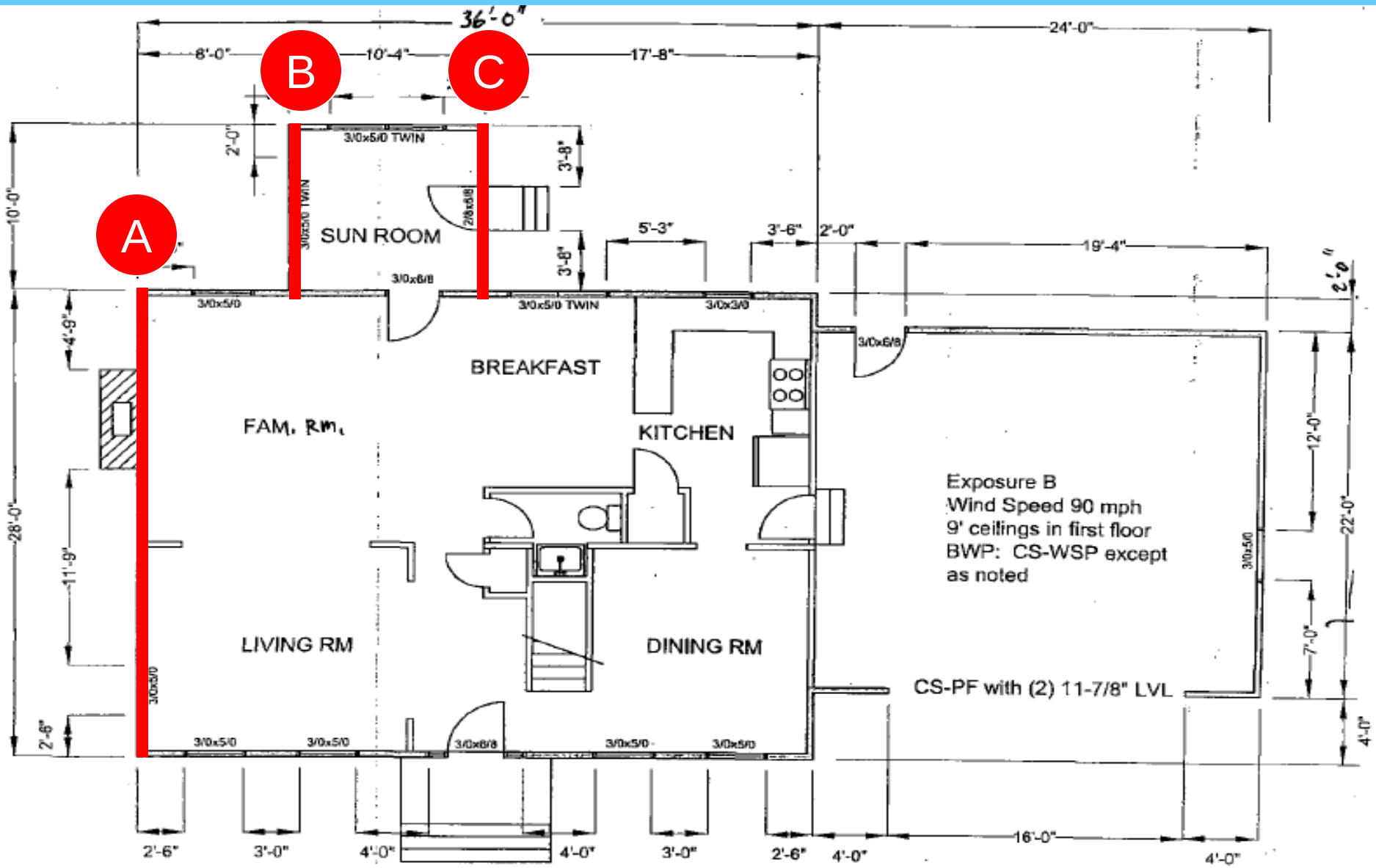
2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



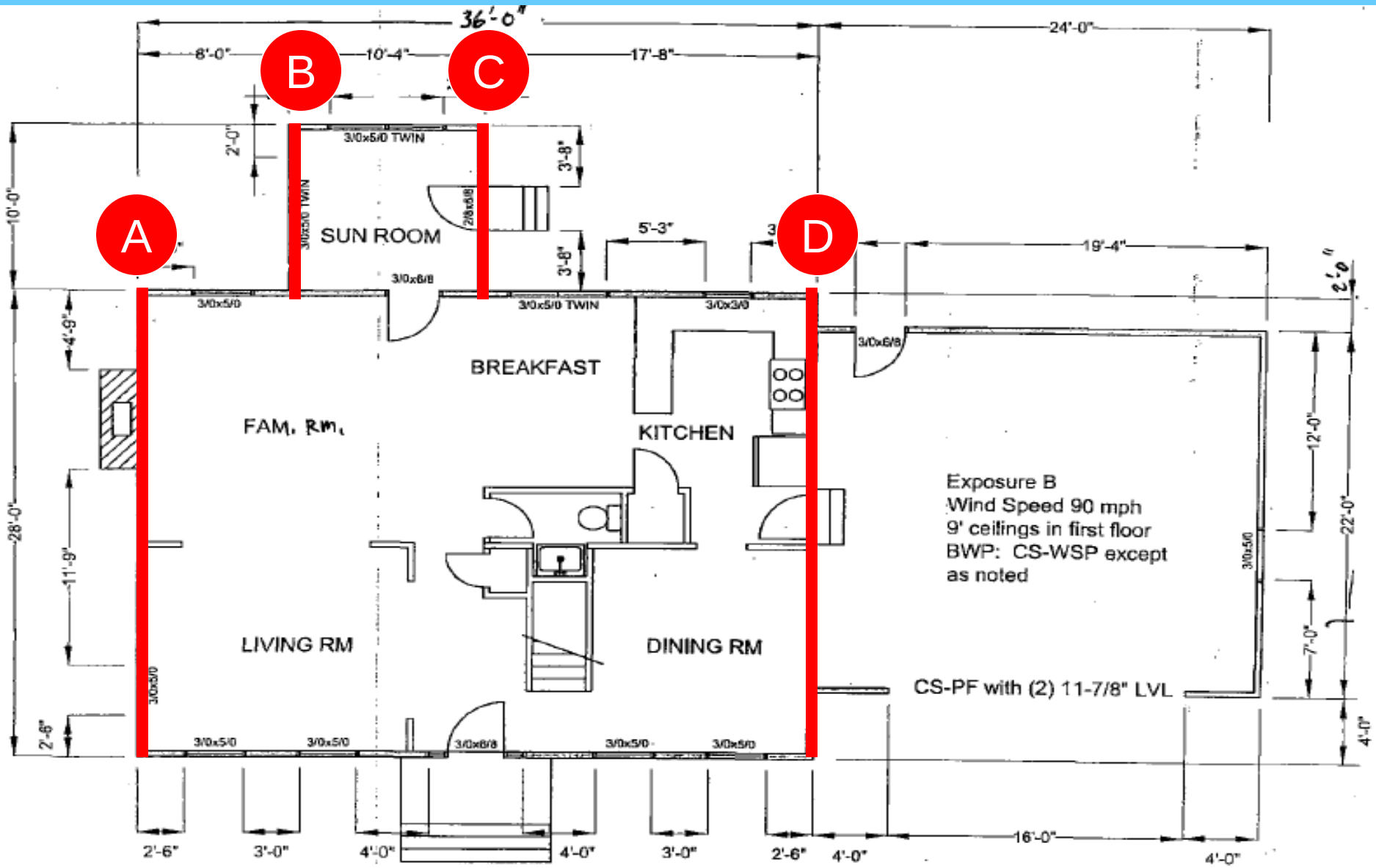
2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



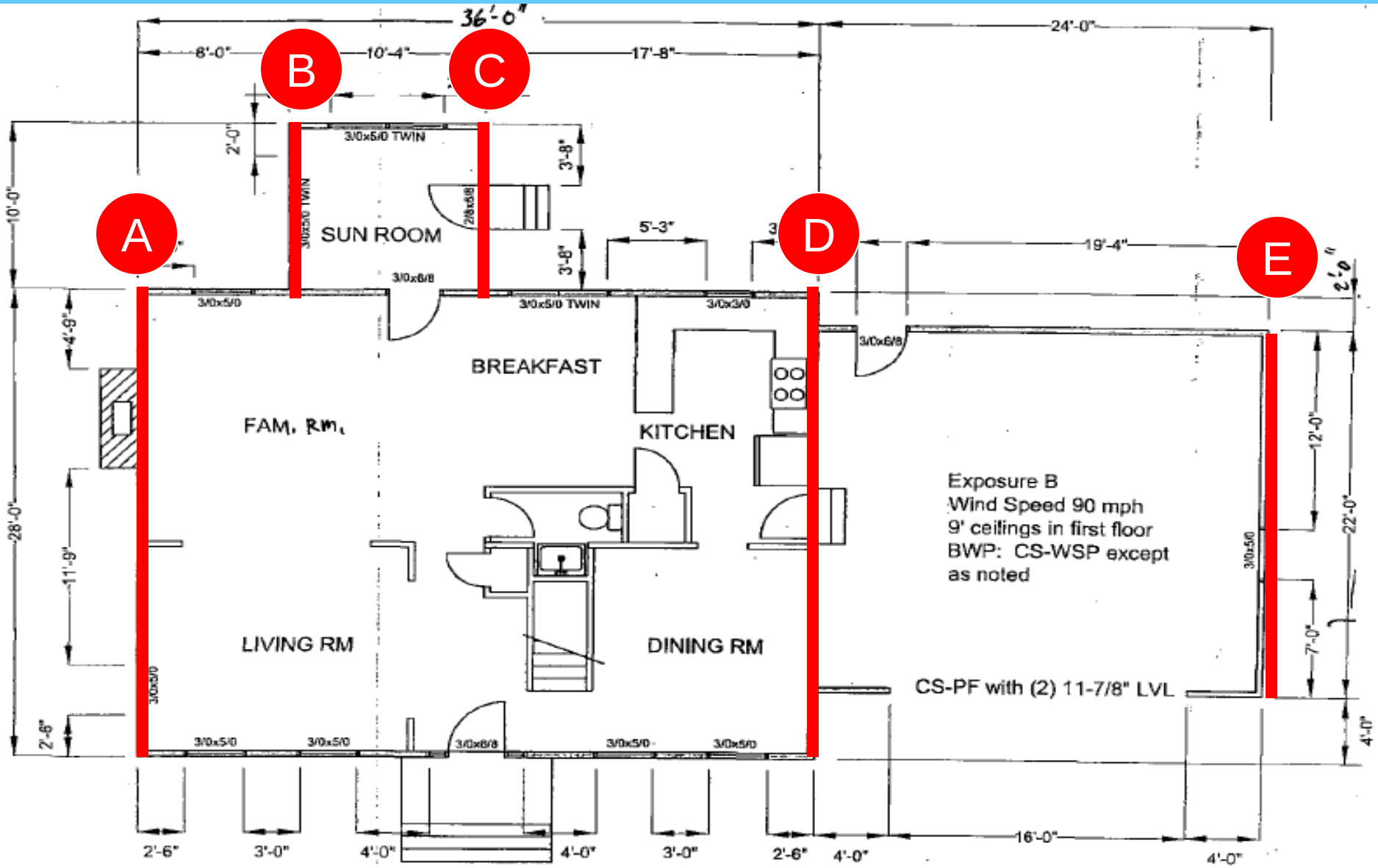
2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING

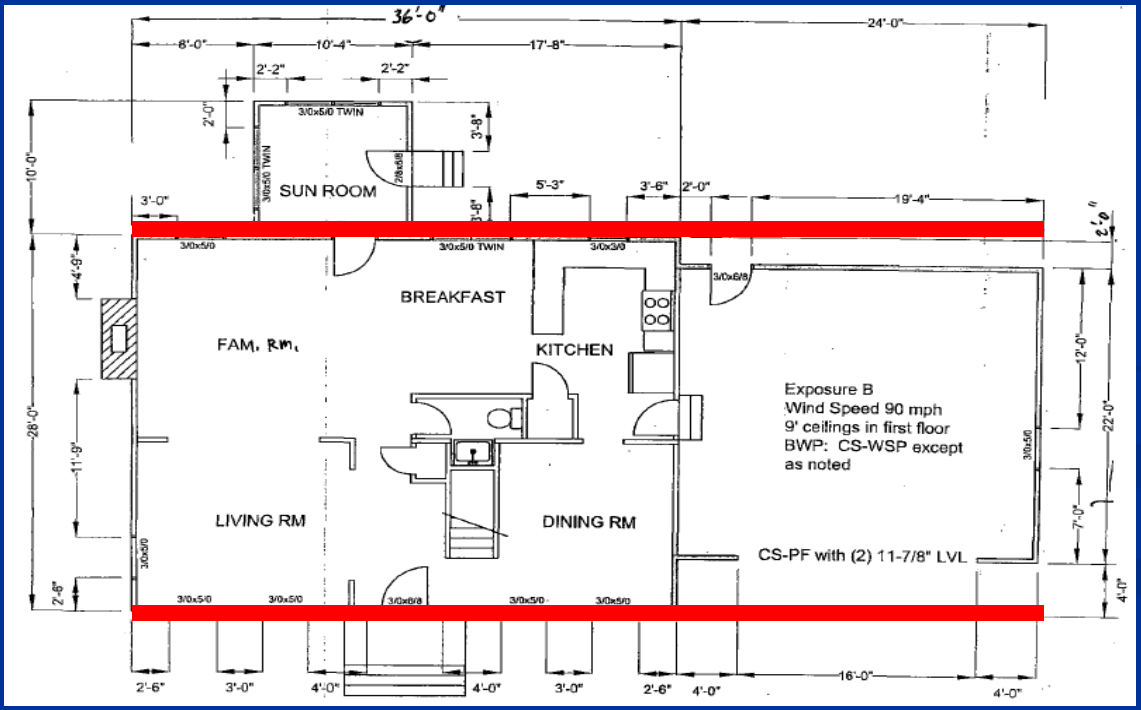


2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

NOW Locate the braced wall lines in E-W direction

Does this work?



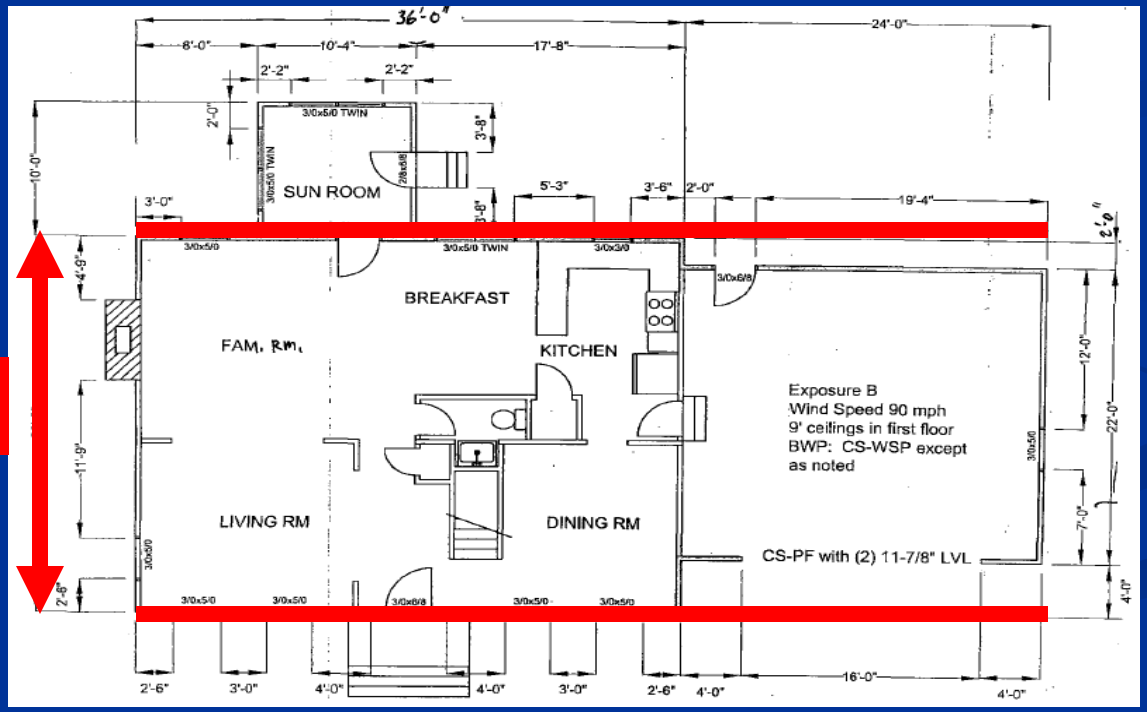
2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

NOW Locate the braced wall lines in E-W direction

28’ Actual Spacing ≤ 60’ MAX. BWL Spacing ✓

28'



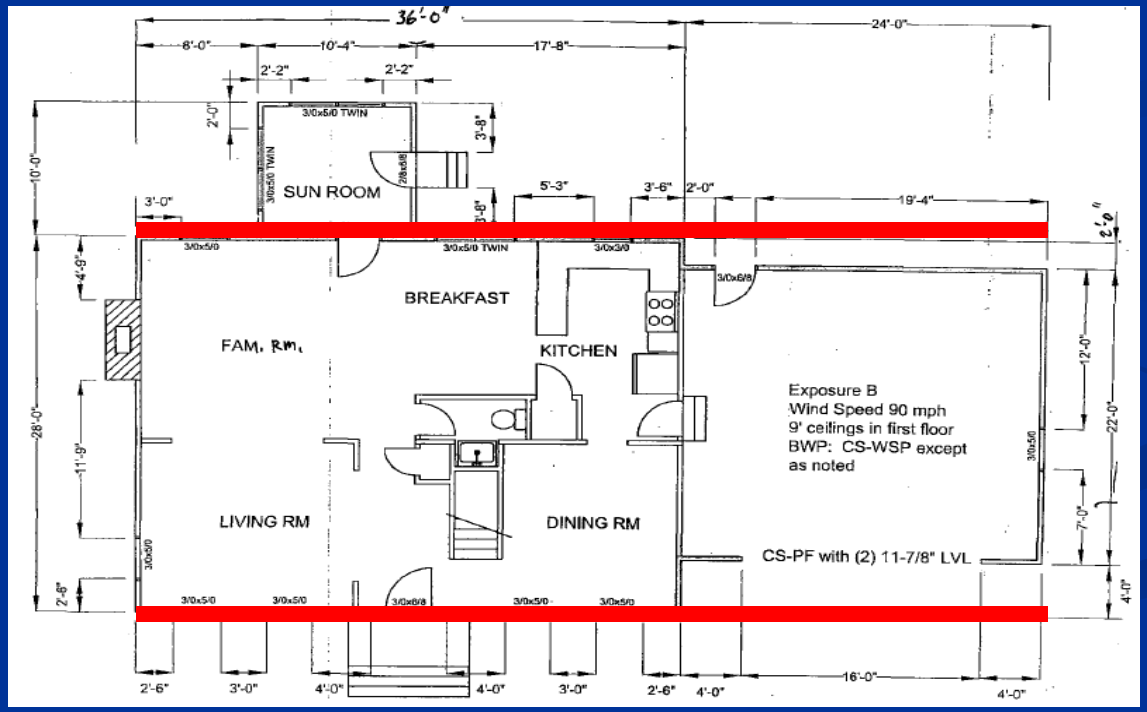
2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

NOW Locate the braced wall lines in E-W direction

What about the offsets in the walls?

10' offset



2' offset

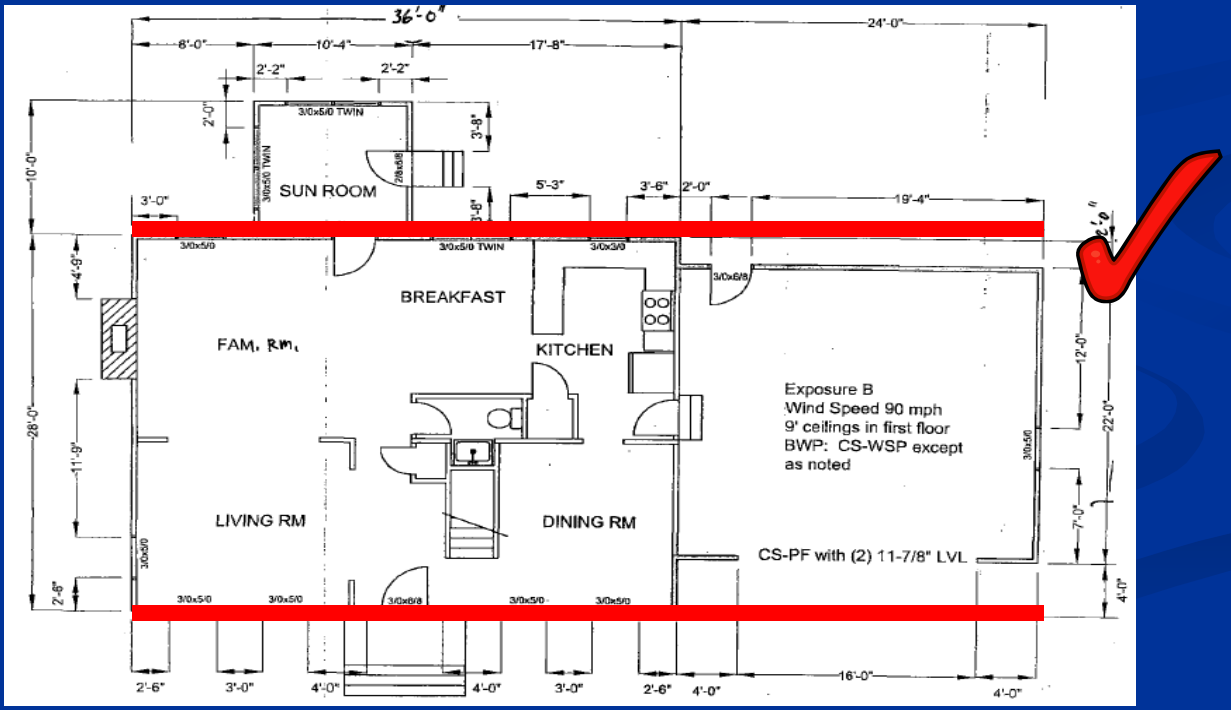
4' offset

2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

NOW Locate the braced wall lines in E-W direction

R602.10.1.2 Offsets along a braced wall line. All exterior walls parallel to a braced wall line shall be permitted to offset up to 4 feet (1219 mm) from the designated braced wall line location as shown Figure R602.10.1.1. Interior walls used as bracing shall be permitted to offset up to 4 feet (1219 mm) from a braced wall line through the interior of the building as shown in Figure R602.10.1.1.

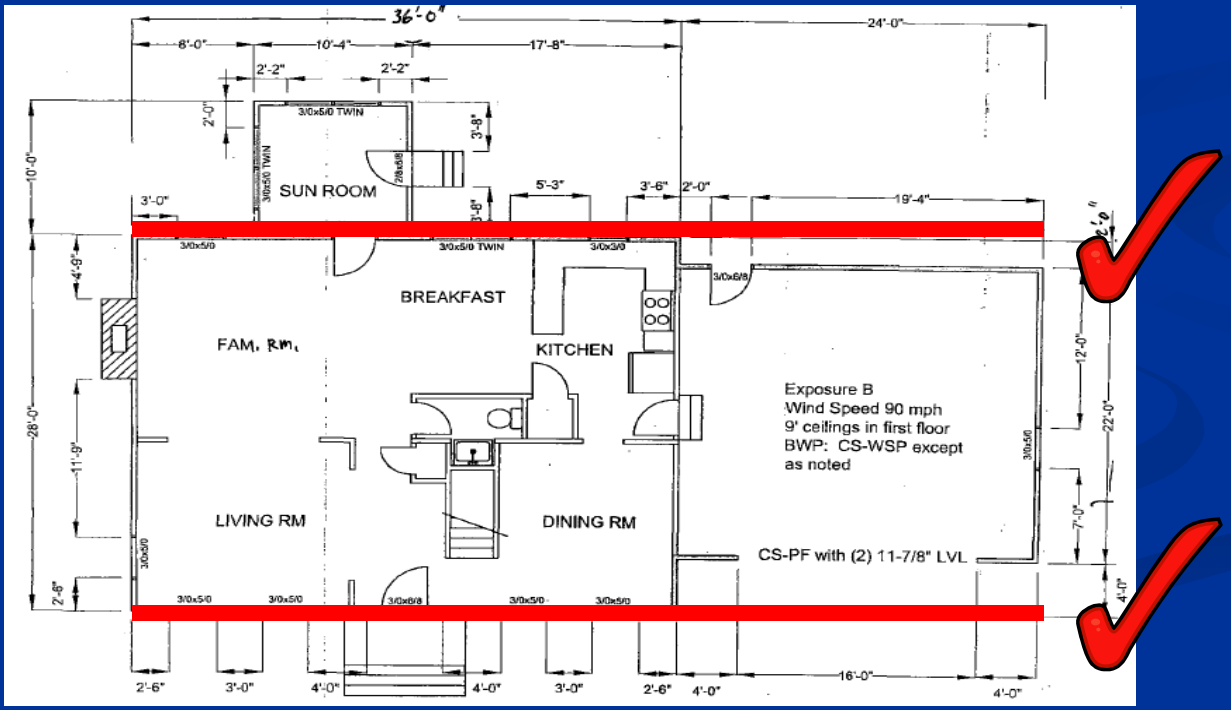


2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

NOW Locate the braced wall lines in E-W direction

R602.10.1.2 Offsets along a braced wall line. All exterior walls parallel to a braced wall line shall be permitted to offset up to 4 feet (1219 mm) from the designated braced wall line location as shown Figure R602.10.1.1. Interior walls used as bracing shall be permitted to offset up to 4 feet (1219 mm) from a braced wall line through the interior of the building as shown in Figure R602.10.1.1.

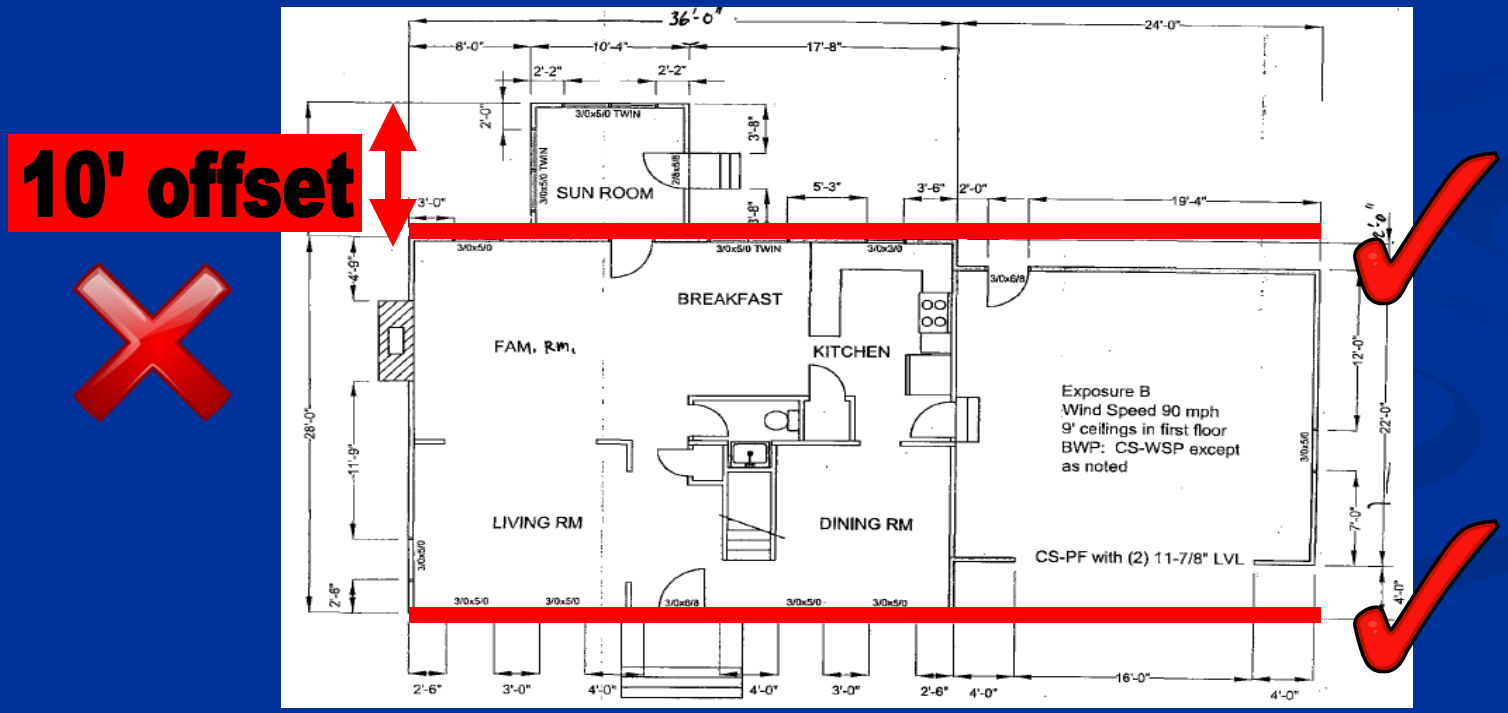


2009 CLASSIC WALL BRACING

R602.10.1.3 SPACING OF BWL

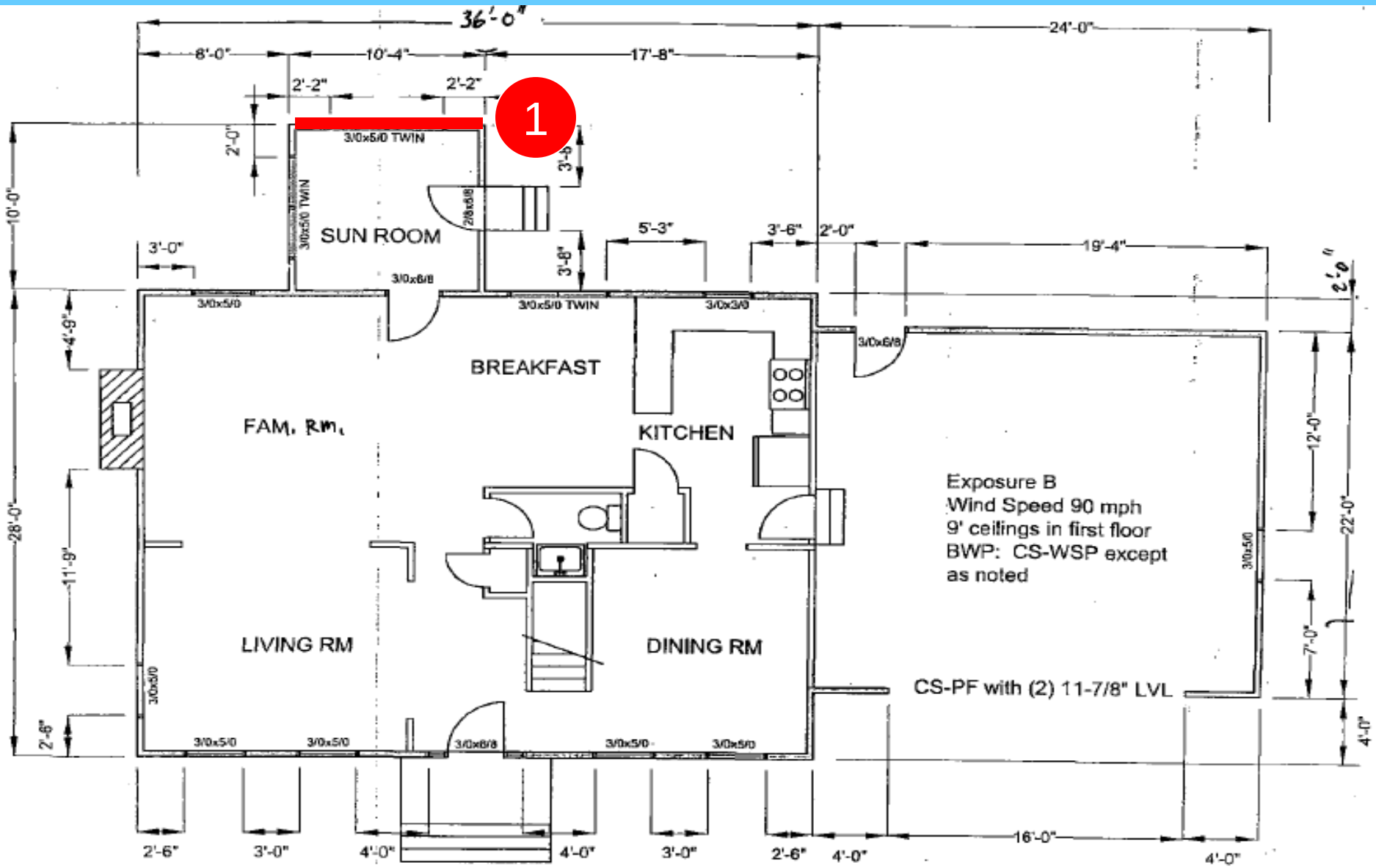
NOW Locate the braced wall lines in E-W direction

10’ Actual Offset > 4’ MAX. Offset. Add another BWL



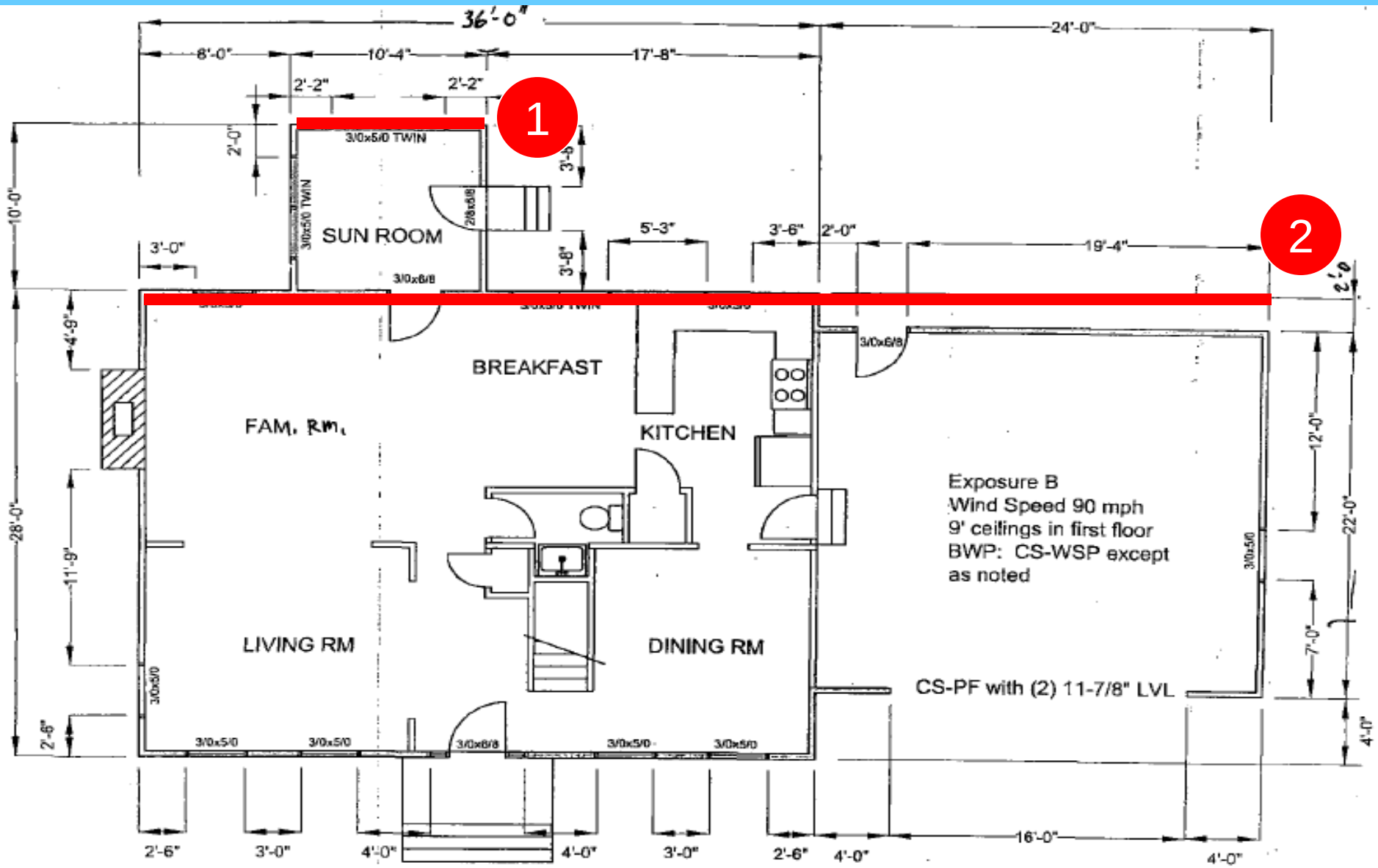
2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



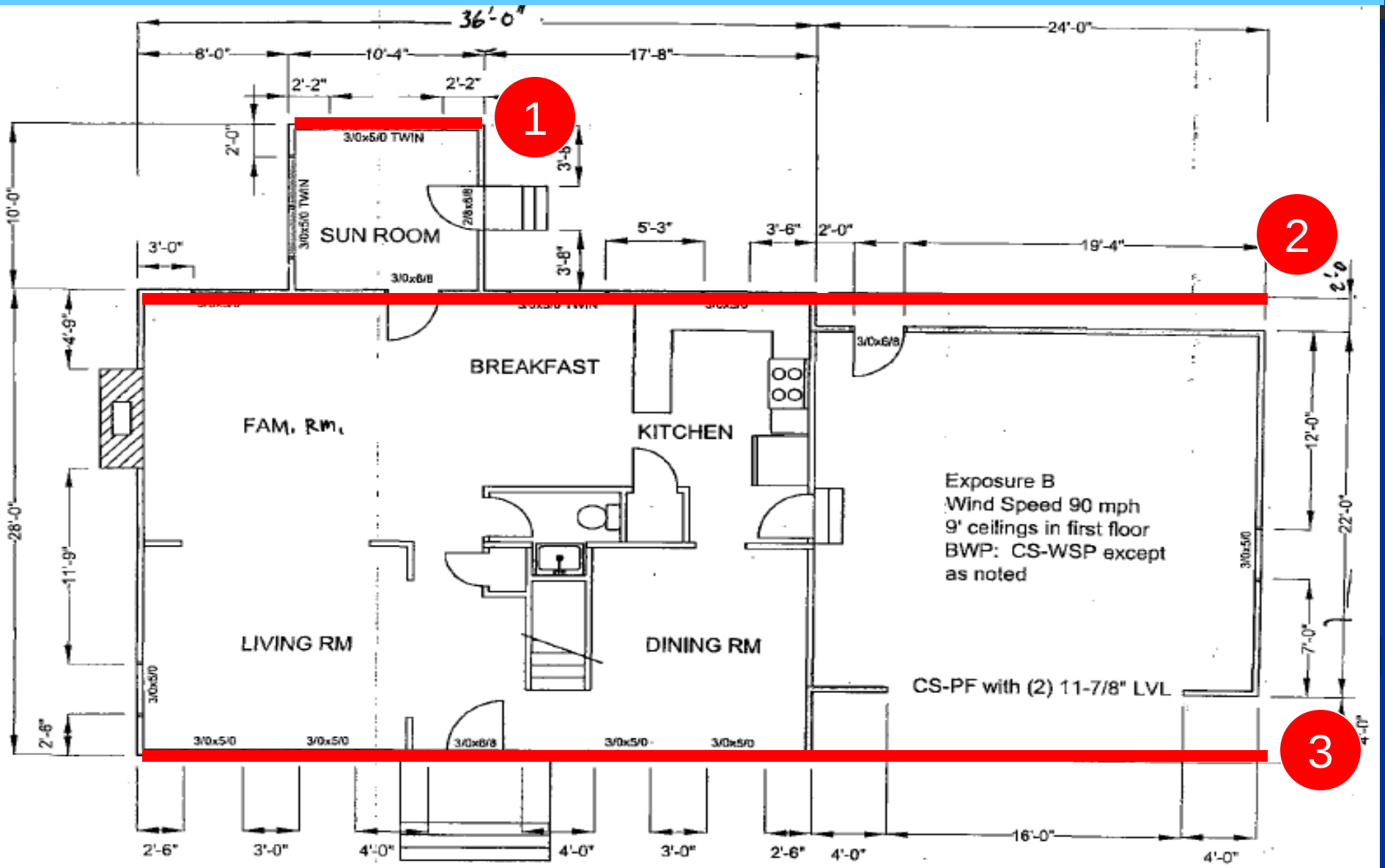
2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



2009 CLASSIC WALL BRACING

R602.10 CLASSIC WALL BRACING



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	A	B	C	D	E	1	2	3
Story→ / Braced wall line criteria↓								
Average spacing to next parallel BWL (ft)								
Tabular required length of bracing (ft)								
Adjust tabular value: Exposure factor (see table)	x	x	x	x	x	x	x	x
Adjust tabular value: Roof eave-to-ridge height factor (see table)	x	x	x	x	x	x	x	x
Adjust tabular value: Wall height factor (see table)	x	x	x	x	x	x	x	x
Adjust tabular value: Number of BWLs factor (in plan direction) 2 BWLs = 1.0, 3 BWLs = 1.3, 4 BWLs = 1.45, ≥ 5 BWLs = 1.6	x	x	x	x	x	x	x	x
Adjust tabular value: Omit interior finish material factor = 1.4	x	x	x	x	x	x	x	x
Adjust tabular value: Interior gypsum board fastener spacing reduced to 4" o.c., factor = 0.7	x	x	x	x	x	x	x	x
Adjusted required length of bracing (ft)→								

Braced Wall Panels on Braced Wall Line	BWP ↓	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)	Method	Contributing length (ft)
Contributing length per Table R602.10.5	1																
Partial credit per Table R602.10.5.2 for intermittent methods only	2		+		+		+		+		+		+		+		+
	3		+		+		+		+		+		+		+		+
	4		+		+		+		+		+		+		+		+
	5		+		+		+		+		+		+		+		+
	6		+		+		+		+		+		+		+		+
	7		+		+		+		+		+		+		+		+
Total contributing length of wall bracing→																	

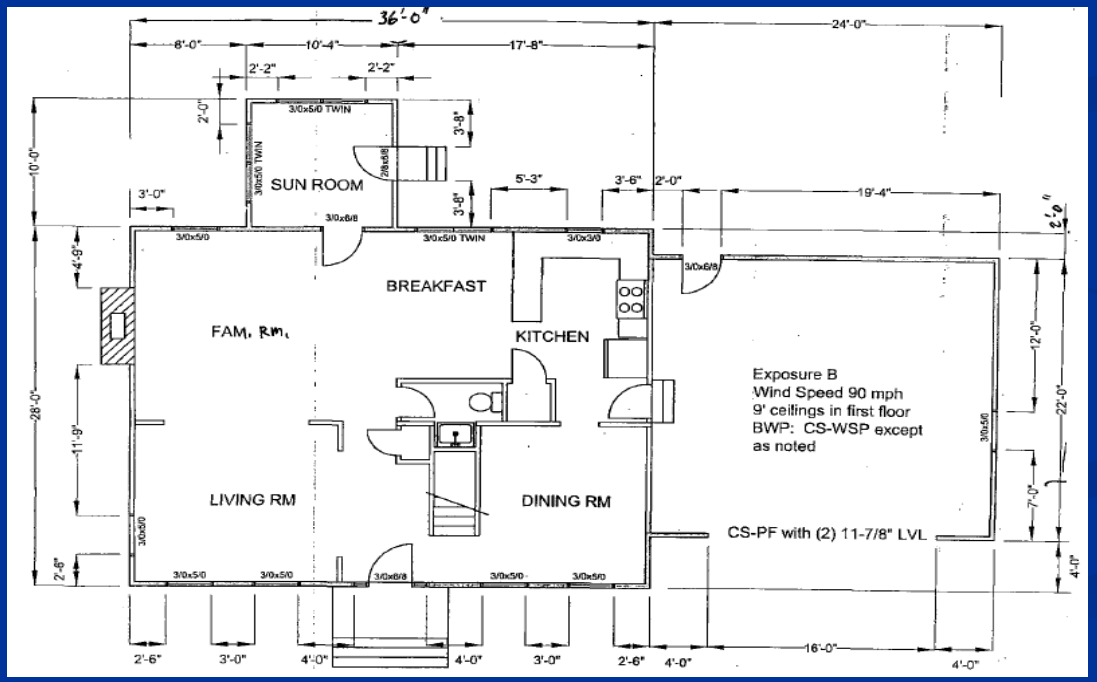
		A	B	C	D	E	1	2	3
Total contributing ≥ adjusted required?		Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
Spacing	BWPs spaced ≤ 20' edge-to-edge	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA	Y - N - NA
No. of BWPs	Length of BWL (ft)								
	BWL has min. 2 BWPs or BWL ≤ 16' has 1-48" BWP	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N	Y - N
BWL ends	BWP at or begins within 10' of end	Y - N Y - N	Y - N Y - N	Y - N Y - N	Y - N Y - N	Y - N Y - N	Y - N Y - N	Y - N Y - N	Y - N Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5	1 2 3 4 5 / 1 2 3 4 5
BWL compliance		Pass Fail	Pass Fail	Pass Fail	Pass Fail	Pass Fail	Pass Fail	Pass Fail	Pass Fail

2009 CLASSIC WALL BRACING

BRACED WALL LINE "A"

The BWLs are established….

Now we can begin to choose the minimum total length of braced wall panels from Table R602.10.3(1).

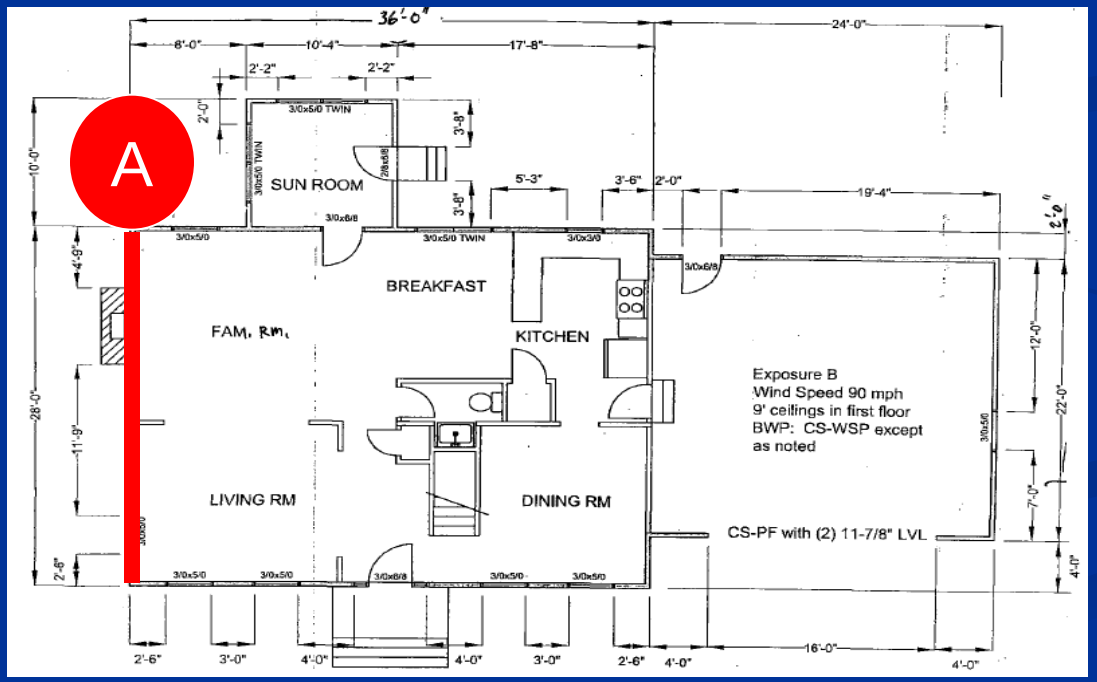


2009 CLASSIC WALL BRACING

BRACED WALL LINE "A"

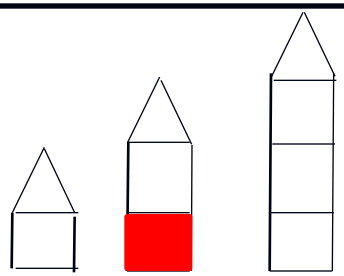
The BWLs are established….

Now we can begin to choose the minimum total length of braced wall panels from Table R602.10.3(1). Let's start with BWL "A"



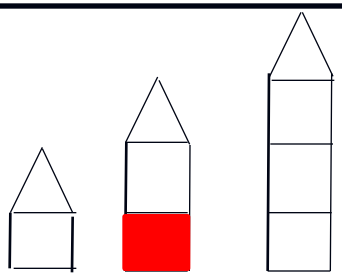
2009 CLASSIC WALL BRACING

BWL "A" COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	
	Roof eave-to ridge height factor	
	Wall height factor	
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

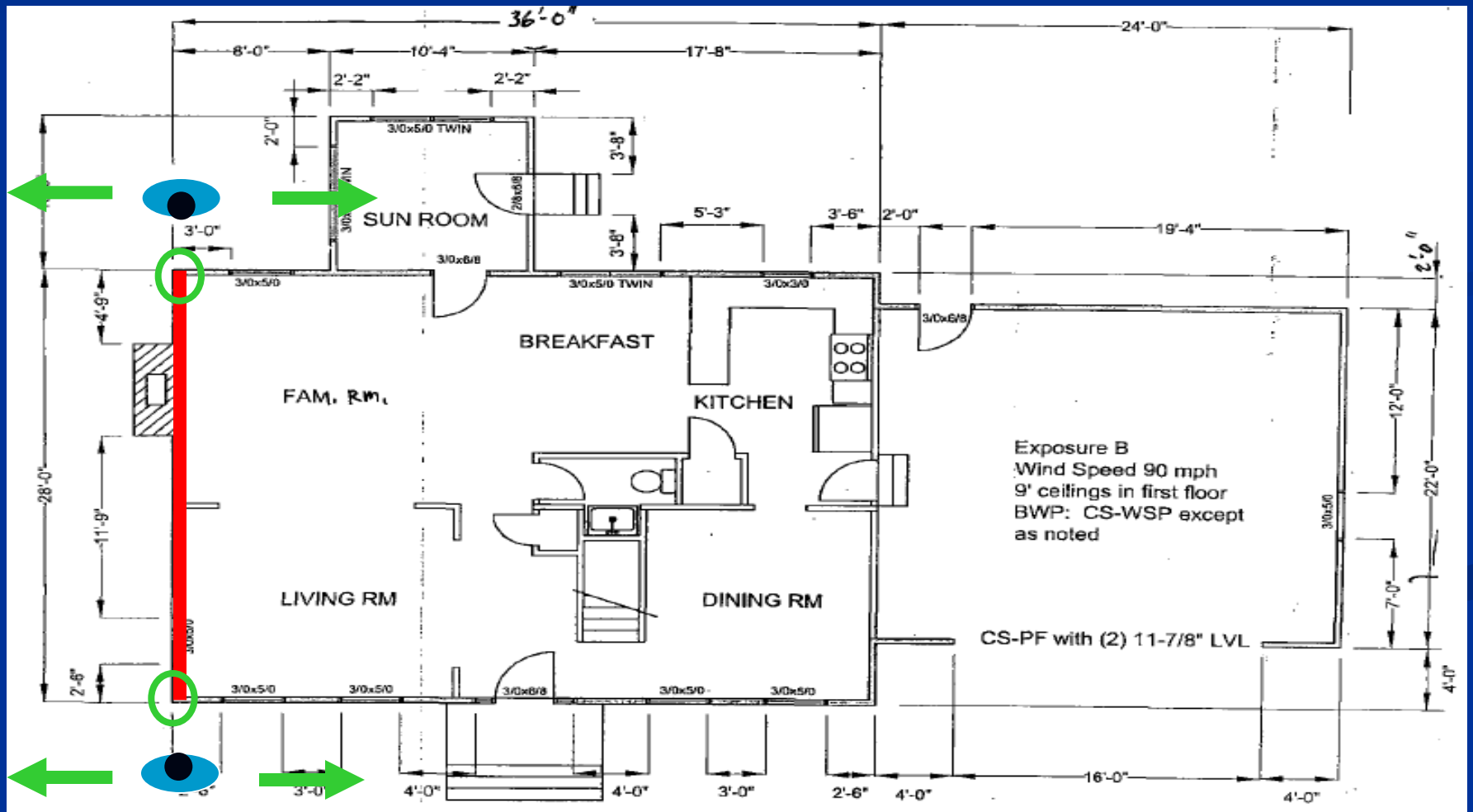
BWL "A" COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	
	Roof eave-to ridge height factor	
	Wall height factor	
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

BWL "A" AVERAGE SPACING

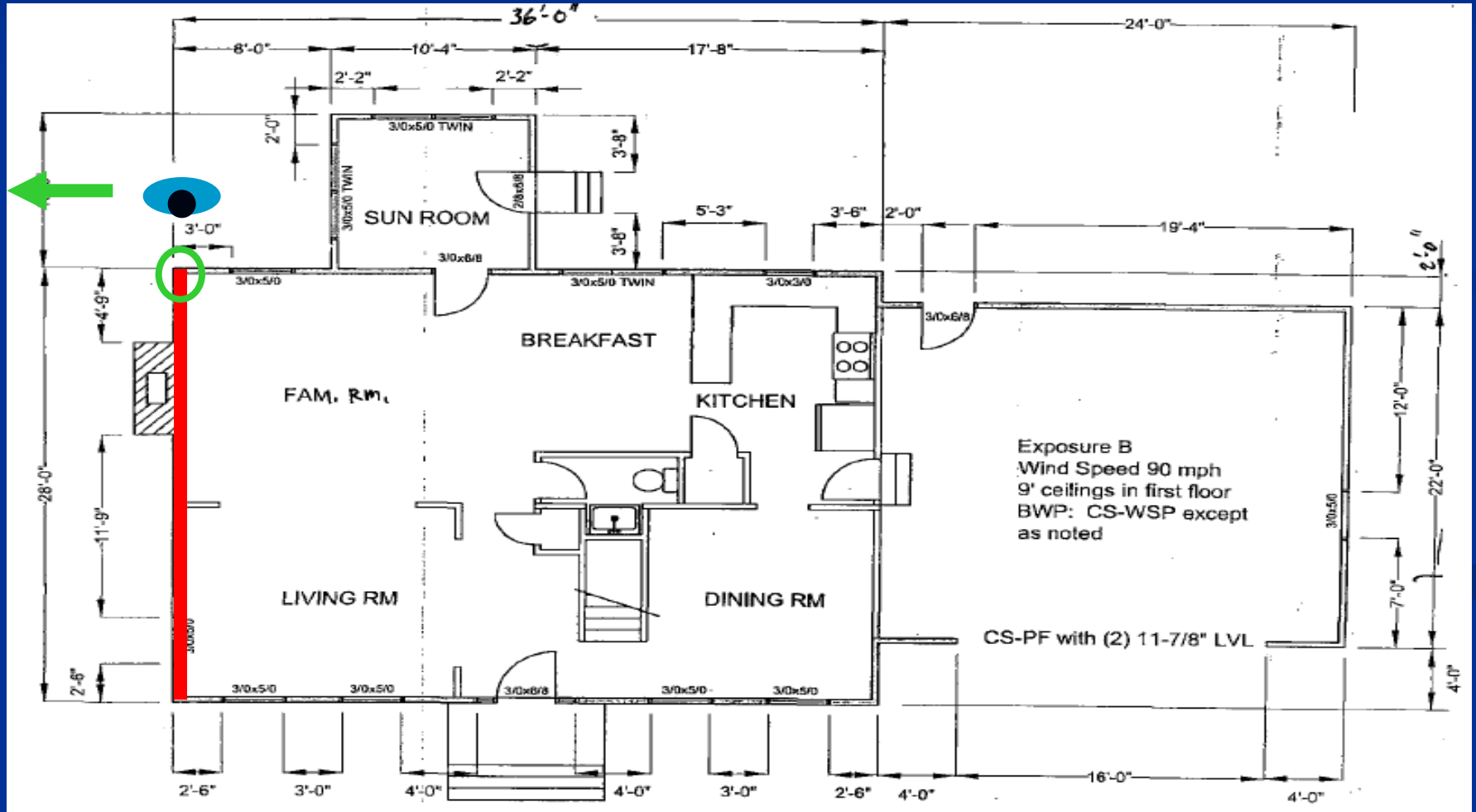
"WHAT OTHER BWLs CAN HELP?"



2009 CLASSIC WALL BRACING

BWL "A" AVERAGE SPACING

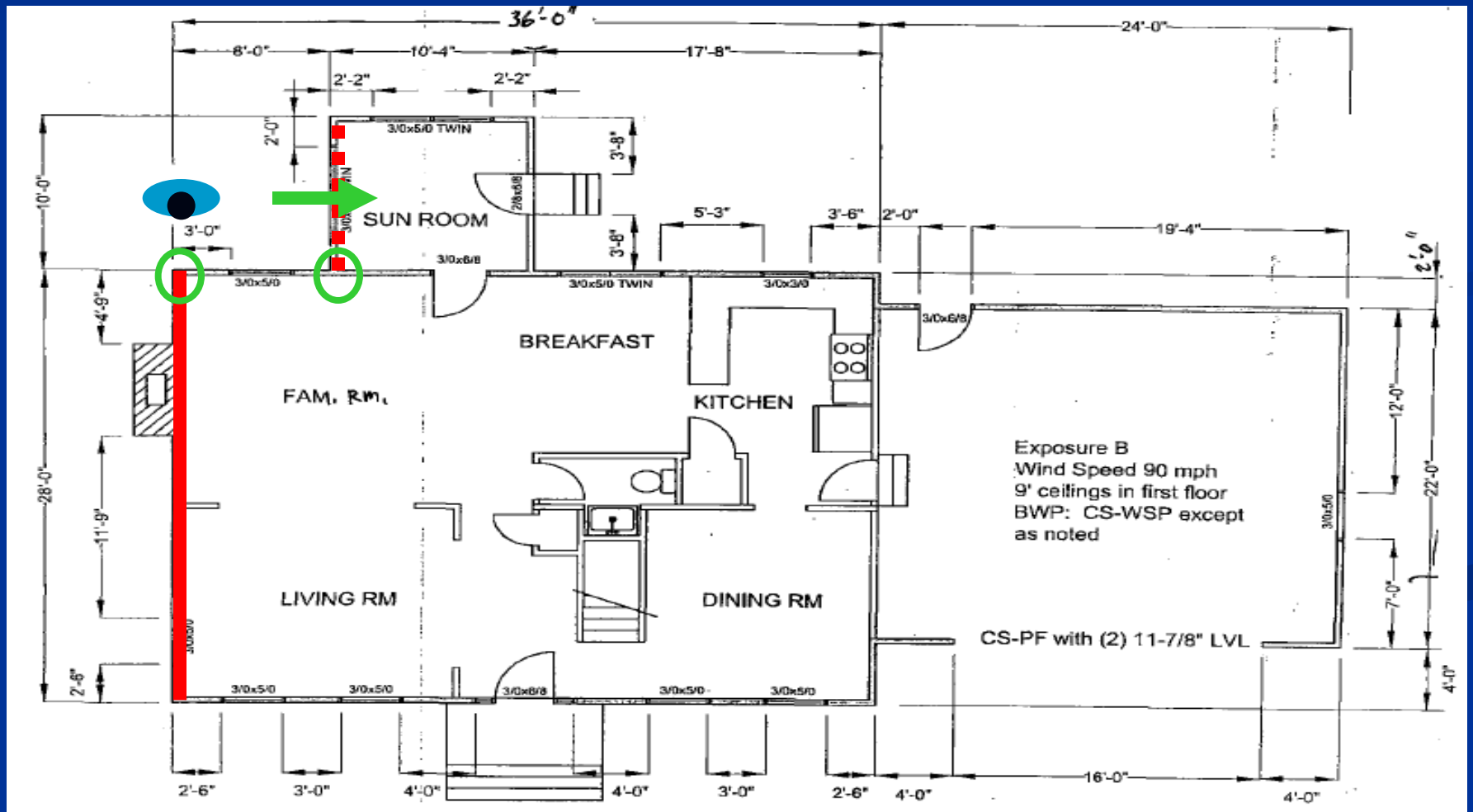
No wall on this side



2009 CLASSIC WALL BRACING

BWL "A" AVERAGE SPACING

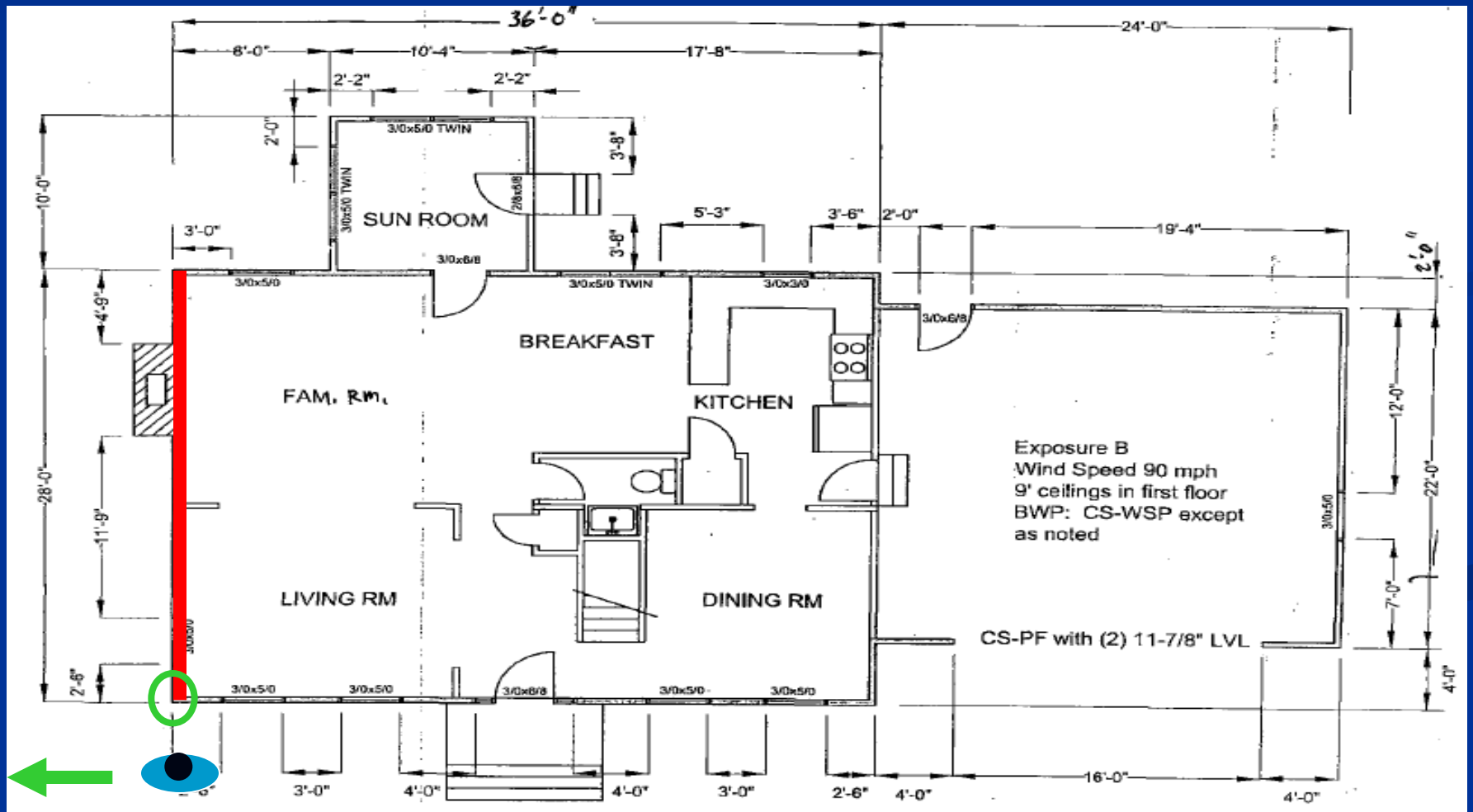
8' to the next braced wall



2009 CLASSIC WALL BRACING

BWL "A" AVERAGE SPACING

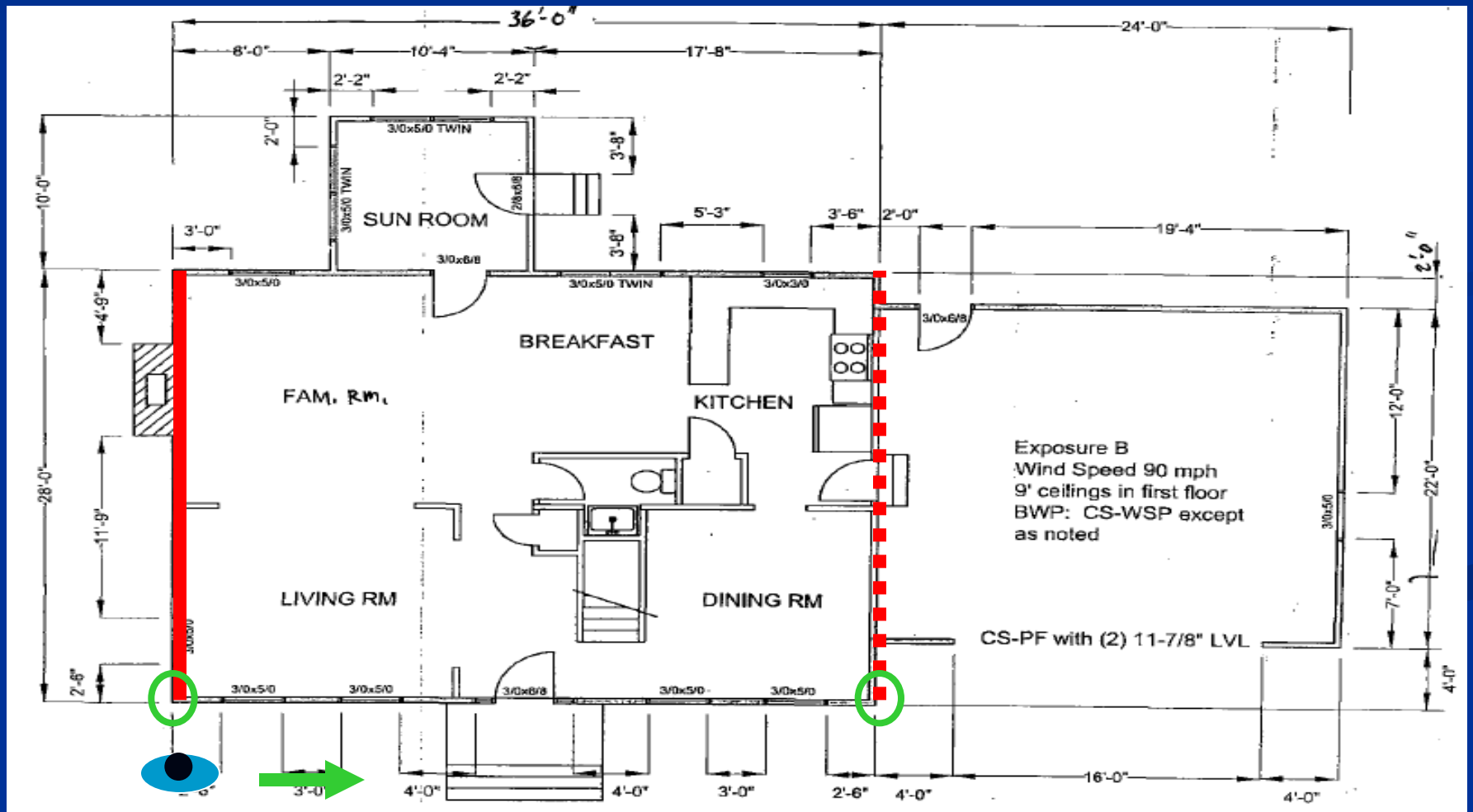
No wall on this side



2009 CLASSIC WALL BRACING

BWL "A" AVERAGE SPACING

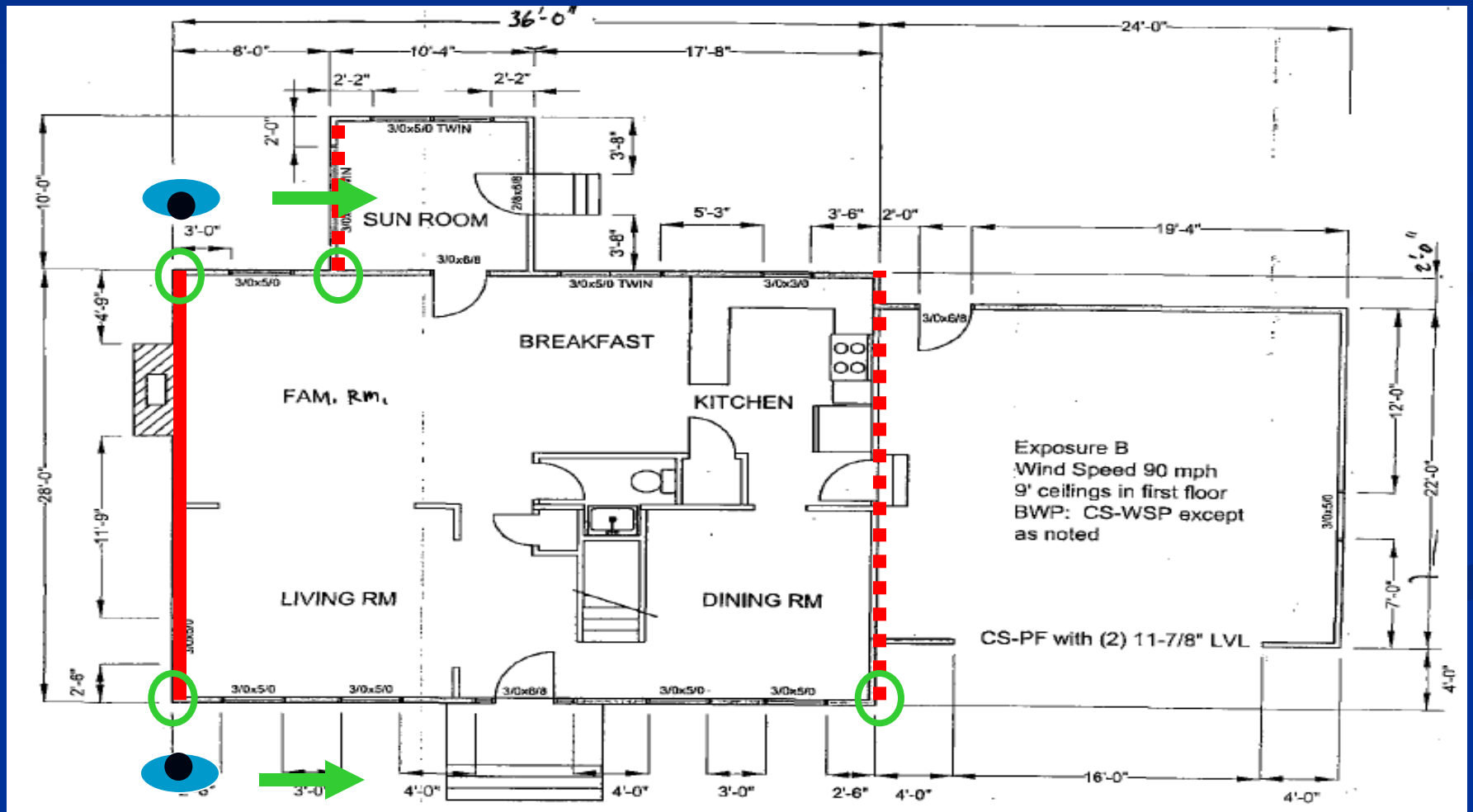
36' to the next braced wall



2009 CLASSIC WALL BRACING

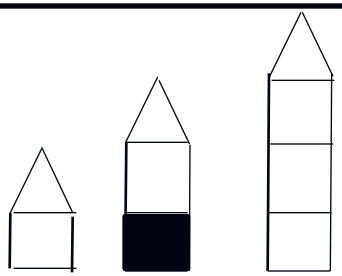
BWL "A" AVERAGE SPACING

(8' + 36') / 2 = 22'



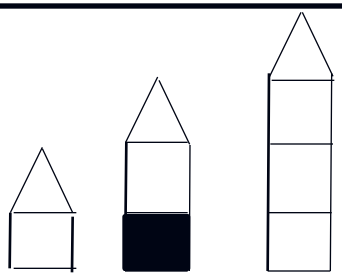
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	
	Roof eave-to ridge height factor	
	Wall height factor	
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

BWL "A" COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22'
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	
	Roof eave-to ridge height factor	
	Wall height factor	
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO CHOOSE

Determine the required length of bracing

R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO CHOOSE

Determine the required length of bracing

Panel length now in feet.
2006 code was a %

NEW

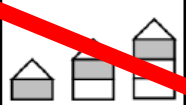
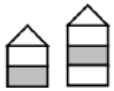
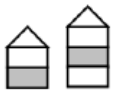
TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF

2009 CLASSIC WALL BRACING

WHATS NEXT?

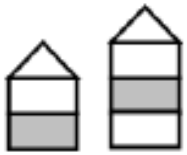
TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 85		10	3.5	3.5	2.0	1.5
		20	6.0	6.0	3.5	[illegible]
		30	8.5	8.5	5.0	4.5
		40	11.5	11.5	6.5	5.5
		50	14.0	14.0	8.0	7.0
		[illegible]	16.5	16.5	9.5	8.0
		10	6.5	[illegible]	3.5	3.0
		20	11.5	11.5	6.5	5.5
		30	[illegible]	16.5	9.5	8.0
		40	[illegible]	21.5	12.5	10.5
		50	26.5	[illegible]	15.0	13.0
		60	31.5	31.5	18.0	15.5
		[illegible]	NP	9.0	5.5	4.5
		20	NP	17.0	[illegible]	8.5
		30	NP	24.5	14.0	12.0
		40	NP	32.0	18.0	15.5
		50	NP	39.0	22.5	[illegible]
		[illegible]	NP	46.5	26.5	22.5
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

MIN. TOTAL LENGTH OF BWP

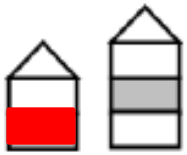
TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

MIN. TOTAL LENGTH OF BWP

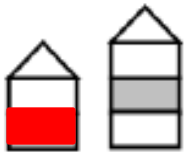
TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

MIN. TOTAL LENGTH OF BWP

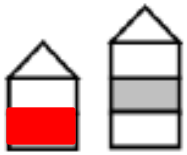
TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

MIN. TOTAL LENGTH OF BWP

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

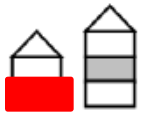
EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

MIN. TOTAL LENGTH OF BWP

6.5’ required for 20’ BWL spacing. 9.0’ required for 30’ BWL spacing. So by interpolation the minimum length of braced wall panel for a 22’ BWL spacing is..

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

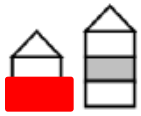
2009 CLASSIC WALL BRACING

INTERPOLATION OF BWP LENGTH

(9.0’ - 6.5’) ÷ (30 – 20) = 2.5’ ÷ 10 = 0.25’

6.5’ + 2(0.25’) = 7.0’

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

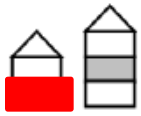
MINIMUM LENGTH OF BRACED WALL PANEL

(9.0’ - 6.5’) ÷ (30 – 20) = 2.5’ ÷ 10 = 0.25’

6.5’ + 2(0.25’) = 7.0’

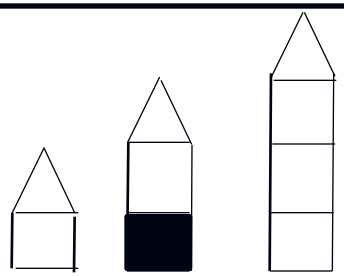
7.0’ is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	A
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	22’
Req’d length of bracing per Table (ft.)	7.0’
Adjust tabular value: Exposure Factor	
Adjust tabular value: Roof eave-to ridge height factor	
Adjust tabular value: Wall height factor	
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
Adjust tabular value: Omit interior finish material factor = 0.7	
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)	

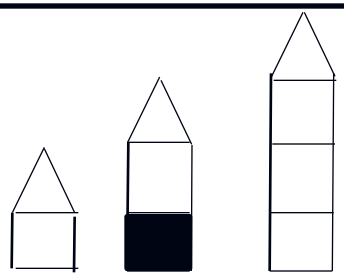
CHOOSE ✓

ADJUST

COMPARE

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	A
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	22’
Req’d length of bracing per Table (ft.)	7.0’
Adjust tabular value: Exposure Factor	
Adjust tabular value: Roof eave-to ridge height factor	
Adjust tabular value: Wall height factor	
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
Adjust tabular value: Omit interior finish material factor = 0.7	
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)	

Now we adjust the table value

CHOOSE

ADJUST

COMPARE

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO ADJUST

Determine the adjustment factors

R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).

TABLE R602.10.3(2)
WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)	APPLICABLE METHODS
Exposure category	One story structure	B	1.00	All methods
		C	1.20	
		D	1.50	
	Two-story structure	B	1.00	
		C	1.30	
		D	1.60	
	Three-story structure	B	1.00	
		C	1.40	
		D	1.70	
Roof eave-to-ridge height	Roof only	≤5 ft	0.70	
		10 ft	1.00	
		15 ft	1.30	
		20 ft	1.60	
	Roof + 1 floor	≤5 ft	0.85	
		10 ft	1.00	
		15 ft	1.15	
		20 ft	1.30	
	Roof + 2 floors	≤5 ft	0.90	
		10 ft	1.00	
		15 ft	1.10	
		20 ft	Not permitted	
Wall height adjustment	Any story	8 ft	0.90	
		9 ft	0.95	
		10 ft	1.00	
		11 ft	1.05	
		12 ft	1.10	
Number of braced wall lines (per plan direction)[c]	Any story	2	1.00	
		3	1.30	
		4	1.45	
		≥5	1.60	
Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c. at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

For SI: 1 foot = 305 mm. 1 pound force = 4.48 N.
a. Linear Interpolation shall be permitted.
b. The total adjustment factor is the product of all applicable adjustment factors.
c. The adjustment factor is permitted to be 1.0 when determing bracing amounts of intermediate braced wall lines provided the bracing amoun on adjacent braced wall lines are based on a spacing and number that neglects the intermediate braced wall line.

Exposure B
Wind Speed 90 mph
9' ceilings in first floor
BWP: CS-WSP except as noted

2009 CLASSIC WALL BRACING

ADJUSTMENT FACTORS

Exposure factor = 1.00

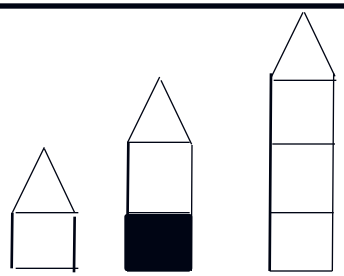
Exposure B
Wind Speed 90 mph
9' ceilings in first floor
BWP: CS-WSP except as noted

TABLE R602.10.3(2)
WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)
Exposure category	One story structure	B	1.00
		C	1.20
		D	1.50
	Two-story structure	B	1.00
		C	1.30
		D	1.60
	Three-story structure	B	1.00
		C	1.40
		D	1.70

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

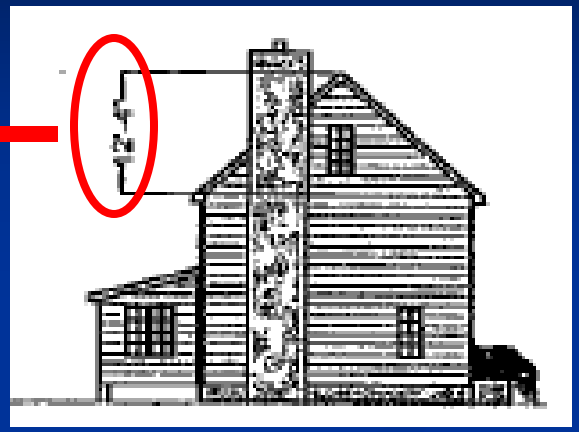
Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	
	Wall height factor	
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

ADJUSTMENT FACTORS

Eave to ridge factor = 1.07

12'-4"



Roof eave-to-ridge height	Roof only	≤5 ft	0.70
		10 ft	1.00
		15 ft	1.30
		20 ft	1.60
	Roof + 1 floor	≤5 ft	0.85
		10 ft	1.00
		15 ft	1.15
		20 ft	1.30
	Roof + 2 floors	≤5 ft	0.90
		10 ft	1.00
		15 ft	1.10
		20 ft	Not permitted

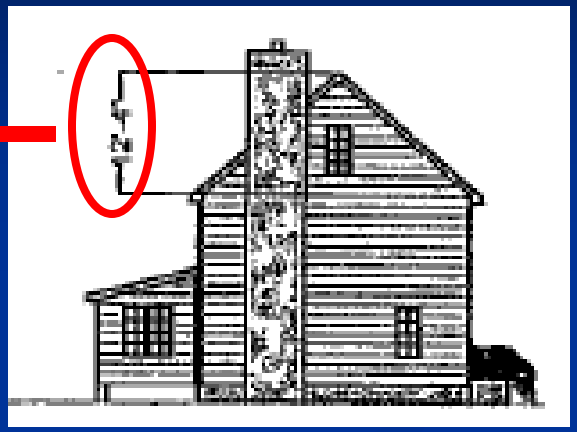
2009 CLASSIC WALL BRACING

ADJUSTMENT FACTORS

Eave to ridge factor = 1.07

By interpolation

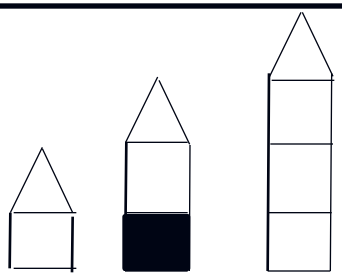
1.00 + 2.33(0.03) = 1.07



Roof eave-to-ridge height	Roof only	≤5 ft	0.70
		10 ft	1.00
		15 ft	1.30
		20 ft	1.60
	Roof + 1 floor	≤5 ft	0.85
		10 ft	1.00
		15 ft	1.15
		20 ft	1.30
	Roof + 2 floors	≤5 ft	0.90
		10 ft	1.00
		15 ft	1.10
		20 ft	Not permitted

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07 ←
	Wall height factor	
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

ADJUSTMENT FACTORS

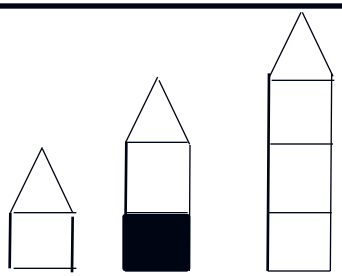
Wall height factor = 0.95

Exposure B
Wind Speed 90 mph
9' ceilings in first floor
BWP: CS-WSP except as noted

Wall height adjustment	Any story	8 ft	0.90
		9 ft	0.95
		10 ft	1.00
		11 ft	1.05
		12 ft	1.10

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

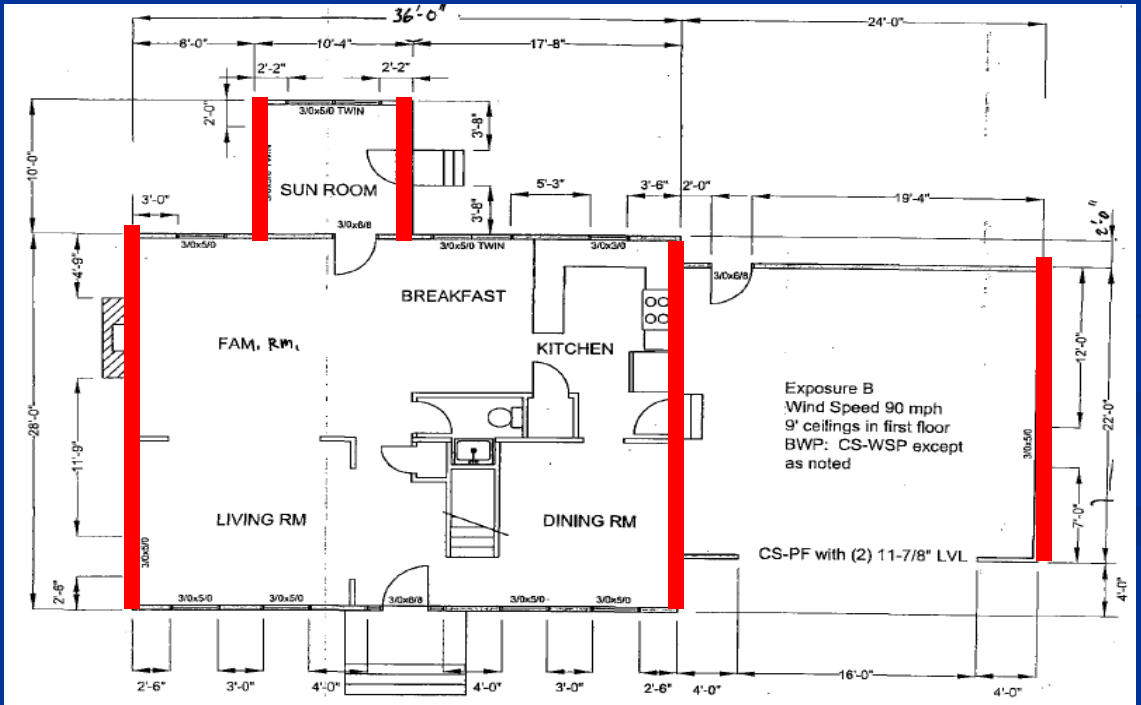
Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

ADJUSTMENT FACTORS

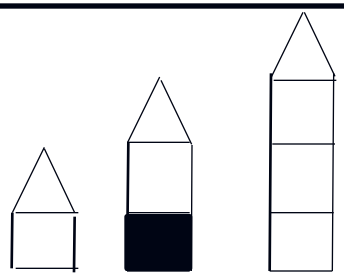
Number of braced wall lines factor = 1.6

Number of braced wall lines (per plan direction)[c]	Any story	2	1.00
		3	1.30
		4	1.45
		≥5	1.60



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

ADDITIONAL ADJUSTMENT FACTORS

By using additional hold-downs, can reduce the required length on the top floor only

Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c. at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

Only applies to top story so this is not shown on our table

2009 CLASSIC WALL BRACING

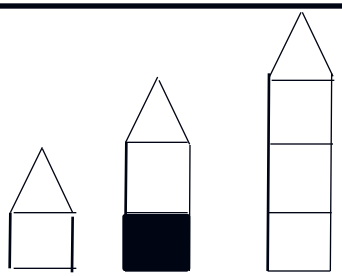
ADDITIONAL ADJUSTMENT FACTORS

Garage situation, can omit interior gyp. Board requirement if willing to increase the required length of wall bracing.

Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c. at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

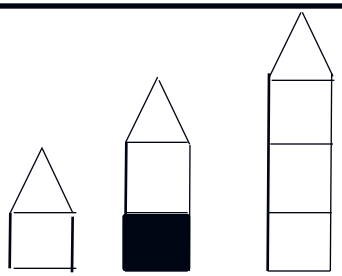
ADDITIONAL ADJUSTMENT FACTORS

By reducing the fastener spacing, can reduce the required length of gyp. board wall bracing

Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c. at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0 ←
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

PLEASE MAKE IT GO AWAY

Multiply the required minimum total length of braced wall panels from Table R602.10.3(1) by all the adjustment factors

R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).

ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)

2009 CLASSIC WALL BRACING

PLEASE MAKE IT GO AWAY

Multiply the required minimum total length of braced wall panels from Table R602.10.3(1) by all the adjustment factors

R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

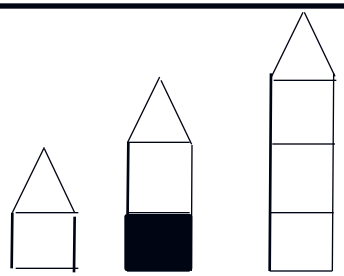
1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).

ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)

7.0’ x 1.0 x 1.07 x 0.95 x 1.6 = 11.4’

2009 CLASSIC WALL BRACING

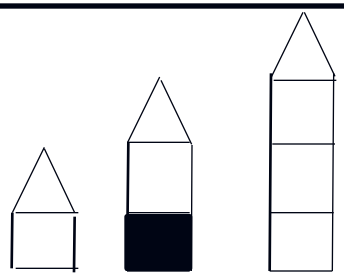
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	A
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	22’
Req’d length of bracing per Table (ft.)	7.0’
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	1.07
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)	11.4’ ←

11.4’ is the total required length of wall bracing

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		A
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		22’
Req’d length of bracing per Table (ft.)		7.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		11.4’ ←

11.4’ is the total required length of wall bracing

CHOOSE ✓

ADJUST ✓

COMPARE

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	A

Braced wall panels on BWL	BWP	Method	Contributing length (ft.)
Contributing length per Table R602.10.5 Partial credit per Table R602.10.52 for intermittent methods only	1		
	2		
	3		
	4		
	5		
	6		
	7		
Total contributing length of wall bracing →			

Now we compare to what we actually have available

CHOOSE

ADJUST

COMPARE

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

Use Table R602.10.5 to determine the minimum length of braced wall panel that can be used.

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)		MINIMUM LENGTH[a] (in) Wall Height 8 ft	9 ft	10 ft	11 ft	12 ft	CONTRIBUTING LENGTH (in)
DWG, WSP, SFB, PBS, PCP, HPS		48	48	48	53	58	Actual[b]
GB		48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB		55	62	69	NP	NP	Actual[b]
ABW		28	32	34	38	42	48
PFH	Supporting roof only	16	16	16	18[c]	20[c]	48
	Supporting one story and roof	24	24	24	27[c]	29[c]	48
PFG		24	27	30	33[c]	36[c]	1.5 x Actual[b]
CS-G		24	27	30	33	36	Actual[b]
CS-PF		16	18	20	22[c]	24[c]	Actual[b]
CS-WSP, CS-SFB	Adjacent opening vertical dimension (in)						
	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

Exposure B
Wind Speed 90 mph
9' ceilings in first floor
BWP: CS-WSP except
as noted

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

For a 9’ CS-WSP wall the minimum length of braced wall panel that can contribute is 48”.

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)	MINIMUM LENGTH[a] (in) Wall Height					CONTRIBUTING LENGTH (in)
	8 ft	9 ft	10 ft	11 ft	12 ft	
DWG, WSP, SFB, PBS, PCP, HPS	48	48	48	53	58	Actual[b]
GB	48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB	55	62	69	NP	NP	Actual[b]
ABW	28	32	34	38	42	48

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

At openings, the min. length of braced wall panel that can be used depends on the opening size.

	Adjacent opening vertical dimension (in)						
CS-WSP, CS-SFB	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

BWL ‘A’ : At the 5’-0” window, the minimum length of wall bracing allowed to contribute is 27”

	Adjacent opening vertical dimension (in)						
CS-WSP, CS-SFB	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

2009 CLASSIC WALL BRACING

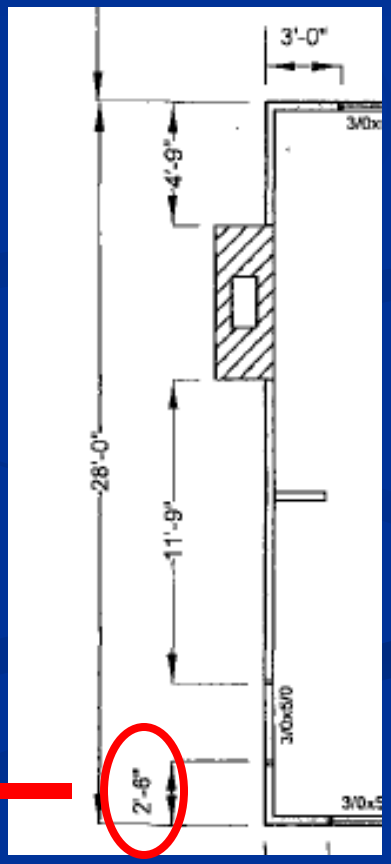
WHATS NEXT? WE HAVE TO COMPARE

Use Table R602.10.5 to determine the minimum length of braced wall panel that can be used.

27" minimum required.

2'- 6" - 1" rough opening =

2'- 5" = 29" ✓



2'-6"

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	A

		BWP	Method	Contributing length
Braced wall panels on BWL	Contributing length per Table R602.10.5 Partial credit per Table R602.10.52 for intermittent methods only	1	CS-WSP	29”
		2		
		3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

BWL ‘A’ : At the fireplace, the minimum length of wall bracing allowed to contribute is 54”

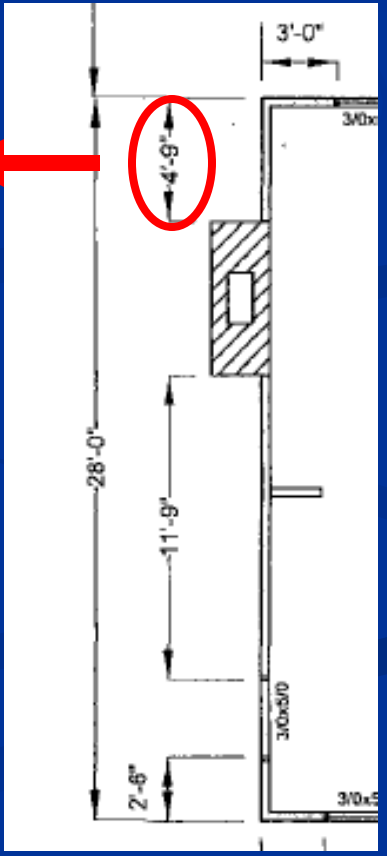
	Adjacent opening vertical dimension (in)						
	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
CS-WSP, CS-SFB	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

Use Table R602.10.5 to determine the minimum length of braced wall panel that can be used.

4'-9"



54" minimum required.

4 - 9" - 2" comb. material offset =

4'- 7" = 55" ✓

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	A

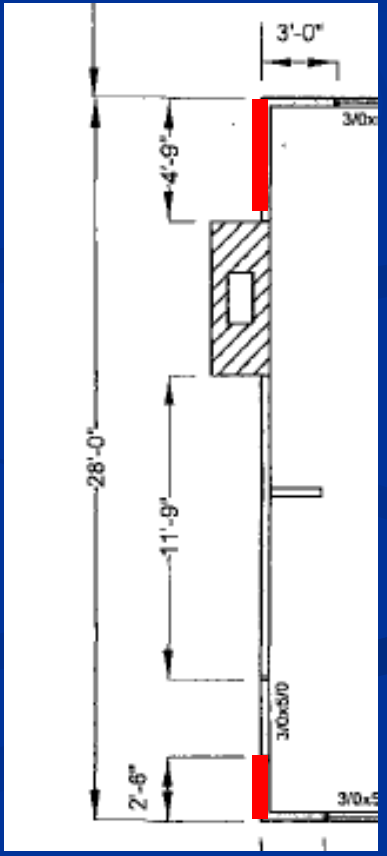
Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	29”
		2	CS-WSP	55”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing ⟶				

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

BWL ‘A’: We have a 29” panel at one end and a 55” panel at the other end.

Does this work?



55"

29"

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

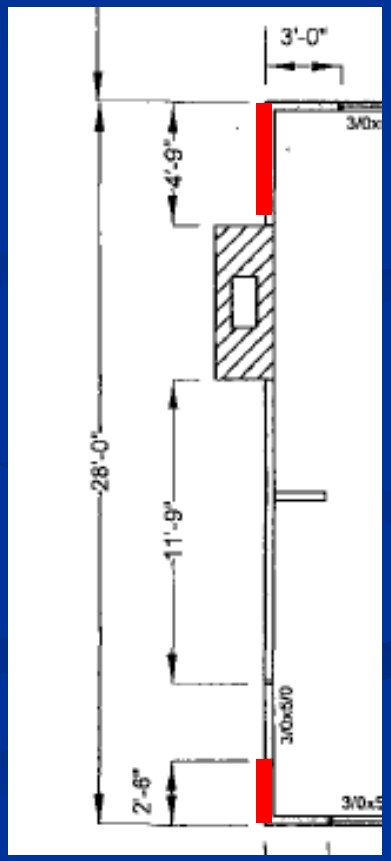
BWL ‘A’: We have a 29” panel at one end and a 55” panel at the other end.

Does this work?

11.4' is the total required length of wall bracing

29" + 55" = 84" = 7' - 0"

7’-0” < 11.4’
Need another panel



55"

29"

2009 CLASSIC WALL BRACING

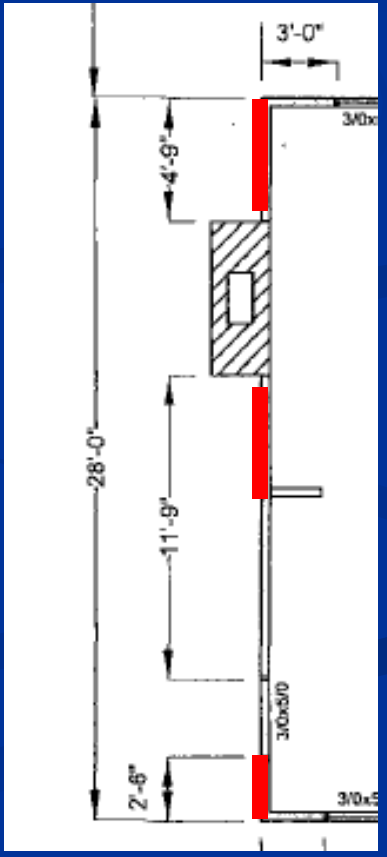
WHATS NEXT? WE HAVE TO COMPARE

BWL ‘A’: We need an additional 4’-5” panel to meet the minimum requirements.

Assuming studs are spaced 16” o.c.
Use a 5’-4”panel opposite fireplace

29" + 64" + 55" = 148"

148” = 12.33’ > 11.4’ ✓



55"

64"

29"

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	A

Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	29”
		2	CS-WSP	55”
	Partial credit per Table R602.10.52 for intermittent methods only	3	CS-WSP	64”
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				148” (12.33’)

2009 CLASSIC WALL BRACING

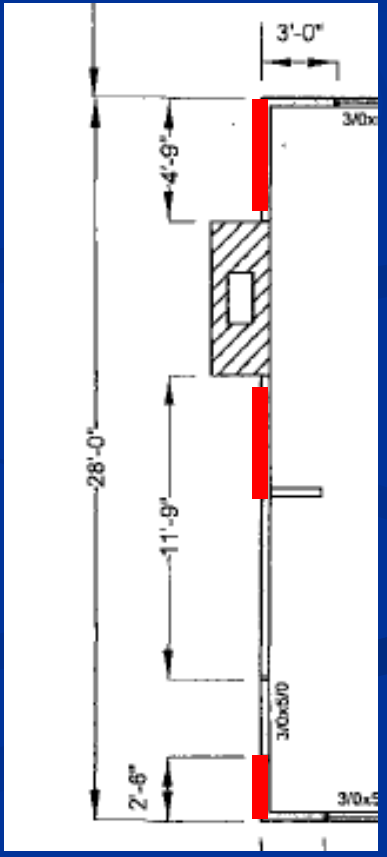
ARE WE DONE?

148” = 12.33’ > 11.4’

CHOOSE ✓

ADJUST ✓

COMPARE ✓



55"

64"

29"

2009 CLASSIC WALL BRACING

ARE WE DONE?

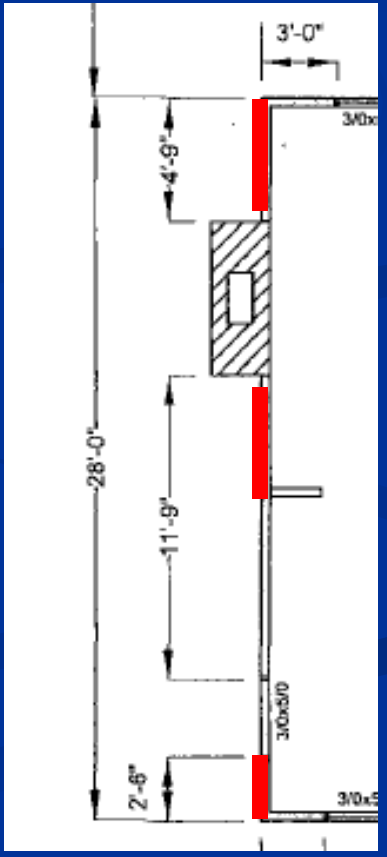
148” = 12.33’ > 11.4’

CHOOSE ✓

ADJUST ✓

COMPARE ✓

ARE WE DONE?



55"

64"

29"

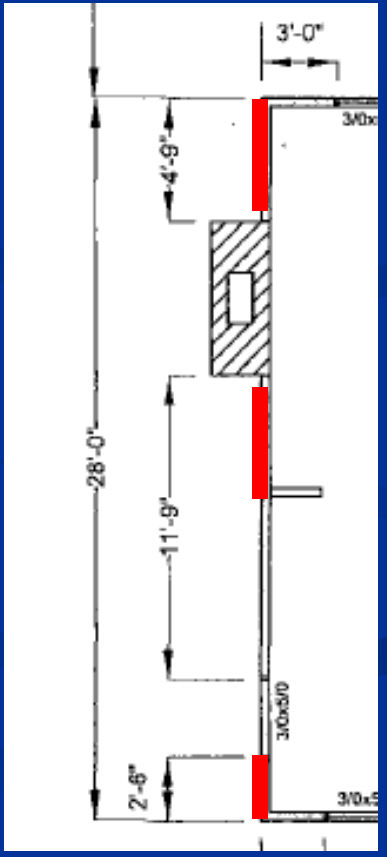
2009 CLASSIC WALL BRACING

FINAL CHECK

BWL 'A': Final check…..We need to verify the BWP spacing, min. number of panels & end conditions

Braced wall line ID	A

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)		
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y - N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL



55"

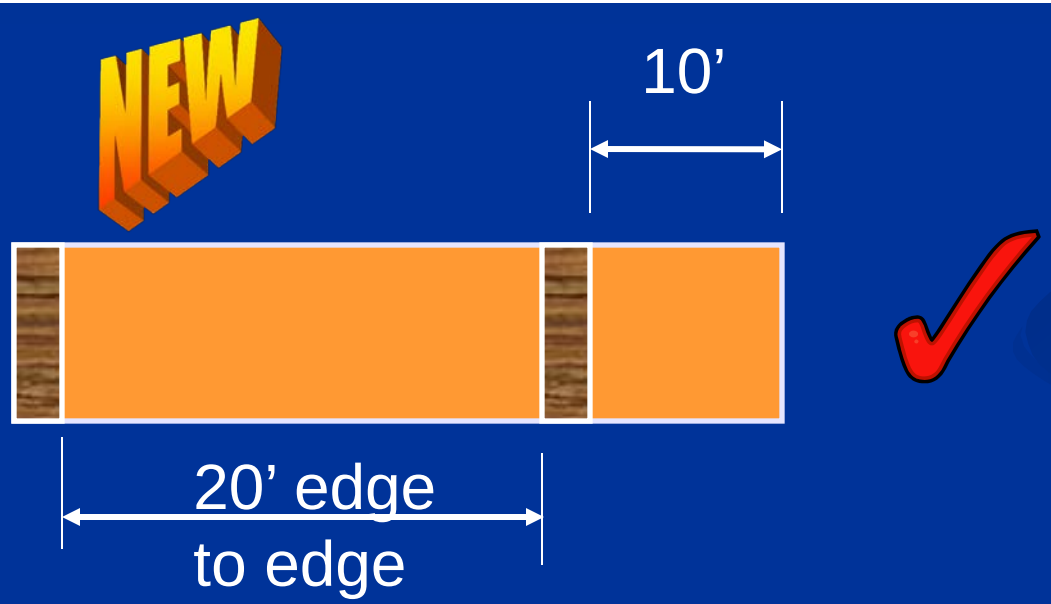
64"

29"

2009 CLASSIC WALL BRACING

R602.10.2.2 Locations of braced wall panels

R602.10.2.2 Locations of braced wall panels. A braced wall panel shall begin within 10 feet (3810 mm) from each end of a braced wall line as determined in accordance with Section R602.10.1.1. The distance between adjacent edges of braced wall panels along a braced wall line shall be no greater than 20 feet (6096 mm) as shown in Figure R602.10.2.2.



2006 code allowed 25’ center to center and 12.5’ from the end of braced wall line

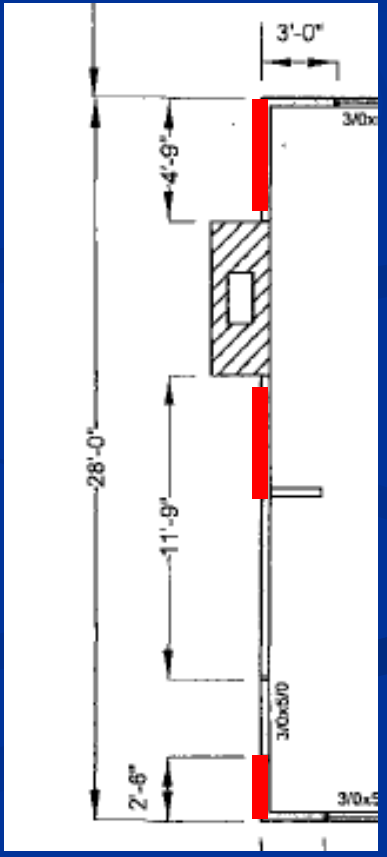
2009 CLASSIC WALL BRACING

FINAL CHECK

BWL 'A': Final check…..We need to verify the BWP spacing, min. number of panels & end conditions

Braced wall line ID	A

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)		
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL



55"

64"

29"

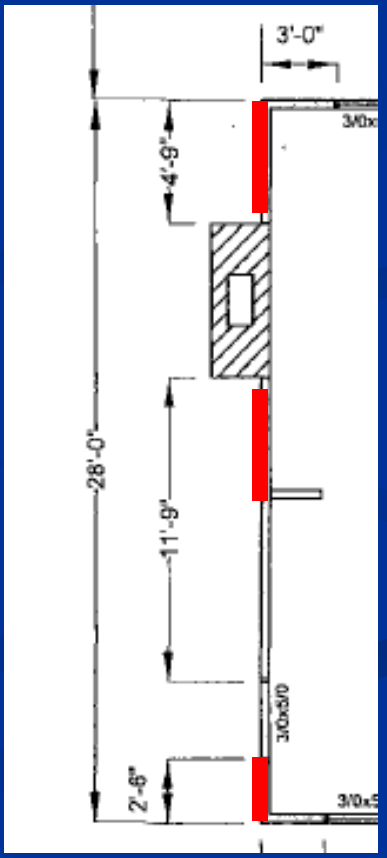
2009 CLASSIC WALL BRACING

BWL 'A' FINAL CHECK

R602.10.2.3 Minimum number of braced wall panels. Braced wall lines with a length of 16 feet (4877 mm) or less shall have a minimum of two braced wall panels of any length or one braced wall panel equal to 48 inches (1219 mm) or more. Braced wall lines greater than 16 feet (4877 mm) shall have a minimum of two braced wall panels.

Braced wall line ID	A

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	28'	
# BWPs	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
BWL ends	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL



55"

64"

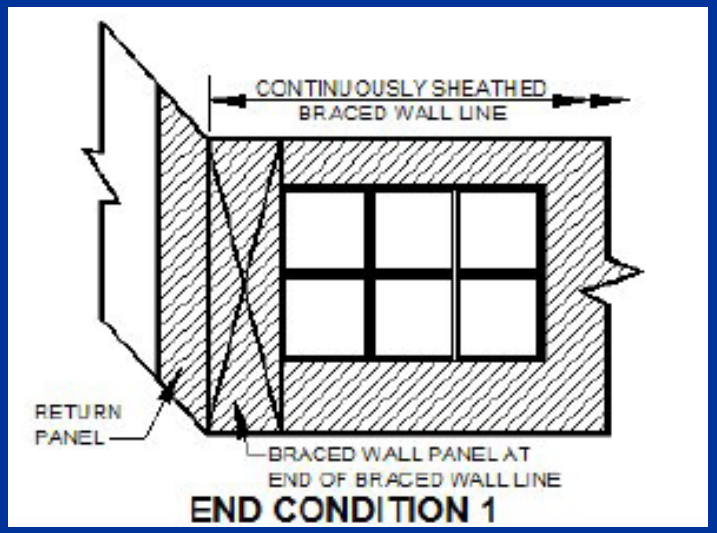
29"

2009 CLASSIC WALL BRACING

R602.10.2.3 ENDS OF BRACED WALL LINES

R602.10.7 Ends of braced wall lines with continuous sheathing. Each end of a braced wall line with continuous sheathing shall be in accordance with one of the end conditions shown in Figure R602.10.7.

BWL 'A' is continuously sheathed, we need to check the end conditions



REQUIREMENTS

Return panel: 24" for braced wall lines sheathed with wood structural panels
32" for braced wall lines sheathed with structural fiberboard

We fall under end condition 1 & meet the return panel requirements (one end could be end condition 3)

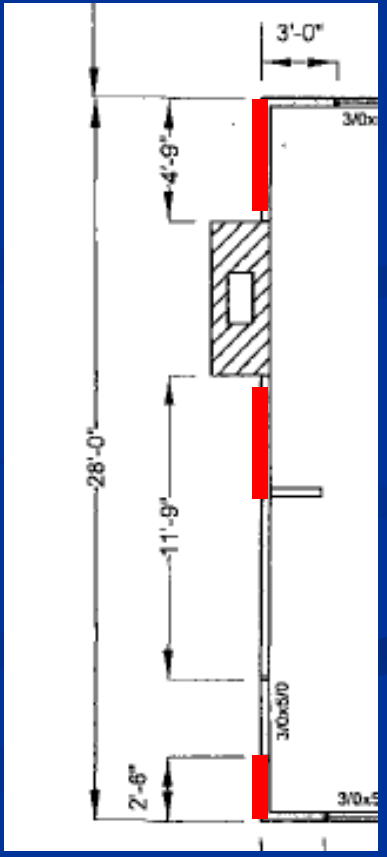
2009 CLASSIC WALL BRACING

BWL 'A' FINAL CHECK

R602.10.7 Ends of braced wall lines with continuous sheathing. Each end of a braced wall line with continuous sheathing shall be in accordance with one of the end conditions shown in Figure R602.10.7.

Braced wall line ID	A

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	28'	
# BWPs	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
BWL ends	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL



55"

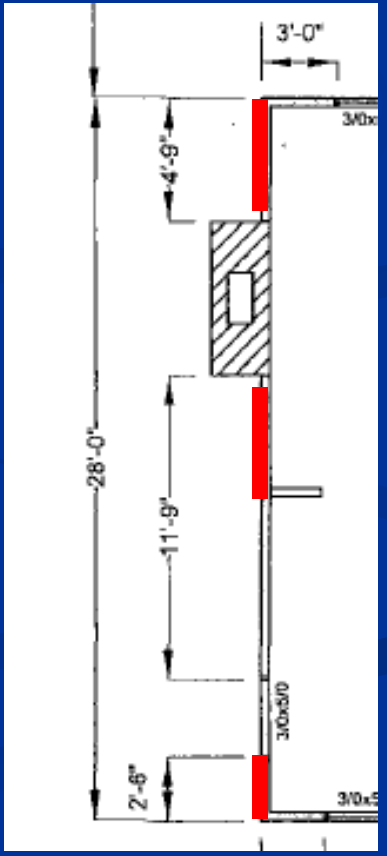
64"

29"

2009 CLASSIC WALL BRACING

R602.10.2.3 MINIMUM NUMBER OF BWP

BWL ‘A’ PASSED ✓



55"

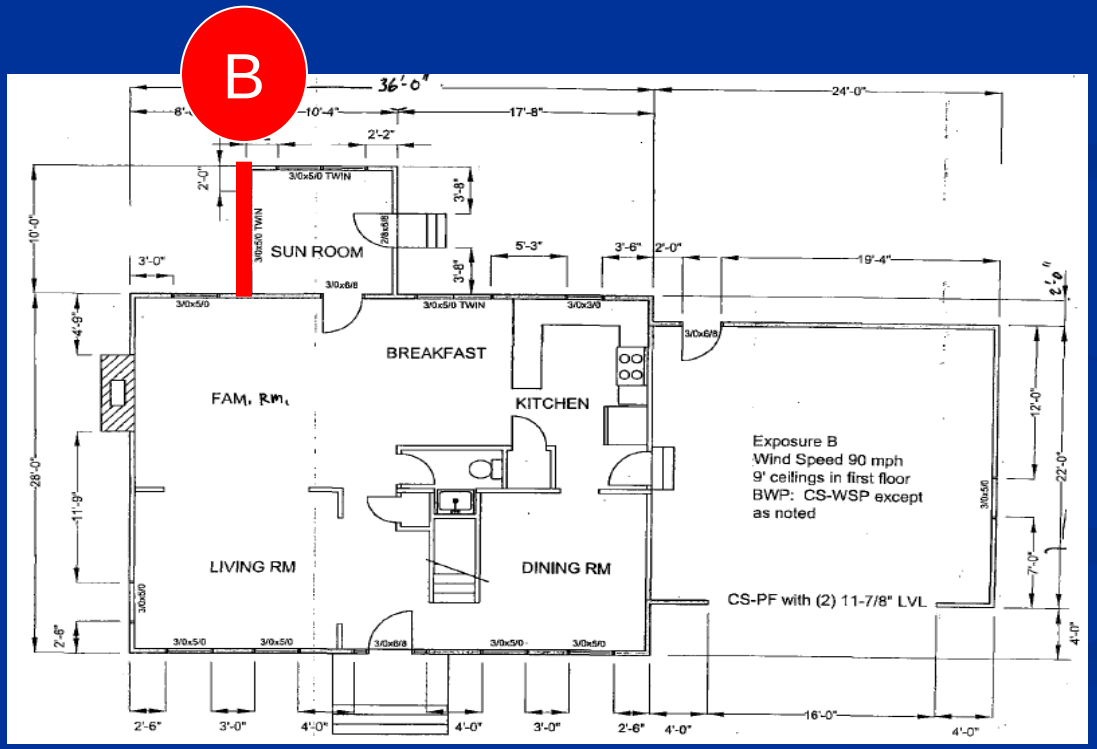
64"

29"

2009 CLASSIC WALL BRACING

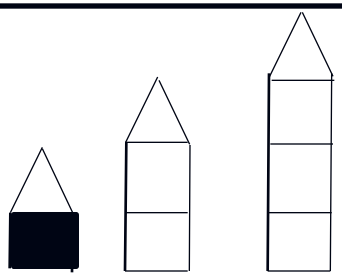
BRACED WALL LINE ‘B’

Let’s try BWL ‘B’ as a group



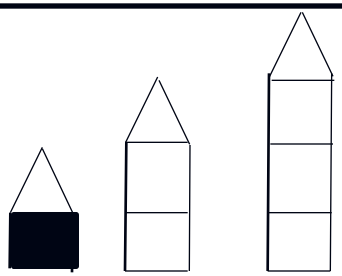
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		B
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

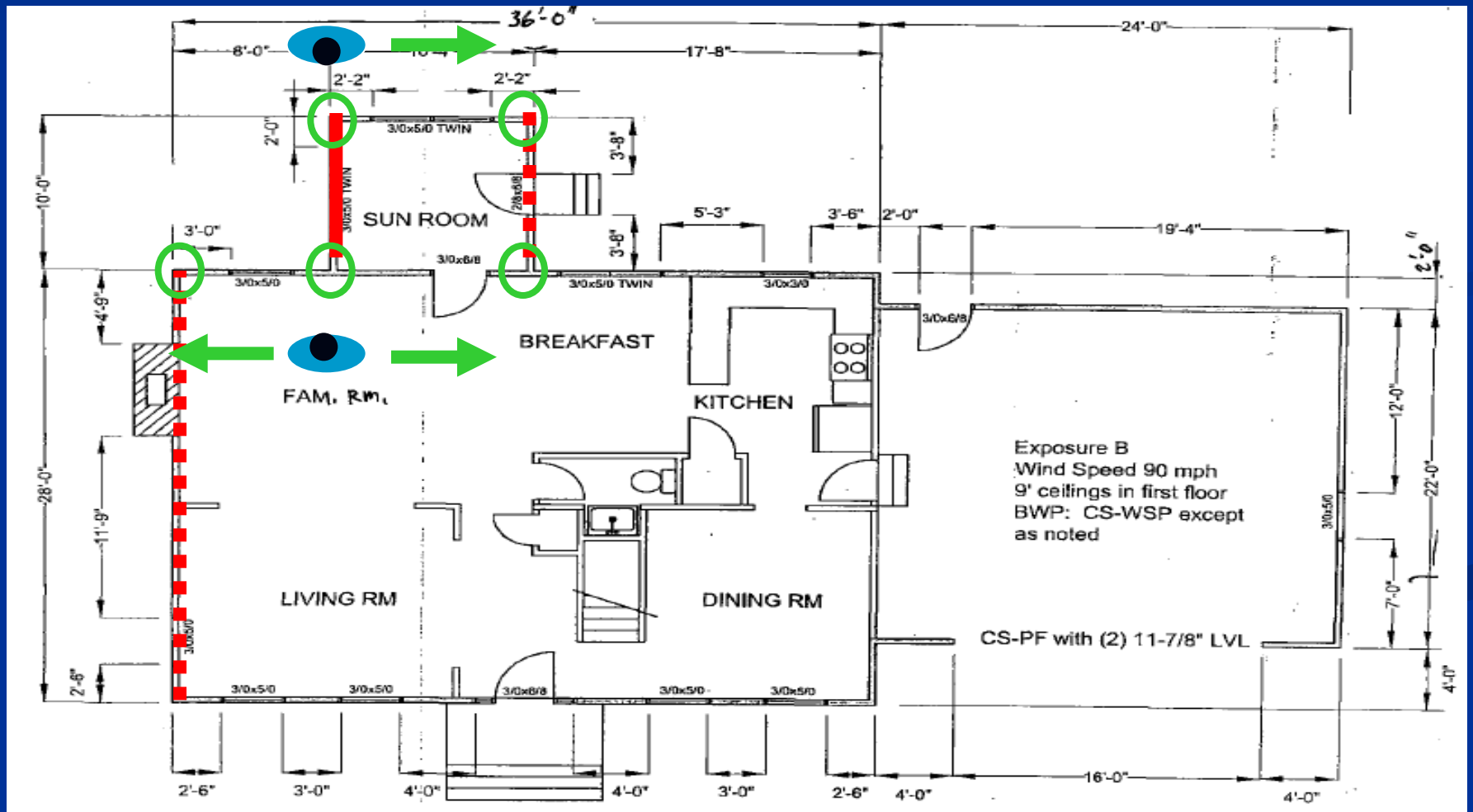
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		B
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		9.55’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

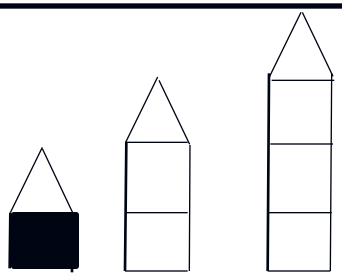
BWL 'B' AVERAGE SPACING

(8' + 10.33' + 10.33') / 3 = 9.55'



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

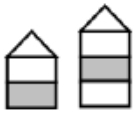
Braced wall line ID →		B
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		9.55’
Req’d length of bracing per Table (ft.)		2.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

MINIMUM LENGTH OF BRACED WALL PANEL

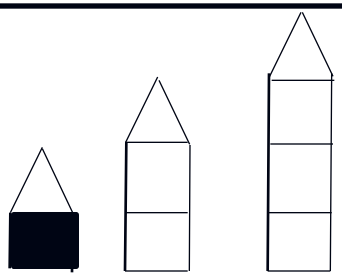
2.0’ is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	B
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	9.55’
Req’d length of bracing per Table (ft.)	2.0’
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	0.7
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)	2.13’ ←

2.0’ x 1.0 x 0.7 x 0.95 x 1.6 = 2.13’

2009 CLASSIC WALL BRACING

COMPARE BWL 'B'

BWL 'B' : At the 5'-0" window, the minimum length of wall bracing allowed to contribute is 27"

	Adjacent opening vertical dimension (in)						
CS-WSP, CS-SFB	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

2009 CLASSIC WALL BRACING

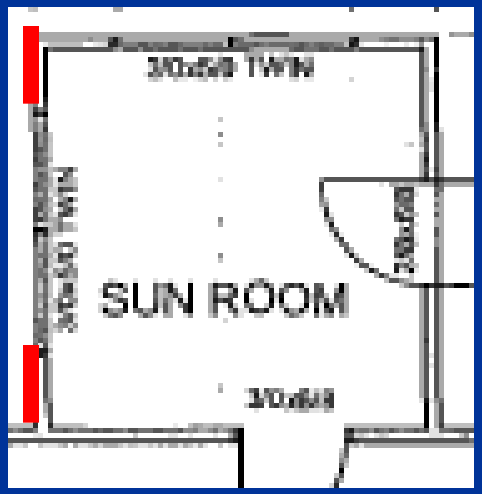
COMPARE BWL 'B'

27" minimum required. On one end we have

2'-0" – 1" rough opening = 1'-11" = 23"

On the other end: 10' – 6' – 2' - 4" R.O. = 20"
27" > 23"

23"



20"

2009 CLASSIC WALL BRACING

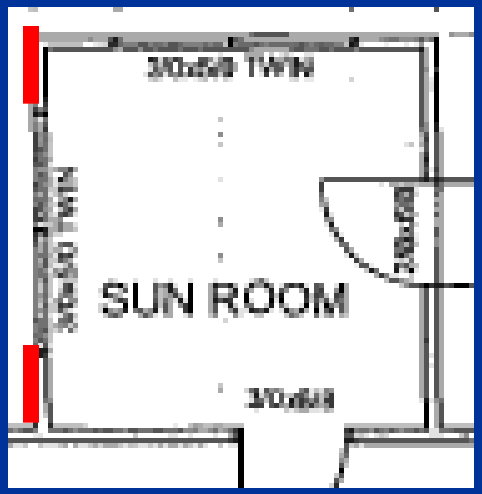
COMPARE BWL 'B'

27" minimum required. On one end we have

2'-0" – 1" rough opening = 1'-11" = 23"

On the other end: 10' – 6' – 2' - 4" R.O. = 20"
27" > 23"

23"



20"

USE A PORTAL FRAME

2009 CLASSIC WALL BRACING

COMPARE BWL 'B'

For a 9' CS-PF wall the minimum length of braced wall panel that can contribute is 18".

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)		MINIMUM LENGTH[a] (in) Wall Height 8 ft	9 ft	10 ft	11 ft	12 ft	CONTRIBUTING LENGTH (in)
PFH	Supporting roof only	16	16	16	18[c]	20[c]	48
	Supporting one story and roof	24	24	24	27[c]	29[c]	48
PFG		24	27	30	33[c]	36[c]	1.5 x Actual[b]
CS-G		24	27	30	33	36	Actual[b]
CS-PF		16	18	20	22[c]	24[c]	Actual[b]

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	B

Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-PF	23”
		2	CS-PF	20”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				

2009 CLASSIC WALL BRACING

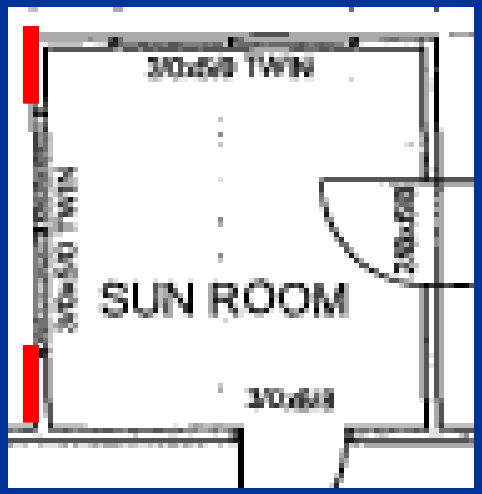
COMPARE BWL 'B'

BWL 'B': We have a 23" PF & 20" PF panel.

Does this work? **2.13' is the total required length of wall bracing**

23" + 20" = 43" = 3' - 7" 3'-7" > 2.13' ✓

23"



20"

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	B

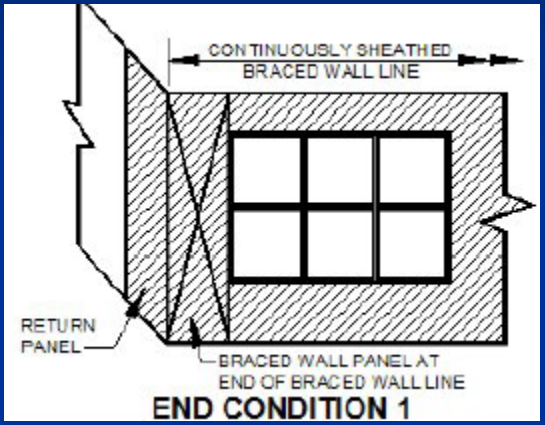
Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-PF	23”
		2	CS-PF	20”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				43” (3.58’)

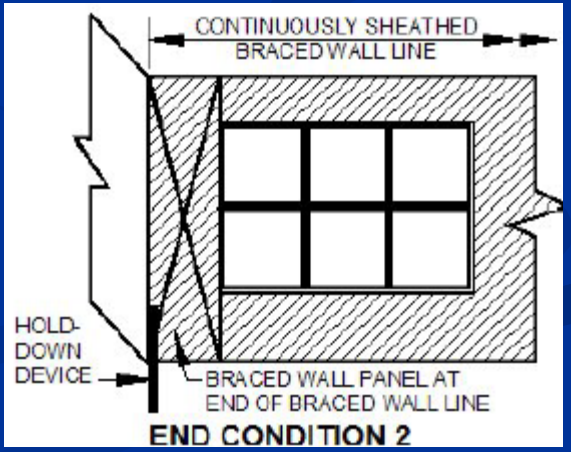
2009 CLASSIC WALL BRACING

BWL 'B' FINAL CHECK

Braced wall line ID	B

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	10'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL



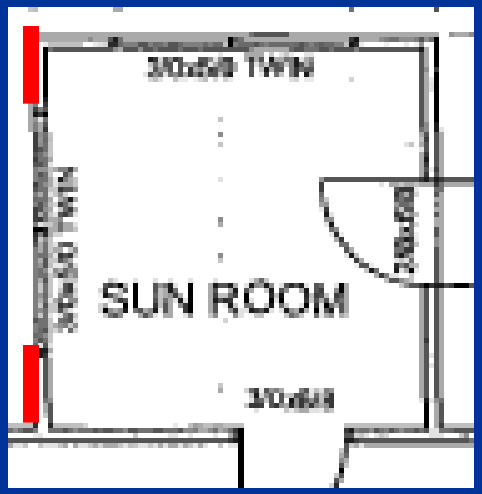


2009 CLASSIC WALL BRACING

R602.10.2.3 MINIMUM NUMBER OF BWP

BWL ‘B’ PASSED ✓

23"

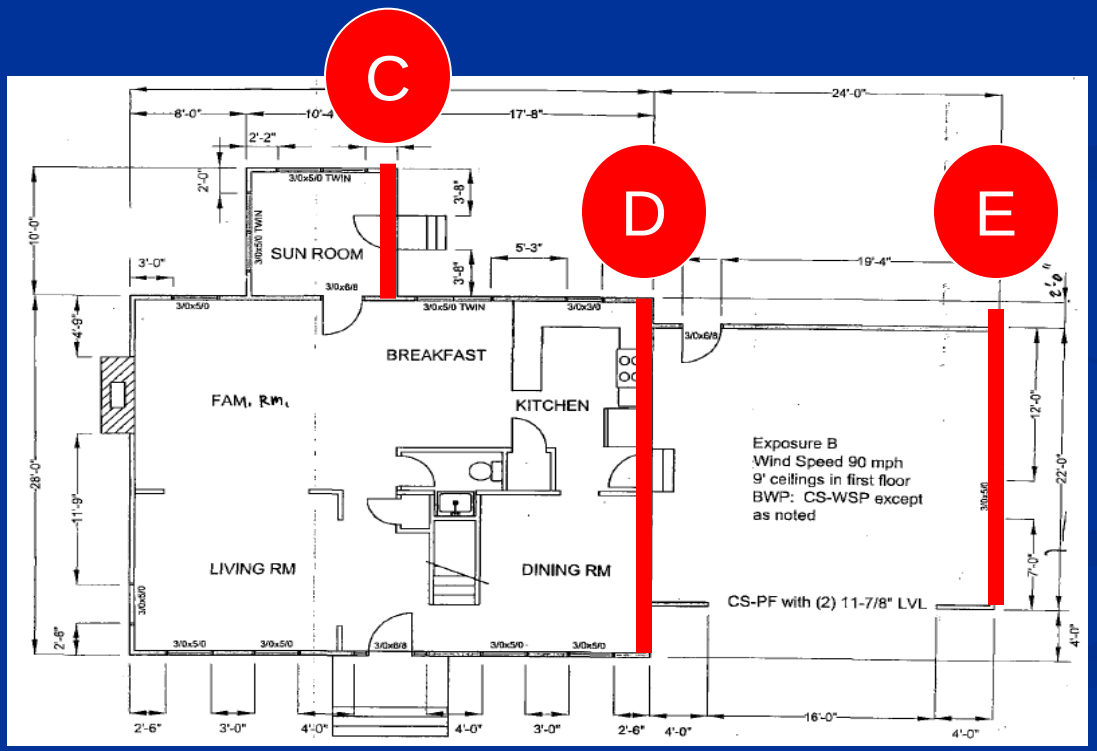


20"

2009 CLASSIC WALL BRACING

BRACED WALL LINES ‘C’, ‘D’ & ‘E’

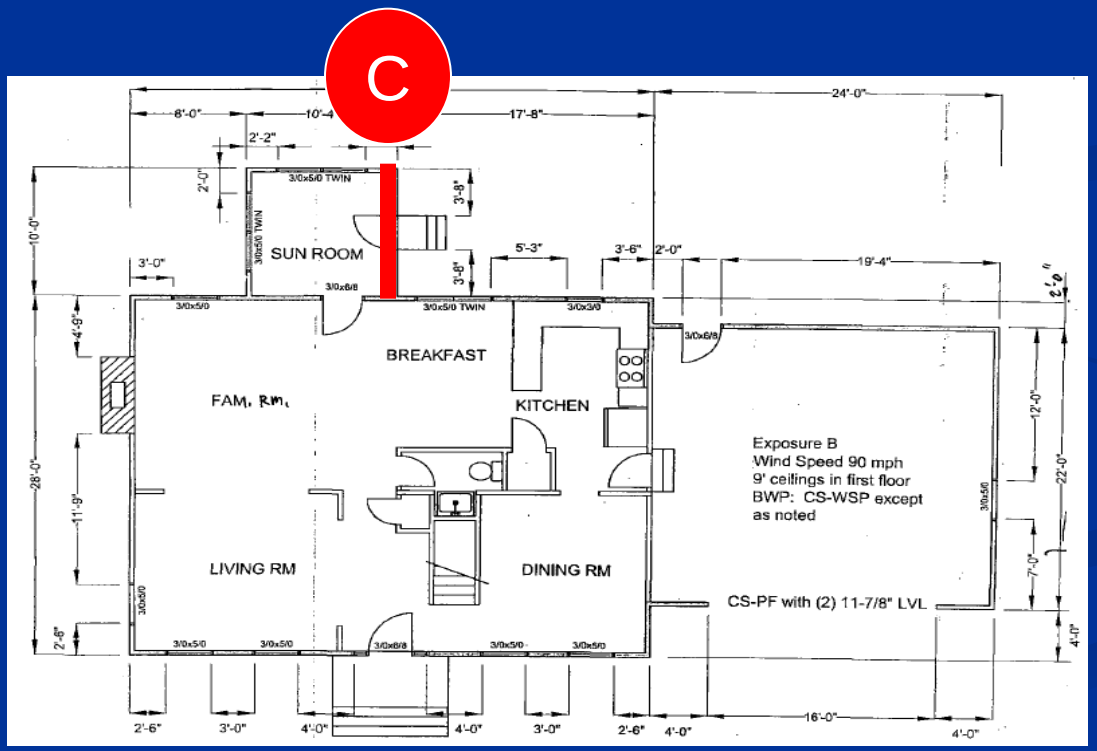
Individually work on BWL ‘C’, ‘D’ & ‘E’



2009 CLASSIC WALL BRACING

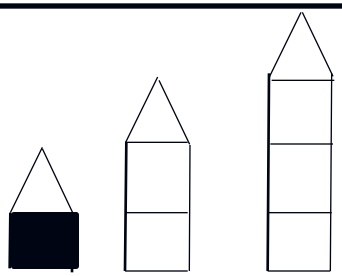
BRACED WALL LINE ‘C’

Let’s review BWL ‘C’



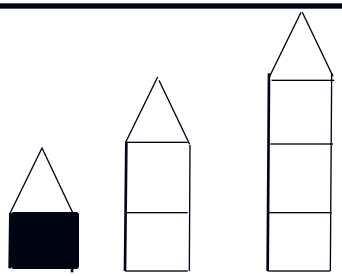
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		C
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

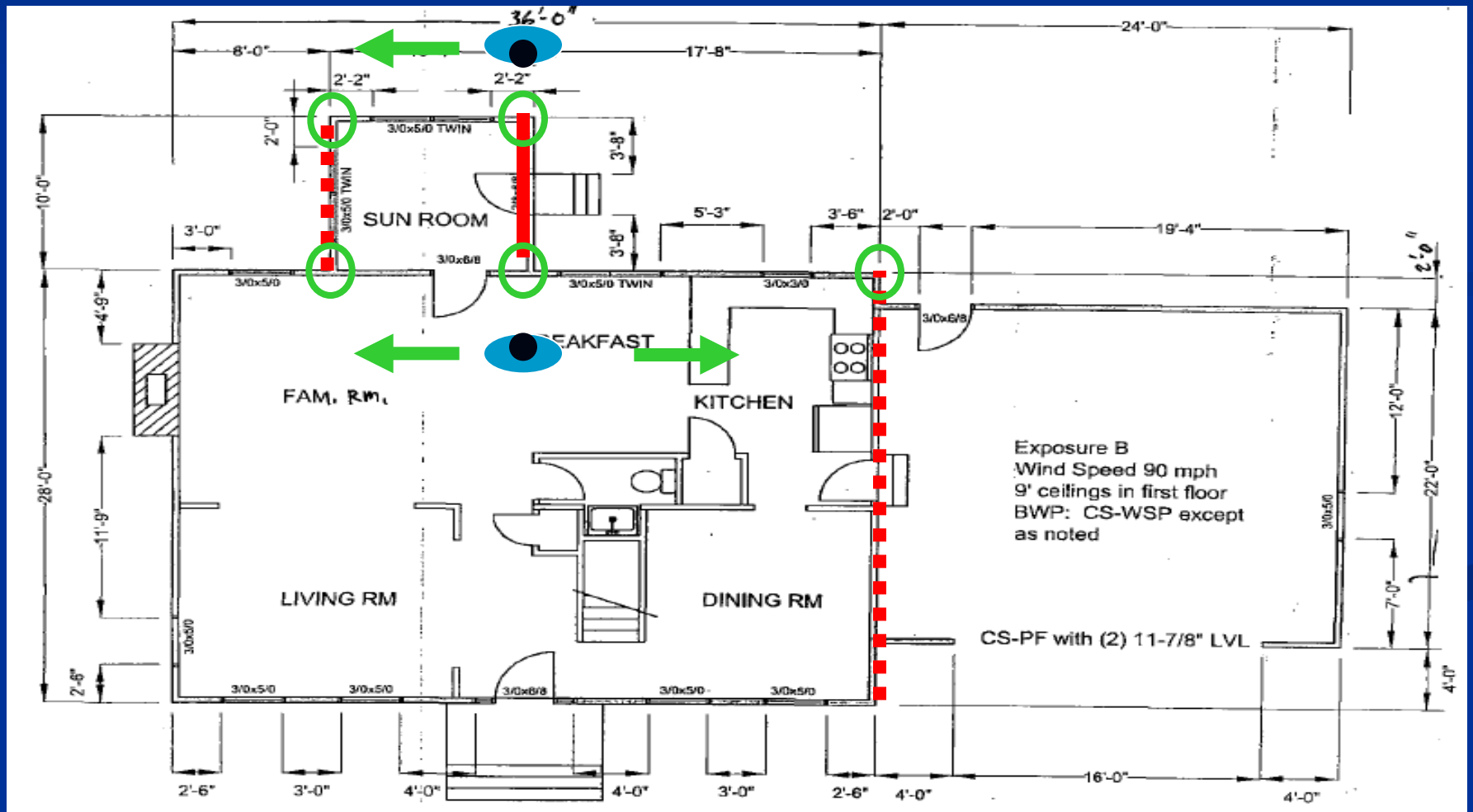
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		C
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		12.78’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

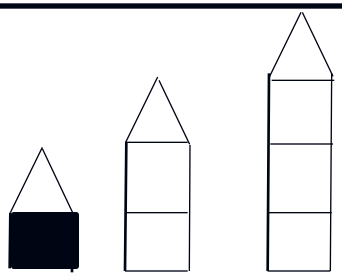
BWL ‘C’ AVERAGE SPACING

(10.33’ + 17.67’ + 10.33’) / 3 = 12.78’



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

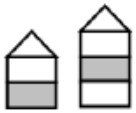
Braced wall line ID →		C
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		12.8’
Req’d length of bracing per Table (ft.)		2.42’ ←
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

MIN. LENGTH OF BWP FOR BWL ‘C’

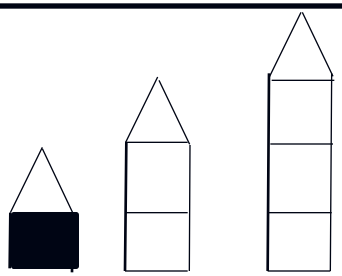
(3.5’ – 2.0’) ÷ (20 – 10) = 1.5’ ÷ 10 = 0.15’
2.0’ + 2.78(0.15’) = 2.42’
2.42’ is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	C
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	10.3’
Req’d length of bracing per Table (ft.)	2.42’
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	0.7
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)	2.57’ ←

2.42’ x 1.0 x 0.7 x 0.95 x 1.6 = 2.57’

2009 CLASSIC WALL BRACING

COMPARE BWL ‘C’

BWL ‘C’ : At the 6’-8” door, the minimum length of wall bracing allowed to contribute is 31”

	Adjacent opening vertical dimension (in)						
	≤ 64	24	27	30	33	36	
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
CS-WSP, CS-SFB	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	Actual[b]
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

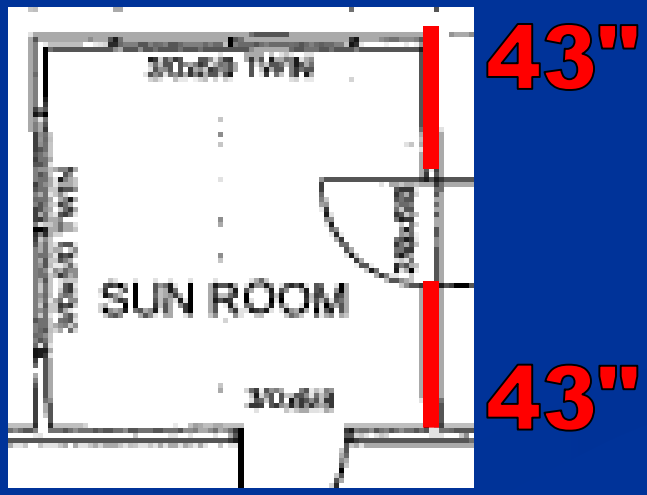
2009 CLASSIC WALL BRACING

COMPARE BWL ‘C’

31” minimum required.

3’-8” – 1” rough opening = 3’-7” = 43”

43” > 31”



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	C

Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	43”
		2	CS-WSP	43”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing ⟶				

2009 CLASSIC WALL BRACING

COMPARE BWL 'C'

BWL 'C': We have a 43" panel at each end.

Does this work? **2.57' is the total required length of wall bracing**

43" + 43" = 86" = 7' - 2" 7'-2" > 2.57' ✓

43"

43"

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	C

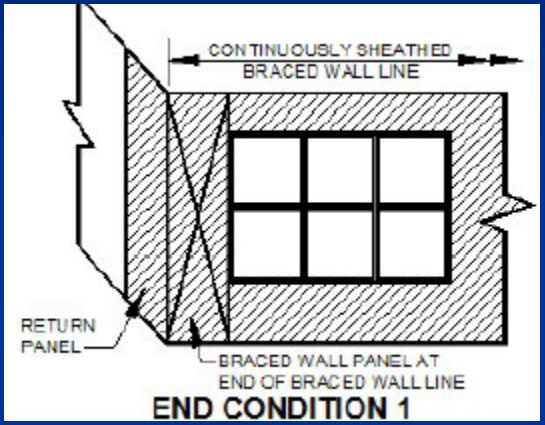
Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	43”
		2	CS-WSP	43”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				86” (7.17’)

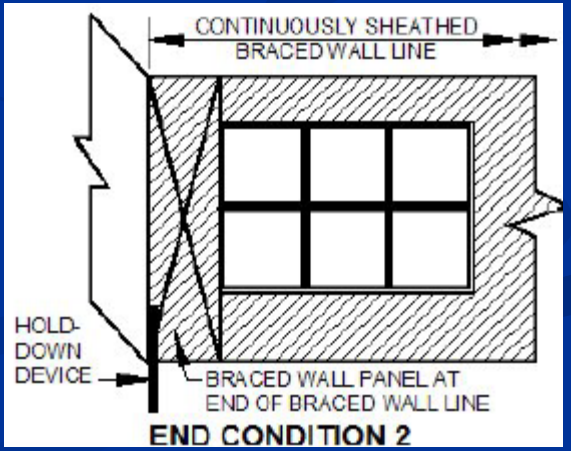
2009 CLASSIC WALL BRACING

BWL 'C' FINAL CHECK

Braced wall line ID	C

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	10'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL

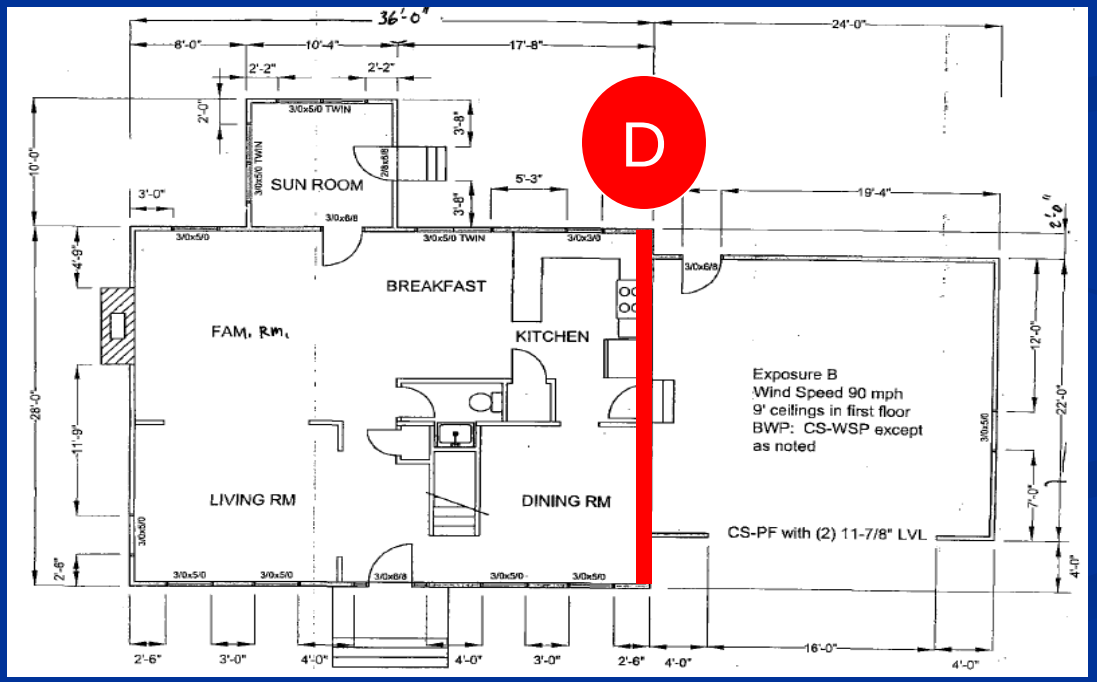




2009 CLASSIC WALL BRACING

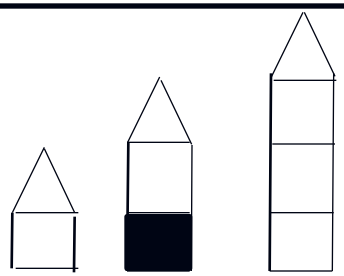
BRACED WALL LINE ‘D’

Let’s review BWL ‘D’



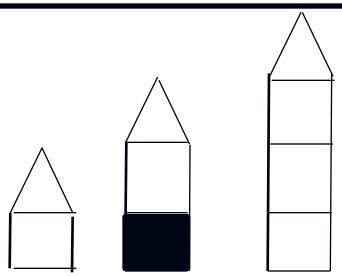
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		D
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

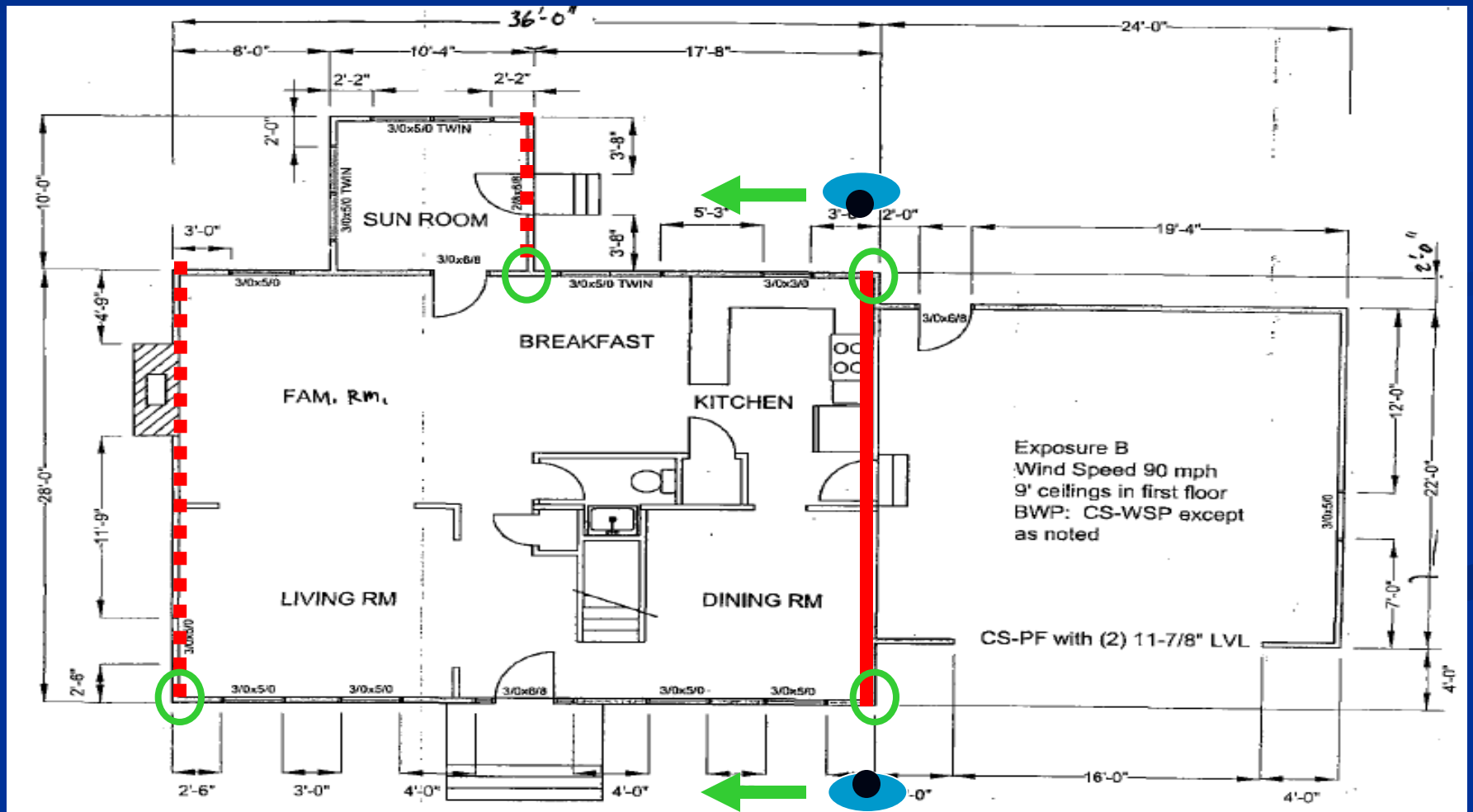
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	D
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	26.84’
Req’d length of bracing per Table (ft.)	
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	1.07
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)	

2009 CLASSIC WALL BRACING

BWL 'D' AVERAGE SPACING

(17.67' + 36') / 2 = 26.84'

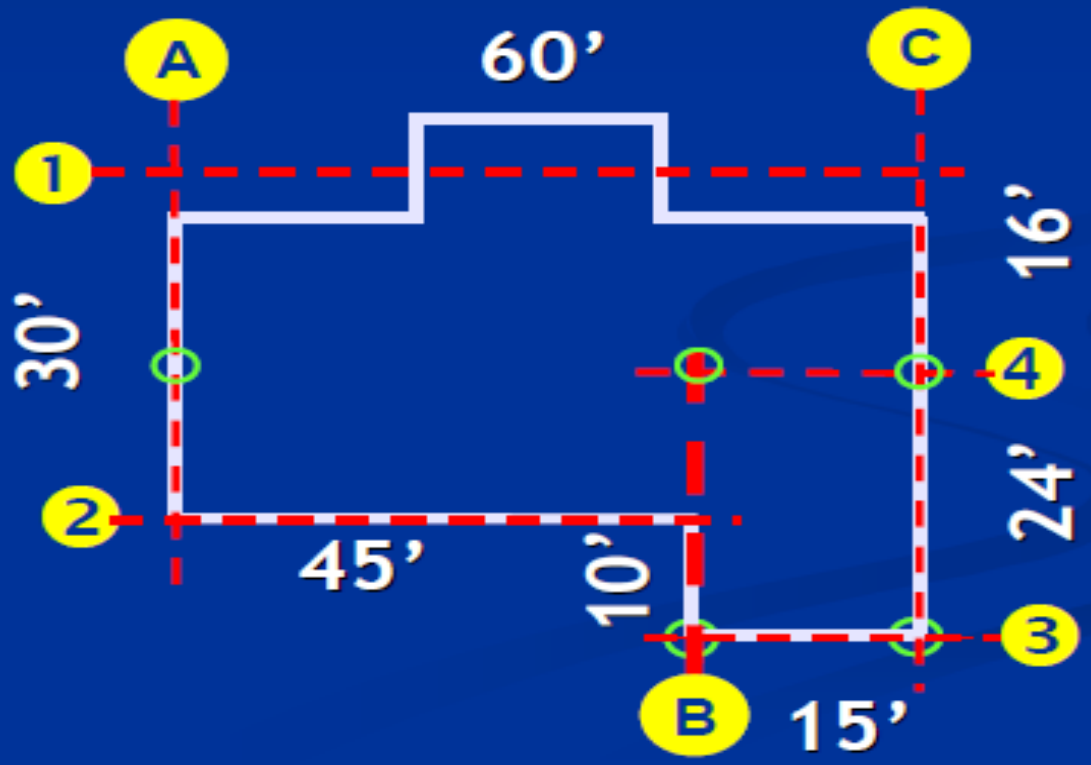


BWL 'D' AVERAGE SPACING

BWL Spacing R602.10.1.3

BWL B spacing: "where is my help?"

Use average length = (15+45+15') ÷3 = 25'



2009 CLASSIC WALL BRACING

COMPARE BWL 'D'

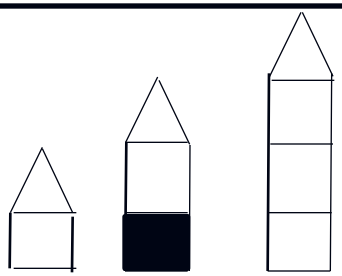
BWL 'D': For a CS-WSP & GB combination wall, the minimum length of braced wall panel must be verified for each method, using the highest value.

R602.10.4.1 Mixing methods. Mixing of bracing methods shall be permitted as follows:

5. In Seismic Design Categories A and B, and for detached one- and two-family dwellings in Seismic Design Category C, mixing of intermittent bracing methods along the interior portion of a braced wall line with continuous sheathing methods CS-WSP, CS-G and CS-PF along the exterior portion of the same braced wall line shall be permitted. The length of required bracing shall be the highest value of all intermittent bracing methods used in accordance with Table R602.10.3(1) or R602.10.3(3) as adjusted by Tables R602.10.3(2) and R602.10.3(4), respectively. The requirements of Section R602.10.7 shall apply to each end of the continuously sheathed portion of the braced wall line.

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		D
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		26.84’
Req’d length of bracing per Table (ft.)		16.76’ ←
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

Check required length for two different methods

2009 CLASSIC WALL BRACING

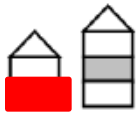
MIN. LENGTH OF BWP FOR BWL ‘D’ CS-WSP

(9.0’ - 6.5’) ÷ (30 – 20) = 2.5’ ÷ 10 = 0.25’

6.5’ + 6.84(0.25’) = 8.21’

8.21’ is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

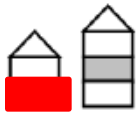
MIN. LENGTH OF BWP FOR BWL ‘D’ GB

(18.5’ – 13.0’) ÷ (30 – 20) = 5.5’ ÷ 10 = 0.55’

13.0’ + 6.84(0.55’) = 16.76’

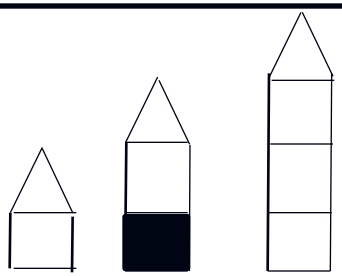
16.76’ is the min. required total length of GB BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		D
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		26.84’
Req’d length of bracing per Table (ft.)		16.76’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		27.25’ ←

16.76’ x 1.0 x 1.07 x 0.95 x 1.6 = 27.25’

2009 CLASSIC WALL BRACING

COMPARE BWL 'D'

BWL 'D': For a 9' CS-WSP or GB wall the minimum length of braced wall panel that can contribute is 48".

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)	MINIMUM LENGTH[a] (in) Wall Height					CONTRIBUTING LENGTH (in)
	8 ft	9 ft	10 ft	11 ft	12 ft	
DWG, WSP, SFB, PBS, PCP, HPS	48	48	48	53	58	Actual[b]
GB	48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB	55	62	69	NP	NP	Actual[b]
ABW	28	32	34	38	42	48

2009 CLASSIC WALL BRACING

COMPARE BWL ‘D’

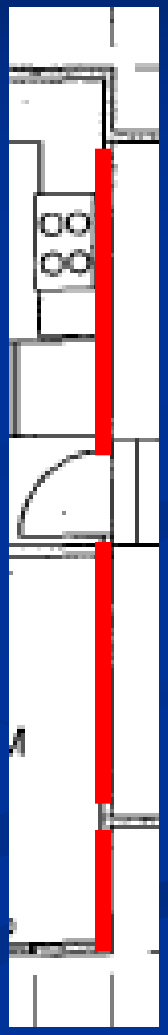
48” minimum required.

Length of interior wall:

22’-0” exterior dimension
- 8” for two walls
- 2’-8” door
- 2” rough opening

18’-6” total length

18’-6” ÷ 2 = 9’-3” =
111” each side of door



2009 CLASSIC WALL BRACING

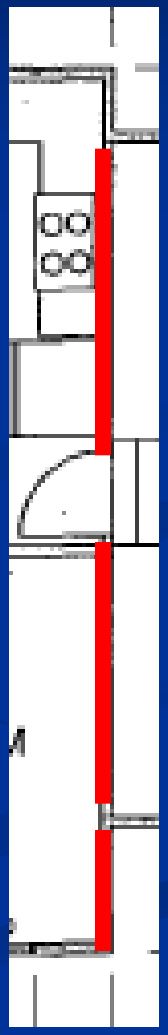
COMPARE BWL 'D'

27.25' is the total required length of wall bracing

111" GB (on each side of wall)

111" GB (on each side of wall)

48" CS-WSP



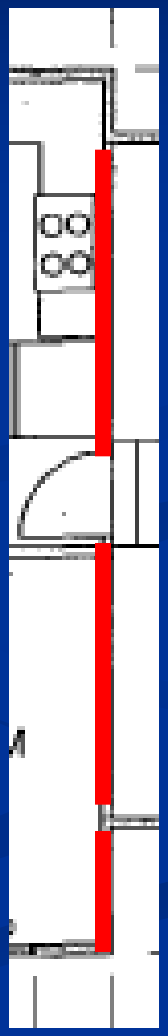
2009 CLASSIC WALL BRACING

COMPARE BWL 'D'

27.25' is the total required length of wall bracing

111" + 111" + 48" = 270" = 22' - 6"

27'-3" > 22'-6"



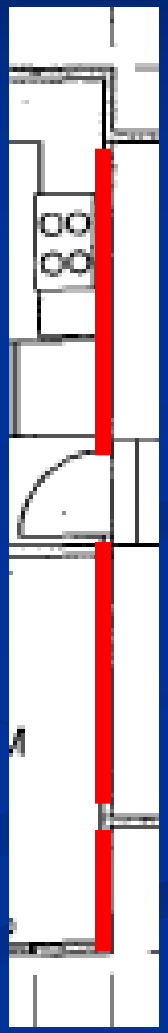
2009 CLASSIC WALL BRACING

COMPARE BWL 'D'

27.25' is the total required length of wall bracing

111" + 111" + 48" = 270" = 22' - 6"

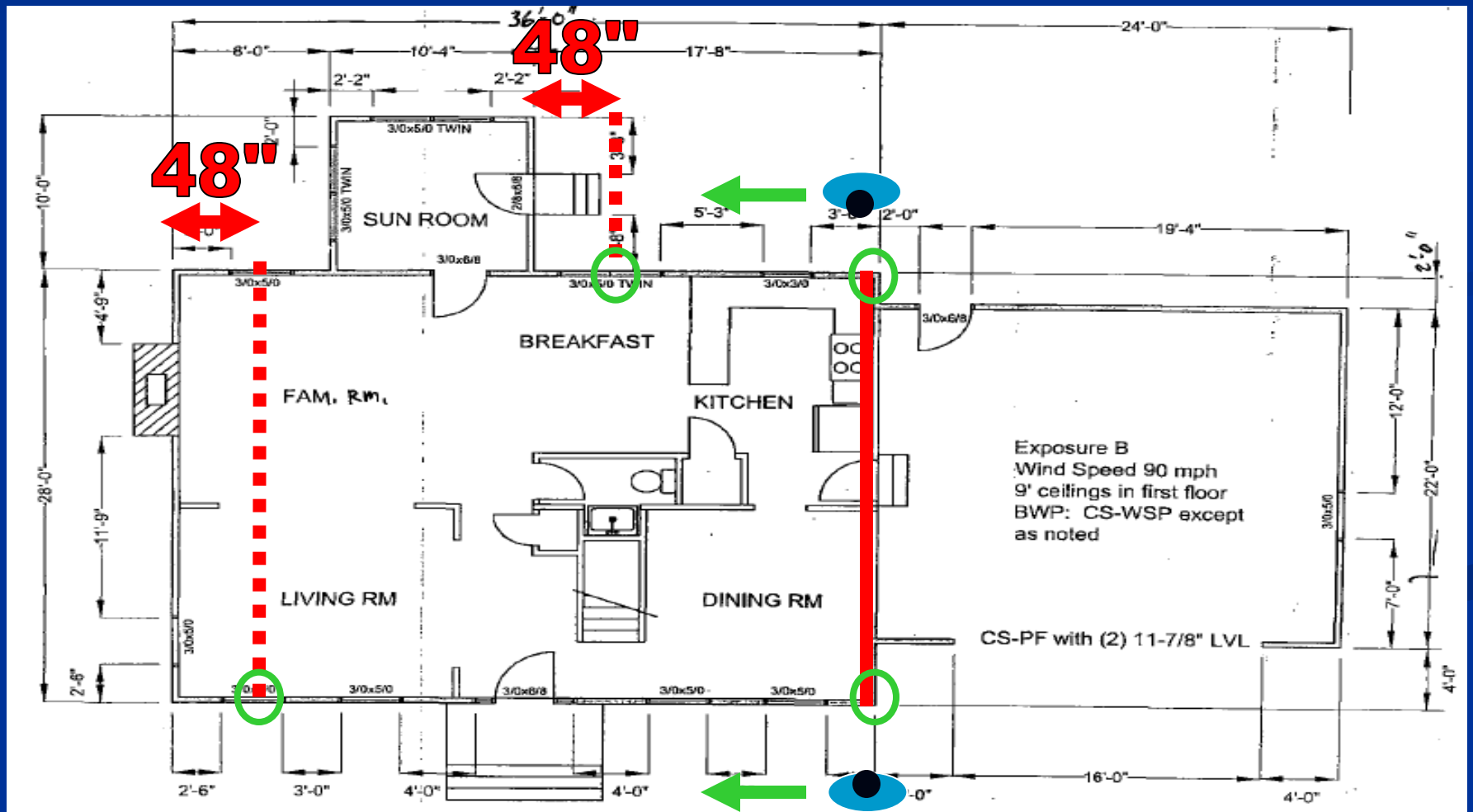
27'-3" > 22'-6"



2009 CLASSIC WALL BRACING

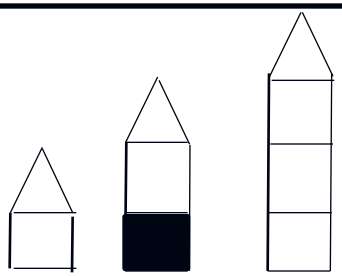
BWL 'D' AVERAGE SPACING

Move BWLs? (13.67' + 32') / 2 = 22.84'



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	D
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	26.84’
Req’d length of bracing per Table (ft.)	16.76’
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	1.07
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	0.7 ←
Adjusted req’d length of bracing (ft.)	19.08’

16.76’ x 1.0 x 1.07 x 0.95 x 1.6 x 0.7 = 19.08’

Reduce the spacing of the gyp. Board fasteners to 4” o.c.

2009 CLASSIC WALL BRACING

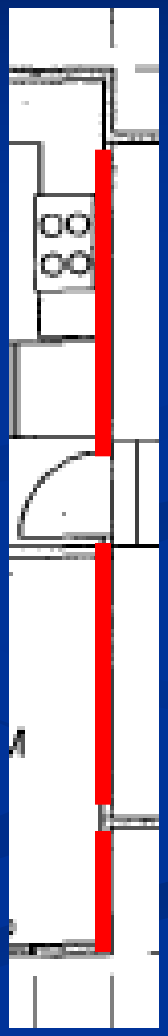
COMPARE BWL ‘D’

BWL ‘D’:

19.08' is the total required length of wall bracing

111" + 111" + 48” = 270" = 22' - 6"

22’-6” > 19’-1” ✓



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	D

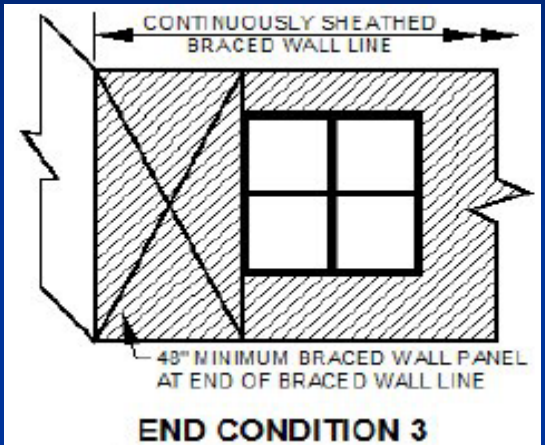
Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	48”
		2	GB	111”
	Partial credit per Table R602.10.52 for intermittent methods only	3	GB	111”
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				270” (22.5’)

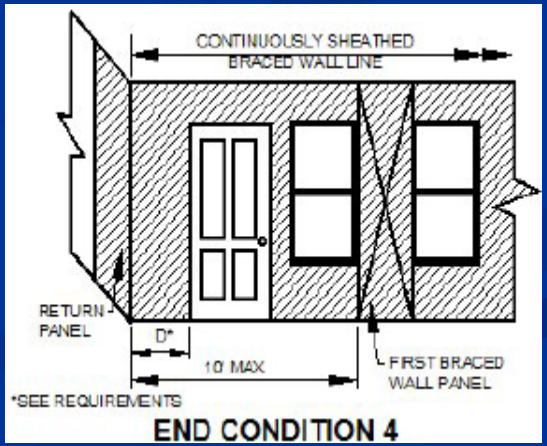
2009 CLASSIC WALL BRACING

BWL 'D' FINAL CHECK

Braced wall line ID	D

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	28'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL

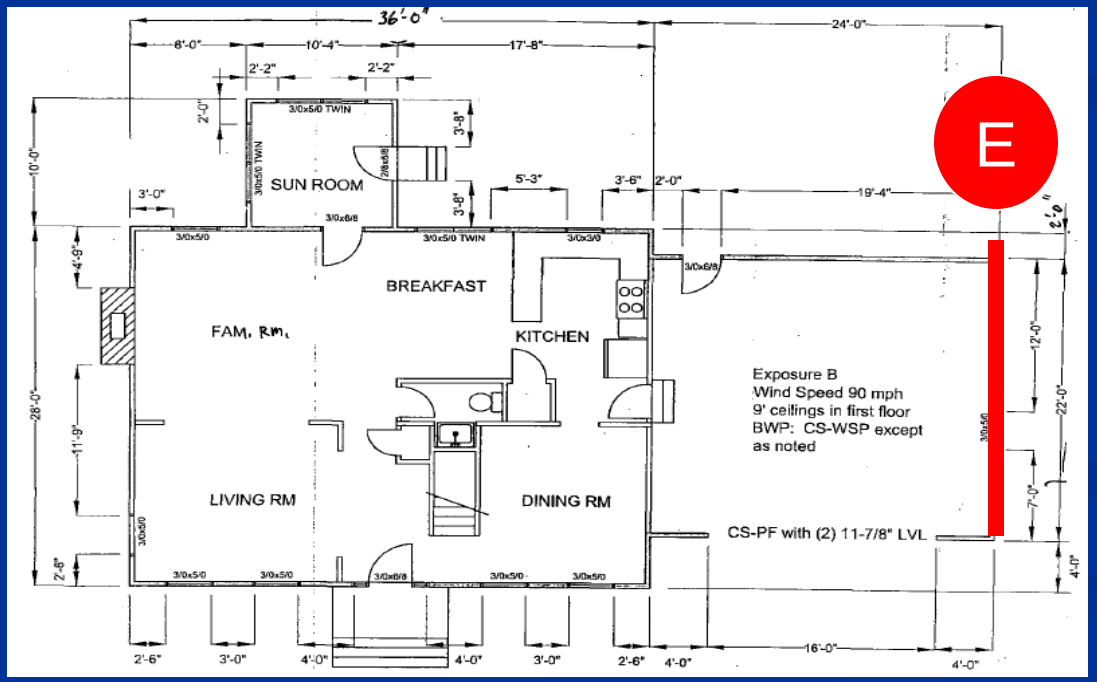




2009 CLASSIC WALL BRACING

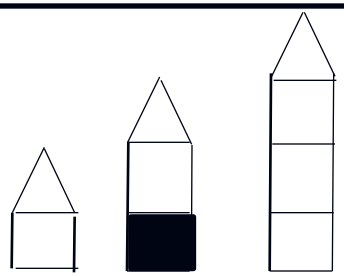
BRACED WALL LINE ‘E’

Let’s review BWL ‘E’



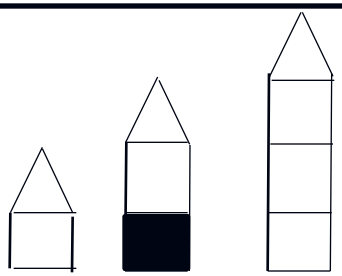
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		E
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

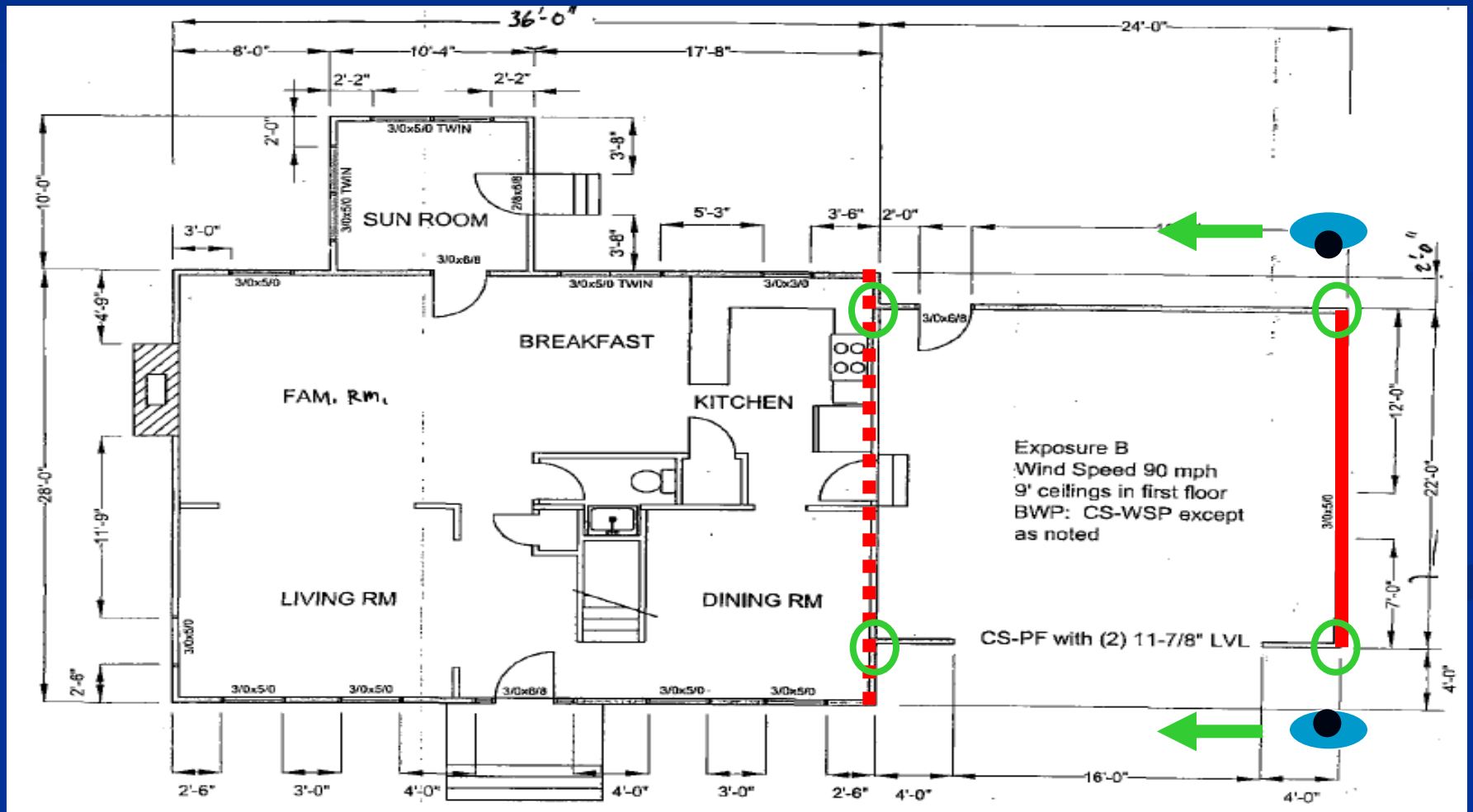
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		E
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		24.0’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

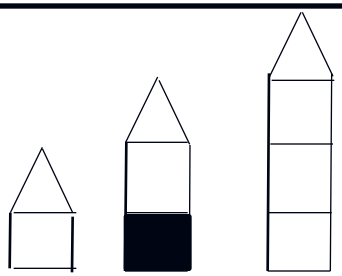
BWL ‘E’ AVERAGE SPACING

(24’ + 24’) / 2 = 24’



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	E
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	24.0’
Req’d length of bracing per Table (ft.)	7.5’ ←
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	1.07
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)	

2009 CLASSIC WALL BRACING

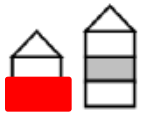
MIN. LENGTH OF BWP FOR BWL ‘E’

(9.0’ - 6.5’) ÷ (30 – 20) = 2.5’ ÷ 10 = 0.25’

6.5’ + 4.0(0.25’) = 7.5’

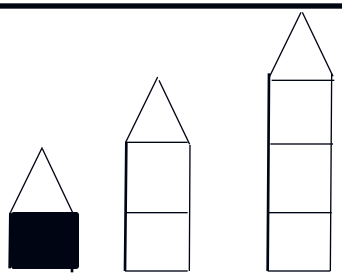
7.5’ is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →	E
Story → / Braced wall line criteria ↓	
Avg. spacing to next BWL (ft.)	24.0’
Req’d length of bracing per Table (ft.)	7.5’
Adjust tabular value: Exposure Factor	1.0
Adjust tabular value: Roof eave-to ridge height factor	1.07
Adjust tabular value: Wall height factor	0.95
Adjust tabular value: Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
Adjust tabular value: Omit interior finish material factor = 0.7	1.0
Adjust tabular value: Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)	12.20’ ←

7.5’ x 1.0 x 1.07 x 0.95 x 1.6 = 12.20’

2009 CLASSIC WALL BRACING

COMPARE BWL 'E'

BWL 'E': For a 9' CS-WSP wall the minimum length of braced wall panel that can contribute is 48".

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)	MINIMUM LENGTH[a] (in) Wall Height					CONTRIBUTING LENGTH (in)
	8 ft	9 ft	10 ft	11 ft	12 ft	
DWG, WSP, SFB, PBS, PCP, HPS	48	48	48	53	58	Actual[b]
GB	48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB	55	62	69	NP	NP	Actual[b]
ABW	28	32	34	38	42	48

2009 CLASSIC WALL BRACING

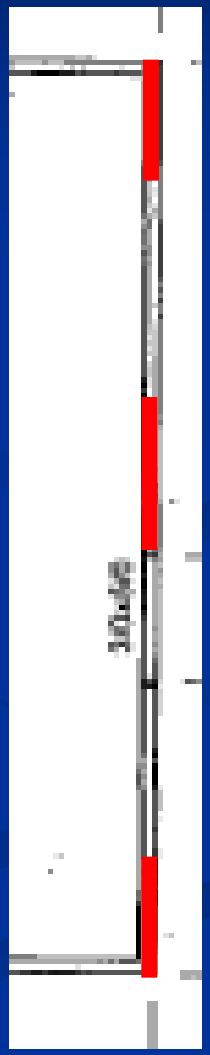
COMPARE BWL ‘E’

48” minimum required.

48” CS-WSP

64” CS-WSP

48” CS-WSP



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	E

Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	48”
		2	CS-WSP	64”
	Partial credit per Table R602.10.52 for intermittent methods only	3	CS-WSP	48”
		4		
		5		
		6		
		7		
Total contributing length of wall bracing ⟶				

2009 CLASSIC WALL BRACING

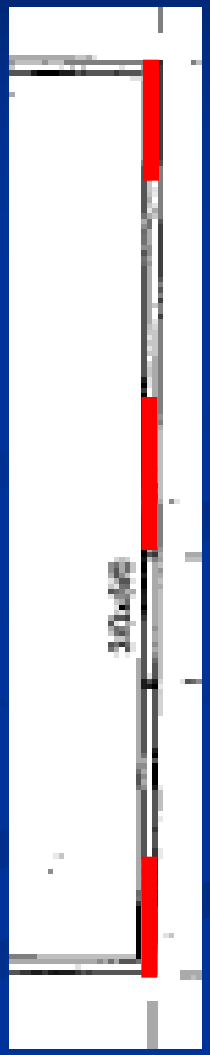
COMPARE BWL ‘E’

BWL ‘E’: We a 48” panel at each end and a 64” panel adjacent to the window.

12.20' is the total required length of wall bracing

48" + 64” + 48" = 160" = 13' - 4"

13’-4” > 12.20’ ✓



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	E

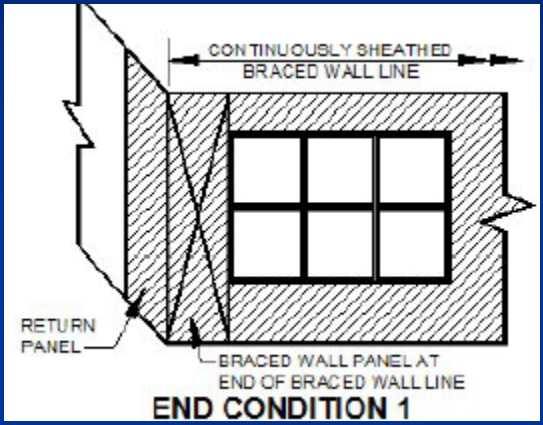
Braced wall panels on BWL		BWP	Method	
	Contributing length per Table R602.10.5	1	CS-WSP	48”
		2	CS-WSP	64”
	Partial credit per Table R602.10.52 for intermittent methods only	3	CS-WSP	48”
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				160” (13.33’)

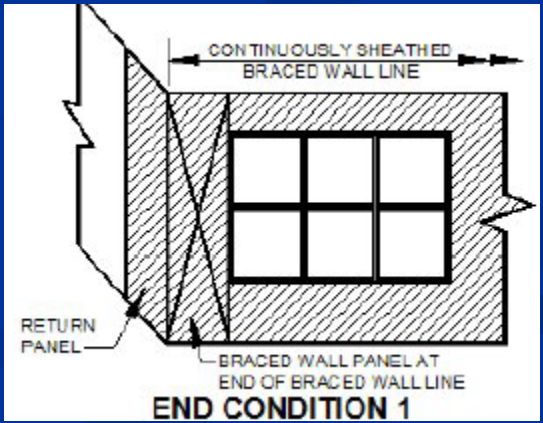
2009 CLASSIC WALL BRACING

BWL 'E' FINAL CHECK

Braced wall line ID	E

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	22'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL

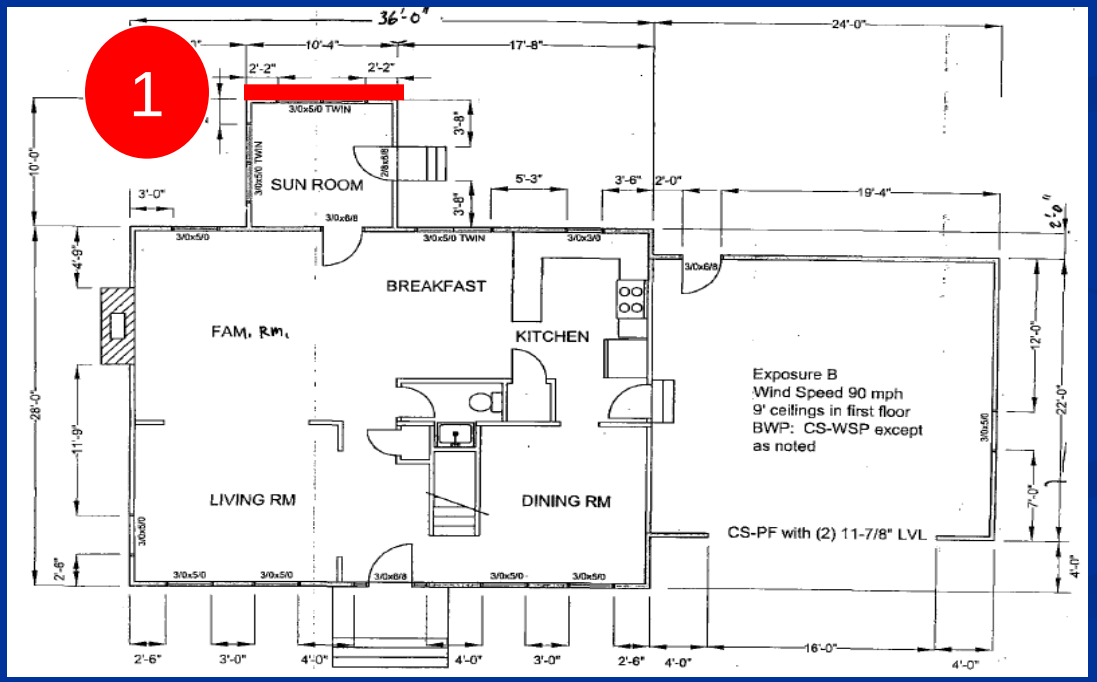




2009 CLASSIC WALL BRACING

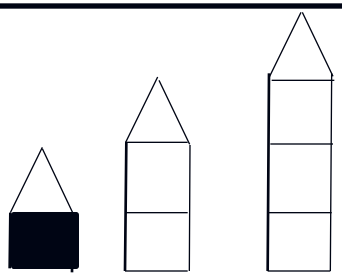
BRACED WALL LINE ‘1’

Let’s try BWL ‘1’



2009 CLASSIC WALL BRACING

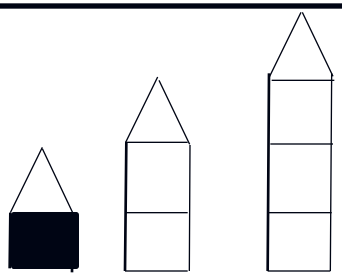
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		1
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

Eave to ridge height < 5'-0"

2009 CLASSIC WALL BRACING

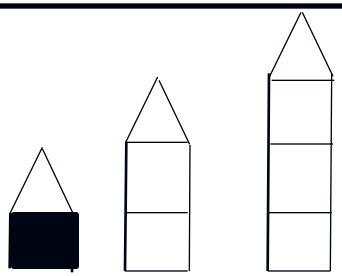
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		1
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

← 3 BWLs

2009 CLASSIC WALL BRACING

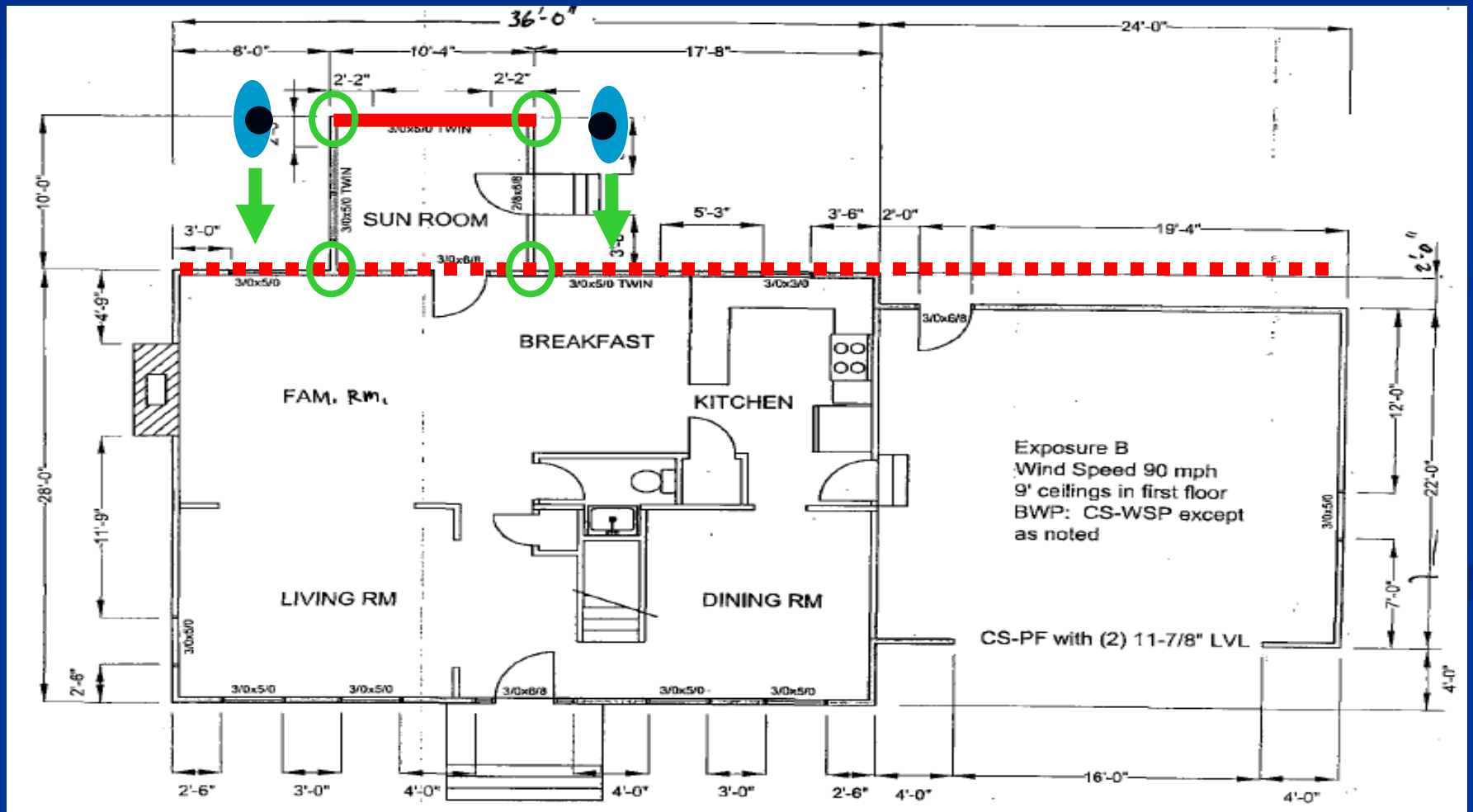
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		1
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		10.0’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

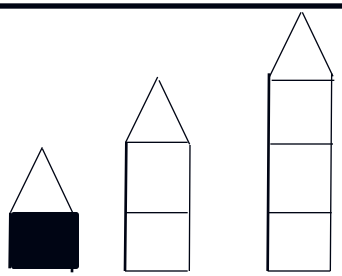
BWL '1' AVERAGE SPACING

(10' + 10') / 2 = 10'



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

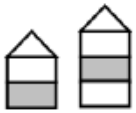
Braced wall line ID →		1
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		10.0’
Req’d length of bracing per Table (ft.)		2.0’ ←
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

MINIMUM LENGTH OF BWL '1'

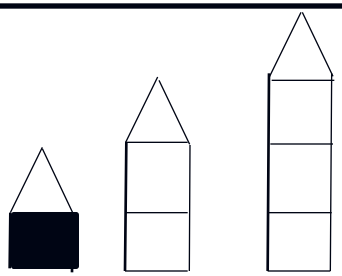
2.0' is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		1
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		10.0’
Req’d length of bracing per Table (ft.)		2.0’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	0.7
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		1.73’ ←

2.0’ x 1.0 x 0.7 x 0.95 x 1.3 = 1.73’

2009 CLASSIC WALL BRACING

COMPARE BWL '1'

BWL '1' : At the 5'-0" window, the minimum length of wall bracing allowed to contribute is 27"

	Adjacent opening vertical dimension (in)						
CS-WSP, CS-SFB	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

2009 CLASSIC WALL BRACING

COMPARE BWL ‘1’

27” minimum required.

2’-2” – 2” twin window rough opening = 2’-0” = 24”

27” > 24”

24"

24"

2009 CLASSIC WALL BRACING

COMPARE BWL '1'

27" minimum required.

2'-2" – 2" twin window rough opening = 2'-0" = 24"

27" > 24"

USE A PORTAL FRAME

24"

24"

2009 CLASSIC WALL BRACING

COMPARE BWL '1'

For a 9' CS-PF wall the minimum length of braced wall panel that can contribute is 18".

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)		MINIMUM LENGTH[a] (in) Wall Height 8 ft	9 ft	10 ft	11 ft	12 ft	CONTRIBUTING LENGTH (in)
PFH	Supporting roof only	16	16	16	18[c]	20[c]	48
	Supporting one story and roof	24	24	24	27[c]	29[c]	48
PFG		24	27	30	33[c]	36[c]	1.5 x Actual[b]
CS-G		24	27	30	33	36	Actual[b]
CS-PF		16	18	20	22[c]	24[c]	Actual[b]

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	1

		BWP	Method	Contributing length
Braced wall panels on BWL	Contributing length per Table R602.10.5	1	CS-PF	24”
		2	CS-PF	24”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				

2009 CLASSIC WALL BRACING

COMPARE BWL '1'

BWL '1': We have a 24" PF panel at each end.

Does this work? **1.73' is the total required length of wall bracing**

24" + 24" = 48" = 4' - 0" 4'-0" > 1.73' ✓

24"

24"

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	1

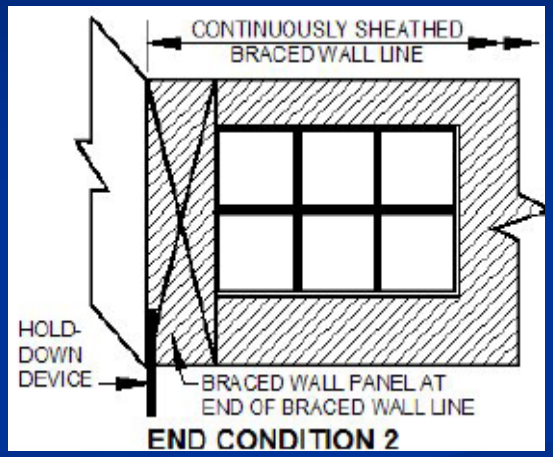
Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-PF	24”
		2	CS-PF	24”
	Partial credit per Table R602.10.52 for intermittent methods only	3		
		4		
		5		
		6		
		7		
Total contributing length of wall bracing →				48” (4.0’)

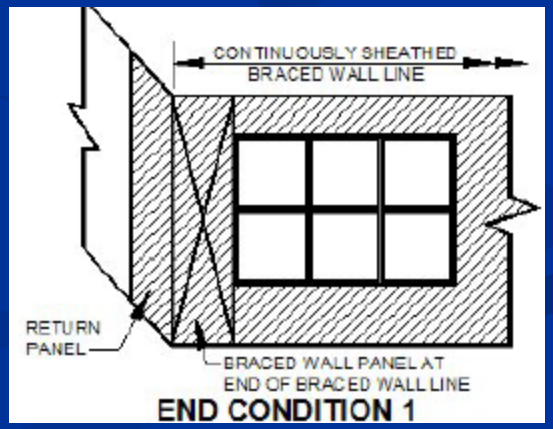
2009 CLASSIC WALL BRACING

BWL '1' FINAL CHECK

Braced wall line ID	1

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	10.33'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL

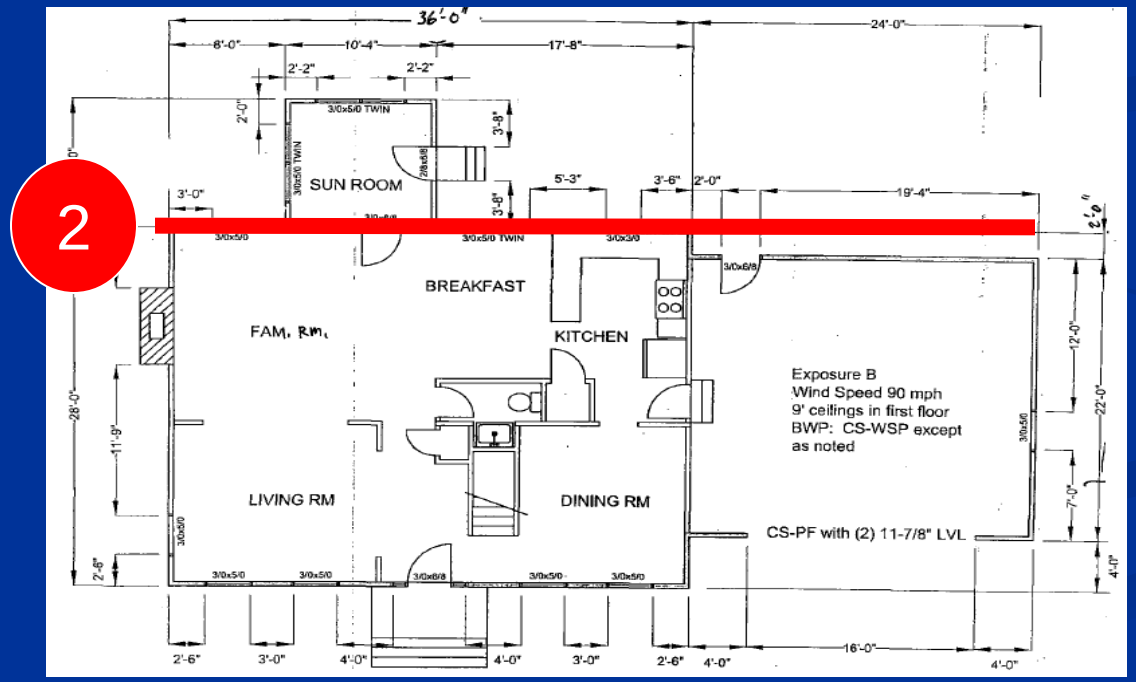




2009 CLASSIC WALL BRACING

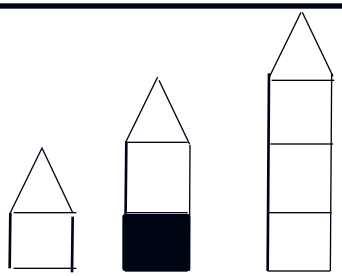
BRACED WALL LINE ‘2’

Let’s try BWL ‘2’



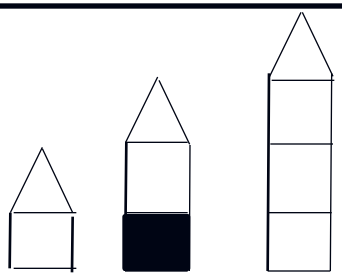
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		2
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

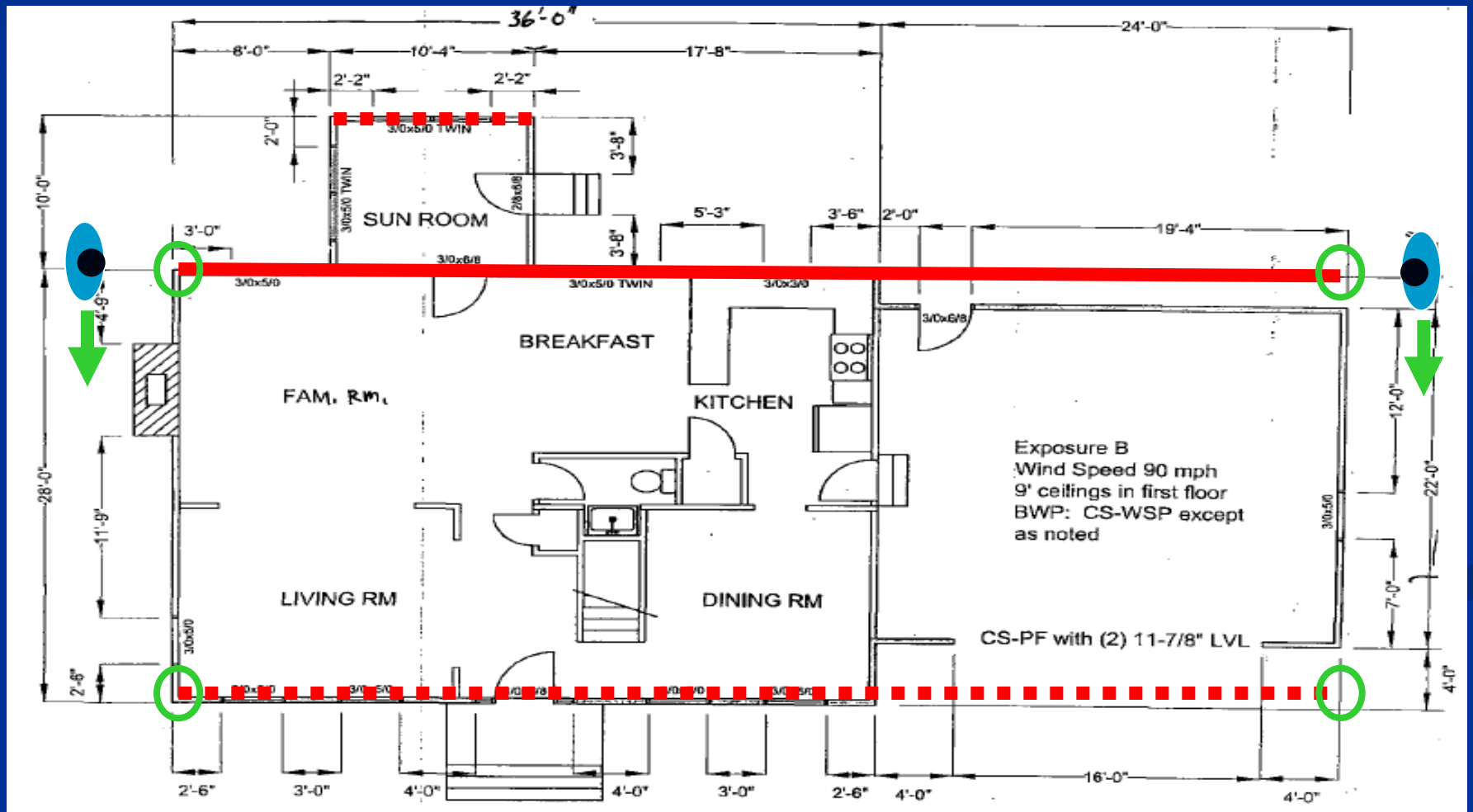
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		2
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		28.0’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

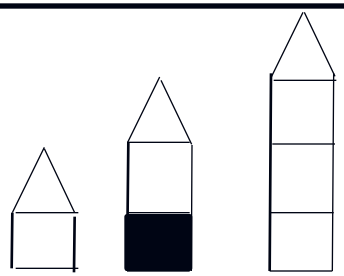
BWL '2' AVERAGE SPACING

(28' + 28') / 2 = 28'



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		2
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		28.0’
Req’d length of bracing per Table (ft.)		17.4’ ←
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

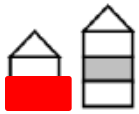
MIN. LENGTH OF BWP FOR BWL ‘2’

(18.5’ – 13.0’) ÷ (30 – 20) = 5.5’ ÷ 10 = 0.55’

13.0’ + 8.0(0.55’) = 17.4’

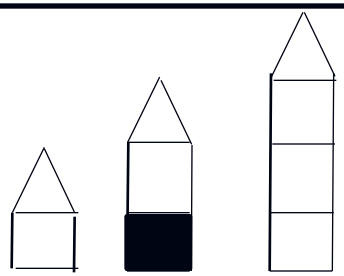
17.4’ is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		2
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		28.0’
Req’d length of bracing per Table (ft.)		8.5’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		23.0’ ←

17.4’ x 1.0 x 1.07 x 0.95 x 1.3 = 23.0’

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

BWL '2' : At the 5'-0" window, the minimum length of wall bracing allowed to contribute is 27"

	Adjacent opening vertical dimension (in)						
CS-WSP, CS-SFB	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

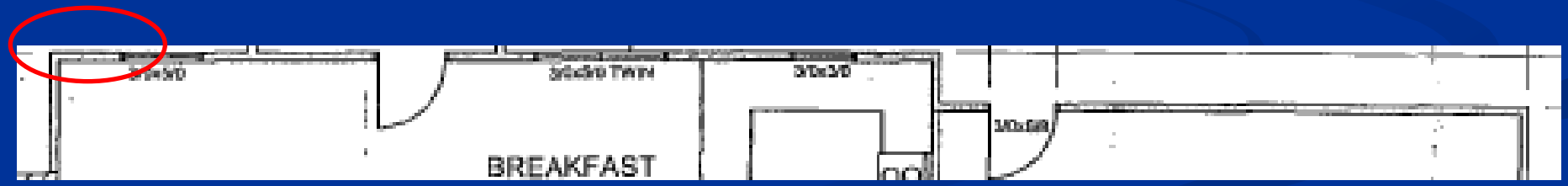
2009 CLASSIC WALL BRACING

COMPARE BWL ‘2’

27” minimum required.

3’-0” – 1” rough opening = 2’-11” = 35”

35” > 27”



2009 CLASSIC WALL BRACING

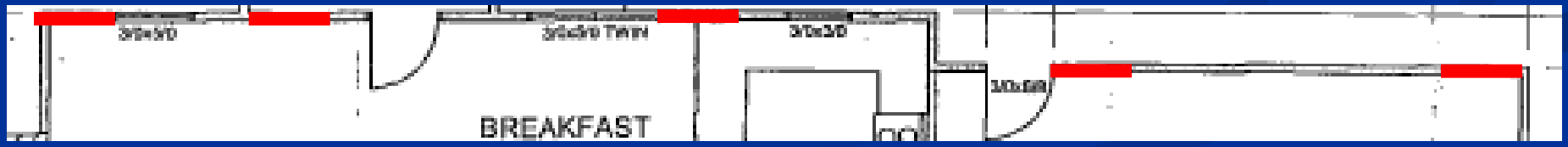
COMPARE BWL ‘2’

27” minimum required.

3’-0” – 1” rough opening = 2’-11” = 35”

35” > 27” ✓

Lets try…



2009 CLASSIC WALL BRACING

COMPARE BWL ‘2’

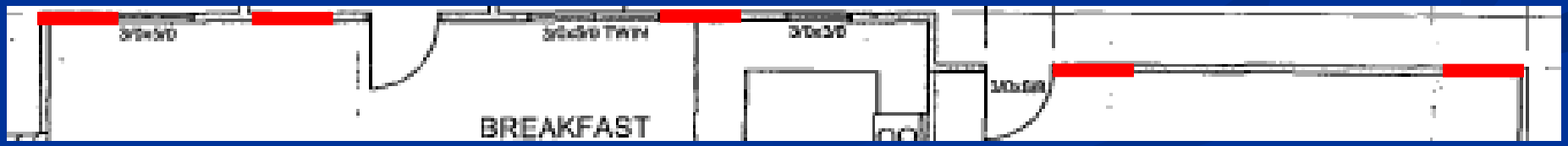
BWL ‘2’: We have five panels.

23.0' is the total required length of wall bracing

35" + 48" + 48" + 48" + 48" = 227" = 18' - 11"

18’- 11” < 23.0’

35" 48" 48" 48" 48"



2009 CLASSIC WALL BRACING

COMPARE BWL ‘2’

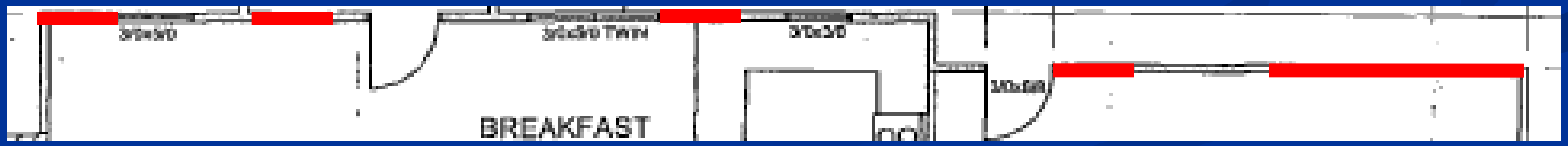
BWL ‘2’: We have five panels.

23.0' is the total required length of wall bracing

35" + 48" + 48" + 48" + 112" = 291" = 24' - 3"

24’- 3” > 23.0’ ✓

35" **48"** **48"** **48"** **112"**



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	2

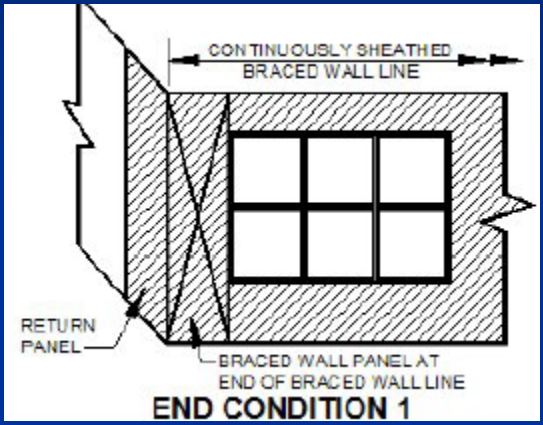
Braced wall panels on BWL		BWP	Method	
	Contributing length per Table R602.10.5	1	CS-WSP	35”
		2	GB	48”
	Partial credit per Table R602.10.52 for intermittent methods only	3	CS-WSP	48”
		4	CS-WSP	48”
		5	CS-WSP	112”
		6		
		7		
Total contributing length of wall bracing →				291” (24.25’)

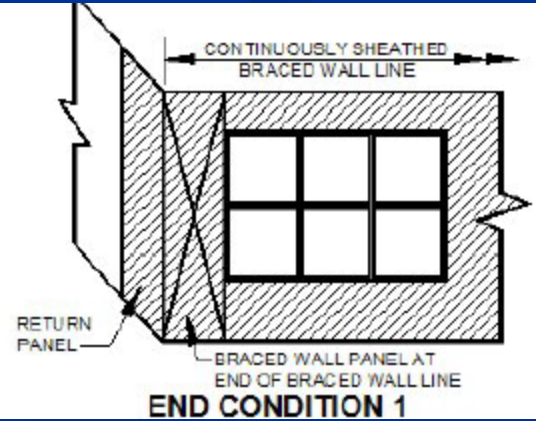
2009 CLASSIC WALL BRACING

BWL '2' FINAL CHECK

Braced wall line ID	2

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	60'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL

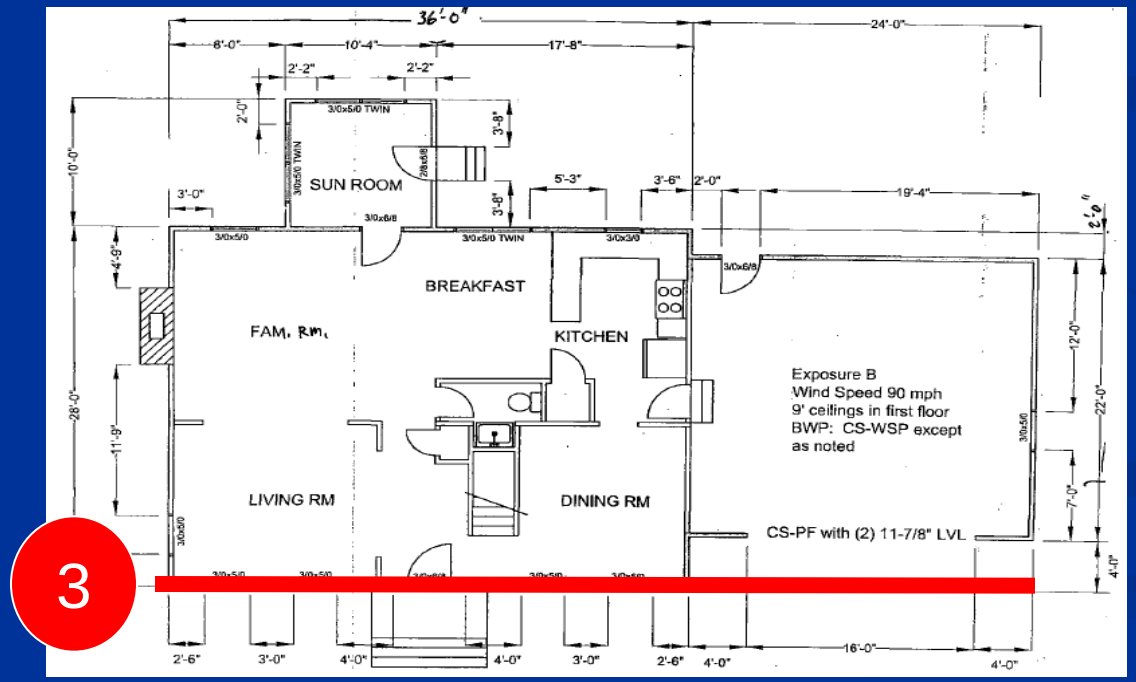




2009 CLASSIC WALL BRACING

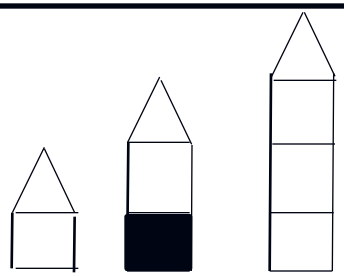
BRACED WALL LINE '3'

Let's try BWL '3'



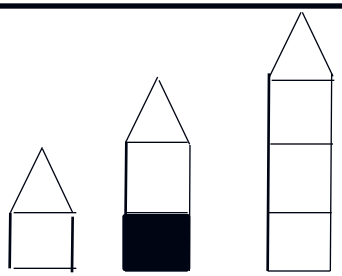
2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		3
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		
Req'd length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4" o.c., factor = 0.7	1.0
Adjusted req'd length of bracing (ft.)		

2009 CLASSIC WALL BRACING

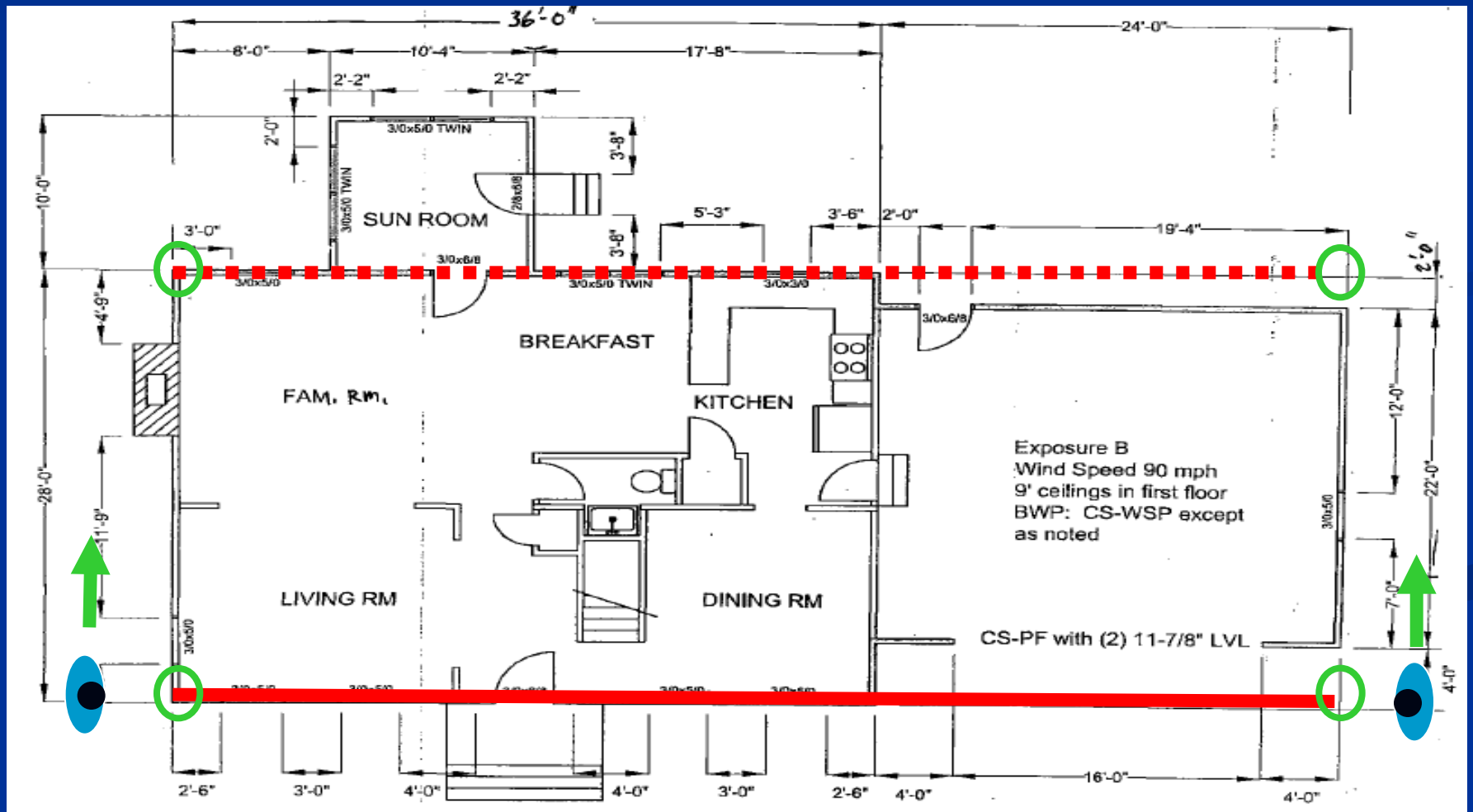
BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		3
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		28.0’
Req’d length of bracing per Table (ft.)		
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

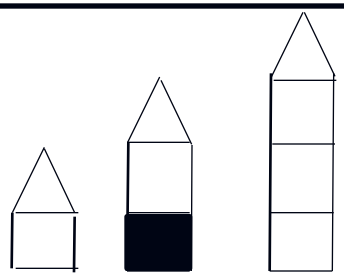
BWL '3' AVERAGE SPACING

(28' + 28') / 2 = 28'



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		3
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		28.0’
Req’d length of bracing per Table (ft.)		8.5’ ←
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.3
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		

2009 CLASSIC WALL BRACING

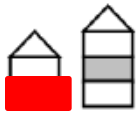
MIN. LENGTH OF BWP FOR BWL '3'

(9.0' - 6.5') ÷ (30 – 20) = 2.5' ÷ 10 = 0.25'

6.5' + 8.0(0.25') = 8.5'

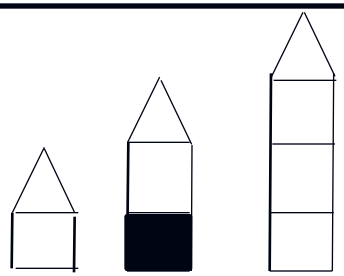
8.5' is the min. required total length of BWP.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP CS-G, CS-PF
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID →		3
Story → / Braced wall line criteria ↓		
Avg. spacing to next BWL (ft.)		28.0’
Req’d length of bracing per Table (ft.)		8.5’
Adjust tabular value	Exposure Factor	1.0
	Roof eave-to ridge height factor	1.07
	Wall height factor	0.95
	Number of BWLs factor: 2 BWL=1.0, 3 BWL=1.3, 4 BWL=1.45, ≥5 BWL=1.6	1.6
	Omit interior finish material factor = 0.7	1.0
	Interior gyp. Board fastener spacing reduced to 4” o.c., factor = 0.7	1.0
Adjusted req’d length of bracing (ft.)		11.23’ ←

8.5’ x 1.0 x 1.07 x 0.95 x 1.3 = 11.23’

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

BWL '3' : At the 5'-0" window, the minimum length of wall bracing allowed to contribute is 27"

	Adjacent opening vertical dimension (in)						
CS-WSP, CS-SFB	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

2009 CLASSIC WALL BRACING

WHATS NEXT? WE HAVE TO COMPARE

BWL ‘3’ : At the 6’-8” door, the minimum length of wall bracing allowed to contribute is 31”

	Adjacent opening vertical dimension (in)						
	≤ 64	24	27	30	33	36	
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
CS-WSP, CS-SFB	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	Actual[b]
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

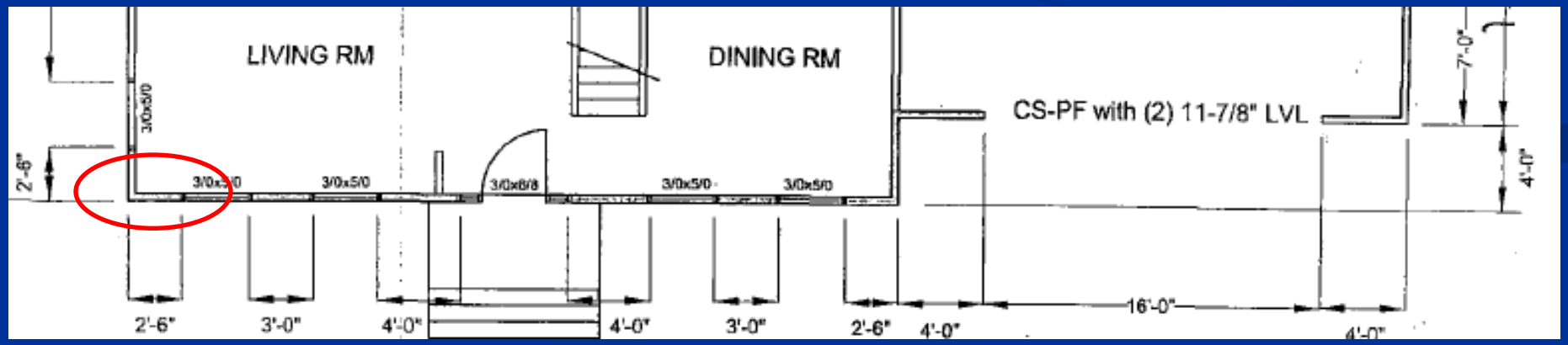
2009 CLASSIC WALL BRACING

COMPARE BWL '3'

27" minimum required at window.

2'-6" – 1" rough opening = 2'-5" = 29"

29" > 27" ✓



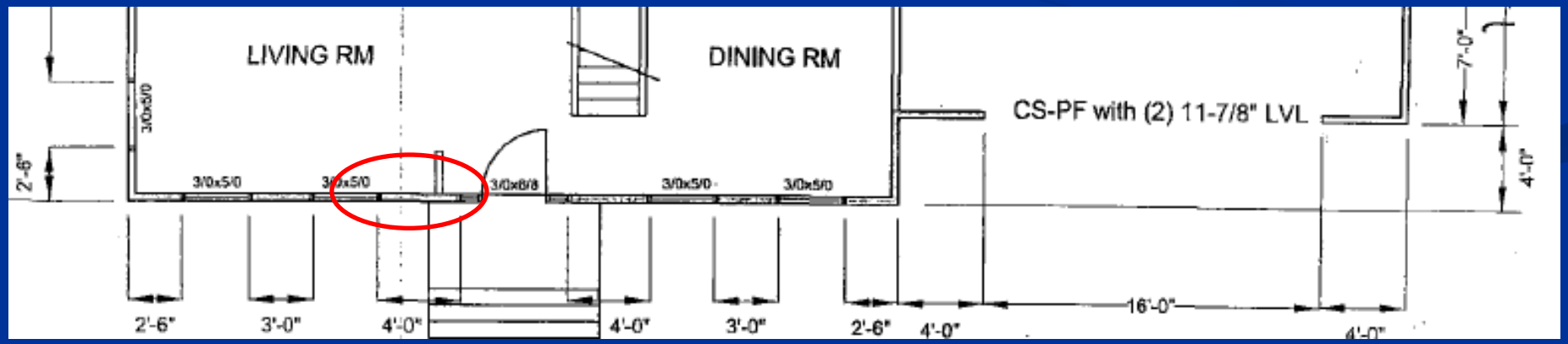
2009 CLASSIC WALL BRACING

COMPARE BWL '3'

31" minimum required at door.

4'-0" – 2" rough opening = 3'-10" = 46"

46" > 31" ✓



2009 CLASSIC WALL BRACING

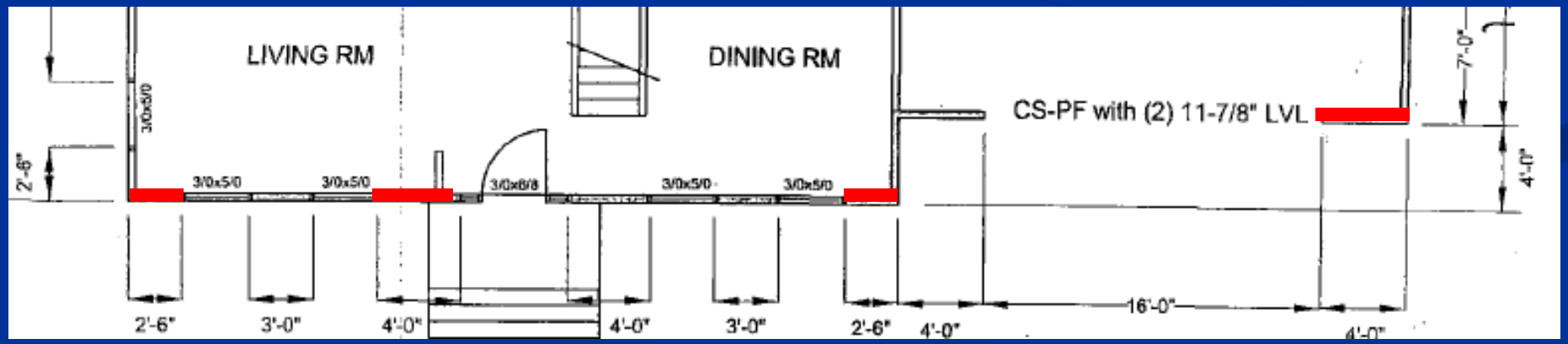
COMPARE BWL '3'

31" minimum required at door.

4'-0" – 2" rough opening = 3'-10" = 46"

46" > 31" ✓

Lets try...



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	3

Braced wall panels on BWL		BWP	Method	Contributing length
	Contributing length per Table R602.10.5	1	CS-WSP	29”
		2	CS-WSP	46”
	Partial credit per Table R602.10.52 for intermittent methods only	3	CS_WSP	29”
		4	CS-WSP	48”
		5		
		6		
		7		
Total contributing length of wall bracing →				

2009 CLASSIC WALL BRACING

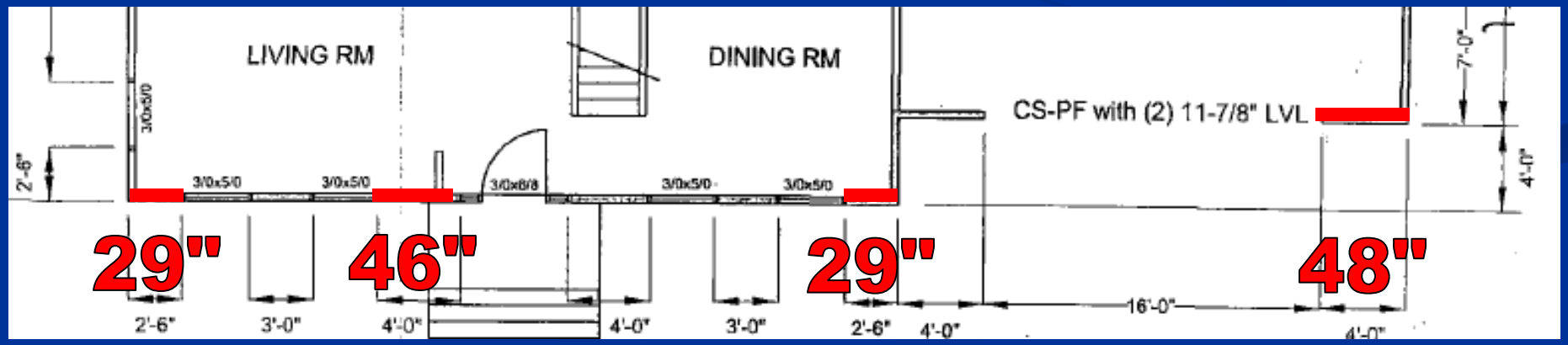
COMPARE BWL '3'

BWL '3': We have four panels.

11.23' is the total required length of wall bracing

29" + 46" + 29" + 48" = 152" = 12' - 8"

12'- 8" > 11.23' ✓



2009 CLASSIC WALL BRACING

BRACED WALL LINE COMPLIANCE FORM

Braced wall line ID	3

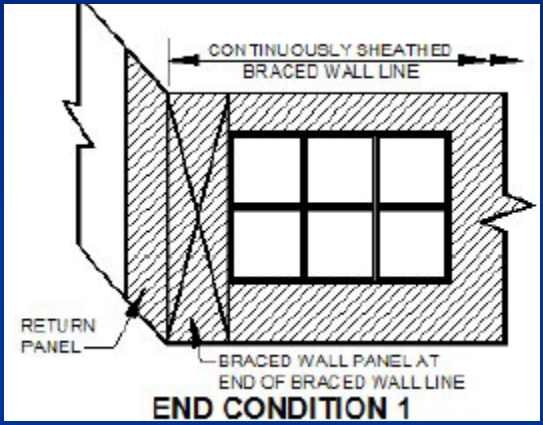
Braced wall panels on BWL		BWP	Method	
	Contributing length per Table R602.10.5	1	CS-WSP	29”
		2	CD-WSP	46”
	Partial credit per Table R602.10.52 for intermittent methods only	3	CS-WSP	29”
		4	CS-WSP	48”
		5		
		6		
		7		
Total contributing length of wall bracing →				152” (12.7’)

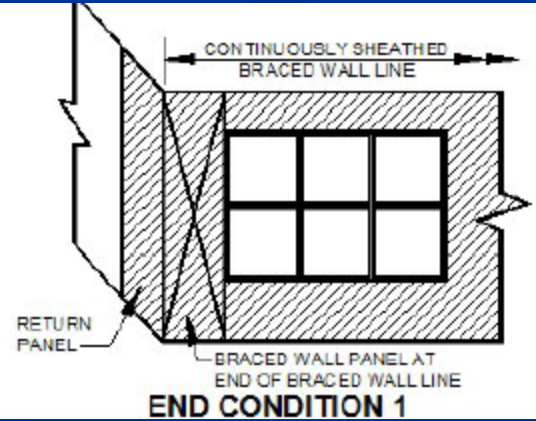
2009 CLASSIC WALL BRACING

BWL '3' FINAL CHECK

Braced wall line ID	3

Total contributing ≥ adjusted required?		Y - N	
Spacing	BWP spaced ≤ 20' edge-to-edge	Y - N - NA	
# BWPs	Length of BWL (ft.)	60'	
	BWL has min. 2 BWPs or BWL≤16' has 1 – 48" BWP	Y - N	
BWL ends	BWP at or begins within 10' of end	Y N	Y - N
	Continuous sheathing only: end condition per Figure R602.10.7	1 2 3 4 5	1 2 3 4 5
BWL Compliance		PASS	FAIL





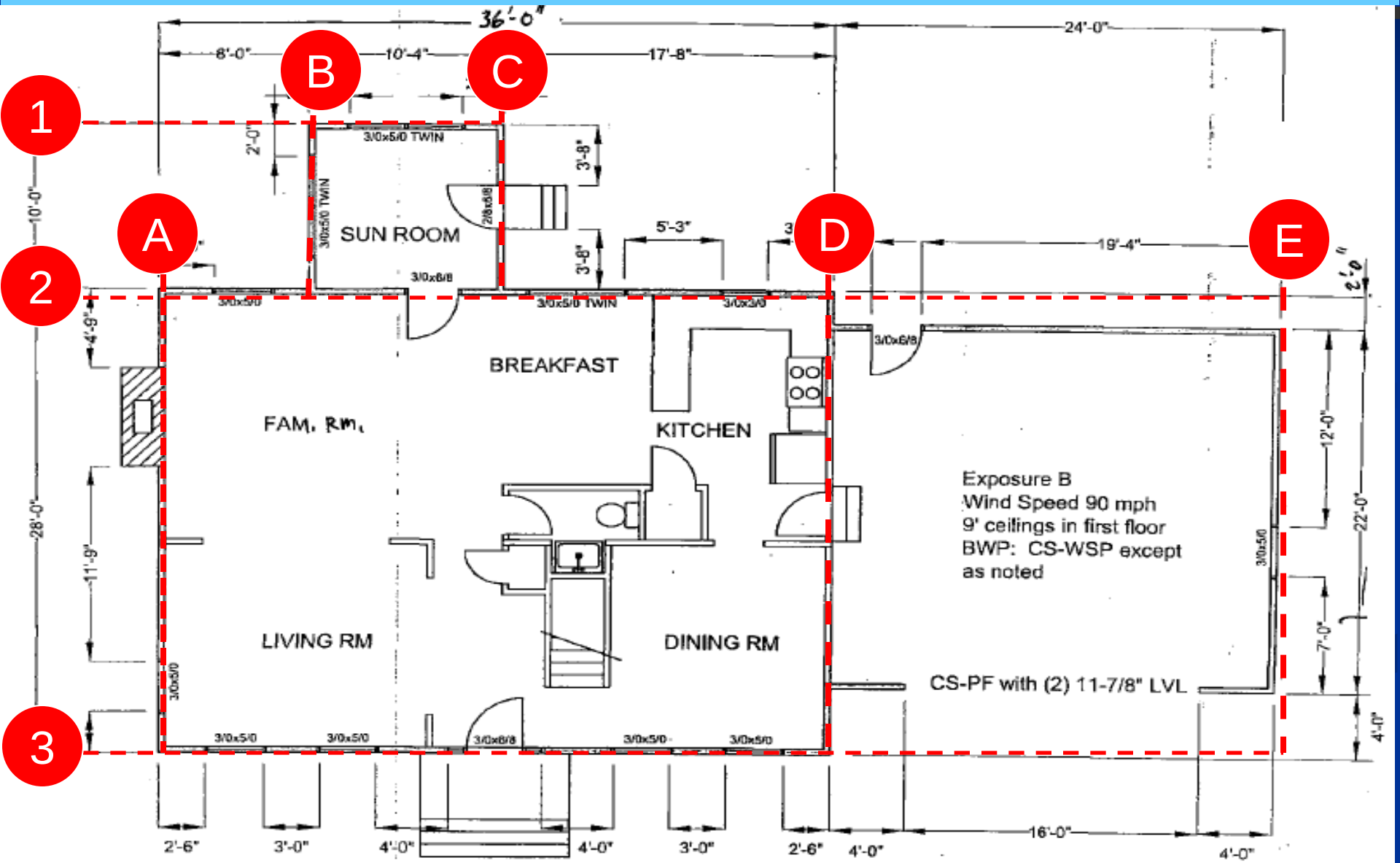
2009 CLASSIC WALL BRACING

ENOUGH ALREADY

NO MORE !!!

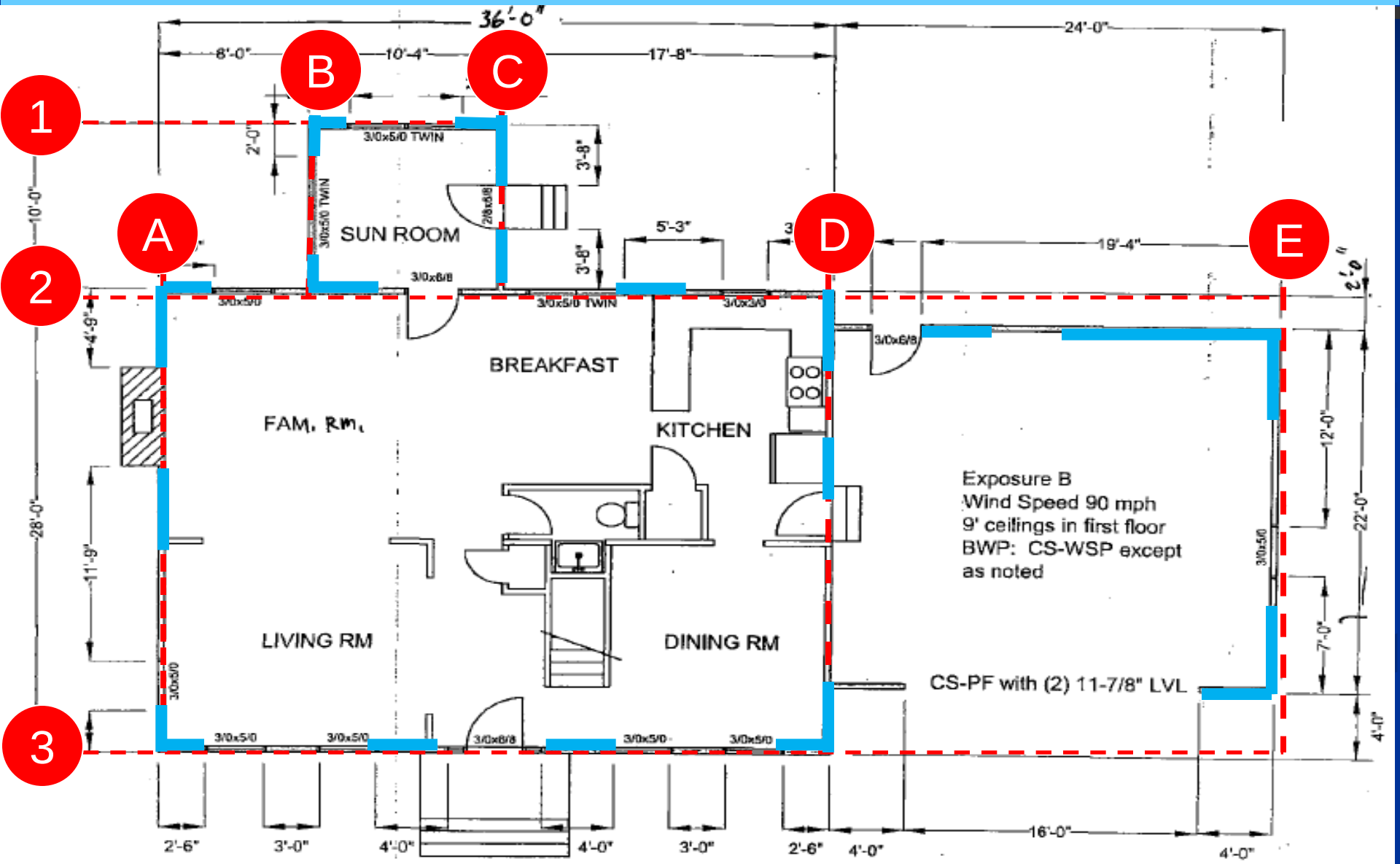
2009 CLASSIC WALL BRACING

BRACED WALL SUBMITTAL DWG.



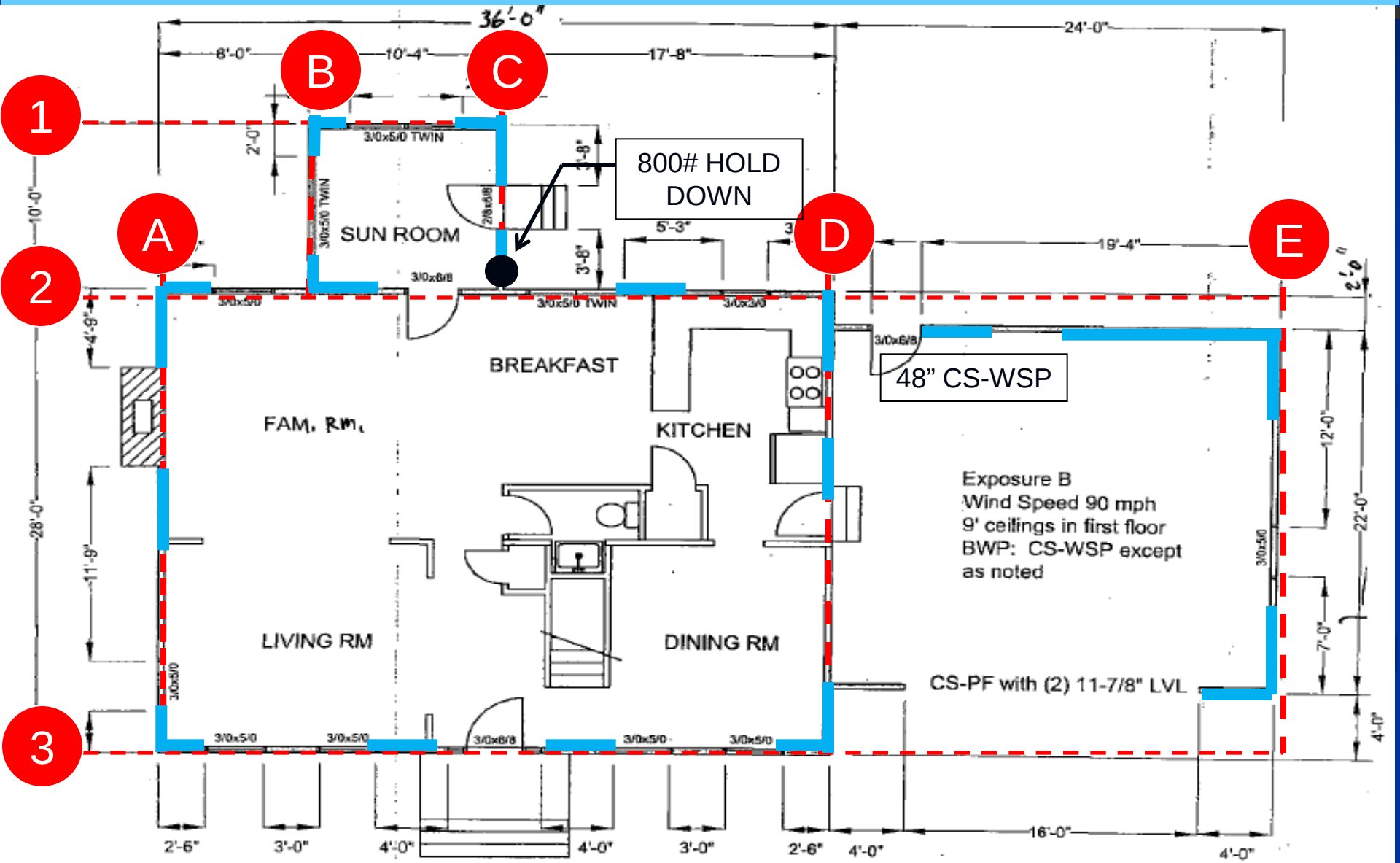
2009 CLASSIC WALL BRACING

BRACED WALL SUBMITTAL DWG.



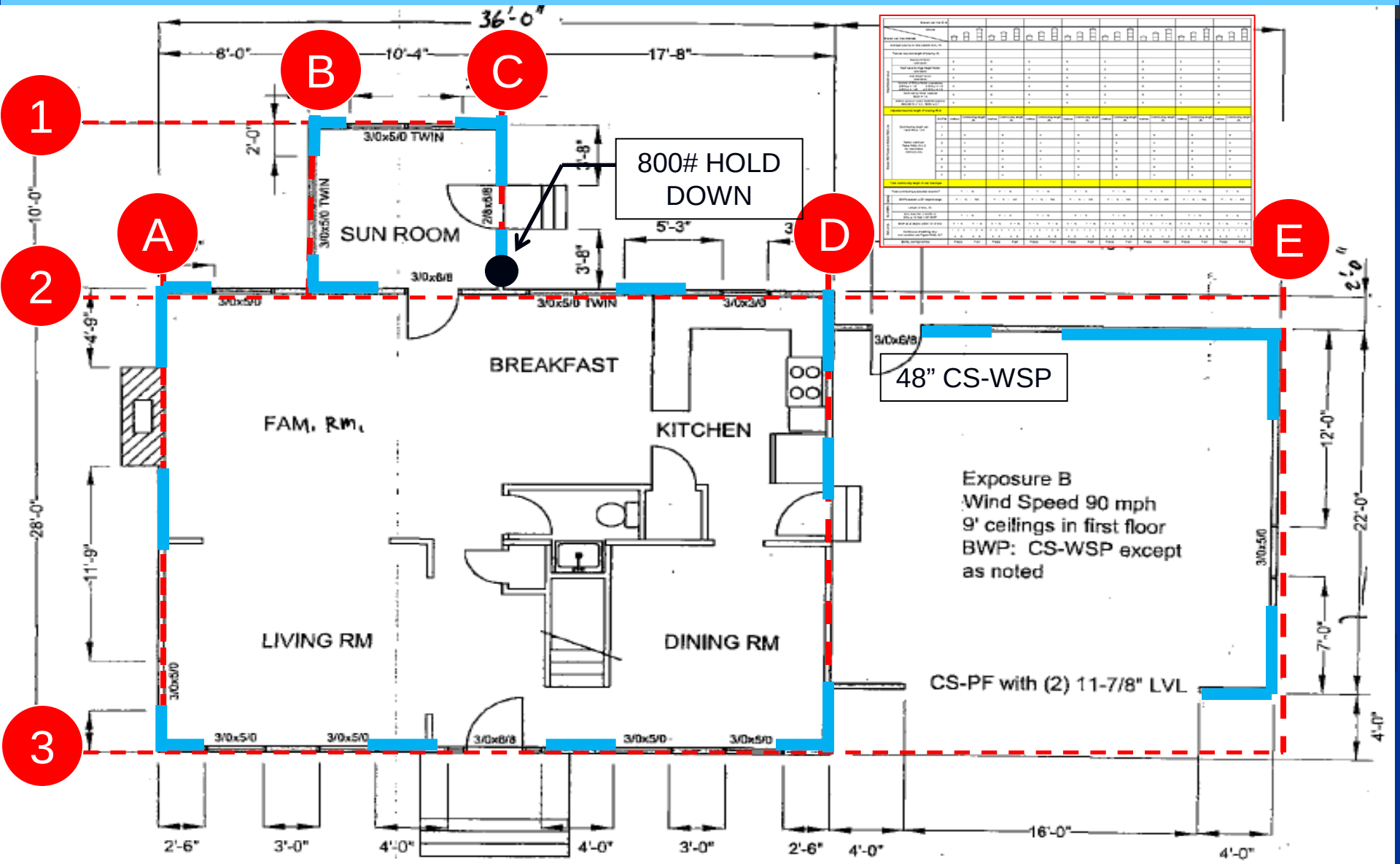
2009 CLASSIC WALL BRACING

BRACED WALL SUBMITTAL DWG.



2009 CLASSIC WALL BRACING

BRACED WALL SUBMITTAL DWG.



OVERVIEW OF CHANGES

More 2009 Wall Bracing Changes

2009 CLASSIC WALL BRACING

R602.10.4 Bracing methods for BWP

Classic method - reformats bracing methods into one table

2009

All methods

LIB	DWB
WSP	SFB
GB	PBS
HPS	PCP
HPS	ABW
PFH	PFG
CS-WSP	CS-PF
CS-G	CS-SFB

2006

Old Intermittent table

LIB	DWB
WSP	SFB
GB	PBS
HPS	PCP
ABW	IPF

Old Continuous table

CS-WSP
CS-G
CS-PF

And Adds three new methods

2009 CLASSIC WALL BRACING

R602.10.4 Bracing methods for BWP

Table R602.10.4 now permits the use of gypsum board screws per Tables R602.3(1) & R702.3.5

2009

GYP BD

Nails
@ 7” o.c.

OR

Screws
@ 7” o.c.

2006

GYP BD

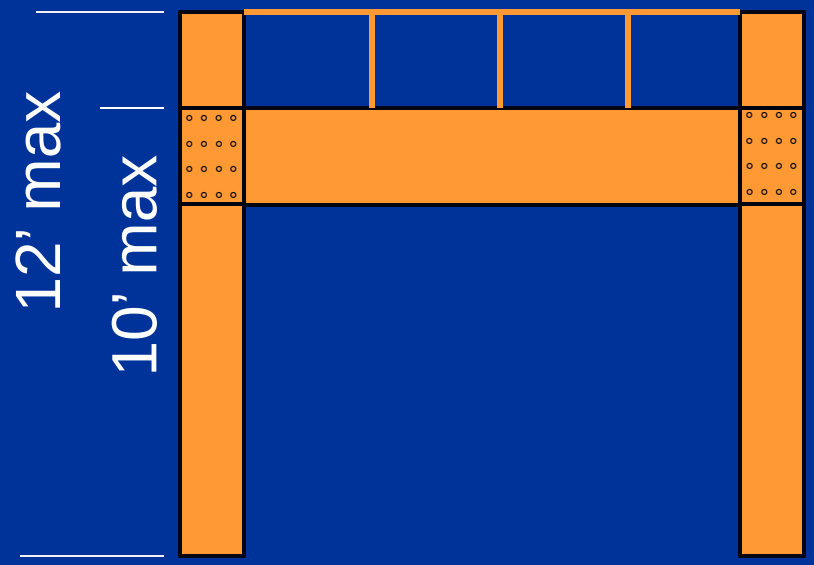
Nails
@ 7” o.c.

2009 CLASSIC WALL BRACING

R602.10.6 Methods ABW, PFH, PFG & CS-PF

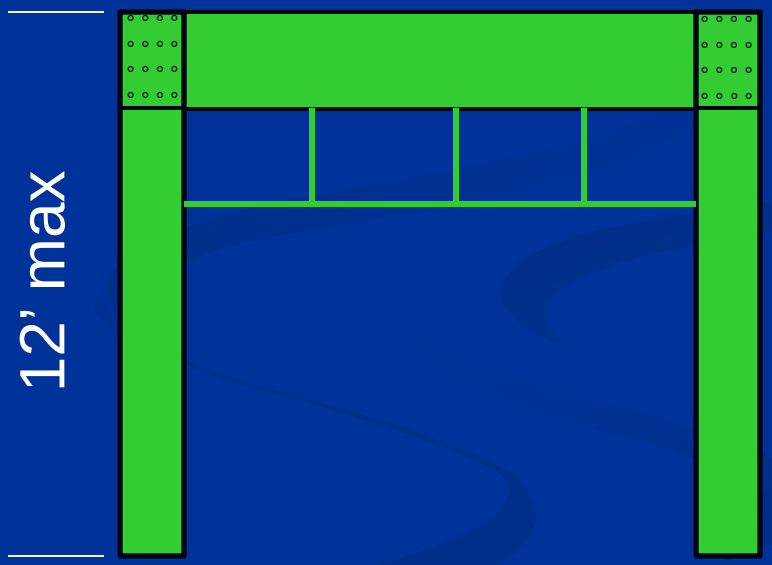
Headers of portal frames allowed to be lowered

2009



Header can be at door opening height with pony wall above

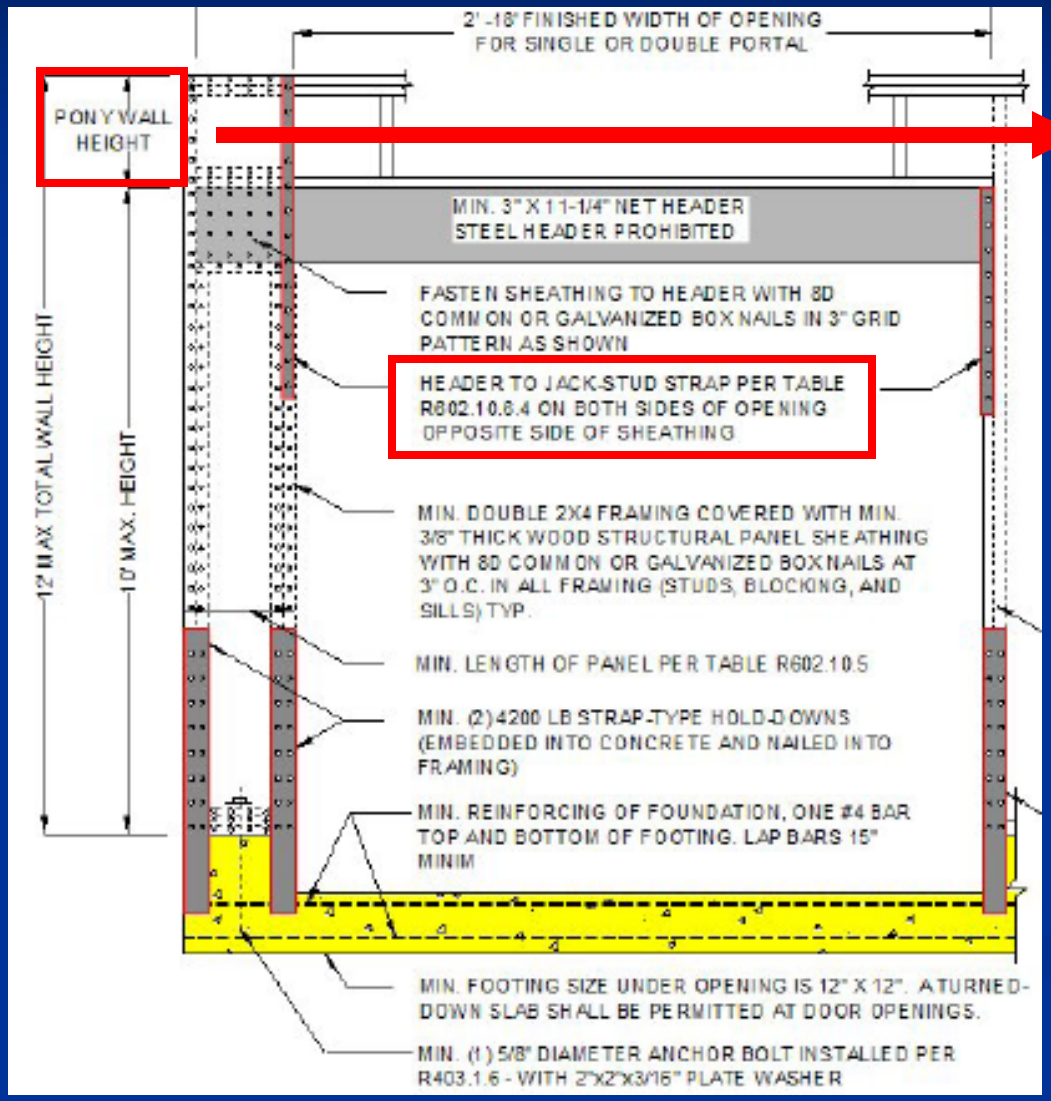
2006



Header had to be at top plates with wall hung beneath

2009 CLASSIC WALL BRACING

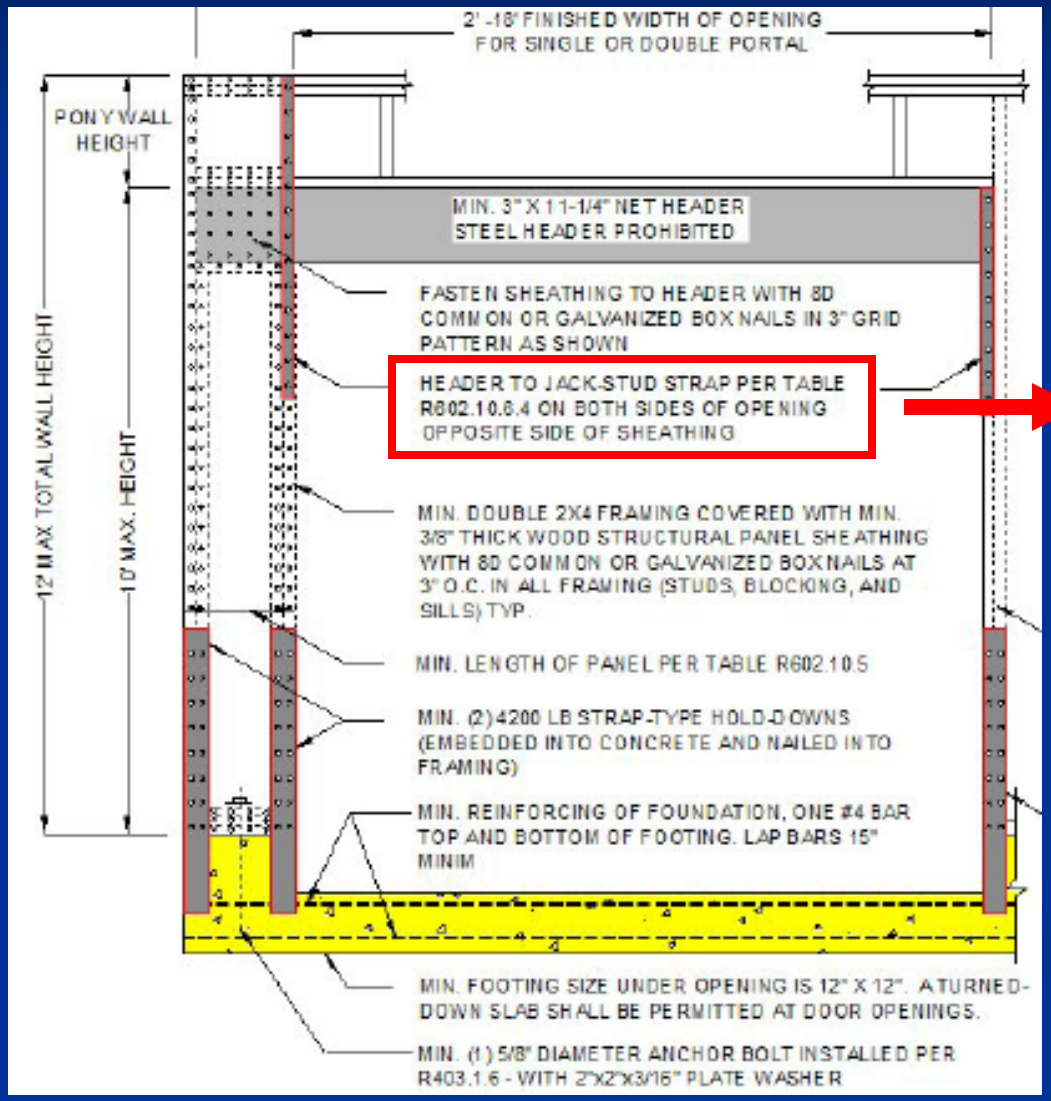
PORTAL FRAMES WITH PONY WALL



Pony wall height. Max. height depends on height of the wall

2009 CLASSIC WALL BRACING

PORTAL FRAMES WITH PONY WALL



Header to jack stud strap per Table R602.10.4

2009 CLASSIC WALL BRACING

TABLE R602.10.6.4

TABLE R602.10.6.4
TENSION STRAP CAPACITY REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHOD PFH, PFG AND CS-PF BRACED WALL PANELS

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (ft)	MAXIMUM TOTAL WALL HEIGHT (ft)	MAXIMUM OPENING WIDTH (ft)	TENSION STRAP CAPACITY REQUIRED (lb)[a]					
				BASIC WIND SPEED (mph)					
				85	90	100	85	90	100
					Exposure B			Exposure C	
2x4 No. 2 Grade	0	10	18	1000	1000	1000	1000	1000	1000
	1	10	9	1000	1000	1000	1000	1000	1275
			16	1000	1000	1750	1800	2325	3500
			18	1000	1200	2100	2175	2725	DR
	2	10	9	1000	1000	1025	1075	1550	2500
			16	1525	2025	3125	3200	3900	DR
			18	1875	2400	3575	3700	DR	DR
	2	12	9	1000	1200	2075	2125	2750	4000
			16	2600	3200	DR	DR	DR	DR
			18	3175	3850	DR	DR	DR	DR
	4	12	9	1775	2350	3500	3550	DR	DR
			16	4175	DR	DR	DR	DR	DR
2x6 Stud Grade	2	12	9	1000	1000	1325	1375	1750	2550
			16	1650	2050	2925	3000	3550	DR
			18	2025	2450	3425	3500	4100	DR
	4	12	9	1125	1500	2225	2275	2775	3800
			16	2650	3150	DR	DR	DR	DR
			18	3125	3675	DR	DR	DR	DR

2009 CLASSIC WALL BRACING

TABLE R602.10.6.4

No. 2 grade stud required

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (ft)	MAXIMUM TOTAL WALL HEIGHT (ft)
2x4 No. 2 Grade	0	10
	1	10
	2	10
	2	12
	4	12
2x6 Stud Grade	2	12
	4	12

2009 CLASSIC WALL BRACING

TABLE R602.10.6.4

No. 2 grade stud required

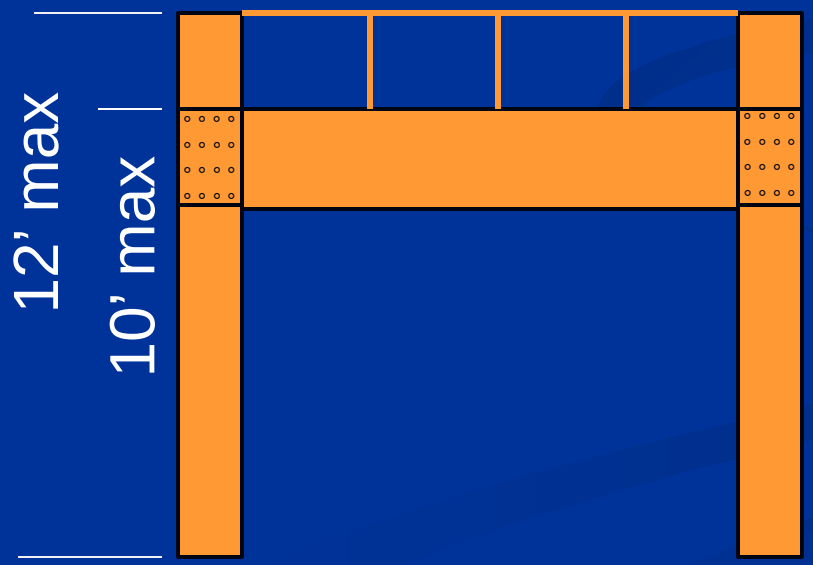
Even without a pony wall

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (ft)	MAXIMUM TOTAL WALL HEIGHT (ft)
2x4 No. 2 Grade	0	10
	1	10
	2	10
	2	12
	4	12
2x6 Stud Grade	2	12
	4	12

2009 CLASSIC WALL BRACING

R602.10.6 Methods ABW, PFH, PFG & CS-PF

DESIGN NOTE: When pony walls are used the top of the header is now UNBRACED the entire length of the opening.



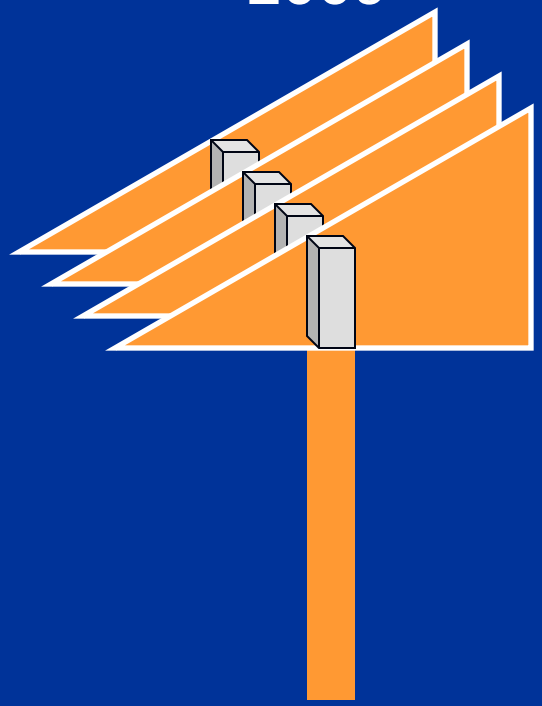
2009 CLASSIC WALL BRACING

R602.10.8.1 Connections to roof framing

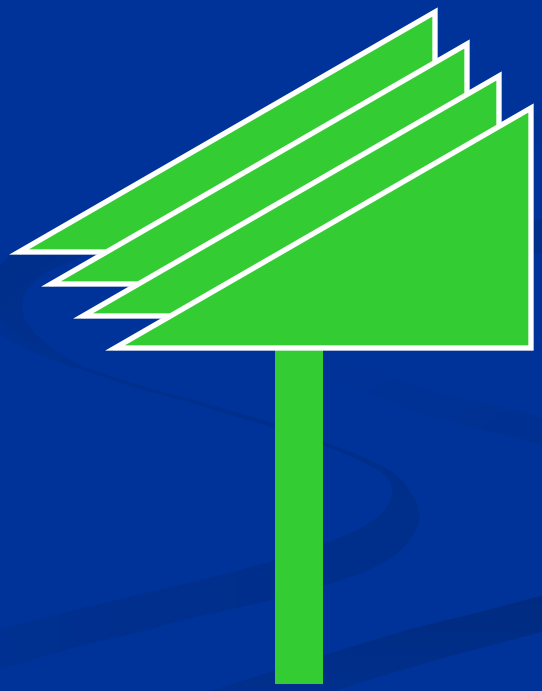
NEW

Blocking between rafters/trusses required depending on the heel height

2009



2006



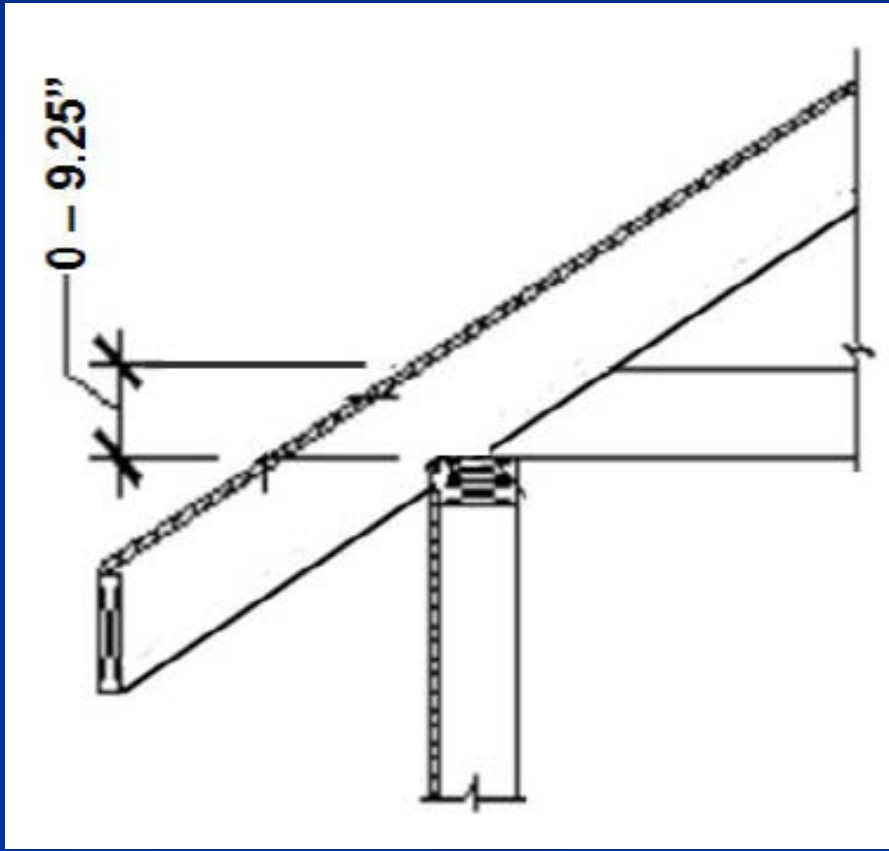
2009 CLASSIC WALL BRACING

R602.10.8.1 Connections to roof framing

Bracing between rafters/trusses @ BWP

Heels up to 9 ¼”

No bracing required



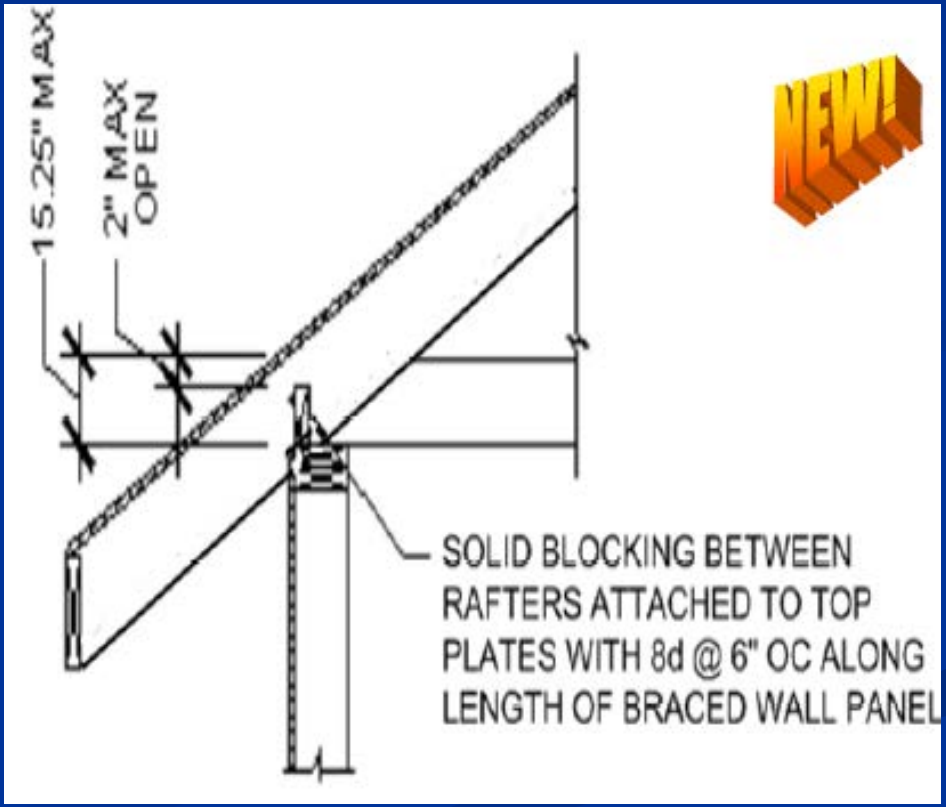
2009 CLASSIC WALL BRACING

R602.10.8.1 Connections to roof framing

Bracing between rafters/trusses @ BWP

Heels from 9 ¼” – 15 ¼”

Require solid 2x blocking



2009 CLASSIC WALL BRACING

R602.10.8.1 Connections to roof framing

Bracing between rafters/trusses @ BWP

Heels between 15.25”-48”:

Soffit blocking panels,
Vertical blocking panels,
Blocking panels designed per American Forest & Paper Association (AF&PA) or Designed in accordance with accepted engineering practice

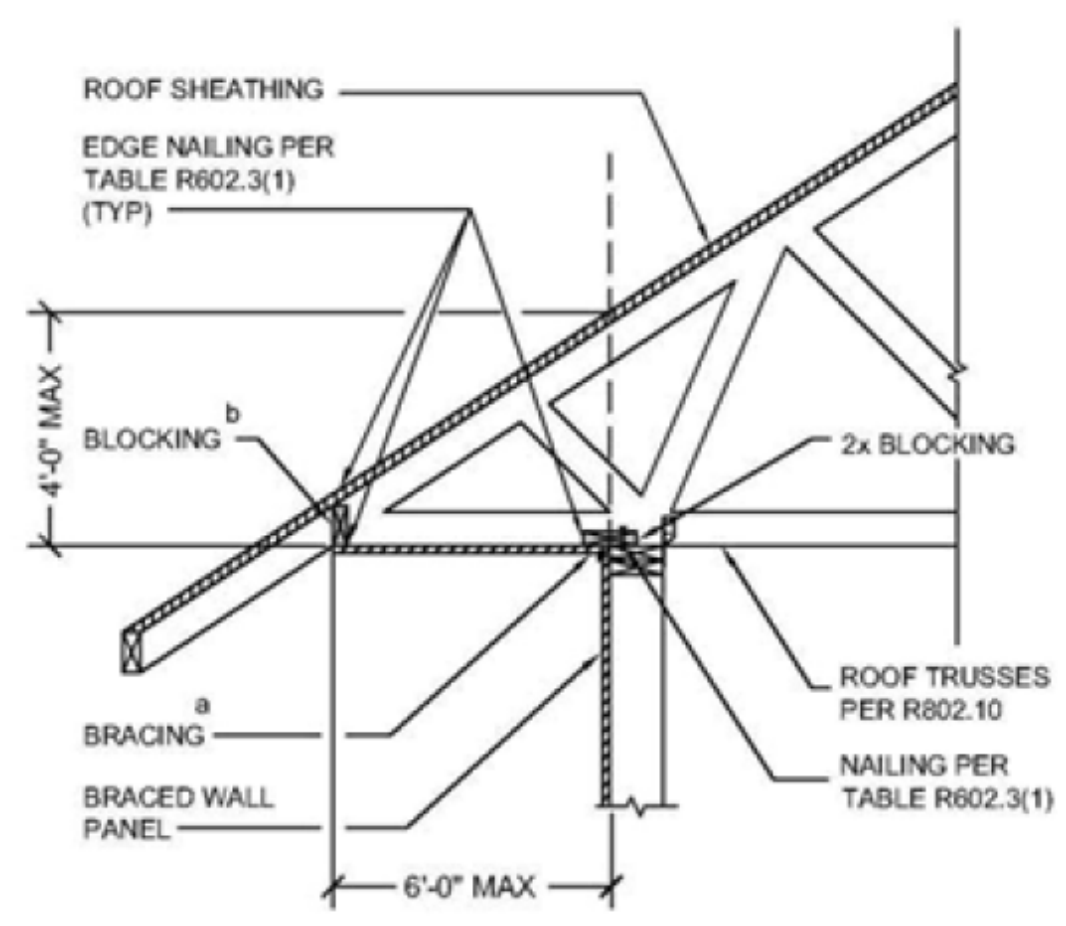
2009 CLASSIC WALL BRACING

R602.10.8.1 Connections to roof framing

Bracing between rafters/trusses @ BWP

Heels between 15.25”-48”:

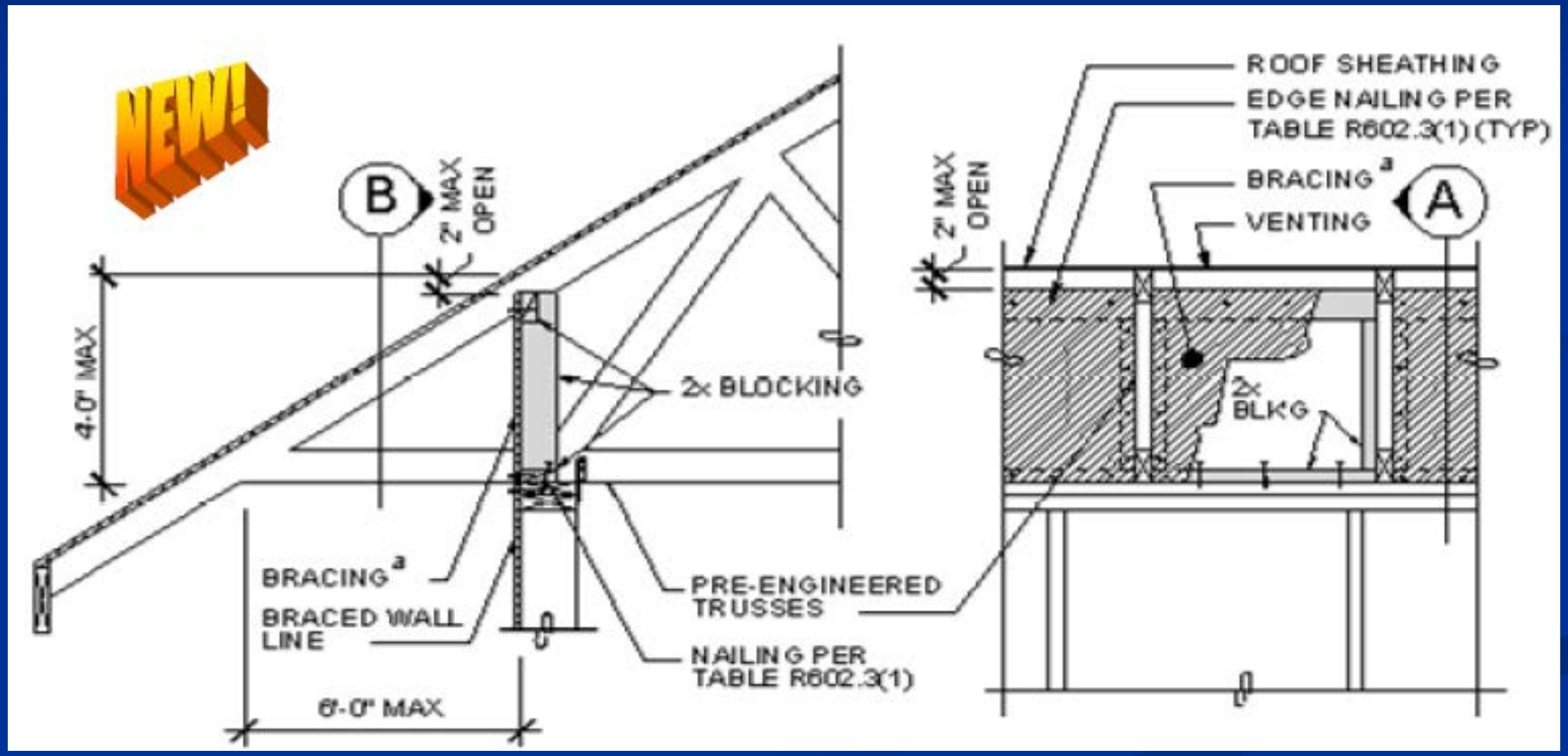
SOFFIT BLOCKING PANEL



2009 CLASSIC WALL BRACING

R602.10.8.1 Connections to roof framing

Bracing between rafters/trusses @ BWP



Heels between 15.25”-48”: VERT. BLOCKING PANEL

THE END OF CLASSIC WALL BRACING

The Classic Wall Bracing portion is OVER!