

# STS 3&4 Festoon Systems Overhaul

## Scope of Work

### 1. Summary

This document is a list of the responsibilities of the successful bidder (i.e. the Contractor ), who shall execute the complete overhaul of the **Cable Festoon Systems** of **Two (2)** Ship-to-Shore container handling cranes, namely **STS 3** and **STS 4**, in operation at Th.P.A. S.A.'s premises at Thessaloniki Port.

The submitted offer, the supply of all materials/parts, as well as the execution of all works must take into consideration all of the attached Annexes.

These Annexes provide information on the existing Festoon systems, as well as the requirements for the new Festoon systems to be installed.

Additional comments are included in the provided photographs at **pages 7-18** below, which also must be taken into consideration in the offer submission.

All data provided in the attached Annexes are to the best of ThPA's knowledge and every effort has been made to ensure that this data is complete & correct.

However, it is strongly advised that each bidder reviews all this data and/or perform his own on-site inspections & measurements as he deems necessary.

Continuous Supervision (both **Technical** and **Health & Safety**) of all Contractor's activities, Commissioning and Start-up of all installed new festoon components is within the Contractor's responsibilities.

This also includes all necessary on-site: Measurements, Tests, Inspections, Verifications, Adjustments, Pre-energisation tests, Operational tests etc. in order to confirm & ensure proper installation and operation of all new Festoon components (both Mechanical and Electrical).

Notes:

1. The technical data of the existing festoon systems are included in the attached annexes :
  - **Annex 02** ( *Mechanical Components* ),
  - **Annex 03** ( *Cables* ) and
  - **Annex 05** ( *Mechanical Components Drawings* ).
2. The attached: **Annex 09** (*Festoon Engineering Guidelines*), and: **Annex 10** (*Festoon Installation Instructions*), are Wampfler's documents regarding Festoon systems and must be taken into consideration by the Contractor in his offer submission, as well as in the final installation.

## 2. Festoon System - Mechanical Components

The Contractor shall be responsible for the Supply, Freight/Transportation and Installation of all new mechanical components of a festoon system for each STS 3 & 4, as well as for the removal of the existing mechanical components.

In detail, all of the following are within the Contractor's responsibilities:

### 2.1 Supply

Supply all new Mechanical Components of a complete festoon system for STS 3 & STS 4, i.e.:

- End Clamp,
- Cable Trolleys,
- Towing Trolley,
- Wire Ropes
- Elastic/Impact Cords
- Cable clamps (for all Upper & Lower cable loops)
- Additional Spacers (for the Cable clamps of all Upper & Lower cable loops)
- Additional Clamping Pieces (for the clamping bars of the Upper & Lower cable supports)
- All auxiliary parts (e.g. bolts, washers, etc.), including the threaded rods  
(see pertinent note at **page 9** below).

Includes all freight & final transportation to ThPA premises.

Also refer to:

- **Annex 02** (*Mechanical Components*)
- **Annex 05** (*Mechanical Components Drawings*)

### 2.2 Removal

Removal / disassembly of all mechanical components of the existing festoon systems, rigging and lowering them down to ground elevation.

### 2.3 Installation

Local transportation to the actual erection site/STS, Final assembly, Rigging, Lifting at final elevation/location, Installation, Adjustment (prior to operation & after operation) of all supplied, new Mechanical Components of **section 2.1** above.

The existing modification (performed by ThPA) regarding the towing trolley and 1<sup>st</sup> cable trolley must be taken into consideration, in order for the new mechanical components of the festoon system to also eliminate / avoid the operational issues with festoon motion.

Therefore, any additional components/parts, materials, fabrication, assembly & installation for the elimination of this issue, are included in the *Contractor's* responsibilities.

Refer to **page 11** below and also to **Annex 08** (STS 3&4 Existing *Festoon Modifications*)

### 3. Festoon System - Electrical Components

The Contractor shall be responsible for the Supply, Freight/Transportation and Installation of all new electrical components of a festoon system for each STS 3 & 4, as well as for the removal of the existing electrical components.

In detail, all of the following are within the Contractor's responsibilities:

#### 3.1 Supply

Supply all new Electrical Components of a festoon system for STS 3 & 4, i.e.:

- Power cables
- Control/Signal cables
- Fibre optic cable
- Electrical enclosures (cabinets) with all necessary internal parts, as well as their support/base frames & anchors.
- All auxiliary parts (connectors, glands, support frames, anchoring parts etc.).  
Note: the Cable clamps & Additional spacers (for all upper & lower cable loops), as well as the Additional clamping pieces, are all included in the **Section 2** above.

Also refer to the attached:

- **Annex 03** ( *Cables* ) and
- **Annex 04** ( *Cabinets* ).

Notes regarding **Annex 03** ( *Cables* ) :

1. Each worksheet row named: STS 3&4 Festoon Overhaul, contains cable data/specifications which are binding to each bidder and prices must be included in the submitted offer for these specific cables. ( regarding the stated Cable quantities & Number of cores, these are also binding to each bidder since current & future needs have been considered ).
2. Each bidder must clearly state in his offer (and also fill in the Annex 03 table), all required data for all offered cables, i.e.: Description, Designation, Manufacturer, Model, Number of Cores x Nominal Cross Section (mm<sup>2</sup>), Part Number.
3. The pertinent, brochures & data tables of the cable's manufacturer for the specific types of offered cables, must also be submitted with the offer. All offered cables must be clearly marked by the bidder on these brochures.

### 3.2 Removal

Careful disconnection / disassembly / removal of all existing Electrical Components, rigging and lowering them down to ground elevation (cables, cabinets etc.)

All existing cables shall be carefully removed so that they can be re-used in other applications.

Includes cable permanent identification & marking before any disconnection of any cable / conductor.

### 3.3 Installation

Local transportation to the actual erection site/STS, Final assembly, Rigging, Lifting to final elevation/location, Installation, Anchoring and Adjustment of all Supplied, new Electrical Components of **section 3.1** above.

Includes cable permanent identification & marking before any disconnection of any cable / conductor.

*Notes regarding the existing & the new Fibre optic cable:*

1. Removal of the existing fibre optic cable and installation of the new one, from the electrical room (STS back-reach), up to operator's cabin (continuous, unspliced length of approximately **200 m**), is within the Contractor's responsibilities.
2. Also included, is performing all new terminations (at both fibre optic cable ends), as well as **precision signal quality (attenuation) measurements & written reports (submitted to ThPA)** of :
  - The existing fibre optic cable before its disconnection
  - The new fibre optic cable before its installation (on the reel delivered on site)
  - The new fibre optic cable right after its installation & completion of all terminations.
3. Also included is the Permanent identification & marking before removal of the existing fibre optic cable and also after completion of all terminations of the new fibre optic cable.

## 4. Contractor's Resources

The Contractor shall provide all necessary resources for the appropriate & suitable **Execution** and continuous **Supervision** (Technical, as well as Health & Safety) of all activities stated in this document.

All Contractor's personnel (including all of his Sub-contractors), have to possess all necessary licenses, as required by **Hellenic Republic's** laws, rules and regulations ("*Law*"), skills, experience and capabilities in order to perform the work in a technically correct, safe & timely manner.

The Contractor shall provide all supervisory personnel who shall all be present at the work site at all times during the execution of any work.

In detail, the Contractor (including all of his Sub-contractors), shall provide all necessary:

[ abiding to all requirements stated in the attached **Annex 11** (*Contractor's H&S Requirements*) ]

### ➤ **Personnel**

Including but not limited to: Site Manager, Site Health & Safety Officer, Engineer(s), Mobile equipment operators, Foremen, Mechanics/Technicians, Craftsmen, Welder(s), Machinist(s), Labour, etc.

### ➤ **Equipment**

Including but not limited to: Generators, Welding machines (diesel and/or electrical), Air compressors, Lifting equipment (chain/wire rope/lever hoists etc.), Rigging gear (shackles, hooks, wire ropes, chains, slings etc.), Oxy-acetylene cutting equipment, Personal Protective Equipment-PPE (refer to H&S annex) etc.

### ➤ **Mobile Equipment** (rental or sub-contractors ones)

Including but not limited to: Telescopic crane(s), Mobile Elevating Work Platform(s)-MEWP, Certified Man basket(s), Forklift(s) etc.

All mobile equipment has to be in a proper operating condition, with maintenance performed according to the manufacturer's instructions, furnished with all necessary certificate and licenses as required by Law and properly operated by licensed personnel with proper training and qualifications.

*Note:* as previously stated, the provision of all operators for any mobile equipment is the Contractor's responsibility.

### ➤ **Tools & Instruments**

Including but not limited to: Hand tools, Power tools, Measuring tools/instruments, Frames/tools/mechanisms (needed for the assembly, temporary support and/or installation of any festoon component), etc.

### ➤ **Parts & Materials**

Including but not limited to: Structural steel members, steel plates, bolts, pins, washers, etc. (for the local fabrication/assembly of any auxiliary structure/mechanism needed for the assembly, temporary support and/or installation of any festoon component), Site fencing materials (refer to H&S annex)

Note: all supplied parts & materials shall be new and appropriate.

### ➤ **Consumables**

Including but not limited to: Welding rods, Oxygen/Acetylene/Propane cylinders, Cleaning agents, Paints, Lubricants, Rugs, Bags, etc.

## 5. Contractor's Organisation & H&S Requirements

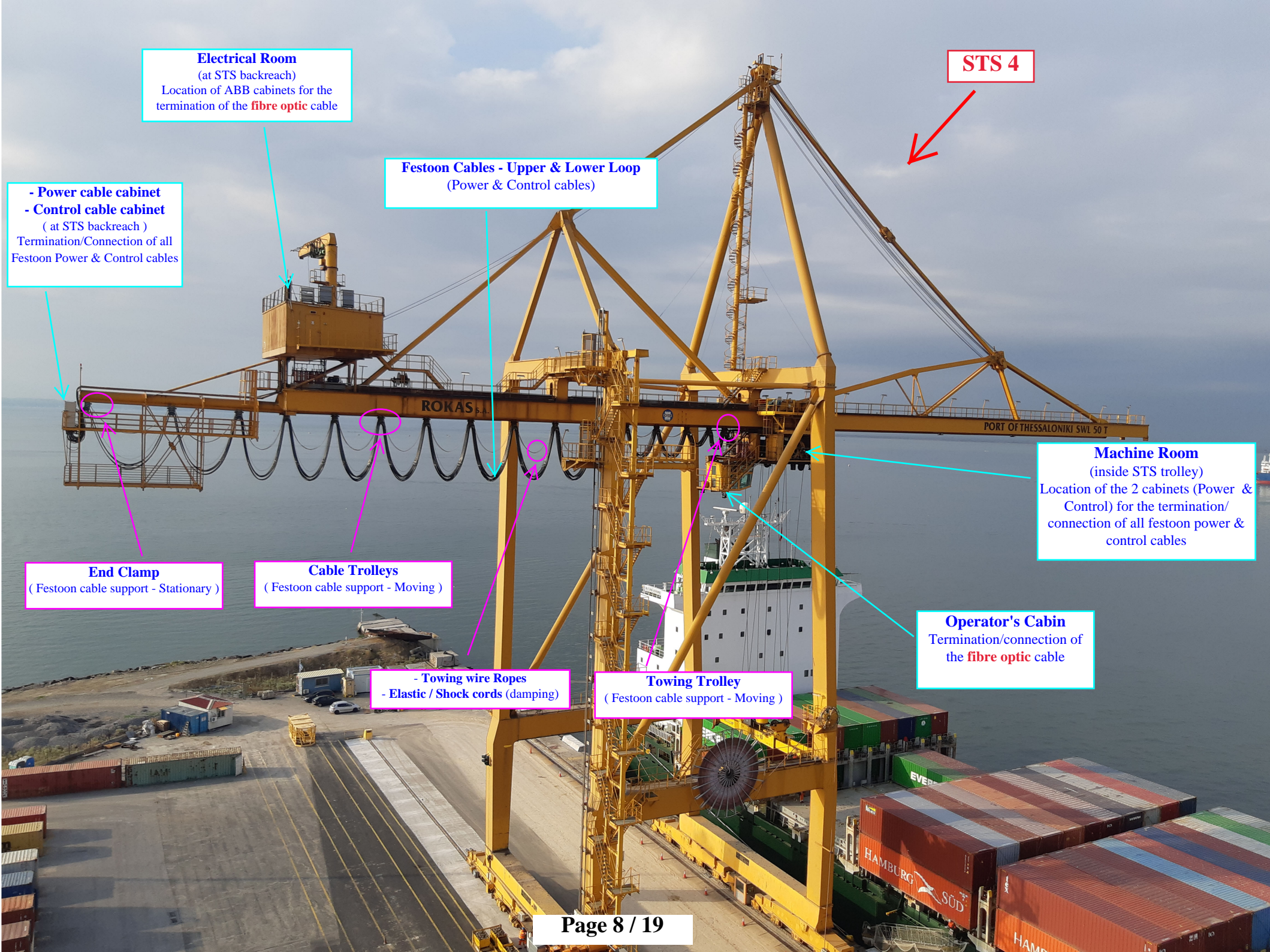
### 5.1 Contractor's Organisation

- The *Contractor* shall appoint the following personnel for the supervision and implementation of all of his responsibilities :
  - **Site Manager**
  - **Site Supervisor** [ Engineer(s) / Foreman (-men) ]
  - **Site Health & Safety Officer**
- Notes:
  - Depending on the number of different *Contractor's* crews working simultaneously and/or the total number of *Contractor's* personnel, **it might be feasible for the *Site Manager* and *Site Supervisor* to be the same person**. However, this must be clearly stated in the submitted offer and also be agreed with Th.P.A.
  - In any case however, the *Contractor's H&S Officer* shall be a different person whatsoever.
- The *Contractor* must ensure that at **any time, any activity undertaken by any personnel** (*Contractor* personnel or *Sub-contractor*) is properly and sufficiently supervised by the afore mentioned appointed personnel.
- No crew / group of personnel (*Contractor* personnel or *Sub-contractor*) should be allowed to perform any activity without a clear instruction of the task to be undertaken, or without a continuous supervision (e.g. by a Supervising engineer or a foreman).
- In case that a person(s) is working without clear instructions or close and continuous supervision, Th.P.A. will ask for an immediate pause of all activities until the respective supervisor reaches the specific location of works.
- Refer to **Section 4 of Annex 11** (*Contractor's H&S Requirements*), for more details on the roles & responsibilities of the *Contractor's Supervising Personnel*.

### 5.2 Health & Safety Requirements

- With regards to Health & Safety (H&S), the *Contractor* shall provide all necessary resources (as also stated in **Section 4** above) and shall strictly conform to:
  - All **Hellenic Republic's** laws, rules and regulations ("Law"),
  - Th.P.A. policies.
  - The attached **Annex 11** (*Contractor's H&S Requirements*)
- The *Contractor* must create, sign, seal and submit to ThPA the **H&S Plan** and the **Hazards & Risk Assessment**, for all activities to be performed.  
Refer to **Section 3.1** of the attached **Annex 11** (*Contractor's H&S Requirements*).
- The *Contractor* must sign & seal both H&S documents: **Annex 12** (*ThPA H&S Guide*) & **Annex 13** (*HSO Statement*) and submit them to ThPA prior to commencement of any activity.
- The *Contractor* is responsible to provide all personnel (*Contractor* personnel and/or *Sub-contractor*), well in advance and before mobilisation, with sufficient quantities and appropriate types of Personal Protective Equipment (PPE).  
Refer also to **Section 8** of the attached **Annex 11** (*Contractor's H&S Requirements*).
- The *Contractor* shall provide the necessary **H&S Amenities**, as well as **Site Fencing & Lighting**, as stated in **Sections 3.3 & 3.4** of the attached **Annex 11** (*Contractor's H&S Requirements*).





**Electrical Room**  
(at STS backreach)  
Location of ABB cabinets for the termination of the **fibre optic** cable

**Festoon Cables - Upper & Lower Loop**  
(Power & Control cables)

**STS 4**

**- Power cable cabinet**  
**- Control cable cabinet**  
( at STS backreach )  
Termination/Connection of all Festoon Power & Control cables

**Machine Room**  
(inside STS trolley)  
Location of the 2 cabinets (Power & Control) for the termination/ connection of all festoon power & control cables

**End Clamp**  
( Festoon cable support - Stationary )

**Cable Trolleys**  
( Festoon cable support - Moving )

**Operator's Cabin**  
Termination/connection of the **fibre optic** cable

**- Towing wire Ropes**  
**- Elastic / Shock cords (damping)**

**Towing Trolley**  
( Festoon cable support - Moving )

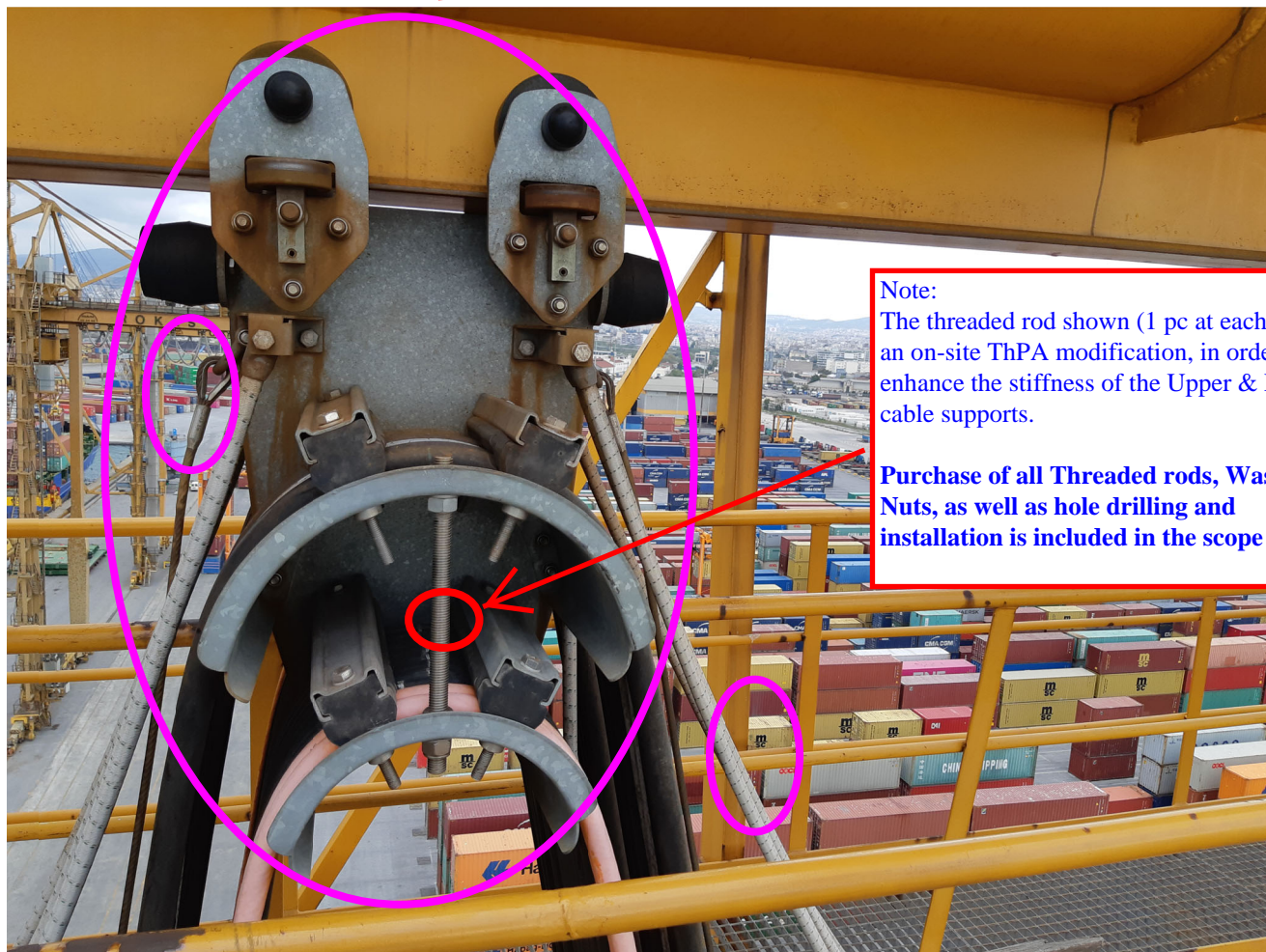
## Festoon System - Mechanical Components

All existing festoon mechanical components shall be removed and replaced with new ones.

i.e. *End Clamp, Cable Trolleys, Towing Trolley, Wire Ropes and Elastic/Shock cords* (dampening), *Cable clamps* (for all upper & lower cable loops), *Auxiliary parts* (e.g. bolts, washers, etc., including the threaded rods indicated below)



**IPE 400**



Note:

The threaded rod shown (1 pc at each side) is an on-site ThPA modification, in order to enhance the stiffness of the Upper & Lower cable supports.

**Purchase of all Threaded rods, Washers & Nuts, as well as hole drilling and installation is included in the scope of work**

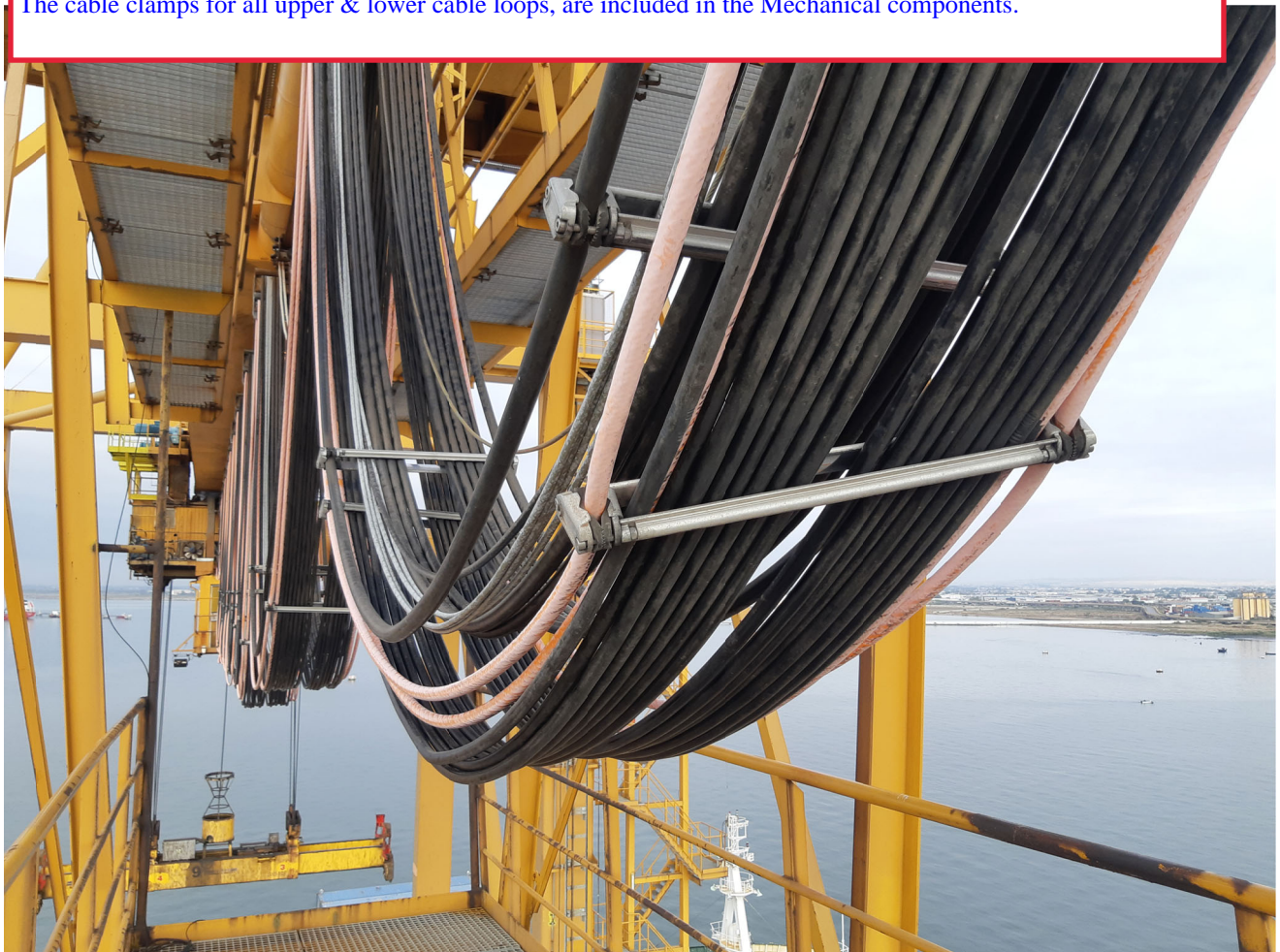


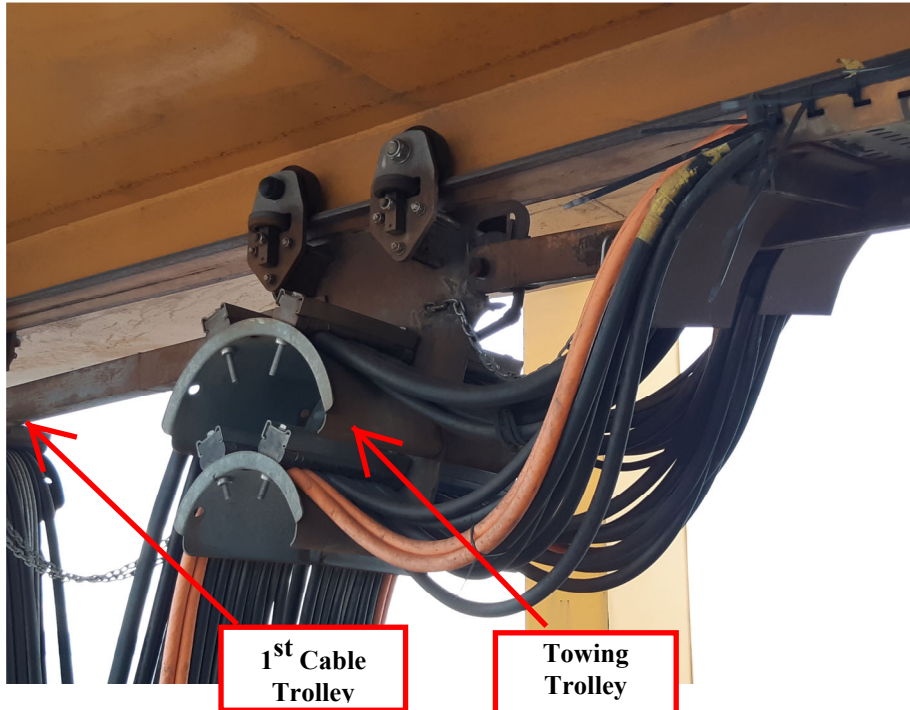
### **Festoon System - Electrical Components**

All existing festoon electrical components shall be removed and replaced with new ones.  
i.e. *Power cables, Control/Signal cables, Fibre optic cable, Electrical enclosures* (with all necessary internal parts, as well as support/base frames & anchors), *Auxiliary parts* (connectors, glands, support frames, anchoring parts etc.).

Note:

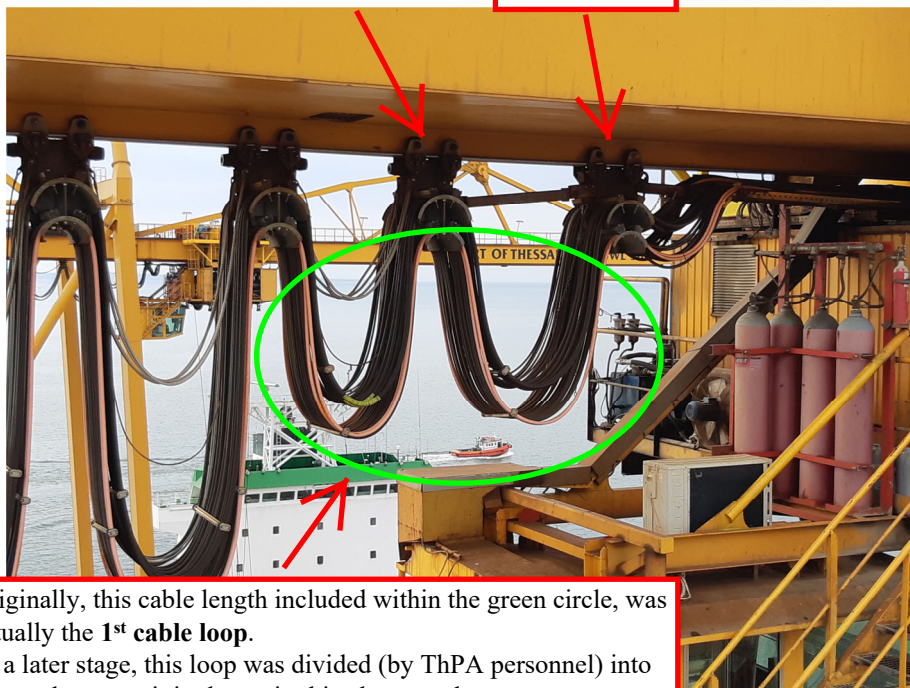
The cable clamps for all upper & lower cable loops, are included in the Mechanical components.





Modification of existing festoon components, performed by ThPA in order to resolve festoon operation issues ( the original **1<sup>st</sup> cable loop** was too long and during festoon acceleration / deceleration, it was heavily swinging and was hitting on the operator's cabin )

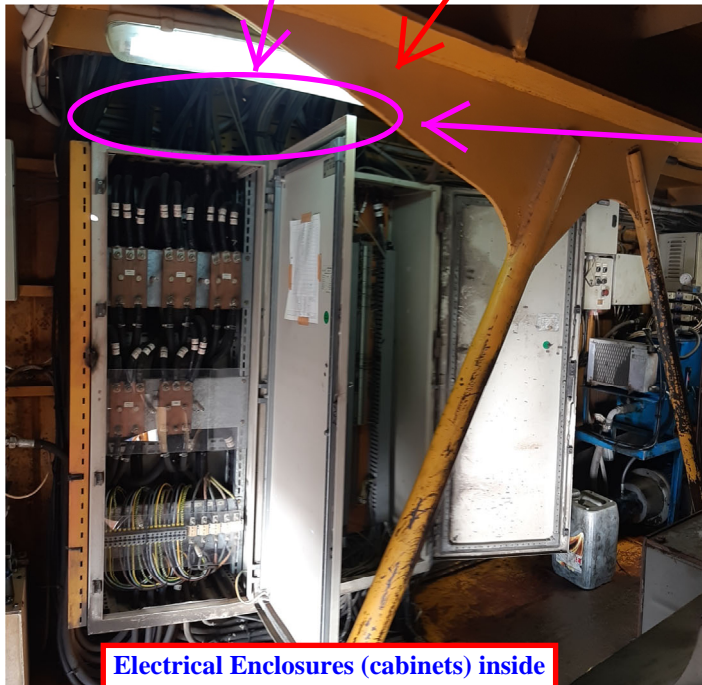
To be taken into consideration by the *Contractor* in his offer & installation, so that these operational issues are also eliminated. ( i.e. any additional components/parts, materials, fabrication, assembly & installation for the elimination of this issue, are included in the *Contractor's* responsibilities )



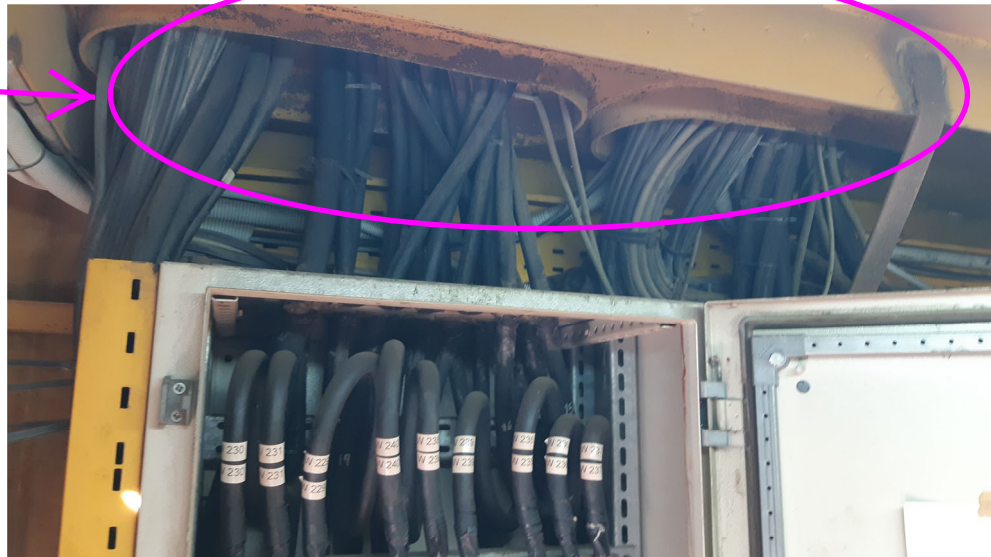
Originally, this cable length included within the green circle, was actually the **1<sup>st</sup> cable loop**. At a later stage, this loop was divided (by ThPA personnel) into 2 more loops, as it is shown in this photograph.



Entry point (on top of machine room) of existing festoon cables



Electrical Enclosures (cabinets) inside the machine room (STS trolley)

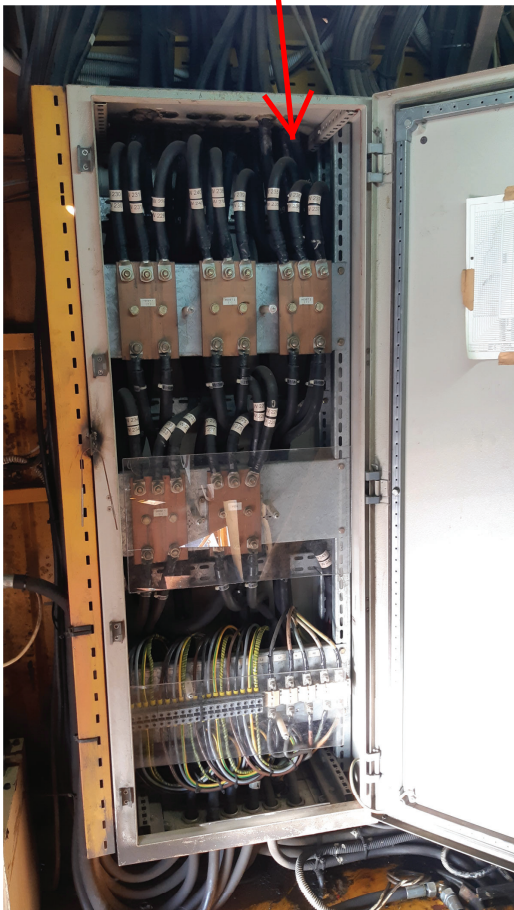


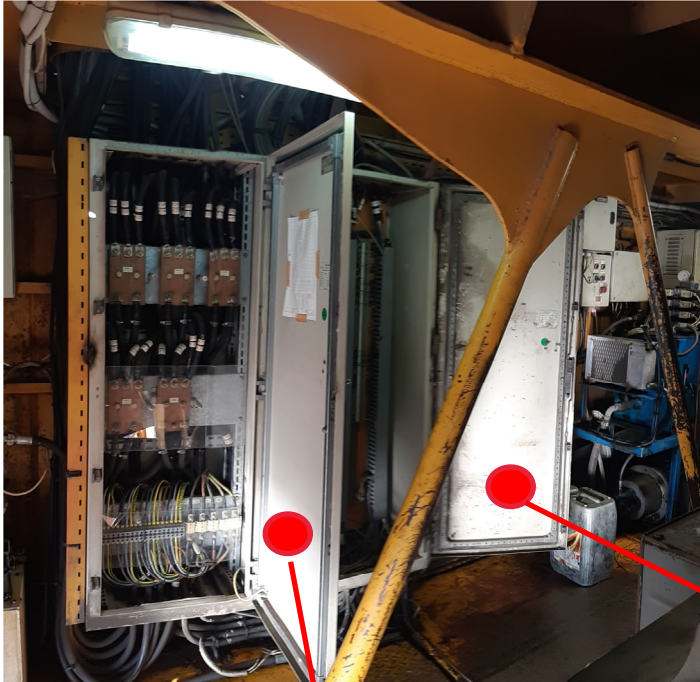
**Electrical Enclosures (cabinets) inside the machine room (STS trolley)**

**To be removed and replaced with new ones**

Dimensions of each existing cabinet:

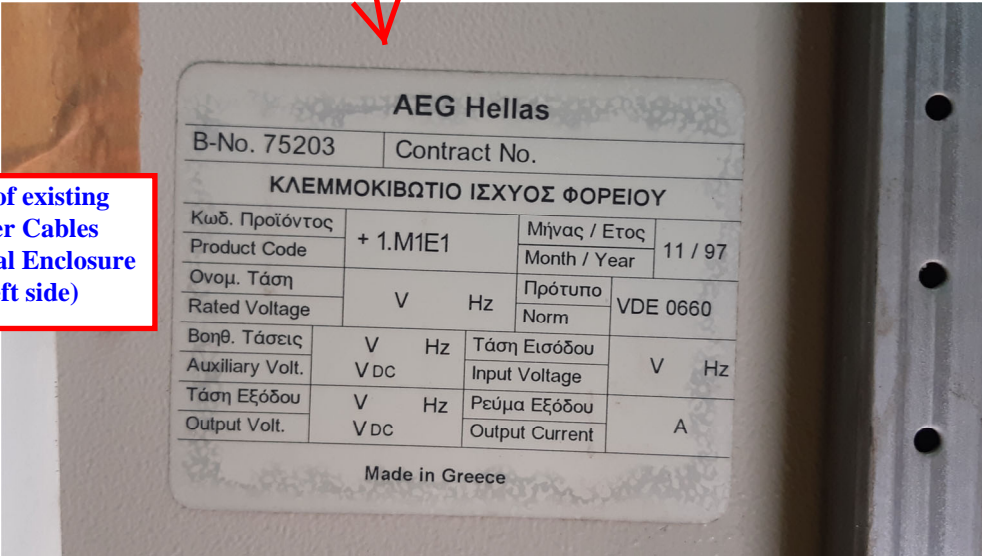
**600 mm (Width) x 1600 mm (Height) x 400 mm (Depth)**



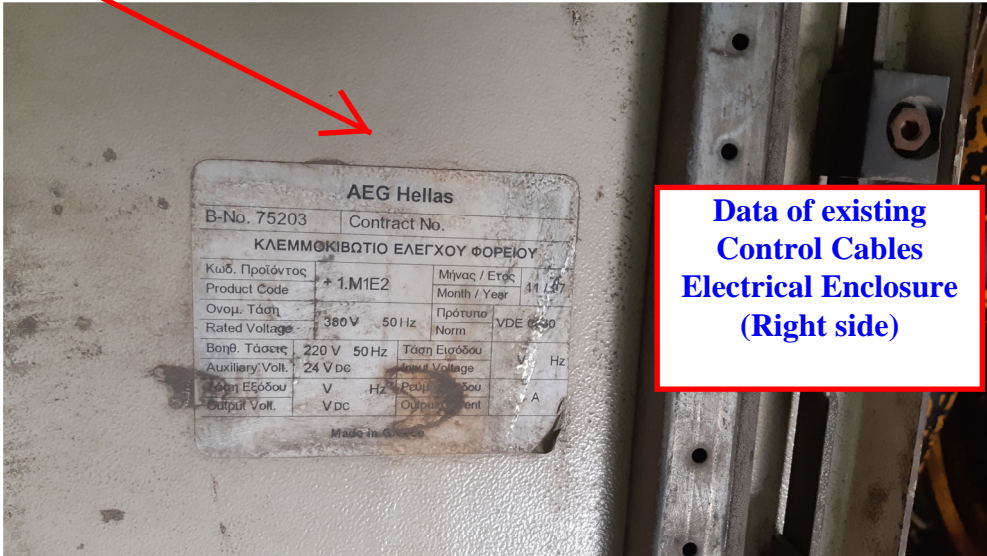


**Electrical Enclosures (cabinets) inside the machine room (STS trolley)**

To be removed and replaced with new ones



**Data of existing Power Cables Electrical Enclosure (Left side)**



**Data of existing Control Cables Electrical Enclosure (Right side)**

## Electrical Enclosures (cabinets) at STS back reach

- To be removed and replaced with new ones
- Fabrication & installation of the support/base frame with anti-vibration mounts is also included in the scope of work



STS 4

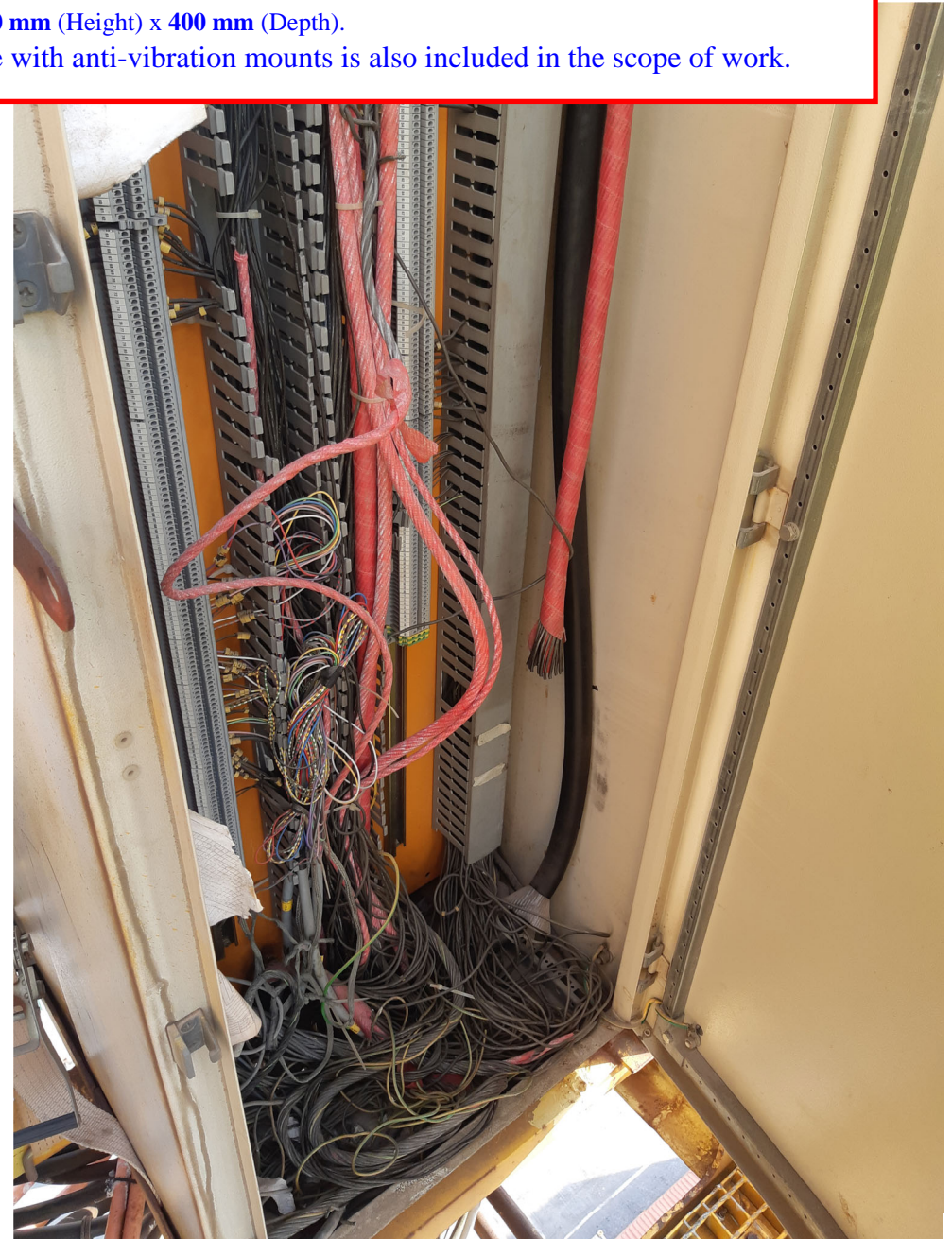


STS 3

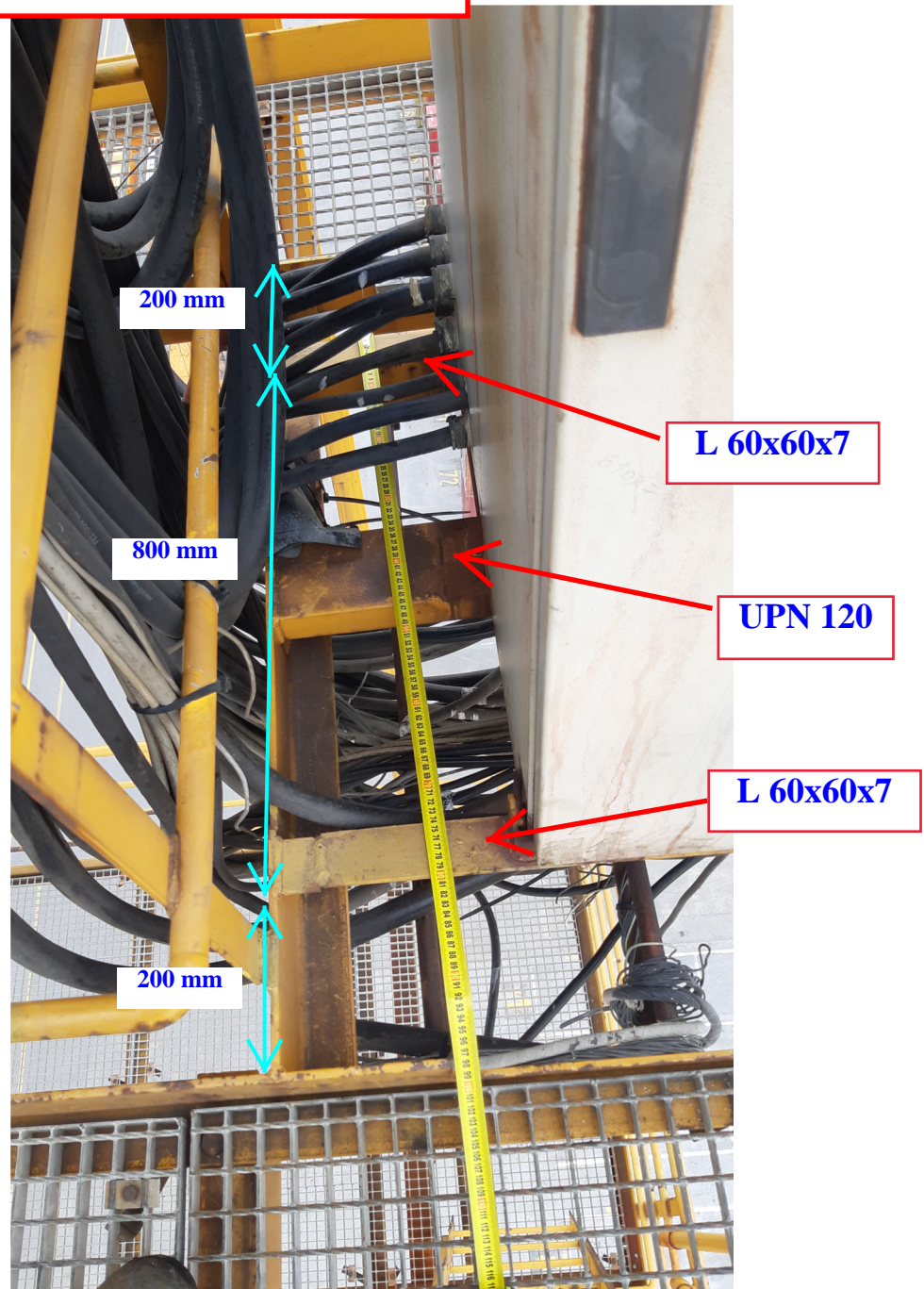


## Electrical Enclosures (cabinets) at STS back reach

- To be removed and replaced with new ones.
- Dimensions of each existing cabinet: **600 mm** (Width) x **1600 mm** (Height) x **400 mm** (Depth).
- Fabrication & installation of the support/base frame with anti-vibration mounts is also included in the scope of work.



**Electrical Enclosures (cabinets) at STS back reach**  
Dimensions of each existing cabinet:  
**600 mm (Width) x 1600 mm (Height) x 400 mm (Depth)**





### Fibre Optic Cable

- Routing of existing fibre optic cable, from **Electrical room** at STS back-reach, through Festoon supports and up to **Operator's cabin**.
- Continuous (unspliced) length of approximately **200m**.
- New fibre optic cable to follow the same route.
- Termination at **both ends** of the new fibre optic cable is included in the scope of work.

## Fibre Optic Cable

- Routing of existing fibre optic cable, from **Electrical room** at STS back-reach, through Festoon supports and up to **Operator's cabin**.
- Continuous (unspliced) length of approximately **200m**.
- New fibre optic cable to follow the same route.
- Termination at **both ends** of the new fibre optic cable is included in the scope of work.



**Electrical room at STS back-reach.**  
Location of ABB cabinets for the termination of (one end) of the fibre optic cable.

