WESTERN RAILWAY

PART - III

Feasibility report
For
Engineering Procurement & Construction Contracts (EPC)
For

Construction of New Line between New Modasa (MDSA) at take off point at Km:99.00 (from Nadiad) Chainage Ch.:0.00 m to Shamlaji Road (SJS) at Ch.:26595.40 m (26.595 km) covering all Civil Engineering works (i.e. Earthwork, Blanketing, Side Drains, Retaining Wall, Construction of Important Bridge, all Major / Minor Bridges, RUBs / LHS, Level Crossings, Complete Track works, Ballast Supply and Other Civil Engineering works) of Vadodara Division on Western Railway On EPC Mode

MINISTRY OF RAILWAYS

GOVERNMENT OF INDIA

WESTERN RAILWAY, AHMEDABAD

FEASIBILITY REPORT

1. Introduction

The project comprises construction of New Line between **Construction of New Line between New Modasa (MDSA) at take off point at Km:99.00 (from Nadiad) Chainage Ch.:0.00 m to Shamlaji Road (SJS) at Ch.:26595.40 m (26.595 km) covering all Civil Engineering works (i.e. Earthwork, Blanketing, Side Drains, Retaining Wall, Construction of Important Bridge, all Major / Minor Bridges, RUBs / LHS, Level Crossings, Complete Track works, Ballast Supply and Other Civil Engineering works) of Vadodara Division on Western Railway**. The proposed alignment of this Project is New Line and the alignment will start by diverting existing alignment from existing km 99.00 from Nadiad Station will be take off point of this alignment towards New Modasa and will end at entry of Dead End provided at Shamlaji Road toward Udaipur. The total route Km is 26.595 and the chainage start from at km 99.00 from Nadiad Station will be as take off point as chainage Ch.:0.00 m towards New Modasa up to Shamlaji Road ending chainage is Ch.26595.40 m up to Dead End before the entry of Shamlaji Road toward Udaipur side.

The New Modasa Railway Station is proposed at new location by diverting existing alignment and proposed take off point at Km:99.00 from Nadiad(towards New Modasa) as Chainage 0.00 m on existing Board Gauge route of Nadiad – Kapadvanj – Modasa and will end at Chainage Ch.:26595. 00 m at provided Dead End in the entry towards Shamlaji Road(Udaipur direction) is located on the main route of Ahmedabad – Himmatnagar-Udaipur. The Ahmedabad - Himmatnagar – Udaipur is existing Broad Gauge route is connecting route to New Delhi and other part of East and North India. The Nadiad Railway Station is located on the main route of Mumbai – Ahmedabad-New Delhi and other part of India.

The construction of New Line between diverting existing alignment at Km:99.00 as take off point and alignment towards New Modasa to Shamlaji Road will carter alternate Railway route facility to connect with Ahmedabad - New Delhi rail route via Nadiad, Himmatnagar and Udaipur. The proposed New Modasa is located on latitude 23°-17'-10" N and Longitude 73°-18'-20" E, elevation 146m in Aravali District of Gujarat State and National Highway No. 848K is passing near Modasa. The Shamlaji Road is located on latitude 23°-38'-4" N and Longitude 73°-20'-34" E, elevation 187m and State Highway No.145 in Aravali District of Gujarat State.

Nadiad – Kapadvanj – Modasa and existing Modasa and Shamlaji Road Stations are on the existing Indian Railway network of Western Railway. New Modasa – Shamlaji Road will be cater has alternative route to Ahmedabad, Mumbai, New-Delhi and rest part of North, South, West and East. It is intended to design and construct the New Line route as Broad Gauge Single line electrified track with 25kV, 50 Hz. overhead catenary system capable of operating at a maximum train speed of 100 kmph with an initial axle load of 25.0 tonne. Formation, Track and bridge structures are envisaged to be provided for 25 tonne axle load

1.1 The work for cost estimation of New Line Project as a part of Material Modification of Ahmedabad – Himmatnagar – Udaipur Gauge Conversion Project was initiated by Western Railway (WR) and North Western Railway. Western Railway has prepared the DPR and the Project cost of the above project for portion Western Railway jurisdiction i.e. Ahmedabad – Himmatnagar and Material Modification as New Line New Modasa – Shamlaji Road.

1.2 The Engineering survey has been completed within the scope of work for the Project and the detailed Estimate for the Project works has been sanctioned by Railway Board.

1.3 It is considered feasible to New Broad Gauge(BG) Line from New Modasa to Shamjali Road with ruling gradient of 1 in 150 for both UP and DN Main Line and Grade compensation has been provided on proposed curves at the rate 0.04 % per degree of curvature for Broad Gauge. The Section should not exceed 3^0. Flatter curves are preferable.

The entire project of New Line New Modasa – Shamlaji Road falls between Latitudes (Northing) and Longitudes (Easting) as follows :-

Station	Latitude (Northing)	Longitude (Easting)
New Modasa	23º-17'-10" N	73º-18'-20" E
Shamlaji Road	23º-38'-4" N	73º-20'-34" E

The terrain entire New Line Project between New Modasa – Shamlaji Road is fairly plain and falls under the geographical jurisdiction of Aravali Districts of Gujarat State.

As per Map of Geological Survey of India and incorporated in IS 1983-84 edition titled "Criteria for Earthquake Resistant Design of Structures" the area under this project falls in Seismic Zone No. III.

2. Description

2.1 The Proposed route form New Modasa Station to Shamlaji Road is an auxiliary route of Nadiad – Kapadvanj - Modasa to the public of Nadiad and Aravali District area and this district are developing district. Local commuter has been connected with Rail network from Modasa to Nadiad. The construction of New Line between New Modasa to Shamlaji Road will cater Indian Railway as alternate route for connecting New Delhi, Ahmedabad, Mumbai and rest part of India. Modasa is the District Head Quarter of Aravali District.

2.2 The area is characterized by an uneven topography. The average height of the plain is **197.00 m (New Modasa) to 206.00 m (Shamlaji Road)** above MSL. The slope of the ground is generally rising from New Modasa to Shamlaji Road. Shamlaji temple is an important pilgrimage site in Aravali district of Gujarat, dedicated to Lord Vishnu, Shamlaji temple stands on the banks of Meshvo river surrounded by wooded hills

2.3 The Project alignment starts at km 99.00 (from Nadiad on the route of Kapadvanj-Modasa) as chainage Ch.;0.00m for New Modasa Station and connect the Dead End at entry of Shamlaji Road at Ch.:26595.40 m towards the direction of Udaipur. In the New Line Section there are 04 Nos. Stations has been proposed including Shamlaji road. There are 03 Nos. "B" Class Stations and 01 "D" Class Station has been proposed. The alignment passes mostly through plain terrain. The existing railway track is designed for the maximum permissible speed of 100 KMPH for passenger services 25.0 T Axles loading including freight traffic.

2.4 The total length of the proposed route, from starting point at Km:99.00 (from Nadiad on the route of Nadiad – Kapadvanj-Modasa) as chainage Ch.:0.00m towards Shamlaji Road and ends at the Dead End in the entry of Shamlaji Road towards Udaipur side at Chianage Ch.:26595.40 m.

2.5 The proposed alignment of is planned as UP and Down Main line and takes off at Km:99.00 (from Nadiad) at Chainage Ch.:0.00 towards Shamlaji Road up to Dead End in the entry of Shamlaji Road Ch.:26595.40 m towards Udaipur side. The main line keeping minimum Bank Width 7.85 m and track center of track center of 5.30 m, in yards.

3 Key Features

All Works i.e. **Construction of New Line between New Modasa (MDSA) at take off point at Km:99.00 (from Nadiad) Chainage Ch.:0.00 m to Shamlaji Road (SJS) at Ch.:26595.40 m (26.595 km) covering all Civil Engineering works (i.e. Earthwork, Blanketing, Side Drains, Retaining Wall, Construction of Important Bridge, all Major / Minor Bridges, RUBs / LHS, Level Crossings, Complete Track works, Ballast Supply and Other Civil Engineering works) excluding Signalling and Telecommunication work and Electrical (General and OHE) work of Vadodara Division on Western Railway** is to be carried out between take of point at Km 99.00 toward New Modasa to Shamlaji Road as this is new line project. The construction of Major, Minor Bridge, ROB/RUBs/LHS and Level Crossings has been covered in this block section. This tender involve the following work are as under:

1. The Construction of New Line is to be done in provided Land which has been acquired by Railway Authority.
2. Earthwork, blanketing, Construction of Retaining wall, Side Drain along the track.
3. Construction of Important Bridge, all Major, Minor Bridge, ROB/RUBs/LHS and Level Crossings
4. Complete Track work including with linking to yard, supply of 65 mm Machine crushed stone ballast.
5. Other Civil Engineering work viz Construction of Side Drains in yards, Platforms, Utility Structures, FOB and providing safety fencing between the block section during the execution of work.
6. Shifting of utilities coming across the ROW

3.1 Following are the key features of the section:

Feature	Description
Length of the line	26.595 km from Km : 99.00 (from Nadiad) towards New Modasa to Shamlaji Road up to Dead End at the entry of Shamalji Road towards Udaipur side.
Number of Block Section	02 Nos “B” Class (including New Modasa and Shamlaji Road (excluding)) (“B” Class Stations are New Modasa and Phuta Kumpa) 01 Nos. “D” Class (Surpur as “D” Class))
Ruling gradient proposed	1:150
Standard of Construction	Broad Gauge (1676 mm)
Maximum Degree of curvature	2.6 Degree
Maximum height of bank	7.866 M
Maximum depth of cutting	22.953 M
Bridges	

(a) Important Bridges	01 No.
(b) Major Bridges	06 Nos
(c) Minor Bridges	30 Nos.
(d) Road Over Bridges	NIL
(i) FOB	01 Nos.
(ii) LHS	12 Nos.
(iii) Proposed Level Crossing	06 Nos.
(iv) Pedestrian Subway on Platform	Nil.
(v) Length of Platform	High Level Platform= 220 m length including Ramp – (total length of platform 880 m) – 2 Nos. at New Modasa, 01 Surpur and 01 No. Phuta Kumpa
(vi) Nos. of Station Buildings	02 Nos. “B” Class and 01 No “D” Class.
Gauge	Broad Gauge
Category of Line	Group D
Track Structure	
Rail	Main Line 60 Kg New Rails Loop Line 52 Kg SH Rails
Sleeper Density	1660 Nos. for Main Line 1540 Nos. for Loop Line
Ballast Cushion	350 on Main line 300 on Loop Line and siding
Point and Crossings	1 in12 switches with CMS crossing on Main Line and Loop Line
Signalling	Standard II (R) Panel/Electronic interlocking with LED based Colour light Signaling along with simultaneous reception facilities as per latest Railway Board Directives
Telecommunication	Absolute Block System in New Modasa – Shamlaji Road New Line Project. Communication facilities are provided for Control Circuit Communication with the help of 6 QUAD cable with 24 Fibre OFC. 512 Port Electronic Exchange is proposed at New Modasa and Shamlaji Road Stations. Passenger Amenities like Coach guidance, PA system communication and digital Clock proposed to be provided at all 'B' class stations as per Railway board’s guidelines.
Electrical	Electrification with 25kV, 50 Hz Section from New Modasa to Shamlaji

3.2 Various structures if required to be constructed / dismantled are given in Schedule B of EPC Document..

4 Site Particulars

4.1 Methodology for Investigation

Detailed field work has been performed by Western Railway along the proposed alignment keeping in view the land availability.

Index section & plan for the entire route have been prepared based on the assessment of levels by using levels of existing line and field work.

The ESP plans for the station yards have been prepared are indicative for reference use only. The quantity of earthwork and land requirement has been worked out roughly based on the land plans, Index sections & index plans.

Bridge proposals for Important Bridge, All Major bridges and Minor bridges have been finalized on the basis of hydrology on route.

4.2 **Seismic Disturbances** - The area of the Project falls under Seismic zone III

4.3 **Climate** - Gujarat State has a subtropical climate. Like most of north India, The climate generally is hot in summer with general dryness . May is the hottest month with the average temperature upto 40º to 42º C. The summer season spreads over from March to June, with rainy season between June to September followed by winter from November to February. The average mean rainfall of these area has been recorded last by 2022 was 851 mm.

4.4 **Means of Communication** - The project area is well connected with National and State Highway Road. A large number of feeder roads exists which will be helpful to connect various points on the project line. The area is well connected with telephone signal and internet network availability also.

4.5 **Outline of Civil Administration** - The entire project is covered under the jurisdiction of Vadodara Division of Western Railway, covering with only 01 Aravali District of Gujarat State.

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