Specification for Fabrication, installation & commissioning of Mechanised sliding Steel Doors in F/47 X-ray enclosure

1 The scope of the work includes:

1.1 Design & Fabrication of three types of doors in the existing F/47 X-Ray Facility at the RFF campus of VSSC as per detailed specifications:

1.1.1 **Door#1** (**D1**—Connecting trap room & X-ray enclosure): Hinged solid Steel door of size 1000 mm (W[1]) × 2100 mm(H[2]) × 23mm (t[3]—20 mm Steel + 3mm Lead lined on enclosure side).

1.1.2 **Door#2** (**D2**—located at job entry side of x-ray enclosure): Horizontal mechanized solid Steel sliding door of size 4000 mm (W) × 4000 mm (H) × 35 mm (t—25mm Steel +10mm encased Lead sheet)

1.1.3 **Door#3** (**D3**—Connecting trap room & control room): Hinged Steel door of size 1000 mm (W) × 2100 mm (H) × 20 mm (t) without any lead lining connecting with door frame.

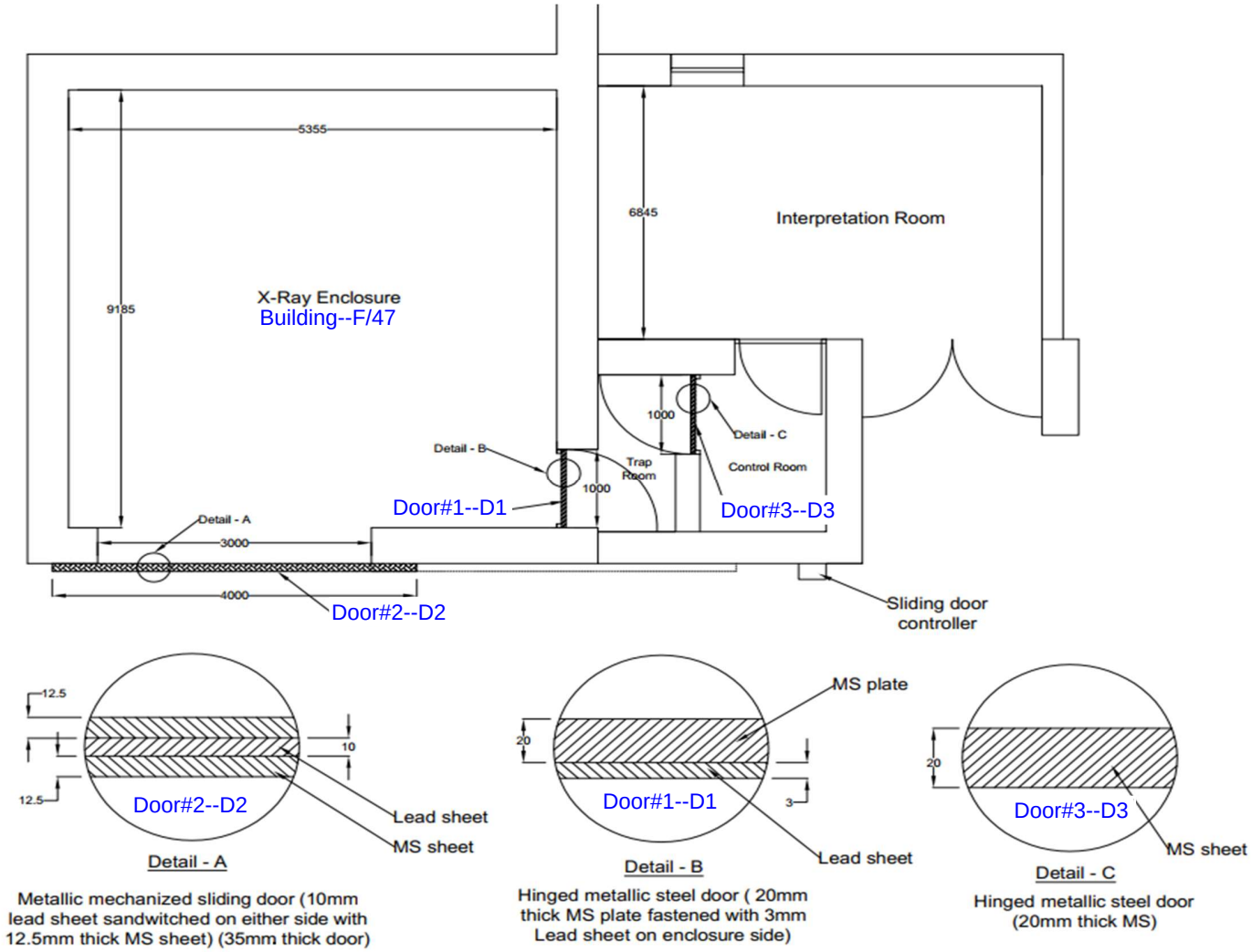

Figure 1 : Schematic diagram of 3 Doors (D1, D2 & D3)—Location & cross sectional detail

[1] W—Width
[2] H—Height
[3] t—Thickness

1.2 Demolition/dismantling of existing doors, frames, sun shade, and relevant structures, if causing hindrance in the erection of proposed doors/ door frame.

1.3 Construction of canopy to prevent rainwater entry, trench with proper foundation for fixing the rail and top guide arrangement for D2.

1.4 Transportation, loading, and unloading of the doors and accessories to RFF in VSSC and disposal of demolished/dismantled structures to VSSC scrapyard

1.5 Installation, Commissioning & Demonstration of the satisfactory operation of all doors as per detailed specification.

2 Specification of Door#1 (D1)

2.1 Dimensions: 1000 mm (W) × 2100mm (H) × 23mm (t)

2.2 Construction type: Hinged solid Steel door with steel thickness of 20mm & lead lining of 3mm at the enclosure/exposure side.

2.3 Deflection and distortion of door under shelf weight will not be entertained.

2.4 New door frame for fixing door D1 shall also be made of solid steel of minimum thickness 20mm, after dismantling existing door frame.

2.5 Door frame shall be provided with heavy duty roller bearing hinges.

2.6 Entire portion of D1 shall be lined with 3mm thick lead sheet at the exposure room side.

2.7 The bottom gap between the door and floor shall be kept minimum to minimize leakage radiation.

2.8 Door shall be provided with suitable bolting/ locking arrangements.

2.9 Radiation leakage from fasteners/bolts/nails used to fix lead lining to steel door shall be arrested by providing additional lead sealing layer/lining.

3 Specification of Door#2 (D2)

3.1 Dimensions: 4000 mm (W) × 4000 mm (H) × 35 mm (t)

3.2 Construction type: Horizontal mechanized solid steel sliding door with an encased lead sheet of 10 mm [welding of two solid steel plates of thickness 12.5 mm with 5 mm of lead lining, ensuring the entire lead layer is encased between steel plates is permitted]

3.3 The cross section shall mandatory have steel of thickness 25 mm and lead lining of 10 mm in total.

3.4 Full penetration Arc/TIG welding with appropriate V/U weld configuration and welding to seal edges shall be done when joining steel plates to minimize radiation leak.

3.5 Deflection and distortion of door under shelf weight after welding will not be entertained.

3.6 Electric motor of adequate capacity and drive mechanism including gear boxes, coupling/decoupling shafts, rails, wheels of appropriate size, wire and cables of required rating etc. shall be provided to ensure smooth sliding of door in top guide channel and bottom trench ensuring electrical safety.

3.7 Length of top guide and bottom rail with trench shall ensure that the D2 is capable of providing a clear opening of minimum 3000 mm at the job entry side to facilitate the movement of job along with forklift.

3.8 Electric control panel and mechanical stops/limit switches:

3.8.1 Entire operation of D2 shall be controlled by "Control Panel". The control panel shall be fixed on the external side of the wall at the location identified by the indentor at the time of installation.

3.8.2 The control panel shall have "open", "close" and "Emergency stop" push buttons.

3.8.3 The operation of D2 should be fully mechanized and should be capable of restarting the opening/closing at any point in between the total stroke length of the door.

3.8.4 Provision to open/close door manually in case of power failure shall also be provided.

3.8.5 Control panel controlling the wheel drive mechanism (arrangement to roll on rails with push button starters) along with all necessary electrical works shall be provided.

3.8.6 Limit switches ensuring the arrest of D2 movement over the stroke length (as per Sl. No. 3.7) and overload safety relay for motors shall be provided. Necessary drive mechanism consisting of 3 phase electrical motor shall be used.

3.8.7 Drive unit shall be suitably designed to achieve a uniform movement of door at a speed of 5±1 m/min.

3.9 Demolition of existing RCC shade at the top of sliding door shall be done if required at the time of fixing guide channels.

3.10 Post installation of D2, a canopy structure at the top shall be constructed to protect door from rain and sunlight in both open and closed condition.

3.11 Top guide arrangement: consists of guides, roller, support with guide beam/channels, and plate's bracket etc. ensuring smooth & jerk free movement of door as required.

3.12 **Bottom guide arrangement/trench:**

3.12.1 150 mm wide and 120 mm deep trench shall be made for fixing bottom rails.

3.12.2 The trench shall extend to the full length of the ramp portion facilitating the easy cleaning and maintenance.

3.12.3 The trench level should be lower than the floor level. The depth of trench can be adjusted to ensure that the distance between bottom edge of door and the flooring of x-ray enclosure shall be minimum 100 mm.

3.13 A uniform gap shall be provided between D2 and wall ensuring minimum radiation leakage, which should not exceed 20mm.

3.14 D2 shall be provided with suitable number of forged and machined wheels with permanent lubricated sealed bearing, shaft brackets and grease nipples, removable cover plates etc. (Preferably conforming to IS 3177).

3.15 Sliding rails for D2 shall be laid with suitable embedment arrangement/foundation basement to maintain uniform level thought the sliding/stroke length.

3.16 Suitable jacking arrangement shall be provided for D2 for repair/replacement of wheels (when required)

3.17 Neoprene rubber pads as mechanical stopper to prevent metal to metal contact shall be used.

3.18 Door shall be provided with suitable bolting/ locking arrangements.

4 Specification of Door#3 (D3)

4.1 Dimensions: 1000 mm (W) × 2100 mm (H) × 20 mm (t)

4.2 Construction type: Hinged solid Steel door without any lead lining.

4.3 Deflection and distortion of door under shelf weight will not be entertained.

4.4 New door frame for fixing door D3 shall also be made of solid steel (of minimum thickness 20mm) after dismantling existing door frame.

4.5 Door frame shall be provided with heavy duty roller bearing hinges

4.6 The bottom gap between the door and floor shall be kept minimum to minimize leakage radiation.

4.7 Door shall be provided with suitable bolting/ locking arrangements.

5 General Specifications (Terms & Condition)

5.1 The offer shall be submitted in two parts

5.1.1 **Part-1**: Technical Bid containing details of the doors meeting all technical specifications. The price masked price bid with split up cost of the basis system with essential accessories/scope of work, AMC cost and price list of probable spares required for the AMC period shall be attached.

5.1.2 **Part-2**: Price bid offer to the system with split up cost for all the items as mentioned in the part-1.

5.2 Party has to ensure that no compromise/reduction in thickness of the solid steel doors and lead lining from the above mentioned specification has been made. Reduction in thickness of steel plate or lead sheets are not at all acceptable.

5.3 Installation of doors (D1, D2 & D3) will be treated as completed only after mandatory radiation survey and clearance provided by the facility/chief RSO.

5.4 The doors shall be finish painted with two or more coats of epoxy paint of approved colour over two or more coats of epoxy primer after preparation of the entire surface. Also "Radiation hazard symbol (warning triangle)" of 1m or appropriate size as per BARC regulation should be drawn/pasted on all the three doors after paint finishing.

5.5 Party has to make and send a draft Fabrication Acceptance Plan (FAP) for the design, fabrication, installation & commissioning of doors within one month after the acceptance of the Purchase Order. It should include the details of the raw materials and standard products procured from the open market, sequence of operations including fabrication, transportation, etc. to be followed till the installation & Commissioning of the doors. Once approved by VSSC, party has to strictly follow the FAP for all the aspects as guideline for the specification and quantity for procurement of raw materials and standard items, fabrication and I & C.

5.6 Loading of the doors and accessories from the fabrication site, unloading at the X-Ray room site at F/47 NDT X-Ray building, Support with Earth movers/Fork lifts/scaffolding during lifting and erecting is the sole responsibility of the party. VSSC shall not entertain any claim against Personal injury/accidents if any to the workers of the party during the supply, erection and commissioning.

5.7 **Warranty:** Party has to provide 2 years of warranty from the date of installation and commissioning. During the warranty period, party has to conduct periodic maintenance of the doors, once in six months. Breakdowns if any, during the warranty period shall be attended and rectified within 24Hrs from the time of communication in the form of phone/email/SMS message from the authorized person from the facility.

5.8 **Annual Maintenance Contract (AMC):**

5.8.1 Party also has to quote for Non-Comprehensive AMC for minimum 5 years, indicating the split up price, Price list of spare, etc. Assurance for service support for minimum 10 years from the date of I&C[4] shall also be provided.

5.8.2 During the AMC period party has to conduct 2 periodic maintenance per year and any number of breakdown Visit (at free of cost)

[4] I&C—Installation and Commissioning

5.8.3 Breakdown visit shall be attended within 24Hrs from the time of communication in the form of phone/email/SMS message from the authorized person from the facility to the party.

5.8.4 Cost of AMC will be accounted for arriving at L1 at the time of tender evaluation but AMC order will be placed only after the expiry of warranty period.

5.9 Party has the provision for visiting the site for realizing the gravity and assessing the quantum of the work involvement, prior to submitting the quote within 15 days from the date of release of the tender inquiry. If any such visit is required, party has to communicate with SPSO, MME (mail id: spso_mme_pur@vssc.gov.in) quoting the inquiry details.