



R-CONTROL SIPs

STRUCTURAL INSULATED PANELS



Note: Information deemed reliable at time of printing.
Please visit www.r-control.com for latest information. February 2008

**CONTROL,
NOT COMPROMISE.®**

www.r-control.com

Architect/Engineering Review

The Load Design Charts for R-Control SIPs have been developed from national testing standards, testing at independent laboratories, and qualified structural engineers. They have been determined to be consistent with sound building practice. These charts cover most common construction requirements. Each building project should be reviewed by an architect/engineer to determine the suitability of R-Control SIPs.

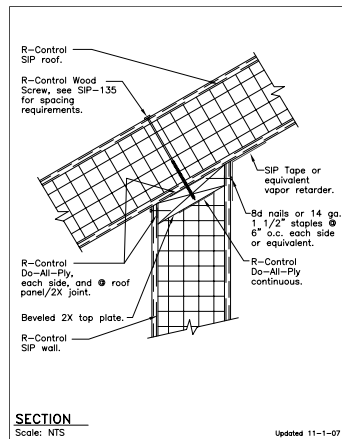
The International Code Council Evaluation Service (ICC-ES) has reviewed the independent testing, structural engineering, and third party QC program conducted by PFS Corp. ICC-ES has issued evaluation report (code report) ESR-2233 covering R-Control SIPs. R-Control SIPs are recognized as being in compliance with the 2006 International Building Code and 2006 International Residential Code.



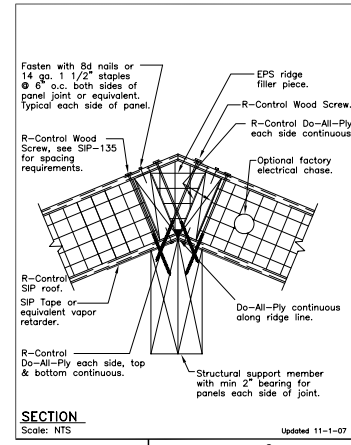
Construction Manual and Video Available

R-Control SIPs are structural components for use in load bearing wall, roof, ceiling, or floor assemblies. Contact us for a Construction Manual, technical specifications and a building techniques video. You can also download many of these documents from our website at www.r-control.com.

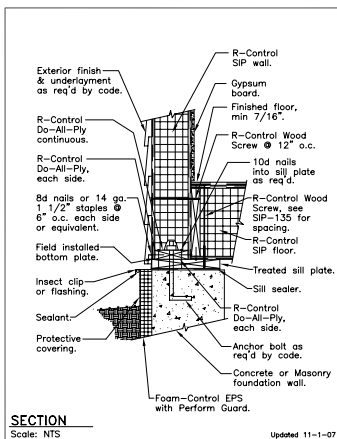
Example:



R-Control® SIP
TITLE: Beveled Wall Panel NO. SIP-122



R-Control® SIP
TITLE: Roof Ridge - Square Cut NO. SIP-121a



R-Control® SIP
TITLE: Foundation Framing - Panel NO. SIP-105b

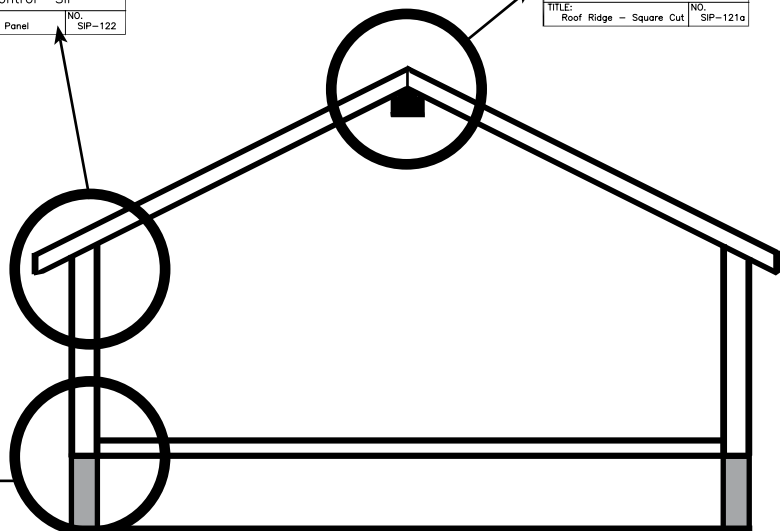


Table of Contents:

Pages

- 4-5..... Wall Design
- 6..... Header Design
- 7-10 Roof/Floor/Ceiling Design
- 11..... Diaphragm Design

Notes:

R-Control SIPs for Walls

- 2X top plate joints must be staggered a minimum of 1' from panel joints.
- For non-loadbearing walls, refer to Load Design Charts #4, #3, #3a, and #3b for transverse capacity.
- Double vertical boundary lumber of #2 Douglass Fir or better is required to achieve shear capacity.

R-Control SIPs for Roofs, Floors, or Ceilings

- Load Design Chart #1 provides transverse capacity using a surface or block spline detail for spans from 4' to 12'.
- Refer to Load Design Charts #3, #3a, and #3b for higher loads and/or longer spans than provided for in Load Design Chart #1.
- Minimum edge bearing for roof, floor, or ceiling panels is 1 1/2".
- For application of R-Control SIPs as flooring, a minimum 7/16" OSB or equivalent overlay is recommended to provide additional impact and point loading resistance.
- For sloped SIPs, the loading conditions and SIP capacities should be reviewed based upon the inclined panel length. Refer to R-Control SIP Technical Bulletin sip no. 2042.
- Load Design Chart #3, for spans greater than 22' and for all 11 1/4" core panels, the dimensional lumber is required to be #2 Douglas Fir or better.

R-Control SIPs used as Headers

- Load Design Chart #5 provides header capacity for R-Control SIPs. For higher capacities, code accepted framing is recommended.

R-Control SIPs used as a Diaphragm

- Diaphragms can be design with R-Control SIPs with capacities up to 850 plf. Refer to Load Design Chart #7.

R-Control SIP Deflections

- R-Control SIPs should be designed to comply with the deflection limits of the applicable building code. R-Control SIP Load Design Charts are for total load (dead load + live load). For long term deflection under sustained load (creep), additional deflection must be evaluated.

R-Control SIP 2X Lumber

- All R-Control SIP 2X Lumber shall be SPF#2, engineered equivalent, or greater; unless otherwise specified.

PANEL WEIGHT

| | R-CONTROL® SIPs | | | | |
|--------------|-----------------|--------|--------|---------|---------|
| | SIP THICKNESS | | | | |
| | 4 1/2" | 6 1/2" | 8 1/4" | 10 1/4" | 12 1/4" |
| WEIGHT (psf) | 3.3 | 3.5 | 3.6 | 3.8 | 4.0 |



Wall - Unity Equation

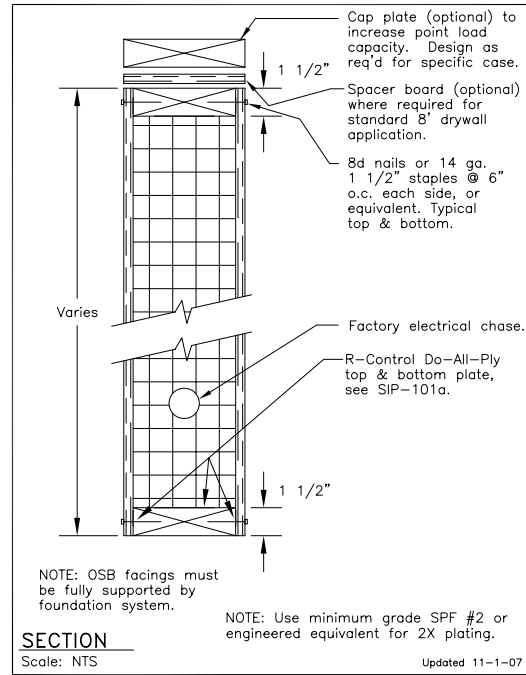
This equation is used to determine design suitability. The equation takes into account the ultimate load for a panel subjected to both axial and transverse (bending) conditions:

$$\frac{\text{design axial load}}{\text{allowable axial load}} + \frac{\text{design transverse load}}{\text{allowable transverse load}} \leq 1$$

(SEE LOAD DESIGN CHART 2B) (SEE LOAD DESIGN CHART 4)

Wall - Axial Loading LOAD DESIGN CHART #2B (SEE DETAIL SIP-101)

| R-CONTROL® SIPs | | | |
|-------------------------|--------------|---------------|--------|
| | PANEL HEIGHT | SIP THICKNESS | |
| | | 4 1/2" | 6 1/2" |
| AXIAL LOAD [1] [PLF] | 8' - 0" | 2750 | 4000 |
| | 10' - 0" | 2500 | 3500 |
| | 12' - 0" | 2000 | 3000 |
| | 14' - 0" | | 2750 |
| | 16' - 0" | | 2500 |



[1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.

[2] PLEASE REVIEW NOTES ON PAGE 3.

| | |
|-----------------------------|----------------|
| R-Control® SIP | |
| TITLE: Plate Connections | NO. SIP-101 |

Wall - Shear Loading LOAD DESIGN CHART #6 (SEE DETAIL SIP-101)

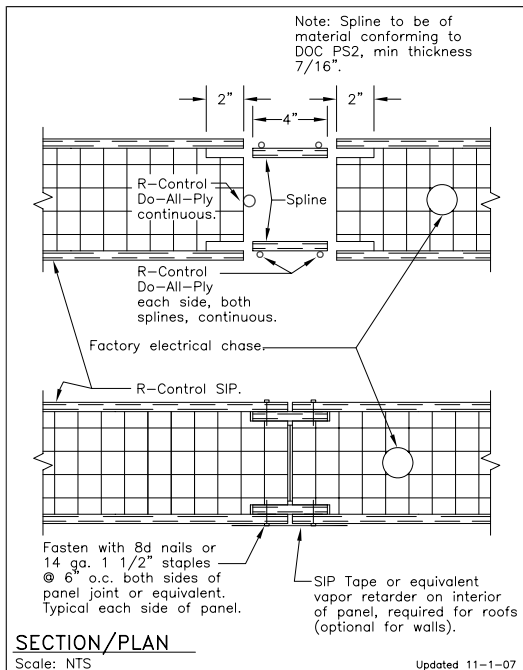
| R-CONTROL® SIPs | | |
|-----------------|---------------|---------|
| RACKING SHEAR | SIP THICKNESS | |
| | 4 1/2" | 6 1/2" |
| | 335 PLF | 335 PLF |

[1] PLEASE REVIEW NOTES ON PAGE 3.

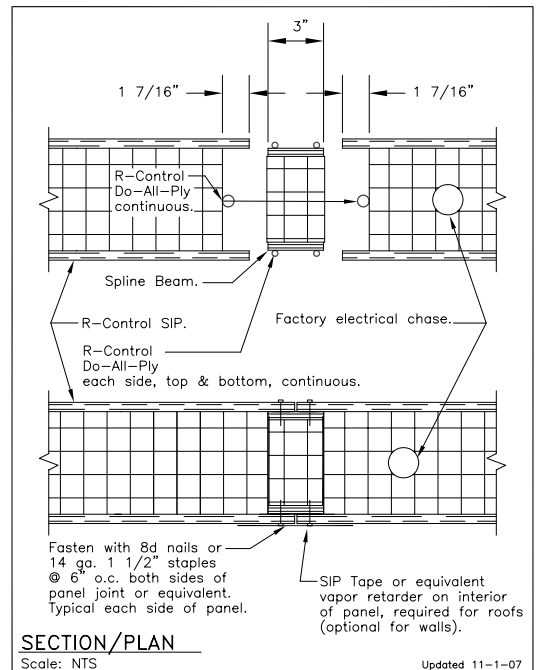
Wall - Transverse Loading
LOAD DESIGN CHART #4
(SEE SPLINE DETAILS SIP-102 or SIP-102g)

| R-CONTROL® SIPS | | | | | | | |
|---|---------------|-------|-----------------|-----------------|-------|-----------------|-----------------|
| PANEL HEIGHT | SIP THICKNESS | | | | | | |
| | 4 1/2" | | | 6 1/2" | | | |
| DEFLECTION | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | |
| T R A N S V E R S E L O A D (P S F) | 8' - 0" | 28 | 40 ¹ | 40 ¹ | 42 | 61 ¹ | 61 ¹ |
| | 10' - 0" | 20 | 30 | 32 ¹ | 32 | 48 | 49 ¹ |
| | 12' - 0" | 15 | 22 | 27 ¹ | 26 | 38 | 41 ¹ |
| | 14' - 0" | | | | 21 | 31 | 35 ¹ |
| | 16' - 0" | | | | 17 | 26 | 31 ¹ |

- [1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.
- [2] PLEASE REVIEW NOTES ON PAGE 3.



R-Control® SIP
 TITLE: Spline Connection Surface Spline NO. SIP-102



R-Control® Panel
 TITLE: Block Spline Connection NO. SIP-102g



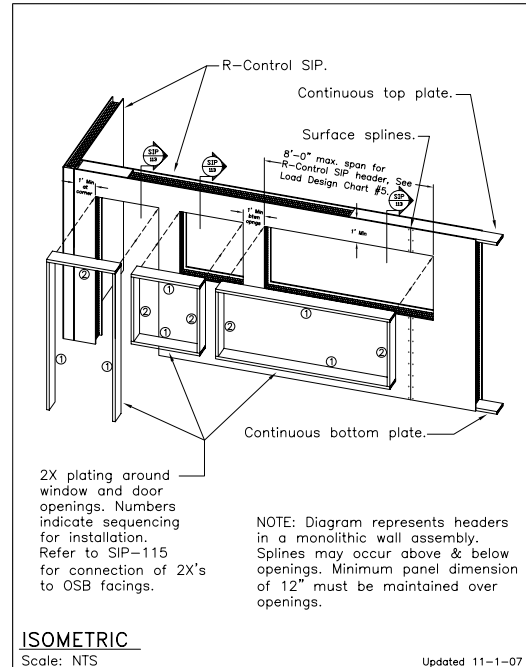
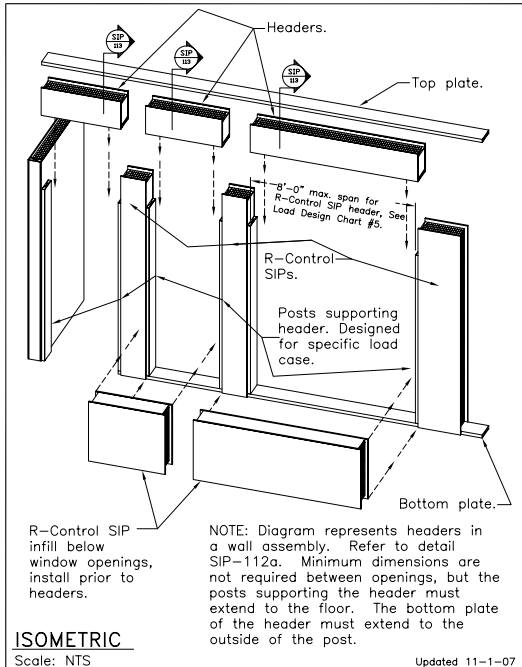
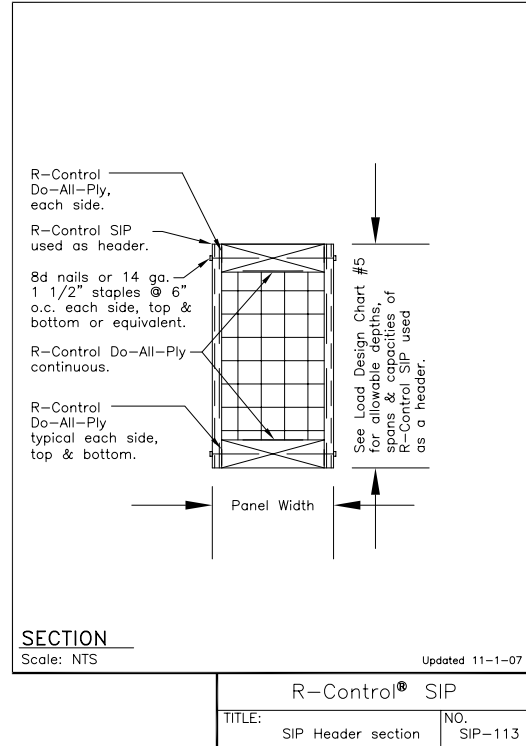
Wall - Header Loading
LOAD DESIGN CHART #5
 (SEE DETAILS SIP-112 through SIP-114)

| R-CONTROL® SIPs | | | | | | | | | | |
|-----------------|--------------|-------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| HEADER SPAN | HEADER DEPTH | | | | | | | | | |
| | 12" | | | 18" | | | 24" | | | |
| DEFLECTION | L/480 | L/360 | L/240 | L/480 | L/360 | L/240 | L/480 | L/360 | L/240 | |
| LOAD (P L F) | 4'-0" | 524 | 703 | 708 | 762 | 773 ¹ | 773 ¹ | 837 ¹ | 837 ¹ | 837 ¹ |
| | 6'-0" | 319 | 374 ¹ | 374 ¹ | 466 ¹ | 466 ¹ | 466 ¹ | 557 ¹ | 557 ¹ | 557 ¹ |
| | 8'-0" | 218 | 248 ¹ | 248 ¹ | 351 ¹ | 351 ¹ | 351 ¹ | 455 ¹ | 455 ¹ | 455 ¹ |

[1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.

[2] PLEASE REVIEW NOTES ON PAGE 3.

Note: Details SIP-112a and SIP-112b are not illustrated here. Refer to R-Control SIP Construction Manual.

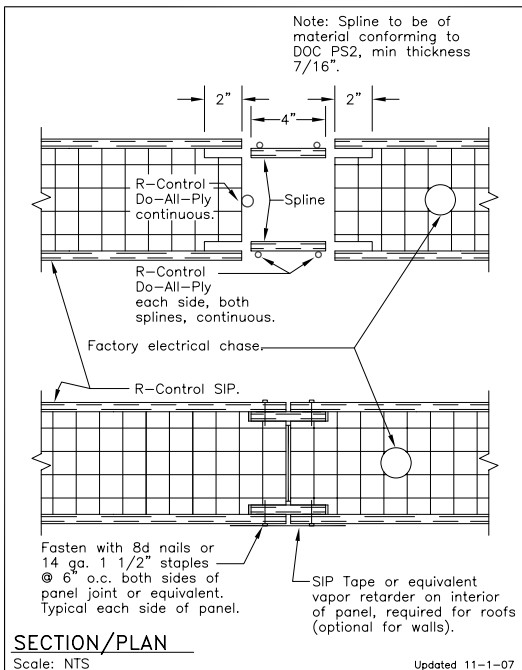


Roof/Floor - Transverse Loading
LOAD DESIGN CHART #1
(SEE SPLINE DETAILS SIP-102 or SIP-102g)

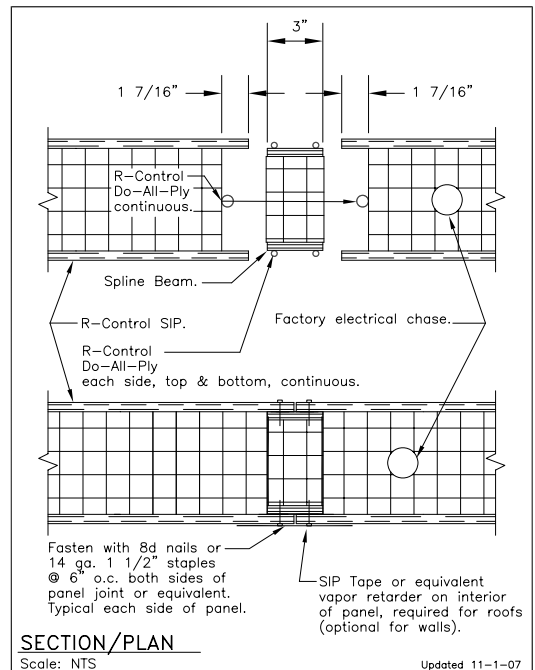
| R-CONTROL® SIPS | | | | | | | | | | | | | | | | |
|-----------------------|---------|---------------|-----------------|-----------------|--------|------------------|------------------|--------|------------------|------------------|---------|------------------|------------------|---------|------------------|------------------|
| PANEL SPAN | | SIP THICKNESS | | | | | | | | | | | | | | |
| | | 4 1/2" | | | 6 1/2" | | | 8 1/4" | | | 10 1/4" | | | 12 1/4" | | |
| DEFLECTION | | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 |
| TRANSVERSE LOAD (PSF) | 4'- 0" | 65 | 80 ¹ | 80 ¹ | 89 | 122 ¹ | 122 ¹ | 92 | 136 ¹ | 136 ¹ | 107 | 136 ¹ | 136 ¹ | 104 | 136 ¹ | 136 ¹ |
| | 6'- 0" | 40 | 53 ¹ | 53 ¹ | 58 | 81 ¹ | 81 ¹ | 64 | 96 ¹ | 96 ¹ | 75 | 96 ¹ | 96 ¹ | 73 | 96 ¹ | 96 ¹ |
| | 8'- 0" | 28 | 40 ¹ | 40 ¹ | 42 | 61 ¹ | 61 ¹ | 51 | 76 ¹ | 76 ¹ | 61 | 76 ¹ | 76 ¹ | 60 | 76 ¹ | 76 ¹ |
| | 10'- 0" | 20 | 30 | 32 ¹ | 32 | 48 | 49 ¹ | 44 | 64 ¹ | 64 ¹ | 54 | 64 ¹ | 64 ¹ | 55 | 64 ¹ | 64 ¹ |
| | 12'- 0" | | | | | | | 40 | 56 ¹ | 56 ¹ | 51 | 56 ¹ | 56 ¹ | 55 | 56 ¹ | 56 ¹ |

[1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.

[2] PLEASE REVIEW NOTES ON PAGE 3.



| | |
|--------------------------|-------------|
| R-Control® SIP | |
| TITLE: Spline Connection | NO. SIP-102 |



| | |
|--------------------------------|--------------|
| R-Control® Panel | |
| TITLE: Block Spline Connection | NO. SIP-102g |



Roof/Floor - Transverse Loading

LOAD DESIGN CHART #3

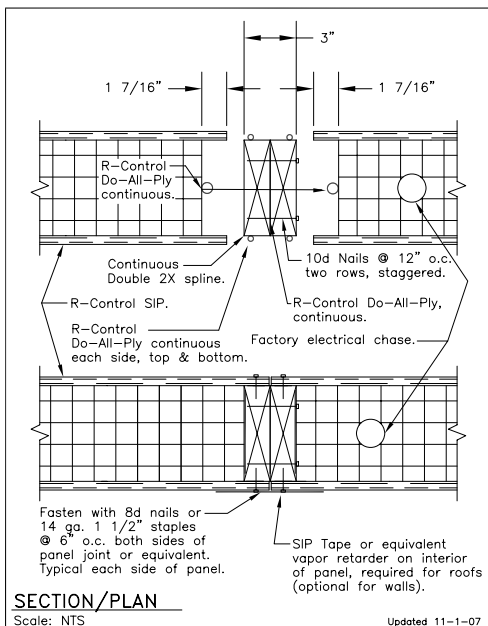
(SEE DOUBLE 2X SPLINE DETAIL SIP-102d and SIP-108)

| R-CONTROL® SIPs | | | | | | | | | | | | | | |
|--|---------|---------------|-------|------------------|--------|------------------|------------------|---------|------------------|------------------|------------------|------------------|------------------|-----------------|
| PANEL SPAN | | SIP THICKNESS | | | | | | | | | | | | |
| | | 6 1/2" | | | 8 1/4" | | | 10 1/4" | | | 12 1/4" | | | |
| DEFLECTION | | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | |
| T R A N S V E R S E L O A D (P S F | 10'- 0" | 53 | 79 | 105 ¹ | 89 | 109 ¹ | 109 ¹ | 150 | 174 ¹ | 174 ¹ | 177 ¹ | 177 ¹ | 177 ¹ | |
| | 12'- 0" | 40 | 59 | 79 | 65 | 91 ¹ | 91 ¹ | 111 | 145 ¹ | 145 ¹ | 148 ¹ | 148 ¹ | 148 ¹ | |
| | 14'- 0" | 30 | 45 | 60 | 48 | 72 | 78 ¹ | 84 | 124 ¹ | 124 ¹ | 115 | 127 ¹ | 127 ¹ | |
| | 16'- 0" | 24 | 35 | 47 | 37 | 55 | 68 ¹ | 65 | 98 | 109 ¹ | 89 | 111 ¹ | 111 ¹ | |
| | 18'- 0" | 19 | 28 | 37 | 28 | 42 | 57 | 51 | 77 | 97 ¹ | 70 | 99 ¹ | 99 ¹ | |
| | 20'- 0" | 15 | 22 | 30 | 22 | 33 | 44 | 41 | 61 | 82 | 56 | 84 | 89 ¹ | |
| | 22'- 0" | | | | | | | | 33 | 49 | 66 | 45 | 68 | 81 ¹ |
| | 24'- 0" | | | | | | | | 27 | 40 | 54 | 37 | 55 | 74 |

[1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.

[2] DOUBLE 2X MUST BE CONTINUOUS AND SPACED 4' O.C.

[3] PLEASE REVIEW NOTES ON PAGE 3.

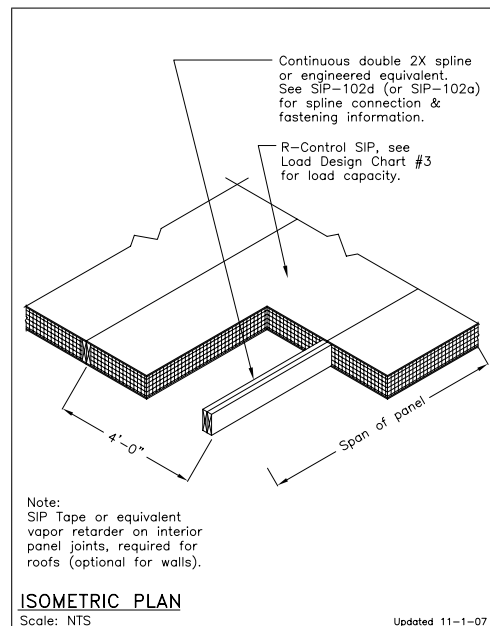


SECTION/PLAN

Scale: NTS

Updated 11-1-07

| | |
|------------------------------------|--------------|
| R-Control® SIP | |
| TITLE: Spline Connection Double 2X | NO. SIP-102d |



ISOMETRIC PLAN

Scale: NTS

Updated 11-1-07

| | |
|---------------------------------------|-------------|
| R-Control® SIP | |
| TITLE: Floor/Roof Panel 2X Connection | NO. SIP-108 |

Roof/Floor - Transverse Loading

LOAD DESIGN CHART #3A

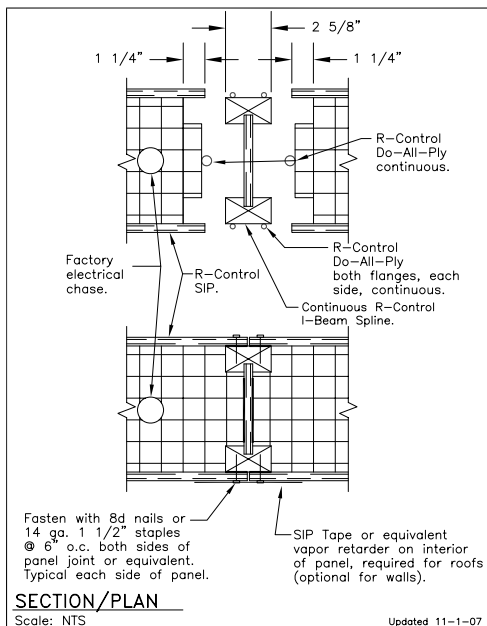
(SEE I-BEAM SPLINE DETAIL SIP-102b and SIP-108a)

| R-CONTROL® SIPs | | | | | | | | | | |
|-----------------------|---------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| PANEL SPAN | | SIP THICKNESS | | | | | | | | |
| | | 8 1/4" | | | 10 1/4" | | | 12 1/4" | | |
| DEFLECTION | | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 |
| TRANSVERSE LOAD (PSF) | 10'- 0" | 81 ¹ | 81 ¹ | 81 ¹ | 118 ¹ | 118 ¹ | 118 ¹ | 131 ¹ | 131 ¹ | 131 ¹ |
| | 12'- 0" | 63 | 68 ¹ | 68 ¹ | 98 ¹ | 98 ¹ | 98 ¹ | 109 | 109 ¹ | 109 ¹ |
| | 14'- 0" | 49 | 58 ¹ | 58 ¹ | 73 | 84 ¹ | 84 ¹ | 87 | 93 ¹ | 93 ¹ |
| | 16'- 0" | 38 | 51 ¹ | 51 ¹ | 55 | 74 ¹ | 74 ¹ | 69 | 82 ¹ | 82 ¹ |
| | 18'- 0" | 30 | 45 ¹ | 45 ¹ | 42 | 63 | 65 ¹ | 55 | 72 | 72 |
| | 20'- 0" | 24 | 37 | 40 ¹ | 33 | 49 | 59 ¹ | 45 | 65 | 65 |
| | 22'- 0" | | | | 26 | 39 | 49 ¹ | 37 | 55 | 57 ¹ |
| | 24'- 0" | | | | 21 | 31 | 41 | 30 | 46 | 48 ¹ |

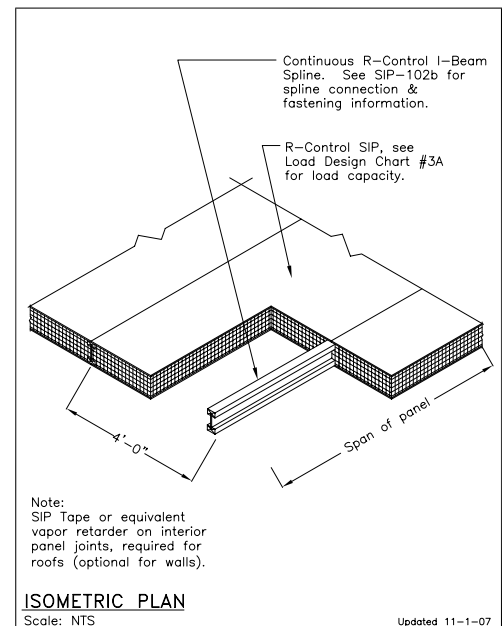
[1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.

[2] I-BEAM SPLINE MUST BE CONTINUOUS AND SPACED 4' O.C.

[3] PLEASE REVIEW NOTES ON PAGE 3.



R-Control® SIP
 TITLE: Spline Connection I-Beam Spline Connection NO. SIP-102b



R-Control® SIP
 TITLE: Floor/Roof Panel I-Beam Connection NO. SIP-108a



Roof/Floor - Transverse Loading

LOAD DESIGN CHART #3B

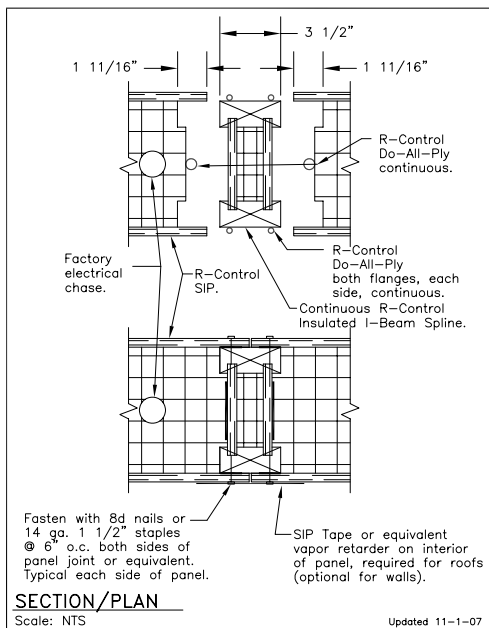
(SEE INSULATED I-BEAM SPLINE DETAIL SIP-102c and SIP-108b)

| R-CONTROL® SIPs | | | | | | | | | | | | | | |
|-----------------------|--------|---------------|-------|------------------|--------|-------|------------------|---------|------------------|------------------|------------------|------------------|------------------|-----------------|
| PANEL SPAN | | SIP THICKNESS | | | | | | | | | | | | |
| | | 6 1/2" | | | 8 1/4" | | | 10 1/4" | | | 12 1/4" | | | |
| DEFLECTION | | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | L/360 | L/240 | L/180 | |
| TRANSVERSE LOAD (PSF) | 10'-0" | 76 | 114 | 132 ¹ | 101 | 151 | 158 ¹ | 117 | 138 ¹ | 138 ¹ | 149 ¹ | 149 ¹ | 149 ¹ | |
| | 12'-0" | 53 | 79 | 96 ¹ | 72 | 109 | 132 ¹ | 88 | 115 ¹ | 115 ¹ | 124 ¹ | 124 ¹ | 124 ¹ | |
| | 14'-0" | 38 | 57 | 70 ¹ | 54 | 80 | 107 ¹ | 68 | 98 ¹ | 98 ¹ | 106 ¹ | 106 ¹ | 106 ¹ | |
| | 16'-0" | 28 | 42 | 54 ¹ | 40 | 61 | 81 | 53 | 80 | 86 ¹ | 76 | 93 ¹ | 93 ¹ | |
| | 18'-0" | 21 | 32 | 42 | 31 | 47 | 62 | 42 | 64 | 64 ¹ | 64 | 83 | 83 | |
| | 20'-0" | 16 | 24 | 32 | 24 | 36 | 49 | 34 | 51 | 52 ¹ | 50 | 74 ¹ | 74 ¹ | |
| | 22'-0" | | | | | | | | 28 | 42 | 43 ¹ | 40 | 60 | 62 |
| | 24'-0" | | | | | | | | 23 | 34 | 36 ¹ | 33 | 49 | 52 ¹ |

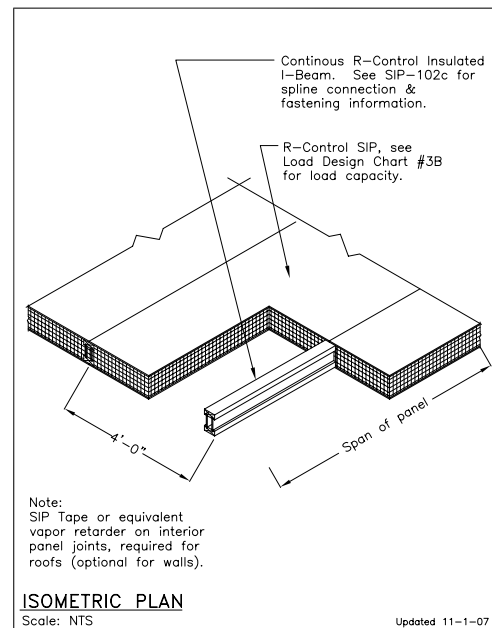
[1] LIMITED TO ULTIMATE FAILURE LOAD DIVIDED BY A FACTOR OF SAFETY OF THREE.

[2] INSULATED I-BEAM SPLINE MUST BE CONTINUOUS AND SPACED 4' O.C.

[3] PLEASE REVIEW NOTES ON PAGE 3.



| | |
|--|--------------|
| R-Control® SIP | |
| TITLE: Spline Connection Insulated I-Beam Spline | NO. SIP-102c |



| | |
|---|--------------|
| R-Control® SIP | |
| TITLE: Floor/Roof Panel Insulated I-Beam Connection | NO. SIP-108b |

Roof/Floor - Diaphragm Loading

LOAD DESIGN CHART #7

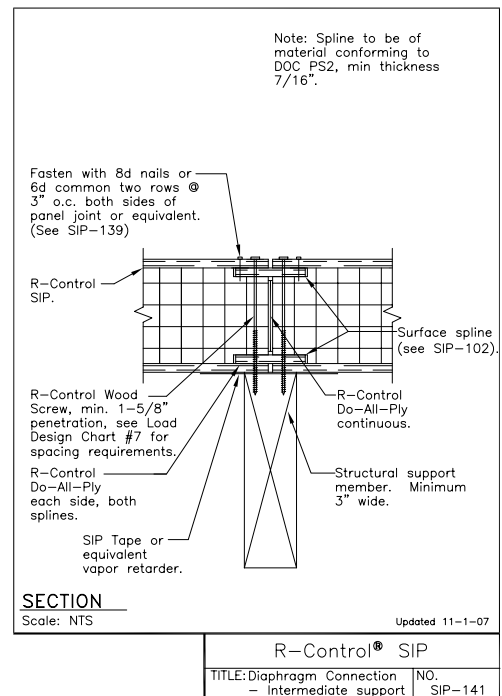
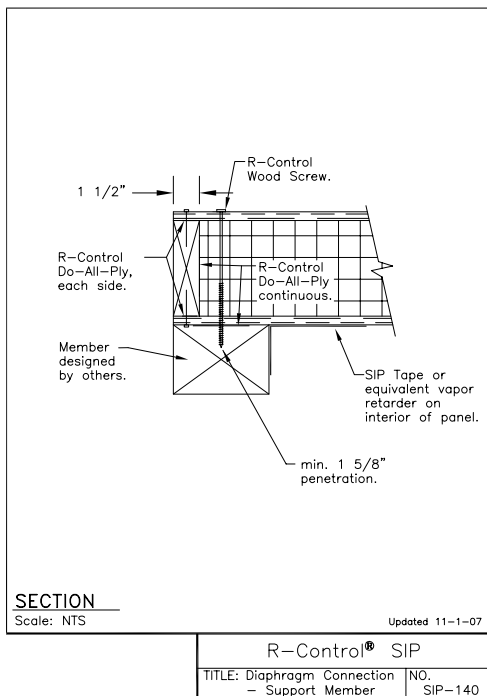
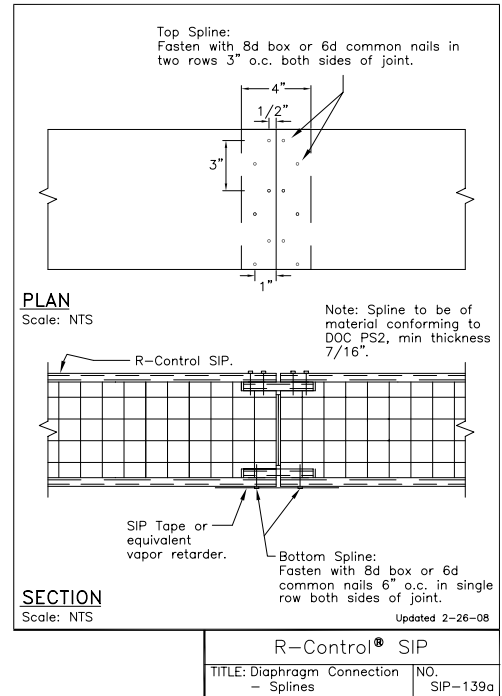
(SEE CONNECTION DETAILS
SIP-139a, SIP-140 and SIP-141)

| R-CONTROL® SIPs | | |
|--|---------|---------|
| Spacing of R-Control SIP Fasteners at supported edges (minimum 1 5/8" penetration) | | |
| 3" | 4" | 6" |
| Spacing of spline fasteners ¹ (8d box or 6d common) at unsupported edges - top side of panel only - Two staggered rows of fasteners on each side of joint | | |
| 3" | 3" | 3" |
| 850 PLF | 750 PLF | 500 PLF |

[1] SPLINE IS 7/16" OSB x 4"

[2] PLEASE REVIEW NOTES ON PAGE 3.

Note: Detail SIP-139 is not illustrated here. Refer to R-Control SIP Construction Manual.



Ready to take control? Start here.

If you're wondering how R-Control SIPs can work on your next project, just contact your nearest R-Control supplier. They'll be happy to collaborate on design, walk you through R-Control SIP installation, provide test data, pricing, and answers to all your questions. Start by visiting our web site: www.r-control.com.

ACH

FOAM TECHNOLOGIES

For further information about

R-Control SIPs

visit www.achfoam.com



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