

STABILITY OF BRIDGE FORMWORK

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Abstract – Different types of Bridge is constructed such as arch bridge, box Girder Bridge, cantilever bridge, continuous span bridge etc. therefore each bridge requires different types of formwork. Mostly the formwork is selected on the basis of requirement of structure and also on the economy.

- For any projects the formworks play an important role because it ultimately results in the success of project in terms of quality, strength, economy, speed and safety of works. We have conducted tests for the improving the bearing capacity and comparison for the economical solution.

Keywords: Stability, Bearing Capacity, Bridge Formwork, Load consideration, Economical

1. INTRODUCTION

As population is increasing throughout the country it's very much a critical issue nowadays. It also affects the traffic due to which there are many projects of road winding taking place, due to which there lots of bridge constructed beside the existing bridge and also bridge are constructed in place of old bridge across rivers for avoiding traffic problem and for avoiding the hazardous effect.

According to survey accounts, formwork cost nearly 35-40% of the total RCC projects cost and 75-80% of the project time.

1.1 Causes Of Formwork Failure

Insufficient Bracing causes to Instability of formwork, Vibration during concrete compaction and placing also causes formwork failure or Unstable Soil, Undermining or Scouring under Supports and sometimes unsatisfactory control of concrete placement leads to the formwork failure

1.2 Effects of Formwork

Due to formwork failure many defects are seen in concrete such as honey comb defect, poor Construction Joint/Offsets in Concrete Joint, collapse and cracking etc. Hydrostatic pressure is exerted on the forms due to the freshly placed concrete, but this pressure does not affect the formwork by length or width but affect by the height of concrete placed. Formwork can be bulged or deflected at a given load due to concrete pressure. If the soil under the formwork cannot carry the heavy load, then the formwork get settled which affect the concrete. When it hardens then the formwork is not affected by bulging further but neither can they can return to plane. Various effects of impact have seen during concrete

placing, this effect varies depending upon the height from which the concrete is placed or the height of formwork, with the rate of concrete placing speed the impact of pressure varies. Other factors due to which the formworks are affected are horizontal construction joints, vibration, vertical construction joints, removable and finishing forms.

2. REMIDIAL MEASURES FOR FAILURE

By analysis of the problems of the failure in formwork it can be conclude that there can be two types of solution can be given. Soil stabilization or Change in the Design of formwork. Different process used for the soil stabilization.

[1] Soil stabilization with removal and replacement.

Form the ancient time this method is being simply used for the soil stabilization. Simplest method in the stabilization is to replace and remove the exiting soil. Soils that will have to be replaced include contaminated soils or organic soils. It is only practical above the groundwater table.

[2] Pre-compression

In this process surcharge filling is simply placed on the top of the soil that requires consolidation. After the sufficient consolidation is done, the fill be removed and construction is processed. Surcharge soil is approximately 10 to 25 feet thick and settlements of 1-3 feet is been produced. This process is effectively used in the clay soil.

[3] In-situ densification

This method is used in conventional earthwork and is only effective to about 2 m below the surface. In this dynamic deep compaction for the soils are deeper than those that can be compacted from the surface. And this method is referred for sands

[4] Grouting

In this method the injection of special liquid or slurry material called grout are used into the ground for the improving the soil bearing capacity.

[5] Stabilization using admixtures

Here the admixture like Portland cement is used. As the admixture like cement is used with the soil it

behaves as the weak concrete. Admixture like asphalt and lime are also used as per the specification. This method is used reduce hydraulic conductivity, compressibility and expansion potential of the clay.



Fig -1: Kaolinite soil

3. CONCLUSION

As considering the economic aspects, mixing the soil with stone dust or kaolinite soil [as admixture] for increasing the bearing capacity for resisting the load of the formwork becomes more effective.

4. REFERENCES

- [1] IRC:87-2011 (Guidelines for formwork, Falsework and temporary structures)
- [2] ACI committee 347, formwork for concrete
- [3] IS 2720, Part 5 1992