Purpose Built Tools, Equipment, and Platforms Framework Contract

Call for Nomination

1. Background

The ITER project is based in St Paul Lez Durance in the south of France. It has entered the construction phase and the assembly of the Machine will start in the coming years. Further information can be found on the ITER website (http://www.iter.org) and also at the web pages of the ITER Parties that can be accessed via the ITER website.

Tooling and equipment will be required for the first phase of assembly of the ITER machine and the associated plant systems. A portion of this tooling and equipment will be procured under this framework contract.

2. Purpose

The purpose of this framework contract is to provide the ITER Organization (IO) with specific tooling and equipment required to assemble auxiliary components of the ITER Machine. It includes the related preliminary and detail design, the manufacture and the test of this equipment.

The evaluation for the contract award will be based on the Contractor's ability to meet the technical requirements defined in the Framework Contract Technical Specification and in the Technical Specification for the first Task Order. Other Individual Task Orders will be issued during the execution of the contract and the Contractor is expected to be compliant with technical and cost requirements for the proposed supply.

3. Scope of Supply

The object of this framework contract is to have an established partnership with a company or consortium ("Suppliers") capable of providing ITER with some or all of the following:

- The design, manufacture and test of tools in accordance with the European machinery directive and other applicable regulations (example: ITER regulation on vacuum environment and clean conditions, seismic requirements)
- training of personnel
- provision of after-sales services
- The development and qualification of an assembly process and provision of the associated on-site services for some specific tasks.

In some cases, IO will provide conceptual designs for tooling and equipment. The Contractor may propose alternative designs to fulfil IO's requirements. For simple tools, IO may only provide the functional requirements.

The following main categories of equipment and tooling may be purchased through this framework contract:

- Handling Equipment:
  - Handling on floor: steel frame structures designed to transfer heavy loads (up to about 100 tons) in limited spaces, over long distances (200 m), and allowing their final placement for welding or other assembly operations (alignment capabilities),
  - Steel structures: tools to interface to off the shelf equipment, tools necessary for temporary supporting of components during testing.
- Alignment & Installation tools:
  - Specific tools used for assembly, alignment and fine adjustment of equipment, pipes, heavy bolts, etc..
  - Specific clamping equipment for welding operations
  - Supports for Metrology Tools
- Lifting Equipment:
  - Heavy lifting equipment: This covers all the lifting beams that will be used for the in-cryostat activities (Example of capacity: 600 tons).
  - Lifting interfaces and adapters to components of a wide range of weights and sizes,
- Access and safety Equipment:
  - Permanent access platforms for use inside nuclear buildings
  - Permanent access platforms for use inside "cryostat", under vacuum,
  - Outdoor temporary access platforms, steel bridges and construction site material hoists used during assembly to introduce heavy equipment through temporary openings in buildings
  - Indoor non-standard mobile access systems Mechanical parts to secure openings on floor or walls.

4. Estimated duration

The duration of the Framework Contract will be three (3) years, with the option to extend it for one additional two (2) year period.

Task Orders will be issued for specific scopes of work, the duration of each being dependent upon the scope of the task.

5. Timetable

The tentative timetable is as follows:

Call for Nomination	Mid-October 2015
Issue Pre-qualification package	Early-December 2015
Deadline for receipt of pre-qualification	Mid Jan 2016
Issue the call for Tender	Mid-March 2016
Deadline for receipt of Tenders	Mid-May 2016
Contract Signature	End September 2016

6. Experience

The Contractor and its personnel shall have adequate experience in design and manufacture of tooling and equipment appropriate to the scope of supply of this contract. This includes, but is not limited to, experience in the following:

- French regulations regarding lifting equipment, personnel access equipment, and machinery. This includes testing, certification, and CE marking of equipment as required;
- European design codes for lifting equipment, personnel access equipment, steel structures, and machinery;
- Design of access platforms for nuclear environments;
- Design of fixed access equipment (platforms, ladders);
- Design of lifting equipment (slings, spreader beams, lifting fixtures) for loads up to 1500 tons;
- Design of handling fixtures with moving parts for positioning and precise alignment of heavy components up to 100 tons weight;
- Mechanical and structural analysis, seismic analysis may be required for some of the items;
- CAD software (CATIA);
- On site machining/ drilling (only for very specific applications);

7. Candidature

Participation is open to all legal persons participating either individually or in a grouping (consortium) which is established in an ITER Member State. A legal person cannot participate individually or as a consortium partner in more than one application or tender. A consortium may be a permanent, legally-established grouping or a grouping, which has been constituted informally for a specific tender procedure. All members of a consortium (i.e. the leader and all other members) are jointly and severally liable to the ITER Organization.

The consortium groupings shall be presented at the pre-qualification stage. The tenderer's composition cannot be modified without the approval of the ITER Organization after the pre-qualification.

Legal entities belonging to the same legal grouping are allowed to participate separately if they are able to demonstrate independent technical and financial capacities. Candidates (individual or consortium) must comply with the selection criteria. The IO reserves the right to disregard duplicated reference projects and may exclude such legal entities from the pre-qualification procedure.

Appendix: Tools of reference

The following content is given for information only, and is intended to clarify the different categories of tools. The pictures shown below do not necessarily describe a tool to be purchased under this contract.

Handling equipment:

1.1 Handling on floor:

1.1.1 Description

Steel frame structures designed to transfer heavy loads (up to about 100 tonnes) in limited spaces, over long distances (200 m), and allowing their final placement for welding or other assembly operation (alignment capabilities).

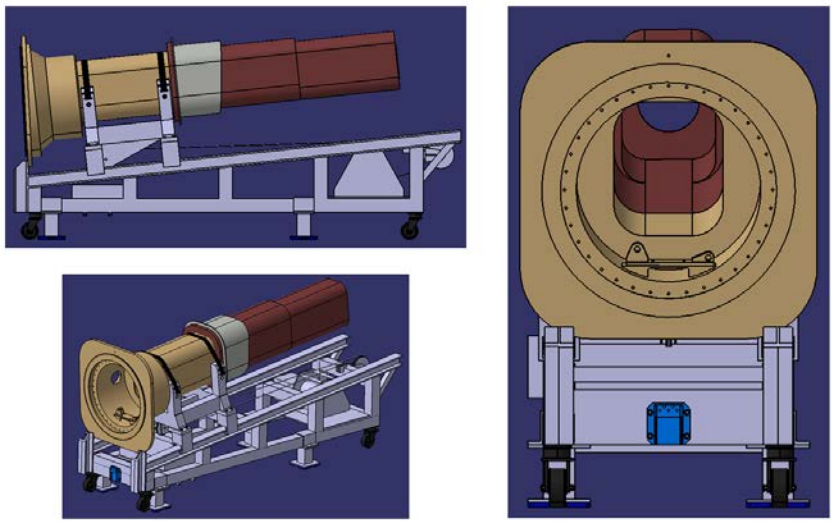


Figure 1 Illustration of a mechanical structure designed to handle a component of about 5 tonnes

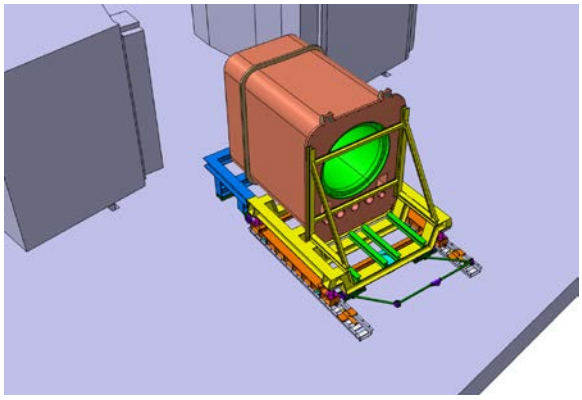


Figure 2 Illustration of a mechanical structure to transport and place in final position a component of about 20 tonnes

1.1.2 Design requirements

- All these tools shall have a common interface to an electric tug (MASTER TUG type),
- All these tools shall enable indoor transport on long distance of about 200m,
- All these tools shall then enable the final placement to allow the connections to be done (welding, bolting..)
- All these tools shall be deigned to ensure safe removal / disconnection of load.

Steel structures

1.1.3 Description

This category of tools will contain:

- Interfaces to off the shelf equipment,
- Tools necessary for temporary supporting,
- Tools for supporting of components during testing,
- Sub-assembly bench: this can be necessary during welding of one component to a second component, it can also be necessary to bolts heavy pieces together. The components assembled would weigh 30 tons.

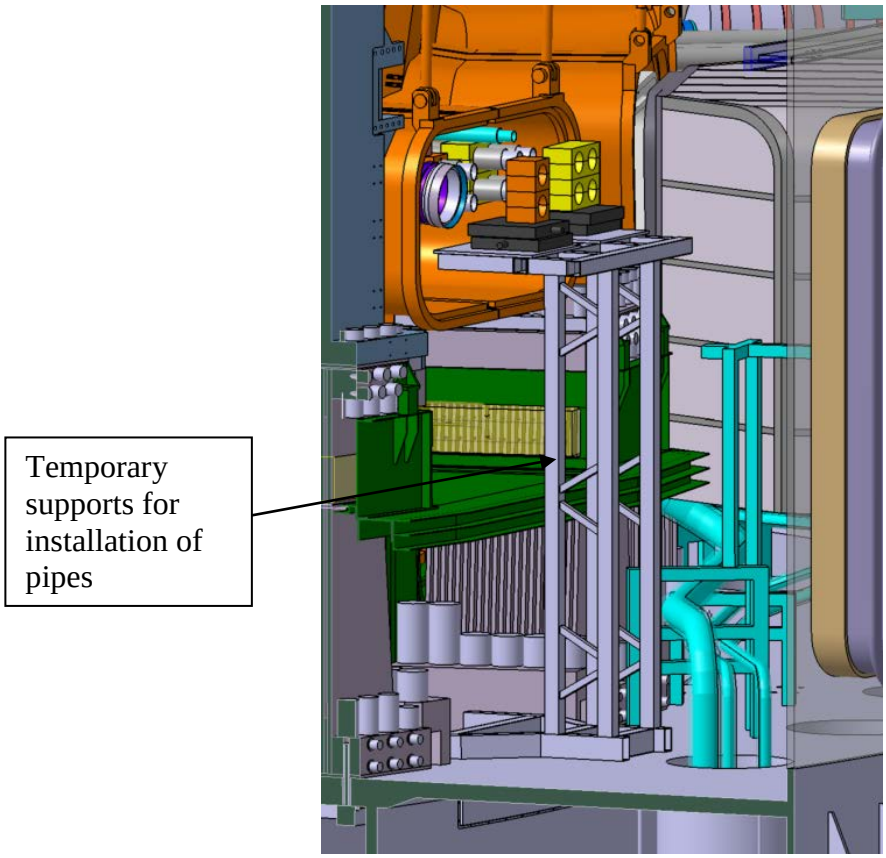


Figure 3 Illustration of a temporary support allowing the placement of pipes and clamping before welding

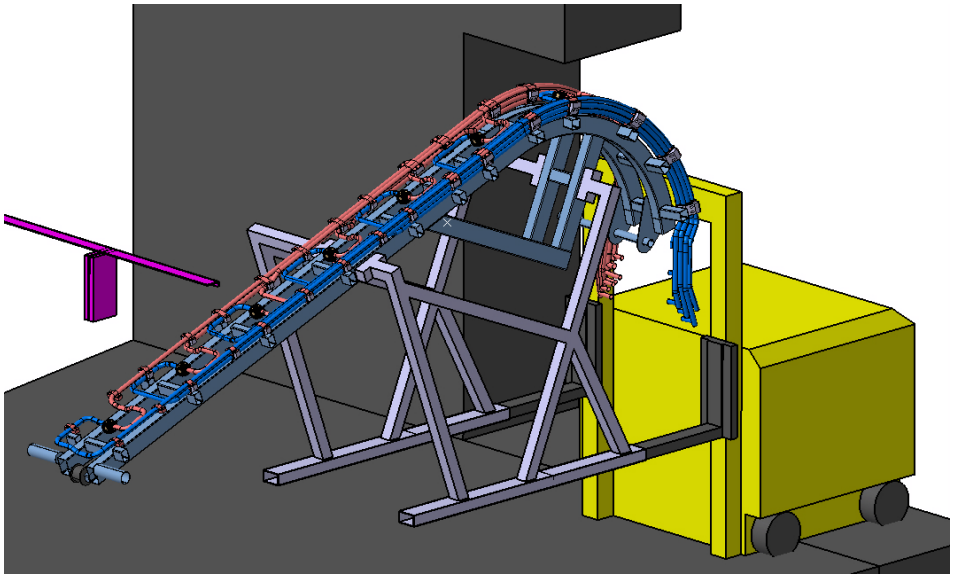


Figure 4 Illustration of an interface used on a standard fork lift to transport a component

1.1.4 Design requirements

- For the tools that will be in contact with vacuum components, care will be given to the material interfacing with the component,
- The tool shall not damage the component handled,
- The tool shall be operable in a safe way in all configurations,

Alignment & Installation tools:

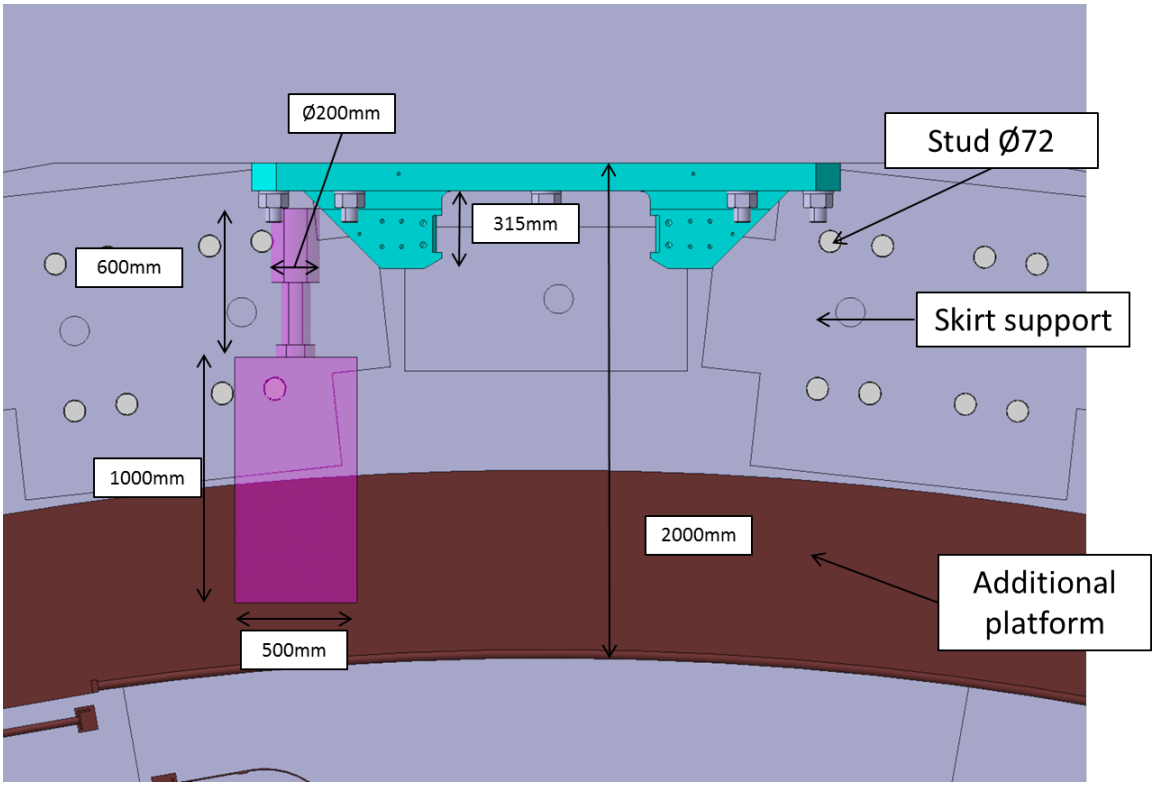
1.2 Specific tools used for fine adjustment, alignment and assembly of equipment, pipes, heavy bolts, etc..

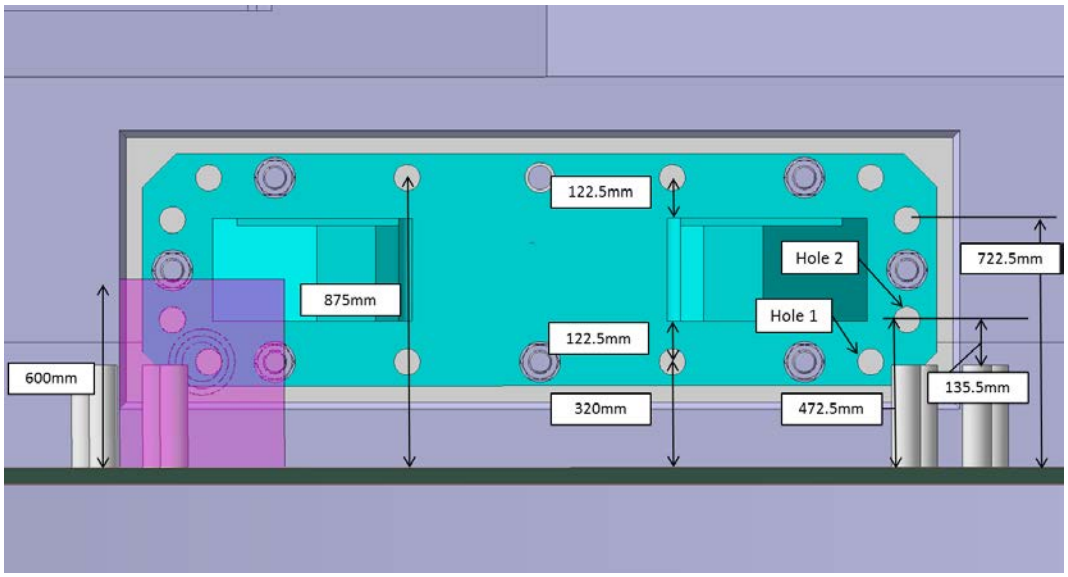
A diverse range of installation tools will be necessary to perform the final adjustment of the components on site.

This comprises but will not be limited to:

- Specific tools for fine adjustment

The following picture illustrates the on-site post drilling of a mechanical part of 2250kg and the associated embedded plate in order to insert by cold fitting the shear pins.





- Some alignment and clamping tools:

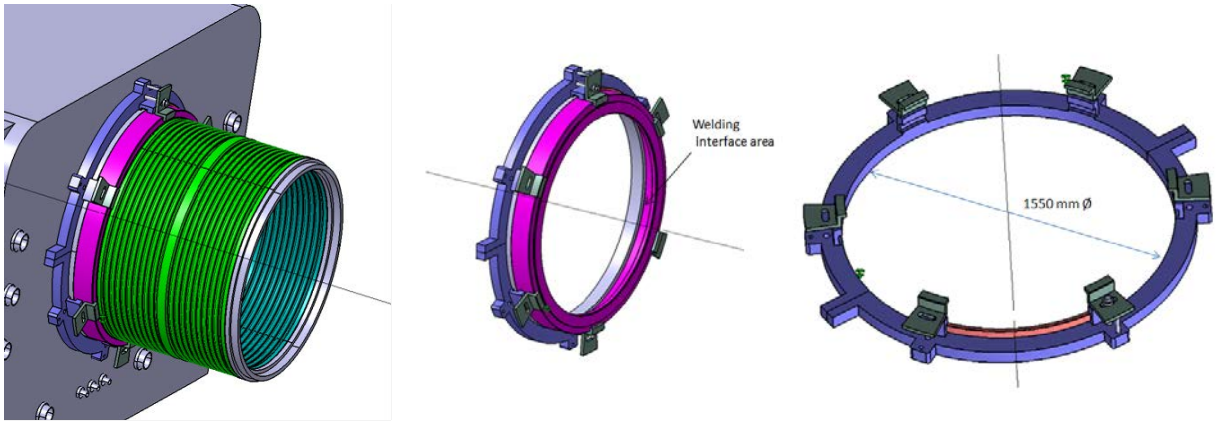


Figure 5 Illustration of an alignment and clamping fixture

- Some tools to handle heavy bolts Some custom made tools to align and assemble pipes.

1.3 Specific clamping equipment for welding,

This category will comprise any clamping system that would need some design and that would not be off the shelf.

1.4 Support for Metrology tools

1.4.1 Description

To perform survey campaigns during installation some custom-made stands for metrology equipment will be necessary. Target nest interfaces may be necessary on components. This is illustrated below:

Figure 6 metal plate with threaded hole welded to a component to install a survey target nest

Figure 7 Second type of foldable interface for metrology equipment

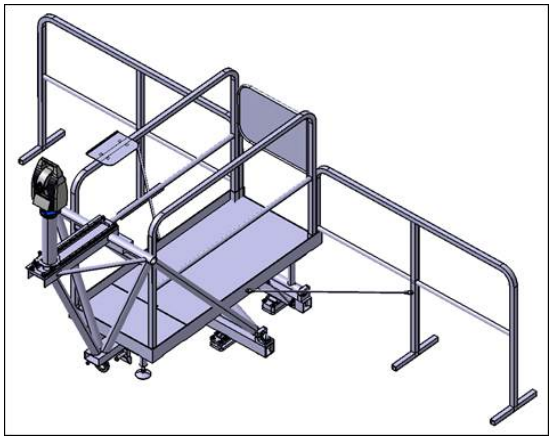


Figure 8 Illustration of a custom made metrology stand with safety barrier

1.4.2 Design requirements

- Metrology stands require a high stability and vibration damping to obtain proper measurements,
- Metrology stand positioning shall be repeatable,
- The material used for the interfaces on components shall not be magnetic.

Lifting equipment:

1.5 Heavy lifting equipment

1.5.1 Description

This will cover any specific lifting equipment needs to be designed, manufactured and tested..

Example

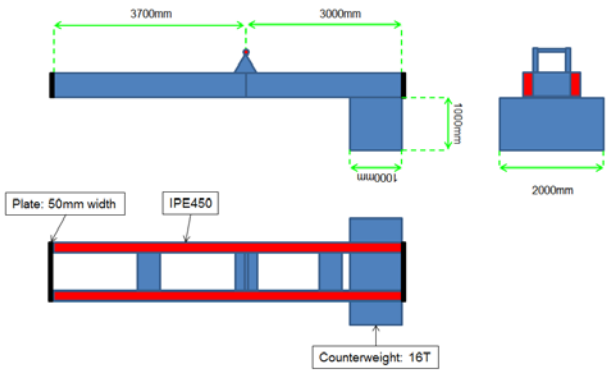


Figure 9 Illustration of a counterbalanced beam

1.5.2 Design requirements

- French regulation to be applied,
- CE marked equipment,

1.5.3 Description

The following illustration shows the possible design of double spreader beam to lift a component that weighs about 1100 tonnes. The capacity of this double spreader beam would be about 400 tonnes and the approximate weight of the double spreader beam is about 60 tonnes.

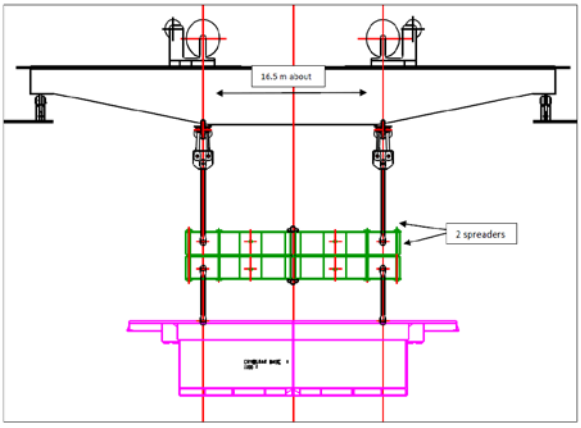


Figure 10 Illustration of a double lifting beam (weight about 60 tonnes)

This category of tool can also cover some lifting beams to be designed and implemented on an existing tool as shown below:

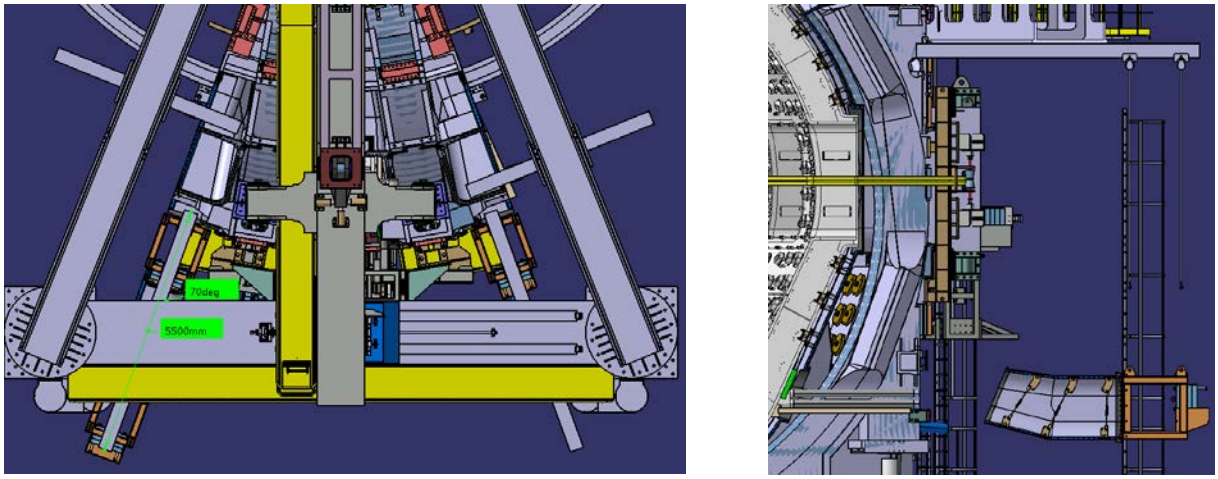


Figure 11 Illustration of a lifting beam implemented on an existing sub-assembly tool

The lifting beam illustrated above is designed and equipped with 2 hoists of capacity 5 tonnes.
This lifting beam will have to be implemented on an existing tool.
This lifting beam will have to be removable in order to enable the main tool to operate.

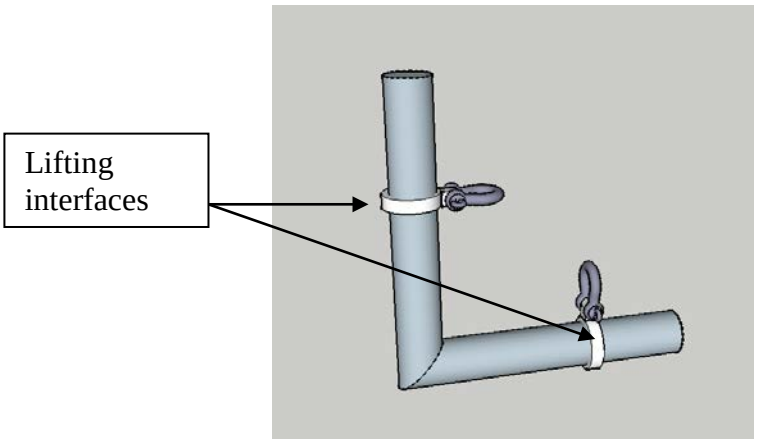
1.5.4 Design requirements

- Shall be designed in accordance with French regulation,
- In some cases, some specific engineering studies may be necessary to modify the design file of a tool after modification, in order to allow the CE certification.

1.6 Lifting interfaces to components of all weights & sizes,

1.6.1 Description

The following illustration shows that only the lifting interfaces (white piece) are to be covered by this scope of supply, not the standard lifting accessories, such as standard shackle.



1.6.2 Design requirements

- Designed in accordance with French regulation and applicable codes and standards,
- Shall not damage the components,
- In the case of in-cryostat components, care shall be given not to contaminate the component with forbidden materials
- The lifting interfaces shall enable a safe and balanced operation of installation,
- All the lifting configurations and the associated load cases shall be evaluated and appropriate safety margins considered.

Access and safety equipment

1.7 Permanent access platforms inside nuclear buildings,

1.7.1 Description

Platforms will be necessary for man access during maintenance.

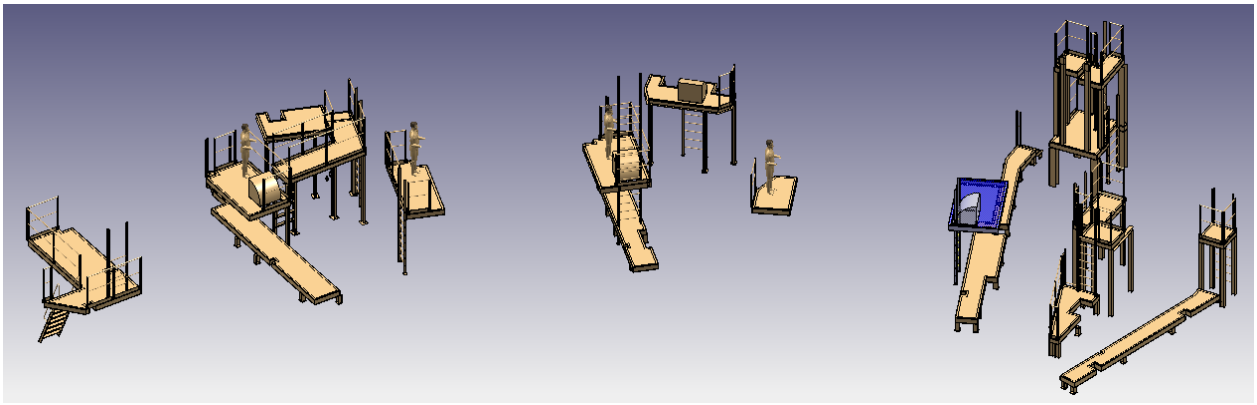


Figure 12 Illustration of some platforms necessary at L1 of the Tokamak building in NB cell

1.7.2 Design Requirements

- Platforms will need to be designed according to Safety of machinery — Permanent means of access to machinery: NF EN ISO 14122
- in order to protect adjacent equipment and the building, the platforms shall be designed for seismic loads (load details in individual TO)
- material compatible with nuclear waste management.

1.8 Permanent access platforms inside “cryostat” vacuum,

1.8.1 Description

Those platforms will be permanently installed in a vacuum vessel called the “cryostat”. Those platforms are primarily for man Those platforms give access from the bottom of base of the cryostat to the top via ladders and hatches on the platforms.

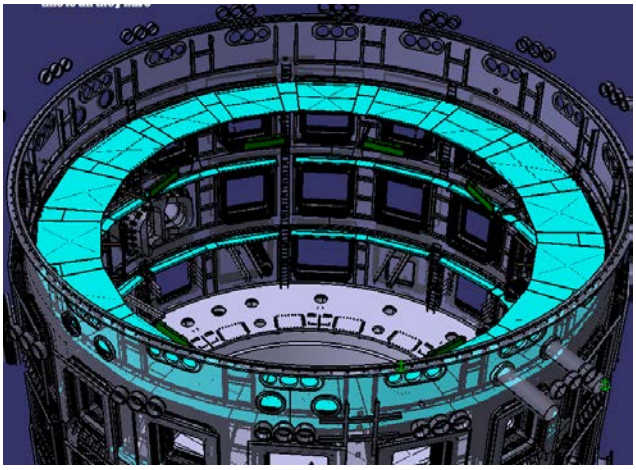


Figure 13 Illustration of In cryostat platforms

1.8.2 Design requirements

- Compatible with clean conditions requirements for cryostat vacuum environment
- Non-magnetic material shall be used as these platforms will be installed permanently in the cryostat,
- Seismic acceleration of the cryostat to be taken into account

1.9 Outdoor temporary access platforms and hoists used during assembly to enter heavy equipment through temporary openings,

1.9.1 Description

During the installation phase, temporary openings will serve the different levels of the buildings (from B2 to L3) allowing the introduction of heavy components without delaying the construction of the buildings. Those temporary openings will be equipped with bridges, fixed platforms or material hoists depending on their location and the configuration of the openings.

Generally:

- Bridges will be used to access temporary openings at L1 (flush with the outside floor),
- Material hoists will be used for indoor access or when several openings are located on top of other ones,
- Fixed platforms will be used in other cases or when heavy loads are planned to be delivered.

Example of outdoor platform giving access to the east of the tritium building:

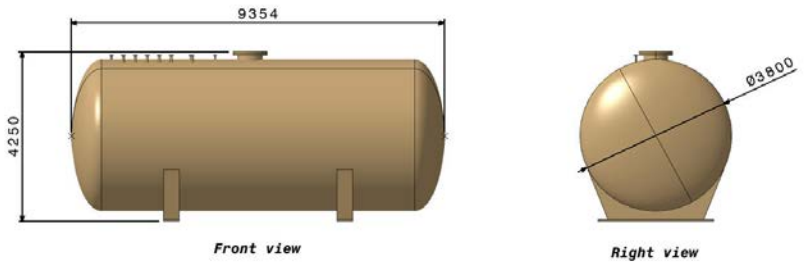
Size of the opening (width*height)	Interface under the opening	Surface of platform	Feet height

7000*5500mm	5 embedded plates of 700*700mm	9200*12600mm	3000mm

Heaviest equipment to be positioned on the platform:

- tank:

Weight: 25 tons
Diameter: 3800 mm
Length: 9354 mm
Contact surface between the component and the platform: 4 air-pads of 900*900 mm



- B2 Feeders installation:

Weight: 30 tons
Diameter: 2.72m*2.13m
Length: 11.8
Contact surface between the component and the platform: 4 air-pads 900*900mm

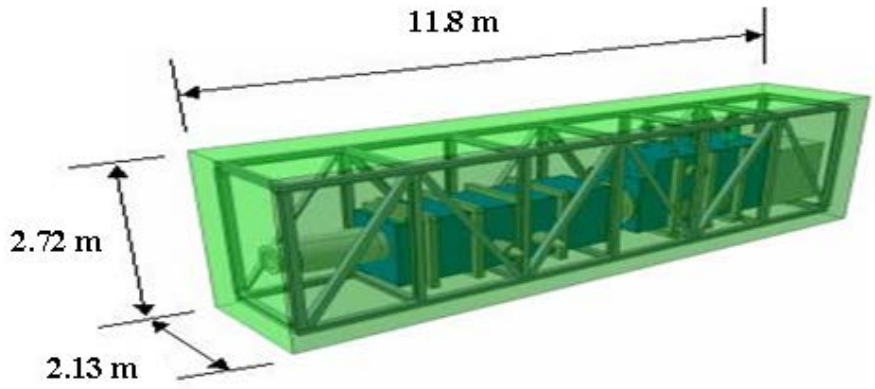


Figure 14 CTB&SBB: 11.5m*1.98*2.39 _ GH40':11.8*2.13*2.72 22t

Available interfaces with the building: embedded plates are foreseen under the opening.

An interface (man access platform and ladder) will have to be foreseen to enable the access to the existing emergency ladders.

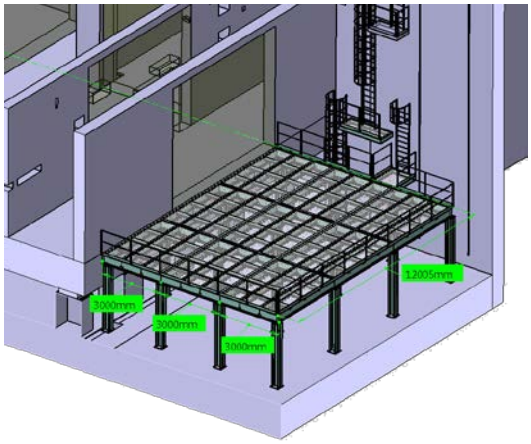


Figure 15 interface with the emergency ladder provided with the seismic pit

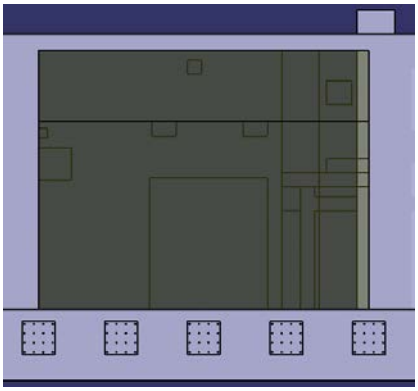


Figure 16 embedded plates located under the opening

Example of outdoor material hoist giving access to the north of the tokomak building:

This material hoist would serve 3 levels of the tritium building. A total height of about 27m shall be reached by the platform of the hoist.

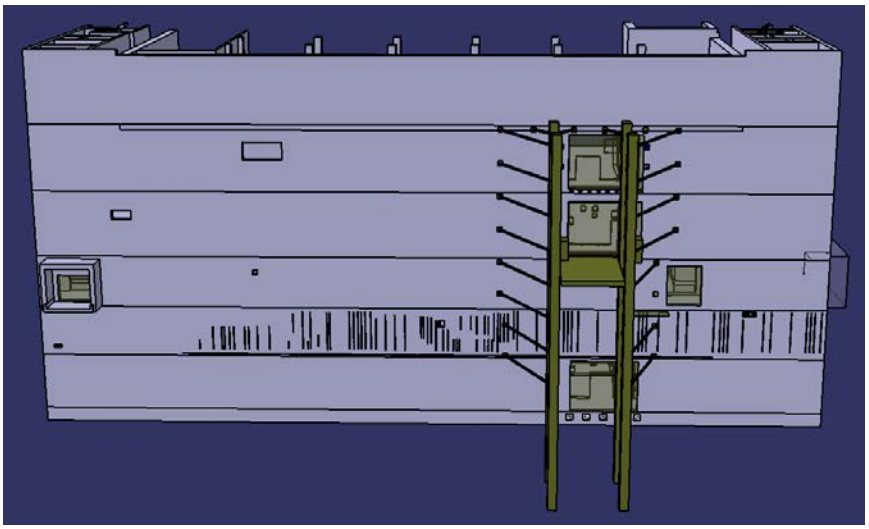


Figure 17 Illustration of an outdoor material hoist

1.9.2 Design requirements

- Outdoor use,
- This material hoist shall respect the French Regulations and the latest applicable codes and standards,
- This material hoist shall be compatible with the use of air-pads on it to unload equipment,
- material hoists will have to be designed taking into account the fact that the tritium building and Tokamak building are on seismic bearings.

1.10 Indoor non-standard mobile access, or access that has to be engineered,

1.10.1 Description

This access equipment will be necessary to access parts of the machine or the buildings during the installation phase.

The following concept is a simple set of stairs to access inside the cryostat base (an ITER component).

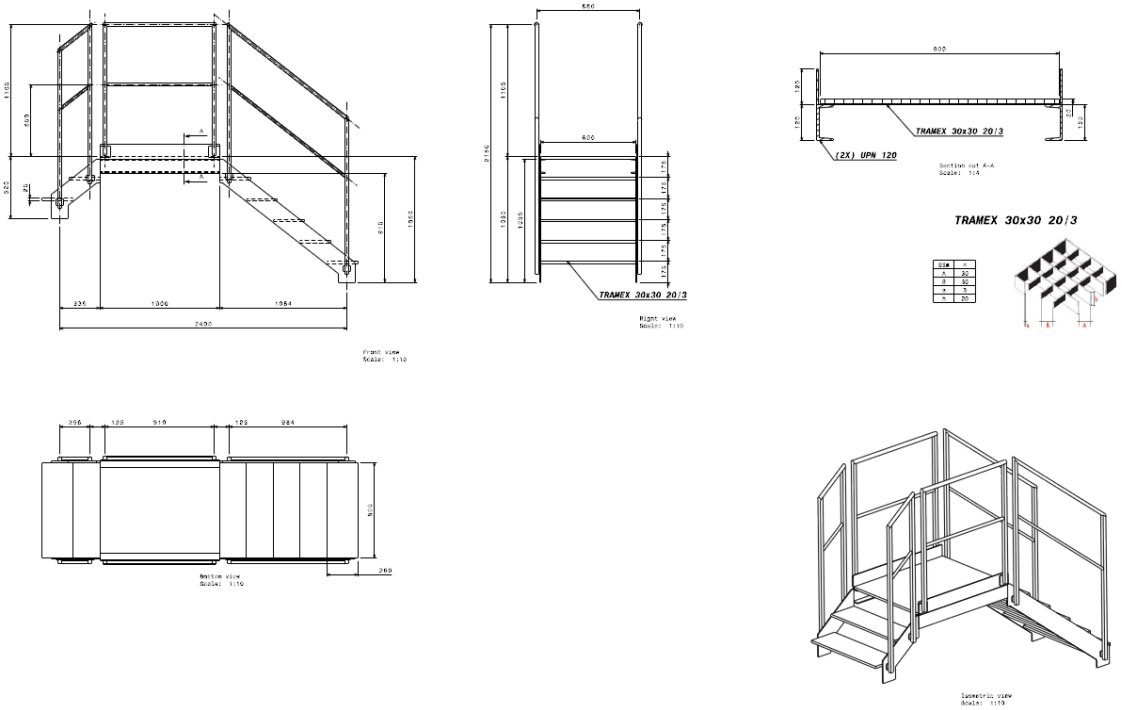


Figure 18 Illustration of an indoor temporary access platform

The following picture illustrates 3 types of access equipment that will be necessary for the access to the top of the machine. This is for illustration only.

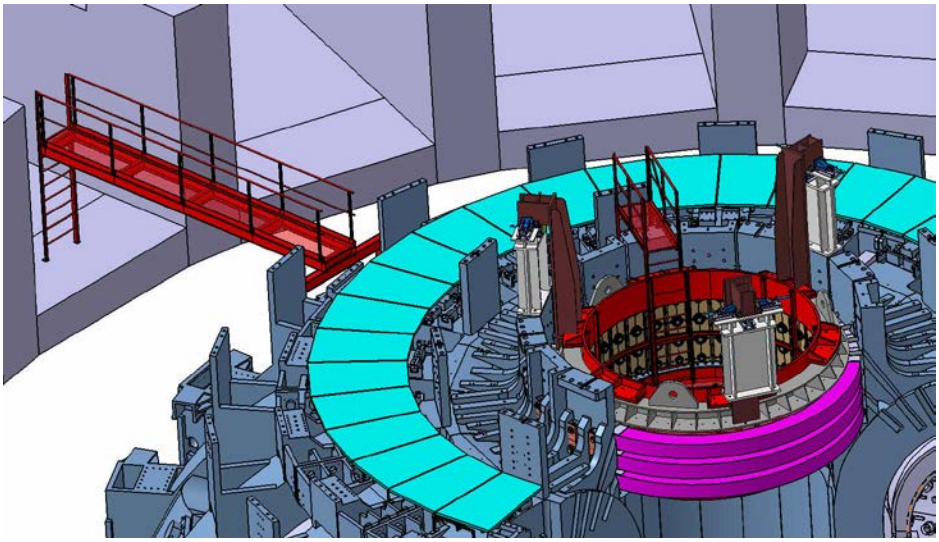


Figure 19 Illustration of indoor temporary access platforms (in red) to access the top of the machine

1.10.2 Design requirements

- Easy to be installed/ removed,
- Depending where used: compatible with clean environment,
- All small parts shall be captive to avoid the fall of objects on workers or to avoid the loss of small items in vacuum environment,
- In some cases, some specific engineering studies may be necessary to modify the design file of a tool after modification, in order to allow the CE certification.

1.11 Mechanical parts to secure openings on floor or walls

1.11.1 Description

The following mechanical parts will be necessary to secure openings during installation phase.

The mechanical part can be necessary to secure an opening on walls as illustrated below:

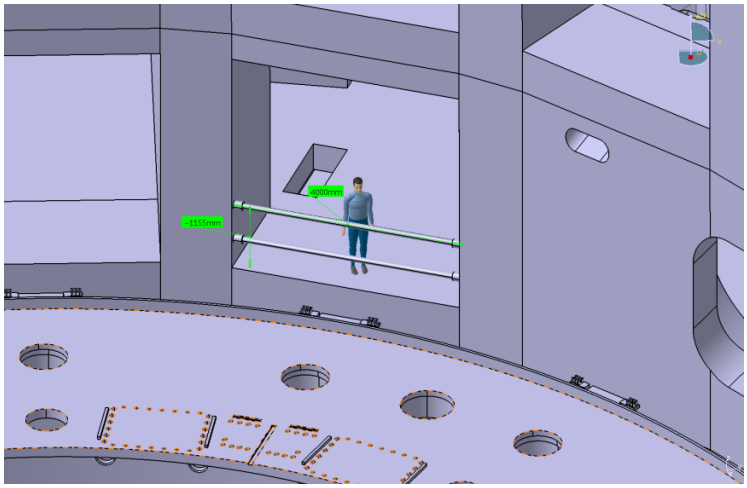


Figure 20 Illustration of a safety fence to protect an indoor opening during installation

The mechanical part can also be necessary to secure an opening on floor as illustrated below: In that case it has to be strong enough to allow heavy loads to be transported over it.

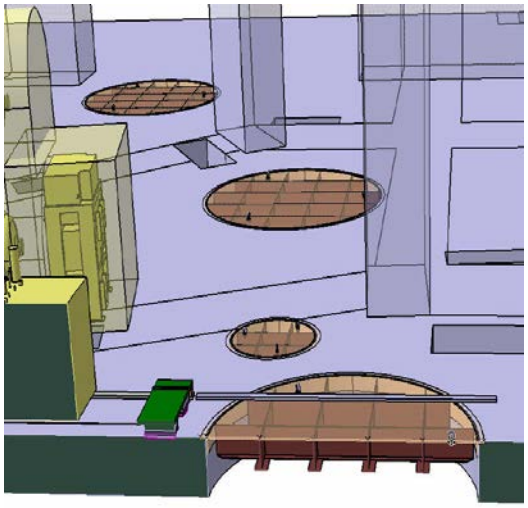


Figure 21 Illustration of a cover plate to protect an opening on the floor during installation

1.11.2 Design requirements

- Safety fences shall be designed in accordance with French regulation,
- Shall be easy to be installed and removed,
- The cover plates for openings on floor shall be compatible with heavy loads traffic in certain area of buildings: equipment of up to 100 tonnes can be transported on rollers or airpads over these steel covers.