Reasoned Documents

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
1.	2.2	Elevators are required to be machine room-less & gear-less and the same shall be suitable for railway stations, be they underground or over ground (please refer item 10 of Annexure-1). In absence of any specific mention to the contrary in the tender, it will be deemed that the railway station is of overground type. The elevator should be fit for use by elderly as well as differently abled passengers. Although focus of the spec. is on vertical movement of passengers from Foot-over-Bridge (FOB) to platform, concourse, circulating area, etc., the spec. is equally suited for multi-storied buildings.	**NR:** Elevators are required to be machine room-less & gear-less and the same shall be suitable for railway stations, be they underground or over ground (please refer item 10 of Annexure-1). In absence of any specific mention to the contrary in the tender, it will be deemed that the railway station is of overground type. The elevator should be fit for use by elderly as well as differently abled passengers. Although focus of the spec. is on vertical movement of passengers from Foot-over-Bridge (FOB) to platform, concourse, circulating area, etc., the spec. is equally suited for multi-storied buildings. **Priority shall be given to Machine room lift in place of MRL lift for such locations where provision of machine Room is feasible.**		Accepted. The necessary change has been made in the specification.
2.	2.8.ii	Supply and fixing of guide rails and related items.	**CR:** The contractor should also take over welding works required for the installation of parts of the elevator assembly. Contractors shall arrange welders to carry out the required fixing works.		Not required to mention as each and every small work cannot be mention in the specification.
3.	2.9.2	The site preparation works to be undertaken by railways may typically include: construction of the Elevator shaft including pit; construction of FOB extension for connecting the main passage to Elevator shaft; raised platform/profiling required for	**CR:** To reduce installation and commission time of lift All civil work, including the pit, installation of Pump and drain pipe should be done by the contractor after joint site feasibility studies from the Electrical		Not required to specify in specification as the various works to be done for installation of lift may be done as

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		prevention of ingress of water into the Elevator shaft; any miscellaneous works (if required), to offer a clear site to the elevator contractor……Provision of earth pits for achieving an earth resistance of max 1 ohm (for elevators, railways shall provide separate earthing pits); making single phase and three phase LT power supply available for the Elevator, etc	& Civil departments. Separate earth pits (preferably two) with a Maintenance Free Earthing Terminal (MET) arrangement should be provided by the contractor. Maintenance-free chemical earthing with a connector strip should be utilized.		per respective standard. Provision of earthing pit and its type may be done by Railway as per their requirements.
4.	2.9.3	Elevator shaft should preferably be of RCC. If brick construction is used, then it is recommended that the minimum thickness of shaft wall shall be 230 mm and RCC tie-beams shall be provided at the bracket fixing levels and any other equipment fixing locations. The location of the RCC tie-beams shall be provided by the Elevator contractor.	1. **SCR:** Details of Elevator shaft constructed using Steel structure shall also to be incorporated in the clause & OEM to give exact location of Tie Beam etc., during design stage of lift shaft with steel structure. 2. **CR:** Both MS structure/RCC should be used in the shaft. 3. **NR:** Elevator shaft should be of RCC. RCC tie-beams shall be provided at the bracket fixing levels and any other equipment fixing locations. The location of the RCC tie-beams shall be provided by the Elevator contractor.		Accepted. The relevant change has been made in the respective clause of RDSO specification.
5.	2.9.5	Provision of CCTV surveillance system.	**1. M/s Otis:** Check & share the CCTV Scope of works. **2. SCR:** Firm shall provide 1 No. of Full HD Fixed Dome Type IP Colour Camera as specified at Clause No.6 of RDSO Specification No. RDSO/ SPN/ TC/65/2021 Version 6.0 with		The CCTV work is under lift contractor scope and now mentioned under cl. No. 2.8.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			Amendment No. 1 or latest inside the Lift car. Railway shall integrate this Camera with the existing Railway surveillance systems. OEM has to share protocals/data access with Railways. Similarly, RPF has to cover surveillance of elevator working area through CC Cameras. CCTV feed should also be integrable with IR-NIYANTRAC. 3. **CR:** A minimum of 01 CCTV cameras must be installed in inside, 01 CCTV at both landing floors to monitor on each floor. The installation of CCTV systems in lifts is part of the contractor's scope of work. Cameras should have a high-resolution video capability, preferably 1080p or higher. Equip the system with night vision or low-light functionality to ensure visibility at all times. Integrate the CCTV system with the central monitoring station for real-time surveillance. Ensure that the live feed is accessible to authorized personnel for continuous monitoring. Implement a secure data storage solution to archive CCTV footage for a specified period.		
6.	3	Applicable standards	1. **M/s OTIS:** IS 14665 & IS 15785 is going to superseded in one or two years & New code		Accepted. The necessary

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			introduced as IS 17900. 2. **M/s TRIO:** New IS Standards IS 17900PUBLISHED / UNDER PUBLICATION to replace old IS standards specified e.g. IS 14665 to be replaced by IS17900 with its relevant part nos. 3. **TK Elevator:** New updated standards to be mentioned. 4. **SCR:** RB Guidelines on accessibility of Indian Railway Stations and facilitities at stations for differently abled persons (divyangjan) and passengers with reduced mobility issued vide letter No. 2019/Stt.Dev.-I/03/06/Policy/PwDs dated 25.11.22, National Building Code- 2016 (or) latest should also be incorporated for lift car dimensions as specified in above letter. The new standards superseding the old may be incorporated. IS 14665 have been superseded by IS 17900, IS 8216 is withdrawn. The equivalent BIS 15999, 2365, 14700, 17806 suggested for IEC 60034, EN 12385-5, EN 61000 and ISO 7465 respectively has been suggested. IEC 60034-30-1 & 2 may be added to comply super ECBC		changes has been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			requirements. 5. **CR:** Standards IS-3043 for earthing and IS-732 for Code of Practice for Electrical Wiring Installations also be included.		
7.	3 NOTE - i	The elevator shall generally confirm to this specification however for parameters and performance criterias not explicitly covered in this specification should be governed by standards mentioned above. In case of conflict between standards the preference should be given in the order of IS, EN.	**SCR:** The elevator shall generally confirm to this specification however for parameters and performance criterias not explicitly covered in this specification should be governed by standards mentioned above. In case of conflict between standards the preference should be given in the order of Railway Board guidelines on divyangjan guidelines (letter No. 2019/Stt.Dev.-I/03/06/Policy/PwDs dated 25.11.22), IS, EN for lift car size, height of lift panel for accessibility, provision of mirrors, handrails inside lift car etc.		Accepted. Necessary changes have been made.
8.	5.1	The construction of all Elevators shall conform to latest editions of IS-14665, IS 15785, IS-15330, and EN 81-~~1~~20.	**SCR:** IS 17900 & latest amendments should also be incorporated and suitably modify the clause.		Accepted. Necessary changes have been made.
9.	5.2	Each Elevator shall have its own driving machine. The method of drive shall be Electric Traction with gearless motor having a provision of VVVF Control; regenerative drive shall be provided, if specifically asked for by the purchaser (please refer item 8, Annexure - 1). In absence of any mention to the contrary in the tender, it will be deemed that regeneration feature is not required. The system, including all sub-systems and equipments shall be of proven design.	**SCR:** Each Elevator shall have its own driving machine. The method of drive shall be Electric Traction with gearless motor having a provision of VVVF Control; regenerative drive shall be provided~~, if specifically asked for by the purchaser~~ (please refer item 8, Annexure - 1). In absence of any mention to the contrary in the tender, it will be deemed that regeneration feature is ~~not~~ required. The system, including all sub-systems and equipments shall be of	Regenerative braking should be mandated atleast at locations where heavy/ frequent usage of Lifts are anticipated. **Default option should be lift with regenerative braking**. Also motors shall be preferably of IE4 (super premium efficiency) class motors to comply to Super ECBC guidelines (Chapter-7 Electrical and Renewable Energy Systems) or BEE	Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			proven design.	5-Star rated motor with VVF control.	
10.	5.3	The design of the elevator shall be such that no major repair shall be necessary for a period of 20 years from the date of issue of certificate of handing over.	**M/s TK Elevator:** 15 years		Not accepted. As codal life of the lift is 20 years.
11.	5.8	The elevator capacity and the outline dimensions viz car size, shaft dimensions, Entrance, overhead, pit depth, car door & landing door etc. should be as per the recommended dimensions given in IS 14665. If necessitated by the site conditions, railways can specify any other dimensions but these should fulfill the conditions of variation given in the IS Standard Elevator car and shaft dimensions for 13/20/26 persons capacity Elevators have been specified in Cl. 11. Railways must choose one of the three aforesaid Elevator capacities (refer item 2 of Annexure-1). Although the standard shaft and pit sizes prescribed.	**M/s JLPL:** To make the specification / requirement clear. The car size shall meets the requirements of "Harmonised Guidelines & Standards For Universal Accessibility in India". Hence kindly modify the clause as mentioned below, The elevator capacity and the outline dimensions viz car size, shaft dimensions, Entrance, overhead, pit depth, car door & landing door etc. should be as per the recommended dimensions given in IS 14665 / "Harmonised Guidelines & Standards For Universal Accessibility in India". **SCR:** The clause should be suitably modified to accommodate guidelines for Divyangjan in connection with minimum car size - minimum car size should be atleast 1500mm x 1500mm wherever the Lift car area size permits.		No change required as the guidelines issued by Rly Bd regarding differently abled persons have been incorporated. Comment of SCR is acceptable and Necessary changes have been made.
12.	6.1.1.1	Driving motor shall be of AC permanent magnet synchronous type (with no slip rings) designed for special duty cycles required for Elevator operation. It should have a high starting torque, high power	1. **M/s TRIO:** Motor efficiency and other parameters of the motor std. should in line with IS17900. 2. **M/s TK elevator:** Motor efficiency not less than 80% on full load. 3. **SCR:** Compliance to standards		No change required for efficiency of motor. The IS 15999 has been specified in

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		factor, high efficiency and low energy consumption. The efficiency of driving motor shall not be less than 85%. The motor should conform to IEC 60034: Part 1 & 2	like IEC 60034-30-1 & IEC 60034-30-2 on energy efficiency class of motors or equivalent IS 15999 Standards should also be incorporated suitably in the clause.	SCR: To comply to Super ECBC guidelines.	the relevant clause.
13.	6.1.1.6	The motor used shall have Class 'F' insulation with IP-21 protection and shall be designed for 110% of rated load.	**NR:** The motor used shall have Class 'F' insulation **with IP-54** protection and shall be designed for 110% of rated load.		No change required as most of the manufacturers are not agreed.
14.	6.1.1.7	The motor shall be designed to conform to S5 – 60% CDF (cyclic duration factor). Duty cycles are defined as per IEC duty cycles for non-peak and peak period of operation.	1. **M/s OTIS:** The motor shall be designed to conform to **S5 – 50%** CDF (cyclic duration factor). Duty cycles are defined as per IEC duty cycles for non-peak and peak period of operation. 2. **M/s TK Elevator:** The motor shall be designed to conform to S5 – 50% CDF (cyclic duration factor).		No change required as motor is being supplied to IR with 60% CDF.
15.	6.1.2.1 (Brake)	BRAKE : The Electro-magnetic brake shall be of the spring applied and electrically released type.	1. **M/s Trio:** Normally all elevator motor supplier uses DISC BRAKE. Hence this clause is to be modified to include the same.		No change required.
16.	6.1.2.7 (Brake)	The handle should be robust and able to bear human intervention. This aspect shall be evaluated during detailed design stage. It is desirable that a mechanical (independent of electrical system) arrangement may be provided for rescuing the trapped passengers. The rescue operation shall be possible even when the total load of the car with passengers become equal to the mass of the counterweight. Only trained	1. **M/s TK Elevator:** The handle /switch should be robust and able to bear human intervention. This aspect shall be evaluated during detailed design stage. It is desirable that a electro-mechanical battery operated arrangement may be provided for rescuing the trapped passengers. The rescue operation shall be possible even when the total load of the car with passengers become equal to the mass of the		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		authorized person should be permitted to use electro-mechanical brake release.	counterweight. Only trained authorized person should be permitted to use electro-mechanical brake release.		
17.	6.2.1 & 6.3.1(Hoisting Rope/ Belt and counter weight)	At least three (3) steel wire ropes/ two (2) belts …….. shall conform to latest version/ amendments of IS: 14665 (Part 4/Sec. 8)/IS-2365 or EN-12385-5. A plate giving the number, size and ultimate tensile strength of the rope used shall be permanently fixed to the crosshead.	1. **SCR:** Safety, design rules & testing provisions under IS 17900 should also be incorporated along with provisions from IS 14665. 2. **NR:** At least three **(3) steel wire ropes** especially manufactured for Elevator use shall be employed for suspension of Elevator car and counterweight. The main suspension ropes shall be in accordance with latest versions of EN 81-1, IS:14665 (part-4, Sec.3) and the strength, construction and diameter of rope for the car and counterweight shall conform to latest version/ amendments of IS: 14665 (Part 4/Sec. 8)/IS-2365 or EN-12385-5. A plate giving the number, size and ultimate tensile strength of the rope used shall be permanently fixed to the crosshead	IS 17900 (Part 1 and Part 2) standards supersede IS 14665, IS 14671 and IS 15785. IS:14665 (part-4, Sec.3) and to improve the reliability of the product.	Accepted. Necessary changes have been made. No change required.
18.	6.5.1 (Guides & Fixings)	Planned steel tees shall be provided as guides for the Elevator car and counterweight, as appropriate, erected plumb and fixed securely to the Elevator shaft by steel brackets. The bracket shall be solidly fixed with the RCC beam/RCC slab. The guide rails shall be connected by steel fish plates. Details of guides and associated items shall be scrutinized and finalized at detailed design stage.	**SCR:** This clause should be suitably modified by incorporating details for Steel structure Lift shaft also. **CR:** Specify the type of steel material (e.g., Carbon/Galvanized). Guide Rail brackets fixing distance should be mentioned.	Currently, the elevator shafts for all 12-meter wide Foot Over Bridges (FOBs) are being constructed using steel structures, as it enhances the speed of construction, provides flexibility in design, offers better space efficiency, and allows for easier adaptations or modifications in the	Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
				future.	
19.	6.5.5	The bracket should be fixed to RCC beams/RCC slab using chemical bolts of Hilti make or other EOTA approved brand of fasteners manufactured as per ETGA document no. 001TR029 with cold forming process.	1. **M/s TK elevator:** The bracket should be fixed to RCC beams/RCC slab using bolts of EOTA approved brand of fasteners manufactured as per ETGA document no. 001TR029 with cold forming process. 2. **SCR:** This clause should be suitably modified by incorporating details for Steel structure Lift shaft also.		Accepted. Necessary changes have been made.
20.	6.6.2 and Clause 11 – Sl. No. 22 & 23	Buffers shall be of spring type and the same shall comply IS: 14665 (part- 4, Sec. 1). If any manufacturer offers PU (polyurethane) type buffer same may be accepted by consignee after evaluating the supporting documents submitted by the manufacturer about the performance of PU buffers.	1. **M/s OTIS:** Buffers shall be of spring type/ **Energy dissipation (hydraulic) buffers** and the same shall comply IS: 14665 (part- 4, Sec. 1). 2. **M/s JLPL:** Buffers shall be of spring type / Polyurethane / Oil buffer and the same shall comply IS: 14665. If any manufacturer offers PU (polyurethane) type buffer same may be accepted by consignee after evaluating the supporting documents submitted by the manufacturer about the performance of PU buffers. 3. **SCR:** Relevant IS number may be updated.		Accepted. Necessary changes have been made.
21.	6.8.1	All diverting pulleys necessary for suspension of car/counterweight or diverting the suspension rope/belt to counterweight shall be of cast iron, grooved for wire ropes complete with shaft, bearings. They shall incorporate devices to prevent	NR: All diverting pulleys necessary for suspension of car/ counterweight or diverting the suspension rope/belt to counterweight shall be of cast iron ***(maximum up to 20 kg each for better load balancing)***, grooved for wire ropes complete with shaft, bearings. They shall incorporate		Not acceptable.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			devices to prevent		
22.	6.9.2.1	A suitable car frame fabricated from cold rolled (up to 4mm thickness) and hot rolled sheet (above 4 mm thickness)/ formed steel hot dipped galvanized / Spray Galvanized, bolted and / or welded together to form a rigid structure shall be provided.	**1. M/s OTIS:** A suitable car frame fabricated from cold **rolled (up to 3mm thickness) and hot rolled sheet (above 3 mm thickness)/** formed steel hot dipped galvanized / Spray Galvanized, bolted and / or welded together to form a rigid structure shall be provided. **2. M/s JLPL:** A suitable car frame fabricated from cold rolled (up to 4mm thickness) or hot rolled sheet (above 4 mm thickness)/ formed steel hot dipped galvanized / Spray Galvanized, bolted and / or welded together to form a rigid structure shall be provided. **3. CR:** Minimum thickness of cold rolled sheet should be specified.		Accepted. The clause has been modified in line with the specification of DMRC and other metro.
23.	6.9.2.5	A Do's and Don'ts instruction plate shall be provided after getting approval at the design stage. There should be two different plates one outside and one inside the car. These plates should be very friendly and simple.	**CR:** Instructions should be imprinted on a metal plate for durability.		Accepted. Necessary changes have been made.
24.	6.9.3.1	Car enclosure shall be of Scratch Resistant Stainless steel of not less than 1.5 mm in thickness and securely fastened to the car platform and so supported that it cannot be loosened or become displaced in ordinary service or on the application of safety gear or on buffer engagement.	**1. M/s OTIS:** Car enclosure shall be of Scratch Resistant Stainless steel of not less than **Nominal 1.5** mm in thickness and securely fastened to the car platform and so supported that it cannot be loosened or become displaced in ordinary service or on the application of safety gear or on buffer engagement.		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			2. NR: Car enclosure shall be of Scratch Resistant Stainless steel of not less than 1.5 mm in thickness, **Water resistance to prevent damage from moisture** and securely fastened to the car platform and so supported that it cannot be loosened or become displaced in ordinary service or on the application of safety gear or on buffer engagement.		
25.	6.9.3.6	The handrail size is not given	1. **M/s TRIO:** State new IS 17900 part-1 where the handrail size is also specified.		Accepted. Necessary changes have been made.
26.	6.9.3.7	A toe guard shall be provided for the car doors conforming to EN 81-20. The toe guard for elevators shall be made of galvanized sheet steel of not less than 1.5mm thick and painted and shall be adequately braced at the back. The depth of the toe guard shall be sufficient to prevent any object from being trapped between the underside of the car platform and the landing during re-leveling operation (with a minimum of 700 mm).	**M/s OTIS:** As toe guard in Galvanized sheet steel hence painting is not required. Pls review & update the clause as below A toe guard shall be provided for the car doors conforming to EN 81-20. The toe guard for elevators shall be made of **galvanized sheet steel of not less than 1.5mm thick** and shall be adequately braced at the back. The depth of the toe guard shall be sufficient to prevent any object from being trapped between the underside of the car platform and the landing during re-leveling operation (with a minimum of 700 mm).		Accepted. Necessary changes have been made.
27.	6.9.4.1 Car Platform	The car platform shall be constructed from cold rolled steel (spray galvanized). The floor finish shall be made of 6 mm thick Aluminum chequered plate which shall be fixed to platform top sheet with pilfer proof	1. **M/s JLPL:** To make the specification / requirement clear. Kindly modify the clause as mentioned below, The car platform shall be constructed from cold rolled **or**		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		screws. If single sheet is not used, it can be in two pieces fixed with pilfer-proof screws. The platform shall be designed on the basis of the rated load evenly distributed with a minimum safety factor of five (5). Design calculations shall be submitted by the contractor at the design stage.	**hot rolled** steel (spray galvanized). The floor finish shall be made of 6 mm thick Aluminum chequered plate which shall be fixed to platform top sheet with pilfer proof screws. If single sheet is not used, it can be in two pieces fixed with pilfer-proof screws. The platform shall be designed on the basis of the rated load evenly distributed with a minimum safety factor of five (5). Design calculations shall be submitted by the contractor at the design stage. 2. **CR:** Lift car floor chequered plate should be SS grade 304 with suitable thickness may be included in place of Aluminium chequered.		Not required.
28.	6.9.5.1	The portion of the car roof visible from inside the car shall be made of Stainless Steel finish. False ceiling shall not be provided. Light fittings and fan shall be provided on car roof and suitably protected against theft.	**1. M/s OTIS:** False ceiling will be provided made of Stainless steel Above false ceiling, Main ceiling will be provided. *This clause conflicts with **6.9.6.1**, where the later says to provide suspended ceiling.* *Request to add the false ceiling requirement is SS304 grade finish.* *However, OTIS provides light in the false ceiling which are anti-theft type.* **2. M/s TK Elevator:** The portion of the car roof visible from inside the car shall be made of MS sheet and cladding of Stainless Steel finish		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			from inside.		
29.	6.9.5.2	The car roof shall be suitably constructed and reinforced to permit the maintenance and inspection of the Elevator shaft ……The roof of the car shall be provided with a trap door of size 450mm x 450mm for 13 passengers elevator and 610(W) mm X 450(H)mm for 20 and 26 passengers elevator to enable rescue of passengers in case the lift get struck up and ARD does not work. Care shall be taken that the opening of the trap door is not obstructed by any other equipments installed on the roof.	**M/s OTIS:** Request to advise other capacities. **M/s TK Elevator:** As per IS 17900, it (trap door) is excluded.		Not required. Trap door is mandatory.
30.	6.9.6.2 Ventilation	The noise level of Fan used for ventilation shall be ~~within the limits as stipulated in Cl. 11.~~ Max 55 dB(A).	**M/s JLPL:** To make the specification / requirement clear. The noise level of Fan used for ventilation shall not exceed 55 dBA (Max) at a distance of 1 meter away from the fan inside the Elevator car.		Accepted. Necessary changes have been made.
31.	6.9.6.3	Fan shall automatically start on registering the command. The car ventilation fan shall be switched off within a period which shall be adjustable from 5 to 15 minutes after the last registered call is answered. However, fan Switch shall be provided to disable auto starting of the Fan when not desired.	**M/s OTIS:** Fan shall automatically start on registering the command. The car ventilation fan shall be switched off within a period which shall be adjustable from **0 to 255 seconds after the last registered call is answered**. However, fan Switch shall be provided to disable auto starting of the Fan when not desired.		Accepted. Necessary changes have been made.
32.	6.9.7.1. ii Landing Doors	ii. Scratch Resistant Stainless steel with fire rating as per IS 14665 part-I	**M/s JLPL:** To make the specification / requirement clear. Kindly modify the clause as mentioned below, Scratch Resistant Stainless steel with		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			fire rating as per IS 14665 (Part 2 / Sec 1) & IS 14665 (Part 4/ Sec 6). SCR: The Fire rating specified in IS 14665 : Part 2 : Sec 1 & Amd. 1 : 2011 is withdrawn. The Active Spec "IS 14665: Part 2: Sec 1 and 2" doesnot specify any Fire rating. As such Fire rating of landing door should be as specified in IS 17900 (Part 1) : 2022 (Part 1 Safety Rules) para 5.12.5.1.5 (Landing doors) may be considered.		
33.	6.9.7.1.II.v	Car Ceiling: Scratch Resistant Stainless steel panels with sufficient LED down lights	**NR:** Car Ceiling: Scratch Resistant Stainless steel panels with sufficient LED down lights ***suitably protected against theft***		Accepted. Necessary changes have been made.
34.	6.9.8.1 (Illumination of cars and Lighting Fixtures)	LED light fittings shall be provided to achieve a minimum illumination level of 150 lux at the floor of Elevator car.	**SCR:** The Guidelines may be reviewed in line with IS 17900 (Part-I) (or) latest guidelines: 5.4.10.1 The car shall be provided with electrical lighting that is permanently installed ensuring a light intensity of at least 100 lux on the control devices and at 1 m above the floor at any point not less than 100 mm from any wall. 5.4.10.2 There shall be at least two lamps connected in parallel. 5.4.10.3 The car shall be continuously illuminated except when the car is parked and the doors are closed.	Since, continuous lighting is necessiated, Minimum LUX levels may be reviewed in line with latest IS 17900 so as to reduce energy intensity.	No change is envisaged.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
35.	6.9.9 (Emergency Lighting)	For emergency lighting, a subset of lighting fixtures for normal lighting, shall be backed up by a UPS. With emergency lighting, the minimum luminous intensity measured at floor level and on the car operating panel shall be 100 lux.	**SCR:** The Guidelines may be reviewed in line with IS 17900 (Part-I) (or) latest guidelines: 5.4.10.4 There shall be emergency lights with an automatically rechargeable emergency supply, which is capable of ensuring a lighting intensity of at least 20 lux for 1 h: a) at each alarm initiation device in the car and on the car roof; b) in the centre of the car, 1 m above the floor; c) in the centre of the car roof, 1 m above the floor. This lighting shall come on automatically upon failure of the normal lighting supply. **NR:** For emergency lighting, a subset of lighting fixtures for normal lighting, shall be backed up by a UPS **with minimum backup of 4 hours.** With emergency lighting, the minimum luminous intensity measured at floor level and on the car operating panel shall be 100 lux.	Duration of emergency lighting should be atleast 1 hour. Minimum LUX levels may be reviewed in line with latest IS 17900 so as to reduce energy intensity.	No change is envisaged.
36.	6.10.1.1 (i)	Each Elevator shall be provided with horizontal sliding doors complete with door frames, arranged in centre opening with two panels. The doors shall be heavy duty and shall be designed for minimum of 180 door opening/closing operations in one hour.	**SCR:** The elevator car door should be provided with at least 25% transparent glass area to enhance comfort and safety for passengers inside the car. The clause should be suitably modified to specify these requirements.	To enhance both comfort and safety for passengers, the elevator car door and landing door should incorporate a transparent glass area covering at least 25% of the door surface.	Accepted. Necessary changes have been made.
37.	6.10.1.1	iii) The doors shall be able to withstand a thrust of 345 N over 5 sq. cm.	**1. M/s OTIS:** The doors shall be able to withstand a thrust of **300 N over 5 sq. cm as per EN81-20.**		Accepted. Necessary changes

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			2. M/s JLPL: The following '***Note***' to be added in below of clause 6.10.1.1 ***Note*** - The Elevator Contractor shall comply with the emergency doors requirements when the distance between consecutive landing door sill exceeds 11 mtrs as per the Latest IS 14665 (Part 2 / Sec 1) and EN81 standard. Stainless Steel doors shall be provided for Emergency landing doors.		have been made. No change is envisaged.
38.	6.10.1.8	Fascia: Fascia shall be provided as per EN 81-1. Where the gap between the car door sill and surface of the Elevator shaft wall exceed 125 mm, galvanized sheet steel fascia plates of not less than 1.5 mm thick shall be provided. These shall be fixed between the undersides of landing entrance sills and the top of the door hanger case to form a flush surface in the path of travel at the car entrance. The plates shall cover the whole width of the landing door and extend by 150 mm on each side of the door. It shall be rigid and properly reinforced.	**M/s OTIS:** With reference to EN 81 clause #11.2.1, the gap between car door sill and surface of elevator shaft wall shall **not exceed 150mm.** please amend this clause.		No change is envisaged.
39.	6.10.1.9 Door profile	To avoid the trapping of fingers in between Car frame and Car door, profile shall be provided and the gap after provision of profile, if any, shall not be more than 5mm.	**M/s JLPL:** As per EN this is required only glass door. Hence modify the clause as mentioned below, For Glass door lifts, to avoid the stucking of fingers in between car frame and car door, profile shall be provided & the gap after provision of		No change is envisaged.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			profile if any shall not be more than 5 mm.		
40.	*6.10.3.2*	Mechanical Force Limiting Devices shall be provided for each car door for preventing door closing when a passenger is entering or leaving the car. This should act as a backup protection to 2D-infrared curtain. For metro rail application 3-D infra red curtain may be provided if purchaser specially mention in the tender documents.	1. **M/s OTIS:** OTIS will provide 2# Photocells in each car door for preventing doors closing, when passenger is entering or exiting the car. Kindly confirm. 2. **TK Elevator:** Mechanical/ Electrical Force Limiting Devices shall be provided		Accepted. Necessary changes have been made
41.	6.11.10	The Elevators shall be suitable to be connected to web based monitoring software. It should be possible to monitor Elevator status with web based application. For this purpose, the contractor shall install web based protocols along with necessary hardware in the Controller. Necessary executable files, if any, will be required to be given free of cost by the supplier on a CD/ or any other storage device.	1. **M/s OTIS:** Request you to provide the details of the signals required for web based monitoring software. 2. **NR:** The Elevators shall be suitable to be connected to web based monitoring software. It should be possible to monitor Elevator status, **fault logger, history, reports generation, graphical analysis & automatic man trapping alert system** with web based application.		Accepted. Necessary changes have been made
42.	6.11.12	The controller should be designed to be compatible with IRNIYANTRAC.	1. **M/S OTIS:** Request you to provide the communication protocol details of IRNIYANTRAC to check feasibility with Controller. However our control system does not support Open protocol. 2. **SCR:** These parameters include, but are not limited to Lift Operation Status, Door Status (Open/Closed), Lift Speed, Lift Weight Capacity / Load Monitoring, Motor Temperature,		Accepted. Necessary changes have been made

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			Vibration Monitoring, Battery Voltage (for Backup Systems)/ARD Battery Voltage, Brake System Monitoring, Energy Consumption, Cabin Position, Safety Systems, Real-Time CCTV Streaming via IR NIYANTRAC. Additionally, provision should be made to continue supporting the existing web-based and remote monitoring system provided by the OEM/contractor.		
43.	6.13.3	Regenerative braking module shall be provided if the railway specifically asks for the same in the tender (refer item 8 of Annexure - 1).	**SCR:** Regenerative braking module shall be provided by default ~~if the railway specifically asks for the same in the~~ until and otherwise specified in the tender (refer item 8 of A nnexure - 1). **NR:** Regenerative braking module shall be provided if the railway specifically asks for the same in the tender. **Provision of System for saving of electrical energy on account of use of Regenerative Braking may also be included.**	Regenerative braking should be mandated at least at locations where heavy/ frequent usage of Lifts are anticipated. **Default option should be lift with regenerative braking**. Also motors shall be preferably of IE4 (super premium efficiency) class motors to comply to Super ECBC guidelines (Chapter-7 Electrical and Renewable Energy Systems) or BEE 5-Star rated motor with VVF control.	Accepted. Necessary changes have been made
44.	6.15.2-ii	An Orange / red "Car Overload" indication with announcement in English and Hindi or only in English, as decided by the railway, shall be provided.	**CR:** A regional language should also be incorporated (Hindi / English / Regional language).		Accepted. Necessary changes have been made
45.	6.16.2 & 6.19.2.1	The faceplate of the car position indicator shall be made of stainless steel grade 304. The Stainless steel plate should be minimum 2 mm thick and its mounting arrangement	1. **OTIS:** LCD display is better than dot matrix for displaying floor information & car direction. Below image indicates the LCD display. 2. **TK Elevator:** Floor numbers shall		Accepted. Necessary changes have been made

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		should have two sunken screws. This plate should be pilfer-proof. Floor numbers shall be digitally displayed using minimum 5 x 7 square dot matrix LED.	be digitally displayed using minimum 5 x 7 square dot matrix LED/10.4 inch LCD screen. 3. **NR:** Car & landing display – Above the doors, flush type, scrolling dot matrix (5X7, 1.2 inch), 2 rows & 10 characters in each row showing complete information e.g. floor position, direction of travel, lift under maintenance, lift out of order, fireman mode, rescue mode, ARD mode, overload, full load & other relevant information with arrival chimes on landings (red colour) on both sides of the display comprising all items to make a single unit for landings.		
46.	6.18 Certificate Holder	A framed and glazed panel made of stainless steel of minimum 2mm thickness, suitable to display the Elevator certificate shall be provided above the car operating panel. This shall be got approved at design stage.	1. **M/s JLPL:** Since all the car panel thickness is mentioned as minimum 1.5mm thick, the license holder plate thickness shall be of minimum 1.5mm thick. Hence the clause to be modified as below: A framed and glazed panel made of stainless steel of minimum 1.5mm thickness, suitable to display the Elevator certificate shall be provided above the car operating panel. This shall be got approved at design stage. 2. **SCR:** In addition to Certificate holder, Every lift shall have a QR code which shall be displayed prominently in the lift car, and when scanned shall provide		Accepted. Necessary changes have been made

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			information about the lift as per IS 17900 (PART 6:2022) [LIFTS FOR THE TRANSPORT OF PERSONS AND GOODS PART 6 - GUIDE FOR MAINTENANCE OF LIFTS] (or) latest guidelines. 3. **Two** framed and glazed panel made of stainless steel of minimum 2mm thickness, suitable to display the Elevator certificate **(One for OEM certificate and 2nd for Electrical Inspector**) shall be provided above the car operating panel. This shall be got approved at design stage.		
47.	6.21.2	The Elevators shall be designed to operate on a 415V ±10% AC, 3 phase, 4 wire, 240V±10% 50Hz AC single phase power supply. Power supply up to Elevator's main control cubicle will be provided and terminated by the purchaser and in this regard, the contractor shall coordinate with the railway. Main switch/MCB Box with ELCB, etc. should be in lockable enclosure and in scope of Elevator contractor. MCB box shall be IP-54. All ELCB's, MCBs & Switches should be of reputed makes. The lighting requirement shall be at least 100 lux throughout the shaft and 200 lux near machine & controller. Socket outlets of 15A capacity shall be provided by the Elevator Contractor inside the shaft, at every floor.	**NR:** The Elevators shall be designed to operate on a 415V ±10% AC, 3 phase, 4 wire, 240V±10% 50Hz AC single phase power supply. Power supply up to Elevator's main control cubicle will be provided and terminated by the purchaser and in this regard, the contractor shall coordinate with the railway. Main switch/MCB Box with **RCCB** should be in lockable enclosure and in scope of Elevator contractor. MCB box shall be IP-54. All **RCCB,** ELCB's, MCBs & Switches should be of reputed makes. The lighting requirement shall be at least 100 lux throughout the shaft and 200 lux near machine & controller.	For safety and reliability, the 3-Phase RCCB shall be provided for 3-phase circuit and single phase RCCB/RCBO of 30mA sensitivity for car light & fan	Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			Socket outlets of 15A capacity shall be provided by the Elevator Contractor inside the shaft, at every floor.		
48.	6.21.10	Electrical Requirements	1. **SCR:** Minimum number of successive operations of ARD per hour may be specified by RDSO in consultation with Manufacturers and UPS capacity & chargers may be standardized for various capacities of Lifts. 2. **CR:** 1. Better quality battery, specifically a Lithium-ion battery, should be used. An additional battery set with an auto-changeover switch should be provided. If the primary battery fails, the load shall be shifted to the secondary battery. Reason: it is seen that when power failure are frequently i.e. 2-4 times in short interval, ARD not work because they are not charged. 3. Introduce a function in the lift system whereby if the battery is not sufficiently charged, the lift will not start. An error message should be displayed at suitable locations to notify users and maintenance personnel. Implementation: Integrate the battery monitoring function into the existing lift control system.	At times, charging time upto full battery may not be available at NSG-3/NSG-4/NSG-5 stations.	Partially accepted. as per the necessary requirements. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			Design and install clear and visible error messaging displays at all entry points and inside the lift car. 4. Replace the existing Automatic Rescue Device (ARD) with a Battery Energy Storage System (BESS) to provide enhanced emergency power and reliability. The existing ARD, which typically relies on limited battery backup, should be replaced with a robust Battery Energy Storage System (BESS). BESS offers a more reliable and efficient power backup solution, ensuring that the lift remains operational during power outages or emergencies. In the event of a power failure, the BESS will seamlessly take over, allowing the lift to complete its current journey and safely transport passengers to the nearest floor. One-minute light switch-off shall be avoided. The system should provide power to essential components such as lighting, communication systems, and ventilation during the emergency		

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			operation. **NR:** In event of failure of normal electric supply, the supply to alarm bell system, intercom system, emergency car lighting and 50% ventilation fans shall be automatically switched to a UPS with battery backup. The battery shall be of sealed maintenance free type with total capacity sufficient to maintain the operation of above equipment for at least **4 hours.** The rating of UPS and battery shall be scrutinized and finalized during design approval.		
49.	6.21.12	All field wiring shall be multi-strand copper conductor type. No joints shall be permitted in any cables or wires in any location.	**CR:** No joints are also permitted in earth wires. Necessary MET arrangements should be done inside the shaft for connecting different earth wires together. MET should be made of copper wire, and connection hardware should be non-corrosive.		No change envisaged.
50.	6.21.14	The arrangements of terminals at either end of flexible trailing cables shall be identical and the terminal blocks marked to identify the cables connected to them. The cable boxes and wiring for the car light and the alarm bell shall be entirely independent of the Elevator control wiring. Flexible trailing cables shall be securely clamped at each end so that the	**M/s Phoenix:** A. The terminal block should be designed as per IEC 60947-7-1. The terminal block should be screwless push-in type front entry allowing direct termination of wire without any tool. For wire removal the tool should not touch any metal part, a pusher type lever shall be used to release the wire, the pusher shall also indicate the state of wire termination thus allowing contact reliability and safety.	In Railway Stations elevators panels and their components should be shocked and vibration and HL-3 Compliance as per EN45545-2 and designed as per IEC 60947-7-1 standards	No change envisaged.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		weight is not supported by any fixing of the various cores. The outer sheath of these cables shall be of waterproof and flame retardant material. A total of 10 or 10% of the total number of wires used (whichever is more) and 2 spare shielded cables shall be provided per Elevator. The outer sheath of these cables shall be of flame resistant material which shall not emit toxic fume when affected by fire i.e. Fire retardant Low Smoke Halogen Free (FRLSZH) type cables and conductors for underground stations and FRLS type cables and conductors for overground stations and service buildings shall be used.	Terminal block should be suitable to terminate wire with lug for specified size and connected in DIN Rail. The insulation material of terminal block shall be made of polyamide 6.6 V0 class according to UL 94 classification. The current carrying conductor shall be of copper alloy and spring shall be made of non-corrosive metal. It should have two bridging shaft for shorting any number of terminal block. Terminal block shall be UL/CSA Approval and will comply EN 45545-2 for Hazards level HL-1,HL-2, HL-3.		
51.	6.21.15 Electrical requirement	The compatibility of MCB and ELCB used for Elevators shall be verified with the requirement of the Elevators. The MCB & ELCB are in the Elevator Contractor's scope. However, termination of main incoming cable on the MCB/ ELCB, provided by the Elevator Contractor shall be the responsibility of purchaser..	**M/s JLPL:** The compatibility of MCB and ELCB / RCCB used for Elevators shall be verified with the requirement of the Elevators. The MCB & ELCB / RCCB are in the Elevator Contractor's scope. However, termination of main incoming cable on the MCB/ ELCB / RCCB, provided by the Elevator Contractor, shall be the responsibility		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			of purchaser. **NR:** The compatibility of MCB, **RCCB** and ELCB used for Elevators shall be verified with the requirement of the Elevators. The MCB, **RCCB** & ELCB are in the Elevator Contractor's scope. However, termination of main incoming cable on the MCB/ ELCB, provided by the Elevator Contractor, shall be the responsibility of purchaser.		
52.	6.22.4	The panel shall be made of SS 304 grade with 1.6 mm thickness sheet.	**M/s TK Elevator:** The panel shall be made of SS 304 grade with 1.5 mm thickness sheet.		Accepted. Necessary changes have been made.
53.	6.22.6 & 6.22.7	It may be possible from RMS to switch off the lift for parking, the elevator shall complete the last landing or car call, if any and return to the designated landing and stop there with both the car and landing doors open for 15 - 20 seconds with audio announcement that lift is going to be shut down and then door should get close. The "Not in service" indicator shall be illuminated on the landing indicator automatically for a pre - determined time and then extinguished. The car light and ventilation fan shall be switched off automatically at the same time. The essential buttons e.g. door open, intercom and alarm bell etc. on the car operating panels shall be remained functional and illuminated	1. **M/s OTIS:** Clauses 6.22.6 & 6.22.7 are not relevant to LED based RMS system. These clauses are more relevant to PC based RMS system. Hence request to remove this clause. 2. **NR:** Development of Announcement System for user of lift during power supply failure or in case of man-trapping in addition to General Audio Instructions. Backlit powered by UPS instruction plate shall be embedded in COP Panel. Facility of change of emergency contact numbers and instructions. Cut out for provision of lift license.		Partially accepted. as per the necessary requirements. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		when the elevators have been parked and locked out. & Upon actuation by RMS for non - parking, the elevator shall be switched back to normal operation and both the car light and ventilation fan shall be switched on automatically.			
54.	6.23.4	The direction of travel shall depend upon the load in the Elevator	**SCR:** A. Maximum time delay between power supply failure & operation of ARD should be specified for uniformity and it should not be more than 30 Seconds - 45 Seconds. B. It is noticed that during less load condition, Lift Car is being stopped at Top Floor upon activation of ARD. The Lift has to open at nearest floor when at least 25% passengers are occupied.	ARD has to act within specific time frame and this requires standardization to bring uniformity across lifts of various make	Accepted. Necessary changes have been made.
55.	6.23.4.1.e	The capacity of the battery when fully charged shall be capable of operating the Elevator at rated load for a minimum of 3 rescue trips without further charging. To ensure this, the same battery should be capable to perform the test for 6 trips without intermediate charging at the time of commissioning. The battery shall be housed in a cabinet/ rack with a corrosion proof finish. For low battery identification, a buzzer shall be provided.	NR: The capacity of the battery when fully charged shall be capable of operating the Elevator at rated load for a minimum of 3 rescue trips without further charging. To ensure this, the same battery should be capable to perform the test for 6 trips without intermediate charging at the time of commissioning. **A Separate** battery shall be housed in a cabinet/ rack with a corrosion proof finish. For low battery identification, a buzzer shall be provided.		Accepted. Necessary changes have been made.
56.	6.24.4	A CCTV system shall be installed for the surveillance of elevator working area.	1. **M/s OTIS:** Please confirm the CCTV Camera specifications. 2. **SCR:** Firm shall also provide 1 No.		Partially accepted. Necessary changes

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			of Full HD Fixed Dome Type IP Colour Camera as specified at Clause No.6 of RDSO Specification No. RDSO/SPN/TC/65/2021 Version 6.0 with Amendment No. 1 or latest inside the Lift car. Railway shall integrate this Camera with the existing Railway surveillance systems. OEM has to share protocals/data access with Railways.		have been made.
57.	6.26.1 Corrosion Protection	All steel components (5mm thick & above) shall be hot dipped galvanized in accordance with BS EN ISO 1461, with minimum thickness of 85 µm.	**M/s JLPL:** Equivalent standard also kindly to be considered. Hence the clause can be modified as below, All steel components (5mm thick & above) shall be hot dipped galvanized in accordance with BS EN ISO 1461/ IS 14759 / IS 2629 with minimum thickness of 85 µm.		No change envisaged.
58.	6.26.2	All parts constructed in sheet steel (less than 5mm) shall be either galvanized by the hot dipped process or fabricated from hot dipped galvanized sheet steel or spray galvanized and epoxy painted.	M/s OTIS: All parts constructed in sheet steel (less than 5mm) shall be either galvanized by the hot dipped process or fabricated from hot dipped galvanized sheet steel or spray (Cold) galvanized **or** epoxy painted.		Accepted. Necessary changes have been made.
59.	6.27-d	A digital voice system for announcing the car position, opening/closing of doors, direction of travel and messages shall be provided as per IS: 15330.	**CR:** A customizable digital voice system for announcing the car position, opening/closing of doors, direction of travel and massage shall be provided.		Accepted. Necessary changes have been made.
60.	6.28	Accessories: Each Elevator shall be provided with the following accessories: a) Two sets each of all necessary keys for the landing door, operating panel, etc.	M/s OTIS: Except item a), the tools are related to the type test, Routine Test and final inspection at site not to daily operational activities. Contractor will facilitate these tools during execution and services as well		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
		b) One 500V insulation resistance testing meggar c) One multimeter having facility to measure: AC and DC currents and voltages, power factor and resistance d) Galvanisation thickness meter e) Device for checking the speed of elevator f) Noise measuring instrument	if required/asked by the Railway. Therefor you are requested to remove these tools form supply portion because its unnecessary increasing the bid cost. **M/s JLPL:** Each station shall be provided with the following accessories: (a) Two sets each of all necessary keys for the landing door, operating panel, etc. (b) One 500V insulation resistance testing meggar. (c) One multimeter having facility to measure: AC and DC currents and voltages, power factor and resistance (d) Galvanisation thickness meter (e) Device for checking the speed of elevator (f) Noise measuring instrument		
61.	6.29	Earthing Arrangement	SCR: Safety & testing provisions under IS 17900 should be incorporated.	Para 5.10.9 of IS 17900 (Part 1) : 2022 specifies protective earthing requirement as per IS 732.	Accepted. Necessary changes have been made.
62.	6.30.1 (i)	Power and control cables shall be rated for 1100V and 600V grade respectively.	**M/s TK Elevator:** Power and control cables shall be rated for 1000V and 600V grade respectively.		No change envisaged.
63.	6.30.1 (ii) Special Cable Requirements	ii) The conductor shall be of stranded conductor composed of plain annealed copper wire complying with IEC 228, Class 2.	**1. M/s Johnson:** ii) The conductor shall be of stranded conductor composed of plain annealed copper wire complying with IEC 60228, Class 2 / IS 8130 / IS 1554 / IS 694.		Accepted. Necessary changes have been made.
64.	6.30.1 (iii) Special Cable Requireme	iii) The insulation shall consist of an extruded layer of cross-linked polyethylene complying with IEC 502	The insulation shall consist of an extruded layer of cross-linked polyethylene complying with IEC 502		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
	nts		/ IS 7098.		
65.	6.30.1 (iv)	(a) The value of smoke generated shall meet the requirements of the relevant clauses of BS 7846, when a sample of the complete cable is tested in accordance with IEC 61034-1 and 2 (3 m Cube Test). The light transmission values shall be minimum of 60%. (b) The maximum specific optical density shall be 170 under the non-polluted condition as per ASTM E662.	**M/s OTIS:** BS 7846 standard is not applicable for Fire retardant, low smoke, halogen free cables since it is relevant to fire resistant cables. Request to remove clauses 6.30.1 (iv) (a) & (b) and add below testing requirements in-line with metro tenders: Smoke density Test (on sheathing material), when tested in accordance to ASTM D-2843, maximum smoke density rating shall be as per IS 7098. **M/s JLPL:** (a) The value of smoke generated shall meet the requirements of the relevant clauses of BS 7846, when a sample of the complete cable is tested in accordance with IEC 61034-1 and 2/IS7098 (3 m Cube Test). The light transmission values shall be minimum of 60%.		Accepted. Necessary changes have been made
66.	6.30.4	The Travelling cables shall comply IEC 60227 part-6.	M/s OTIS; Travelling cables shall be rated for 300V/500V & shall comply with EN 50214 - 2006. **M/s JLPL:** The Travelling cables shall be of 500V and to meet the standards BS EN 50214-2006/ IEC 60227 – 6		Accepted. Necessary changes have been made.
67.	9	Software Support	**SCR:** Clauses to ensure cyber security of various communication devices in line with Indian/ International Standards like IS 16335, IS 13252, ISO/IEC 27001 & 62443 etc., may be added.	To cover vulnerabilities in software & to prevent any sabotage of lifts by means of Software/Control Systems Hacking, relevant cyber security norms and auditing & compliance	Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
				norms should be specified.	
68.	11.A.4	Car Height: 2400 mm	***NR:*** ***Minimum*** Car height: 2400 mm		Accepted. Necessary changes have been made.
69.	11. B.19	Noise In Car (with Fan in operation): max 55dB	M/s TK Elevator: Noise In Car (with Fan not in operation): max 55dB.		No change envisaged.
70.	11.C.25	Counterweight frame : Fabricated from sheet steel. Cold rolled steel up to 4mm and Hot rolled sheets above 4mm thick	**M/s JLPL:** Counterweight frame: Fabricated from sheet steel. Cold rolled steel up to 4mm or Hot rolled sheets above 4mm thick.		Accepted as per the IR requirements. Necessary changes have been made.
71.	11.C.26	Over speed Governor with test groove - Type : Centrifugally operated	**M/s JLPL:** Over speed Governor - Type : Centrifugally operated / Lever operated		No change envisaged.
72.	Clause 11 – Sl. No. 31 (elevator shaft width and depth tolerance)	- 0 + 75 mm	As per IS 14665 (Part 2 / Sec 1) for Well up to 30 m tolerance wiil be - 0 + 25 mm well up to 60 m tolerance will be - 0 + 35 mm well up to 90 m tolerance will be - 0 + 50 mm So Elevator shaft width and depth tolerance to be modified as - 0 + 25 mm		No change envisaged.
73.	11.E.43	Steel Door thickness: Minimum 1.5 mm Stainless Steel sheet	**NR Comments: Minimum Car Body &** Steel Door thickness – Minimum 1.5 mm Stainless Steel sheet **with linen finish/honeycomb/moon rock finish.**		Accepted. Necessary changes have been made.
74.	11.E.44	Fire rating of landing door As per IS 14665-1	1. **M/s OTIS:** Fire rating of landing door as per **IS17518** integrity. 2. **SCR:** Fire rating of landing door should be as specified in IS		Accepted. Necessary changes have been made.

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
			17900 (Part 1) : 2022 (Part 1 Safety Rules) para 5.12.5.1.5 (Landing doors). If any glass portion is available in the landing door, the same should also have Fire rating as specified in IS 17900 & latest standards.		
75.	11G54	Car flooring: Min 6 mm thick Aluminum chequered plate	NR: Car flooring: ***Granite flooring***	Due to Extended life and Easy to clean	No change envisaged.
76.	L.94.	Surge Suppressor/Over Voltage Protection	**M/s Phoenix:** Type-2 Surge Suppressor/Over Voltage Protection shall be installed in Passenger Elevator Panel in accordance to IEC 61643-11:2011 and NBC 2016. SPD shall be pluggable (Separate base and plug for both L/N and N/PE) must have Voltage Protection level ≤ 1.5 KV with fuse & mechanical health indication for Visual checking and potential free remote monitoring feature. SPD shall be connected on DIN Rail: 35 mm channel. Device must be tested and certified from KEMA/ KEUR/VDE/UL. Nominal Discharge Current In (8 / 20µs) (L-N & N-E) should be 20 KA & Maximum Discharge Current Imax (8 / 20µs) (L-N & N-E) 40 KA. The installation of the equipment shall be fully 4 poles connection (LA – Neutral, LB – Neutral, LC – Neutral and Neutral – Ground). Unit shall be installed in parallel with the	Incoming Power Supply Line for the Passenger Elevators must be protected with Pluggable (Separate base and plug for each pole/phase) Type -1 Surge Protection Device in accordance to IEC 61643-11- IEC 61643-12/ BIS National Building Code 2016 Volume 1 Part 8 Building Services- Section 2 and all technical parameters shall be as per, RDSO Specification **RDSO/SPN/165/2023 Version 4. (If Type-1 SPD is not installed at Main Power Supply) and** Type-2 Surge Suppressor/Over Voltage Protection shall be installed in Passenger Elevator Panel.	No change envisaged.

<table>
<tr><th>Sl. No.</th><th>cl. no. of RDSO spec</th><th>Clause description</th><th>Comments of Railways/firms</th><th>Remarks of stakeholders</th><th>RDSO remarks</th></tr>
<tr><td></td><td></td><td></td><td>protected equipment. No series connected protective elements shall be used.</td><td>Please check Annexure 1 for complete SPD specification.</td><td></td></tr>
<tr><td>77.</td><td>13.1</td><td>Design Criteria<table><tr><th>Elevator Component</th><th>Design life (yea</th></tr><tr><td>Safety gear rope</td><td>8</td></tr><tr><td>Governor</td><td>20</td></tr><tr><td>##Anti Creep device,</td><td>20</td></tr><tr><td>Hoisting hoisting</td><td>8</td></tr><tr><td>Contactors/relays*</td><td>10</td></tr><tr><td>Traction</td><td>20</td></tr><tr><td>#Hall and Car buttons</td><td>15</td></tr></table>* Frequently operating contactors/relays may have lesser life of 5 years</td><td>M/s OTIS: Hall and Car buttons operates more frequently during normal conditions & its design life is 10 years in metro tenders. Hence, will comply with 10 years lifetime.
M/s TK Elevator:
Governor : 15
Hall and car button: 5</td><td></td><td>Accepted. Changes have been made.</td></tr>
<tr><td>78.</td><td>14.1.2 Type Testing of Complete Elevator and its sub-systems</td><td>One complete Elevator as also its sub-systems shall be type tested. Type testing of the complete Elevator shall be done as per the protocol approved by RDSO. The Elevator selected for type testing shall be representative of the types to be supplied.</td><td>M/s JLPL:
One complete Elevator as also its sub-systems shall be type tested. Type testing of the complete Elevator shall be done as per the protocol approved by RDSO. The Elevator selected for type testing shall be representative of the types / Range / Models to be supplied.</td><td></td><td>No change envisaged.</td></tr>
<tr><td>79.</td><td>22.5</td><td>The bidder is required to quote separately for a comprehensive annual maintenance contract (AMC) for the Elevator…</td><td>SER: The bidder is required to quote separately for a comprehensive annual maintenance contract (AMC) for the Elevator for entire codal life of the Elevator.</td><td></td><td>No change envisaged.</td></tr>
</table>

Sl. No.	cl. no. of RDSO spec	Clause description	Comments of Railways/firms	Remarks of stakeholders	RDSO remarks
80.	23.0 (Training)	OEM/AMC Contractor/Firm shall train the Staff in emergency rescue operations at the Site atleast twice in a year.	**SCR:** To facilitate Training of Electrical Maintenance, RPF & other necessary Staff at station on emergency rescue operation. **CR:** The training programme will be held in India only at OEM's training facility or at any other location as agreed between railway administration and the contractor.		No change envisaged.
81.	24	Operation & Maintenance Manual	**SCR:** Standardized Elevator Maintenance Check List - Monthly, Quarterly, Half-Yearly & Yearly should be prepared by RDSO and enclosed with the Specification. Conducting of load test & issuance of Annual Safety Certificate for Elevator should also be incorporated in Annual Check list.	RDSO should standardize Maintenance check list as that of Escalators Specification No. RDSO/ PE/SPEC/RL/0095 (Rev "3")-2019.	Will be done by issuing a separate maintenance Schedule (MS).
82.	24.6	The periodic maintenance schedule recommended by the Contractor for the satisfactory performance of the system shall also be included.	**NR:** The periodic maintenance schedule & check list for Monthly/quarterly/half yearly & yearly as per RDSO specification for the satisfactory performance of the system.	RDSO is requested to incorporate Uniform maintenance schedule & check list for Monthly/ quarterly/ half yearly & yearly maintenance in the RDSO Specifications.	Will be done by issuing a separate maintenance Schedule (MS).
83.	**ANNEXURE – 3, Part A2. Type Tests on Elevator Sub-systems#**	**Part A2. <u>Type Tests on Elevator Sub-systems#</u>** Dynamic test: vii) A locked rotor test (where applicable) shall be carried out at rated voltage and frequency for the windings. Current and Voltage shall be recorded and Torque calculated.	M/s OTIS: Locked rotor test is only applicable for Induction motors and irrelevant for PMSM machine. Kindly remove the clause from Test Annexure.		No change envisaged.

RDSO initiated Changes:

Sl.no.	cl. no.	Changes made	Reason of change
1.	6.24.1	The requirements of remote monitoring and fault diagnostic system have been specified in details.	To bring clarity.
2.	**13.2.1. f and 14**	New clause added. Requirement of test rig/test tower has been added.	Necessary for the type testing.
3.	14.1.1 and annexure-2	Frequency and requirements of type testing	To reduce the delay and ensure the reliability and safety.