

## FUTURE TRENDS AND DEVELOPMENTS IN BRIDGE AND FLYOVER CONSTRUCTION

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**Abstract:** *Bridges and flyovers are key to the development of any city, state or country. In our research we have highlighted the various innovative flyovers and bridges and we have also worked out on the feasibility of the flyovers and bridges, so that they will implemented in our city Jaipur.*

**Keyword:** *Flyovers, Bridges.*

### I. INTRODUCTION

The impact of the flyover construction to control traffic clog issue has been evaluated regarding traffic decongestion, efficient and fuel sparing. It was found that around 35% of the aggregate traffic is occupied to the flyover, which brings about a reduction of around 32% in the aggregate emanation era. It is the efficient strategy by going on the flyover. The loss of fuel for ignition and the related cost coming about because of sitting tight for the flag to change are likewise evaluated, and these are observed to be noteworthy. When it rains, it's not quite recently the streets that are water logged every single other road likewise get full with water so it's anything but difficult to make a trip by flyover to get simplicity of rain water. In this manner it is constantly critical to gadget and build up the viable strategies for the flyover and bridge construction.

### II. RELATED STUDY

M.A. Sobhan, A.F.M. Saiful Amin [1], the point of this paper is to upgrade and further invigorate the diverse controls of structural engineering and design that can enhance the execution and monetary return of a bridge over the long haul. To this end, the paper takes a note of current pattern of bridge engineering in Bangladesh and endeavors to give an advanced vision to improvement in the coming decades by keeping a match with the financial improvement status of the nation. Narabodee Salatoom<sup>1</sup>, Pichai Taneerananon [2] suggested that to lessen traffic blockage at an at-grade crossing point close to a major city, one technique is construction a flyover bridge at the old junction in two bearings on one of the principle interstates. The flyover encourages the traffic stream in the bearings of the bridge, however the framework can't completely take care of the majority of the issues particularly on the optional road. Under the bridge, despite the fact that it mitigates the traffic blockage at the crossing point; the traffic flag still uses an indistinguishable control from the "before" circumstance, that is the settled time control plan. With the flyover bridge set up, it was found that around 30-35% of all traffic volumes occupied to the bridges, and time delay reduced by 30% over a similar period. This paper which is one a player in the

principal creator's postulation, displays the issues that still exist at the flyover-enhanced junction and makes recommendations to expand the advantages of the flyover, for example, making another cycle and stage times and enhancing the physical region under the bridge. The SIDRA software is utilized to decide the suitable settled time plans, and utilizing the procedure of Road Safety Inspection (RSI) to review the safety of the site and introduces the changes to the rest of the issues. Kuldip.B.Patel, Anand D. Sapariya, Pradeep P. Lodha [3] concentrated that the general population of Vijalpore town are confronting intense traffic issue at railroad crossing road in Navsari. The fundamental explanation behind this issue is entry of more number of trains from here which brings about conclusion of railroad entryway for longer timeframes. Individuals need to sit tight for a few minutes to pass through this railway crossing. Likewise, an underpass arranged close to the railroad intersection is little and water gets aggregated under in stormy season. Waste framework for evacuation of water is not adequate near the underpass. Keeping in mind the end goal to solvethis traffic issue, planning and building a Flyover Bridge over railroad intersection might be a practical choice. For planning of bridge, a site visit and traffic survey at railroad crossing should have been done. Additionally to plan of fly over bridge over railroad crossing, essential guidelines and benchmarks in bridge design according to Indian models code ought to be considered. Keeping the above focuses in view, a survey was led amid this review to investigate the likelihood of planning and developing a fly-over bridge at Vijalpore railroad crossing. Kavitha.N, Jaya kumari.R, Jeeva.K, Bavithra.K, Kokila.K[4] project manages the Design of a grade separator in a convergence. The area is at four roads junction at SALEM town, which is confronting real traffic issues because of the construction. We have done a traffic survey and designed all the structural parts for this grade separator. The grade separator is of 640 m length with 21 ranges, 20m for every traverse. It comprises of a deck slab, longitudinal braces, cross supports, deck pillar, wharf and establishment. Structural design of one traverse was made for all the above segments. Anuj Dubey Tajammul Sayed [5] this paper underscores on the utilization of software's for scheduling purposes in Project Management. In India, dreary and tedious regular strategies are as yet utilized for project management as opposed to utilizing present day software instruments. The Hadapsar-Saswad Bridge in Pune is selected for construction booking as a contextual analysis. In this project the exercises were drilled down, amounts were evaluated, assets were assigned and henceforth a calendar was made. A few proposals were made

on the site to beat the obstructions on the site without influencing the project's duration and furthermore not hampering excessively with the cost.

### III. OBJECTIVE OF STUDY

The main objective of the research is study the new concept and techniques which are currently and in future to be adopted in the world most developed countries like United States of America and will try to perform the cost and benefit analysis of the main and implement the techniques in city Jaipur for the bridge and flyover construction. The art of bridge design is a time-honored pursuit that, throughout the centuries, has undergone significant advances in engineering and technology as a result of mankind's passion to conquer the challenges of any given crossing. It has evolved through the acceptance of well-established practices, codes and construction techniques. In fact, when new materials or methodologies are brought to the market, it often takes many years for the techniques to gain inclusion in the modern practice of bridge design. For example, even after the high-strength characteristics of iron were recognized, as compared with timber, iron was still used as a lighter-weight substitute. It was years before it came to be a stand-alone structural material for bridge design. Steel also went through a similar transformation before it was used as a replacement for iron; welding and bolts replaced rivets; and in today's modern age, computer analysis and CAD (from matrix methods though FEMs) have replaced hand calculations and hand drafting.

### IV. PROPOSED METHODOLOGY

The proposed study lie in studying the innovative bridges all around the world and studying the new techniques and concepts which are emerging in this field. And on the basis of the survey and the parameters based filtering we will decide the techniques which are feasible for implementation in our city Jaipur.



Fig 1 Jaipur Map

Construction of Flyover at Transport Nagar Circle(Jaipur)  
 Transport Nagar Chouraha is one of the gateways to Jaipur on junction of NH-8 (From Delhi) and NH-11 (From Agra). With the view to ease out the traffic congestion at this important junction , after evaluating various options JDA has undertaken construction of three level grade separator at the crossing. The proposal is to construct underpass towards MI

Road- Agra side and flyover from Delhi side with one leg flying towards MI Road (Flyover-1) and other towards Jawahar Nagar Bypass road (Flyover-2) along with slip lanes on all the four sides. The other instruments of junction improvement along with improvement of drainage system of the area as well as for new constructed elements are part of the project. Some of the elements like Diaphragm wall, for construction of underpass, will be constructed for the first time in Jaipur and perhaps Rajasthan. The administrative & financial sanction amounting to Rs. 71.25 Crore has been approved for the project. At transport nagar Flyover Cast-in-place method of construction of diaphragm wall is used. Cast-in-place diaphragm walls are usually excavated under bentonite slurry. Various types of excavation equipment can be used depending on project conditions, including hydraulic excavators and kelly-mounted or cable-hung clam buckets. Depths in excess 150 feet are possible. (The Hydrofraise, a highly specialized excavation tool, can reach depths of 500 feet.)

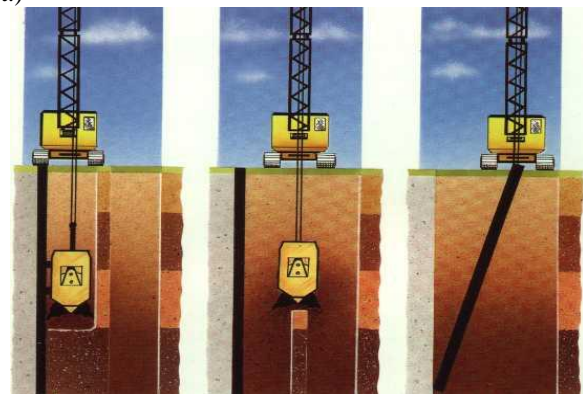


Fig 2. Diaphragm Wall Excavation



Fig 3. Excavation with the Help of Grab at Site.

Diaphragm wall construction begins with the trench being excavated in discontinuous sections or "panels". Stop-end pipes are placed vertically at each end of the primary panel to form joints for adjacent secondary panels. Panels are usually 8 to 20 feet long, with widths varying from 2 to 5 feet. Once the excavation of a panel is complete, a steel reinforcement cage is placed in the center of the panel. Concrete is poured in one continuous operation through one or more tremie pipes that extend to the bottom of the trench. The tremie pipes are extracted as the concrete rises; however, the discharge end of the tremie pipe always remains embedded in the fresh concrete.



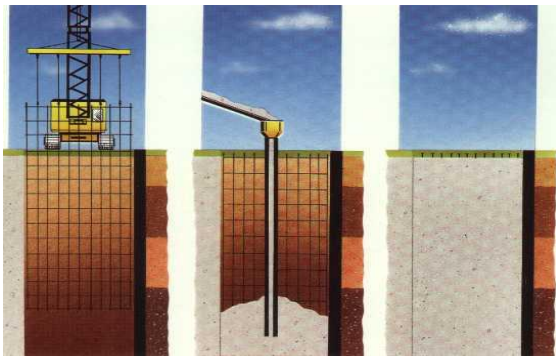


Fig 4. Diaphragm Wall Reinforcement & Concreteing



Fig 5. Installation of Reinforcement Frame for Diaphragm Wall

The slurry that is displaced by the concrete is saved and reused for subsequent panel excavations. As the concrete sets, the end pipes are withdrawn. Similarly, secondary panels are constructed between the primary panels to create a continuous wall. The finished wall may be cantilever or require anchors or props for lateral support.

List of some innovative bridges and Flyovers


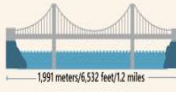







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|---|---|
|  | <p><b>AKASHI-KAIKYO BRIDGE</b></p> <ul style="list-style-type: none"> <li>▶ Longest suspension bridge, completed in 1998, also known as the Pearl Bridge</li> <li>▶ Designed to resist high winds and earthquakes</li> </ul> <p><b>LENGTH:</b> <br/>1,991 meters/6,532 feet/12 miles</p> <p><b>COST:</b>  approximately Japanese Yuan <b>1470B or ¥4.3B</b></p>             |
|  | <p><b>CHESAPEAKE BAY BRIDGE-TUNNEL</b></p> <ul style="list-style-type: none"> <li>▶ One of the few structures that can be seen from space, opened in 1964</li> <li>▶ Designed as one of Seven Engineering Wonders of the Modern World in 1965</li> </ul> <p><b>LENGTH:</b> <br/>28,300 meters/92,848 feet/28.3 kilometers/17.6 miles</p> <p><b>COST:</b>  <b>\$450M</b></p> |
|  | <p><b>DANWANG-KUNSHAN GRAND BRIDGE</b></p> <ul style="list-style-type: none"> <li>▶ Longest bridge of any type, opened in 2011</li> <li>▶ Viaduct along the Beijing-Shanghai High-Speed Railway</li> </ul> <p><b>LENGTH:</b> <br/>164,800 meters/540,682 feet/102 miles in length</p> <p><b>COST:</b>  <b>\$33B</b></p>   |

Fig 6. World Innovative Bridges

## V. CONCLUSION

This research will show the innovations in the field of the bridges and the flyover going all around the world and the factors which have to be taken in considerations for implementing the same. The future aspect of research is to inspire form the same and will construct similar structures in the city Jaipur.

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