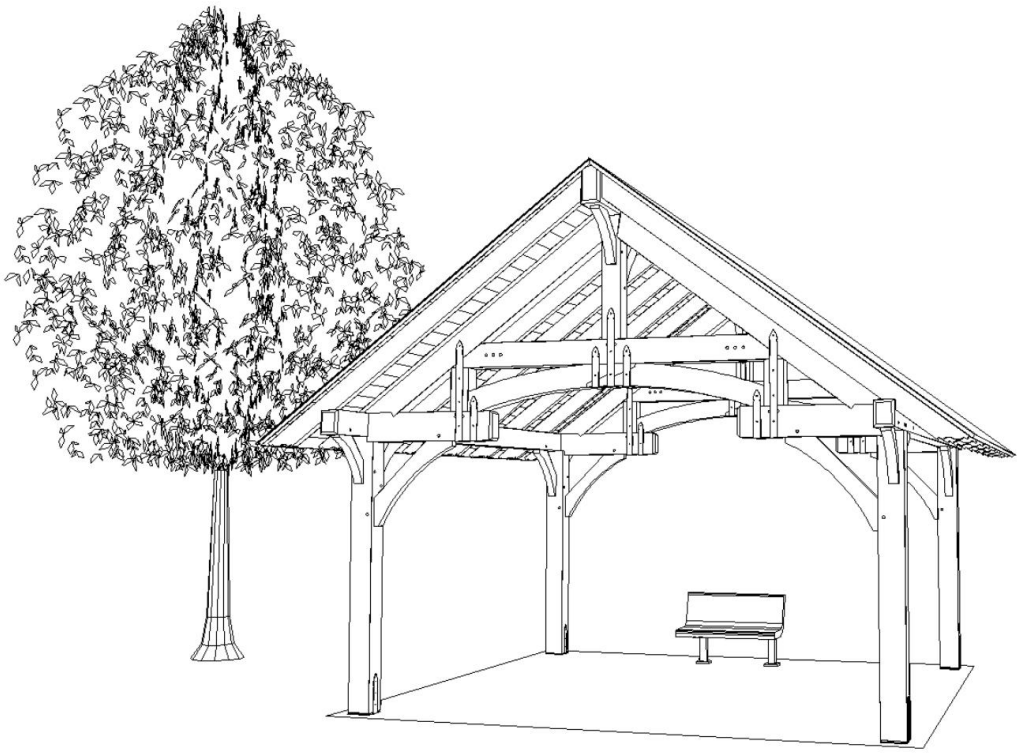
New England Outdoor

Custom Built Structures

Outdoor Living Structures Handbook

Timber Frame Pavilions



NEW ENGLAND OUTDOOR

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37 Oakland Ave, Methuen MA • 372 Calef Highway, Epping NH

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Table of Contents

Timber Frame Pavilions 3

Planning & Site Preparation 3

Post Stand-off Brackets 6

Timber Frame Pavilions 7

Kingston 7

Kingston — with Optional Pro Package 8

Denali 10

Grand Teton 11

Compare Timber Frame Pavilions 12

Timber Frame Pavilions

Our majestic Timber Frame Outdoor Pavilions combine modern engineering with the traditional art of mortise and tenon joined heavy timbers. Constructed with #1 Douglas Fir, these solid structures pair classic detail with the rustic beauty of natural wood — perfect for a backyard retreat, large gatherings, weddings, or commercial settings such as parks, businesses, and poolside resorts.

Planning & Site Preparation

Permits

Permits are often required for pavilion installation. New England Outdoor can assist with the permit process, or you may apply yourself and list yourself as the contractor on the application — this is generally permitted when the property is your primary residence. Confirm requirements with your local building department.

Site Requirements

We recommend that all pavilions be anchored on a concrete pier or footer. Exact pier size is determined by the structural drawing for your pavilion and any applicable local code requirements.

- **Existing concrete pad.** We do not recommend mounting to an existing concrete pad. Typical residential pads are only 3–4 inches thick, which is insufficient to support the structure long-term. If a pavilion is mounted on an existing slab of any thickness, the homeowner assumes all responsibility for any cracking or failure that may result.
  - Our recommended approach is to cut and remove a section of the existing slab at each post location and install a proper footer. Stone fallout from the surrounding sub-base must be minimized.

Damage Waiver: If the patio surface is concrete and was poured prior to installation, any damage that may occur during installation — including tire marks, cracks, breaks, and other surface damage — is the customer's responsibility. Any damage caused by heavy vehicles or equipment is also the customer's responsibility.

Patio Surfaces

Existing paver patio

- Remove a section of pavers approximately 30 inches in diameter at each post location.
- Install footers so the tops of the footers sit just below the bottom of the pavers. This allows for a small layer of sand to be installed on top of the footer for easy paver reinstallation. Pier tops do not need to be level with each other — they should be installed with grade.
- Install Post Stand-off Brackets (see Post Stand-off Brackets section).
- Erect the structure.
- Reinstall the pavers, cutting and fitting them around the posts.

Planned paver patio

Wait to install the pavers until after the pavilion has been installed.

Planned concrete patio

Choose one of the following two methods:

- **Method A — Recessed footers:** Pour footers 4 inches lower than the final patio grade. Install 4-inch Post Stand-off Brackets, install the structure, then pour the 4-inch concrete slab.
- **Method B — Footers at grade:** Pour footers to the top of the final patio grade (the tops of the footers will always be visible), install the structure, then pour the concrete slab.

Electrical

An electrical package is not offered as a regular option for timber frame pavilions, but electrical can be incorporated during the installation. We recommend installing an external conduit directly beside one of the posts. The conduit should protrude at least 24 inches above the top of the concrete, where an outlet or junction box can be installed. The conduit can then be continued up the side of the post and into the roof system.

Desired fixture locations can be achieved using a combination of exposed conduit and exterior UF wiring run in inconspicuous areas. If you prefer hidden wiring within the timbers, ask your New England Outdoor representative — we may be able to accommodate this on a case-by-case basis.

For switches and receptacles, consider locating them in your outdoor kitchen, on the sides of a chimney, or on adjacent structures when available.

Gutters

- Timber Frame pavilions can be modified to include fascia boards to accommodate standard residential 5K gutters.
- Alternatively, gutters can be added to a structure without fascia boards using specialized Roof Strap Hangers.

Third Gable

A custom additional gable can be added to the Kingston Pro Package, the Denali, and the Grand Teton.

What to Expect from Wood Timbers

Especially with large timbers such as Douglas Fir, Hemlock, and Eastern White Pine, splits, shakes, and checking will occur as the wood dries — and large cracks should be expected. These cracks rarely affect the structural integrity of the pavilion.

Sap is the lifeblood of every tree, so all wood contains sap. Changes in humidity or temperature may cause cut boards to ooze sap, so we recommend covering all outdoor furniture beneath your pavilion until the sap ceases to be emitted.

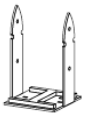
Bark and wane edges can be expected on large beams. These large "green" timbers typically have a high moisture content. Prior to staining, we recommend allowing the wood to weather for one full year.

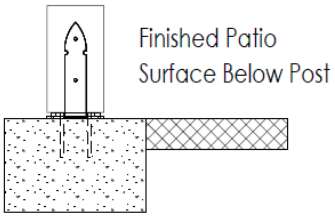
These natural processes are perfectly normal — they should be expected, and hopefully enjoyed as part of the character of a real timber-frame structure.

Post Stand-off Brackets

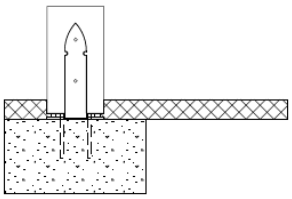
Standard

No Post Standoff Required



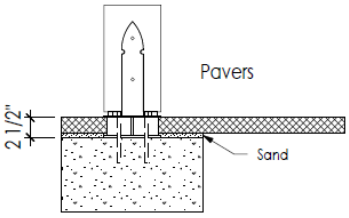


Finished Patio Surface Above Bottom of Post Is Not Recommended



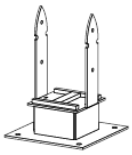
2 1/2" Standoff

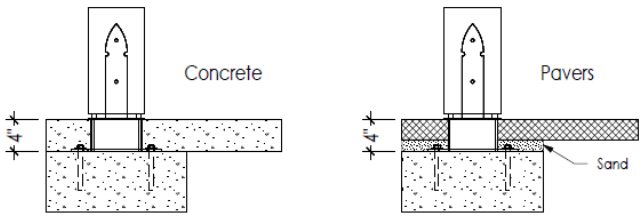
(24' Wide and Smaller)



4" Standoff

(26' Wide and Larger)





Timber Frame Pavilions

Kingston

King post truss design; A-frame

Available Sizes: 12x12 – 40x80

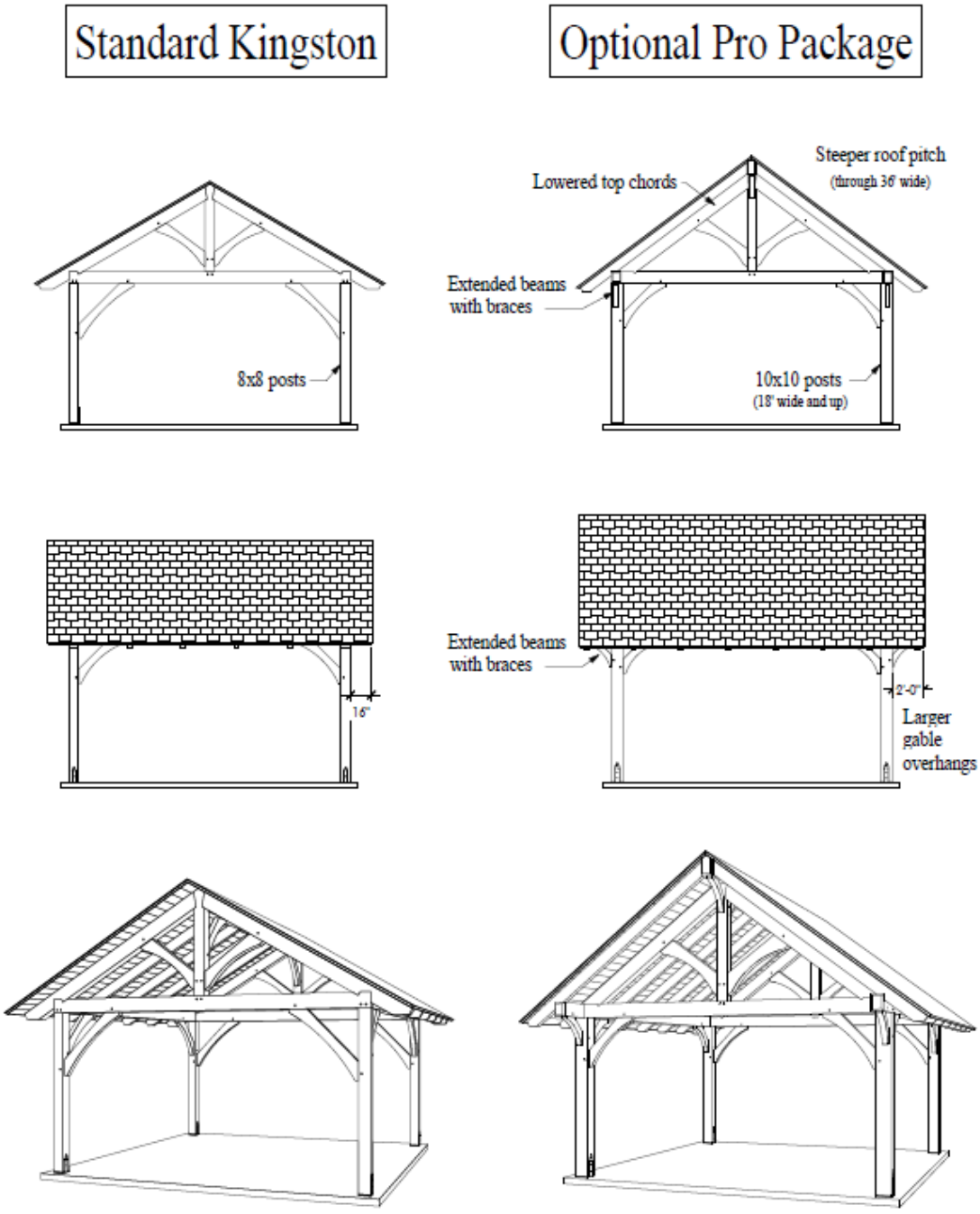
Optional Pro Package

Kingston Timber Frame Pavilion Specifications:							
WIDTH OF STRUCTURE	POST HEIGHT	EAVE OVERHANG	GABLE OVERHANG	ROOF PITCH	RAFTERS	APPROX OVERALL HEIGTH	DESIGNED GROUND SNOW LOAD
12'	9'	18"	16"	8	4x8	172"	40
14'	9'	18"	16"	8	4x8	181"	40
16'	9'	18"	16"	8	4x8	189"	40
18'	9'	24"	16"	7	4x8	188"	40
20'	9'	24"	16"	7	4x8	195"	40
22'	9'	24"	16"	7	4x8	202"	40
24'	9'	24"	16"	7	4x8	209"	40
26'	9'	24"	16"	6.5	4x8	210"	40
28'	9'	24"	16"	6.5	4x8	216"	40
30'	10'	24"	16"	6.5	4x10	235"	40
36'	10'	24"	16"	6.5	6x10	254"	30
40'	10'	24"	16"	6.5	6x10	267"	30

Bent (Trusses):							
WIDTH OF STRUCTURE	BOTTOM CHORD	TOP CHORD	KING POST	QUEEN POSTS	STRUTS	BOTTOM CHORD SPLIT	
12'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
14'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
16'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
18'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
20'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
22'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
24'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	
26'	8x10	8x10	8x8	N/A	6x10 Curved	Yes	
28'	8x10	8x12	8x8	N/A	6x10 Curved	Yes	
30'	8x10	8x12	8x8	N/A	6x10 Curved	Yes	
36'	8x10	8x12	8x8	8x8	6x10 straight	Yes	
40'	8x10	8x12	8x8	8x8	6x10 straight	Yes	

Standard Timber Material:	Douglas Fir #1 & Better, S4S (smooth), FOCH (Free of center heart), Green
Number of bents (Trusses):	Equal to one-half of the number of posts
Knee Braces:	4x10 with curve - lengths vary based on width of pavilion
Rafter Plates:	Either 8x8 or 8x10 - varies depending on length of pavilion
Ridge beam:	Either 6x12, 8x12, or 8x14 - varies depending on length of pavilion
Roof Decking	2x Tongue & Groove Decking #1 SPF
Standard Roof Material:	1 1/2" Musket Brown Drip edge, Synthetic roof underlayment, GAF HD Timberline Shingles

Kingston – with Optional Pro Package



Kingston Pro Timber Frame Pavilion Specifications:

WIDTH OF STRUCTURE	POST HEIGHT	POST SIZE	EAVE OVERHANG	GABLE OVERHANG	ROOF PITCH	RAFTERS	APPROX OVERALL HEIGTH	DESIGNED GROUND SNOW LOAD
12'	9'	8x8	18"	24"	10	4x8	186"	40
14'	9'	8x8	18"	24"	10	4x8	169"	40
16'	9'	8x8	18"	24"	10	4x8	206"	40
18'	9'	10x10	24"	24"	9	4x8	207"	40
20'	9'	10x10	24"	24"	9	4x8	216"	40
22'	9'	10x10	24"	24"	9	4x8	225"	40
24'	9'	10x10	24"	24"	9	4x8	235"	40
26'	9'	10x10	24"	24"	9	4x8	243"	40
28'	10'	10x10	24"	24"	8	4x8	249"	40
30'	10'	10x10	24"	24"	8	4x10	257"	30
36'	10'	10x10	24"	24"	7	4x10	257"	30
40'	10'	10x10	24"	24"	6.5	4x10	257"	30

Bents (Trusses):

WIDTH OF STRUCTURE	BOTTOM CHORD	TOP CHORD	KING POST	QUEEN POSTS	STRUTS	BOTTOM CHORD SPLIT	BRACES ON TRUSS
12'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	4x10
14'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	4x10
16'	8x10	8x10	8x8	N/A	6x10 Curved	N/A	4x10
18'	8x10	8x10	8x8	N/A	6x12 Curved	N/A	4x10
20'	8x10	8x10	8x8	N/A	6x12 Curved	N/A	4x10
22'	8x10	8x10	8x8	N/A	6x12 Curved	N/A	4x10
24'	8x10	8x10	8x8	N/A	6x12 Curved	N/A	4x10
26'	8x10	8x10	8x8	N/A	6x12 Curved	Yes	4x10
28'	8x12	8x10	8x8	N/A	6x12 Curved	Yes	4x12
30'	8x12	8x10	8x8	N/A	6x12 Curved	Yes	4x12
36'	8x12	8x10	8x8	8x8	6x10 Straight	Yes	4x12
40'	8x12	8x10	8x8	8x8	6x10 Straight	Yes	4x12

Standard Timber Material:	Douglas Fir #1 & Better, S4S (smooth), FOCH (Free of center heart), Green
Number of bents (Trusses):	Equal to one-half of the number of posts
Knee Braces:	4x10 with curve - lengths vary based on width of pavilion. 4X8 on extended beams
Rafter Plates:	Either 8x10 or 8x12 - varies depending on length of pavilion. Extended Beams
Ridge beam:	Either 8x12, 8x14, or 8x16 - varies depending on length of pavilion. Extended Beams
Roof Decking	2x Tongue & Groove Decking #1 SPF
Standard Roof Material:	1 1/2" Musket Brown Drip edge, Synthetic roof underlayment, GAF HD Timberline Shingles

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Denali

Hammerbeam truss design; A-frame

Available Sizes: 12x12 – 36x80

Denali Timber Frame Pavilion Specifications:

WIDTH OF STRUCTURE	POST HEIGHT	POST SIZE	EAVE OVERHANG	GABLE OVERHANG	ROOF PITCH	RAFTERS	APPROX OVERALL HEIGTH	DESIGNED GROUND SNOW LOAD
12'	9'	8x8	18"	24"	10	4x8	186"	40
14'	9'	8x8	18"	24"	10	4x8	169"	40
16'	9'	8x8	18"	24"	10	4x8	206"	40
18'	9'	10x10	24"	24"	9	4x8	207"	40
20'	9'	10x10	24"	24"	9	4x8	216"	40
22'	9'	10x10	24"	24"	9	4x8	225"	40
24'	9'	10x10	24"	24"	9	4x8	235"	40
26'	9'	10x10	24"	24"	9	4x8	243"	40
28'	10'	10x10	24"	24"	8	4x8	249"	40
30'	10'	10x10	24"	24"	8	4x10	257"	30
36'	10'	10x10	24"	24"	7	4x10	257"	30

Bents (Trusses):

WIDTH OF STRUCTURE	BOTTOM CHORD	TOP CHORD	KING POST	QUEEN POSTS	BRACES ON TRUSS
12'	8x10	8x10	8x8	8x8	4x10
14'	8x10	8x10	8x8	8x8	4x10
16'	8x10	8x10	8x8	8x8	4x10
18'	8x10	8x10	8x8	8x8	4x10
20'	8x10	8x10	8x8	8x8	4x10
22'	8x10	8x10	8x8	8x8	4x10
24'	8x10	8x10	8x8	8x8	4x10
26'	8x10	8x10	8x8	8x8	4x10
28'	8x12	8x12	8x8	8x8	4x12
30'	8x12	8x12	8x8	8x8	4x12
36'	8x12	8x12	8x8	8x8	4x12

Standard Timber Material:	Douglas Fir #1 & Better, S4S (smooth), FOCH (Free of center heart), Green
Number of bents (Trusses):	Equal to one-half of the number of posts
Truss Style	Hammerbeam
Knee Braces:	4x10 with curve - lengths vary based on width of pavilion. 4X8 on extended beams
Rafter Plates:	Either 8x10 or 8x12 - varies depending on length of pavilion. Extended Beams
Ridge beam:	Either 8x12, 8x14, or 8x16 - varies depending on length of pavilion. Extended Beams
Roof Decking	2x Tongue & Groove Decking #1 SPF
Standard Roof Material:	1 1/2" Musket Brown Drip edge, Synthetic roof underlayment, GAF HD Timberline Shingles

Grand Teton

Arched Hammerbeam truss design; A-frame

Available Sizes: 12x12 – 30x80

Grand Teton Timber Frame Pavilion Specifications:

WIDTH OF STRUCTURE	POST HEIGHT	POST SIZE	EAVE OVERHANG	GABLE OVERHANG	ROOF PITCH	RAFTERS	APPROX OVERALL HEIGTH	DESIGNED GROUND SNOW LOAD
12'	9'	8x8	18"	24"	10	4x8	186"	40
14'	9'	8x8	18"	24"	10	4x8	169"	40
16'	9'	8x8	18"	24"	10	4x8	206"	40
18'	9'	10x10	24"	24"	9	4x8	207"	40
20'	9'	10x10	24"	24"	9	4x8	216"	40
22'	9'	10x10	24"	24"	9	4x8	225"	40
24'	9'	10x10	24"	24"	9	4x8	235"	40
26'	9'	10x10	24"	24"	9	4x8	243"	40
28'	10'	10x10	24"	24"	8	4x8	249"	40
30'	10'	10x10	24"	24"	8	4x10	257"	40

Bents (Trusses):

WIDTH OF STRUCTURE	BOTTOM CHORD	TOP CHORD	KING POST	QUEEN POSTS	TIE BEAM	BRACES ON TRUSS
12'	8x10	8x10	8x8	8x8	8x8	4x10
14'	8x10	8x10	8x8	8x8	8x8	4x10
16'	8x10	8x10	8x8	8x8	8x8	4x10
18'	8x12	8x12	8x8	8x8	8x10	4x10
20'	8x12	8x12	8x8	8x8	8x10	4x10
22'	8x12	8x12	8x8	8x8	8x10	4x10
24'	8x12	8x12	8x8	8x8	8x10	4x10
26'	8x12	8x14	8x8	8x8	8x10	4x10
28'	8x12	8x14	8x8	8x8	8x10	4x12
30'	8x12	8x14	8x8	8x8	8x10	4x12

Standard Timber Material:	Douglas Fir #1 & Better, S4S (smooth), FOCH (Free of center heart), Green
Number of bents (Trusses):	Equal to one-half of the number of posts
Truss Style	Hammerbeam with arch
Knee Braces:	4x10 with curve - lengths vary based on width of pavilion. 4X8 on extended beams
Rafter Plates:	Either 8x10 or 8x12 - varies depending on length of pavilion. Extended Beams
Ridge beam:	Either 8x12, 8x14, or 8x16 - varies depending on length of pavilion. Extended Beams
Roof Decking	2x Tongue & Groove Decking #1 SPF
Standard Roof Material:	1 1/2" Musket Brown Drip edge, Synthetic roof underlayment, GAF HD Timberline Shingles

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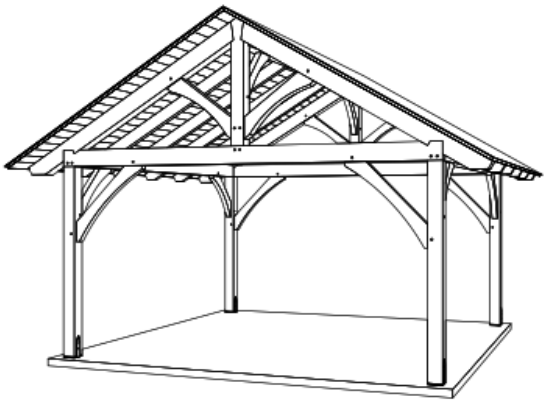
Compare Timber Frame Pavilions

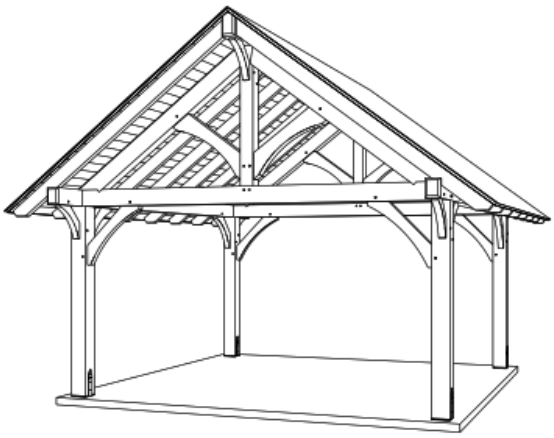
Kingston	Denali	Grand Teton
AVAILABLE SIZES 12x12 – 40x80	AVAILABLE SIZES 12x12 – 36x80	AVAILABLE SIZES 12x12 – 30x80
POSTS 8x8	POSTS 8x8 10x10 @ 18’ wide	POSTS 8x8 10x10 @ 18’ wide
EAVE OVERHANG 18” 24” @ 18’ wide	EAVE OVERHANG 18” 24” @ 18’ wide	EAVE OVERHANG 18” 24” @ 18’ wide
GABLE OVERHANG 16”	GABLE OVERHANG 24”	GABLE OVERHANG 24”
EXTENDED BEAMS No	EXTENDED BEAMS YES	EXTENDED BEAMS YES
LOWERED TOP CHORD IN TRUSS No	LOWERED TOP CHORD IN TRUSS Yes	LOWERED TOP CHORD IN TRUSS Yes
ROOF PITCH 8/12 7/12 @ 18’ wide 6.5/12 @ 26’ wide	ROOF PITCH 10/12 9/12 @ 18’ wide 8/12 @ 28’ wide 7/12 @ 36’ wide	ROOF PITCH 10/12 9/12 @ 18’ wide 8/12 @ 28’ wide
ROOF MATERIAL Asphalt* Regular Metal Standing Seam Metal	ROOF MATERIAL Asphalt* Regular Metal Standing Seam Metal	ROOF MATERIAL Asphalt* Regular Metal Standing Seam Metal

*Indicates standard option

Compare Timber Frame Pavilions

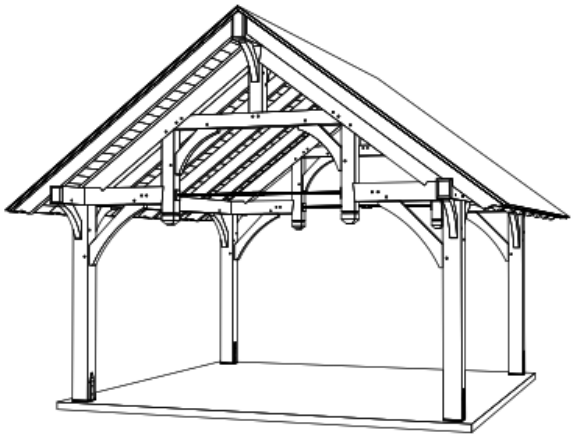


Kingston

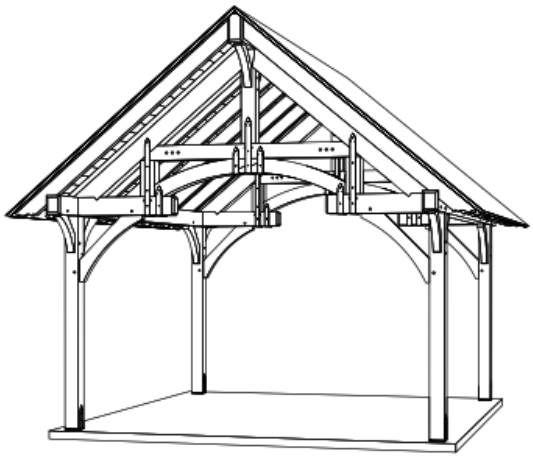


Kingston

W/ Pro Option



Denali



Grand Teton

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