International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 9 Issue 7 ǁ 2021 ǁ PP. 06-08

Live Study of Uplifting Of Ground Water in the College Campus

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ABSTRACT
This project discusses the different solutions for managing the rise of the groundwater level in the Pharmacy building of JSPM'S Campus. The study area is interested by a regional rising trend of the water table, which can bring about a hydrogeological hazard for the existing underground structures (basement of building, foundations, etc.). The study was carried out by means of the following steps: (1) scenarios simulation of the aquifer system evolution (2) evaluation of its effects on underground infrastructures; (3) evaluation of the different solutions for hazard mitigation. In the present day scenario, results pointed out a local increasing of the groundwater levels over basement area located in the pharmacy building, where the highest increase in water table due to the regional trend is observed (i.e, uplifting of water through the soil layer below the basement). Results obtained for the future scenarios pointed out a significant increase in water level, as well as an increase in water thrusts acting on the structures, bringing about important issues related to their static stability in the long term. Finally, the results for different mitigation systems showed that in the long term the problem could be solved through a superimposition of the effects of several solutions.
Keyword : - *Groundwater level, Water proofing, Uplifting*

Date of Submission: 06-07-2021 Date of acceptance: 19-07-2021

I. INTRODUCTION

Soil is the most important factor for any type of construction work because whole structure rest on soil. Before starting the foundation of construction work on site, it must essential that various investigations are carried out regarding soil and surrounded water table condition. When underground structure i.e. basement is constructed at considerable depth below the ground level with high water level than it deals with some problems for it. When basement is subjected to low ground water table then it requires less precaution regarding construction works. But when there is high water table, it must require evaluating some major problems for construction of basement. Following are the main two problems which are influencing after the construction of basement. A. Moisture and water seepage problems through peripheral retaining wall B. Hydraulic uplift pressure The interaction between underground construction and groundwater is twofold, i.e. groundwater impacts an underground construction and vice versa . This interaction must be assessed during the initial stages of the project, when it is easier, cheaper, and more efficient to adopt mitigation measures. During the construction phase of an underground structure below the water table, groundwater is usually pumped in order to work in dry conditions, and to avoid bottom instabilities. These instabilities could lead to bottom uplift or liquefaction. After the construction phase, pumping is stopped and the water table returns to its original level. As a result, groundwater pressure on the bottom slab of the structure increases.

II. LITERATURE SURVEY

2.1." Problems and Remedies for Basement Construction (In High Water Table Area)" Rathod Maulik A., Upadhyaya Deep S., Agarwal Sunnykumar P. Patel Dhruv R. Government Eng Bharuch , India. As we know that India is the second largest country in population so day by more and more infrastructure facilities are going to develop. In other hand available lane for construction is becoming at the edge of shortness. So many underground constructions are going on each year for utilizing as car parking, shops in basement of building, basement in residential building, mass rapid transit stations, depressed roadways and civil defense shelters. Many cities are located in coastal areas where elevations are low with attendant high ground water table. So some problems are occurring during construction and after construction. This paper discusses the various methods of providing residence against those problems for construction of basement. For this works various literatures are referred. For this paper, case of Construction site at "AKSHAR PURUSHOTTAM CHHATRALAYA", V.V.NAGAR, and GUJARAT, INDIA is studied.

2.2. "Integration of groundwater by-pass facilities in the basement flooring design for large underground structures" A. Serrano-Juana,b,c, E. Pujadesd, , E. VázquezSuñèa,c, V. Velascoa,c, R. Criolloa,c,e, A. Juradod a Institute of Enviromental Assessment and Water Research (IDAEA), CSIC, c/ Jordi Girona 18, 08034 Barcelona, Spain The impacts induced by the interaction between underground constructions and groundwater should be minimised by implementing corrective measures. These impacts are twofold, which means that underground constructions affect groundwater, and vice versa. Two common situations resulting from this interaction are the barrier effect (impact of an underground construction on groundwater) and groundwater pressure on the basement floor (impact of groundwater on an underground construction). In the literature, there are examples and designs of mitigation measures to minimise both impacts. However, to the best of the authors' knowledge, there are not any designs that combine corrective measures to minimise these simultaneously. This paper proposes an innovative groundwater by-pass design to mitigate the barrier effect and to alleviate the groundwater pressure on the bottom slab. The proposed integrated design was applied to the largest underground infrastructure in Barcelona: the Sagrera railway station. The design was tested and compared numerically with a solution initially designed (not integrated). The numerical comparison was undertaken with three different hydrogeological scenarios. The proposed integrated design mitigated the barrier effect and optimised the basement floor. It considerably reduced costs and increased safety during the construction phase.

2.3. " The groundwater rise in the urban area of Milan (Italy) and its interactions with underground structures and infrastructures" P. Gattinoni , L. Scesi Department of Civil and Environmental Engineering, Politecnico di Milano, P.zza Leonardo da Vinci 32, 20133 Milan, Italy:This paper discusses the effectiveness of different solutions for managing the rise of the groundwater level in the urban area of Milan (Italy). The study area is interested by a regional rising trend of the water table, which can bring about a hydrogeological hazard for the existing underground structures (metro tunnels, stations, deep foundations, etc.). The study was carried out by means of the following steps: (1) monitoring data analysis for reconstructing the regional trend of the water table; (2) calibration of a 3D numerical model of the groundwater flow; (3) scenarios simulation of the aquifer system evolution and evaluation of its effects on underground infrastructures; (4) evaluation of the effectiveness of different solutions for hazard mitigation. In the present day scenario, modelling results pointed out a local increasing of the groundwater levels over wide areas located nearby the tunnels intersections, where the highest increase in water table due to the regional trend is observed (about 10 m in the last 20 years). Results obtained for the future scenarios pointed out a significant increase in water level (from 1 m in short term scenarios to 10 m in the most pessimistic long term scenario), as well as an increase in water thrusts acting on the structures and flow velocity below foundations, bringing about important issues related to their static stability in the long term. Finally, the numerical results for different mitigation systems showed that in the long term the problem could be solved only through a superimposition of the effects of several solutions.

2.4."Preventation of Hydrostatic Uplift Pressure underneath of Basement Floor Slab in High Water Table Area"D.S. Upadhaya, assistant professor, Government Engineering College, BharuchMany underground constructions are going on each year for utilizing as car parking, shops in basement of building, basement in residential building, mass rapid transit stations, depressed roadways and civil defense shelters. Many cities are located in coastal areas where elevations are low with attendant high ground water table. So some problems are occurring regarding the cracking and damage of basement floor due to hydrostatic uplift pressure. This paper discusses various methods to prevent the effect of hydrostatic uplift pressure at the basement floor slab.

III. METHODOLOGY

This chapter deals with the detailed methodology of the project, which include various steps following flow chart shows the detailed methodology and the chapter will cover the detailed explanation of methodology that is being used to make this project complete.

Dewatering means "the separation of water from the soil", or perhaps "taking the water out of a particular construction completely." Many excavations are carried below groundwater level. Techniques for dealing with the problems that result depend on the excavation dimensions, the soil type, and the groundwater control requirement, among other factors. The simplest dewatering operations are carried out with little planning major operations in difficult conditions require advanced engineering and constructions methods. Basement flooding can be devastating and a costly problem for homeowners. In order to prevent flooding and keep your basement dry, it's key to understand why flooding happens in the first place.

3.1 CRITERIA FOR SELECTION OF SUITABLE METHOD

1. Ground water table and it's Location
2. Permeability of soil

3.2 METHODS

1. Exclusion techniques

✓ Steel sheet piling

✓ Concrete waterproofing

✓ Silicate-based concrete sealers

2. Dewatering techniques

✓ Well points (Horizontal)

✓ Sump pumping

✓ Deep (bored) wells

IV. CONCLUSIONS

i. The present status of the water percolating problem in the basement of campus building is studied.
ii.Economically viable techniques for the prevention of entry of water in the basement of building is suggested.
iii.The efficient possible route to attain uplifting of ground water problem solution is discovered.

V. RESULT

There are various methods for preventing the uplifting or seepage of water in the basement, but if we use these methods individually it becomes time consuming and also does not gives satisfactory results. Instead if we superimposed two or more methods then we can get effective results. So it is preferable to modify these individual methods by superimposition.

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