

## Static and dynamic analysis of Lali bridge basin and caisson foundation

**Ghahramani, Arsalan**  
Shiraz University, Shiraz, Iran

ghahrama@shirazu.ac.ir

### Abstract

The static and dynamic analysis of Lali bridge basin and caisson foundation is discussed in this paper. The bridge is on Karoon River at elevation 240 m. The river water level is now at 110 and after water is impounded behind Gotvand Dam, the water level will rise to 235 meter. The bridge is cable stay type and will basically rest on two piers, each having two caissons foundations. The caissons have a deck of 16 by 32 meter with 5 meter thickness and are of diameter of 10 meter and depth of 20 meter in rock foundation. The submergence has important consequences on the basin stability and caisson design. The heave and stability of the basin as well as the details of the geotechnical design of the foundation caissons will be discussed.

**Keywords:** caisson, submergence, geotechnical design, dynamic

### 1. INTRODUCTION

The geotechnical report study of the Lali Bridge was assigned to this expert by Bolandpayeh Company. The static analysis of Lali bridge basin and caisson foundations were presented in 3<sup>rd</sup> International Bridge Conference, Tehran May 2008 [1] and can also be viewed in web site : <http://www.arsalanghahramani.com/lalibrIDGEpaper.pdf> . Basin time history analysis and spectrum analysis and caisson design will be presented in this paper.

For completeness the geological plan , the abutment figure and the caisson group and the rock mass properties is reproduced here, see Figure 1, 2 and 3 and Table 1. The bridge caisson foundations are located in sandstone layer. The caisson group consists of deck of 16 by 32 meters with 5 meter thickness and two caissons of 10 meter diameter and depth of 20 meters and the shell of the caissons are 1 meter thick and the bottom shell is two meters thick, the inner part will be filled with lean concrete. The caisson group is located in the left and right abutment and will be fully inundated after Gotvand dam is impounded.



**Figure 1. Rock Mass unit ASA3 foundation of rock socket for bridge**



**Figure 2. The thick bedded sandstone geological unit A7 and rock mass unit ASA3 for the rock socket bridge foundation**