

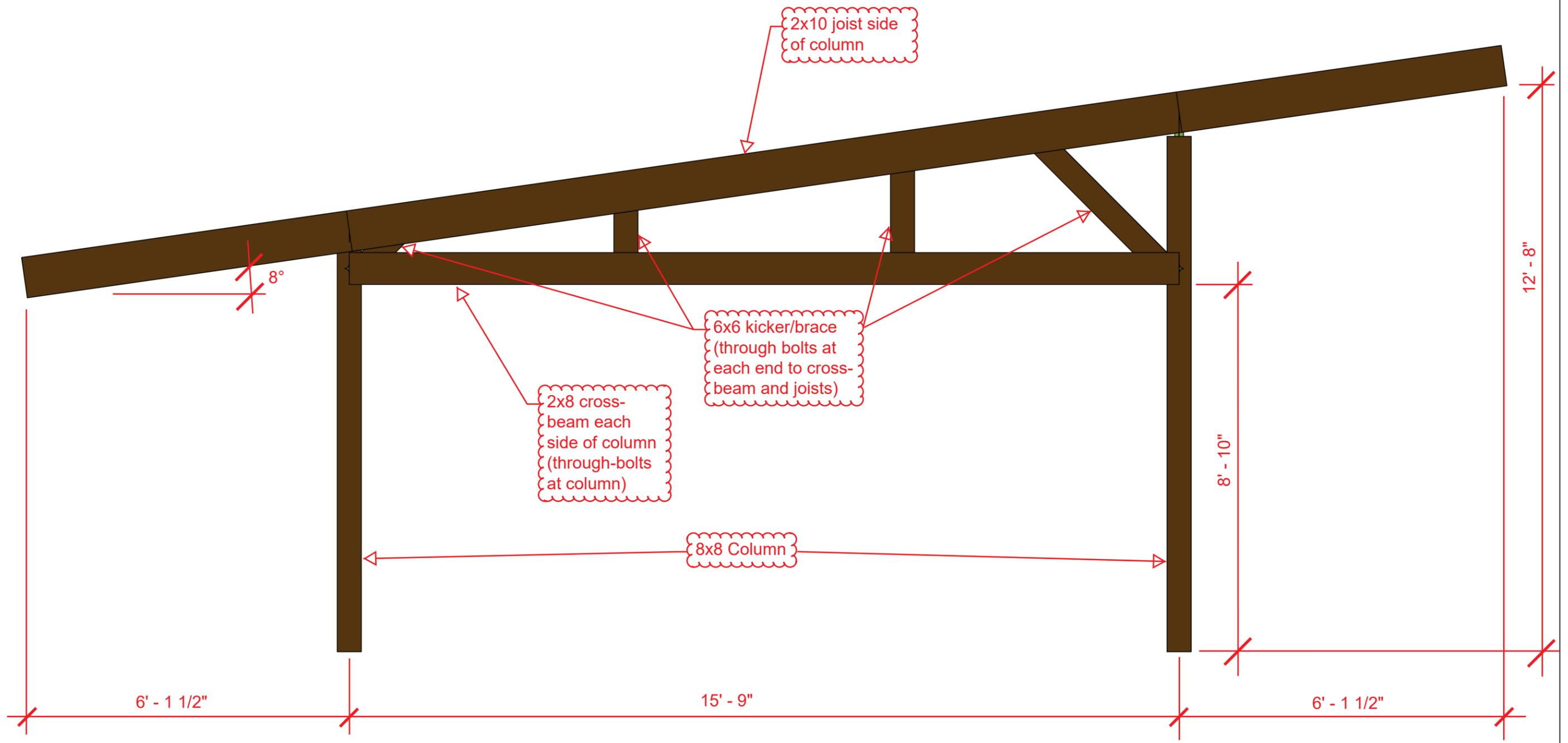
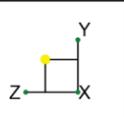
Joist splice - lap min. 60" (typ.)

2x10 joist @ 16" o.c.

2x10 each side of column (typ. at columns)

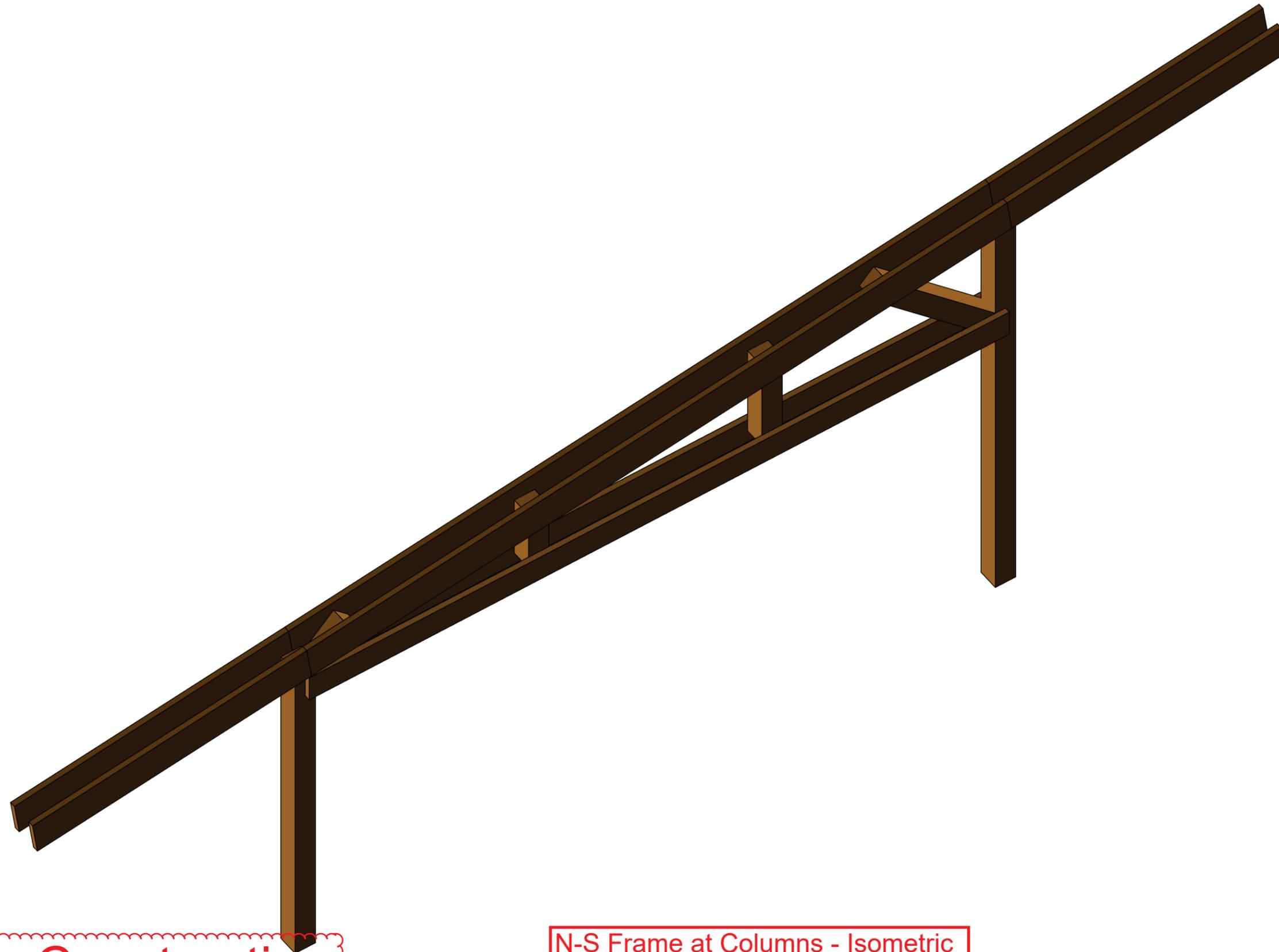
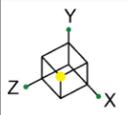
- General Notes:**
1. All wood members to be treated SP No. 1 or better.
 2. Dimensions are approximate.
 3. Some member alignment not shown properly (e.g. joists to bear on top of beams).
 4. Estimated drilled pier size: 16" diameter down to bedrock (estimated 6')
 5. Connections and hardware not designed- anticipate thru bolting and Simpson connectors
 6. Member sizes may change after finalized design

Not for Construction



Not for Construction

Section at Columns Looking E-W



Not for Construction

N-S Frame at Columns - Isometric



Note:
Joists not shown
for clarity

8x8 beam (typ.)

6x8 kicker (typ.)

2x8 cross-beam
each side of
column (typ.) - see
page 2 of 5

8x8 column (typ.)

7'-0"

4'-0"

10'-0"

10'-0"

4'-0"

Not for Construction

Section at North Column Line Looking North



Note:
Joists not shown
for clarity

8x8 beam (typ.)

6x8 kicker (typ.)

2x8 cross-beam
each side of
column (typ.) - see
page 2 of 5

7' - 0"

4' - 0"

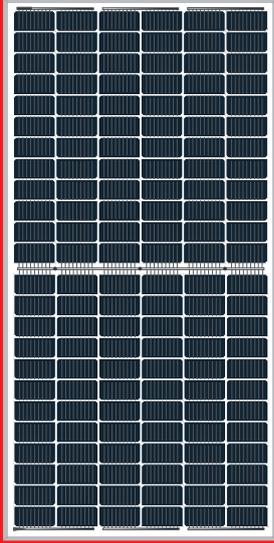
10' - 0"

10' - 0"

4' - 0"

Not for Construction

Section at South Column Line Looking North



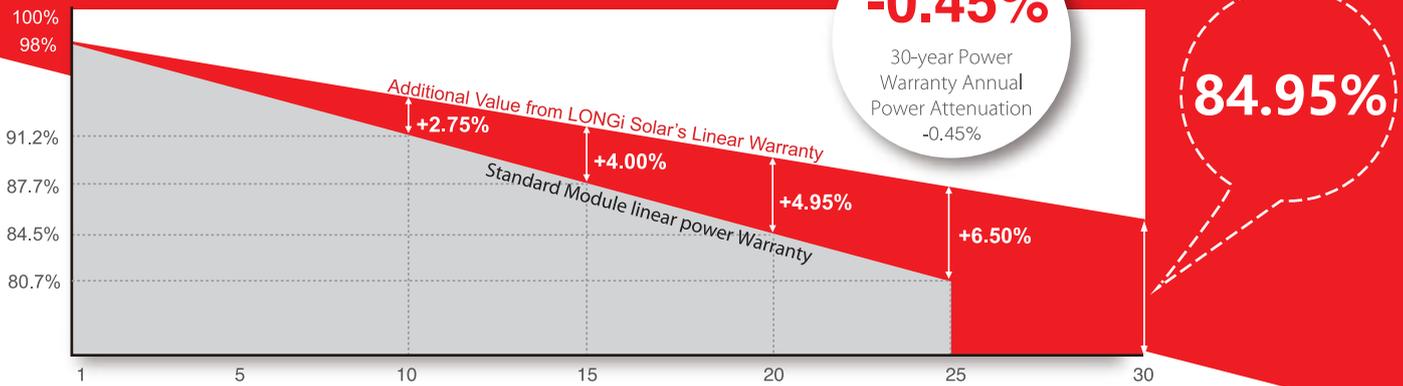
LR4-72HBD 425~455M



**High Efficiency
Low LID Bifacial PERC with
Half-cut Technology**

*Both 6BB & 9BB are available

12-year Warranty for Materials and Processing;
30-year Warranty for Extra Linear Power Output



Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730
 ISO 9001:2008: ISO Quality Management System
 ISO 14001: 2004: ISO Environment Management System
 TS62941: Guideline for module design qualification and type approval
 OHSAS 18001: 2007 Occupational Health and Safety



* Specifications subject to technical changes and tests. LONGi Solar reserves the right of interpretation.

Front side performance equivalent to conventional low LID mono PERC:

- High module conversion efficiency (up to 20.9%)
- Better energy yield with excellent low irradiance performance and temperature coefficient
- First year power degradation <2%

Bifacial technology enables additional energy harvesting from rear side (up to 25%)

Glass/glass lamination ensures 30 year product lifetime, with annual power degradation < 0.45%, 1500V compatible to reduce BOS cost

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

Reduced resistive loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current



Room 801, Tower 3, Lujiazui Financial Plaza, No.826 Century Avenue, Pudong Shanghai, 200120, China
 Tel: +86-21-80162606 E-mail: module@longi-silicon.com Facebook: www.facebook.com/LONGi Solar

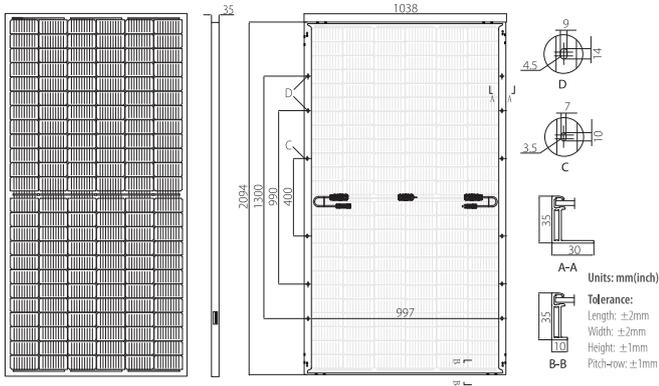
Note: Due to continuous technical innovation, R&D and improvement, technical data above mentioned may be of modification accordingly. LONGi have the sole right to make such modification at anytime without further notice; Demanding party shall request for the latest datasheet for such as contract need, and make it a consisting and binding part of lawful documentation duly signed by both parties.

* These Modules are not offered, distributed or supplied to Germany by the LONGi Group.
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20200401V11

LR4-72HBD 425~455M

Design (mm)



Mechanical Parameters

Cell Orientation: 144 (6×24)
 Junction Box: IP68, three diodes
 Output Cable: 4mm², 300mm in length,
 length can be customized
 Glass: Dual glass
 2.0mm coated tempered glass
 Frame: Anodized aluminum alloy frame
 Weight: 27.5kg
 Dimension: 2094×1038×35mm
 Packaging: 30pcs per pallet
 150pcs per 20'GP
 660pcs per 40'HC

Operating Parameters

Operational Temperature: -40 C ~ +85 C
 Power Output Tolerance: 0 ~ +5 W
 Voc and Isc Tolerance: ±3%
 Maximum System Voltage: DC1500V (IEC/UL)
 Maximum Series Fuse Rating: 25A
 Nominal Operating Cell Temperature: 45±2 C
 Safety Class: Class II
 Fire Rating: UL type 3
 Bifaciality: Glazing 70±5%

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number	LR4-72HBD-425M		LR4-72HBD-430M		LR4-72HBD-435M		LR4-72HBD-440M		LR4-72HBD-445M		LR4-72HBD-450M		LR4-72HBD-455M	
	STC	NOCT												
Maximum Power (Pmax/W)	425	317.4	430	321.1	435	324.9	440	328.6	445	332.3	450	336.1	455	339.8
Open Circuit Voltage (Voc/V)	48.7	45.6	48.9	45.8	49.1	45.9	49.2	46.0	49.4	46.2	49.6	46.4	49.8	46.6
Short Circuit Current (Isc/A)	11.22	9.06	11.30	9.13	11.36	9.18	11.45	9.25	11.52	9.30	11.58	9.36	11.65	9.41
Voltage at Maximum Power (Vmp/V)	40.4	37.7	40.6	37.9	40.8	38.0	41.0	38.2	41.2	38.4	41.4	38.6	41.6	38.8
Current at Maximum Power (Imp/A)	10.52	8.42	10.60	8.49	10.66	8.54	10.73	8.60	10.80	8.65	10.87	8.70	10.93	8.76
Module Efficiency(%)	19.6		19.8		20.0		20.2		20.5		20.7		20.9	

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 C, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20 C, Spectra at AM1.5, Wind at 1m/s

Electrical characteristics with different rear side power gain (reference to 445W front)

Pmax /W	Voc/V	Isc /A	Vmp/V	Imp /A	Pmax gain
467	49.4	12.09	41.2	11.34	5%
490	49.4	12.67	41.2	11.88	10%
512	49.5	13.24	41.3	12.42	15%
534	49.5	13.82	41.3	12.96	20%
556	49.5	14.40	41.3	13.50	25%

Temperature Ratings (STC)

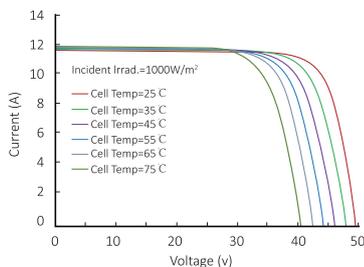
Temperature Coefficient of Isc	+0.050%/ C
Temperature Coefficient of Voc	-0.284%/ C
Temperature Coefficient of Pmax	-0.350%/ C

Mechanical Loading

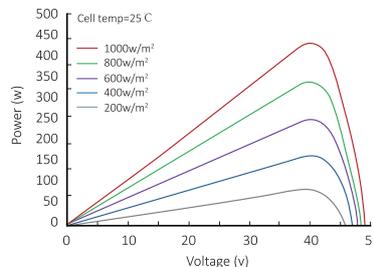
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve

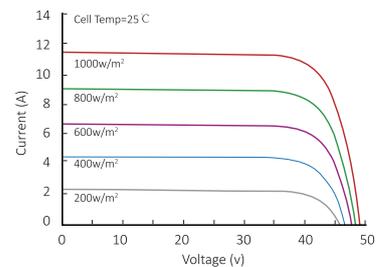
Current-Voltage Curve (LR4-72HBD-440M)



Power-Voltage Curve (LR4-72HBD-440M)



Current-Voltage Curve (LR4-72HBD-440M)



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Additional Documentaiton of Proposed Project for Imminent Brewing.



sign may move up to accommodate the pergola's height.

sign over the gate will move to East/West sides of pergola.

current posts will be removed.

Additional Details of Pergola



current posts
will be
removed.

sign over the gate
will move to
East/West sides
of pergola.

sign may move up to
accomodate the
pergola's height.

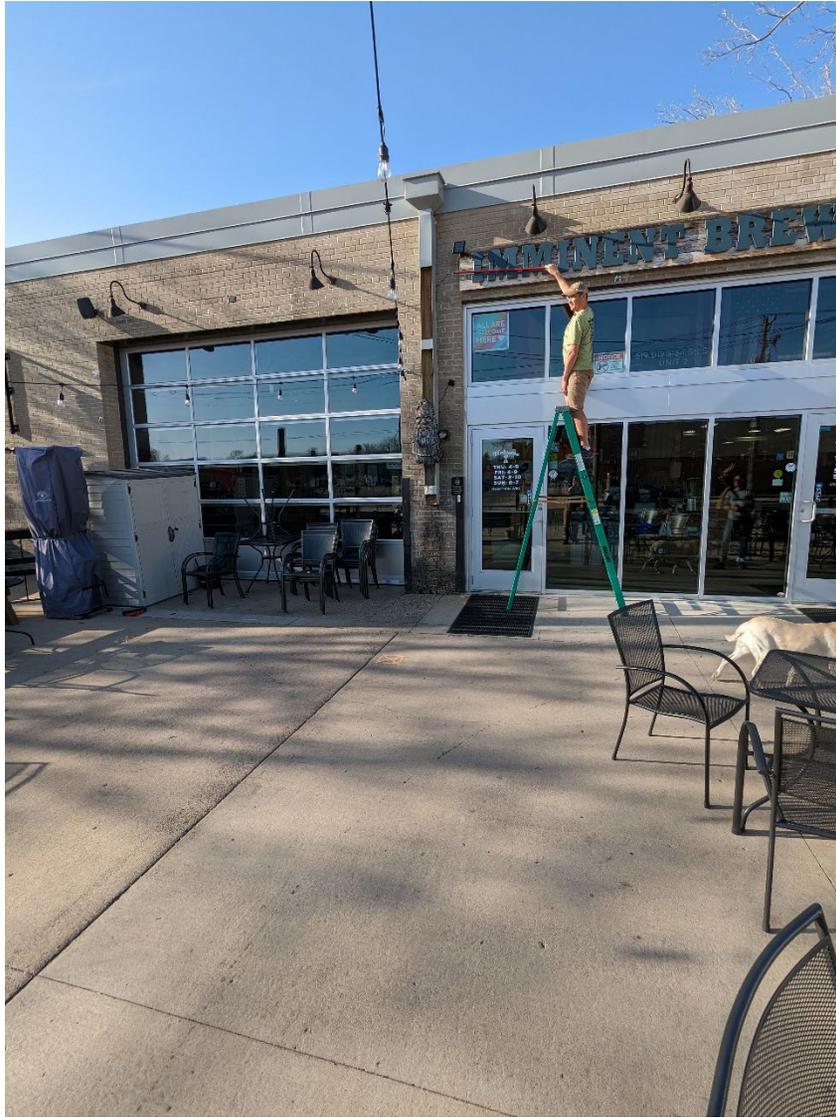
Additional details of pergola.



Approximate Height of Pergola in the Front (Left)



Approximate Height of Pergola in the Front (right)



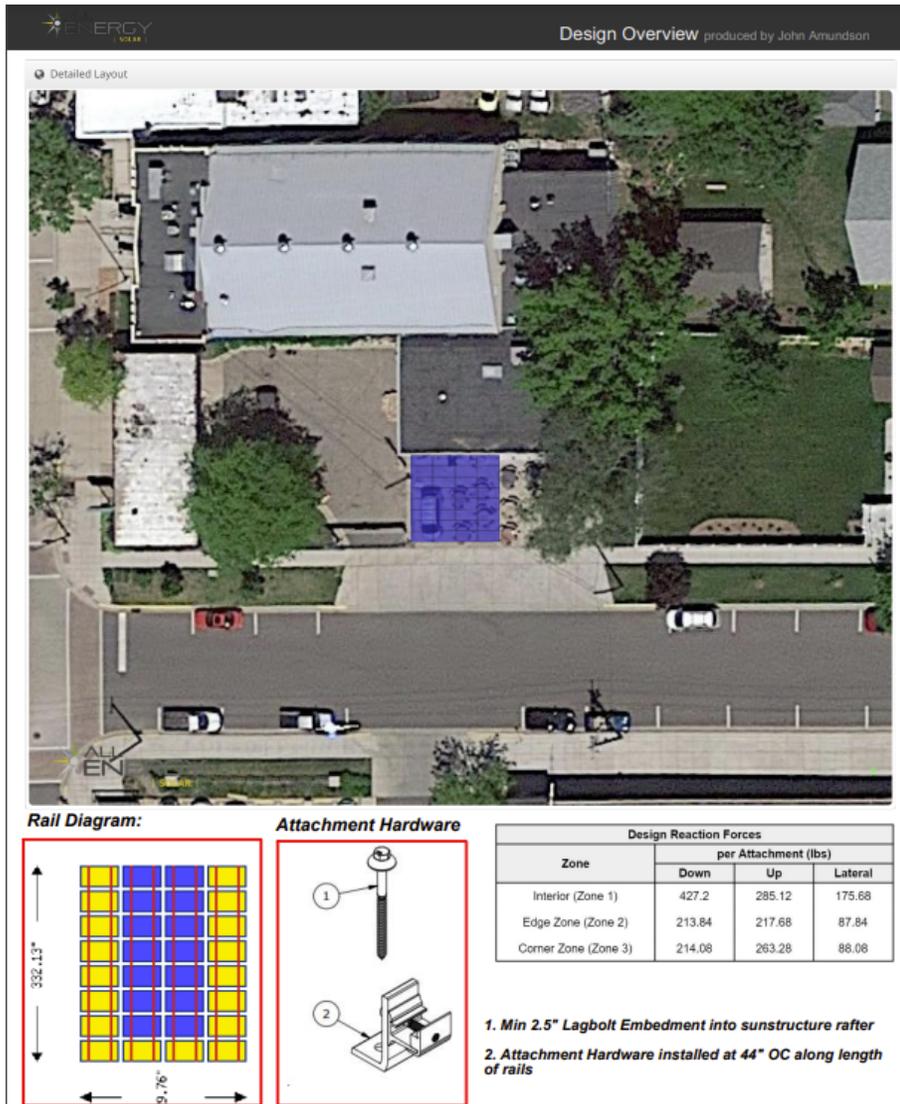
Approximate Height of Pergola in the Rear.



Approximate locations of pergola posts.

Imminent Brewing Solar Pergola

Over the last few years, we have used a temporary shade cloth to provide shade to our customers on the patio at Imminent Brewing. This shade cloth covers the western third of our patio and since most of our open hours are in the afternoon and evening, the shade it provides moves across the patio to the east as the sun begins to set. We are now looking to replace that shade cloth with a permanent structure in the form of a pergola with solar panels on top of it. The pergola will be freestanding and provide more shade than we currently have. It has been engineered by Tekton to accommodate solar panels as soon as Xcel approves our interconnection agreement to install the array (hopefully in the next few years). All Energy Solar will do the solar installation work and Northfield Construction Company will build the pergola. Below is a site map with the approximate location of the pergola and panels along with the reaction forces on the solar array.



We would love to do the entire project this summer, but because there are so many large scale solar projects in our area, there is a long queue to get any new solar approved for interconnection to Xcel's grid in Northfield. Our project is in this queue and we expect to be able to install in the coming years, but there will be a gap between putting up the pergola this summer and getting the panels installed. As such, NCC and Tekton are a bit further ahead in the process than All Energy Solar. However, all three have been working together to make sure that what NCC builds will support the solar array we are proposing and we are seeking approval of the full project from the HPC at this time.

Regarding just the pergola, Tekton is working on full drawings for construction and NCC is hoping to begin work in June of this year. Once the pergola is up, we will be able to add a handicap entrance by placing a handicap door opening button on the pergola post nearest our west door. Additionally, this entrance will now be covered and sheltered from weather as you walk up to the building, making the space even more accessible. Below is a picture of the front of the building with the shade cloth up so you can see the area, from ground level, of where the pergola would stand on the patio.



To give you an idea of what these structures look like, I have included some examples in the images below. The first three images are of solar pergola at Little Thistle Brewing in Rochester, so you can see a fairly local example of how this would work even though that pergola is much larger than what we're proposing. The last photo is just of the underside of a pergola using bifacial solar panels with a clear backsheet. Basically, these panels allow a little bit of light through providing a nice dappled shade.







Regarding the solar side of the project, the specific panels we're using are LONGi LNG-445-LR4-72HBD BiFacial 445W Mono Perc Modules and I've included a datasheet on those panels with our application. However, given the quick moving nature of solar technology, the actual panel we use could differ from this one by the time we're actually able to install. Still, we can be quite certain that it will be a bifacial, monocrystalline panel and look very similar to the LONGi panel.

Finally, I'm including a photo of what the building used to look like prior to Imminent Properties purchasing and remodeling the space.



If you have any questions please do not hesitate to reach out, but we hope you will consider the improvements we are suggesting. We very much care about this space and wish to continue preserving it and operating it, like we always have, in a way that allows the entire community to enjoy the building. Thank you for your time.

Sincerely,

Derek Meyers