Chapter I

EXECUTIVE SUMMARY

1.0 Introduction

1.0.1 Government of Chhattisgarh (GoCG) is keen to develop Rail infrastructure for facilitating passengers and freight traffic in the Northern part of Chhattisgarh. To this extent the State Government, in consultation with Ministry of Railways (MoR), has appointed a high level Committee, chaired by Mr. A.K. Mishra, Retd. Chief Secretary of C.G comprising representatives of MoR, GoCG, NTPC ltd, SECL and Confederation of Indian Industry to identify the rail corridors. As per the committee's report and in line with the recommendations of Chhattisgarh Integrated Infrastructure Development Committee (CIIDC), three corridors were identified for the development of rail infrastructure.

1) Corridor-I: East corridor: Kharsia - Chhal - Gharghoda – Korichhapar - Dharamjaygarh up to Korba with a spur from Gharghoda to Donga Mauha to connect mines of Gare-Pelma block, approximately 180km in length.
2) Corridor-II: North Corridor: Surajpur-Parsa-Katghora-Korba, approximately 150km in length.
3) Corridor-III: East-west Corridor: Gevra Road to Pendra Road via Dipka, Katghora, Sindurgarh, Pasan, approximately 122 km in length.

1.0.2 MoU was made on 03.11.12 between GoCG, South East Coalfields Limited (SECL) and IRCON for formation of Specific Joint Venture Companies (JVCs) upon the advice /instructions of MoR to develop rail infrastructure for facilitating passengers and freight traffic in northern parts of Chhattisgarh. In consideration of the above, the implementation of developing Corridor-I and Corridor-III would be taken up by JVCs. The names of the JVCs are proposed as "Chhattisgarh East Rail Ltd" for Corridor- I and "Chhattisgarh East-West Rail Ltd" for Corridor-III.

1.0.3 South East Coalfields Limited (SECL), one of partners of JVC, is a subsidiary of coal India limited and a company registered under the Indian Companies Act, 1956.

1.0.4 IRCON INTERNATIONAL LIMITED (IRCON), a government company incorporated by the Central Government (Ministry of Railways) under the Companies Act, 1956 on 28th April, 1976 originally under the name Indian Railway Construction

Company Limited, is the leading turnkey construction company in the public sector known for its quality, commitment and consistency in terms of Performance. IRCON has widespread operations in several States in India and in other countries (Malaysia, Nepal, Bangladesh, Mozambique, Ethiopia, Afghanistan, U.K. Algeria & Sri Lanka.

1.0.5 IRCON is a specialized Constructions organization covering the entire spectrum of construction activities and services in the infrastructure sector. However, Railway and Highway Construction, EHP sub-station (engineering and constructions), and MRTS are the core competence areas of IRCON.

1.0.6 IRCON operates not only in a highly competitive environment but also in difficult terrains and regions in India and abroad and is an active participant in prestigious nation building projects. IRCON has so far completed more than 280 infrastructure projects in India and more than 90 projects across the globe in more than 21 countries.

1.0.7 Aiming at expansion of railway infrastructure for smooth movement of passengers and freight in Chhattisgarh, the state government has joined hands with IRCON and South Eastern Coalfields for construction of about 300 km of rail network. A MoU envisaging the development two rail corridors in the state was signed between Chhattisgarh government, South Eastern Coalfields Ltd (SECL) and IRCON. The rail corridors project is to be implemented in joint venture model in which IRCON will hold 26 per cent equity and the balance will be held by the state government (10%) and SECL (64%). The project — East Corridor and East-West Corridor — would come up at an estimated cost of Rs 4,000 crore. The corridors are expected to facilitate movement of passengers as well as freight traffic mainly coal.

1.0.8 IRCON is executive agency for implementation of New BG Electrified Double line Rail Corridor from Gevra Road station on Champa- Gevra Road section to Pendra Road stations on Bilaspur-Anuppur section of SEC Railway, Chhattisgarh. Entire Alignment is passing through the Bilaspur and Korba Districts of state of Chhattisgarh is taking off from Existing GVR stations goes upto PND with approximate length of 131 Km.

1.0.9 The Preliminary Engineering Cum traffic Survey for the project was approved in 1996-97. The same was updated in 2011-12 as per Railway Board letter no. 2009/ W-1/Genl/Sur/09-10 dt 24.06.2010.

1.0.10 A vicinity plan showing the connectivity is placed as Annexure -I(A).

1.0.11 The MOU between Ministry of Railways and Government of Chhattisgarh is annexed as Annexure I(B).

1.0.12 The MOU between Government of Chhattisgarh, South East Coalfields Limited (SECL) and IRCON International Limited (IRCON) is annexed as Annexure I(C).

1.1 DIMTS Limited - Authorized Railway Consultants

Delhi Integrated Multi Modal Transit System Ltd. (DIMTS) is a Joint Venture Company set up with equal equity of the Government of National Capital Territory of Delhi (GNCTD) and Infrastructure Development Finance e Company Foundation (IDFC). The Company was incorporated in April 2006 and became operational in June, 2006.

The company has been set up to conceptualize, manage, implement and operate complex citizen centric projects in the transportation domain. DIMTS has been involved in the strengthening of the country's urban transport and infrastructure and believes that a carefully selected draft of measures that ensures reliable, safe, comfortable and affordable public transit combined with an awareness raising campaign, will encourage people to choose public transport over personal transport. DIMTS has been working closely with GNCTD for the development of Multi-modal Transit Systems in Delhi which includes Bus Rapid Transit, Light Rail, Monorail, and improved pedestrian and cycle access. DIMTS is also working to improve Delhi's bus services in augmenting the state-owned Delhi Transport Corporation (DTC) fleet and revamping the private operations through corporatization of bus services.

Apart from assisting GNCTD in its initiatives, DIMTS also intends to leverage its knowledge base and expertise in assisting other cities/city managers in effectively addressing urban transportation issues.

DIMTS is an ISO 9001:2008, ISO 14001:2004, RS OHSAS 18001:2007 and ISO 27001 certified company. M/s DIMTS Limited is the approved Railway consultants for carrying out survey and construction of private siding works in SEC Railway.

The authorization letter to carry out the study by IRCON is enclosed as annexure-I(D) and the letter of approval by SEC Railway is enclosed as annexure-I(E).

1.2 Project Objective

1.2.1 The rail link between Gevra Road and Pendra Road is being planned in view of the very high increase in the coal movement from Korba area. There is further increase in the traffic is anticipated, due to the under Construction Thermal Power Plants in North –West and central India. At present the traffic the movement of coal traffic is done through Gevra Road via Champa branch line. However due to spurt in the coal requirement for the power plant, the Coal movement towards North West India is very high and likely to increase further. The traffic has to pass via Bilaspur and Bilaspur-Annupur section which is mostly single line. Doubling of the same is in progress. Despite of proposed doubling and Fly over at Bilaspur, this section is likely to remain as bottleneck. Considering additional traffic generation of coal planned from the Sendurgarh, Hasdeo Arrand, Dipka, Gevra, Kushmunda and Korba coal Fields of M/s SECL, this new rail link is must for smooth movement of the coal required. This rail link will facilitate serving of coal needs of MP, Western UP, Delhi, Haryana, Punjab and Rajasthan economically.

1.2.2 As per the updated Preliminary Engineering Cum Traffic Survey the projected rate of return (ROR) on the investment was 21.16%.

1.2.3 The present study is to survey the proposed alignment as per PETS and other feasible alignment and select the most optimal alignment and preparing the detailed project report, Environment Impact study, land requirements and R & R requirement for the project.

1.2.4 During the study possibility of joining the alignment at Bijuri station on Anuppur-Ambikapur section was also considered as per the MOM between IRCON International and SEC Railways (annexure-1F). Later on it was decided that the alignment should join at Pendra Road.

1.3 Concept of the study

1.3.1 The alignment is to take-off from existing GVR station of SEC Railways.

1.3.2 The alignment to join the existing SEC Railway network at Pendra Road station.

1.3.3 Field Reconnaissance and assessment of existing yard facilities at serving station using hand held GPS.

1.3.4 Desk study on Google imagery and Topo-sheets for assessment of alternative routes.

1.3.5 Foot by foot survey for identification of major constraints and features

1.3.6 Following the alignment along the exiting SECL siding to save cost and land acquisition.

1.3.7 Detailed survey of the entire corridor with state of art DGPS.

1.3.8 Detailed topographical Survey on the patches where alignment was getting obstructed due to proposed coal blocks, over-head HT lines or high cutting/ filling.

1.3.9 Proposed rail infrastructure facilities for the corridor have been formulated with due consideration to the following aspects.

- Topographical and Geographical features of various routes.
- Existing National as well as State Highways and Indian Railway lines.
- Existing rivers, streams,canals and forest lands.
- Connectivity by means of curves and gradients.
- Planning and development of connectivity at PND station and fly over to avoid surface crossing.
- Proximity of crossing stations to human settlements for future development as passenger corridor.
- At this stage, no siding is proposed along the alignment from GVR to PND. However, provision has been made for future extra loop to connect the future sidings.
- Examining the alternate connectivity of the alignment at Bijuri station.

1.4 Briefings of the related studies carried out for preparation of Report

1.4.1 *Following are the studies and assesments made in designing the alignment*

1.4.1.1 Surveying

- The detailed topographical survey was conducted using Lyca DGPS GS10 which has an accuracy of 2mm and range of 20 Km (10 Km Radius). However, the during survey, the range utilised only 5 Km radius for batter signal strength.

- Each change point was independently set out with the DGPS base unit and rover unit captured the details of the topographical features.
- Carrying out topographical suvey by DGPS along the proposed alignment covering all the existing features like buildings, waterways, roads, HT/LT lines etc.
- Carrying out closed traverse surveying to facilitate the stacking of pillars.
- Stacking of centre line of designed alignment was done at every 200m for curves as well as straight line portion of alignment.

1.4.1.2 Land aquisition assessment

- The detailed revenue maps along with the khasara particulars were collected from Chips, Raipur. The proposed alignment plotted on the cadastral maps with GTS coordinates.
- Revenue and forest management maps of the areas through which the alignment is passing were collected furnished.
- Identification of alignment pillars on revenue maps and superimposition of alignment on revenue maps.
- Marking of corridor on the topo sheet and revenue maps with reference to the designed alignment.
- Generating plot details like plot no, area in order to obtain details like owner of the plot, category of the owner and to identify government, private or forest land from the Government of Chhatishgarh web site.
- Certification of the land plans and land schedules from state revenue authorities through a separate agency.

1.4.1.3 Take off Station:

Based on the Reconnaissance survey and as submitted in the alignment report for selection of take-off station, GVR has been selected as take-off station on Champa-Gevra Road line of SEC Railway.

GVR station is at Km 710.500 (from HWH) and at 299.000 m above MSL. The existing GVR station yard is having 7 lines with line no 1 & 2 are common loop with passenger platform of 366 m (Line 1) and 185m (Line 2). Banki (single line) and Junadih siding (double line) are taking off from the station from the dead end on South side. The Kushmunda siding is on north of GVR yard is required to be designed for loading of about 50 MT coal per annum. M/s RITES has developed a plan for yard remodelling for the Kushmunda siding, but is does not take into

consideration of proposed East –west corridor from GVR-PND and have proposed reversal of the train back to Korba. The yard is to be redesigned condiring connectivity to the East –West corridor and coal movement from the Junadih and Dipika collieries. A separate study is required for the following:

- Kushmunda Yard for handling 50MT traffic with connectivity to East West corridor.
- Additional line for supply of Empties to the Kushmunda, Junadin and Dipika siding from Korba or from Urga bye-passing Korba.
- Connectivity of Junadin and Dipika Collieries siding with East west Corridor with yard remodelling
- Reversal of rakes through a merry-go-round at Dipika/ Junadih

PND station on Bilaspur-Anuppur section. Presentably the station is single line section and doubling of the same is in progress by Rail Vikas Nigam Limited. The proposed alignment will join the PND on BSP end. It is proposed to connect the UP line through fly-over to avoid surface crossing. The flyover alignment shall be proposed closed to the detour UP line alignment between PND-SBRA of doubling being executed by RVNL.

From GVR, the alignment initially follows the existing Banki siding of SECL. After crossing the NTPC power plant siding through the existing ROR, the alignment takes a left turn after the take-off point of the Power plant siding near Surkachhar. The Alignment is generally in rolling terrain till km 58 (near Jatgaon) from Jatgaon to km 98 the alignment passes through the hill terrain. From Km 98 to Pendra Road the terrain is again rolling.

IBH/PH locations have been proposed to split the block sections. Total 5 IBH are proposed out of which 2 may be provided in phase-I and remaining 2 in phase-II. The IBH can also be developed as Passenger halt station.

It was discussed in the meeting with SECR on June 19, 2013, that in loaded direction (from GVR to PND) 1 in 150 (c) ruling gradient will be provided and in opposite empty direction (PND-GVR) the ruling gradient can be proposed as 1 in 100 (C). However, later it was decided by SEC Railway that loaded traffic movement may take place from either side, hence in both directions, ruling gradient should be 1 in 150 (C).

1.5 Salient features of proposed rail infrastructure facilities are as follows:

1.	Take-off Railway Station	:	Gevra Road (GVR)
2.	Route length of proposed Rly. siding from take off point Main line Fly-over	 : :	 131.598 Km 10.540 Km
3.	Gauge	:	Broad Gauge 1676 mm
4.	Ruling gradient	:	1 in 150 (Compensated) in both direction
5.	No. of Curves Main line Fly Over	 : :	 80 06
6.	Bridges:- Road : RUB/ ROB Water Way: Girder Bridge RCC Box Bridges Total	 : : : :	 68+25+3 Fly over 07 125+12 (extension) + 4 on flyover
7.	RORB (Fly –over)	:	1 At Pendra Road
8.	Rails	:	60 Kg (T-12) – Prime quality
9.	Sleepers	:	60 kg PSC sleepers with 1660 Nos. per Km
10.	Point and crossings	:	60 Kg, 1 in 12 CMS crossings, Thick web curved switch on PSC Sleepers with fan-shaped layout in crossing stations connecting with main lines and loop lines. 1 in 8.5 curved switch on PSC Sleepers with fan-shaped layout in stations connecting with loop lines and sidings not negotiated by passenger trains
11.	Rail Joints	:	Primarily LWR/CWR Track with SWR / fish plated track where LWR/CWR is not permissible.
12.	Ballast : Main Line Loop line and siding	: 	50 mm nominal size track Ballast, 350mm ballast cushion 250 mm ballast cushion
13.	OHE and Traction	:	Electrified
14.	Estimate cost of the Corridor	:	INR 17932412 Thousand
15.	Number of stations Crossing	: 	 8 + 2 end stations

	IBH		Phase-I (2) Phase-II (3)
16.	Proposed holding lines in crossing stations	:	Minimum one loop line with minimum CAL 755m
17.	Safety provisions	:	The stations and the locations where infringement from outside is envisaged shall be barricaded.

1.6 Report format

1.6.1 The Report prepared, shall present a clear concept of selecting the alternative and finalising the corridor, along with future plan of actions involved in completion of the proposed SECR Corridor. The report constitutes other details on different aspects in subsequent chapters which are furnished as under:

- Site Conditions and Terrain Assessment
- Basis of Design and Methodology
- Proposed Rail Infrastructure
- Civil Engineering
- Cost Estimates