RFP Document Volume-II (Part-2)

Schedules ‘A’ to ‘P’

[except Sch.‘D’]

Redevelopment of Ludhiana Junction Railway Station in Firozpur Division of Northern Railway.

Ministry of Railways
Government of India

Dated - 21.09.2022

Index

Schedules

SCHEDULE – A
(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site:

1.1. Site of the Project shall include the land, buildings and structures as described in Annex-I of this Schedule-A.

1.2. The dates of handing over Right of Way to the Contractor are specified in Annex-II of this Schedule-A.

1.3. An inventory of the Site including the land, buildings, structures, track works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority's Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2.1 of this Agreement.

1.4. The master plan/layout plan of the Project is specified in Annex-III.

1.5. The status of the forest clearances obtained or awaited is given in Annex IV.

Annex-I

SCHEDULE-A

1. SITE: Ludhiana Junction Railway Station

Redevelopment of Ludhiana Junction Railway Station to integrate approximate 85.8 Acres of Station complex with other infrastructure and facilities to provide a seamless experience to the passengers. Currently Ludhiana Junction Railway station has a large number of passengers flowvolume (69,778 Nos. per day) and this is estimated that the projected footfall would be somewhere near 82,260 Nos. per day in the coming forty-five years.

Key Points

- **World class infrastructure** – Emphasis as an integrated and efficient transportation hub.
- **Smart City Concept** – Developing as one of the smart cities of India.
- **Iconic Architecture -** Including state of the art architecture, technology and energy.

Description of Project Facilities

The station Development project shall comprise of the development of station building to be constructed on Land and Airspace as earmarked on the Master plan as per and Railway operational Area Land is categorized as below:

S.no.	*Description*	*Area (Sqm)*
1.	Area under Railway operation	3,47,217
2.	Area under Roads	20730
3.	Area under Public Greens	10,955

Proposed Land for:

S. No.	Building Block	Total Built Up Area (in sq.m.)
1	Main Station Building (East Side)	23181
2	Arrival Concourse (East Side) – JRC End (in sub-plot 1)	10248
3	Secondary Station Building (West Side)	8239
4	72m Wide Departure Air concourse	5350
5	Railway Hospital	2302
6	Elevated Departure Level Plaza (on East Side)	3385
7	Plaza & Promenade Area at Ground Floor	5550
8	FOB connection on North Side	2860
9	FOB connection on South Side	2735
10	Platform Development Area	24190

S. No.	Building Block	Total Built Up Area (in sq.m.)
11	Type-II (80 Units) 04 Tower	8036
12	Type-III (40 Units) 02 Tower	4454
13	Type-IV , (10- Units) 01 Tower	1864
14	Rest House	823
15	Relocation of Existing Railway Quarters	26932
16	Temporary UTS/PRS	200
17	Through roof Area (including Departure Air Concourse Area)	29500

For Existing Structures, Utilities, Encroachments, Encumbrances and Existing Trees, please refer Survey drawing (Survey will be part of Contactor).

Drawings are enclosed (as link in general instructions) as per the below list:

List of Tender Drawings – Architectural		
Sl. No.	DRAWING No	Title
A	**Master Plan**	
1	LDH-TD-AR-SP-101	SITE PLAN (At Platform Level)
2	LDH-TD-AR-CON-152	SITE PLAN AT +9000 LVL (showing FOB & Air Concourse)
3	LDH-TD-AR-SS-201	TYPICAL SITE SECTION
4	LDH-TD-AR-CP-101	CIRCULATION PLAN AT PLATFORM LVL
5	LDH-TD-AR-CP-102	CIRCULATION PLAN AT +9000 LVL
6	LDH-TD-AR-SP-Resi-101	SITE PLAN RESIDENTIAL
7	LDH-TD-LS-SP -100	LANDSCLAPE SITE PLAN
B	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-AR-EB-151	GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
2	LDH-TD-AR-EB-152	FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
3	LDH-TD-AR-EB-153	DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
4	LDH-TD-AR-EB-154	THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
5	LDH-TD-AR-EB-155	FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
6	LDH-TD-AR-EB-201	SECTIONS
7	LDH-TD-AR-EB-301	FRONT ELEVATION
8	LDH-TD-AR-EB-302	FRONT ELEVATION WITH ELEVATED ROAD

C	WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)	
1	LDH-TD-AR-WTB-151	GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
2	LDH-TD-AR-WTB-152	FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
3	LDH-TD-AR-WTB-153	SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
4	LDH-TD-AR-WTB-201	SECTIONS WEST SIDE BUILDING
5	LDH-TD-AR-WTB-202	SECTION THROUGH FOB CONNECTION WEST SIDE BUILDING
6	LDH-TD-AR-WTB-301	FRONT ELEVATIONS (WEST SIDE BUILDING)
7	LDH-TD-AR-WTB-401	TOILET DETAIL-01 WEST SIDE BUILDING
8	LDH-TD-AR-WTB-402	TOILET DETAIL-02 WEST SIDE BUILDING
9	LDH-TD-AR-WTB-501	STAIRCASE DETAIL-02 WEST SIDE BUILDING
10	LDH-TD-AR-WTB-502	STAIRCASE DETAIL-03 WEST SIDE BUILDING
D	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-AR-AB-JRC-151	EAST SIDE ARRIVAL CUM MLCP BUILDING (JRC) GROUND & FIRST FLOOR PLAN
2	LDH-TD-AR-AB-JRC-152	EAST SIDE ARRIVAL CUM MLCP BUILDING (JRC) SECOND
3	LDH-TD-AR-AB-JRC-201	EAST SIDE ARRIVAL BUILDING (JRC) SECTIONS
4	LDH-TD-AR-AB-JRC-301	FRONT ELEVATION
E	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-AR-TYPE 02-151	GROUND FLOOR TYPE-02 RESIDENCE
2	LDH-TD-AR-TYPE 03-152	TYPICAL FLOOR TYPE-02 RESIDENCE
3	LDH-TD-AR-TYPE 03-153	MACHINE ROOOM LVL. TYPE-02 RESIDENCE
4	LDH-TD-AR-TYPE 03-301	ELEVATIONS TYPE-02 RESIDENCE

F	TYPE-III RESIDENCE (S+5)	
1	LDH-TD-AR-TYPE 03-151	STILT FLOOR TYPE-03 RESIDENCE
2	LDH-TD-AR-TYPE 03-152	TYPICAL FLOOR TYPE-03 RESIDENCE
3	LDH-TD-AR-TYPE 03-153	MACHINE ROOOM LVL. TYPE-03 RESIDENCE
4	LDH-TD-AR-TYPE 03-201	SECTION & ELEVATION TYPE-03 RESIDENCE
5	LDH-TD-AR-TYPE 03-401	TOILET DETAIL TYPE-03 RESIDENCE
6	LDH-TD-AR-TYPE 03-451	KITCHEN DETAIL TYPE-03 RESIDENCE
7	LDH-TD-AR-TYPE 03-501	TYPICAL STAIRCASE DETAIL TYPE-03 RESIDENCE
8	LDH-TD-AR-TYPE 03-600	OPENING DETAIL TYPE-03 RESIDENCE
9	LDH-TD-AR-TYPE 03-701	BALCONY DETAILS TYPE-03 RESIDENCE
10	LDH-TD-AR-TYPE 03-702	CUPBOARD DETAIL TYPE-03 RESIDENCE
11	LDH-TD-AR-TYPE 03-751	UNIT FLOORING PLAN TYPE-03 RESIDENCE
12	LDH-TD-AR-TYPE 03-752	FLOORING & RCP FOR COMMON AREA
G	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-AR-TYPE 04-151	GROUND FLOOR PLAN TYPE-04 RESIDENCE
2	LDH-TD-AR-TYPE 04-152	FIRST FLOOR PLAN TYPE-04 RESIDENCE
3	LDH-TD-AR-TYPE 04-153	TYPICAL FLOOR PLAN TYPE-04 RESIDENCE
4	LDH-TD-AR-TYPE 04-154	TERRACE FLOOR PLAN TYPE-04 RESIDENCE
5	LDH-TD-AR-TYPE-04-301	ELEVATION-01 TYPE-04 RESIDENCE
6	LDH-TD-AR-TYPE-04-302	ELEVATION-02 TYPE-04 RESIDENCE
7	LDH-TD-AR-TYPE-04-303	ELEVATION-03 TYPE-04 RESIDENCE
8	LDH-TD-AR-TYPE-04-304	ELEVATION-04 TYPE-04 RESIDENCE
9	LDH-TD-AR-TYPE-04-305	SKIN SECTIONS TYPE-04 RESIDENCE
10	LDH-TD-AR-TYPE-04-501	STAIRCASE-01 DETAIL TYPE-04 RESIDENCE
11	LDH-TD-AR-TYPE-04-502	STAIRCASE-02 DETAIL TYPE-04 RESIDENCE
12	LDH-TD-AR-TYPE-04-601	OPENING DETAIL TYPE-04 RESIDENCE
H	**REST HOUSE (G+1)**	
1	LDH-TD-AR-RH-151	FLOOR PLANS
I	**HOSPITAL BUILDING**	
1	LDH-TD-AR-HB-151	GROUND FLOOR PLAN HOSPITAL BUILDING

2	LDH-TD-AR-HB-152	FIRST FLOOR PLAN HOSPITAL BUILDING
3	LDH-TD-AR-HB-153	TERRACE FLOOR PLAN HOSPITAL BUILDING
4	LDH-TD-AR-HB-201	SECTION & ELEVATIONS HOSPITAL BUILDING
5	LDH-TD-AR-HB-401	TYPICAL TOILET DETAIL HOSPITAL BUILDING
6	LDH-TD-AR-HB-501	STAIRCASE DETAIL HOSPITAL BUILDING
J	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-AR-CON-151	PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08)
2	LDH-TD-AR-CON-152	PLAN AT +8760 LEVEL (Showing FOB & Air Concourse)
3	LDH-TD-AR-CON-153	PLAN AT +9000 LEVEL (BLOW UP) (Showing FOB & Air Concourse)
5	LDH-TD-AR-CON-201	FOB, PLATFORM & AIR-CONCOURSE SECTIONS
6	LDH-TD-AR-CON-151	PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08)
K	**DETAILS**	
1	LDH-TD-AR-ESC-701	TYPICAL ESCALATOR DETAIL
2	LDH-TD-AR-LL-701	TYPICAL LIFT LOBBY DETAIL
3	LDH-TD-AR-GL-701	TYPICAL GLAZING DETAIL
4	LDH-3D View-01	CANOPY 3D VIEW 01
I	**TEMPORARY RELOCATION DRAWINGS(as attached in link)**	

STRUCTURAL DRAWINGS		
	TYPE-II (S+5)	
1	FOUNDATION PLAN & DETAIL	LJR-TD-ST-TYPE II-101
2	FRAMING PLAN AT PLINTH LVL.	LJR-TD-ST-TYPE III-102
3	FRAMING PLAN AT TYPICAL FLOOR LVL.	LJR-TD-ST-TYPE III-103
4	FRAMING PLAN AT TERRACE LVL.	LJR-TD-ST-TYPE III-104
5	FRAMING PLAN AT MUMTY MACHINE ROOM LVL.	LJR-TD-ST-TYPE III-105
	TYPE-III (S+5)	
6	FOUNDATION PLAN & DETAIL	LJR-TD-ST-TYPE III-101
7	FRAMING PLAN AT PLINTH LVL.	LJR-TD-ST-TYPE III-102
8	FRAMING PLAN AT TYPICAL FLOOR LVL.	LJR-TD-ST-TYPE III-103
9	FRAMING PLAN AT TERRACE LVL.	LJR-TD-ST-TYPE III-104
10	FRAMING PLAN AT MUMTY MACHINE ROOM LVL.	LJR-TD-ST-TYPE III-105
	TYPE-IV (S+5)	
11	FOUNDATION PLAN & DETAIL	LJR-TD-ST-TYPE IV-101
12	FRAMING PLAN AT PLINTH LVL.	LJR-TD-ST-TYPE IV-102
13	FRAMING PLAN AT FIRST FLOOR LVL.	LJR-TD-ST-TYPE IV-103
14	FRAMING PLAN AT TYPICAL FLOOR LVL.	LJR-TD-ST-TYPE IV-104
15	FRAMING PLAN AT TERRACE LVL.	LJR-TD-ST-TYPE IV-105
16	FRAMING PLAN AT MUMTY & MACHINE ROOM LVL.	LJR-TD-ST-TYPE IV-106
	REST HOUSE (G+1)	
17	FOUNDATION PLAN & DETAIL	LJR-TD-ST-RH-101
18	FRAMING PLAN AT PLINTH & FIRST FLOOR LVL.	LJR-TD-ST-RH-102
19	FRAMING PLAN AT TERRACE & MUMTY LVL.	LJR-TD-ST-RH-103
	HOSPITAL BUILDING (G+1)	
20	FOUNDATION PLAN & DETAIL	LJR-TD-ST-HB-101
21	FRAMING PLAN AT PLINTH LVL.	LJR-TD-ST-HB-102
22	FRAMING PLAN AT FIRST FLOOR LVL.	LJR-TD-ST-HB-103
23	FRAMING PLAN AT TERRACE LVL.	LJR-TD-ST-HB-104
	EAST SIDE DEPARTURE BUILDING	
24	FOUNDATION PLAN & DETAIL	LJR-TD-ST-ESDB-101
25	FRAMING PLAN AT PLINTH LVL.	LJR-TD-ST-ESDB-102
26	FRAMING PLAN AT +4.800 LEVEL	LJR-TD-ST-ESDB-103
27	FRAMING PLAN AT +9.000 LEVEL	LJR-TD-ST-ESDB-104
28	FRAMING PLAN AT +13.500 LEVEL	LJR-TD-ST-ESDB-105
29	FRAMING PLAN AT +18.000 LEVEL	LJR-TD-ST-ESDB-106
	WEST SIDE BUILDING	
30	FOUNDATION PLAN & DETAIL	LJR-TD-ST-WSB-101
31	FRAMING PLAN AT PLINTH LVL.	LJR-TD-ST-WSB-102
32	FRAMING PLAN AT +4.200 LEVEL	LJR-TD-ST-WSB-103
33	FRAMING PLAN AT +4.650 LEVEL	LJR-TD-ST-WSB-104
34	FRAMING PLAN AT +8.700 LEVEL	LJR-TD-ST-WSB-105
35	FRAMING PLAN AT THIRD FLOOR LEVEL	LJR-TD-ST-WSB-106
	JRC END ARRIVAL BLDG	
36	FOUNDATION PLAN	LJR-TD-ST-JRC-101
37	FRAMING PLAN AT GR. & 1ST FLOOR LVL.	LJR-TD-ST-JRC-102
38	FRAMING PLAN AT 2ND & TYP. FLOOR LVL.	LJR-TD-ST-JRC-103
	CONCOURSE, FOB & PLATFORM	
39	FOB & AIR CONCOURSE FOUNDATION PLAN (SHEET 1 OF 4)	LJR-TD-ST-FOB-101
40	FOB & AIR CONCOURSE FOUNDATION PLAN (SHEET 2 OF 4)	LJR-TD-ST-FOB-101
41	FOB & AIR CONCOURSE FOUNDATION PLAN (SHEET 3 OF 4)	LJR-TD-ST-FOB-101
42	FOB & AIR CONCOURSE FOUNDATION PLAN (SHEET 4 OF 4)	LJR-TD-ST-FOB-101
43	FOB & AIR CONCOURSE FOUNDATION PLAN	LJR-TD-ST-FOB-101A
44	PLATFORM PART FRAMING PLAN	LJR-TD-ST-PF-101
45	FOB & AIR CONCOURSE LEVEL FRAMING PLAN (SHEET 1 OF 4)	LJR-TD-ST-FOB-102
46	FOB & AIR CONCOURSE LEVEL FRAMING PLAN (SHEET 2 OF 4)	LJR-TD-ST-FOB-102

47	FOB & AIR CONCOURSE LEVEL FRAMING PLAN (SHEET 3 OF 4)	LJR-TD-ST-FOB-102
48	FOB & AIR CONCOURSE LEVEL FRAMING PLAN (SHEET 4 OF 4)	LJR-TD-ST-FOB-102
49	FOB & AIR CONCOURSE LEVEL FRAMING PLAN	LJR-TD-ST-FOB-102A
50	FOB & AIR CONCOURSE TOP ROOF LEVEL FRAMING PLAN (SHEET 1 OF 4)	LJR-TD-ST-FOB-103
51	FOB & AIR CONCOURSE TOP ROOF LEVEL FRAMING PLAN (SHEET 2 OF 4)	LJR-TD-ST-FOB-103
52	FOB & AIR CONCOURSE TOP ROOF LEVEL FRAMING PLAN (SHEET 3 OF 4)	LJR-TD-ST-FOB-103
53	FOB & AIR CONCOURSE TOP ROOF LEVEL FRAMING PLAN (SHEET 4 OF 4)	LJR-TD-ST-FOB-103
54	FOB & AIRCONCOURSE LEVEL TOP ROOF LEVEL FRAMING PLAN	LJR-TD-ST-FOB-103A
55	FOB & AIRCONCOURSE LEVEL TOP ROOF LEVEL FRAMING PLAN	LJR-TD-ST-FOB-103B
	ELEVATED ROAD	
56	FOUNDATION PLAN	LJR-TD-ST-ELV. ROAD-101
57	FRAMING PLAN	LJR-TD-ST-ELV. ROAD-102

List of Tender Drawings - Electrical		
Sno	**DRAWING No**	**Title**
A	**Site Plan**	
1	LDH-TD-EL-SP-101	SITE PLAN
B	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-EL-EB-151	GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) ELECTRICAL LAYOUT
2	LDH-TD-EL-EB-152	FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) ELECTRICAL LAYOUT
3	LDH-TD-EL-EB-153	DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) ELECTRICAL LAYOUT
4	LDH-TD-EL-EB-154	THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) ELECTRICAL LAYOUT
5	LDH-TD-EL-EB-155	FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) ELECTRICAL LAYOUT
C	**WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)**	
1	LDH-TD-EL-WTB-151	GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) ELECTRICAL LAYOUT
2	LDH-TD-EL-WTB-152	FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) ELECTRICAL LAYOUT
3	LDH-TD-EL-WTB-153	SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) ELECTRICAL LAYOUT
4	LDH-TD-EL-WTB-154	THIRD (TYPICAL) FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) ELECTRICAL LAYOUT
D	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-EL-AB-JRC-151	EAST SIDE ARRIVAL BUILDING (JRC) GROUND & FIRST FLOOR PLAN ELECTRICAL LAYOUT
2	LDH-TD-EL-AB-JRC-152	EAST SIDE ARRIVAL BUILDING (JRC) SECOND & TYPICAL FLOOR PLAN ELECTRICAL LAYOUT
E	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-EL-TYPE 02-151	GROUND FLOOR TYPE-02 RESIDENCE ELECTRICAL LAYOUT
2	LDH-TD-EL-TYPE 02-152	TYPICAL FLOOR TYPE-02 RESIDENCE ELECTRICAL LAYOUT
3	LDH-TD-EL-TYPE 02-153	MACHINE ROOM LEVEL PLAN TYPE-02 RESIDENCE ELECTRICAL LAYOUT
F	**TYPE-III RESIDENCE (S+5)**	
1	LDH-TD-EL-TYPE 03-151	STILT FLOOR TYPE-03 RESIDENCE ELECTRICAL LAYOUT

2	LDH-TD-EL-TYPE 03-152	TYPICAL FLOOR TYPE-03 RESIDENCE ELECTRICAL LAYOUT
3	LDH-TD-EL-TYPE 03-153	MACHINE ROOM LVL TYPE-03 RESIDENCE ELECTRICAL LAYOUT
G	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-EL-TYPE 04-151	GROUND FLOOR PLAN TYPE-04 RESIDENCE ELECTRICAL LAYOUT
2	LDH-TD-EL-TYPE 04-152	FIRST FLOOR PLAN TYPE-04 RESIDENCE ELECTRICAL LAYOUT
3	LDH-TD-EL-TYPE 04-153	TYPICAL FLOOR PLAN TYPE-04 RESIDENCE ELECTRICAL LAYOUT
4	LDH-TD-EL-TYPE 04-154	TERRACE FLOOR PLAN TYPE-04 RESIDENCE ELECTRICAL LAYOUT
H	**REST HOUSE (G+1)**	
1	LDH-TD-EL-RH-151	FLOOR PLANS
I	**HOSPITAL BUILDING**	
1	LDH-TD-EL-HB-151	GROUND FLOOR PLAN HOSPITAL BUILDING ELECTRICAL LAYOUT
2	LDH-TD-EL-HB-152	FIRST FLOOR PLAN HOSPITAL BUILDING ELECTRICAL LAYOUT
3	LDH-TD-EL-HB-153	TERRACE FLOOR PLAN HOSPITAL BUILDING ELECTRICAL LAYOUT
J	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-EL-CON-151	PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08) ELECTRICAL LAYOUT
2	LDH-TD-EL-CON-152	PLAN AT +8760 LEVEL (Showing FOB & Air Concourse) ELECTRICAL LAYOUT
3	LDH-TD-EL-CON-153	PLAN AT +9000 LEVEL (BLOW UP) (Showing FOB & Air Concourse) ELECTRICAL LAYOUT

LUDHIANA JUNCTION RAILWAY STATION REDEVELOPMENT		
List of Tender Drawings - Plumbing		
Sno	**DRAWING No**	**Title**
	-	-
A	**Site Plan**	-
1	LDH-TD-PL-SP-101	PLUMBING SITE PLAN (At Platform Level)
2	LDH-TD-PL-SP-RESI-101	PLUMBING SITE LAYOUT RESIDENTIAL (AT COLONY-05)
B	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-PL-EB-151	PLUMBING GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
2	LDH-TD-PL-EB-152	PLUMBING FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
3	LDH-TD-PL-EB-153	PLUMBING DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
4	LDH-TD-PL-EB-154	PLUMBING THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
5	LDH-TD-PL-EB-155	PLUMBING FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
6	LDH-TD-PL-401	PLUMBING TOILET DETAILS
7	LDH-TD-PL-SCH-402	PLUMBING SCHEAMTIC DIAGRAM
C	**WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)**	
1	LDH-TD-PL-WTB-151	PLUMBING GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
2	LDH-TD-PL-WTB-152	PLUMBING FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
3	LDH-TD-PL-WTB-153	PLUMBING SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
4	LDH-TD-PL-WTB-401	PLUMBING TOILET DETAIL-01 WEST SIDE BUILDING
5	LDH-TD-PL-WTB-402	PLUMBING TOILET DETAIL-02 WEST SIDE BUILDING
6	LDH-TD-PL-SCH-WTB-501	PLUMBING SCHEAMTIC DIAGRAM
D	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-PL-AB-JRC-151	PLUMBING EAST SIDE ARRIVAL BUILDING (JRC) GROUND & FIRST FLOOR PLAN
2	LDH-TD-PL-AB-JRC-152	PLUMBING EAST SIDE ARRIVAL BUILDING (JRC) SECOND & TYPICAL FLOOR PLAN
3	LDH-TD-PL-AB-JRC-401	PLUMBING SCHEAMTIC DIAGRAM
E	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-PL-TYPE 02-151	PLUMBING GROUND FLOOR TYPE-02 RESIDENCE
2	LDH-TD-PL-TYPE 02-152	PLUMBING FIRST FLOOR TYPE-02 RESIDENCE
3	LDH-TD-PL-TYPE 02-153	PLUMBING MACHINE ROOOM LVL. TYPE-02 RESIDENCE
4	LDH-TD-PL-TYPE 02-401	PLUMBING SCHEAMTIC DIAGRAM

F	**TYPE-III RESIDENCE (S+5)**	
1	LDH-TD-PL-TYPE 03-151	PLUMBING STILT FLOOR TYPE-03 RESIDENCE
2	LDH-TD-PL-TYPE 03-152	PLUMBING TYPICAL FLOOR TYPE-03 RESIDENCE
3	LDH-TD-PL-TYPE 03-153	PLUMBING MACHINE ROOOM LVL. TYPE-03 RESIDENCE
4	LDH-TD-PL-TYPE 03-401	PLUMBING TOILET DETAIL TYPE-03 RESIDENCE
5	LDH-TD-PL-TYPE 03-451	PLUMBING KITCHEN DETAIL TYPE-03 RESIDENCE
6	LDH-TD-PL-SCH-TYPE 03-402	PLUMBING SCHEAMTIC DIAGRAM
G	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-PL-TYPE 04-151	PLUMBING GROUND FLOOR PLAN TYPE-04 RESIDENCE
2	LDH-TD-PL-TYPE 04-152	PLUMBING FIRST FLOOR PLAN TYPE-04 RESIDENCE
3	LDH-TD-PL-TYPE 04-153	PLUMBING SECOND FLOOR PLAN TYPE-04 RESIDENCE
4	LDH-TD-PL-TYPE 04-154	PLUMBING TERRACE FLOOR PLAN TYPE-04 RESIDENCE
5	LDH-TD-PL-TYPE-04-401	PLUMBING SCHEAMTIC DIAGRAM
H	**REST HOUSE (G+1)**	
1	LDH-TD-PL-RH-151	PLUMBING FLOOR PLANS
I	**HOSPITAL BUILDING**	
1	LDH-TD-PL-HB-151	PLUMBING GROUND FLOOR PLAN HOSPITAL BUILDING
2	LDH-TD-PL-HB-152	PLUMBING FIRST FLOOR PLAN HOSPITAL BUILDING
3	LDH-TD-PL-HB-153	PLUMBING TERRACE FLOOR PLAN HOSPITAL BUILDING
4	LDH-TD-PL-HB-401	PLUMBING TYPICAL TOILET DETAIL HOSPITAL BUILDING
5	LDH-TD-PL-HB-402	PLUMBING SCHEAMTIC DIAGRAM
J	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-PL-CON-151	PLUMBING PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08)
2	LDH-TD-PL-CON-152	PLUMBING PLAN AT +9000 LEVEL (Showing FOB & Air Concourse)
3	LDH-TD-PL-CON-153	PLUMBING PLAN AT +9000 LEVEL (BLOW UP) (Showing FOB & Air Concourse)

LUDHIANA JUNCTION RAILWAY STATION REDEVELOPMENT		
List of Tender Drawings - Fire fighting		
Sno	**DRAWING No**	**Title**
	-	-
A	**Site Plan**	-
1	LDH-TD-FF-SP-101	FIRE FIGHTING SITE PLAN (At Platform Level)
B	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-FF-EB-151	FIRE FIGHTING GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
2	LDH-TD-FF-EB-152	FIRE FIGHTING FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
3	LDH-TD-FF-EB-153	FIRE FIGHTING DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
4	LDH-TD-FF-EB-154	FIRE FIGHTING THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
5	LDH-TD-FF-EB-155	FIRE FIGHTING FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
6	LDH-TD-FF-SCH-EB-401	FIRE FIGHTING SCHEMATIC, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
C	**WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)**	
1	LDH-TD-FF-WTB-151	FIRE FIGHTING GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
2	LDH-TD-FF-WTB-152	FIRE FIGHTING FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
3	LDH-TD-FF-WTB-153	FIRE FIGHTING SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
4	LDH-TD-FF-SCH-WTB-401	FIRE FIGHTING SCHEMATIC WEST SIDE BUILDING
D	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-FF-AB-JRC-151	FIRE FIGHTING EAST SIDE ARRIVAL BUILDING (JRC) GROUND & FIRST FLOOR PLAN
2	LDH-TD-FF-AB-JRC-152	FIRE FIGHTING EAST SIDE ARRIVAL BUILDING (JRC) SECOND & TYPICAL FLOOR PLAN
3	LDH-TD-FF-AB-JRC-401	FIRE FIGHTING SCHEMATIC EAST SIDE ARRIVAL BUILDING (JRC)
E	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-FF-TYPE 02-151	FIRE FIGHTING GROUND FLOOR TYPE-02 RESIDENCE
2	LDH-TD-FF-TYPE 03-152	FIRE FIGHTING FIRST FLOOR TYPE-02 RESIDENCE

3	LDH-TD-FF-TYPE 03-153	FIRE FIGHTING MACHINE ROOOM LVL. TYPE-02 RESIDENCE
4	LDH-TD-FF-TYPE 03-401	FIRE FIGHTING SCHEMATIC TYPE-02 RESIDENCE
F	**TYPE-III RESIDENCE (S+5)**	
1	LDH-TD-FF-TYPE 03-151	FIRE FIGHTING STILT FLOOR TYPE-03 RESIDENCE
2	LDH-TD-FF-TYPE 03-152	FIRE FIGHTING TYPICAL FLOOR TYPE-03 RESIDENCE
3	LDH-TD-FF-TYPE 03-153	FIRE FIGHTING MACHINE ROOOM LVL. TYPE-03 RESIDENCE
4	LDH-TD-FF-TYPE 03-401	FIRE FIGHTING SCHEMATIC TYPE-03 RESIDENCE
G	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-FF-TYPE 04-151	FIRE FIGHTING GROUND FLOOR PLAN TYPE-04 RESIDENCE
2	LDH-TD-FF-TYPE 04-152	FIRE FIGHTING FIRST FLOOR PLAN TYPE-04 RESIDENCE
3	LDH-TD-FF-TYPE 04-153	FIRE FIGHTING SECOND FLOOR PLAN TYPE-04 RESIDENCE
4	LDH-TD-FF-TYPE 04-154	FIRE FIGHTING TERRACE FLOOR PLAN TYPE-04 RESIDENCE
5	LDH-TD-FF-SCH-TYPE 04-401	FIRE FIGHTING SCHEMATIC TYPE-04 RESIDENCE
H	**REST HOUSE (G+1)**	
1	LDH-TD-FF-RH-151	FIRE FIGHTING FLOOR PLANS
I	**HOSPITAL BUILDING**	
1	LDH-TD-FF-HB-151	FIRE FIGHTING GROUND FLOOR PLAN HOSPITAL BUILDING
2	LDH-TD-FF-HB-152	FIRE FIGHTING FIRST FLOOR PLAN HOSPITAL BUILDING
3	LDH-TD-FF-HB-153	FIRE FIGHTING TERRACE FLOOR PLAN HOSPITAL BUILDING
4	LDH-TD-FF-HB-401	FIRE FIGHTING SCHEMATIC HOSPITAL BUILDING
		-
J	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-FF-CON-151	FIRE FIGHTING PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08)
2	LDH-TD-FF-CON-152	FIRE FIGHTING PLAN AT +8760 LEVEL (Showing FOB & Air Concourse)
3	LDH-TD-FF-CON-153	FIRE FIGHTING PLAN AT +9000 LEVEL (BLOW UP) (Showing FOB & Air Concourse)

LUDHIANA JUNCTION RAILWAY STATION REDEVELOPMENT

List of Tender Drawings - HVAC

Sno	DRAWING No	Title
	-	-
A	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-HVAC-EB-151	GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
2	LDH-TD-HVAC-EB-152	FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
3	LDH-TD-HVAC-EB-153	DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
4	LDH-TD-HVAC-EB-154	THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
5	LDH-TD-HVAC-EB-155	FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
B	**WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)**	
1	LDH-TD-HVAC-WTB-151	GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) HVAC LAYOUT
2	LDH-TD-HVAC-WTB-152	FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) HVAC LAYOUT
3	LDH-TD-HVAC-WTB-153	SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) HVAC LAYOUT
C	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-HVAC-AB-JRC-151	EAST SIDE ARRIVAL BUILDING (JRC) GROUND & FIRST FLOOR PLAN HVAC LAYOUT
2	LDH-TD-HVAC-AB-JRC-152	EAST SIDE ARRIVAL BUILDING (JRC) SECOND & TYPICAL FLOOR PLAN HVAC LAYOUT
D	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-HVAC-TYPE 02-151	GROUND FLOOR TYPE-02 RESIDENCE HVAC LAYOUT
2	LDH-TD-HVAC-TYPE 03-152	TYPICAL FLOOR TYPE-02 RESIDENCE HVAC LAYOUT
3	LDH-TD-HVAC-TYPE 03-153	MACHINE ROOOM LVL. TYPE-02 RESIDENCE HVAC LAYOUT
E	**TYPE-III RESIDENCE (S+5)**	
1	LDH-TD-HVAC-TYPE 03-151	STILT FLOOR TYPE-03 RESIDENCE HVAC LAYOUT
2	LDH-TD-HVAC-TYPE 03-152	TYPICAL FLOOR TYPE-03 RESIDENCE HVAC LAYOUT
3	LDH-TD-HVAC-TYPE 03-153	MACHINE ROOOM LVL. TYPE-03 RESIDENCE HVAC LAYOUT
F	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-HVAC-TYPE 04-151	GROUND FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
2	LDH-TD-HVAC-TYPE 04-152	FIRST FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT

3	LDH-TD-HVAC-TYPE 04-153	TYPICAL FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
4	LDH-TD-HVAC-TYPE 04-154	TERRACE FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
G	**HOSPITAL BUILDING**	
1	LDH-TD-HVAC-HB-151	GROUND FLOOR PLAN HOSPITAL BUILDING HVAC LAYOUT
2	LDH-TD-HVAC-HB-152	FIRST FLOOR PLAN HOSPITAL BUILDING HVAC LAYOUT
3	LDH-TD-HVAC-HB-153	TERRACE FLOOR PLAN HOSPITAL BUILDING HVAC LAYOUT
H	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-HVAC-CON-151	PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08) HVAC LAYOUT
2	LDH-TD-HVAC-CON-152	PLAN AT +8760 LEVEL (Showing FOB & Air Concourse) HVAC LAYOUT

Annex-II:

Schedule-A

(Please refer to Clause 8.2.2)

Dates for providing Right of Way

The following are complete details of the Right of Way showing the dates on which the Authority shall provide Right of Way for the different areas of the Site in phases to the Contractor:

Sl. No.	Phase	Area (Sqm)	Date
1	**I**	1,49,142	In accordance with clause No. 8.2.1

Building/structure-wise details are as follows:

S. No.	Building Block	Total Built Up Area (in sq.m.)
1	Main Station Building (East Side)	23181
2	Arrival Concourse (East Side) – JRC End (in sub-plot 1)	10248
3	Secondary Station Building (West Side)	8239
4	72m Wide Departure Air concourse	5350
5	Railway Hospital	2302
6	Elevated Departure Level Plaza (on East Side)	3385
7	Plaza & Promenade Area at Ground Floor	5550
8	FOB connection on North Side	2860
9	FOB connection on South Side	2735
10	Platform Development Area	24190
11	Type-II (80 Units) 04 Tower	8036
12	Type-III (40 Units) 02 Tower	4454
13	Type-IV 01 Tower	1864
14	Rest House	823
15	Relocation of Existing Railway Quarters	26932
16	Temporary UTS/PRS	200
17	Through Roof (covering all platforms and intermediate tracks and also the concourse as per drawings)	29500

Area as marked for construction of above buildings shall be handed over in accordance with the Clause No. 8.2.1, The above zones are entirely encumbrances free, and shall be handed over along

with existing quarters, buildings, structures, impediments utilities, passenger facilities & station amenities as already installed, existing or attached to these zones. The list of these shall be enclosed as appendix during handing over the land which are to be either dismantled & disposed out of site, removed & handed over to concerned in-charge, or to be shifted temporary or permanently as the case may be.

The existing building must be demolished and a new building with wider footprint is to be constructed at the same place. There are some operational offices which need to be shifted once the new building under Phase-1 is constructed and these offices are shifted in the new building. Therefore, during construction, such offices are to be demolished only after they are shifted to new location temporarily. Since it is an important station, the entry and exit must be barricaded during the construction work is in progress and therefore proper provision must be made well in advance before the demolition of the existing structures.

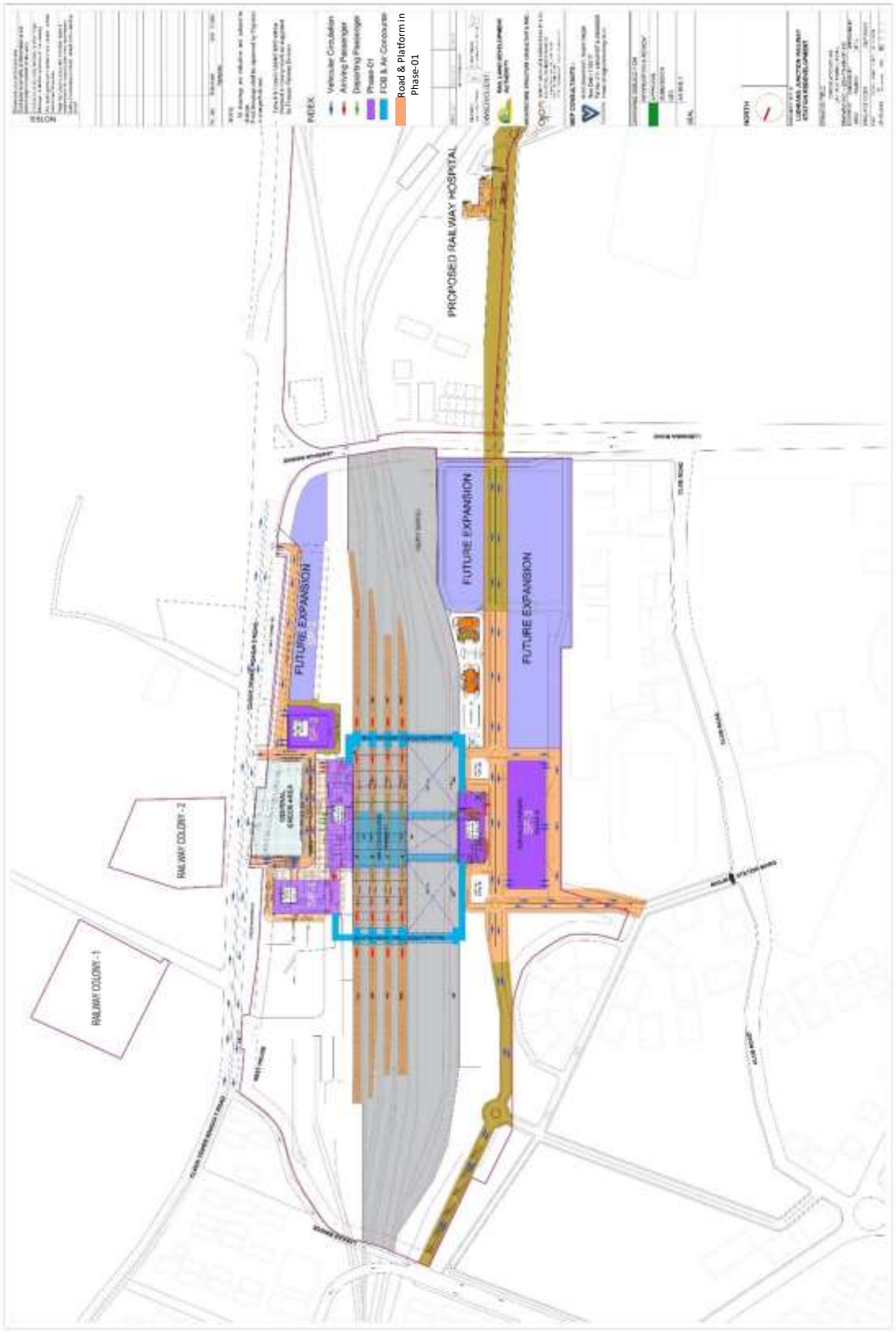
The key stages of construction (Tentative) will be:

Phase 1

1. Refurbishment of Existing Buildings for temporary relocation of Station Building. (East Side)
2. Construction of new temporary UTS and PRS structure.
3. Preparing alternate entries (East side) for passengers at UMB and JRC end respectively.
4. Relocation of east side circulating area to JRC and UMB end respectively and cordoning off of central circulating area from public for construction of main building, MLCP building and elevated road.
5. Construction of JRC end Arrival Building.
6. Construction of Railway Quarters. (for relocation)
7. Construction of Hospital Building & ORH. (for relocation)
8. Partial construction of New FOB. (JRC end)
9. Demolition of existing FOB. (JRC end)
10. Complete construction of New FOB. (JRC end)
11. Construction of New FOB. (UMB End)
12. Demolition of FOB. (UMB End)
13. Partitioning and refurbishing of existing loco lobby building for shifting of railway offices at second entry (ADEN office complex).
14. Shifting of existing station building (Main Station Building East Side) to temporary building and dismantling of old main station building.
15. Shifting of UTS and PRS to a new temporary structure/building.
16. Dismantling of existing UTS and PRS building.
17. Shifting of hospital building to existing training institute building (after refurbishing) and dismantling of existing hospital building.
18. Shifting of Railway Quarters to new building and dismantling of old buildings.
19. Shifting of existing Officers Rest house(ORH) to New ORH or to some other building as required as per methodology proposed by EPC contractor.
20. Construction of East Side Main Station Building.
21. Construction of West Side Secondary Station Building.
22. Establishing connections between both FOB and Station Buildings. (Both Side)
23. Construction of Air concourse FOB.
24. Dismantling of Partial FOB.

25. Construction of Air Concourse.
26. Complete construction of East Side Station Building.
27. Provision of lifts and escalators in the new station buildings, FOB, Air-concourse, Railway residential quarters as per approved drawings.
28. Provision of Water-supply, Sanitary fittings, drainage, Sewerage, HVAC, Firefighting, Electrical installations, CCTV, Baggage Scanner, SCADA system, BMS etc. and miscellaneous passenger amenities.
29. Dismantling of all structures to clear the site for circulating areas.
30. Development of circulating area, green area, pathway including construction of roads to facilitate smooth Pedestrian and Vehicular circulation.
31. Temporary works to keep station functional for passengers and railway offices during construction.

The above planning is tentative and the EPC contractor will propose his own methodology for taking up the work, so as to complete the project in targeted time.


Road & Platform in Phase-01
PROPOSED RAILWAY HOSPITAL
FUTURE EXPANSION
FUTURE EXPANSION
FUTURE EXPANSION
RAILWAY COLONY - 2
RAILWAY COLONY - 1

Annex-III:

Schedule-A

Master Plan Project as approved by Railway is enclosed

DRG. No: SD-FZR-202205-07 SH-01

DRG. No: SD-FZR-202205-07 SH-02

Annex-IV:

Schedule-A

Environment/Forest Clearances

(Please refer Clause 4.3):

Environment Clearances and Forest Clearances (If applicable)

1. **Environment Clearances:** In terms of MoEFCC's letter dated 28.05.2020, the projects at stations shall be exempt from seeking prior environmental clearance under the provisions of EIA Notification, 2006 subject to the condition that the individual projects of Station development shall draw up a sustainable Environment Management Plan (EMP) taking into account all factors related to Environment Management viz. air pollution, water load, water pollution, land degradation etc. and get the Environment Management Plan approved by EnHM Directorate of Ministry of Railway.

   The contractor shall draw the EMP duly covering the standard environmental safeguards and stipulations as per MoEFCC's letter dated 28.05.2020 in the following format and submit to Authority for obtaining approval of EnHM Directorate of Ministry of Railway**.**

Format for the EMP

S.No.	Stipulation (as per Annexure to MOEFCC's letter)	Codal provisions, as applicable	Estimated Quantity Generation		Proposed Mitigation Measures
			Construction Phase	Operation Phase	
i.	Statutory Compliances				
ii.	Air quality monitoring and preservation				
iii.	Water quality monitoring and preservation				
iv.	Noise monitoring and prevention				
v.	Energy conservations measures				
vi.	Waste Management				
vii.	Green Cover				
viii.	Transport				
ix.	Human Health Issues				

The contractor must obtain approval of Environment Management Plan before any physical development at the site.

2. Forest Clearances: The forest clearance is not required for construction of the Project.

3. **Tree Cutting Permission:** There are 260 trees existing at the site. The following clearances /permission shall be applied by the Authority:

   Permission required for felling of trees: 260 Nos. (approx.)

   The numbers are as per survey done by The Authority, actual no. to be cut off shall be jointly examined while handing over of the Zones of land as per Annexure-II, above.

   The permission for cutting of trees has been obtained by the authority. Contractor will be responsible for cutting off these trees, if required.

SCHEDULE – B

(See Clauses 2.1)

Scope of the Project

Development of the Project

Development of the Project shall include construction of the Project as described in this Schedule–B and in Schedule–C.

Construction of Project

As per the Specifications Standards and Scope of the Project outlined in the agreement.

The design and elevation of commercial floors will be as per the 3D view attached. For all practical purposes the 3D view will have precedence over all other tentative drawings.

Project Facilities

Project facilities shall be constructed in conformity with Schedule-C.

Specifications and Standards

The Project shall be designed and constructed in conformity with the Specifications and Standards specified in Schedule-D.

Annexure – 1
(Schedule-B)
Scope of Project

1. General

The Project along with the Project Facilities/Utilities as specified in Schedule C shall be constructed as per the detailed Scope of the Project given in this Schedule–B as per the Specifications and Standards set forth in Schedule–D. The Contractor is required to understand detailed Scope of the Project and develop his own drawings, details and methodologies for fulfilling the overall objectives and functions of the structures contemplated under this Project.

The hierarchy of provisions in this respect shall be as follows:

1.1.1. Any requirement given in Contract Agreement other than Schedules.

1.1.2. Any requirement given in Schedule – B.

1.1.3. Any requirement given in Schedule – C.

1.1.4. Any requirement given in Schedule – D.

1.1.5. Any requirement as per Codal provisions.

1.1.6. Any requirement as per drawings, in case the same is not clear from the above. The drawings have been prepared at conceptual level and can be proposed to be modified by the Contractor slightly to meet the vision and essential features of the station or for meeting any Codal provisions.

1.1.7. Specifications or standards of any element, which is not covered in Schedules, shall be governed by specifications or standards being followed in central/ state government organisations & as per provisions of relevant IS, ASTM & AASHTO or other international code with the approval of AE.

2. Vision

The aim of the project is to create a Railway Station that is modern yet connected with traditions / heritage– a complex that is worthy representative of new India and which provides a new iconic identity to the city of Ludhiana, Punjab. The station shall be safe, accessible, easy to use & inclusive complex for passengers, staff, visitors and general public.

3. Essential Features

The essential features of the station to be redeveloped under this work shall be as follows:

- The entire project shall have Green Building features with facilities for reduction in energy consumption during construction as well as Operations & Maintenance, which is designed with passive energy saving features, which promotes usage of local materials and reuses the existing materials to the extent possible, which generates renewable energy on site and which reduces requirement for resources such as water, processing of generated waste, rain water harvesting, etc. Necessary certification as per Clause 3.1.1 of EPC agreement shall be obtained by the contractor at his own cost.
- The project shall be executed with minimized impact on the environment of surrounding areas during execution and noise, dust and other types of pollution shall be minimized. The damage to the soil, water and surrounding areas shall be minimized. The contractor shall prepare & submit Environmental Management Plan as per Clause 4.3 & Annexure-IV of Schedule-A to the Authority.
- The entire project shall provide divyang friendly environment with access ramps, lifts, escalators, tactile flooring, suitable toilets, hand rails for support, braille signs, aural messages, necessary signages, dedicated parking and other accessible facilities etc. as per "Harmonised Guidelines and Space Standards for Barrier Free Environment for Persons with Disability and Elderly Persons, February 2016" issued by the Ministry of Urban Development, read with "Harmonised guidelines for standards of accessibility & provision of facilities for Persons with Disabilities (Divyangjan) in Indian Railways" issued by Ministry of Railways vide letter dated: 12/02/2020. Provision for battery charging facility & operation of battery power vehicles to be made.
- An easy to navigate and understand station complex with logical flows of vehicles, pedestrians and other Railway uses like parcels/mail/ground support for train operations such as catering, linen and cleanliness etc. The flows shall be logical as well as intuitive and the same shall be supplemented by user-friendly signages, displays, display panels for information other way finding features such as floor markings, change in colours/lighting etc. at the decision points and well-designed public announcement system.
- A modern and smart station which has access control and security checks as per MSSR (the equipment mentioned in Schedule-C is to be provided) and the space planning shall be such that 100% access control, baggage scanning, Door Frame Metal Detectors and frisking of passengers can be done and necessary spaces are provided for the queuing. Whole premises shall be secured through Closed Circuit Television (CCTV) cameras as

per specifications, having Building Management System (BMS)/ Supervisory control and data acquisition (SCADA) as per specifications given in Schedule-D, which is intelligently designed with facilities of panic/help buttons so that the station management can quickly respond to any requirement of passengers.

- A well-designed station with adequate areas for different types of uses for the passengers such as ticketing, boarding trains, de-boarding trains, waiting for trains & other requirements such as information, water, toilets, retail areas for food and other purposes. The premises shall have segregation of Arrival /Departure Passengers as per planning done by the Authority. Congestion free & conflict-free Entry/ Exits in Station Premises, parking arrangements as per Schedule-C. The design shall promote non-motorised transport including walking & cycling through dedicated footpaths and table top crossings etc.
- A station with architectural ambience as per Schedule – B Part-C which shall ensure that the entire station premises presents a unified theme through appropriate facade, finishes, colours, materials, textures for overall look and feel. Use of compatible and modular elements, members shall be encouraged.
- Placement of wires, pipes, cables, external units and other unpleasant elements shall be done in concealed and camouflaged manner.
- Adequate Concourse/Waiting Spaces to avoid overcrowding on platforms
- All facilities for passengers such as ticketing, retail & Kiosks area, help desks, information booths, cloak rooms, AC waiting rooms, ladies waiting room with baby feeding room, VIP room/lounges, Retiring rooms, dormitories, tourist information, etc. as mentioned in the Schedule-B and C.
- External development including roads, drop-offs, pick-ups, parking, benches, signages, lighting, site drainage and landscaping etc. complete as per Schedule B and C.
- Drop offs/Pick-ups to ensure easy ingress/exit along with convenient parking provisions without creating a traffic block and congestion within the station premises as well as on the station approach roads.
- Drainage shall be designed such as to ensure self-cleansing velocities and also ensure that no puddles/ local standing water situation are developed.

- External development including roads, drop-offs, pick-ups, dedicated parking for 2 wheelers, commercial vehicles, 4 wheelers; benches, signages, lighting, site drainage and landscaping etc. complete as per Schedule B and C
- Necessary facilities to receive important persons on the station through dedicated locations for drop-off/pick-ups, waiting and boarding the trains. This shall include discrete entry/exits without discomforting general passengers.
- Dedicated parking areas for station staff (Railway or Non-Railway) that comes regularly to serve at the station.
- Relocation of Railway structures/services and refurbishment of existing structures as required as per execution methodology approved from authority.
- Future provision for additional floors to be kept in the structural design and MEP planning of the station building. RCC columns to be continued up to parapet top (or 1200 mm above roof) and left for extension in future.
- OHE modification required for execution of air concourse and FOBs
- To provide required furniture both for about 40 offices (each-including but not limited to good quality executive chair, executive table, 3 guest chairs, 1 cupboard), passenger areas (like waiting rooms, air concourses, retiring rooms, dormitories, VIP lounges, common areas), Site office for authority engineer and officers rest house to make the station and service buildings functional.
- To Provide Facade lighting for maintaining aesthetic ambiance required for iconic building of the city.
- To provide through roof over air concourse and FOBs to meet the architectural vision of 3D views and to give a grand look to the station.
- To provide platform shelters for balance length of platforms left out of through roof area.
- Shifting of existing Flag post to new location approved by Authority engineer.
- Provision of additional connectivity with existing flyover and elevated promenade along the elevated road for pedestrian circulation
- All works required (during construction phase) for temporary relocation of offices, railway hospital, ORH and passenger facilities like parking, waiting hall, booking etc.
- Art Work (including installation) :The Contractor shall also provide art & architectural master pieces at identified distinct locations, spaces in the building & outside area on floor, walls or roof, incorporating exclusive elements like sculptures, visual impact, modern art, mural, design work, images, local painting works and other exclusive Artifacts etc. in consultation with the interior, architectural consultant. Such work shall exhibit & concern

theme & true spirit of national & cultural / complement statement and also match with the local elements & buildings as a whole.

1.0 Scope:

1.1 The Contractor shall design, construct the Project in accordance with the provisions of this Agreement. Such Project Facilities shall include but not be limited to the followings:

S. no.	Description	Built-up Area (SQM)
1.	Main Station Building (East Side), Total G+7 Scope in this contract: G+5 with foundation/structure for additional **TWO** floors to be constructed in future.	23181
2.	Arrival Concourse (East Side) – JRC End (in sub-plot 1). Total-G+6 Scope in this contract: G+2 with foundation/structure for additional **FOUR** floors to be constructed in future.	10248
3.	Secondary Station Building (West Side), Total- G+7 Scope in this contract: G+2 with foundation/structure for additional **FIVE** floors to be constructed in future.	8239
4.	72m Wide Departure Air concourse	5350
5.	Railway Hospital	2302
6.	Elevated Departure Level Plaza (on East Side)	3385
7.	Plaza & Promenade Area at Ground Floor	5550
8.	FOB connection on North Side	2860
9.	FOB connection on South Side	2735
10.	Platform Development Area	24190
11.	Type-II (80 Units) 04 Towers	8036
12.	Type-III (40 Units) 02 Towers	4454
13.	Type-IV (10 units) 01 Tower	1864
14.	Rest House	823
15.	Relocation and then demolition of Existing Railway Quarters	26932
16.	Temporary UTS/PRS	200
17.	Through Roof (covering all platforms and intermediate tracks and also the concourse as per drawings)	29500
18.	Internal Roads with WMM & Bituminous top	20730
19.	Cement Concrete Pavement with vacuum dewatered Concrete	5550
20.	Paved Area – Footpath with PCC base, 60mm Thick paver blocks and kerb stone edging	3300
21.	Strom water drains (Additional)	4000 Rm

S. no.	Description	Built-up Area (SQM)
22.	Platform surfacing & Roofing including Structural Steel Work	24190
23.	Boundary Wall	As per site requirement.
24.	Elevated Roads	4910
25.	Dismantling of existing structures for execution of buildings	30100
26.	Provision of new customer friendly passenger amenities	As per Schedules
27.	External Development and Services	As per schedules & drawings.
28	Surface Parking	12625
29.	Temporary relocation of Railway hospital, ORH, Offices and passenger amenities by refurbishing existing buildings/sheds.	As per site, methodology and drawings approved from FZR division

a. Site development which includes the following:

   i. Levelling, Filling Up / Cutting of Ground.
   ii. Dismantling of abandoned structures coming in the site and surrounding area and disposal of muck.
   iii. Developing service Roads & Internal Paths
   iv. Sewer, Water Supply & Storm Water Drainage
   v. Landscaping / Horticulture Operations
   vi. Street Lighting with LED lamps
   vii. Signages, Boards, Barricading
   viii. Site Offices, Store Development

b. Refurbishment of existing platforms which includes resurfacing, flooring, covering, shelters, S&T cable tunnel, etc. as per approved plans.
c. Development of surface parking as per approved plan.
d. Construction of canopy, shading devices (Covered driveway, pick-up area, drop-off area).
e. Construction of entry and exit gates of the station both for main entry and second entry at all entry/exit points.
f. Before & after laying of any cables in duct, meggering of cables must be done as per Railway Practices.
g. All necessary services and utilities for the above including but not limited to Electrical, Water Supply, Sanitary, ELV (Extra Low Voltage), PA (Public Address) systems, Train and Passenger Information Systems, Coach position indication systems, Signages, illuminated / Non Luminated Displays, HVAC (Heating ventilation and Air Conditioning), Fire-fighting, Solar PV (Photo Voltaic) Systems, BMS (Building Management System), SCADA (Supervisory Control and Data Acquisition), IPIS (Integrated Passenger Information System), LAN, Wi-fi, SITC IP based EPABX system, earthing of equipment as per Railway Standards, Furniture / furnishing etc.
h. Fully furnished offices with internal partitioning and furniture will be provided by contractor in east and west side buildings in office and railway use areas as per approved drawings.
i. To take up the sites of work, contractor shall refurbish existing buildings as identified by the authority including associated works for making these buildings functional (like wall paneling, false ceiling, electrical and plumbing works, additional toilets as required for making these buildings operational). Railway offices in existing main building, second entry side ADEN office complex, Railway hospital etc shall be shifted to these refurbished buildings by the EPC contractor. Existing buildings will be identified by authority and handed over to contractor for refurbishment.
j. External development works such as internal roads, pavements, landscaping, greenery development, compound wall, fencing, parking area development, etc.
k. MEP (Mechanical Electrical Plumbing) works, storm water drains, Rainwater harvesting mechanisms, Sewage Treatment Plant, water storage structures, underground tanks, Overhead Tank (capacity as per schedule C) with staging height not less than 36 M, electrical poles, façade lighting, campus lighting, Street Lighting and illumination, etc. as per green building module.
l. Contractor shall provide plinth protection, water leakage arrangement, water proofing & watertight sanitary works.

m. Architectural work, façade work, art work, interior works as per local ethos & culture.

n. Tensile fabric canopy with M.S. tubular frame structure over footpath in front of East and West side station building at locations approved by authority engineer. (Total: 160 SQM)

o. 2 Nos Bus stop's enclosure on East and West side station building respectively at location approved from authority engineer (20 SQM each).

The contract is on EPC mode, so contractor shall be responsible for Engineering, Procurement, Construction of all the buildings, structures, elements, facilities including that of MEP, Electric general, Electrical-TRD alteration and other works. Complete designing, detailing, drawings shall be responsibility of Contractor, as defined in Schedule-D.

• The Contractor shall execute the Works in two phases, the Design Phase and the Construction Phase.

• The Design Phase shall commence upon the date of issue of Letter of Acceptance. This phase shall include the preparation and submission of:

(i) the Preliminary Design
(ii) the Definitive Design; and
(iii) the Construction Drawings.

While designing the building, various facilities, the aspect of maintainability, accessibility shall be thoughtfully considered and appropriated provisions shall be incorporated with view of cleaning, maintenance of the assets, facilities during entire service period with special focus for façade, through roof, concourse, platform shelters etc.

• The contractor shall carry out load testing of the structures specially for the concourse and roof structures in designed manner on fully launched / installed structure at his own cost.

• Contractor shall provide site office for authority as per area, facilities, T&Ps as laid down in Schedule-D.

The aforementioned facilities shall be designed, procured and constructed in accordance with the list of drawings attached, with latest amendments/ alterations.

1.2: The following facilities shall be provided in the proposed new station buildings on East & West Sides at Ludhiana as shown in drawing, but not limited to:

i. The façade of the East & West sides of the building to be constructed as specified in 3D views and Architectural drawings.

ii. External and internal water supply, sanitary arrangements, Electrical wiring and installations.

iii. Lifts and Escalators as specified under Station Facilities.

iv. All facilities for passengers such as ticketing including retail & Kiosks area, help desks, information booths, cloak rooms, AC waiting rooms, ladies waiting room with baby feeding room, VIP room/lounges, Retiring rooms, dormitories, tourist information, etc. as mentioned in the Schedule-B and C and detailed in Finishing Schedule.

v. Split AC system, Air cooled VRF System, CCTV system, Access control system, LAN system.

vi. Firefighting system with wet riser and sprinkler system, automatic fire alarm system.

vii. Landscaping, Parking Facilities and station approach roads on East & West Side of station building.

1.3: Air Concourse and FOB:

01 no. Air Concourses (72m width) including connection to second entry, 02 Nos. FOB (both of

8m width) are proposed connecting the East side and West side station buildings over and across all the Platforms. The Departure air concourse is designed to serve the following purpose:

- Waiting areas for passengers boarding train
- Provision of Retail shops
- Transfer of passengers to platforms by the help of Vertical Circulation Elements such as Escalators, Lifts and Stairs
- Providing exclusive view of inner side of the station

Air concourse shall be covered with through roof across all the platforms. Accordingly, the existing Platform shelter shall be dismantled beneath the through cover roof and to be suitably modified so that passengers are not exposed to rain and sun.

The detailed design & drawing shall be developed for the foundation, columns, pier, girder, beam, slab for the air concourse. The contractor shall provide details of execution strategy.

All necessary arrangements for providing/modifying OHE as per existing/ future railway requirements shall be made by the Contractor. The design of the concourse and beam shall be with appropriate loads for providing OHE. The arrangements shall be got approved from Railways by the Contractor. All associated works such as earthing, protection from bird menace and other measures stipulated by Railways shall be deemed to be included in the scope of Work. However, the work of modification of OHE shall be taken up by the Contractor in the power and traffic block.

The Concourse and all Passenger holding areas under the scope of work shall be designed, detailed and provided for such that bird menace is ruled out.

All necessary coordination, safety precautions required to take up these works shall be the sole responsibility of the Contractor. The required blocks, speed restriction shall be provided by Railways as indicated in **SCHEDULE 'O'.** The planning of the blocks is to be done in such a way that there is minimum possible impact on traffic/ punctuality of trains. Easy access for maintenance and arrangements for safety line / belts are to be provided in the structure.

Measurement: The area of the airspace concourse is to be measured considering outer dimensions of the deck slab excluding cutouts.

1.4: **Through Roof**: Through Roof cover extending across all platforms and intermediate tracks, integrated with the concourse shall as shown in the drawings, must have a minimum apex height as required from rail level. The supporting structure for the through roof may be provided at intermediate platforms. The sheeting shall be as per Schedule DB.

Measurement: Plan area will be measured.

1.5: Improvements to Platform No. 1, 2&3, 4&5, 6&7:

Entire portion of Platform surfaces after the execution of Stairways, Escalators and Lifts etc. to be laid with 40 mm thick Kota stone flooring (approximately 80%) and granite (approximately 20%) or as per approved design. The platform surface to be brought to proper level and slope using base concrete of CC (1:2:4)(with temperature reinforcement as per design) and necessary arrangement wherever required and to meet Schedule of dimensions. All coping stones will also be replaced within the scope of this contract. Necessary facilities for passengers including water booths, benches, dustbins, charging facilities etc. shall be provided as per railway norms and approved design.

1.6 Dismantling Works

The EPC contractor's scope shall also include Dismantling of Existing Structures & Utilities in a phased manner in accordance with the dismantling plan prepared by the contractor and as approved by Authority Engineer. Necessary arrangements will be done by the contractor for keeping the water supply, electric connections, access and other utilities etc. of existing buildings and quarters functional during construction phase.

1.7 Dismantling of existing Cover over platforms (COPs) and erection of new COPs:

i. Existing Cover over all the platforms are to be dismantled and disposed as per the proposed location of Air Concourses, FOBs and their VCEs (Stairways, Lifts and Escalators). The COPs on all the platforms are to be dismantled and constructed afresh including sub-structure also.
ii. No Structural steel members released from dismantling of existing COPs are to be reused.
iii. Disturbed platform walls, pavement etc. to be reconstructed to match with existing platforms.
iv. Released material, structural steel shall be property of the EPC contractor and will be disposed outside railway boundary by EPC contractor at own cost..
v. Electrical and electronic fixtures, fittings to be handed over to concerned SSE's as per annexure 2 of schedule B.

vi. New Cover over Platforms:

New Cover over Platforms (COPs) are to be provided in entire platform area not covered by through roof.

Cover over Platform to be provided on all the platforms as decided by the Authority's Engineer duly adopting approved design and drawings for steel structure and Railway design for foundation. Roofing is to be provided with Galvalume sheet of approved profile and colour.

Suitable ventilation, lighting arrangements, charging facilities, Wifi, PA system, station name boards, coach indication boards, train indication boards, signages and advertisement boards etc shall be designed as per railway norms, got approved and provided in the scope of this contract.

1.8 Office Spaces:

The scope of work includes construction of office spaces for Railway offices on East and West

side station buildings. The office space shall be constructed to suit and cater to the requirements and working conditions of the staff/ user department. This shall include the already demarcated offices in the tentative drawings and the open spaces (marked railway use) left for detailing at a later stage.

a) Properly designed arrangement for fixing of office T&Ps, equipment, Computer systems shall be provided.
b) Telephone connection, LAN connectivity and Wi-Fi shall be provided for all officers near to sitting arrangement in the scope of this contract
c) Partitions and/or workstations are to be provided in the office spaces as advised by Authority's Engineer and the same to be included in the working drawings to be prepared by theContractor.
d) Toilets to be provided in the office space as decided by the Authority's Engineer.
e) Good quality Furniture for about 40 offices to be provided (as per furniture schedule).

1.9 Temporary relocations during construction phase:

1) During the construction phase of the project, existing structures/sheds will be refurbished by providing partitioning, electrical connections, wall paneling, false ceiling, toilets etc for shifting the offices and railway hospital temporarily for taking up the sites. Detailed relocation strategy (both temporary during construction phase and final after construction) shall be devised by the contractor based on the relocation plans attached, got approved by authority and executed.
   a) Old loco lobby building has been identified for temporarily shifting of ADEN office complex after refurbishing and some additional alterations as per tentative drawing attached with the tender.
   b) Existing vacant structures on main east side of the station will be refurbished by the EPC contractor and offices/passenger amenities/utilities/GRP barrack in the main side building will be temporarily shifted by EPC contractor to these refurbished buildings/sheds during construction phase by providing equivalent services as in the existing offices.
   c) Training institute in colony no 9 has been identified for shifting Railway hospital temporarily till construction of new hospital. EPC contractor will refurbish this building to equivalent standard as the existing hospital and make all arrangements for making equivalent facilities (as in the existing hospital). EPC contractor will arrange for shifting of all equipment etc of the hospital from existing building to this refurbished training institute and then to the new hospital when it is ready/operational.

2) If the current Officer's Rest House (which comes in the foot print of second entry west side building) is proposed to be dismantled before construction of new rest house as per the methodology proposed by EPC contractor and approved by authority, EPC contractor will make following arrangements for the interim period (when the old rest house is taken up for dismantling and the new rest house is not operational/ready):
   - The EPC contractor will lease 2 Nos, 3 BHK fully furnished apartments and maintain them as officers rest houses including housekeeping services during the interim period.

     Or

     The EPC contractor will arrange 6 rooms in 3 star or equivalent hotel which will be available for railway officers during this period.
   - The apartment/hotel shall be in the vicinity of station area in good locality (acceptable to authority) with 1 KM radius of the LDH railway station.
   - Housekeeping and dining facilities shall be maintained by the EPC contractor at his on cost in the apartments during this interim period.

3) The new quarters to be constructed as a part of this project may take some time to be constructed and ready for staff to move in. During this period, some quarters (Approx 30 nos as per preliminary assessment) may have to be got vacated for taking up the sites of MLCP building, Second entry building, New ORH, New Hospital and for construction site purposes. Authority will provide vacant quarters and EPC contractor will arrange for repairs of these quarters for making them functional for staff to be relocated to these quarters.

1.10 Furniture

INDICATIVE FURNITURE SCHEDULE

S no.	Description	Unit	Qty
A	Offices (40 Nos.)		
1	Executive table	Each	40
2	High Back Chair	Each	40
3	Low Back Chair (Visitor)	Each	120
4	Cupboard	Each	40
B	Conference Room		
	Conference Table	Each	1
	Chairs	Each	22
	SS (304 grade) perforated Chair	Each	18
C	VIP Lounge		
1	3 Seater Sofa	Each	8
2	2 Seater Sofa	Each	19
3	Center Table	Each	19
D	Retiring rooms		
1	Double Bed	Each	4
2	Bed side table	Each	8
3	Wardrobe	Each	4
4	2 Seater Sofa	Each	8
5	Center Table	Each	4
E	Dormitory		
1	Double Bed	Each	50
2	Lockers	Each	50
F	SS (304 grade) Benches (3 Seater)	Each	920
G	Rest House (8 Guest Rooms)		
1	Double Bed	Each	8
2	Bed side table	Each	16
3	Wardrobe	Each	8
4	7 Seater Sofa	Each	8
5	Center Table	Each	8
6	Study table & chair	Set	4
7	Shoe rack	Each	4
H	Railway Hospital		
1	Executive table	Each	12
2	High Back Chair	Each	12
3	Low Back Chair (Visitor)	Each	24
4	SS (304 grade) perforated Chair	Each	48
5	2 Seater Sofa	Each	16

Note: Furnishing of Officer's rest house, dormitories, retiring rooms, VIP lounges, Offices required for making these fully functional (including bedding, curtains, blinds, mattresses, door mats, bathroom accessories etc) to be provided by EPC contractor as approved from authority engineer.

2.0 Signaling & Telecommunication Engineering scope

SCOPE OF INFOTAINEMENT ITEMS

Sl No	Description
1	**Passenger Information Display System (PIDS):**
	Preparation of Scheme Plan, Supply, Installation, Testing and Commissioning of PIDS as per the specification given in Annexure. The PIDS System shall comprise of all associated equipment but not limited to (i) Outdoor Video Display at all entrances– 12/6 Line (as per requirement at site), Single Face (5 Nos.) (ii) Double Face Coach Guidance Display Boards for all Platforms (192 Nos) (iii) Indoor Video Display – 6 Line, Single Face (5 Nos). (iv) At a Glance Display Board Single Face on all platforms (8 Nos) (v) Platform Display Board Single line double Face on Air concourse, FOB & platforms (16 Nos) (vi) Commercial LCD Display Units (Smart TV: 80": 12 Nos.; 50": 40 Nos. and 40": 40 Nos.) UHD Tech., with resolution 3840x2160 wherever required as per site conditions (vii) Platform Digital Clocks with GPS synchronization - Double face (16 Nos) (vii) Digital Clocks single face with GPS synchronization (15 Nos) (ix) Digital tower clock of size not less than 60''x 48''on both east and west buildings.
2	**Passenger Announcement System (PAS):**
	Preparation of Scheme Plan, Supply, Installation, Testing and Commissioning of PAS, as per the specification given in Annexure. The PAS System shall comprise of all associated equipment but not limited to (i) Announcement Amplifier having RMS 1000Watt capacity, suitable for Voltage matching / Impedance matching (4 Nos) (ii) On Speakers similar to UHC – 30XT max 30Watt (OR) better adjustable from 5Watt to 30Watt in Steps (20 Nos) (iii) column speaker (100 Nos) (iv) cabinet speaker with rotatory switch volume 100 V (50 Nos) (v) PA microphones goose neck (15 Nos) (iii) Surface Mount Speakers similar to Yamaha VS6 (50 pairs).
3	**Cameras and Monitoring room equipment for Surveillance System**
	Preparation of Scheme Plan, Supply, Installation, Testing and Commissioning of CCTV System as per the specification given in Annexure. The CCTV System shall comprise of all associated equipment but not limited to (i) IP Based Colour Cameras full HD, fixed box type with varifocal lens (80 Nos) (ii)P/T/Z IP colour cameras (20Nos) (iii) ON VIF 16 Channel NVR of reputed make (10 Nos) (iv) 8 TB Internal Surveillance Hard Disk HDD suitable for 16 channel NVR (40 Nos) (v) not less than 65-inch large format monitor of commercial/industrial grade to suit site conditions (10 Nos) (vi) server along with Artificial Intelligence (AI) enabled Video Analytics Software(vii) industrial grade work stations for monitoring (4Nos).
4	**Intercom, LAN wiring for PRS/UTS/PMS/COIS/FOIS & Railnet facility to service building**
	Preparation of Scheme Plan, Supply, Installation, Testing and Commissioning of Exchange gateway and Railnet facilities as per the specification given in Annexure the System shall comprise of all associated equipment but not limited to (i) Firewall minimum capacity of concurrent 2000 user (01 Nos) and provision of 100Mbps Railnet bandwidth from RailTel (ii) 12 port Routers for Tyre II location for PRS/UTS/FOIS facility (3 No's) (iii) Modems for PRS/UTS/FOIS connectivity – (40 Pairs) (iv) Exchange Gateway with server , PRI connectivity, phones and user licences 192 port and above (01 set) (v) portable programable equipment

	(05Nos) (vi) VDSL DSLAM along with VDSL modems 48 Port (01 Nos) (vii) Telephone and Lan connectivity to all subscribers as per site condition.
5	**Shifting OFC equipment and all working circuits to new building**
	Preparation of Scheme Plan, Supply, Installation, Testing and Commissioning of OFC connectivity System as per the specification given in Annexure. The OFC connectivity System shall comprise of all associated equipment but not limited to (i) fully loaded STM 1/4 equipment (01 Nos) & PD MUX (2Nos) along with NMS software (ii) SMPS charger along with battery bank (01 set) (iii) Provisioning of lightning and surge arrestors as per requirement (iv) All types of required cabling not limited to OFC 24 pair – 4KM, 6 quad cable – 3Km and 50/20/10 pair PIJF cable – 3Km each.
6	**Tools for Maintenance**
	At the time of commissioning for all installed equipment 20% spares (not limited to cameras, switches, modems, various cards for electronic equipment etc.) to be provided and necessary testing and maintenance related equipment like OTDR, splicing machine and Portable programming equipment (laptops) and other tool kits/ equipment like ladders required for maintenance to be supplied.

INFOTAINEMENT ITEMS

Technical Specifications (Passenger Information Display System, Passenger Announcement System, CCTV System, Intercom and Rail net connectivity, OFC connectivity)

S.No.	Description	Specification No.
1.0	**Passenger Information Display Boards (PIDS)**	
1.1	Double Faced Coach Guidance Display Boards	RDSO/SPN/TC/108/2019,Rev- 1.0,Amdt-1orlatest
1.2	Outdoor Video – Display (OVD)-6Line Single Face	RDSO/SPN/TC/108/2019,Rev-1.0, Amdt-1orlatest.
1.3	Indoor Video Display (IVD)-6 Line Single Face	RDSO/SPN/TC/108/2019,Rev-1.0, Amdt-1orlatest.
1.4	True color outdoor 12-line LED videowall cum train information display board	RDSO spec No. RDSO/SPN/TC/108/2013, Rev.3.0. Amdt.1 or latest.
1.5	At-A-Glance Display Board Single Face	RDSO/SPN/TC/108/2019,Rev-1.0, Amdt-1orlatest.
1.6	Platform Display Board Single Line double face	RDSO/SPN/TC/108/2019,Rev-1.0, Amdt-1orlatest.
1.7	CDC including CDS along with required Software	RDSO/SPN/TC/108/2019,Rev-1.0, Amdt-1orlatest.
1.8	RMS along with software	RDSO/SPN/TC/108/2019,Rev-1.0, Amdt-1or latest.
1.9	PDC	RDSO/SPN/TC/108/2019,Rev-1.0,Amdt-1orlatest.
1.10	65-inch commercial LCD display	Tech specifications picture engine-UHD technology with Resolution 3840x2160, Smart TV, UHD

		mastering engine dimming-UHD dimming auto motion plus-Yes, film mode-Yes, Natural Mode support - Yes, Motionrate-100PQI (Picture quality index) - 1300 HDR (High dynamic range)-HDR.
1.11	All in one desktop computer with preloaded operating system	(Core i5 (6th Gen)/4 GB DDR 4/1 TB/Windows 10 Home/512 MB) 19.5 Inch Screen, Wired Keyboard, Wired Mouse, Power Adapter Make: HP /Lenovo/DELL
1.12	Double faced digital Clock (Platform Clock) with GPS Synchronization	RDSO/TC/62/2008 Rev.3.0 or latest.
1.13	Single sided Digital clock (Office clock) with G.P.S synchronization	RDSOSPN/TC/62/2008 (REV3) or latest.
1.14	OFC to Ethernet converter with built in AC power supply, converter to have one fibre port with SC connector, single mode fibre upto 15 Kms, four Ethernet ports	(10/100 Mbps), configuration with DIP switches. Make: Microtek/ Cygnus/ Dlink
2.0	**Passenger Announcement System**	
2.1	AHUJA high power amplifier SSA 10000 (1000 watt capacity suitable for voltage matching/ impedance matching	Tech spec. Make -Ahuja/ Phillips/Shure/ BOSCH/Yamaha/ Crown
2.2	Horn speakers similar to UHC 30XT max30 Wattor better adjustable from 5 watts to 30 watts insteps	Tech Spec. Make- Ahuja/ Phillips/ Shure
2.3	Supply of PA cabinet speaker with rotary switch volume control 100V of model WS-664T or equivalent	Tech spec. Make - Ahuja/ Phillips/ Shure/ BOSCH/ Yamaha/ Crown
2.4	Supply of goose neck PA microphones, robust construction and excellent performance, Model AGN-500 of Ahuja make or equivalent	Tech spec. Make -Ahuja/ Phillips/ Shure/ BOSCH/ Yamaha/ Crown
2.5	Speakers similar to Yamaha VS6 Surface Mount Speaker.	Make- Electro Voice/ Bosch/Shure/Yamaha/JBL
3.0	**CCTV System**	
3.1	Full HD Fixed Box Type IP Colour Camera with varied focal Lens along with Housing and Mount for Fixed Box Type IP Colour Cameras	Item No: 5.1 and 5.3 of RDSO Specification. RDSO Spec No: RDSO/SPN/TC/65/2021 Ver 6.0 Or Latest. Make: Dahua/Hikvision/Sony/Pelco/Bosch
3.2	Supply And installation of P/T/Z (Pan/Tilt/Zoom) IP Colour Camera	Item no.7.0 of RDSO Specification No. RDSO/SPN/TC/65/2016 Rev - 4.0, Amdt-1 or latest
3.3	ONVIF 16 channel NVR of similar of make Dahua/Hikvision/CP plus to Model No. DH-NVR52A16-16P-4KS2	Tech Specification –Main Processor: Quad-core embedded processor; •Interface:1HDMI,1VGA,•Resolution: 1920 ×1080;•Multi-screen Display:1/4/8/9/16;•OSD:

		Camera title, Time, Video loss, Camera lock, Motion detection, Recording;•Trigger Events; Recording, PTZ, Tour, Alarm Out, Video Push, Email, FTP, Snapshot, Buzzer and ScreenTips; Video Detection: Motion Detection,MDZones:396 (22 ×18), Video Loss and Camera Blank;•Playback:16;•Search Mode: Time /Date, Alarm, MD and Exact Search (accurate to second), Smart search;•Play back Function: Play, Pause, Stop, Rewind, Fast play, Slow Play, Next File, Previous File, Next Camera, Previous Camera, Full Screen, Repeat, Shuffle, Backup Selection, Digital Zoom;•Backup Mode: USB Device/Network/Internal SATA burner/e SATA
3.4	8 TB Internal Surveillance Hard Disc HDD	Tech. Specification - 3.5 Inch SATA 6Gb/s 256MB Cache suitable for 16 channels NVR Security Camera System with Drive Health Management suitable item No.2 of make : Seagate Skyhawk/Western Digital Purple.
3.5	Gold Plated HDMI Cable	1) Provides full 1080p support 2) Built-in audio return channel for smooth sound 3) Up to 120Hz refresh rate for a clear picture 4) Built-in Ethernet with 10.2Gb ps band widthspeed 5) Built-in Ethernet with 10.2 Gbps band width speed. Make: Belkin /MX
3.6	1000Mbps 12 Port Gigabit Ethernet PoE Switch,	1)12 10/100/1000 Mbps Giga bit Ports. 2)Auto MDI/ MDIX Cross over for all ports 3) Full/half-duplex for Ethernet/Fast 4) Plug-and-play Installation. Make: Cisco/D-Link/MROTEK/HP
3.7	Server having minimum specification	Minimum spec power edge T30 server, Intel Xeon E2-1225 v5 with 16GB RAM and 1TB SATA Hard disk. Licensed server windows software wireless key board and mouse, on-site warranty 03years. Make: Dell/Acer/Lenovo/HP.
3.8	Industrial grade 65-inch large format monitor	display UHD technology with Resolution 3840x2160, Smart TVs per Tech specifications picture engine - UHD mastering engine dimming - UHD dimming auto motion plus - Yes, film mode - Yes, Natural Mode support - Yes, Motion rate - 100 PQI (Picture quality index) - 1300 HDR (High dynamic range)-HDR.

4.0	**Intercom, LAN wiring for PRS/UTS/PMS/COIS/FOIS & Railnet facility to service building**	
4.1	Firewall	Sophos / Forti Gate / Check Point/ Palo Alto Networks/Cisco
4.2	12 port Router	RDSO Specification RDSO SPN/TC/84 2008 or latest. Make: CISCO, Model:4400 series
4.3	Portable programming equipment	Tech spec. Processor-i7-4810MQ CPU@2.80 GHZ, RAM 8GB, 64 Bit operating System X 64-based processor, windows 10 licensed, 1TB Hard Disk Make- DELL/HP/THOSHIBA
4.4	SCxSC3 Meters Patch Cord	Make: Bestnet/Fibrain
4.5	Supply of SC-PC to SC-PC patch cards (5 mtrs length) with o db coupler.	Make: Bestnet/Fibrain
4.6	96 port analog Gateway including license (Dual DC based) suitable for existing divisional server model.	Make: Aeonix.
4.7	Supply of wireless N VDSL2 4port gateway modem	Make: Zyxel/Cisco/Actiontec/Motorola
4.8	48 port VDSL IPDSLAM	Make: Zyxel/Cisco/Ericson
4.9	Armored 12 Core Fiber	Make: Finolex, D- Link, Cisco, BESTNET or latest
4.10	Rack mounted 24F FMS	RDSO Spec No.: RDSO/ SPN/TC-037-2000 (Ver.3) or latest.
4.11	24 Port PoE Gigabit manageable Switch with two SFP with power budget 382W model No.SG350 or latest	CiscoSG350-28 or latest Managed Switch| 28Gigabit Ethernet (GbE) Ports |24Gigabit Ethernet RJ45Ports|2SFPSlots |2Gigabit Ethernet Combo|
5.0	**Cable laying and OFC connectivity to new building**	
5.1	Supply of Thermo Shrinkable jointing kit for 10/20pair PIJF cable (TSF-1)	RDSO Spec No: RDSO/SPN/TC/57/2006 or latest
5.2	Managed Expandable rack type STM-1/4 ADM L1.1	RDSO specification No. TEC GR NOTE C/GR/TX/SDH 0/04 JAN 2011 or latest. It should be compatible with the existing in the STM network of division.
5.3	PD MUX	RDSO's Specification No.TC: 68/2012 with amd.1 or latest. It should be compatible with the existing PD Mux network of division.
5.4	48V /200AH VRLA battery bank	RDSO Specification no. IRS.S-93/96(A) Amendment-1 or latest
5.5	SMPS charger 230V AC 50Hz input and 48V DC/25A output in (2+1) configuration suitable for VRLA battery	RDSO spec: RDSO/SPN/TL/23/99 Ver.4 or latest

6.0	**Cables & Wire Coils**	
6.1	24 fiber OFC cable.	RDSO specification IRS TC 55-2006 (rev.1) or latest
6.2	10/20/50 pair PIJF cable	RDSO specification IRS:TC 41-97 or latest
6.3	Quad Cable – 0.9 sqm	Spec. No. IRS/TC/30/2005 (Ver.1) Amd.5 or latest
6.4	Power cable 3 core 2.5 sq.mm multi strand cable	IS 694:1990 reaffirmed 1995 or latest suitable for IP based
6.5	Power cable 3 core 4 sq. mm multi strand cable	IS 694:1990 reaffirmed 1995 or latest
6.6	PVC Wire coil 10 Sq mm	IRS 76/89 100 Mts.
6.7	35 Sq.mm Multi-strand single core PVC insulated copper cable	IS:694
6.8	6 Sq mm multi-stand single core PVC Insulated copper cable	IS:694
6.9	PVC Thermo shrinkable jointing kit	IRS TC. 77/2010(Rev 2) or latest
6.10	4 pair CAT-6 UTP/STP cable	Make: Finolex/ Bestnet/ Krone/D-Link
7.0	**Earthing, Lightening and Surge Arrestors**	
7.1	Basic material to construct unit maintenance free earth	RDSO Spec no. RDSO/SPN/197/2008 or latest
7.2	Lightening and surge arrestors	RDSO/SPN/165/2004orlatest

RDSO specification of Telecom Items

S. Nos	Description of Items	RDSO Specification No
1	Analog Clock System with GPS Synchronization	RDSO/SPN/TC/76/2021 Version No. 1.0 or Latest
2	SMPS BASED TELECOM INTEGRATED POWER SUPPLY SYSTEM (TIPSS) for station	RDSO/SPN/TC/102-2013 Version 1.0 or Latest
3	Specification for IP Based Integrated Passenger Information System (IPIS)	RDSO/SPN/TC/108/2019 Ver.- 0.0 or Latest
4	TELECOM CABLE TERMINATION BOXES FOR INDOOR USE (NON METALLIC)	Specification No. RDSO/ SPN/ TC/97/2012 or Latest
5	ACCESS CONTROL SYSTEM	SPECIFICATION NO. RDSO/SPN/TC/93/2010 or latest
6	DIGITAL/ISDN & IP READY EPABX SYSTEM AND ATTENDANT CONSOLE – FOR MORE THAN 256 PORTS & UPTO 5000 PORTS	SPECIFICATION NO. RDSO/SPN/TC/27/2007 Revision 1.0 or latest

7	IP Based Video Surveillance System at station	RDSO/SPN/TC/65/2021 Version 6.0 or latest
8	Digital Clock with GPS Synchronization	SPECIFICATION NO. RDSO/SPN/TC/62/2008 Revision 3.0 or latest
9	SPECIFICATION FOR PUBLIC ADDRESS (PA) SYSTEM	SPECIFICATION NO. RDSO/SPN/TC/63/2006 Version-1 or latest
10	REAL-TIME TRAIN INFORMATION SYSTEM	SPECIFICATION NO. RDSO/SPN/TC/77/2011 Version 1.0 Amendment 2.0 or latest
11	Digital Modem(nX64Kbps) upto 2 Mbps (Line Driver)	SPECIFICATION NO. RDSO/SPN/TC/80/2020 Revision 2.0 or latest
12	LAN EXTENDER	SPECIFICATION NO. RDSO/SPN/TC/82/2020 Revision 2.0 or latest
13	LAN SWITCH	SPECIFICATION NO. RDSO/SPN/TC/83/2020 Revision 2.0 or latest
14	Router	SPECIFICATION NO. RDSO/SPN/TC/84/2008 Revision 0.0 or latest
15	SURGE PROTECTIVE DEVICES FOR TELECOMMUNICATION EQUIPMENTS	Specification No.RDSO/ SPN/ TC/98/2011 Revision 0 or latest
1	All these materials to be supplied as per above RDSO specifications only and with RDSO inspection.	
2	All equipments to be installed as per RDSO guidelines and pre-commissioning checklist to be prepared and Signed by the respective OEM/Authorized representative	
3	Any other item (Including cable) if required, should be procured from RDSO specification with RDSO approved venors along with RDSO inspection. Items which are not covered in RDSO specification should be procured from TEC specification with RITES inspection. Any minor item which is not part of RDSO & TEC specification and is being not inspected by RDSO/RITES shall be inspected by railway representative.	
4	Any material required during execution of work/utility shifting shall be arranged by contractor. Railway will not provide any material.	

3. Scope of Station Facilities

Building Block	Ground floor	1st floor	2nd floor	3rd floor	4th floor	5th floor	TOTAL AREA
Main Station Building (East Side)	4502	3212	4502	3605	3680	3680	23181
Arrival Concourse (East Side) – JRC End (in sub-plot 1)	3556	3290	3402				10248
Secondary Station Building (West Side)	2777	250 (Mezzanine)+ 2435	2777				8239
72m Wide Departure Air concourse			5350				5350
FOB connection on North Side			2860				2860
FOB connection on South Side			2735				2735
Railway Hospital	1202	1055	45				2302
Elevated Departure Level Plaza (on East Side)			3385				3385
Plaza and Promenade Area at ground Floor			5550				5550
Relocation of Existing Railway Misc. Structures							26932

4. The Contractor shall develop Parking area & landscape as a part of the Station Development Project as below:

Description	Area (Sqm)
Surface Parking area	12625
Road Area	25640
Landscape Area	10955
Hardscape Area	3300

The Contractor shall as a part of the Project, construct minimum surface parking area of 12625 Sqm including all facilities as listed below:

Mode / Proposed Parking Bays	Parking area
East side parking area	3585 sq.m.
West side parking area	9040 sq.m.

Automatic boom barriers shall be provided wherever required as per detailed design for access control. Dedicated Parking areas are to be planned for 2 wheeler parking, 4 wheeler parking, commercial vehicle parking, staff parking and heavy vehicle parking.

During construction phase, to take up the main entry side site, alternate parking space at LDH end and JRC end respectively shall be created by contractor for passenger convenience.

5. Other Items

a) Existing flag post and high mast lights in circulating area on East and West side of station to be shifted to suitable location and refixed as directed by Authority Engineer

b) Station name boards with Pillar/ Columns work with Exit, entry statement (retro reflective type) shall be constructed and installed at all required locations including LED (Trilingual) name board on both sides.

c) The work of yard remodelling of LDH station is also sanctioned separately and is expected to be under execution during this contract's period. The contractor shall coordinate with yard remodelling agency for smooth work progress. As the yard lines will get slewed during yard remodelling, the foundations of FOB shall be so planned that they do not infringe the existing lines or the slewed alignment of lines.

d) Providing the installation of necessary marking, luminaries, announcement works, CCTV, Displays, IPIS, Digital Clocks, signages etc. complete in all respects.

e) All marking, rubber paint work, greenery work & surface development area needs to be done as per instructions of Authority Engineer.

f) Landscaping, vertical garden & greenery development work in the open area shall be as per the given plan. Also, tree guards shall be provided as approved by Authority Engineer.

g) Drip Irrigation arrangement shall be provided as approved by Authority Engineer.

h) Boundary walls, Compound Walls, Fencing, Platform Back Walls, etc. needs to be provided as per given plan / suggested by AE.

i) Construction of Road including Elevated portion suitably linking Departure Plaza & Main City Road and skywalk from departure plaza to MLCP.

j) Providing & installation of GPS based Digital & Drum Clocks in positions.

k) Proper development of colony site (quarter towers in colony no 5) and Railway use plot (ORH and type IV tower), railway hospital by providing landscaping, internal roads, compound wall, horticulture, entry gates and associated amenities.

NOTE: The Scope of the work as mentioned above is without prejudice to any of the obligations of the Contractor as set forth under the provisions of this Agreement.

Annexure – II

(Schedule-B)

Safety of Traffic & Passengers

2.1. Safety should be ensured while executing work over Railway tracks or Railway asset to safeguard passenger & train movement according to Railway Board Guidelines.

2.2. Joint procedure orders, compendium of instructions issued by Northern Railway on safety at work site shall be followed for undertaking digging work in the vicinity of underground signalling, electrical and telecommunication cables.

2.3. Compendium of instructions on safety at work site shall be strictly followed for ensuring safety while carrying out work near the track to ensure safe train movement and safe passenger movement.

2.4. Methodology regarding safety precautions for basement excavation work for safety of existing structure, earth, TRD portals etc. adequate safety measures like micro-piling, sheet piling or any other appropriate modern technology shall adopted as approved by AE. The detailed methodology shall be worked out by the contractor before execution of work.

2.5. Methodology regarding safety precautions for launching, placement works for Air Concourses shall be carried out by taking adequate safety measures for ensuring safe train movement and passenger movement. This work should be carried out in presence of Railway official during blocks.

2.6. Methodology regarding safety precautions for dismantling work – While taking up the dismantling work, its repercussions should not be on nearby existing structures. The detailed methodology shall be worked out by the contractor before execution of work.

2.7. Methodology regarding safety precautions for electrified area – Safety precaution should be taken while carrying out any work in electrified territory/ near OHE wire according to Railway board guidelines

2.8. Contractor shall follow the Railway Board's Joint Procedure Order for undertaking digging work in the vicinity of Signalling, Electrical and Telecommunication Cable which will be available at the following web link:

https://indianRailways.gov.in/Railwayboard/uploads/directorate/ele_engg/RE/Procedure_undertaking_221214.pdf

Annexure – III
(Schedule-B)

Shifting of Obstructing Utilities

a) The EPC contractor's scope shall include shifting / relocation of necessary services and utilities on the site, location of Construction activity, as per Article 9 of the Agreement.

b) For all the structures, buildings, Quarters, service rooms, electric room, refurbished buildings, platform area, Contractor shall remove all the existing, attached fittings, fixtures, installations pertaining to Electrical, Telecom, Signalling such as fans, bulbs, tube lights, Meters, Pumps, Poles, CCTVs, ACs, TV, display units, PA System, PC Systems, Routers, indicator boards, PV systems, benches, shutter gates, water coolers, station name boards, misc. items etc. shall be removed intact and handed over to concerned SSE, at his depot.

c) An indicative list of utilities, amenities, cables is being provided below for reference only, and it will be the responsibility of the EPC contractor to shift and relocate them at his own cost.

d) For avoidance of doubt for such utilities including its shifting which form part of scope of work under Schedule B or Schedule C, no payments over and above the Contract Price shall be payable.

S.No.	Description	Scheme Of Shifting / Location
A	**TICKETING COUNTER, PRS &BOOKING OFFICE**	Ticketing counter, PRS and booking office is to be relocated to porta cabins or temporary buildings. Spare electrical & electronic items(including PRS box) shall be handed over to concerned SSE of Firozpur division at his store/depot. Structure to be demolished thereafter and debris removed from site.
B	**EXISTING FOB TO BE DISMANTLED**	To be dismantled, debris removed from site by Agency and released structural steel will be property of Agency.
1.	CASING-CAPPING, WIRES ETC	Shifting of existing Wires, Casing,Capping etc as per requirement at site with approval of authority engineer. Spare material to be handed over to concerned SSE of Firozpur division at his store/depot only after provision of an alternate arrangement as per guidelines of Railways/CORE/RDSO.
2.	12U/4U RAKE	to be removed by agency and handed over to concerned SSE of Firozpur division at his store/depot.
C	**ELECTRIC SUBSTATION COMPONENTS (on City Side)**	
S.No.	**Description**	**Scheme Of Shifting / Location**

3.	11 KV SUBSTATION (EXISTING)	To add/upgrade 11KV substation, making it operational and then dismantling existing and debris removal from site by EPC contractor. Dismantling to be done after alternate structure at specified location is installed to ensure availability of power supply to the existing infrastructure. Released material including fittings, fixtures, installation, Sets, equipment, systems, panels etc. to be handed over to concerned SSE of Firozpur division at his store/depot.
D	**EXTERNAL STREET COMPONENTS-**	
4.	SIGNAGE BOARDS	to be removed by agency and disposed at his own cost.
5.	STREET LIGHTS	to be removed by agency and handed over to concerned SSE at his store/depot.
6.	ELECTRIC POLES WITH LIGHTS	to be removed by agency and handed over to concerned SSE at his store/depot.
7.	OUTER BOUNDARY CCTV CAMERAS	to be removed by agency and handed over to concerned SSE at his store/depot.
8.	ROTATING CC TV CAMERAS	to be removed by agency and handed over to concerned SSE at his store/depot.
9.	WATER SUPPLY PIPELINE	to be kept functional by necessary modifications till commissioning of new water supply system for supply to existing (in use) structures. After commissioning of new system to be dismantled and released material will be property of agency.
10	Sewer Line	to be kept functional by necessary modifications till commissioning of new sewerage system for service to existing (in use) structures. After commissioning of new system to be dismantled and debris removed from site.
11.	LT CABLES OF DIFFERENT SIZES (SQMM)	After providing an alternate arrangement, to be removed by agency and handover to concerned SSE of firozpur division at his store/depot.
F	**STATION BUILDING**	
12	Offices	To be relocated to existing structures after refurbishing and then to be dismantled after removing electrical& electronic items which shall be handed over to concerned SSE of firozpur division at his store/depot.
13	Passenger amenities like refreshment room, retiring rooms, waiting halls, toilets etc	To be relocated to existing structures after refurbishing and then to be dismantled after removing electrical& electronic items which shall be handed over to concerned SSE of firozpur division at his store/depot.

S.No.	Description	Scheme Of Shifting / Location
G	**ORH, Hospital, Office complex**	To be relocated either to existing structures after refurbishing or to new structures created for relocation. After relocation to be dismantled after removing electrical& electronic items which shall be handed over to concerned SSE of firozpur division at his store/depot.
H	**OTHER COMPONENTS**	
11.	QUARTERS	To be dismantled and debris removed from site by agency. Released structural steel shall be property of agency. Electrical fixtures, installations to be handed over to concerned SSE of Firozpur division at his store/depot.
12.	Generator/LT Panel Room - LT panel and DG set, associated electric equipment.	Dismantling to be done after alternate structure at specified location is installed to ensure availability of power supply to the existing infrastructure. Released equipments to be handed over to concerned SSE of Firozpur division at his store/depot.
14.	LT CABLES OF VARIOUS SIZES	Re-laying in Trench/Cable tray by Contractor for permanent shifting
15.	BENCHES	To be removed by agency. The concrete benches and SS benches shall be handed over to SSE of firozpur division at his store/depot., for reuse after refurbishment of platform surface.
16.	COACH INDICATOR	to be removed by agency and handed over to SSE of firozpur division at his store/depot of firozpur division at his store/depot.
17.	TRAIN INDICATOR BOARDS	to be removed by agency and handed over to SSE of firozpur division at his store/depot. E of firozpur division at his store/depot.
18.	S&T BOX	to be removed by agency and handed over to SSE of firozpur division at his store/depot.E of firozpur division at his store/depot. of firozpur division at his store/depot.
19.	CCTV CAMERAS	to be removed by agency and handed over to SSE of firozpur division at his store/depot.
20.	SIGNAGE BOARDS	to be removed by agency and handed over to SSE of firozpur division at his store/depot.

21.	Water Booth / Water cooler	to be dismantled and debris removed from site by agency , fitting and installation to be handed over to concerned SSE.
22.	SPEAKERS	to be removed by agency and handed over to SSE of firozpur division at his store/depot
23.	RAIL TEL ROUTERS	to be removed by agency and handed over to SSE of firozpur division at his store/depot
24.	CLOCK	to be removed by agency and handed over to concerned SSE of Firozpur Division at his store/depot.
26.	TOILET BLOCK	To be dismantled and debris removed from site by agency, after handing over required fitting, fixtures, installation, Sets to concerned SSE of firozpur Division at his store/depot.
27.	SULABH COMPLEX	
28.	ELECTRIC POLE	to be removed by agency and handed over to SSE of firozpur division at his store/depot.
29.	OHE equipment	Alternate arrangement to be provided as per clause 11.9.2 of schedule C. Removal of existing OHE equipment and hand over to concerned SSE of firozpur division at his store/depot.
30.	AT CABLE 2X70SQMM	Removal and re-laying of new cable of suitable size.
31.	LUGGAGE SCANNER MACHINE BOOTH ANDMETAL DETECTOR	to be removed by agency and shifted to alternate location for reuse
32.	STATION NAME BOARD ATEND OF PLATFROM	to be dismantled and debris removed from site by agency
33.	GRANITE SITTING AREA AROUND PLATFORM SHELTER COLOUMNS	to be dismantled and debris removed from site by agency
34.	OFC 6 FIBER	To be removed by agency and handed over to concerned SSE of firozpur division at his store/depot of firozpur division at his store/depot Re-laying in Trench/Cable tray by Contractor for permanent shifting
35.	SIGNALLING	
36.	QUAD CABLES	
37.	OFC 24	
38.	CAT 6	
39.	POWER CABLE 3 COREx2.5	
40.	DATA CABLE	
42.	12U/4U RAKE	to be removed by agency and handed over to concerned SSE of firozpur division at his store/depot.

44.	SHUTTER GATE	to be removed by agency and disposed off at own cost.
45.	Platform Flooring & Platformshelters on PF No. 1,2,3,4,5 & 6	To be dismantled, debris to be removed & released material, structural steel, roof sheeting etc. will be property of Agency. Electrical& electronic items shall be removed intact and handed over to concerned SSE of firozpur division at his store/depot.

The listed items above are indicative and non–exhaustive and the contractor shall ensure complete shifting /demolishing as per site condition with the approval of AE. Debris shall be removed from site by agency from all locations as instructed.

a) Any unforeseen utility which comes into notice afterwards and becomes inevitable to be shifted in favour of the work, shall be executed by Contractor including obtaining related permission/ NOC from the concerned department, and payment shall be done as the procedure laid down in Article 13.

b) The permission of local authority for disposal of debris shall be obtained by contractor himself at his own cost, the required norms, bylaws for carting, loading, unloading of the debris shall be complied by the Contractor.

Installation and commissioning in Contractor's scope for the following items:

1. Before shifting of S&T cable, Passenger Amenities System and other related installation: Provision to be made as per approved drawing at new location. So that train operation is not hampered.

2. Electric & Telecom Cables: Existing electric & telecom cables will not be removed or damaged before standby arrangements or standby cables are laid as per approved drawing. Only after laying cables at new locations and connection within old arrangement is done, then only existing electric & telecom cable can be removed in presence of concerned department's Railway Representative.

3. Always keep in mind that this shifting from old to new alignment must not effect the train operations at any given point of time.

4. Contractor has to take care and duly protect of the existing as well as newly laid cables, connections, utilities so that the traffic operation, passenger utilities and other services do not get hampered.

5. Please refer Clause 8.2.4 of EPC Agreement for released material.

SCHEDULE-C

(See Clause 2.1)

PROJECT FACILITIES/UTILITIES (SCOPE OF PROJECT)

Without prejudice to the other terms of this Agreement the Contractor shall develop/ redevelop the following services, amenities and facilities as a part of the Project:

Station Development Utilities

Part A: WATER SUPPLY

1. Water supply system shall be developed as per the given drawing provided in Schedule B. This drawing is indicative and for reference the contractor shall calculate, design and develop detailed scope, drawing for water supply for approval of AE, before execution of work.

2. The Contractor shall have to suitably replace / modify / augment the existing water supply system and water supply facility to the extent required as per detailed design. This shall include laying of pipelines, dual plumbing system, underground tanks, water softening plant, chlorine dozing system, pumping stations, internal plumbing system, sanitary installation and installation of new functional meters and their integration with existing system

3. Water supply network to be developed covering new station buildings (As per Schedule B) , new quarters, new ORH, new Hospital, platforms, utility buildings, refurbished area, circulating area, outside area including greenery, retained buildings, etc.

4. Internal plumbing system shall be developed for new Station buildings, , new quarters, new ORH, new Hospital, platforms, utility buildings, refurbished area, circulating area, outside area including greenery, retained buildings, etc.

5. Water supply system for existing station shall be separated yet integrated / connected with station redevelopment project. Moreover, the potable water supply network shall be entirely separate & different (in design & operation) from the non-potable water supply network. The non-potable network shall be met with bore wells & Sewer Treatment Plant

6. The Contractor shall ensure that the decommissioning of existing system shall be done only after the commissioning of new water supply system so that it would not cause any effect on the ongoing station operations, existing quarters, service buildings, passenger area. Necessary works shall be done by the contractor to keep the existing water supply functional during construction phase.

7. Water Chlorine Dozing Unit shall be developed / upgraded for entire potable water supply.

8. Water metering shall be separate for each of the Project Facilities developed as part of Station Development Project. Further, for better water management, meters shall be

installed at all the locations which shall help in assessment of leakage and wastage in a particular section of the network.

9. The total water demand for various components are as follows:

Potable Water Demand (KLD)	Non-Potable Water Demand (KLD)	Total Demand (KLD)	Additional Raw Water Demand (KLD)
1867	983	2850	N.A

10. For the water distribution system, it is proposed to have a grid system of water supply. Required automation shall be incorporated in the design of water supply and provided fully functional by the contractor.
11. Underground storage reservoirs (RCC) and OHT (RCC) shall be designed/refurbished/utilized so that in case of any emergency, the operations at the station can sustain smoothly. The storage capacities of the tanks shall not be less than the following values:

Sr. No.	Description	Storage capacity* (KL)	Remark
1	**At Water Utility location for Station complex**		
a)	UG tank for raw water, treated water and flushing water (2 Tanks each of – 900 KL) One tank of 500 KL for Fire Water storage.	2300	This will serve as balancing tank wherein water coming from Bore well will be stored and further pumped to the OHT for chlorination and drinking water stream.
b)	OHT for Water stream (1 tank of 600 KL & Tanks for Flushing waterof total 315 KL) One tank of 20 KL for Fire Water storage	935	This is for water to be stored and distributed for potable use. The water shall be further treated through the portable water dispenser units at various locations.

**The above capacity excludes freeboard of 0.5m.*

12. The Under ground and Over head tanks have to be constructed in Reinforced Cement Concrete on East side or West side based on the availability of space within a radius of 3Km.

13. Minimum 02 nos. Pumping stations (including civil structure, designing, procuring, installation, testing including commissioning of pumps and associated connections) considered for pumping to drink water stream, chlorination stream and rake filling. All the pumps shall be designed considering 12 hours operations per day with provision for 100% standby capacity.
14. Water demand for secondary uses like horticulture, apron washing, flushing etc. shall be met through treated sewage effluent (TSE).
15. Drinking water demand of the station including offices and catering shall be **1.867 MLD** for which water treatment plant of appropriate technology shall be provided.
16. Dispenser units with water coolers for potable water supply shall be provided at least at **25 locations** of 100 LPH capacity such as platforms, concourse, Buildings etc. wherever drinking water is required for public/passengers and employees. (Ref. Schedule-B)
17. RO treatment Unit of capacity 150 Ltr per hr. with SS water tank and storage water cooler shall be provided in at least 7 locations.

Part B: SEWERAGE TREATMENT SYSTEM

1. Sewerage treatment system for the entire area shall be developed by Contractor. The Contractor shall develop necessary facility for waste-water recycling for the wastewater generated from the station area.
2. The Contractor shall have to suitably replace/modify/ augment the existing Sewerage system to the extent required as per detailed design including but not limited to laying of collection network, plumbing, reservoirs, Sewage Treatment Plant, connection with existing municipal sewer line for overflow of sewage and pumping stations shall have to be provided by the Contractor. The Contractor shall ensure that replacement / modification/ augmentation shall be done in such a manner so that it would not cause any effect on station operation. Minimum 2 nos. Pumping stations (including civil structure, designing, procuring, installation, testing including commissioning of pumps and associated connections) to be considered for pumping to rake washing and treated sewage effluent UGTs, chlorination stream and rake washing.
3. Sewerage system shall be developed for station building all floors and for platforms, Station Parking, Circulation, Landscaping, new quarters, ORH, hospital, retained buildings etc
4. The sewerage system networking to be developed for station development and redevelopment project, this shall cover station area including platforms, utility land, station building, circulating area, outside area including greenery, retained buildings etc.

5. Sewage treatment plants of **2190 KLD** total capacity shall be provided as per approved specification. The Contractor shall work out and may suggest use of Compact modular plant with latest technologies
6. Considering various reuses like horticulture, flushing, apron washing etc. and their desired water quality, the sewerage treatment facilities shall be designed to produce a secondary and tertiary effluent having following characteristics:

Secondary Treated Sewage Quality

S. No.	Raw Sewage	Characteristics
1	Biological Oxygen Demand (BOD)	20 mg/l
2	**Total Suspended Solids (TSS)**	30 mg/l

*The Contractor to provide facility as per latest standards applicable during execution

Tertiary Treated Sewage Quality

Si. No.	Raw Sewage	Characteristics
1	Biological Oxygen Demand (BOD)	5 mg/l
2	**Total Suspended Solids (TSS)**	5 mg/l

** The Contractor to provide facility as per latest standards applicable during execution*

7. The storage capacities of the tanks shall not be less than the following values:

Sr. No.	Description	Storage capacity* in Million Liters
1	**For Treated sewage stream**	
a)	UGT for Treated sewage effluent	1.0

**The above capacity excludes freeboard of 0.5m.*

Separate water supply network for feeding this effluent water to flushing connections, for horticulture and for apron and coach washing shall be planned and laid in the scope of this contract.

Part C: STORM WATER DRAINAGE

The catchment area (Roofs, Sheds, Parking, Basements, Hardscape, Road and Yard area) as per schedule A & B) is to be planned and to be constructed for comprehensive storm water drainage network as per recommendations laid down in the Manual of CPHEEO ((Central Public Health and Environmental Engineering Organisation) of MoUD (Ministry of Urban Development). The given drawing is indicative and for reference only, the detailed drawing & design shall be worked out & developed by the contractor for approval of AE before execution of work.

The slopes of roofs, sheds, basements, draw down pipes, floors, open area shall be ensured and pipes shall be designed with self-cleansing velocity. Utmost care shall be exercised while designing drainage of the basement with modalities to ensure minimum ingestion of water into basement. Pumping facilities needs to be provided at basements at multiple locations.

Contractor may note that the Ludhiana station is located in low lying area and has history of water filling and stagnation, which shall be taken in view and resolved while designing the disposal of storm water

Part D: RAIN-WATER HARVESTING

Comprehensive ground water recharging plan is to be developed by the Contractor based on the outputs of hydro geological survey of complete land. Minimum **30** recharge pits of minimum capacity of 75 KL each shall be designed and constructed which includes construction of pits, manholes, grit chambers, drainage pipeline network and connections etc. as per Central Ground Water Board Norms and Specification.

Part E: FIRE FIGHTING

The National Building Code of India (NBC) together with relevant aspects of NFPA Standards will form the basis of safety provisions for the project. Where appropriate, fire engineering will be applied to justify deviations from the NBC. The firefighting system shall be developed but not limited to as per following details:

LUDHIANA JUNCTION RAILWAY STATION REDEVELOPMENT		
List of Tender Drawings - Fire fighting		
Sno	**DRAWING No**	**Title**
	-	-
A	**Site Plan**	-
1	LDH-TD-FF-SP-101	FIRE FIGHTING SITE PLAN (At Platform Level)

2	LDH-TD-FF-CON-152	FIRE FIGHTING SITE PLAN AT +9000 LVL (showing FOB & Air Concourse)
B	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-FF-EB-151	FIRE FIGHTING GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
2	LDH-TD-FF-EB-152	FIRE FIGHTING FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
3	LDH-TD-FF-EB-153	FIRE FIGHTING DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
4	LDH-TD-FF-EB-154	FIRE FIGHTING THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
5	LDH-TD-FF-EB-155	FIRE FIGHTING FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
5	LDH-TD-FF-SCH-EB-401	FIRE FIGHTING SCHEMATIC, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL)
C	**WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)**	
1	LDH-TD-FF-WTB-151	FIRE FIGHTING GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
2	LDH-TD-FF-WTB-152	FIRE FIGHTING FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
3	LDH-TD-FF-WTB-153	FIRE FIGHTING SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE)
4	LDH-TD-FF-SCH-WTB-401	FIRE FIGHTING SCHEMATIC WEST SIDE BUILDING
D	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-FF-AB-JRC-151	FIRE FIGHTING EAST SIDE ARRIVAL BUILDING (JRC) GROUND & FIRST FLOOR PLAN
2	LDH-TD-FF-AB-JRC-152	FIRE FIGHTING EAST SIDE ARRIVAL BUILDING (JRC) SECOND & TYPICAL FLOOR PLAN
3	LDH-TD-FF-AB-JRC-401	FIRE FIGHTING SCHEMATIC EAST SIDE ARRIVAL BUILDING (JRC)
E	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-FF-TYPE 02-151	FIRE FIGHTING GROUND FLOOR TYPE-02 RESIDENCE
2	LDH-TD-FF-TYPE 03-152	FIRE FIGHTING TYPICAL FLOOR TYPE-02 RESIDENCE
3	LDH-TD-FF-TYPE 03-153	FIRE FIGHTING MACHINE ROOOM LVL. TYPE-02 RESIDENCE
4	LDH-TD-FF-TYPE 03-401	FIRE FIGHTING SCHEMATIC TYPE-02 RESIDENCE
F	**TYPE-III RESIDENCE (S+5)**	
1	LDH-TD-FF-TYPE 03-151	FIRE FIGHTING STILT FLOOR TYPE-03 RESIDENCE
2	LDH-TD-FF-TYPE 03-152	FIRE FIGHTING TYPICAL FLOOR TYPE-03 RESIDENCE
3	LDH-TD-FF-TYPE 03-153	FIRE FIGHTING MACHINE ROOOM LVL. TYPE-03 RESIDENCE
4	LDH-TD-FF-TYPE 03-401	FIRE FIGHTING SCHEMATIC TYPE-03 RESIDENCE

G	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-FF-TYPE 04-151	FIRE FIGHTING GROUND FLOOR PLAN TYPE-04 RESIDENCE
2	LDH-TD-FF-TYPE 04-152	FIRE FIGHTING FIRST FLOOR PLAN TYPE-04 RESIDENCE
3	LDH-TD-FF-TYPE 04-153	FIRE FIGHTING TYPICAL FLOOR PLAN TYPE-04 RESIDENCE
4	LDH-TD-FF-TYPE 04-154	FIRE FIGHTING TERRACE FLOOR PLAN TYPE-04 RESIDENCE
5	LDH-TD-FF-SCH-TYPE 04-154	FIRE FIGHTING SCHEMATIC TYPE-04 RESIDENCE
H	**REST HOUSE (G+1)**	
1	LDH-TD-FF-RH-151	FIRE FIGHTING FLOOR PLANS
I	**HOSPITAL BUILDING**	
1	LDH-TD-FF-HB-151	FIRE FIGHTING GROUND FLOOR PLAN HOSPITAL BUILDING
2	LDH-TD-FF-HB-152	FIRE FIGHTING FIRST FLOOR PLAN HOSPITAL BUILDING
3	LDH-TD-FF-HB-153	FIRE FIGHTING TERRACE FLOOR PLAN HOSPITAL BUILDING
4	LDH-TD-FF-HB-401	FIRE FIGHTING SCHEMATIC HOSPITAL BUILDING
		-
J	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-FF-CON-151	FIRE FIGHTING PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08)
2	LDH-TD-FF-CON-152	FIRE FIGHTING PLAN AT +8760 LEVEL (Showing FOB & Air Concourse)
3	LDH-TD-FF-CON-153	FIRE FIGHTING PLAN AT +9000 LEVEL (BLOW UP) (Showing FOB & Air Concourse)

LUDHIANA JUNCTION RAILWAY STATION REDEVELOPMENT

List of Tender Drawings - HVAC

Sno	DRAWING No	Title
	-	-
A	**MAIN TERMINAL BUILDING EAST SIDE (DEPARTURE CUM ARRIVAL BUILDING)**	
1	LDH-TD-HVAC-EB-151	GROUND LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
2	LDH-TD-HVAC-EB-152	FIRST FLOOR PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
3	LDH-TD-HVAC-EB-153	DEPARTURE CONCOURSE LEVEL, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
4	LDH-TD-HVAC-EB-154	THIRD FLOOR LEVEL PLAN, MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
5	LDH-TD-HVAC-EB-155	FOURTH (TYPICAL) LEVEL PLAN (+18000), MAIN TERMINAL BUILDING (DEPARTURE CUM ARRIVAL) HVAC LAYOUT
B	**WEST SIDE TERMINAL BUILDING (ARRIVAL AND DEPARTURE)**	
1	LDH-TD-HVAC-WTB-151	GROUND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) HVAC LAYOUT

2	LDH-TD-HVAC-WTB-152	FIRST FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) HVAC LAYOUT
3	LDH-TD-HVAC-WTB-153	SECOND FLOOR PLAN WEST SIDE TERMINAL BUILDING (ARRIVAL & DEPARTURE) HVAC LAYOUT
C	**ARRIVAL CUM MLCP BUILDING JRC END**	
1	LDH-TD-HVAC-AB-JRC-151	EAST SIDE ARRIVAL BUILDING (JRC) GROUND & FIRST FLOOR PLAN HVAC LAYOUT
2	LDH-TD-HVAC-AB-JRC-152	EAST SIDE ARRIVAL BUILDING (JRC) SECOND & TYPICAL FLOOR PLAN HVAC LAYOUT
D	**TYPE-II RESIDENCE (S+5)**	
1	LDH-TD-HVAC-TYPE 02-151	GROUND FLOOR TYPE-02 RESIDENCE HVAC LAYOUT
2	LDH-TD-HVAC-TYPE 03-152	TYPICAL FLOOR TYPE-02 RESIDENCE HVAC LAYOUT
3	LDH-TD-HVAC-TYPE 03-153	MACHINE ROOOM LVL. TYPE-02 RESIDENCE HVAC LAYOUT
E	**TYPE-III RESIDENCE (S+5)**	
1	LDH-TD-HVAC-TYPE 03-151	STILT FLOOR TYPE-03 RESIDENCE HVAC LAYOUT
2	LDH-TD-HVAC-TYPE 03-152	TYPICAL FLOOR TYPE-03 RESIDENCE HVAC LAYOUT
3	LDH-TD-HVAC-TYPE 03-153	MACHINE ROOOM LVL. TYPE-03 RESIDENCE HVAC LAYOUT
F	**TYPE-IV RESIDENCE (G+5)**	
1	LDH-TD-HVAC-TYPE 04-151	GROUND FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
2	LDH-TD-HVAC-TYPE 04-152	FIRST FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
3	LDH-TD-HVAC-TYPE 04-153	TYPICAL FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
4	LDH-TD-HVAC-TYPE 04-154	TERRACE FLOOR PLAN TYPE-04 RESIDENCE HVAC LAYOUT
G	**HOSPITAL BUILDING**	
1	LDH-TD-HVAC-HB-151	GROUND FLOOR PLAN HOSPITAL BUILDING HVAC LAYOUT
2	LDH-TD-HVAC-HB-152	FIRST FLOOR PLAN HOSPITAL BUILDING HVAC LAYOUT
3	LDH-TD-HVAC-HB-153	TERRACE FLOOR PLAN HOSPITAL BUILDING HVAC LAYOUT
H	**PLATFORM, CONCOURSE AND FOB**	
1	LDH-TD-HVAC-CON-151	PLAN AT PLATFORM LEVEL (Showing Platforms- 01 to 08) HVAC LAYOUT
2	LDH-TD-HVAC-CON-152	PLAN AT +8760 LEVEL (Showing FOB & Air Concourse) HVAC LAYOUT

The following key features will form part of the approach to safety:

i. Prevention of fire by design and mitigation of risk.
ii. Low fire load in public circulation areas.
iii. High fire load area (e.g. retail) to be confined to designated areas.
iv. Use of non-combustible construction materials.
v. Rapid evacuation via normal access routes.
vi. High standard of supervision, management and maintenance.

Fire Detection and Alarm System shall be installed in covered areas i.e. Subways, Station Building at Ground Floor, Mezzanine Floor, Concourse falling under Station Area.

Part F: ELECTRICITY SUPPLY

The scope of work under this scheme includes supply, transportation, unloading, erection and commissioning of the electrical items. It is Contractor's responsibility to execute the job in all respect as per the detailed drawings / specifications.

Any other equipment/services which are not explicitly mentioned in the schedule but deemed necessary for the successful operation of the system complete in all respects shall be in Contractor's scope.

The Contractor shall be responsible for all electrical installations and electrical fixtures including lighting and other power equipment for Station Buildings and suitable systems for Platforms, FOBs, Station Parking, Circulation, landscaping, Residential quarters (as per Railway board scale of fitting), Hospital building, rest house building etc. Façade Lighting is also part of the EPC Scope of work for Both side Entry Façade.

Dismantling of the fittings / fixtures, keeping them in safe custody and /or protection of the fittings & fixtures, civil & electrical installations & services in the best interest of the Railway and depositing them in the store of concerned SSE/Power/TRD.

Finishing works civil including electrical conduit & wiring as per requirement.

Installation and commissioning in Contractor's scope for the followings items:

1. Approval and sanction of Electrical load from Local / State supply shall be arranged by Contractor.
2. 2 nos Electrical Substations (which includes civil work for substation structure) for arranging electricityfrom the Local supply/State supply shall be arranged by the Contractor.

3. Electrical metering for station area load and railway load shall be separated.
4. The Contractor shall ensure that replacement / modification/ augmentation of existing system shall be done as per the detailed design in such a manner so that it would not cause any effect on Station operations.
5. Electrical Installation: Before shifting, all electrical installations and cable to be provided in advance and only connections with existing line to be done in period (if required). Work of connections of old with new to be done only in presence of concerned department supervisor's / Railway representative
6. Additional Cables from RMU to Bus Bar to Each substation shall be provided by the EPC contractor
7. Additional 3 Nos of Spare Cables in Each Electrical room to be provided by the EPC contractor. Cable Sizes should as per the site requirement and Final load calculations
8. All the necessary Safety Equipment's, Measuring Equipment's, Tools, Safety Charts, Maintenance Charts Etc needs to be provided by the EPC contractor.
9. Additional 1 Nos. of spare cable has to be provided for each Fire Fighting System Room.
10. EPC contractor shall make provisions of track crossing of cables through HDD, HDPE pipe of size 160 SQMM at between platforms, and at both ends of platform. For the same EPC contractor has to take prior approvals on drawings and material.
11. Considerations (like: CSS, D.G., LT Panel Qty & Ratings) are design basis only (Not Final), Changes may occur during the execution and it has to be done as per the approved designs, as per site condition & directed by Railway
12. Installation of all electrical services as per relevant codes, standard & guidelines as per Schedule D.

Proposed Electrical Maximum Demand	Existing	Contractor Scope	Remarks
4800 KW **Say 4.8 MW**	Exiting supply is 11 KV however this is for information only to be verified by the contractor	S.I.T.C. of 2000KVA 3 Nos. Transformers substation for Railway Station while 3 Nos 1500 KVA for 2nd substation including 1 no transformer standby. Shifting, Commissioning, Testing & charging of Existing transformer at new location, if required, for Railway operation	Contractor shall be responsible for Providing 4.8 MW load requirement With redundant supply system for Station and Railway associated building including HT panel, Transformer, Incoming and Outgoing panels.
2 Nos. 1500 kVA D G S e t **(Silent Type) &** **1 Nos. 1000 KVA for 2nd sub station**	-	DG Set for Station Area and associated building.	Supply, Installation, Testing and Commissioning of Silent Type DG Set along with AMF panel and necessary connections with LT panel shall be in scope of Contractor
	-	LT panels for the Station redevelopment for safe, efficient, and smooth operation of equipment in Station Area and Railway Operations.	Supply, installation, testing and commissioning of LTPCCs, PCCs, MCCs, MPDBs, MLDBs, PDBs, LDBs & Emergency panels which will feed power to various facilities shall be provided by Contractor for the Station redevelopment and Shifting, Commissioning, Charging for Existing LT Panels at new location for Railway Operations.

APFCR	-	Automatic power factor capacitor bank along with Panel at suitable locations for improvement of P.F up to 0.99 to minimize maximum demand, to avoid penalty because poor P.F and to de-stress all current carrying equipment's.	Supply, installation, testing and commissioning of APFCR panel and Capacitor banks for as per statutory norms in State shall be provided by Contractor.
HT & LT power and control cable & Bus Duct	-	LV Bus duct, HT & LT Power, and control cable suitable for System requirement.	Supply, installation, laying, termination and connection of all the electrical HT & LT Power and Control cables, wires, cable trays, interconnecting cabling for Station & Railway shall be in the scope of Contractor as per requirement.
Illumination System	-	All lighting as per relevant standard codes for the Station development area including Street Lighting with LED	Supply, installation, Testing and commissioning of lighting Fixture, Fans etc. for station development along with all the Hardware requirement as per relevant
		bulbs, Facade Lighting etc. The railway track shall also be illuminated below Foot over bridge with Low bay lighting	standard codes shall be developed by Contractor.

Solar SPV System		443 KWP	Supply, installation, Testing and commissioning of Solar SPV System including all fixing/installing arrangement etc. complete in all respect.
6 No 20 KVA+ 4 Nos. 7.5 KVA UPS with SMFbattery (Minimum 30 minutes backup)	-	Centralized or Distributed on-line UPS with SMF battery bank, Battery charger for supplying critical load, Emergency Lighting, ticket booking etc. as per the requirement of Station.	Supply, installation, Testing and commissioning of UPS with SMF battery & Battery Charger shall be in the scope of Contractor.
Power and Switch Socket	-	Small power modules and switch socket, Receptacles as per requirement	Supply, Installation, Testing and Commissioning of All small power modules and Switch socket, receptacles for Station development as per requirement based on location and utility shall be in the scope of Contractor.
Earthing System	-	Earthing system and Lightning Protection	Supply, installation, Testing and commissioning of all the
			items required for Earthing system & lightning protection system as per relevant codes and standards shall be in scope of Contractor.

Additional Points related to General electrical work and TRD/OHE works

Contractor shall carry out the general electrical works as given below:-

1. Based on the preliminary electrical load calculation, maximum electrical power demand is estimated as 4800kW (The figure is tentative and Changes may occur during the execution). However, the existing arrangement of 11kV substation is not able to cater the enhanced load due to station development project, the EPC contractor shall augment the capacity of 11kV Sub-station load at his own cost including the cost of additional equipment like HT panel, Transformer, LT panels etc.
2. The EPC contractor shall also avail new connection or augment the existing sanctioned load from State Utility/DISCOM at his own expenses. Liasoning with the State Power Supply utility or any other power supply distribution authority and getting the electrical connection released from them also to be done by the EPC contractor. All statutory charges against challans shall be borne by the Contractor.
3. The contractor shall apply for a temporary connection on chargeable basis from Sr. DEE/G/FZR for the electricity required for the execution of the project with all the necessary documentation/charges.
4. Construction of new Substation/Plant Room should be as per approved Railway drawing. The EPC contractor shall submit the Single Line Diagram/power flow diagram of Electrical power distribution scheme to Railways for approval before starting the work at site. EPC contractor shall arrange for the power supply by providing Transformer, HT & LT panels, DG set etc. along with accessories of suitable capacities as per requirement of Railways. The EPC contractor shall also arrange for laying of HT/LT cables of suitable sizes along with all other associated work required for the successful operation of the system. The EPC contractor shall submit the HT/LT cable route plan in advance for approval from Railways. The existing LT Panel room or any other electrical assets/equipment can be dismantled only after successful commissioning of the new one.
5. The EPC contractor shall ensure that all the substations (New/Existing) for station redevelopment project are connected through separate RMUs.
6. Dismantling and shifting/relocating/re-commissioning of existing Solar panels, DG sets & Transformer, associated HT/LT panel with necessary laying of cables & connection with existing cables of old service station in new Substation/Plant Room works shall be done only after making arrangement of alternate source of power supply during shifting work till completion of shifting work. The existing LT Panel room on rear side can be dismantled only after successful commissioning of the new LT room on front side. The contractor shall be responsible for providing continuous/undisturbed power supply during the entire period of execution of work.
7. All the released material which is not made in use or replaced as per Railway requirement shall be returned to Railways.
8. EPC contractor shall provide minimum 65 nos. EV charging points (AC & DC fast charging) in parking areas (both sides Station parking area and as well as in each floor of MLCP) as per requirement.
9. The EPC contractor shall provide all the electrical Equipment like Transformer, HT Panel, APFC, DG set, LT panels etc. along with accessories of suitable capacities including all HT/LT cable, bus trunking (Cu) and associated works as per the Railway Norms and requirement in existing sub-station building to be extended.
10. Required capacity of DG set, AMF Panel and other accessories to meet the CPCB (Latest) Norms like exhaust structure (chimney) height etc. shall be provided by the EPC contractor

to cater the 40% of total load or emergency loads as per the Railway requirement for power back up.

11. EPC contractor is required to set up all substations and electrical switch rooms as per the latest norms/guidelines of Railways fully charged and get the same approved from Competent Authority of Railways i.e. EIG of Railways.
12. EPC Contractor shall provide 11kV cables as per standard practices of Railways and as per relevant standards. Terminations of these HT cables shall be through heat shrinkable kits/Joints or as per the latest guidelines or Railway practices available.
13. The contractor shall also include future load requirement in the sub-station. Additional Spare HT cables shall be provided by the EPC contractor for the reliable Electrical Power supply system in case of any power failure.
14. EPC contractor shall make provisions of track crossing of cables through HDD, HDPE pipe of required size in between platforms, and at both ends of platform. Cable laying in the yard/station area shall be executed following latest Railway Board guidelines.
15. All the necessary Safety Equipment's, Measuring Equipment's, Tools, Safety Charts, Maintenance Charts, First Aid box, Hand gloves etc. as per the latest Railway Norms/guidelines to the staff shall be provided by the EPC contractor.
16. The EPC contractor shall provide 11/0.433 kV transformers in substations confirming to latest IS 1180 or latest with BEE level 2 specification or latest or as per site requirement.
17. EPC contractor shall ensure the latest CPCB norms/guidelines for supply and installation of DG sets. The EPC contractor may also explore the availability of PNG based DG sets as per the requirement.
18. Provision of net metering from DISCOM shall be ensured by EPC contractor in the event of Solar capacity addition.

Operational Topology of HT/LT Panels, Transformer, DG through PLC and SCADA

i.) 1500 kVA Transformer – 03 Nos and 2000 kva transformer- 3 nos (including 2 nos standby shall be online mode and 2 nos. of 1500 kVA DG set and 1 no 1000 kVA DG set in power backup as per site requirement. The 70% (approx.) of total load of substation or emergency load as per the Railway requirement shall be catered capacity D.G. sets of the sub-station.

ii. These all operations will be done through PLC/SCADA based system. Every Main LT and Sub Panels (Distribution boards etc.) has to be connected through PLC & SCADA.

iii. Supply from these transformers shall be advanced to Main LT Panel in each substation &

D.G. Sets through sandwich type bus trunking (Copper) with prior approval of Railways of suitable rating from where the supply will reach to Main LT panel of each area.

(iv) All above considerations (like: Transformer, D.G. sets etc. & their Ratings) are design basis only (Not Final), Changes may occur during the actual execution and it has to be done as per the approved designs, as per site condition & as per requirement &as directed/approved by Railway.

v. EPC contractor has to make all necessary arrangements for the future expansion of building
i.e. to cater increased load demand, Spare Switch gears in all LT Panels and also in the sub- station.

vi. The EPC contractor shall use all good quality items/prior approved makes and also get inspected vide latest inspection policy of Railway. The contractor shall bear all the expenses/cost of inspections to be done by third party like RITES/RDSO.

vii. The proposed SCADA system shall be integrated with the existing system.

9.3. **Lighting, Fans &electrical wiring works (internal, external, platform, circulating area etc.):-**

1. EPC contractor has to maintain proper minimum LUX levels as prescribed by Railway Board's latest guidelines in regard to passenger amenities in the entire building/Station complex including platforms and circulating area etc.
2. All the LED luminaries shall confirm to latest PCEE/NR specification.
3. LM 79 & LM 81/ warranty certificate for Lighting should be submitted to Railway.
4. EPC contractor shall submit makes, designs & drawings of every items/circuits/systems & get approval before starting of work & submit copies of each approved drawings including soft copies, if any.
5. EPC contractor has to connect & operate each lighting through SCADA System.
6. The EPC contractor shall supply and install all types of fans as per latest BEE guidelines.
7. EPC contractor shall ensure that Switch sockets used are of modular type of reputed makes.
8. EPC contractor shall ensure the use of FRLSH wires PVC insulated copper conductor confirming to IS 694 or latest.

9.4 Back Lit (LED) Signage's:

1. All the LED based signages shall confirm to latest PCEE/NR specification.
2. All internal and external signage's should be backlit and properly illuminated.

9.5. **Green Energy Building:**

All the application/design/execution of work necessary for green energy building certifications shall be done/borne by the EPC contractor along with preparation of all documents.

9.6. **Lift & Escalators:**

1. All the Lifts & Escalators to be installed shall be as per the latest guidelines of Railways.
2. EPC contractor shall bear all the expenses towards the dismantling and reinstallation of existing lifts/escalators proposed in the development scheme.
3. EPC contractor shall ensure the issuance of lift license from statutory authority at his own expense.

9.7. **Existing System:**

1. Existing System shall be retained by the EPC contractor which shall be in running mode continuously.
2. The assets outlived the codal life as prescribed by Railway Board but is in running condition and required to be retained in the proposed development scheme shall be replaced by the EPC contractor.

3. Existing Sub Station shall be extended only

4. Entire cabling (temporary or permanent) for existing system shall be done and executed by the EPC contractor as per requirement of Railways. EPC contractor is fully responsible for shifting all the existing utilities well in time.

5.During the On Going work temporary connections to all existing system should be provided by the contractor as the existing operations and existing utilities of the entire station runs smoothly without any disturbance.

Instruction to EPC Contractor:

1. It is the sole responsibility of the contractor to full-fill all the RDSO Specifications for RDSO approved Items. Materials which require inspection from RDSO/RITES as per Railway practice should be got inspected by the contractor at his own costs.
2. Every item that needs to be inspected as per RDSO guidelines has to be done by the Third Party or as directed by Railways. The cost of such inspection shall be borne by EPC Contractor.
3. CPRI /NABL Test Reports (65 kA Short Circuit Test & IP 65 Test etc.) for each panel has to be submitted by the contractor to the Railway departments.
4. Before Executing any item related to site development work, EPC contractor has to submit all necessary Drawings, Technical Data Sheets/Test reports of each item for approval from Railway department.
5. It is sole responsibility of contractor to provide necessary warranty agreement/ certificate from the original equipment manufacturers (OEM) or supplier for the time period as mentioned in detailed specification for various electrical items.
6. Illumination level of service building, station platform, circulating areas and other associated areas shall be as per latest Railway Board norms and specifications using LED light fittings.
7. The contractor shall preferably provide BEE 5 Star Rated Electrical equipment or as per latest BEE guidelines available.

TRD Scope of the project:

Part A: TRD (Temporary Shifting Work)

If, any no's of OHE Portals & Dwarf Mast or any other TRD equipment are causing infringement to the proposed redevelopment building at Ludhiana station, then these needs to be relocated / shifted by EPC contractor as per approved design/drawings of Railways/ (RDSO/CORE).

1. For relocation / modification of portals & dwarf mast, steel items or any other TRD equipment (Portals, Dwarf mast & drop arm etc.) shall be supplied by EPC contractor as per the specifications/latest guidelines of Railways for temporary shifting. All other associated items/fittings (cantilever assembly, Anti creep wire, large span wire, terminations, small part steel etc.), foundations and erection work shall also be included in the scope of EPC contractor.
2. All necessary items for Permanent modification shall be supplied by EPC contractor.
3. All OHE items should be procured from approved RDSO/CORE vendors and prior approval of Railway should be taken. All the TRD works shall be done as per the guidelines/norms of RDSO/CORE/Railways.
4. Scope of work covers foundations for new OHE structures; Supply and erection of OHE fittings such as different types of mast as per site condition, cantilever assembly, droppers, insulators, jumpers, end fittings, anti-creep wire, LS wire, guy rod etc.; Transfer of OHE system from existing structures to new structures; Profiling, checking, commissioning of modified OHE and Dismantling of existing OHE structures (Portal, DMA, associated fittings). Dismantled structures to be transported to concern OHE depot for handover.
5. Activities involved-

o Design and Submission / approval of design drawings (Modified LOP, CSD & SED etc.)

o Foundation work

o Mast/Portal upright erection and grouting

o Portal boom, drop arm & Guy rod erection

o Bracket erection & Transfer of OHE.

o SED & Tower wagon checking.
o Dismantling of infringing Portals/Mast & associated OHE fittings.

11.9.2. Part B: OHE associated modification work

1. OHE design should be modified either by hanging arrangements or any other designing, scheme as approved by RDSO/CORE/Railways so that there should not be any portal/ mast in the through Roof Area. Similarly in Covered platform area, OHE should be designed in such a way that there should not be any Portal leg in platform area or it should be integrated with the pier/ column of the shed over the Platform. Prior approval of railways shall be obtained for any such design of OHE. All relevant drawing / designs will be submitted by EPC contractor. The Drawings other than supplied shall be approved by RDSO.

2. The work of modification of OHE in the power and traffic block shall be taken up by contractor with the help of Railways with all associated costs for execution of work shall be borne by the Contractor.

3. Work will be executed as per latest guidelines and designed approved by railways as applicable. For modification of OHE, all necessary required material will be in the scope of EPC Contractor.

4. Prior approvals of drawings (For Material & Modification Work) have to be taken for this work from the concerned Railway Authority. All material including steel shall be in the scope of contractor. All material shall be procured from approved vendor with prior approval from Railway.

5. The masts that would be dismantled would be returned to the concerned SSE/TRD the contractor securely.

6. It is sole responsibility of the contractor to full-fill all the RDSO Specifications for RDSO approved Items. Materials which require inspection from RDSO/RITES as per Railway practice should be got inspected by the contractor at his own costs.
7. Every item that needs to be inspected as per RDSO guidelines has to be done by the Third Party or as directed by Railways. However, the cost of such inspection shall be borne by EPC Contractor.

8. CPRI /NABL Test Reports (65 kA Short Circuit Test & IP 65 Test etc.) for each panel has to be submitted by the contractor to the Railway departments.

9. Before Executing any item related to site development work, EPC contractor has to submit all necessary Drawings, Technical Data Sheets/Test reports of each item for approval from Railway department.

10. It is sole responsibility of contractor to provide necessary warranty agreement/ certificate from the original equipment manufacturers (OEM) or supplier for the time period as mentioned in detailed specification for various electrical items.

11.10 Dismantling of OHE asset for the proposed concourse

The OHE mast required to be dismantled as effected due to concourse

1. The EPC contractor has to carry out dismantling of OHE masts, TTC, portals, IOL, 50 kV ATs, isolators and section insulator station yard.

The above quantity is tentative; however EPC contractor shall carry out the TRD works as per site requirement.

2. Permanent arrangements under concourse for drop arm (DA) for holding of OHE as per

RDSO/Railways guidelines after launching of girder may be required. Necessary strengthening of concourse/FOB/through roof/COP for OHE load should be considered.

3. Protective screen as per RDSO specifications shall be provided on entire concourse or any suitable arrangement as suggested by contractor and approved by AE may be considered.

4. If any other TRD installations found infringing the structural elements same shall be suitably modified by EPC contractor to ensure sufficient clearance as per existing codal provisions of Railways.

5. It is the responsibility of the contractor to prepare and submit drawings in c/w the modification of the OHE/TRD installations. This includes, both removing the existing infringing installations as per list above, or any other as required at site and installation of new OHE/TRD assets as required such as Contact, Catenary, LS wire, OHE Masts, TTC, Drop arms, portals, ATs, IOL, Isolator, Section insulator, insulators and other accessories as per requirement etc. The platform is envisaged to be OHE mast free space and the contractor should ensure this. All the drawings would be approved by Railways before starting the work. The OHE and traffic blocks would be arranged by the railways as required.

6. All the released material shall be deposited to the nearest TRD depot by the EPC contractor.

NOTE: The relevant Standards/IS/specifications for electrical works shall be governed by respective clause

Part G: VENTILATION AND AIR CONDITIONING SYSTEM

A. AIR CONDITIONING SYSTEM

B. MECHANICAL VENTILATION & PRESSURIZATION SYSTEM

A AIR CONDITIONING SYSTEM: -

1. Basis Of Design:

Outdoor Design Conditions:		As per NBC-2016/ ISHRAE-India Weather Data-2017
Summer		
Dry Bulb Temp.	42.2 deg. C (107.96 deg F)	
Wet Bulb Temp.	23.8 deg. C (74.84 deg F)	
Monsoon		
Dry Bulb Temp.	33.9 deg. C (93.02 deg F)	
Wet Bulb Temp.	29.1 deg. C (84.38 deg F)	
Winter		
Dry Bulb Temp.	2.0 deg. C (35.6 deg F)	
Inside Design Conditions :		
Area as specified below		Summer & Monsoon:- 24±1 deg C (75.2±2 deg F) (RH) 55% (Design Value – No Control)
Lighting Load		As per ECBC-2017 (Latest Edition)
Equipment Load		As per ECBC-2017 (Latest Edition)
Occupancy		As per Architectural or as per NBC-2016
Fresh Air		As per NBC-2016
Ventilation		As per NBC-2016

2. Factor Detail:

2.1 **Heat Transfer Co- Efficient (BTU / Hr. x FT^2 x °F)**

2.1.1	U value Glass & SHGC	:	0.67 & 0.33 or final value as per approved Glass only (Refer Glazing specification)
2.1.2	Wall	:	0.36
2.1.3	Insulated RCC exposed slab	:	0.12
2.1.4	Floor	:	0.40
2.1.5	Pre-insulated Polycarbonate sheet roof	:	0.15

Note: - Under-deck Thermal insulation shall be carried out by Contractor for all roofs (above air-conditioned areas) exposed to sun to achieve the required u value of roof.

3. Scope of Air-conditioning System:

S. No.	Area Description	Proposed System	Remarks
1	**Main Terminal Building (East Side)**	**Min. Capacity**	
1.1	GROUND FLOOR		
	CHEIF TRAIN SUPERVISION, CEW OFFICE, DYP. S/S, RAILWAY OFFICE, STATION DIRECTOR ROOM, STATION SUPERIN TENDENT ROOM, TTE ROOM, CTI ROOM, RPF & TICKETING COUNTER	Air Cooled VRF System (Cooling & Heating)- 62HP (Approx.)	VRF system complete with refrigerant piping, drain piping and associated electrical work, ductwork, air terminal and insulation work, dedicated central controller (as per requirement) to be provided.
1.2	FIRST FLOOR- Retiring Room-01 to 04, CONFERENCE & MEETING ROOM	Air Cooled VRF System (Cooling & Heating)- 28HP (Approx.)	
1.3	SECOND FLOOR- TICKETING COUNTER, AC WAITING ROOM	Air Cooled VRF System (Cooling & Heating)- 14HP (Approx.)	
1.4	THIRD FLOOR- Food Court & Offices	Air Cooled VRF System (Cooling & Heating)- 106HP (Approx.)	
1.5	4TH TO 7TH FLOOR- Commercial Activity areas	Electrical Provision of VRF system at each floor to be provided	
2	**West Side Building**		
2.1	Ground Floor-Ticketing Counter	Air Cooled VRF System (Cooling & Heating)- 8HP (Approx.)	
2.2	First Floor-Railway Offices	Air Cooled VRF System (Cooling & Heating)--64HP (Approx.)	
2.3	Second Floor-Food Court & VIP Lounge	Air Cooled VRF System (Cooling & Heating)--30HP (Approx.)	
2.4	Third floor- Commercial	Electrical Provision of VRF system at each floor to be provided	
3	**Railway Hospital Relocation**		
3.1	Ground level-(as per drawing attached)	Air Cooled VRF System (Cooling & Heating)--88HP (Approx.) Note: - Hospital to be designed as per guidelines of ASHRAE/ ISHRAE/ NBC-2016 & NABH. Inside temp., filtration level, RH control pressure relationship etc. to be provided as per guidelines.	
3.2	First Floor-(as per drawing attached)		

Note: - 1. Officers rest house, UPS room, BMS room, fire control room, MDF room, Monitoring Room shall be provided with DX split units with N+1 combination.

2. HVLS fans of suitable sizes have to be provided for the platform area below concourse area & for Departure air concourse/ waiting area.

3. Suitable ventilation for platform area and FOB area also needs to be incorporated in the design and shall be provided accordingly.

4. Air concourse area, lobby areas at GF and 2nd floor level (other than VIP area/executive waiting areas) in main building, arrival concourse areas, lobby areas in west side building shall have adequate system using advance techno economic solution other than air conditioning system to achieve ambient temperature during the hot weather condition (i.e 48.5 degree centigrade and above) around 10 degree centigrade below the outside air temperature to ensure comfort for railway station users. Contractor to develop and install the HVAC/VRF system which shall include air conditioning (HVAC/VRF/VRV type air conditioning system) for all the areas.

Complete VRF system (ODU, IDU, AHU etc.) with refrigerant piping, drain piping and associated electrical work, ductwork, air terminal and insulation work, dedicated central controller (as per requirement) shall be as per CPWD-HVAC 2017 specification & NBC-2016 requirement. The COP of VRF system at AHRI conditions shall not be less than 3.5 @ 100% load and IEER not less than 6.5. All IDUs/CS AHUs shall have high lift Drain pumps.

Efficiency of complete HVAC system shall meet ECBC-2017 (Latest edition) requirement.
VRF Outdoor units suitable for cooling and heating, having all hermetically sealed inverter type Scroll Compressor(s), minimum two compressors for above 14HP modules.
Detailed heat load estimation sheet shall be prepared and need to be submitted for approval along with equipment selection during detailed engineering stage for all the seasons (Summer/Monsoon/winter) in which, the specified conditions are to be maintained.

The contractor shall make final calculation as per prevailing local by-laws & NBC whichever is more stringent and get the approved from client.

The capacities indicated are minimum capacities and any rating/ capacities required over and above the indicated capacity shall be provided by the contractor at his own expense.

B. MECHANICAL VENTILATION & PRESSURIZATION SYSTEM

1. INTRODUCTION

The Ventilation, smoke exhaust & pressurization system to be provided as per NBC-2016 and as required by the Fire authority.

2. VENTILATION RATES

Mechanical ventilation, smoke exhaust and pressurization system has to be provided for building as per NBC 2016 and as required by the Fire Authority.
The complete design will be as per NBC-2016.

Area / Space	Air Changes Per Hour
Enclosed Car Parking-Normal Ventilation	6APCH
Enclosed Car Parking-Smoke/Exhaust Ventilation (In case of fire)	12APCH (6+6)
Pump Room	20APCH
STP Room	30APCH
LT, HT Panel & Transformer Rooms	20APCH
DG Room	CFM based on DG capacity

Upper Floor Smoke ventilation	As per NBC -2016
Kitchen Ventilation	Min. 40ACPH or BOH/Kitchen requirement
Toilets	20ACPH

All ventilation equipment shall conform to CPWD-HVAC 2017 specifications & NBC-2016.

3. SYSTEM DESCRIPTION

a) VENTILATION

For enclosed car parking and services area, mechanical ventilation which shall include supply and exhaust stale air. Further, as per fire laws of the land, it is mandatory that in case of fire, smoke will also be removed from the area. The rate of supply shall be 6 air changes per hour and exhaust shall be 6 air changes per hour in normal case. In case of fire, the supply and exhaust shall be increased to 12 air changes per hour (as per NBC-2016, Part-4 section-4.5 & 4.6).

Compartmentation / Fire zones have been provided as per NBC-2016.

Sub stations, DG Sets room, LT panel room, STP room & pump room shall also be provided with mechanical ventilation system.

The system shall consist of axial fans, fresh/exhaust air grille, louvers etc. CO sensors shall be provided with coverage area of 500sqmt. Complete with PLC controller, control wiring etc. GI back draft damper will be provided to the fan.

The exhaust fans shall have motors with Class H insulation and the fan motor should be rated for 250° C for 2 hours.

All fans shall be AMCA Certified.

b) UPPER FLOOR VENTILATION

Smoke exhaust system shall be as per NBC-2016, Part-4, clause-4.

c) PRESSURIZATION

Pressurization is a method adopted for protecting the exits from ingress of smoke.

Air shall be injected into staircases, lobbies, corridors to raise their pressure slightly above the pressure in adjoining parts of the building, as a result of which ingress of smoke into escape routes will be prevented. It shall be as per NBC 2016 (as given in Table-6) and local by laws.

c.1) STAIRCASE PRESSURIZATION

All enclosed staircases shall be mechanically pressurized as per NBC 2016, wherever required. The mechanism of pressurization shall be automatic linked to the fire alarm system. Manual operation shall also be possible. The staircases, which are not enclosed, shall need to be ventilated to the atmosphere at each landing and a vent at top. The vent opening shall be of 0.5m2 in the external wall and the top. Enclosed staircase leading to more than one basement shall be pressurized.

c.2) Lift lobby & Lift shaft pressurization

Lift shafts shall be maintained at a positive pressure of 50 Pascal. Enclosed lift lobbies shall also be pressurized to 25-30 Pascal at all levels. The mechanism of pressurization shall be automatic linked to fire alarm system. Manual operation shall also be possible. Lift shafts shall have a vent at the top, of area not less than 0.2m2.

d) Platform Track Area Ventilation Scheme (below Concourse slab)

Platform is partly covered with the concourse slab. As there are fair chances that locomotive exhaust and heat can get trapped in this area and can put users in an uncomfortable situation (suffocation' low visibility and heat) hence ventilation jet fans (duct less ventilation) along the tracks is proposed to cater to the requirement.

These fans shall operate only in case of a temperature rise and smoke detection in the affected area only, to keep environment healthy for users in this area. For detail, design CFD of this area is recommended to analyses the exact Jet fan configuration and location on the basis of heat and smoke behavior. It is recommended that jet fan discharge should be in direction of train movement if train movement direction can be standardizing on the track-way basis otherwise fan discharge could be planned on either direction.

4. OPERATION

All emergency exhaust & supply air fans and pressurization fans shall start on receiving signal from fire Panel of the building .The signal shall be received at the NO relay contact of fan starter Panel which shall close on receipt of fire signal and start the fan.

5. TOILET VENTILATION

All toilets in station buildings shall be provided with mechanical ventilation system. The system shall consist of Propeller fans (Wall mounted) / In-line fans at each level with ducting & grilles. Exhaust air shall be discharged through a cowl mounted at every floor. Bird-screen shall be provided on the discharge annular ring of cowl to prevent birds nesting in idling period.

6. KICTHEN & KIOSK VENTILATION: -

Main Kitchens with Food court/ Canteen & Restaurants shall be provided by evaporative cooling units (Air Washer) & exhaust from the kitchen hoods shall be exhausted out with Dry scrubbers for remove smoke/ oil fumes.

Negative pressure shall be maintained with respect to surrounding areas.

7. APPLICABLE CODES AND GUIDES:

- National Building Code-2016.
- AMCA-Air Movement and Control Association International, Inc.
- ASHRAE
- ISHRAE
- IS Standards
- SMACNA-Fire and Smoke Damper Installation Guide.
- ECBC-2017
- CPWD-2017

Part H: BUILDING MANAGEMENT SYSTEM (BMS)

The Building Management System & SCADA Systems at the station shall be provided by the Contractor to control, monitor and supervise various system / services on Station Building and suitable systems for Platforms, Station Parking, Circulation, landscaping etc. covering both proposed and existing structures. The BMS shall be designed & developed in detail by the contractor for approval of AE before execution of work. The BMS should include features like facility management immediate fault detection, better performance of assets, fault location, easy access to fault & repair mechanism in minimum time in discreet manner with intention to cause minimum disturbances inconvenience to the passenger / user:

- Electrical Systems such as Substation, Main LT Panels, DG System.
- Lighting System
- HVAC services
- Plumbing
- Firefighting system
- Fire Alarm and Detection System
- Station Utility Services
- A/V display system
- Cabling, recording and distribution system
- Other supporting hardware

The ELV components for this project include the following:

- Data and Telecommunications Network
- IP Video Surveillance System
- Public Address (PA) and Evacuation System
- Passenger Information System
- Digital Clock system

The design basis report of ELV systems is also being provided.
All above mentioned systems should be connected through either SCADA or BMS as per site requirement and directed by Railway.

Part I: SOLAR PANEL

Platform roof area shall be available for solar power generation with Installing of new panels having 443 kwp capacity by using the modern PV cells / BIPV (Building Integrated Photo Voltaic) / Rooftop Panels. The structure to be developed by the Contractor should be feasible to install solar infrastructure which shall be taken up by the Railway in future. Contractor shall also provide decorative solar panels or trees in circulating / outside building areas.
+-

Rooftop of proposed building shall not be available for installing Solar Panels in any case.

Part J: Miscellaneous Facilities

The scope of work under this scheme includes supply, transportation, unloading, erection and commissioning works. It is Contractor's responsibility to execute the job in all respect as per the detailed drawings / specifications.
Any other equipment / services which are not explicitly mentioned in the schedule but deemed necessary for the successful operation of the system complete in all respects shall be in Contractor's scope.
1. Signages & signboards should be provided as per manual on "World Class Station" Volume-2.
2. Facilities for Divyang People to be provided as per Railway Board Guidelines.
3. Shaft, Staircase, Ramp should be provided as per requirement or as shown in given plans.
4. All required Approvals / NOC (Fire NOC, Lift NOC, Green Building, etc.) shall be borne by the EPC Contractor.

Part K: Building Treatments

Contractor shall design and propose methods, scheme for exclusive leak proof plumbing system (internal and external), also the building shall be provided with water proof and damp-proof behaviour during entire service life.
1. Water proofing treatment at basement, terraces, all type of tanks, etc. should be of advanced & effective material which needs to be done through company's authorised applicator only, as approved by AE.
2. Leakage Proofness of plumbing system shall be ensured with advance testing modules.
3. There should be no leakage shall be allowed from platform shelter, terraces, sheet roofing, etc.
4. Contractor shall adopt most effective and efficient methods, techniques and execute the Roof leakage treatment work over all exposed roof, as approved by AE.
5. Anti-Termite Treatment shall be taken up for all the areas where applicable.

Part L: Green Building Certification

The contractor shall design the overall project on net zero energy building (NZEB) concept as far as practically possible. The contractor shall obtain certification for the project under either the Leadership in Energy and Environmental design (LEED), Green Building / rating system, USA; or under the IGBC rating system. **The contractor shall obtain the gold level or equivalent level of certification**. The contractor must obtain green building certification for the project as per Cl. No. 3.1.11.

Part M: Scope of Passenger Amenities (Telecom Facility)

Scope of Services: It is sole responsibility of the contractor to fulfill all the RDSO Specifications of RDSO approved Items. Materials which require inspection from RDSO / RITES as per Railway practice should be got inspected by the contractor at his own costs.

For the entire system setup of ELV / TELECOM system reference drawings set has been attached with the RFP's. The drawings provided by the department are only for the understanding, before executing any item it has to be done with the prior approvals of AE.

Warranty: Contractor shall provide Guarantee / Warranty (Min. 5 years) from OEMs (original equipment manufacturers) for all the telecom equipment supplied by him.

Telecom facilities to be provided as per given drawing

All passenger related telecom facilities must be provided in the passenger accessible area/premises.

1. Video Surveillance System (CCTV):

All CCTV camera & software, CCTV Analytic Solution and command and control application proposed should be from the same OEM.
OEM has to be an International Brand.

2. Wi-Fi system should work on 2.5Ghz / 5 GHz with minimum data rate capacity of 1Gbps.

3. Integrated passenger information system (IPIS) system as per RDSO Specification No. RDSO/SPN/TC/108/ 2019 Version 0.0 Amendment-1.

4. Various Video Display systems and international standard signage for train information and entertainment.

5. Digital Clocks / Drum clocks / Office Clocks.

6. Hybrid type exchange (Analog, Digital, IP Based for communication at Ludhiana RailwayStation)

7. Earthing of all telecom equipment is in contractor's scope and shall be installed as per railway standards and practice.

Note:

1. All cables of Passenger amenities such as IPIS, CCTV, Wi-Fi, Displays, etc. should be concealed with proper size of cable tray, casing capping and suitable duct as per site requirement.

2. As per RDSO / OEM guidelines Guarantee / Warranty of all Equipment's supplied by the contractor shall be submitted.

Requirement in Brief: -

1. Video Surveillance System CCTV: -

• The Camera OEM shall be in IP CCTV manufacturing for 10 years. The documentary proof shall be submitted and shall be of Global Repute

• All the network cameras supplied must be certified for: BIS, FCC, CE and UL (Certificates to be enclosed)

• The network cameras for 720P HD and 1080P HD supplied must meet the SMTPE video standards: SMTPE 296M (HDTV 720p & HDTV 1080P) or better.
• The network cameras supplied must meet the ISO/IEC 14496-10 AVC (H.264) video compression standards.

• The network cameras supplied must be compliant with 2002/95/RoHS.

• The network cameras supplied must have In-house Processor for Bandwidth Compensation & Optimization. The Camera Shall Support 3rdParty Edge Analytics and documentary evidence shall be submitted for the same.

• The cameras shall support the use of HTTPS and SSL/TLS, providing the ability to upload signed certificates to encrypt and secure authentication and communication of both administration data and video streams.

• The unit shall provide centralized certificate management, with both pre-installed CA certificates and the ability to upload additional CA certificates. The certificates shall be signed by an organization providing digital trust services.

• The proposed camera OEM should have a valid H.265 HEVC Certificate and should be listed on HEVC website at the time of bidding. Documentary evidence and OEM declaration shall be submitted.

• The Camera shall support IEEE 802.1X authentication, Password protection, IP address filtering, HTTPS encryption, Digest authentication, User access log, Centralized certificate management

• The camera shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.

• The implemented API shall be standardized and supported by all network video products offered by the manufacturer

• The network surveillance cameras must support minimum On Board Edge storage of 256GB or better as per detailed specifications.

• The cameras shall support minimum 4 nos. simultaneous and individually configurable Streams@ H.264, H.265 with Maximum frame rate and Maximum Resolution and shall be user configurable or better as per tender specifications.

• The camera shall have built in 512MB RAM and 256MB flash for better performance unless specified in camera specifications.

• The specified unit shall be of manufacturer's official product line, designed for commercial and/or industrial 24/7/365 use.

• The specified unit shall be based upon standard components and proven technology using open and published protocols and adopt to industry established standards.

• Firmware/software upgrades are to be provided by the OEM free of cost during the warranty period and AMC Period. Undertaking from OEMs to be provided on their Letter head

• All the major components of the CCTV systems shall be latest but field-proven and shall not be End-of-Life / Outdated; the same shall have to be supported by concerned OEM for at-least 5

year’s period from the date of supply. All the cameras shall have 3 Years OEM warranty and the same shall be submitted on OEM Letter head.

• Cameras shall be fully supported by an open and published API (Application Programmers Interface), which shall provide necessary information for integration of functionality into third party applications.

• OEM of CCTV should have registered office and presence in India for Last 5years. Proof of the same shall be attached with the technical bid.

• All the cameras shall have built in feature of Dynamic GOP/GOV, Dynamic FPS, Dynamic Region of Interest for bit rate, and bandwidth and storage optimization without affecting video quality.

• All Fixed cameras shall have ability to select user-defined shape for motion detection to include or exclude area to reduce false alarms, bandwidth and storage.

• All cameras shall have ability to send and receive triggers to perform any action without intervention of VMS.

• Vendor should submit technical compliance on OEM letterhead for all major items i.e., Camera, VMS, Switch, Storage and passive items.

• Bidder Should Submit Valid authorization in original form from all major Items i.e., Camera, VMS, Switch, Storage and passive items.

• Products from OEMs having its origin I place of incorporation as China I People's Republic of China I PRC are not allowed to participate. Sis is not allowed to propose any products/ equipment/ items/solutions from any such OEMs; the same shall be liable for rejection of bid).

• The Products offered shall be NDAA compliant.

• The proposed OEM for all equipment should provide MAC ids of the quoted products; the MAC address of the proposed equipment must be registered in the name of the OEM only. The Intellectual Property Rights (IPR) of equipment (CCTV camera and VMS) Must Not Reside in China. The Equipment supplied should not be manufactured by an entity in which the majority shareholding of the entity is from China

2. Wi-Fi system: -

Wi-Fi should have 100% coverage in station premises and various offices and should work on 2.5Ghz / 5 Ghz with minimum data rate capacity of 1Gbps.

• Cloud-Enabled Indoor/Outdoor AP

o 1x Gigabit Ethernet Port (PoE IN)

o 1x Gigabit Ethernet Port

o 1x USB 2.0 Port

o Dual flash image support

- IP55 rated enclosure
- RF PERFORMANCE (TX)
- 2.4GHz: 23 dBm @ 6Mbps, 14 dBm @ 1 GBPS
- 5GHz: 26 dBm @ 6Mbps, 18 dBm @ 1 GBPS
- RF PERFORMANCE (RX)
- 2.4GHz: -86 dBm @ 6Mbps, -64 dBm @ 1 GBPS
- 5GHz: -82 dBm @ 6Mbps, -51 dBm @ 1 GBPs
- ANTENNA GAIN
- 2.4GHz: 6 dBi - omnidirectional
- 5GHz: 8 dBi - omnidirectional
- 802.11a/b/g/n/ac, 2x2, Dual Band Dual Concurrent (2.4GHz and 5GHz)
- Supports up to 8 SSIDs per radio
- IEEE802.11e Wi-Fi Multimedia (WMM-QoS)
- WPA, WPA2-PSK, WPA2-AES, PSK and Enterprise
- Admission control by client MAC address
- REGULATORY / STANDARDS COMPLIANCE
- FCC, IC, CE, AU, MIC, NCC, SRRC, TELEC, JATE
- POWER
- 12V/1A DC
- 802.3af Power over Ethernet
- --30ºC~+45ºC operating temperature

Preferred Make: CISCO/RUCKUS/ARUBA/ZYXEL/CAMBIUM

3. Integrated Passenger Information System (IPIS):-

IPIS system should be as per RDSO specification No. RDSO/SPN/TC/108/2019.Ver.-0. amendt.-1.

A) Coach guidance Display System on Platform 1 and Platform 2.

B) Single Line Display System.

C) Multiline True colour Display System.

D) Outdoor video display (OVD)- 6 Line single face as per RDSO spec no-

RDSO/SPN/TC/108/2019 Revision 1.0 Amdt.1 or latest.

E) At a glance Display system.

F) IP Based Public Address System.

G) GPS based Digital Clock, GPS based Office Clock, Drum Clock (MAKE: RDSO

APPROVED SOURCE).

H) Hybrid Type Exchange (Analog, Digital, IP Based for communication at

Ludhiana Railway Station).

Supply of Hardware platform for Unified Communication which shall employ IP at its core and 100% non-blocking configured for 4 Port Voice Mail, 64 Analog Extensions, IP card with 32 Channels expandable upto 512 TDM ports (Operational for full capacity) and expandable upto 2000 IP extensions Exchange shall be supplied with following items:-

• Analog Extensions - 64 Nos.

• IP card with 32 IP Channel - 1 No.

• Supply of Analog Extension card - 288 PORT

• Supply of Digital Extension card - 16 PORT

• Supply of CO Line card suitable - 16 PORT

• Supply of DMKT Telephone / Console - 2 PORT

• Supply of Q-SIG PRI Trunk Interface card for connecting 2 Mbps stream of 30 channels each card suitable for connecting other exchanges of WR along with cords and connectors - 2 PORT

• Supply of 50 No. IP Extensions compatible to exchange supplied in item no 1 Make – Matrix / Tadiran or similar

Supply of 600 pair Main distribution frame along with Krone Modules and Integrated protection device - 2 No.

• Installation, testing and commissioning of IP based communication exchange. It includes supply and installation of necessary hardware and software for smooth running of system - 1 No.

Make - Matrix (Eternity MENX16SAC) / Tadiran / SYNTELL / NEC / or similar

4. Various Display System: -

Extensive LED Display and international standard signage for train information and entertainment.

S. No.	Product Name	Description
1.	**Outdoor LED Video Wall display (Location: Main Building Entry gate Left & Right Side)**	SITC of Outdoor LED Video Wall display Screen size: 12 x 16 (Ft.) Pixel Pitch (mm) 4.81mm, LED Packaging SMD2727 NATION STAR, Cabinet Size (mm): 576*576MM, LED Arrangement SMD2727 3in1, Brightness (cd/m2) 4500 nits, Density (Real) (dots/m2), Cabinet Weight (kg) 10.5 Module Size (mm): (L)=288; (H)=288; Cabinet Size (mm)(L) =576; (H)=576 Resolution/Cabinet 104*104, Power Supply G-energy, Waterproof Material / Waterproof Size Silicone / Display Size, Cabinet: Aluminum, Angle-Level (angle) 140 (Right/Left), Best-Vision-Distance (m) 8m and upwards Display Color (Color) Full Color (16.7m), Cooling 1 Special silent fans/ cabinet Drive Mode 1/8 Constant Current Driver, Control Mode Synchrony Transfer, In-Interface - RJ45, Connecting Series - HDMI/PAL/NTSC/USB, Refresh rate: 3840 Hz, Max Power Consumption (W/m2) 1200, Avg Power Consumption (W/m2) 600~960, Voltage (V) AC: 220 /380 ±10 %, 50 Hz, Control Distance (m) < 100, IC's –icn2038 With Iron structure **MAKE:** **CHRISTIE/SONY/SAMSUNG/BARCO/DELTA//Qlite/Extremedia** 
2.	**Touch screen Kiosk (Location-on both platforms)**	Screen: 65'' Resolution: 1920*1080 DPI, Display Area: 930（H）x 527（V）mm Dot pitch: 0.63mm(H)*0.63mm(V), Viewing Angle: H178, V178, Brightness: 450cd/m2, Contrast: 5000:1, Colors: 16.7M, Response time :5ms Lifetime: ≥60000 hours, Power- AC 110-240V (50/60Hz), Power consumption: 100W, Standby power: <3W, Working temperature: -5°C~60°C, Working humidity: 10%~80%, Frame: Aluminum profile, Glass: Tempered glass Back frame: STANDING / Wall Hanging **MAKE: SAMSUNG/BARCO/DELTA/QLite or Equivalent**

		
3.	**Commercial LED Display (Location- at Waiting hall, Rooms etc.)**	SITC of Commercial LED Display Panel Size – 55'' Brightness (cd/m2) Typical: 440, Panel Type (IPS /VA), IPS Panel Surface Anti-Glare Haze (%) 1, Backlight Type Direct LED Video, HDR Compatibility HDR10 / HLG / Dolby Vision, Size, VESA ® power Rated Power consumption (W) 107 Power Consumption (in Standby) ,degree Panel Refresh Rate (Native Hertz) 50Hz Professional Features Operating System Android 10 , 6 Network Features Wi-Fi direct Yes Wi-Fi Certified Yes Wi-Fi Standard a/b/g/n/ac Wi-Fi Frequency 2.4 Ghz / 5 GHz (for Wi-Fi Direct: 2.4 GHz Only) Apple AirPlay (Internet required) Yes Chromecast built-in Yes Wireless LAN Integrated IP Control Yes RS-232C Control 1 (Side) Pro mode Yes Inputs & Outputs Composite Video Input(s) 1 (Side) HDMI Inputs Total 4 (Side) Digital Audio Output(s) 1 (Side) Headphone Output(s) 1 (Side) USB Ports 2 (Side) Ethernet Inputs 1 (Side) ,7 RS-232C Input(s) 1 (Side) Approved Make: Christie/SONY/Samsung/Maxtell/Panasonic 
4.	**VIDEO WALL CONTROLLER**	SITC of video wall Controller Support Wi-Fi AP connection Electrical parameters Maximum power consumption 18W Input voltage 100V~240V AC Storage memory 2GB Internal storage 32GB onboard, user available 28GB Working environment temperature -20°C~60°C Humidity 0% RH~80% RH, non-condensing Storage environment temperature -40°C~80°C Humidity 0% RH~80% RH, non-condensing Packaging Dimensions (L × W × H) 375mm × 280mm × 108mm 1 × TB4 1 × AC power cord 1 × Wi-Fi 1 × Quick Guide Dimensions (length × width × height) 278.5mm × 139.5mm × 45.0mm Weight 1301.9g Protection class IP20 Approved Make: Novastar/Colorlight/VDwall/Watchout

Note:

1. Above are minimum required dimensions which may be modified suitably with the approval of Railways.
2. Contractor shall carry out supply, installation, testing and commissioning of necessary software for IPIS, Video wall, TV display, CCTV, PA announcement, etc. as per Railway's requirement torun system.
3. All cables of Passenger amenities such as IPIS, CCTV, Wi-fi, Displays, etc. should be concealed with proper size of cable tray, casing capping and suitable duct as per site requirement.

Annex – 1

(Schedule-C)

Station Functional Requirements

The Contractor shall ensure that the Station Development Project shall adhere to and comply with the below set requirements:

1. Primary movement of arrival, departure, commuting passenger to be vertically segregated. Segregation of arriving, departing & commuting passengers to prevent cross flow of pedestrian movement.
2. Clarity of movement & ease and convenience of interchange with inter modal transport.
3. Station shall be able to provide patronage to the following:

Scenario in different years	**Passenger per day**	**Peak station population/hr.**
Existing - 2019	69779	6977
Future - 2045	82259	8225
Future - 2060	82259	8225

Station shall be able to handle people/day during peak season with slightly reduced level of service.

i. The station shall be developed for physically, socially, economically and ecologically in terms of comfort, security and safety for passengers, staff, visitors and the general public.

ii. Vertical Circulation Facilities

	Units per Platform
Passenger Elevator	3
Escalator	3

iii. Equipment requirement:

Description	**Nos.**
Door Frame Metal Detection (DFMD-20 Zone or above)	12
Baggage Scanner	12

iv. A Fire engineering approach has been assumed for the design of the station as statutory guidelines are in adequate for the type of facility envisaged.

4. Architectural Expression

i. Architectural Drawings as per schedule – A shall be developed into working drawings and submitted for approval.

ii. Circulation – Pattern of circulation i.e., segregating of departing and arriving long haulpassengers, segregation of long haul of commuter passengers.

iii. Entrances: **2 each on both Side Blocks)**

iv. For Basic station layout refer master plan and other drawings listed in schedule A

5. Landscaping as per specification / design to be approved by RLDA.

6. Seating

7. Bollard

8. Signage and as per **the Specification/Manual for Standards and Specification for Railway Stations**

- All entrances to the station & roads leading to the same
- Location of booking & reservation counters
- Way to all platforms
- All facilities such as international tariff bureau, waiting rooms, retiring rooms, refreshment rooms, May I help you counters and offices of importance – Station officials
- Food stalls & book stalls
- Locations where various coaches in a train will come to halt on platform
- Train composition chart
- Handicap facilities
- On the FOB & Air Concourses indication of train & platform with train information diagram

9. Art-Work Refer: ***As per specification to be approved by RLDA***

10. Advertising: ***As per specification to be approved by RLDA***

11. Finishes: ***As per specification outlined in Schedule D & PAR.***

12. Temporary diversions: ***As per site***

13. Construction of temporary buildings for work: ***As per site requirement***

14. Furniture, Fixtures & Equipment Refer: Drawings

15. General Office layouts:

Refer: Drawing listed in (Schedule A)

16. Detailed Design & Drawings for the Station Development Project shall be developed based on the following:

(i) The station shall be developed physically, socially, economically and ecologically in terms of comfort, security and safety for passengers, staff, visitors and the general public.

(ii) Vertical circulation to comply with evacuation requirements and minimum as below:

	Total units
Passenger Elevators	39
Escalators (Floor to floor height: 8.4 m/4.2 m/4.5m/3.6m etc) as per drawing	28

17. Movement in the station can be summarized as follows:

Local Transport*=> *Unpaid Concourse* => *Metal Detection* => *X-Ray* => *Ticket check* => *Paid Departure lounge* => *Platform

18. Movement out of station can be summarized as follows:

Platform* => *arrival fob/arrival concourse* => *Gate line/ Ticket Check* => *Unpaid Concourse* => *Local Transport

SCHEDULE - D

(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

DA, DB & DC ATTATCHED

Annex - I

(Schedule-D)

(Please refer Clause 10.2.7(c))

TIME FRAME FOR APPROVAL OF DRAWINGS

Sl. No.	Item	Preparation	Authority Review/ Approval with time limit	Review/ Approval by Open line	Sanctionof CRS
1	Buildings GADs	Contractor	CE/C/NC 30 days	-	-
2	Structural and Architectural drawings of buildings	Contractor	CE/C/NC 45 days	-	-
3	Air Concourses GAD	Contractor	CE/C/NC 30 days	CE/P&D/ NR30 days	60 days
4	Structural drawings of Air Concourses	Contractor	CE/C/NC 30 days	CBE/NR 30 days	-

SCHEDULE - E

(See Clause 3.1.6(a))

APPLICABLE PERMITS

1. Applicable Permits

1.1 As part of overall development of Master Plan of LUDHIANA railway station Authority had consulted Ludhiana Municipal Corporation, concerned Local Authority and Punjab Govt. The re-alignment of Master plan road and change of land use were processed with Punjab Govt and Municipal corporation/ issued GO in this regard in 2020, for re-alignment of Master plan road on south side of Ludhiana Railway Station and change of land use from Traffic and Transportation to Commercial use along withconcession in set-backs. This is being shared only for the purpose of providing information and the specific approvals applicable for the purposes of this Project, to be procured further.

1.2 The Contractor shall obtain; as required under the Applicable Laws; the following Applicable Permits:

(i) Permission of State Government for extraction of earth, boulders from quarry.

(ii) Permission of Pollution Control board for installation of crusher, concrete batching plant, bitumen/asphalt hot mix plant etc.

(iii) Permission of the relevant department of Punjab State Government for drawingwater from Underground/River/Reservoir

(iv) Clearance of Pollution Control board for installation of diesel generator sets;

(v) Final approval from Punjab Government as required.

(vi) Fire safety clearance from fire authority

(vii) Forest clearance for cutting trees (if required);

(viii) Labour officer for labour license;

(ix) Taxation Department for GST/VAT/PAN/TAN;

(x) Commissioner of Railway Safety, Northern Circle, CRS, Northern Circle for execution of Air Concourses.

(xi) Obtaining/possession of valid electrical license to carry out the electrical works including modifications to existing general assets

(xii) Processing/obtaining of EIG sanction for electrical assets as per latest guidelines of RB/RDSO.

(xiii) For pre-inspection of material by RITES/RDSO, latest Railway Board guide lines to be followed.

1.3 TRD Stipulations:

1. The electrical OHE works shall be executed/got executed by the agency which has the following credentials:
   a. The executing agency should have valid Electrical Contractor's License Grade "A"/33 kV or above issued by Government Electrical Licensing Board (OR) the site Supervisor should possess necessary "A" grade/33kV or above License issued by Government Electrical Licensing authority to carry out works of appropriate voltage. The executing agency shall have the experience in executing OHE works. The credentials of the executing agency to be approved priorly by the Engineer In Charge/Dy.CEE/C/OHE.
   b. The work shall be executed under a qualified supervisor having experience in OHE works.
2. The material shall be procured from RDSO/CORE approved vendors.
3. The OHE work shall be executed as per ACTM, RDSO drawings, IS standards & specifications with the latest guidelines and amendments.
4. The work shall be carried out as per the drawings approved by Engineer-In-Charge/Dy.CEE/Con/OHE.
5. After completion of OHE works, tower car checks shall be conducted and necessary sanctions to be obtained from EIG (Electrical Inspector to the Government) i.e. PCEE/SCR before energisation.

The aforesaid list is illustrative, and the Contractor is required to obtain all other Applicable Permits as required under any Applicable Law. The contractor shall at all times, obtain and maintain all Applicable Permits which are required by Applicable Law to undertake the Project.

2. Approvals obtained/ applied by the Authority

1. Approval of Master Plan from Indian Railways;

Note: Notwithstanding any approvals obtained by Authority as specified in this Schedule, the Contractor shall at all times be liable to obtain all the requisite approvals, clearances and other Applicable Permits as per Applicable Law and otherwise comply with all Applicable Laws including all Applicable Permits and approvals as identified in Schedule 29-B and/or as may be required from time to time. Authority for the faster implementation of the Project has started the process of getting approvals for the Project. The following is the status of various approvals:

Details of In-Principal Approvals/ Clearances for Project			
S.no	**Applicable Permits/Approvals**	**Approving Authority**	**Status**
1	Environment Impact Assessment Clearance	EnHM directorate, RB.	Tree cutting approval will be obtained by authority. Tree cutting is to be done by contractor.
2	Master Plan Approval from Railways	Northern Railway	Approved. Any revision, if proposed by EPC contractor will have to be got approved by EPC contractor.
3	Traffic Circulation Plan from Punjab State Government	*Municipal Authority, Punjab State Government*	Joint feasibility of road connection done with MC LDH. GAD preparation and approval from MC authorities to be done by contractor.
4	Height clearance of building structure	Not Applicable	-
5	Ancient Monument protection	Not Applicable	-
6	Firefighting scheme Approval	Fire department authorities of *Punjab State*	To be obtained by the Contractor
7	Master Plan Approval from *Ludhiana Municipal Corporation*	Not Applicable	Joint feasibility of road connection done with MC LDH. GAD preparation and approval from MC authorities to be done by contractor.
8	Construction of Air Concourses	CE(P&D), CBE & Sanction of CRS	Required Documents to be submitted by the Contractor to the AE

Note: The Contractor shall be responsible to prepare and submit applications to Authority Engineer for obtaining sanction of CRS/GM at least 60 (sixty) days in advance of commencing a work that requires prior sanction of CRS/GM.

SCHEDULE - F

(See Clauses 7.1.1, 7.5.3 and 17.2)

FORM OF BANK GUARANTEE

Annex-I

(See Clause 7.1.1)

Performance Security

Name of the Bank…….
President of India,
Acting through FA & CAO/C,
Northern Railway, Kashmere Gate
Delhi-110006
Bank Guarantee Bond No……

WHEREAS:

(A) ……(insert name and address of the contractor) (hereinafter called the "**Contractor**") and (insert name and address of the project authority), (hereinafter called the **"Authority**") have entered into an agreement (hereinafter called the "**Agreement**") for the Major Upgradation of the Railway Station at Ludhiana in the ***Northern*** Railway zone on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement

(B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period} (as defined in the Agreement) in a sum of Rs….. cr. (Rupees.....crore) (the "**Guarantee Amount**").

(C) We, ……..through our branch at ……. (the "**Bank**") have agreed to furnish this bank guarantee (*hereinafter called the* **"Guarantee**") by way of Performance Security. NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor's obligations during the {Construction Period/ Defects Liability Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the [mention Finance of Authority], upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the

Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of Deputy General Manager in the Rail Land Development Authority, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or

thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****[$]. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

[$]Insert date being 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 7.2 of the Agreement).

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of …….., 20…… at ……..

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex – II

(Schedule - F)

(See Clause 7.5.3)

Form of Guarantee for Withdrawal of Retention Money

Name of the Bank…….
President of India,
Acting through FA & CAO/C,
Northern Railway, Kashmere Gate
Delhi-110006

WHEREAS:

(A) [insert name and address of the contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the project authority), (hereinafter called the "**Authority**") for the Major Upgradation of the Railway Station at Ludhiana in the Northern Railway zone on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 7.5.3 of the Agreement, the Contractor may withdraw the retention money (hereinafter called the "**Retention Money**") after furnishing to the Authority a bank guarantee for an amount equal to the proposed withdrawal.

(C) We, ……..through our branch at ……. (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the "**Guarantee**") for the amount of Rs. …… cr. (Rupees crore) (the "**Guarantee Amount**").

NOW, THEREFORE, the Bank hereby unconditionally and irrevocably guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of Deputy General Manager in the Rail Land Development Authority, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final, and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal,

arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Retention Money and any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Retention Money.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect 15 (fifteen) days after the date of the Completion Certificate specified in Clause 12.4 of the Agreement.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment

thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of ……., 20…… at …….

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

Annex – III

(Schedule - F)

(See Clause 17.2)

Form of Guarantee for Advance Payment

Name of the Bank…….
President of India,
Acting through FA & CAO/C,
Northern Railway, Kashmere Gate
Delhi-110006

WHEREAS:

(A) [name and address of the contractor] (hereinafter called the "**Contractor**") has executed an agreement (hereinafter called the "**Agreement**") with the [name and address of the project authority], (hereinafter called the "**Authority**") for the **Major Upgradation** of the Railway Station at **Ludhiana** in the **Northern** Railway zone on Engineering, Procurement and Construction (the "**EPC**") basis, subject to and in accordance with the provisions of the Agreement.

(B) In accordance with Clause 17.2 of the Agreement, the Authority shall make to the Contractor advance payment (herein after called "**Advance Payment**") equal to 10% (ten per cent) of the Contract Price; and that the Advance Payment shall be made in two instalments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} instalment of the Advance Payment is Rs. ……cr. (Rupees ……crore) and the amount of this Guarantee is Rs. …… cr. (Rupees ……crore)(the **"Guarantee Amount")**[$]**.**

[$]The Guarantee Amount should be equivalent to 110% of the value of the applicable installment.

(C) We, ……..through our branch at ……. (the "**Bank**") have agreed to furnish this bank guarantee (hereinafter called the **"Guarantee**") for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

2. A letter from the Authority, under the hand of an officer not below the rank of Dy. General Manager in the Rail Land Development Authority, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.

5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any

exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.

7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.

8. The Guarantee shall cease to be in force and effect on ****.[$] Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.

9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.

10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.

Signed and sealed this ……. day of …….. 20…… at …….

[$] Insert a date being 90 (ninety) days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause 17.2 of the Agreement to be effective till complete and full repayment thereof).

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:
(Signature)

(Name)
(Designation)
(Code Number)
(Address)

NOTES:

(i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

(ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

SCHEDULE – G

(See Clauses 10.1.4, 17.3 and 17.8)

Contract Price Weightages for Payment Purpose

1. The Contract Price for this Agreement is the accepted amount for Schedule-Q. The payment for the different items and stages shall be made as per their respective percentage weightages as mentioned below on the accepted amount for Schedule-Q.

2. Proportions of the Contract Price for different items / component and stages of Construction of the Project may be as specified below:

Note – The Above list is illustrative and may require modification as per the scope of the work

1 Weightage in percentage to the Contract Price for DESIGNING & PLANNING : 1.50%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
1.1	Soil investigation, its report, digital survey, Architectural drawings, MEP drawings		Payment shall be made on Pro-rata basis on the basis of submissions and approval
1.2	On preparation & submission of structural drawings & design including obtaining their approval from Architect Consultant /Engineer-in-Charge/ Local Authorities	20%	
1.3	On approval of Structural Design	20%	
1.4	On submission of all working drawings for structure including for all services.	25%	
1.5	Issuing of GFC Drawing During Execution of work (Pro rata basis)	20%	
1.6	On submission of as built drawings	15%	
	Total	**100%**	

2 Weightage in percentage to the Contract Price for MAIN STATION BUILDING (WEST) : 15.20%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
2.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	5%	Payment may be made on pletion of each component/stage of the Building as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
2.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	5%	
2.3	On completion of columns and roof slabs of ground floor	7.5%	
2.4	On completion of columns and roof slabs of First floor	7.5%	
2.5	On completion of superstructure above Second Floor, third floor roof slab	12.5%	
2.6	On completion of superstructure above fourth floor, Fifth floor with terrace	12.5%	
2.7	On completion of side cladding, door windows, staircase, Plumbing work, wiring, all electrical installation works etc. complete in all respects.	20%	
2.8	On completion of flooring, Plastering , finishes, furnishing, HVAC, announcement systems, signages, CCTV, LAN, Sanitary ware, fitting etc. complete in all respects.	20%	
2.9	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

3 Weightage in percentage to the Contract Price for ARRIVAL CONCOURSE - 1 (EAST SIDE) : 7.27%

Note:-Only Plan area of concourse to be measured, cost of staircase, lift well included in plan area of concourse.

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
3.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	5%	Payment may be made on completion of each component/stage of the building as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
3.2	Foundation: On completion of 100 %Foundation work(open foundations/pile foundations including pile caps) and testing	5%	
3.3	On completion of columns and roof slabs of ground floor	12.5%	
3.4	On completion of columns and roof slabs of First floor	12.5%	
3.5	On completion of superstructure above Second Floor with terrace and ramps	20%	
3.6	On completion of side cladding, door windows, staircase, Plumbing work, wiring, all electrical installation works etc. complete in all respects.	20%	
3.7	On completion of flooring, Plastering , finishes, furnishing, HVAC, announcement systems, signages, CCTV, LAN, Sanitary ware, fitting etc. complete in all respects.	15%	
3.8	Completion of all allied works, handing over and approval from Authorities.	10%	
	Total	**100%**	

4 Weightage in percentage to the Contract Price for SECONDARY STATION BUILDING (WEST SIDE) : 6.15%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
4.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	5%	Payment may be made on completion of each component/stage of the Building as per the
4.2	Foundation: On completion of 100 %Foundation work(open foundations/pile foundations including pile caps) and testing	5%	

4.3	On completion of columns and roof slabs of ground floor	10%	weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
4.4	On completion of columns and roof slabs of First floor	10%	
4.5	On completion of superstructure above Second Floor with terrace	20%	
	On completion of side cladding, door windows, staircase, Plumbing work, wiring, all electrical installation works etc. complete in all respects.	20%	
4.6	On completion of flooring, Plastering , finishes, furnishing, HVAC, announcement systems, signages, CCTV, LAN, Sanitary ware, fitting etc. complete in all respects.	20%	
4.7	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

5 **Weightage in percentage to the Contract Price for DEPARTURE AIR-CONCOURSE :** **4.78%**

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
5.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	3%	Payment may be made on completion of each component/stage of the Concourse as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
5.2	Foundation: On completion of 100 %Foundation work(open foundations/pile foundations including pile caps) and testing	3%	
5.3	On completion of Vertical members of steel structure upto Air Concourse Floor level	20%	
5.4	On completion of Steel structure of Bridge	30%	
5.5	On completion of side cladding, railing, roofing, staircase and all electrical installation works complete in all respects.	15%	
5.6	On completion of floor finishes, furnishings,etc	11%	
5.7	On completion of E&M services like CCTV etc in all respects.	8%	
5.8	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

6	**Weightage in percentage to the Contract Price for FOOT OVER BRIDGE CONNECTION AT NORTH SIDE :**		**3.12%**
S. No.	**Stages for Payment**	**Percentage weightage**	**Payment Procedure**
6.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	3%	Payment may be made on completion of each component/stage of the FOB as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
6.2	Foundation: On completion of 100 %Foundation work(open foundations/pile foundations including pile caps) and testing	3%	
6.3	On completion of Vertical members of steel structure upto FOB Floor level	20%	
6.4	On completion of Steel structure of FOB	30%	
6.5	On completion of side cladding, railing, roofing, staircase and all electrical installation works complete in all respects.	15%	
6.6	On completion of floor finishes, furnishings,etc	11%	
6.7	On completion of E&M services like CCTV etc in all respects.	8%	
6.8	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

7	**Weightage in percentage to the Contract Price for FOOT OVER BRIDGE CONNECTION AT SOUTH SIDE :**		**2.83%**
S. No.	**Stages for Payment**	**Percentage weightage**	**Payment Procedure**
7.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	3%	Payment may be made on completion of each component/stage of the FOB as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
7.2	Foundation: On completion of 100 %Foundation work(open foundations/pile foundations including pile caps) and testing	3%	
7.3	On completion of Vertical members of steel structure upto FOB Floor level	20%	
7.4	On completion of Steel structure of FOB	30%	
7.5	On completion of side cladding, railing, roofing, staircase and all electrical installation works complete in all respects.	15%	
7.6	On completion of floor finishes, furnishings,etc	11%	
7.7	On completion of E&M services like CCTV etc in all respects.	8%	
7.8	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

8	**Weightage in percentage to the Contract Price for ELEVATED ROADS & DEPARTURE PLAZZA &:**		**3.48%**
S. No.	**Stages for Payment**	**Percentage weightage**	**Payment Procedure**
8.1	Foundation: On completion of 50 % Foundation work (open foundations/ pile foundations including pile caps) and testing	10%	Payment may be made on completion of each component/stage of a Ramp as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default. .
8.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	10%	
8.3	Completion of structure and all finishing etc. All complete	55%	
8.4	Completion of all E & M services etc. Complete	15%	
8.5	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

9	**Weightage in percentage to the Contract Price for DEPARTURE PLAZZA & PROMENADE at Ground Floor :**		**0.48%**
S. No.	**Stages for Payment**	**Percentage weightage**	**Payment Procedure**
9.1	On completion of Sub Grade of 50 % Area	15%	Payment may be made on completion of each component/stage as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 80% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
9.2	On completion of Sub Grade of 100 % Area	15%	
9.3	Completion of structure RCC base slab, Flooring, Finishing etc. All complete	50%	
9.4	Completion of all E & M services etc. Complete	10%	
9.5	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

10 **Weightage in percentage to the Contract Price for RAILWAY HOSPITAL : 1.87%**

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
10.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	10%	Payment may be made on completion of each component/stage of the Building as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
10.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	10%	
10.3	On completion of columns and roof slabs of ground floor	15%	
10.4	On completion of columns and roof slabs of First floor with terrace	15%	
10.5	On completion of side cladding, door windows, staircase, Plumbing work, wiring, all electrical installation works etc complete in all respects.	20%	
10.6	On completion of flooring, Plastering , finishes, furnishing, HVAC, announcement systems, signages, CCTV, LAN, Sanitary ware, fitting etc. complete in all respects.	20%	
10.7	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

11 **Weightage in percentage to the Contract Price for THOROGH ROOF : 13.55%**

Note:- Plan area of roofing to be measured

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
11.1	Foundation: On completion of 50 % Foundation work (open foundations/ pile foundations including pile caps) and testing	10%	Payment may be made on completion of each component/stage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
11.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	10%	
11.3	On completion of structural steel work vertical members	25%	
11.4	On completion of structural steel work in roof including painting and finishing, Electrical Mast column cladding etc. all complete.	15%	
11.5	On completion of roofing work including all other works as per scope of work, drawings as per requirements	30%	
11.6	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

12	**Weightage in percentage to the Contract Price for PLATFORM ROOFING WORK:**		**3.04%**

Note:- Plan area of roofing to be measured

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
12.1	Foundation: On completion of 50 % Foundation work (open foundations/ pile foundations including pile caps) and testing	10%	Payment may be made on completion of each component/stage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
12.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	10%	
12.3	On completion of structural steel work vertical members	25%	
12.4	On completion of structural steel work in roof including painting and finishing, Electrical Mast column cladding etc. all complete.	30%	
12.5	On completion of roofing work including all other works as per scope of work, drawings as per requirements	15%	
12.6	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

13	**Weightage in percentage to the Contract Price for PLATFORM SURFACING :**		**1.30%**
S. No.	**Stages for Payment**	**Percentage weightage**	**Payment Procedure**
13.1	Dismantling, disposal and re-laying Base concrete	10%	Payment may be made on completion of each component/stage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
13.2	On Completion of Flooring, skirting, Finishing etc. All complete	65%	
13.3	Electrical work & installation of appliances, CCTV, Lan, signages etc. All E & M facilities Scope of work and Site requirement etc	15%	
13.4	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

14 **Weightage in percentage to the Contract Price for TEMPORARY OFFICE BUILDING :** **0.16%**

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
14.1	Foundation: On completion of 50 % Foundation work and testing.	7.50%	Payment may be made on completion of each component/stage of the building as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
14.2	Foundation: On completion of 100 % Foundation work and testing	7.50%	
14.3	Completion of structure and all finishing etc. All complete	55%	
14.4	Completion of all the water supply, Fire fighting, Electrical, electrical appliances, plumbing work, overhead tanks etc. All complete	15%	
14.5	Completion of all E & M services etc.	5%	
14.6	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

15 **Weightage in percentage to the Contract Price for DISMANTLING WORK :** **0.21%**

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
15.1	Dismantling, disposal, Clearing and cleaning of the site -- 25% work of the scope of work.	20%	Payment may be made on completion of each component/stage given in this schedule. Payment on "Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
15.2	Dismantling, disposal, Clearing and cleaning of the site -- 25% work of the scope of work.	20%	
15.3	Dismantling, disposal, Clearing and cleaning of the site -- 25% work of the scope of work.	30%	
15.4	Dismantling, disposal, Clearing and cleaning of the site -- 25% work of the scope of work.	30%	
	Total	**100%**	

16 Weightage in percentage to the Contract Price for RESIDENTIAL QUARTERS (Type – II, III) : 6.62%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
16.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	5%	Payment may be made on completion of each component/stage of the Building as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
16.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	5%	
16.3	On completion of columns and roof slabs of ground/Stilt floor	7.5%	
16.4	On completion of columns and roof slabs of First floor	7.5%	
16.5	On completion of superstructure above Second Floor, third floor, fourth floor, fifth floor with terrace	25%	
16.6	On completion of side cladding, door windows, staircase, Plumbing work, wiring, all electrical installation works etc. complete in all respects.	20%	
16.7	On completion of flooring, Plastering , finishes, furnishing,, CCTV, LAN, Sanitary ware, fitting etc. complete in all respects.	20%	
16.8	Completion of all allied works, handing over and approval from Authorities	10%	
	Total	**100%**	

17 Weightage in percentage to the Contract Price for RESIDENTIAL QUARTERS (Type – IV & Rest House) : 1.48%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
17.1	Foundation: On completion of 50 % Foundation work(open foundations/ pile foundations including pile caps) and testing	10%	Payment may be made on completion of each component/stage of the Building as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is
17.2	Foundation: On completion of 100 % Foundation work (open foundations/pile foundations including pile caps) and testing	10%	
17.3	On completion of columns and roof slabs of ground/Stilt floor	10%	
17.4	On completion of columns and roof slabs of First floor	10%	
17.5	On completion of superstructure above Second Floor with terrace	10%	
17.6	On completion of side cladding, door windows, staircase, Plumbing work, wiring, all electrical installation works etc. complete in all respects.	20%	

17.7	On completion of flooring, Plastering , finishes, furnishing, HVAC, announcement systems, signages, CCTV, LAN, Sanitary ware, fitting etc. complete in all respects.	20%	satisfied that the delay in completion of the stage is not due to contractor's default.	
17.10	Completion of all allied works, handing over and approval from Authorities	10%		
	Total	**100%**		

18 **Weightage in percentage to the Contract Price for EXTERNAL SERVICES WORKS:** **3.32%**

S. No.	Stages for Payment	Percentage weightage	Payment Procedure	
18.1	On completion of leveling work of the entire campus including site clearance	5%	Payment may be made on completion of each component/stage as per the weightage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.	
18.2	Internal Roads with WMM and Bituminous top including surface preparation, Kerb channel etc. complete	18.87%		
18.3	On completion of CC pavement & Footpaths, including Kerb stones, base concrete, paver, dressing etc. All complete.	17.48%		
18.4	**STREET LIGHTING WITH LED** -- Supplying, installation, testing and commissioning of LED Street/ Compound/ High mast/ Pathway/ Landscape Lighting for the entire Campus	3.00%		
18.5	On completion of Horticulture Works.	1.65%		
18.6	On completion and commissioning of Sewer line	10%		
18.7	On completion and commissioning of Filter, STP treated & unfiltered water supply including peripheral and distribution system with all accessories	41.50%		
18.9	On completion construction of boundary wall and Completion of all allied works	2.00%		
18.10	On completion of fencing work all round the land vacated by demolition of building with angle iron and barbed wire fencing.	0.50%		
	Total	**100.00%**		

19	**Weightage in percentage to the Contract Price for OTHER SPECIALISED WORKS:**		**7.64%**
S. No.	**Stages for Payment**	**Percentage weightage**	**Payment Procedure**
19.1	**SUBSTATION** : Supplying, installation, testing and commissioning of 33kV/0.433kV or 11kV/0.433 kV substation equipments comprising HT Panel, Dry type Transformers, HT cable, Bus trunking from Transformer to LT Panel, LT Panel, Automatic Power factor correction panel, Active Harmonic Filters, TVSS (Transient Voltage suppression system),SPD (Surge protection system), Essential panel, Earthing, required inter-connections, substation safety equipment including LT cabling from substation to the buildings fed by the substation.	14.35%	
19.2	**DG SET** :Supplying, installation, testing and commissioning of Silent Type DG Sets, AMF Panel, Bus Ducting/ Cables from DG Sets to Essential Panel, Synchronizing Panel where required, DG Set enclosure room sound insulation/ventilation/smoke exhaust as required, Earthing of DG Set system, control cabling, Fuel tank/piping, DG set Exhaust piping/ Exhaust Chimney as per CPCB norms, Civil works connected with DG Sets including Foundation as required.	10.00%	
19.3	**HYDROPNEUMATIC WATER SUPPLY SYSTEM**-Supplying, installation, testing and commissioning of Hydro-pneumatic water supply system consisting of pumps, pneumatic tank, Microprocessor based control panel, VFD, inter connecting pipes, valves, cabling, switchgear etc. As required	0.70%	
19.4	On completion and commissioning of Rain Water Harvesting	3.00%	
19.5	**STP/ETP PLANT** --Supplying, installation, testing and commissioning of STP/ETP of appropriate technology including Civil Works (except plant room), Tertiary Treatment etc. For the Building/ campus	25.35%	

19.6	**UNINTERRUPTED POWER SUPPLY** -- Supplying, installation, testing and commissioning of online 3 phase UPS System with 30 minutes back up including batteries, interconnecting cables, battery racks etc.	0.68%		
19.7	**SOLAR PHOTO VOLTAIC POWER GENERATION SYSTEM & SOLAR WATER HEATING SYSTEM**	5.50%		
19.8	On completion and commissioning of Underground Tank	14.80%		
19.9	On completion and commissioning of Overhead Tank	4.25%		
19.10	**Public Announce System**	2.30%		
19.11	**IP BASED INFORMATION DISPLAY PANEL** (LED PANELS) AT VARIOUS AREAS INCLUDING WIRING ETC	1.20%		
19.12	**Waste Disposal/ Dustbin etc**	0.05%		
19.13	**BAGGAGE SCANNER BIG:**Baggage scanner Big: computer based multi energy X-Ray Baggage Inspection System capable of passing through bags/parcels of dimension 940mm (W) x 640mm (H) with Belt Height – 750mm –1050mm with 22”/24” LCD Monitor, Input/ Output rollers with frames	7.06%		
19.14	**Door frame Metal Detector** -- 20 zone or above Door frame Metal detector nominal Size: 760 mm (W) x 2050 mm (H) x 700 mm (D) loaded with necessary software (Note: this will include supply of 1 no hand held metal detector as well along with each DFMD)	0.95%		
19.15	Providing and fixing **Digital Clock & Drum Clock** with GPS Based	0.09%		
19.16	Facade Lighting	2.35%		
19.17	Furniture	1.35%		
19.18	TRD Work	3.67%		
19.19	Art Work	2.35%		
	Total	**100.00%**		

20 Weightage in percentage to the Contract Price for Lifts : 1.68%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
20.1	On completion of Lifts/ Elevators complete in all respect as per scope of work, drawings and Technical Specifications.		Payment may be made on completion of each component/stage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
	Elevators/ Lift		
	i) On approval of shop drawing	5%	
	ii) On supply of material	50%	
	iii) On installation and commissioning	35%	
	iv) Testing ,commissioning and handing over including NOC fire department, lift inspector or local authority	10%	
	Total	**100%**	

21 Weightage in percentage to the Contract Price for Escalators : 3.32%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure
21.1	On completion of Escalators complete in all respect as per scope of work, drawings and Technical Specifications.		Payment may be made on completion of each component/stage given in this schedule. Payment on " Pro rata basis" may be made if 100% of work of a stage has been completed and Authority's Engineer is satisfied that the delay in completion of the stage is not due to contractor's default.
	Escalators		
	i)On approval of shop drawing	5%	
	ii) On supply of material	60%	
	iii) On installation and commissioning	25%	
	iv) Testing ,commissioning and handing over including NOC fire department, lift inspector or concerned department	10%	
	Total	**100%**	

20	Weightage in percentage to the Contract Price for GREEN BUILDING NORMS :		1.00%

S. No.	Stages for Payment	Percentage weightage	Payment Procedure	
20.1	Successful completion of the buildings and all the works as per GREEN BUILDING NORMS and submission of Compliance Certificate as per EPC agreement.	100%		
	Total	**100%**		

21	Weightage in percentage to the Contract Price for integrated testing & commissioning:		10.00%

S. No.	Stages for Payment for integrated testing & commissioning	Percentage Weightage	Payment Procedure	
21.1	Successful completion of Integrated testing and commissioning including Completion of all allied works and handing over of the assets.	[100%]	On issue of Completion Certificate. In case the Completion Certificate is for part of the Railway Project, the payment may be made for the part of the Project specified in the Part Completion Certificate. Contractor will have to submit all completion drawings and maintenance manual before completion of project.	
	Total	**100%**		

Note – The Above list is illustrative and may require modification as per the scope of the work

26. For the purpose of Price Adjustment as above, the percentages of various commodities shall be taken as follows (Please refer Clause 17.10.4)

Cement (PC)	**Fuel and lubricants (PF)**	**Labour (PLB)**	**Machinery and Plants (PMACH)**	**Other Materials (POTH)**	**Steel (PS)**	**Total**
14.5 %	9%	20%	15.5%	15%	26%	100 %

SCHEDULE - H

(See Clause 10.2.7)

DRAWINGS

1 Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement; the Contractor shall furnish to the Authority Engineer; free of cost; all Drawings developed by the Contractor.

The designs and drawings provided by the Authority to the Bidder are preliminary in nature. The Selected Bidder/Contractor accepts that it is solely responsible for the verification of any design, data, design documents or information provided by the AUTHORITY, its consultants or any Government Authority and that it shall accept and act thereon at its own cost and risk.

[*The Drawings are attached as Part 3 of Schedules to EPC Agreement*.]

The Selected Bidder/Contractor shall be solely responsible for the contents of its Bid, adequacy and correctness of the Design and Drawing, data and detailed engineering prepared or procured by the Contractor for implementing the Project.

2 Additional Drawings

If the Authority Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority Engineer, as if such drawings formed part of Annex-I of this Schedule-H.

SCHEDULE - I

(See Clause 10.3.2)

PROJECT COMPLETION SCHEDULE

1. Project Completion Schedule

a. During Construction Period; the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the Scheduled Project Completion Date (the "Project Completion Schedule"). Within 15 (fifteen) days of the date of each Project Milestone; the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

b. Scheduled completion date for the project is 30 months (915 days) from the appointed date.

2. The milestone to be read as D+ (number of days from Appointed Date as shown in table below)

2.1 Scheduled Completion Period for Setting up of site offices, laboratory &necessary support arrangements for execution of work:

S. No.	Stages for Completion for Setting up of site offices, laboratory &necessary support arrangements for execution of work	Completion Period in Days
1.	Completion of Civil Works	D + 30
2.	Finishing of works	D + 45

2.2 Scheduled Completion Period for temporary relocation of offices, hostels & service buildings.

S. No.	Stages for Completion for Temporaryrelocation of offices & Institute	Completion Period in Days
1.	Finishing of works	D + 90

2.3 Scheduled Completion Period for concourse and through roof

S. No.	Stages for Completion forConcourse 1	Completion Period in Days
1.	Completion of Civil works	D + 550
2.	Completion of Internal Finishing works exceptlighting, signages, BMS, SCADA etc.	D + 850
3.	Completion, Testing, Commissioning and handover to authority	D+900

2.4 Scheduled Completion Period for FOBs

S. No.	Stages for Completion forFOBs	Completion Period in Days
1.	Completion of Civil works	D + 400
2.	Completion of Internal Finishing works exceptlighting, signages, BMS, SCADA etc.	D + 600
3.	Completion, Testing, Commissioning and handover to authority	D + 900

2.5 Scheduled Completion Period for main Station Building (East side):

S. No.	Stages for Completion forMain entry Side Building	Completion Period in Days
1.	Approval of Detailed Design and Drawings	D + 120
2.	Foundation: On completion of Foundation work (any type) and necessary	D + 250
3.	On completion of all structural components including roof complete, porches up to top andinternal Drainage works	D + 410
4.	On completion of side cladding, facade, staircase balustrade works, floor finishes &furnishings complete in all respects.	D + 510
5.	On completion of HVAC, Luminaires & all Electrical Installation works, toilets, internalplumbing, signanges & display system complete in all respects.	D + 710
6.	On completion of Installing lifts and escalatorsin all respect.	D + 850
7.	Completion, Commissioning, Testing, obtaining necessary NOC's and handing over toAuthority.	D + 900

2.6 Scheduled Completion Period for second Station building:

S. No.	Stages for Completion	Completion Period in Days
1.	Approval of Detailed Design and Drawings	D + 120
2.	Foundation: On completion of Foundationwork (any type) and necessary testing including basement work	D + 250
3.	On completion of all structural components including roof complete, porches up to top andinternal Drainage works	D + 410

S. No.	Stages for Completion	Completion Period in Days
4.	On completion of side cladding, facade, staircase balustrade works, floor finishes &furnishings complete in all respects.	D + 510
5.	On completion of HVAC, Luminaires & all Electrical Installation works, toilets, internalplumbing, signanges & display system complete in all respects.	D + 710
6.	On completion of Installing lifts and escalatorsin all respect.	D + 850
7.	Completion, Commissioning, Testing, obtaining necessary NOC's and handing overto Authority.	D + 900

2.7 Scheduled Completion Period for Quarters (Multi Stories and others):

S. No.	Stages for Completion for Quarters (Multi Stories)	Completion Period in Days
1.	Completion of Civil works	D + 550
2.	Completion of Internal Finishing works except lighting, signages, BMS, SCADA etc.	D + 870
3.	Completion, Testing, Commissioning and hand over to authority	D + 900

2.8 Scheduled Completion Period for Railways Hospital

S. No.	Stages for Completion for Railways hostel (S&T)	Completion Period in Days
1.	Completion of Civil works	D + 410
2.	Completion of Internal Finishing works except lighting, signages, BMS, SCADA etc.	D + 670
3.	Completion, Testing, Commissioning and hand over to authority	D+ 750

2.9 Scheduled Completion Period for COP & platform refurbishment

S. No.	Stages for Completion forCOP	Completion Period in Days
1.	Completion of Civil works	D + 500
2.	Completion of Internal Finishing works except lighting, signages, BMS, SCADA etc.	D + 710
3.	Completion, Testing, Commissioning andhand over to authority	D + 900

2.10 Scheduled Completion Period for External development (i.e. circulating areas, roads, horticulture, landscaping etc).

S. No.	Stages for Completion for External development	Completion Period in Days
1.	Completion of Civil works	D + 600
2.	Completion of Internal Finishing works except lighting, signages, BMS, SCADA etc.	D + 850
3.	Completion, Testing, Commissioning andhand over to authority	D + 900

2.11 Scheduled Completion Period for utilities and centralized system

S. No.	Stages for Completion for utilities and centralized system	Completion Period in Days
1.	Completion of Civil works	D + 500
2.	Completion of Internal Finishing works exceptlighting, signages, BMS, SCADA etc.	D+850
3.	Completion, Testing, Commissioning and handover to authority	D+900

2.12 Scheduled Completion period for integrated testing & commissioning

S. No.	Stages for Completion for integrated testing & commissioning	Completion Period in Days
1.	Successful completion of Integrated testing and commissioning	D + 915

SCHEDULE - J

(See Clause 12.1.2)

Tests on Completion

1 Schedule for Tests

1.1 The Contractor shall; no later than 30 (thirty) days prior to the likely completion of Construction of Project; notify the Authority Engineer and the Authority of its intent to subject the Project to Tests; and no later than 7 (seven) days prior to the actual date of Tests; furnish to the Authority Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Project.

1.2 The Contractor shall notify the Authority Engineer of its readiness to subject the Project to Tests at any time after 10 (ten) days from the date of such notice; and upon receipt of such notice; the Authority Engineer shall; in consultation with the Contractor; determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-J.

2 Tests

2.1 Visual and physical Test: The Authority Engineer shall conduct a visual and physical check of construction as per the provisions of Specifications and Standards outlined under Schedule D to determine that all works and equipment forming part thereof conform to the provisions of this Agreement.

2.2 Environmental audit: The Authority Engineer shall carry out a check to determine conformity of the Project with the environmental requirements set forth in Applicable Laws and Applicable Permits.

2.3 Safety Audit: The Authority Engineer shall carry out; or cause to be carried out; a safety audit to determine conformity of the Project with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

All Tests set forth in this Schedule-J shall be conducted by the Authority Engineer or such other agency or person as it may specify in consultation with the Authority.

4 Completion Certificate

Upon successful completion of Tests, the Authority Engineer shall issue the Provisional Certificate in accordance with the provisions of Article 12.

SCHEDULE - K

(See Clause 12.2 and 12.4)

PROVISIONAL CERTIFICATE

1 I;..... (Name of the Authority Engineer); acting as the Authority Engineer; under and in accordance with the Agreement dated ……. (The "Agreement"); for Major Upgradation of the Ludhiana Railway Station on Engineering; Procurement and Construction (EPC) basis through …… (Name of Contractor); hereby certify that the Tests in accordance with Article 12 of the Agreement have been undertaken to determine compliance of the Project with the provisions of the Agreement.

2 Works that are incomplete on account of Project Time Extension have been specified in the Punch List appended hereto; and the Contractor has agreed and accepted that it shall complete all such works in the time and manner set forth in the Agreement. In addition; certain minor works are incomplete and these are not likely to cause material inconvenience to the Users of the Project or affect their safety. The Contractor has agreed and accepted that as a condition of this Provisional Certificate; it shall complete such minor works within [30 (thirty)] days hereof as per Clause 12.3. These minor works have also been specified in the aforesaid Punch List.

3 In view of the foregoing; I am satisfied that the Project can be safely and reliably placed in service of the Users thereof; and in terms of the Agreement; the Project is hereby provisionally declared fit for entry into operation on this the …… day of …….. 20…...

ACCEPTED, SIGNED, SEALED	SIGNED, SEALED AND
AND DELIVERED	DELIVERED
For and on behalf of	for and on behalf of
CONTRACTOR by:	Authority ENGINEER by:
(Signature)	(Signature)

COMPLETION CERTIFICATE

1 I; ..... (Name of the Authority Engineer); acting as the Authority Engineer; under and in accordance with the Agreement dated..... (The "Agreement"); for Major Upgradation of the Ludhiana Junction Railway Station on Engineering, Procurement and Construction (EPC) basis through ……. (Name of Contractor); hereby certify that the Tests in accordance with Article 12 of the Agreement have been successfully undertaken to determine compliance of the Project with the provisions of the Agreement; and I am satisfied that the Project can be safely and reliably placed in service of the Users thereof.

2 It is certified that, in terms of the aforesaid Agreement, all works forming part of the Project have been completed, and the Project is hereby declared fit for entry into operation on this the …… day of …… 20…..

SIGNED, SEALED AND DELIVERED

For and on behalf of

The Authority Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE - L

(See Clause 16.1.1)

SELECTION OF AUTHORITY ENGINEER

1 Selection of Authority Engineer

1.1 Authority shall appoint a railway engineer/ Project Management Consultancy (PMC), to be the engineers set forth in Article 16, to be the engineer under this Agreement (the "**Authority Engineer**").

Generally, a railway officer of Selection Grade (SG)/Junior Administrative Grade (JAG)/Project Management Consultant (PMC) shall be appointed as Authority Engineer. Authority shall notify the Contractor in writing of the appointment and identity of the Authority Engineer and of any replacement thereof from time to time.

2 Terms of Reference

The Terms of Reference for the Authority Engineer (the "**TOR**") shall substantially conform with Annex 1 to this Schedule L.

3 Appointment of Government entity as Authority Engineer

Notwithstanding anything to the contrary contained in this Schedule; the Authority may in its discretion appoint a government-owned entity as the Authority Engineer.

Annexure-I

(Schedule-L)

DUTIES & RESPONSIBILITIES FOR AUTHORITY ENGINEER

1. Scope

1.1. These Terms of Reference (the "TOR") for the Authority Engineer are being specified pursuant to the EPC Agreement dated..... (The "Agreement); which has been entered into between the..... [name and address of the Authority] (The "Authority") and..... (the "Contractor") for the ……; and a copy of which is Annexure hereto and marked as Annexure-A to form part of this TOR

1.2. The TOR shall apply to construction of the ***Project***.

2. Definitions and interpretation

2.1. The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have; unless repugnant to the context; the meaning respectively assigned to them in the Agreement.

2.2. References to Articles; Clauses and Schedules in this TOR shall; except where the context otherwise requires; be deemed to be references to the Articles; Clauses and Schedules of the Agreement; and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.

2.3. The rules of interpretation stated in Clauses 1.2; 1.3 and 1.4 of the Agreement shall apply; mutatis mutandis; to this TOR.

3. General

3.1. The Authority Engineer shall discharge its duties in a fair; impartial and efficient manner; consistent with the highest standards of professional integrity and Good Industry Practice.

3.2. The Authority Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement; but subject to obtaining prior written

approval of the Authority(where Authority Engineer is designated as the Authority, the compliance of these conditions have to be ensured by him/her) before determining:

(a) any Time Extension;

(b) any additional cost to be paid by the Authority to the Contractor;

(c) the Termination Payment;

(d) providing Power Block or Traffic Block or necessary disconnections to the Contractor;

(e) approval of disconnections for modification of signalling and telecom works,

(f) Any other matter which is not specified in (a); (b), (c), (d) or (e) above and which creates an obligation or liability on either Party for a sum exceeding Rs. .50, 00,000 (Rupees fifty lakh).

3.3. The Authority Engineer shall submit regular periodic reports; at least once every month; to the Authority in respect of its duties and functions assigned to him for the Project. Such reports shall be submitted by the Authority Engineer within 10 (ten) days of the beginning of every month.

3.4. The Authority Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13.

3.5. In the event of any disagreement between the Parties regarding the meaning; scope and nature of Good Industry Practice; as set forth in any provision of the Agreement; the Authority Engineer shall specify such meaning; scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

3.6 The Authority Engineer shall verify the as built drawings submitted by the Contractor after completion of the works. These drawings will be signed by the Authority Engineer after due verification.

4. Construction Period

4.1. During the Construction Period; the Authority Engineer shall review the Drawings furnished by the Contractor along with supporting data; including the geo-technical and hydrological investigations; characteristics of materials from borrow areas and quarry

sites; topographical surveys; and the recommendations of the Safety Consultant in accordance with the provisions of Clause 10.1.6.The Authority Engineer shall complete such review and send its observations to the Authority and the Contractor within 21(twenty one) days of receipt of such Drawings**;** provided, however that in case of Structures, airspace development at railway stations including concourse and any other specified item the aforesaid period of 21 (twenty one) days may be extended as per the time limit as indicated in Annexure-II of Schedule-D; In particular; such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.

4.2. The Authority Engineer shall review any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings.

4.3. The Authority Engineer shall review the Quality Assurance Plan submitted by the Contractor and shall convey its comments to the Contractor within a period of 21 (twenty-one) days stating the modifications; if any; required thereto.

4.4. The Authority Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works; and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.

4.5. The Authority Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the Contractor within 7 (seven) days of receipt of such report.

4.6. The Authority Engineer shall inspect the Construction Works and the Project and shall submit a monthly Inspection Report bringing out the results of inspections and the remedial action taken by the Contractor in respect of Defects or deficiencies.

4.7. The Authority Engineer shall conduct the pre-construction review of manufacturer's test reports and standard samples of manufactured Materials; and such other Materials as the Authority Engineer may require.

4.8. For determining that the Works conform to Specifications and Standards; the Authority Engineer shall require the Contractor to carry out; or cause to be carried out; tests at such time and frequency and in such manner as specified in the Agreement and in

accordance with Good Industry Practice for quality assurance. For purposes of this Paragraph 4.9; the tests specified in the Schedule D-Specifications and Standards, shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

4.9. The Authority Engineer shall test check prescribed in this Agreement for each category or type of test for quality control by the Contractor.

4.10. The timing of tests referred to in Paragraph 4.9; and the criteria for acceptance/ rejection of their results shall be determined by the Authority Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to; and independent of; the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.

4.11. In the event that results of any tests conducted under Clause 11.10 establish any Defects or deficiencies in the Works; the Authority Engineer shall require the Contractor to carry out remedial measures.

4.12. The Authority Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project; whether because of an accident; unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event; the provisions of Clause 19.6 shall apply.

4.13. In the event that the Contractor fails to achieve any of the Project Milestones; the Authority Engineer shall undertake a review of the progress of construction and identify potential delays; if any. If the Authority Engineer shall determine that completion of the Project is not feasible within the time specified in the Agreement; it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be taken to expedite progress; and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor; the Authority Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.

4.14. The Authority Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.4.

4.15. Authority Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the public .pedestrians or Users. After the Contractor has carried out remedial measure; the Authority Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.

4.16. In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and Users; and requires the Authority Engineer to inspect such works; the Authority Engineer shall inspect the suspended works within 3 (three) days of receiving such notice; and make a report to the Authority forthwith; recommending whether or not such suspension may be revoked by the Authority.

4.17. The Authority Engineer shall carry out; or cause to be carried out; all the Tests specified in Schedule-J and issue a Completion Certificate or Provisional Certificate; as the case may be. For carrying out its functions under this Paragraph 4.110 and all mattersincidental thereto; the Authority Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-J.

5. Determination of costs and time

5.1. The Authority Engineer shall determine the costs; and/or their reasonableness; that are required to be determined by it under the Agreement.

5.2. The Authority Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.

5.3. The Authority Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 16.5.

6. Payment

6.1. The Authority Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority Engineer in accordance with the provisions of Clause 10.2.7 (d).

6.2. Authority Engineer shall:

(a) within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 17.4; determine the amount due to the Contractor

and recommend the release of 100 (eighty) percent of the amount so determined as part payment; pending issue of the Interim Payment Certificate; and

(b) within 20(twenty) days of the receipt of the Stage Payment Statement referred to in Clause 17.5; deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor; after adjustments in accordance with the provisions of Clause 17.5.1.

7. Other duties and functions

The Authority Engineer shall perform all other duties and functions as specified in the Agreement.

8. Miscellaneous

8.1. A copy of all communications; comments; instructions; Drawings or Documents sent by the Authority Engineer to the Contractor pursuant to this TOR; and a copy of all the test results with comments of the Authority Engineer thereon; shall be furnished by the Authority Engineer to the Authority forthwith.

8.2. The Authority Engineer shall retain at least one copy each of all Drawings and Documents received by it; including 'as-built' Drawings; and keep them in its safe custody.

8.3. Within 90 (ninety) days of the Project Completion Date; the Authority Engineer shall obtain a complete set of as-built Drawings; in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority; reflecting the **Project** as actually designed; engineered and constructed; including an as-built survey illustrating the layout of the ***Project*** and setback lines; if any; of the buildings and structures forming part of Project Facilities; and shall hand them over to the Authority against receipt thereof.

8.4. The Authority Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.

SCHEDULE - M

(See Clauses 17.4, 17.5.1, and 17.7.1)

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

(a) The estimated amount for the Works executed in accordance with Clause 17.3.1 subsequent to the last claim;

(b) Amounts reflecting adjustments in price for the aforesaid claim;

(c) The estimated amount of each Change of Scope Order executed subsequent to the last claim;

(d) Amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2.3 (a);

(e) Total of (a), (b), (c) and (d) above;

(f) Deductions:

  (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;

  (ii) Any amount payable by the Contractor to the Authority under the provisions of the Agreement; and

  (i) Any amount towards deduction of taxes at source under Applicable Laws.

  (ii) Total of (i) to (iii) above.

(g) Net claim: (e) – (f) (IV);

(h) The amounts received by the Contractor up to the last claim:

  (i) For the Works executed (excluding Change of Scope orders);

  (ii) For Change of Scope Orders, and

  (iii) Taxes deducted at source under Applicable Laws

2. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

___

SCHEDULE - N

(See Clause 110.1)

INSURANCE

1. Insurance during Construction Period

1.1 The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:

(a) insurance of Works, Plant and Materials and an additional sum of 15% (fifteen per cent)] of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and

(b) Insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.

1.2 The insurance under paragraph 1.1 (a) and (b) above shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor’s Defects Liability

The Contractor shall effect and maintain insurance cover for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

3.1 The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule) or to any person (except persons insured under Clause 110.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount specified below with no limit on the number of occurrences.

The insurance cover shall be not less than: **Rs. 50,00,000/-**

3.2 The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor’s performance of this Agreement excluding:

(a) the Authority right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and

(b) Damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

SCHEDULE - O

(See Clauses 4.7)

Provision of Traffic Blocks and Power Blocks

1. Provision of Traffic Blocks Power Blocks and Disconnections

1.1 The authority shall provide Traffic Blocks or Power Blocks or both, during day or night, as the case may be, to enable the Contractor to execute the construction works of overhead equipment, or such other work as may be determined by the Authority Engineer. Within 30 days of issue of the LoA, the contractor will submit a detail programme listing all such activities requiring traffic blocks/power blocks. The 'maximum aggregate duration of blocks' for the entire Project shall be approved by the Authority in consultation with Northern Railway.

1.2 The Contractor is entitled to execute the construction work within the block period specified in this Schedule-O. The total duration of Power Block or Traffic Block or both, as the case may be, shall not exceed 20% of the 'Maximum Agreement Duration of Blocks' approved by the Authority as mentioned in clause 1.1 above. In case, such total duration exceeds 20%, the Contractor shall pay damages at the rate of Rs.10,000 per hour or part thereof for the exceeded Block periods.

1.3 The Authority shall arrange for disconnections of S&T system as determined by Authority Engineer, to enable the Contractor to execute the construction work which affects existing Signalling and Telecommunication installations.

1.4 As per clause 4.7.6; minimum period for which a power block or traffic block shall be provided to the contractor shall not be less than 2 hours. However as per requirement, some of the blocks are planned upto 3 hours and some blocks are planned 90 minutes as per the requirement.

SCHEDULE - P

(See Clauses 4.4)

Machinery and equipment

1. The Authority shall provide the following machinery and equipment to the Contractor at the daily rates shown against each machinery and equipment subject to availability:

Serial No.	**Particulars of each type of machinery and equipment**	**Rate in rupees in rounded figures(per day)**
	Nil	-

Note:

1. For any machines or T&P which is lying idle with Railways and the same is provided to the contractor on his request, the monthly rate for such machines/ equipment shall be equal to 2% (two per cent) of the cost of such machine or equipment, as published in the latest Pink Book of Ministry of Railways. If the cost of any machine or equipment has not been published in the latest Pink Book, then the last purchase price thereof shall be applicable for determining the charges for such machine or equipment.

2. RH girders may also be spared to the agency by Railway, if available. However, RH girder has to be transported wherever available in the Railway's jurisdiction at agency's own cost and shall hand over back at same place after completion of work.