



Reconstruction of arch bridges by lithely arch method

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ABSTRACT

Lithely arch method is innovative, modern, economic and fastest method of construction of arch bridges. This method is invented in Maharashtra, India. Bridges constructed using this method are purely compressive in nature. This method utilizes precast units for construction of arch bridges. This method can be utilized for reconstruction of old arch bridges in India very economically and with less time.

KEYWORDS— Arch bridges, Reconstruction

1. INTRODUCTION

Bridge is a typical structure of cross drainage work. There are number of bridges which are used since ancient era. In fact the development in bridge technology is also the yardstick to measure the development of human being. Today arch bridges can be built very fast with advanced technologies and advanced materials. With help of new construction techniques now it has been possible to achieve economy during construction of arch bridges. Also these new arch bridges are durable and withstands in natural calamities due to advanced materials. Today arch bridges can be built for longer spans. Lithely Arch is a precast, modular, concrete arch bridge system. The bridges constructed using Lithely Arch technology are purely compressive in nature. Lithely Arch technology can be used for replacing, widening and strengthening old arch bridges.

1.1 Proces of manufacturing and Installation of arch bridge constructed using Lithely Arch technology Method of manufacturing and installation contains following steps

1. Wedge shaped blocks of concrete are manufactured in the workshop situated near to the construction site.
2. Then wedge shaped blocks are connected in series with steel wire ropes.
3. After connecting wedge shaped blocks in series screed concreting is done over it to cover steel wire ropes. Before screed concreting hooks are prepared in steel wire ropes for lifting purpose.
4. This completed strip of wedge shaped concrete blocks is then transported to the construction site.
5. This flat strip of block is lifted using cranes at the site and installed at desired position.

6. After installing all strips at desired positions the hunches are filled with concrete and rubble
7. Then brick masonry is constructed as parapet for panels
8. Then embankment is constructed to connect the bridge at ends with road.
9. Then road is constructed over completed work.

1.2 Construction steps of lithely arch bridge



Fig.1 Steel Mould for casting Concrete Blocks



Fig.2 Sockets for resting arch



Fig.3 Concrete Blocks in line and level

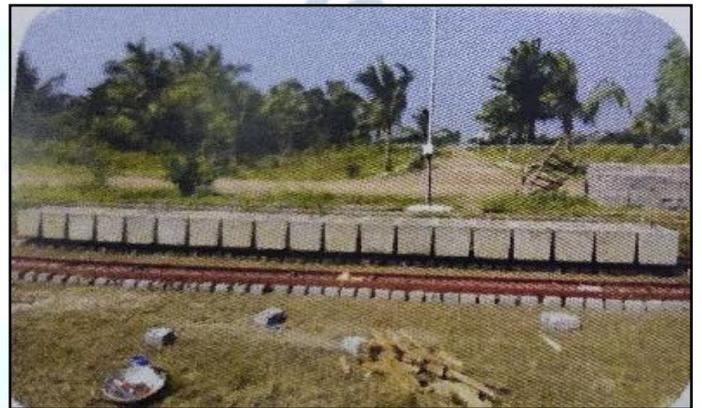


Fig.4 Wire Rope for lifting



Fig.5 Ready for screed Concrete





Fig.6 Arch strip before screed and after screed



Fig.7 Lifting of arch strip



Fig.8 Arch placed on socket stabilized, no support required



Fig. 9.Back filling procedure 60% rubble, 40% concrete

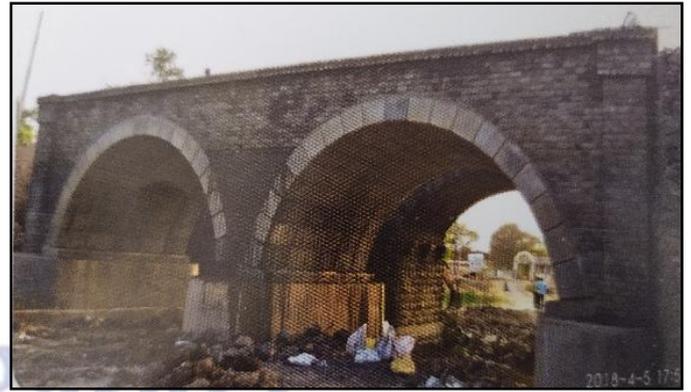


Fig.10.Basic structure



Fig.11 Completed open for traffic

1.3 Methods of determining bearing capacity

- Presumptive Analysis
- Analytical Methods
- Plate Bearing Test
- Penetration Test
- Modern Testing Methods
- Centrifuge Test

1.4 Important benefits of Lithely Arch Technology

- Economic method of construction of arch bridge
- As there is no use reinforcement in the method there are no chances of corrosion.
- No use of bearings and other attachments so there is no maintenance.
- Formwork is not needed in this method so this is the faster method of construction of arch bridges
- Load carrying capacity is high
- Less workers are required
- Ensure life above 100 years

2. CONCLUSION

Following are the conclusions drawn from the study

- Lithely Arch method is very useful for rehabilitation of old arch bridges in India.
- Lithely Arch method is easy, fastest and economical method than other methods of construction of arch bridges.
- Lithely Arch method is mostly useful for medium and short span arch bridges.
- This method is also useful for widening of old arch bridges

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Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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