Technical Specifications (In-Cash Procurement)

TS-63-34.00-001 - IOTS - 000001 : Technical Specifications B50s Grouting and related works

This document provides requirements for grouting works and accompanied surface preparation and oil-resistant painting works to be performed on IO platform in B50s (B51/B52/A53) in order to complete the interface between PBS63 and each of PBS34.10 and PBS34.40.
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1 Purpose

This document provides requirements for grouting works and accompanied surface preparation that have to be performed on IO platform in Buildings 50s (B51/B52/A53) in order to complete the interface between PBS63 and each of PBS34.10 and PBS34.40. In this document, the technical specifications of the scope are described for the purpose of a call for tender to select the Contractor.

2 Scope

The scope treated in this document is covering remained work shown on Fig.1 “General scope split regarding installation of plant in B50s”, Item 6. “Grout to underside of bed frame” and execution of preliminary surface preparation.

Fig. 1: General scope split regarding installation of plant in B50s

3 Definitions

The acronyms employed in this document are the following:

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>IO</td>
<td>ITER Organization</td>
</tr>
<tr>
<td>PBS 34</td>
<td>Cryogenic System</td>
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<td>PBS 34.1</td>
<td>Cryogenic Nitrogen Systems</td>
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<td>PBS 34.4</td>
<td>Cryogenic Helium Systems</td>
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<td>PBS 63</td>
<td>Steel Frame Systems</td>
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<tr>
<td>IDM</td>
<td>ITER Document Management (system)</td>
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<td>CSP</td>
<td>Concrete Surface Profile</td>
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<td>ICRI</td>
<td>International Concrete Repair Institute</td>
</tr>
<tr>
<td>SAF</td>
<td>Subcontractors Acceptance Form</td>
</tr>
<tr>
<td>MoS</td>
<td>Method of Statement</td>
</tr>
</tbody>
</table>
4 Duration

The expected duration for the completion of the Works is 3 months. Both early and late shifts (from 06.30 until 22.00) are possible at the construction site if necessary for a better temperature control of grouting material in an appropriate range during the summer period. Power supply for the contractor’s water cooler is also available. The construction schedule and the method of grouting temperature management shall be included in the proposal by the Contractor.

5 Work Description

5.1 Scope of Works

All the reference drawings listed in Appendix A and Grouting information for LN2 compressors and 80K Loop compressors are extracted and uploaded in the archive [1]. The items listed below are included in the Contractor’s scope of works:

- Surface cleaning and preparation work for grouting (Surface roughness has to be CSP3, according to ICRI 310-2R-2013 [2])
- Grouting works for the items listed in Appendix A: “B50s Grouting list and specification”
  - Roughening and cleaning of the grout supports (removal of dust, laitance, and grease)
  - Humidification of the concrete support and suction of excess water (Moisture < 4%, using Concrete moisture meter)
  - Tracing, positioning and fixing of the peripheral formwork at the right side of each plate
  - Preparation of injection points and peripheral vinyl protection (if necessary)
  - Mixing inside and application of mortar (if G1/G2 type grouting)
  - Grouting manufacturer’s products datasheets, installation guidelines and safety measures shall be incorporated to the site working procedure.
  - As chemicals products are to be used, technical application recommendations from manufacturers should be followed (climatic conditions, mixing ratio, roughness profile...)
- Grouting material selection, procurement, preparation, and characteristic test according to Appendix B: “Grouting material general specification”
- Protection of the gutters (by formwork for G1/G2 grouting and by polyurethane foam if G3 epoxy grouting)
- After work treatments and reports
  - Stripping of formwork, covering, masking, and protection
  - Ragging and cleaning
  - Writing and transmission of reports
• Effluent recovery and treatment
• The materials, chemicals, and tools used for the work listed above
• On-site workshop / work area setup and recovery
  o Bringing equipment and materials
  o Setting up a container
  o Establishment of a marked buffer storage area
  o Installation of the mixing zone inside protected by a vinyl tent
  o Cleaning and folding at the end of the service
• Documentation for ITER Quality Assurance requirements
  o Access formalities, staff security receptions
  o Implementation of the PPSPS (French & English)
  o MoS and drafting of the procedure (French or English)
  o SAF, PRE and ITP[3] (English)
• Participation in the joint inspection visit

The following items are excluded from the Contractor’s scope:
• Topographic surveys (concrete, slabs, etc...) and implementation
• Installation, wedging, adjustment any handling of the installed equipment other than concrete and steel structures
• Shim cutting before grouting
• Supply of electricity at ITER construction site

5.2 Grouting volume and preparation work
Grouting volume estimation is given in Appendix A, mainly for reference during the quotation phase. However, the contractor of the grouting work may optimize so that the total cost including the preparation works can be minimized with a reasonable duration of work. As example:

• The current volume estimation for skid frame grouting is only below the main structure, however if grouting formwork installation is too complicated, it is possible that grouting all over the surface minimizes the total cost.

For this reason, during the call for tender process will be organized a site review and discussion between ITER experts, plant supplier and potential Contractor to properly estimate the complexity and accessibility of the work to be done.

NOTE: Plant construction and installation is on-going and some pieces of equipment are not installed yet. This point has to be taken into account for the site investigation.

5.3 Standards
The selection of contractor’s grouting material is subject to ITER approval and EN standards (or identical regional standards) shall be applied for the relevant grouting material, work, and test specification.

5.4 Other remarks
• Expansion joints will not be required for the grouting work, as each grouting surface area is not such extensive
6 Responsibilities

The Contractor’s responsibility to identify the relevant ICPE headings (rubriques) for environmental protection mandated by French regulations, then to inform them IO.

7 List of Deliverables and Due Dates

The contractor should provide minimum required documents listed in the Table 1. Format of the reports is a subject of the discussion with IO.

<table>
<thead>
<tr>
<th>№</th>
<th>Description</th>
<th>Due Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Safety Requirements (PPSPS) + The Work schedule breakdown for each piece of equipment*</td>
<td>Within 3 week after contract signed</td>
</tr>
<tr>
<td>2</td>
<td>ITER Environmental Plan (PRE)</td>
<td>Within 3 week after contract signed</td>
</tr>
<tr>
<td>3</td>
<td>Grouting Technical Procedure**</td>
<td>Within 2 week after contract signed</td>
</tr>
<tr>
<td>4</td>
<td>Method of Statement</td>
<td>Within 3 week after contract signed</td>
</tr>
<tr>
<td>5</td>
<td>Chemical product acceptance form for applying Grouting Materials + Material Safety Data Sheet</td>
<td>Within 3 week after contract signed</td>
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<tr>
<td>6</td>
<td>Work Permit at the IO site</td>
<td>Within 2 weeks after contract signed</td>
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<tr>
<td>7</td>
<td>3 Weeks Look ahead Plan</td>
<td>Within 3 weeks after contract signed</td>
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<tr>
<td>8</td>
<td>Inspection and Test Plan</td>
<td>Within 2 weeks after contract signed</td>
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<tr>
<td>9</td>
<td>Intermediate Report after completion of each area (B51/B52/A53)</td>
<td>≤ 2 week after completion</td>
</tr>
<tr>
<td>10</td>
<td>Final Test Report</td>
<td>≤ 2 week after completion of the last grouting</td>
</tr>
</tbody>
</table>

* The work schedule breakdown for each piece of equipment to be used to undertake the grouting by the Contractor to secure the availability and coactivity of each zone of IO construction site.

** In addition, the method of grouting temperature management shall be included in the proposal by the Contractor (by water cooler, early or late shift work, etc.)

8 Acceptance Criteria

The acceptance criteria and during the works should be included as a minimum, the following:

- The test method and criteria to pass the test shall be described in the Contractor’s method of statement and Technical Procedure
- Visual inspection at the completion of the work for each piece of equipment
- Compressive strength shall be measured according to the selected grouting product specification.

9 Specific Requirements and Conditions

9.1 Language

Since the official language of the ITER Organization is English, all written communication and deliverables shall be in English.
9.2 Site data

The Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works. To the same extent, the Contractor shall be deemed to have inspected and examined the site, its surroundings, the above data and other available information, and to have been satisfied as to all relevant matters.

9.3 Safety

The Contractor shall comply with the following procedures and all proceedings arising therefrom:

- Alert procedure [4]
- ITER Internal Regulations [5]
- General measures for the safety coordination of the ITER Organization common area [6]

The area of the Works falls under decree 94-1159. A safety plan (PPSPS) shall be established by the Contractor prior to the start of the Works, using the ITER template [7].

In the case where the Works involve the use of chemical products, the Contractor shall comply with the Chemical product management procedure [8] and fill in the Chemical product acceptance form [9].

9.4 Environmental protection

The Contractor shall comply with environmental protection requirements and procedures applicable at the ITER Site:

- ITER Organization Environmental Management System [10];

An environmental respect plan shall be provided by the Contractor in 3 weeks prior to the start of the Works, using the ITER template [12].

Debris and waste of all type shall be removed as work progresses.

The Contractor shall be responsible for cleaning, repairing and restoring facilities which are dirtied or damaged to their original condition, and shall remove their debris and rubbish to site available rubbish tips.

9.5 Access to the site / Worksite installation

Access to the ITER Site is subject to the ITER Site Access Procedure [13].

The Contractor shall be responsible for supplying and installing fencing protecting the worksite which shall be maintained for the duration of the works and removed after completion of the Works. The Contractor shall also display signs prohibiting entry onto the worksite.

9.6 Work authorisation

Prior to the start of any Works on the ITER Site, a Work Authorisation must be obtained in accordance with the Work Authorisation Procedure [14].

10 Work Monitoring / Meeting Schedule

A general meeting will be organized as a weekly inspection on Site in order to monitor the work progress. Additionally, after every formwork preparation, IO should be invited for the inspection, and only after the formwork inspection grouting operation can be started.
11 Payments Breakdown:

1. Documents preparation + procurement of the materials. 15%
2. Completion of the LN2 Plant Area 53 grouting with related issued documentation (Reports, Test Results,) 25%
3. Completion of the LN2 Plant B51 grouting with related documentation (Reports, Test Results,) 25%
4. Completion of the LHe Plant grouting with related documentation (Reports, Test Results) + Final Report of the completed grouting works on LN2+LHe Plant (B51/B52/A53) 35%

12 Reference and Applicable Documents

[1] Grouting Drawing Package including LN2 and 80 K Loop Compressors Grouting Zip Archive
[2] 10.2R-2013 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair Guide
[3] Inspection and Test Plan template ITER_D_TTPQL2
[5] Internal Regulations ITER_D_27WDZW
[6] General measures for the safety coordination of the ITER Organization common area ITER_D_FF72HN
[7] Individual Health Protection and Safety Plan (PPSPS) ITER template ITER_D_K7C6SZ
[8] The Chemical product management procedure ITER_D_TF5GP8
[12] Environmental Respect Plan ITER Template ITER_D_9FUP5C
Appendix A: B50s Grouting list and specification
(from the next page)
<table>
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<th>Ref.</th>
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</table>

### Notes for drawing dimensions
- **G2** = counting and measure on site  
- **G1** = dimension by 3d model, height measured on site
- **G3** = dimension by drawing and checked on site, height measured on site
- **G4** = superseded by 3d model, drawing still valid

### Unit Conversion
- **L*W (Length*Width)/mm** (Refer to manufacturer's document for conversion)
- **Volume/m³**

### Grouting Surface
- **Grouting surface finish**

### Recommended Practices
- For more information, refer to the manufacturer's documentation.
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</table>

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

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G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3

Notes on grouting work

Gutter for effluent to be protected, if necessary

Oil Resistant G2, or G3 (RAL specified by IO)

G2, G3, or G2 + G3
Appendix B: Grouting material general specification

a) **G1 (Portland Cement grout)**
   - Volume Expansion: shrinks up to -1.2%
   - Minimum Compressive Strength (nominal):
     - 22 MPa at 7th day
     - 30 MPa at 28th day

b) **G2 (Cement Based Non-Shrink Grout)**
   - Volume Expansion: more than +0.5%
   - Minimum Compressive Strength (nominal):
     - 50 MPa after 1st day
     - 90 MPa after 28th day
   - Recommended commercial products by the plant subcontractor:
     - Five Star High Strength Grout
     - PAGEL V1/10, V1/50, V1/160 (choice depending on the grouting thickness)
     - BETEC 110, 140, 180 (choice depending on the grouting thickness)

c) **G3 (Epoxy Based Non-Shrink Grout)**
   - Volume Expansion: +0.1% to +0.5%
   - Minimum Compressive Strength (nominal):
     - 55-75 MPa at 7th day
     - 75-105 MPa at 28th day
   - Recommended commercial products by the plant subcontractor:
     - Five Star SP Epoxy Grout
     - Sikadur-42 Grout