

**Annexure-6.6**  
**(Section 6: Scope of Work)**  
**Key Experts – International**

<b>S. No.</b>	<b>Code</b>	<b>Description</b>	<b>Man-month</b>
<b>A</b>		<b>Core Group</b>	
1	PD	Project Director	54
<b>G</b>		<b>Track</b>	
2	E29	Chief Track Expert	30
<b>H</b>		<b>Signaling and Telecommunication</b>	
3	E36	Chief Signaling Expert	24
<b>I</b>		<b>Traction</b>	
4	E43	Sr. Traction Expert	12
<b>J</b>		<b>Rolling Stock</b>	
5	E56	Chief Rolling Stock Expert	54

**Annexure-6.7**  
**(Section 6: Scope of Work)**  
**Key Experts – Local**

<b>S. No.</b>	<b>Code</b>	<b>Description</b>	<b>Man-month</b>
<b>(A)</b>		<b>Core Group</b>	
<b>1</b>	<b>DPD</b>	<b>Chief System Integration &amp; Interface Expert-cum-Dy. Project Director</b>	54
<b>2</b>	E3	Sr. RAMS Expert	18
<b>3</b>	E4	Chief Operation and Maintenance Expert	36
<b>(B)</b>		<b>Contracts</b>	
<b>4</b>	E5	<b>Chief Contracts Expert</b>	54
5	E6	Sr Contracts Expert (Civil) – One Expert	48
6	E7	Sr Contracts Expert (Systems)	48
7	E8	Sr Contracts Expert (Finance)	48
8	E9	Sr. Planning and Program Scheduling Expert	54
<b>(C)</b>		<b>Quality Assurance &amp; Quality Control</b>	
9	<b>E10</b>	<b>Chief Quality Assurance &amp; Quality Control Expert</b>	48
10	E11	Sr. Quality Assurance & Quality Control Expert – (Elevated and Depot)	48
11	E12	Sr. Quality Assurance & Quality Control Expert-(Underground)	48
<b>(D)</b>		<b>Safety, Health and Environment</b>	
12	<b>E13</b>	<b>Chief Safety, Health and Env. Expert (Elevated)</b>	96
13	E14	Sr. Safety Expert – (Elevated and Depot)	48
14	E15	Sr. Safety Expert – (Underground)	48
15	E16	Sr Environment & Health Expert	42
16	<b>E17</b>	<b>Chief Testing and Commissioning Expert</b>	42
17	E18	Sr. Testing and Commissioning Expert	42
<b>(E)</b>		<b>Design (Civil)</b>	
18	E19	Chief Structural Design Expert	108
19	E20	Chief Geotechnical and Foundation Expert	48
20	E21	Sr. Structural Design Expert (Elevated and Depot)	144
21	E22	Sr. Structural Design Expert (Underground)	48
<b>(F)</b>		<b>Architectural</b>	
22	<b>E23</b>	<b>Chief Architectural Expert</b>	54
23	E24	Sr. Architectural Expert (Underground)	54

<b>S. No.</b>	<b>Code</b>	<b>Description</b>	<b>Man-month</b>
24	E25	Sr. Architectural Expert – Elevated & Depot Facade and Roofing (PEB) Expert	72
25	E26	Sr. Plumbing Expert	42
26	E27	Sr. Building Information Modelling Expert (UG) - Civil	24
27	E28	Sr. Building Information Modelling Expert - Elevated	54
<b>(G)</b>		<b>Track</b>	
28	E30	<b>Chief Track Expert</b>	48
29	E31	Sr. Track Design Expert	48
30	E32	Sr. Track Installation Expert - 1	48
31	E33	Sr. Track Installation Expert- 2	48
32	E34	Sr. Track Installation Expert Factory and Supply	36
33	E35	Sr. Survey and Alignment Expert	24
<b>(H)</b>		<b>Signaling and Telecommunication</b>	
34	E37	Sr. Signaling Expert	96
35	E38	Sr. Platform Screen Door Expert	30
36	E39	<b>Chief Telecommunication Expert</b>	30
37	E40	Sr. Telecommunication Expert	42
38	E41	Sr. LTE Expert	24
39	E42	Sr. Automatic Fare Collection Expert	24
<b>(I)</b>		<b>Electrical, Power supply &amp; Traction</b>	
40	E44	<b>Chief Power Supply and Traction System Expert</b>	54
41	E45	Sr. Traction System Expert	54
42	E46	Sr. Power Supply System Expert (Elevated and Underground)	54
43	E47	Power Supply System Design Expert	48
44	E48	Traction System Design Expert	48
45	E49	<b>Chief E&amp;M, ECS, TVS and HVAC Expert</b>	54
46	E50	Sr. E&M Expert (Elevated)	54
47	E51	Sr. E&M Expert (Underground)	48
48	E52	Sr. ECS, TVS, HVAC & BMS Expert	48
49	E53	Sr. Lift and Escalator Expert	54
50	E54	Sr. Depot Facility Design & Installation Expert	48
51	E55	Expert for Building and Electro- Mechanical Services	36
<b>(J)</b>		<b>Rolling Stock</b>	
52	E57	Chief Depot Expert	48
53	E58	Senior Rolling Stock Expert	108

**Annexure-6.8****(Section 6: Scope of Work)****Deployment Schedule of Non-Key Staff**

S. No.	Group/ Non-Key Staff	Man-months			
		Senior Engineer (NK-01)	Assistant Engineer (NK-02)	Assistant Site Engineer (NK-03)	Junior Site Engineer (NK-04)
<b>A</b>	<b>Core Group</b>				
1	Project Planning, Scheduling and Contract Management	72	-	-	-
2	Quality Assurance	336	-	-	-
3	Safety Health and Environment	336	-	--	-
4	Civil	240	-	480	-
5	Integrated Testing and Commissioning	84	-	-	-
6	Multi-modal Integration (MMI)	-	42	-	-
7	System Integration and Interface including planning and scheduling of integration	54	-	-	-
<b>B</b>	<b>Contracts</b>				
8	Contracts (Civil) for elevated	24	48	-	-
9	Contracts (Civil) for Underground	24	48	-	-
10	Contracts (Systems)	24	-	-	-
11	Contracts (Finance)	48	-	-	-
<b>E</b>	<b>Design (Civil)</b>				
12	Structural	275	250	-	-
13	BIM - Structures	-	12	-	-
14	CAD – Structures	-	-	-	48
<b>F</b>	<b>Architecture</b>				
15	Senior Architect (Underground)	48	-	-	-
16	Senior Architect - (Elevated & Depot)	144	-	-	-
17	BIM (Underground)	-	36	-	-
18	BIM (Elevated & Depot)	-	54	-	-
19	Building Information Modeling (BIM)	-	48	-	-
<b>G</b>	<b>Track</b>				
20	Track system	480	120	-	330
21	Alignment	54	-	-	330
22	CAD (Alignment)	-	-	-	78

S. No.	Group/ Non-Key Staff	Man-months			
		Senior Engineer (NK-01)	Assistant Engineer (NK-02)	Assistant Site Engineer (NK-03)	Junior Site Engineer (NK-04)
<b>H</b>	<b>Signaling and Telecommunication</b>				
23	Signaling	96	144	192	384
24	Telecommunication	96	144	144	144
24	Platform Screen Door	36	36	36	144
25	Automatic Fare Collection	24	72	-	-
26	LTE	48	48	-	96
<b>I</b>	<b>Electrical, Power Supply and Traction</b>				
27	Traction	54	120	450	600
28	Power Supply	54	120	450	600
29	Solar Work	30	-	30	-
30	E&M (Elevated, Lift & Escalators)	216	-	450	-
31	E&M- (Underground, ECS & TVS)	144	12	288	-
32	Depot	36	36	-	-
<b>J</b>	<b>Rolling Stock</b>				
33	Rolling Stock	156	156	156	54
34	Rolling Stock (for manufacturing site)	36	36	-	-

**Annexure-6.9****(Section 6: Scope of Work)  
Deployment of Key Experts**

<b>S. No.</b>	<b>Code</b>	<b>Designation</b>	<b>Minimum Qualification</b>	<b>Minimum Experience Requirement</b>
1	PD	Project Director (International)	<b>For Minimum Qualification and Experience, please refer Evaluation &amp; Qualification Criteria (EQC) (Section- 3).</b>	
2	E29	Chief Track Expert (International)		
3	E36	Chief Signaling Expert (International)		
4	E43	Sr. Traction Expert (International)		
5	E56	Chief Rolling Stock Expert (International)		
6	DPD	Chief System Integration & Interface Expert -cum - Dy. ProjectDirector		
7	E4	Chief Operation and Maintenance Expert		
8	E5	Chief Contracts Expert		
9	E10	Chief Quality Assurance & Quality Control Expert		
10	E13	Chief Safety, Health and Environmental Expert –		

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
11	E17	Chief Testing and Commissioning Expert	<p><b>For Minimum Qualification and Experience, please refer Evaluation &amp; Qualification Criteria (EQC) (Section- 3).</b></p>	
12	E19	Chief Structural Design Expert		
13	E20	Chief Geotechnical and Foundation Expert		
14	E23	Chief Architectural Expert		
15	E30	Chief Track Expert		
16	E39	Chief Telecommunication Expert		
17	E44	Chief Power Supply and Traction System Expert		
18	E49	Chief E&M, ECS, TVS and HVAC Expert		
19	E57	Chief Depot Expert		
20	E3	Sr. RAMS Expert	<p><b>Minimum Qualification:</b> Graduate in any branch of Engineering with working Knowledge of reading, writing and speaking in English.</p>	<p><b>Post Qualification Minimum Experience:</b> Minimum Experience of 10 years post minimum qualification in RAMS in any Rail based Passenger Transit system.</p> <p><b>Relevant Experience -</b> 05 years' experience for Evaluating of the system by conducting RAMS Study on the basis of</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>Outline, planning and design parameters for the Rail Based Passenger Transit System as Sr. RAMS Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in clause-3.2 (II)(B) of Section 3 EQC as Sr. RAMS Expert or equivalent position or one level below to the proposed position for a full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
21	E6	Sr. Contracts Expert (Civil)	<p>Minimum Qualification: Graduate in Civil Engineering with working Knowledge of reading, writing and Speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure sub sector related to Transport &amp; Logistics as defined in Notes (i) under Clause 2.4 of Section 3 EQC</p> <p><b>Relevant Experience</b> - Relevant Experience - 05 years' experience of Managing overall procurement process including bid document preparation and Bid Process Management, Contract management in Infrastructure sub sector related to Transport &amp; Logistics as defined in Notes (i) under Clause 2.4 of Section 3 EQC as Senior Contract expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its</p>



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II) (B) of Section 3 EQC as Senior Contract expert or equivalent position or one level below to the proposed position or one level below to the proposed position for a full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
22	E7	Sr. Contracts Expert (Systems)	Minimum Qualification : Graduate in Electrical Engineering or Electronics Engineering or Electronics and Communication Engineering with working Knowledge of reading, writing and Speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects. (Infrastructure projects as defined in Note (i) under clause 2.4.1 of Section 3 EQC )</p> <p><b>Relevant Experience</b> - 05 years experience for Managing overall procurement process including bid document preparation and Bid Process Management, Contract management for any Infrastructure project (Infrastructure projects as defined in Note (i) under clause 2.4.1 of Section 3 EQC as Sr. Contract expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> -Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II) (B) of Section 3 EQC as Sr. Contract expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
23	E8	Sr. Contracts Expert (Finance)	Minimum Qualification : Graduate in any discipline with working Knowledge of reading, writing and Speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects. (Infrastructure projects as defined in Note (i) under clause 2.4.1 of Section 3 EQC )</p> <p><b>Relevant Experience</b> - 05 years experience for Managing overall procurement process including bid document preparation and Bid Process Management, Contract management for any Infrastructure project (Infrastructure projects as defined in Note (i) under clause 2.4.1 Section 3 EQC as Sr. Contract expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> -Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II) (B) of Section 3 EQC as Sr. Contract expert or equivalent position or one level below to the proposed position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
24	E9	Sr. Planning and Program Scheduling Expert	<b>Minimum Qualification :</b> Graduate in Civil Engineering with working Knowledge of reading, writing and Speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects. (Infrastructure projects as defined in Note (i) under clause 2.4 of Section 3 EQC.)</p> <p><b>Relevant Experience -</b> 05 years experience for project scheduling, planning and monitoring for any Infrastructure project (Infrastructure projects as defined in Note (i) under clause 2.4 of Section 3 EQC as Sr. Planning and Programme Scheduling Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment -</b> Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II) (B) of Section 3 EQC as Sr. Planning and Programme Scheduling Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
25	E11	Sr. Quality Assurance & Quality Control Expert - Elevated and Depot	<b>Minimum Qualification:</b> Graduate in Civil Engineering Must have Working Knowledge in Writing and Speaking English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects. (Infrastructure projects as defined in Note (i) under clause 2.4 Section 3 EQC )</p> <p><b>Relevant Experience -</b> 05 years experience for Preparation, Implementation and monitoring of Quality Assurance Plan and procedures for elevated stations, viaduct and Depot for Rail based Passenger Transit Systems as Sr. Quality Assurance &amp; Quality Control Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment -</b> Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 EQC as Sr. Quality Assurance &amp; Quality Control Expert or equivalent position for full-time continuous deployment period not less than 2 years).</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
26	E12	Sr. Quality Assurance & Quality Control Expert - Underground	<b>Minimum Qualification :</b> Graduate in Civil Engineering Must have Working Knowledge in Writing and Speaking English.	<b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects (Infrastructure projects as defined in Notes (i) under clause 2.4 of Section 3 EQC <b>Relevant Experience -</b> 05 years experience for Preparation, Implementation and monitoring of Quality Assurance Plan and procedures for underground tunnel & stations for Rail based Passenger Transit Systems as Sr. Quality Assurance & Quality Control Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment -</b> Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 EQC as Sr. Quality Assurance & Quality Control Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
27	E14	Sr. Safety Expert – (Elevated and Depot)	Minimum Qualification: Graduate in Engineering in Civil / Mechanical / Electrical with Full time Post Graduate/Advance diploma/MBA in Industrial Safety. Must have working Knowledge of reading, writing and Speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects (Infrastructure projects as defined in Notes (i) under clause 2.4 of Section 3 EQC</p> <p><b>Relevant Experience –</b> 05 years' experience for Preparation, Implementation and monitoring of safety Management system and emergency procedures regarding construction safety for elevated stations and viaduct of Rail based Passenger Transit System as Sr. Safety Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> -Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Safety Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
28	E15	Sr. Safety Expert – (Underground)	Minimum Qualification : Graduate in Engineering in Civil / Mechanical / Electrical with Full time Post Graduate/Advance diploma/MBA in Industrial Safety. Must have working Knowledge of reading, writing and Speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects (Infrastructure projects as defined in Notes (i) under clause 2.4 of Section 3 EQC )</p> <p><b>Relevant Experience - 05</b> years experience for Preparation, Implementation and monitoring of safety Management system and emergency procedures regarding construction safety for underground stations and tunnel of Rail based Passenger Transit System as Sr. Safety Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment -</b> Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 EQC as Sr. Safety Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
29	E16	Sr. Environment & Health Expert	<p><b>Minimum Qualification:</b> Post graduate in Environmental Science/Engineering. Must have Working Knowledge in Writing and Speaking English.</p>	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in Infrastructure projects (Infrastructure projects as defined in Notes (i) under clause 2.4 of Section 3 EQC)</p> <p><b>Relevant Experience</b> - 05 years' experience for Preparation, Implementation and monitoring of Environment Management system and emergency procedures regarding construction Health &amp; Environment for elevated or underground projects of Rail based Passenger Transit System as Sr. Environment Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> -Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. Environment Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
30	E18	Sr. Testing and Commissioning Expert	<p><b>Minimum Qualification:</b> Graduate in Engineering with working Knowledge of reading, writing and Speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience</b> - Must have experience for two works of Planning and supervising Trial tests and commissioning of subsystems of Rail based Transit system and obtaining statutory approvals for Commercial operation as Sr. Testing and Commissioning Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. Testing and Commissioning Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
30	E18	Sr. Testing and Commissioning Expert	<b>Minimum Qualification:</b> Graduate in Engineering with working Knowledge of reading, writing and Speaking in English.	<b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system. <b>Relevant Experience</b> - Must have experience for two works of Planning and supervising Trial tests and commissioning of subsystems of Rail based Transit system and obtaining statutory approvals for Commercial operation as Sr. Testing and Commissioning Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. Testing and Commissioning Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
31	E21	Sr. Structural Design Expert (Elevated and Depot)	<b>Minimum Qualification :</b> Graduate in Civil Engineering and post graduate in Structural Engineering with working Knowledge of reading, writing and Speaking in English.	<b>Post Minimum Qualification Experience:</b> Minimum experience of 15 years post bachelor degree in detailed structural designs/ Proof Checking in Infrastructure projects as defined in Notes (i) under Clause 2.4 of EQC. Out of which 10 years in detailed structural designs/ Proof Checking of Elevated/At-grade stations, Viaduct with at least 5 years in Detailed structural design of

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>Elevated stations and Viaduct for the Rail Based Passenger Transit System.</p> <p><b>Relevant Experience</b> -05 years' experience for Detailed structural design/ Proof Checking of Elevated stations and Viaduct for the Rail Based Passenger Transit System as Sr. Structural Design Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as Detailed design consultancy services or Proof consultancy services comprising of structural designs of Elevated Viaduct, Elevated stations having concourse and platform level for any Rail based Passenger Transit System as Sr. Structural Design Expert or equivalent position or one level below to the proposed position for a full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
32	E22	Sr. Structural Design Expert (Underground)	<p><b>Minimum Qualification :</b></p> <p>Graduate in Civil Engineering with working Knowledge of reading, writing and Speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b></p> <p>Minimum 15 years post bachelors degree in detailed structural designs/ Proof Checking in Infrastructure projects as defined in Notes (i) under Clause 2.4 of EQC. Out of which 5 years in detailed design of underground stations and tunnels for Rail Based Passenger Transit System</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p><b>Relevant Experience-</b> 5 years' experience for Detailed structural design/ Proof Checking of underground stations and tunnels for the Rail Based Passenger Transit System as Chief Structural Design Expert or equivalent position</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment -</b> Must have Experience of one "Eligible assignment" as Detailed design consultancy services or Proof consultancy services comprising of structural designs of Underground tunnel and stations having concourse and platform level for Metro Railway / Regional Railway / High Speed Railway Project as Chief Structural Design Expert or equivalent position or one level below to the proposed position for a full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
33	E24	Sr. Architectural Expert – Underground	<p><b>Minimum Qualification:</b></p> <p>Graduate in Architecture with working Knowledge of reading, writing and Speaking in English. Registered architect with Council of Architecture (CoA).</p>	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 years post minimum qualification Experience in Architectural Design in Infrastructure sub sector related to Transport &amp; Logistics as defined in Note (i) under clause 2.4 of EQC.</p> <p><b>Relevant Experience -</b> 5 years experience for Planning and review of detailed</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>Architectural design and drawings of Elevated stations, <b>Underground</b> stations and Depot, Preparation of Tender Drawings of Rail based Passenger Transit system as Sr. Architect Expert - Underground Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Experience of one "Eligible Work" as defined in clause 3.2 (II) (B) as Sr. Architect Expert - Underground or equivalent position or one level below.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
34	E25	Sr. Architectural Expert – Elevated & Depot	<p><b>Minimum Qualification :</b></p> <p>Graduate in Architecture with working Knowledge of reading, writing and Speaking in English.</p> <p>Registered architect with Council of Architecture (CoA).</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 15 years post minimum qualification Experience in Architectural Design in Infrastructure sub sector related to Transport &amp; Logistics as defined in Note (i) under clause 2.4 of EQC.</p> <p><b>Relevant Experience</b> - 5 years experience for Planning and review of detailed Architectural design and drawings of Elevated stations, Underground stations and Depot, Preparation of Tender Drawings of Rail based Passenger Transit system as Sr. Architect Expert–Elevated, PEB/Roofing Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment-</b> Experience of one "Eligible Work" as defined in clause 3.2 (II) (B) as Sr. Architect Expert-Elevated, PEB/Roofing Expert or equivalent position or one level below.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
35	E26	Sr. Plumbing Expert	<p><b>Minimum Qualification :</b></p> <p>Graduate in Mechanical Engineering or Civil Engineering with working Knowledge of reading, writing and Speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b></p> <p>Minimum 15 years post minimum qualification Experience in Infrastructure sub sector related to Transport &amp; Logistics as defined in Note (i) under clause 2.4 of EQC.</p> <p><b>Relevant Experience-</b> 5 years experience for detailed design and review of plumbing system of Elevated stations, Underground stations, tunnels and Depot of Rail based Passenger Transit system as Sr. Plumbing Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment -</b> Experience of one "Eligible Work" as defined in clause 3.2 (II) (B) as Sr. Plumbing Expert or equivalent position or one level below.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage</p>



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				for the period shall be 50%. (For example, 02 years will be considered as 01 year).
36	E27	Sr. Building Information Modelling Expert - Underground	<b>Minimum Qualification :</b>  Graduate in Architecture/ Civil/ Electrical/ Mechanical Engineering with working Knowledge of reading, writing and Speaking in English.	<b>Post Minimum Qualification Experience:</b>  Minimum 15 years post minimum qualification Experience in Infrastructure sub sector related to Transport & Logistics as defined in Notes (i) under clause 2.4 of EQC.  <b>Relevant Experience-</b> 7 years experience of Building Information Modelling of Infrastructure sub sector related to Transport & Logistics as defined in Notes (i) under clause 2.4 of EQC as Building Information Modelling Expert or equivalent position.  The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).  <b>Eligible Assignment-</b> Experience of one "Eligible Work" as defined in clause 3.2 (II) (B) as Building Information Modelling Expert or equivalent position or one level below.  The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
37	E28	Sr. Building Information Modelling Expert - (Elevated)	<b>Minimum Qualification :</b>  Graduate in Architecture/ Civil/ Electrical/ Mechanical	<b>Post Minimum Qualification Experience:</b>  Minimum 15 years post minimum qualification Experience in Infrastructure



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
			Engineering with working Knowledge of reading, writing and Speaking in English.	<p>sub sector related to Transport &amp; Logistics as defined in Notes (i) under clause 2.4 of EQC.</p> <p><b>Relevant Experience-</b> 7 years experience of Building Information Modelling of Infrastructure sub sector related to Transport &amp; Logistics as defined in Notes (i) under clause 2.4 of EQC as Building Information Modelling Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment-</b> Experience of one "Eligible Work" as defined in clause 3.2 (II) (B) as Building Information Modelling Expert or equivalent position or one level below.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
38	E31	Sr. Track Design Expert	<p>Minimum Qualification: Graduate in Engineering with working knowledge of reading, writing and speaking in English.</p> <p>The person shall have working knowledge of structure design software.</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience - 5</b> years' experience for Design or Installation of Ballastless Track system including Track Alignment for MRTS /RRTS /High Speed Rail as Sr. Track Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment - Must</b> have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Track Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
39	E32	Sr. Track Installation Expert - 1	Minimum Qualification: Graduate in Civil Engineering with working Knowledge of reading, writing and speaking in English.	<p><b>Post Qualification</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Minimum Experience:</b> <b>Relevant Experience</b> - 5 years' experience for Installation of Ballastless Track system having precast rail seat structure for MRTS /RRTS /High Speed Rail as Sr. Track Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr.Track Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
40	E33	Sr. Track Installation Expert - 2	Minimum Qualification: Graduate in Engineering with working knowledge of reading, writing and speaking in English.	<p><b>Post Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience - 5 years'</b> experience for Installation of Ballastless Track system having precast rail seat structure for MRTS /RRTS /High Speed Rail as Sr. Track Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment - Must</b> have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Track Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of "Eligible assignment" at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
41	E34	Sr. Track Installation Expert Factory & Supply	<b>Minimum Qualification:</b> Graduate in Engineering with working Knowledge of reading, writing and speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail-based Transit system.</p> <p><b>Relevant Experience</b> - 5 years' experience for production of precast elements preferably for Ballastless Track for MRTS /RRTS /High Speed Rail as Sr. Track Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Track Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
42	E35	Sr. Survey and Alignment Expert	<b>Minimum Qualification:</b> Diploma in Civil with working knowledge of reading, writing and speaking in English.	<p><b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience</b> - 05 years' experience for Alignment Design on MX Rail/Bentley or similar software including modification in alignment required as per as built data and preparation/ checking of BIM models for MRTS /RRTS /High Speed Rail as Sr. Survey and</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>Alignment Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Survey and Alignment Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
43	E37	Sr. Signaling Expert	<b>Minimum Qualification:</b> Graduate in Electronics and Communication Engineering or equivalent with working Knowledge of reading, writing and speaking in English.	<b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit System. <b>Relevant Experience</b> - 05 years' experience for Design, procurement and Implementation, Testing & Commissioning of Signalling System including interface with Telecom for Rail Based Transit System as Sr. Signaling Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment</b> -Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. Signaling Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
44	E38	Sr. Platform ScreenDoor Expert	<b>Minimum Qualification:</b> Graduate in Electronics and Communication Engineering or equivalent with working Knowledge of reading, writing and speaking in English.	<b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit System. <b>Relevant Experience</b> - 05 years' experience for Design , procurement and Implementation, Testing & Commissioning of Platform

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>Screen Door System including interface with Signalling &amp; Telecom for Rail Based Transit System as Sr. PSD Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. Signaling Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
45	E40	Sr. Telecommunication Expert	<p><b>Minimum Qualification:</b> Graduate in Electronics and Communication Engineering with working Knowledge of reading, writing and speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience</b> - 05 years' experience for Review of Design, Implementation and Integrated Testing and Commissioning of Telecom system including Interface with other sub-systems for Rail Based Transit System as Sr. Telecommunications Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For</p>



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> -Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Telecommunications Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
46	E41	Sr. LTE Expert	<p><b>Minimum Qualification:</b> Graduate in Electronics and Communication Engineering with working Knowledge of reading, writing and Speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience</b> - 05 years experience for Review of Design, Implementation and Integrated Testing and Commissioning of Telecom and LTE system including Interface with other sub-systems for Rail Based Transit System as Sr.LTE Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. LTE Expert for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
47	E42	Sr. Automatic Fare Collection Expert	<b>Minimum Qualification:</b> Graduate in Electronics and Communication Engineering with working Knowledge of reading, writing and speaking in English.	<b>Post Minimum Qualification Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system. <b>Relevant Experience</b> - 05 years' experience for Review of Design, Implementation and Integrated Testing and Commissioning of Automatic Fare Collection system including Interface with other sub-systems for Rail Based Transit System as Sr. Automatic Fare Collection Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 EQC as Sr. Automatic Fare Collection Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
48	E45	Sr. Traction System Expert	<b>Minimum Qualification:</b> Graduate in Electrical Engineering with working knowledge of reading, writing and speaking in English.	<b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system. <b>Relevant Experience</b> - 05 years' experience for Design / Review and Implementation of AC Power Supply (EHV sub-station) & 25 KV AC Traction system for Rail Based Transit System as Sr. Traction System Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). Eligible Assignment - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Traction System Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
49	E46	Sr. Power Supply System Expert (Elevated and Underground)	<b>Minimum Qualification:</b> Graduate in Electrical Engineering with working knowledge of reading, writing and speaking in English.	<b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system. <b>Relevant Experience</b> - 05 years experience for Design / Review and Implementation of AC Power Supply (EHV sub-station) & 25 KV AC Traction system for Rail Based Transit System as Sr. Power Supply System Expert or equivalent

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Power Supply System Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
50	E47	Power Supply System Design Expert	<p><b>Minimum Qualification:</b></p> <p>Graduate in Electrical Engineering with working knowledge of reading, writing and speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b></p> <p>Minimum 10 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience</b> - 05 years experience for Design / Review and Implementation of AC Power Supply (EHV sub-station) &amp; 25 KV AC Traction system for Rail Based Transit System as Power Supply System Design Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3:</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>EQC as Power Supply System Design Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
51	E48	Traction System Design Expert	<p><b>Minimum Qualification:</b> Graduate in Electrical Engineering with working knowledge of reading, writing and speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b> Minimum 10 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience -</b> 05 years experience for Design / Review and Implementation of AC Power Supply (EHV sub-station) &amp; 25 KV AC Traction system for Rail Based Transit System as Traction System Design Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment -</b> Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Traction System Design Expert or equivalent position for full-time continuous deployment period not less than 2 years. The eligible assignment shall be design of 25 kV AC Traction system with a minimum design speed of 180 kmph.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
52	E50	Sr. E&M Expert- (Elevated)	<b>Minimum Qualification:</b> Graduate in Electrical/ Mechanical Engineering with working knowledge of reading, writing and speaking in English.	<b>Minimum Experience:</b> Minimum 15 Years experience in any Rail based Transit system/ Building Services. <b>Relevant Experience</b> - 05 years' experience for Design /Review and Implementation of ECS & TVS System/HVAC and E&M for Rail Based Passenger Transit System as Sr. E&M Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. E&M Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
53	E51	Sr. E&M Expert (Underground)	<b>Minimum Qualification:</b> Graduate in Electrical Engineering with working knowledge of reading, writing and speaking in English.	<b>Post Minimum Qualification Experience:</b> Minimum 15 Years experience in any Rail based Transit system. <b>Relevant Experience</b> - 05 years' experience for Design /Review and Implementation of ECS & TVS System/HVAC and E&M for Rail Based Passenger Transit System as Sr. E&M Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3 : EQC as Sr. E&amp;M Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
54	E52	Sr. ECS, TVS, HVAC & BMS Expert	<p><b>Minimum Qualification:</b> Graduate in Electrical or Mechanical Engineering with working Knowledge of reading, writing and Speaking in English.</p>	<p><b>Post Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system.</p> <p><b>Relevant Experience</b> - 05 years' experience for Design /Review and Implementation of ECS &amp; TVS System/HVAC and E&amp;M for Rail Based Passenger Transit System as Sr. ECS, TVS, HVAC &amp; BMS Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. ECS, TVS, HVAC &amp; BMS Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible</p>



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
55	E53	Sr. Lift and Escalator Expert	<b>Minimum Qualification:</b> Graduate/ Diploma in Electrical/ Electronics/ Mechanical Engineering with Knowledge of reading, writing and speaking in English.	<b>Minimum Experience:</b> 15 Years Experience for Graduate Engineers and Min 20 years for Diploma Engineers. <b>Relevant Experience</b> - 12 years for Graduate Engineers and 18 Years for Diploma Engineers for implementation of Lift & Escalators work as Sr. Lift and Escalator Expert or equivalent position (i.e. Project Head). The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Lift and Escalator Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).



S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
56	E54	Sr. Depot Facility Design & Installation Expert	<b>Minimum Qualification:</b> Graduate in Electrical Engineering with working Knowledge of reading, writing and speaking in English.	<b>Post Qualification Minimum Experience:</b> Minimum 15 Years post minimum qualification experience in any Rail based Transit system. <b>Relevant Experience</b> - 03 years experience for Review of Design/ proof checking of Design and Site Implementation of Depot installation for Rail Based Transit System as Sr. Depot Facility Installation Expert or equivalent position. The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year). <b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Depot Facility Installation Expert or equivalent position for full-time continuous deployment period not less than 2 years. The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).
57	E55	Expert for Building and Electro-Mechanical Services	<b>Minimum Qualification:</b> Graduate in Electrical Engineering or Electronics Engineering with working Knowledge of reading, writing and Speaking in English.	<b>Post Qualification Minimum Experience:</b> Minimum 15 years post minimum qualification Experience in Detail Design / Proof checking of Electrical/Mechanical works. <b>Relevant Experience</b> - 05 years' experience for Planning and Designing and specifications for electrical, Plumbing and HVAC works for Rail Based Transit System as

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>Building and Electro Mechanical Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as Detailed design consultancy services or Proof consultancy services comprising Architectural designs services of minimum four (04) number of elevated stations and two (02) nos. of Underground station having concourse and platform level for Metro Railway / Regional Railway / High Speed Railway Project as Building and Electro Mechanical Expert or equivalent position.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>
58	E58	Sr. Rolling Stock Expert	<p><b>Minimum Qualification:</b></p> <p>Graduate in Electrical Engineering with working knowledge of reading, writing and speaking in English.</p>	<p><b>Post Minimum Qualification Experience:</b></p> <p>Minimum 15 Years post minimum qualification experience in any Rail based Transit System.</p> <p><b>Relevant Experience</b> - 05 years' experience for Design, procurement and Implementation, Testing &amp; Commissioning of Rolling Stock for Rail Based Transit System as Sr. Rolling Stock Expert or equivalent position.</p> <p>The period of relevant Experience at the position immediately below the proposed position in organization shall</p>

S. No.	Code	Designation	Minimum Qualification	Minimum Experience Requirement
				<p>also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p> <p><b>Eligible Assignment</b> - Must have Experience of one "Eligible assignment" as defined in above clause-3.2 (II)(B) of Section 3: EQC as Sr. Rolling Stock Expert or equivalent position for full-time continuous deployment period not less than 2 years.</p> <p>The period of Eligible Assignment at the position immediately below the proposed position in organization shall also be considered but its weightage for the period shall be 50%. (For example, 02 years will be considered as 01 year).</p>

**Notes:**

- 1) Key Experts (Project Director, System Integration & Interface Expert-Cum- Deputy Project Director and K1) shall not be more than 65 years of age as on last day of the month before the month of bid submission deadline.
- 2) Experts (K2 and below) shall not be more than 62 years of age at the time of deployment.
- 3) The Key Experts as mentioned above other than those Key Experts evaluated during Bid Evaluation as per Section-03, EQC, shall be proposed by consultant after award of Contract along with detailed CV and Supporting documents as per Section-4, Bidding Form CL-1 format within prescribed time frame of mobilization of Key experts.
- 4) The Submitted CVs of Proposed Key experts shall be considered based on following qualifying criteria:
  - i) **Minimum Qualification Criteria** - Qualification of Proposed Key Experts shall be equal or higher than the criteria of Minimum Qualification as mentioned above in Annexure-6.9 corresponding to their position.
  - ii) **Minimum Experience Criteria** -
    - a. **Minimum Experience Criteria**- Post Minimum Qualification Experience of Proposed Key Experts shall be equal or higher than the criteria of Minimum total post qualification experience as mentioned above in Annexure-6.9 corresponding to their position in relevant discipline for its position.
    - b. **Minimum Relevant Experience** - Relevant Experience of the proposed Key experts shall qualify the criteria of relevant work as mentioned above in Annexure-6.9 corresponding to their position.
    - c. **Minimum Eligible Assignment** - Proposed Key expert shall qualify the one minimum eligible assignment's as defined above in Annexure-6.9 corresponding to their position.

**Annexure-6.10**  
**(Section 6: Scope of Work)**  
**Roles and Responsibilities of Key Experts**

S. No.	Code	Description	Roles and Responsibilities
1	PD	<b>Project Director (International)</b>	<ol style="list-style-type: none"> <li>1. Leading and supervising the team of personnel for planning, construction and successful commissioning of the Project. Provide advice and guidance to the experts and the team on Technical, contractual, financial and legal matters related to the project implementation.</li> <li>2. Finalization of technical parameters for future Namu Bharat corridors.</li> <li>3. Act as a bridge between the GC, NCRTC and other stakeholders including regular interaction with the NCRTC. Attend meetings with NCRTC and others stakeholders for exchange of policy and other matters related to: <ol style="list-style-type: none"> <li>a) Successful implementation of Sarai Kale to Karnal corridor.</li> </ol> </li> <li>4. Overall responsibility for the design deliverables and the supervision of the project including quality, safety, environment, interface and timely delivery.</li> <li>5. Preparation of project strategy and plans. Review the project implementation schedule developed in the detailed engineering design stage. Review and monitor the work plans and schedules of various stakeholders and ensure consistency with the overall project schedule and updating NCRTC on the progress of the project and GC activities on a regular basis. Scheduling and ensuring timely mobilization and demobilization of team members.</li> <li>6. Compliance to requirements of multi-lateral funding institutions.</li> <li>7. Establishing procedures for any changes in the project criteria/scope.</li> <li>8. Act as the Engineer during construction Stage as per Scope of consultancy and Administer and supervise the works and consultancy including making correspondence, regular inspection of works and services, maintaining documents, interim and final payments, inspect adjacent properties etc.</li> <li>9. Establishing procedures and overall responsibility for Documentation for all works and contracts.</li> <li>10. Review the procedures for Construction and operational safety measures.</li> <li>11. PD of Delhi-Karnal Namu Bharat Corridor shall be responsible for all kinds of communications and interface for Rolling Stock Works with General Consultant of Delhi-Bawal corridor.</li> </ol>

			<ol style="list-style-type: none"> <li>12. Review and approve the bid documents to ensure that the construction and installation works include specific provisions to minimize damage to local settlements (such as buildings, major utilities, underpass, flyovers, metros etc.) due to construction. Review and approve the bid documents suitable for procurement in accordance with the procurement guidelines of funding agencies. Assist NCRTC in bid process to appraise bids as part of the bid evaluation process.</li> <li>13. Prepare monthly progress reports and quarterly progress reports in a form agreed upon by NCRTC and funding agencies and highlight the slippage of any activity and propose catch-up programme for the same to adhere the proposed construction schedule.</li> <li>14. Assist NCRTC in contract Management and settlement of claims, disputes, Arbitration and courts of law and timely prepare the responses for the claims/disputes raised by the contractors and submit with all logical (technical and legal) recommendations along with backup documents within the ambit of the contract and prevalent law. Assist NCRTC in claims &amp; dispute management.</li> <li>15. Attend the periodical site inspection during the defects liability period also. If any action is required to be taken, the same shall be communicated to the contractor and the compliance of the same shall be ensured. For all such works during defect liability period, he shall determine and advise financial implication also.</li> <li>16. Supervising integrated testing and commissioning and preparation of the project completion report, which will be a compilation and condensation of the data presented in regular monthly progress reports, together with copies of as-built drawings.</li> <li>17. Reviewing, analyzing and recommending all aspects of proposals for Property Development and Transit Oriented Development including financials Services related to non-fare box revenue models.</li> <li>18. Any other role and responsibilities required for successful implementation of Sarai Kale Khan to Karnal section of NCRTC as directed by the Employer.</li> </ol>
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2	DPD	<b>Chief System Integration &amp; Interface Expert -Cum-Dy. Project Director.</b>	<b>A. Dy Project Leader</b> <ol style="list-style-type: none"> <li>1. Assist Project Director in planning, designing, implementation, testing and commissioning of the project.</li> <li>2. Finalization of technical parameters for future Namu Bharat corridors.</li> <li>3. Administrative and supervisory activities and documentation for all works during construction.</li> <li>4. Preparation of bid documents suitable for procurement with prequalification in accordance with the procurement guidelines of funding agencies, invitation of tenders, prequalification of bidders and evaluation of bids.</li> <li>5. Prepare monthly progress reports and quarterly progress reports in a form agreed upon by NCRTC and funding agencies and shall highlight the slippage of any activity and propose catch-up programme for the same to adhere the proposed construction schedule.</li> <li>6. Attend the periodical site inspection during the contract execution period and order the contractors' actions to be taken, resolution of interface issues and payment methods.</li> <li>7. Support testing and commissioning and preparation of the project completion report, which will be a compilation and condensation of the data presented in regular monthly progress reports, together with copies of as-built drawings.</li> <li>8. Co-ordinated Planning of systemwide works and integration with project planning.</li> <li>9. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
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		<p><b>B. Chief System Integration &amp; Interface Expert</b></p> <ol style="list-style-type: none"><li>1. Complete system integration in the project.</li><li>2. Identifying/defining all the potential interfaces among various components of the project. Develop and incorporate necessary provisions for interfacing in respective tender documents. Reviewing Tender Documents of the works for interface issues.</li><li>3. Outlining the process for coordination and management of parties involved across various disciplines for various interface activities.</li><li>4. Developing BIM platform shall be developed in such a detail that all interface activities can be ensured.</li><li>5. Conduct regular interfacing site visits/meetings with all the stakeholders to ensure compliance of interfacing requirements.</li><li>6. Establishing monitoring process for the interfacing of the registered request.</li><li>7. To prepare detailed interfacing matrix for exchange of information and proper compliance of different requirements by all stakeholders.</li><li>8. Facilitate assimilation of requirements of all phases i.e. planning, designing, procurement, construction, testing and commissioning among various consultants / contractors / suppliers / other stakeholders and thereby prepare, manage and control, the overall system integration processes.</li><li>9. Manage System Integration tests and coordination for trial runs before operations and demonstrate the system readiness for commercial operations.</li></ol>
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3	E29	<b>Chief Track Expert (International)</b>	<ol style="list-style-type: none"> <li>1. Lead the track work team to perform review and supplement DPR/DBR, design standards in respect of track work, alignment, track design, procurement, installation, testing and commissioning of track work duly considering the track standards. Also ensure proper interface of Civil structures with track works. Prepare details for value addition/improvements in Track system, if any.</li> <li>2. Evaluate track structures to be adopted for the project.</li> <li>3. Review, finalization and approval of track alignment.</li> <li>4. Review/ preparation of outline design, preliminary design, tender design, prequalification criteria and bid documents for the tender packages for trackwork contracts, attend pre bid meetings and assist in tendering and evaluation process.</li> <li>5. Review and approval of outline design of depot sheds, stabling sheds from the point of track requirements.</li> <li>6. Review, Value addition and approval of the design of ballastless track of all types and its suitability w.r.t. the supporting structure, noise and vibration mitigation measures, arrangement required for fixing of S &amp; T equipment, technical proposals including track curvatures, turnouts, gradient, crossovers, fittings, buffer stops and distressing plans etc. Review the track structure design and ensure its suitability w.r.t. the supporting structure.</li> <li>7. Project Management of Trackwork installation, testing, safety, handle day to day technical matters, contract management, attend meetings, submit reports, supervise and assist NCRTC in obtaining approvals and certifications.</li> <li>8. Review of track installations procedures and method statements of ballastless and ballasted tracks.</li> <li>9. Review and compile of installation &amp; maintenance manual of various track components and structures.</li> <li>10. Propose/Review procedure of Maintenance procedures of ballastless/ballasted track.</li> </ol> <p>Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
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4	E36	<b>Chief Signaling Expert (International)</b>	<ol style="list-style-type: none"> <li>1. Design review of ETCS Signalling System, Installation, Integration, Testing &amp; Commissioning of ETCS signalling system. Interfacing of ETCS Signalling System with other Subsystems, PSD, DDC, Civil, Track, Traction, E&amp;M, Rolling Stock and Maintenance vehicle, Telecom Subsystems, Asset Management System etc. and Interface document approval.</li> <li>2. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. ISA, CMRS etc. for successful completion of the project. Coordination of failures and correction with Contractor during DLP period. Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</li> <li>3. Identifying/defining all the potential interfaces among various components of the project.</li> <li>4. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>5. Develop and incorporate necessary provisions in respective tender documents</li> <li>6. Conduct regular site visits/meetings along with relevant stakeholders to review and monitor any interface related issues</li> <li>7. Ensuring a technology enabled diagnostics and quality control mechanism for Signalling subsystem</li> <li>8. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities.</li> <li>9. Analyse the manpower/training requirements for O&amp;M team and recommend training program and schedules.</li> <li>10. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> <li>11. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement.</li> <li>12. Assessment of life cycle cost for the various project related assets</li> <li>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets- <ul style="list-style-type: none"> <li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job</li> </ul> </li> </ol>
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			<p>descriptions required for implementation and operations &amp; maintenance phase</p> <ul style="list-style-type: none"><li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li><li>• Preparation of all documents with BIM Expert but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li><li>• Implementation of RAMS in rail-based transit system.</li><li>• Defining the requirements of RAMS for the various sub systems.</li><li>• Assist NCRTC in obtaining statutory approval.</li></ul> <p>Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
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5	E43	<b>Sr. Traction Expert (International)</b>	<p>The broad activities of the key experts shall include but not limited to:</p> <ol style="list-style-type: none"> <li>1. Reviewing of DPR provisions related to respective domain and to provide recommendations for system improvements.</li> <li>2. Preparation of Bid documents based on preliminary design of GC including but not limited to Preparation of typical method statements, required tools and plants/machinery, checklists for installation, testing and commissioning of OHE system as per the international practices for operational speed similar to Namo Bharat corridors along with actual references of such implementations outside India, Cost Estimation, Bid Process management, Bid Evaluation and award of Contracts for Power Supply and Traction System including SCADA works. Procurement, Proof checking and value addition of design.</li> </ol> <p>In this regard, Traction System Design Expert shall work for the first 6 man-months for preparation of above mentioned bid documents and the next 6 man-months (in two parts) in the implementation of at least 04 Rkm ROCS &amp; 10 Rkm of FOCS including neutral section as per requirement of Employer.</p> <ol style="list-style-type: none"> <li>3. Review, proof check of Simulations/studies, Design documents and other submissions of contractors/agencies and value addition relevant to Traction system.</li> <li>4. Contract management and implementation of traction system works.</li> <li>5. Interface and coordination with other experts, system &amp; civil contractors, Engineers and Employer's representatives</li> <li>6. Any other roles and responsibilities required to be performed as assigned by the PD/Employer.</li> </ol>
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<b>6</b>	<b>E56</b>	<b>Chief Rolling Stock Expert (International)</b>	<ol style="list-style-type: none"> <li>1. Design, procure and implement Rolling Stocks for continuous automatic train control rail-based transit system and maintenance vehicles.</li> <li>2. Provide tender design/drawings along with specifications for related components covering aspects of efficiency and maintenance etc.</li> <li>3. Assistance in providing relevant inputs during the entire bid process management</li> <li>4. Assist in testing and commissioning including final acceptance of the rolling stock based on the results of the prototype, serial and/or system test.</li> <li>5. Assist in detailed interfacing with other sub components.</li> <li>6. Identification of all systems and parameter.</li> <li>7. Approvals of sub-systems of the rolling stock such as propulsion, current collection systems, seating arrangement, passenger amenities, energy efficiency parameters, illumination, wheels profile, etc.</li> <li>8. Assist in system integration.</li> <li>9. Design and safety certification from ISA and obtaining Statutory Approval.</li> <li>10. All kinds of communications and interface for Rolling Stock Works with General Consultant of Delhi-Bawal Namo Bharat Corridor.</li> </ol> <p>Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
7	E3	Sr. RAMS Expert	<ol style="list-style-type: none"> <li>1. Implementation of RAMS in rail-based transit system.</li> <li>2. Defining the requirements of RAMS for the various sub systems.</li> <li>3. Evaluate various components on the RAMS parameters.</li> <li>4. Proof checking of verification &amp; validation reports of RAMS of different subcomponents.</li> </ol> <p>Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
<b>8</b>	<b>E4</b>	<b>Chief Operation Expert</b>	<p>The Chief O&amp;M Expert appointed by the General Consultant (GC) shall provide expert support to the Employer throughout the project lifecycle, covering pre- and post-Commercial Operation Date (COD) phases. The scope of work of the key expert shall include, but not be limited to:</p> <ol style="list-style-type: none"> <li>1. Assist the Employer in inventorying, listing, and formal handover of assets from respective OEMs (S&amp;T, MEP, PST, Civil, Track &amp; Rolling Stock or any other asset finalized during the COD phase) to the Operator before commissioning each stage.</li> <li>2. Support the Employer in the implementation and monitoring of Operation and Maintenance (O&amp;M) activities across all systems to ensure contractual,</li> </ol>

			<p>safety, and performance standards are continuously met.</p> <ol style="list-style-type: none"> <li>3. Facilitate the Employer in obtaining all statutory approvals and No Objection Certificates (NOCs), including certification from the Independent Safety Assessor (ISA).</li> <li>4. Support the Employer in the implementation and administration of an Asset Management System (AMS), ensuring proper classification, documentation, and real-time monitoring of assets through operational dashboards and analytics.</li> <li>5. Assist in the digital transformation of operational procedures and documentation to improve efficiency and compliance thereby moving towards unmanned Station Operation.</li> <li>6. Help prepare, review, and finalize Standard Operating Procedures (SOPs)/Manuals for station operations, train operations, and system-wide management related to normal and emergency scenarios. Prepare and review O&amp;M manuals, operating procedure orders, safety guidelines, and disaster management plans, ensuring alignment with regulatory and industry standards.</li> <li>7. Support pre-COD deliverables and readiness assessments, including comprehensive training programs and competency management for operational staff.</li> <li>8. Provide guidance and review on safety management systems and risk mitigation practices in coordination with safety regulators and stakeholders.</li> <li>9. Assist in testing, commissioning, and operational trials, ensuring smooth transition from construction to operational phases.</li> <li>10. Coordinate with various contractors, vendors, and stakeholders for timely resolution of operational issues.</li> <li>11. Review and advise on maintenance planning and lifecycle management strategies to optimize asset availability and reliability.</li> <li>12. Assist in contingency planning and emergency response preparedness to ensure resilient and safe operations.</li> <li>13. Facilitate knowledge transfer and capacity-building initiatives for the Employer's team and the Operator.</li> <li>14. Monitor and oversee the achievement of DLP / DNP and Reliability, Availability, Maintainability, and Safety (RAMS) targets, ensuring compliance with contractual and regulatory standards. Regularly review and report on system performances against these KPIs, facilitating timely corrective actions to meet stipulated performance benchmarks.</li> <li>15. Review signage requirements of the stations during</li> </ol>
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			<p>various project stages and post-commissioning to ensure that signage meets operational, passenger information, and safety standards.</p> <p>16. Review the station and depot layouts from operational efficiency and security perspectives, highlighting requirements and recommending improvements to meet operational and safety needs comprehensively.</p> <p>17. Facilitate and support the planning, design, and implementation of seamless multimodal integration at metro stations and related facilities. This includes ensuring efficient physical connectivity and coordination with other transport modes such as buses, feeder services, non-motorized transport, and para-transit options. The O&amp;M Expert shall review and recommend solutions for last-mile connectivity, integrated ticketing support, signage for easy transfers, and passenger convenience to promote sustainable and accessible urban mobility.</p> <p>18. Plan and recommend spare parts inventory needed for uninterrupted operations and maintenance, including evaluation of critical spares, storage, and timely replenishment strategies.</p> <p>19. Develop job descriptions, qualification criteria, and competency requirements for all categories of O&amp;M staff to ensure alignment with organizational and safety standards.</p> <p>20. Advise on suitable operational control philosophies including centralized, semi-centralized, or decentralized modes of control, with due consideration to system safety and efficiency.</p> <p>21. Prepare and review train operation schedules and associated duty rosters, ensuring compliance with service frequency and operational constraints.</p> <p>22. Conduct manpower and training needs assessment for O&amp;M staff, and recommend appropriate training modules, timelines, and delivery mechanisms.</p> <p>23. Recommend behavioural and simulation-based training programs and identify suitable equipment such as simulators for skill enhancement and emergency preparedness.</p> <p>24. Review and document contemporary domestic and international practices in metro operations and maintenance, identifying innovations and process improvements relevant to the Employer's system.</p>
<b>9</b>	<b>E5</b>	<b>Chief Contracts Expert</b>	<ol style="list-style-type: none"> <li>1. Managing overall procurement process including bid document preparation and Bid Process Management till closure of contract.</li> <li>2. Ensuring proper risk analysis and recommending risk mitigation measures.</li> <li>3. Assistance in entire Contract administration, including dispute resolution, contract terminations,</li> </ol>

			<p>contract renegotiation, exit strategies, establishing standard procedures &amp; tools, arbitration etc.</p> <ol style="list-style-type: none"> <li>4. Assist in compliance of the requirements of Multilateral/Bilateral funding agencies with respect to procurement.</li> <li>5. Supervising certification of progress payments and final payments of the contractors and consultants including variations and extension of time etc.</li> <li>6. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> <li>7. Assist NCRTC in contract Management and settlement of claims, disputes and Arbitration and timely prepare the responses for the claims/disputes raised by the contractors and submit with all logical (technical and legal) recommendations along with backup documents within ambient of the contract as well as latest Arbitration and Reconciliation Act of India, 2019.</li> </ol>
10	E6	Sr. Contracts Expert (Civil)	<ol style="list-style-type: none"> <li>1. Ensure that the bid documents for all works include specific provisions to minimize disruption/damage to local settlements due to construction.</li> <li>2. Assist NCRTC in the preparation of invitation for bids, evaluation of bids received, and award of contracts for all works.</li> <li>3. Assess time and cost claims submitted by contractors and advise NCRTC for actions to be taken.</li> <li>4. Support Chief Contract Expert for all the consulting services.</li> <li>5. Support on bid documents control, preparation of invitation for bids, evaluation of bids received, and award of contracts for all works.</li> <li>6. Reviewing of the MPRs and assuring the adherence of the contractual stipulations for each concern packages.</li> <li>7. Determination and proposal of the EOT as and when required</li> <li>8. Assist NCRTC in contract Management and settlement of claims, disputes and Arbitration and timely prepare the responses for the claims/disputes raised by the contractors and submit with all logical (technical and legal) recommendations along with backup documents within ambient of the contract as well as latest Arbitration and Reconciliation Act of India, 2019.</li> <li>9. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>

11	E7	Sr. Contracts Expert (Systems)	<ol style="list-style-type: none"> <li>1. Ensure that the bid documents for all works related to systems include specific provisions to minimize disruption/damage to local settlements due to construction.</li> <li>2. Assist NCRTC in the preparation of invitation for bids, evaluation of bids received, and award of contracts for all works related to systems.</li> <li>3. Assess time and cost claims submitted by contractors and advise NCRTC for actions to be taken.</li> <li>4. Support Chief Contract Expert for all the consulting services.</li> <li>5. Support on bid documents control, preparation of invitation for bids, evaluation of bids received, and award of contracts for all works related to systems.</li> <li>6. Assist NCRTC in contract Management and settlement of claims, disputes and Arbitration and timely prepare the responses for the claims/disputes raised by the contractors and submit with all logical (technical and legal) recommendations along with backup documents within ambient of the contract as well as latest Arbitration and Reconciliation Act of India, 2019.</li> <li>7. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
12	E8	Sr. Contracts Expert(Finance)	<ol style="list-style-type: none"> <li>1. Cooperation on preparation of Prequalification and bid documents in compliance with the Guidelines of funding agencies.</li> <li>2. Assist NCRTC on the preparation of invitation for bids, evaluation of bids received, and award of all packages of contractors.</li> <li>3. Maintain regular estimates of the cost to completion and time to completion for each contract.</li> <li>4. Certify advance payments in accordance with the contracts when necessary.</li> <li>5. Certify interim and final payment certificates for submission to NCRTC and assist NCRTC in documentation for submission to funding agencies.</li> <li>6. Assist NCRTC in contract Management and settlement of claims, disputes and Arbitration and timely prepare the responses for the claims/disputes raised by the contractors and submit with all logical (technical and legal) recommendations along with backup documents within ambient of the contract as well as latest Arbitration and Reconciliation Act of India, 2019.</li> <li>7. Reviewing and analysing financial aspects of proposals for Property Development and Transit Oriented Development including financials Services related to non-fare box revenue models.</li> </ol>



			8. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.
13	E9	Sr. Planning and Program Scheduling Expert	<ol style="list-style-type: none"> <li>1. Preparation of detailed integrated schedule / project timelines for the entire project.</li> <li>2. Review and monitor the work plans and schedules of various Consultants and Contractors and ensure their consistency with the overall project schedule.</li> <li>3. Assist in compliance of the requirements of Multilateral/Bilateral funding.</li> <li>4. Preparation of cost breakdown structure, creation of baseline project cost, budget and cashflow schedule.</li> <li>5. Assessment of project's long-term financial statements and preparation and submission the documents as per the requirements of multi/bi-lateral funding institution.</li> <li>6. Supervising certification of progress payments and final payments of the contractors and consultants including variations and extension of time etc.</li> <li>7. Assisting PD and Dy. PD in planning of entire project.</li> <li>8. Review and monitor the work plans and schedules of various Contractors, suppliers and consultants and ensure consistency with the overall project schedule.</li> <li>9. Maintaining regular estimates of the completion cost and completion time to each contract.</li> <li>10. Submitting proposal for the format and contents of periodic reporting of the progress including frequency of reporting for approval of the NCRTC.</li> <li>11. Submitting the required reports highlighting key areas where NCRTC intervention shall be required.</li> <li>12. Assisting in deployment of effective Project control system to enable proper planning, scheduling, budgeting, and measurement of performance and to ensure successful delivery of the Project</li> <li>13. Document control and assistance in cost and risk management.</li> <li>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
14	E10	<b>Chief Quality Assurance &amp; Quality Control Expert</b>	<ol style="list-style-type: none"> <li>1. Overall responsibility for the quality assurance management for the whole project. Including all types of works of project clearly outlined or not in the contract.</li> <li>2. Preparation of detailed Quality Assurance &amp; Control Plans, Inspection and Test Plans, Audit plans, Project Quality Risk Register (as per ISO) and mitigation plan, Inspection plans, Reports (daily/weekly/monthly/annual) on any platform (physical/digital or both), formats, checklists, work methodology (if required), minutes of meetings etc.</li> </ol>

			<p>and their implementation in the entire project.</p> <ol style="list-style-type: none"> <li>3. Reviewing and monitoring the implementation of Quality plans, ITPs (inspection &amp; test plan) and standard operating procedures of the Contractors.</li> <li>4. Review and approve the method statements submitted by the contractors in respect of quality assurance.</li> <li>5. Establishing standard quality assurance procedures &amp; tools for Quality Control in line with project specifications, standards, and ISO 9001.</li> <li>6. Work in close coordination with various stakeholders and technical teams of GC in respect of quality assurance.</li> <li>7. Perform quality audits (random and periodical) of contractors' works at site and issue NCR for non-conformance.</li> <li>8. Develop and incorporate necessary provisions in respective tender documents. Review of QA/QC plan for tender documents. Assist NCRTC to evaluate bids submitted by contractors in terms of QA/QC.</li> <li>9. Assist the Engineer and experts in site inspections of contractor's works. Review, assist, approve and coordinate for CMRS compliances / documents related to the quality.</li> <li>10. Any other roles and responsibilities required to be performed (as and when required in any manner) to complete the project and assigned by the PD/Employer.</li> <li>11. Prepare presentations and assist Employer to prepare presentations related to project quality assurance / quality control / quality excellence for the project.</li> <li>12. Provide trainings on the topics as required/defined by the Employer, to all the stakeholders of the project.</li> <li>13. Review, assist, approve and coordinate for CMRS compliances / documents related to the quality for the project.</li> </ol>
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15	E11	Sr. Quality Assurance & Quality Control Expert-Elevated and Depot	<p>Assist Chief Quality Assurance and Quality Control Expert in respect of Elevated section and Depot in respect of following</p> <ol style="list-style-type: none"> <li>1. Overall responsibility for the quality assurance management for the whole project</li> <li>2. Preparation of detailed Quality Assurance Plans and implementation in the entire project.</li> <li>3. Reviewing and monitoring implementation of Quality plans, procedures of the Contractors.</li> <li>4. Review and approve the method statements submitted by the contractors in respect of quality assurance.</li> <li>5. Establishing standard quality assurance procedures &amp; tools for Quality Control.</li> <li>6. Work in close coordination with various stakeholders and technical teams of GC in respect of quality assurance.</li> <li>7. Perform quality audits (random and periodical) of contractors' works at site and issue NCR for non-conformance. Re-inspection to ensure the proper closure of NCR (i.e. ensure quality work at site after the rectifications of non-compliance as brought out in NCR).</li> <li>8. Develop and incorporate necessary provisions in respective tender documents. Review of QA/QC plan for tender documents. Assist NCRTC to evaluate bids submitted by contractors in terms of QA/QC.</li> <li>9. Assist the Engineer and experts in site inspections of contractor's works.</li> <li>10. Any other roles and responsibilities required to be performed (as and when required in any manner by the Employer) to complete the project and assigned by the PD/Employer.</li> </ol>
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16	E12	Sr. Quality Assurance & Quality Control Expert- Underground	<p>Assist Chief Quality Assurance and Quality Control Expert in respect of Underground section and Depot in respect of following</p> <ol style="list-style-type: none"> <li>1. Overall responsibility for the quality assurance management for the whole project</li> <li>2. Preparation of detailed Quality Assurance Plans and implementation in the entire project.</li> <li>3. Reviewing and monitoring implementation of Quality plans, procedures of the Contractors.</li> <li>4. Review and approve the method statements submitted by the contractors in respect of quality assurance.</li> <li>5. Establishing standard quality assurance procedures &amp; tools for Quality Control.</li> <li>6. Work in close coordination with various stakeholders and technical teams of GC in respect of quality assurance.</li> <li>7. Perform quality audits (random and periodical) of contractors' works at site and issue NCR for non-conformance. Re-inspection to ensure the proper closure of NCR (i.e. ensure quality work at site after the rectifications of non-compliance as brought out in NCR).</li> <li>8. Develop and incorporate necessary provisions in respective tender documents. Review of QA/QC plan for tender documents. Assist NCRTC to evaluate bids submitted by contractors in terms of QA/QC.</li> <li>9. Assist the Engineer and experts in site inspections of contractor's works.</li> <li>10. Any other roles and responsibilities required to be performed (as and when required in any manner by the Employer) to complete the project and assigned by the PD/Employer.</li> </ol>
17	E13	<b>Chief Safety, Health and Environment Expert</b>	<p>Lead the Construction Safety, Health and Environment team to perform the following tasks:</p> <ol style="list-style-type: none"> <li>1. Chief Safety, Health and Environment expert shall report to Project Director.</li> <li>2. Review and approval of provision in the bid documents related to Construction Safety, Health and Environment.</li> <li>3. Establish Safety Management System covering the comprehensive safety in whole NCRTC projects.</li> <li>4. Implement and ensure the compliance of the provisions of the Employer Requirement of Safety, Health and Environment at site.</li> <li>5. Prepare disaster management and preparedness plan covering all emergencies including pandemic scenarios also.</li> <li>6. Review &amp; comment on documents like method statement, SHE plans, lifting plan, monthly report etc. submitted by the contractor.</li> </ol>

			<ol style="list-style-type: none"> <li>7. Prepare detail document covering majority aspect for monitoring safety performance of the contractors.</li> <li>8. Conduct regular safety inspections, audits of all worksites of civil &amp; systems contracts in the project and prepare report with recommendation for improvement.</li> <li>9. Carry out independent incident investigation to identify the cause and prepare &amp; submit report with recommendation to avoid in future with corrective and preventive actions.</li> <li>10. Present learning from the incident as case study in all site offices</li> <li>11. Conduct awareness training programs in site offices</li> <li>12. Prepare documents like safety alerts, checklist, operating procedures, formats etc. and submit to NCRTC for review.</li> <li>13. Prepare &amp; deliver presentation on the site issues and recommend preventive measures.</li> <li>14. Prepare Quarterly safety progress report.</li> <li>15. Prepare/Review Hazard Identification, Risk Assessment and control measures for critical activities being performed at site.</li> <li>16. Advise the Environmental Expert to undertake environmental monitoring and take necessary mitigations.</li> <li>17. Assist NCRTC on supervision of contractors in Safety, Health &amp; Environment and Health aspects.</li> <li>18. Any other roles and responsibilities required to be performed to complete the project and assigned by their PD/GC and NCRTC.</li> </ol>
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18	E14	Sr. Safety Expert- [Elevated and Depot]	<p>Assist Chief Safety, Health and Environment Expert in respect of Elevated section and Depot in respect of following:</p> <ol style="list-style-type: none"> <li>1. Chief Safety, Health and Environment expert shall report to Project Director.</li> <li>2. Review and approval of provision in the bid documents related to Construction Safety, Health and Environment.</li> <li>3. Establish Safety Management System covering the comprehensive safety in whole NCRTC projects.</li> <li>4. Implement and ensure the compliance of the provisions of the Employer Requirement of Safety, Health and Environment at site.</li> <li>5. Prepare disaster management and preparedness plan covering all emergencies including pandemic scenarios also.</li> <li>6. Review &amp; comment on documents like method statement, SHE plans, lifting plan, monthly report etc. submitted by the contractor.</li> <li>7. Prepare detail document covering majority aspect for monitoring safety performance of the contractors.</li> <li>8. Conduct regular safety inspections, audits of all worksites of civil &amp; systems contracts in the project and prepare report with recommendation for improvement.</li> <li>9. Carry out independent incident investigation to identify the cause and prepare &amp; submit report with recommendation to avoid in future with corrective and preventive actions.</li> <li>10. Present learning from the incident as case study in all site offices</li> <li>11. Conduct awareness training programs in site offices</li> <li>12. Prepare documents like safety alerts, checklist, operating procedures, formats etc. and submit to NCRTC for review.</li> <li>13. Prepare &amp; deliver presentation on the site issues and recommend preventive measures.</li> <li>14. Prepare Quarterly safety progress report.</li> <li>15. Prepare/Review Hazard Identification, Risk Assessment and control measures for critical activities being performed at site.</li> <li>16. Advise the Environmental Expert to undertake environmental monitoring and take necessary mitigations.</li> <li>17. Assist NCRTC on supervision of contractors in Safety, Health &amp; Environment and Health aspects.</li> <li>18. Any other roles and responsibilities required to be performed to complete the project and assigned by their PD/GC and NCRTC.</li> </ol>

19	E15	Sr. Safety Expert - [Underground]	<p>Assist Chief Safety, Health and Environment Expert in respect of Elevated section and Depot in respect of following :</p> <ol style="list-style-type: none"> <li>1. Chief Safety, Health and Environment expert shall report to Project Director.</li> <li>2. Review and approval of provision in the bid documents related to Construction Safety, Health and Environment.</li> <li>3. Establish Safety Management System covering the comprehensive safety in whole NCRTC projects.</li> <li>4. Implement and ensure the compliance of the provisions of the Employer Requirement of Safety, Health and Environment at site.</li> <li>5. Prepare disaster management and preparedness plan covering all emergencies including pandemic scenarios also.</li> <li>6. Review &amp; comment on documents like method statement, SHE plans, lifting plan, monthly report etc. submitted by the contractor.</li> <li>7. Prepare detail document covering majority aspect for monitoring safety performance of the contractors.</li> <li>8. Conduct regular safety inspections, audits of all worksites of civil &amp; systems contracts in the project and prepare report with recommendation for improvement.</li> <li>9. Carry out independent incident investigation to identify the cause and prepare &amp; submit report with recommendation to avoid in future with corrective and preventive actions.</li> <li>10. Present learning from the incident as case study in all site offices</li> <li>11. Conduct awareness training programs in site offices</li> <li>12. Prepare documents like safety alerts, checklist, operating procedures, formats etc. and submit to NCRTC for review.</li> <li>13. Prepare &amp; deliver presentation on the site issues and recommend preventive measures.</li> <li>14. Prepare Quarterly safety progress report.</li> <li>15. Prepare/Review Hazard Identification, Risk Assessment and control measures for critical activities being performed at site.</li> <li>16. Advise the Environmental Expert to undertake environmental monitoring and take necessary mitigations.</li> <li>17. Assist NCRTC on supervision of contractors in Safety, Health &amp; Environment and Health aspects.</li> <li>18. Any other roles and responsibilities required to be performed to complete the project and assigned by their PD/GC and NCRTC.</li> </ol>
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20	E16	Sr Environment & Health Expert	<ol style="list-style-type: none"> <li>1. Review the EIA &amp; SIA measures recommended in earlier studies and Assist NCRTC to review the contractor's Environmental Program to be prepared by the contractor in accordance with EMP relevant plans and the Guidelines of the funding agencies and to make recommendations to NCRTC regarding any necessary amendments for its approval.</li> <li>2. Review and propose contents in respect of Environment and Health in the bid documents.</li> <li>3. Supervise the Contractor if mitigation measures are taken in accordance with EMP.</li> <li>4. Monitor the effectiveness of EMP and negative impact on environment caused by the construction works and provide technical advice, including a feasible solution proposal, so that NCRTC can carry out improvement when necessary.</li> <li>5. Monitor compliance with conditions stated in the ECC as well as the requirements under EMP and funding agencies' Environmental Guidelines.</li> <li>6. Submit the periodical Environmental Monitoring Report to NCRTC after the commencement of the services until the completion of the Project and after the completion of the Project. The Environmental Monitoring Form will be filled and attached to the Report. After verifying the Environmental Monitoring Report by NCRTC, assist submitting the report to funding agencies as part of the Progress Status Report, after the commencement of the services until the completion of the Project and after the completion of the Project.</li> <li>7. Monitor the effectiveness of EMP and negative impacts on environment caused by the construction works and provide technical advice, including a feasible solution, so that NCRTC can improve situation when necessary.</li> <li>8. Assist NCRTC in preparation of the answer to the queries from advisory committee for environmental and social considerations if necessary.</li> <li>9. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> <li>10. Supervise the Contractor if mitigation measures are taken in accordance with SMP (Social Management Plan).</li> <li>11. Monitor the implementation of Resettlement Action Plan (RAP) including rehabilitation and resettlement activities in accordance with national and international social safeguard policies.</li> <li>12. Facilitation for conducting public consultation, stakeholder consultation followed by information disclosure.</li> <li>13. Implementation of Grievance Redress Mechanism and Gender Action Plan across the project corridor.</li> <li>14. Submit the periodical Social Monitoring Report to NCRTC</li> </ol>



21	E17	<b>Chief Testing and Commissioning Expert</b>	<ol style="list-style-type: none"> <li>1. Planning of complete testing and commissioning of sub systems/prototypes of rail based transit system</li> <li>2. Prepare testing and commissioning plans based on inputs from all sub groups, standards, best practices, operational requirement so as to demonstrate the system readiness for commercial operations.</li> <li>3. Final acceptance of the system based on the results of the prototype, serial and/or system test.</li> <li>4. Submitting all necessary documents and have discussions etc. with CMRS / RDSO/ other Statutory Authorities to obtain approvals.</li> <li>5. Plan, arrange and supervise all the trial tests, if required, with the support of the Employer, well in advance of the trial runs.</li> <li>6. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
22	E18	Sr. Testing and Commissioning Expert	<ol style="list-style-type: none"> <li>1. Planning of complete testing and commissioning of sub systems/prototypes of rail based transit system</li> <li>2. Prepare testing and commissioning plans based on inputs from all sub groups, standards, best practices, operational requirement so as to demonstrate the system readiness for commercial operations.</li> <li>3. Final acceptance of the system based on the results of the prototype, serial and/or system test.</li> <li>4. Submitting all necessary documents and have discussions etc. with CMRS / RDSO/ other Statutory Authorities to obtain approvals.</li> <li>5. Plan, arrange and supervise all the trial tests, if required, with the support of the Employer, well in advance of the trial runs.</li> <li>6. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
23	E19	Chief Structural Design Expert	<ol style="list-style-type: none"> <li>1. Review and approval of tender design/drawings along with specifications for the procurement of civil related components elevated and underground structures.</li> <li>2. Proof checking of geotechnical reports/data, providing the technical inputs for design etc.</li> <li>3. Proof check and approval of the technical civil works proposals, design and drawings of civil works such as structural elements of station entry-exit, PD, viaduct, ramps, depot, drainage arrangement, roads subways, utility diversions, STP, retaining wall, Sheds, railing, cable trays, crash barrier, view barrier, steel structure, PEB &amp; facade, bearing, method statements, repair methodology, building, construction methodology, erecting scheme, temporary structure and all miscellaneous items related to implementation of project etc.</li> <li>4. Proof check and approval of the technical civil works proposals, design &amp; drawings of civil works such as</li> </ol>

			<p>structural elements of underground station, tunnel, ramps, cross-passage, shafts, ancillary building, cut and cover tunnel, FOBs, entry-exit of underground station, PD, drainage arrangement, subways, utility diversions, STP, retaining wall, Sheds, railing, cable trays, steel structure, PEB &amp; facade, method statements, repair methodology, building, construction methodology, erecting scheme, temporary structure and all miscellaneous items related to implementation of project etc.</p> <ol style="list-style-type: none"> <li>5. Ensure that recommended design complies with tender requirements, enactments, codes and regulations relevant to the Civil Works and has taken into consideration the construction methodologies, associated Temporary Works and Contractor's Equipment and available resources.</li> <li>6. Coordination with different sub-groups/All departments of NCRTC &amp; GC/agency hired by NCRTC/contractor/other government department/ for implementation of project.</li> <li>7. Assist NCRTC for presentations to be made to the Ministries/statutory approving authorities/ other stakeholders/ management as per requirement.</li> <li>8. Conduct weekly reviews meeting for design works and site queries and site requirements.</li> <li>9. General consultants shall interface with all civil, system wide contractors and stake holders to expedite the approval of all stages of design and drawings.</li> <li>10. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol> <p>GC shall also suggest new ideas/value engineering/ concepts beneficial for the overall success of the project based on their national/ international experience.</p>
24	E20	Chief Geotechnical Expert	<ol style="list-style-type: none"> <li>1. Design and interpretation of subsurface investigation data.</li> <li>2. Preparation of geological/ geotechnical investigation reports.</li> <li>3. Estimate the magnitude and location of the loads to be supported including estimation of bearing capacity, settlement, and ground movement beneath the foundations.</li> <li>4. Design of geotechnical structures</li> <li>5. Design of shallow and deep foundations</li> <li>6. Design of piles and well foundations</li> <li>7. Design of tunnels and retaining structures.</li> <li>8. Coordination with different sub-groups/All departments of NCRTC &amp; GC/agency hired by NCRTC/contractor/other government department/ for implementation of project.</li> <li>9. Assist NCRTC for presentations to be made to the Ministries/statutory approving authorities/ other stakeholders/ management as per requirement</li> <li>10. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>

			GC shall also suggest new ideas/value engineering/concepts beneficial for the overall success of the project based on their national/ international experience.
25	E21	Sr. Structural Design Expert (Elevated and Depot)	<ol style="list-style-type: none"> <li>1. Review of tender design/drawings along with specifications for the procurement of civil related components.</li> <li>2. Proof checking of geotechnical reports/data, providing the technical inputs for design etc.</li> <li>3. Proof check and approval of the technical civil works proposals, Design and drawings of civil works such as structural elements of station, entry-exit viaduct, PD, ramps, depot, drainage arrangement, roads subways, utility diversions, STP, retaining wall, Sheds, railing, cable trays, crash barrier, view barrier, steel structure, PEB &amp; facade, bearing, method statements, repair methodology, building, construction methodology, erecting scheme, temporary structure and all miscellaneous items related to implementation of project etc.</li> <li>4. Ensure that recommended design complies with tender requirements, enactments, codes and regulations relevant to the Civil Works and has taken into consideration the construction methodologies, associated Temporary Works and Contractor's Equipment and available resources.</li> <li>5. Coordination with different sub-groups/All departments of NCRTC &amp; GC/agency hired by NCRTC/contractor/other government department/ for implementation of project.</li> <li>6. Assist NCRTC for presentations to be made to the Ministries/statutory approving authorities/ other stakeholders/ management as per requirement.</li> <li>7. Conduct weekly reviews meeting for design works and site queries and site requirements.</li> <li>8. General consultants shall interface with all civil, system wide contractors and stake holders to expedite the approval of all stages of design and drawings.</li> <li>9. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol> <p>GC shall also suggest new ideas/value engineering/concepts beneficial for the overall success of the project based on their national/ international experience.</p>
26	E22	Sr. Structural Design Expert (Underground)	<ol style="list-style-type: none"> <li>1. Review of tender design/drawings along with specifications for the procurement of civil related components.</li> <li>2. Proof checking of geotechnical reports/data, providing the technical inputs for design etc.</li> <li>3. Proof check and approval of the technical civil works proposals, Design &amp; drawings of civil works such as structural elements of underground station, tunnel, ramps, PD, cross-passage, shafts, ancillary building, cut and cover tunnel, FOBs, entry-exit of underground station, drainage arrangement, subways, utility diversions, STP, retaining wall, Sheds, railing, cable</li> </ol>

			<p>trays, steel structure, PEB &amp; facade, method statements, repair methodology, building, construction methodology, erecting scheme, temporary structure and all miscellaneous items related to implementation of project etc.</p> <ol style="list-style-type: none"> <li>4. Ensure that recommended design complies with tender requirements, enactments, codes and regulations relevant to the Civil Works and has taken into consideration the construction methodologies, associated Temporary Works and Contractor's Equipment and available resources.</li> <li>5. Coordination with different sub-groups/All department of NCRTC &amp; GC/agency hired by NCRTC/contractor/other government department for implementation of project.</li> <li>6. Assist NCRTC for presentations to be made to the Ministries/statutory approving authorities/ other stakeholders/ management as per requirement.</li> <li>7. Conduct weekly reviews meeting for design works and site queries and site requirements.</li> <li>8. General consultants shall interface with all civil, system wide contractors and stake holders to expedite the approval of all stages of design and drawings.</li> </ol> <p>Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p> <p>GC shall also suggest new ideas/value engineering/ concepts beneficial for the overall success of the project based on their national/ international experience.</p>
27	E23	<b>Chief Architectural Expert</b>	<p>The broad activities of the key expert shall include as detailed in the Scope of Work and listed below, but not limited to the same. GC shall also suggest new ideas/ concepts beneficial for the overall success of the project based on their national/ international experience.</p> <ol style="list-style-type: none"> <li>1. Lead GC Architectural team to review and supplement the details given in DPR, OCS and DBR/ODS in respect of Architectural design considering operational efficiency, maintainability, cost performance etc.</li> <li>2. Lead GC Architectural team to prepare, review and approve tender drawings, Documents &amp; BIM models, BOQs (<i>DSR and NDSR items including rate analysis &amp; reference detail drawings</i>), Quantities with base calculations, Cost Estimates and Detailed Technical Specifications for Stations, depot, PD areas &amp; other supporting buildings) in consultation with NCRTC</li> <li>3. Lead GC Architectural team to prepare, review and approve Architectural design of Underground At Grade &amp; Elevated Stations, depot, PD areas &amp; other supporting buildings like housing, police stations/ post, barracks, RSS, public convenience structures, such as facility areas FOB, Subways, skywalks etc. and other structures required to be constructed for SKK-Bawal-SNB/ SKK-Panipat-Karnal/ Future corridor RRTS Corridor in consultation with NCRTC.</li> <li>4. Lead GC Architectural team to prepare, review and approval of detailed design/drawings along with specifications covering all aspects of station design such as innovative station layout, and global best practices followed, sustainability, architectural finishes, space optimization, optimized Roofing(PEB) &amp; facade design, aesthetic lighting, multi modal integration, spatial</li> </ol>

			<p>modelling, overcrowding controls, complete signages (station &amp; way finding signage), multi modal exchange, traffic movement, parking facilities, entry exit and evacuation facilities, public, realm etc. in consultation with NCRTC.</p> <p>5. Coordinate with different sub-groups for Detailed Design layout of the stations depots other ancillary buildings and finalize the requirement of equipment rooms, platform, operation services, and ticketing systems etc. till completion of works on site.</p> <p>6. Review requirements of staircase, lift and escalators including access for divyangjan and elderly commuters.</p> <p>7. Manage site supervision team during construction stage for review of material approval submissions, method statements, mock-ups and monitoring compliance.</p> <p>8. Conduct weekly reviews of ongoing architectural works (including but not limited to finishes, Roofing (PEB), façade, complete signages, etc.) on site to ensure work is being done as per approved drawings, methodology issued to site, prepare weekly reports &amp; suggest effective remedial measures of site related issues in a timely manner in consultation with NCRTC to ensure smooth functioning at construction site.</p> <p>9. Shall coordinate for proper Interface Management.</p> <p>10. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/NCRTC.</p> <p>11. Assist NCRTC for presentations to be made to the Ministries/statutory approving authorities/ other stake holders/ management as per requirement.</p> <p>12. Review and approve contractor's shop drawings and method statement against the design [tender] drawings for compliance with the design intent.</p>
28	<p><b>E24</b></p> <p><b>E25</b></p>	<p>Sr. Architectural Expert – (Underground)</p> <p>Sr. Architectural Expert – Elevated &amp; Depot</p>	<p>The broad activities of the key expert shall include as detailed in the Scope of Work and listed below, but not limited to the same. GC shall also suggest new ideas/ concepts beneficial for the overall success of the project based on their national/ international experience.</p> <ol style="list-style-type: none"> <li>1. Prepare, review and approve of Architectural design and details of Elevated Stations, depot, PD areas &amp; other supporting buildings like housing, police stations/ post, barracks, RSS, public convenience structures, such as facility areas, subway, FOB, entry/exit, skywalks, passenger simulation, etc.</li> <li>2. Prepare, review and approve of Architectural design and details of Underground Stations, and vent shafts cum escape shafts.</li> <li>3. Prepare, review and approve of Technical proposals, drawings of the architectural works including station sizing, egress calculations and other codal requirements.</li> <li>4. Prepare, review and approve tender drawings, Documents &amp; BIM models, BOQs (<i>DSR and NDSR items including rate analysis &amp; reference detail drawings</i>), Quantities with base calculations, Cost</li> </ol>

			<p>Estimates and Detailed Technical Specifications for Stations, depot, PD areas &amp; other supporting buildings) in consultation with NCRTC</p> <ol style="list-style-type: none"> <li>5. Prepare, review of Design/drawings/ BIM models along with specifications covering all aspects of station design such as station layout, green building certification, architectural finishes, entry/exit, subway, space optimization, structural configurations, optimized PEB &amp; façade and roofing design, aesthetic lighting, multi modal integration, spatial modelling, overcrowding controls, signage (station &amp; way finding complete signages), multi modal exchange, traffic movement, parking facilities, entry exit and evacuation facilities, public amenities, etc.</li> <li>6. Review of schemes and value addition for optimized and innovative station design including PEB Structures, Architectural finishes, BOH, etc. to assist NCRTC for improvisation and finalization.</li> <li>7. Prepare, review of Design layout of the stations / depots in conjunction with inputs from all sub-groups/stakeholder and finalize the requirement of equipment room, platform, operation services, ticketing systems and other services.</li> <li>8. Prepare. review &amp; approve design scheme of façade &amp; roofing for stations / depots in coordination with all sub-groups/stakeholders and finalize the requirement.</li> <li>9. Review of Requirements of staircase, lift and escalators including access for special abled commuters.</li> <li>10. Review of Requirements of divyangjan and elderly and accessibility.</li> <li>11. Conduct weekly reviews of ongoing architectural works and Coordinate with team during construction stage for periodical review of ongoing Architectural works with respect to approved design/drawing, material submissions, method statements, mock-ups till completion of works on site.. Periodical coordination between Architecture and other services to highlight issues if any and resolve the same in consultation with NCRTC to ensure smooth functioning at construction site.</li> <li>12. Review and approve contractor's shop drawings and method statement against the design [tender] drawings for compliance with the design intent.</li> <li>13. Shall coordinate for proper Interface Management.</li> <li>14. Assist NCRTC in presentations to be made to the Ministries/statutory approving authorities/ other stake holders as per requirement.</li> <li>15. GC will be required to depute his Key experts in NCRTC corporate office for the duration as approved as/when required for the completion of the entire work to the full satisfaction of NCRTC.</li> </ol>
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			16. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/ NCRTC.
<b>29</b>	<b>E26</b>	Sr. Plumbing Expert	<p>T The broad activities of the key expert shall include as detailed in the Scope of Work and listed below, but not limited to the same. GC shall also suggest new ideas/ concepts beneficial for the overall success of the project based on their national/ international experience.</p> <ol style="list-style-type: none"> <li>1. Prepare, review and approve plans, details, specifications, BIM Models and cost estimates of plumbing systems as per actual site conditions like site levels, etc</li> <li>2. Analyze Plumbing engineering problems and formulate solutions as per industry best practices/ latest technologies, optimization, etc.</li> <li>3. Prepare and deliver effective oral presentations whenever required.</li> <li>4. Advice on all issues regarding LEED/ IGBC and ensure that the appropriate documentation and information is provided to the appropriate authorities to obtain the LEED/ IGBC standard required on the project.</li> <li>5. Review and approve the Contractor's installation method statements.</li> <li>6. Review and approve Contractor's shop drawings against the design [tender] drawings for compliance with the design intent and return to Project Director with appropriate comments/approval within the specified period</li> <li>7. Review and approve contractor's plumbing shop drawings in conjunction with the structural and other services to ensure engineering co-ordination and advise the Project Director accordingly.</li> <li>8. Interface Management.</li> <li>9. Coordinate with team during construction stage for periodical review of ongoing Plumbing works with respect to approved design/drawing, material submissions, method statements, mock-ups till completion of works on site. Periodical coordination between Plumbing, Architecture, Structure and other services to highlight issues if any and resolve the same in consultation with NCRTC to ensure smooth functioning at construction site.</li> <li>10. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> <li>11. GC will be required to depute his Key experts in NCRTC corporate office for the duration as approved as/when required for the completion of the entire work to the full satisfaction of NCRTC.</li> </ol>

<b>30</b>	<b>E27</b>	Sr. Building Information Modelling (BIM) Expert-(Underground)	<p>The broad activities of the key experts shall be as per defined Scope of Work but not limited to the following:</p> <ol style="list-style-type: none"> <li>1. Prepare, review and Recommendation of appropriate detailing to be undertaken for defining information in BIM models subcomponent wise along with interdependency between the information</li> <li>2. Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li> <li>3. Preparation of all documents but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li> <li>4. Identification of BIM performance parameters for various stakeholders and monitoring their adherence by the stakeholders</li> <li>5. Providing relevant inputs during the entire bid process management</li> <li>6. Assist in proper operations and maintenance of the BIM interface including all techno-managerial assistance.</li> <li>7. Assisting in proof checking Building Information Models of the structures and services, asset management, operating BIM interface, identification of clashes between different proposals and their resolution.</li> <li>8. Proof check to ensure that the model aligns with the standards and goals set in BIM Execution Plan and BIM project workflow criteria.</li> <li>9. Collaborate and coordinate internally or/and externally with other disciplines for architectural design-changes and model changes.</li> <li>10. Proof check to ensure discipline specific BIM Modelling content as per standards / codes.</li> <li>11. Proof check to ensure that all drawings are developed and extracted from BIM at all stages.</li> <li>12. Proof checking of the final integrated as-built BIM models as per AMS/ O&amp;M requirements.</li> <li>13. Assist NCRTC in presentations to be made to the Ministries/statutory approving authorities/ other stake holders as per requirement.</li> <li>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> <li>15. GC will be required to depute his Key experts in NCRTC corporate office for the duration as approved as/when required for the completion of the entire work to the full satisfaction of NCRTC.</li> </ol>
	<b>E28</b>	Sr. Building Information Modelling (BIM) Expert-(Elevated)	



31	E30	<b>Chief Track Expert</b>	<ol style="list-style-type: none"> <li>1. Lead the track work team to perform review and supplement DPR and DBR in respect of track work, alignment, track design, procurement, installation, testing and commissioning of track work.</li> <li>2. Review, finalization and approval of track alignment.</li> <li>3. Review/ preparation of outline design, preliminary design, tender design, prequalification criteria and bid documents for the tender packages for trackwork contracts, attend pre bid meetings and assist in tendering and evaluation process. Review the track structure design and ensure its suitability w.r.t. the supporting structure.</li> <li>4. Review and approval of outline design of depot sheds, stabling sheds from the point of track requirements.</li> <li>5. Review, Value addition and approval of the design of ballastless track of all types, noise and vibration mitigation measures, arrangement required for fixing of S &amp; T equipment, technical proposals including track curvatures, turnouts, gradient, crossovers, fittings, buffer stops and destressing plans etc.</li> <li>6. Project Management of Trackwork installation, testing, safety, handle day to day technical matters, contract management, attend meetings, submit reports, supervise and assist NCRTC in obtaining approvals and certifications.</li> <li>7. Review of track installations procedures and method statements of ballastless and ballasted tracks.</li> <li>8. Review and compile of installation &amp; maintenance manual of various track components and structures.</li> <li>9. Propose/Review of Maintenance procedure/method statements of ballastless/ballasted track.</li> <li>10. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
32	E31	<b>Sr. Track Design Expert</b>	<ol style="list-style-type: none"> <li>1. Review and finalization of track alignment.</li> <li>2. Review and finalization of rail-structure interaction.</li> <li>3. Review of Ballastless and Ballasted Track Design including design models w.r.t various design standards and also suggest the point out the design interface with civil and other systems. May also require to prepare and review design models on software, to cross check the designs submitted by designer. Also review the Civil designs and track structure suitability w.r.t. Civil Structure.</li> <li>4. Proof checking and Value addition in the design of ballastless track of all types, noise and vibration mitigation measures, arrangement required for fixing of S &amp; T equipment, technical proposals including track curvatures, turnouts, gradient, crossovers, fittings, buffer stops and destressing plans etc.</li> <li>5. Review of track installations procedures of ballastless</li> </ol>

			<p>and ballasted tracks.</p> <p>6. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
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33	E32  E33	Sr. Track Installation Expert – 1 & Sr. Track Installation Expert – 2	<ol style="list-style-type: none"> <li>1. Review and finalization of track alignment.</li> <li>2. Conversant in rail-structure interaction.</li> <li>3. Proof checking and Value addition in the design of ballastless track of all types, noise and vibration mitigation measures, arrangement required for fixing of S &amp; T equipment, technical proposals including track curvatures, turnouts, gradient, crossovers, fittings, buffer stops and destressing plans etc.</li> <li>4. Supervision of track installations procedures of ballastless and ballasted tracks.</li> <li>5. Progress review as per the site requirement.</li> <li>6. Quality control &amp; assurance for production and installation of track works including documentation.</li> <li>7. Safety assurance for all track related works.</li> <li>8. Maintenance of ballastless/ballasted track. Prepare and compile maintenance manuals for the various track components.</li> <li>9. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
34	E34	Sr. Track Installation Expert - Factory and Supply	<ol style="list-style-type: none"> <li>1. Review and approval of Design Mix used for track works.</li> <li>2. Quality control &amp; assurance for production and installation of track works including documentation.</li> <li>3. Finalization for machinery and equipment for factory and ensure proper documentation of machinery and equipments.</li> <li>4. Safety assurance for all factory related works.</li> <li>5. Proof checking and Value addition in the design of ballastless track of all types, noise and vibration mitigation measures, arrangement required for fixing of S &amp; T equipment, technical proposals including track curvatures, turnouts, gradient, crossovers, fittings, buffer stops and destressing plans etc.</li> <li>6. Review of track installations procedures of ballastless and ballasted tracks.</li> <li>7. Progress review as per the site requirement.</li> <li>8. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
35	E35	Sr. Survey and Alignment Expert	<ol style="list-style-type: none"> <li>1. Proof checking and finalization of track alignment.</li> <li>2. Conversant in rail-structure interaction.</li> <li>3. Review Survey methodology for achieving desired accuracy of track works.</li> <li>4. Proof checking and Value addition in the installation of ballastless track of all types, noise and vibration mitigation measures, arrangement required for fixing of S &amp; T equipment, technical proposals including track curvatures, turnouts, gradient, crossovers, fittings, buffer stops and destressing plans etc.</li> </ol>

			<p>5. Proof Checking of Survey and Alignment.</p> <p>Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
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36	E37	Sr. Signaling Expert	<ol style="list-style-type: none"> <li>1. Design review of ETCS Signalling System, Installation, Integration, Testing &amp; Commissioning of ETCS signalling system. Interfacing of ETCS Signalling System with other Subsystems, PSD, DDC, Civil, Track, Traction, E&amp;M, Rolling Stock and Maintenance vehicle, Telecom Subsystems, Asset Management System etc. and Interface document approval.</li> <li>2. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. ISA, CMRS etc. for successful completion of the project. Coordination of failures and correction with Contractor during DLP period (if available at that time). Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</li> <li>3. Identifying/defining all the potential interfaces among various components of the project.</li> <li>4. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>5. Develop and incorporate necessary provisions in respective tender documents</li> <li>6. Conduct regular site visits/meetings along with relevant stakeholders to review and resolve any interface related issues timely before execution.</li> <li>7. Ensuring a technology enabled diagnostics and quality control mechanism for Signalling subsystem</li> <li>8. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities.</li> <li>9. Analyse the manpower/training requirements for O&amp;M team and recommend training program and schedules.</li> <li>10. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> <li>11. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement.</li> <li>12. Assessment of life cycle cost for the various project related assets</li> <li>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets- <ul style="list-style-type: none"> <li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job descriptions required for implementation and operations &amp; maintenance phase</li> <li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li> <li>• Preparation of all documents with BIM Expert but not limited to Employer Information</li> </ul> </li> </ol>
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			<p>Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</p> <ul style="list-style-type: none"> <li>• Implementation of RAMS in rail-based transit system.</li> <li>• Defining the requirements of RAMS for the various sub systems.</li> <li>• Assist NCRTC in obtaining statutory approvals.</li> </ul>
37	E38	Sr. Platform ScreenDoor Expert	<ol style="list-style-type: none"> <li>1. Design review, Installation, Integration, Testing &amp; Commissioning and implementation of platform screen door system for a continuous automatic train control rail-based transit system. Interfacing of PSD System with other Subsystems S&amp;T, DDC, Civil, Track, Traction, E&amp;M, Rolling Stock and Maintenance vehicle, Asset Management System ERP, SAP, IT etc. and Interface document approval.</li> <li>2. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. ISA, CMRS etc. for successful completion of the project. Coordination of failures and correction with Contractor during DLP period. Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</li> <li>3. Identifying/defining all the potential interfaces among various components of the project.</li> <li>4. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>5. Develop and incorporate necessary provisions in respective tender documents</li> <li>6. Conduct regular site visits/meetings along with relevant stakeholders to review and monitor any interface related issues</li> <li>7. Ensuring a technology enabled diagnostics and quality control mechanism for PSD subsystem</li> <li>8. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities.</li> <li>9. Analyse the manpower/training requirements for O&amp;M team and recommend training program and schedules.</li> <li>10. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> <li>11. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement.</li> <li>12. Assessment of life cycle cost for the various project related assets</li> <li>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets-</li> </ol>

			<ul style="list-style-type: none"><li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job descriptions required for implementation and operations &amp; maintenance phase</li><li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li><li>• Preparation of all documents with BIM Expert but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li><li>• Implementation of RAMS in rail-based transit system.</li><li>• Defining the requirements of RAMS for the various sub systems.</li><li>• Assist NCRTC in obtaining statutory approvals.</li></ul> <p>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
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38	E39	<b>Chief Telecommunication Expert</b>	<ol style="list-style-type: none"> <li>1. Design review, Installation, Integration, Testing &amp; Commissioning and implementation of telecommunication system including sub systems for backbone of data transmission from field units to centralized control centres, systems for passengers and Employer's telecommunication connectivity such as mobile connectivity, LTE, Wi-Fi etc, systems for CCTV, access control for a continuous automatic train control rail-based transit system. Interfacing of Telecom System with other Subsystems DDC, Civil, Track, Traction, E&amp;M, Rolling Stock and Maintenance vehicle, Asset Management System ERP, SAP, IT etc. and Interface document approval.</li> <li>2. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. ISA, CMRS etc. for successful completion of the project. Coordination of failures and correction with Contractor during DLP period. Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</li> <li>3. Identifying/defining all the potential interfaces among various components of the project.</li> <li>4. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>5. Develop and incorporate necessary provisions in respective tender documents</li> <li>6. Conduct regular site visits/meetings along with relevant stakeholders to review and monitor any interface related issues</li> <li>7. Ensuring a technology enabled diagnostics and quality control mechanism for telecom subsystem</li> <li>8. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities.</li> <li>9. Analyse the manpower/training requirements for O&amp;M team and recommend training program and schedules.</li> <li>10. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> <li>11. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement.</li> <li>12. Assessment of life cycle cost for the various project related assets</li> <li>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets- <ul style="list-style-type: none"> <li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job descriptions required for implementation and operations &amp; maintenance phase</li> <li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be</li> </ul> </li> </ol>
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			<p>incorporated in all bid documents to ensure desired implementation of BIM.</p> <ul style="list-style-type: none"> <li>• Preparation of all documents with BIM Expert but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li> <li>• Implementation of RAMS in rail-based transit system.</li> <li>• Defining the requirements of RAMS for the various sub systems.</li> <li>• Assist NCRTC in obtaining statutory approvals.</li> </ul> <p>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
39	E40	Sr. Telecommunication Expert	<ol style="list-style-type: none"> <li>1. Design review, Installation, Integration, Testing &amp; Commissioning and implementation of telecommunication system including sub systems for backbone of data transmission from field units to centralized control centres, systems for passengers and Employer's telecommunication connectivity such as mobile connectivity, LTE, Wi-Fi etc, systems for CCTV, access control for a continuous automatic train control rail-based transit system. Interfacing of Telecom System with other Subsystems DDC, Civil, Track, Traction, E&amp;M, Rolling Stock and Maintenance vehicle, Asset Management System ERP, SAP, IT etc. and Interface document approval.</li> <li>2. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. ISA, CMRS etc. for successful completion of the project. Coordination of failures and correction with Contractor during DLP period. Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</li> <li>3. Identifying/defining all the potential interfaces among various components of the project.</li> <li>4. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>5. Develop and incorporate necessary provisions in respective tender documents</li> <li>6. Conduct regular site visits/meetings along with relevant stakeholders to review and monitor any interface related issues</li> <li>7. Ensuring a technology enabled diagnostics and quality control mechanism for telecom subsystem</li> <li>8. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities.</li> <li>9. Analyse the manpower/training requirements for O&amp;M team and recommend training program and schedules.</li> <li>10. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> </ol>

			<p>11. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement.</p> <p>12. Assessment of life cycle cost for the various project related assets</p> <p>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets-</p> <ul style="list-style-type: none"> <li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job descriptions required for implementation and operations &amp; maintenance phase</li> <li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li> <li>• Preparation of all documents with BIM Expert but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li> <li>• Implementation of RAMS in rail-based transit system.</li> <li>• Defining the requirements of RAMS for the various sub systems.</li> <li>• Assist NCRTC in obtaining statutory approvals.</li> </ul> <p>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
40	E41	Sr. LTE Expert	<p>1. Design review, Installation, Integration, Testing &amp; Commissioning and implementation of telecommunication system including sub systems for backbone of data transmission from field units to centralized control centres, systems for passengers and Employer's telecommunication connectivity such as mobile connectivity, LTE, Wi-Fi etc, for a continuous automatic train control rail-based transit system. Interfacing of LTE System with other Subsystems DDC, Civil, Track, Traction, E&amp;M, Rolling Stock and Maintenance vehicle, Asset Management System ERP, SAP, IT etc. and Interface document approval.</p> <p>2. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. DoT, TRAI, ISA, CMRS etc. for successful completion of the project. Coordination of failures and correction with Contractor during DLP period (if available at that time). Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</p>

			<ol style="list-style-type: none"> <li>3. Identifying/defining all the potential interfaces among various components of the project.</li> <li>4. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>5. Develop and incorporate necessary provisions in respective tender documents</li> <li>6. Conduct regular site visits/meetings along with relevant stakeholders to review and monitor any interface related issues</li> <li>7. Ensuring a technology enabled diagnostics and quality control mechanism for LTE subsystem</li> <li>8. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities.</li> <li>9. Analyse the manpower/training requirements for O&amp;M team and recommend training program and schedules (if available at that time).</li> <li>10. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> <li>11. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement.</li> <li>12. Assessment of life cycle cost for the various project related assets</li> <li>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets- <ul style="list-style-type: none"> <li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job descriptions required for implementation and operations &amp; maintenance phase</li> <li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li> <li>• Preparation of all documents with BIM Expert but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li> <li>• Implementation of RAMS in rail-based transit system.</li> <li>• Defining the requirements of RAMS for the various sub systems.</li> <li>• Assist NCRTC in obtaining statutory approvals.</li> </ul> </li> <li>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
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41	E42	Sr. Automatic FareCollection Expert	<ol style="list-style-type: none"> <li>1. Design review, review of Installation, Integration, Testing &amp; Commissioning and implementation of automatic fare collection system and integrated ticketing models. Interfacing of AFC System with other Subsystems, DDC, S&amp;T, Design, Arch., Civil, E&amp;M, IT, Asset Management System, ERP/SAP , Financial Institution, etc. and Interface document approval.</li> <li>2. Preparing model for Automatic Fare Collection prevalent in the market. Review and approval of Integration with other transport modes in NCR (like DMRC, DTC, IRCTC etc.). Formulate business rules for the employer.</li> <li>3. Review and Implementation of Interoperability within different Corridors. Verify completed work (MCC) and preparation of request for payment (IPC). Assist in obtaining statutory approvals. Assist and coordinate with various agencies i.e. CMRS etc. for successful completion of the project. Coordination for failures and correction with Contractor during DLP and CAMC period (as applicable) (if available at that time). Any other roles and responsibilities required to be performed to complete the project as assigned by Employer.</li> <li>4. Identifying/defining all the potential interfaces among various components of the project.</li> <li>5. Outlining the process for coordination and management of parties involved across various interfaces.</li> <li>6. Develop and incorporate necessary provisions in respective tender documents.</li> <li>7. Conduct regular site visits/meetings along with relevant stakeholders to review and monitor any interface related issues</li> <li>8. Ensuring a technology enabled diagnostics and quality control mechanism for AFC subsystem</li> <li>9. Implementation of Operation and Maintenance for a rail-based transit system and monitor operations and maintenance activities (if available at that time).</li> <li>10. Analyse the manpower/ training requirements for O&amp;M team and recommend training program and schedules(if available at that time).</li> <li>11. Documentation of latest trends both in domestic and international market regarding project implementation and operations &amp; maintenance which can be relevant to NCRTC</li> <li>12. Prepare asset management plan including asset management policy, along with the asset policies for sub systems to cover the full life cycle management of physical assets from design, construction, operation, inspection and maintenance to take decision for renewal, alteration or replacement. Assessment of life cycle cost for the various project related assets</li> <li>13. Development of following systems but not limited to Monitoring and storing information about condition of all assets- <ul style="list-style-type: none"> <li>• Providing organization roles and staffing including delegation of authority, trainings required, manpower planning, job</li> </ul> </li> </ol>
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			<p>descriptions required for implementation and operations &amp; maintenance phase</p> <ul style="list-style-type: none"> <li>• Identification of policy provisions, terms and conditions specifically relating to BIM to be incorporated in all bid documents to ensure desired implementation of BIM.</li> <li>• Preparation of all documents with BIM Expert but not limited to Employer Information Requirement (EIR), Organizational Information Requirement (OIR), Asset Information Requirement (AIR), master delivery list, master information delivery plan in line with PAS 1192 or latest amendments</li> <li>• Implementation of RAMS in rail-based transit system. Defining the requirements of RAMS for the various sub systems.</li> </ul> <p>14. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
42	E44	<b>Chief Power Supply and Traction System Expert</b>	<ol style="list-style-type: none"> <li>1. Act as a person in charge of Power Supply &amp; Traction System including SCADA works.</li> <li>2. Reviewing DPR provisions related to respective domain and to provide recommendations for system improvements.</li> <li>3. Preparation of Bid documents based on preliminary design of GC, Cost Estimation, Bid Process management, Bid Evaluation and award of Contracts for Power Supply and Traction System including SCADA works.</li> <li>4. Review, proof check of Simulations/studies, Design documents and other submissions of contractors/agencies and value addition relevant to the Power Supply and Traction system including SCADA.</li> <li>5. Contract management and implementation of power supply &amp; traction system works including SCADA.</li> <li>6. Interface and coordination with other experts, system &amp; civil contractors, engineers and NCRTC representatives.</li> <li>7. Certification of milestones/measurements, billing and Recommendations for Payments to Contractors.</li> <li>8. Supervision of contractors/ suppliers/ manufactures in construction and system integration works.</li> <li>9. Any other role and responsibility assigned by PD/Employer.</li> </ol>
43	E45	<b>Sr. Traction System Expert</b>	<ol style="list-style-type: none"> <li>1. Reviewing of DPR provisions related to respective domain and to provide recommendations for system improvements.</li> <li>2. Preparation of Bid documents based on preliminary design of GC, Cost Estimation, Bid Process management, Bid Evaluation and award of Contracts for Power Supply and Traction System including SCADA works.</li> <li>3. Review, proof check of Simulations/studies, Design</li> </ol>

			<p>documents and other submissions of contractors/agencies and value addition relevant to the Power Supply and Traction system including SCADA.</p> <ol style="list-style-type: none"><li>4. Contract management and implementation of traction system works including SCADA for main line and Depots.</li><li>5. Interface and coordination with other experts, system &amp; civil contractors, Engineers and NCRTC representatives</li><li>6. Measurement, Billing and Recommendations for Payments to Contractors.</li><li>7. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li></ol>
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44	E46	Sr. Power Supply System Expert (Elevated and Underground)	<ol style="list-style-type: none"> <li>1. Reviewing of DPR provisions related to respective domain and to provide recommendations for system improvements.</li> <li>2. Preparation of Bid documents based on preliminary design of GC, Cost Estimation, Bid Process management, Bid Evaluation and award of Contracts for Power Supply and Traction System including SCADA works.</li> <li>3. Review, proof check of Simulations/studies, Design documents and other submissions of contractors/agencies and value addition relevant to the Power Supply and Traction system including SCADA.</li> <li>4. Contract management and implementation of Power Supply system works including SCADA.</li> <li>5. Interface and coordination with other experts, system &amp; civil contractors, Engineers and NCRTC representatives</li> <li>6. Measurement, Billing and Recommendations for Payments to Contractors.</li> <li>7. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
45	E47	Power Supply System Design Expert	<ol style="list-style-type: none"> <li>1. Reviewing of DPR provisions related to respective domain and to provide recommendations for system improvements.</li> <li>2. Preparation of Bid documents based on preliminary design of GC, Cost Estimation, Bid Process management, Bid Evaluation and award of Contracts for Power Supply and Traction System including SCADA works.</li> <li>3. Review, proof check of Simulations/studies, Design documents and other submissions of contractors/agencies and value addition relevant to the Power Supply and Traction system including SCADA.</li> <li>4. Contract management and implementation of traction system works including SCADA for main line and Depots.</li> <li>5. Interface and coordination with other experts, system &amp; civil contractors, Engineers and NCRTC representatives</li> <li>6. Measurement, Billing and Recommendations for Payments to Contractors.</li> <li>7. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
46	E48	Traction System Design Expert	<ol style="list-style-type: none"> <li>1. Reviewing of DPR provisions related to respective domain and to provide recommendations for system improvements.</li> <li>2. Preparation of Bid documents based on preliminary design of GC, Cost Estimation, Bid Process management, Bid Evaluation and award of Contracts for Power Supply and Traction System including SCADA works.</li> <li>3. Review, proof check of Simulations/studies, Design</li> </ol>

			<p>documents and other submissions of contractors/agencies and value addition relevant to the Power Supply and Traction system including SCADA.</p> <p>4.Contract management and implementation of traction system works including SCADA for main line and Depots.</p> <p>5.Interface and coordination with other experts, system &amp; civil contractors, Engineers and NCRTC representatives</p> <p>6.Measurement, Billing and Recommendations for Payments to Contractors.</p> <p>7.Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</p>
47	E49	<b>Chief E&amp;M, ECS,TVS and HVAC Expert</b>	<ol style="list-style-type: none"> <li>1. Recommendation of Estimates for Tender packages and of Tender Documents of E&amp;M, TVS, ECS, BMS Packages</li> <li>2. Review of Design, Proof checking &amp; recommendation with engineering report to NCRTC for approval,</li> <li>3. Prebid meetings, Tender evaluation, etc</li> <li>4. Procurement &amp; implementation of E&amp;M and TVS &amp; ECS system</li> <li>5. Site Monitoring and Interface for E&amp;M and TVS &amp; ECS Works.</li> <li>6. Vendor Evaluation &amp; Factory Inspection, Dispatch clearance after FAT (Factory Acceptance Test) of material/ equipment if required by Employer (NCRTC)</li> <li>7. Issue Milestone Certificate of Site work with MIR (Material inspection report) and Site measurement of work. Payment recommendation to Employer.</li> <li>8. Verification and submission of Documents for statutory clearance including CMRS (Commissioner Metro Rail Safety) and Fire Authority, Directorate of Electrical Safety, EIG, etc.</li> <li>9. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
48	E50	<b>Sr. E&amp;M Expert – Elevated</b>	<ol style="list-style-type: none"> <li>1. Reviewing of DPR (Detail Project Report) &amp; DBR (Design Base report) provisions related to respective domain and to provide recommendations for systemimprovements.</li> <li>2. Preparation of Estimates for Tender packages and Preparation of Tender Documents of E&amp;M Packages</li> <li>3. Review of Design, Proof checking &amp; recommendation with engineering report to NCRTC for approval,</li> <li>4. Bid Process management, Prebid meetings, Tender evaluation, etc.</li> <li>5. Procurement &amp; implementation of E&amp;M system (LV System, Fire Detection, Solar, Fire Suppression System and utilities) for elevated stations and other Buildings.</li> </ol>



			<ol style="list-style-type: none"> <li>6. Site Supervision and Interface at site for E&amp;M Works.</li> <li>7. Vendor Evaluation &amp; Factory Inspection, Dispatch clearance after FAT (Factory Acceptance Test) of material/ equipment if required by Employer (NCRTC)</li> <li>8. Issue Milestone Certificate of Site work with MIR (Material inspection report) and Site measurement of work. Payment recommendation to Employer.</li> <li>9. Preparation, Verification and submission of Documents for statutory clearance including CMRS (Commissioner Metro Rail Safety) and Fire Authority, Directorate of Electrical Safety, EIG, etc.</li> <li>10. Supervise the defect rectification works during DefectLiability Period/ Defect Notification Period.</li> <li>11. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
49	E51	Sr. E&M Expert (Underground)	<ol style="list-style-type: none"> <li>1. Design/Design Verification, procurement, implementation of E&amp;M system (LV System, Fire Detection, Fire Suppression System and utilities) for underground stations and other Buildings.</li> <li>2. Supervision and Interface against E&amp;M Works.</li> <li>3. Supervise the defect rectification works during DefectLiability / Notification Period (DLP/DNP).</li> <li>4. Technical compliances of contract for E&amp;M system.</li> <li>5. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
50	E52	Sr. ECS, TVS, HVAC & BMS Expert	<ol style="list-style-type: none"> <li>1. Design/Design Verification, procurement, implementation of Environment Control System, Tunnel Ventilation System and Building Management system for underground stations and associated tunnels.</li> <li>2. Supervision and Interface against ECS, TVS, BMS &amp; HVAC Works.</li> <li>3. Supervise the defect rectification works during DefectLiability / Notification Period (DLP/DNP).</li> <li>4. Technical compliances of contract for ECS, TVS, BMS &amp; HVAC Works.</li> <li>5. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
51	E53	Sr. Lift and EscalatorExpert	<ol style="list-style-type: none"> <li>1. Preparation of Estimates for Tender packages and Preparation of Tender Documents</li> <li>2. Review of Design, Proof checking &amp; recommendation with engineering report to NCRTC for approval,</li> <li>3. Bid Process management, Prebid meetings, Tender evaluation, etc.</li> <li>4. Procurement, Implementation and Lifts &amp; Escalators/Travellators.</li> <li>5. Supervision and Interface for Lifts, Escalators/travellators Works.</li> </ol>

			<ol style="list-style-type: none"> <li>6. Vendor Evaluation &amp; Factory Inspection, Dispatch clearance after FAT (Factory Acceptance Test) of material and Prototype of Escalator, lift &amp; Travelator if required by Employer (NCRTC)</li> <li>7. Issue Milestone Certificate of Site work with MIR (Material inspection report) and Site measurement of work. Payment recommendation to Employer</li> <li>8. Preparation, Verification and submission of Documents for statutory clearance including CMRS (Commissioner Metro Rail Safety) and Directorate of Electrical Safety, Lift Inspector, etc.</li> <li>9. Supervise the defect rectification works during Defect Liability Period.</li> <li>10. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
52	E54	Sr. Depot Facility Design & Installation Expert	<ol style="list-style-type: none"> <li>1. Preparation of Estimates for Tender packages and Preparation of Tender Documents of E&amp;M Packages</li> <li>2. Review of Design, Proof checking &amp; recommendation with engineering report to NCRTC for approval,</li> <li>3. Reviewing of DPR (Detail Project Report) &amp; DBR (Design Base report) provisions related to respective domain and to provide recommendations for system improvements</li> <li>4. Bid Process management, Prebid meetings, Tender evaluation, etc.</li> <li>5. Procurement &amp; implementation of E&amp;M system (LV System, Fire Detection, Solar, Fire Suppression System and utilities) for elevated stations and other Buildings.</li> <li>6. Site Supervision and Interface at site for E&amp;M Works.</li> <li>7. Vendor Evaluation &amp; Factory Inspection, Dispatch clearance after FAT (Factory Acceptance Test) of material/ equipment if required by Employer (NCRTC)</li> <li>8. Issue Milestone Certificate of Site work with MIR (Material inspection report) and Site measurement of work. Payment recommendation to Employer.</li> <li>9. Preparation, Verification and submission of Documents for statutory clearance including CMRS (Commissioner Metro Rail Safety) and Fire Authority, Directorate of Electrical Safety, EIG, etc</li> <li>10. Supervise the defect rectification works during Defect Liability Period/ Defect Notification Period.</li> <li>11. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>

53	E55	Expert for Building and Electro-Mechanical Services	<ol style="list-style-type: none"> <li>1. Reviewing of DPR (Detail Project Report) &amp; DBR (Design Base report) provisions related to respective domain and to provide recommendations for system improvements</li> <li>2. Preparation of Estimates for Tender packages and Preparation of Tender Documents</li> <li>3. Review of Design, Proof checking &amp; recommendation with engineering report to NCRTC for approval,</li> <li>4. Bid Process management, Prebid meetings, Tender evaluation, etc.</li> <li>5. Procurement &amp; implementation of BMS (Building Management System) of LV System, Fire Detection, Fire Suppression System, Plumbing, ECS &amp; TVS System, Solar, Lift &amp; Escalators and utilities) for elevated &amp; Underground stations and other Buildings.</li> <li>6. Site Supervision and Interface at site.</li> <li>7. Vendor Evaluation &amp; Factory Inspection, Dispatch clearance after FAT (Factory Acceptance Test) of material/ equipment if required by Employer (NCRTC)</li> <li>8. Issue Milestone Certificate of Site work with MIR (Material inspection report) and Site measurement of work. Payment recommendation to Employer.</li> <li>9. Preparation, Verification and submission of Documents for CMRS (Commissioner Metro Rail Safety)</li> <li>10. Supervise the defect rectification works during Defect Liability Period/ Defect Notification Period.</li> <li>11. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li> </ol>
54	E57	<b>Chief Depot Expert</b>	<ol style="list-style-type: none"> <li>1. Chief Depot Expert will be responsible for Overall Project Management, facility/ workshop/ offices development for Depot. Further, Chief Depot Expert shall be broadly involved in the following major tasks but not limited to: Planning, design and operation of Depot.</li> </ol>
55	E58	<b>Sr. Rolling Stock Expert</b>	<p>The broad activities of the key experts shall include but not limited to:</p> <ol style="list-style-type: none"> <li>1. Design, procure and implement Rolling Stocks for continuous automatic train control rail based transit system</li> <li>2. Provide tender design/drawings along with specifications for related components covering aspects of efficiency and maintenance etc.</li> <li>3. Assistance in providing relevant inputs during the entire bid process management</li> <li>4. Assist in testing and commissioning including final acceptance of the rolling stock based on the results of the prototype, serial and/or system test.</li> <li>5. Assist in detailed interfacing with other sub components.</li> </ol>

			<ol style="list-style-type: none"><li>6. Any other roles and responsibilities required to be performed to complete the project and assigned by the PD/Employer.</li><li>7. Perform following activities:<ol style="list-style-type: none"><li>a. Identification of all systems and parameter</li><li>b. Approvals of sub-systems of the rolling stock such as propulsion, current collection systems, seating arrangement, passenger amenities, energy efficiency parameters, illumination, Wheel profile, etc.</li><li>c. Assist in system integration.</li></ol></li><li>8. Design and Safety certification from ISA and obtaining Statutory Approval.</li><li>9. All kinds of communications and interface for Rolling Stock Works with General Consultant of Delhi-Bawal Namo Bharat Corridor.</li></ol>
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