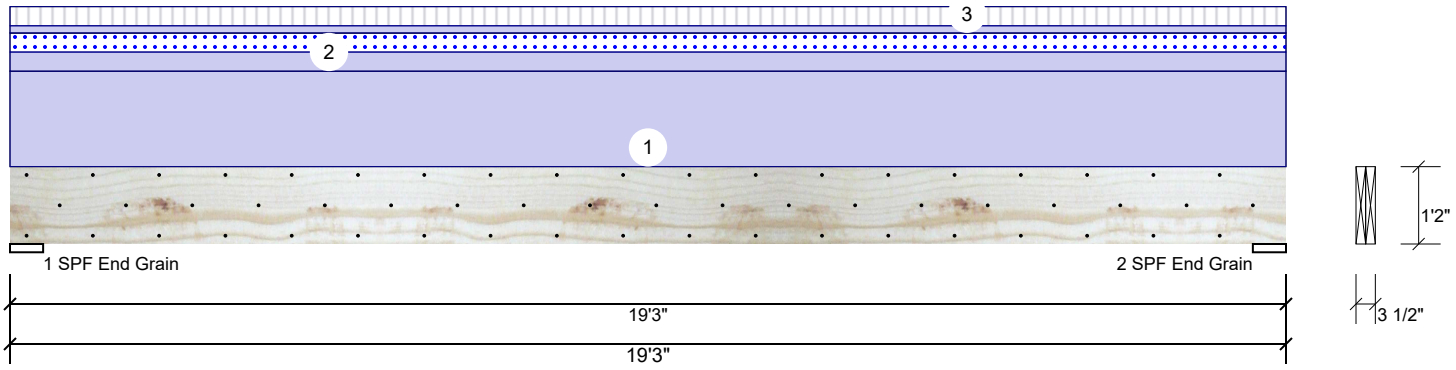
Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

GDH Kerto-S LVL 1.750" X 14.000" 2-Ply - PASSED

Level: Level



Member Information

Type:	Girder	Application:	Roof
Plies:	2	Slope:	0/12
Moisture Condition:	Dry	Design Method:	ASD
Deflection LL:	480	Building Code:	IBC 2012
Deflection TL:	360	Load Sharing:	No
Importance:	Normal	Deck:	Not Checked
Temperature:	Temp <= 100°F		

Reactions UNPATTERNED lb (Uplift)

Brg	Live	Dead	Snow	Wind	Const
1	385	2559	385	0	0
2	385	2559	385	0	0

Bearings

Bearing	Length	Cap.	React D/L lb	Total	Ld. Case	Ld. Comb.
1 - SPF End Grain	6.000"	17%	2559 / 578	3137	L	D+0.75(L+S)
2 - SPF End Grain	6.000"	17%	2559 / 578	3137	L	D+0.75(L+S)

Analysis Results

Analysis	Actual	Location	Allowed	Capacity	Comb.	Case
Moment	12910 ft-lb	9'7 1/2"	26999 ft-lb	0.478 (48%)	D+L	L
Unbraced	13754 ft-lb	9'7 1/2"	13758 ft-lb	1.000 (100%)	D+0.75(L+S)	L
Shear	2453 lb	1'7 1/4"	10453 lb	0.235 (23%)	D+L	L
LL Defl inch	0.102 (L/2160)	9'7 9/16"	0.459 (L/480)	0.220 (22%)	0.75(L+S)	L
TL Defl inch	0.555 (L/398)	9'7 9/16"	0.612 (L/360)	0.910 (91%)	D+0.75(L+S)	L

Design Notes

1 Fasten all plies using 3 rows of 10d Box nails (.128x3") at 12" o.c. Maximum end distance not to exceed 6".
2 Refer to last page of calculations for fasteners required for specified loads.
3 Girders are designed to be supported on the bottom edge only.
4 Top loads must be supported equally by all plies.
5 Top must be laterally braced at a maximum of 7'5 5/8" o.c.
6 Bottom braced at bearings.
7 Lateral slenderness ratio based on single ply width.

ID	Load Type	Location	Trib Width	Side	Dead 0.9	Live 1	Snow 1.15	Wind 1.6	Const. 1.25	Comments
1	Uniform			Top	200 PLF	0 PLF	0 PLF	0 PLF	0 PLF	Wall
2	Uniform			Top	40 PLF	0 PLF	40 PLF	0 PLF	0 PLF	roof
3	Uniform			Top	15 PLF	40 PLF	0 PLF	0 PLF	0 PLF	floor
	Self Weight				11 PLF					

Notes

Calculated Structured Designs is responsible only of the structural adequacy of this component based on the design criteria and loadings shown. It is the responsibility of the customer and/or the contractor to ensure the component suitability of the intended application, and to verify the dimensions and loads.

Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
2. Refer to manufacturer's product information regarding installation requirements, multi-ply fastening details, beam strength values, and code approvals
3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
5. Provide lateral support at bearing points to avoid lateral displacement and rotation
6. For flat roofs provide proper drainage to prevent ponding

This design is valid until 2/26/2023

Manufacturer Info

Metsä Wood
301 Merritt 7 Building, 2nd Floor
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(800) 622-5850
www.metsawood.com/us
ICC-ES: ESR-3633

Comtech, Inc.
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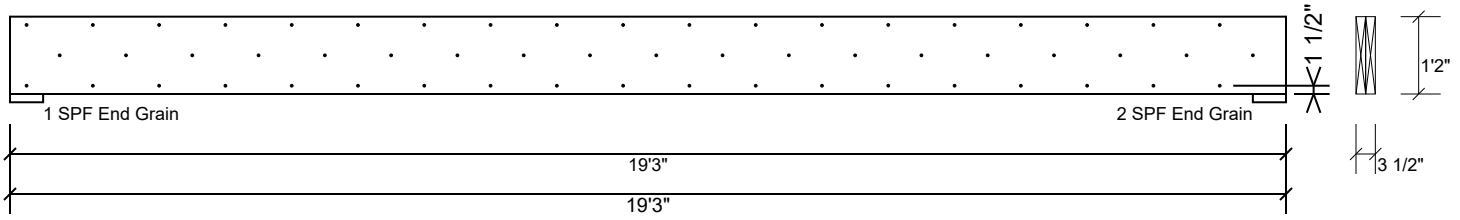
28314
910-864-TRUS

Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

GDH Kerto-S LVL 1.750" X 14.000" 2-Ply - PASSED

Level: Level



Multi-Ply Analysis

Fasten all plies using 3 rows of 10d Box nails (.128x3") at 12" o.c.. Maximum end distance not to exceed 6"

Capacity	0.0 %
Load	0.0 PLF
Yield Limit per Foot	245.6 PLF
Yield Limit per Fastener	81.9 lb.
Yield Mode	IV
Edge Distance	1 1/2"
Min. End Distance	3"
Load Combination	
Duration Factor	1.00

Notes

Calculated Structured Designs is responsible only of the structural adequacy of this component based on the design criteria and loadings shown. It is the responsibility of the customer and/or the contractor to ensure the component suitability of the intended application, and to verify the dimensions and loads.

Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
2. Refer to manufacturer's product information regarding installation requirements, multi-ply fastening details, beam strength values, and code approvals
3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
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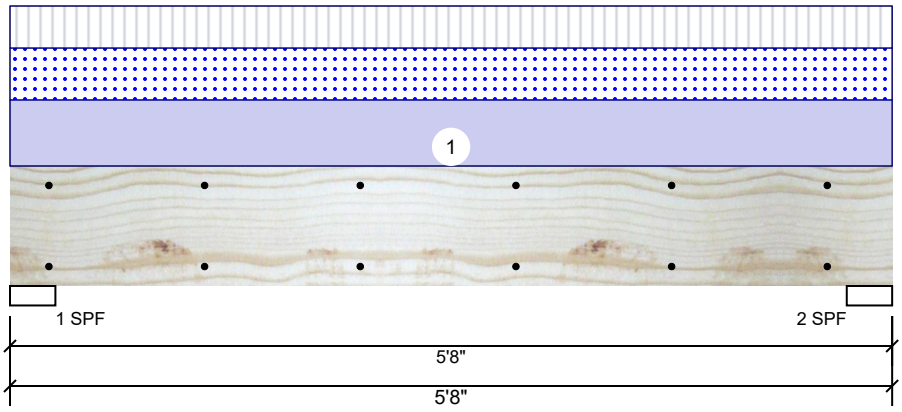
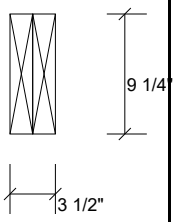
Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

BM1 Kerto-S LVL 1.750" X 9.250" 2-Ply - PASSED

Level: Level





Member Information

Type:	Girder	Application:	Floor
Plies:	2	Design Method:	ASD
Moisture Condition:	Dry	Building Code:	IBC 2012
Deflection LL:	480	Load Sharing:	No
Deflection TL:	360	Deck:	Not Checked
Importance:	Normal		
Temperature:	Temp <= 100°F		

Reactions UNPATTERNED lb (Uplift)

Brg	Live	Dead	Snow	Wind	Const
1	533	856	657	0	0
2	533	856	657	0	0

Bearings

Bearing	Length	Cap.	React D/L lb	Total	Ld. Case	Ld. Comb.
1 - SPF	3.500"	34%	856 / 893	1749	L	D+0.75(L+S)
2 - SPF	3.500"	34%	856 / 893	1749	L	D+0.75(L+S)

Analysis Results

Analysis	Actual	Location	Allowed	Capacity	Comb.	Case
Moment	2093 ft-lb	2'10"	14423 ft-lb	0.145 (15%)	D+0.75(L+S)	L
Unbraced	2093 ft-lb	2'10"	11402 ft-lb	0.184 (18%)	D+0.75(L+S)	L
Shear	1132 lb	4'8"	7943 lb	0.142 (14%)	D+0.75(L+S)	L
LL Defl inch	0.015 (L/4140)	2'10"	0.130 (L/480)	0.120 (12%)	0.75(L+S)	L
TL Defl inch	0.030 (L/2113)	2'10"	0.174 (L/360)	0.170 (17%)	D+0.75(L+S)	L

Design Notes

1 Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c. Maximum end distance not to exceed 6".
2 Refer to last page of calculations for fasteners required for specified loads.
3 Girders are designed to be supported on the bottom edge only.
4 Top loads must be supported equally by all plies.
5 Top braced at bearings.
6 Bottom braced at bearings.
7 Lateral slenderness ratio based on single ply width.

ID	Load Type	Location	Trib Width	Side	Dead 0.9	Live 1	Snow 1.15	Wind 1.6	Const. 1.25	Comments
1	Uniform			Top	295 PLF	188 PLF	232 PLF	0 PLF	0 PLF	A1 R+F
	Self Weight				7 PLF					

Notes

Calculated Structured Designs is responsible only of the structural adequacy of this component based on the design criteria and loadings shown. It is the responsibility of the customer and/or the contractor to ensure the component suitability of the intended application, and to verify the dimensions and loads.

Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
2. Refer to manufacturer's product information regarding installation requirements, multi-ply fastening details, beam strength values, and code approvals
3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
5. Provide lateral support at bearing points to avoid lateral displacement and rotation
6. For flat roofs provide proper drainage to prevent ponding

This design is valid until 2/26/2023

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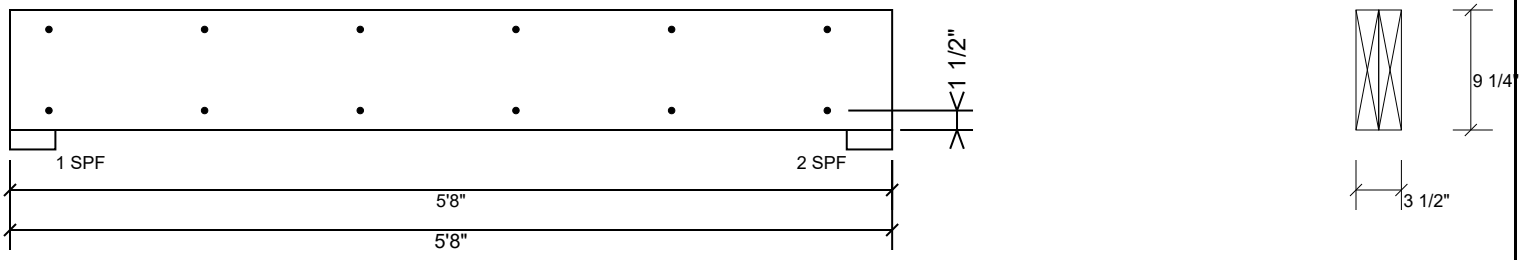
Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

BM1 Kerto-S LVL 1.750" X 9.250" 2-Ply - PASSED

Level: Level



Multi-Ply Analysis

Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c.. Maximum end distance not to exceed 6"

Capacity	0.0 %
Load	0.0 PLF
Yield Limit per Foot	163.7 PLF
Yield Limit per Fastener	81.9 lb.
Yield Mode	IV
Edge Distance	1 1/2"
Min. End Distance	3"
Load Combination	
Duration Factor	1.00

Notes

Calculated Structured Designs is responsible only of the structural adequacy of this component based on the design criteria and loadings shown. It is the responsibility of the customer and/or the contractor to ensure the component suitability of the intended application, and to verify the dimensions and loads.

Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
2. Refer to manufacturer's product information regarding installation requirements, multi-ply fastening details, beam strength values, and code approvals
3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
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6. For flat roofs provide proper drainage to prevent ponding

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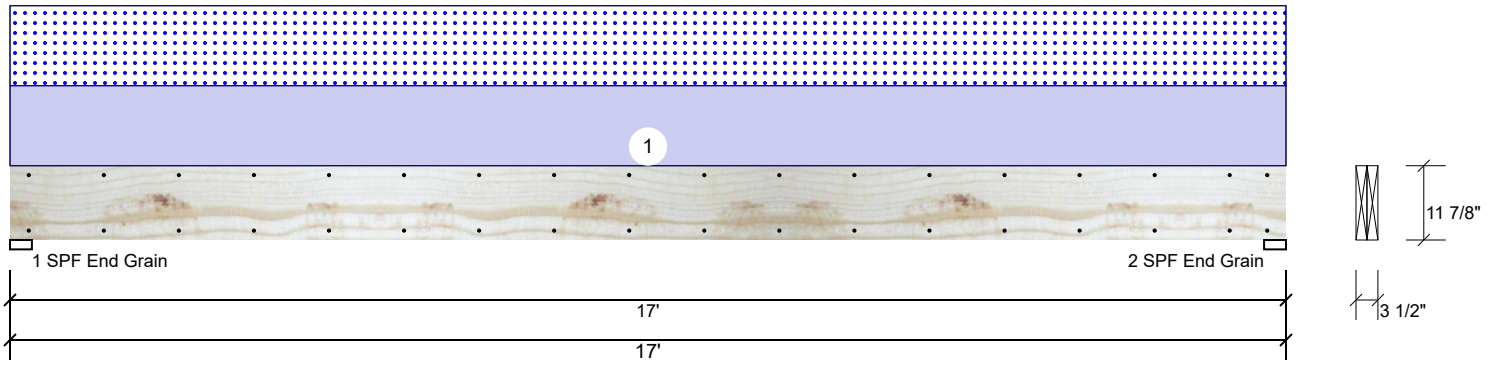
Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

PBM1 Kerto-S LVL 1.750" X 11.875" 2-Ply - PASSED

Level: Level



Member Information

Type:	Girder	Application:	Floor
Plies:	2	Design Method:	ASD
Moisture Condition:	Dry	Building Code:	IBC 2012
Deflection LL:	480	Load Sharing:	No
Deflection TL:	360	Deck:	Not Checked
Importance:	Normal		
Temperature:	Temp <= 100°F		

Reactions UNPATTERNED lb (Uplift)

Brg	Live	Dead	Snow	Wind	Const
1	0	682	604	0	0
2	0	682	604	0	0

Bearings

Bearing	Length	Cap.	React D/L lb	Total	Ld. Case	Ld. Comb.
1 - SPF End Grain	3.500"	12%	682 / 604	1286	L	D+S
2 - SPF End Grain	3.500"	12%	682 / 604	1286	L	D+S

Analysis Results

Analysis	Actual	Location	Allowed	Capacity	Comb.	Case
Moment	5173 ft-lb	8'6"	22897 ft-lb	0.226 (23%)	D+S	L
Unbraced	5173 ft-lb	8'6"	6026 ft-lb	0.858 (86%)	D+S	L
Shear	1101 lb	15'9 3/8"	10197 lb	0.108 (11%)	D+S	L
LL Defl inch	0.129 (L/1537)	8'6 1/16"	0.414 (L/480)	0.310 (31%)	S	L
TL Defl inch	0.275 (L/721)	8'6 1/16"	0.551 (L/360)	0.500 (50%)	D+S	L

Design Notes

1 Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c. Maximum end distance not to exceed 6".
2 Refer to last page of calculations for fasteners required for specified loads.
3 Girders are designed to be supported on the bottom edge only.
4 Top loads must be supported equally by all plies.
5 Top braced at bearings.
6 Bottom braced at bearings.
7 Lateral slenderness ratio based on single ply width.

ID	Load Type	Location	Trib Width	Side	Dead 0.9	Live 1	Snow 1.15	Wind 1.6	Const. 1.25	Comments
1	Uniform			Top	71 PLF	0 PLF	71 PLF	0 PLF	0 PLF	A1
	Self Weight				9 PLF					

Notes

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Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
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3. Damaged Beams must not be used
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6. For flat roofs provide proper drainage to prevent ponding

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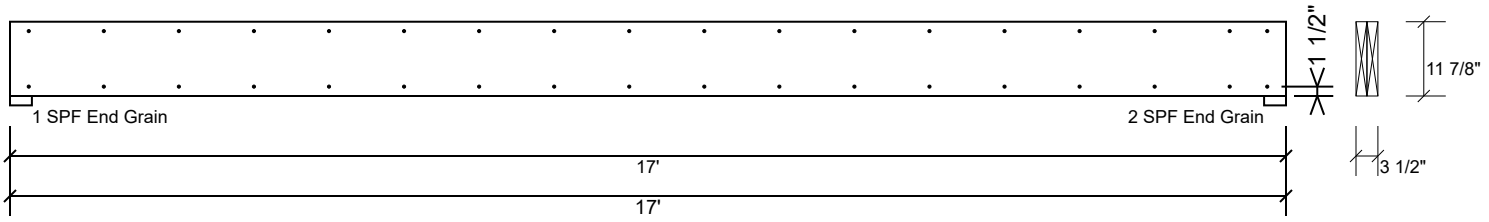
PBM1 Kerto-S LVL 1.750" X 11.875" 2-Ply - PASSED

Level: Level



Multi-Ply Analysis

Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c.. Maximum end distance not to exceed 6"

Capacity	0.0 %
Load	0.0 PLF
Yield Limit per Foot	163.7 PLF
Yield Limit per Fastener	81.9 lb.
Yield Mode	IV
Edge Distance	1 1/2"
Min. End Distance	3"
Load Combination	
Duration Factor	1.00

Notes

Calculated Structured Designs is responsible only of the structural adequacy of this component based on the design criteria and loadings shown. It is the responsibility of the customer and/or the contractor to ensure the component suitability of the intended application, and to verify the dimensions and loads.

Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
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3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
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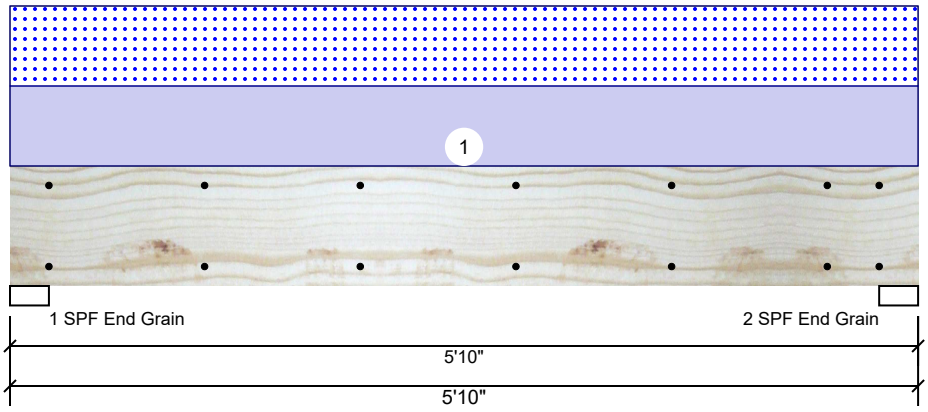
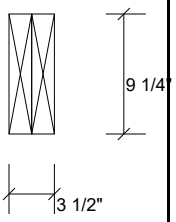
HDR1 Kerto-S LVL 1.750" X 9.250" 2-Ply - PASSED

Level: Level





Member Information

Type:	Girder	Application:	Floor
Plies:	2	Design Method:	ASD
Moisture Condition:	Dry	Building Code:	IBC 2012
Deflection LL:	480	Load Sharing:	No
Deflection TL:	360	Deck:	Not Checked
Importance:	Normal		
Temperature:	Temp <= 100°F		

Reactions UNPATTERNED lb (Uplift)

Brg	Live	Dead	Snow	Wind	Const
1	0	1538	1517	0	0
2	0	1538	1517	0	0

Bearings

Bearing	Length	Cap.	React D/L lb	Total	Ld. Case	Ld. Comb.
1 - SPF End Grain	3.000"	33%	1538 / 1517	3054	L	D+S
2 - SPF End Grain	3.000"	33%	1538 / 1517	3054	L	D+S

Analysis Results

Analysis	Actual	Location	Allowed	Capacity	Comb.	Case
Moment	3900 ft-lb	2'11"	14423 ft-lb	0.270 (27%)	D+S	L
Unbraced	3900 ft-lb	2'11"	11110 ft-lb	0.351 (35%)	D+S	L
Shear	2051 lb	11 1/2"	7943 lb	0.258 (26%)	D+S	L
LL Defl inch	0.029 (L/2229)	2'11"	0.136 (L/480)	0.220 (22%)	S	L
TL Defl inch	0.059 (L/1107)	2'11"	0.182 (L/360)	0.330 (33%)	D+S	L

Design Notes

1 Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c. Maximum end distance not to exceed 6".
2 Refer to last page of calculations for fasteners required for specified loads.
3 Girders are designed to be supported on the bottom edge only.
4 Top loads must be supported equally by all plies.
5 Top braced at bearings.
6 Bottom braced at bearings.
7 Lateral slenderness ratio based on single ply width.

ID	Load Type	Location	Trib Width	Side	Dead 0.9	Live 1	Snow 1.15	Wind 1.6	Const. 1.25	Comments
1	Uniform			Top	520 PLF	0 PLF	520 PLF	0 PLF	0 PLF	A1
	Self Weight				7 PLF					

Notes

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Lumber

1. Dry service conditions, unless noted otherwise
2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

1. LVL beams must not be cut or drilled
2. Refer to manufacturer's product information regarding installation requirements, multi-ply fastening details, beam strength values, and code approvals
3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
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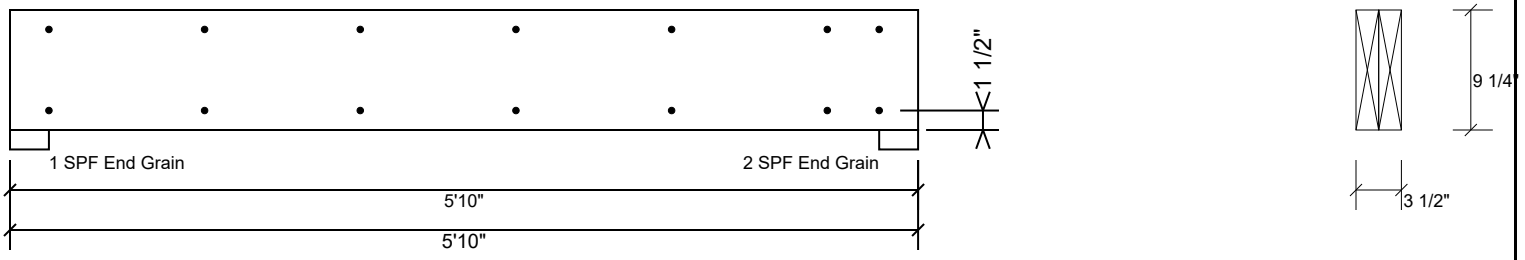
		Project #:	J0720-3454

HDR1 Kerto-S LVL 1.750" X 9.250" 2-Ply - PASSED

Level: Level



Multi-Ply Analysis

Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c.. Maximum end distance not to exceed 6"

Capacity	0.0 %
Load	0.0 PLF
Yield Limit per Foot	163.7 PLF
Yield Limit per Fastener	81.9 lb.
Yield Mode	IV
Edge Distance	1 1/2"
Min. End Distance	3"
Load Combination	
Duration Factor	1.00

Notes

Calculated Structured Designs is responsible only of the structural adequacy of this component based on the design criteria and loadings shown. It is the responsibility of the customer and/or the contractor to ensure the component suitability of the intended application, and to verify the dimensions and loads.

Lumber

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2. LVL not to be treated with fire retardant or corrosive chemicals

Handling & Installation

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2. Refer to manufacturer's product information regarding installation requirements, multi-ply fastening details, beam strength values, and code approvals
3. Damaged Beams must not be used
4. Design assumes top edge is laterally restrained
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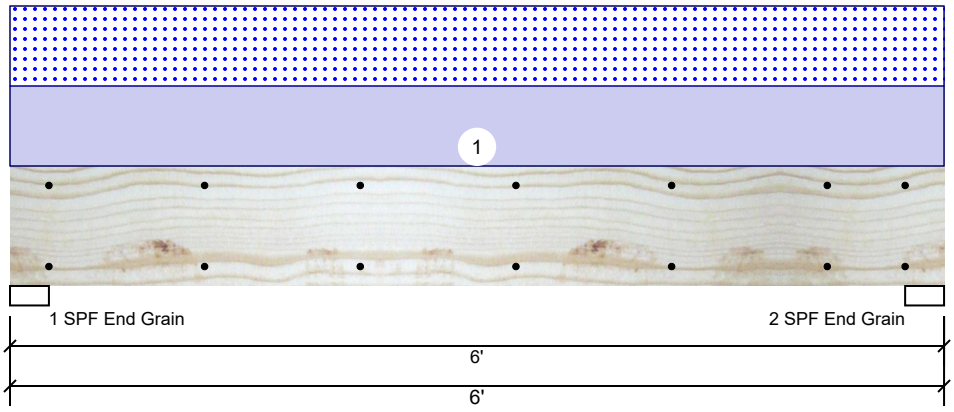
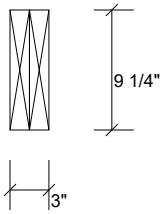
Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

HDR3 SP #2 2.000" X 10.000" 2-Ply - PASSED

Level: Level





Member Information

Type:	Girder	Application:	Floor
Plies:	2	Design Method:	ASD
Moisture Condition:	Dry	Building Code:	IBC 2012
Deflection LL:	480	Load Sharing:	No
Deflection TL:	360	Deck:	Not Checked
Importance:	Normal		
Temperature:	Temp <= 100°F		

Reactions UNPATTERNED lb (Uplift)

Brg	Live	Dead	Snow	Wind	Const
1	0	885	885	0	0
2	0	885	885	0	0

Bearings

Bearing	Length	Cap.	React D/L lb	Total	Ld. Case	Ld. Comb.
1 - SPF End Grain	3.000"	35%	885 / 885	1770	L	D+S
2 - SPF End Grain	3.000"	35%	885 / 885	1770	L	D+S

Analysis Results

Analysis	Actual	Location	Allowed	Capacity	Comb.	Case
Moment	2333 ft-lb	3'	3280 ft-lb	0.711 (71%)	D+S	L
Unbraced	2333 ft-lb	3'	3074 ft-lb	0.759 (76%)	D+S	L
Shear	1205 lb	11 1/2"	3723 lb	0.324 (32%)	D+S	L
LL Defl inch	0.024 (L/2814)	3'	0.141 (L/480)	0.170 (17%)	S	L
TL Defl inch	0.048 (L/1407)	3'	0.188 (L/360)	0.260 (26%)	D+S	L

Design Notes

1 Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c. Maximum end distance not to exceed 6".
2 Refer to last page of calculations for fasteners required for specified loads.
3 Girders are designed to be supported on the bottom edge only.
4 Top loads must be supported equally by all plies.
5 Top braced at bearings.
6 Bottom braced at bearings.
7 Lateral slenderness ratio based on single ply width.

ID	Load Type	Location	Trib Width	Side	Dead 0.9	Live 1	Snow 1.15	Wind 1.6	Const. 1.25	Comments
1	Uniform			Top	295 PLF	0 PLF	295 PLF	0 PLF	0 PLF	A6

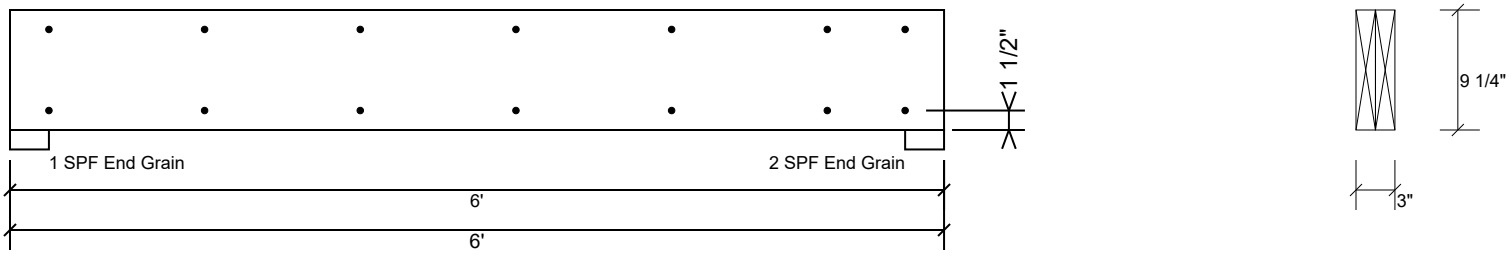
This design is valid until 2/26/2023

Manufacturer Info

Comtech, Inc.
1001 S. Reilly Road, Suite #639
Fayetteville, NC
USA
28314
910-864-TRUS

HDR3 SP #2 2.000" X 10.000" 2-Ply - PASSED

Level: Level



Multi-Ply Analysis

Fasten all plies using 2 rows of 10d Box nails (.128x3") at 12" o.c.. Maximum end distance not to exceed 6"

Capacity	0.0 %
Load	0.0 PLF
Yield Limit per Foot	202.6 PLF
Yield Limit per Fastener	101.3 lb.
Yield Mode	IV
Edge Distance	1 1/2"
Min. End Distance	3"
Load Combination	
Duration Factor	1.00

Manufacturer Info

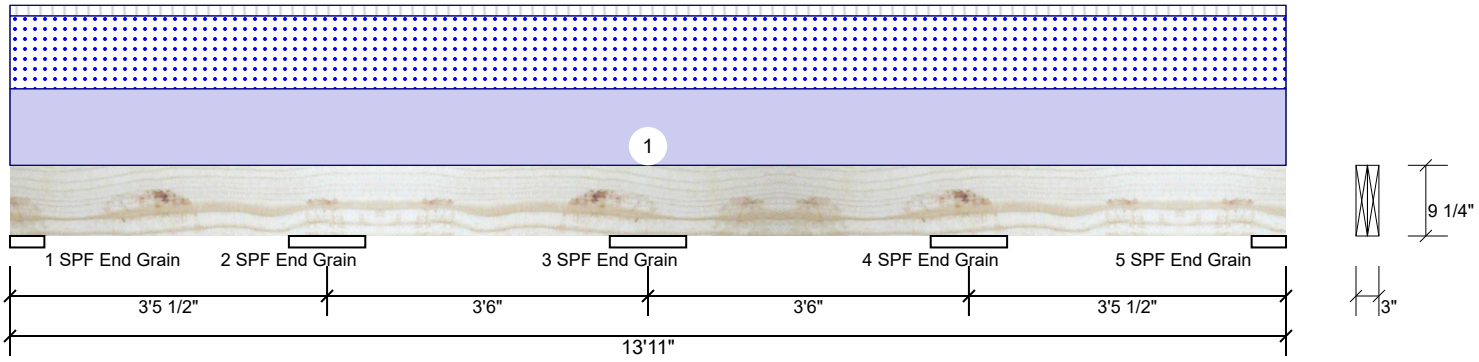
Comtech, Inc.
1001 S. Reilly Road, Suite #639
Fayetteville, NC
USA
28314
910-864-TRUS

This design is valid until 2/26/2023

Client:	Watermark Homes	Date:	7/30/2020
Project:		Input by:	Anthony Williams
Address:		Job Name:	The Sugarberry
		Project #:	J0720-3454

HDR2 S-P-F #2 2.000" X 10.000" 2-Ply - PASSED

Level: Level



Member Information

Type:	Girder	Application:	Floor
Plies:	2	Design Method:	ASD
Moisture Condition:	Dry	Building Code:	IBC 2012
Deflection LL:	480	Load Sharing:	No
Deflection TL:	240	Deck:	Not Checked
Importance:	Normal		
Temperature:	Temp <= 100°F		

Reactions UNPATTERNED lb (Uplift)

Brg	Live	Dead	Snow	Wind	Const
1	139	1001	954	0	0
2	340	2454	2338	0	0
3	309	2233	2128	0	0
4	340	2454	2338	0	0
5	139	1001	954	0	0

Bearings

Bearing	Length	Cap.	React D/L lb	Total	Ld. Case	Ld. Comb.
1 - SPF End Grain	4.500"	35%	1001 / 1021	2022	L_L_	D+S
2 - SPF End Grain	10.000"	38%	2454 / 2429	4883	LL_L	D+S
3 - SPF End Grain	10.000"	36%	2233 / 2309	4542	_LL_	D+S
4 - SPF End Grain	10.000"	38%	2454 / 2429	4883	L_LL	D+S
5 - SPF End Grain	4.500"	35%	1001 / 1021	2022	_L_L	D+S

Analysis Results

Analysis	Actual	Location	Allowed	Capacity	Comb.	Case
Neg Moment	-1514 ft-lb	3'5 1/2"	3946 ft-lb	0.384 (38%)	D+S	LL_L
Unbraced	-1514 ft-lb	3'5 1/2"	3795 ft-lb	0.399 (40%)	D+S	LL_L
Pos Moment	1024 ft-lb	1'6 15/16"	3946 ft-lb	0.260 (26%)	D+S	L_L_
Unbraced	1024 ft-lb	1'6 15/16"	3818 ft-lb	0.268 (27%)	D+S	L_L_
Shear	1510 lb	11'2 3/4"	2872 lb	0.526 (53%)	D+S	L_LL
LL Defl inch	0.003 (L/12274)	1'9 3/16"	0.079 (L/480)	0.040 (4%)	S	L_L_
TL Defl inch	0.005 (L/6895)	1'8 5/8"	0.157 (L/240)	0.030 (3%)	D+S	L_L_

Design Notes

1 Girders are designed to be supported on the bottom edge only.
2 Multiple plies must be fastened together as per manufacturer's details.
3 Top loads must be supported equally by all plies.
4 Top braced at bearings.
5 Bottom braced at bearings.
6 Lateral slenderness ratio based on single ply width.

ID	Load Type	Location	Trib Width	Side	Dead 0.9	Live 1	Snow 1.15	Wind 1.6	Const. 1.25	Comments
1	Uniform			Top	657 PLF	91 PLF	626 PLF	0 PLF	0 PLF	A1

This design is valid until 2/26/2023

Manufacturer Info

Comtech, Inc.
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