

**A SITE VISIT REPORT AT**  
**“CASTING YARD 6-BULLET TRAIN PROJECT” @ GAMDI, ANAND**  
**ON 18<sup>TH</sup> MARCH 2023.**

**PREPARED BY:**

**SHIREEN E MASIH (12102030603011)**

**GUIDED BY:**

**DR. RAJIV BHATT SIR (HOD CIVIL ENGG. DEPT.)**

**PROF. AXAY SHAH SIR**



**SPECIAL THANKS:**

**MR. GAURAV SRIVASTAV SIR**

**MR. AKSHAY GUJRAL SIR (ENGINEER ON-SITE)**

## **INTRODUCTION OF SITE**

The operator of Mumbai-Ahmedabad High Speed rail corridor project is National High Speed Rail Corporation Limited (NHSRCL). It will be India's first high-speed rail line. NHSRCL has divided the whole project into 8 packages i.e, C1, C2, C3, C4, C5, C6, C7 and C8. These packages includes making of underground tunnels and viaducts (elevated structures) at different intervals of the rail line. E5 Series Shinkansen from Japan are the technical partners for this project.

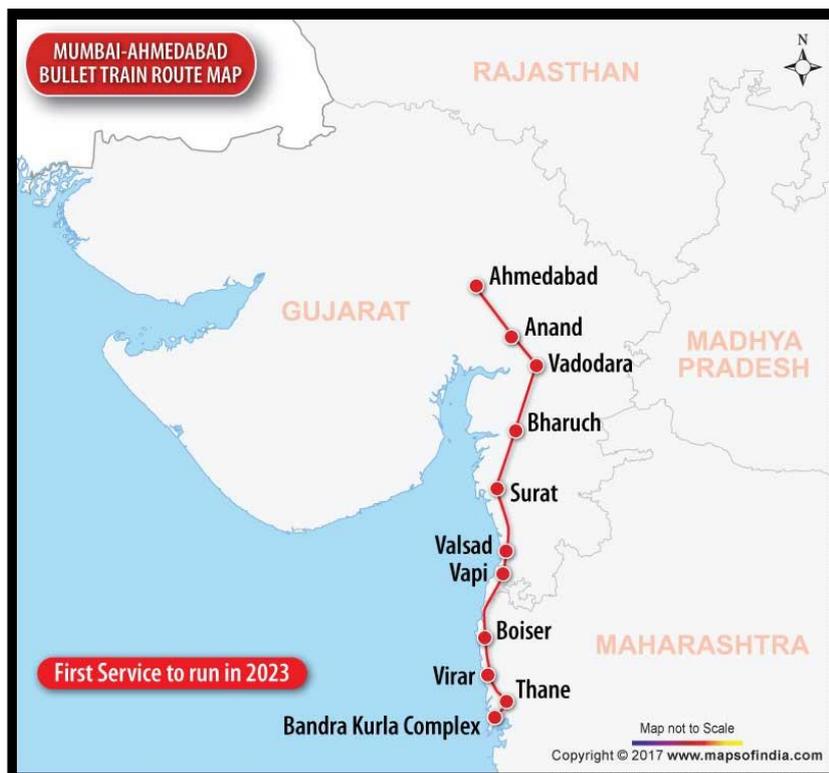
The overall high-speed rail line has 91% of elevated corridors, which reduced the land requirement 17.5 m against 36 m. The operating speed is 320 km/h.

The construction was started from April 2020 and the project was expected to be completed by December 2023.

A full Span Launching Equipment-Straddle Carrier and Girder Transporter was deployed in the project in September 2021. The equipment was designed and manufactured at Larsen and Toubro's manufacturing facilities in Tamil Nadu. Over 30 such machines will be used in the construction of the project.

The visit was planned for the C6 package under the construction of L & T Constructions which is between Vadodara and Ahmedabad having a total length of 87.56 km.

The line will have 12 stations i.e, Mumbai BKC, Thane, Virar, Boiser, Vapi, Valsad, Surat, Bharuch, Vadodara, Anand/Nadiad, Ahmedabad and Sabarmati.



## DESCRIPTION OF SITE

The C6 Package is under MAHSR which is of 88 km having 4 river crossings.

The viaduct section is been constructed using precast super structures.

The foundation type for almost all the piers is a pile foundation up to 50 m below the ground level and the pier height is about 10-15 m.

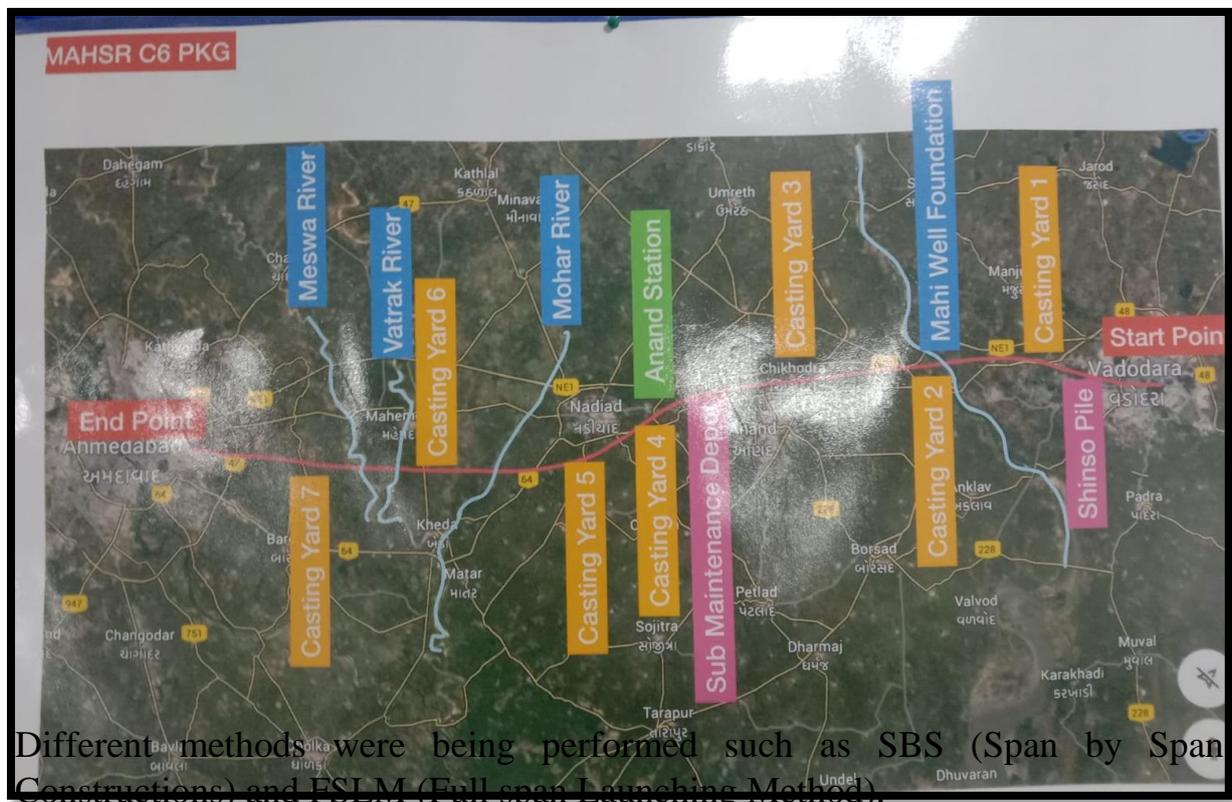
In the exception case of the track crossing the Mahi River well foundation is been constructed at that particular place.

There was construction of a labour colony, 2 RMC Plants, RO water plant and a chilling plant on site before starting the project.

The major section to be focused on before the project starts was the load bearing capacity of the soil along the track.

For these purpose Asia's largest soil testing laboratory was established in Surat for easy operation. Total of 6 months of testing was done.

From 2018-2020 they worked on clearance of obstructions including trees, farms, religious places, etc. Land free of any acquisition was given to L & T Constructions in just 1 day and trees were transplanted again.



A Helicopter survey was been conducted in 2016 from Mumbai to Ahmedabad.

At the end mostly FSLM was opted for construction of 734 Girders till date and 14 Girders by SBS method. And by using FSLM they have saved up to 3000 crores.

They are able to construct 40m span in 16 hours at present which took 5-6 days for construction in the initial days.

A single span of girder is of 1000 metric tonne weight.

Less than 600m radius curve was not permitted to be constructed.

The site has Mould Section production unit for casting 3 rebar cut and bend reinforcement.

They construct 30 girders 1 per day using FSLM. The casting time is 6:00-10:00 am.



## CONSTRUCTION SEQUENCE

## **DETAILS AND SPECIFICATIONS**

The Concrete used for particular this site was of M50 Grade. It was been prepared at the site location during concreting work at their 2 RMC Plants on-site.

The Water/Cement ratio is 0.314.

The pouring time for concrete was 15 hrs for 400 m<sup>3</sup> but it has been reduced to optimal time of 5 hrs for 390 m<sup>3</sup> till date.

Removal of mould restrain is after 48 hrs.

Then grouting of cables and application of epoxy is done.

Rebar Fabrication is for 5 days.

They construct up to 1 km in just 4 days.

Spreader beams are used. PT Ducts are of + or – 5mm.

They have provided an effective cover of 50mm along the whole section.

There is a bulk head fixing and thereafter insertion of inner form work and dummy HDPE.

Drawings such as NONO (Notice of No Objection), NONC (Notice of No Connections) were being checked on-site.



TESTING OF REINFORCMENT BARS

They have 84 Nos. of shutter vibrators and 40 Nos. of needle vibrators.

The placement of concrete was done according to the below pattern.

They use 3 boom placers to reduce time-lapse.

Curing period is for 15 days and they achieve 42.5 MPa strength in just 3 days.

For curing wet hessian cloth, plastics and curing compound are used to control the temperature for not more than 20°C.

The slump value for the concrete is 165-175 mm.

Casting layer thickness is 300 mm.

There is application of shutter oil before pouring of concrete.

The reduction of temperature in different materials were upto:

Concrete- 3°C

Aggregate- 8°C

Water- 4.5°C from 8°C by chiller plants.

For temperature measurement of water they have followed IS 7861-1(1975).

Planned number of Girders in the month of February were 34 and number of girders casted till date were 29. Thus they have achieved 85.29% of the work.

Some of the reasons for delay in work were delay in bulk head removal, span lifting, cage lowering, mould was not ready to be commissioned, crane unavailability, LG breakdown, 20 m/hr wind speed, etc.

The work done was been monitored on a pictorial chart by different colour codes such as:

Green- Done

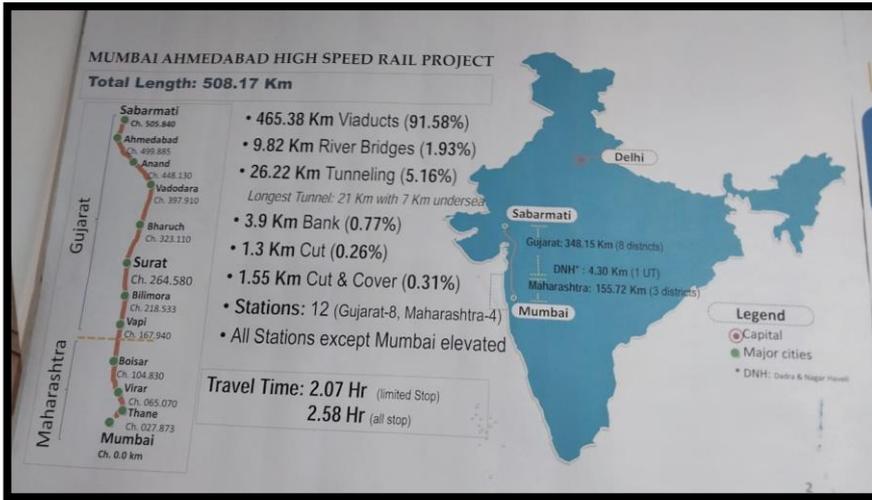
Yellow- On the way

Red- Left to be done.

They have in all submitted around 40,000 drawings for the tender.

The software which were used are Stadpro, Primavera, Midas, etc.

# PHOTO GALLERY



MUM-AHM HIGH SPEED RAIL PROJECT

LAUNCHING GIRDER



FULL SPAN BOX GIRDER ERECTION

BRIDGE GANTRY



BRIDGE GANTRY

LAUNCHING GIRDER



STRADDLE CARRIER



MAHSR (PROJECT OVERVIEW)



GIRDER TRANSPORTER



FACULTY MEMBERS



EXPLANATION OF DAMPERS PROVIDED FOR SEISMIC LOAD RESISTANCE



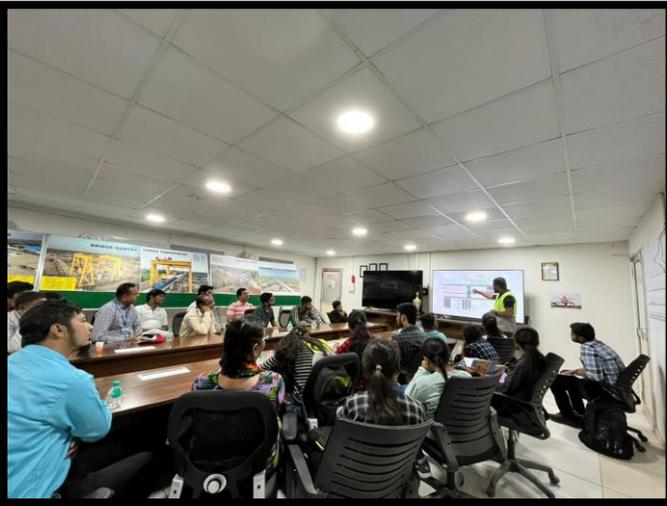
GIRDER FORMWORK AND CURING APPLICATION



QUANTITY OF TMT BARS USED



INSERTION OF INNER FORMWORK



GLANCE ON THE RPROJECT



REINFORCMENT OF GIRDER



Special thanks to the On-site Manager Gaurav shrivastav sir and Engineer Akshay Gujral sir for there humble approach which lead us fot easy understanding of the on going project.