



INDIAN HIGHWAYS

APRIL 2026

Volume: 54 ▪ Number: 04 ▪ Total Pages: 68



A View of National Highway-66 (Thalappady–Chengala Section) in the State of Kerala

DESIGN & CONSTRUCTION OF RAILWAY UNDERPASS BRIDGE BY PUSH-BOX WITH PILE INTEGRATION STRUCTURE AT AUNTA-SIMARIYA SECTION OF NH-31 OF NHAI ROAD PROJECT IN BIHAR



Rashid Ahmad Najfi¹



Saurabh Pratap Singh²

ABSTRACT

This Paper highlights the construction of Railway underpass by Push box method integrated with pile foundation post box pushing. The structure in discussion is a case study is a first of its kind that re-invents the load transfer mechanism of the pile and raft foundation acting together under live load after box is pushed. The study shows how push box structure can be implemented by integrating it with pile foundation in an area of low safe bearing capacity of ground and where ground improvement cannot be done. Piling can be done after pushing the box into the location to integrate it with box to enhance the load carrying capacity. This paper provides solution for locations where cut and cover method of construction cannot be implemented. The push box with pile type structure simultaneously enables to overcome both poor ground condition and limitation of construction due to running railway traffic.

Finished structure has 3 components which is integrated into one monolithic unit. The first part is the RCC box (marked in red) which was cast outside the railway embankment and pushed into final place under the railway track. The second part is the pile foundation (highlighted in green) which is driven through the gaps left in the RCC pushed box. The third part is the cast in situ pile cap (highlighted in blue) which integrates the RCC push box and the pile into one monolithic unit. Along with the aforementioned components, to enable the box pushing a thrust bed was cast during the construction stage outside the railway embankment.

1. INTRODUCTION

Ministry of Surface Road Transport through National Highway of Authority India had decided to construct a “Four/Six Laning of Aunta - Simaria (Ganga Bridge with Approach Road) Aunta-Simaria Section of NH-31 from km 197.900 to km 206.050 (Design Chainage) and (Existing Chainage km 204.741 to km 209.945 of NH- 31) [Total Design Length = 8.150 km]” in the State of Bihar. The district through which the project road passes are considered to be the primary project influence area. The project road corridor (NH-31) being the important National Highway connecting Patna (Bihar) to Begusarai (Bihar), facilitates traffic movement for the various important city of Bihar State.

This paper highlights the evolution, conceptualization and construction of Railway Underpass Bridge (RUB)

which is part of this project. This RUB is unique in itself and first time in India such RUB where pile has been integrated with the structure after box was pushed has been designed and constructed. Since box was to push through a running railway traffic, hence it was not possible to do the geotechnical investigation exactly under the high embankment to get the available safe bearing capacity (SBC) of soil. Railway didn't allow any disturbance in the embankment. Borehole for soil investigation was done slightly outside of the embankment. As per geotech report the permissible SBC was 17 t/m² which was sufficient to support the self-weight of the Box, however SBC required during service and future track expansion was much higher. Ground improvement during box pushing was not feasible. Hence it was decided to do the piling post box pushing in the projected portion of box beyond the embankment. Concept was develop with the assumptions

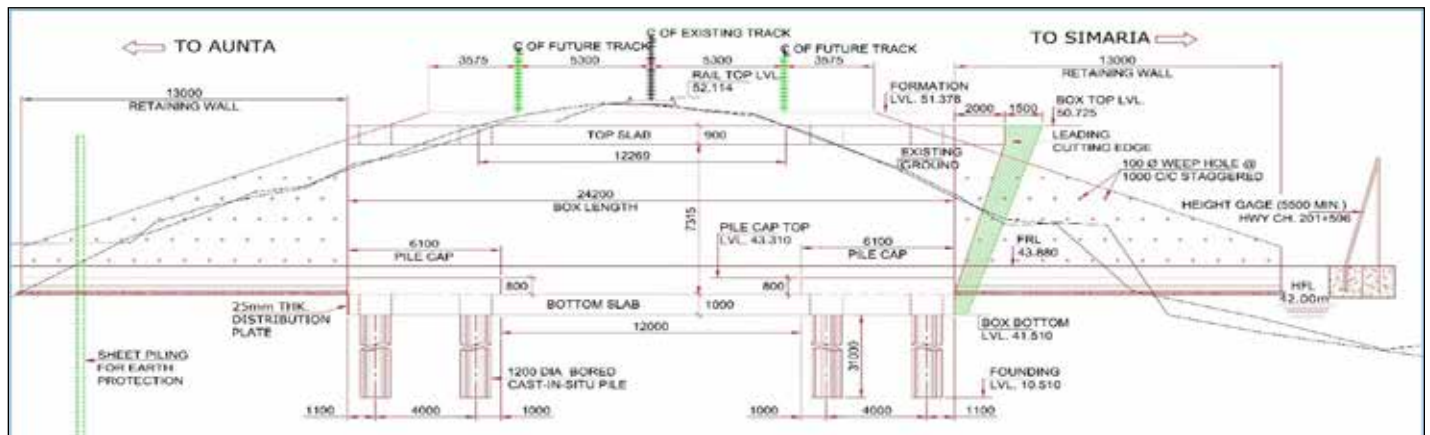
1 Vice President & HoD, (Design), Email: Rashid_najfi@welspun.com
2 Dy. Manager, Email: saurabhpratap016@gmail.com

} Welspun Enterprises Ltd.

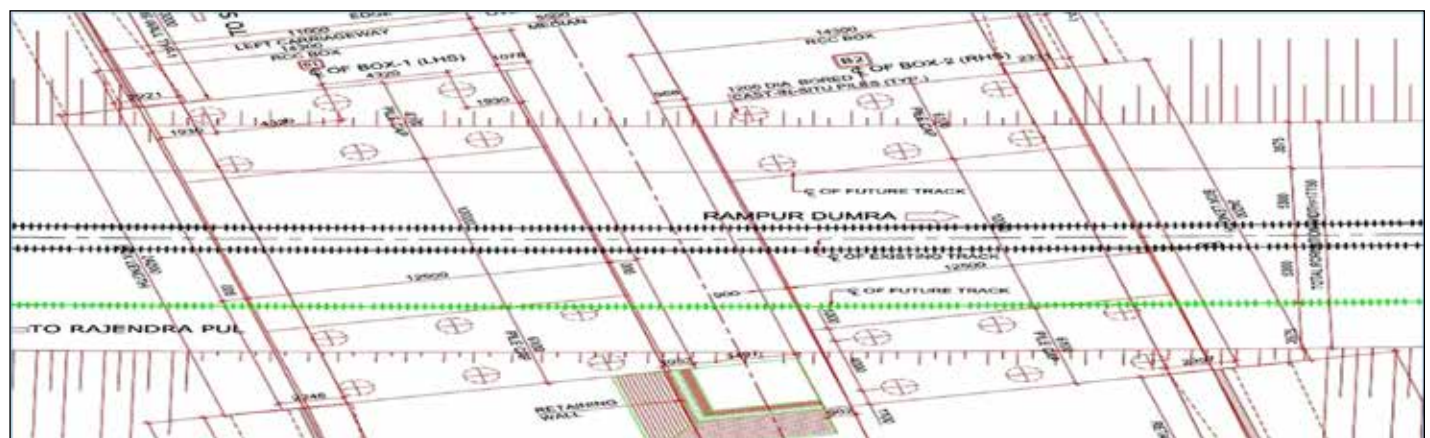
that self-weight was already mobilized and was supported by earth as raft. Pile was constructed and made integrated with bottom slab of box after box pushing was completed. At service due to increase in load box will try to settle then pile will be activated to take additional load through skin and end bearing. This has been mathematically modeled in MIDAS and seen that additional load due to LL & future

expansions is being shared by pile on both end of the box. Concept of load flow has been depicted in Fig 11. Detail construction sequence is being discussed separately in this paper.

The proposed Railway Underpass Bridge (RUB2) intersect at Railway Ch 1.5426 on Rampur-Dumra Railway Track near Hathidah Junction, in the state of Bihar.



(a)



(b)

Fig. 1 (a&b) Elevation & Plan RUB Structure Components



Fig.2 RUB Location marked in Plan of Project Area showing all Railway Tracks and Highway Alignment

The project's highway alignment in approach to the Ganga Bridge at the Southern end of the river intersects with railway tracks at 3 locations. A Railway over Bridge (ROB) structure was constructed at the first intersection using which the project highway passes over the existing Hathidah Junction Railway Station. The alignment next intersects at Rampur-Dumra line, perched over 12 m high railway embankment (RUB2 location). The final intersection occurs with 3 new railway tracks being constructed on proposed railway 17 m high embankment (RUB1 location). This report discusses about the evolution of design and construction of RUB2 structure under a live railway track with traffic density more than 200 trains per week.

2 PROBLEM STATEMENT

As per the Contract Agreement (CA) proposal, 3 ROB with RE-wall were proposed (Fig.3). At RUB1 & RUB2 locations the finished road levels has to be maintained at 26 m above the existing ground level in order to maintain minimum required vertical clearance 6.5 m above Railway tracks.

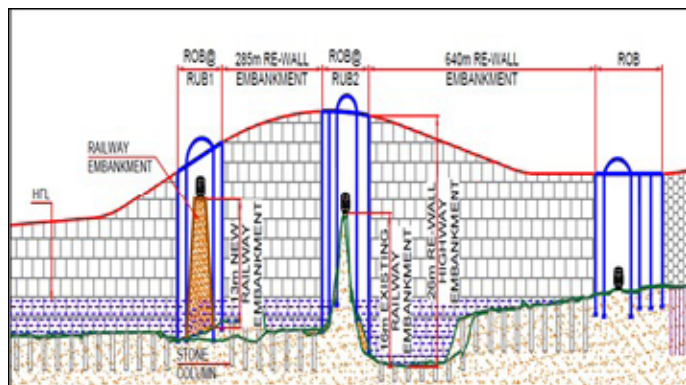


Fig.3 ROB Proposals with RE Wall and Stone Column Ground Improvement Showing Highway Passing over Railway tracks

Contract Agreement proposal has the following execution related challenges at RUB2 location.

2.1 Erection and Launching of 72 m Bow-String Girder Superstructure

For railway span RDSO approved 7 m span standard bowstring girder was required to be assembled at the height of 26 m above the ground and then the same has to be moved to its location between the piers. Though this operation is a common practice for execution of such railway superstructure, the height of the arrangement and site in accessibility made it more challenging and difficult.

2.2 Insufficient Soil Bearing Capacity of the Water Logged Marshy Land

The region in the approach of ROB towards RUB2 & RUB1 is Ganga flood plain, remains under water for 4-5 months after monsoon. It remains submerged for about six months during and after monsoon months (Fig.4). This makes area in accessible for most of the working period. Geotechnical investigation near railway embankments (where height was 26 m) revealed that the safe bearing capacity of soil was not more than 17t/sqm, which is significantly lesser than the SBC required to sustain the 26 m high RE-Wall embankment. Hence, ground improvement measures with stone columns was recommended by the DPR Consultants which was not only expensive but time taking to execute. Refer (Fig.5) for the region between the approaches of ROB at location RUB1 & RUB2 location.



Fig. 4 Water-logged Area of RUB1-RUB2-ROB stretch (Image taken towards RUB1 from top of Railway Embankment at RUB2 location)

3. ROB WITH VIADUCT OPTION

In order to avoid extensive ground improvement, an alternative proposal was worked out. The entire stretch between the ROB to be converted into a viaduct (Fig.6) with 2 intermediate railway spans at RUB1 & RUB2. In this proposal the viaduct structure shall be founded on pile foundations, eliminating the need for ground improvement of the water logged region. However, even in this option the issues related to erection and launching of 72 m bowstring girder was not resolved. Construction time for Viaduct option was exceeding than the original planned, overall cost of viaduct structures was also an uneconomical option and was out of budget considered during planning. Hence this option was not adopted for final execution.

4. INACCESSIBLE REGION BETWEEN RUB2 & ROB LOCATION

In addition to the aforementioned design, cost, time line and execution related issues causing delay in finalization of structural arrangement, a major constraint was poised

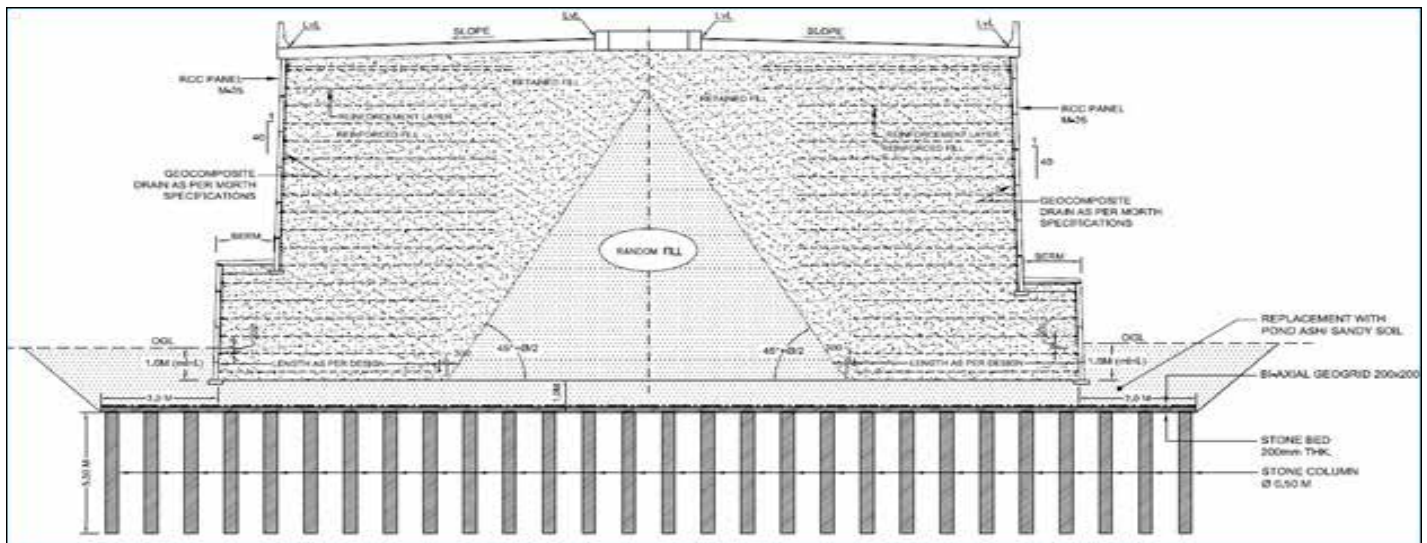


Fig. 5 Ground improvement by Stone column 500 dia 5.0 m long proposed to sustain 26 m high RE-wall embankment

due to inaccessibility to the region between RUB2 and ROB which was obstructed by existing Railway track towards the north and 12 m high railway embankment in the south (Fig.2). Regardless of the structural arrangement we adopted, it was still not clear as to how machinery and material could be carried into waterlogged region.

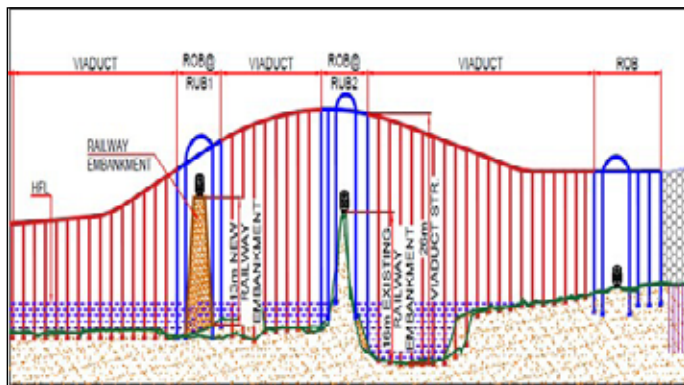


Fig. 6 ROB Proposals Passing over Railway Tracks with Viaduct Structures in Approaches

the railway embankment was the only feasible method to construct the RUB2 structure under live railway track without hampering the movement of railway traffic. At the RUB1 location new railway line was proposed and still not constructed, hence RUB1 structure can be constructed as a normal abutment and pier structure since at this location the railway embankment was still not constructed.

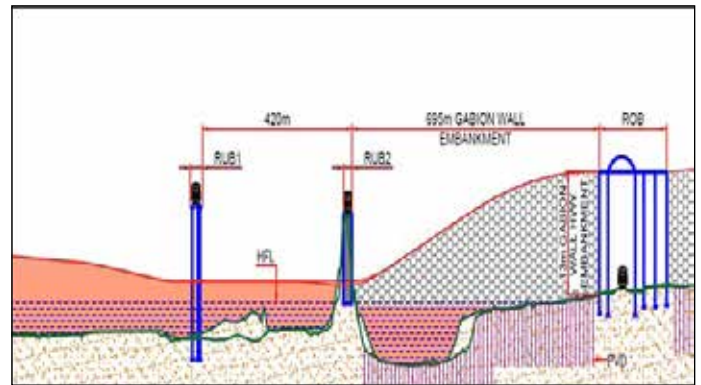


Fig.7 Proposal of RUBs 1&2 Reduced Highway Embankment Height

5. EVOLUTION OF SOLUTION

5.1 RUB proposal at joint meeting of NHA and Eastern Central Railway

Joint meeting was held in the Railway head quarter of East central Railway at Patna/Hajipur along with NHA, Concessionaire and designer. In the joint meeting between NHA and Eastern Central Railways various options was discussed and finally it was proposed to take the highway alignment under the railway tracks by providing RUB1 & RUB2 structure (Fig.8) instead of ROB. At RUB2 location it was realized that pushing of precast RCC box through

The elegant solution of taking the highway alignment under the railway tracks by constructing RUBs instead of ROB drastically reduced the highway embankment height from 26 m to 13 m leading to major cost and time savings in the project which was facing cost overrun due to change in proposal. Due to reduction in highway embankment the earth fill quantity and requirements of ground improvement for majority stretch was eliminated. The structure at RUB2 also provided access to the inaccessible region between RUB2 and ROB.

5.2 Small Push Box Structure with Micro-Piles

The first proposal comprises with 3 small boxes to be pushed which would serve as abutments (box 1&3) and pier (box 2) to support the RDSO PSC superstructure. The proposal was envisioned with the provision of micropiles (Fig.8) for the case where total design reaction under bottom

slab of boxes was exceeding the safe bearing capacity. This proposal was submitted to Railways in principle Railway agreed to review the proposal and agreed for geotechnical investigation in the railway embankment. Geotechnical proposal was submitted and was approved by the Railway Authority.

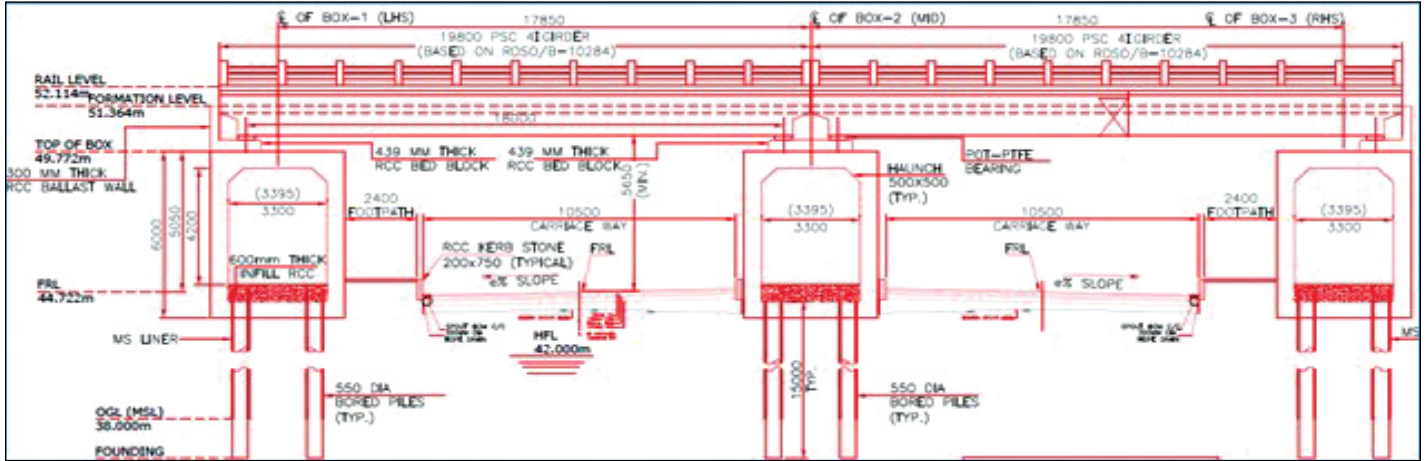


Fig.8 Transverse Section of RUB2 proposal with 3 Boxes Pushed under Railway Tracks with Provision of Micro-Pile

5.3 Geotechnical Investigation and Superstructure Launching

The geotechnical investigation revealed that maximum safe bearing capacity at the founding level of the box could not be considered more than 19t/m². However, require safe bearing capacity due to self-weight, SIDL and the railway live load for 3 tracks (1 existing and 2 future) exceeded the recommended SBC significantly. Even combination of 600 mm diameter micro-piles along with the raft reaction of the bottom slab was not enough to cater to the design loads. So it was clear, that the higher diameter piles would be required to support the structure.

Also the entire operation of removing railway existing track, putting girder over Box and restoring the track back in positions would require more than 4 hrs. Since the railway blockage of more than 4 hours could not be obtained, it was understood that the complete assembly of RDSO-B/10284 superstructure which was having overall

weight more than 225 tones had to be launched at once. Many options were considered which included use of two high capacity cranes, lateral sliding on top of box, etc. But none of the options worked out to a successful viable conclusion.

5.4 Big Push Box Structure with 1.2 diameter piles

In order to provide 1.2 m diameter piles the size of the boxes needed to be increased. After studying multiple options of box sizes and pile numbers, it was finally decided to eliminate the separate superstructure completely and provide two large boxes (with box pushing), wide enough to allow 3 lanes of highway carriageway passing through each boxes. Since allowable SBC was not sufficient enough to support base pressure due to self-weight and Railway LL. Hence, the arrangement of 2 boxes of 12.5 m wide to be pushed and later 1.2 m dia 12 nr piles to be constructed and integrated with bottom slab to take additional base pressure arising out from the LL was finalized.

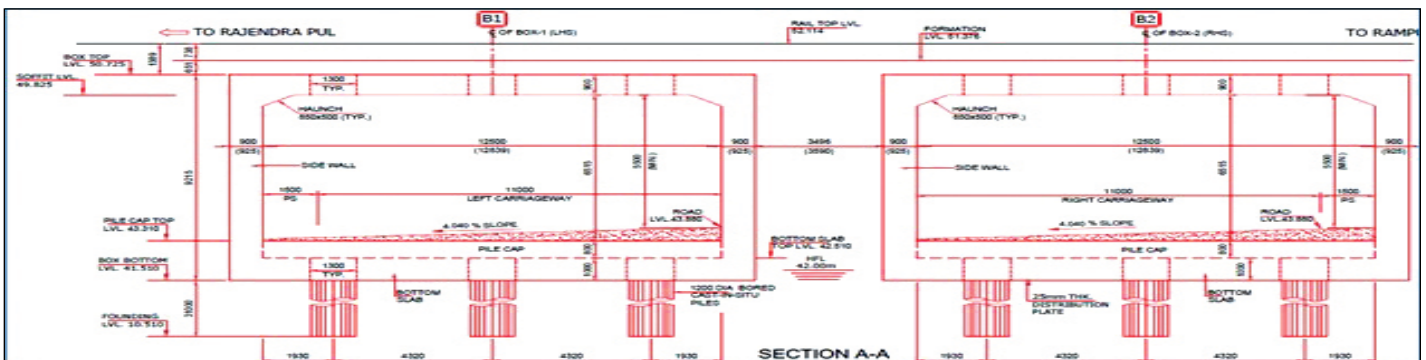


Fig.9 Finalized RUB2 Proposal with 2 Boxes Pushed under Railway Tracks with Provision of 1.2 m dia. Piles

5.5 Load Transfer Mechanism of Pile and Raft

In general, for structures with pile foundation; piles are constructed first and then the pile cap is cast by integrating the pile with pile cap. Under subsequent application of a vertical downward load on top of pile cap, the pile and pile-cap is strained vertically at the top, inducing downward deformation (Δ in **Fig.10**). The downward deformation of pile group and pile-cap is resisted by following three components,

- i. Pile end bearing reaction
- ii. Pile skin friction
- iii. Pile Cap raft base reaction

The stiffness of pile's skin friction and end bearing component is significantly higher than the stiffness of soil under the pile cap. As a result, for a given deformation a very small component of the load acting on the foundation is mobilized through the Pile Cap's base reaction, and majorly the loads are mobilized through the piles. Hence in normal design procedures, the base reaction offered by the pile cap raft is conservatively ignored and all loads are assumed to be transferred through the pile group only.

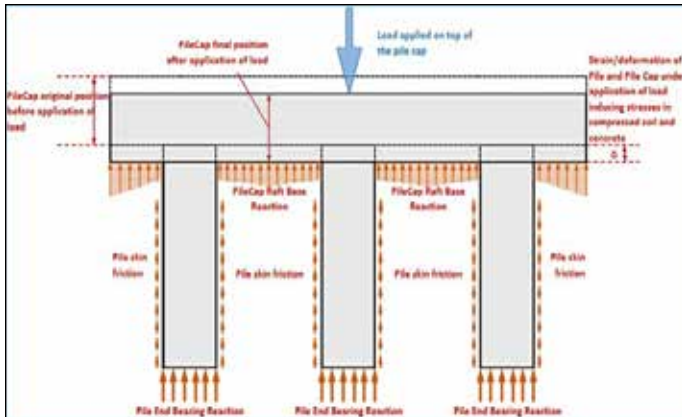
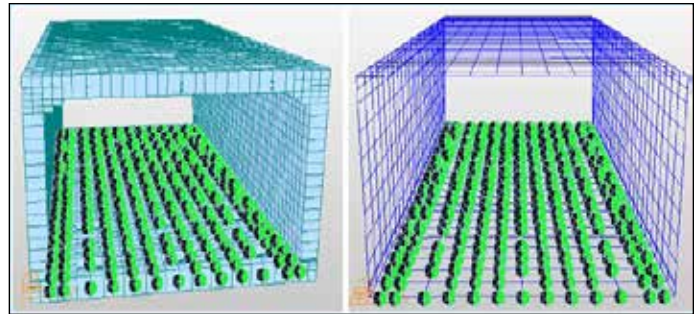
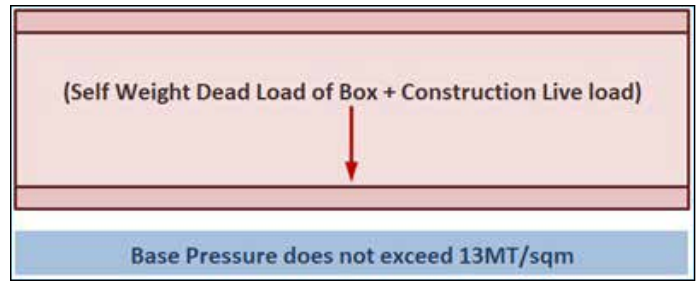


Fig.10 Load Transfer Mechanism under Pile and Pile Cap in General Case where Pile is Cast before the Raft/Pile Cap

5.6 Mobilization of Self Weight through Raft Base Reaction

When the pre-cast box is pushed through the railway embankment, the self-weight of the box itself is already mobilized through the raft base reaction under the bottom slab of the box structure. So even in the later stages, when the piles are cast and integrated with the box structure, no component of the self-weight of the box gets mobilized through the pile. It can be assumed that the springs of the soil under the bottom of the slab are already activated by the box self-weight during the box pushing stage (**Fig.11**), before the construction of pile.



(a)

(b)

Fig.11 (a) Dead Weight of Box Mobilized through Raft Base Reaction, (b) Springs Modelled under Bottom Slab of Box during Stages Prior to PSiling

5.7 Mobilization of Loads Activated after Integration of Pile with Box Structure

After establishing structural integrity of piles with the RCC Box, the raft and pile act as a one unit which behaves like a normal pile and pile cap. The additional loads due to railway live load from 3 tracks and surcharge fill on top of the box, highway live loads and surcharge load of highway due to pavement on the bottom slab are transferred through the combination of box raft and pile. In analysis it was found that an additional base pressure of merely 5t/sqm was mobilized through the raft, while the piles took up the majority share of the additional loads. Maximum load coming on a pile was 300T in worst load combination. Hence the maximum base pressure under the bottom slab raft for worst load combination was restricted under 18 t/sqm, which was well within the safe bearing capacity 19t/sqm of the soil strata at that location.

5.8 Analysis & Design

It is important to understand the sequence of load activation on the structure foundation. In normal condition for structure constructed by cut and cover method. The pile foundations would have been casted first and then the bottom slab cum pile cap would have been constructed on top of it. In this case, the dead load of the box will get mobilized through the piles during the construction stage itself. The reaction in piles for worst loading combination

in service stage would have increased more than 500T far exceeding the allowable vertical pile load capacity of 400T as recommended in the geotechnical report. In such a case the base reaction under bottom slab would have not mobilized to values more than 6t/sqm. So, by simply altering the sequence of construction and activation of load, the requirements of pile would have increased many folds to sustain the structure. Hence, one can appreciate the selection of sequence of construction can substantially optimizes the requirements of pile and overall reduce to cost.

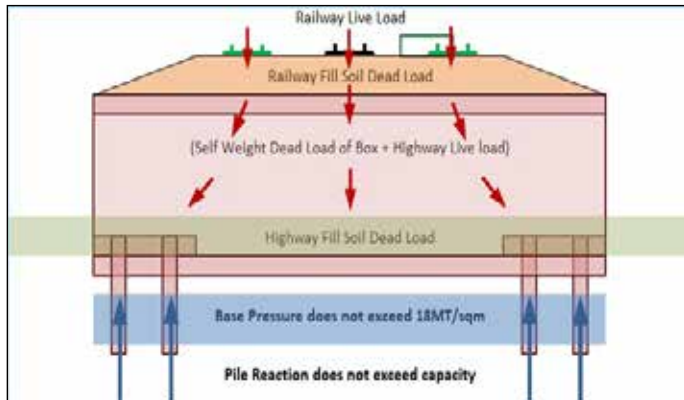


Fig.12 Load Mobilized through Pile and Raft Combined action after Integration of Piles with the Box

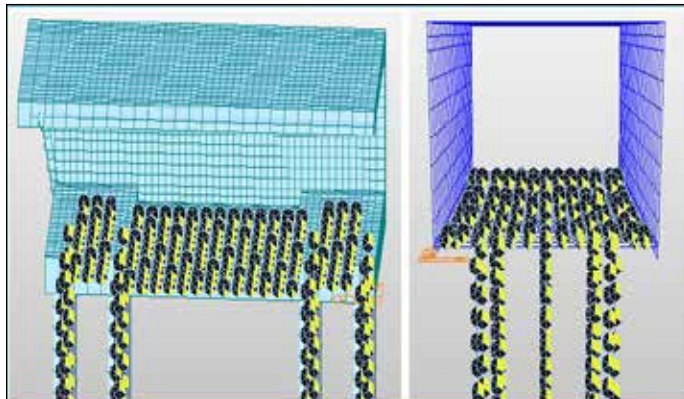


Fig.13 Springs as Modelled under Bottom Slab of Box and Pile for Stages after Pile Box Integration

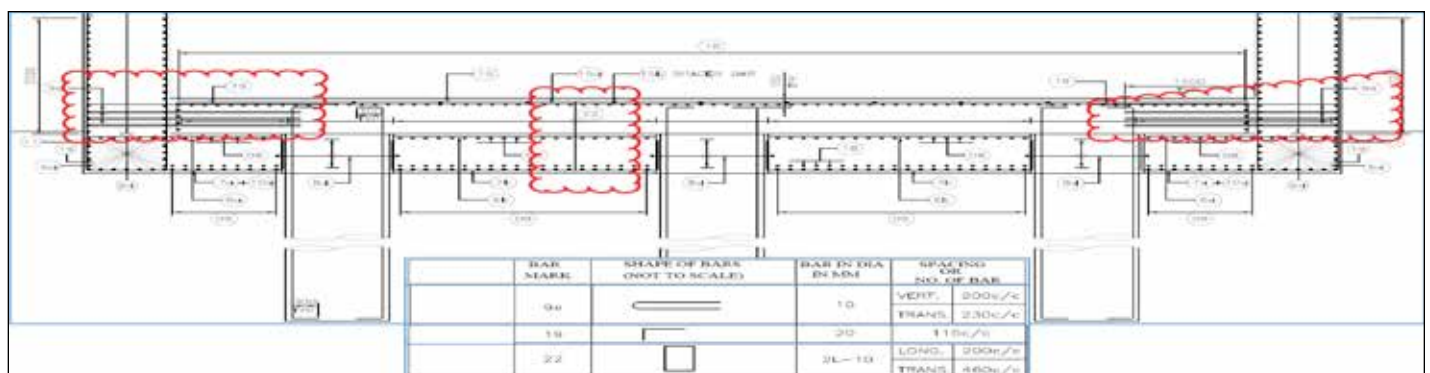


Fig.14 Transverse sectional view showing dowels left in the bottom slab and walls for pile pile-cap and box integration

6. DESIGN CODES AND STANDARDS

The RUB structure sustains both railway loading complaint to IRS codes and standards, and also the highway live loads compliant to IRC codes and standards. The codes referred to in design of the structure are listed as follows.

- IRS Steel Bridge Code 2017
- IRS Concrete Bridge Code: 1997
- IRS Welded Bridge Code: 2001
- IRC: 24-2010
- IS 1893 (Part 3): 2014
- IRC: 6-2014
- IRC:78-2014
- IRC:112-2020
- IS 456:2000
- MoRTH Specifications (Fifth Edition) 2013
- IS 2911 (Part 2&4): 2021 for Piles

7. PILE INTEGRATION WITH THE PUSHED BOX

Since the Railway traffic on the embankment could not be stopped, there was no way to increase the safe bearing capacity of the soil strata under the box by implement any ground improvement solution. So in order to sustain the additional structure load, piling was the only viable solution. The success of the structure depended on the integration of the pushed box structure with the pile bored through the gap left in the bottom slab of the box. In order to ensure proper integration 3 set of reinforcement dowels (See Bar Mark 9e, 19 and 22 in **Fig.14**) were left exposed from the bottom slab and the side wall. The bottom slab of the box being pushed was 1000 mm thick. And after the piling, additional 800 mm thick concreting was done to complete the pile cap and establish complete integrity of pile with the bottom slab and hence with the structure.

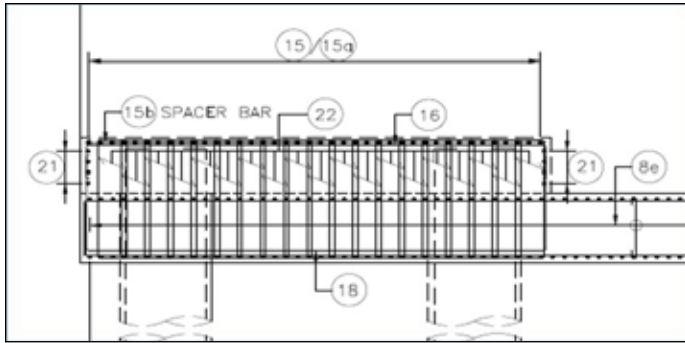


Fig. 15 Longitudinal Sectional View Showing Dowels Left in the Bottom Slab and Walls for Pile-Pile-Cap and Box Integration



Fig.16 Visible Dowels Left in the Bottom Slab and Walls along with Pockets Left in Bottom Slab for Piling after Box Pushing

8. RAILWAY BLOCK CONSTRAINTS AND TRACK ISOLATION BY RH GIRDERS

The Rampur-Dumra Railway Line is a very busy railway traffic route with on an average more than 200 trains plying on the route per week, including both passenger and goods train. It was categorically stated by the Eastern Central Railway authorities that in no case traffic blockage window shall be given for more than 4 hours. The entire

construction operation have to be done by ensuring safety and uninterrupted functioning of the railway track. Hence, in order to isolate the traffic load from the box pushing zone Restricted Height (RH) Girders were used (**Fig.17**). RH girders are temporary steel plate girder bridges integrated with railway tracks, which are installed prior to the start of the box pushing, such that the box can be pushed under this temporary bridge structure without affecting the railway traffic.

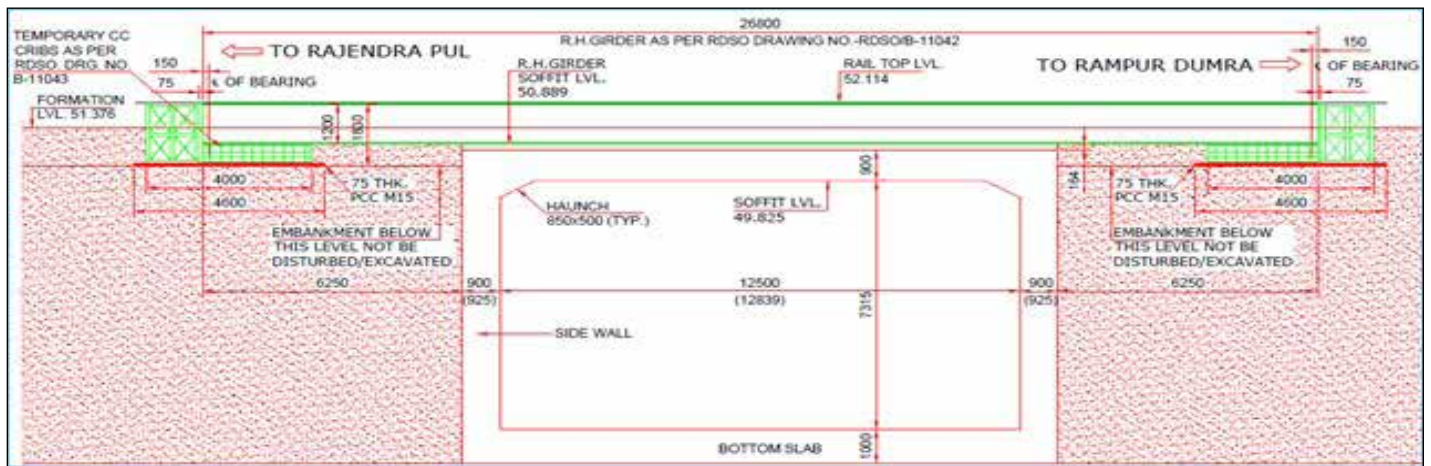


Fig.17 Temporary Deck RH Girder Arrangement to Isolate Railway Traffic from Box Top



(a)



(b)

Fig.18 Assembled RH Girder Showing Box as Pushed under the Temporary Bridge

The construction sequence was so designed that only 3 Railway Block of 4 hours each were required to complete the entire construction operation of both the boxes. In the one year construction period of the RUB2, railway traffic was stopped for only 12 hours in total. These railway blocks were required for installation, shifting and removal of these RH girder temporary bridge deck.

9. CONSTRUCTION SEQUENCE

Construction sequence was prepared for pushing of two boxes (RHS & LHS). Since the boxes were skewed towards

the left in the plan, the RHS box was pushed first and then the LHS box was pushed. This tendency of drifting of box was avoided by pushing the RHS box first.

10. PREPARATORY PHASE

Prior to excavation of the railway embankment for construction of thrust bed, safety of railway embankment was ensured by installing sheet pile for the entire width of the two boxes to be pushed (Fig.20). The thrust beds were constructed and the boxes were cast on top of the thrust bed (Fig.21).

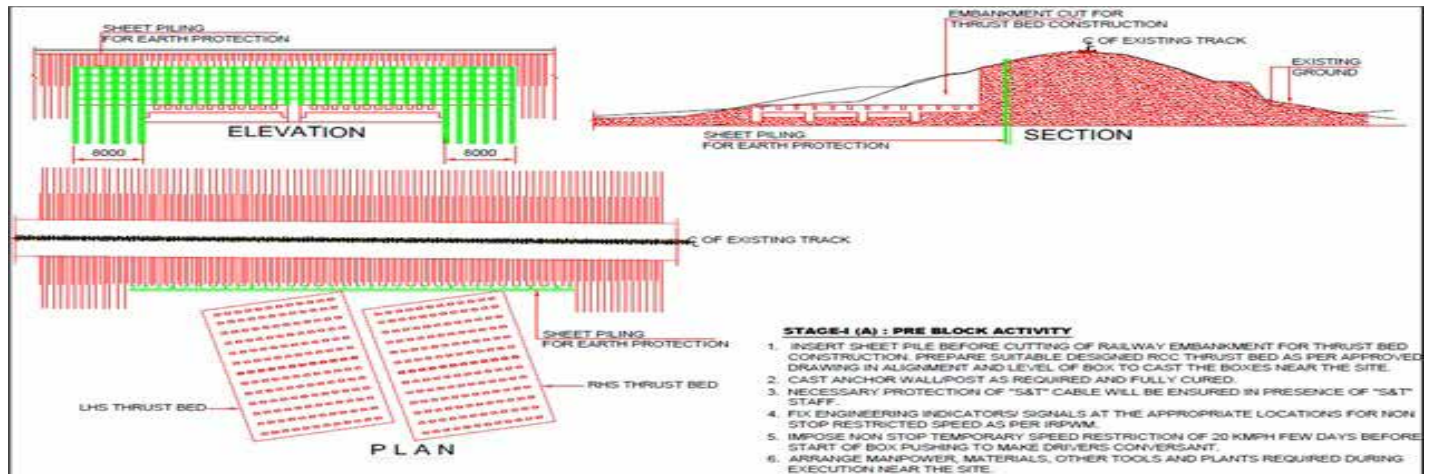


Fig.19 Pre-Block Activity Stage of Sheet Piling



(a)



(b)

Fig.20 (a & b) Sheet Piling using Vibro-Hammer for Railway Embankment Ensuring Safety during Excavation for Thrust Bed Casting



(a)



(b)

Fig.21 Both Box Casted over Thrust Bed with Leading Cutting Edge

11. RAILWAY BLOCK STAGE FOR RH GIRDER INSTALLATION

After RHS box construction was completed, Eastern Central Railway Authorities were invited to inspect the structure and issue clearance for commencement of box pushing. ECR accordingly granted first railway block period of 4 hours for installation of the RH Girder. In order to install the RH Girder, the railway track on top of the railway embankment was cut and lifted by crane to put

it aside (Fig.22). The earth is excavated and the resting precast bed blocks are installed (Fig.23). The RH Girder arrangement is then lifted and rested on top of the bed blocks (Fig.24). The tracks are connected using fish plates and railway traffic is released to ply over the RH Girder temporary deck.

11.1 Pushing of RHS Box

After the installation of RH Girder, pushing process of the RHS box under installed RH Girder was commenced.



(a)



(b)

Fig.22 (a&b) Track Section Cut and Removed



(a)



(b)

Fig.23 (a&b) Embankment Excavated to Accommodate the RH Girder and Bed Block Lifted and Installed



(a)

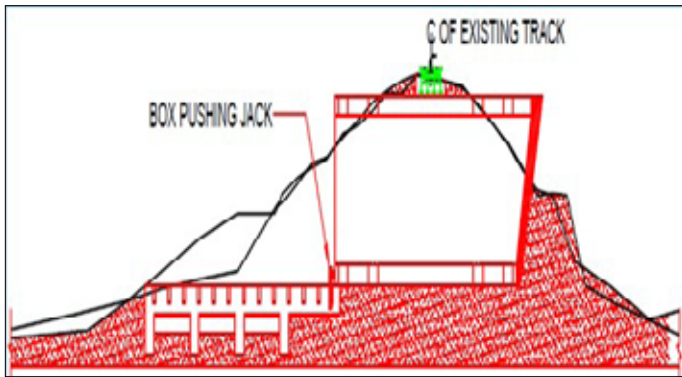


(b)

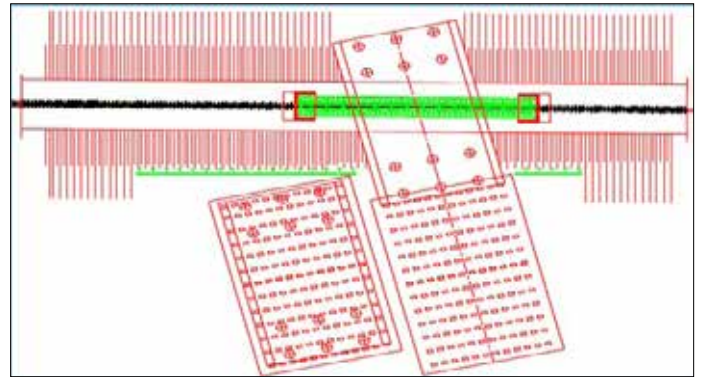
Fig.24 (a&b) RH Girder Arrangement Launched and Installed

The sheet piles in front of the Box were removed. Steel Pins were inserted into the pin pockets of the thrust bed. The pushing of the boxes started by using hydraulic jacks

taking support from the pins. The intended rate of pushing was 1 m per day, but pushing of box for the length of 35 m was completed within a record time of 2 weeks.



(a)



(b)

Fig.25 (a&b) Schematic Elevation and Plan showing Pushing of RHS Box under the Temporary RH Girder (green)



(a)



(b)

Fig.26 (a&b) Jacking Arrangement used to Push the Box by taking Support from Pin Inserted in the Pin Pockets of Thrust Bed

11.2 Piling through the pushed Box

The boxes were casted with 12 pockets left in the bottom and top slab for the purpose of piling. After the box was pushed into the location, piling rig was taken on top of the deck slab and piling process was completed. After piling was done, 800 mm thick second stage layer of the pile cap was cast to integrate the piles with the pile cap and box structure.

11.3 Second Railway Block for Shifting of RH Girder

After completion of RHS Box Pile structure, second Railway block was availed to shift the RH girder to align it with the axis of pushing of the LHS box.

11.4 Pushing of LHS Box and Piling

After shifting of the RH Girder the entire process of box pushing and piling was repeated for LHS box.

11.5 Third Railway Block for removal of RH Girder

After completion of LHS Box Pile structure, third and last



Fig.27 Pockets Left in Top Slab for Piling

railway block was availed to remove the RH girder, filling of earth fill, ballasts reinstallation of track. After inspection by Railway official caution was removed from the line.



(a)



(b)

Fig.28 (a&b) Piling Rig Boring from Top of Top Slab through the Pockets Left in Top and Bottom Slab of Box



Fig.29 Pile Cap Casted to Complete Integration of Pile with the Box

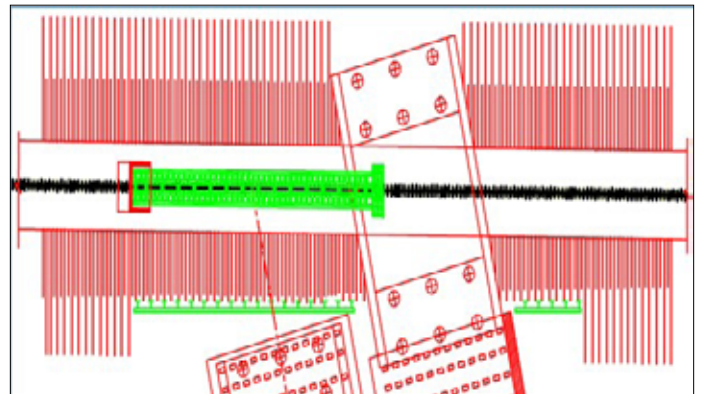


Fig.30 Schematic Plan Showing Shift in Position of RH Girder to Align with LHS Box

11.6 Construction of Wing/Retaining Walls and the Highway

The wing/retaining walls on the outer edges of the carriageway and at the median between the two boxes was constructed to complete the structure in totality and the pavement construction team was given access to commence with construction of the highway.

12. CONCLUSION

In many of the central and state government highway projects, it is a major challenge to construct highway at the points where it intersects with railway high embankments. Having the highway alignment passing over the railway embankment involves construction of high ROBs, its approaches & approach viaduct structure. Safe bearing capacity of the existing embankments is not always enough to simultaneously sustain multiple lanes of railway and highway traffic loads. Hence, the proposed Push-Box with Pile type structure serves as a viable alternative to cut and cover method of construction required for the ground improvement measures. The RUB proposal in place of ROB, reduces the structure height by almost 15 m and shortens the approach length on the each end by 600 m leading to cost saving of approximately 100 Cr, a major time and cost savings in the project execution.

This alternative solution minimize the uses of our natural resources and also reduce carbon footprint enabling safe environment for the inhabitants.

In times when India eyes to be a dominant nation of the world, it is important to expand our connectivity infrastructure to boost our economy even further. It can be done by overcoming technical challenges using smart solutions like the proposed which is an evolution of our well established industry practices and technical expertise of structures.



Fig. 31 Showing Underpass after Finishing



SA INFRASTRUCTURE CONSULTANTS PVT. LTD

(An ISO 9001-2008 Certified Company)

SMART INNOVATIVE INFRA SOLUTIONS - WORKING TOWARDS BETTER TOMORROW

About SAICPL

SA Infrastructure Consultants Pvt. Ltd along with its subsidiary UPHAM International Corporation and QUEST Engineers & Consultants are focused on delivering multi-disciplinary infra projects with innovative ideas of International Standards. The Group forms an ambitious consortium of consultancy firms with commitment to provide high quality specialized consultation into the field of Highways, Structures and Design.



Sectors



Services

SA Infrastructure synchronizes every aspect of engineering with imbibed commitment to deliver high quality infrastructure and development consultation that glorifies a new world. We have successfully carried out numerous consultancy projects in Civil infrastructure development, transportation, primary & secondary highway networks, Project Management under BOT/Annuity Model, Resource Management, Social aspects including poverty alleviation and Institutional support.

Highways : Including Access Controlled Expressway and upgradation of existing 2/4 Lanes.

Bridges : Including VUP, Flyovers, rehabilitation, ROB and Inspection Report and Conditional Survey.

Metro-Rail Services : Including design of underground and elevated metro stations, viaducts, architect design of stations and technical services.

Traffic & Transportation and intelligent Transport System - including preparation of Urban and Regional Transportation Plans, Land-use Transport Modeling for Policy Testing and Traffic Predictions, Traffic Management Plans, Road Safety Audit, Public Transport Planning and Management.

Urban Infrastructure Development : Including preparation of Plans, development of townships, infra corridors, water supply, sanitation and power supply etc.

Water Resources including irrigation Flood Control, Ground water exploration, Environmental and Social Aspects.

BOT/Annuity : including project identification, Detailed Survey, Feasibility Study, Detailed Engineering and Design, Economic and Financial viability analysis



Our Prestigious Clients



Corporate Address : 1101, 11th Floor, Tower A-II, Ansal Corporate Park, Sector 142, Noida - 201 301, Uttar Pradesh, INDIA

Tel : +91-120-6148000 / Fax : +91-120-6148090 www.sainfra.com Email : info@sainfra.com