

Internal Piping and Field Cage Update

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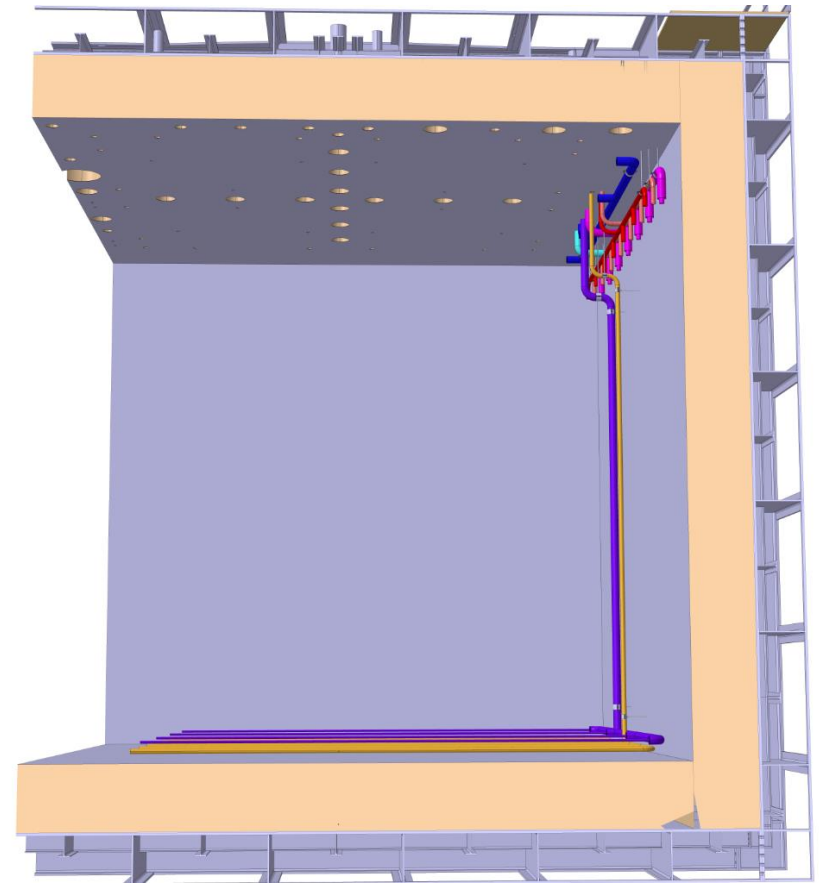
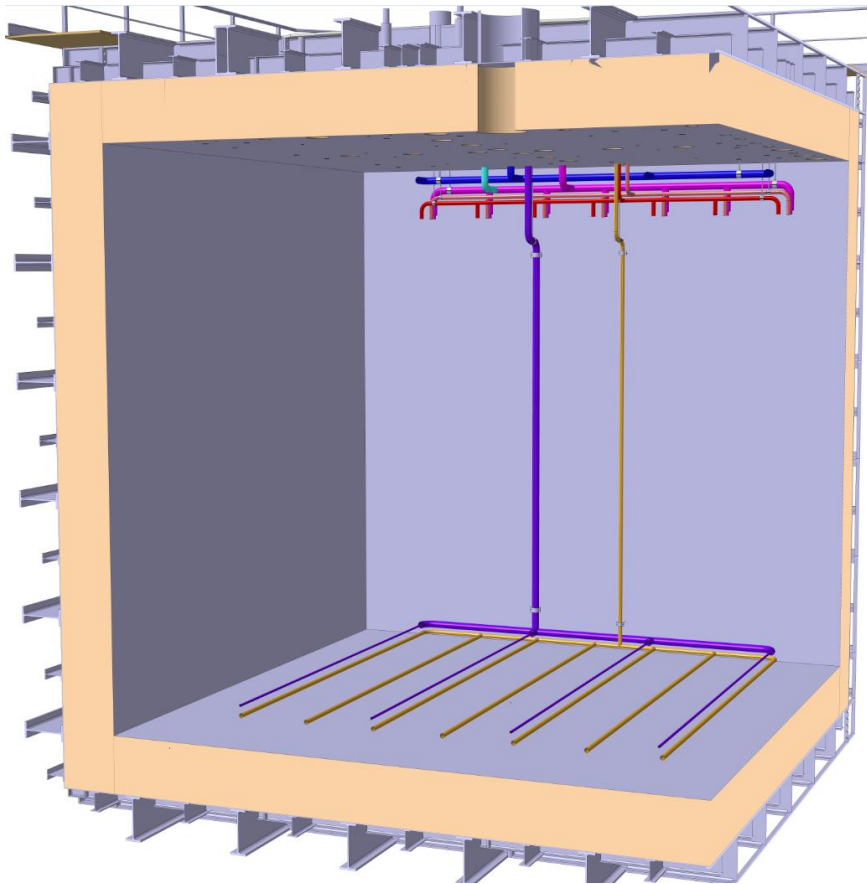
- Internal Piping:
 - Internal Piping stp from D. Montanari
 - Integrated in the main 3D
 - Position respect to the Detector and Bottom PMTs seems to be ok

- Field Cage Update
 - Updates at the Field Cage Modules
 - Cathode and Ground Grid preliminary design
 - Preliminary weight Calculation

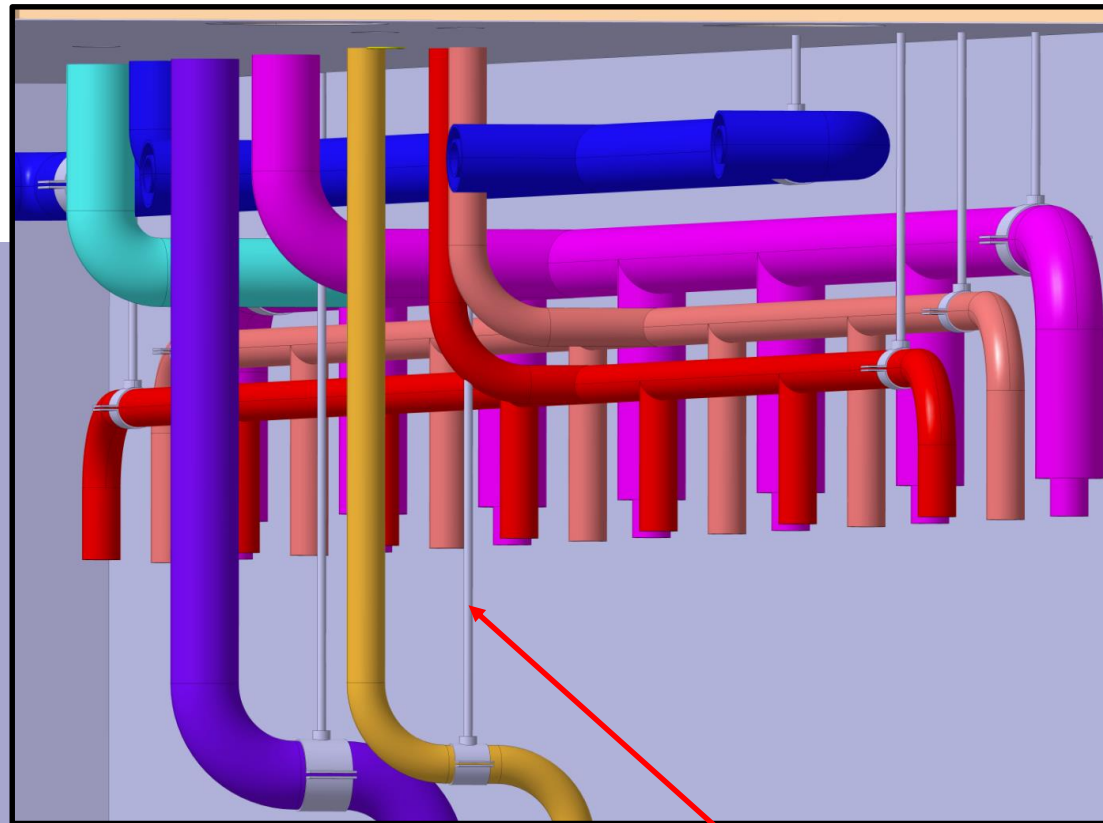
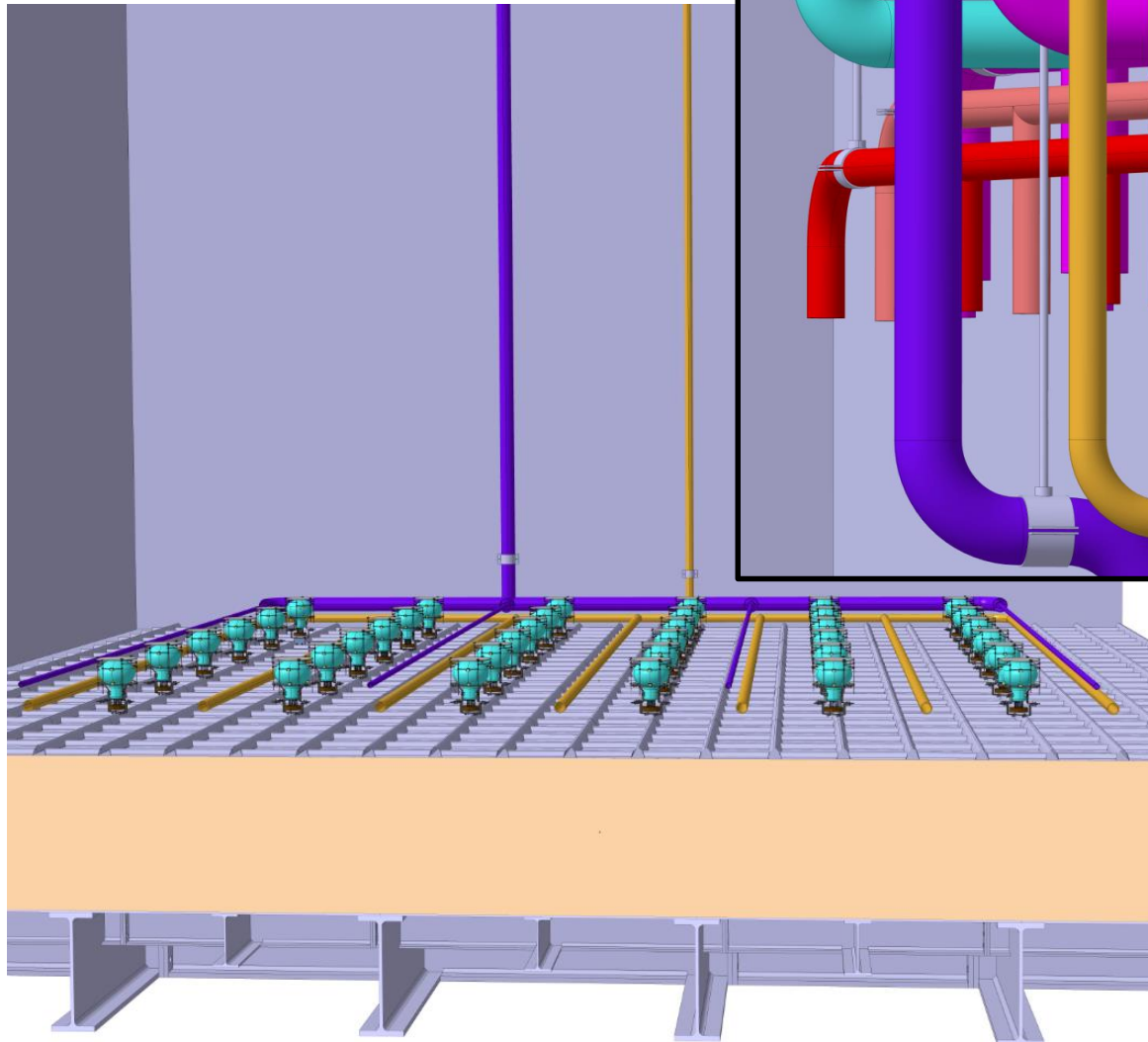
- General
 - Material Properties of the FR-4 I-Beam fro FEM calculation (Rahul S.)
 - Company is investigating to find Metric FR-4 screws
 - Laura M.B. together with Jaehoon Y. and Animesh C. will start simulation in COMSOL

Internal Piping :

- Pipes are fixed on the Top with rods and on the Bottom with feet at the Membrane



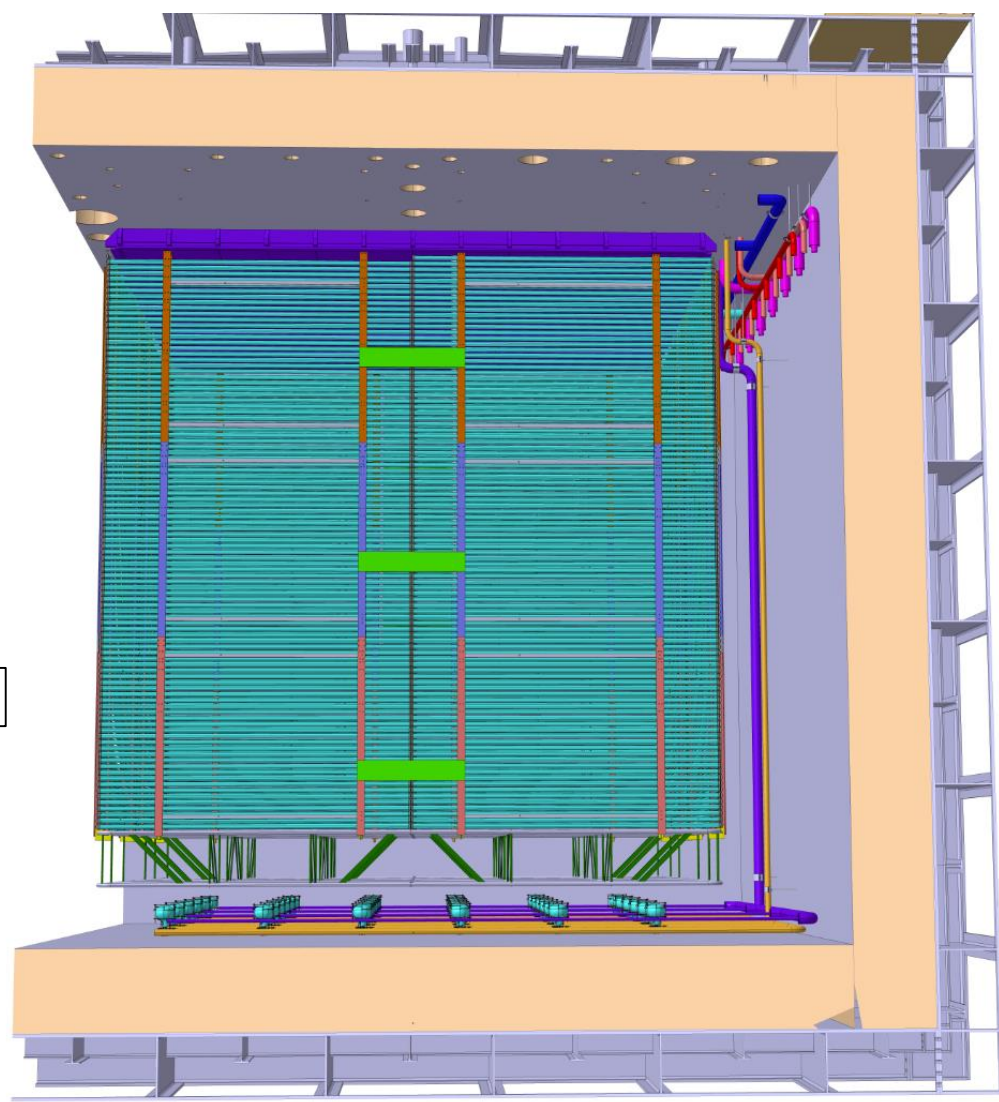
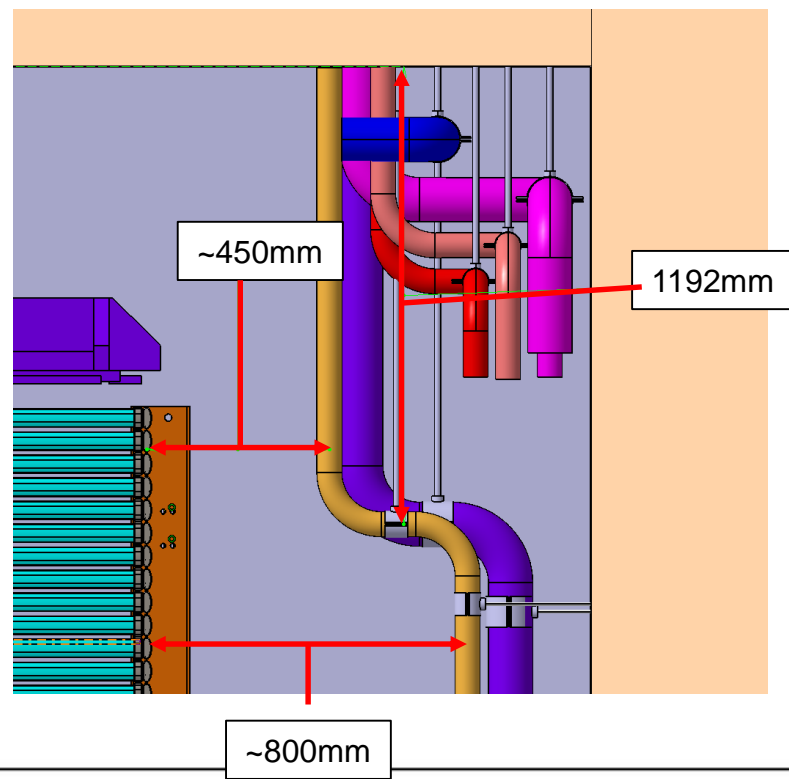
Internal Piping :



Treaded Rods

Internal Piping :

First 6 Field Shapers are at ~450 mm from the piping

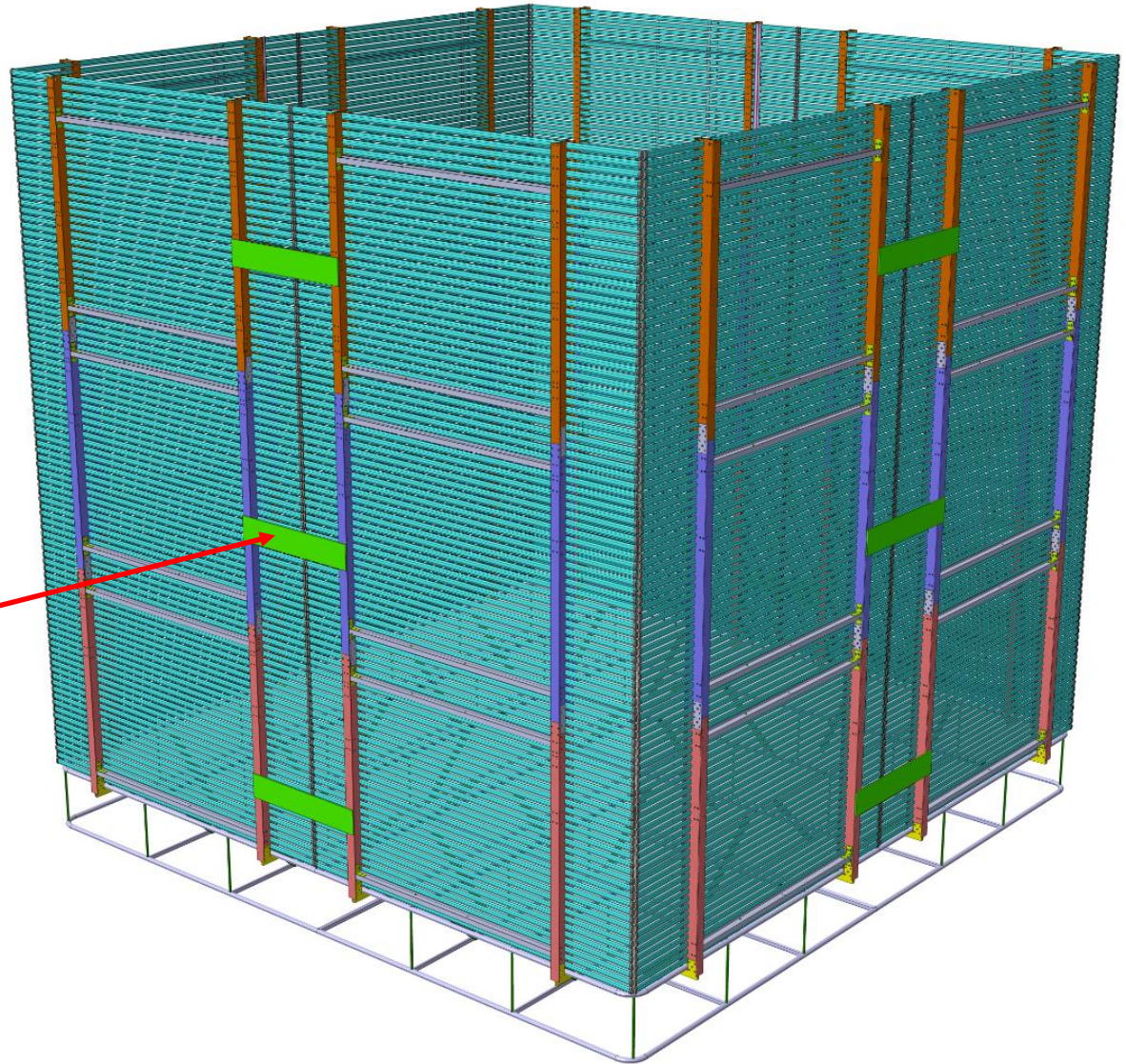


Field Cage Update:

Field Cage on Modules

FR-4 Field Cage Reinforcement

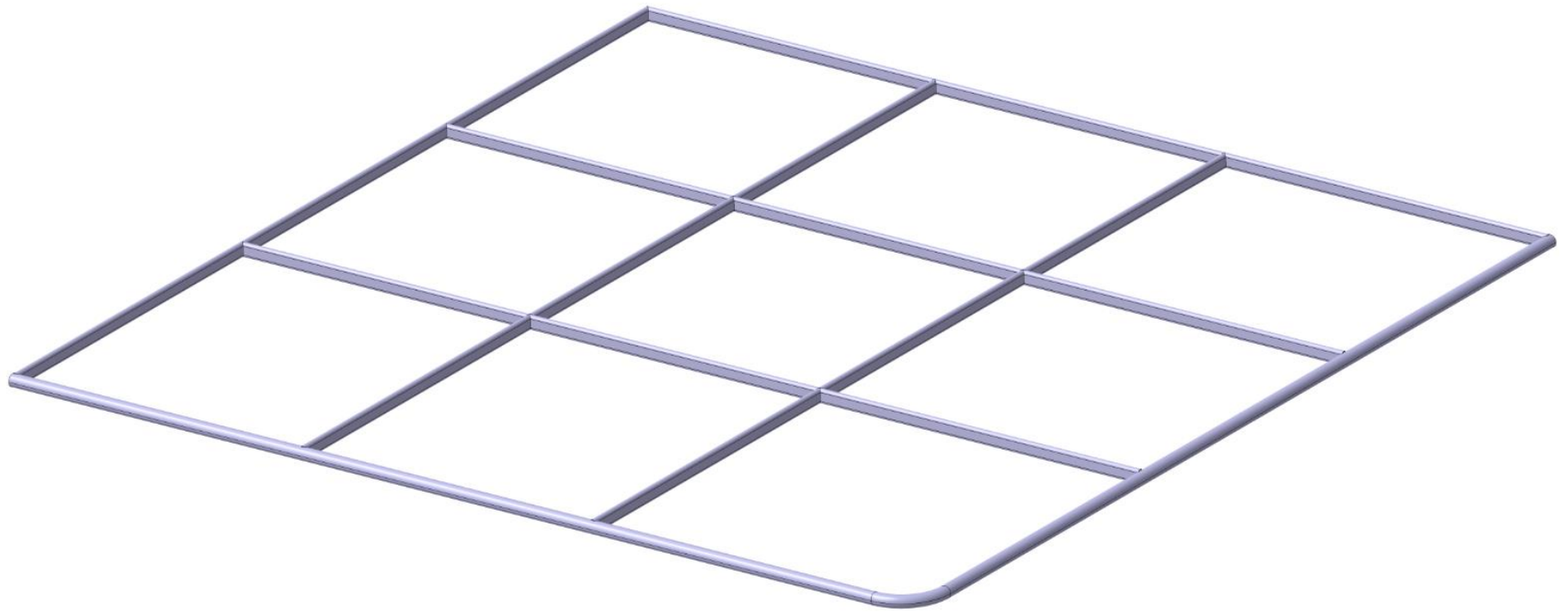
60mm between Field Shapers



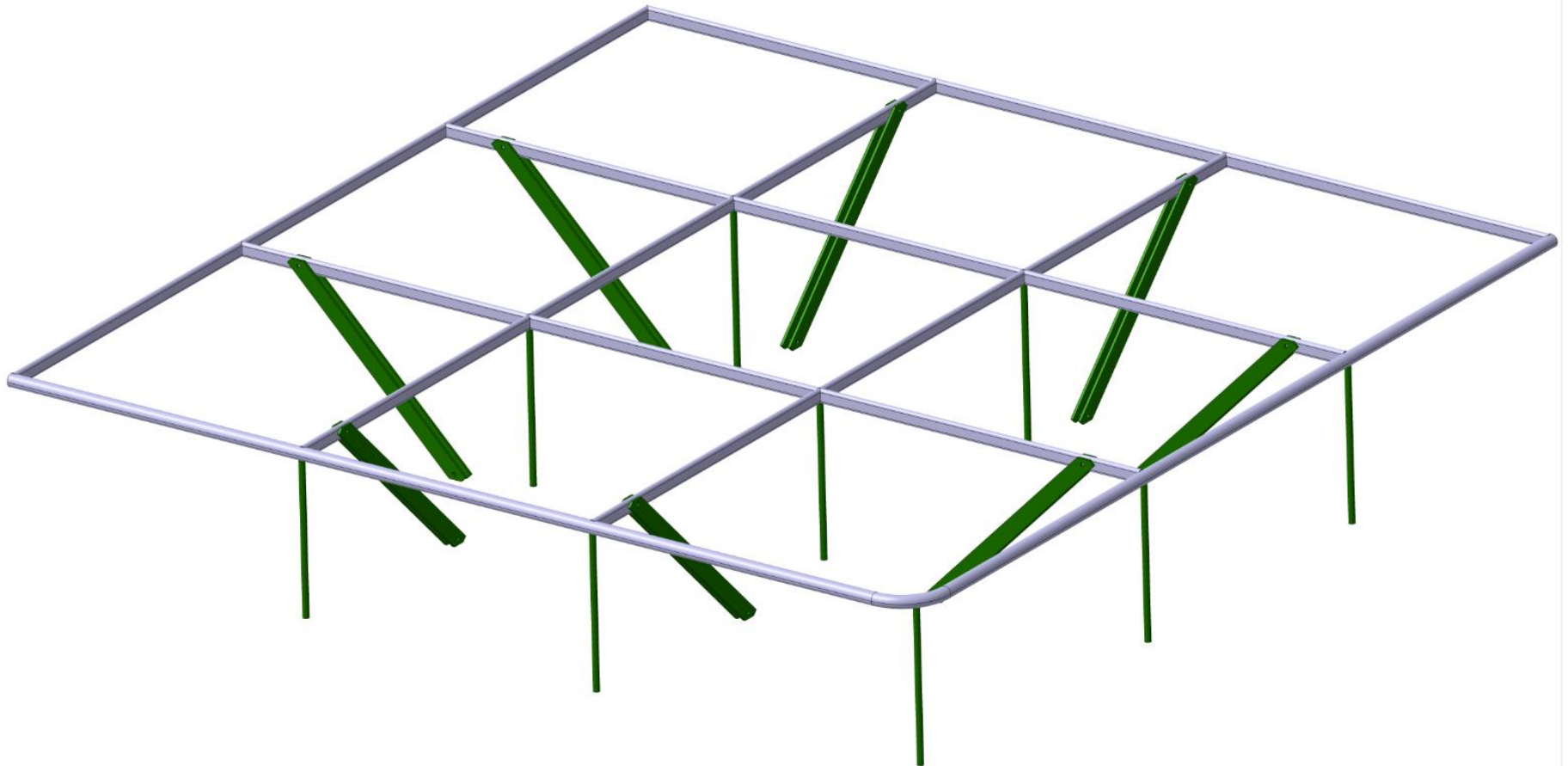
New Cathode and Ground Grid Design

Cathode and Ground Grid Structure:

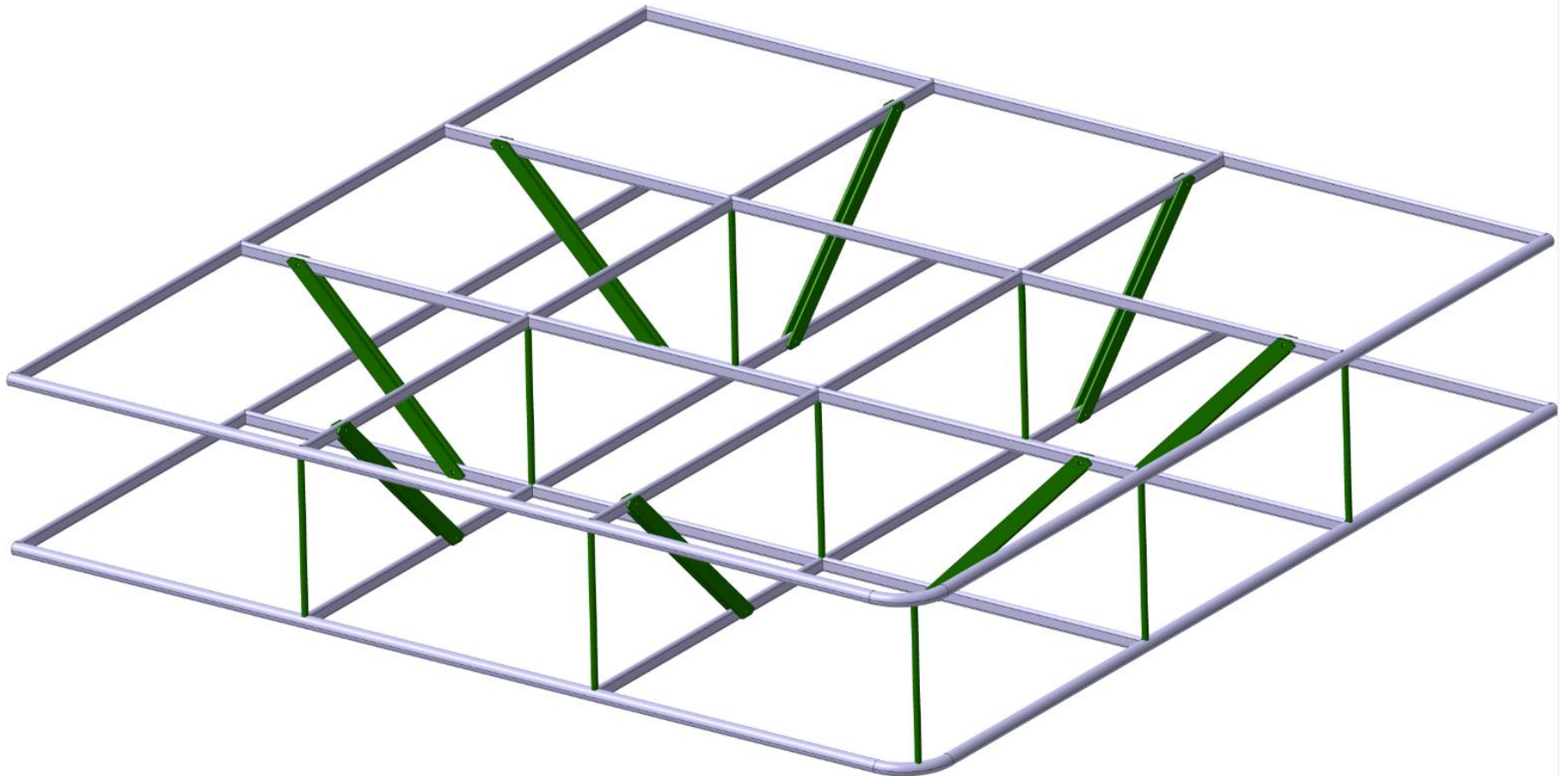
- $\frac{1}{4}$ of the Cathode Structure: $\sim 3.2 \times 3.2 \text{ m}^2$
- Material: Alu



- FR-4 Reinforcement

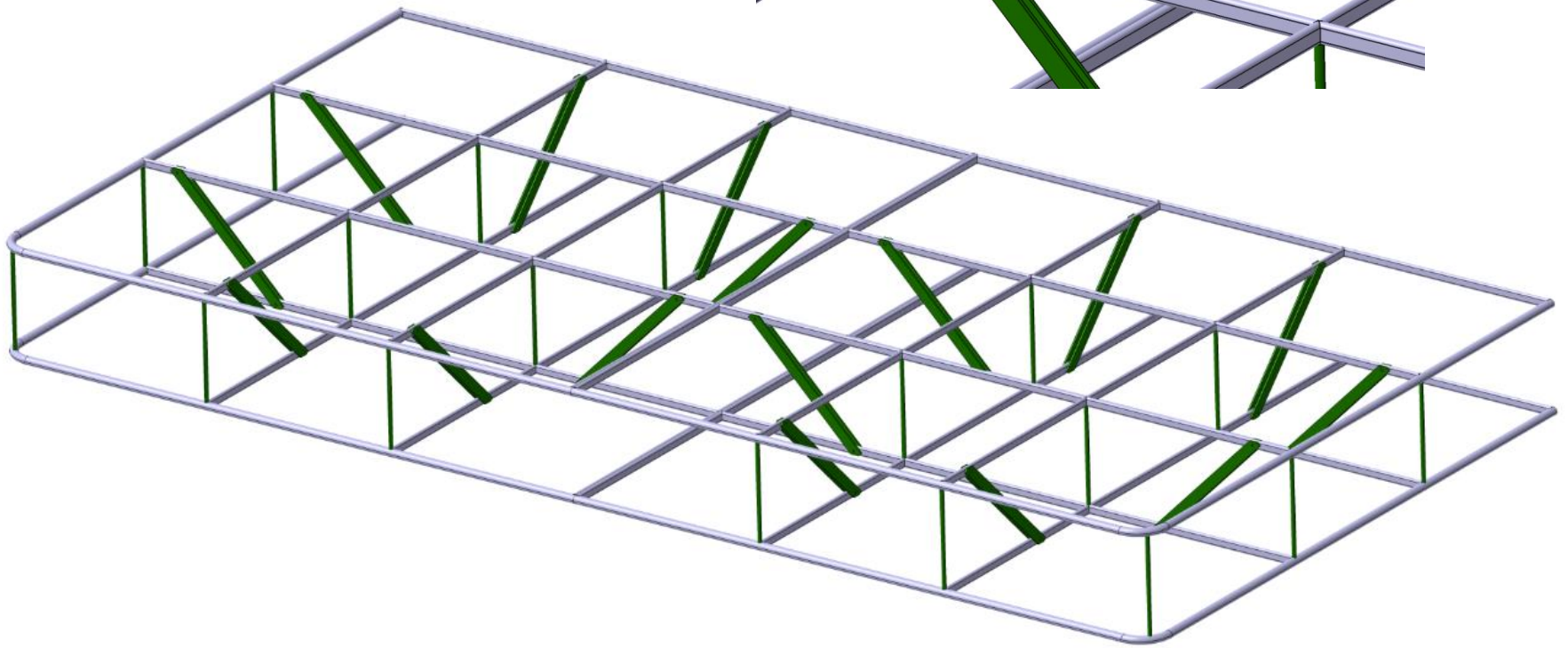
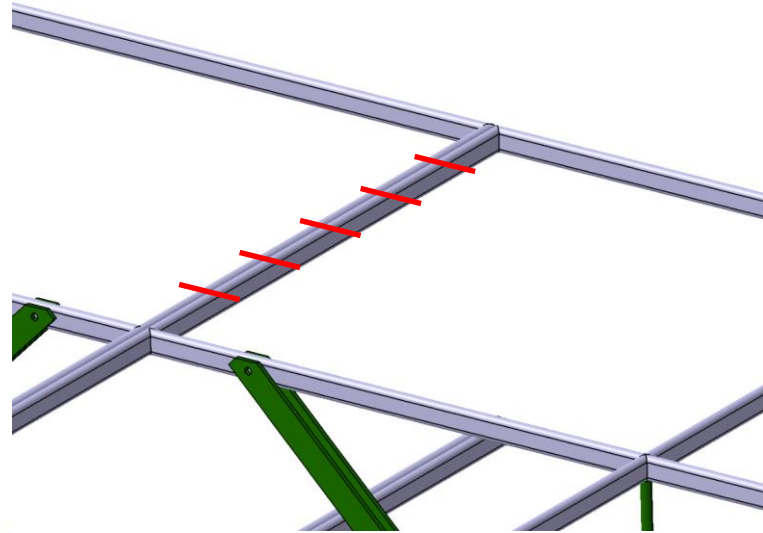


- Ground Grid Geometry same as the Cathode

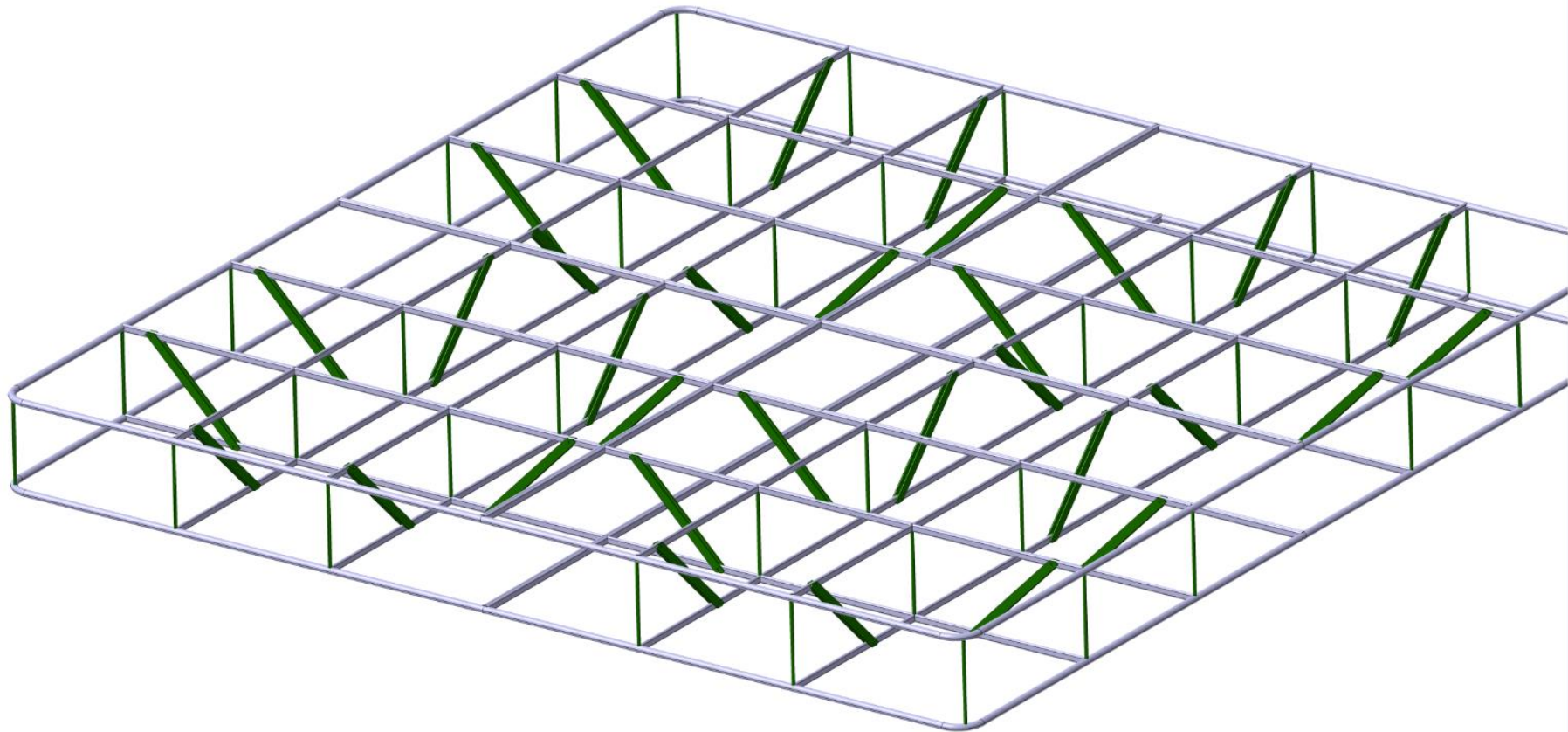


Cathode and Ground Grid Structure:

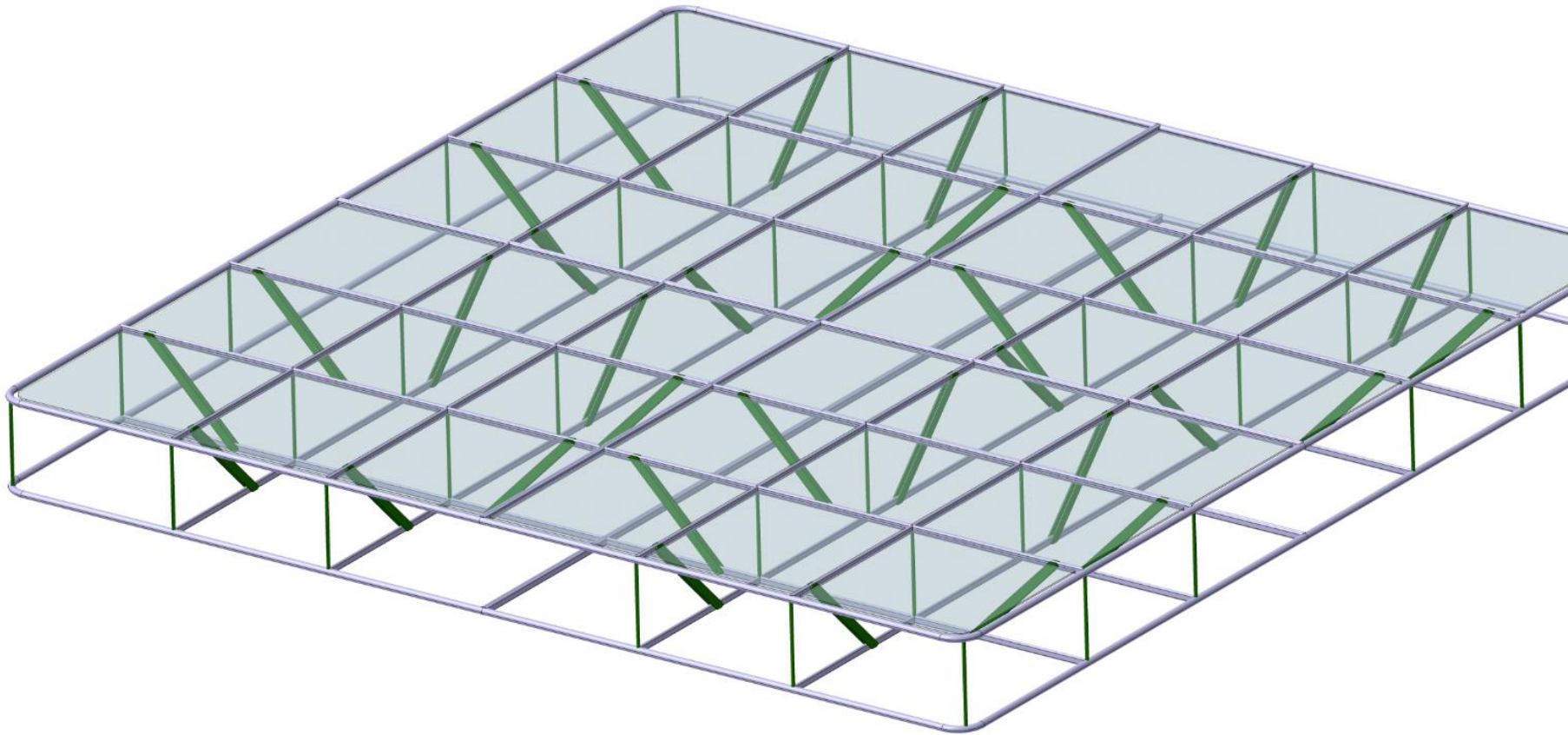
- 2 modules assembled
- Connection bewt modules with screws



- 4 modules assembled

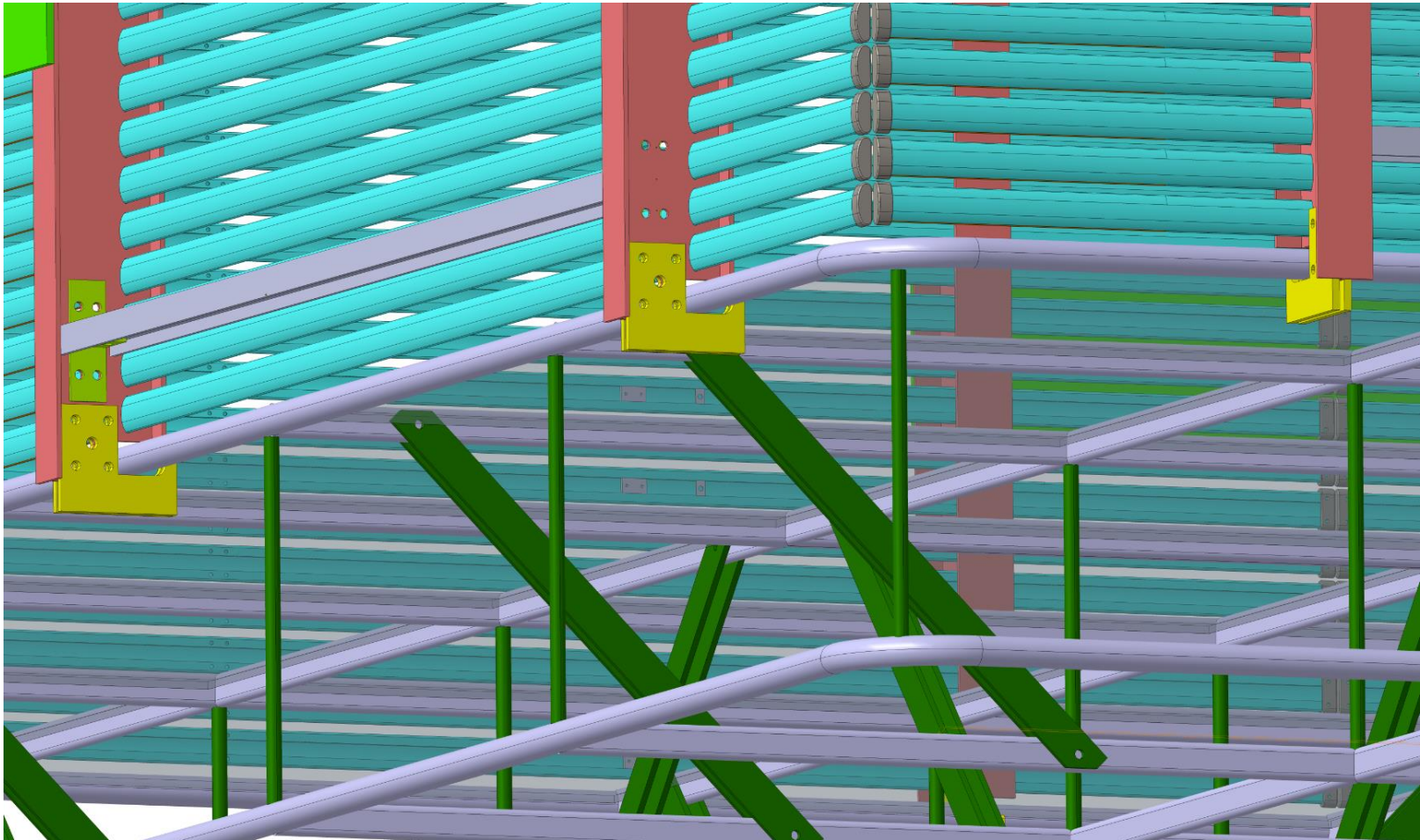


- PMMA panels

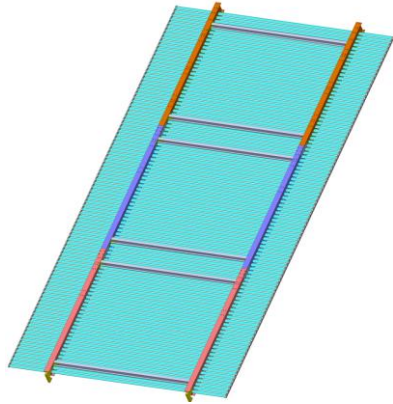


Cathode and Ground Grid Structure:

- Bottom connection for the Cathode at the FC
- Hook-shaped FR-4 Plate in order to hang the Cathode after that the FC is assembled

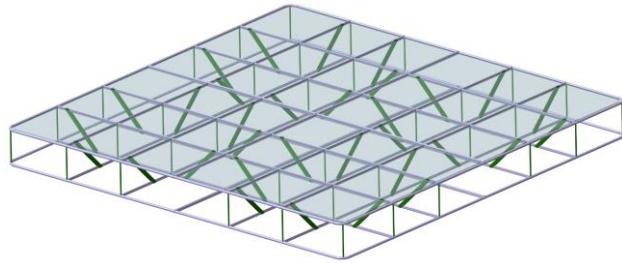


Preliminary weight Calculation:



- 98 Alu Profiles: $0.620 \text{ Kg} \times 98 = 60.8 \text{ Kg}$
- FR-4 Beams and Reinforcements 65 kg

FC Module $125.8 \text{ Kg} \times 8 \text{ Modules} = 1007 \text{ Kg}$



- Cathode Module: 26 Kg
- Ground Grid Module 30 kg
- FR-4 Reinforcement 10 kg
- PMMA 105 Kg

Module weight $171 \text{ kg} \times 4 \text{ Modules} = 684 \text{ Kg}$

- Additional FC reinforcement ~100 Kg
- Hanging System ~ 40 kg
- Details (HV divider, small connection, bolts etc..) ~100 Kg

Total FC weight estimation ~2 Tons

- Field Cage

- hanging system
- reinforcement at the corner for structural stability
- HVFT connection and Voltage divider
- preliminary FEM calculation

