National Council of Science Museums
Block GN, Sector V, Bidhan Nagar.
Kolkata-700091

Specification for the Fabrication of 'Mobile Science Exhibition' Bus

1. **General Description:**

A specially designed bus body for holding Mobile Science Exhibition Panels along with all accessories and necessary inside paneling, partition works to be built on a standard **'Diesel Engine Monocoque Chassis'**. It should have provision to accommodate sixteen 'Mobile Science Exhibit Panels'- (Portable in nature) and other educational equipment, mounted on a customized design based structure / cabinet both at interior and exterior parts of the Bus.

2. **The Integrated Bus Body & Chassis:**

Drive	Two Wheel Drive (Rear Wheel)
Chassis Frame	Monocoque
Engine & Emission	Diesel Engine., BS-VI
Max -Out put Power	114HP @ 2950rpm or equivalent in the same segment
Max -Out put torque	350 Nm@1400 – 2000 rpm or equivalent in the same segment
Transmission	Manual-Synchromesh
Steering	Power Steering (Right Handed Steering)
Gear Box	Minimum Five Forward speed & One Reverse
Axles	Front-1, Rear-1 (Rear wheel drive)
Displacement	2596 cc or equivalent in the same segment
Fuel Tank	120 liters or equivalent in the same segment
Wheels & Tires	Front-2, Rear-4, One spare, 215/75 R15"
Wheel Base	4020 mm (Should not be larger than 4.1m)
Overall Length	8450 mm approx.
Overall Width	2420 mm approx.
Overall Height	Not more than 3100mm with AC
Ground Clearance	Not less than 185 mm

3. **Structural materials for Interior Part of the Bus**:

- (Ref.Drawing.no **Assembly Drawing (HFV/CRTL/MSE/01/A,B,C/22)**

a) All side wall paneling, roof done by ACP / PVC, thickness (5mm), of good quality product of India. Aluminum foil covered glass wool insulation 1" thickness between vehicle cell & fiber.

b) Marine Grade plywood (IS 710) with Vinyl flooring(PVC) / SPC flooring, Features: No Wax, No Polish, Water Resistant, Wear Layer Polyurethane reinforce, Multi color, Scratch Resistant, Anti-Bacterial, Anti Fungi, thickness 3.0 mm.

c) Proper mounting and holding structure for Exhibit Cabinets / Panels along with the other accessories with flexible supporting members should be designed and fabricated with the approval of authorized personnel of the council.

d) The 16 exhibition panels (portable in nature, dimension 6' H x 4' B x 3" W) are to be mounted with fixtures in two columns and individual columns (as shown in drawings) in

exhibit cabin and during the exhibition these exhibits are to be unclamped, unboxed from the mountings for its display. And the upper row mounting members for exhibit cabinets are to arranged in such a way that those would be folded / rearranged upon the top layer of bottom row exhibit cabinet mounting, which in turn, will be used as a table / desk platform of entire length for other educational exhibiting purposes. *(This detailed design is to be enclosed with technical bid).*

4. Rear Stair / Foot rest:

A rear stair/ foot rest (Ramp cum foot rest on a sliding rail) shall be provided at the rear end of the bus i.e. at the visitor's entrance inside the exhibit cabin. It (ramp) will also facilitate the easy handling during the loading and unloading of the portable exhibition panels.

5. Driver's Cabin:

A Cabin for Facilitators – Pilot, Co-pilot & Education Staff Member (Air-Conditioned)

a) Standard / Adjustable type standard Driver's seat (for height, back, forward movement), three numbers of individual push back seat just behind of driver seat, should be provided and all the seats should have 100mm / applicable thickness foam covered with foam-Rexine (Leatherite) and seat belts.

b) Two numbers of rear view mirror shall be provided at the both sides of the bus and Reverse Camera is to be equipped on dash board / inside the driver's cabin.

c) Two doors (one for the driver & one for the co-driver at left side) to be provided with toughened glass auto windshield.

d) A partition with one sliding door 1800mm x 900mm with proper channel, should be provided in between the driver cabin and exhibit cabin cum exhibition space with proper locking arrangement.

e) The front windshield and a pair of heavy-duty standard wiper blades with motors to be provided on the front windshield, as per standard model of the bus.

f) Three numbers of wall / ceiling mounted fans (12V DC) should be provided inside the driver's cabin.

g) One number of multi pin charger / USB charging port should be provided inside the driver's cabin.

h) Automobile AC – Product of Subros or equivalent high quality, should be provided inside the driver's cabin considering the volume of the space.

National Council of Science Museums
Block GN, Sector V, Bidhan Nagar.
Kolkata-700091

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i) 1KVA High Frequency Inverter Product of Luminous with 150AH Battery of Product of Exide, should be provided.

j) A good quality of car audio (stereo) / infotainment system with USB drive and FM Radio, speakers and one set of public address system should be provided for announcement purpose during the exhibition.

k) A programmable running LED display (preferably built-in type) for information with micro-controller, should be provided inside the driver's cabin.

l) Driver's cabin interior should be full PVC cladded aluminum including dashboard with proper insulation on all sides & ceiling.

m) The driver's cabin should be equipped with two numbers of Fire extinguishers as per standard safety norms. Fire extinguishers (Minimax/equivalent) – Two numbers to be fixed in Driver's Cabin.
   - One suitable for electric fire - 1-pint capacity CTC type.
   - One number of foam types –2 gallons' capacity.

6. Exhibit Cabin:

The Basic feature of this cabin:

- A Permanent Set-up for Demonstration Purpose with Kits
- Place for Holding 16numbers of Portable Exhibition Content Panels
- Wardrobe for Kits / Equipment
- Permanent Wall with Contents (inside the cabin)
- Table top with Drawers, Seating Arrangements for Demonstration

a) All exhibit cabinets, and accessories partitions are to be fabricated by ACP / PVC as per thickness mentioned in the drawing and proper locking arrangements for each exhibit cabinet, is to made to avoid damage during the drive on road.

b) All partitions and locking arrangements for all accessories including exhibit cabinets with detailed drawing and materials details with specification, are to be enclosed in technical bid.

c) Rubber beading or vibration damping materials should be provided at desired points / surfaces of all partition walls for shock absorbing and scratch resistant for the objects.

d) Inside the exhibit cabinet, 06nos. of 220V plug points with individual switches are to be provided.

e) Two numbers of LED tube light (220V) and a ceiling fan (220V) are to be fitted with switches.

National Council of Science Museums
Block GN, Sector V, Bidhan Nagar.
Kolkata-700091

Specification for the Fabrication of 'Mobile Science Exhibition' Bus

7. Exterior Components of the Bus:

a) Provision for Water proof / Well ventilated cabinets for Digital Display Units (up to 55" of Screen Size) on Both the exterior sides of Bus. These are to be designed for easy fixing of the TV unit(s) and maintenance purposes as well. (Drawing of the mounting is to be provided in technical bid).

b) Running Digital Displays with proper power supply connection should be provided on both the sides of the bus (as per drawing details). Should be programmable running LED display (preferably built-in type) for information with micro-controller.

c) Motorized External awning on rear side (as shown in drawing) should be provided with proper mounting and electric supply.

8. Body Painting and vinyl pasting:

a) Exterior surface of the body should be painted with two coats of standard automotive paint (metal finish MRF paint / Du-Pont – approved color) coating over proper surface finish & primer and necessary art work or design to be done as per details provided by the council.

9. Electrical Fittings:

a) Complete wiring, Sleeves with channel routed product of Finolex, India. SCB (Short circuit breaker) switch for 220V ac line & 12V line product of Havells, India. Fuses with fuse box for all 12 v lights product of Roots / equivalent good quality product of India.

b) External 'Electric Board (EB)' along with MCB for power input from external source during exhibition, should be arranged on RHS of the Bus (at exterior part).

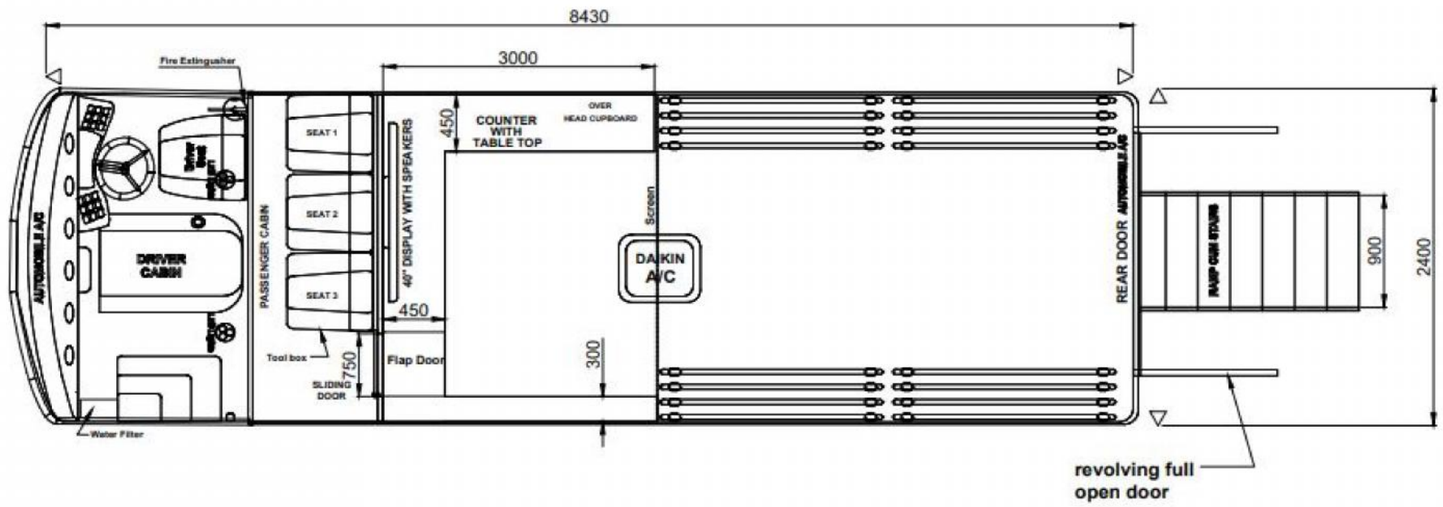
10. Other Equipment and Accessories:

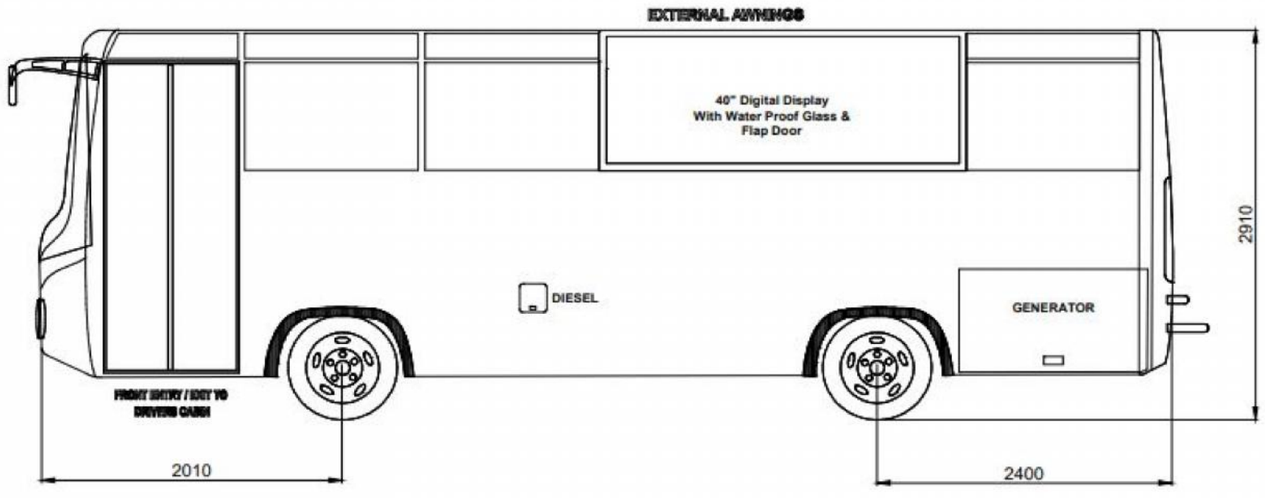
a) Gen-set Unit: 3KVA Inverter generator set with Electric Start, Make: Honda (Inverter Generator Series).
b) UV radiation resistant Sun control film should be provided at the exterior windows (if, required).
c) Proper arrangements for stepney wheel alteration under chassis should be provided with tool sets.
d) All joints should be waterproof. No water seepage to the interior cabinet will be allowed.

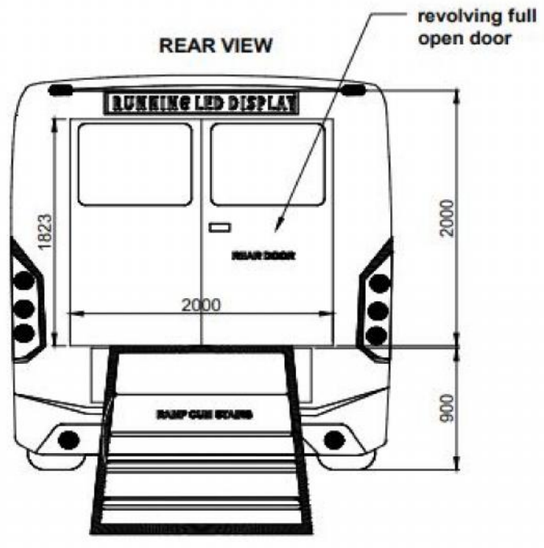
ANNEXURE E

National Council of Science Museums
Block GN, Sector V, Bidhan Nagar.
Kolkata-700091

Specification for the Fabrication of 'Mobile Science Exhibition' Bus
Assembly Drawing (HFV/CRTL/MSE/01/A/22)







All Dimensions are in mm

NATIONAL COUNCIL OF SCIENCE MUSEUMS			
UNIT: C.R.T.L.		PROJ.- MSE Bus	
DRG. NO. HFV/CRTL/MSE/01/A/22	DATE 07/03/22	SCALE 1 : 40	TOLERANCE ±0.25mm
TITLE:- MSE BUS			NO OFF.
DRN. BY Minakshi Dutta	CKD. BY	APPRD. BY	

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Kolkata-700091

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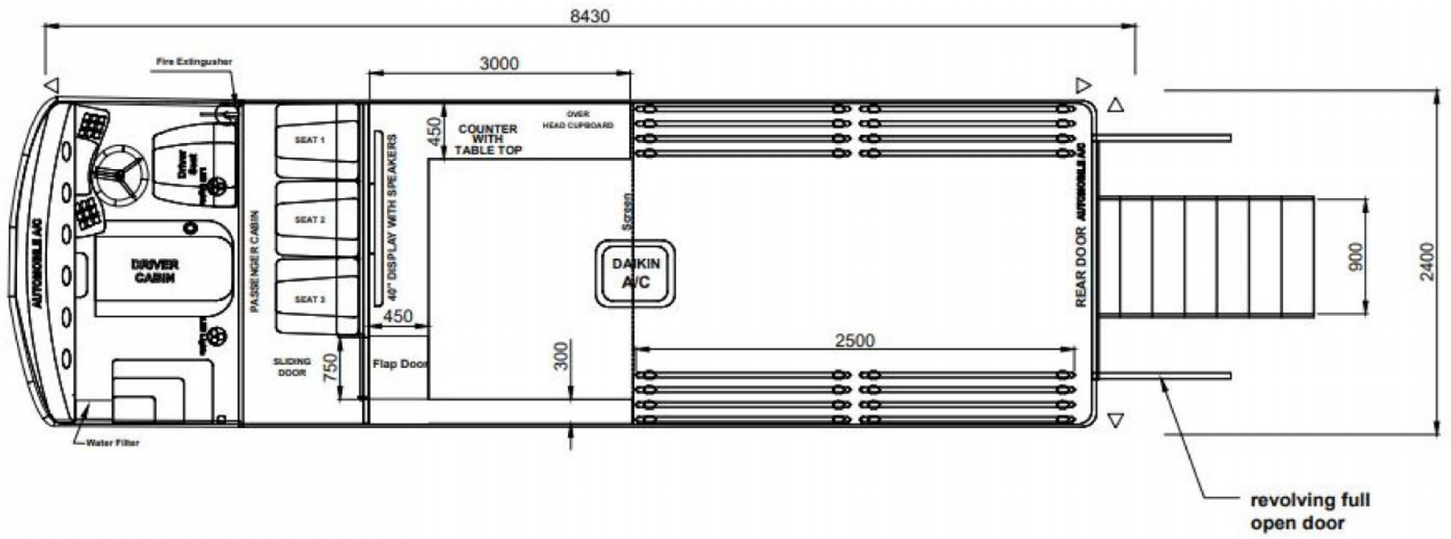
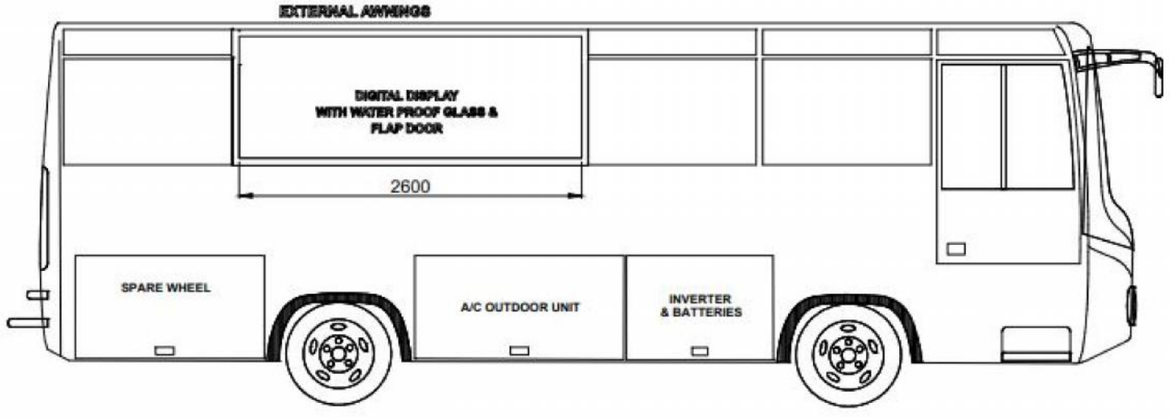
Assembly Drawing (HFV/CRTL/MSE/01/B/22)





FRONT VIEW

All Dimensions are in mm

NATIONAL COUNCIL OF SCIENCE MUSEUMS			
UNIT: C.R.T.L.		PROJ.- MSE Bus	
DRG. NO. HFV/CRTL/MSE/01/B/22	DATE 07/03/22	SCALE 1 : 40	TOLERANCE ±0.25mm
TITLE:- MSE BUS			NO OFF.
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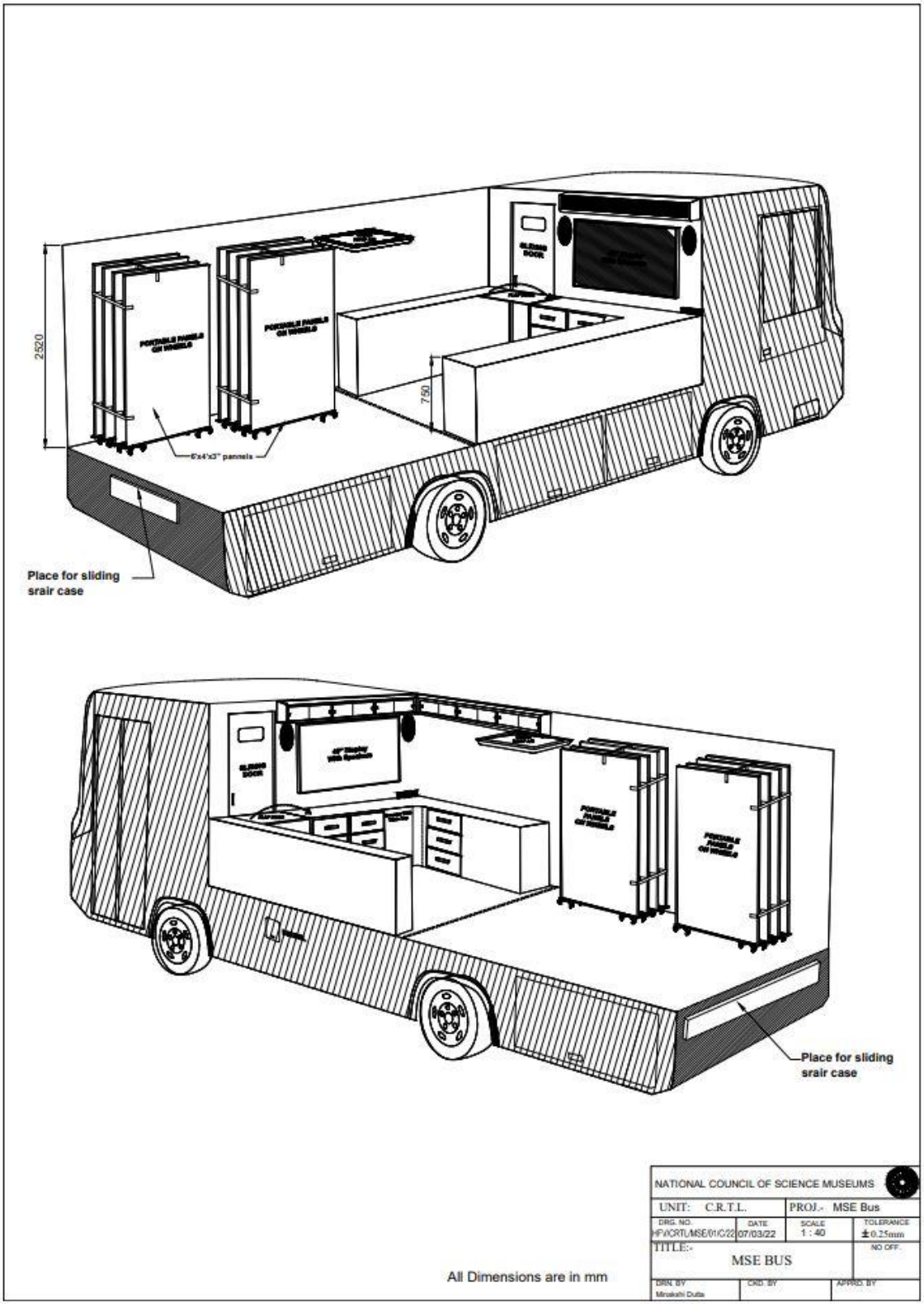

National Council of Science Museums
Block GN, Sector V, Bidhan Nagar.
Kolkata-700091

Specification for the Fabrication of 'Mobile Science Exhibition' Bus

General Terms and Condition: **(in addition to all other terms and conditions of the council):**

- Firm must have been authorized for fabrication work and should have in-house manufacturing facility. Firms, those do not possess the authorized manufacturing/work shop facility will be disqualified.
- All raw materials are required to be inspected by the authorized officers of the council in every stage of fabrication before starting the work.
- Warranty: Standard warranty of one year or more for all equipment and accessories including AC unit (s) must have been specified in technical bid.
- All required RTO related NOC, Licensing, Registration and Insurance (A minimum period of one year / As per Guidelines of the RTO / till the delivery of Bus, whichever is higher) in complete respect will be made by the successful tenderer and all the necessary documents in original will be handed over to NCSM at the time of the delivery of Bus.

Time of Completion:

- The fabrication job/work shall be made/completed as per following schedule:
- Stage : I
  The Diesel Engine Monocoque Chassis / Body (as per specification of the council), should be ready for inspection at National Council of Science Museums, Sector – V, Block – GN, Bidhan Nagar, Kolkata – 700 091 or at the workshop of Dealer/Manufacturer/Fabricator, as directed by the Council, within 15 working days from the date of receipt of the Order (P.O).
- Stage – II
  The raw materials for fabrication work of interior and exterior part of the MSE Bus including all accessories and equipment (electrical & electronics), should be finalized & procured as per specification of the council and duly approved by the competent authority of the council within 20 (twenty) working days from the date of receipt of the Order (P.O).
- Stage – III
  Structural work including Driver's cabin, and Exhibit Cabin as laid down in the approved drawing should be completed within 30 (thirty) working days from the date of receipt of the Order (P.O).
- Stage – IV
  Entire paneling work as laid down in the approved drawing should be completed within 40(Forty) working days from the date of receipt of the Order (P.O).
- Stage – V
  Entire interior work and all other details including mounting of all accessories & equipment, as laid down in the approved drawing should be completed within 60 (Sixty) working days from the date of receipt of the Order (P.O).
- Stage – VI
  The Mobile Science Exhibition Bus complete in all respect strictly as per enclosed specifications and drawings duly inspected and approved by the competent authority of the Council should be delivered to National Council of Science Museums, Sector – V, Block – GN, Bidhan Nagar, Kolkata – 700 091 within 80(eighty) working days (working day means all the days excluding Sun day and Listed National & State Holiday) from the date of receipt of the Order (P.O).

National Council of Science Museums
Block GN, Sector V, Bidhan Nagar.
Kolkata-700091

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The **inspection** shall be preferably in 6 (Six) stages.

- The successful tenderer shall arrange for inspection of the raw materials and fabrication job including other items at their premises on completion of every stages as detailed in Clause No. 5 of GTC i.e. (Time of Completion) and / or whenever desired by the authorized officer of this Council. Any defect / deviation from the specification of the council pointed out by the competent representative of this Council during such inspections have to be promptly rectified to ensure desired quality of work. It would be mandatory on the part of the successful tenderer to arrange inspection and obtain approval of every stages of work as detailed in Clause No. 5 of GTC (Time of Completion).

- During the course of fabrication stages, the changes / modifications in structural & mounting of equipment (if necessary), may be incorporated with due approval of the competent authority of the council and the same will be communicated / finalized during the inspection stages.

List of Documents to be submitted with Technical – Commercial Bid:
(in addition to all other desired documents as per terms and condition of the council).

a. A set of Technical drawings for fabrication work in compliance with the Annexure ' E', comprising the complete details of materials to be used, mounting of exhibits and accessories (as mentioned in the specification), and the assembling / dismantling procedure or mechanism details for exhibit cabinets, accessories, is to be submitted in Cover-1.
b. Compliance to the specification sheet and drawings of the council.
c. Authorized dealership certificate.
d. Authorized Manufacturing / Manufacturer certificate.
e. Certificates of Past Experience (last 5yrs) in relevant field.