

CENPES II

- concurso abril a junho de 2004
- inicio dos projetos novembro 2004
- entrega do executivo (versão inicial) dezembro 2004 a junho 2005
- Inicio da obra junho 2006

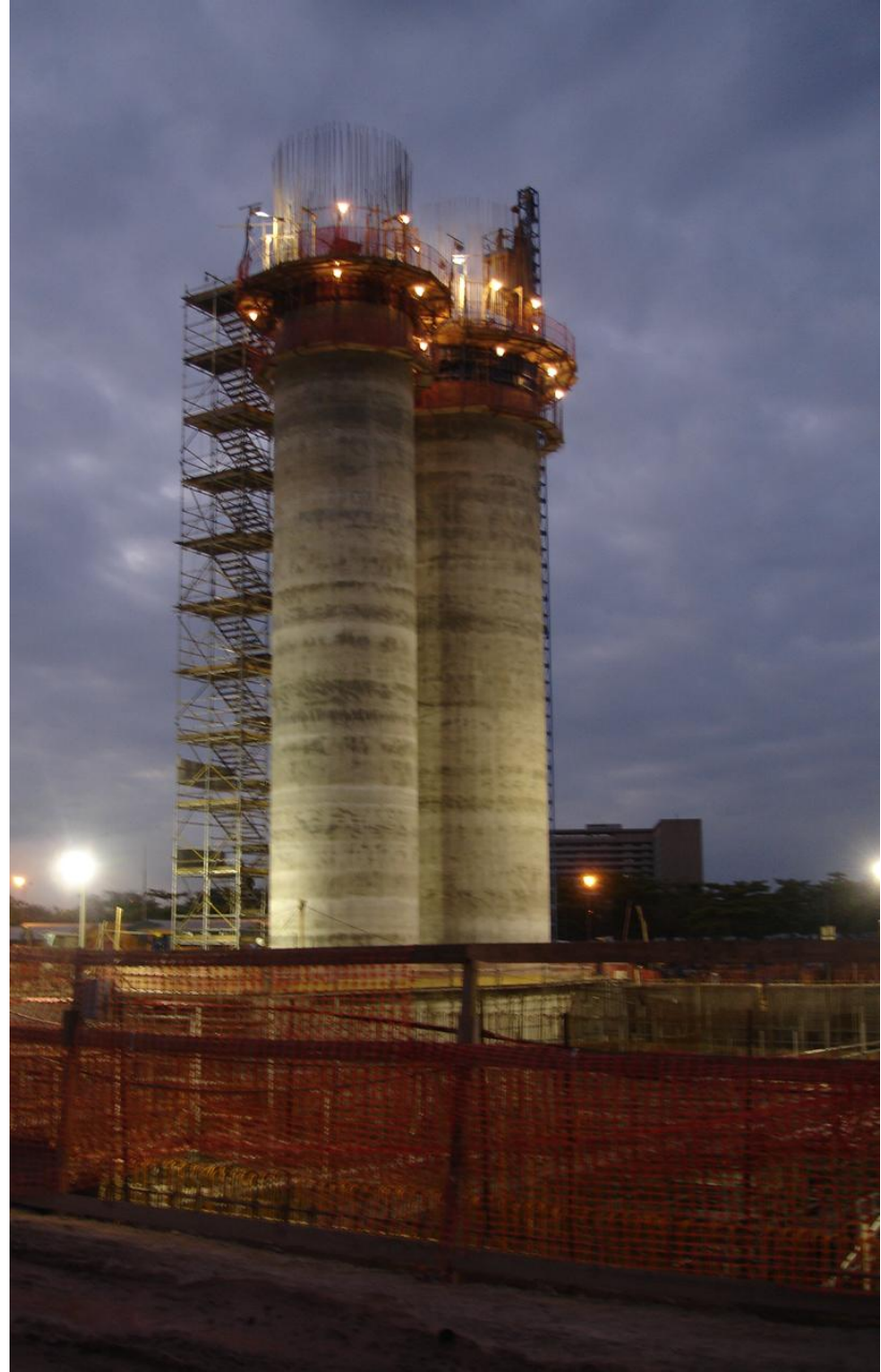
conceitos de projeto

- flexibilidade
- soluções construtivas
- industrialização
- fluxos
- custo benefício
- estética

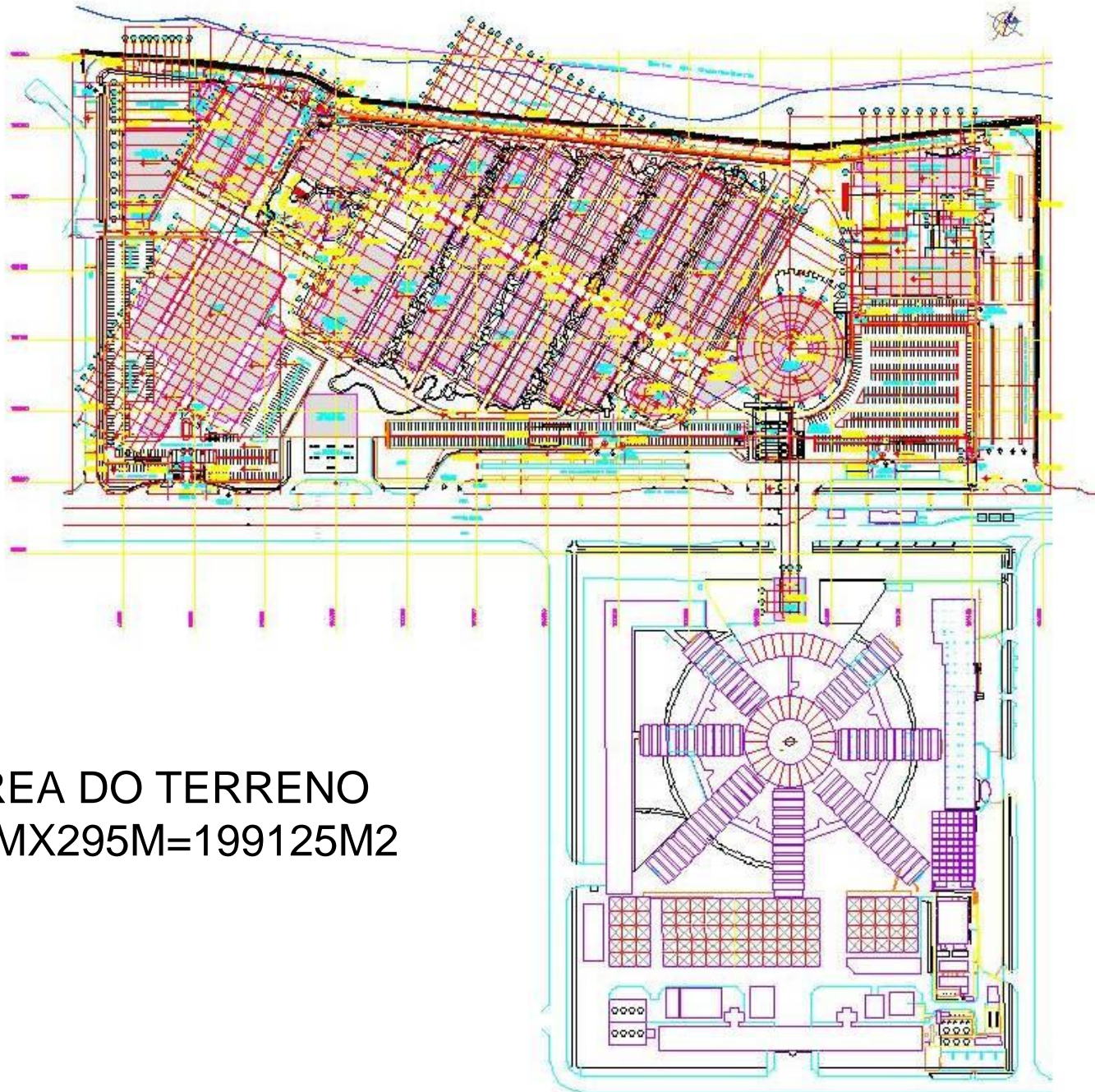
justificativa do aço

- permeabilidade do olhar
- simetria e regularidade da estrutura
- equalização de vãos e dimensões das peças
- padronização de usos
- facilidade de transporte
- organização do canteiro de obras
- racionalização de materiais e mão de obra
- sistemas para uso racional: metodologia e rapidez de montagem
- clareza na intenção dos detalhes
- reversibilidade

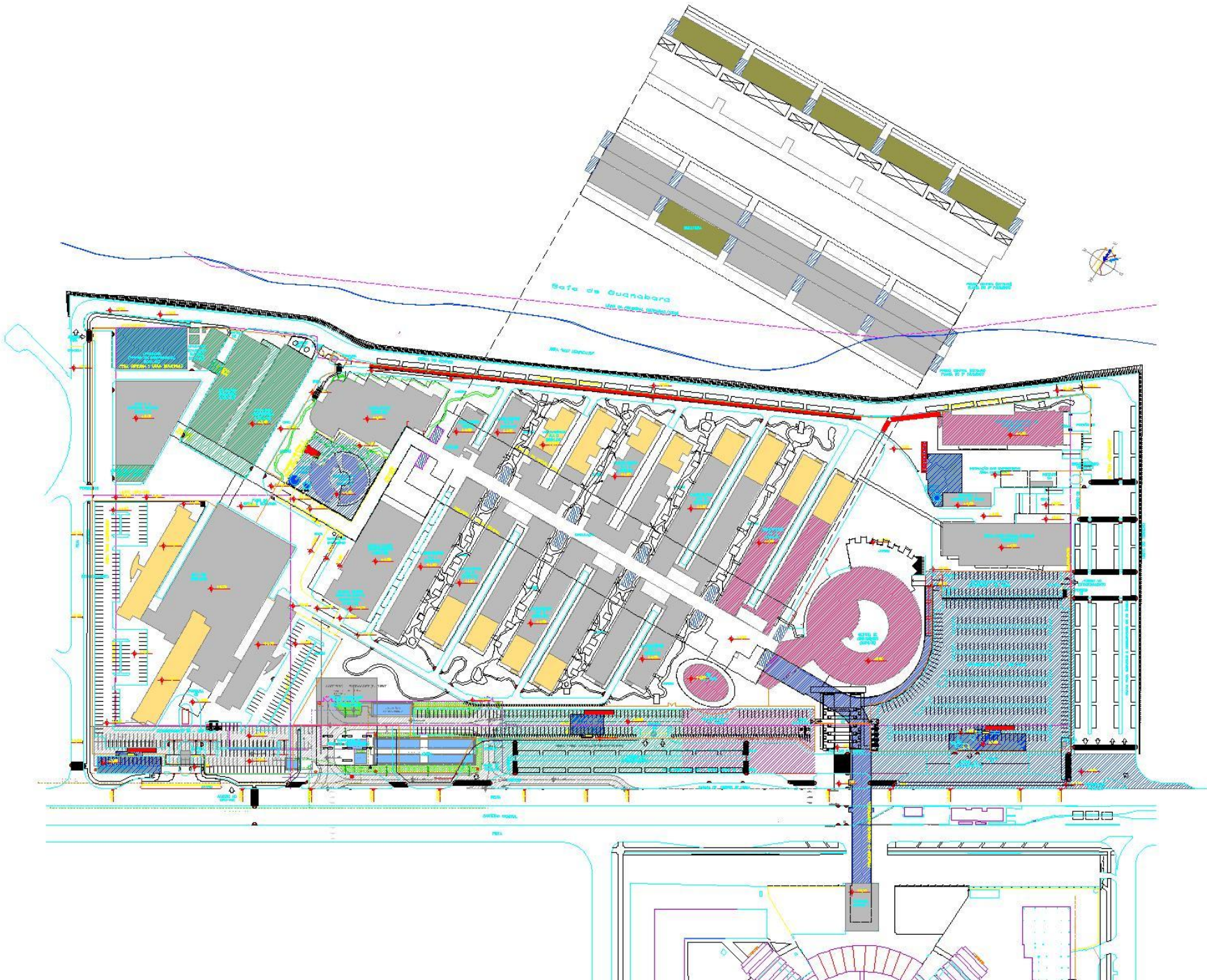
333	CENPES	TOTAL	19807,5 m ³
251	<u>CENTRAL DE UTILIDADES</u>		781,5 m ³
252	<u>RESTAURANTE</u>		380,5 m ³
253	<u>PLANTA PILOTO</u>		653,5 m ³
254	<u>CRV</u>		251,7 m ³
256	<u>C CONVENÇÕES</u>		490,4 m ³
257	<u>EMPREITERÓPOLIS</u>		274,2 m ³
258	<u>LAB A</u>		829,4 m ³
259	<u>LAB B</u>		730,2 m ³
260	<u>LAB C</u>		513,7 m ³
261	<u>LAB D</u>		449,3 m ³
262	<u>LAB E</u>		303,6 m ³
263	<u>LAB F</u>		478,1 m ³
264	<u>LAB G</u>		644,0 m ³
265	<u>LAB H</u>		673,7 m ³
266	<u>LAB I</u>		398,7 m ³
276	<u>P CENTRAL</u>		3717,0 m ³
277	<u>PAS SUBTERRÂNEA</u>		1917,6 m ³
278	<u>OFICINA</u>		379,1 m ³
282	<u>IMPLANTAÇÃO</u>		5941,3 m ³
	CISTERNA 1 (400)		1818,6 m ³
	CISTERNA 2		1520,0 m ³
	CISTERNA 3		625,2 m ³
	CISTERNA 4		360,7 m ³
	CISTERNA 5		214,9 m ³
	CISTERNA 6		318,3 m ³
	ESP ÁGUA (PÇA DA BANDEIRA)		148,0 m ³
	MURO		747,5 m ³
	PIPE RACK		136,6 m ³
	PORTARIAS		51,5 m ³



OBRA:	333 - CENPES				
ASSUNTO:	RESUMO GERAL				
CODIGO	NOME	PESO (kg)	%	PESO % (kg)	PESO (kg)
DO	DO				
EDIFÍCIO	EDIFÍCIO	SUB-TOTAL	ACRÉSCIMO	SUB-TOTAL	TOTAL
0251	CENTRAL DE UTILIDADES	510.000	10,0%	51.000	561.000
0252	RESTAURANTE	149.237	20,0%	29.847	179.084
0253	PLANTA PILOTO	325.000	10,0%	32.500	357.500
0254	CENTRO DE REALIDADE VIRTUAL	485.300	15,0%	72.795	558.095
0256	CENTRO DE CONVENÇÕES	314.810	7,5%	23.611	338.421
0257	EMPREITEIRÓPOLIS	217.989	7,5%	16.349	234.338
0258	LABORATÓRIO ALA A	300.641	7,5%	22.548	323.189
0259	LABORATÓRIO ALA B	282.385	7,5%	21.179	303.564
0260	LABORATÓRIO ALA C	183.824	7,5%	13.787	197.611
0261	LABORATÓRIO ALA D	176.081	7,5%	13.206	189.287
0262	LABORATÓRIO ALA E	111.955	7,5%	8.397	120.352
0263	LABORATÓRIO ALA F	173.420	7,5%	13.007	186.427
0264	LABORATÓRIO ALA G	184.909	7,5%	13.868	198.777
0265	LABORATÓRIO ALA H	275.987	7,5%	20.699	296.686
0266	LABORATÓRIO ALA I	140.020	7,5%	10.502	150.522
0276	PRÉDIO CENTRAL	2.175.000	10,0%	217.500	2.392.500
0278	OFICINAS	200.000	7,5%	15.000	215.000
TOTAL		6.206.558		595.794	6.802.352



AREA DO TERRENO
 $675\text{M} \times 295\text{M} = 199125\text{M}^2$





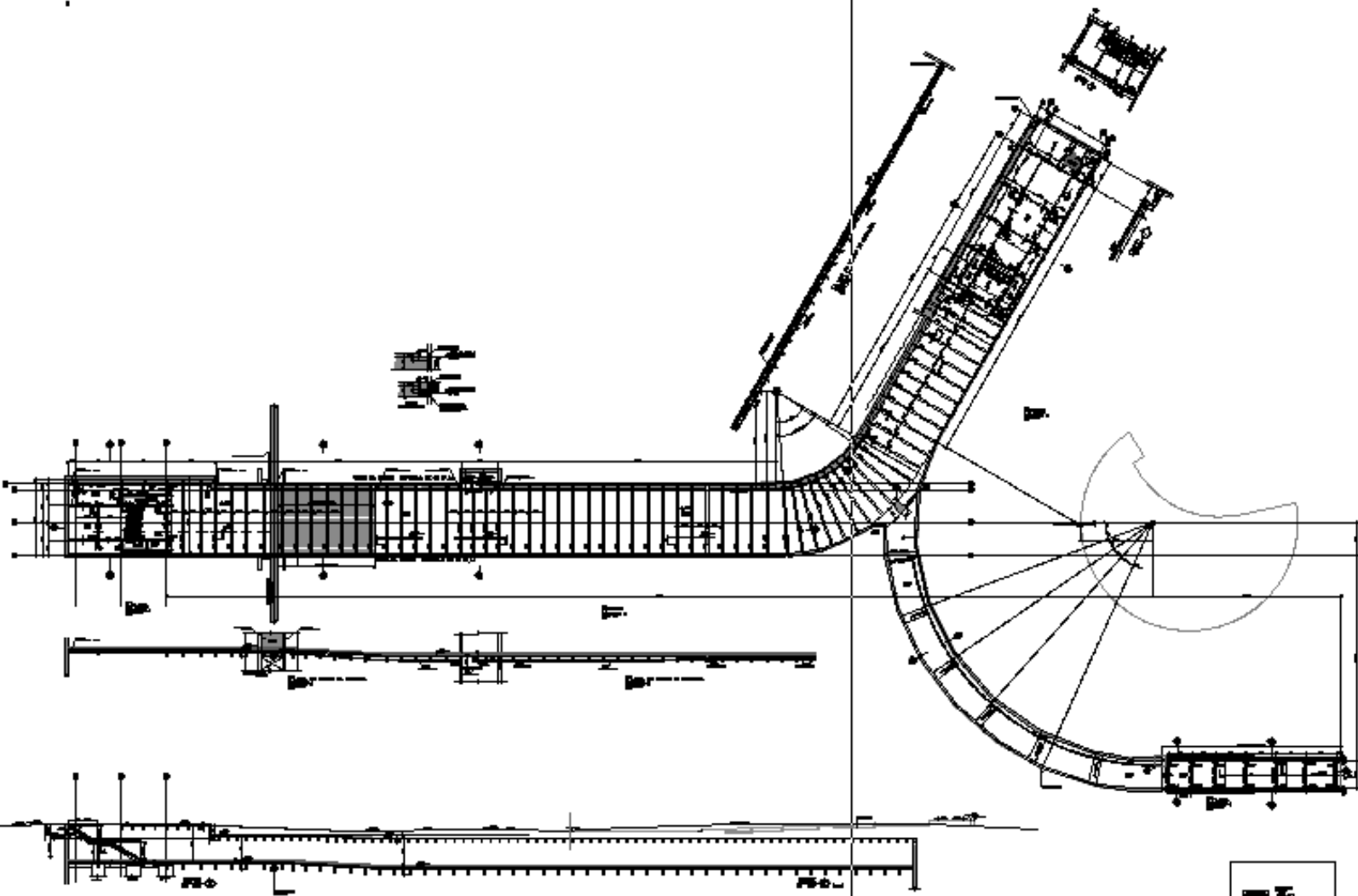
TRECHO B

TRECHO A

TRECHO C



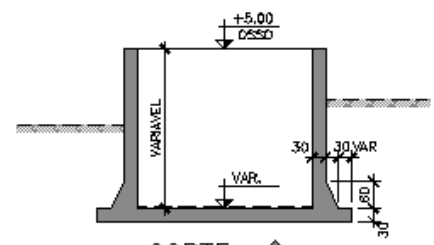
KADILLAK	
PROYECTO N.º	
FECHA	
ESCALA	
PROYECTISTA	
CLIENTE	
UBICACION	
OTROS DATOS	



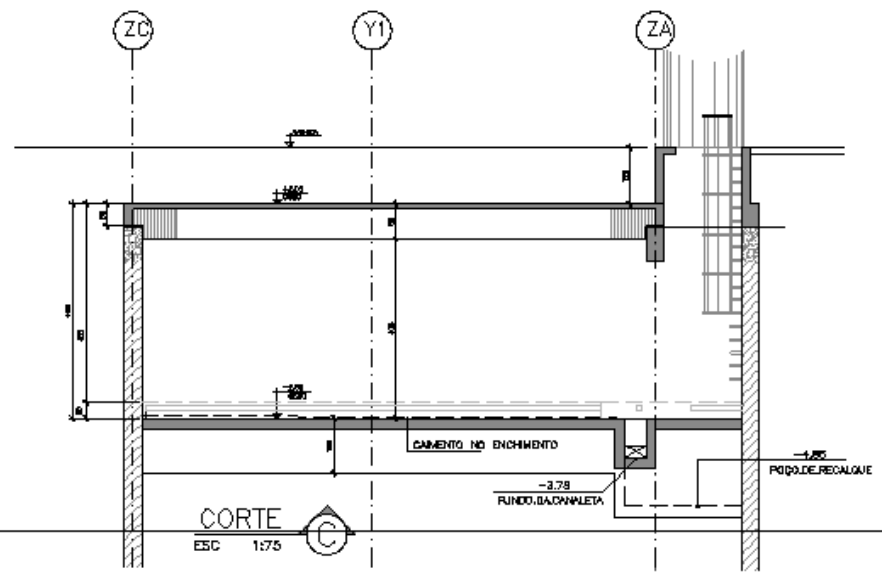
Architectural title block containing project information, including the name 'ZARRETT & CO.', the title 'ENGINEERS', and other project details.



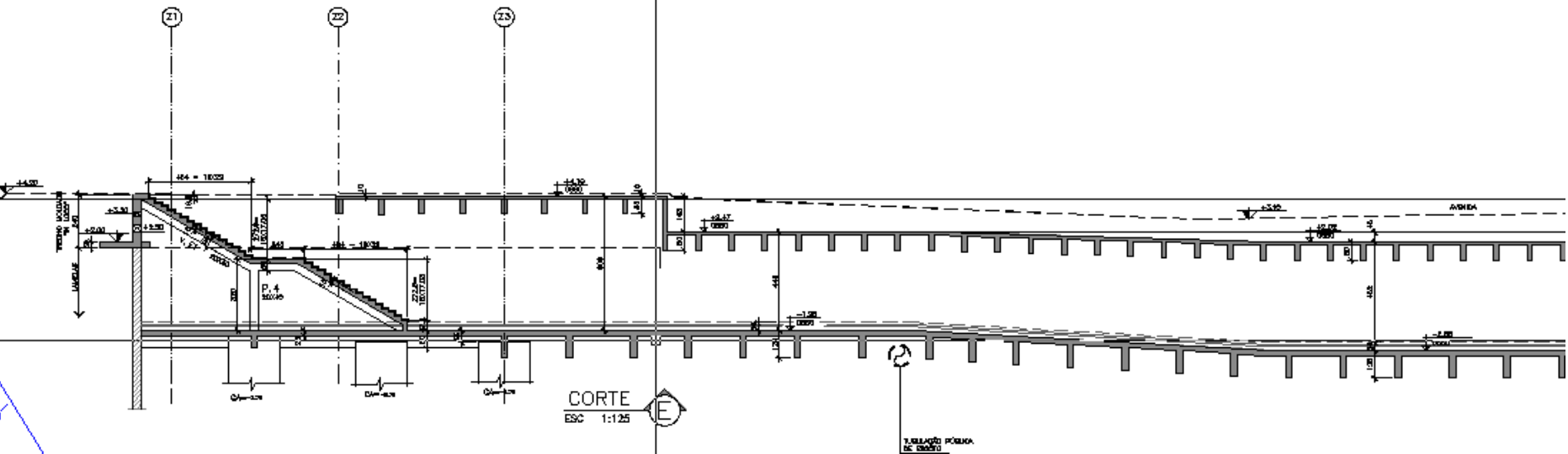
TRECHO MOLDADO, "IN LOCO"
CORTE
ESC 1:75



CORTE
ESC 1:75



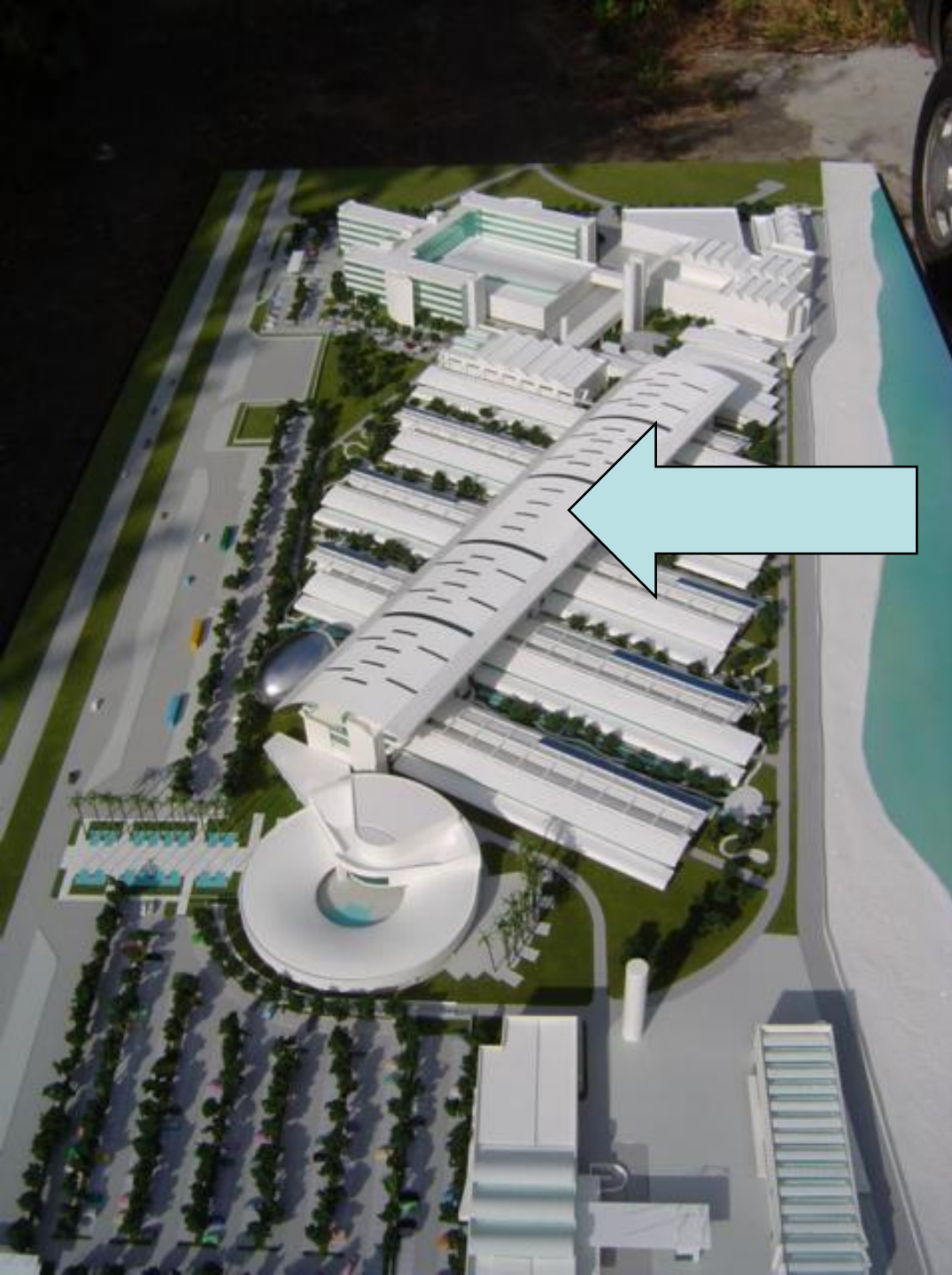
CORTE
ESC 1:75



CORTE
ESC 1:125

TUBO LIGADO PORMA DE CASSO





PREDIO CENTRAL

Estrutura metálica em vigas mistas com modulação principal 10m, painéis steel-deck sobre vigas secundárias com modulação a cada 2,5m

Travamentos nas caixas de circulação vertical em concreto executada com formas deslizantes.

Cobertura de sombreamento em estrutura espacial

2.393t

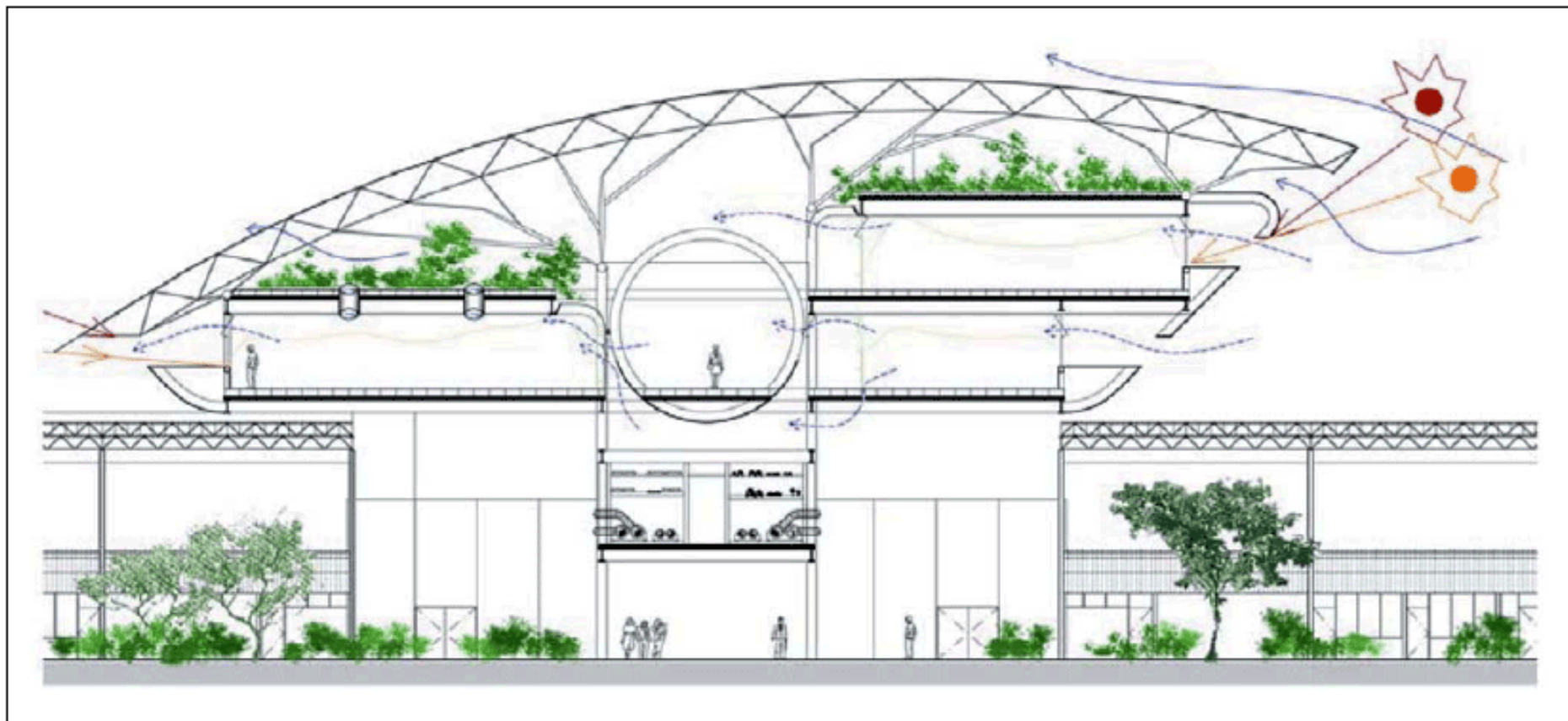
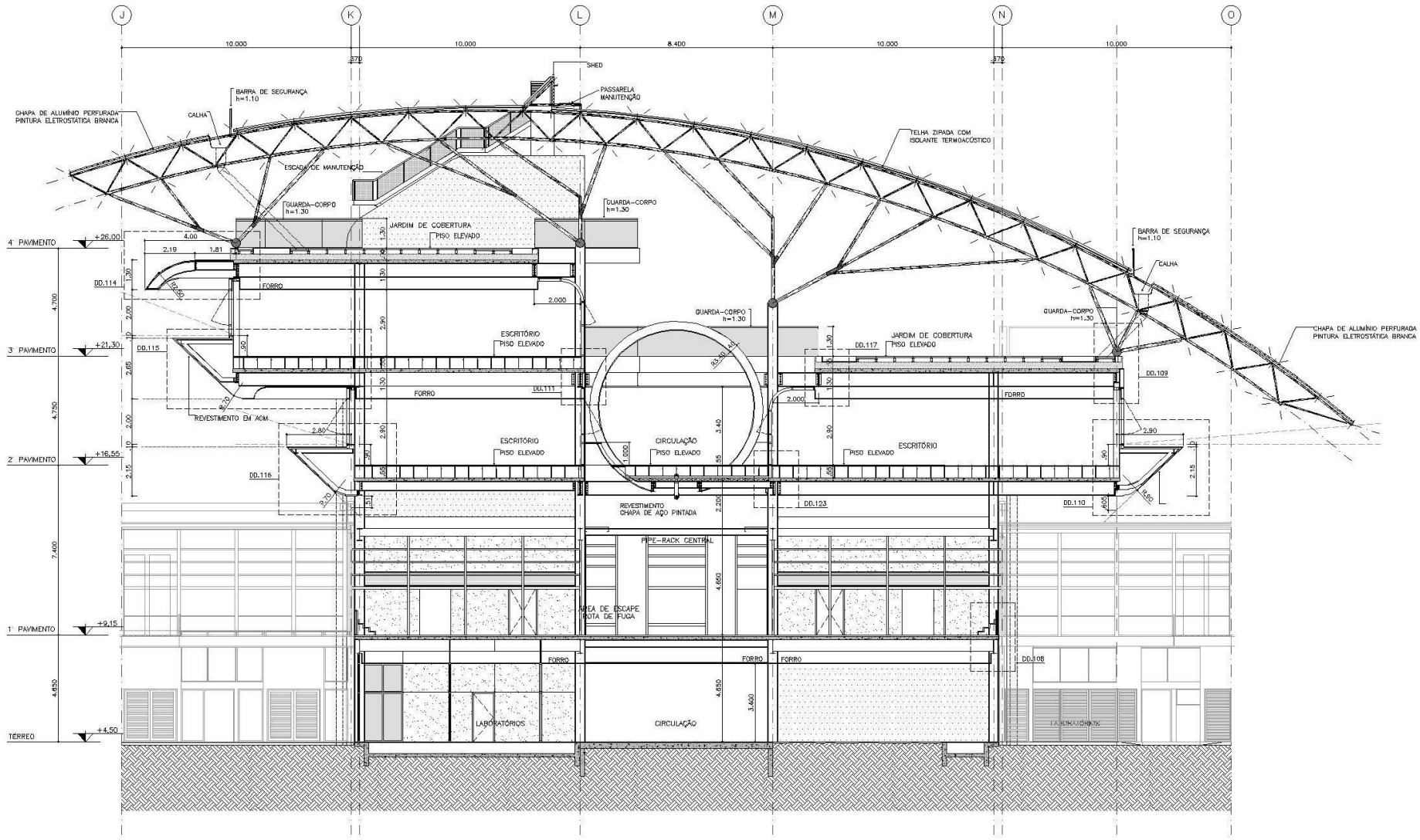
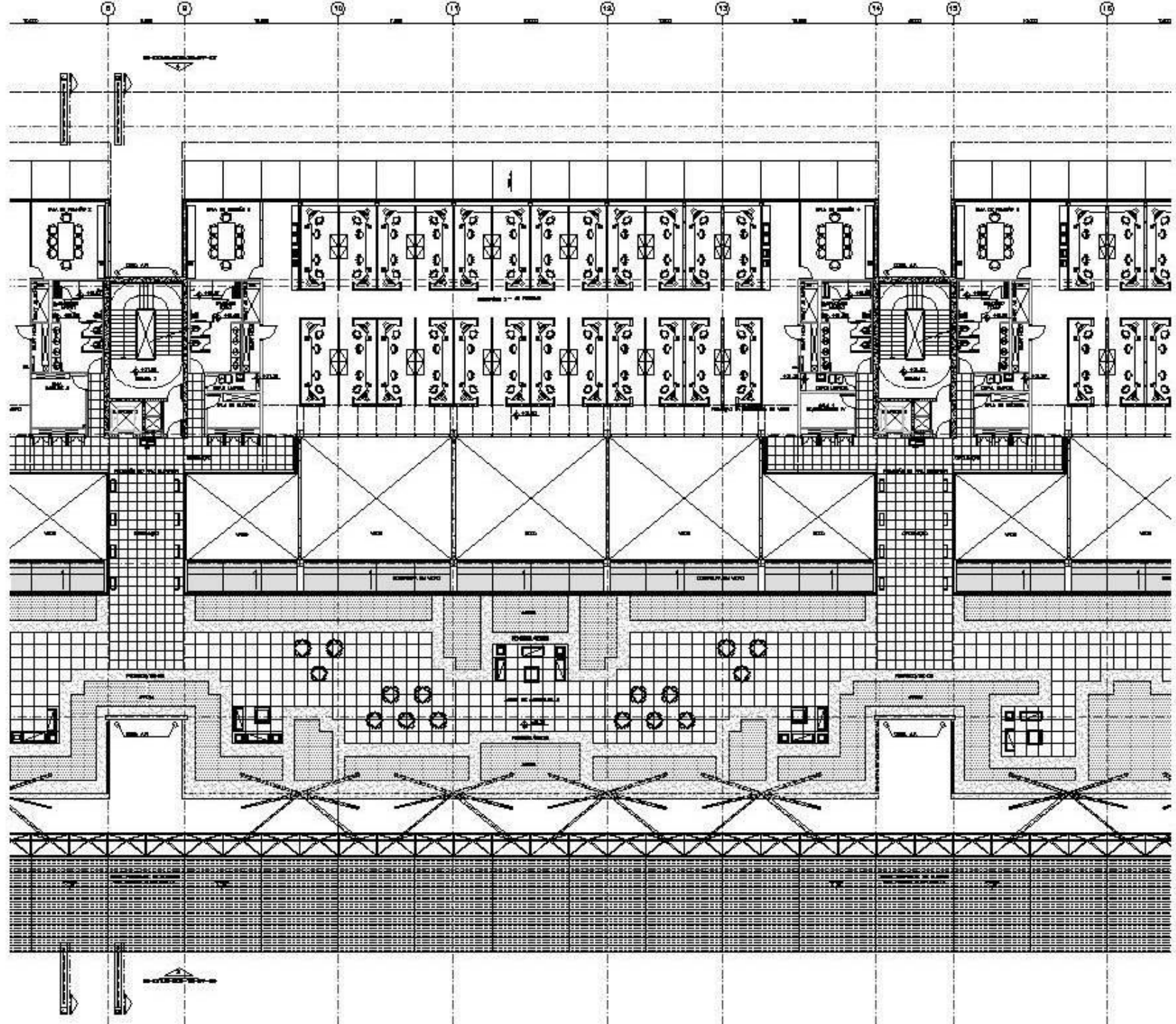
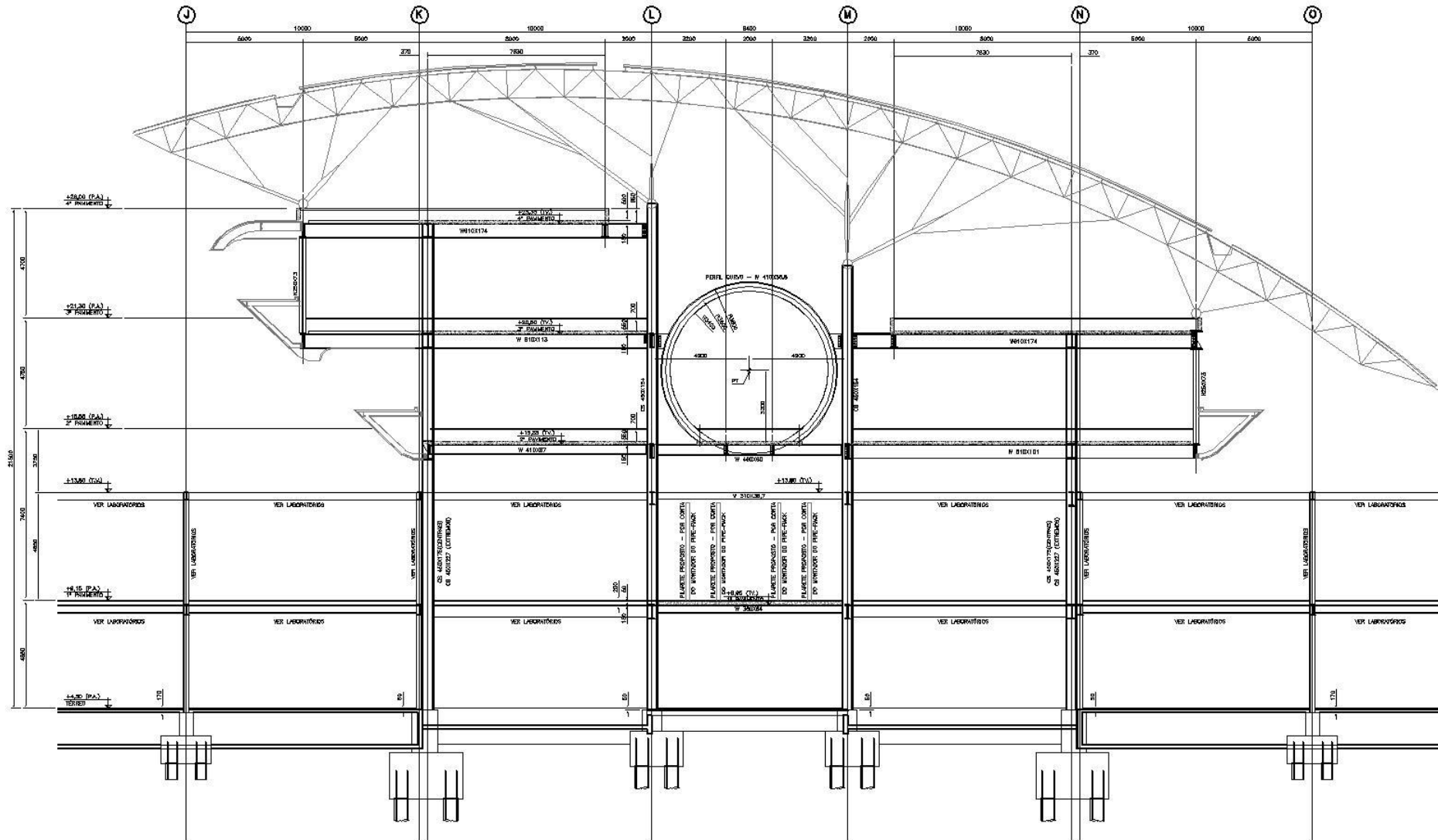


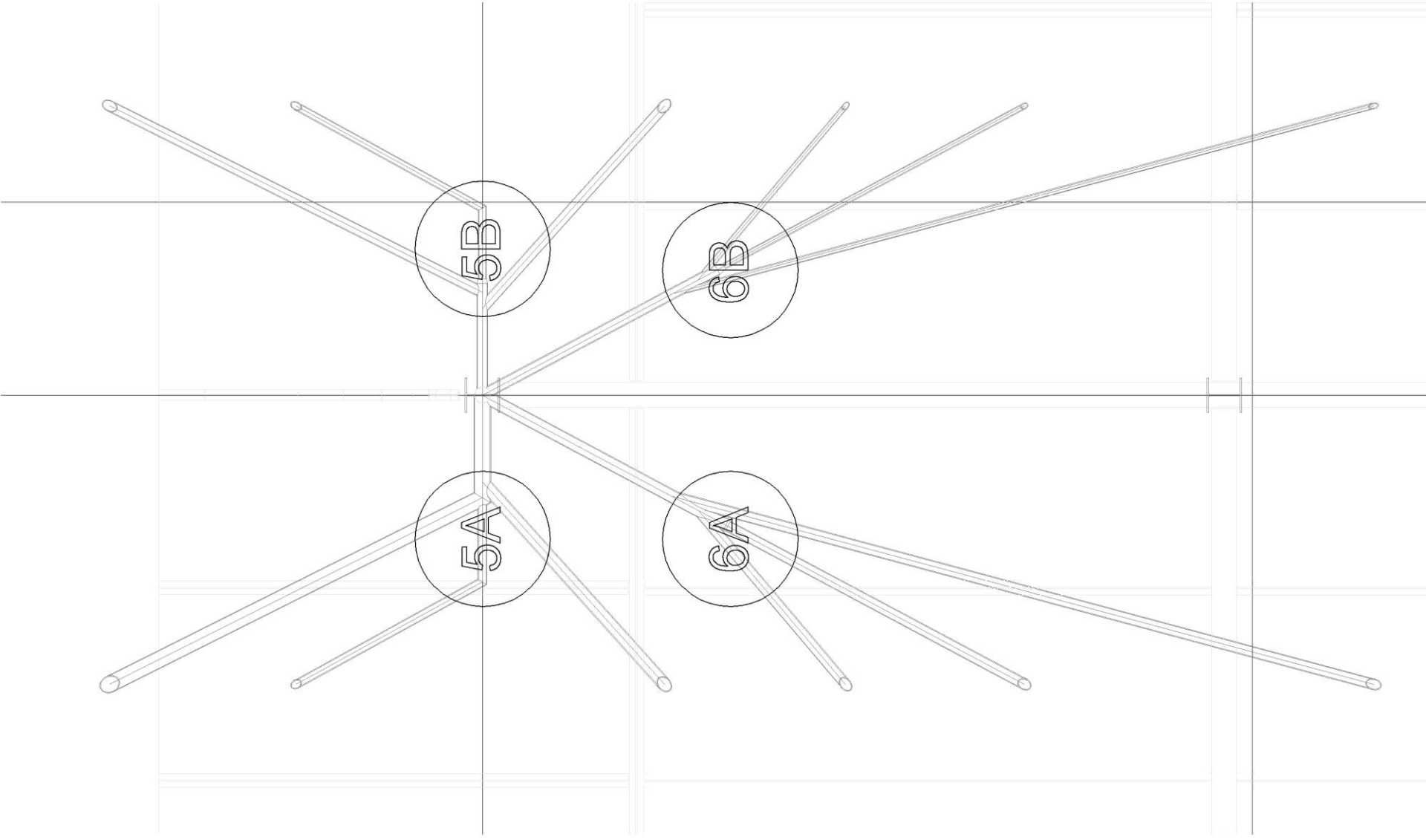
Figura 3 - Estruturas metálicas de coberturas e envoltórias.

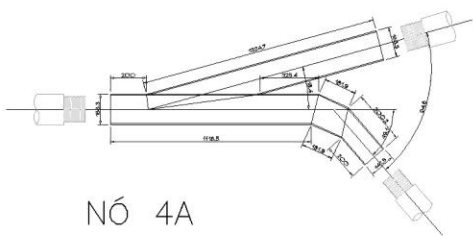




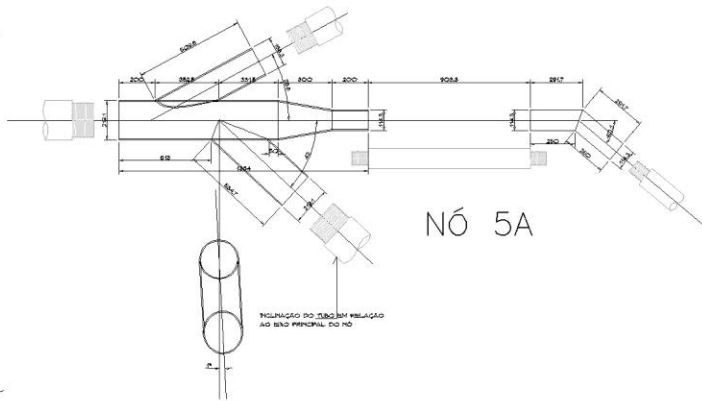


PRÉDIO CENTRAL
CORTE TRANSVERSAL TÍPICO NO EIXO
 1/25

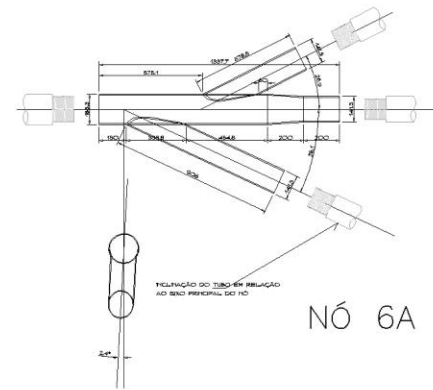




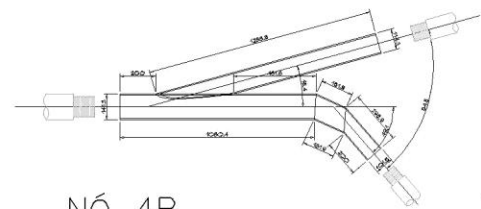
NÓ 4A



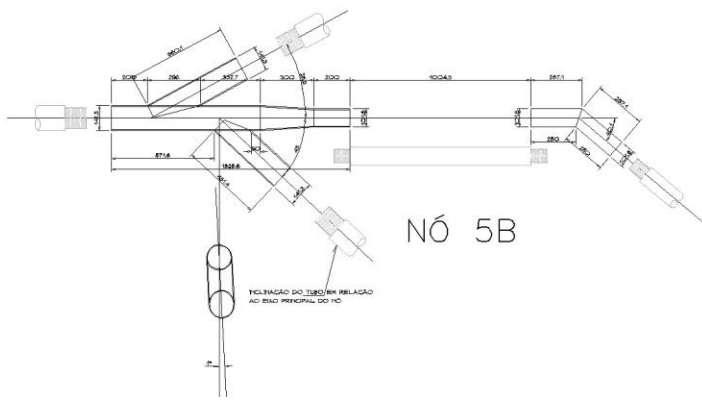
NÓ 5A



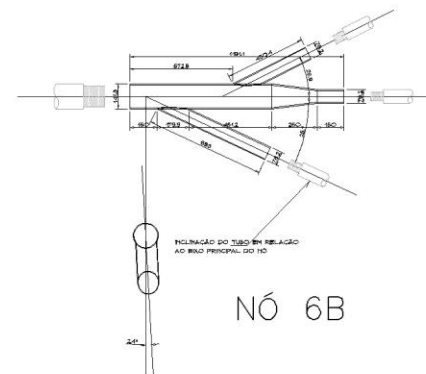
NÓ 6A



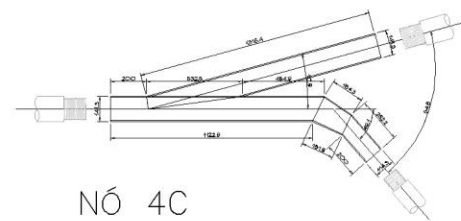
NÓ 4B



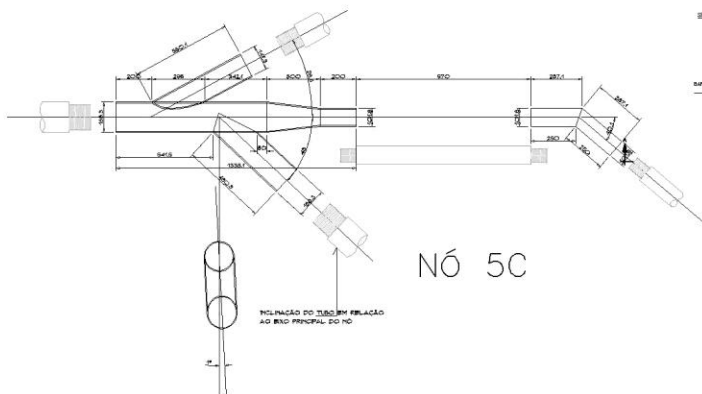
NÓ 5B



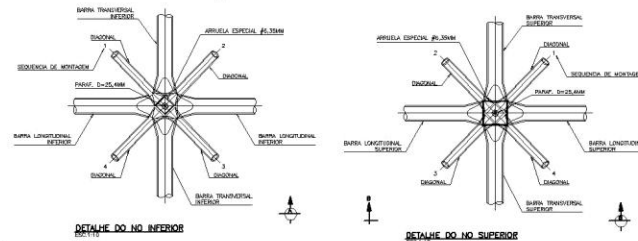
NÓ 6B



NÓ 4C

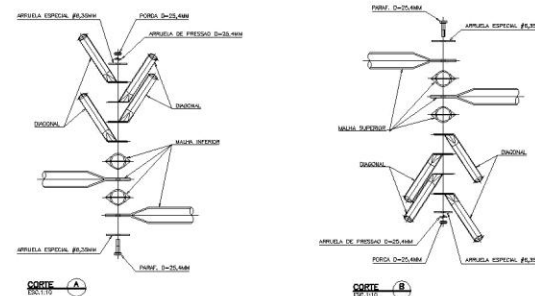


NÓ 5C



DETALHE DO NÓ INFERIOR

DETALHE DO NÓ SUPERIOR

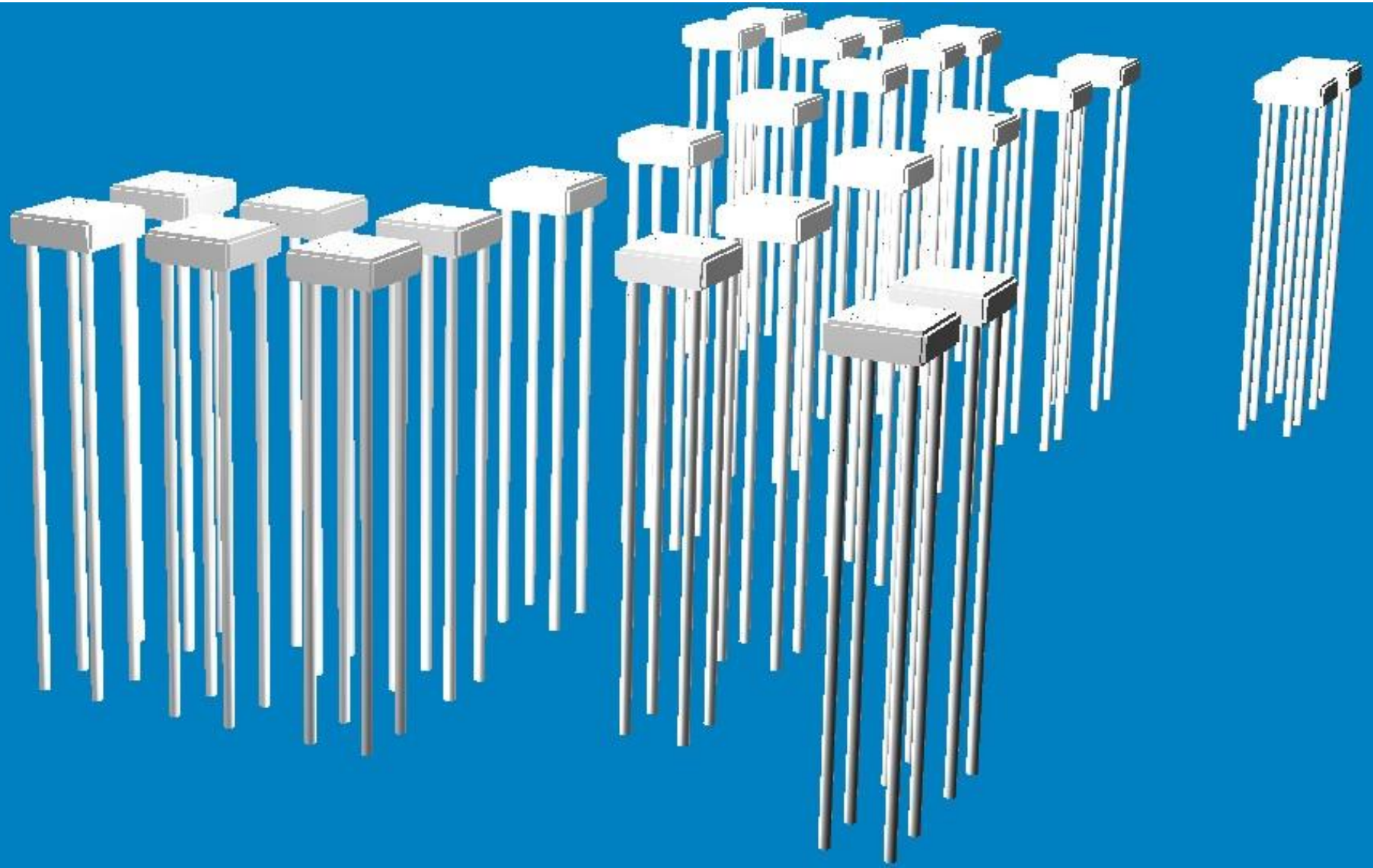


CORTE A-A

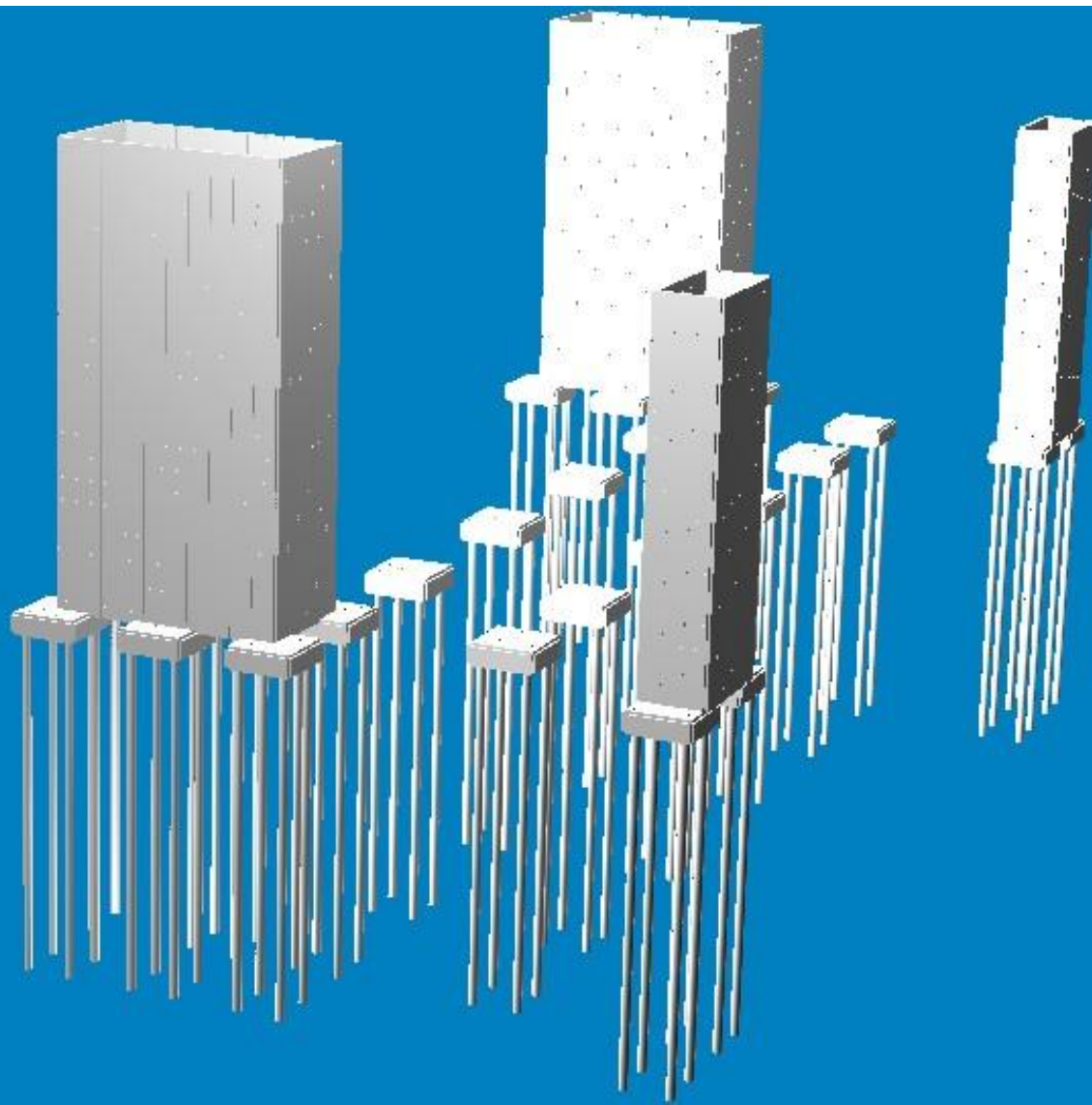
CORTE B-B

Seqüência de montagem

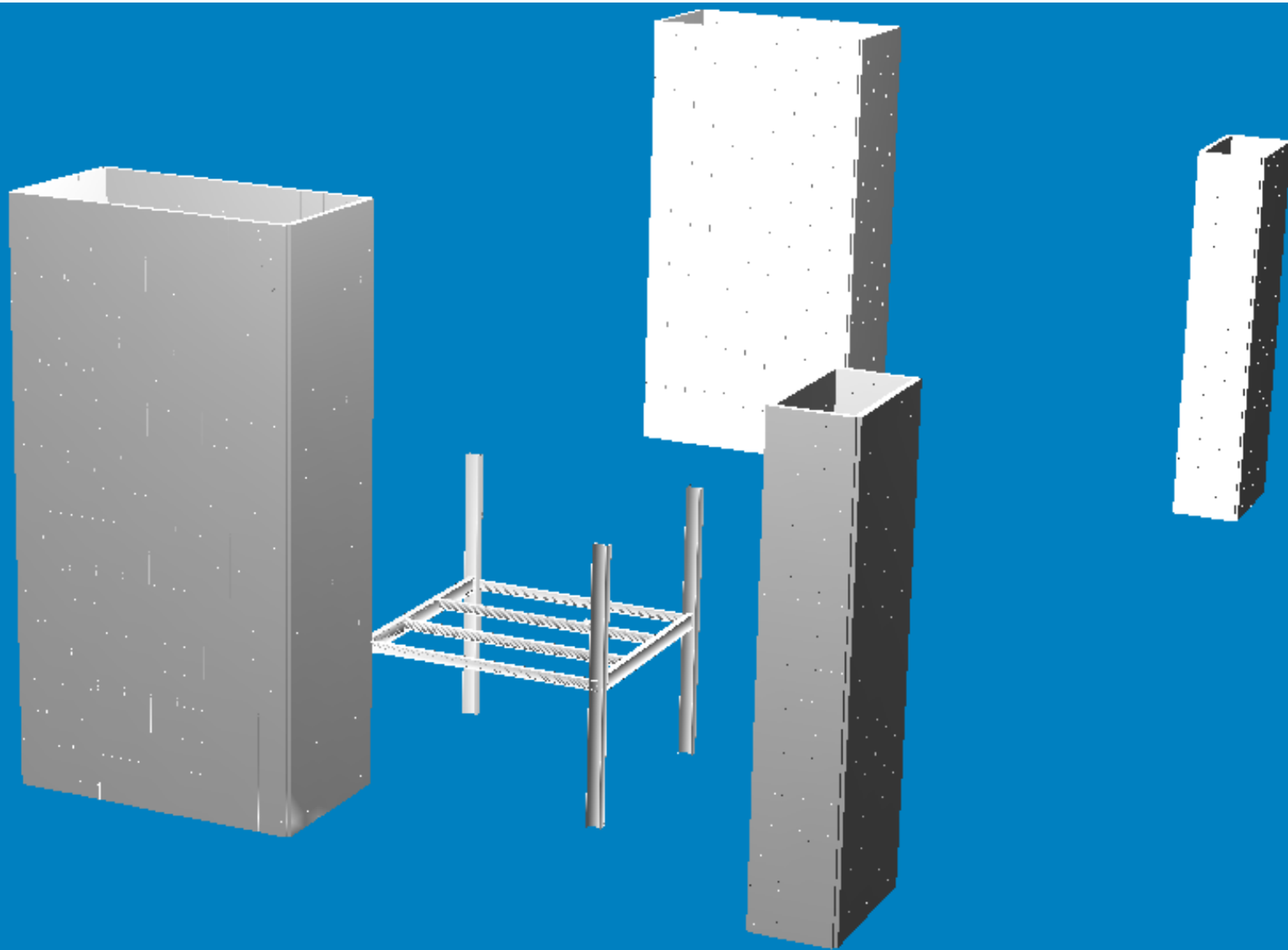
Execução do estaqueamento e blocos



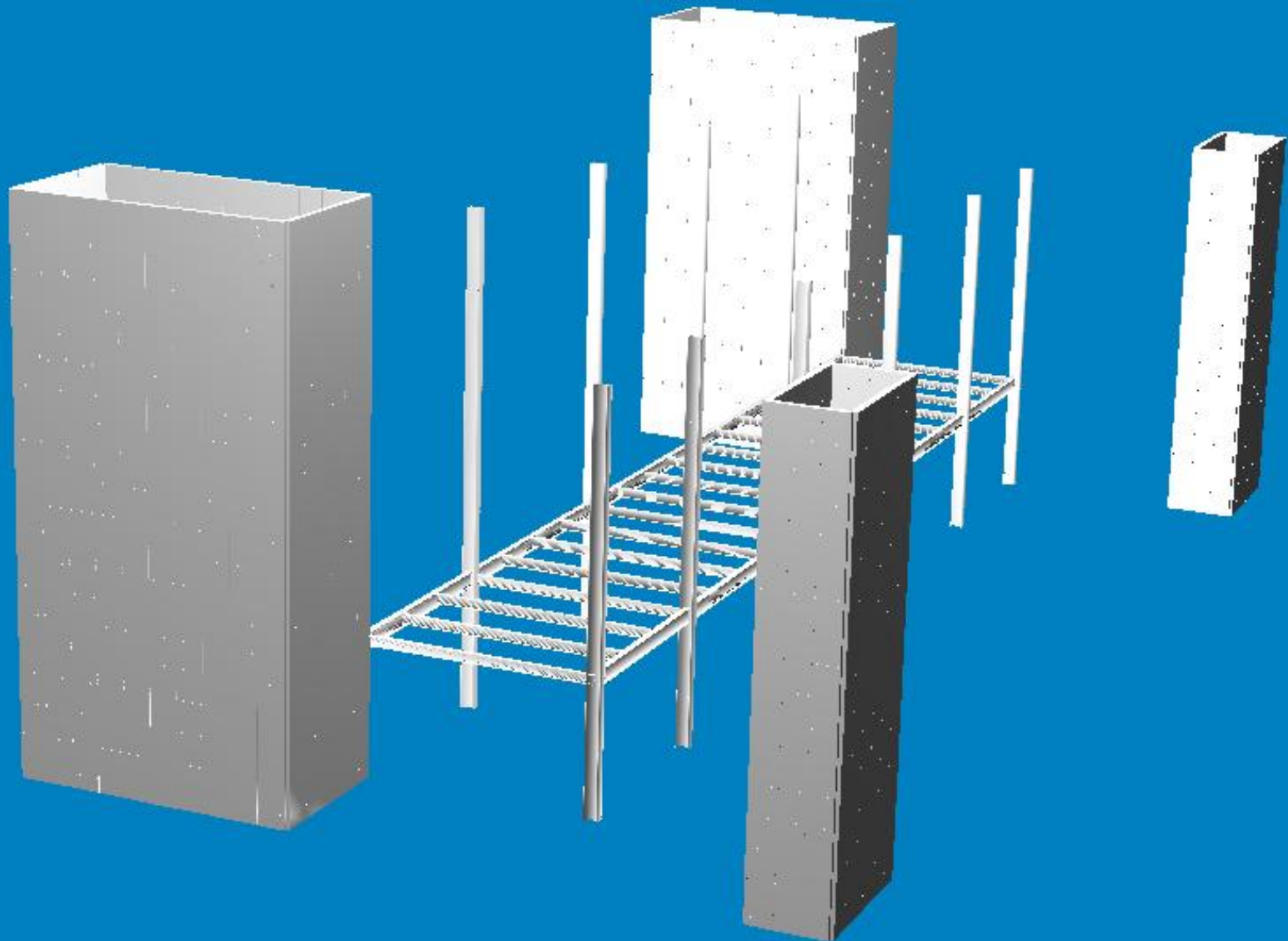
Execução das caixas de circulação vertical em formas deslizantes



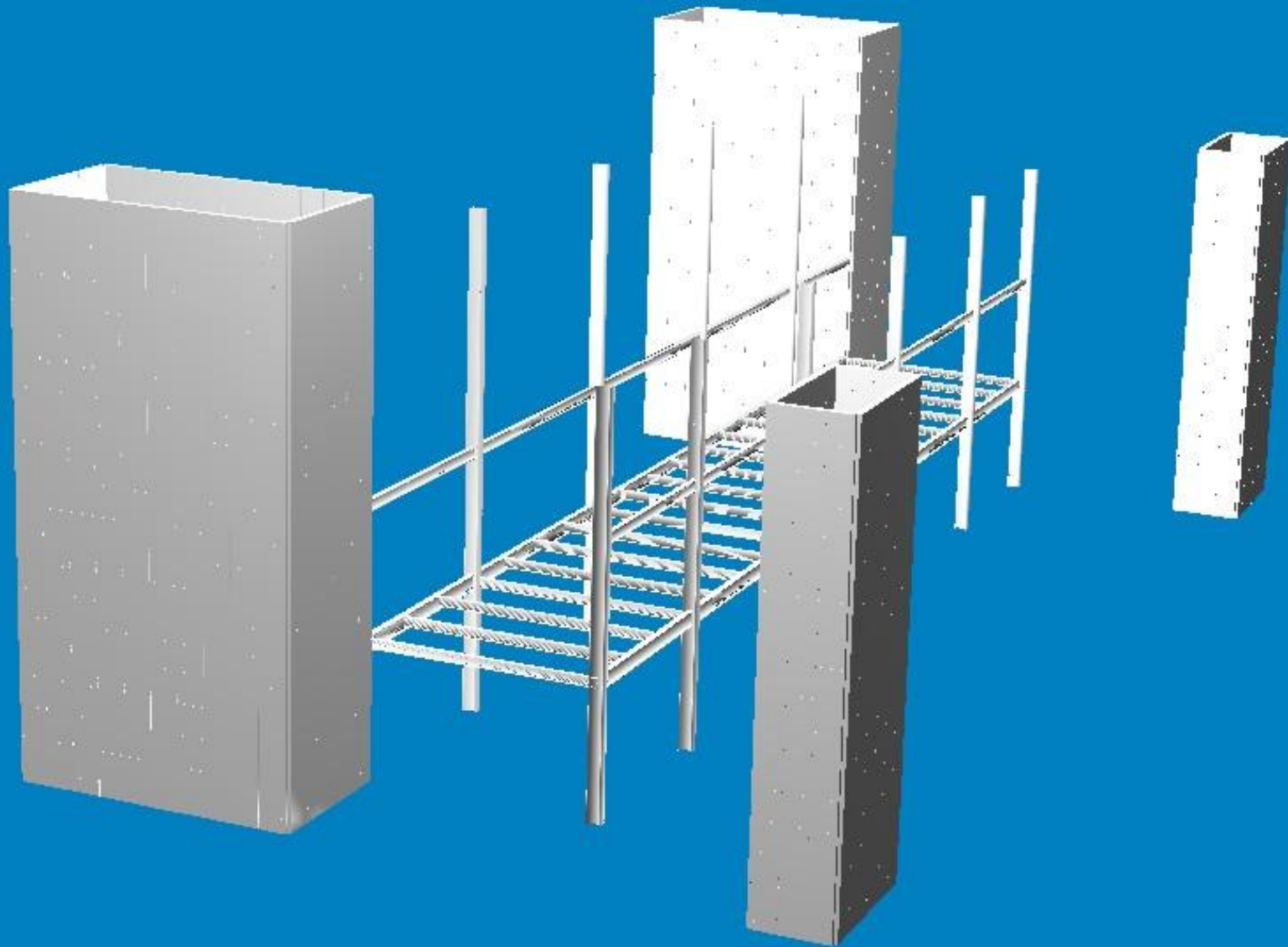
Montagem dos primeiro modulo do piso do pipe rack



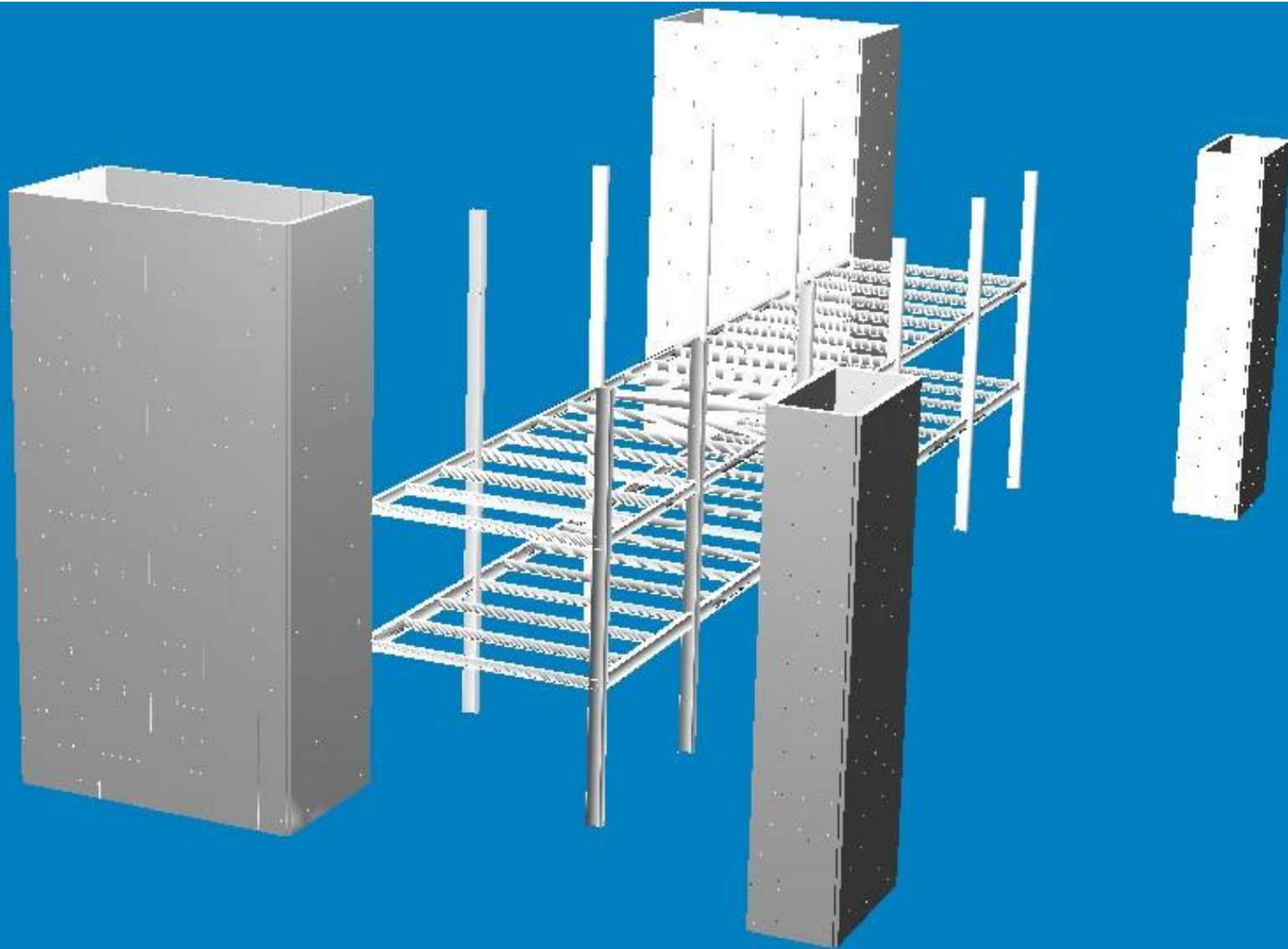
Montagem sequencial dos módulos de piso do pipe rack



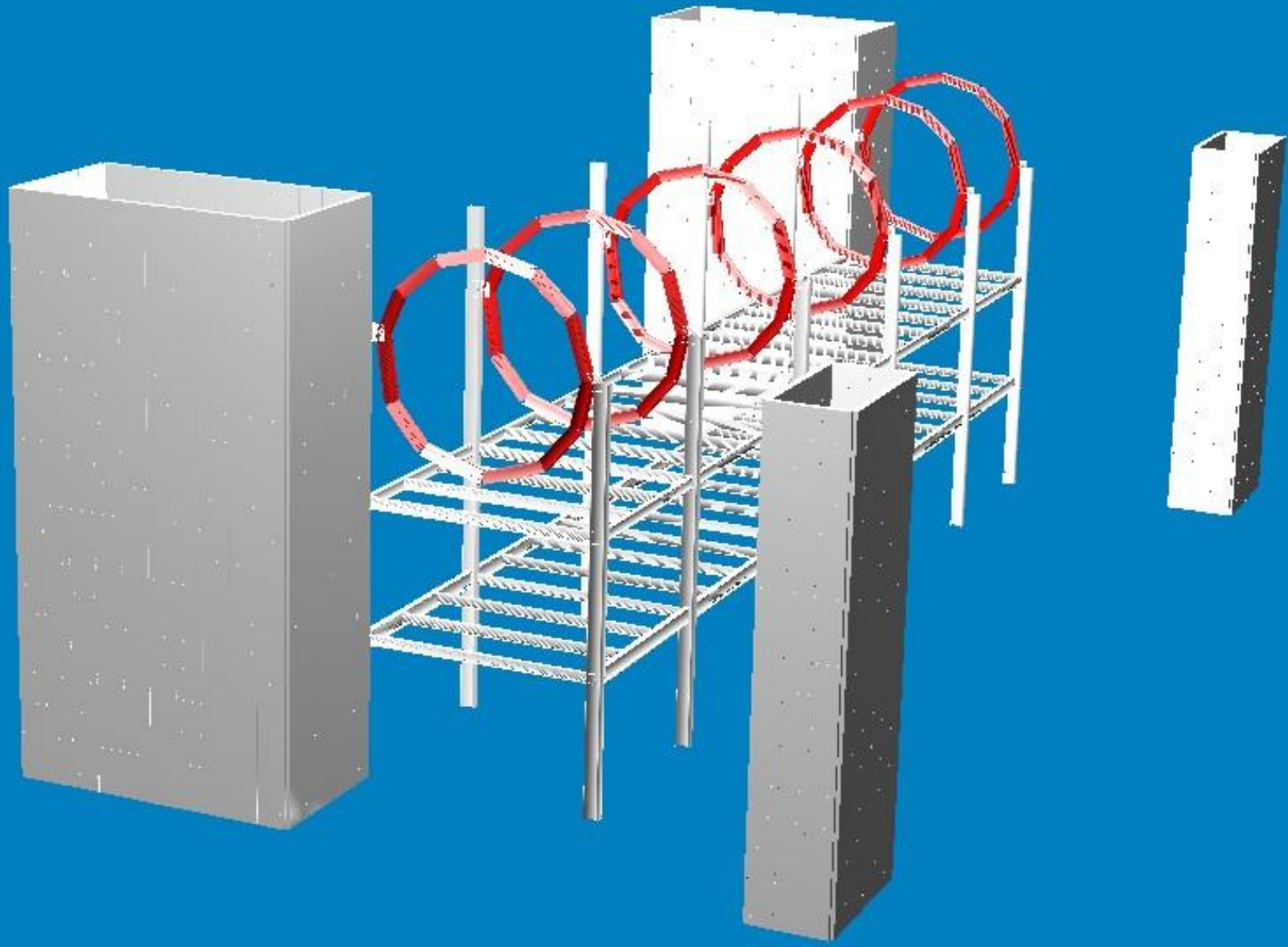
Montagem das vigas longitudinais da cobertura do pipe rack



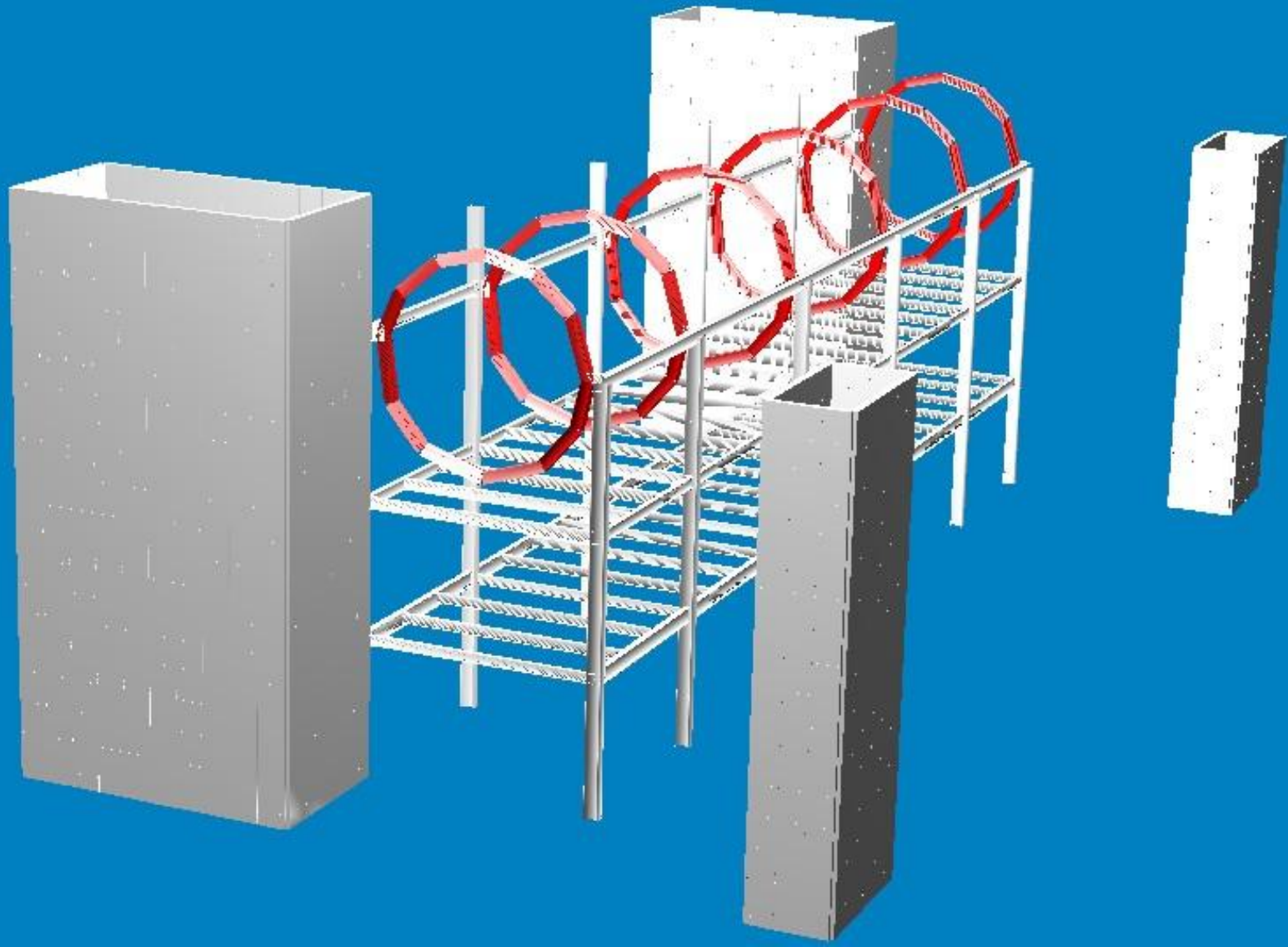
Montagem das vigas transversais da cobertura do pipe rack



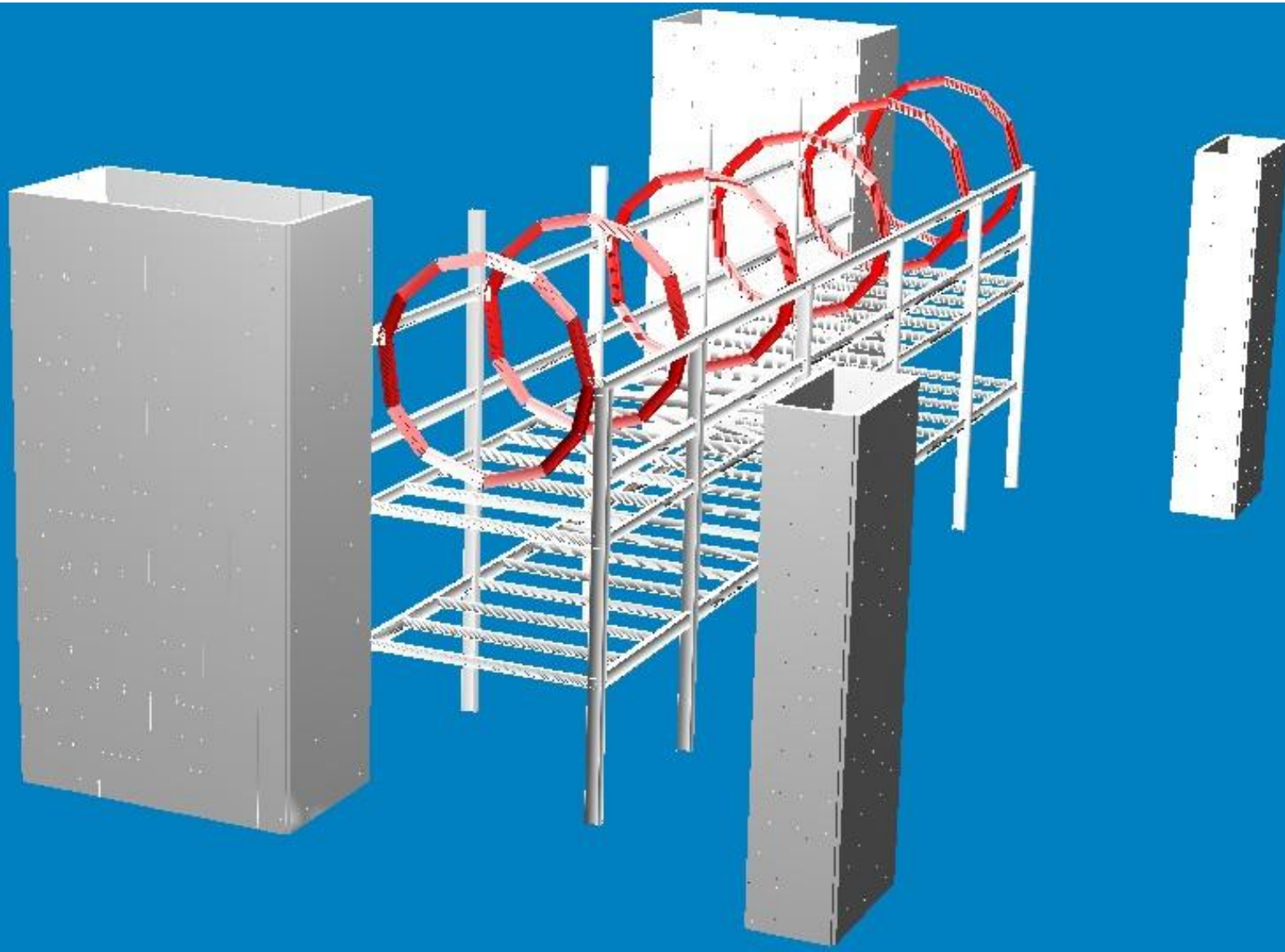
Montagem dos arcos da passarela



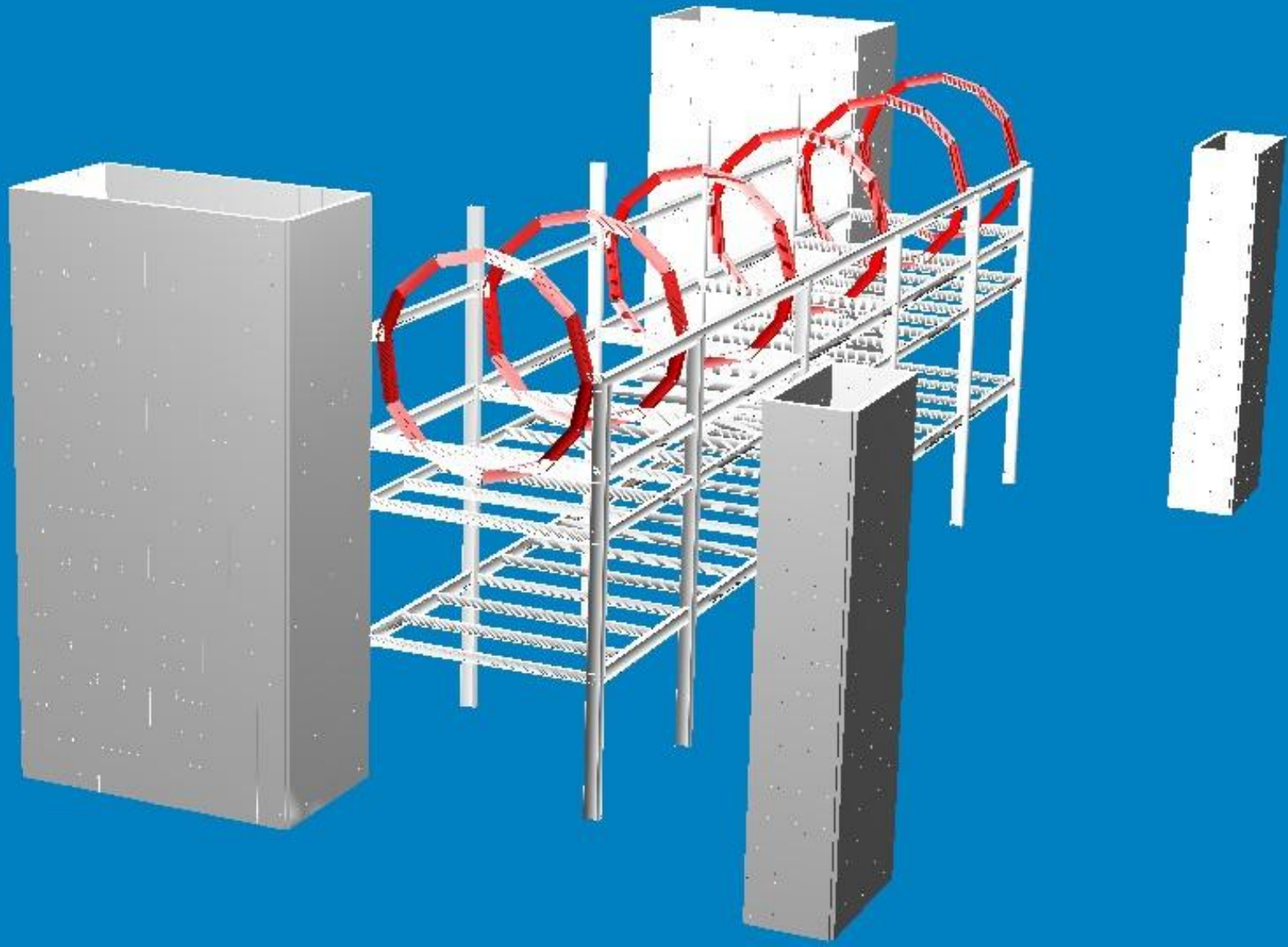
Longarinas dos quadrantes dos arcos



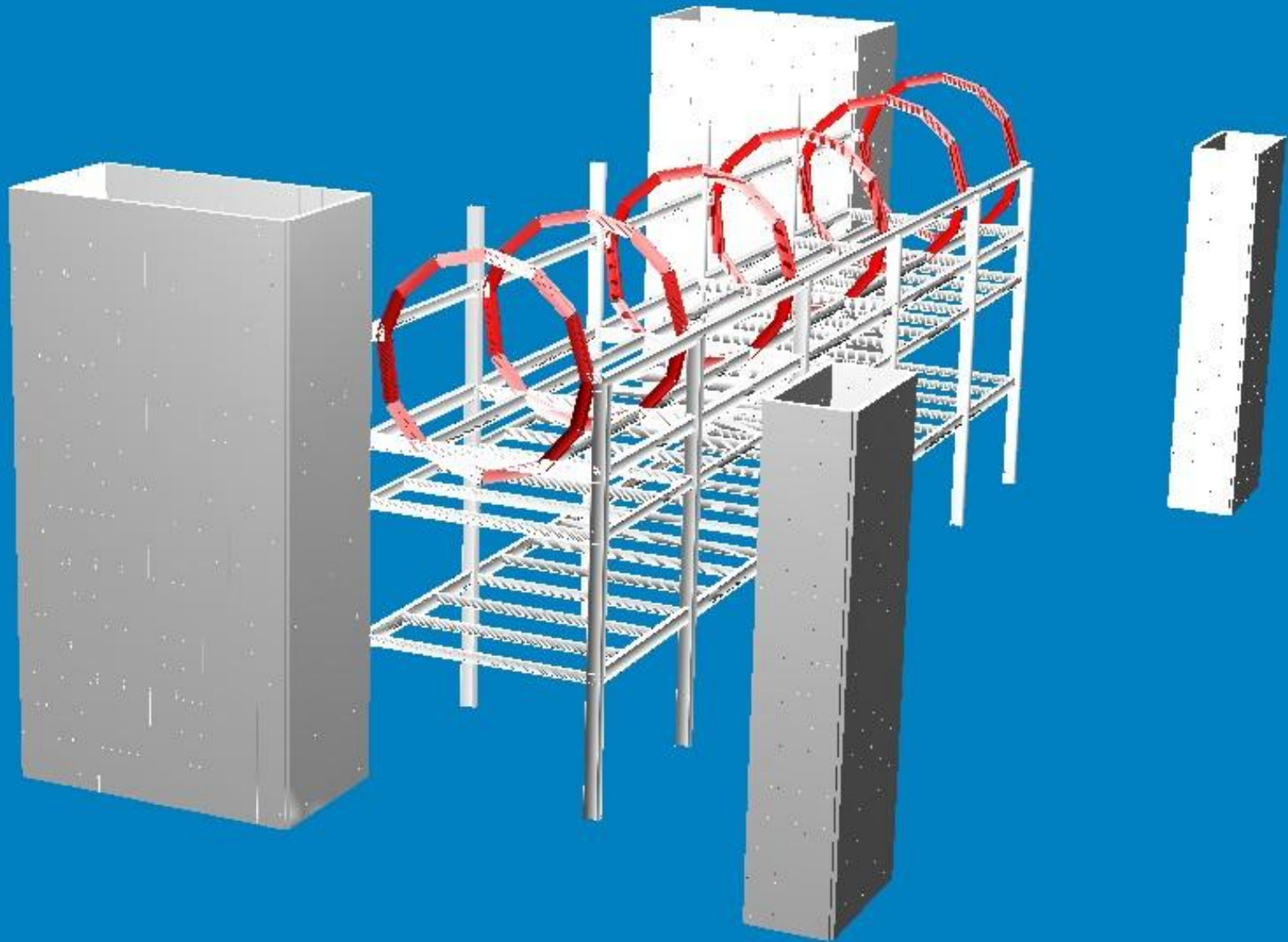
Longarinas do 1º piso



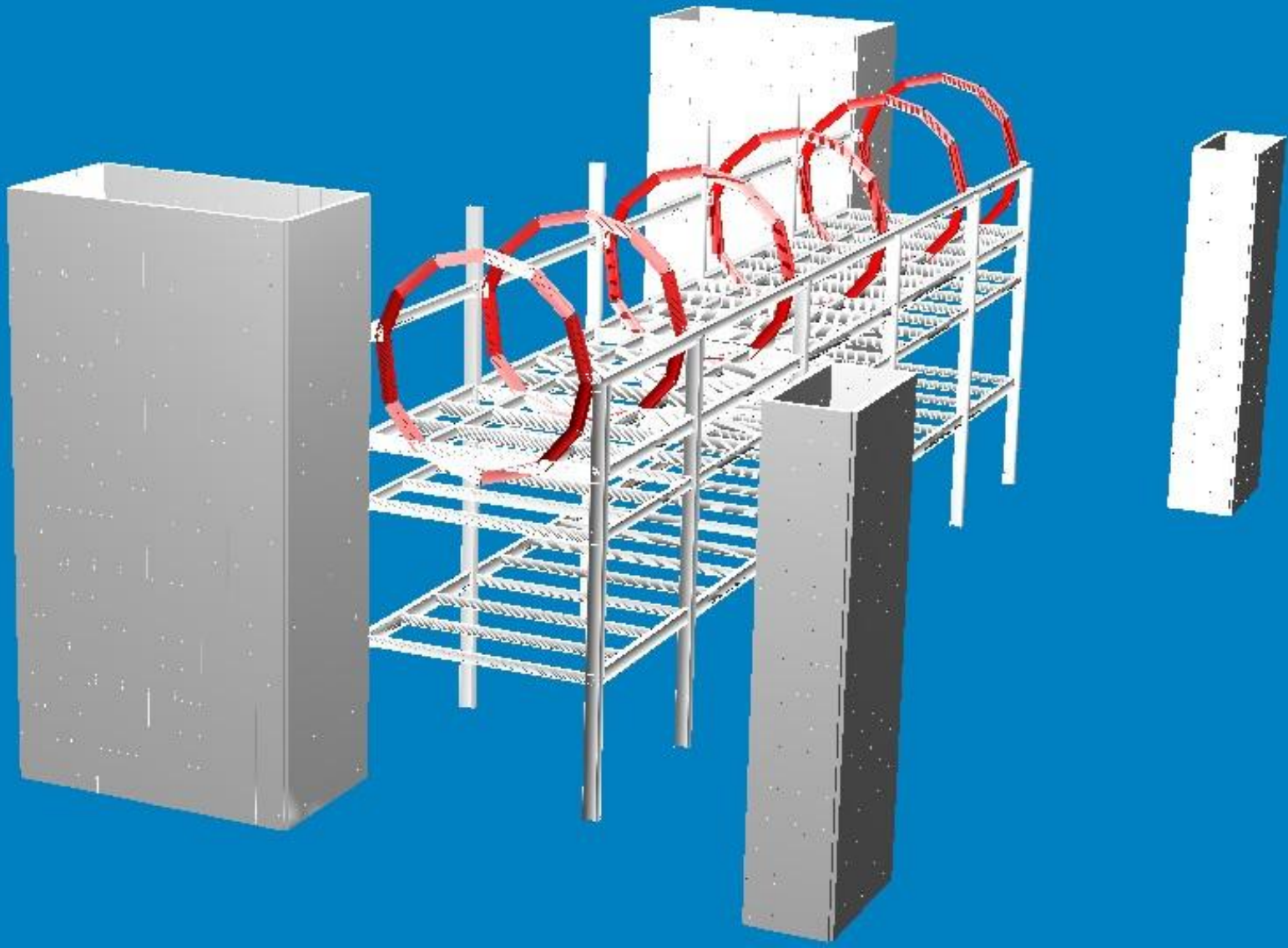
Transversinas do 1º piso



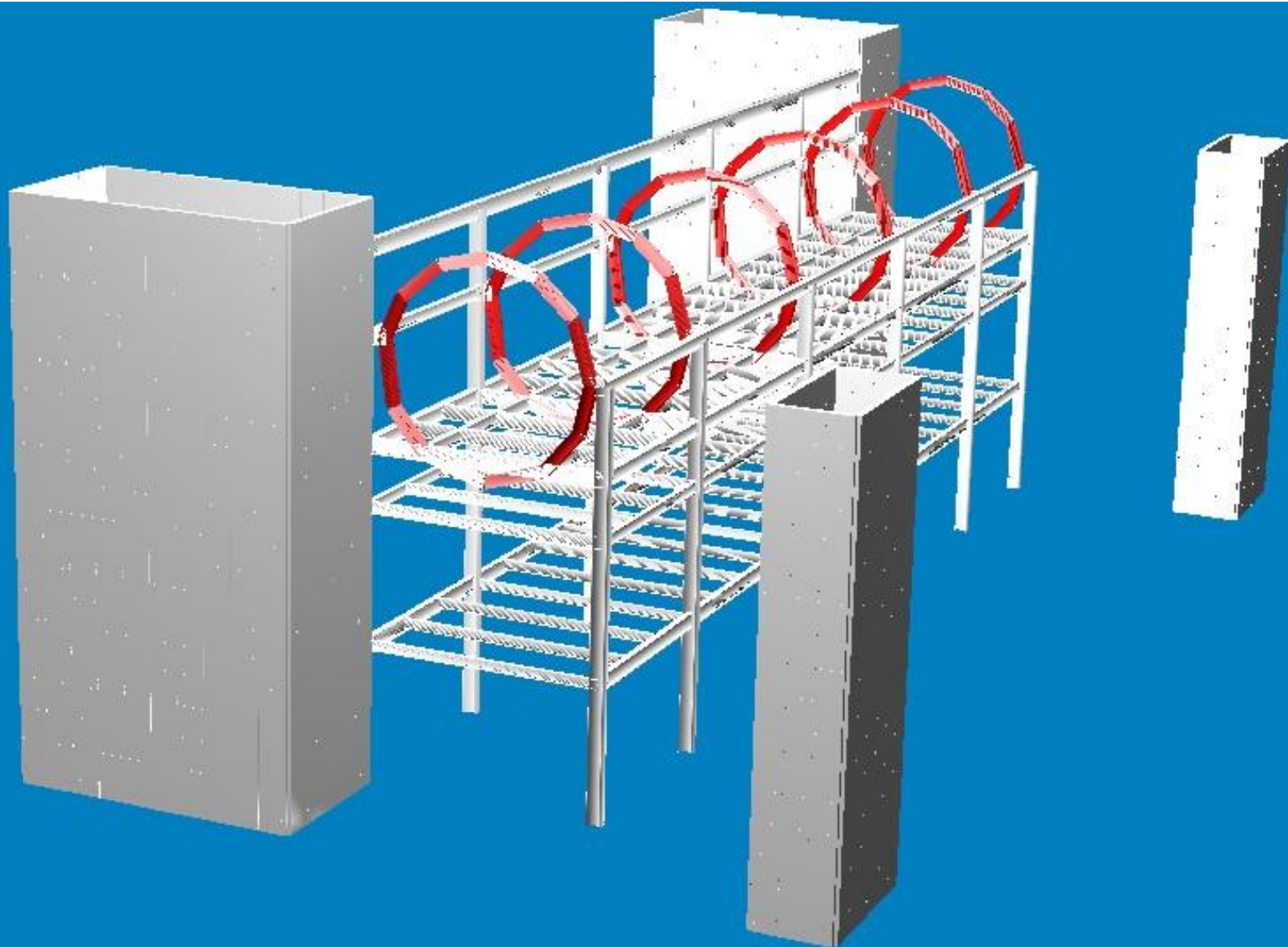
Longarinas da passarela



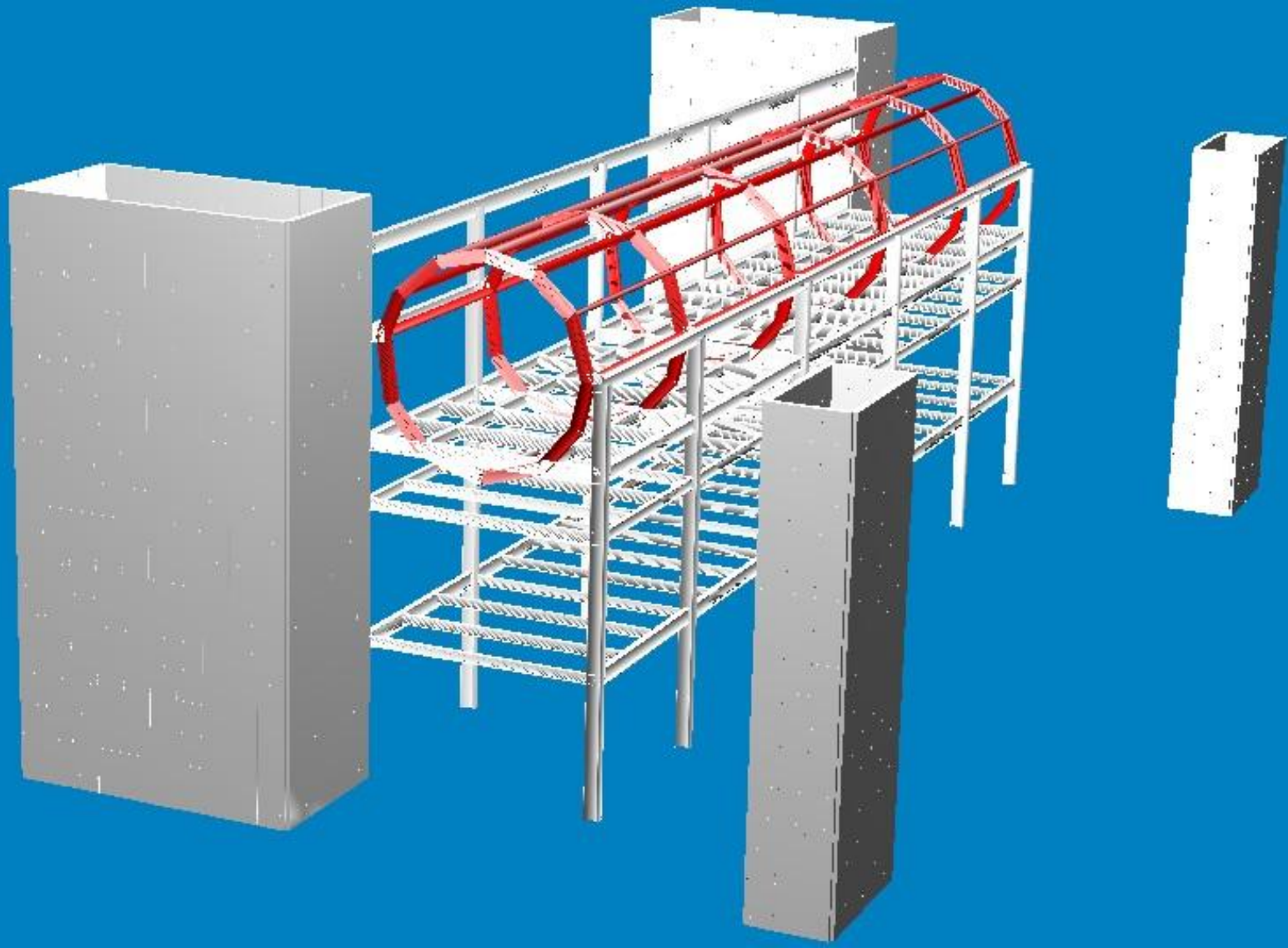
Montagem do piso da passarela que servirá como plataforma de lançamento para as vigas principais do piso



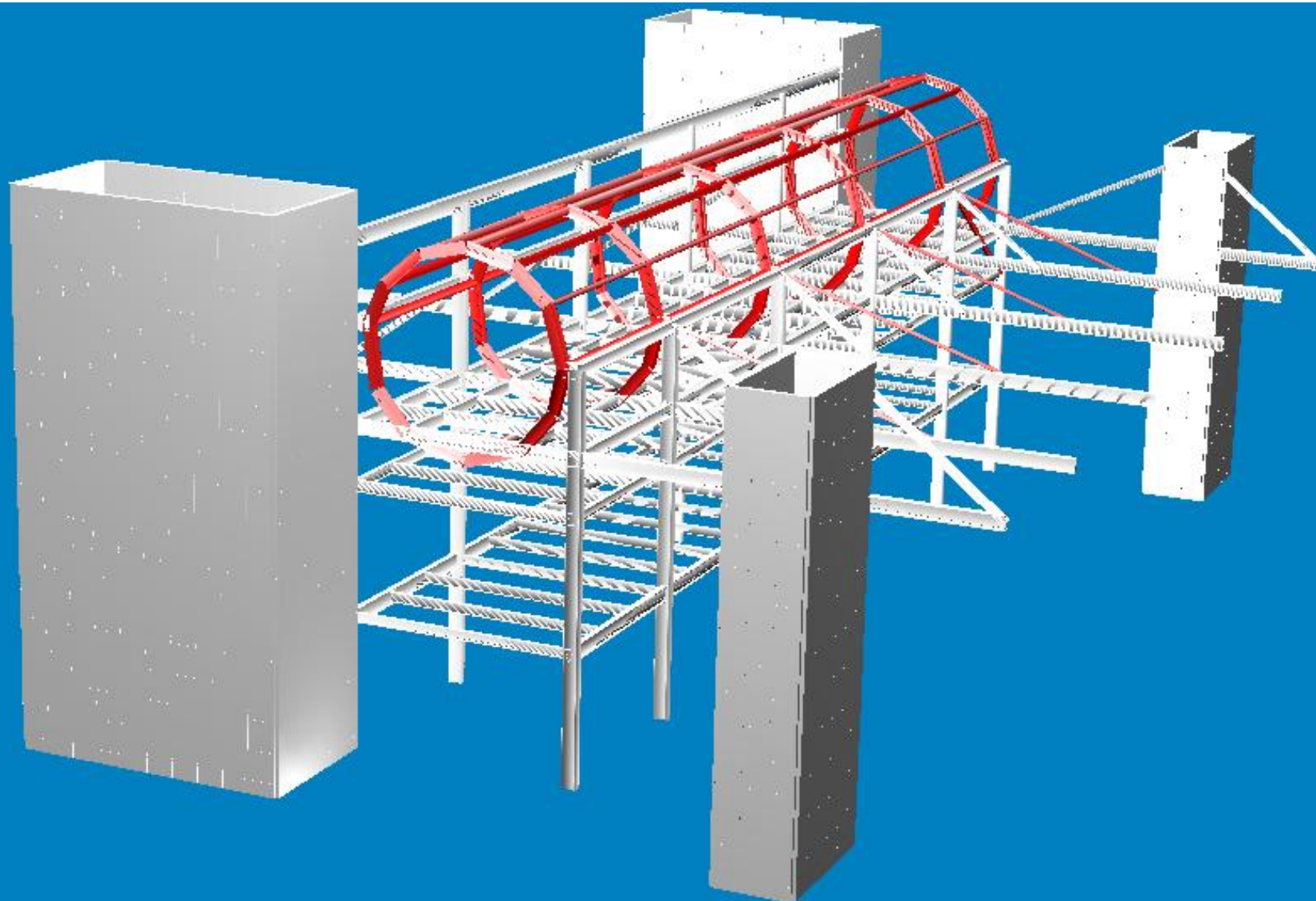
Execução das longarinas de apoio junto ao portico central



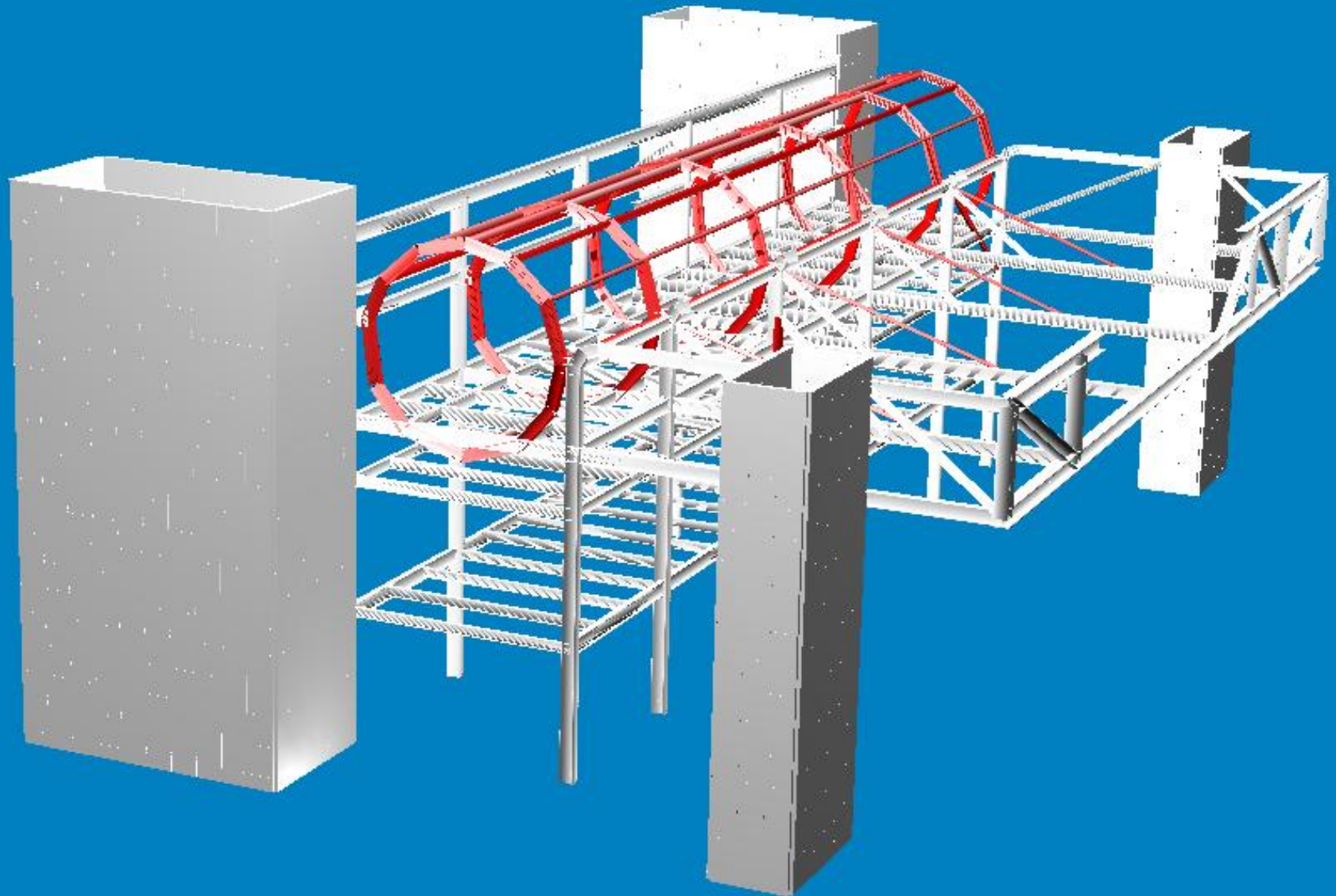
Travamento dos arcos



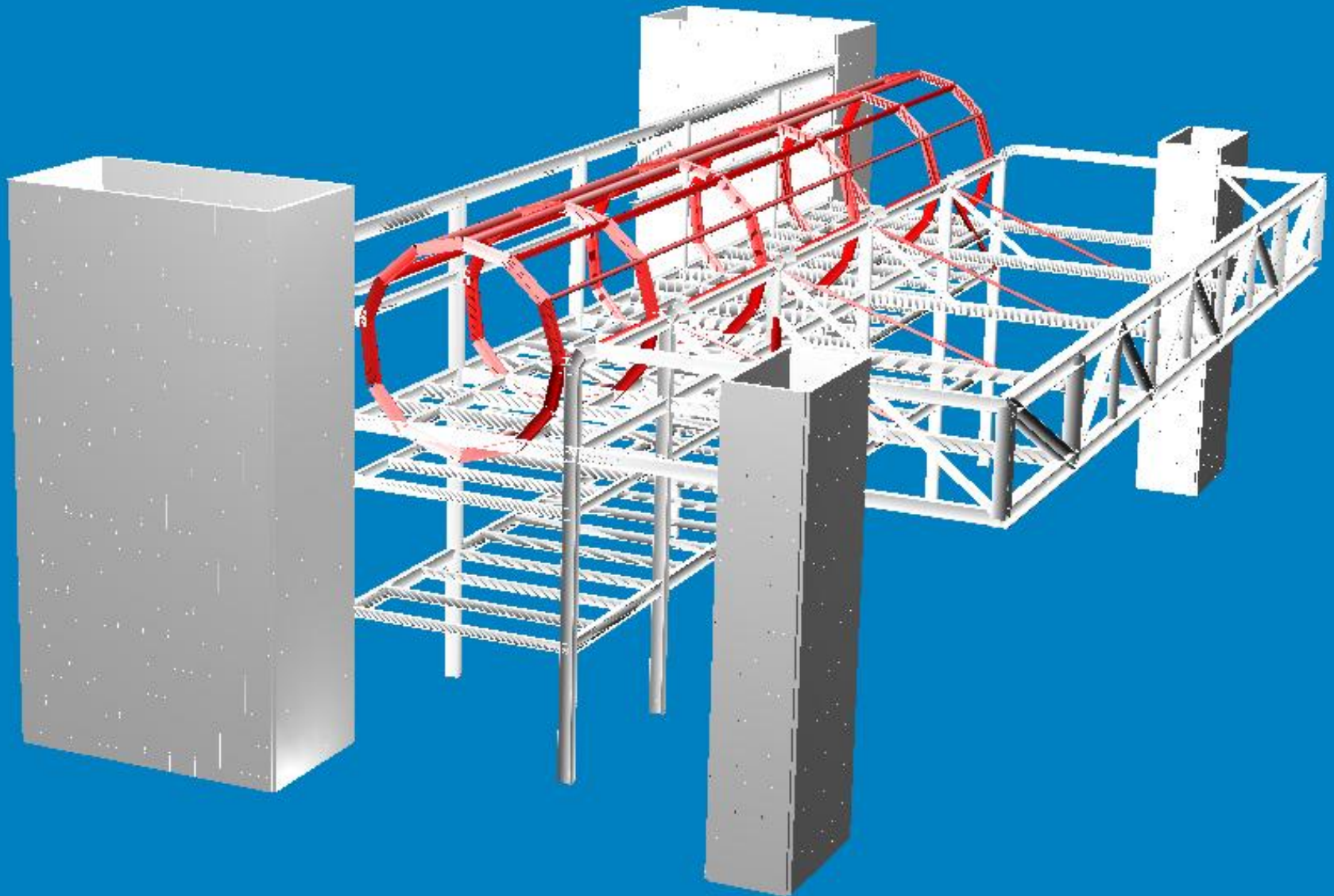
Lançamento das vigas principais do 1º piso, estaiadas nos pórticos centrais



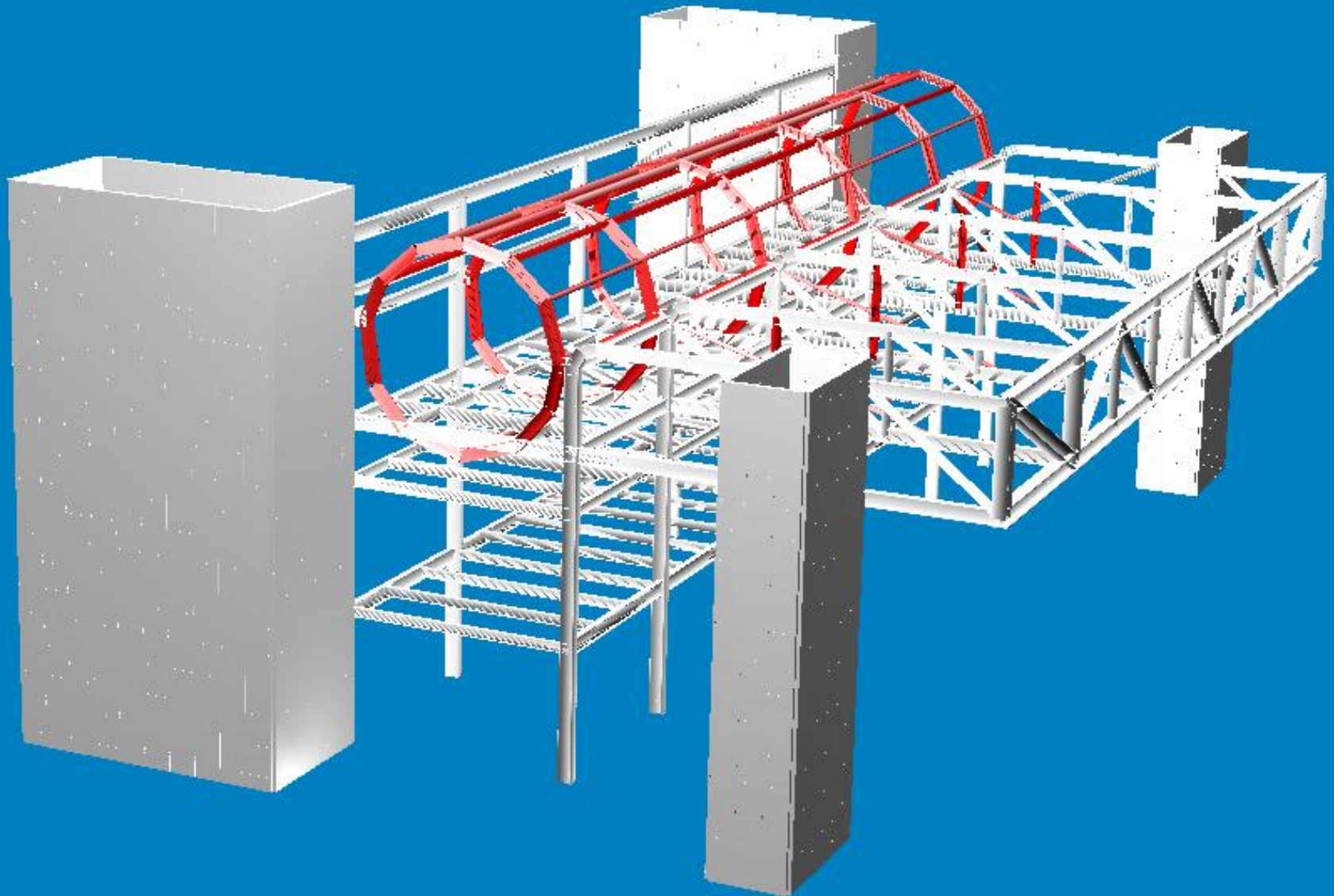
Montagem das barras da treliça frontal, provisoriamente apoiada nas vigas estaiadas do piso



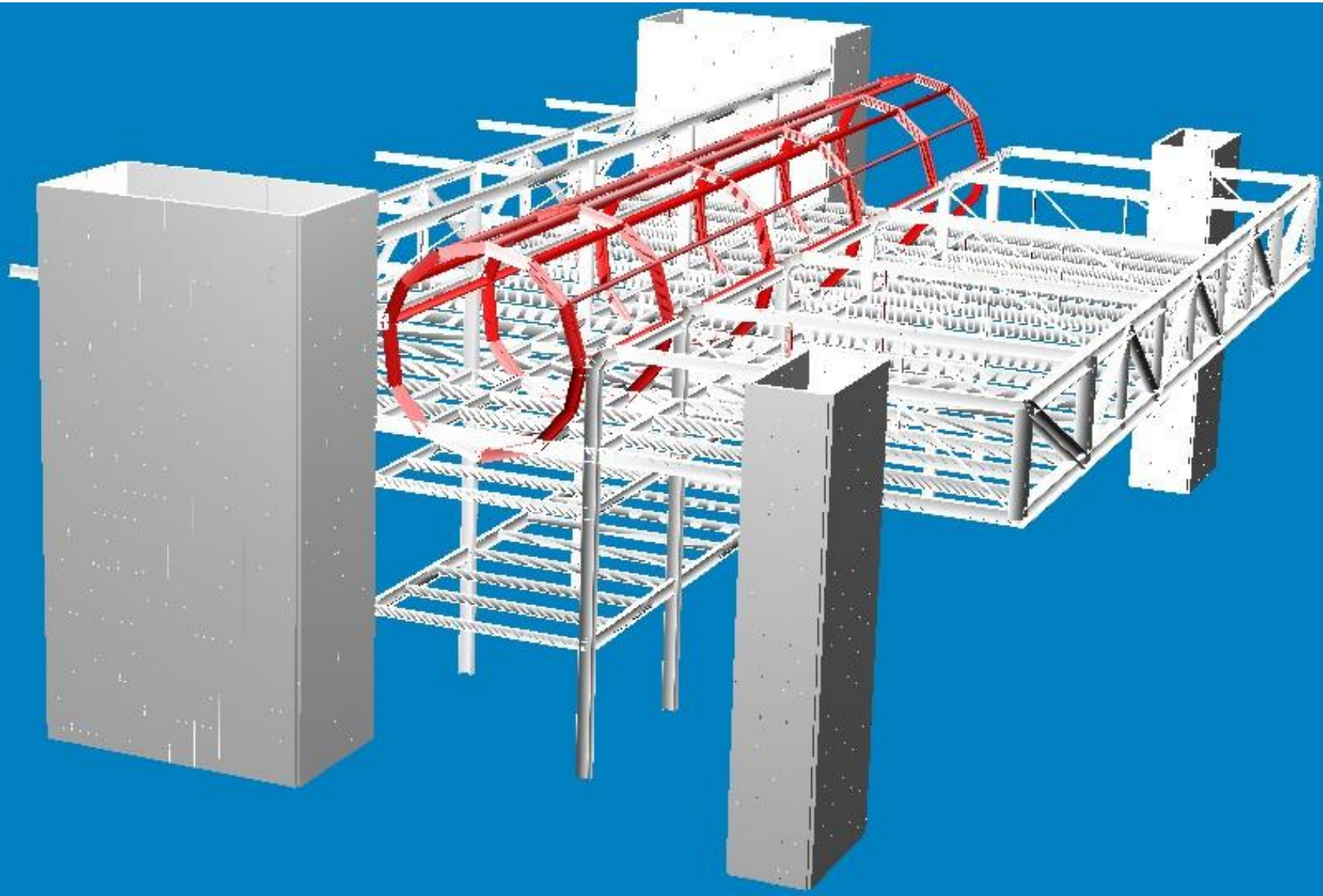
Finalização da montagem da treliça frontal

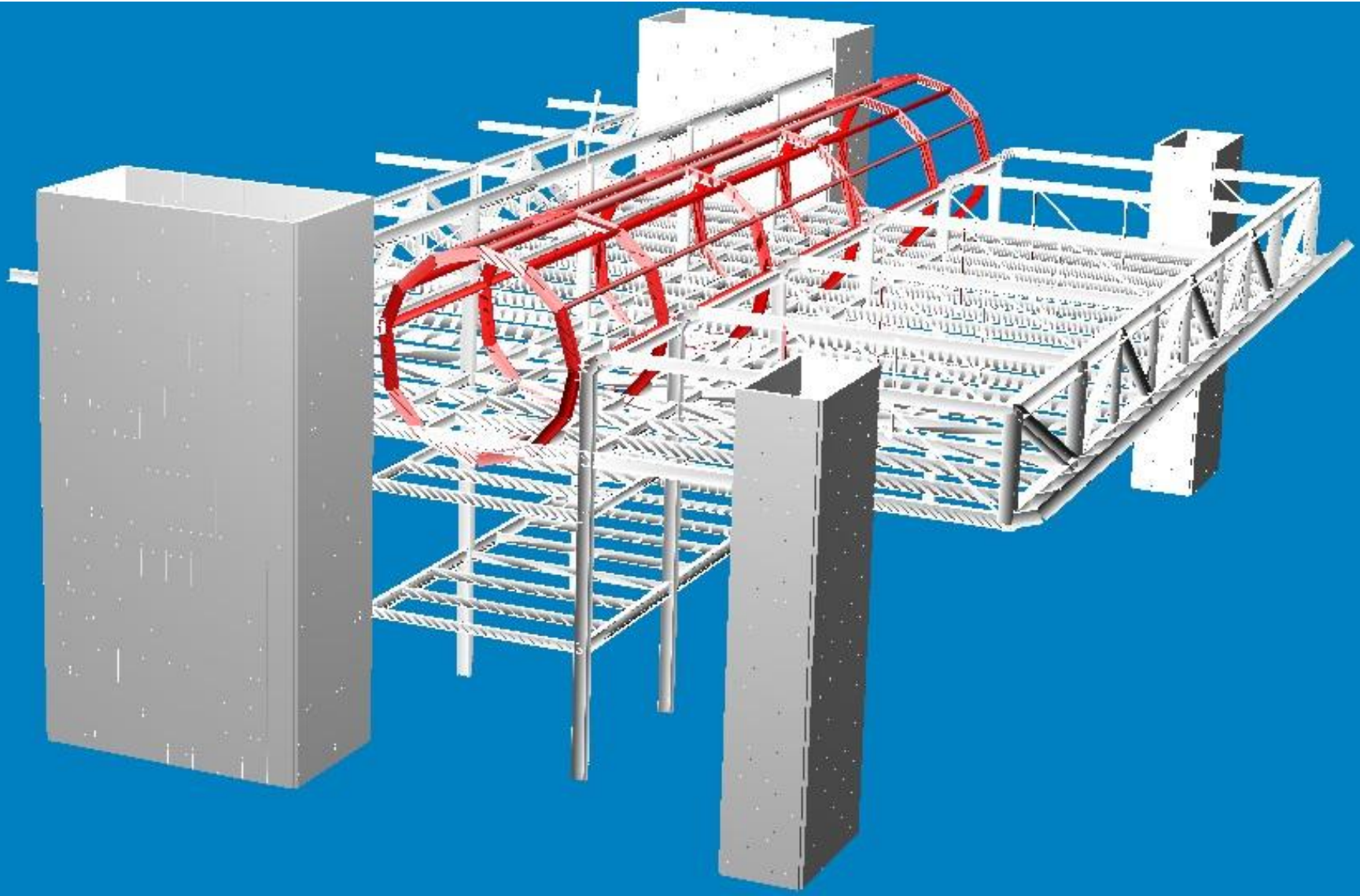


Colocação das vigas principais do 2º piso

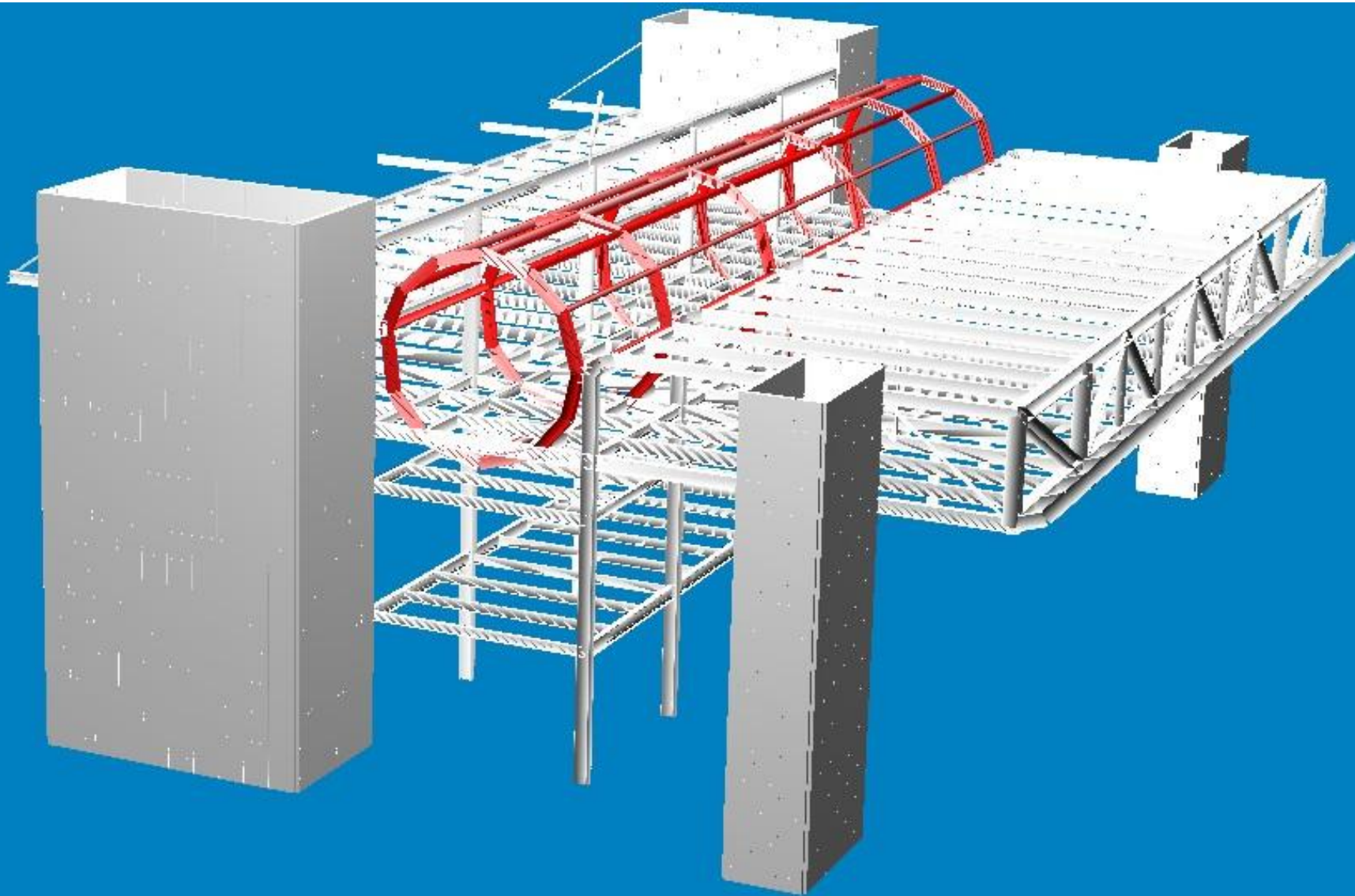


Complementação das vigas do 1º piso

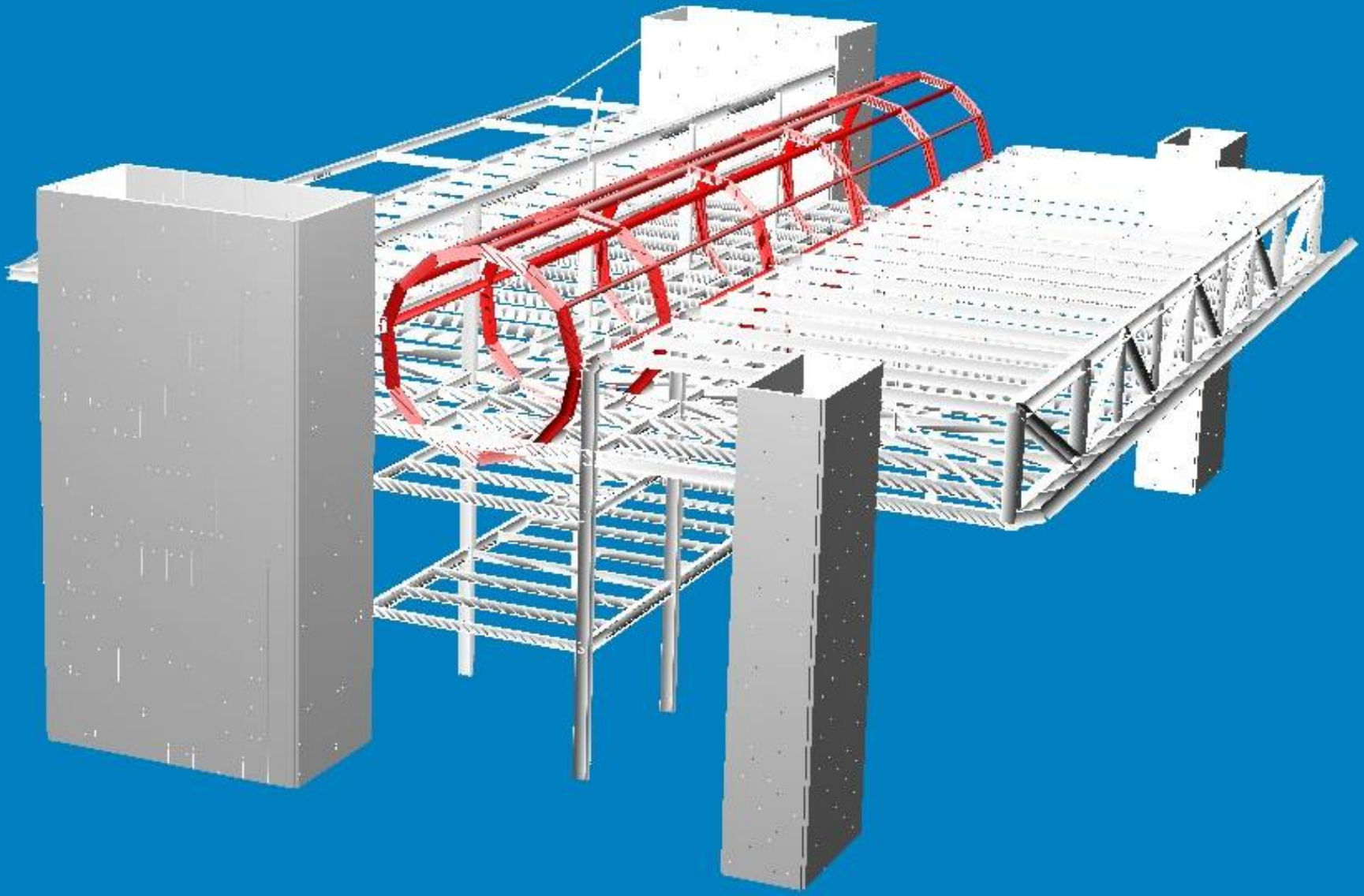


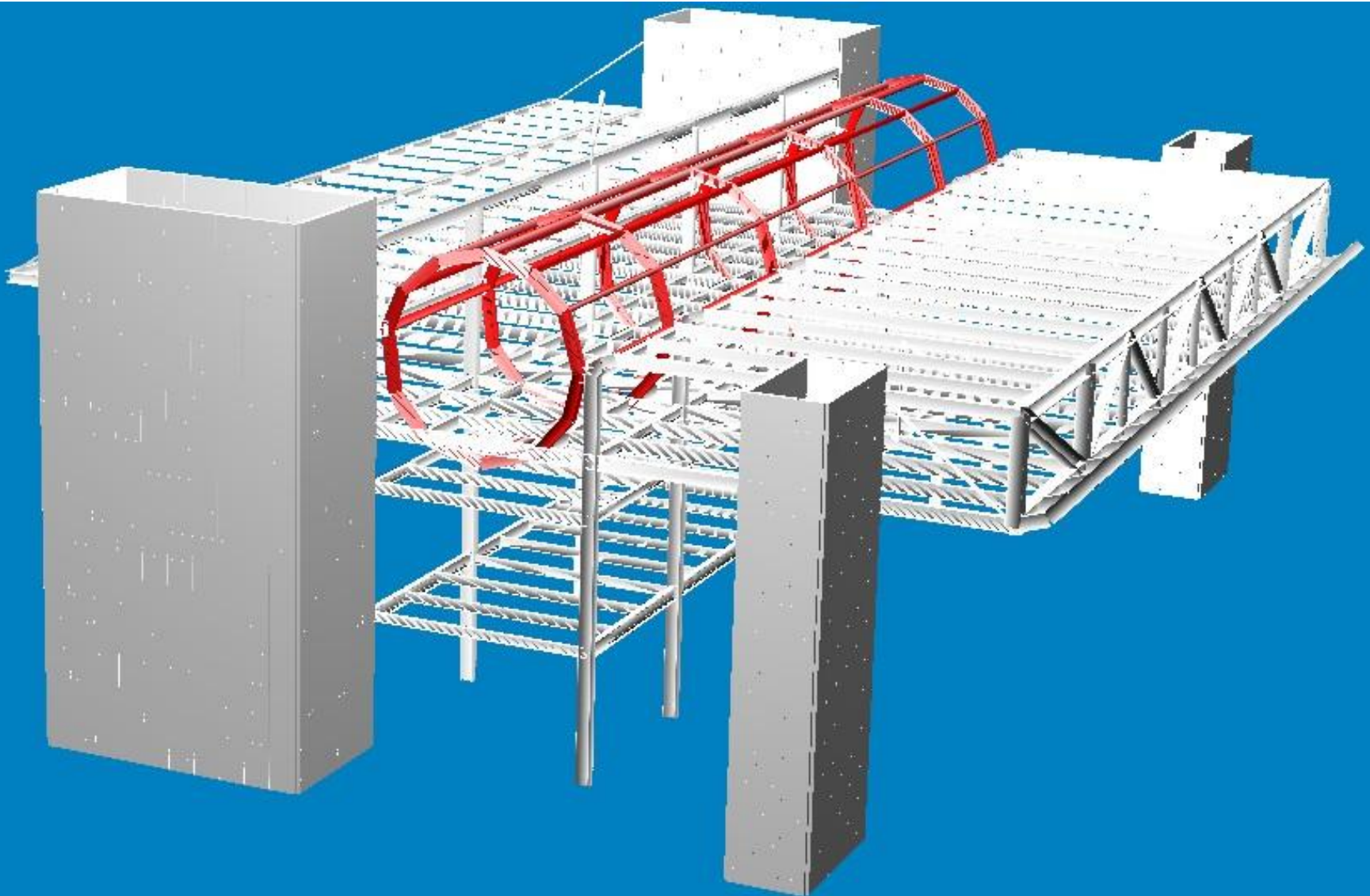


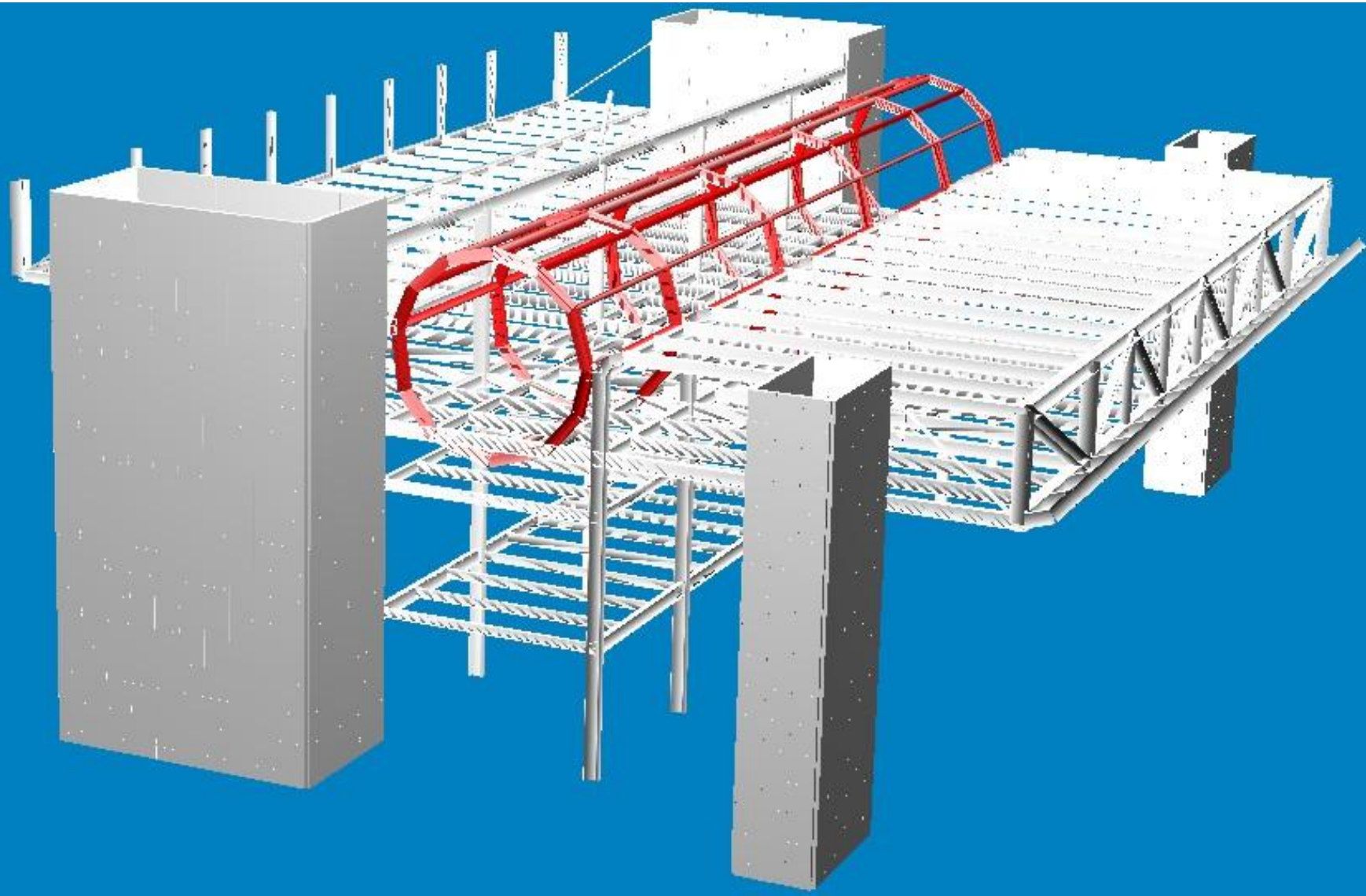
Complementação das vigas do 2º piso

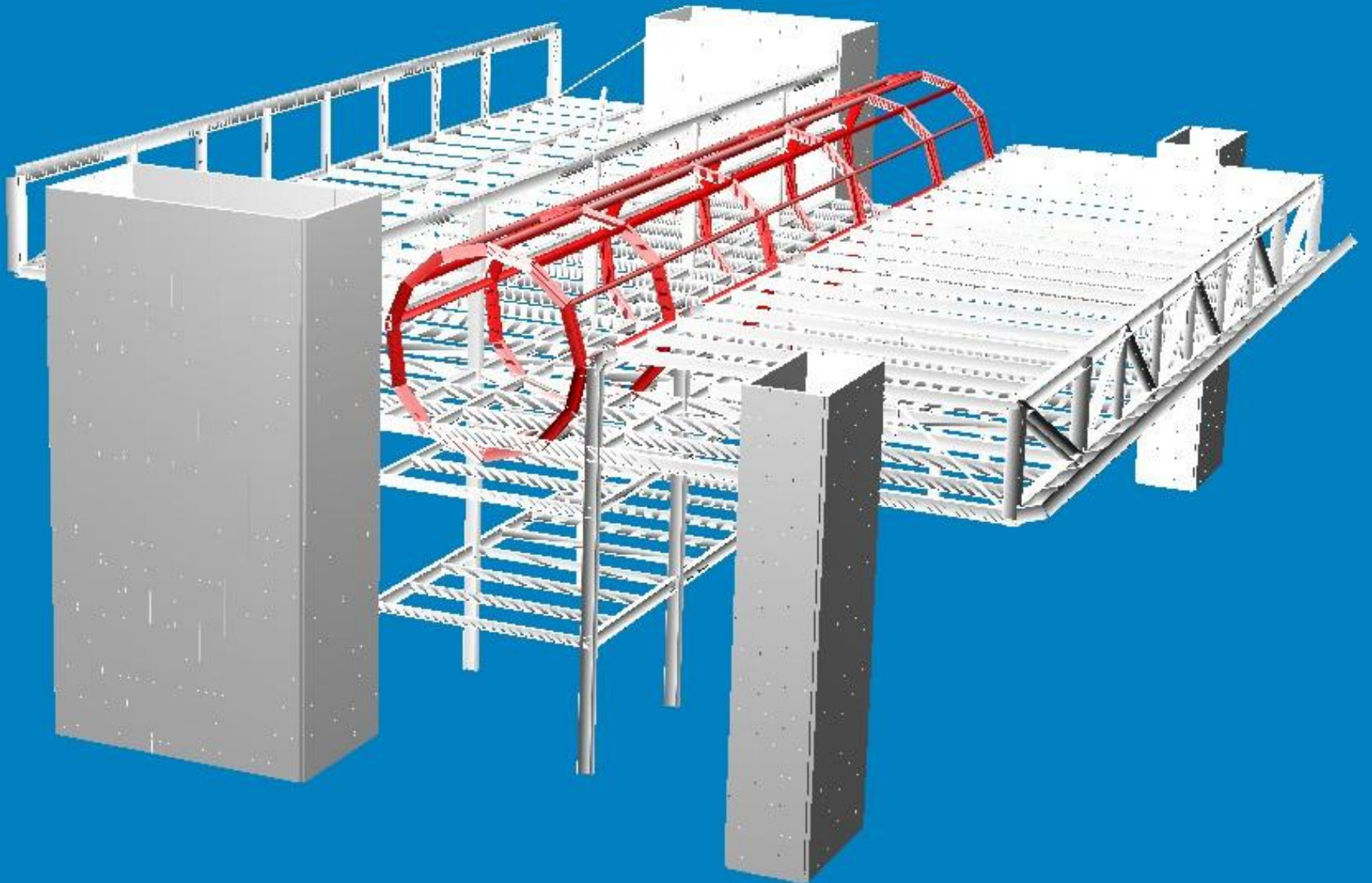


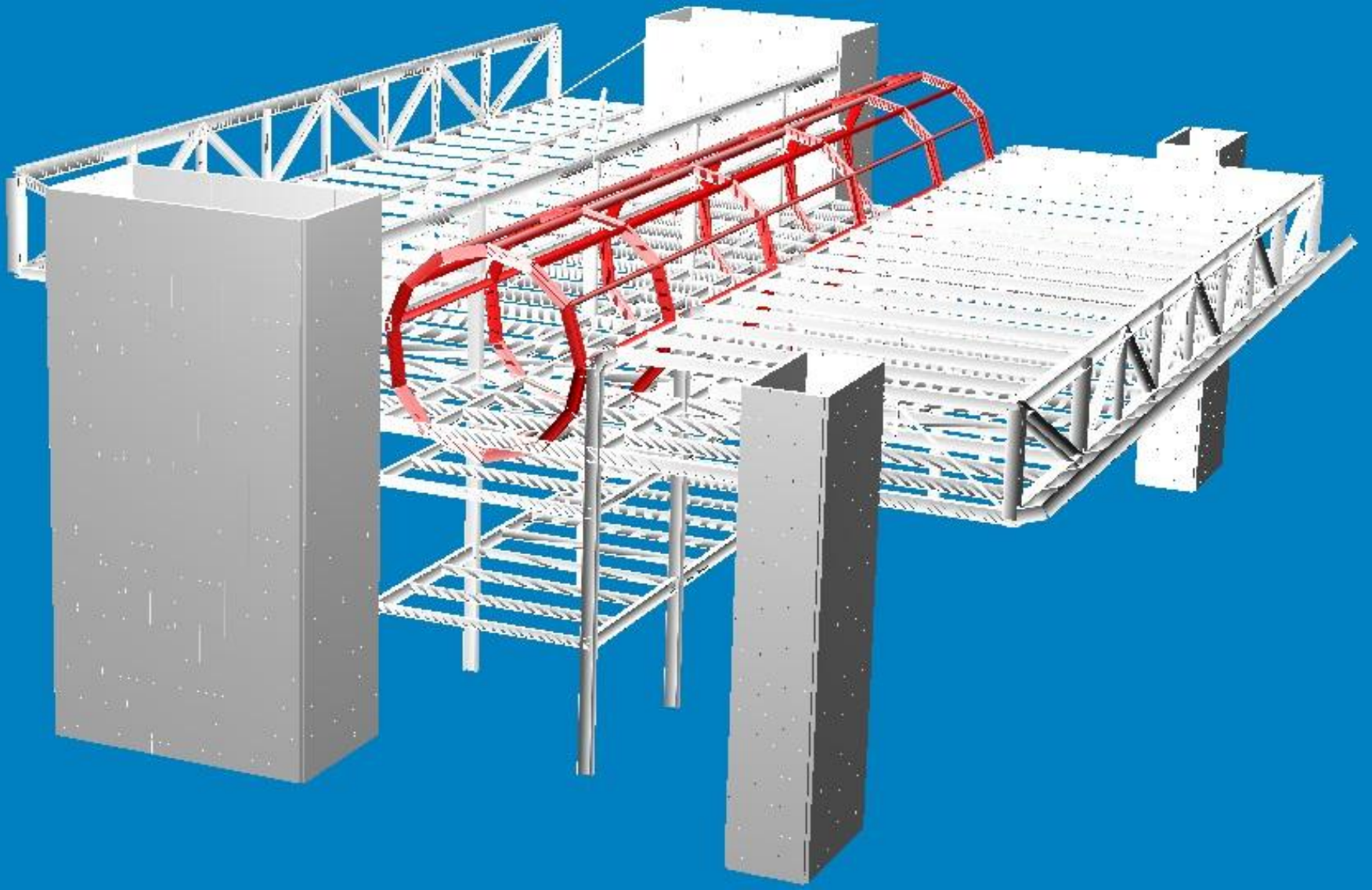
Repetição da seqüência de montagem para o vigaumento do lado oposto



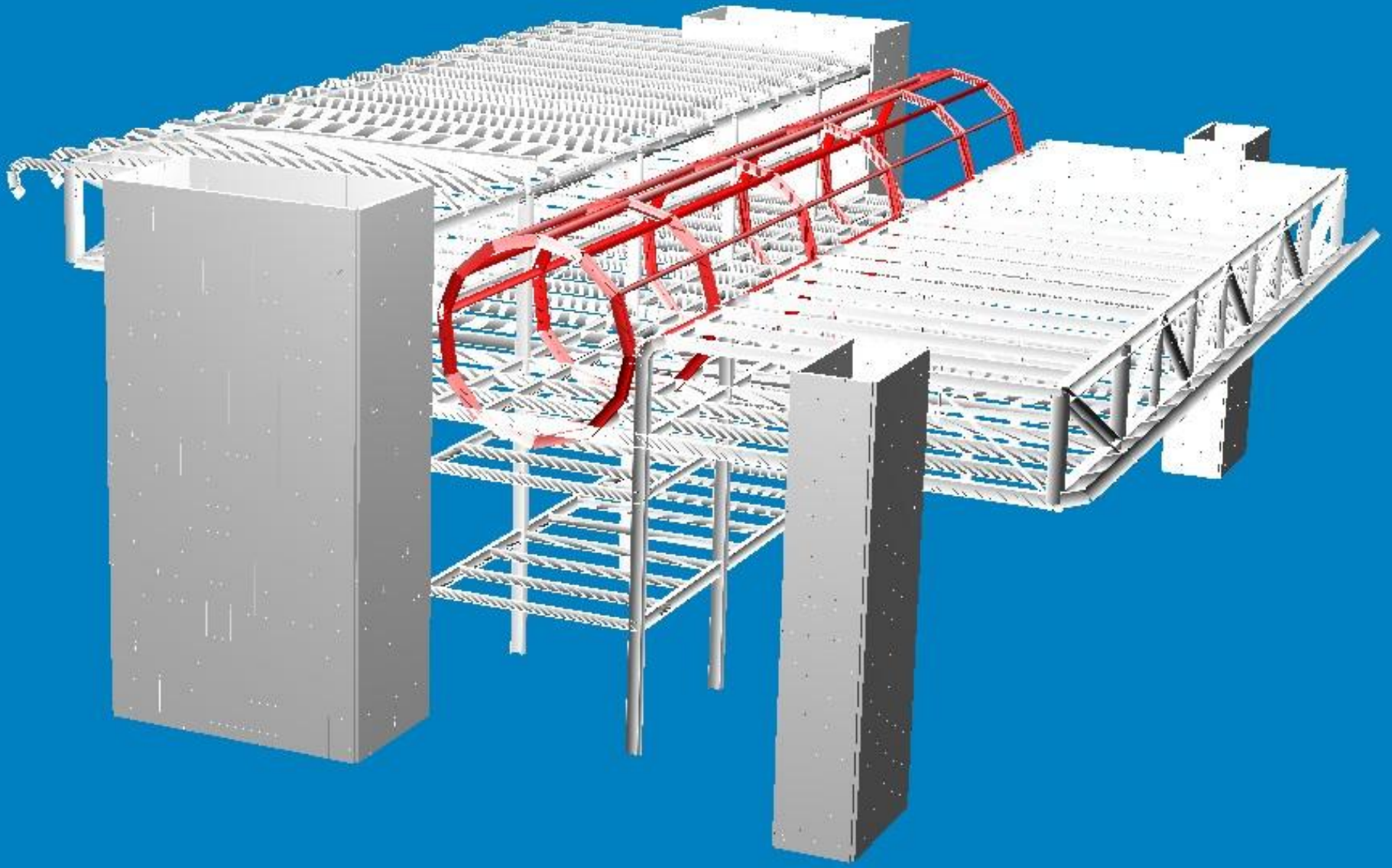




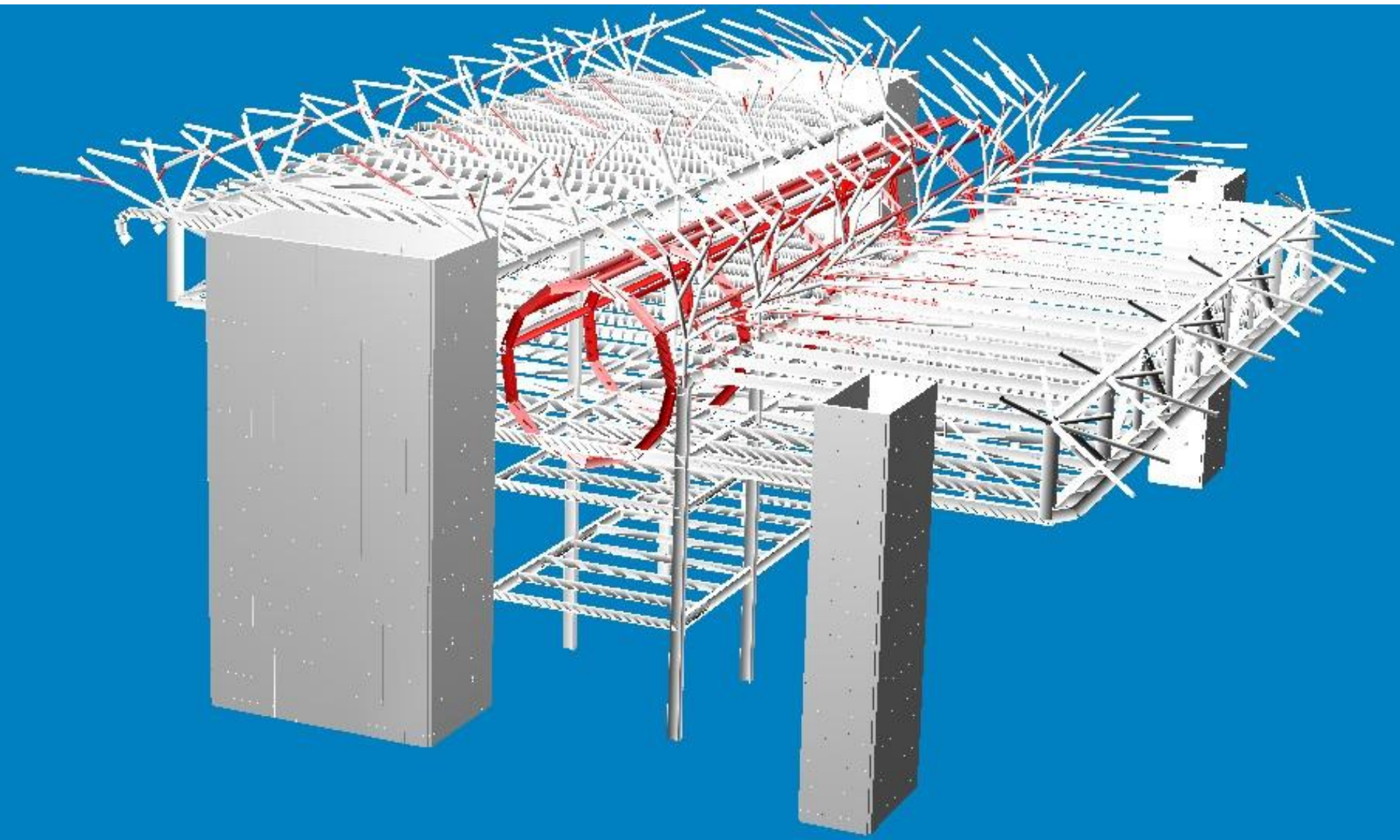


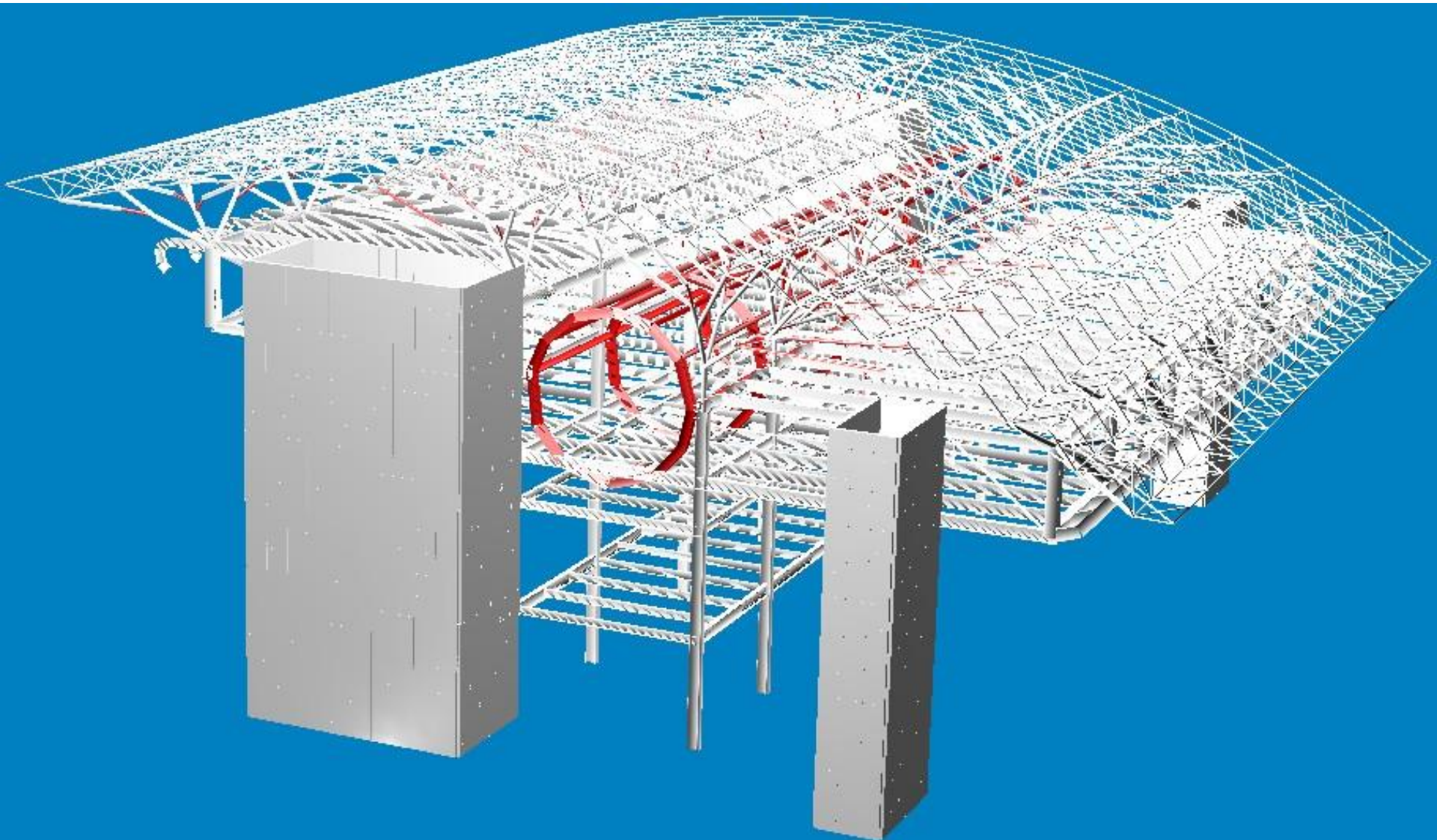


Montagem das vigas da cobertura

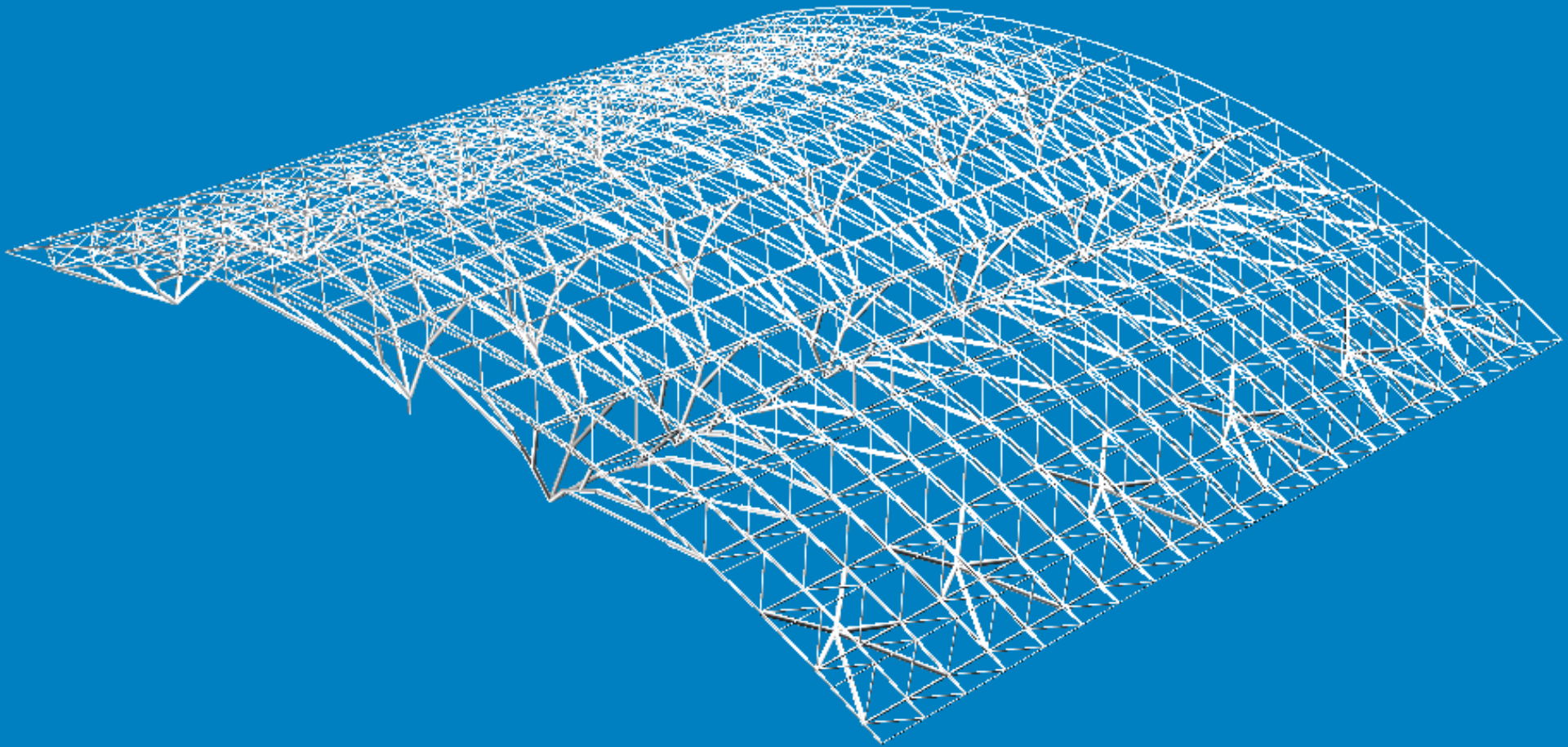


Montagem da estrutura espacial da cobertura de sombreamento

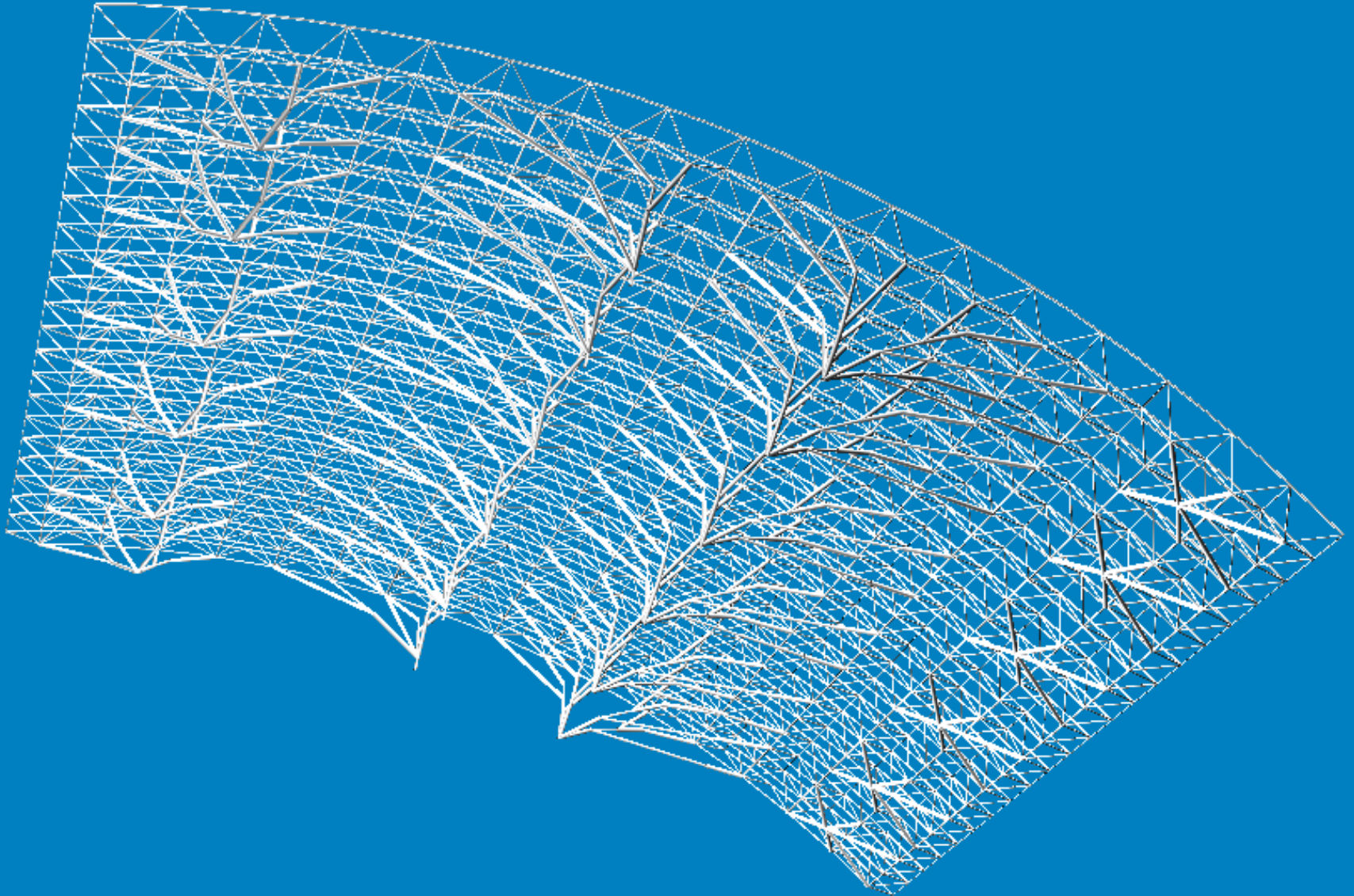




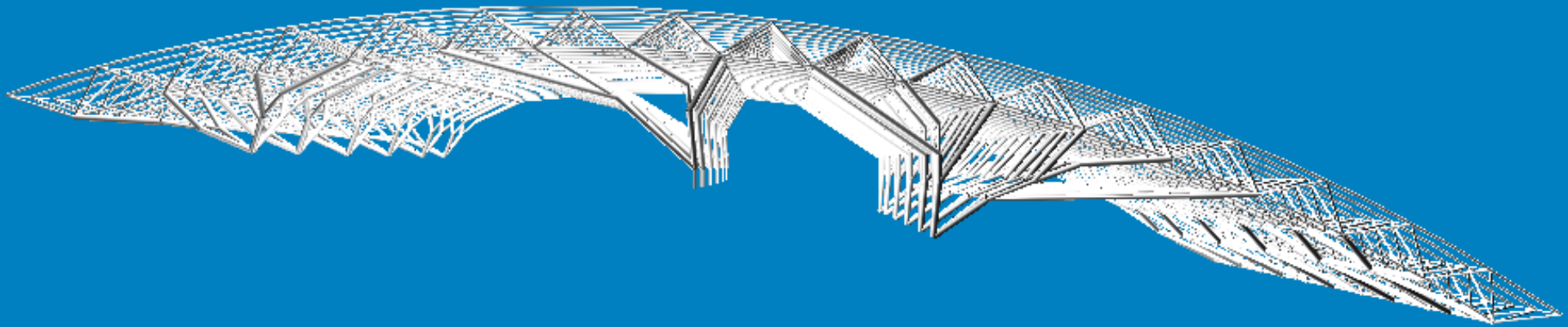
Cobertura de sombreamento vista superior



Cobertura de sombreamento vista inferior



Cobertura de sombreamento vista lateral









laboratórios

Modulação típica 10x10m

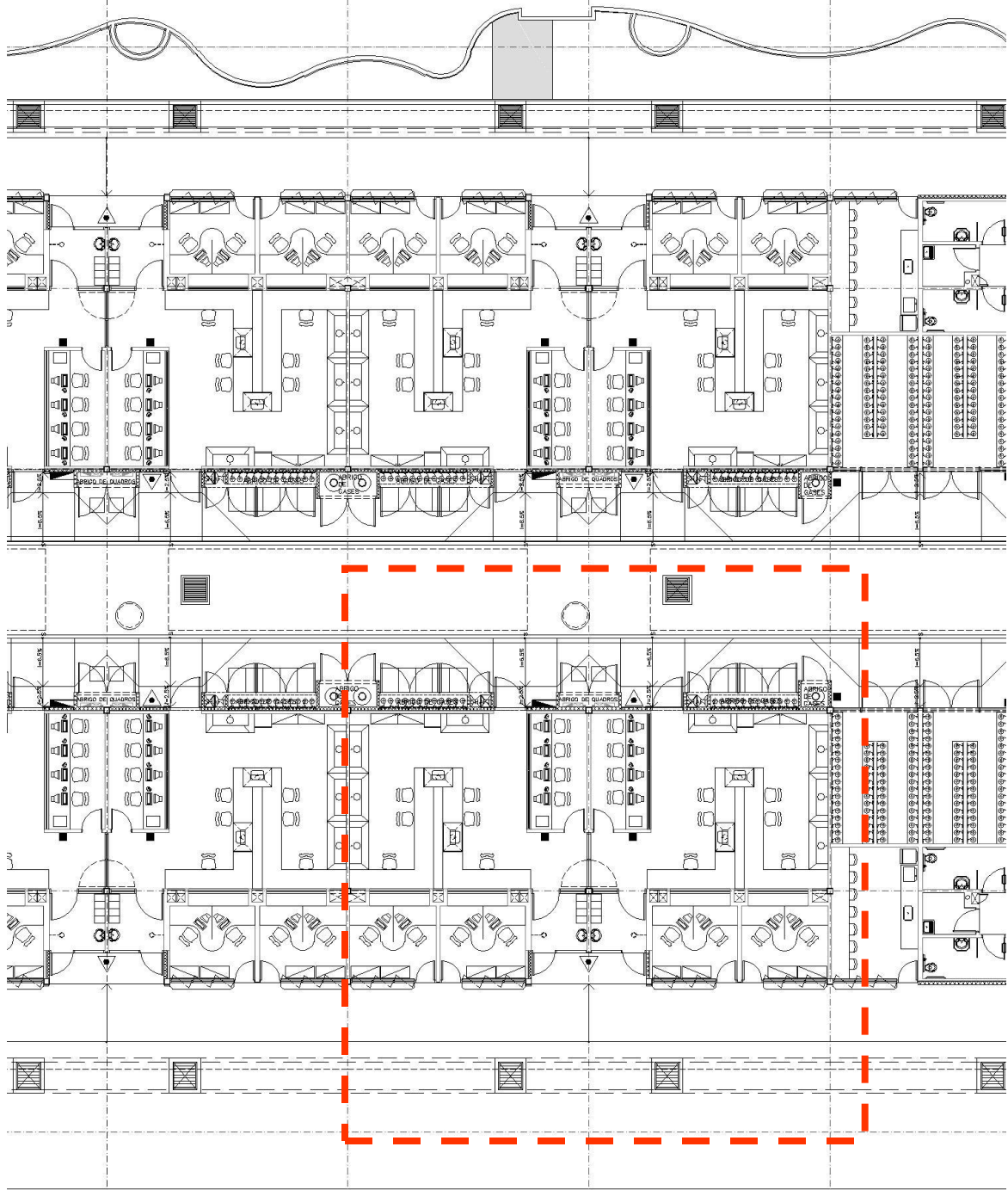
laje de piso em painéis alveolares protendidos, com sobre-laje para liberação de espaços intermediários para instalações.

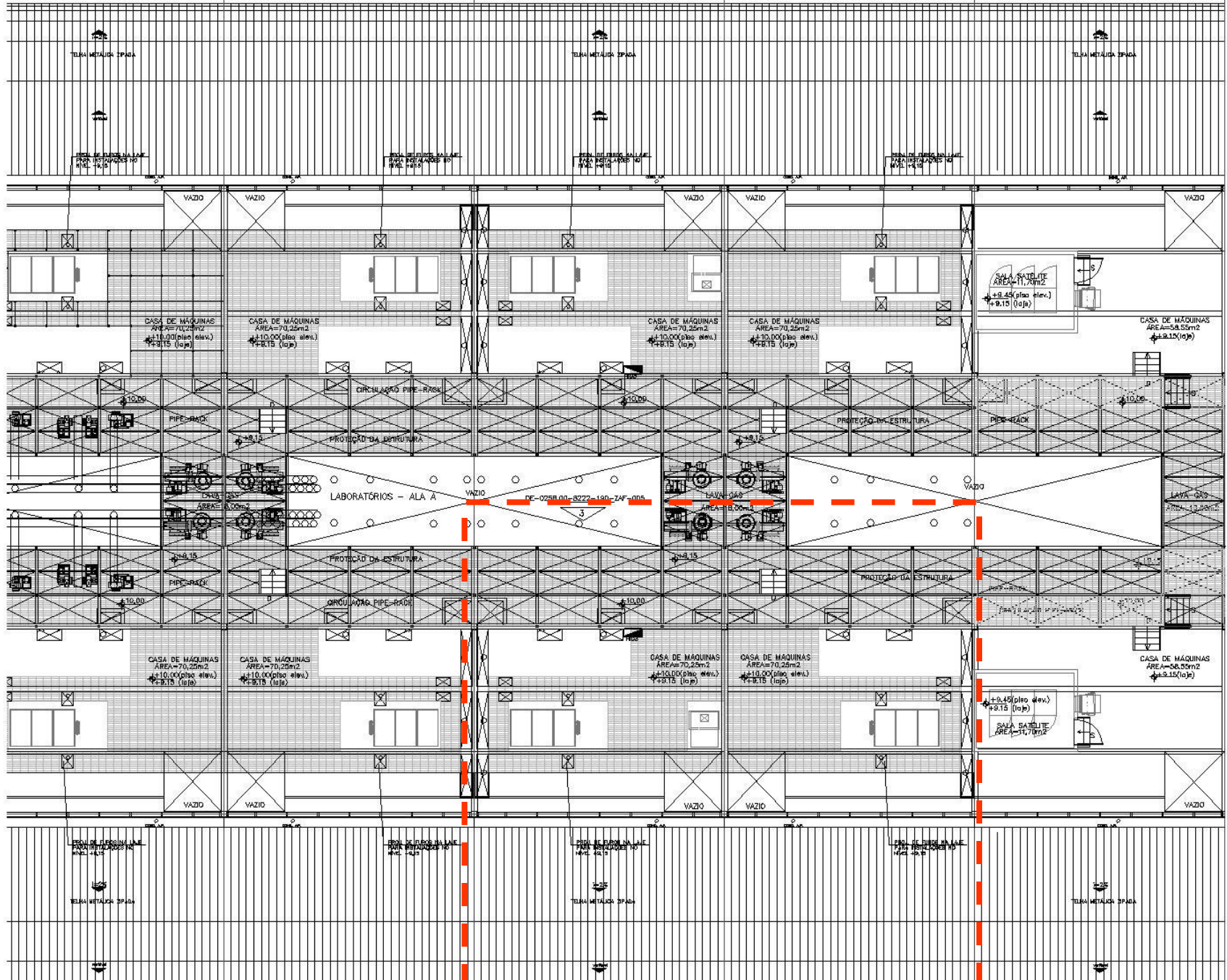
Superestrutura em aço com vigas mistas nos pisos técnicos

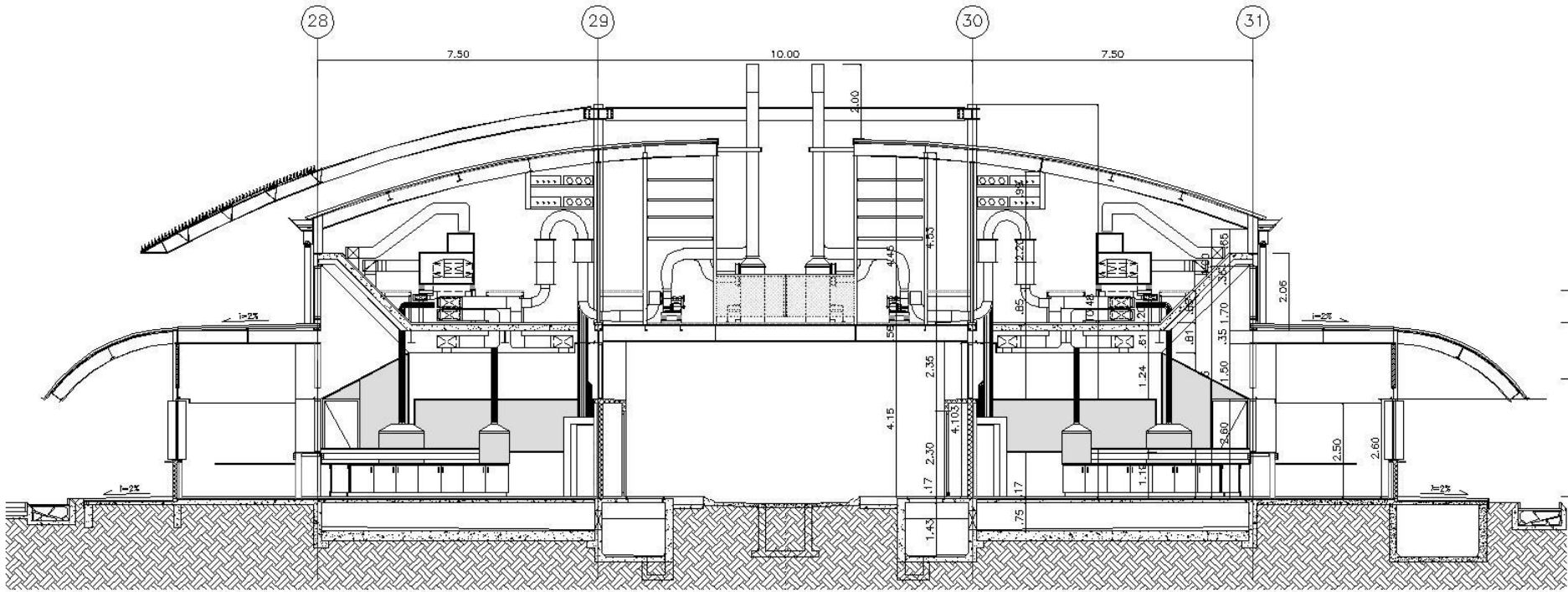
Cobertura de sombreamento /suporte de coletores solares

2.200t

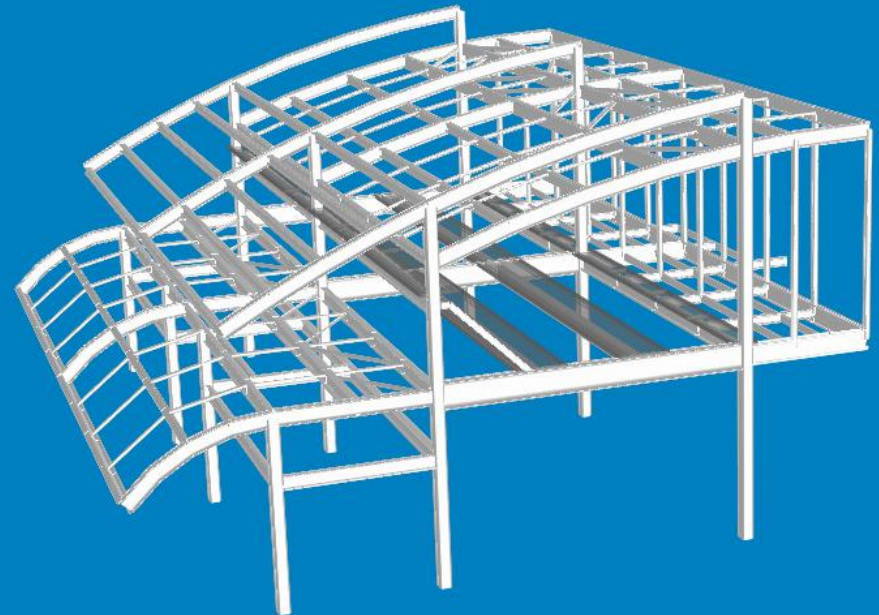
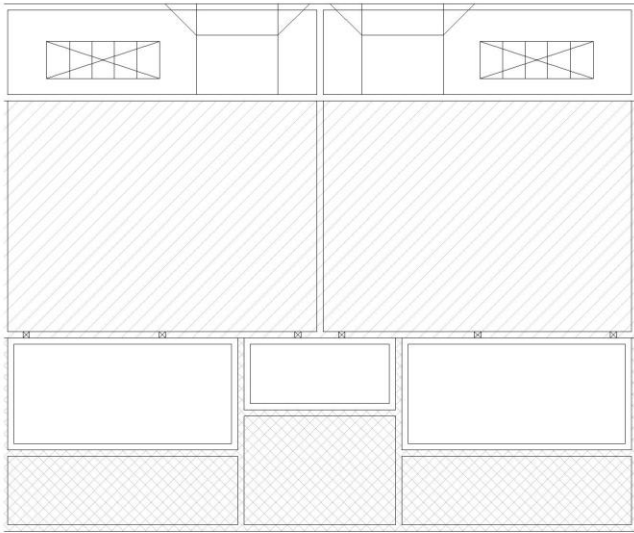


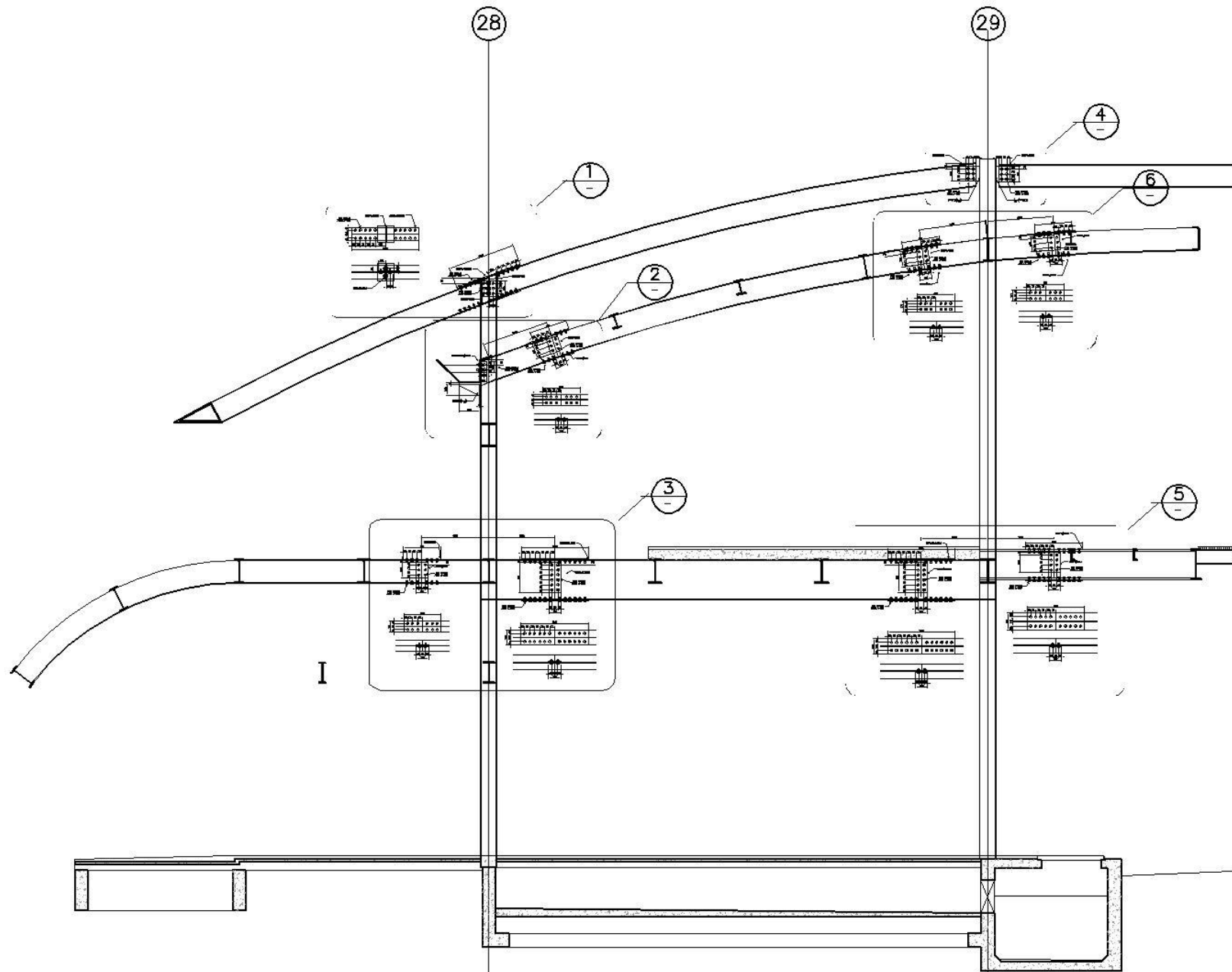




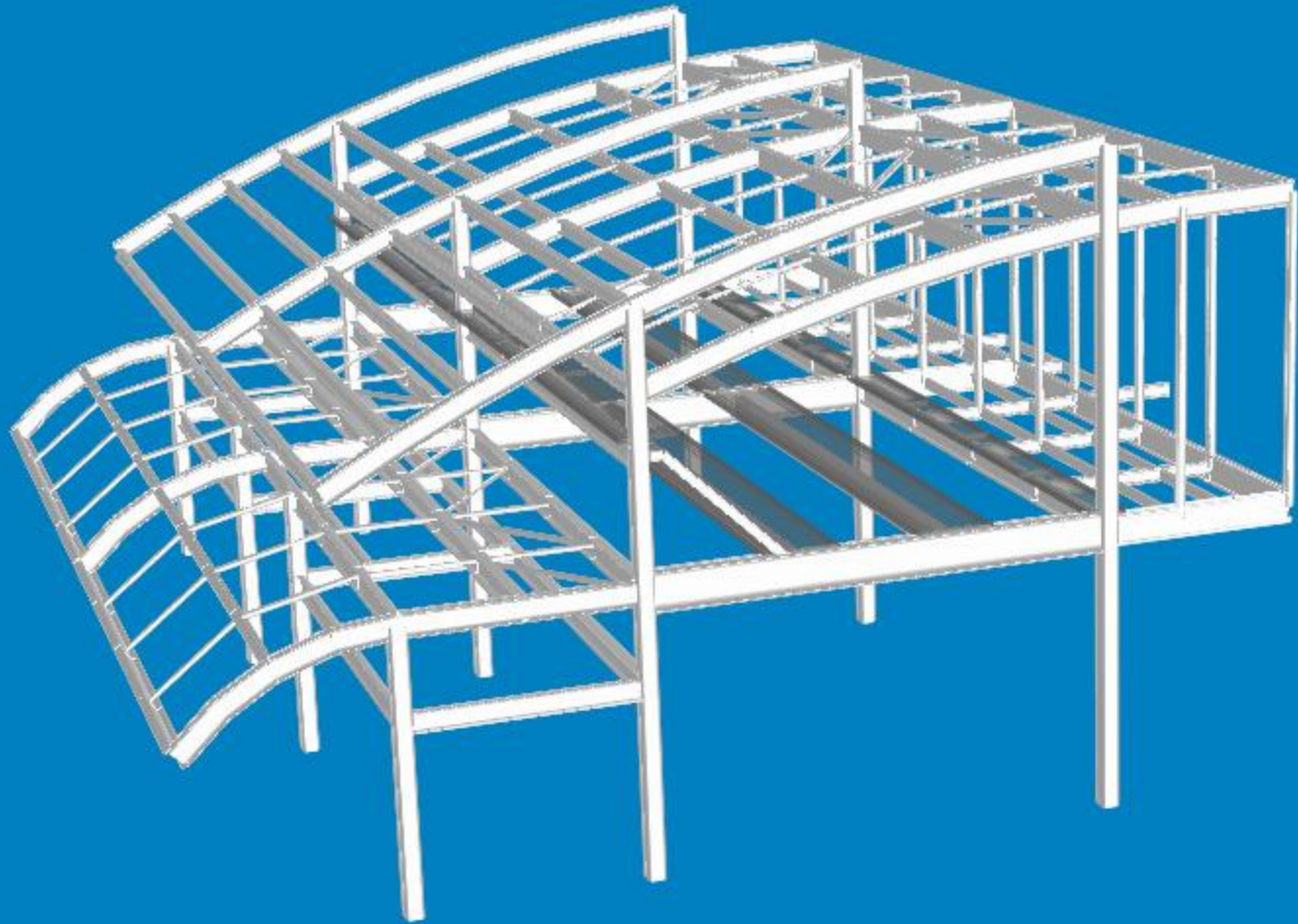


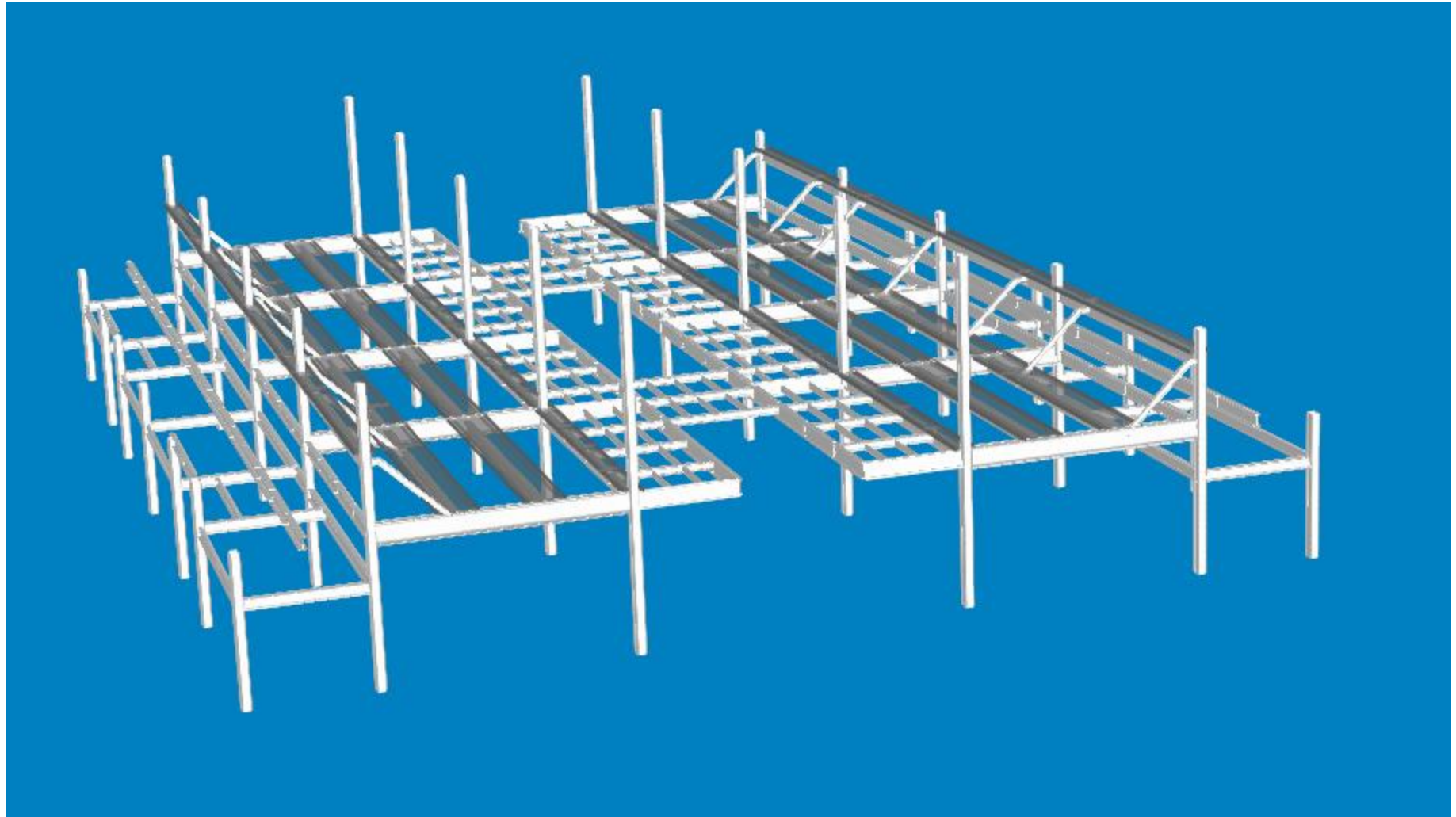
Modulo típico

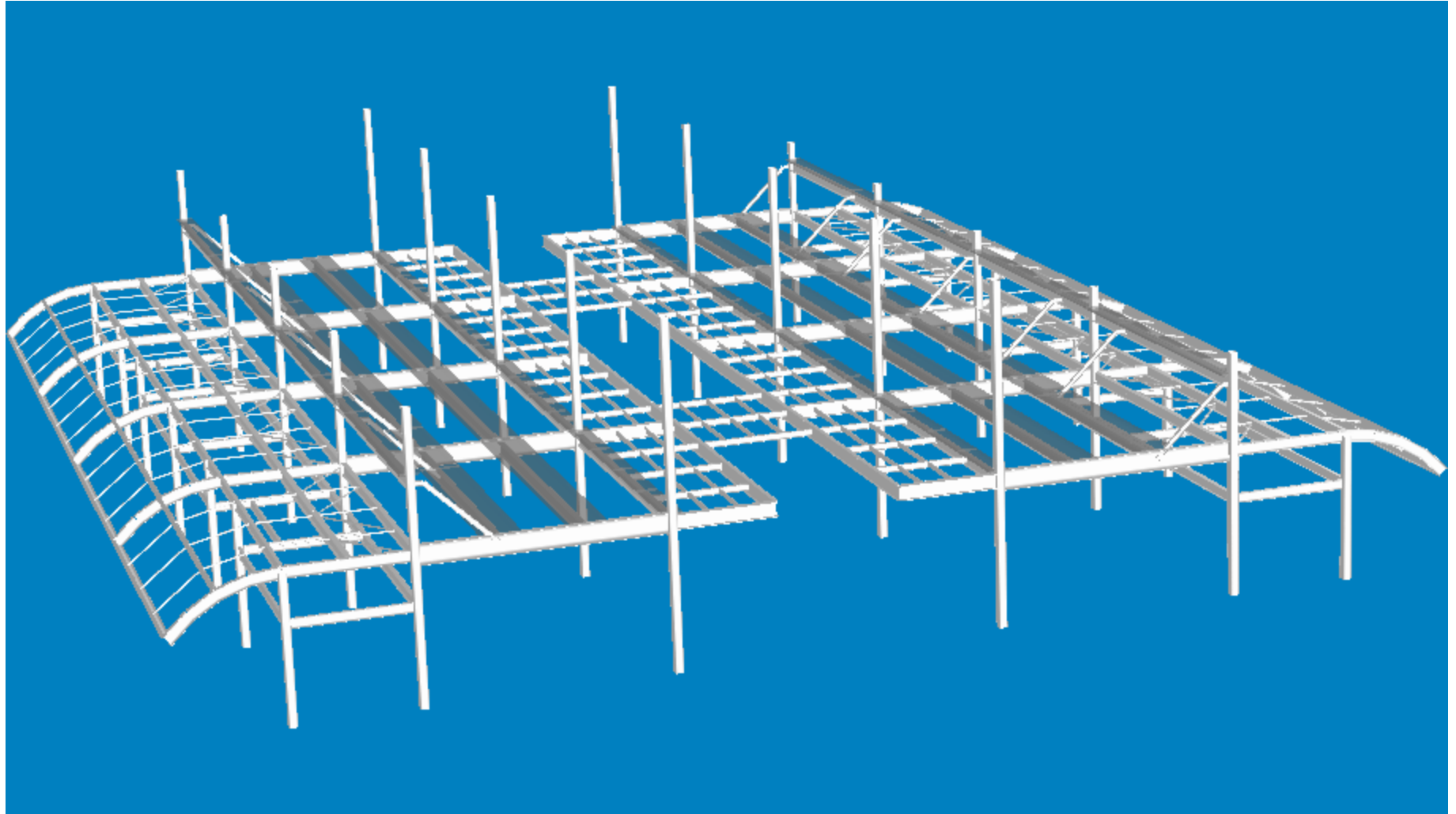


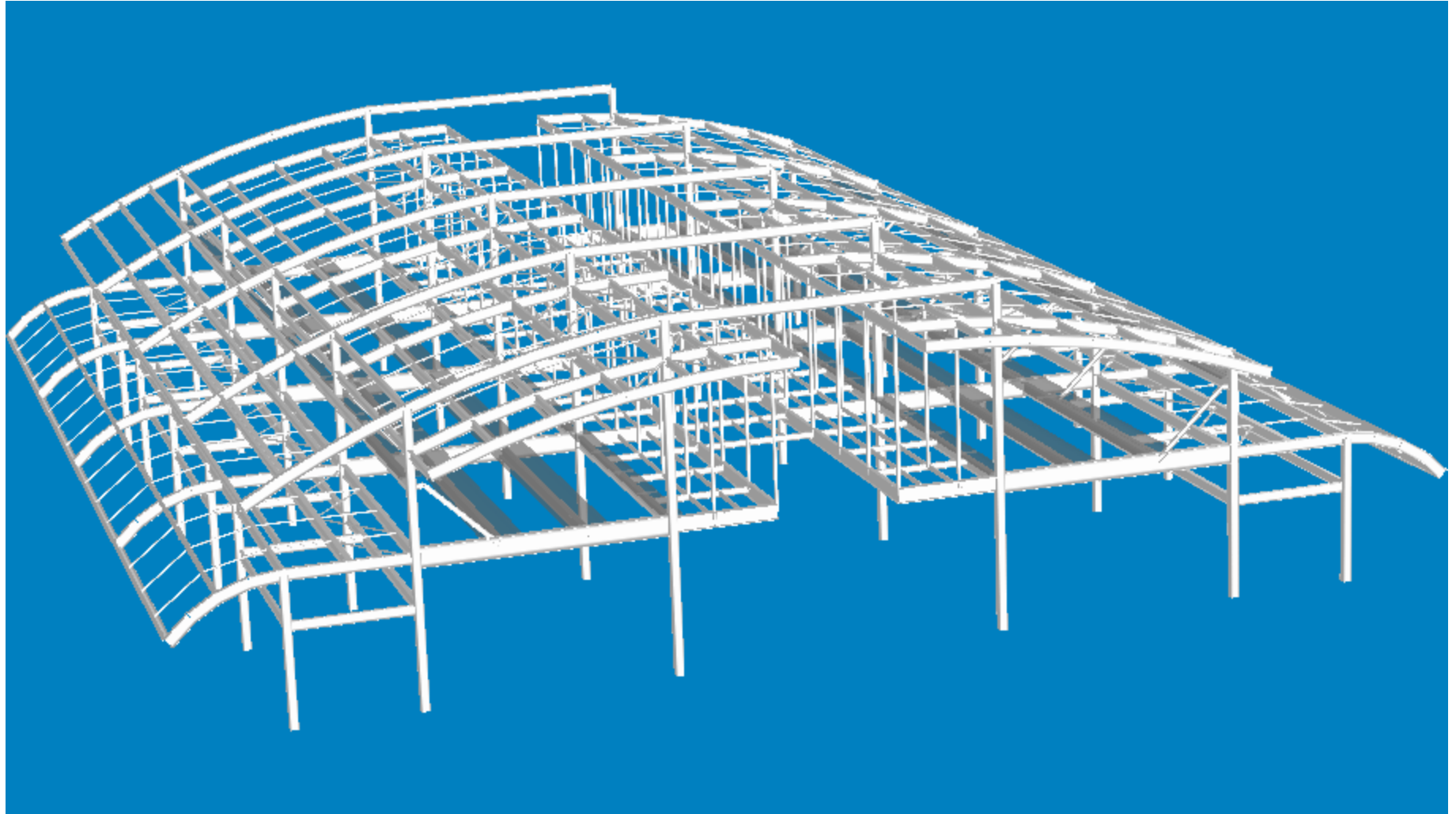


Seqüência de montagem













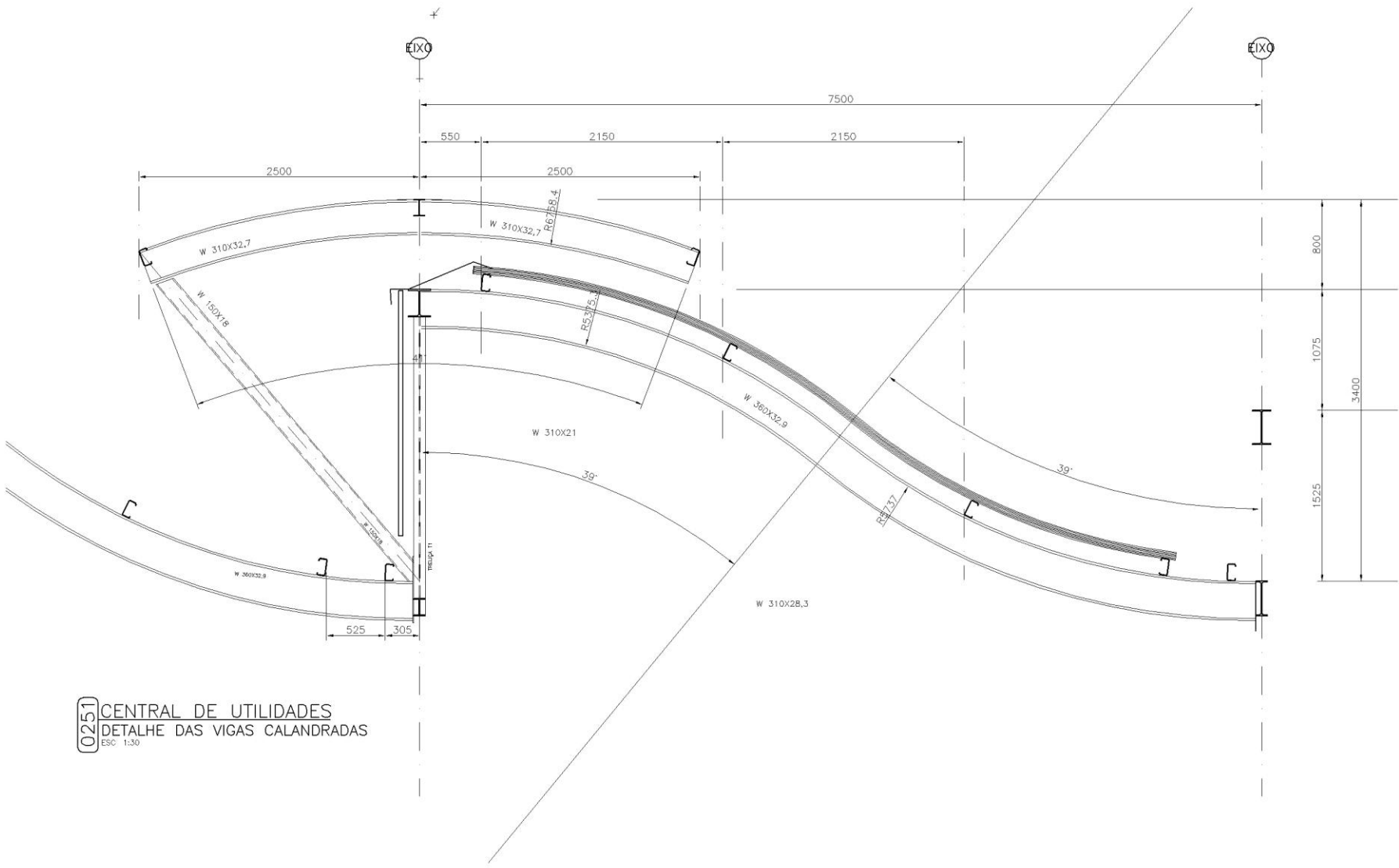
Central de utilidades



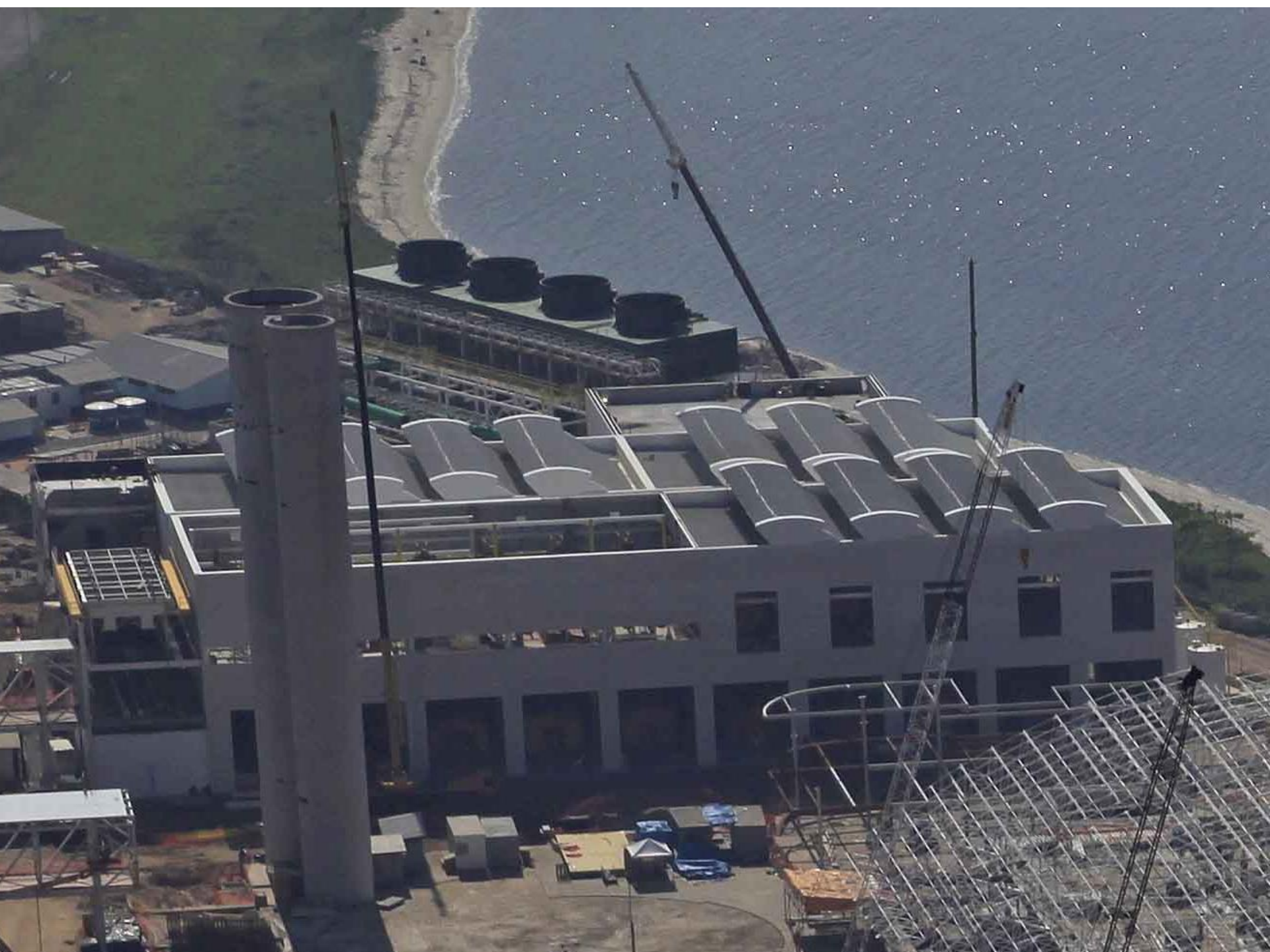
Estrutura metálica em
sheed, com pisos
técnicos

Para $2\text{t}/\text{m}^2$ em lajes
mistas

565t



CEU CENTRAL DE UTILIDADES
 DETALHE DAS VIGAS CALANDRADAS
 ESC: 1:30





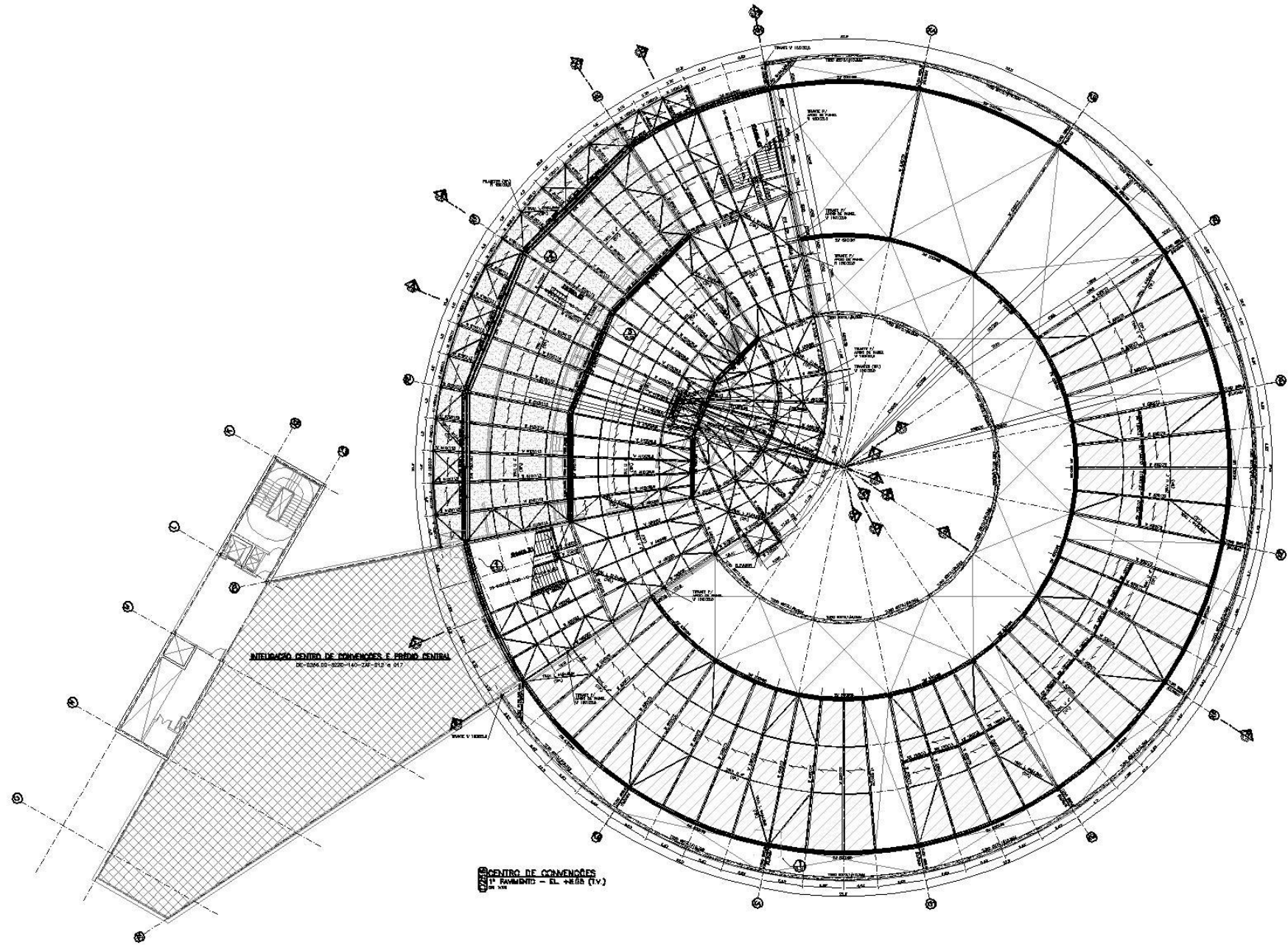
Centro e convenções

Estrutura radial

Com cobertura de
sombreamento em lona
tracionada

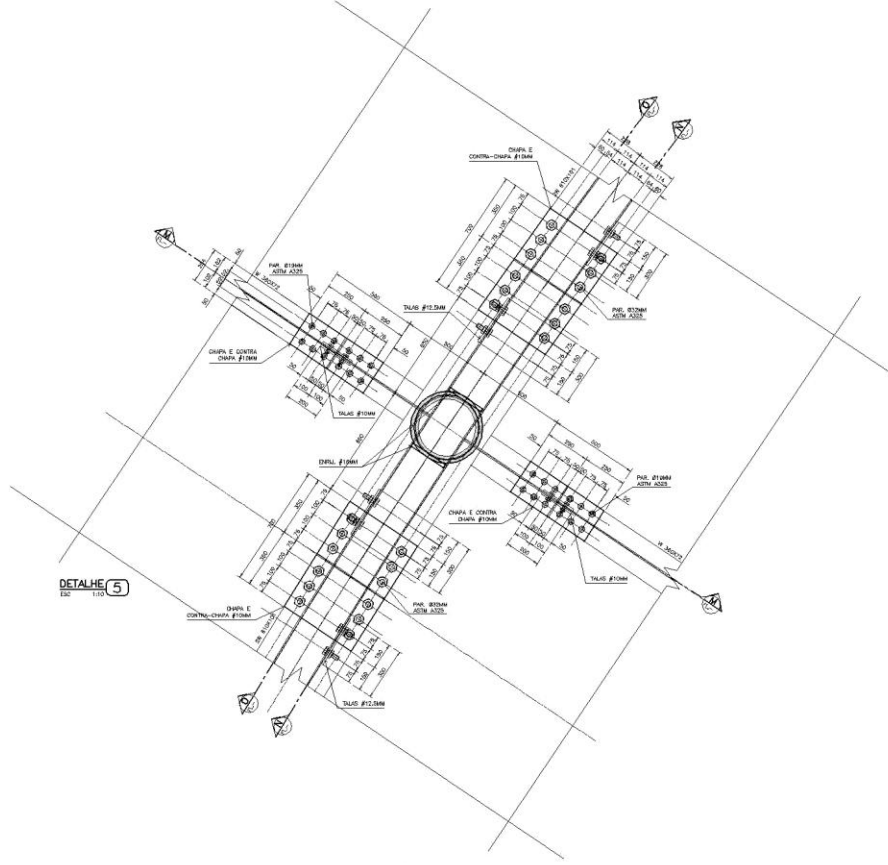
Diametro de 75m

470t

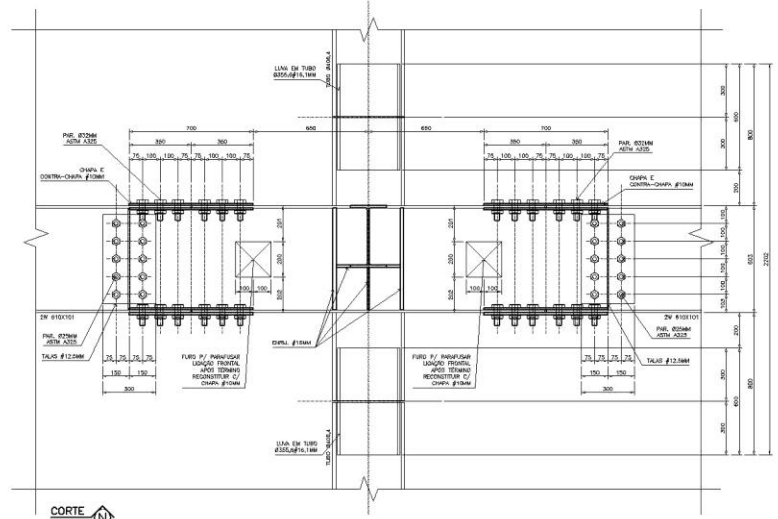


MUSEO CENTRO DE FOMENTOS Y PABLO CENTRA

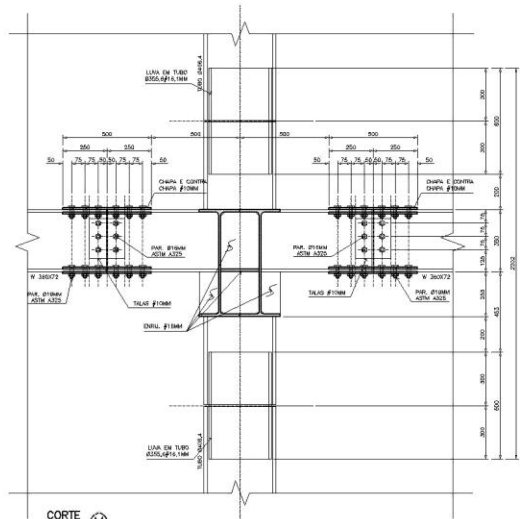
CENTRO DE CONVENIOS
1º PAVIMENTO - EL 4º BS (IV)



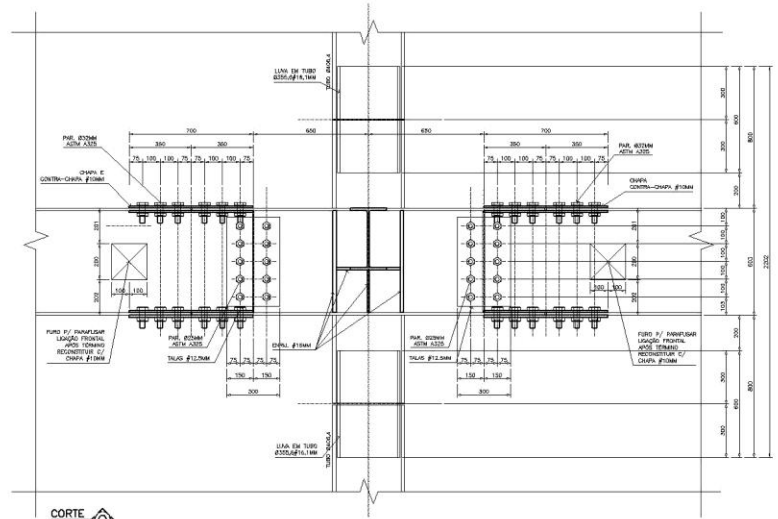
DETALHE 5



CORTE 1110

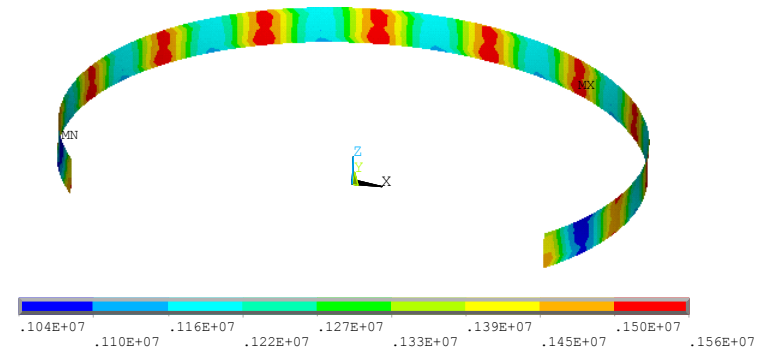
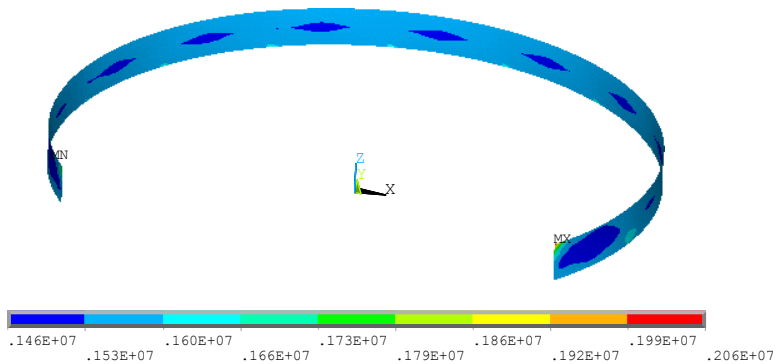
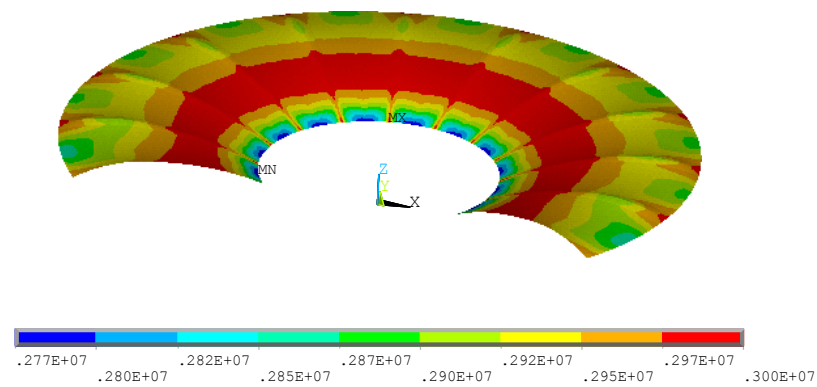
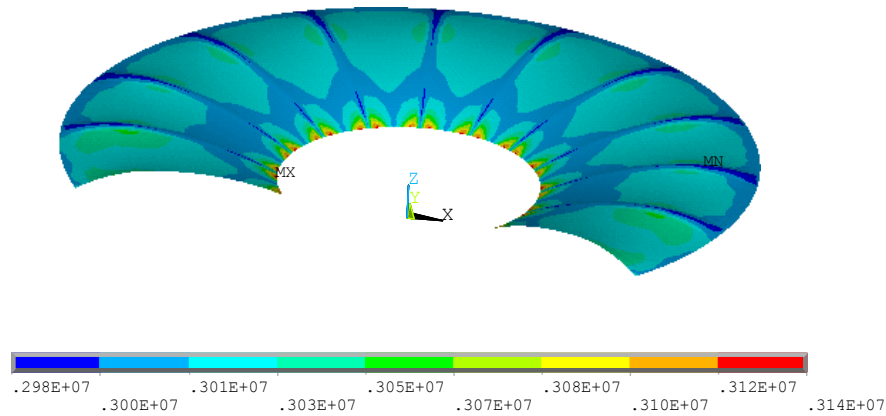


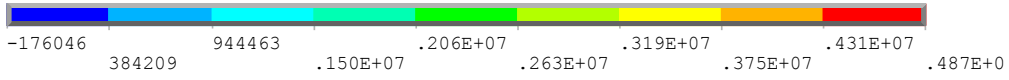
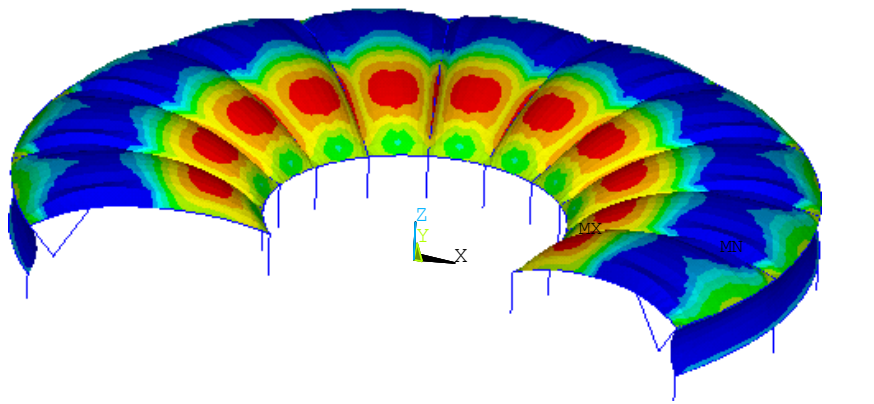
CORTE 1110



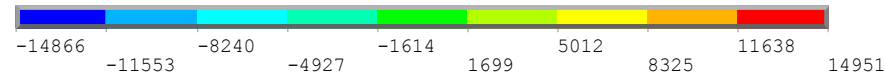
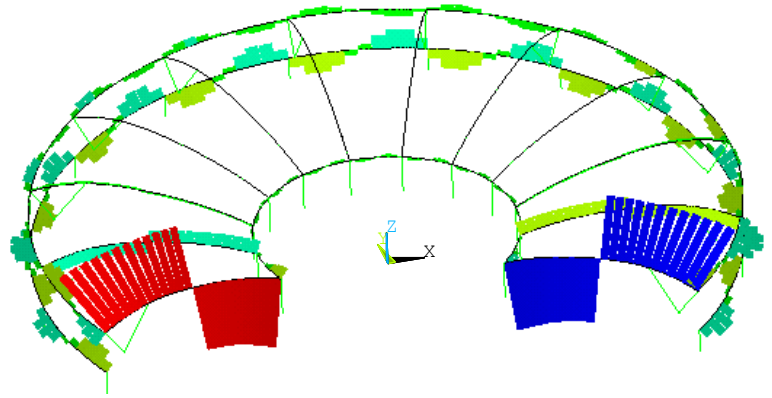
CORTE 1110

tensões principais maximas e minimas

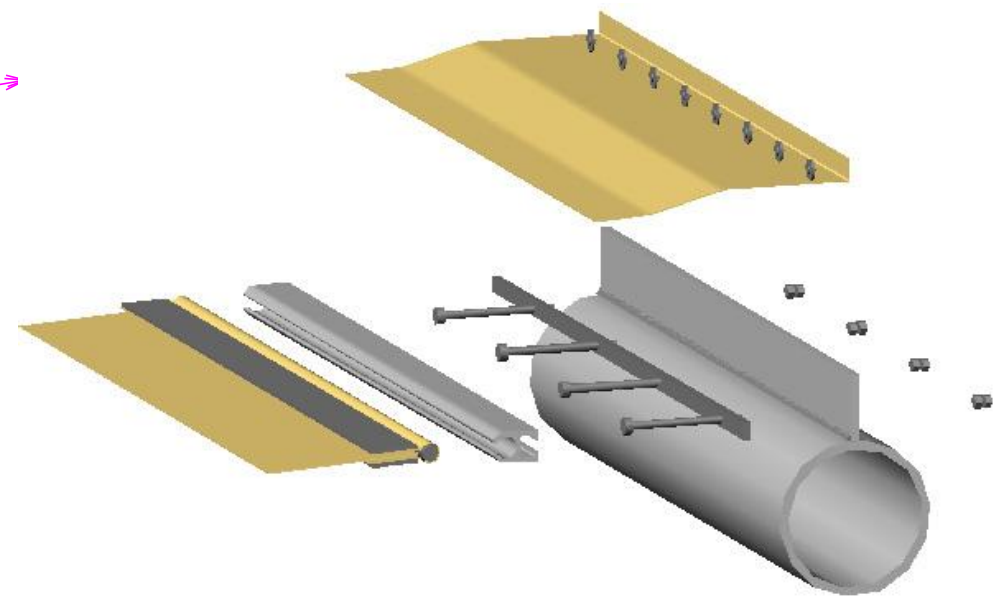
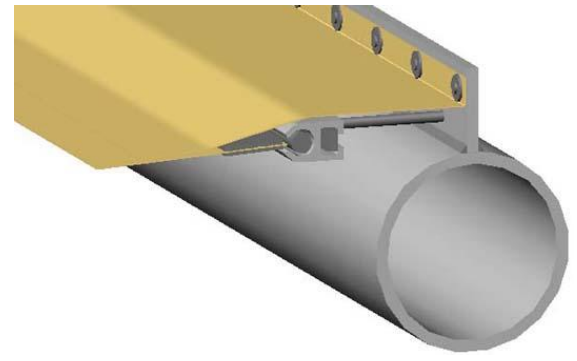
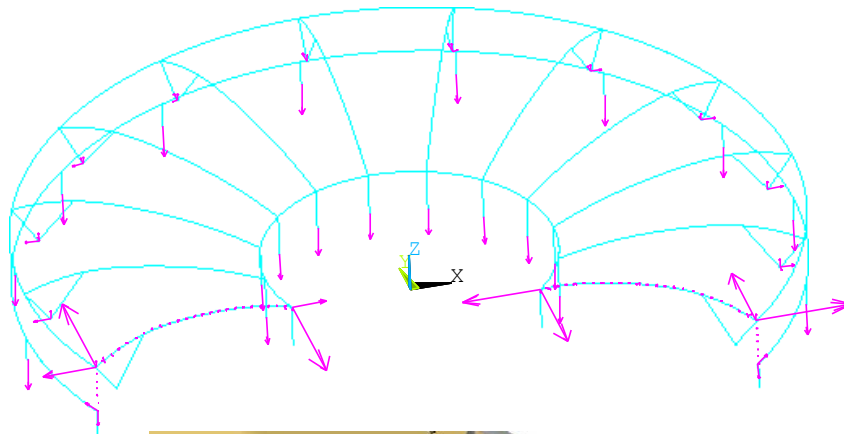


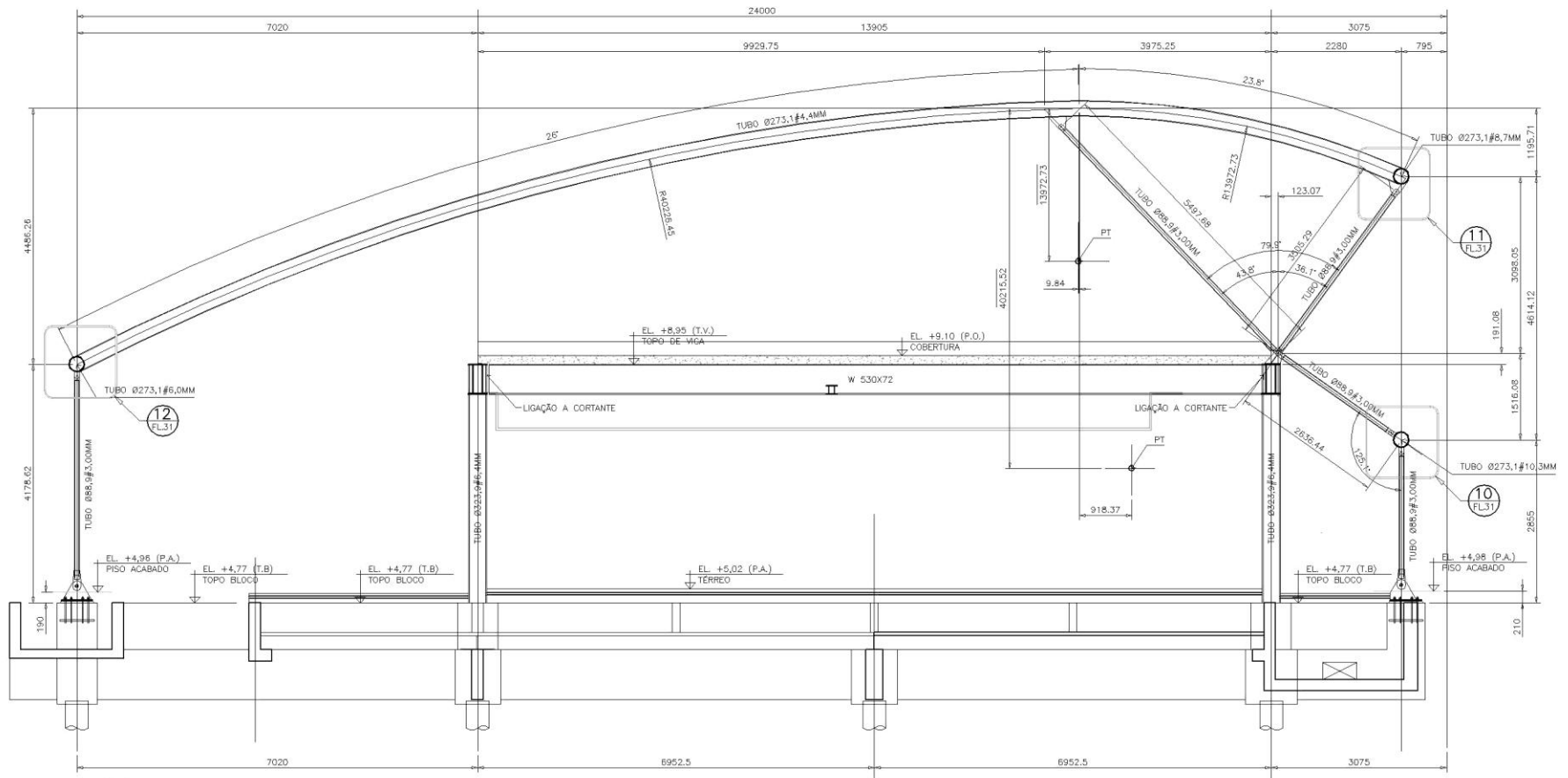


10
 =-14866
 =409
 =14951
 =499

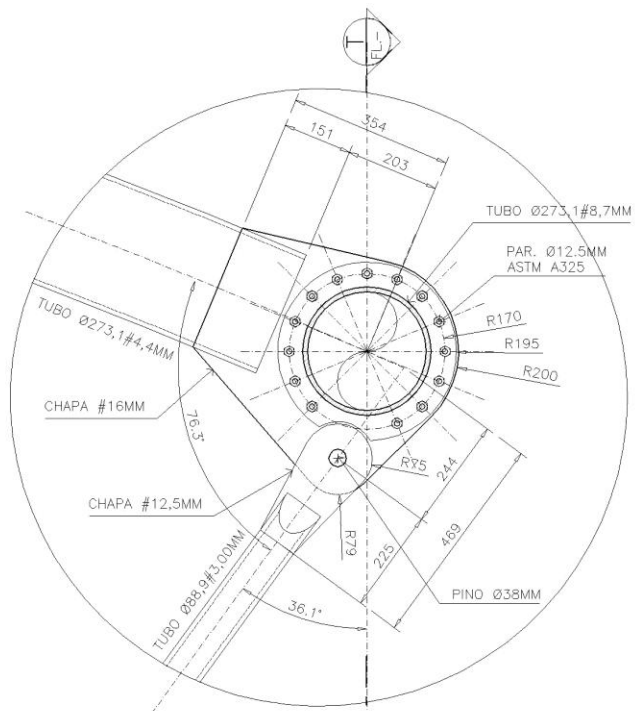


s-rev-3

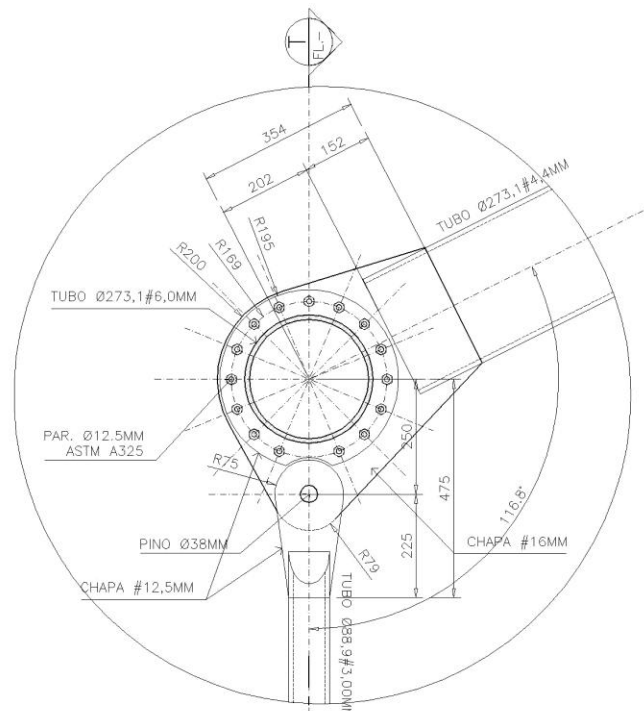




0256 CENTRO DE CONVENÇÕES
 CORTE LONGITUDINAL H-H
 ESC 1:50

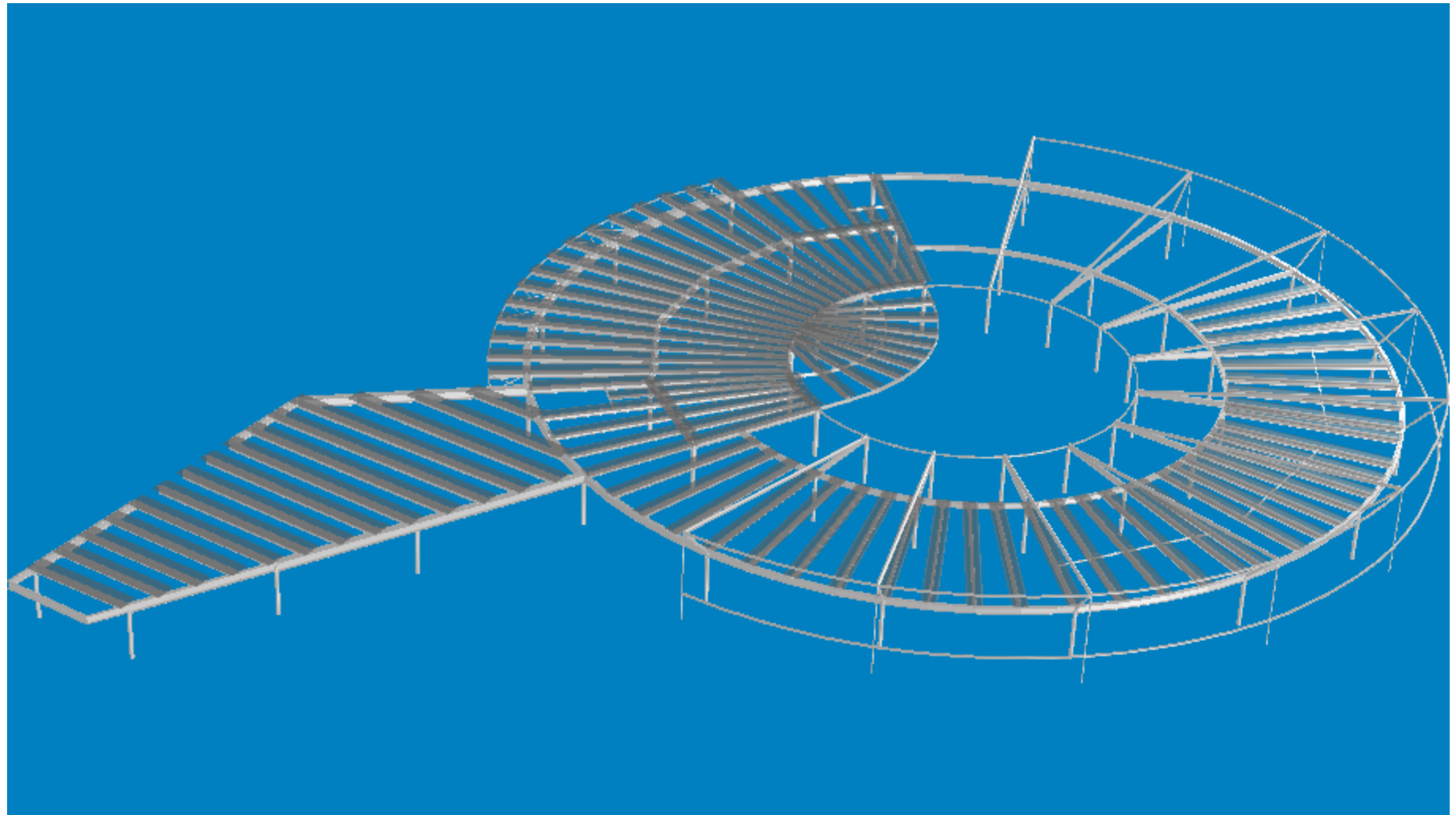


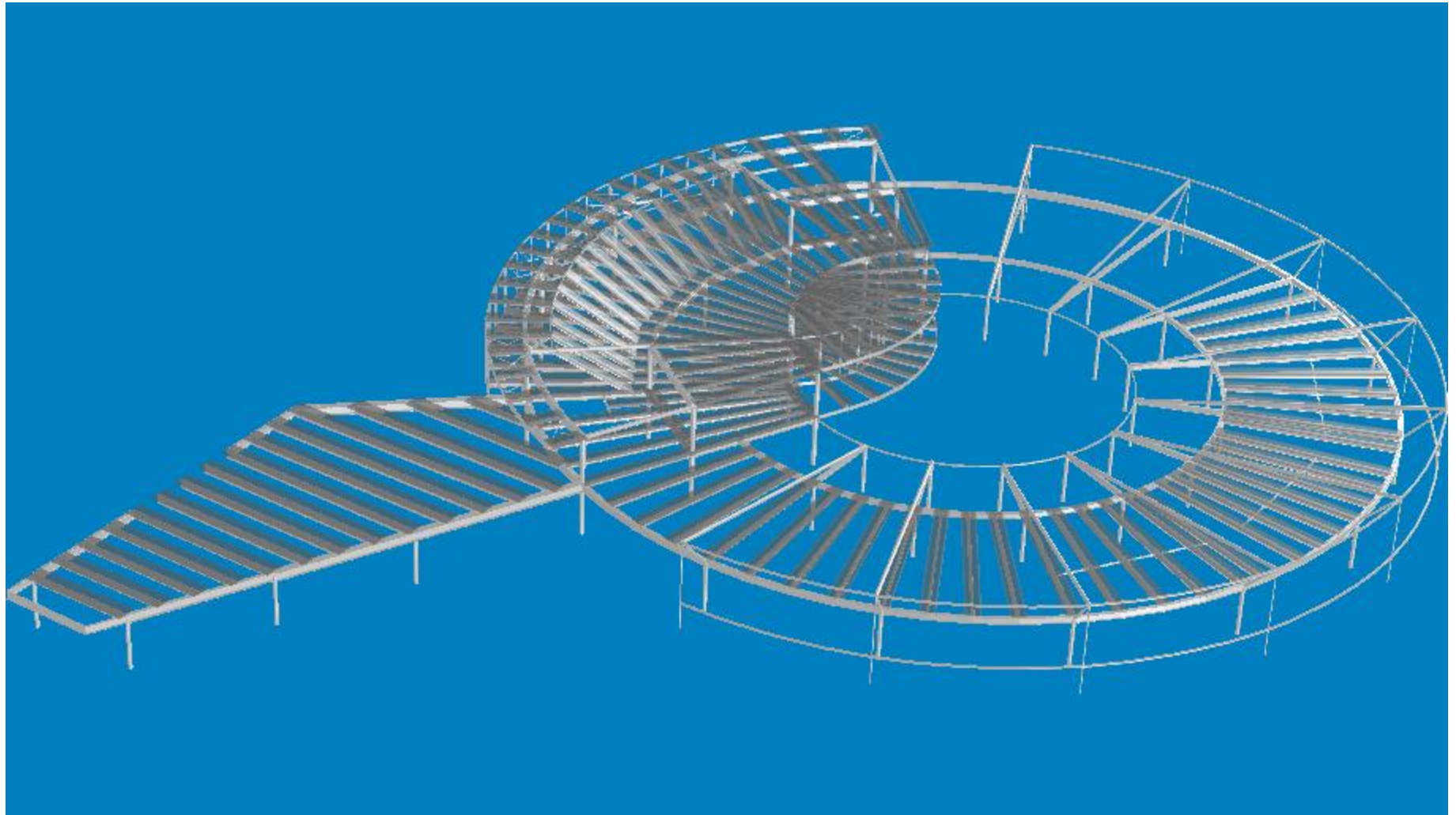
DETALHE 11
ESC 1:10

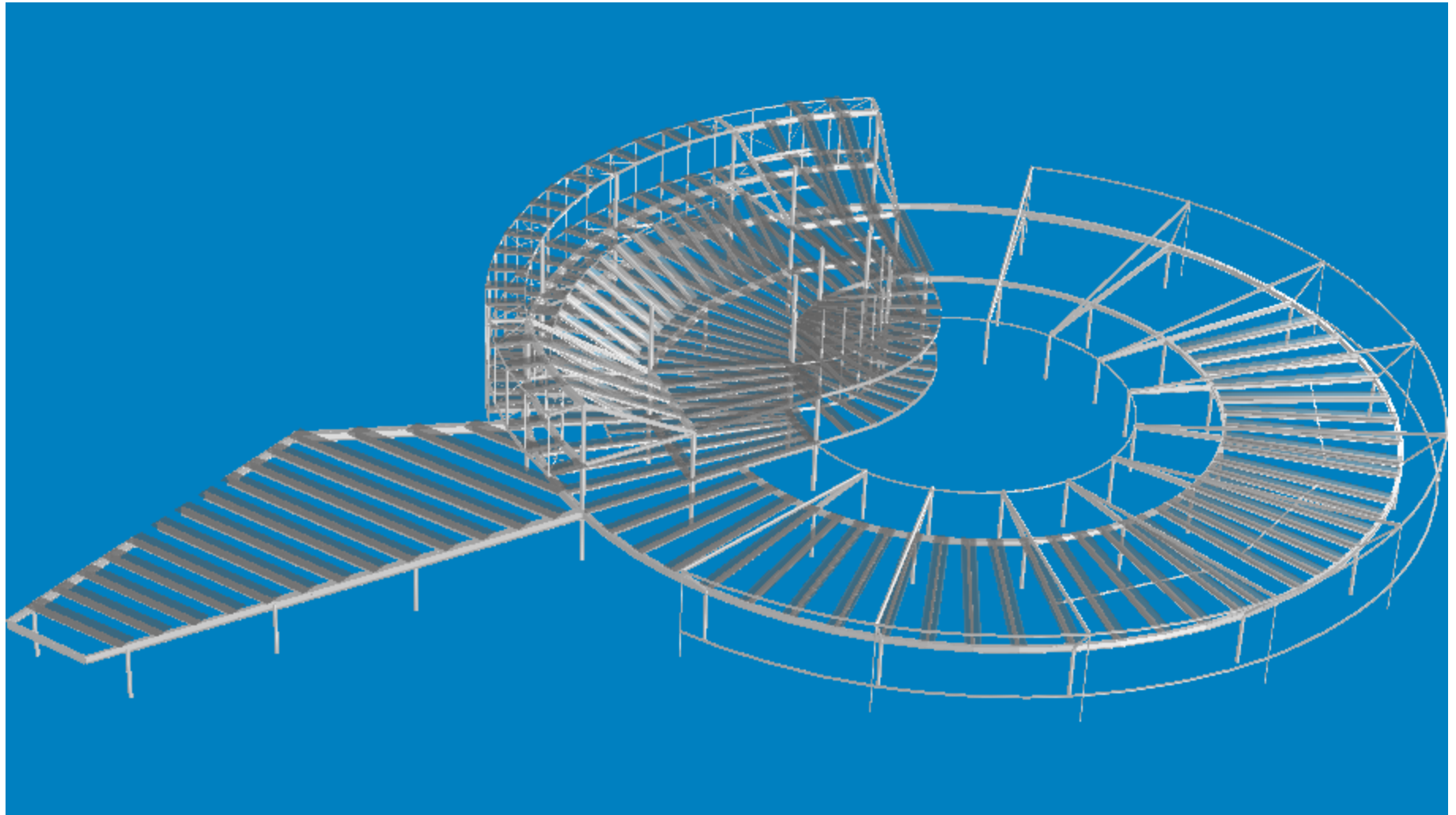


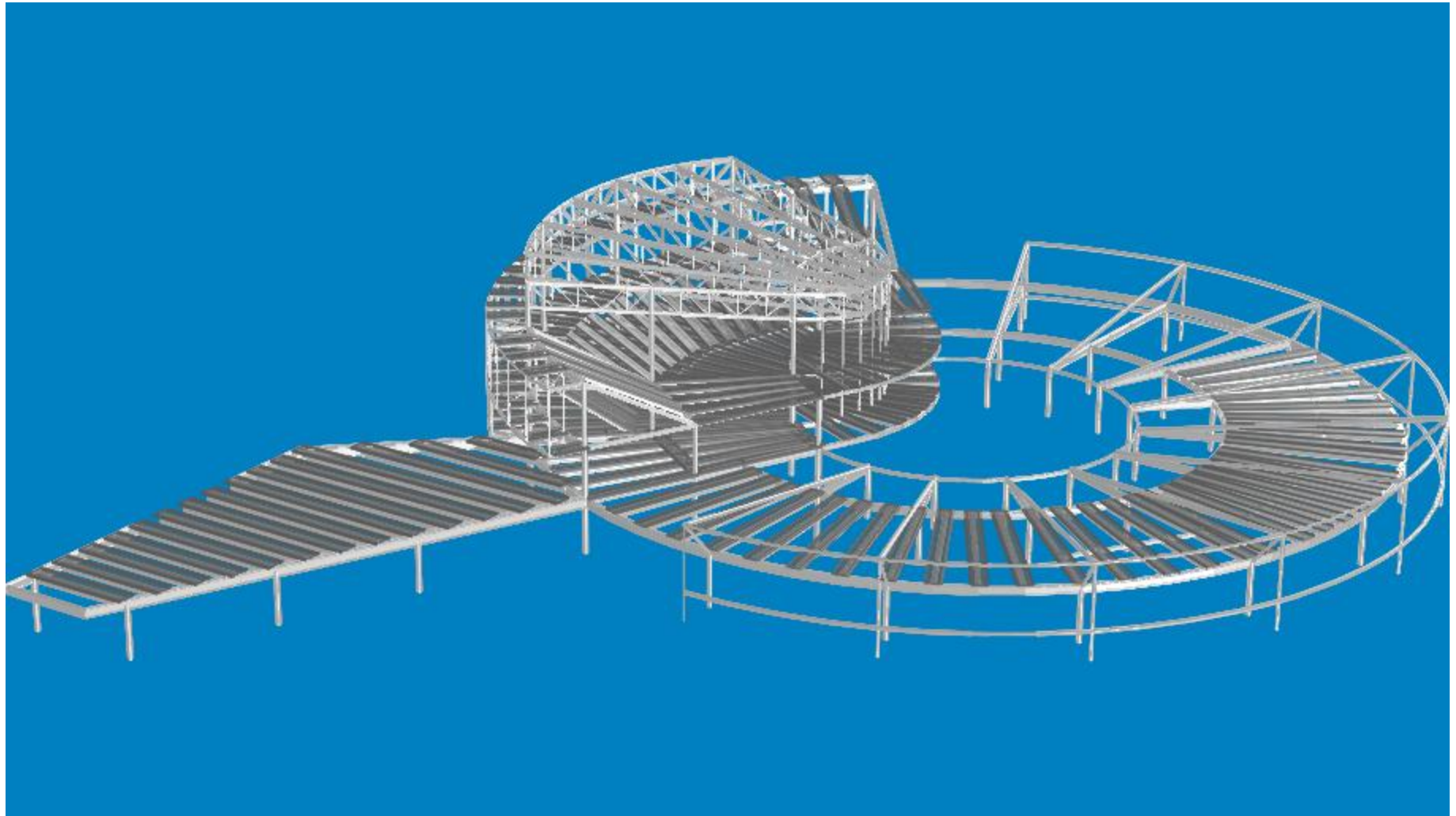
DETALHE 12
ESC 1:10

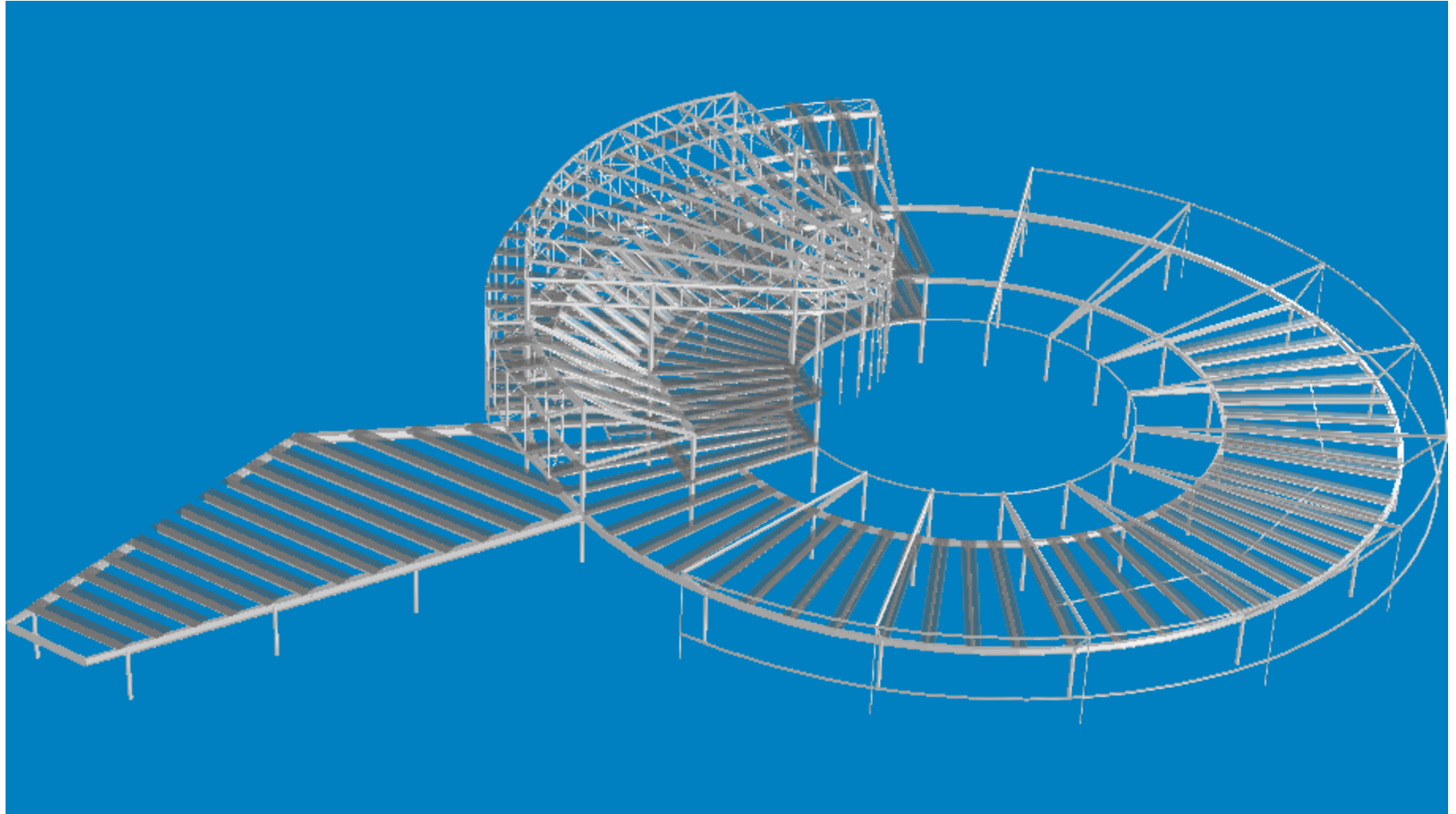
Seqüência de montagem

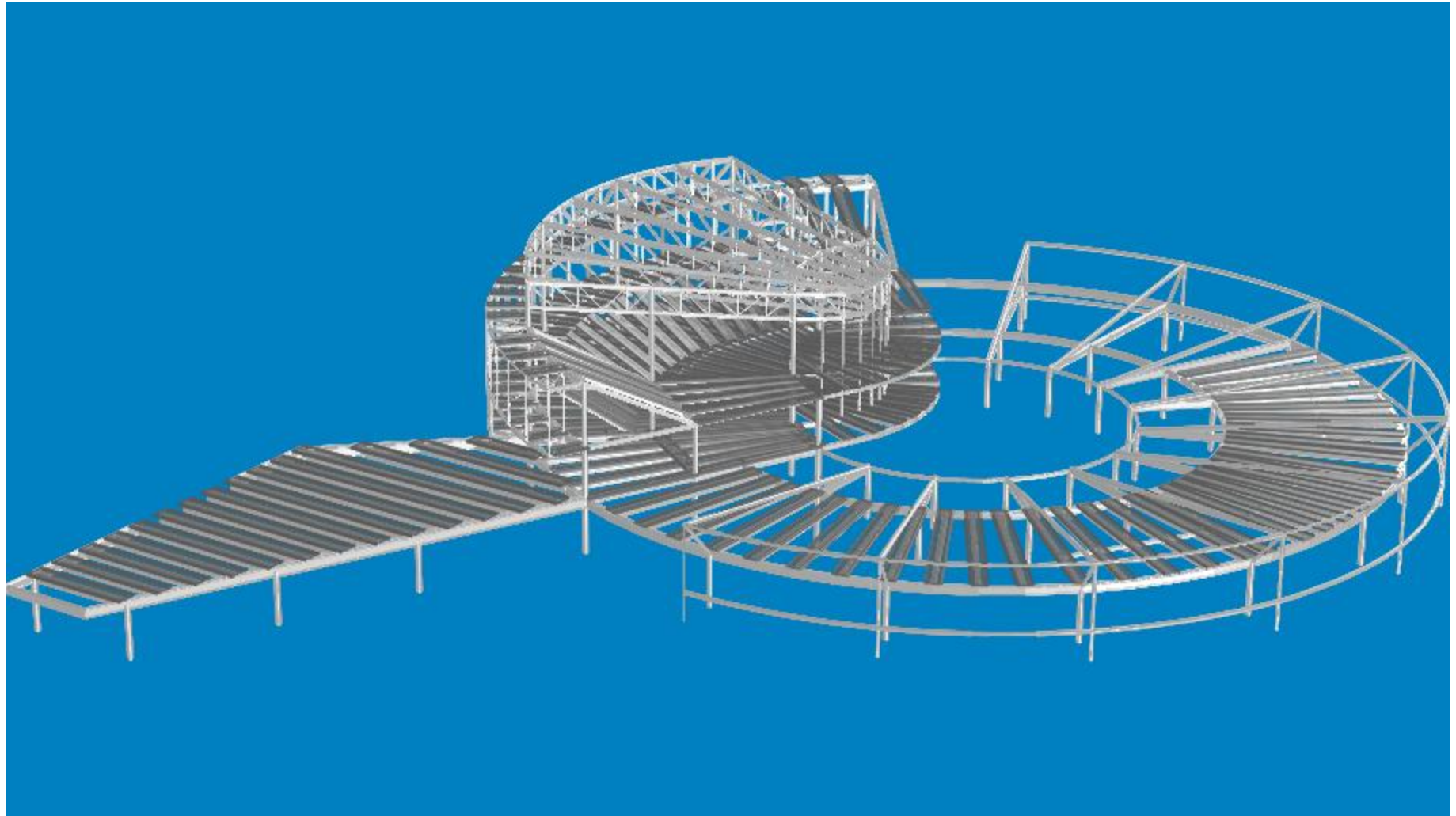


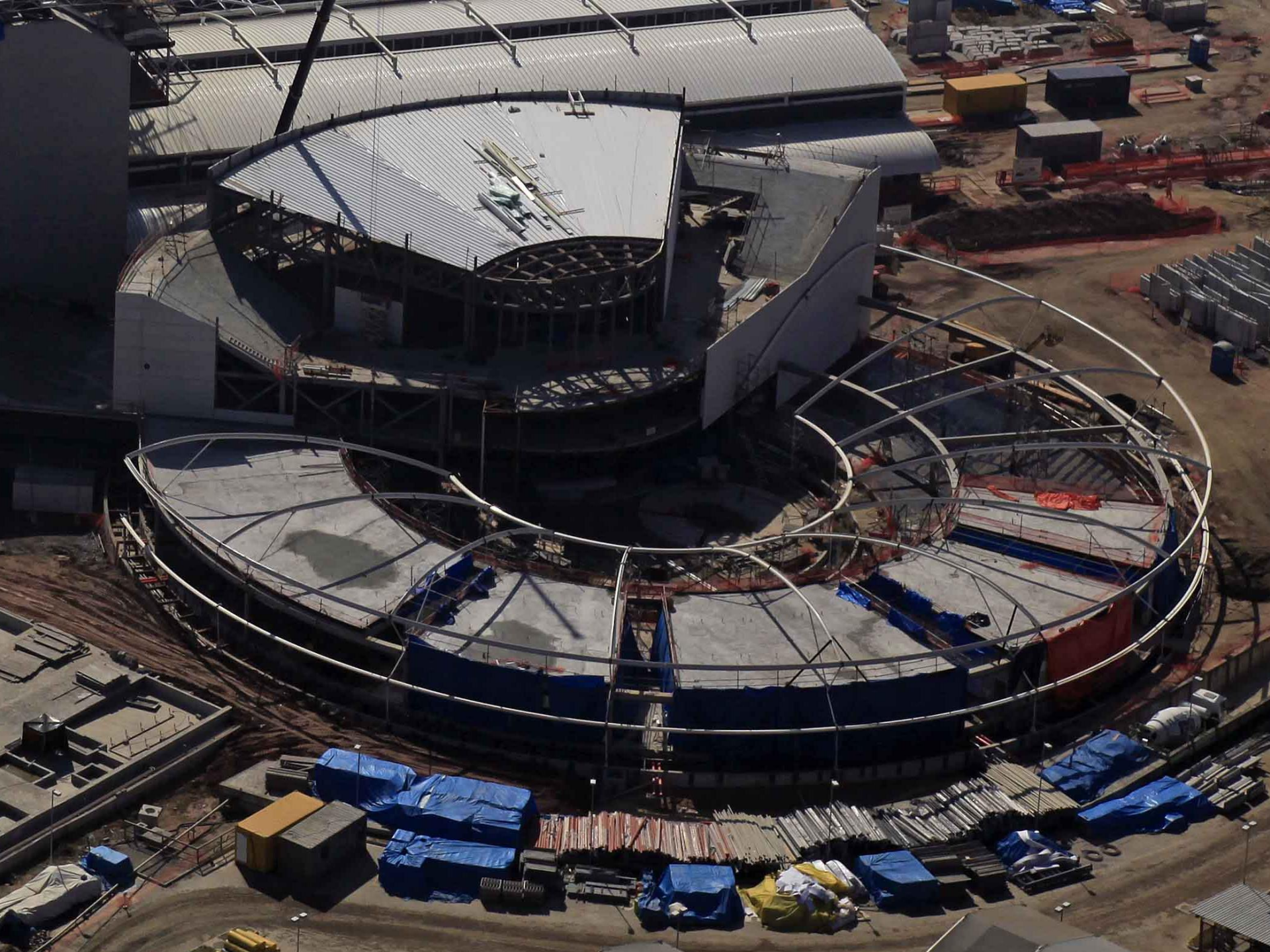
















crv

Geodesica eliptica

960 triangulos

(576 diferentes)

1623 barras

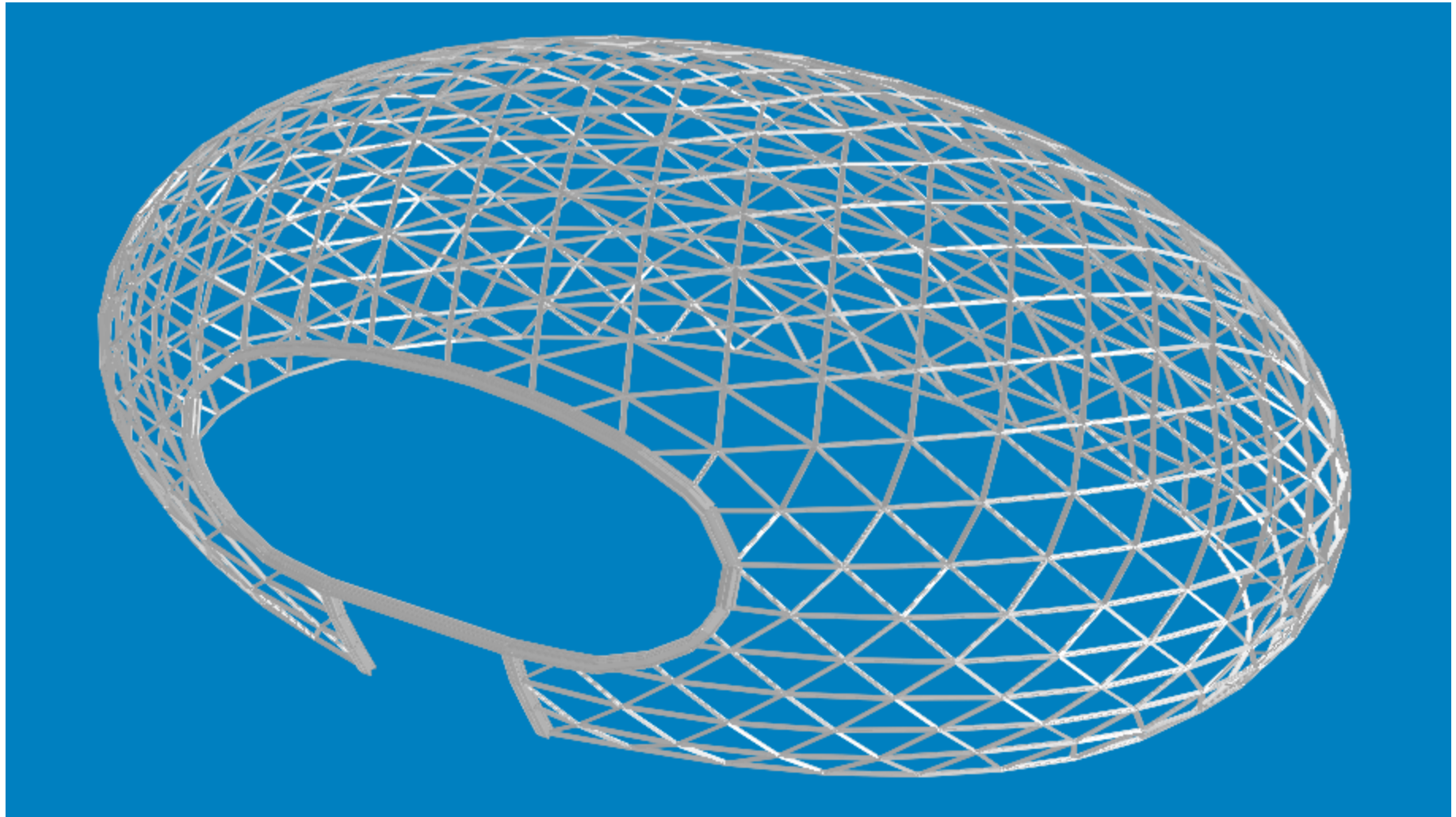
477 nós

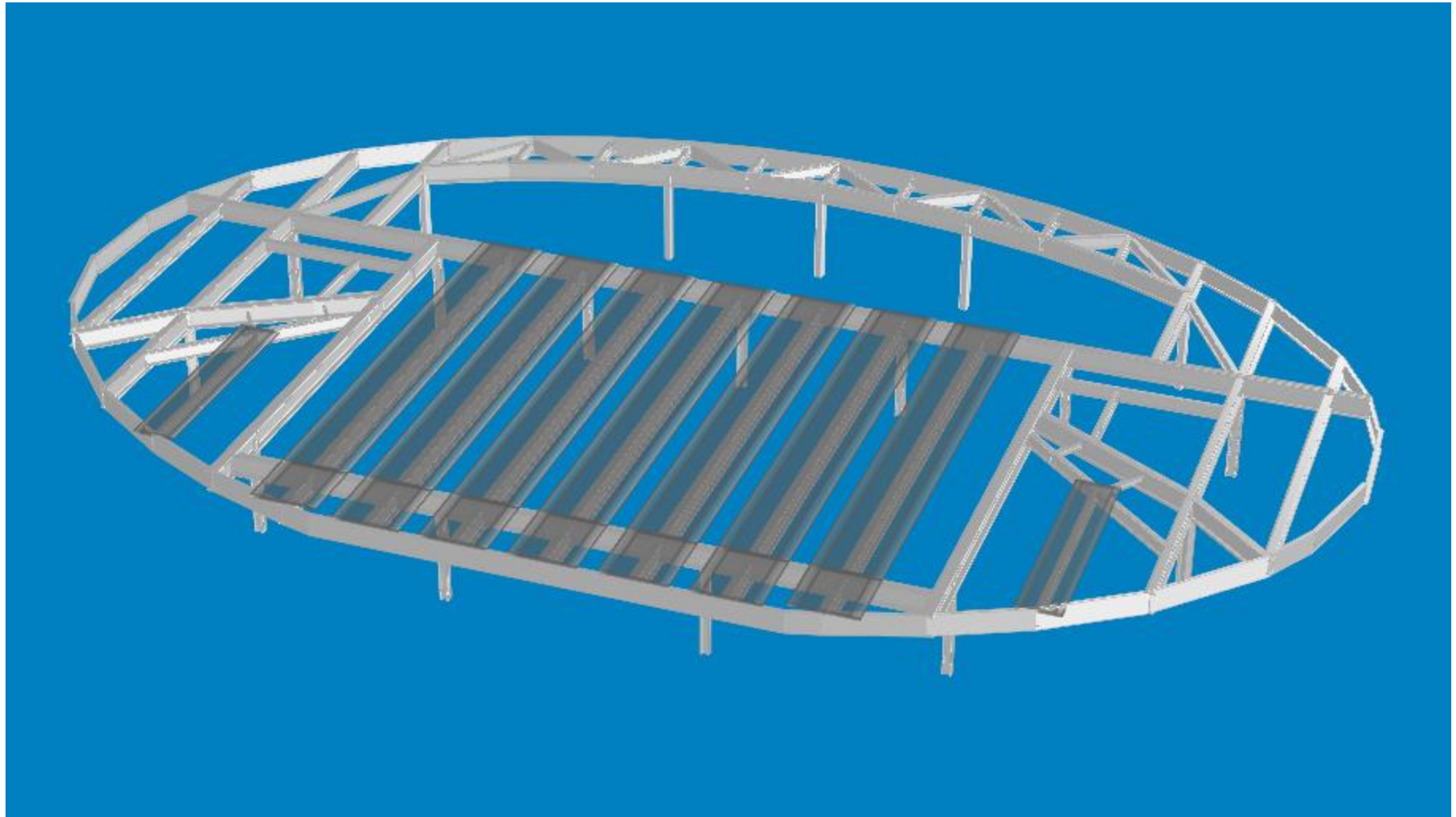
Com 35x20m

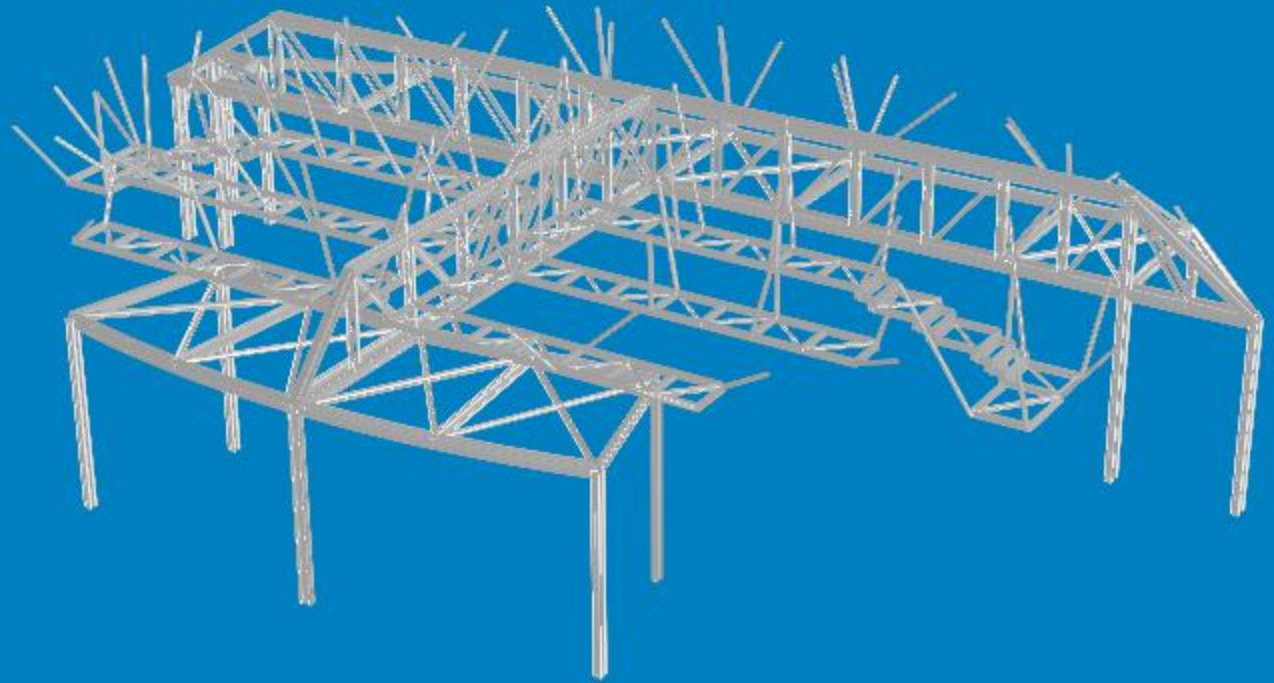
Altura 14m

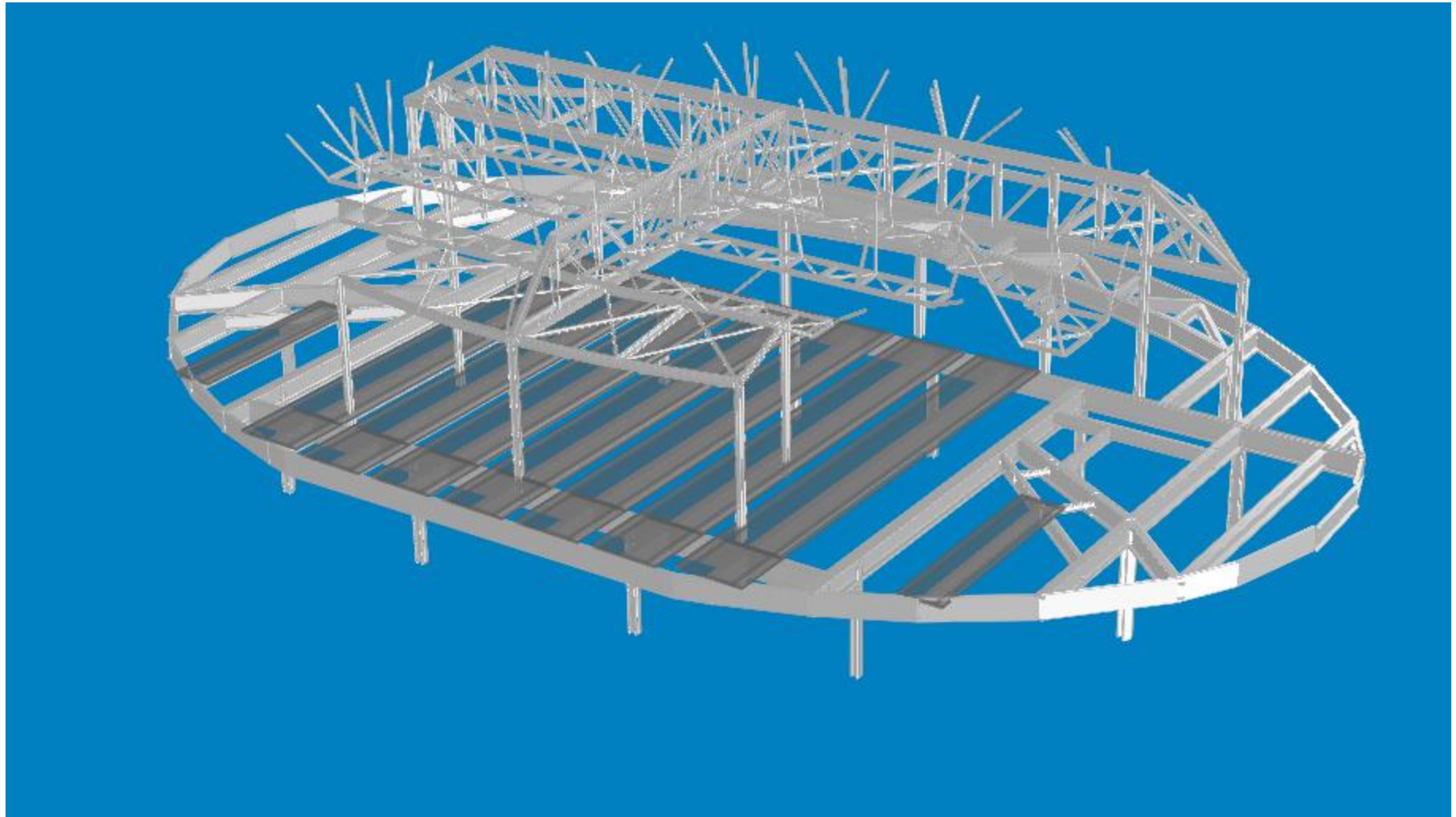
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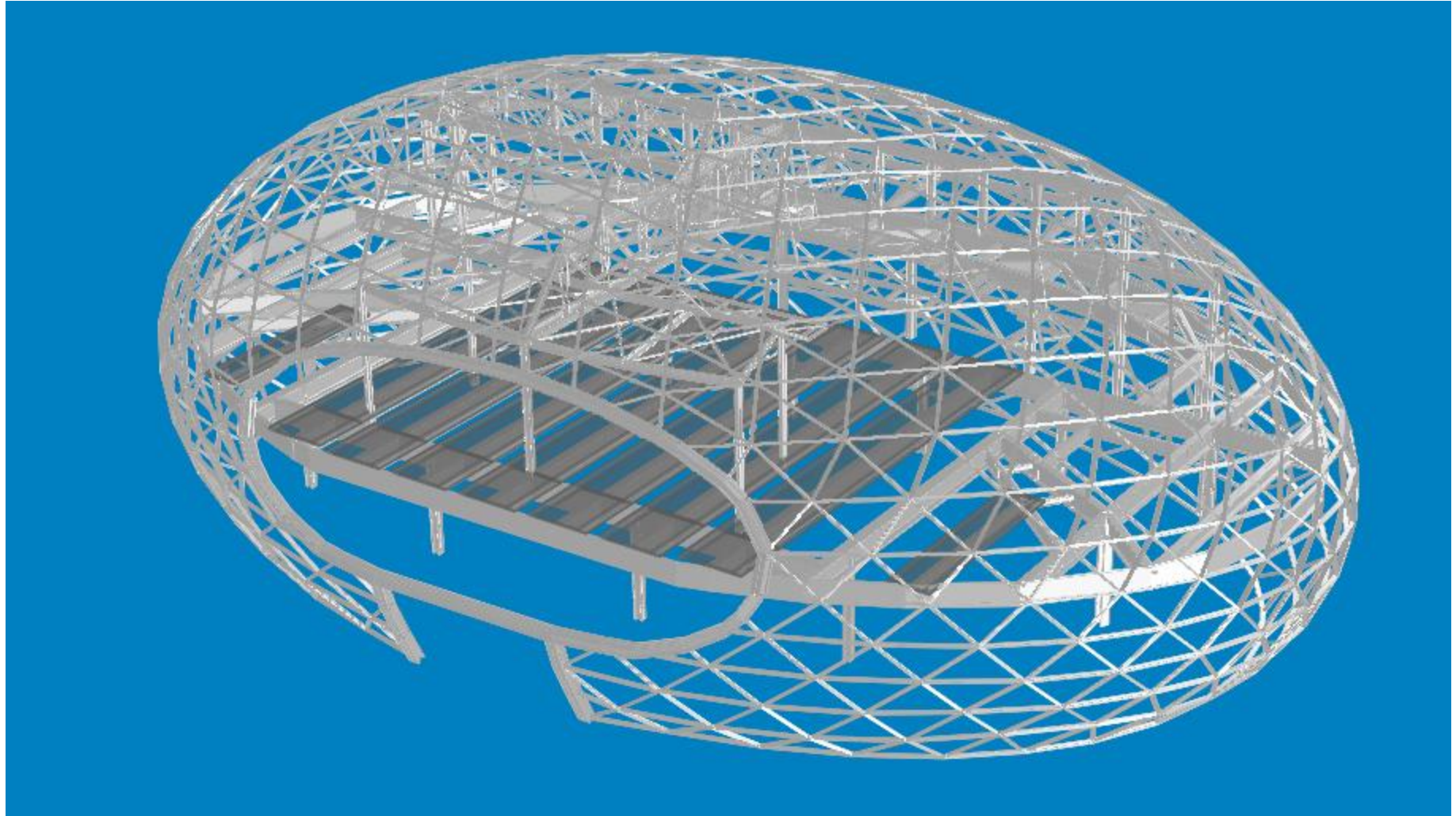


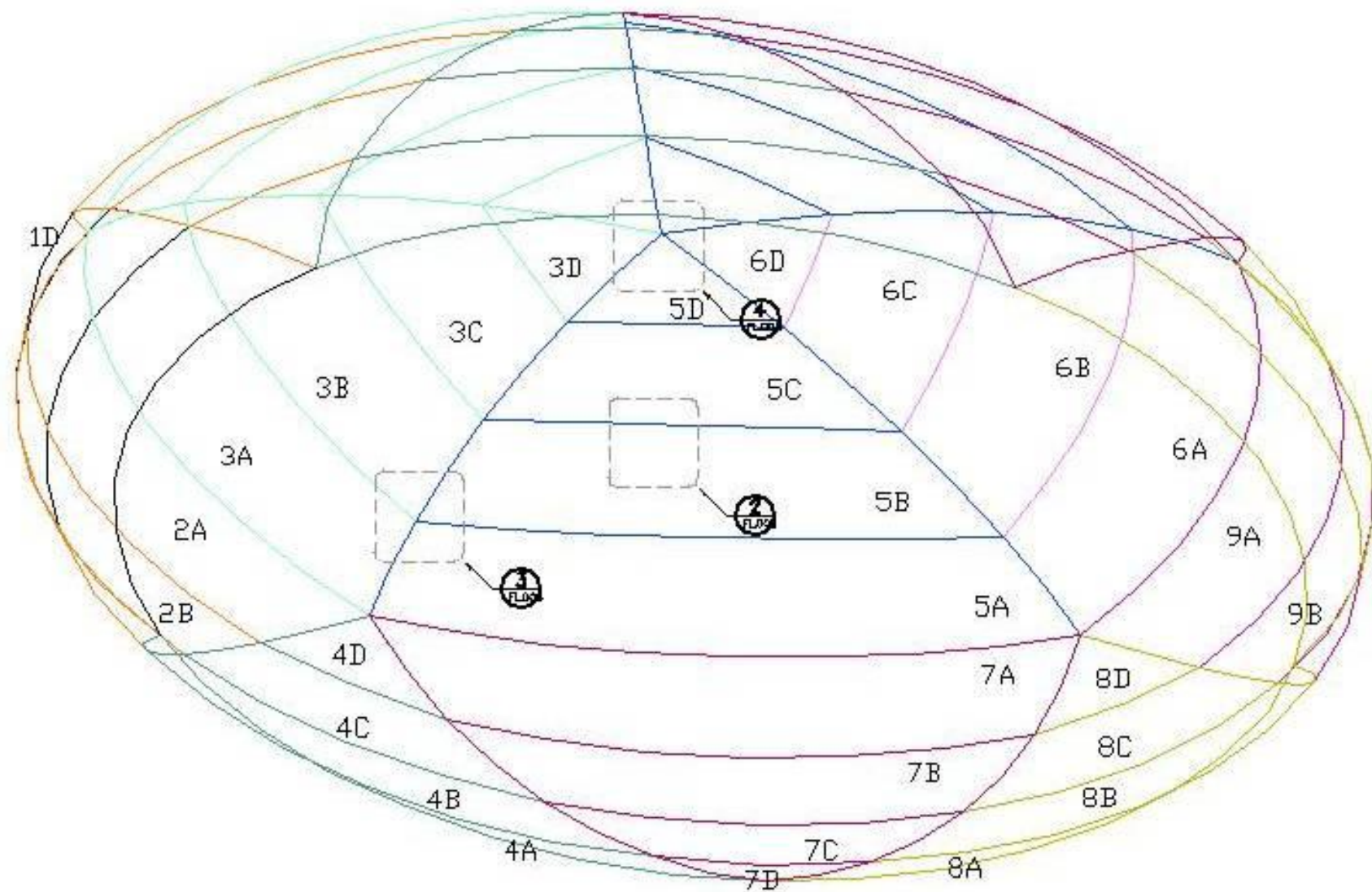


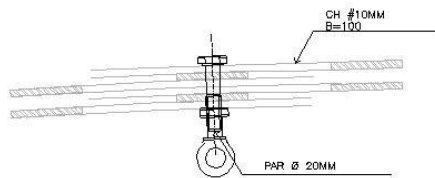
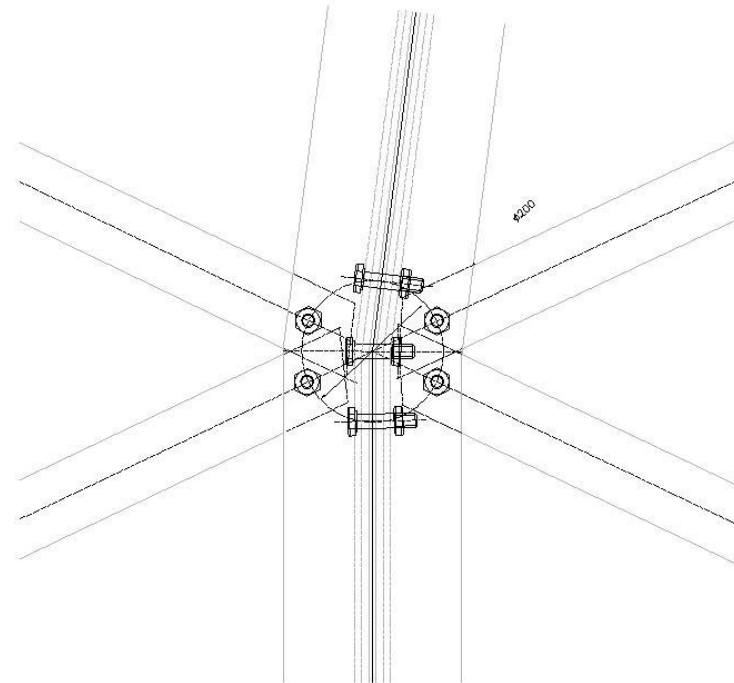
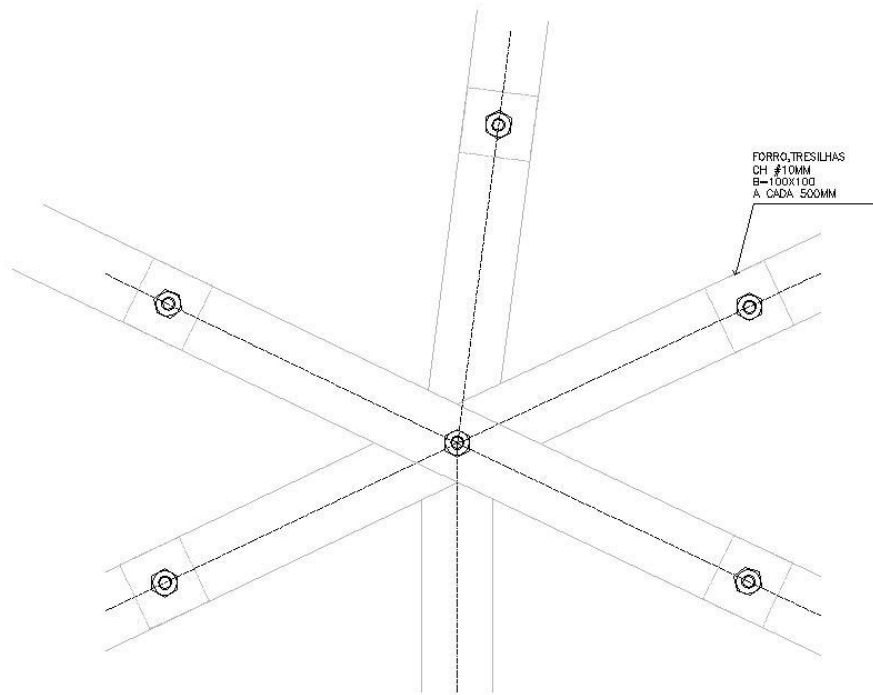






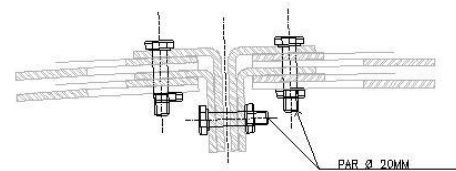




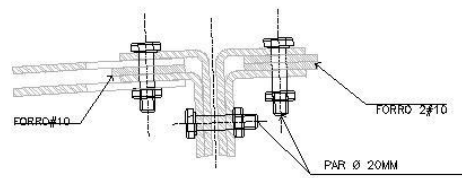
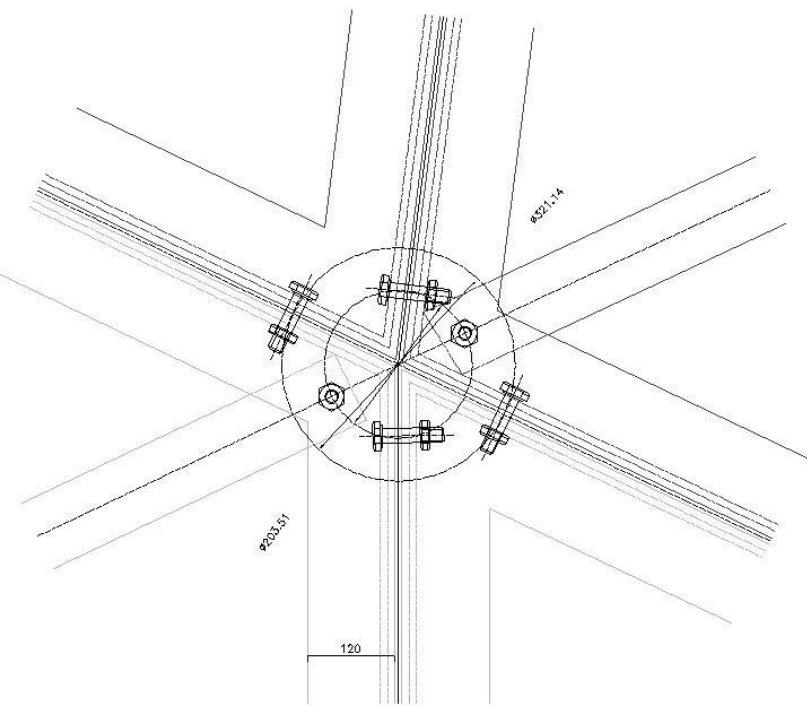


DETALHE TÍPICO DE CONSTRUÇÃO DA MALHA

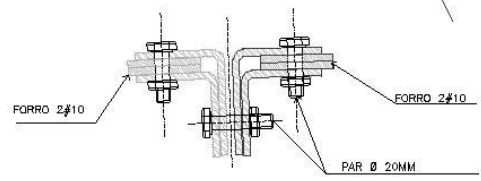
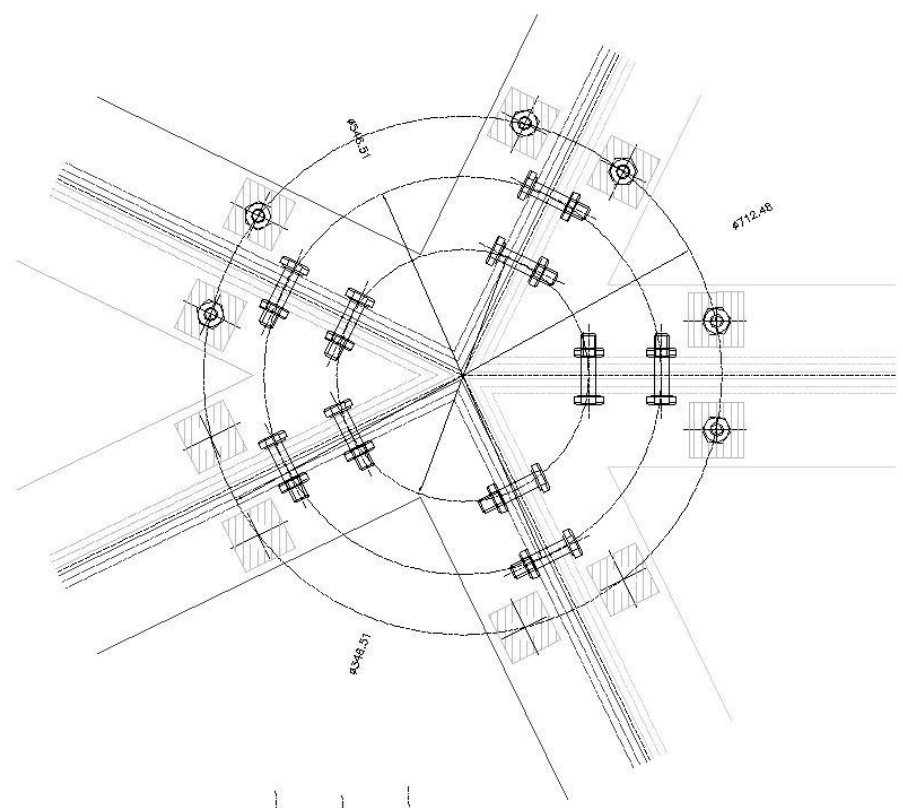
DETALHE 01
ESC 1:5



DETALHE 02
ESC 1:5

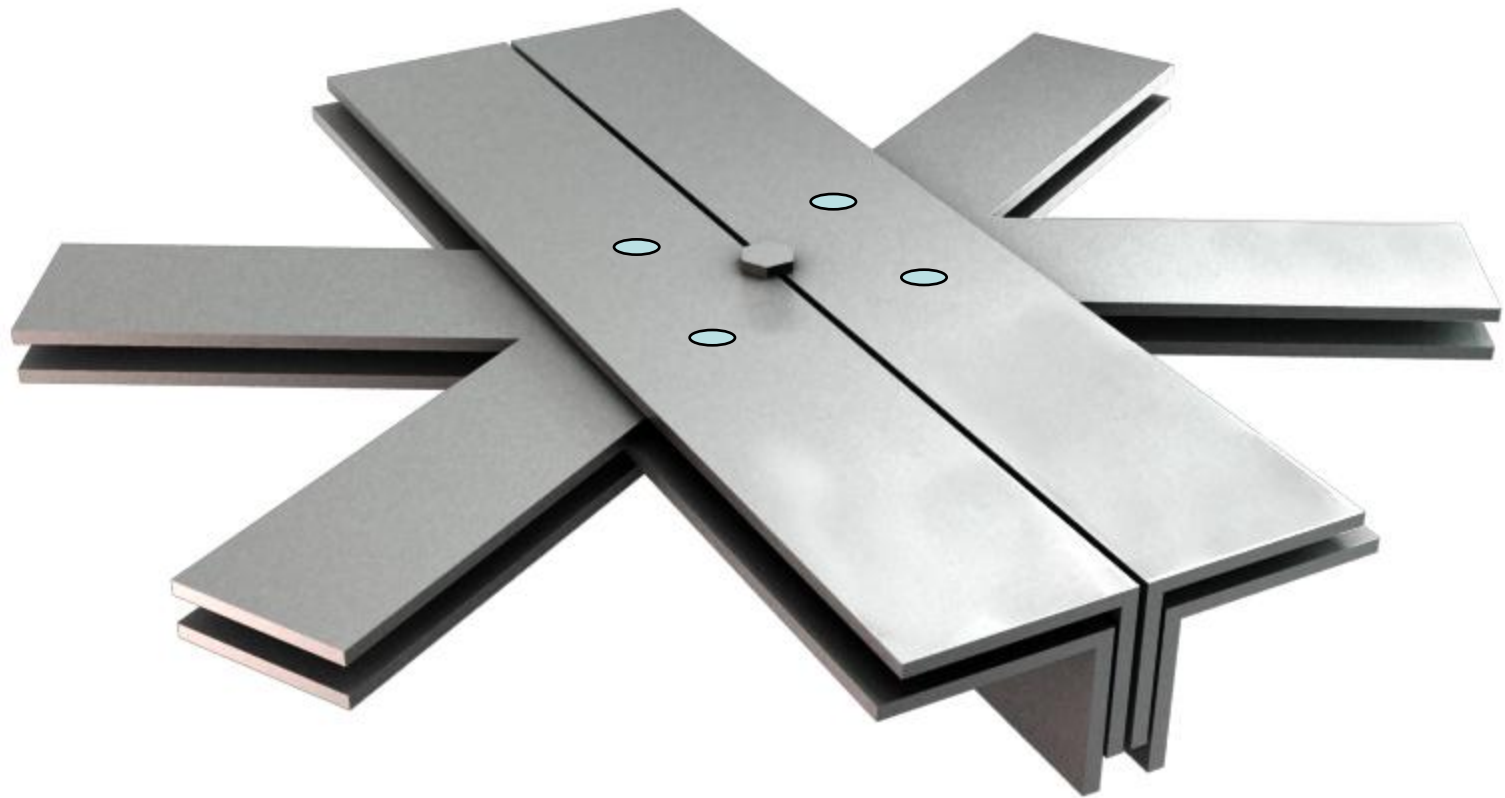


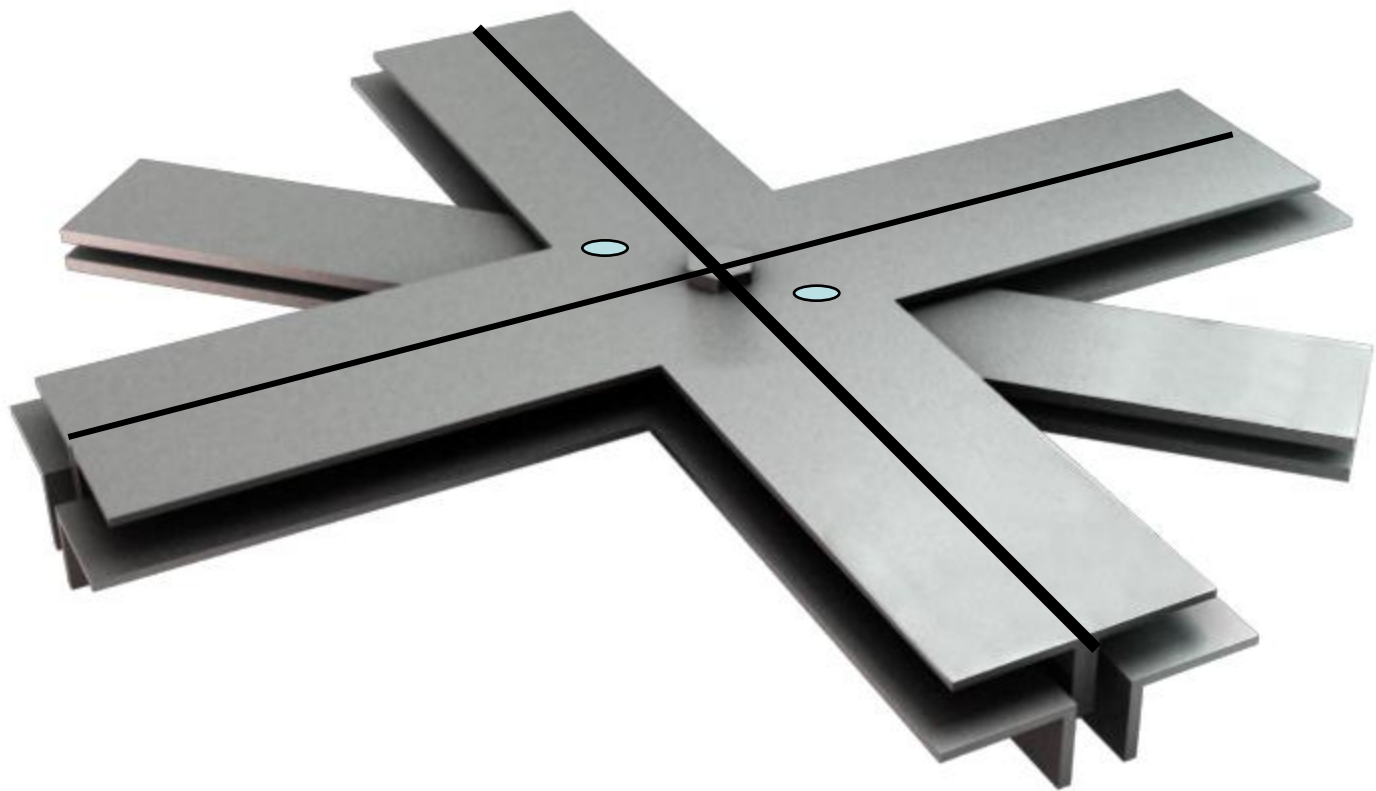
DETALHE 03
ESC 1:5

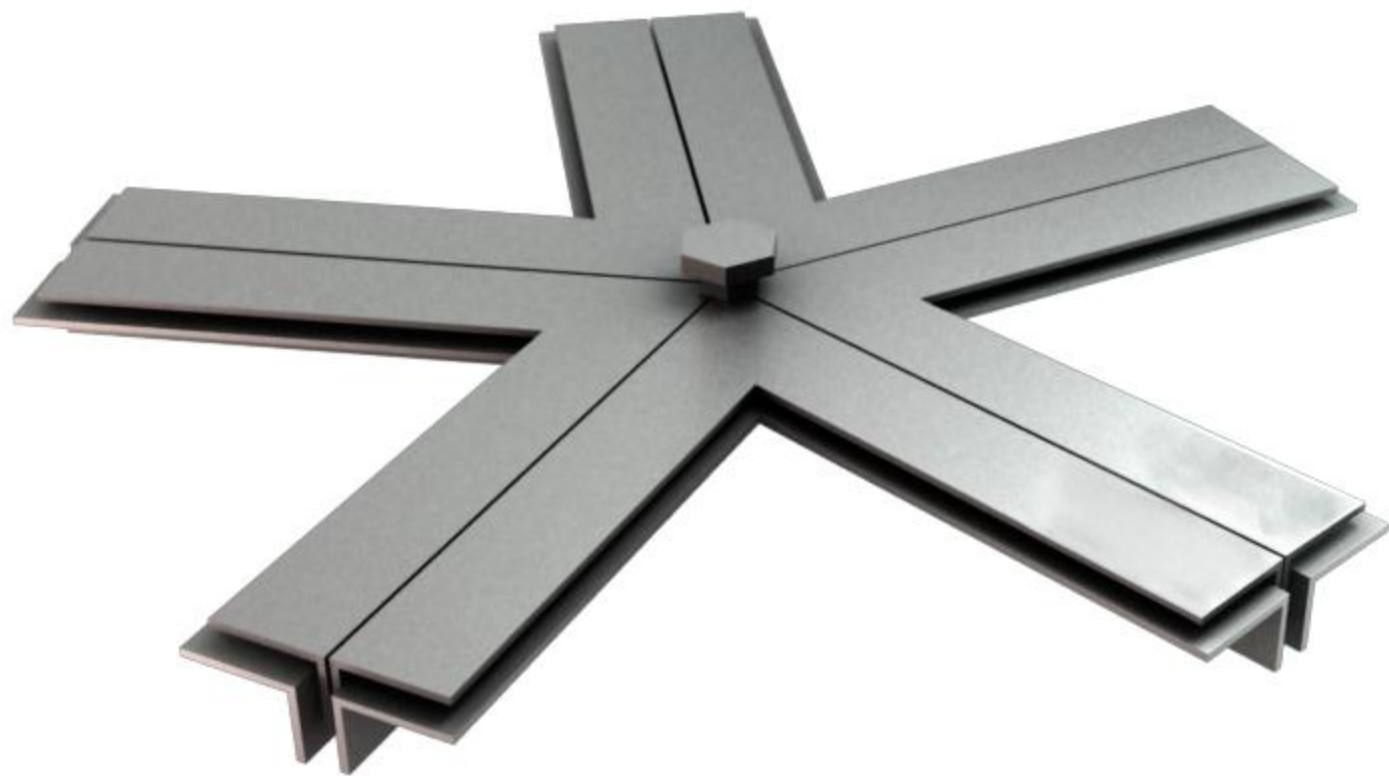


DETALHE 04
ESC 1:5













PERIGO
QUEDA
DE MATERIAL

ATENÇÃO
CERRADO
PROIBIDO
RESPIRAR













