



**Engineering**  
the energy saving

the  
Passive  
Cooling

# ITR-ETR CABIN SYSTEM

---

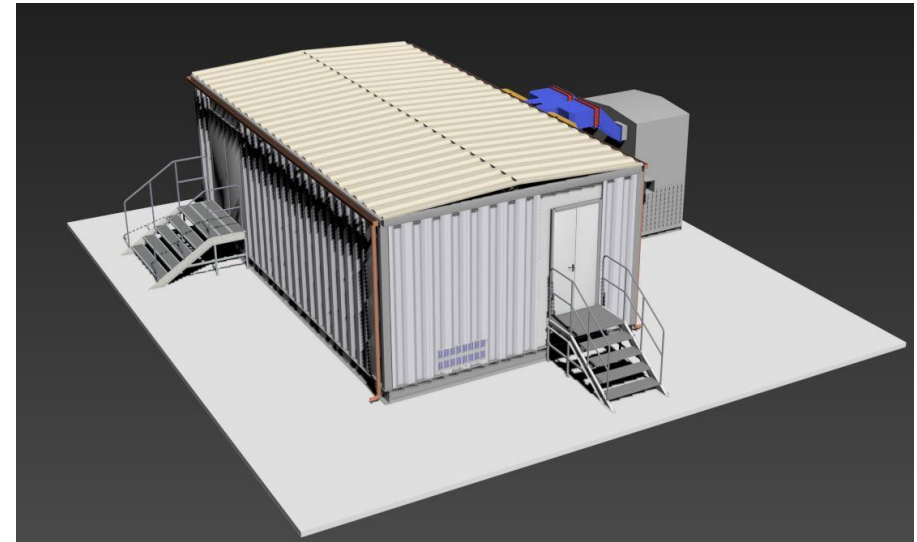
*MANUFACTURING EXAMPLE*

# Structure - I

The structure of the shelters is of monolithic type, completely made in steel, with doors built into the wall panels. The structural design and the construction detailing will meet the requirements of the International Recognized Standards. Shelters are designed to have a long life span even under harsh field conditions, with particular aim for resistance to moving in hard conditions, tightness for water, resistance to vermin, extreme climates suitable insulation and reduced maintenance.

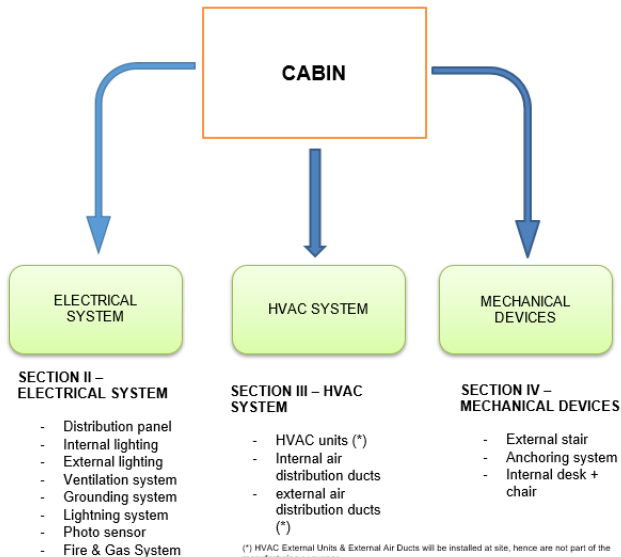
The structure of the shelters and the fixing of the equipment/accessories will be sturdy, stable and solid enough to enable loading, unloading and off-road transport operations on trucks.

The entire structure is a torsion-resistant construction. Wall and roof panels are welded continuously tight to be resistant against intrusion of water and very fine sand.



## SECTION I – CABIN CONSTRUCTION

- Structure
- Insulation panel
- Painting
- Doors
- MCT frames
- Panel frames
- False Flooring & Cable Trays



## Floor

The modular raised floor consists of a galvanized steel structure for a new floor at elevation of 600mm from the bottom of the skid floor to allow cable transit, Load capacity is 500 Kg/sqm, with supports adjustable in height, plastic gaskets and panels in high density conglomerate of wood and resins with fire retardant tiles (class E1), squared, edged and lined with PVC coating thickness 2mm. Battery rooms are not equipped with a false floor. The floor is made in stainless steel 4mm thick.

## External Walls

The external wall is made of galvanized corrugated steel sheets; steel sheeting is watertight welded both to the floor skid and the roof frame and spot welded vertically inside, in order to have a torsion-resistant construction, during off-road transport and loading/unloading operations.

The interior lining consists of **120 minute fire-rated insulated sandwich type panels**, having a total thickness of 80 mm. The insulation is ensured by a core of high density rockwool (100 Kg/m<sup>3</sup>) fitted between two galvanised metal sheets 0.6 mm thick. Internal finishing of wall panels consists of one coat of polyester based white/grey colour paint. Panels have tongue-and-groove vertical joints.

# Structure - II

## **Roof**

The roof is built with a square tubular, forming the edge frame, welded to four corner.

External covering consists of corrugated galvanized sheets, watertight welded to the roof frame and longitudinally between each other. Roof sheeting is installed with the ribs perpendicular to the longitudinal side of the shelter and 5° slope is provided (for rain water drain).

The interior lining consists of 120 minute fire-rated insulated sandwich type panels, having a total thickness of 100 mm. The insulation is ensured by a core of high density rockwool (100 Kg/m<sup>3</sup>) fitted between two galvanised metal sheets 0.6 mm thick. Internal finishing of ceiling panels consists of one coat of polyester based white/grey colour paint. Panels have tongue-and-groove vertical joints.

## **Doors**

Each shelter is provided with IP66 external metal door, outward opening, single or double leaf and insulated. Joints between moving and fixed frames are provided with rubber gaskets on 4 sides in order to grant suitable sealing and waterproofing.

Doors are provided with a lockset "Yale" type, lever handle on the outside and panic bar on the inside, automatic door closer together with a 90 degrees limiting device to prevent damages caused by the wind, threshold, weather stripping and three stainless steel hinges. Doors are provided with door open switch.

## **Painting**

The painting is performed after the full assembly of the shelter by using a priming coat of epoxy paint and a final coating of polyurethane RAL 7035 (Light grey) paint for outdoor environment for a total dry film thickness 300 µm.

## **MCT Frames**

Gas Tight Multi Cable Transit frames (MCT) are welded on the side wall of the shelter for power supply in the underfloor area.



# Equipment integration - I

## **FIRE FIGHTING AND DETECTION SYSTEM**

The objective of the Fire & Gas Detection System is to detect fires or gas leaks at an early stage and promptly activate/initiate the relevant alarms and shut down and/or protection systems. To achieve this, F&G detectors will be provided in all areas with a significant fire or gas hazard; detectors will be selected and located to maximise the speed and reliability of response.

The basic requirements of the fire and gas detection system are be as follows:

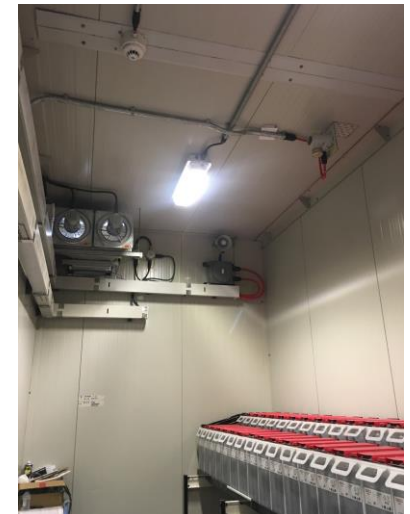
- To monitor all areas where a fire could occur;
- To monitor all areas where flammable/toxic vapours could occur or accumulate during normal operations;
- To monitor HVAC air intakes to buildings and enclosures for flammable and/or toxic gas and smoke;
- To provide a facility for raising an alarm and alerting personnel out on site to a fire or gas emergency situation;

The following detection equipment shall be considered:

- Fire detection
- Flammable gas detection
- Toxic gas detection (if required)

## **ELECTRICAL SYSTEM**

The shelter is equipped with internal/external lighting, grounding and power distribution systems designed in accordance with the customer specifications.





# Equipment integration - II

## **HVAC SYSTEM**

All cabins are to be treated by one HVAC self-standing units with redundant compressors, air-cooled condenser and condenser fans (one as duty and one as standby) located on the side of the buildings.

An insulated fresh air duct fitted with a sand trap louver and a gas tight damper is to be connected to the HVAC units.

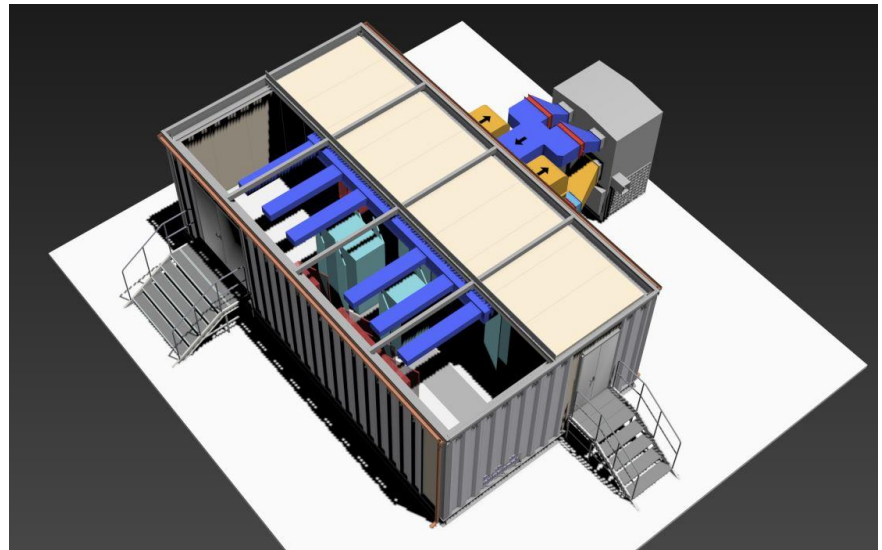
Air is to be supplied to the rooms by means of insulated ductwork systems fitted with supply grilles and all necessary fire dampers and balancing dampers. Fresh air shall be discharged to outside via building air leakages.

Insulated return ductwork shall be fitted with return grilles and all necessary fire dampers and balancing dampers.

A temperature sensor located in return duct operates on the refrigerating system.

## **MECHANICAL DEVICES**

The shelter is integrated with mechanical devices like stairs, supports, platform and handrails, cable entries and other components for the shelter integration. All the parts are to be chosen according to the customer indication.



# Codes, FAT and documentation

<b>Shelter Body Structural Design</b>	UNI EN 1991 Eurocode 1: Basis of design and actions on structures <ul style="list-style-type: none"> <li>• UNI EN 1991-1, Basis of design</li> <li>• UNI EN 1991-2-1, Actions on structures - Densities, self-weight and imposed loads</li> </ul> UNI EN 1993 Eurocode 3: Design of steel structures <ul style="list-style-type: none"> <li>• UNI EN 1993-1-1, General rules and rules for buildings</li> </ul>		
<b>Insulation Material</b>	<i>Mechanical properties</i>	<i>Thermal properties</i>	<i>Fire resistance</i>
	UNI EN 13164:2015 UNI EN1607:2013	UNI EN 13164:2015 UNI EN 13165:2016	UNI EN 13501-1:2019
<b>FRP Cladding</b>	Reaction to Fire: NF P92-501 M2 Mechanical properties: ISO 3262, 180 and 527-4		
<b>Protection Degree</b>	IEC 60529; DIN 40050		
<b>Electrical Materials and Installation</b>	CEI 64-8; IEC 60364		
<b>Extruded aluminium</b>	EN 573-3		
<b>Steel hardware protection</b>	Hot Deep Zinc: DIN 50976; EN 10111; EN 1461; CEI 7-6		
<b>Stainless steel fixtures</b>	EN 10088-1		
<b>Fire / Smoke detectors</b>	EN 54-7:2018		
<b>Metallic Products Types of Inspection Documents</b>	EN 10204:2005		
<b>Welding</b>	<ul style="list-style-type: none"> <li>• UNI EN ISO 4063:2001</li> <li>• UNI EN ISO 15614-1:2005</li> <li>• UNI EN 1011:2005</li> <li>• UNI EN ISO 9692-1:2005</li> <li>• UNI EN ISO 5817:2004</li> <li>• EN 1090</li> </ul>		

## Factory tests

Factory inspection and tests will be carried out in accordance with the ISO 9001 standard and to the approved ITP.

It will include:

- Visual inspection of equipment and installation for the checking of mechanical integrity
- Inspection of equipment and installation for the checking of compliance with specifications, . data sheets and drawings
- Inspection of earthing, continuity and connections
- Checking of lighting circuits
- Air Conditioning system tests
- Fire protection system
- Power distribution panel
- Functional tests
- Factory acceptance procedures will be submitted for approval

## Documentation

- Fabrication & QCP " Quality Control Plan "
- Procurement & Fabrication Schedule & Status
- Shelter detailed structural analysis report
- Power Distribution panel specification
- Power Distribution panel Single line diagram
- Power Distribution panel Interconnection & Termination
- A/C System data sheets
- A/C System schematic diagram
- A/C System Interconnection & Termination drawings
- Fire protection specification
- Fire protection - P&IDs
- Fire protection - calculation note
- Fire protection - Logic diagram
- Lighting System data sheets
- Lighting System schematic diagram
- Shelter general arrangement
- Material Take-Off
- Installation & Mounting Details
- Installation Procedure
- Factory Acceptance Test procedure
- As built Vendor documentation (after FAT)



**Engineering the energy saving**

**Celant.Tel srl**

Via Pellizzari 28 20871 Vimercate (MB) - ITALY

Ph. +39 0396084217 Fax +39 0396084213

[info@celantel.com](mailto:info@celantel.com)

<https://www.celantel.com/cabinet/#passive-cabinet>

**[www.celantel.com](http://www.celantel.com)**