



VETO TT assembly and installation

Yury Gornushkin (JINR)

- The TT walls assembly and their installation have been discussed at last few meetings.
- The procedure looks to be understood. The COVID-19 problems seems to be left behind. The situation now is improving and it is likely that the assembly will go as was foreseen before the pandemic.
- Nevertheless we'll keep preparing the backup solutions.

One TT wall assembly and installation per day:

Every morning we have 8 modules fully prepared for installation and the table assembled the previous day

- **TT wall assembly on the table**
- **Electronics connection, final TT wall test**
- **TT wall installation in the detector**
- **TT wall survey (?)**

8-12

Performed by the whole crew in the 1st half of each day

Preparation for the assembly of the next wall:

- **TT table assembly and delivery to the main hall**
- **TT table cabling**
- **TT modules tests, repair, electronics replacement and commissioning (TRT test etc.)**

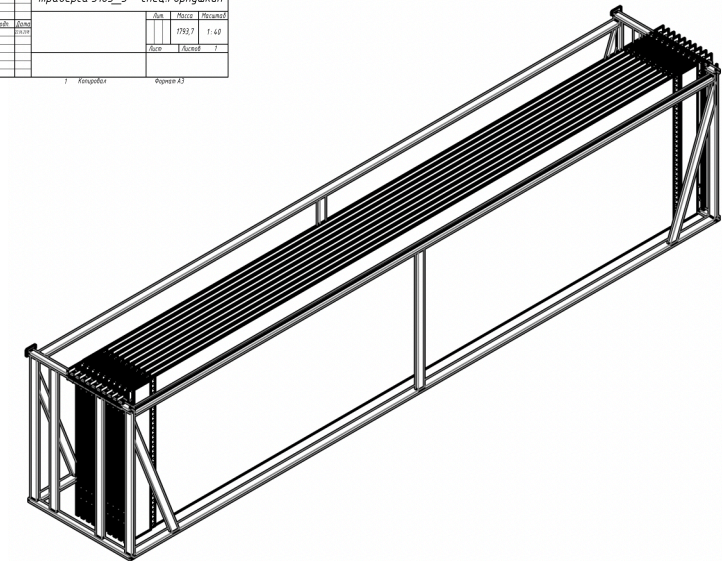
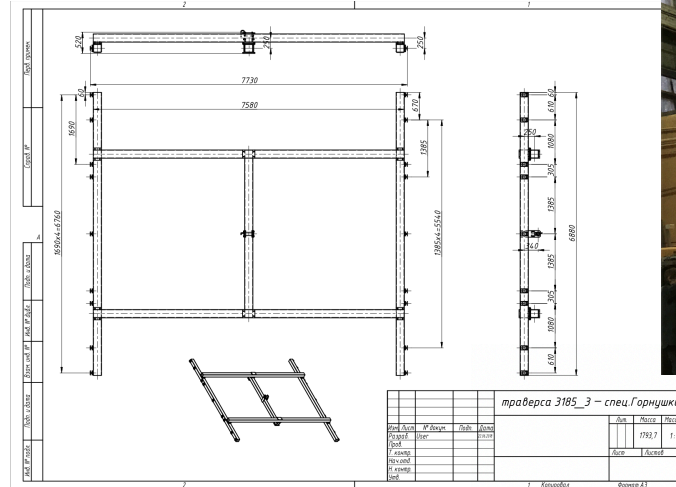
13-17

In parallel, 4 h in the afternoon of each day

By 5-6 people including the expert shifter and a crane operator

Auxiliary tools needed on site

- The main **frame** to handle the walls - the drawings are in China (**included in the contract with the company**)
- The **tool to handle the modules** - exists on site, needs a small modification, perhaps another one has to be made
- A **rack** for the tests of the modules, their reparation and electronics replacement



The drawings were provided to estimate the additional cost



Needed equipment and materials :

- cables 4 RJ45 2 LV power cables
- concentrator
- LV (could be Wiener)
- pc for data acquisition
- light to found the leak
- black sheet
- sikka 221 strong adhesive sealant
- black tape

1- Installation of the new electronic
-2 electronic board (2FE+2
ROB)

- 2 samtec cables
- 8 screws 3x5
- 4 metal plates
- 8 expansion fix brass insert
flange



- 4 screws for the covers
- Software

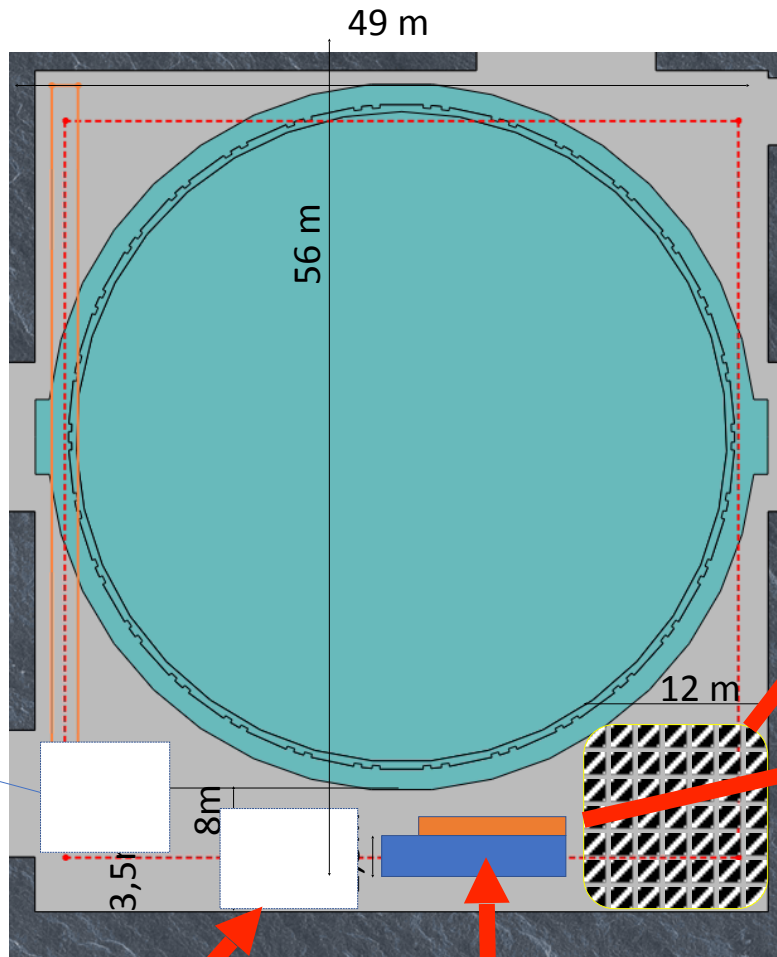


2- Checking for the Light Leak/Electronic

- connect the electronic to the special concentrator
(2 RJ45+ 1 LV) each board
- check electronic & cure module

- We need to create a full list of the materials and equipment and understand the logistics
 - Exists? Where? Delivery?
 - Needs to be purchased? Where, when, how, quantity?
 - Where will be stored?

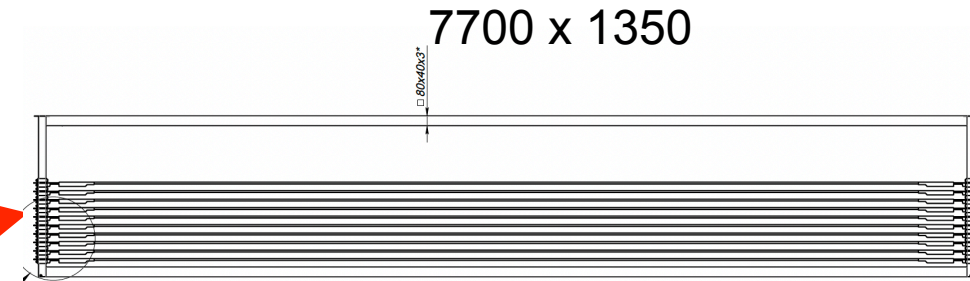
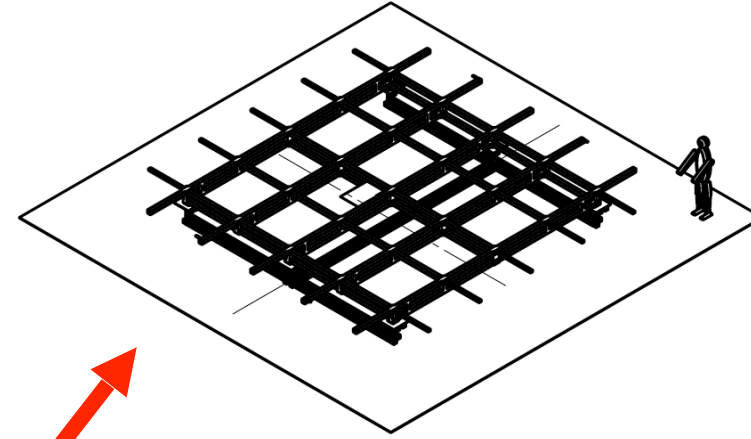
TT Wall Assembly



Trolley

Parking of the main
frame (6760x7730)?

TT Container



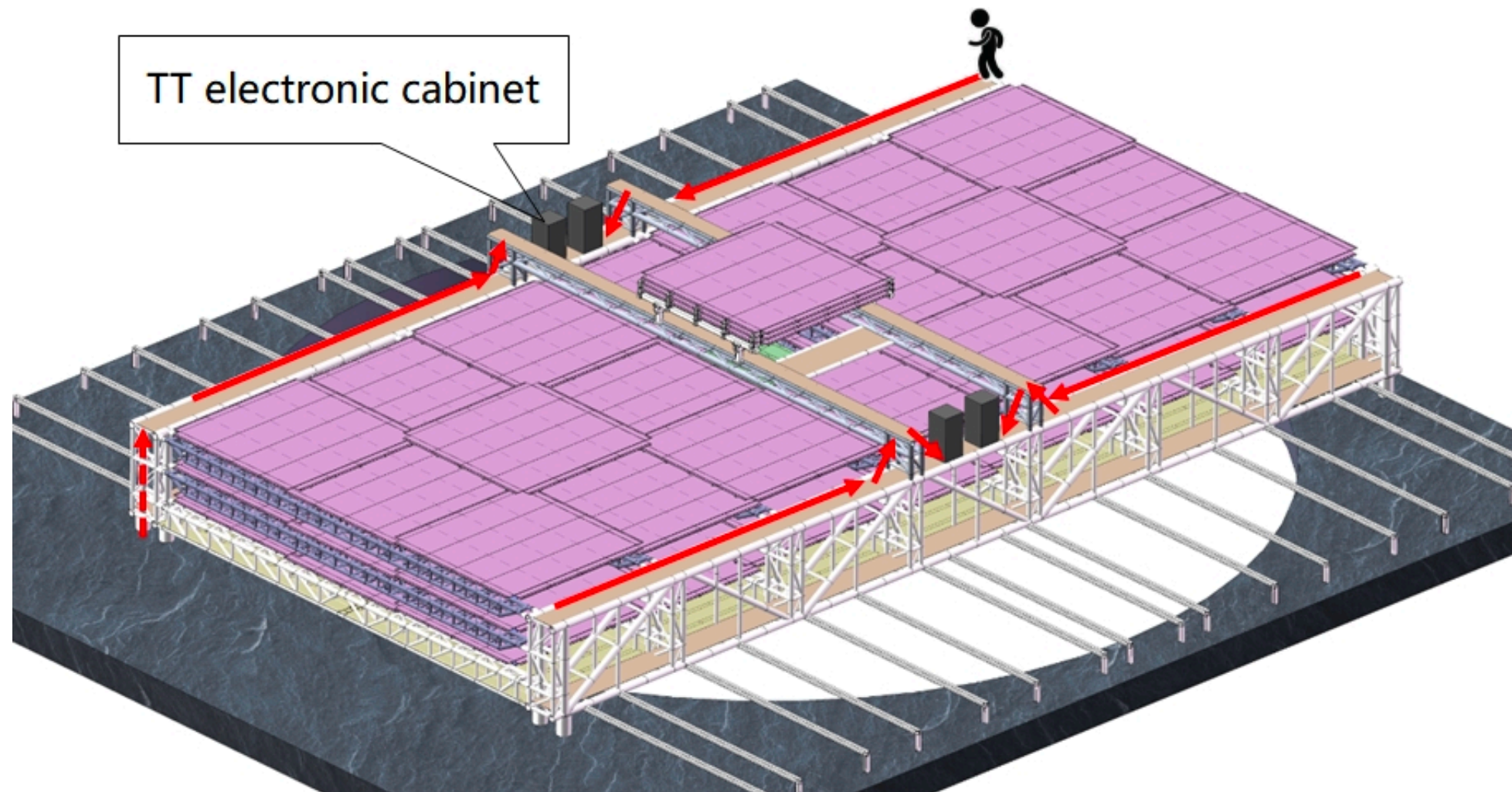
- A rack for 10 modules near the container for electronics replacement, tests and modules reparation. Can be on wheels.
- A cupboard for materials and tools

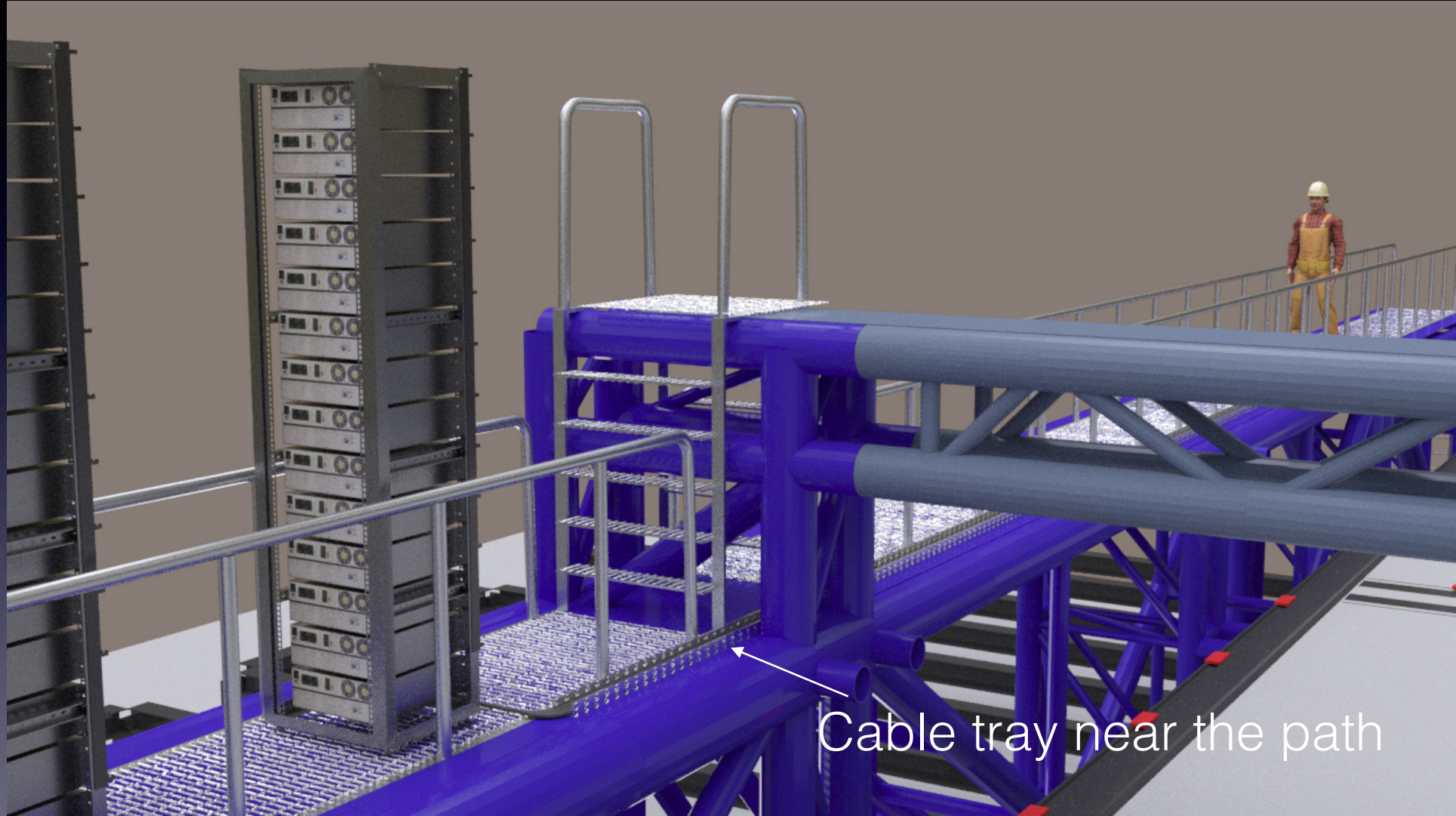
TT installation manpower

- Originally: IPHC, INFN and JINR provide 4-5 people including shift expert + local technicians (2 people + crane operator).
- As the COVID situation improves this scenario looks possible.
- Otherwise - to rely on local manpower.
- 63 walls installation = 11-13 weeks (may be more if remote participation from Europe)

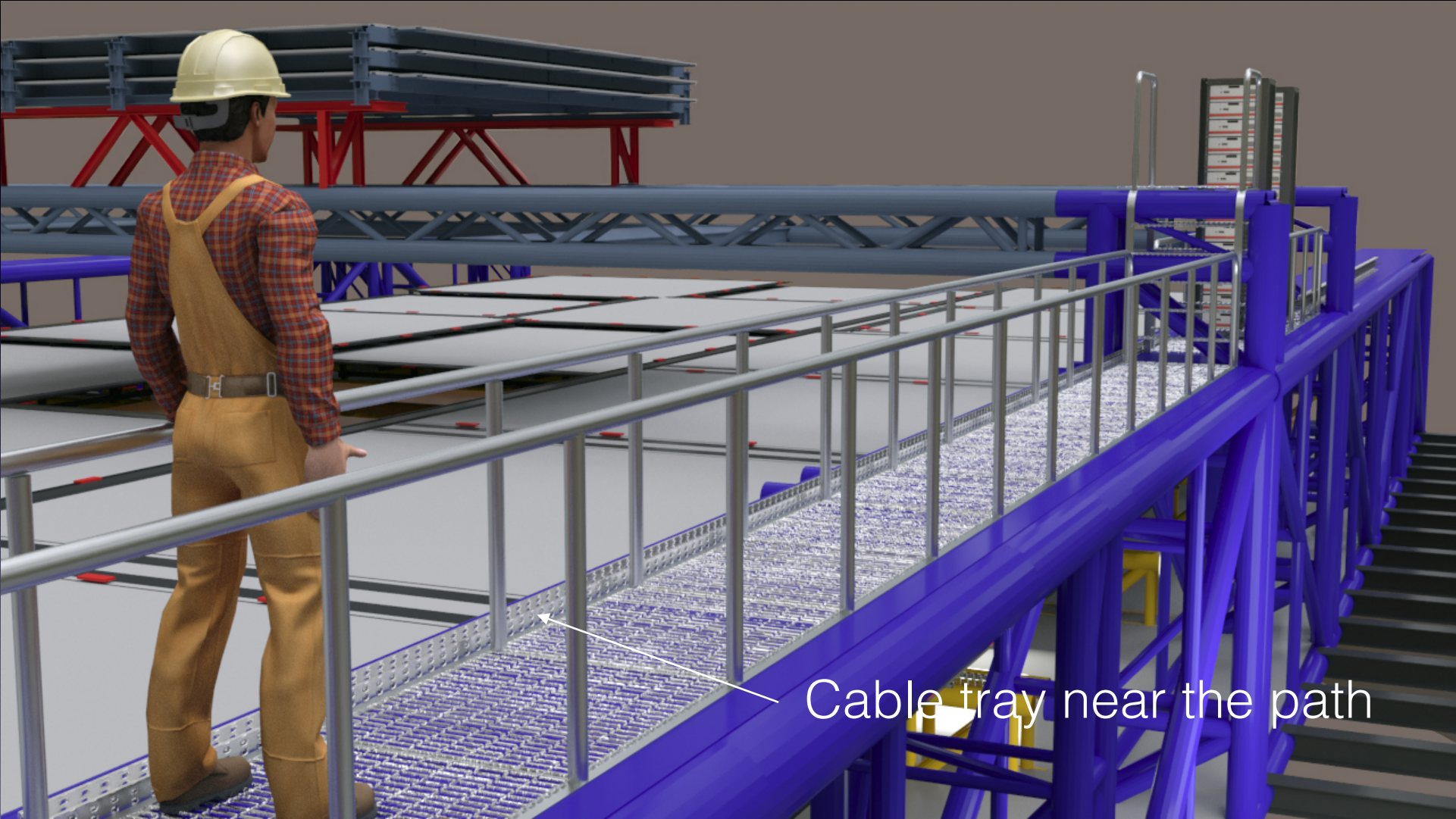
“Remote” assembly and installation ?

Cabling





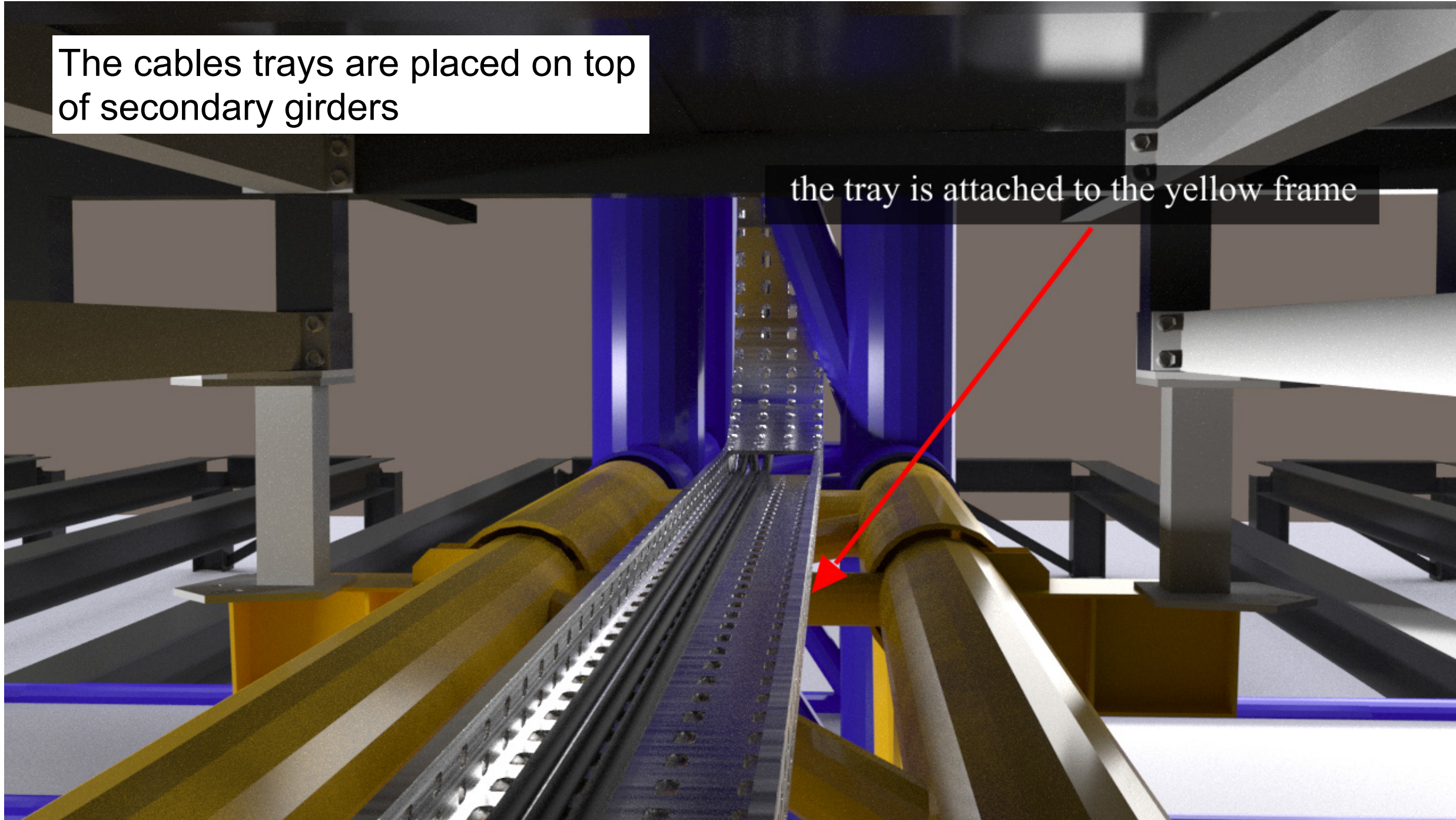
Cable tray near the path

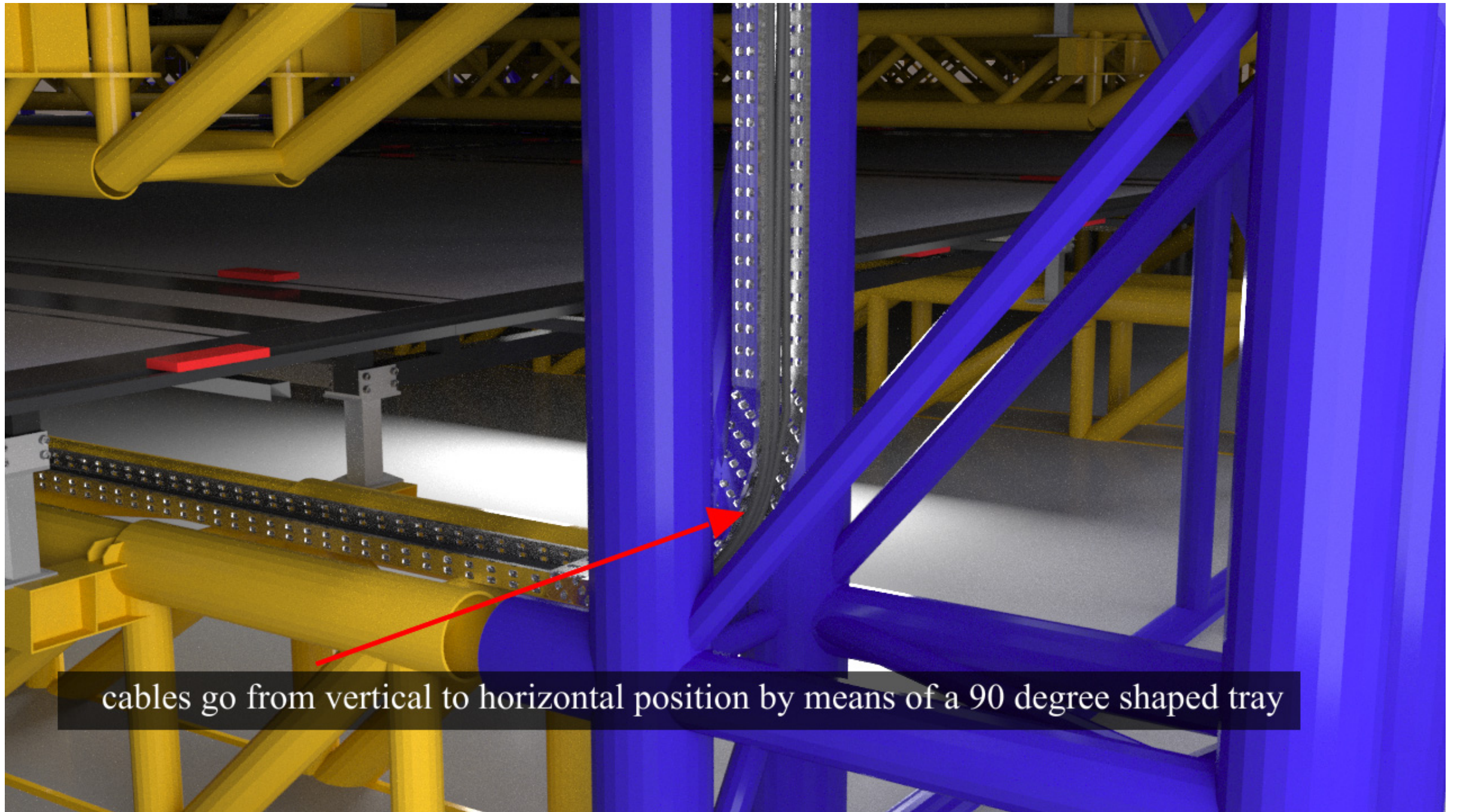


Cable tray near the path

The cables trays are placed on top of secondary girders

the tray is attached to the yellow frame



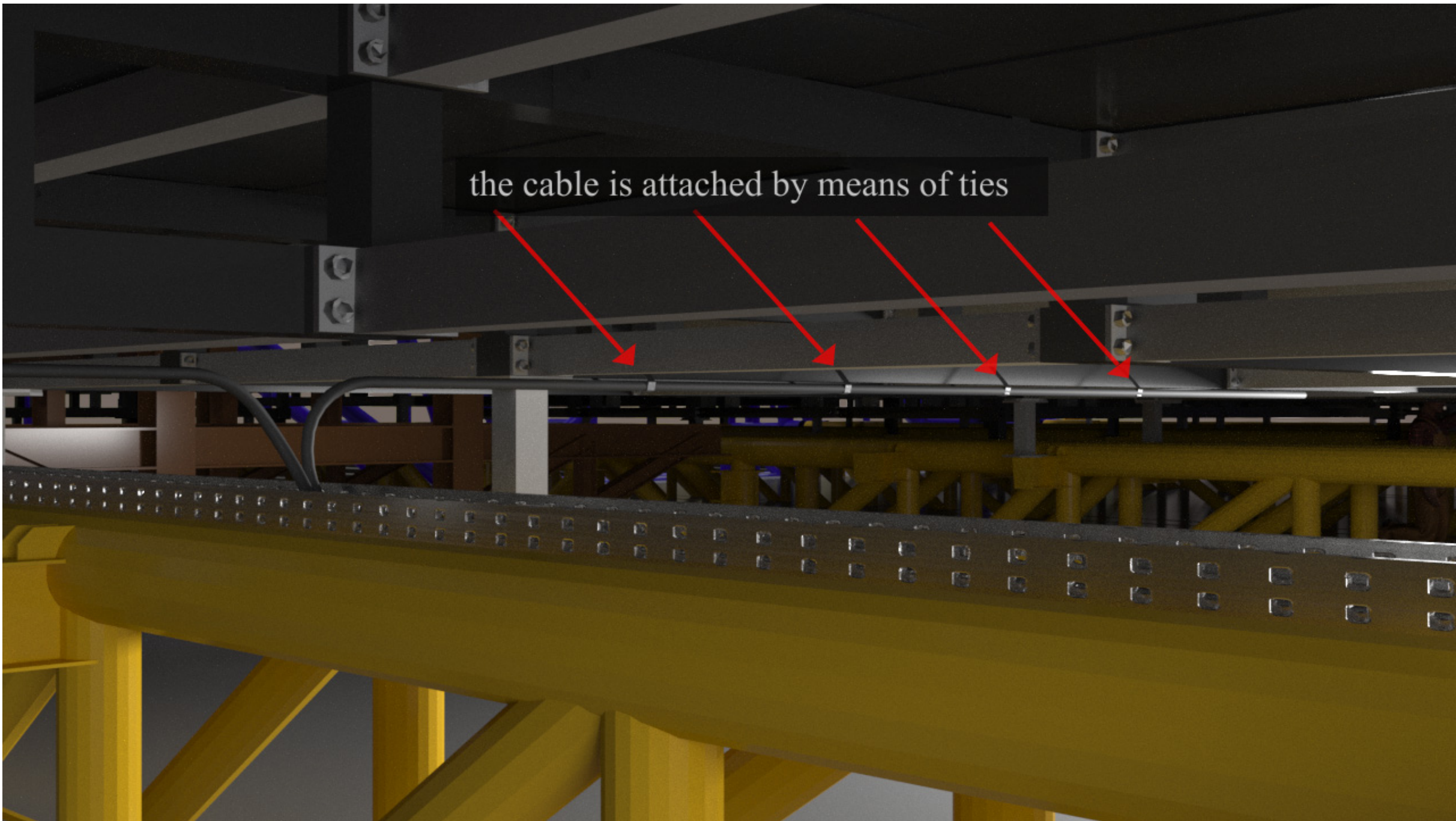


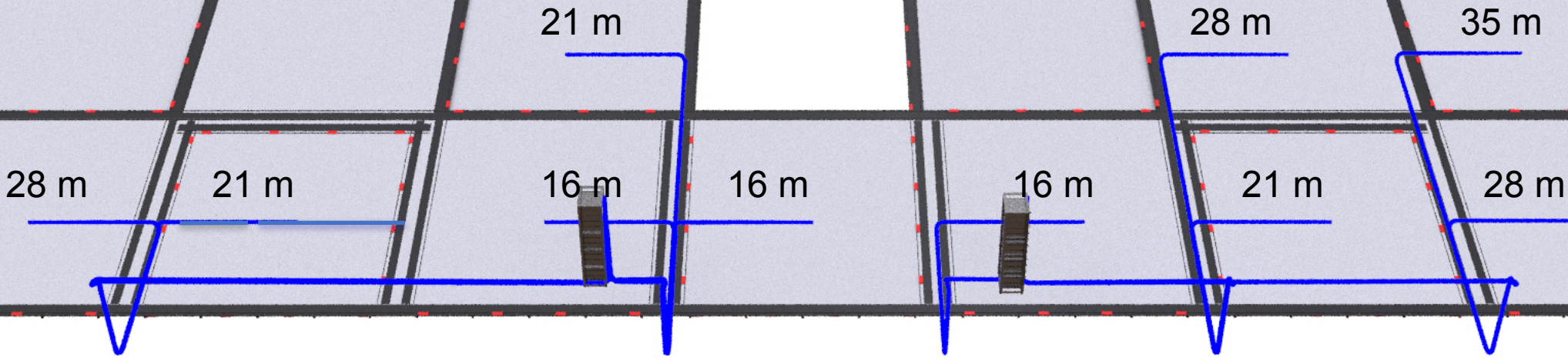
cables go from vertical to horizontal position by means of a 90 degree shaped tray

each cable turns and goes to its destination



the cable is attached by means of ties





The cable length calculated for the lowest (1st) layer (the cables are shorter for the other layers)

Total length of the trays ~300-400 m .

Trays are available @ 5-10 \$/m

Beijing Shengshi Huaneng International Trade Co., Ltd.

13YRS



Verified

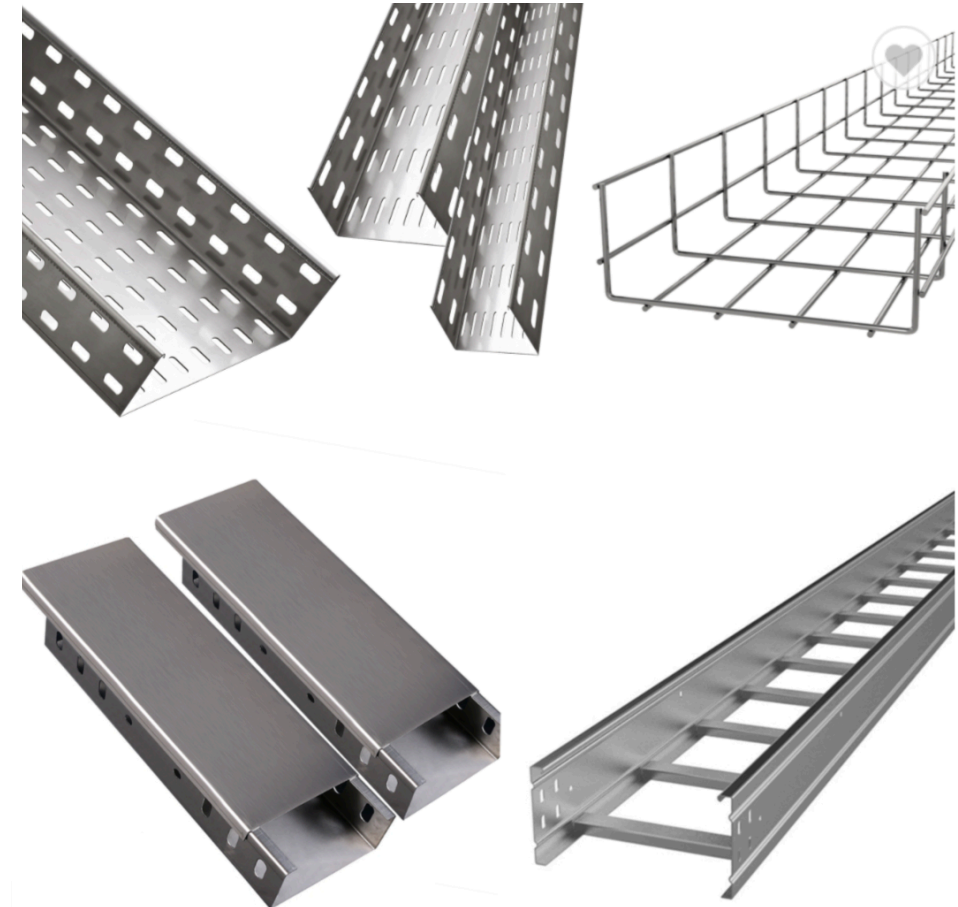
Beijing, China

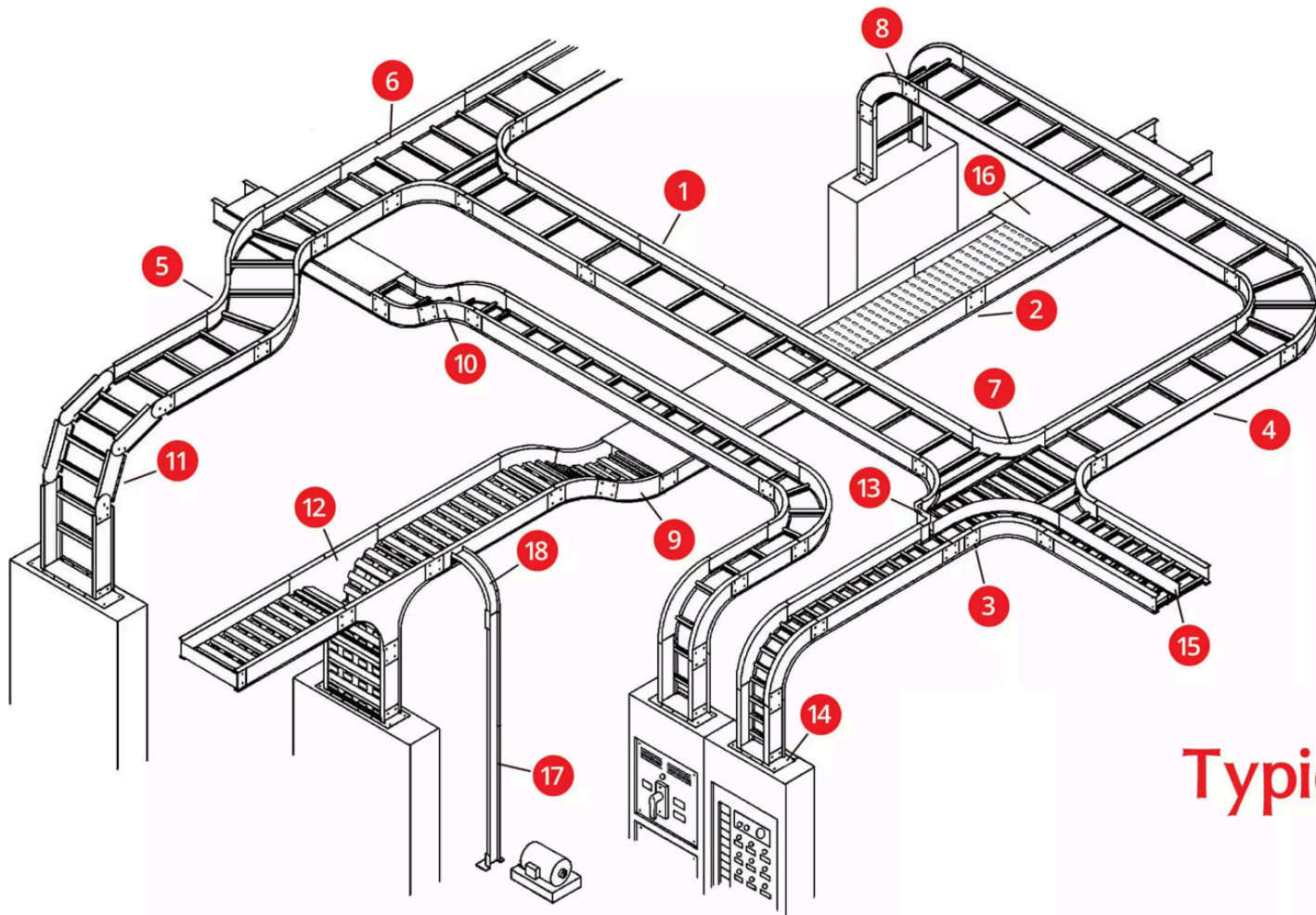
Trays are available from many suppliers with large variety of size and design.

Product Description

Waterproof aluminum ventilated cable tray support raceway powder coated 400x100 outdoor metal steel gi galvanized cable trunking

Material	Steel or Customized vertical metal strut cable tray
Width	50mm, 100mm, 150mm, 200mm, 250mm, 300mm, 450mm, 600mm, or as you required.
Height	15mm, 50mm, 75mm, 100mm, or as you required.
Length	3000mm, 6000mm, or as you required.
Thickness	0.8mm, 1mm, 1.2mm, 1.5mm, 2mm, 2.5mm, 3mm, or as you required.
Raw Materials	Q235, SS304, SS316, Aluminum, FRP
Surface Finish	Hot Dipped Galvanized – for outdoor use to BS EN 1461-1999 Electro zinc plated – for indoor use to BS EN 12329-2000 Electrolytic Polishing – for stainless steel use Powder coating-for indoor and outdoor use





Typical Cable Tray Layout

- | | |
|--|--|
| 1. Ladder Type Cable Tray | 10. 30° Vertical Inside Bend, Ladder Type Tray |
| 2. Perforated Cable Tray | 11. Vertical Bend Segment (VBS) |
| 3. Splice Plate | 12. Vertical Tee Down, Ventilated Trough Type Tray |
| 4. 90° Horizontal Bend, Ladder Type Tray | 13. Left Hand Reducer, Ladder Type Tray |
| 5. 45° Horizontal Bend, Ladder Type Tray | 14. Frame Type Box Connector |
| 6. Horizontal Tee, Ladder Type Tray | 15. Barrier Strip Straight Section |
| 7. Horizontal Cross, Ladder Type Tray | 16. Solid Flanged Tray Cover |
| 8. 90° Vertical Outside Bend, Ladder Type Tray | 17. Cable Channel Straight Section, Ventilated |
| 9. 45° Vertical Outside Bend, Ventilated Type Tray | 18. Cable Channel, 90° Vertical Outside Bend |

Preparation of the tests with the prototype @ JINR

The hall where we assembled the TT walls in the past was occupied by another project.

Next week we plan to assemble the frame («table») at JINR and to perform the tests we planned:

- cabling of the table
- fixation of the modules on the table etc.



Next steps

As next steps we consider the production of the first «table» by Chinese company and its tests. After that we can give «a green light» for the mass production.

During the next CM in Kaiping I'd propose to visit the warehouse where the containers are stored and to estimate the conditions of the modules and the auxiliary equipment we have inside the containers.

Summary

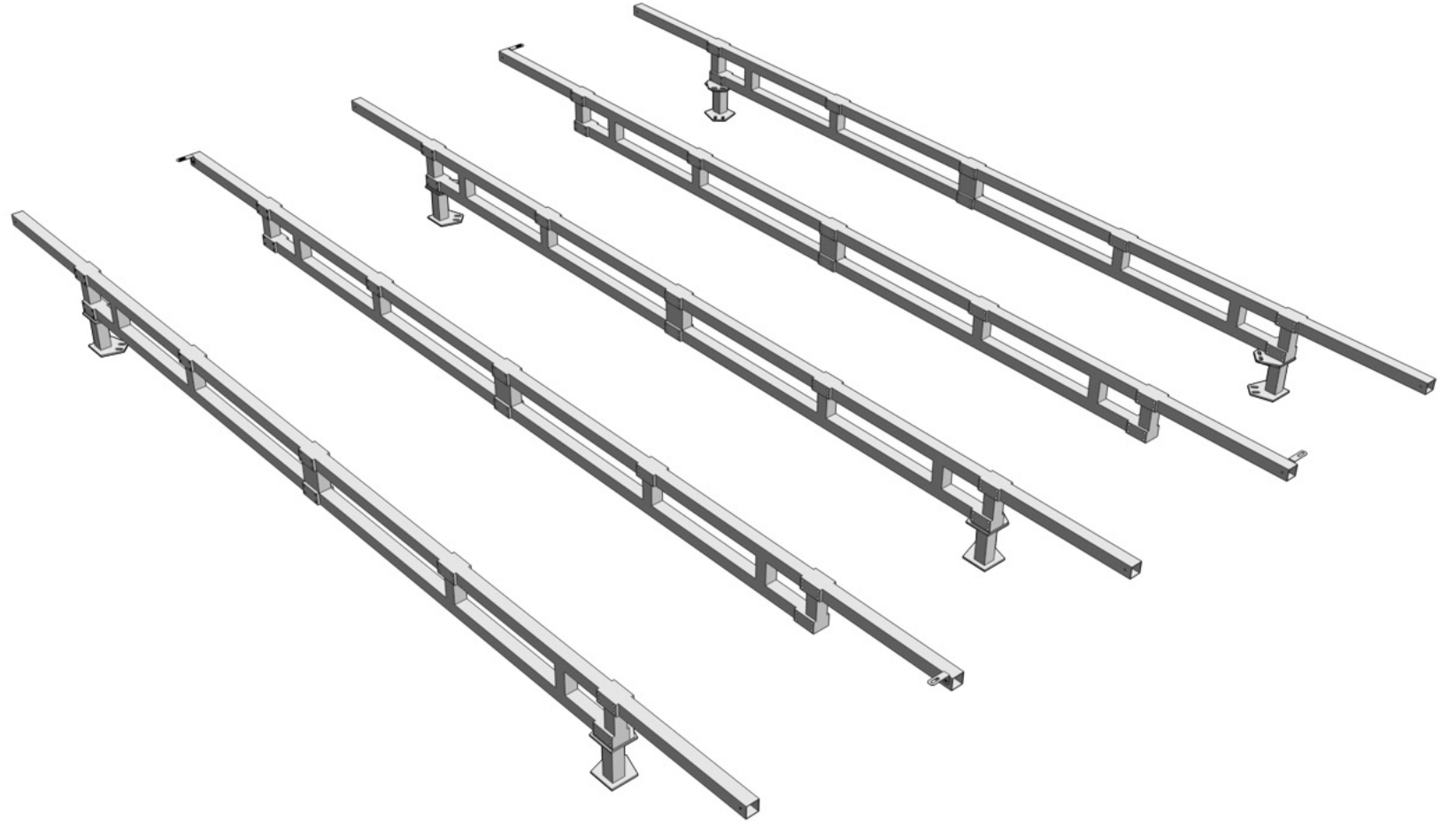
- The TT assembly and installation procedure has been already well discussed
- Look forward to beginning of the tables production
- Some additional equipment needs to be fabricated (added to the contract)
- Detailed list of the materials and equipment to be purchased is needed.
- Look forward to visiting China, perhaps in Feb.2023

TT wall assembly

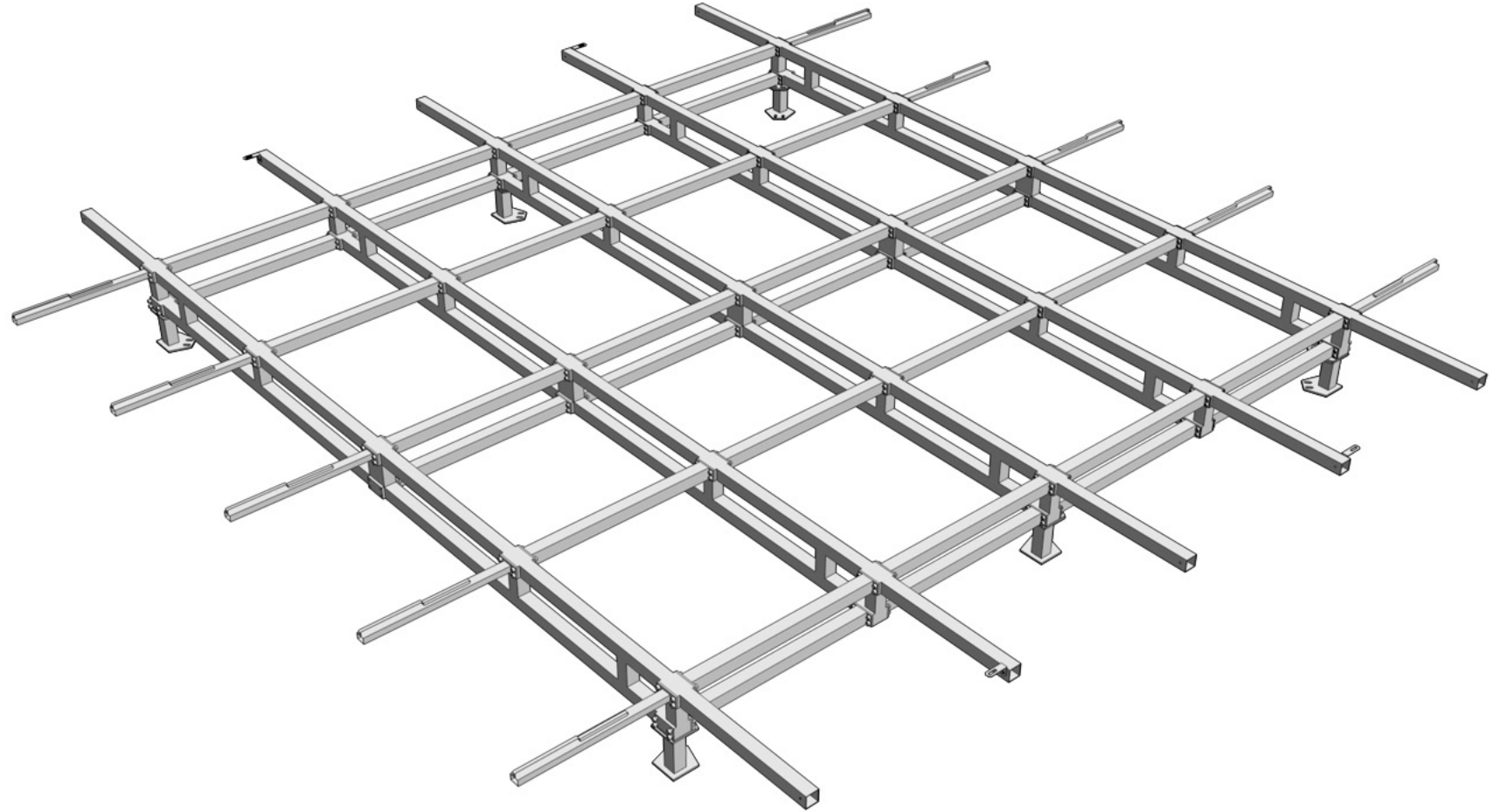
1. prepare the footings

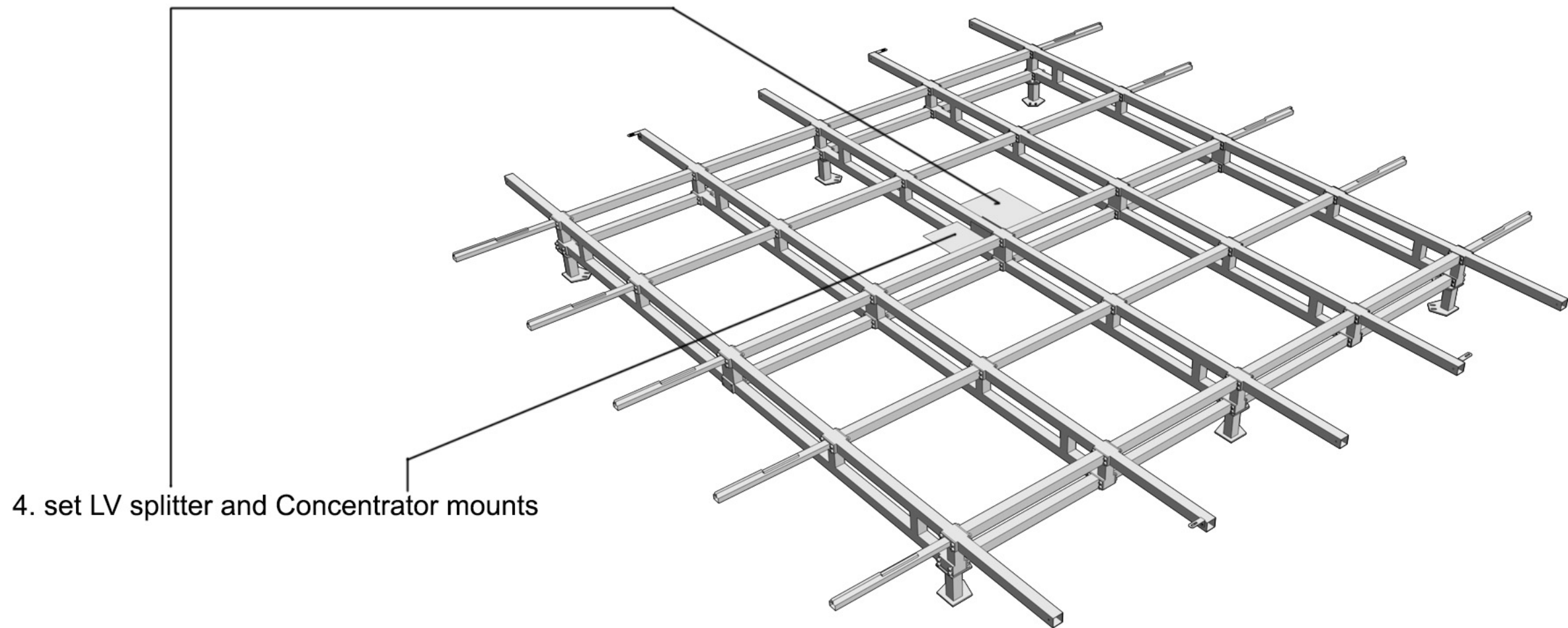


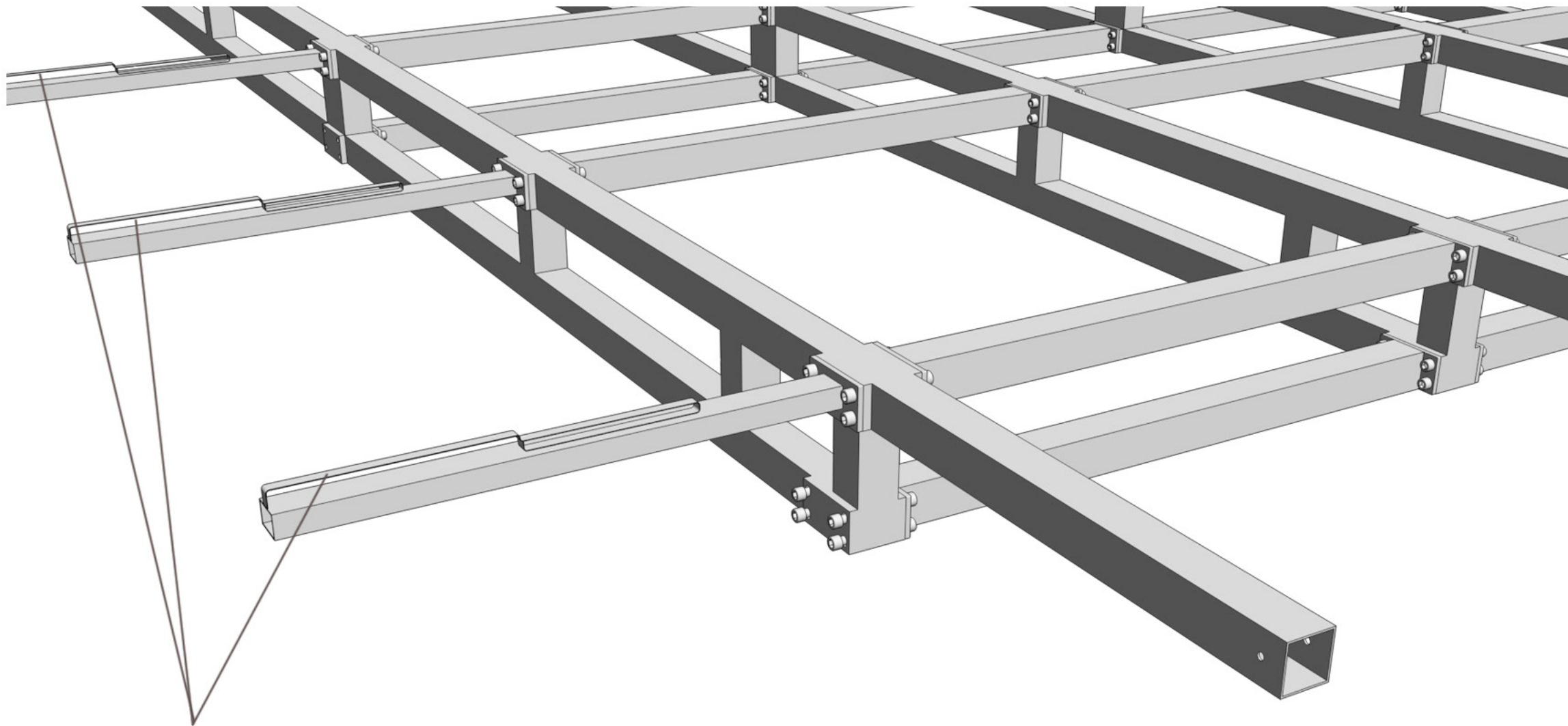
2. set longitudinal beams



3. set transversal beams

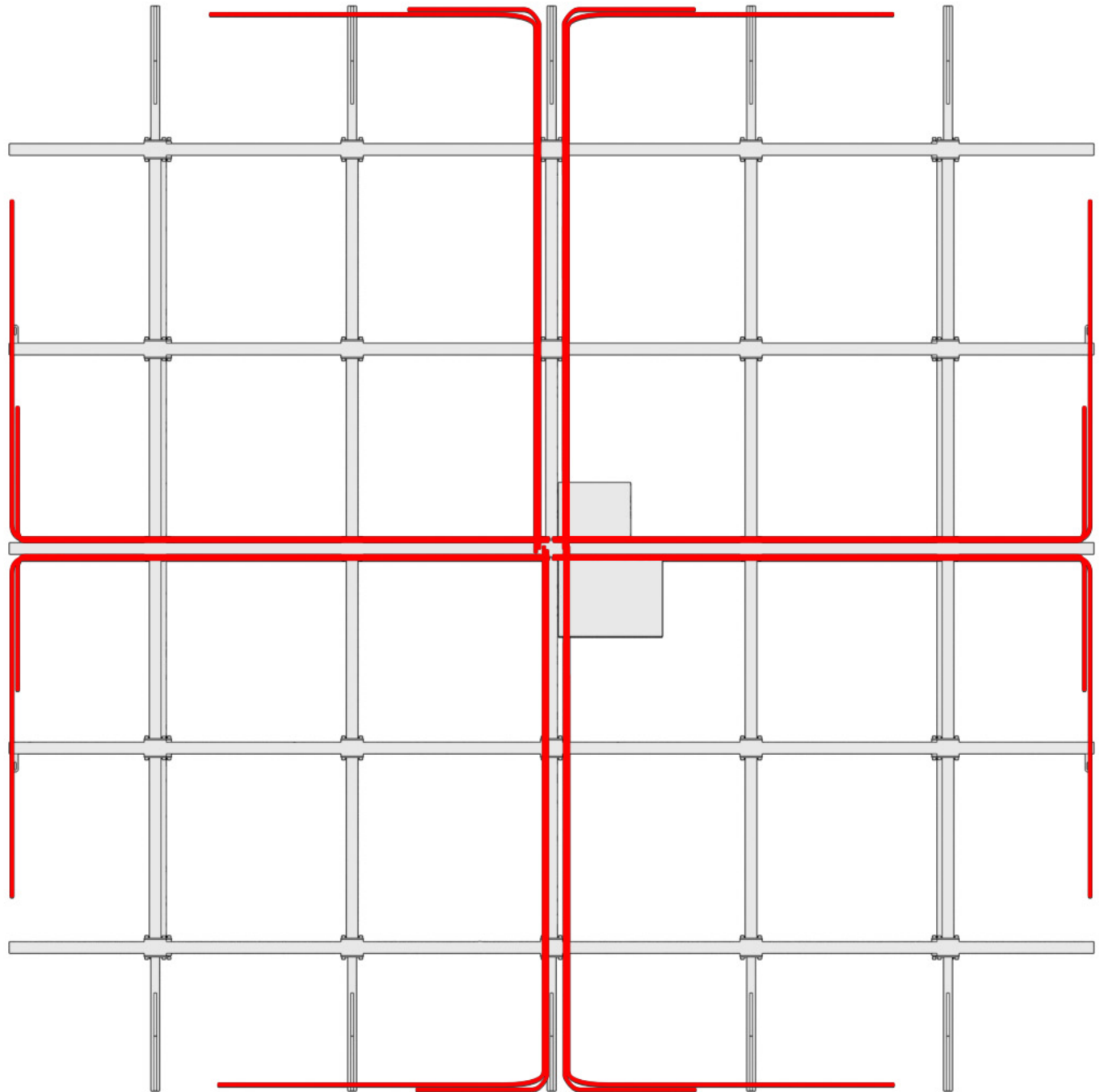


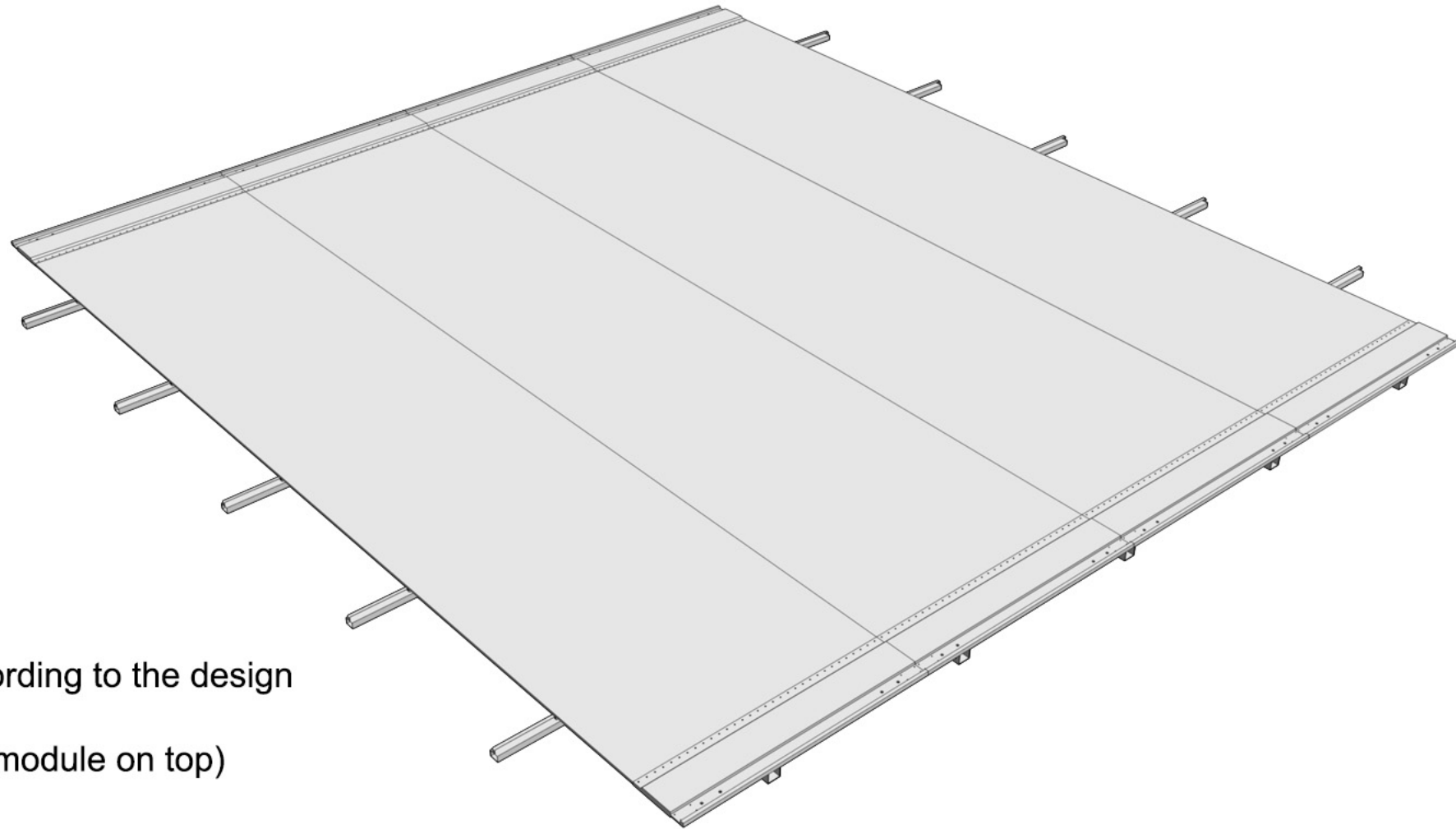




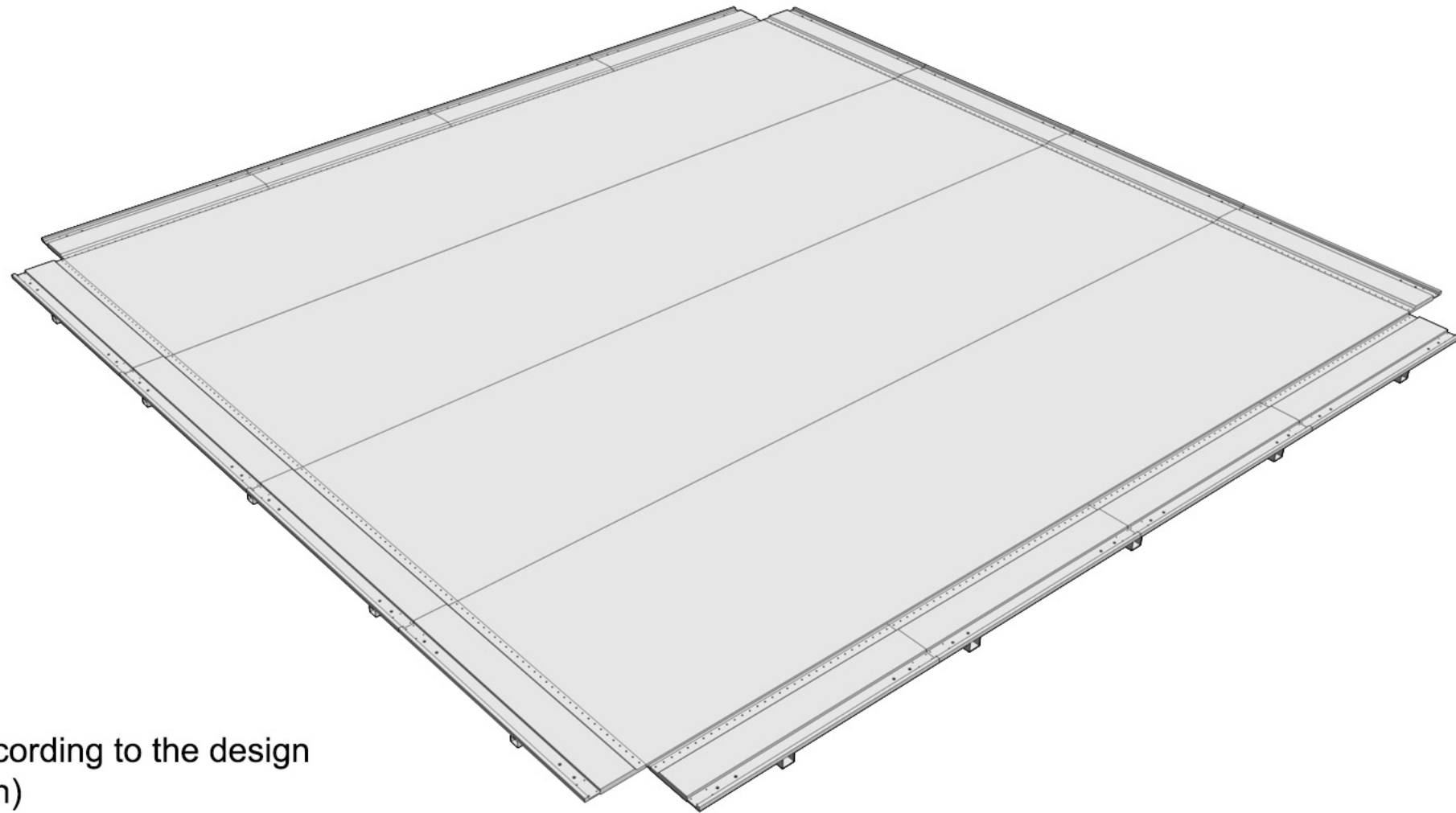
extended supports are used to fix the detector according to the design of the wall

5.fix RJ-45 and LV cables along the beams in the following manner (from center to cap-ends)





5. place 1st layer of modules according to the design
of the wall (face up or face down)
*in this case - face up (electronic module on top)



7. place 2d layer of modules according to the design
of the wall (face up or face down)
*in this case - face up (electronic module on top)

8. according to the design (face up or down)
the cables go either to the top or bottom of the module
(electronic unit either on top or bottom)

9. fix the modules to the table

