

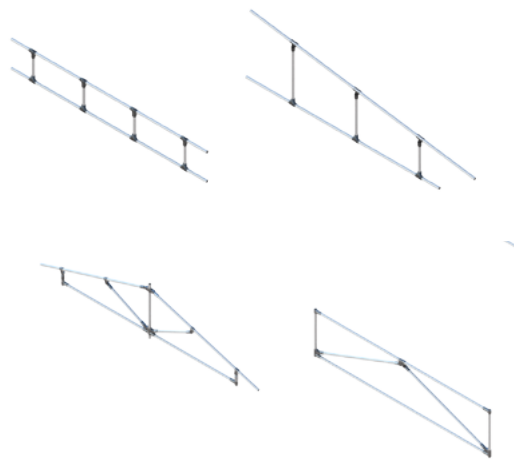
MANUAL PARA CONSTRUÇÕES DE RÁPIDA IMPLEMENTAÇÃO, RECONFIGURÁVEIS E DESMONTÁVEIS

Trecho da dissertação “Tubos e conexões aplicados à arquitetura e engenharia: manual não prescritivo para construções de rápida implementação, reconfiguráveis e desmontáveis” (ELIAS, Vitor B. P., 2018) para o mestrado profissional em habitação na área de Tecnologia e Construção de Edifícios (TCE) do Instituto de Pesquisas Tecnológicas do Estado de São Paulo (IPT)

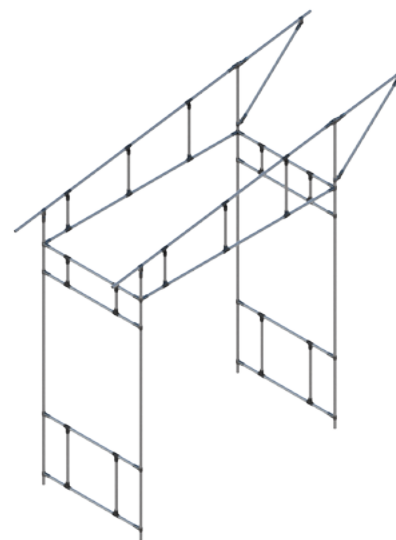
COMPONENTES BÁSICOS



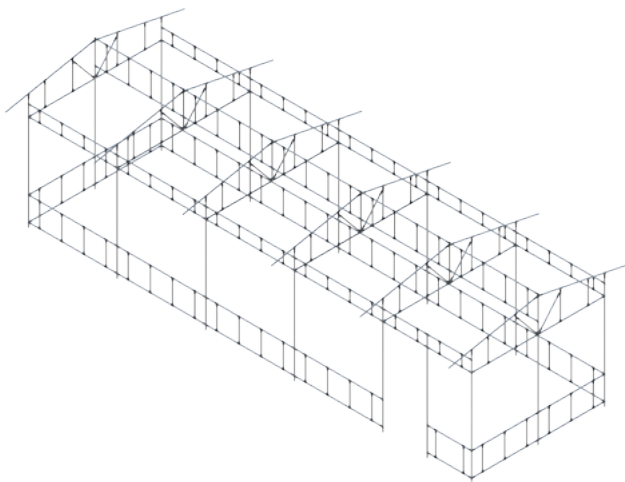
COMPONENTES PRÉ FABRICADOS (CF, CA, CC)



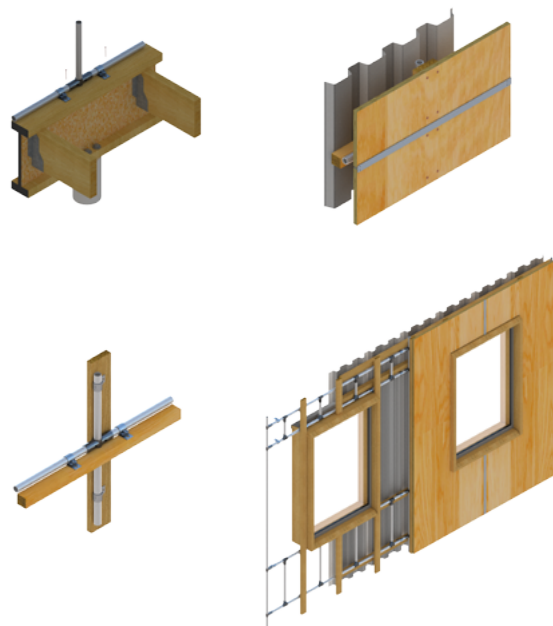
MÓDULOS



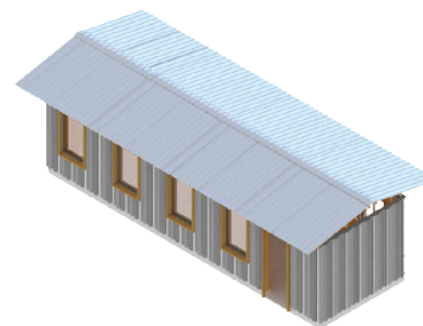
CONFIGURAÇÕES



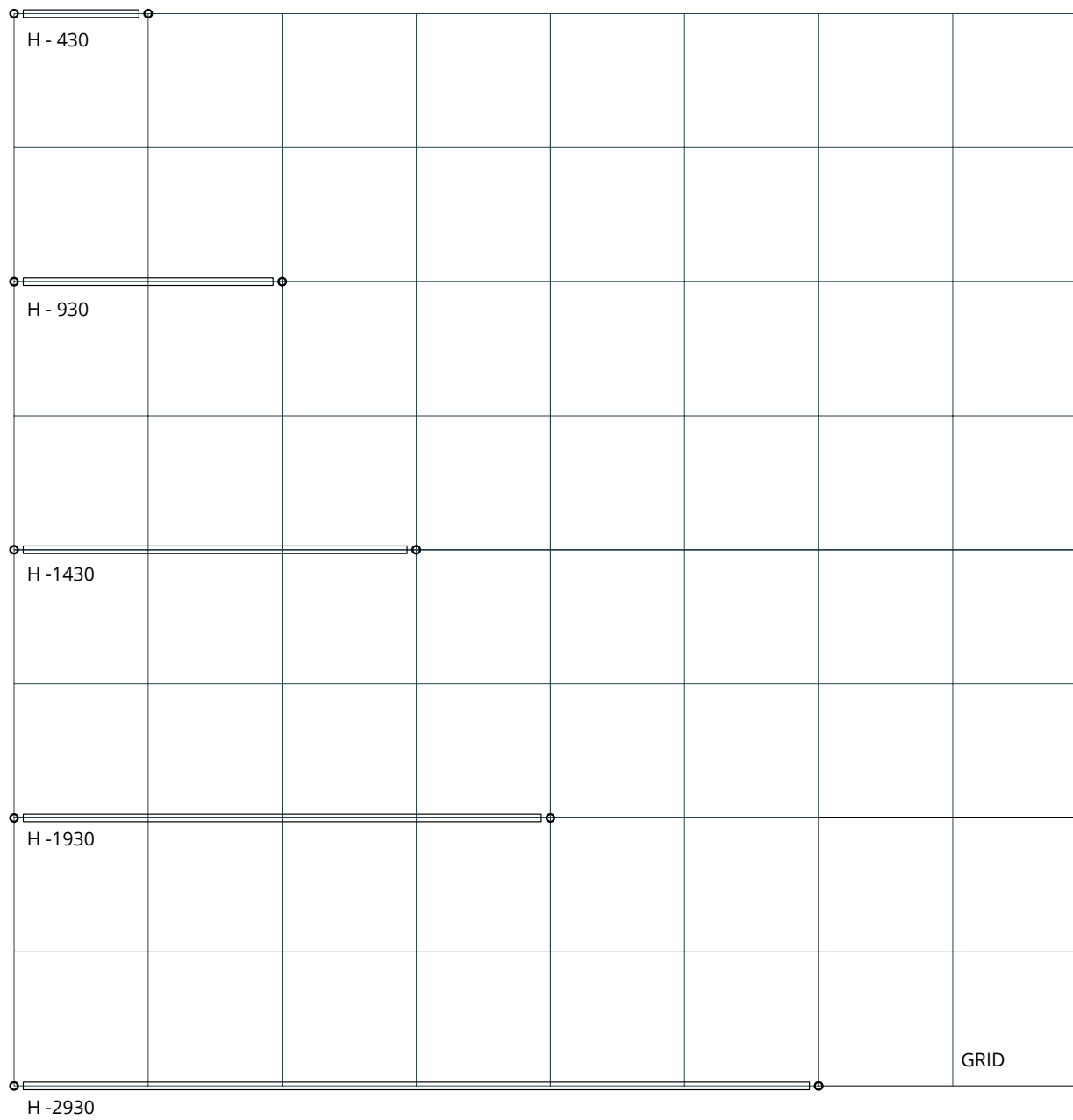
INTERAÇÕES



PROGRAMAS



PRINCIPAIS DIMENSÕES DE TUBO EM PLANTA
(MM)



TUBO (28MM)



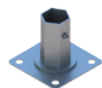
H -

ACESSÓRIOS



TX - 0019

TX - 0010



EL - 1206SA



EL - 4018

CONEXÕES PLÁSTICAS



J - 7C



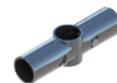
J - 43

CONEXÕES METÁLICAS

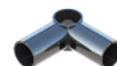
JUNTAS



HJ - 1



HJ - 4



HJ - 2



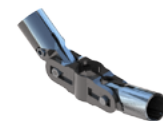
HJ - 5



HJ - 3



HJ - 7



HJ - 12

PARTES



H - 2



H - 3



H - 1



H - 4



HJ - 5

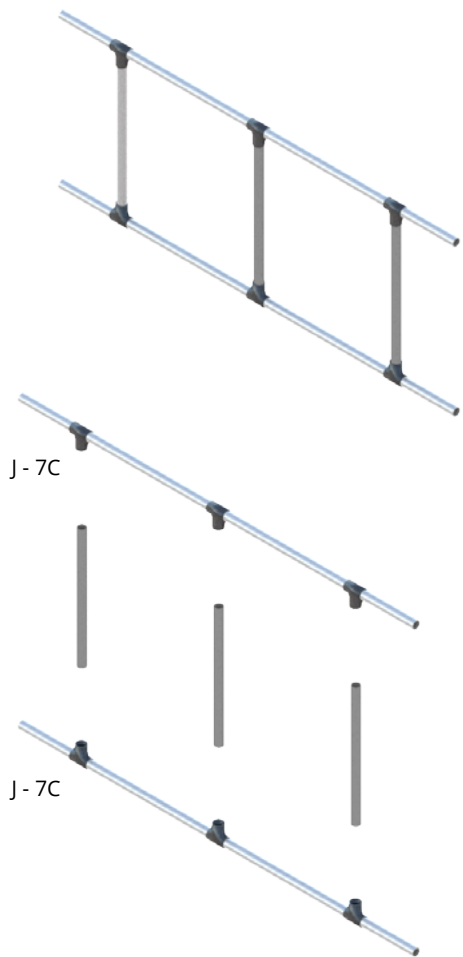


H - 14

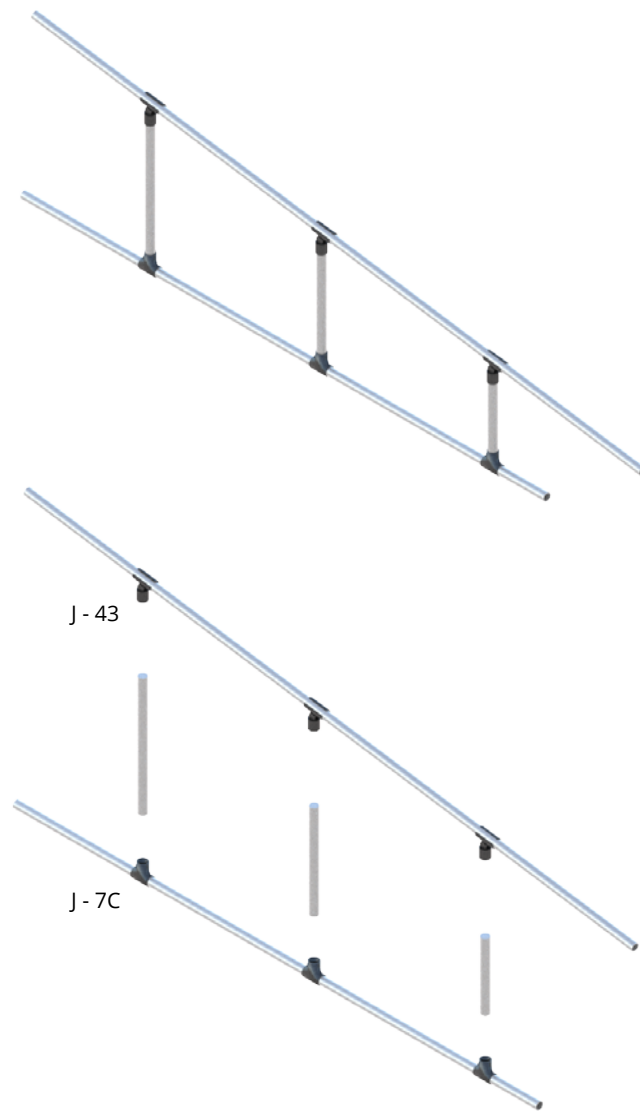


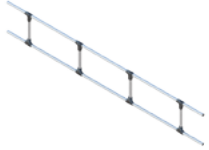
H - 6

COMPONENTE PRÉ-FABRICADO FIXO EREGULAR (CF-R)



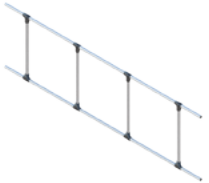
COMPONENTE PRÉ-FABRICADO FIXO IRREGULAR (CF-I)





CF - R 2000x250

CB	
H - 1930	2x
H - 495	4x
J - 7C	8x



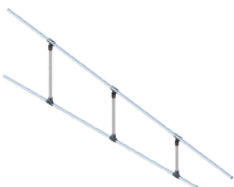
CF - R 2000x535

CB	
H - 1930	2x
H - 495	4x
J - 7C	8x



CF - R 2000x820

CB	
H - 1930	2x
H - 780	3x
J - 7C	6x



CF - I 2000x600

CB	
H - 1930	1x
H - 2300	1x
H - 430	1x
H - 340	1x
H - 240	1x
J - 7C	3x
J - 43	3x



CF - R 1500x535

CB	
H - 1430	2x
H - 495	3x
J - 7C	6x



CF - R 1500x820

CB	
H - 1430	2x
H - 780	3x
J - 7C	6x



CF - I 1500x740

CB	
H - 1430	1x
H - 1730	1x
H - 550	1x
H - 430	1x
J - 7C	3x
J - 43	3x



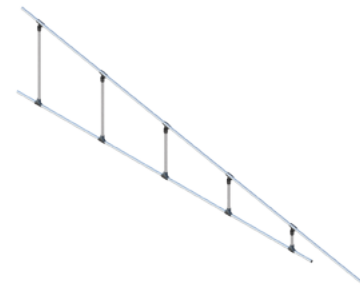
CF - R 1000x250

CB	
H - 930	2x
H - 210	2x
J - 7C	4x



CF - R 1000x535

CB	
H - 930	2x
H - 495	2x
J - 7C	4x



CF - I 1500x740

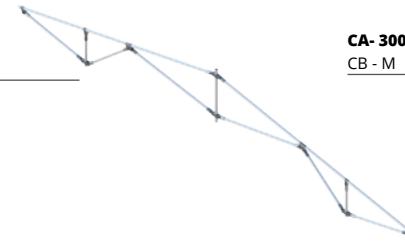
CB	
H - 2930	1x
H - 3500	1x
H - 630	1x
H - 500	1x
H - 380	1x
H - 250	1x
H - 125	1x
J - 7C	3x
J - 43	3x

**CA - 1000x650**

CB - M		CB - F	
H 930	1x	H 930	2x
H100	1X	H650	2x
HJ-6	2X	HJ-1	4X

**CA- 2000x500_(DUAS ÁGUAS)**

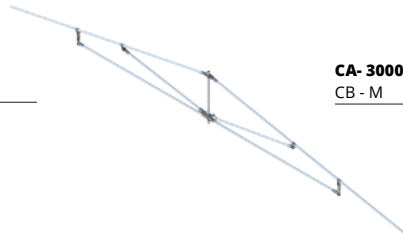
CB - M	CB - F
--------	--------

**CA- 3000x600_DUAS ÁGUAS**

CB - M	CB - F
--------	--------

**CA - 1000x300**

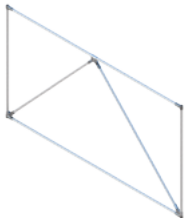
CB - M		CB - F	
H 930	1x	H 930	1x
H 450	2x	H 300	2x
HJ-6	4x	HJ-1	4x

**CA- 3000x500_(DUAS ÁGUAS)**

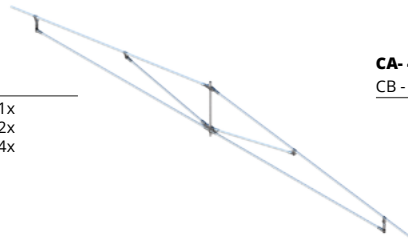
CB - M	CB - F
--------	--------

**CA- 2000x500_**

CB - M	CB - F
--------	--------

**CA - 1000x1100**

CB - M		CB - F	
H 1930	1x	H 1930	1x
H 1250	2x	H 1100	2x
HJ-6	4x	HJ-1	4x

**CA- 4000x500_(DUAS ÁGUAS)**

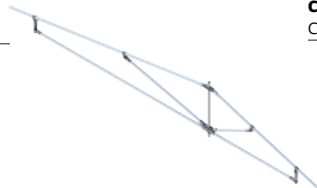
CB - M	CB - F
--------	--------

**CA- 2000x500_**

CB - M	CB - F
--------	--------

**CA - 2000x470**

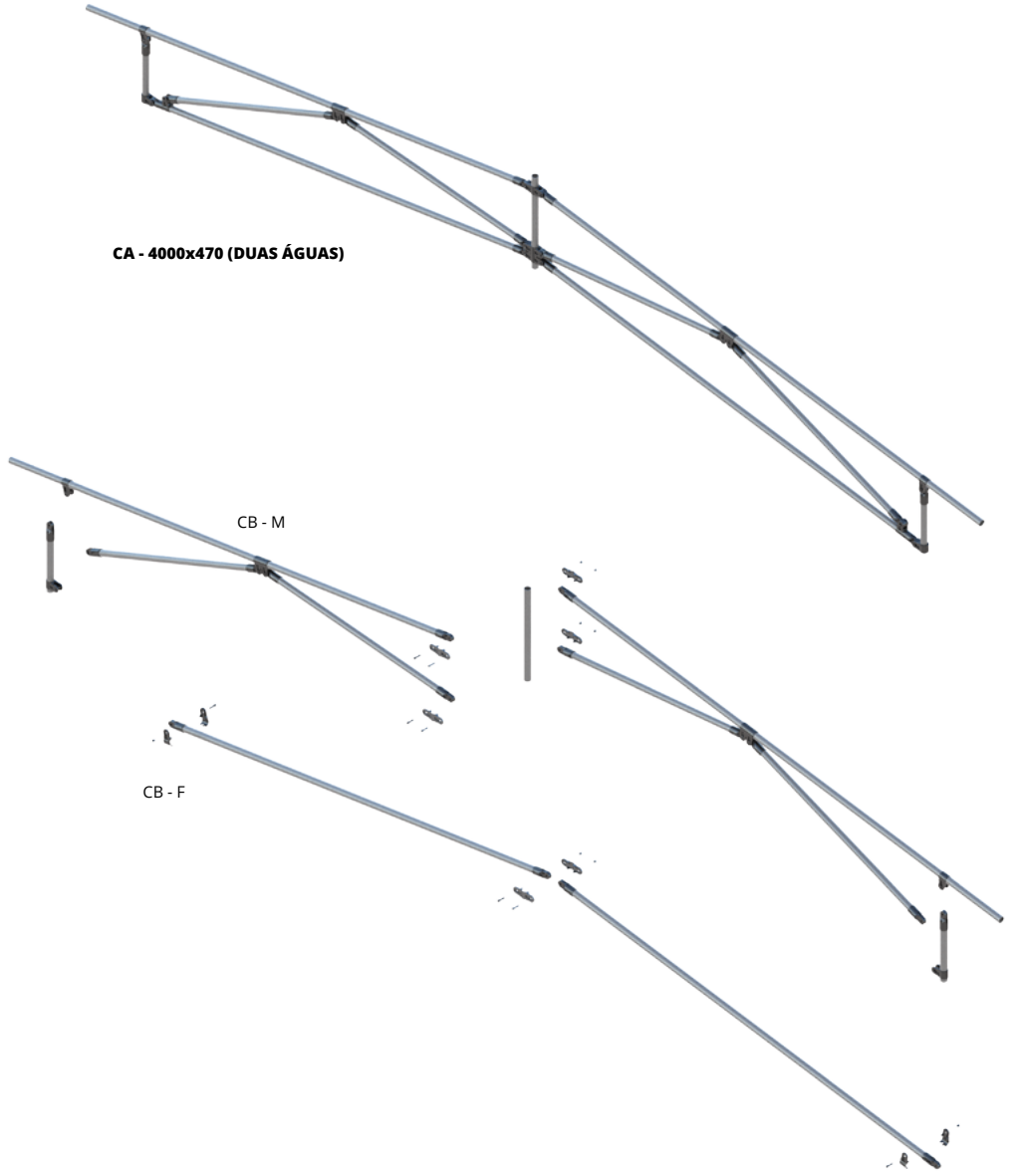
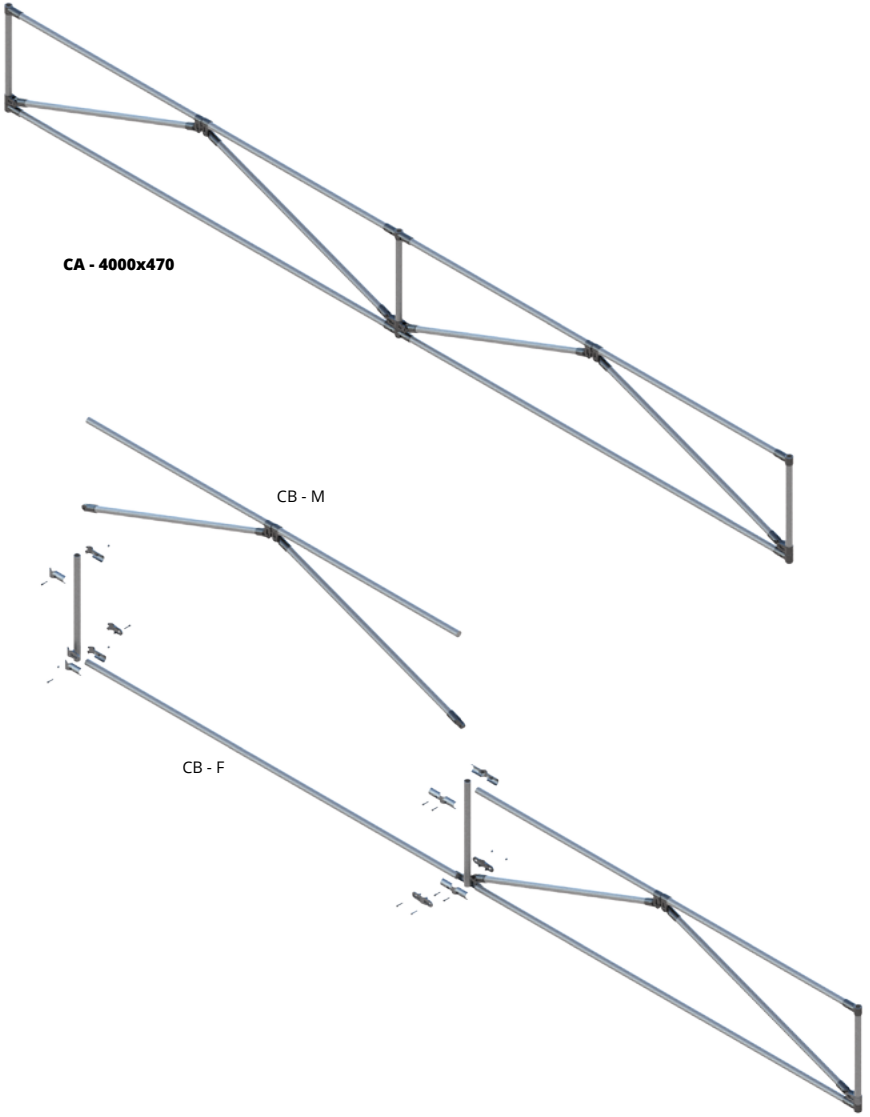
CB - M		CB - F	
H 1930	1x	H 1930	1x
H 950	2x	H 470	2x
HJ-6	4x	HJ-1	4x

**CA- 3000x500_B (DUAS ÁGUAS DESI-**

CB - M	CB - F
--------	--------

CA- 2000x500_

CB - M	CB - F
--------	--------



ESTÁGIOS DE COMPONENTES PRÉ-FABRICADOS ARTICULADOS

- 1 - PRÉ-MONTADOS
- 2 - EM MONTAGEM
- 3 - MONTADOS



1



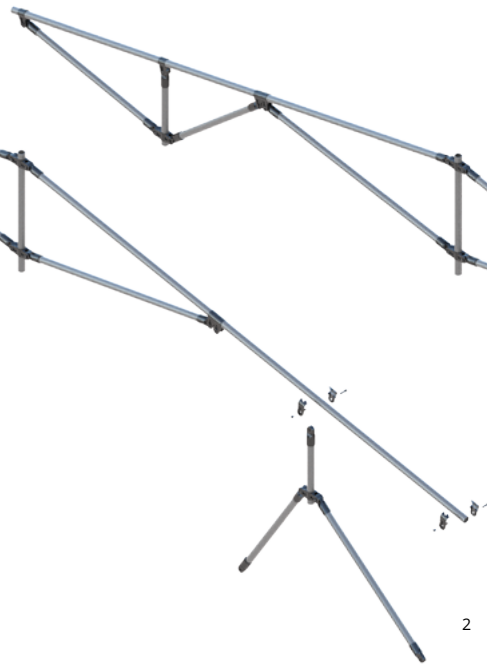
2



3



1



2

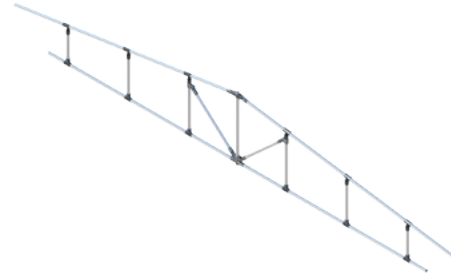


3



CC - CF/CB - 2000x820
 CF
 CF-R 200x820 1x

CB
 470 2x
 HJ-12 1x
 HJ -6 2x



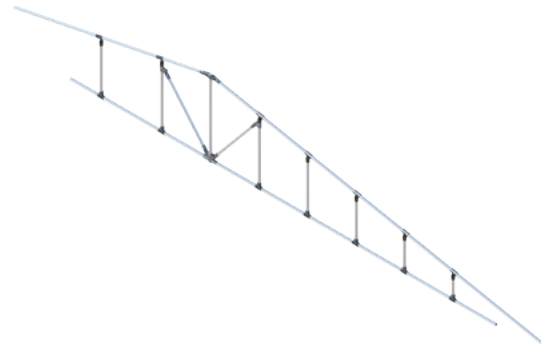
CC_CF/CB 4000x600
 CF
 CF-I 2000x600 2x

CB
 1930 2x
 495 4x



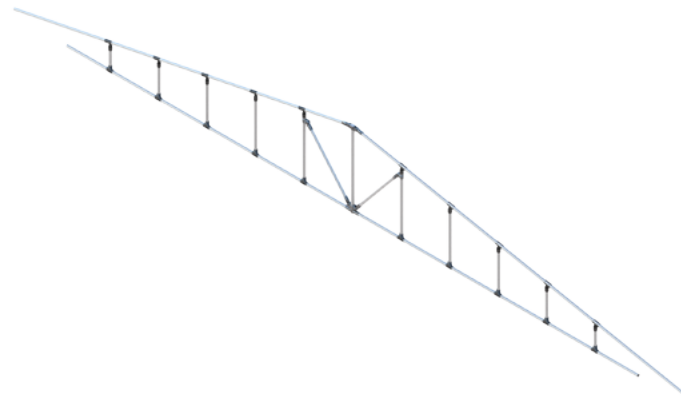
CC - CF/CB - 2000x600
 CF
 CF-1200x600 1x

CB
 H - 660 2x
 H - 750 1x
 HJ-12 1x
 HJ -6 2x



CC - CF/CB - 3000x750
 CF
 CF-I - 3000x750 1x

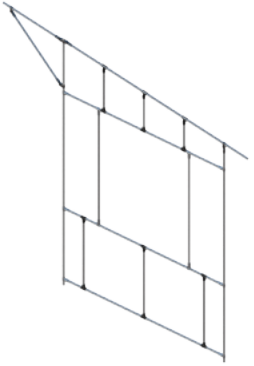
CB
 H - 660 1x
 H - 550 2x
 H - 440 2x
 HJ-12 3x
 HJ -6 2x



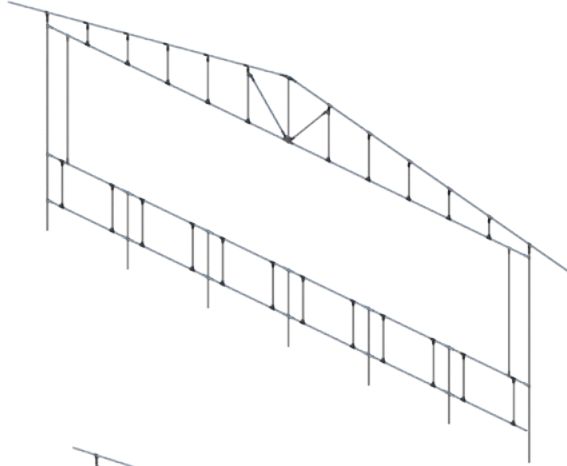
CC - CF/CB - 3000x750
 CF
 CF-I - 3000x750 1x

CB
 H - 660 1x
 H - 550 2x
 H - 440 2x
 HJ-12 3x
 HJ -6 2x

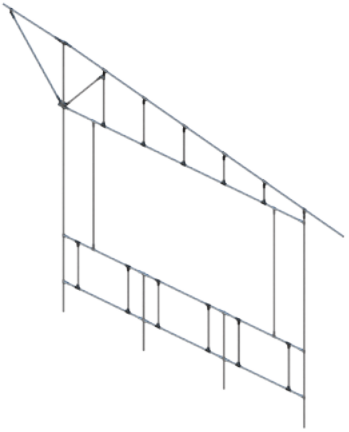




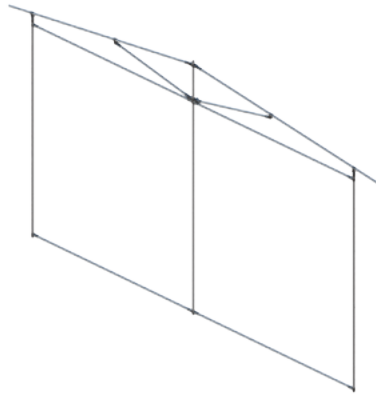
CC - CF/CB - 2000x2700



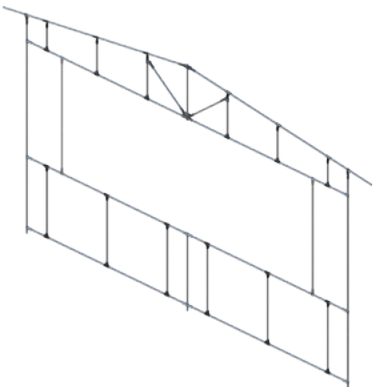
CC - CF /CB - 6000x2250



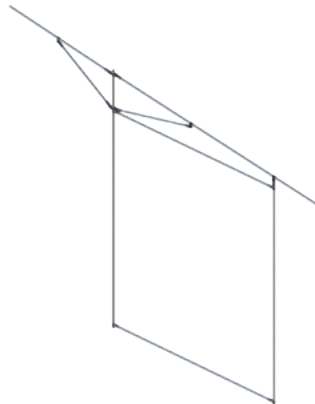
CC - CF/CB - 3000x2700



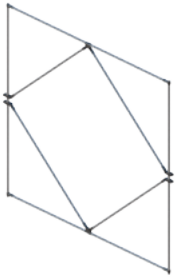
CC - CA/CB - 4000x2700



CC - CF/CB - 3000x2250



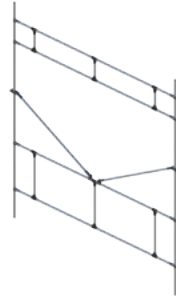
CC - CA/CB - 2000x2700



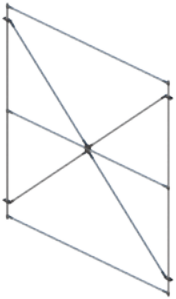
CC - CA/CA - 2000x2250



CC - CF /CB - 6000x2250



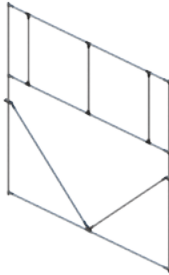
CC - CF /CA - 2000x2250



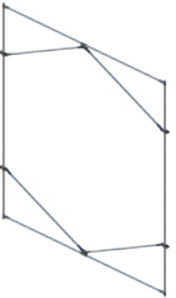
CC - CA/CA - 2000x2250



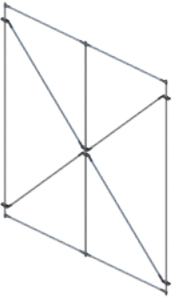
CC - CA/CA - 2000x2250



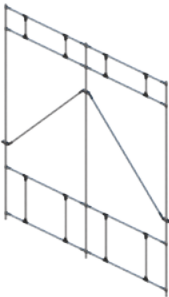
CC - CF/CA - 2000x2250



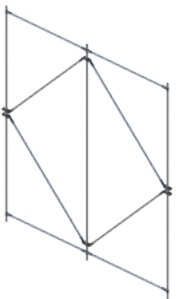
CC - CA/CA - 2000x2250



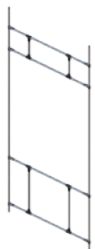
CC - CA/CA - 2000x2250



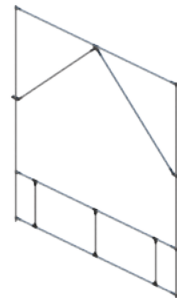
CC - CF/CA - 2000x2250



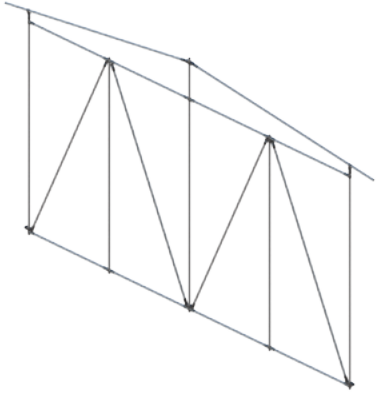
CC - CA/CA - 2000x2250



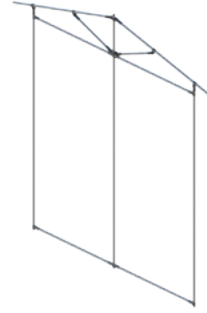
CC - CF/CF - 1000x2250



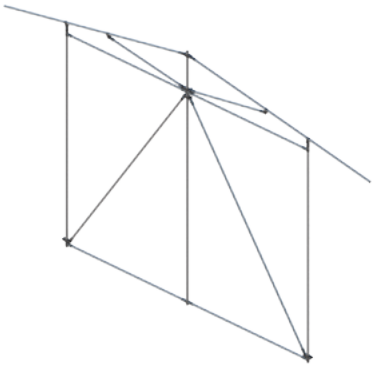
CC - CF/CA - 2000x2250



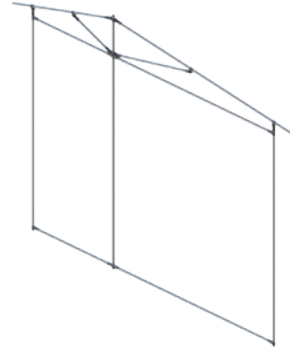
CC - CA/CA - 4000x2700 DUAS ÁGUAS



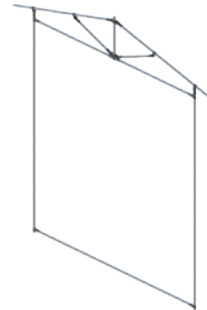
CC - CA /CA - 2000x2700 DUAS ÁGUAS



CC - CA/CA - 3000x2700 DUAS ÁGUAS

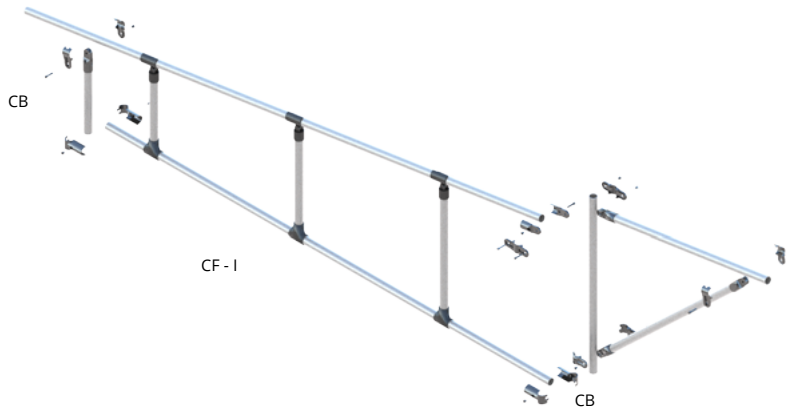
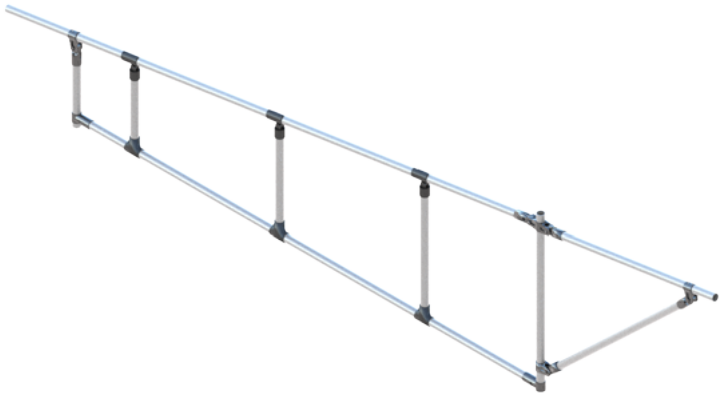


CC - CA/CA - 3000x2700 DUAS ÁGUAS



CC - CA/CA - 2000x2700 DUAS ÁGUAS

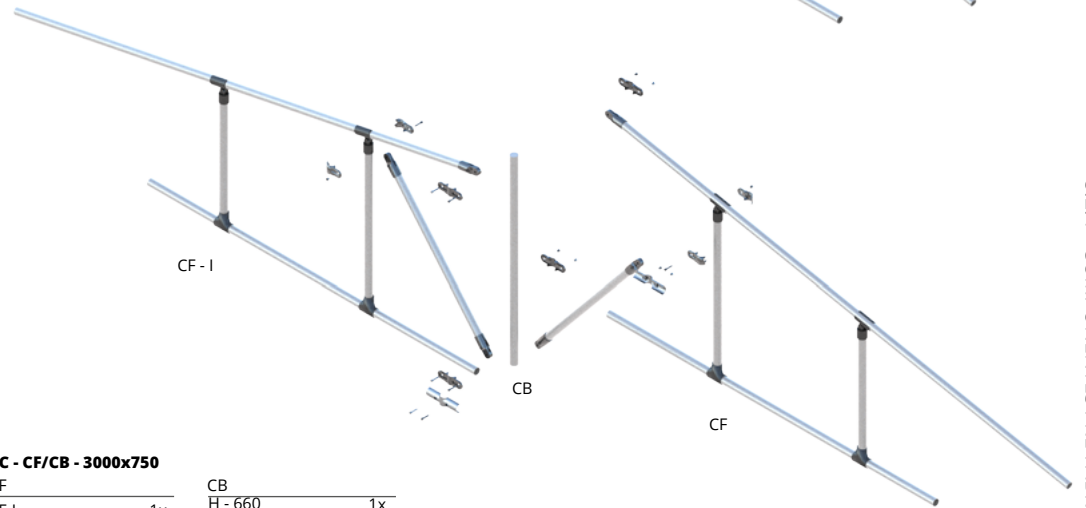
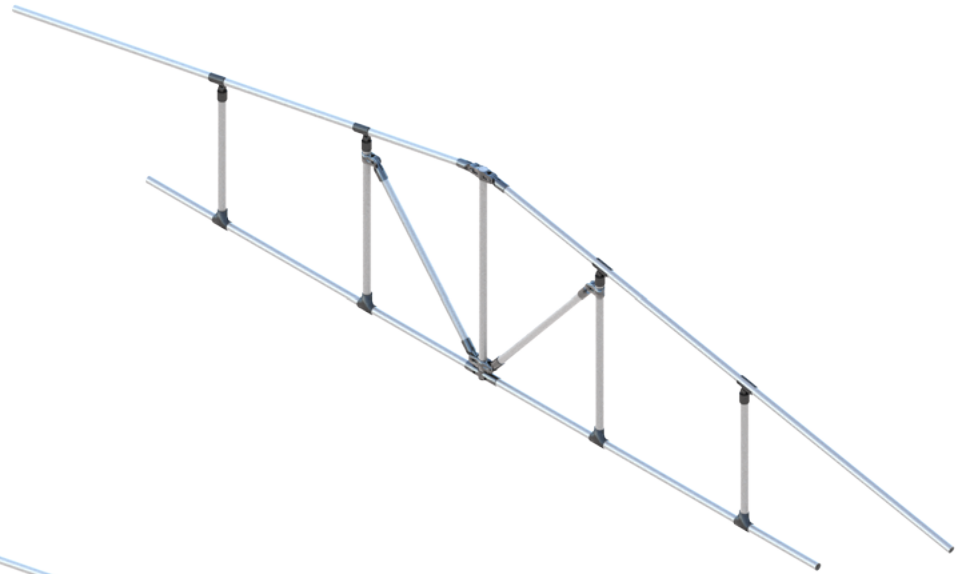
CC - CF/CB - 2000x600



CC - CF/CB - 2000x600

CF		CB	
CF-1200x600	1x	H - 660	2x
		H - 750	1x
		HJ-12	1x
		HJ - 6	2x

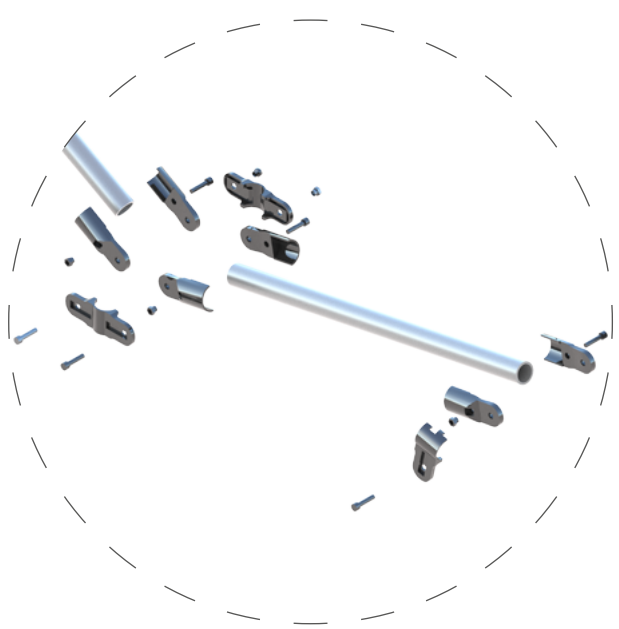
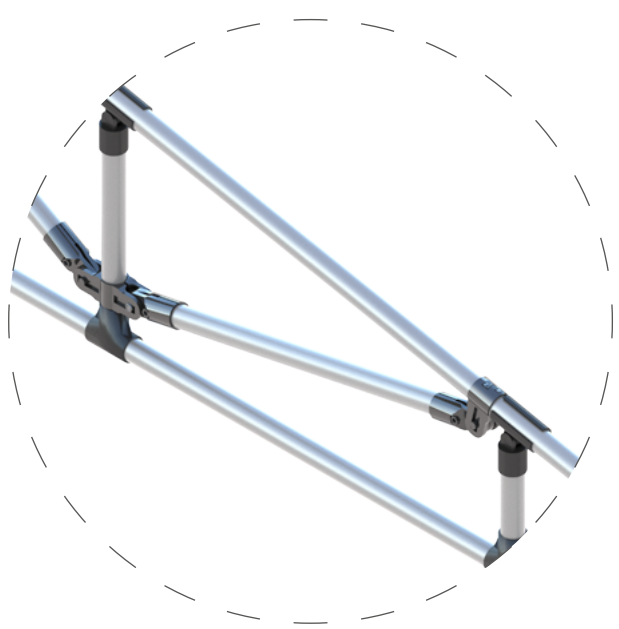
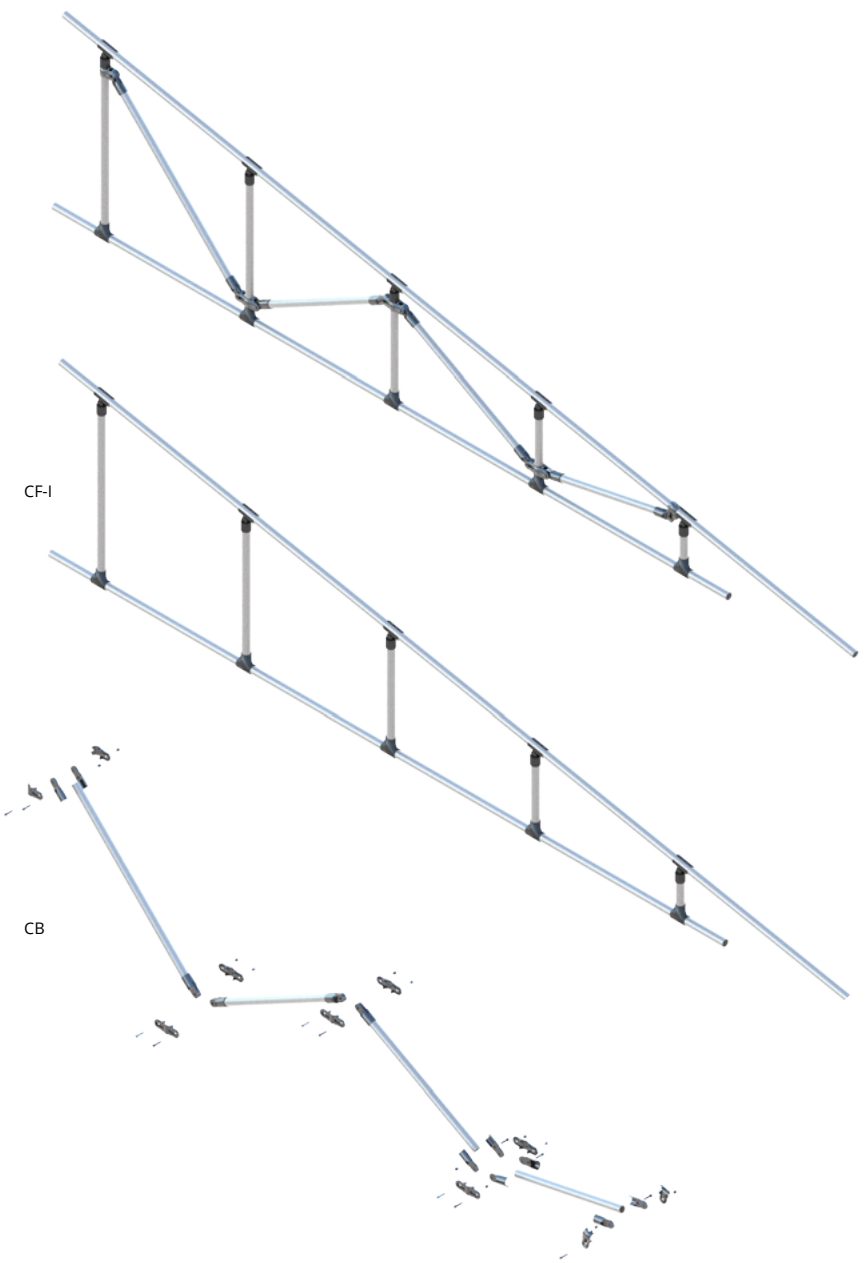
CC - CF/CB - 3000x750



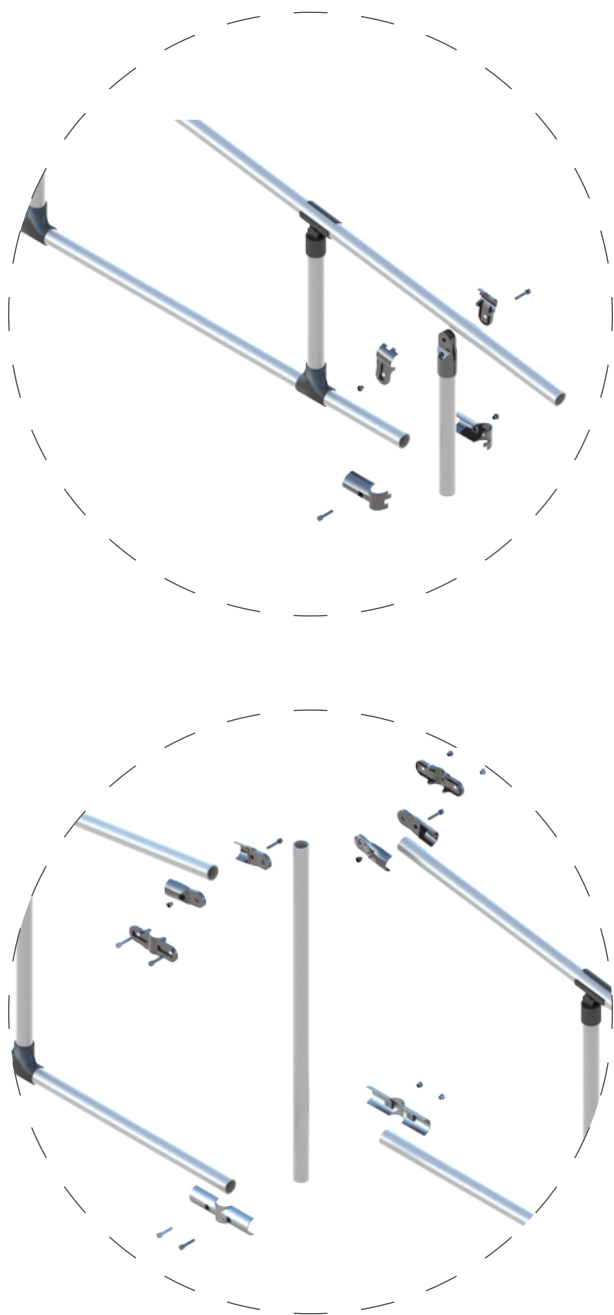
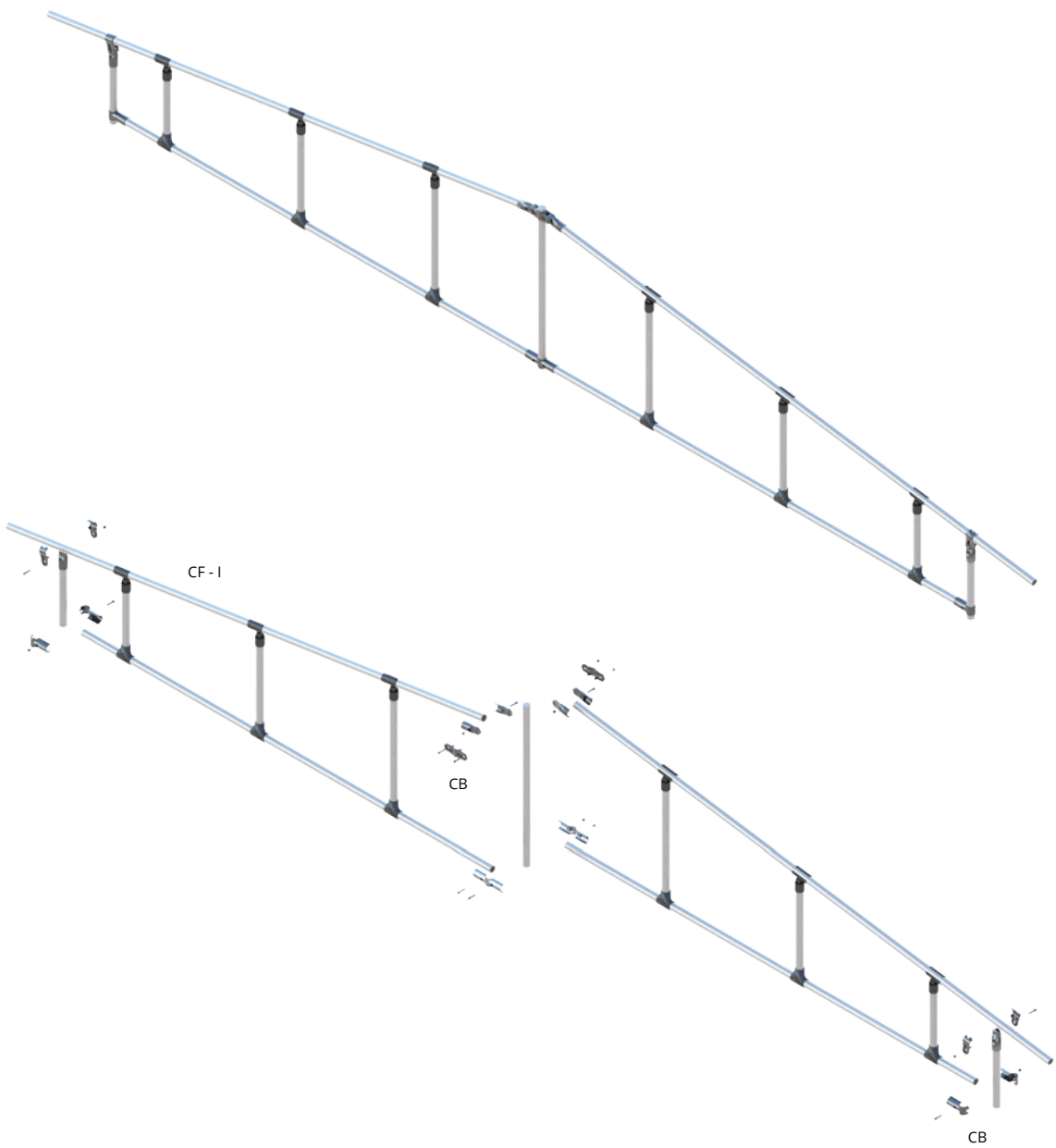
CC - CF/CB - 3000x750

CF		CB	
CF-I - 3000x750	1x	H - 660	1x
		H - 550	2x
		H - 440	2x
		HJ-12	3x
		HJ - 6	2x

CC - CF/CB - 3000x750



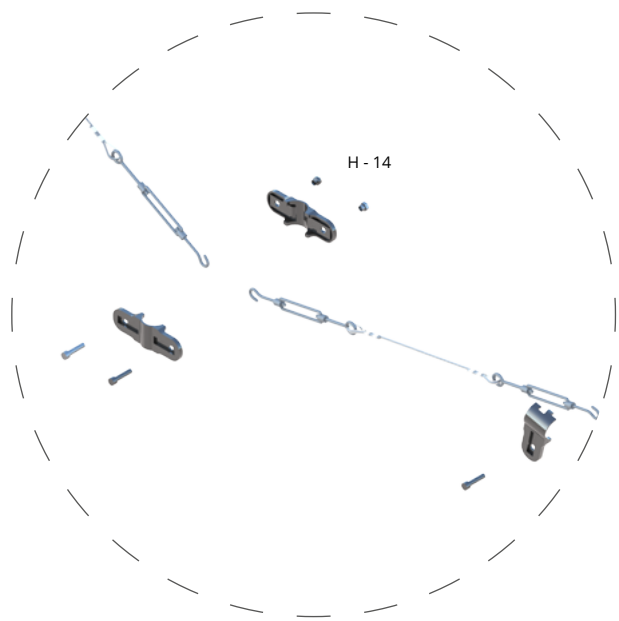
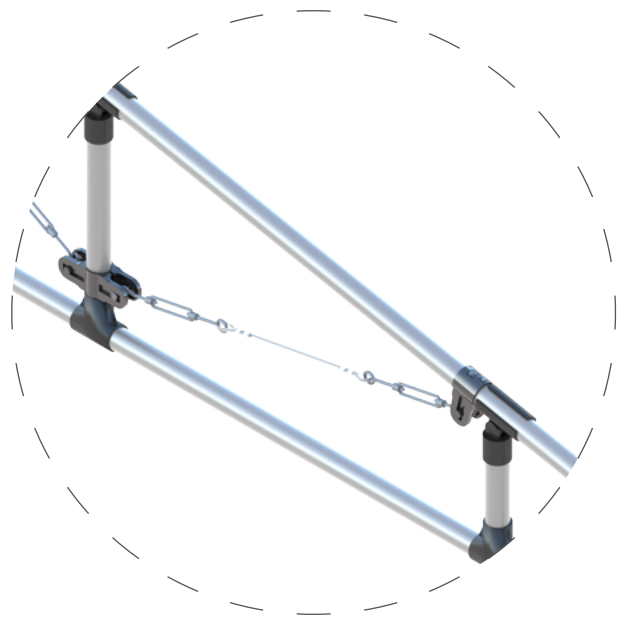
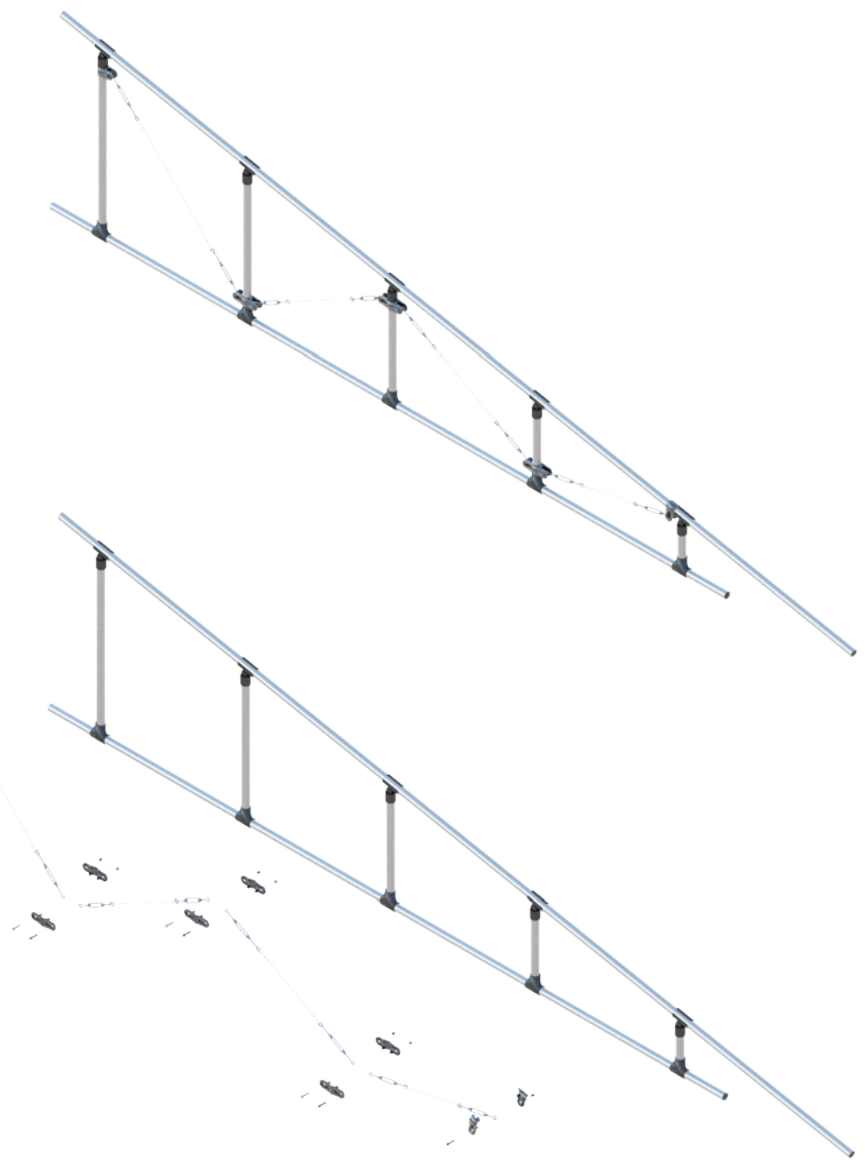
CC - CF/CB - 4000x600

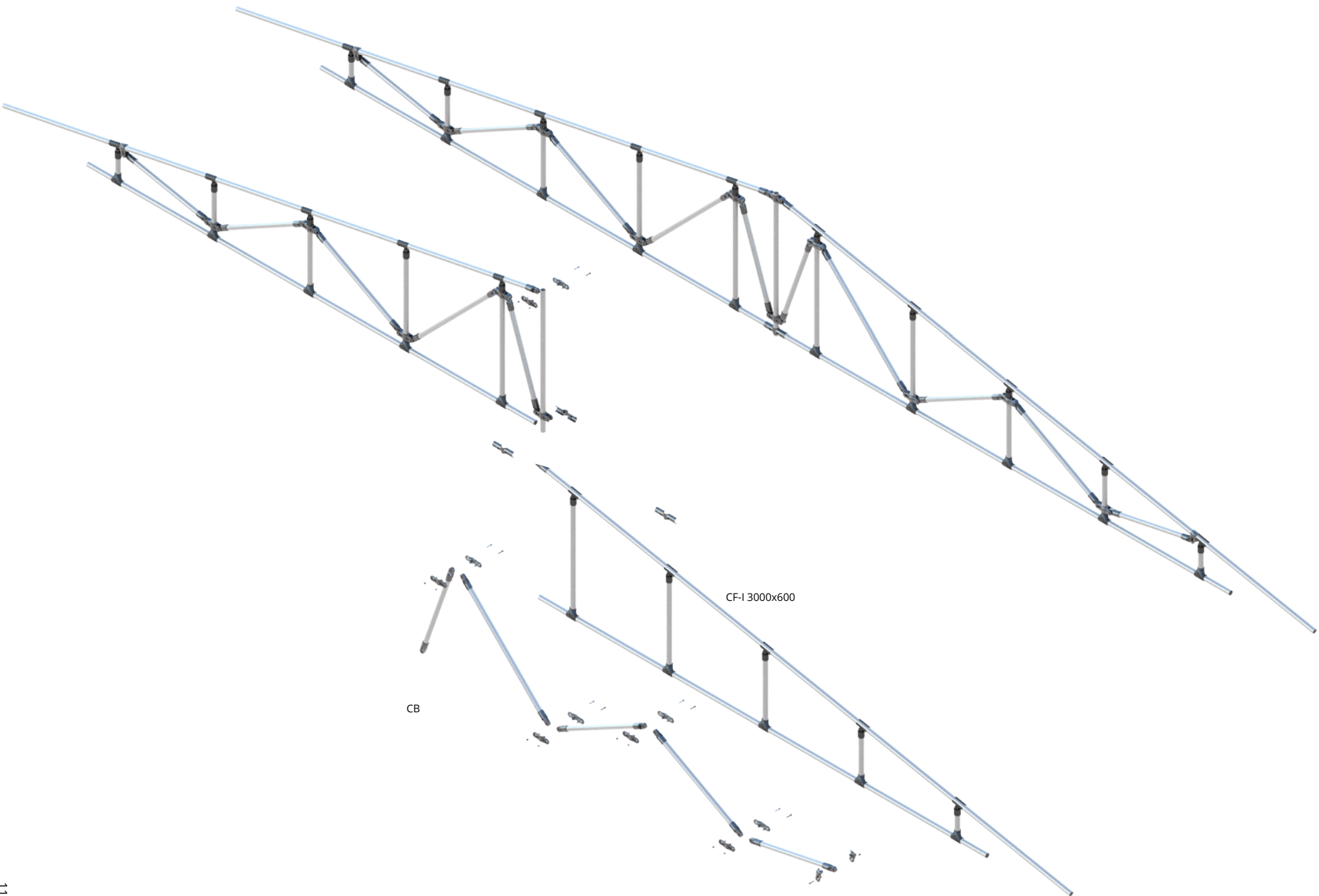


CC - CF/CB - 3000x750 COM TENSORES E CABOS DE AÇO

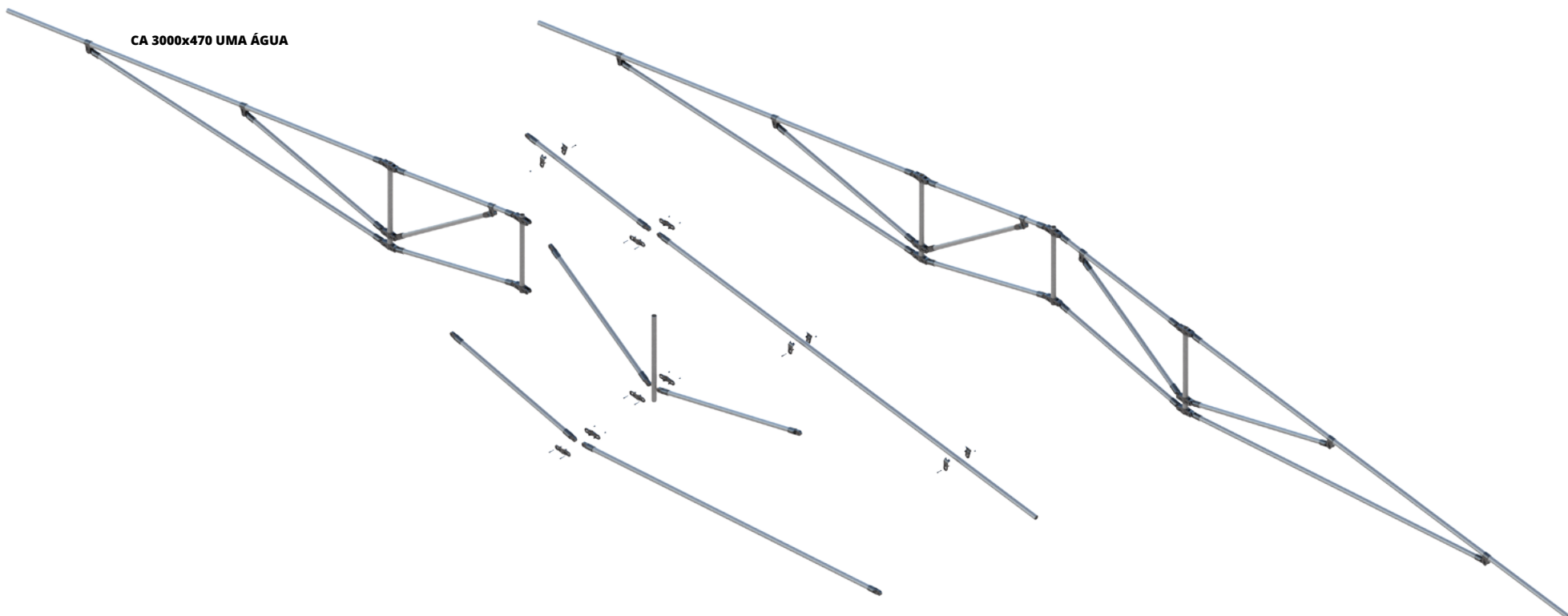
CF-I 3000x600

CB



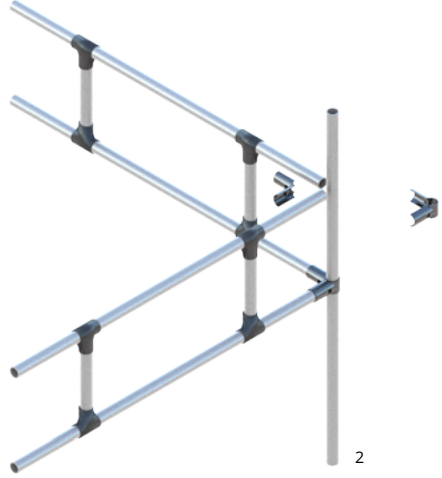


TRELIÇA PLANA -CC CA/CA 6000x470 DUAS ÁGUAS

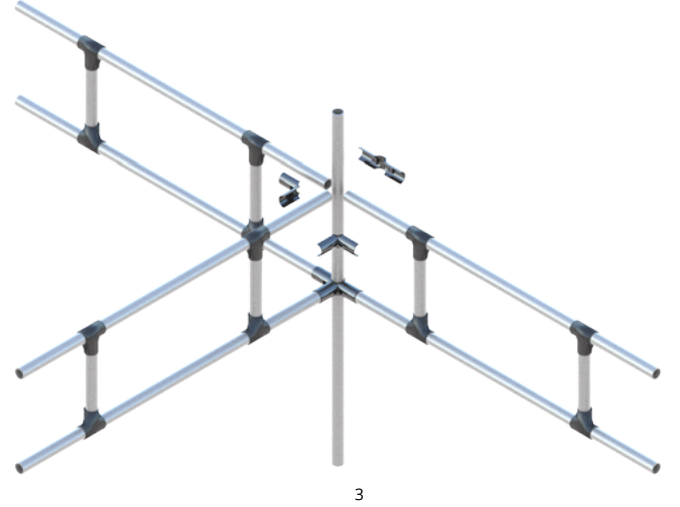




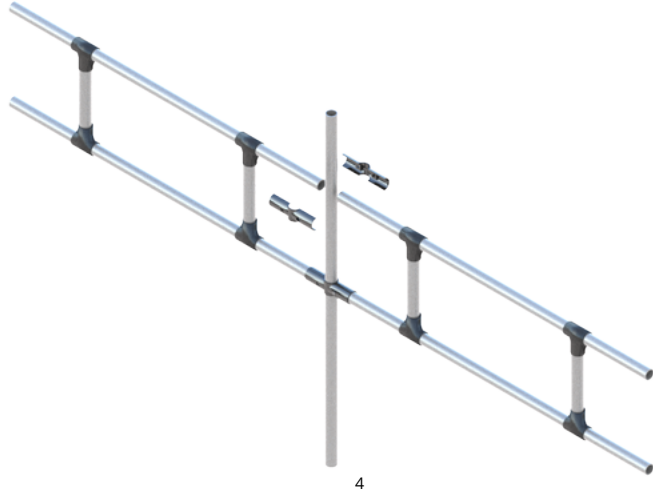
1



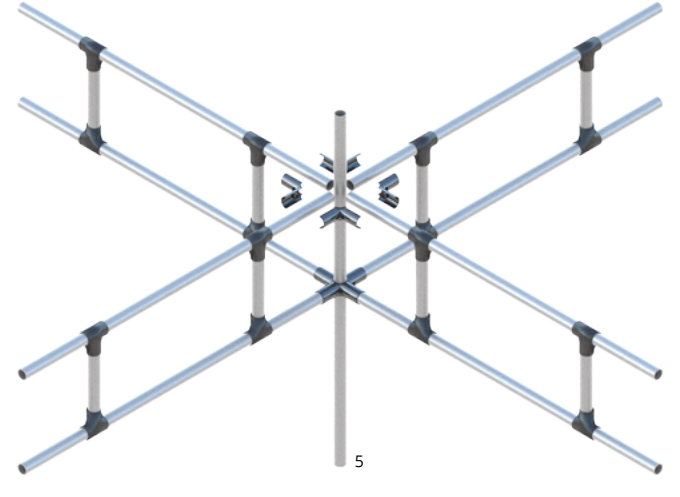
2



3



4

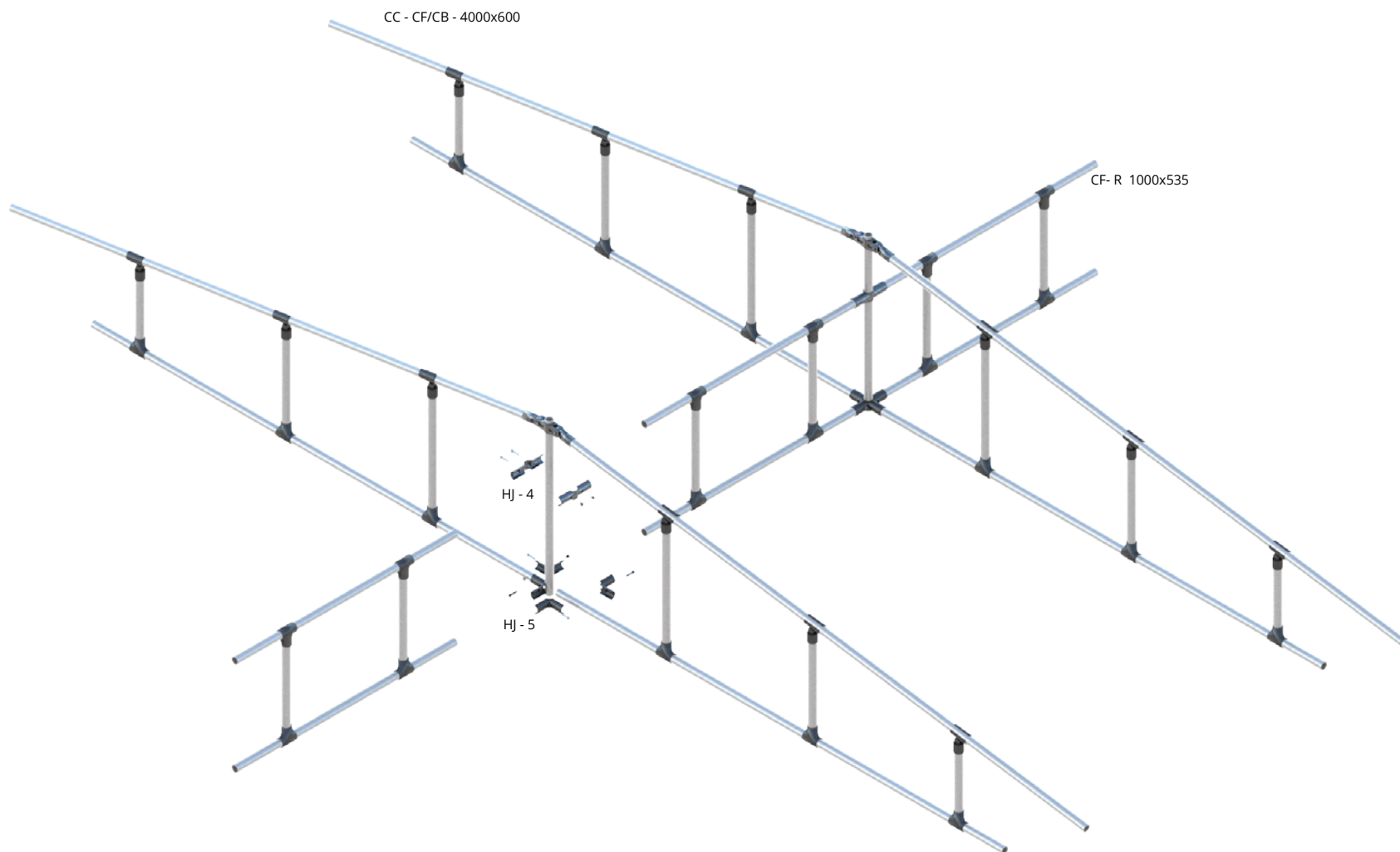


5

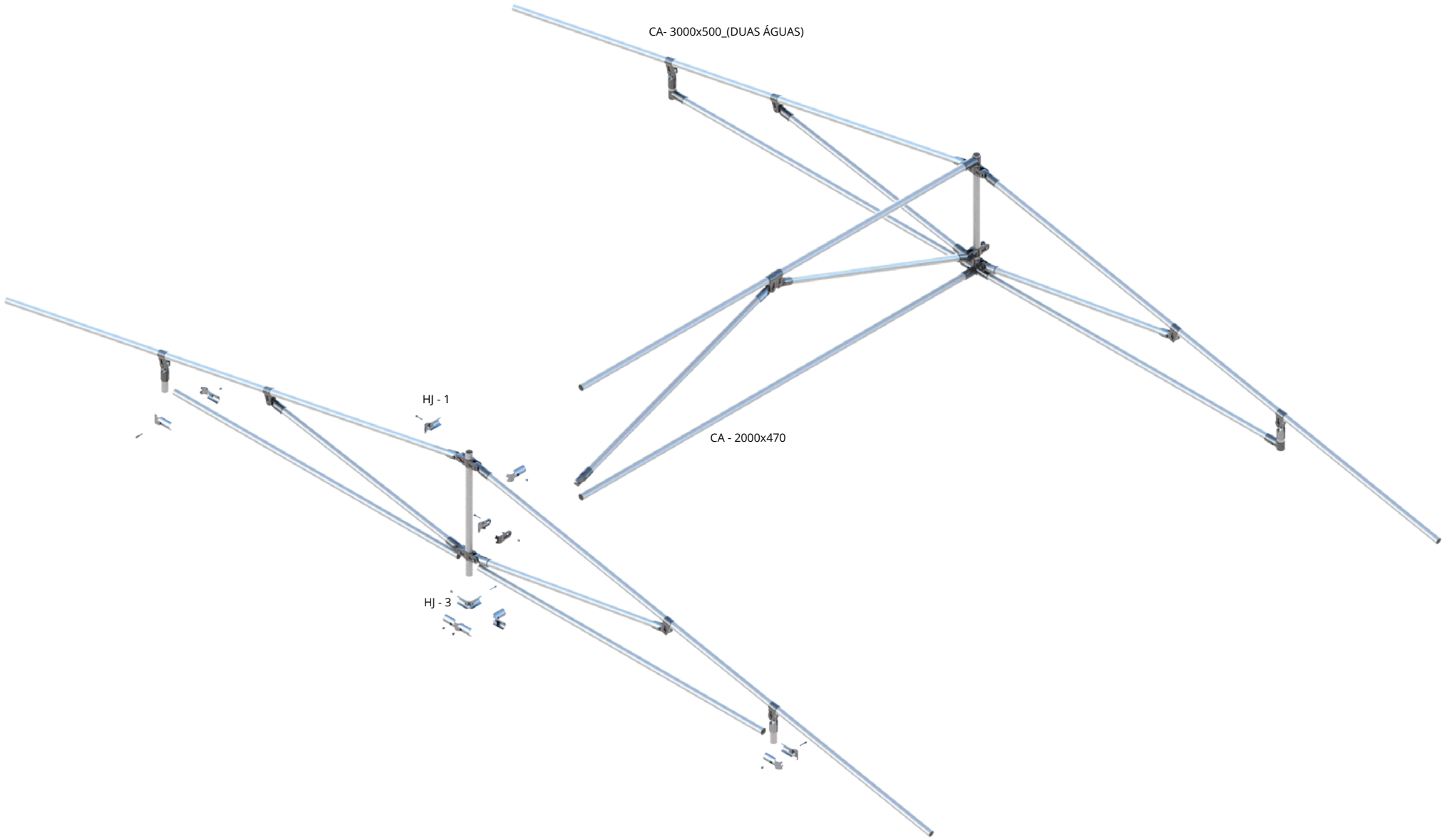
INTERAÇÕES ENTRE COMPONENTES EM DIFERENTES DIERÇÕES

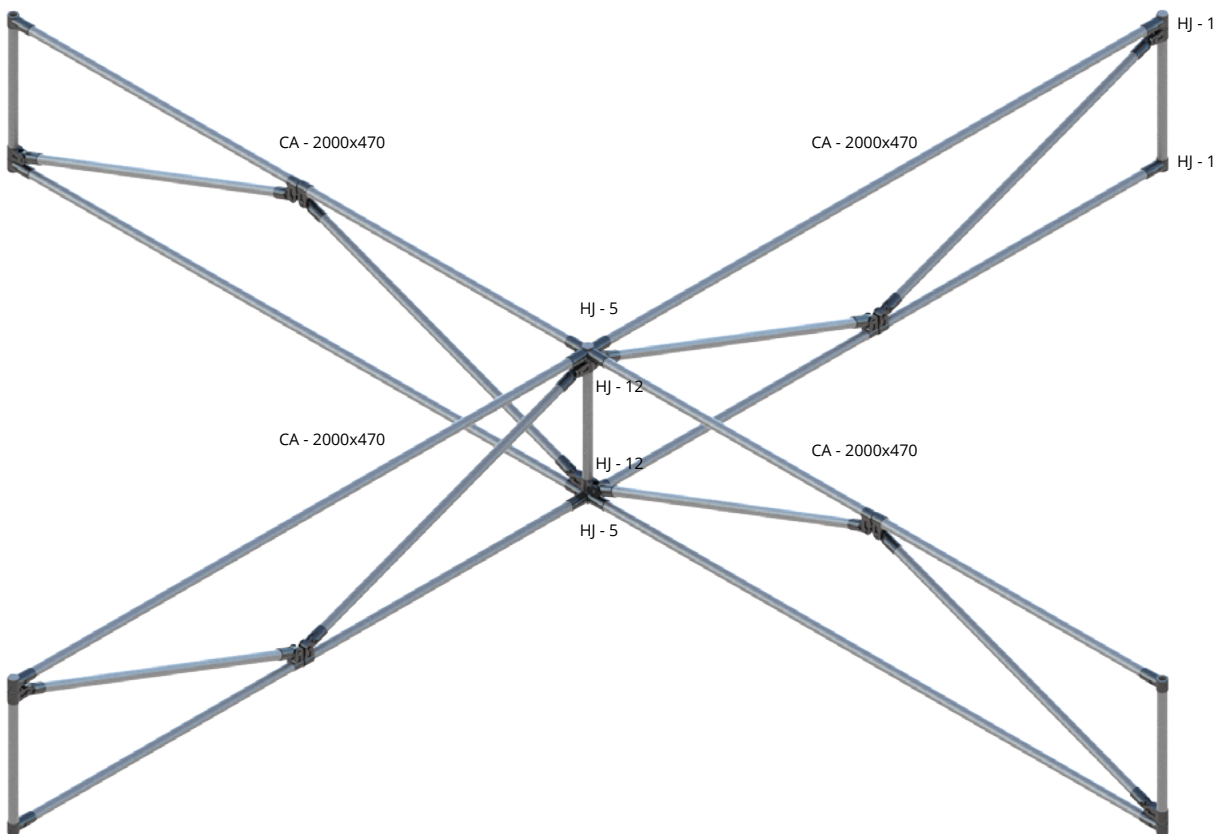
- 1 HJ - 1
- 2 HJ - 2
- 3 HJ - 2
- 4 HJ - 4
- 5 HJ - 5

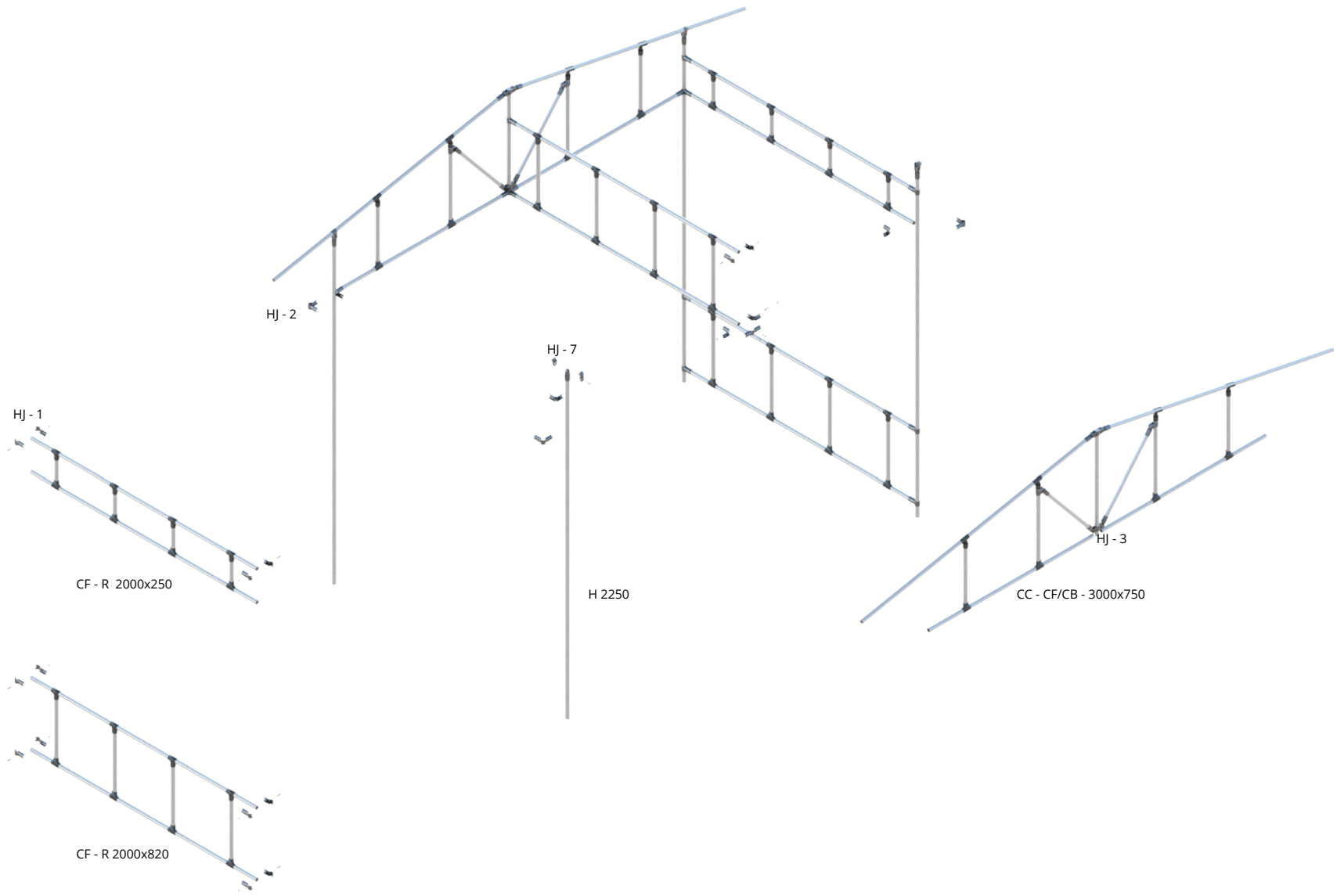
COMBINAÇÕES EM PLANOS DFERENTES

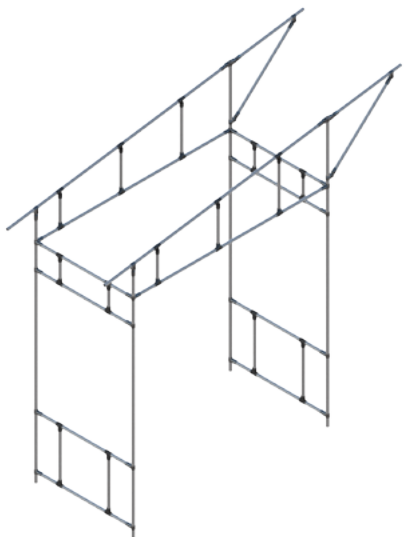


COMBINAÇÕES EM PLANOS DFERENTES

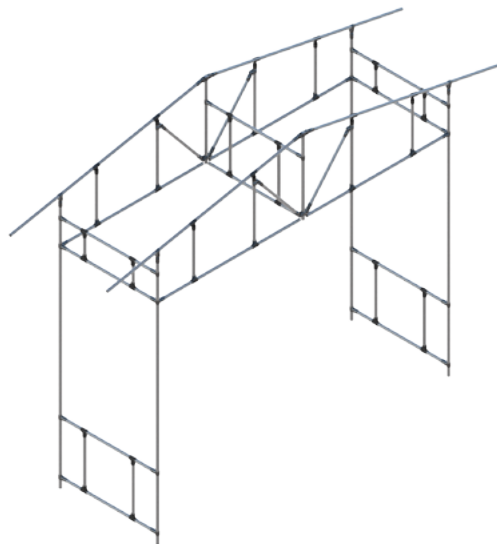




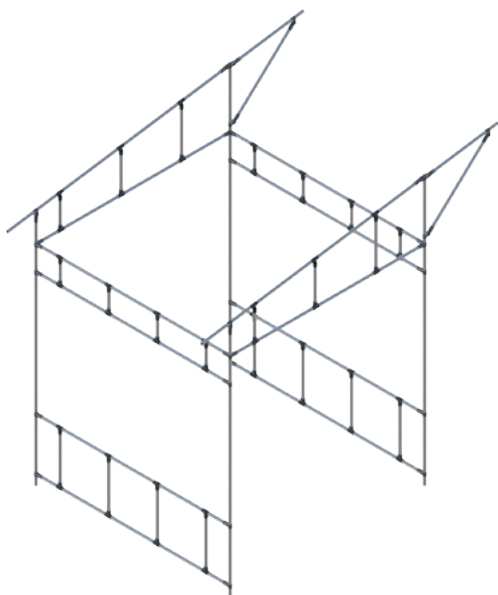




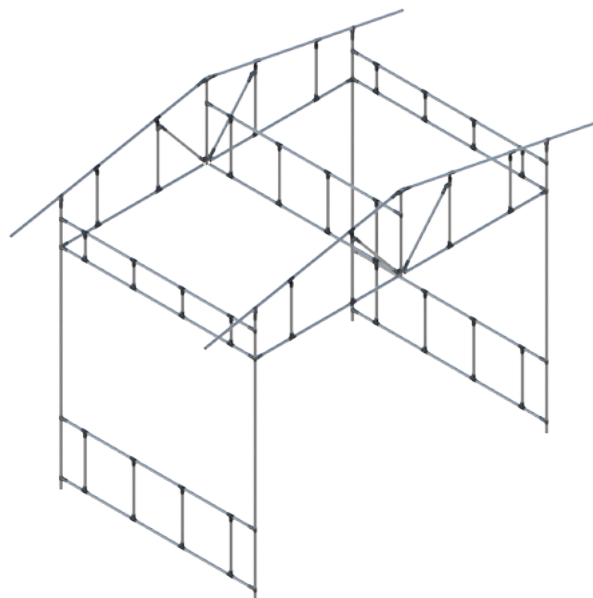
M CF/CF - 3000x1000 UMA ÁGUA



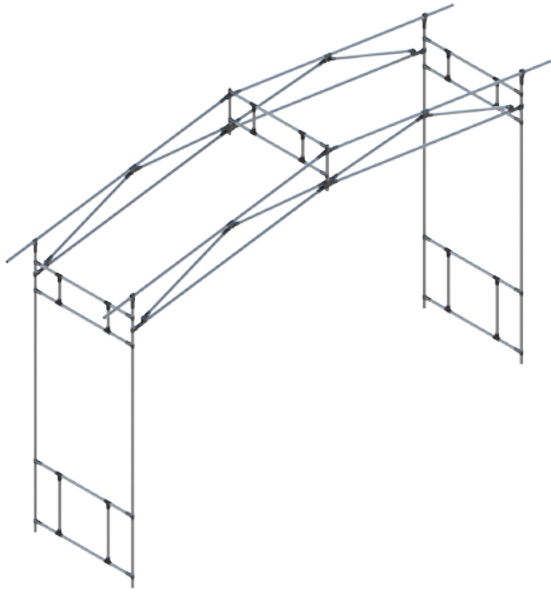
M CF/CF - 3000x1000 DUAS ÁGUAS



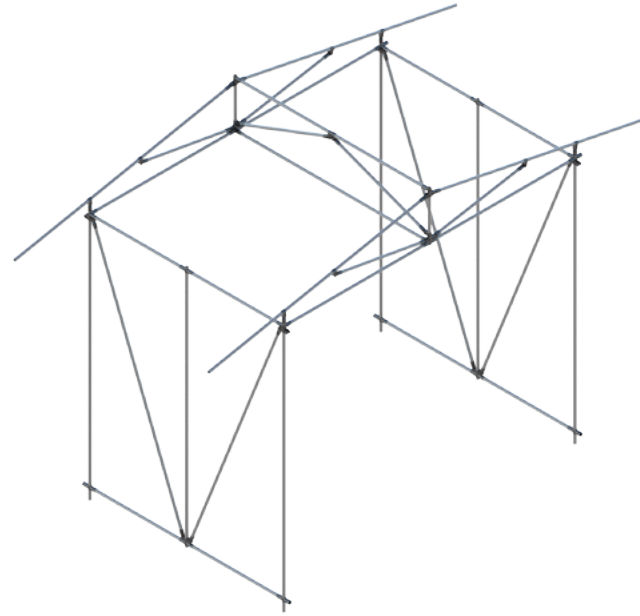
M CF/CF - 3000x2000 UMA ÁGUA



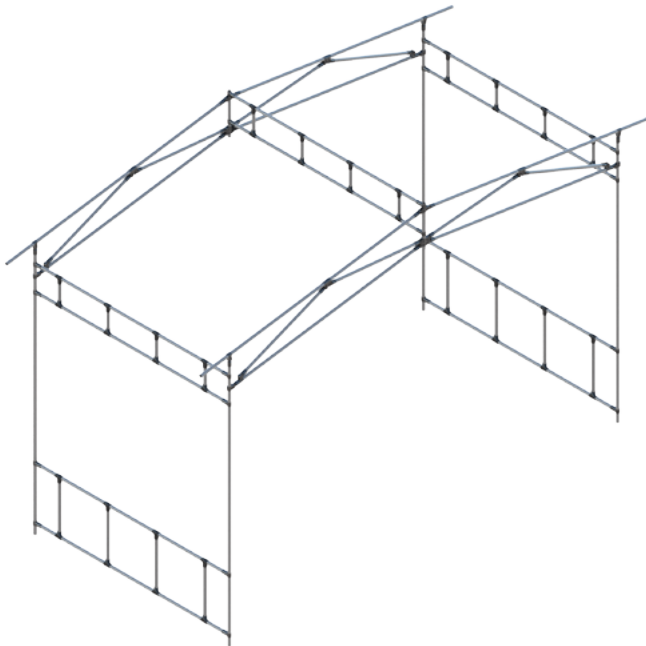
M CF/CF - 3000x2000 DUAS ÁGUAS



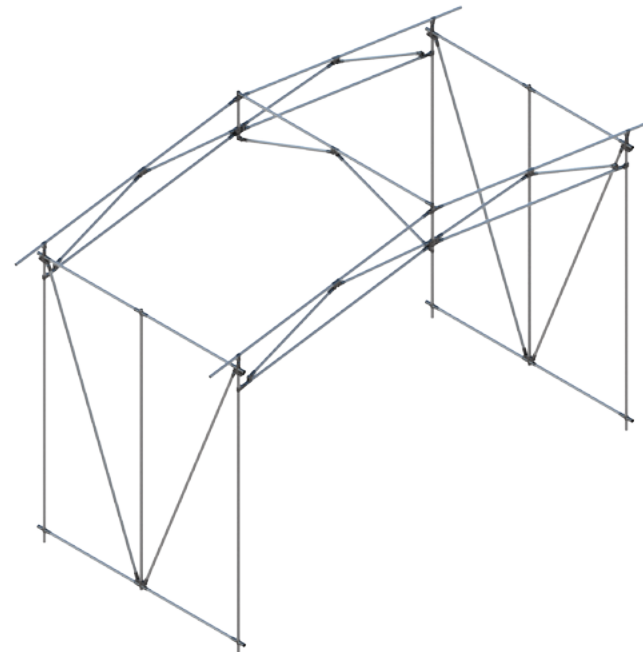
M CF/CA - 4000x1000 DUAS ÁGUAS



M CA/CA - 3000x2000 DUAS ÁGUAS

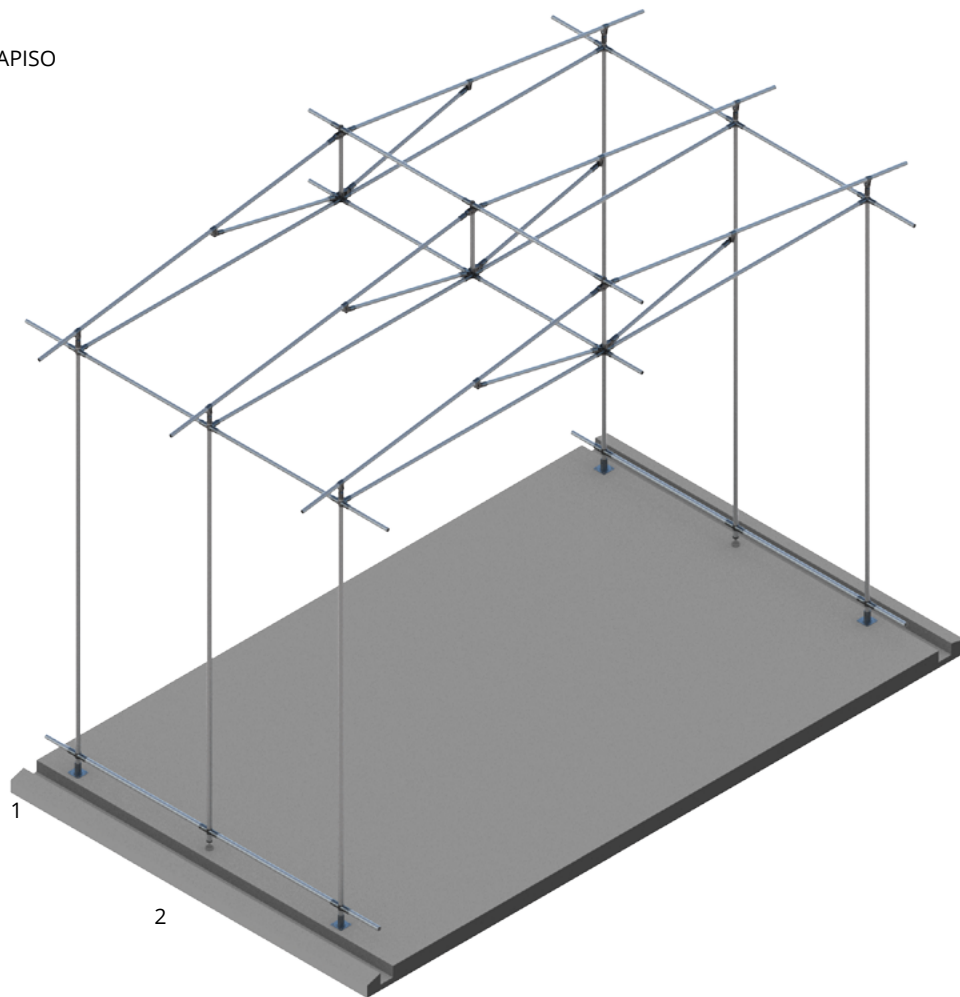


M CF/CA - 4000x2000 DUAS ÁGUA

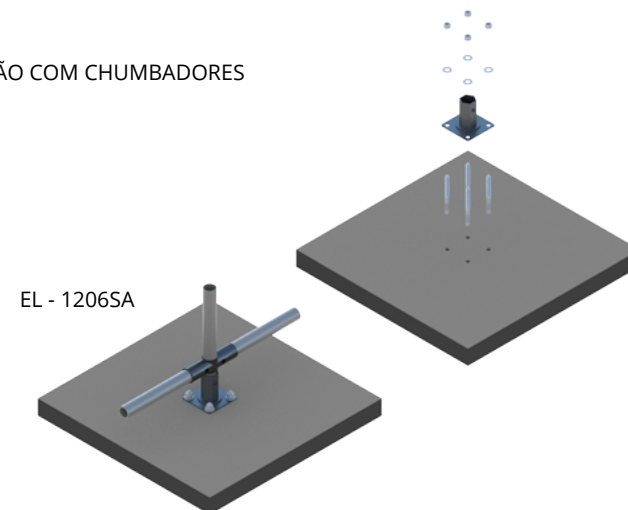


M CA/CA - 4000x1000 DUAS ÁGUAS

FIXAÇÃO SOBRE CONTRAPISO NIVELADO

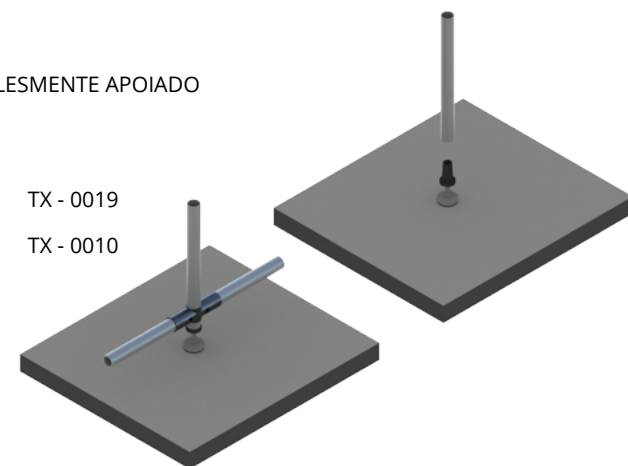


1 FIXAÇÃO COM CHUMBADORES



EL - 1206SA

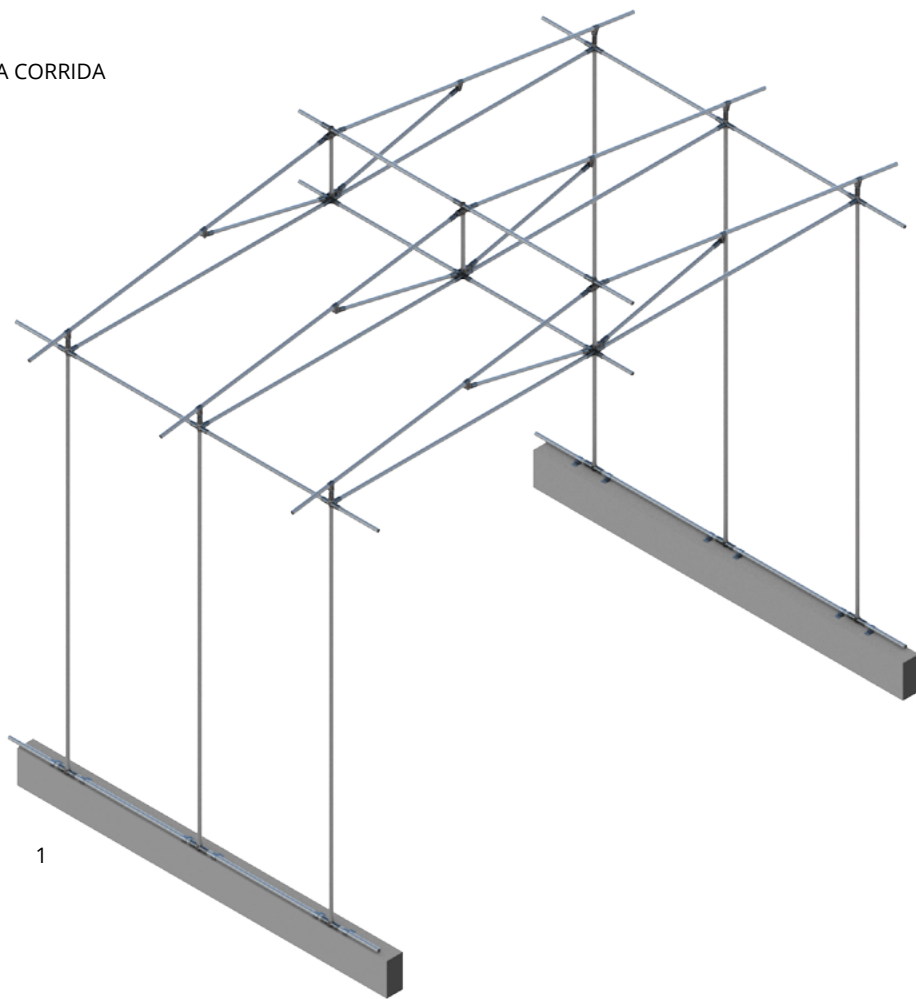
2 -SIMPLEMENTE APOIADO



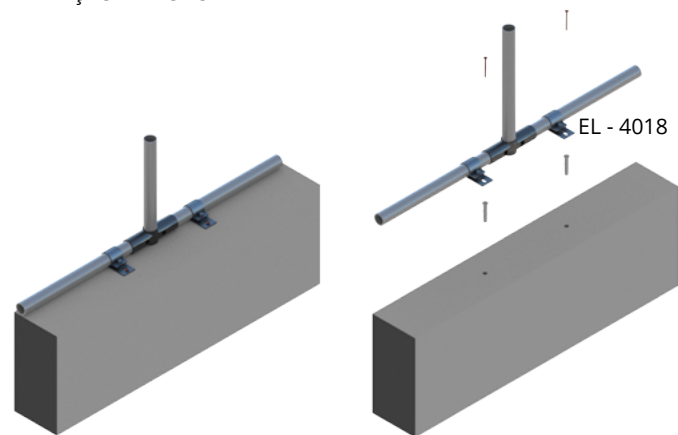
TX - 0019

TX - 0010

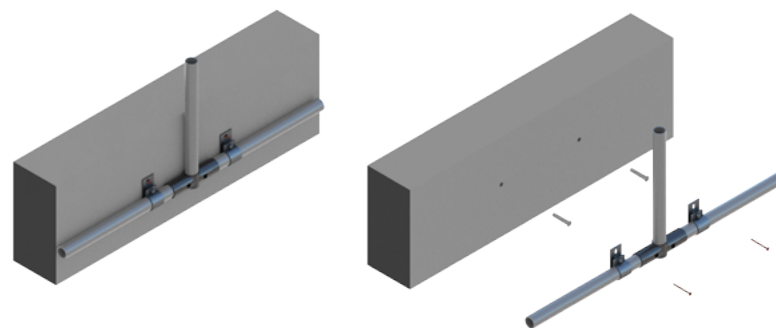
FIXAÇÃO SOBRE SAPATA CORRIDA



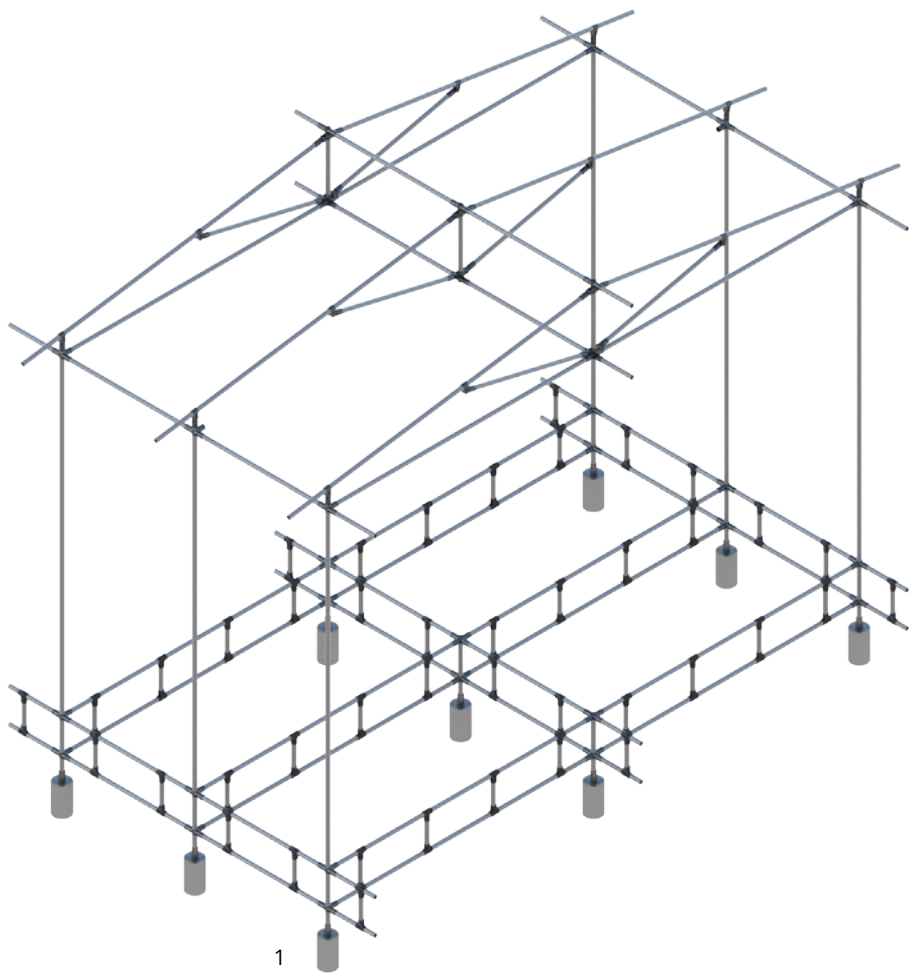
1 - FIXAÇÃO DE TOPO



2 - FIXAÇÃO NA FACE



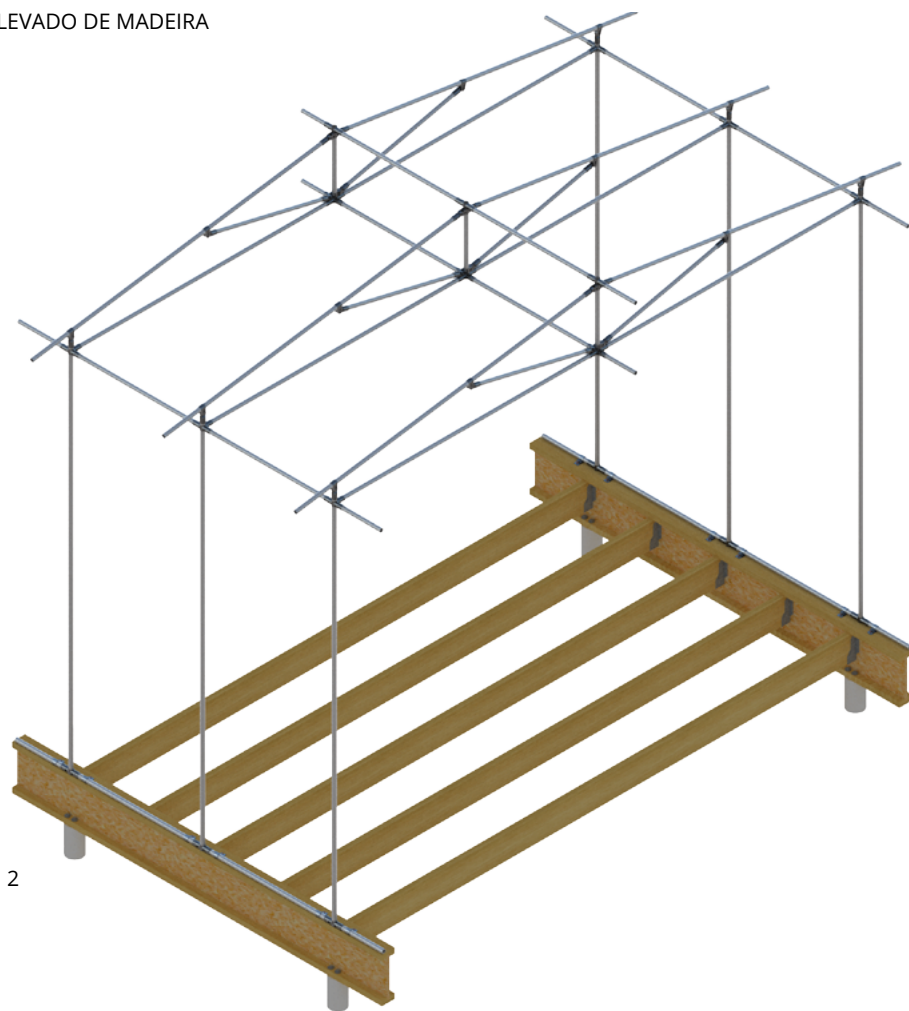
PISO ELEVADO DE TUBOS E CONEXÃO VINCULADO A FUNDAÇÕES



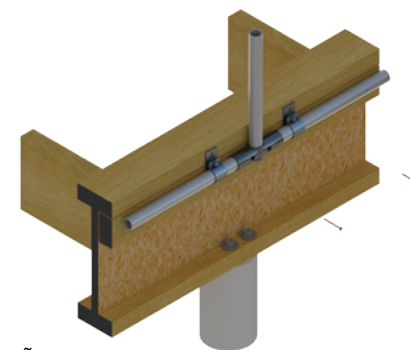
1 FIXAÇÃO DE TOPO
COM CHUMBADORES



FIXAÇÃO SOBRE PISO ELEVADO DE MADEIRA

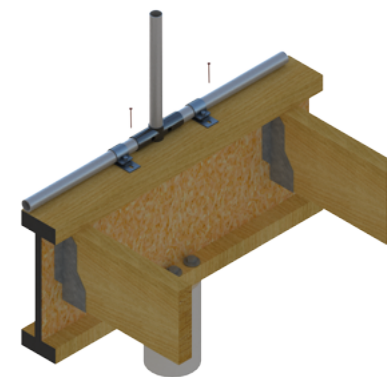


2



1 FIXAÇÃO DE TOPO

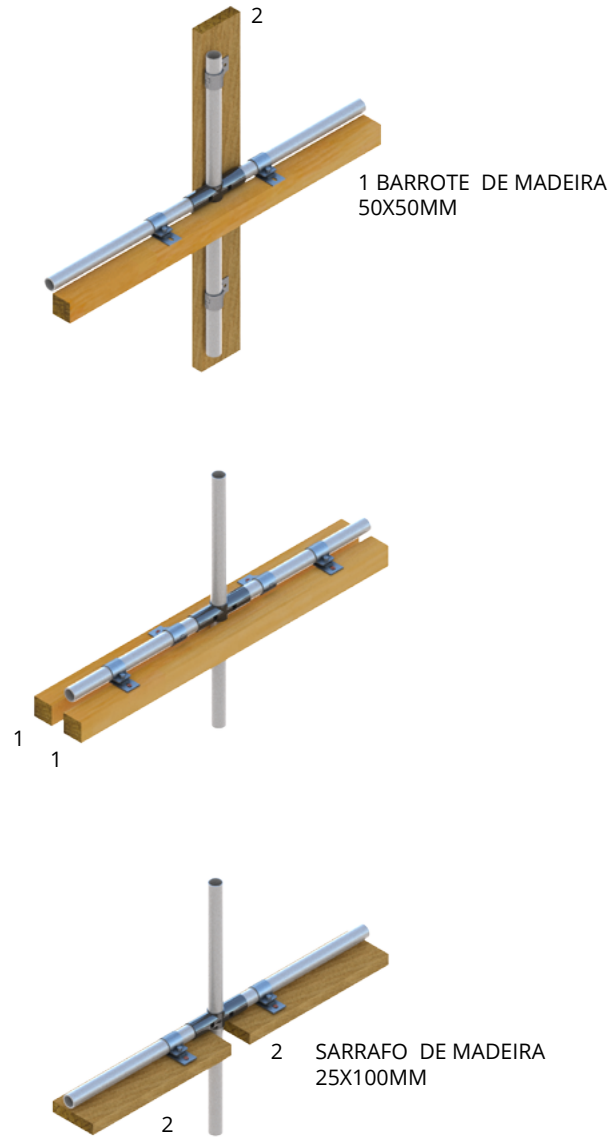
EL - 4018



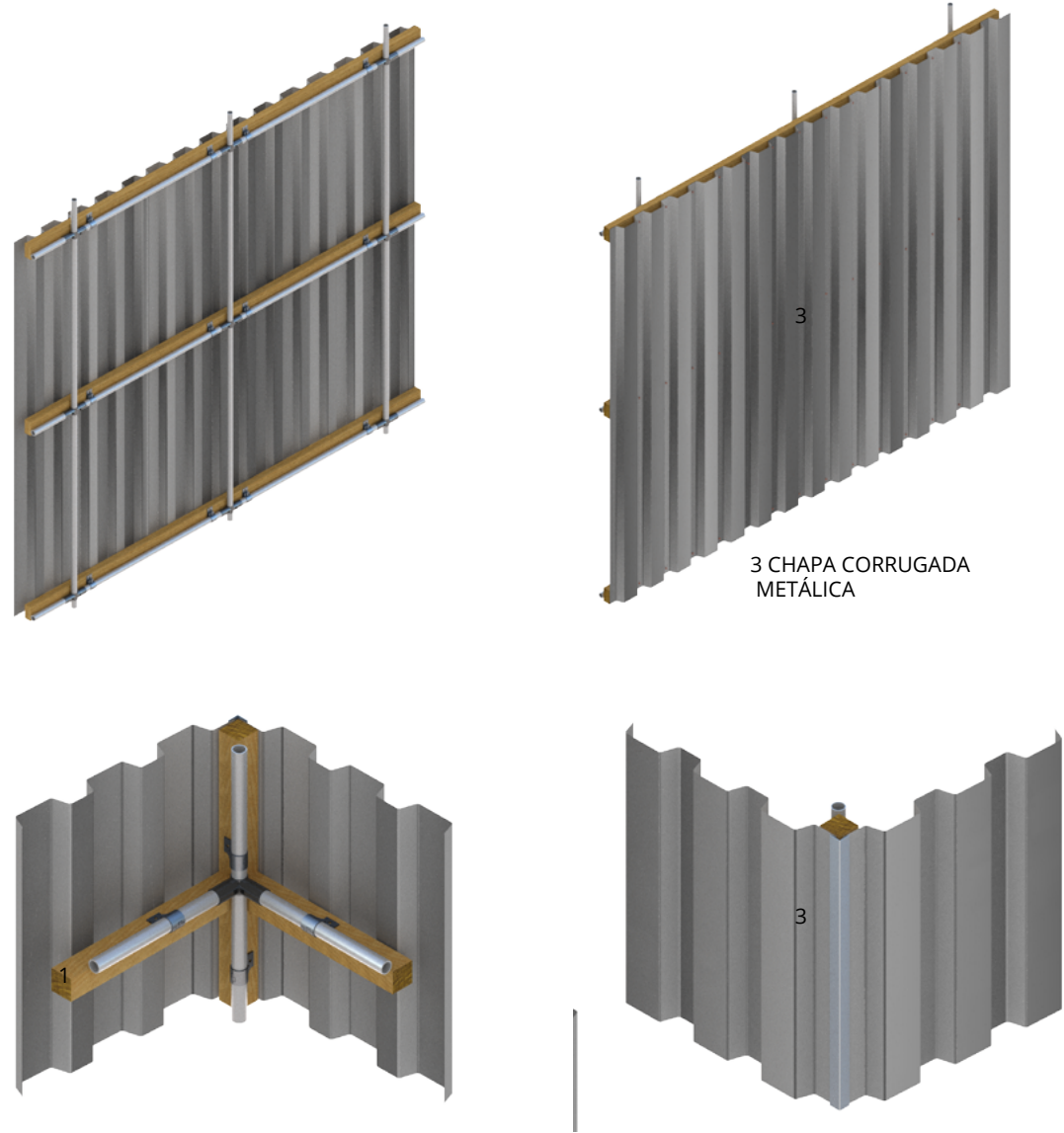
2 -FIXAÇÃO NA FACE

EL - 4018

FIXAÇÃO DE ELEMENTOS INTERMEDIÁRIOS PARA
VEDAÇÕES ATRAVÉS DO ACESSÓRIO EL - 4018

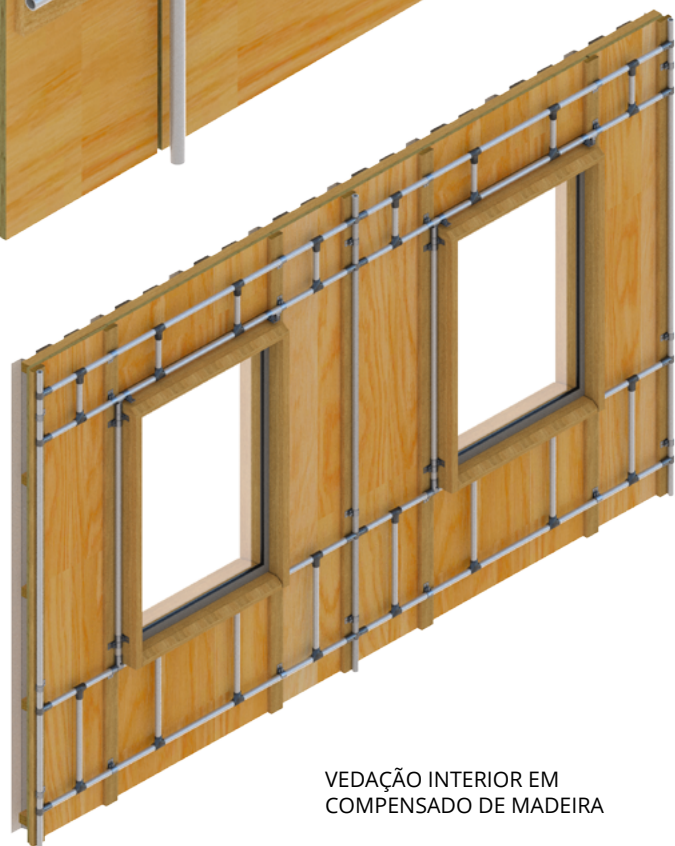
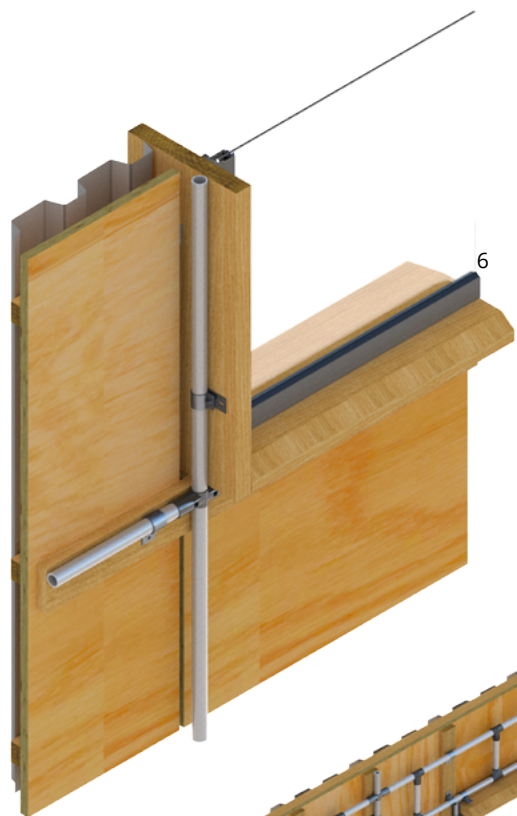


VEDAÇÃO SIMPLES EM CHAPA
CORRUGADA METÁLICA

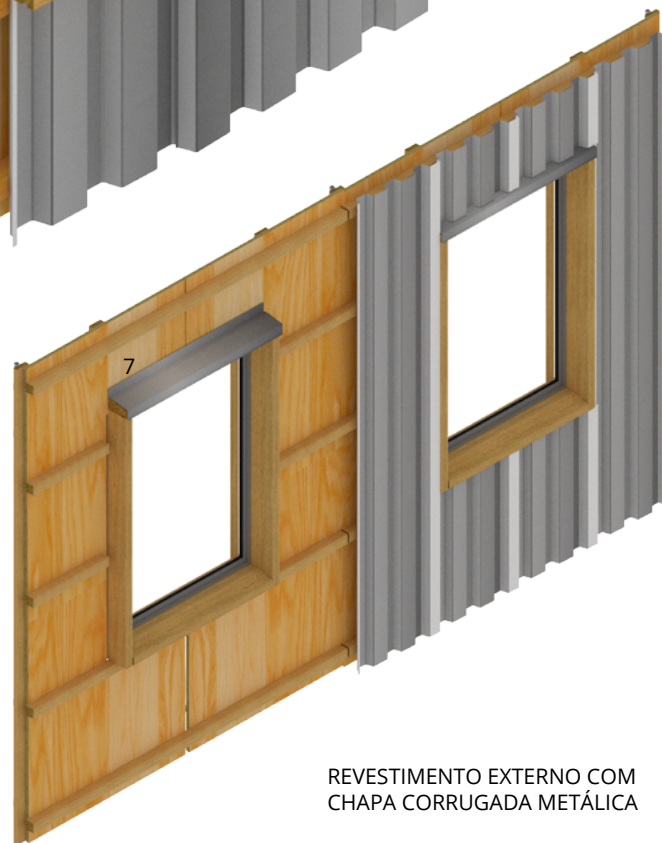
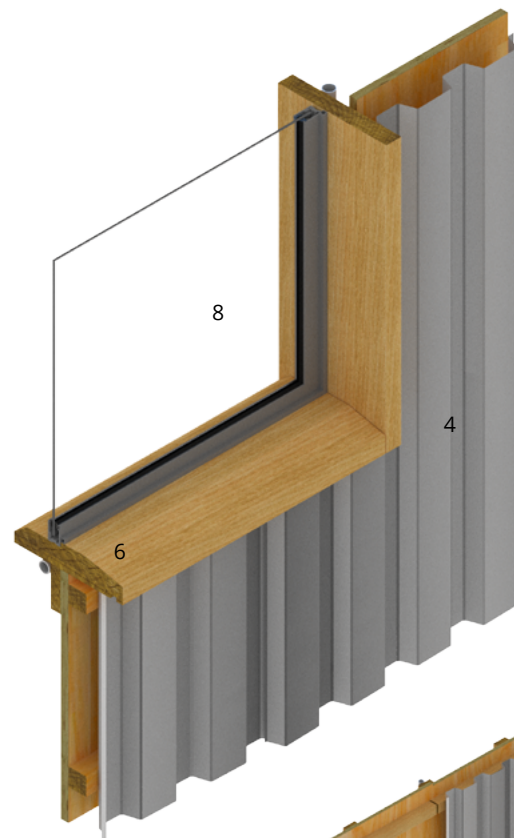


VEDAÇÃO SIMPLES EM COMPENSADO DE MADEIRA





VEDAÇÃO INTERIOR EM
COMPENSADO DE MADEIRA



REVESTIMENTO EXTERNO COM
CHAPA CORRUGADA METÁLICA

VEDAÇÃO EXTERNA EM MADEIRA COM
REVESTIMENTO EM CHAPA CORRUGADA METÁLICA

6 - BATENTES 40X220MM

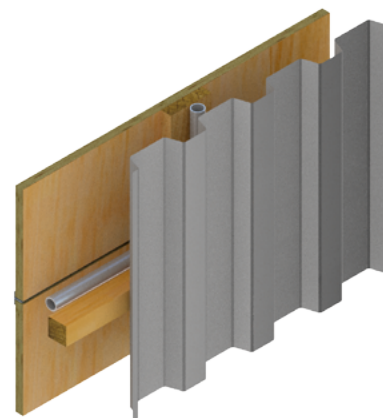
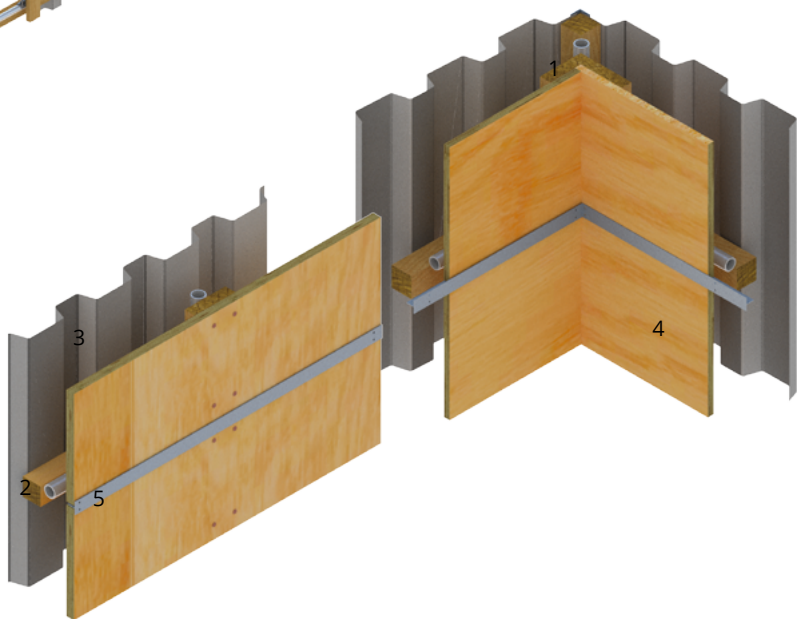
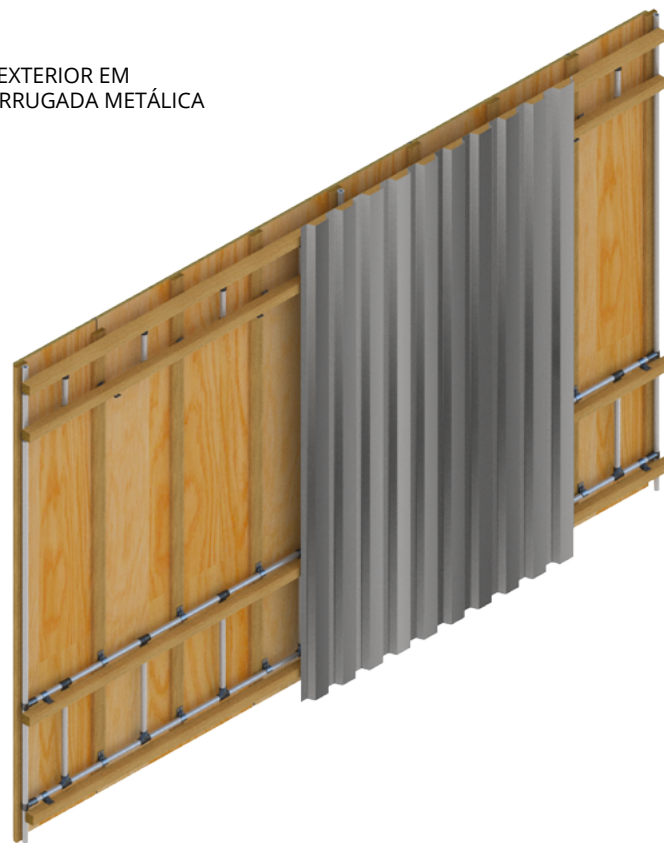
7 - RUFO EM CHAPA DE AÇO
CARBONO GALVANIZADA

8 - CAIXILHO DE ALUMÍNIO COM
VIDRO SIMPLES 6mm

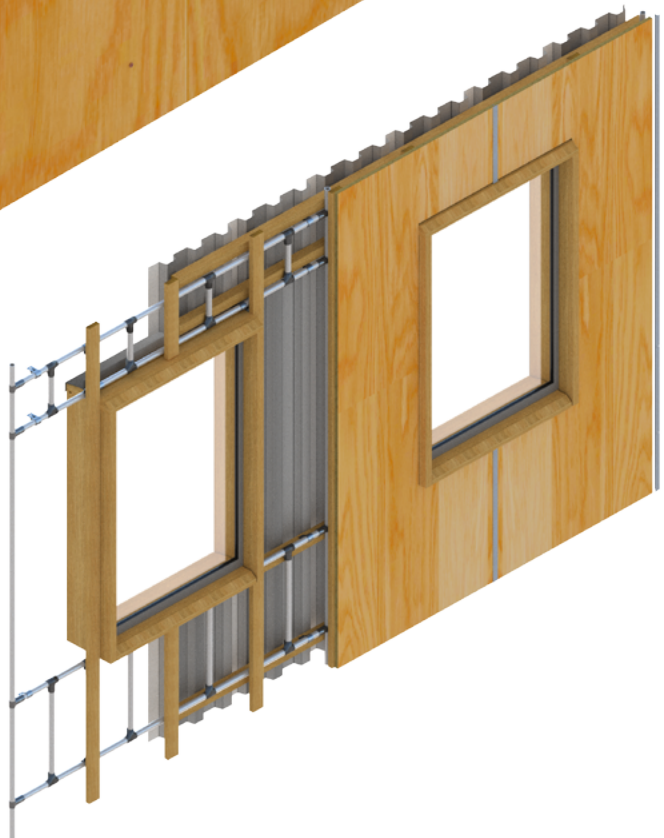
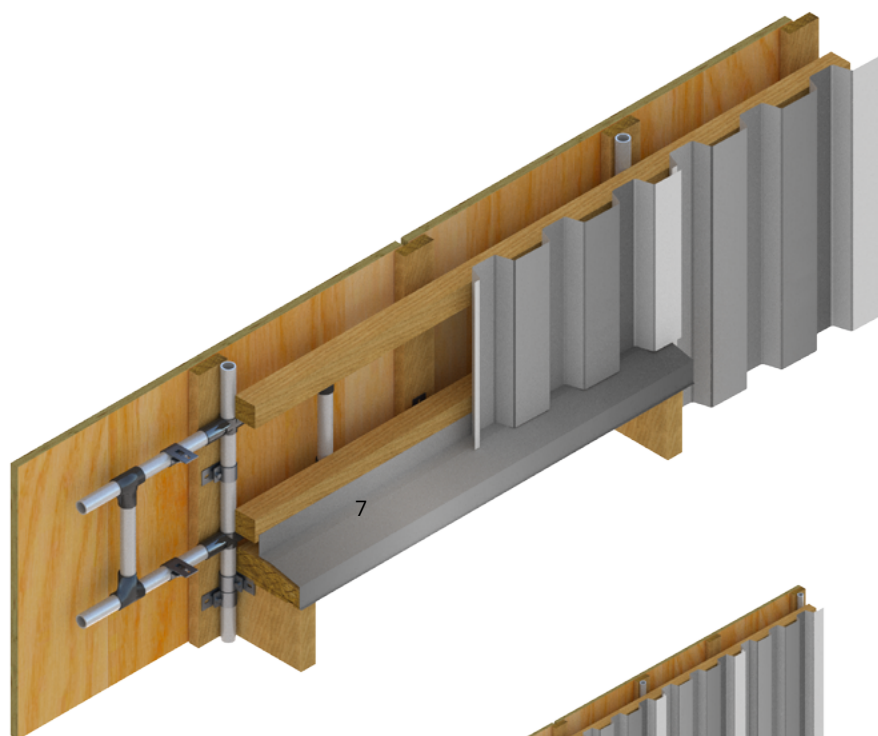
VEDAÇÃO INTERIOR EM
COMPENSADO DE MADEIRA

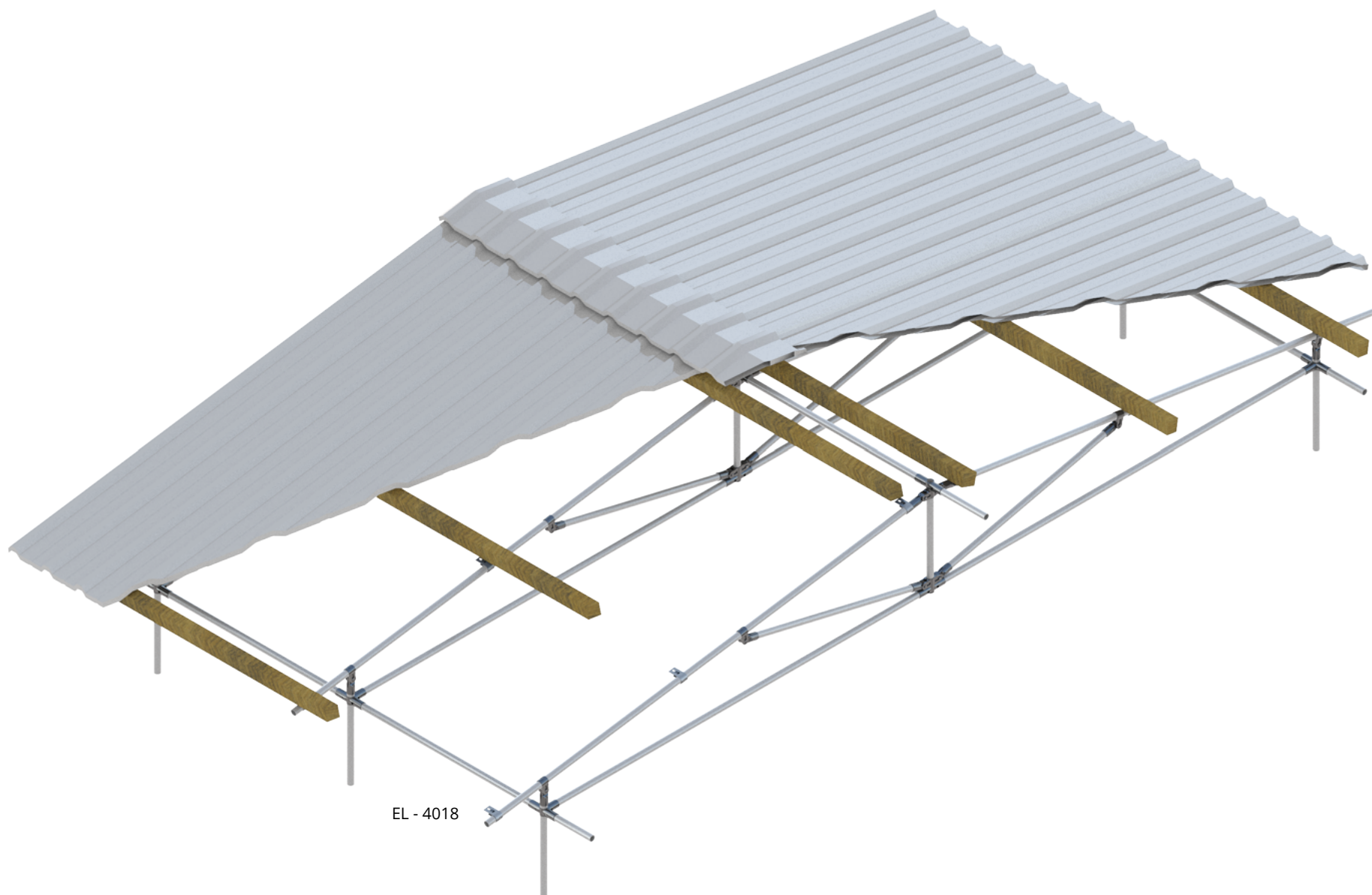


VEDAÇÃO EXTERIOR EM
CHAPA CORRUGADA METÁLICA

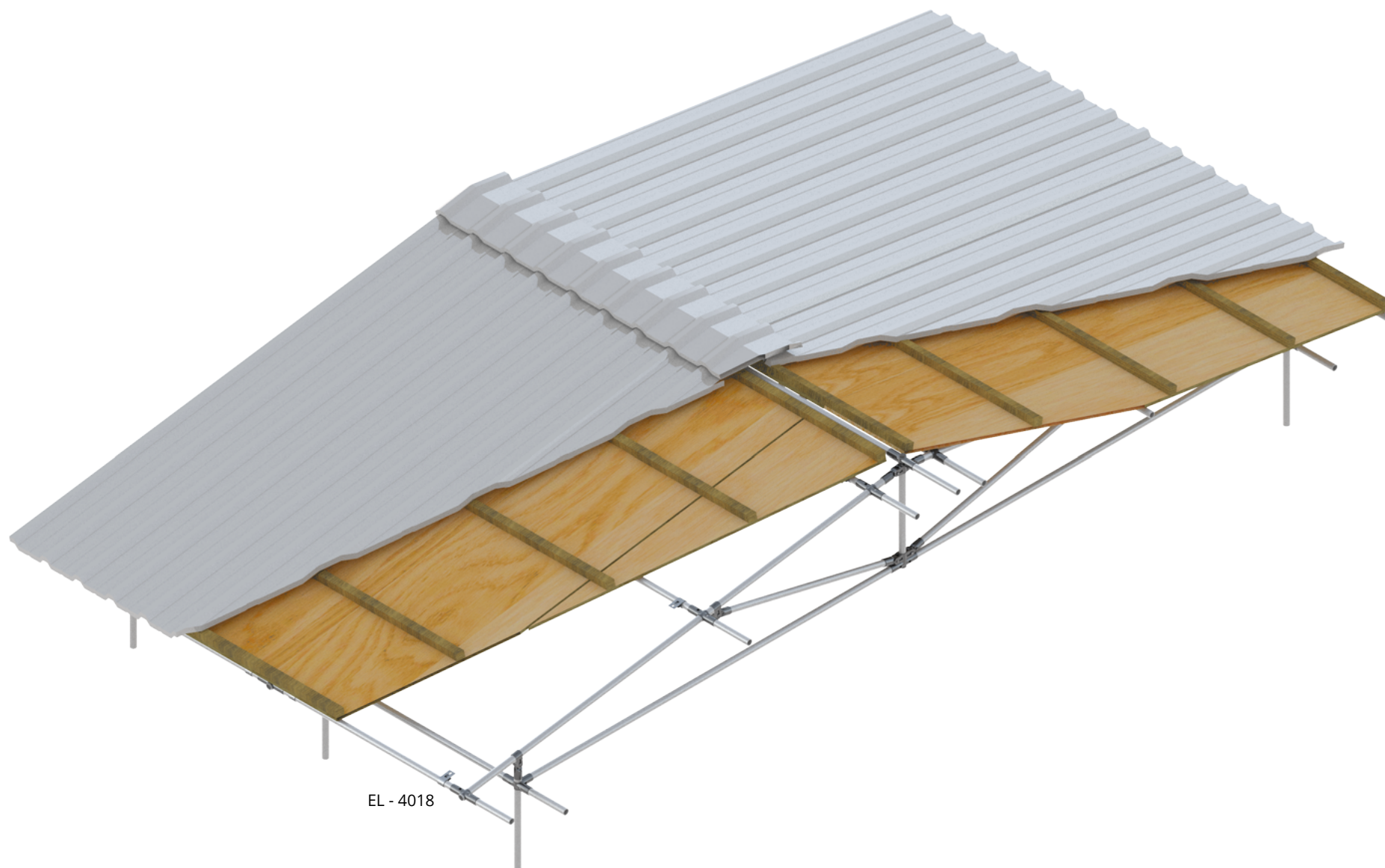


VEDAÇÃO DUPLA SANDUÍCHE

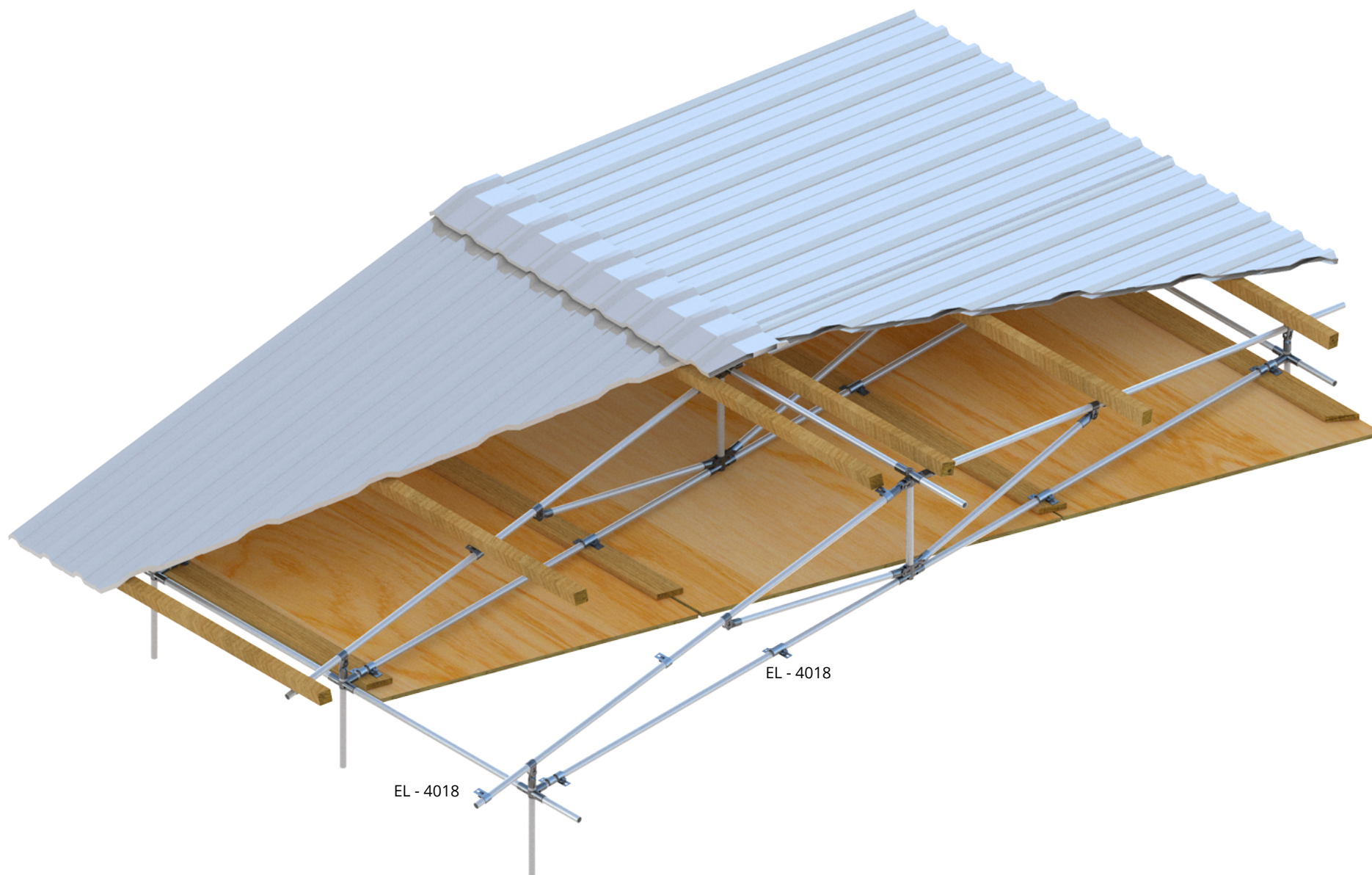


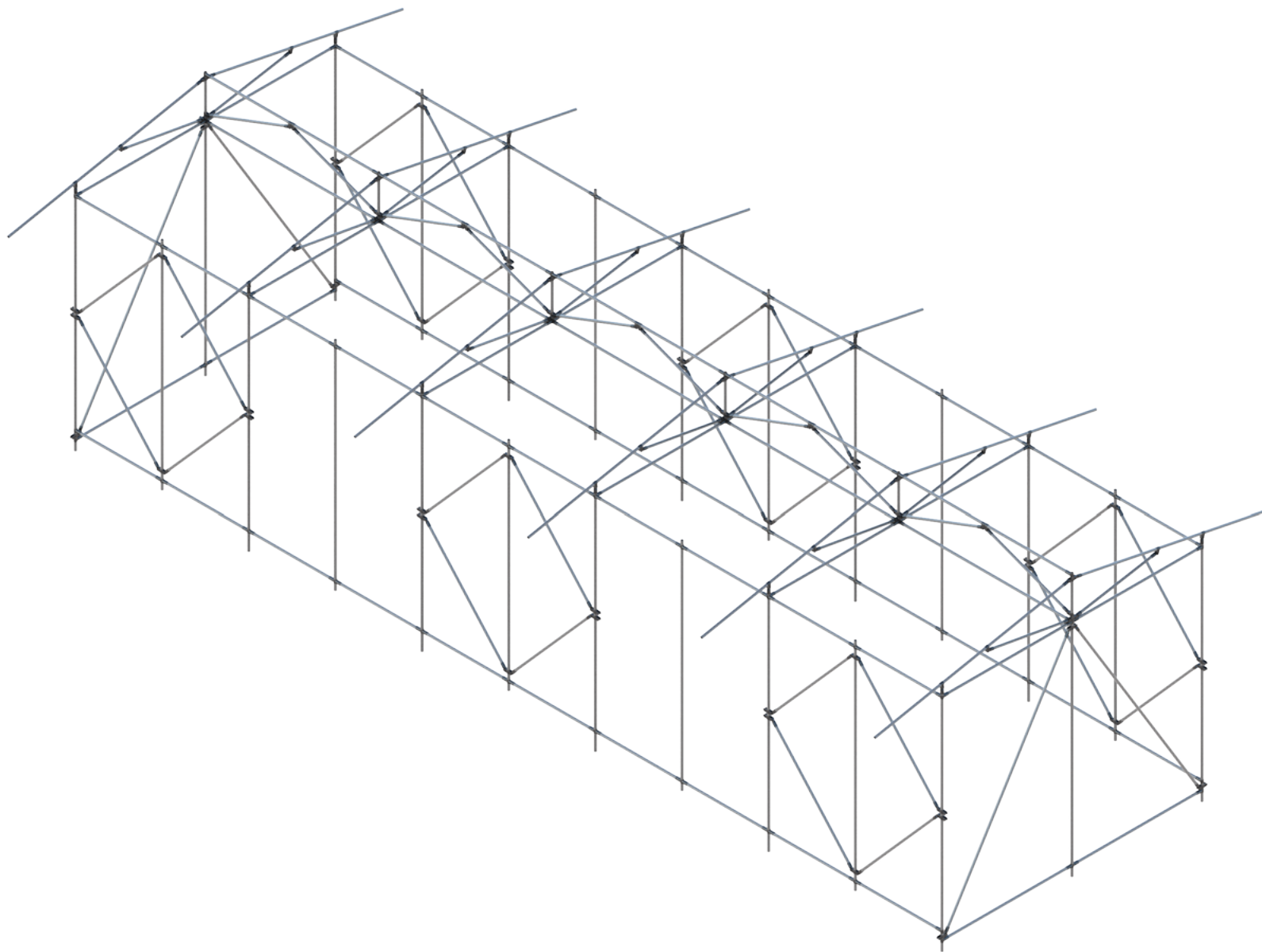


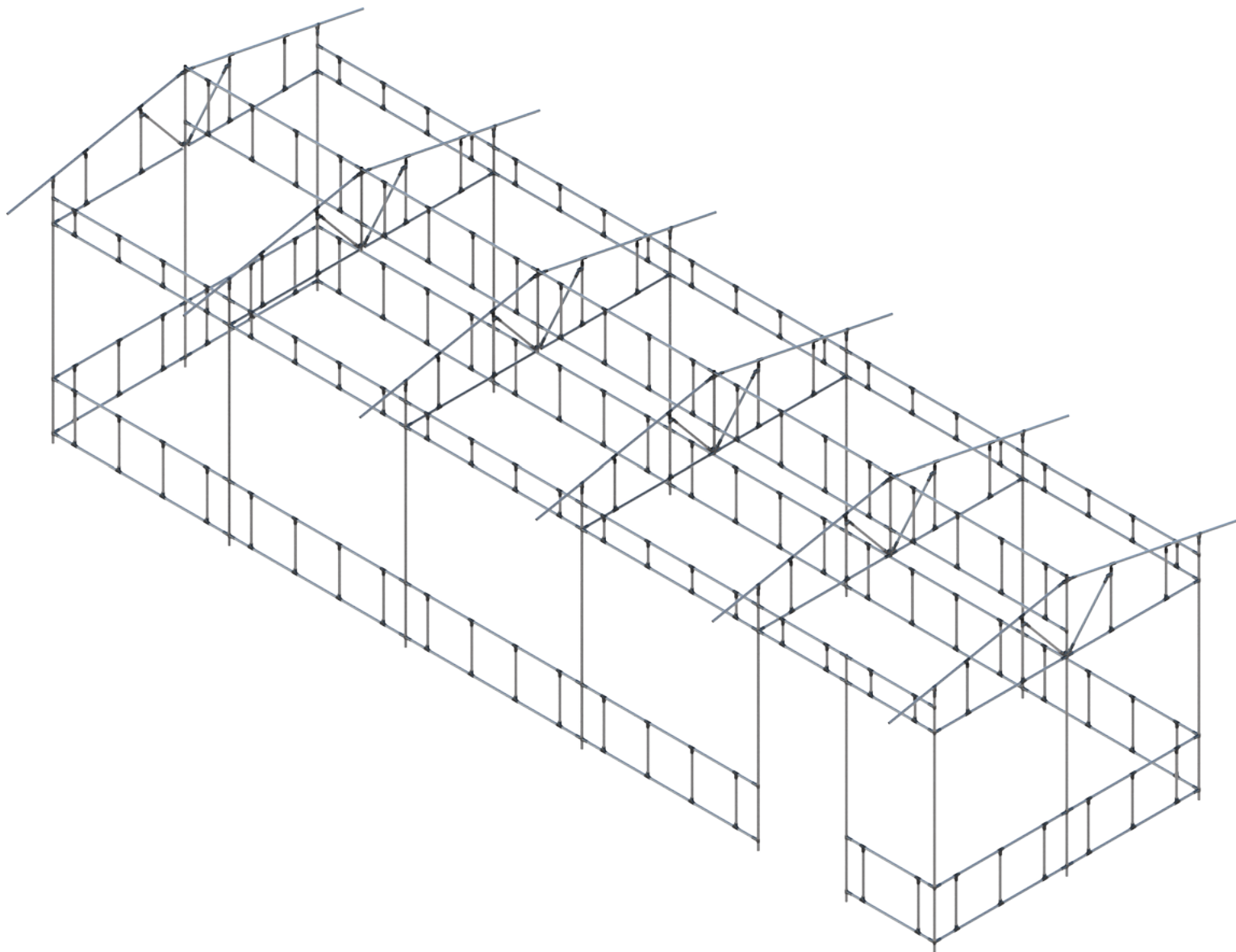
EL - 4018

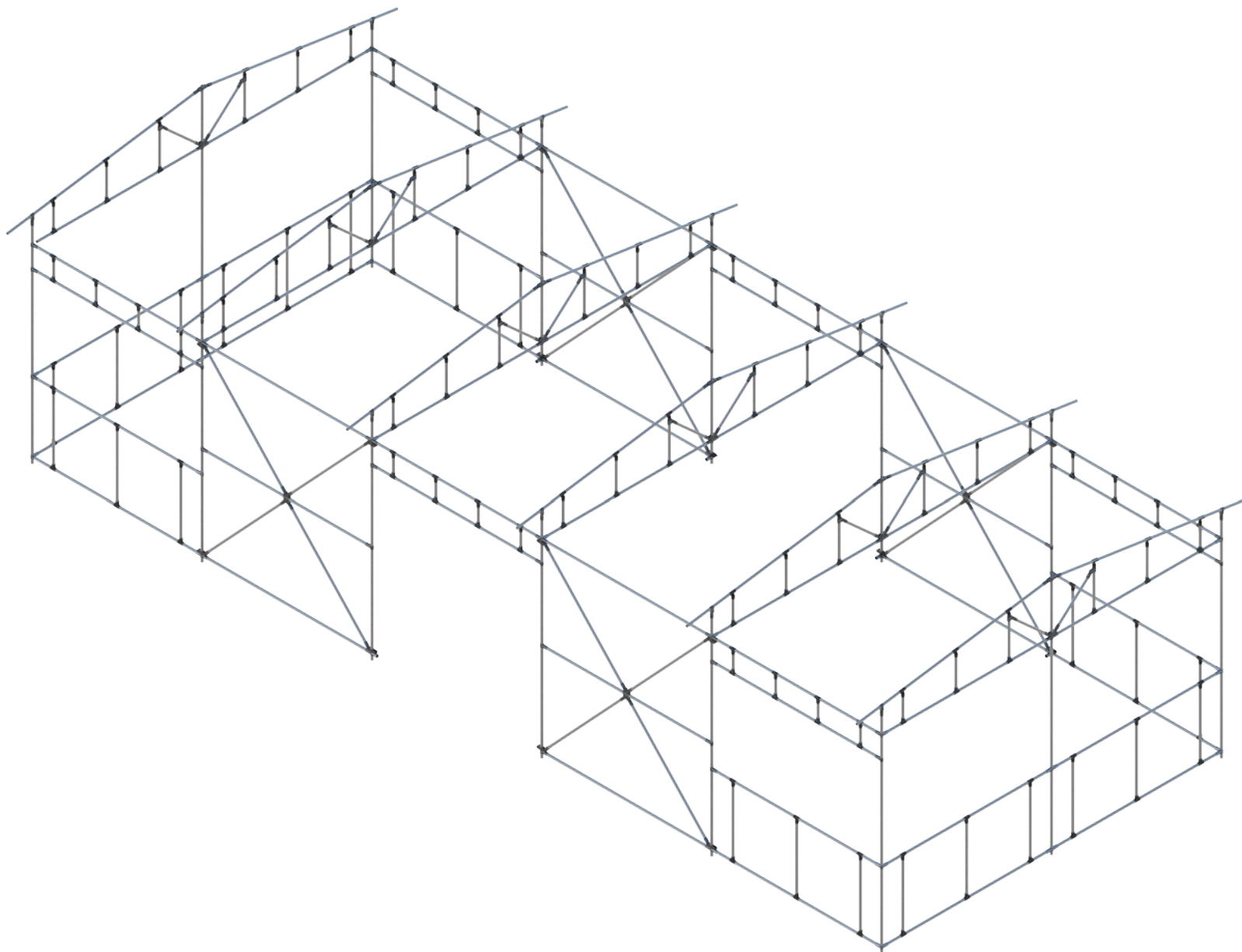


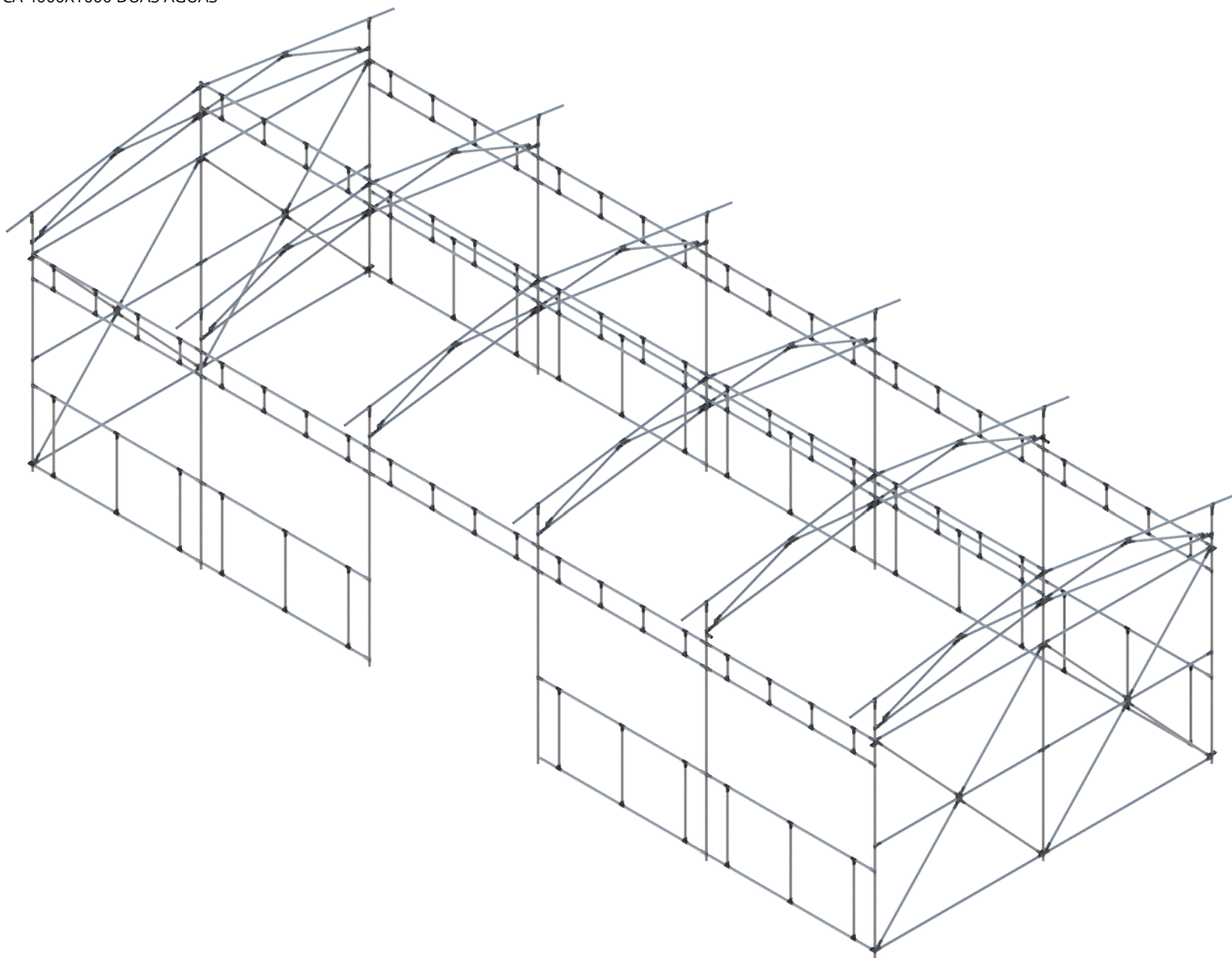
EL - 4018

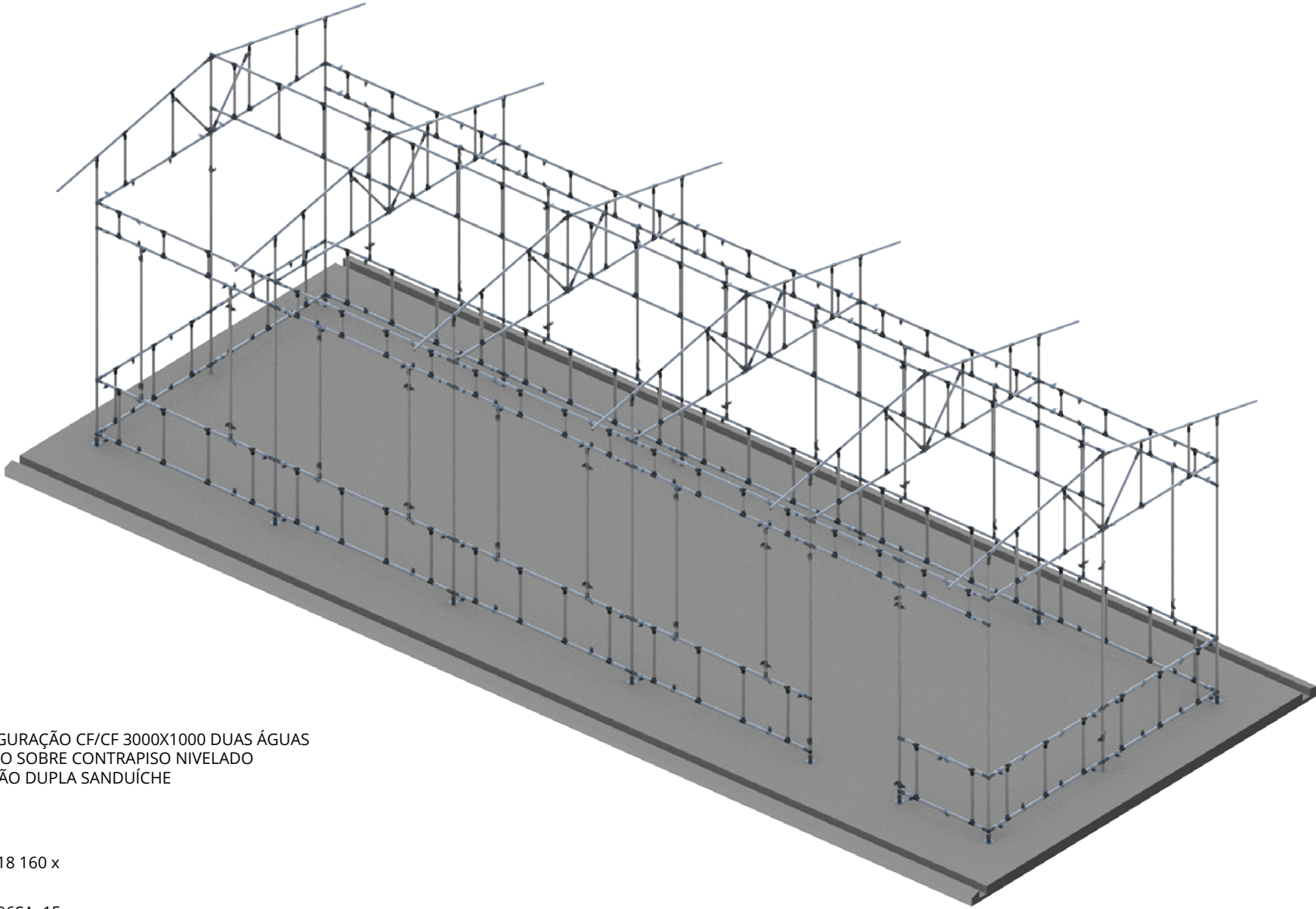








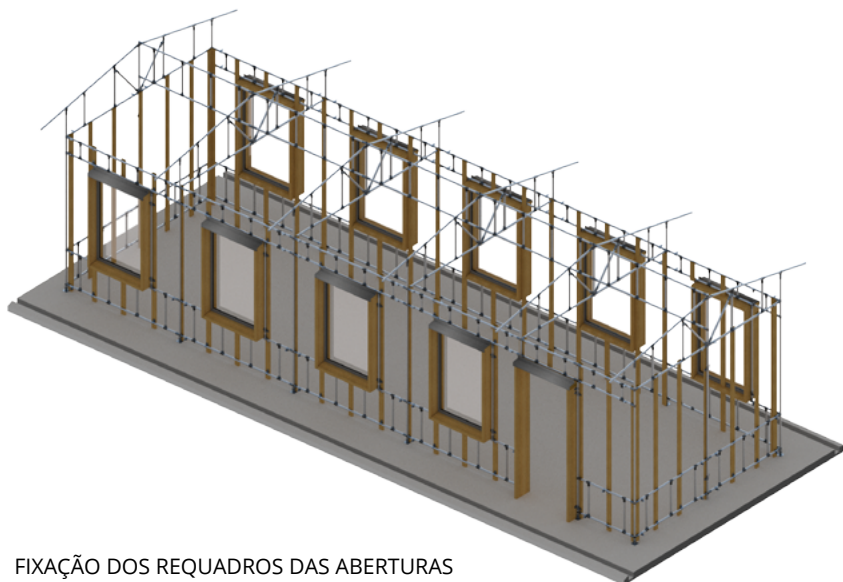




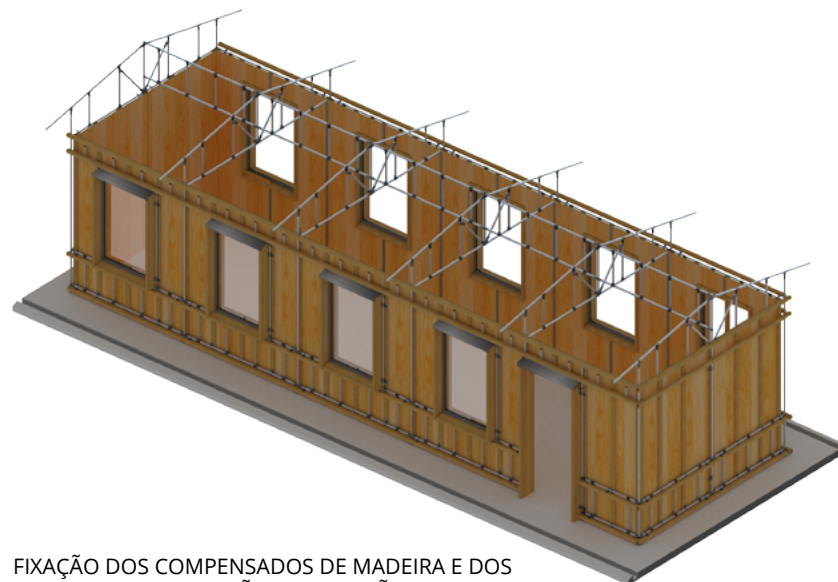
CONFIGURAÇÃO CF/CF 3000X1000 DUAS ÁGUAS
FIXAÇÃO SOBRE CONTRAPISO NIVELADO
VEDAÇÃO DUPLA SANDUÍCHE

EL - 4018 160 x

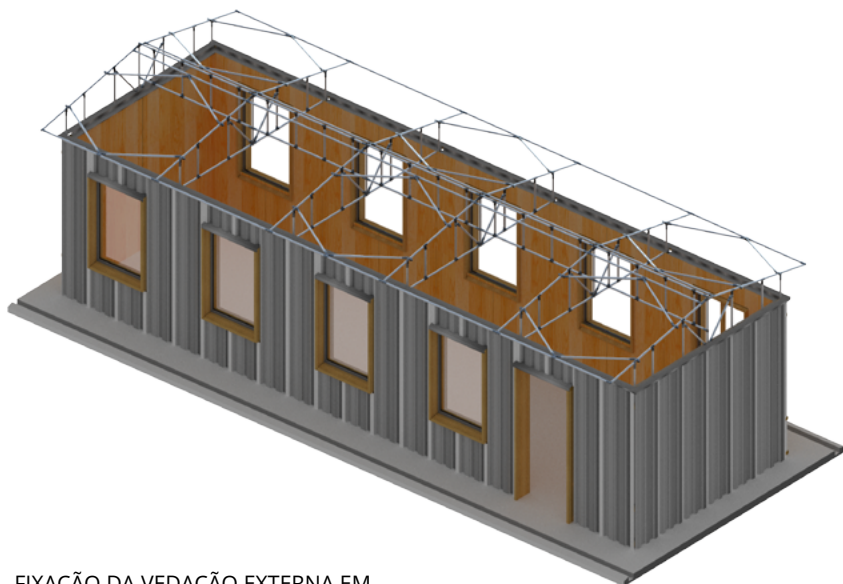
EL - 1206SA 15x



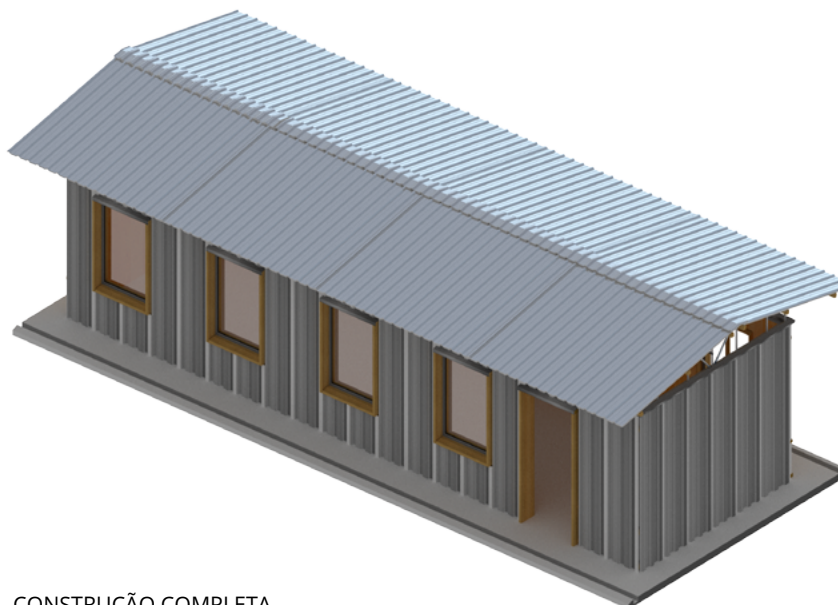
FIXAÇÃO DOS REQUADROS DAS ABERTURAS E SARRAFOS DE MADEIRA



FIXAÇÃO DOS COMPENSADOS DE MADEIRA E DOS BARROTES PARA FIXAÇÃO DA VEDAÇÃO EXTERNA



FIXAÇÃO DA VEDAÇÃO EXTERNA EM CHAPA CORRUGADA METÁLICA



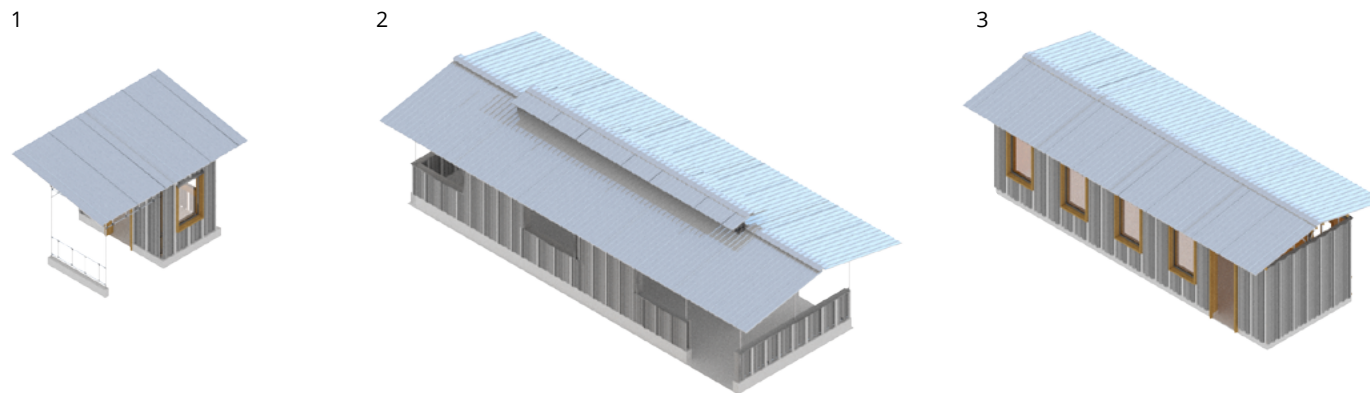
CONSTRUÇÃO COMPLETA

INSTALAÇÕES PROVISÓRIAS PARA CANTEIRO DE OBRAS

1 - GUARITA
CONFIGURAÇÃO CF/CF
3000X2000

2 - ÁREA DE VIVÊNCIA
CONFIGURAÇÃO CF/CA
4000X12000

3 - ESCRITÓRIO DE OBRAS
CONFIGURAÇÃO CF/CA



FORNECIMENTO DE ABRIGO EM RESPOSTAS EMERGENCIAIS

4 - COMPARTIMENTAÇÕES PARA ABRIGOS
TEMPORÁRIOS EMERGENCIAIS (A.T.E)

CONFIGURAÇÃO CA/CA 2000X12000 3x

CONFIGURAÇÃO CA/CA

