

“ FLOOD MITIGATION WORK IN THE BUSINESS PARK WITH THE INFRASTRUCTURE DEVELOPMENT - CASE STUDY ”

Dr Naveen G M¹, Anusha P², & Gurukiran S³
¹Professor & HOD, ² Assistant Professor & ³ Research Scholar
^{1,2 & 3} Department of Civil Engineering
¹Government Engineering College, Kushalnagara-571234

^{2,3} BGSIT, B G Nagar

Email: *¹naveengm.gowda@gmail.com*

ABSTRACT

Office parks have a more man and vehicular movement, required infrastructure development like bridge, storm water drain, traffic control, roads, cross overs, and flood mitigations during high peak rains. With required drainage system and proper planning of infrastructure & water management system will help to eliminate the flood during high peak rains. Other criteria for the office parks existing buildings property managed by including and adopting new technologies which is reduce the carbon emission and reduce the energy consumption by using the energy efficient and renewable source of energy equipment's. Using renewable sources of energy helps in reducing the greenhouse gas effect and lower the effect on environment and human beings and the existing building can enhance their durability by adopting the waterproofing technology and arrest the water seepage and leakage and enhance the durability of the structure.

Key words: Flood mitigations, high peak rains & renewable sources of energy.

1. Introduction

The company has developed projects in many Indian cities like Bengaluru, Chennai, Hyderabad, Pune, Coimbatore, Trivandrum etc. and two countries abroad (Serbia and Malaysia). Embassy Group is headed by Jitu Virwani, Chairman & Managing Director of the group. Embassy also operates a real estate investment trust (REIT), called

Embassy Office Parks REIT. Embassy Office Parks is the first listed REIT in India and the Asia's largest office REIT by area.

M/s Embassy group has developed the biggest IT park in North Bengaluru as Manyata Embassy Business Park (also called Manyata Tech Park) is a software technology park in Bangalore, Karnataka, India. The park is situated in Nagawara (near Hebbal) on Outer Ring Road and has a building area of 9.8 million square feet. The park is spread over 300 acres (1.2 km²)

A nalla crossing the MEBP campus from West to East and this nalla contains sewerage/Storm water from the various Inlets, nearby lake, and other outlet water from the nearby located buildings.

Due to the excessive rainfall last year, the nalla overflowed into the MEBP property roads & basements of adjoining buildings, to avoid such scenario in future during the monsoon season Embassy group has appointed structural consultant Innotech Engineering consult pvt ltd for appropriate solutions to enhance the surface/storm water capacity of the existing nalla.

2. Objectives of the study

To ascertain the site conditions of nallas flowing parallelly side by side crossing the property from West to East .

Nalla-01  Open Nalla.

Nalla-02  Covered Nalla.

- 1.The present study captures the detailed study on the nalla as per the site condition, study of inflow and outflow capacity, profile of nalla.
- 2.Suggestion of necessary tests, capturing necessary reports and details.
- 3.Various solutions to enhance the storm water capacity in the existing nalla.

3.Steps involved During Completion of Project

- Analyze the site.
- Understand the requirement.
- Examine the problem.
- Work out the possible solutions for the problem.
- Discuss the fitted solutions as per the site conditions.
- Select the options based on the faster ,economical and maintenance free solutions.
- Proper planning of schedule and materials.
- Successful completion of the project and make its serviceability friendly.

4.Site preliminary investigation



Figure 1:- View shows the Nalla 01 and Nalla 02

Study of nalla includes the following details,

1. Length of the nalla to be renovate.
2. Width of the nalla.
3. Depth of the nalla.

4. Gap between the nalla 1 & 2
5. Foundation details of the existing nalla.
6. High flood level.
7. Adjacent property like road, building and landscape levels along the nalla.
8. Cross overs like bridges, pedestrian walkway & culverts.
9. Catchment areas (upstream)

Nalla Profile to Renovate

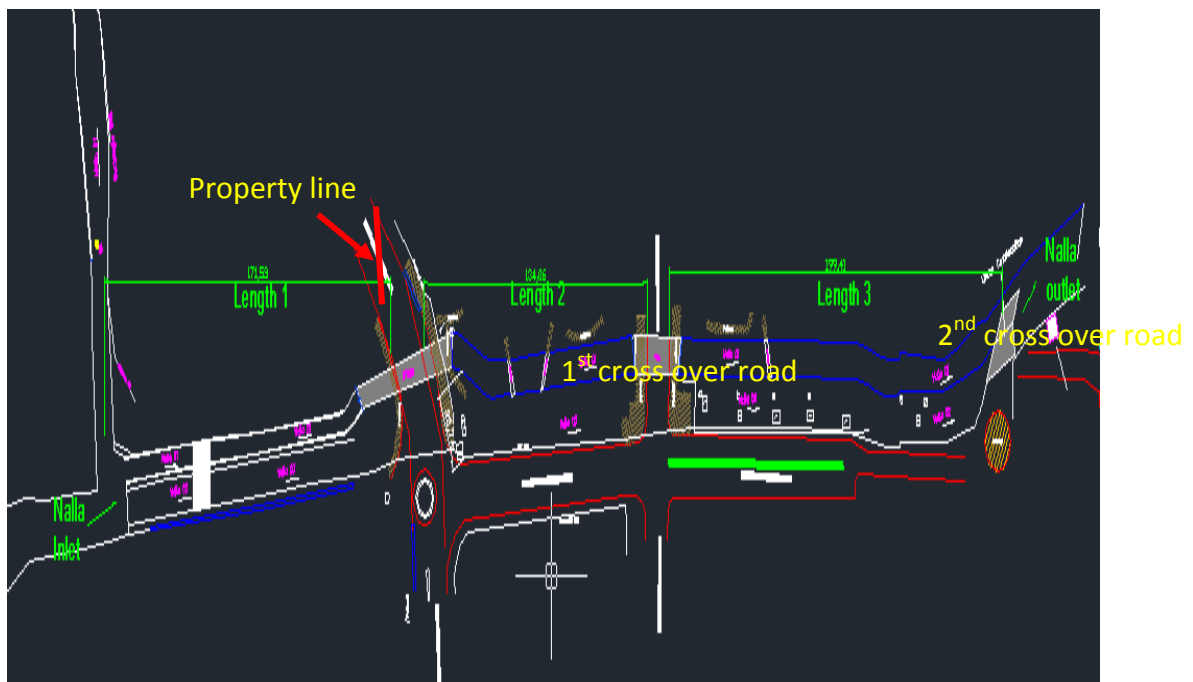


Figure 2:- Existing nalla running through campus and divided into following length to easy to understand and work execution.

Length 01: Nalla from inflow to the 1st cross over road.

Length 02: From 1st cross over road to 2nd cross over road.

Length 03: From 2nd Cross over road to outflow of Nalla.

4. Conclusion

The following conclusion can be drawn based on the result obtained in the present study.

1. On site preliminary investigation we come to know what the problem are facing as per the present condition and understood on the site topography and what are the possible best options can be worked
2. On the basis of the site survey conducted understood the high flood level and this helped us on what height retaining wall need to be developed to avoid the flood from the nalla to the tech park campus.
3. Suggested for the different tests this gives us existing partial structure are strength to add additional load on the same, this gives us the satisfactory results and based on this structural detailing is being designed.
4. Retaining wall constructed on either side of the nalla ht of about 5.2 mts above the NGL and this will be sufficient to avoid the water/flood of water from nalla to the campus By this we are successfully mitigate the flood/overflow of nalla water to the campus ,even in peak rains
5. implanting renewable sources of energy and using less energy consumption equipment ,more usage of sky lights and this will reduce the co2 emission and help in the sustainable development and environmental friendly ecosystem.

REFERENCES

- [1] Nijssen, D., A. Schumann, M. Pahlow, and B. Klein. "Planning of technical flood retention measures in large river basins under consideration of imprecise probabilities of multivariate hydrological loads." *Natural Hazards and Earth System Sciences* 9, no. 4 (August 6, 2009):
- [2] Yi, Xiu Yong, and Yang Zhang. "Study of Urban Flood Control Planning in Taiyuan." *Advanced Materials Research* 838-841 (November 2013)
- [3] Yamashita, Sampei, Yukihiro Shimatani, Ryoichi Watanabe, Toshiyuki Moriyama, Tomoko Minagawa, Kumiko Kakudo, and Terukazu Yamashita. "Comprehensive flood control involving citizens in a Japanese watershed." *Water Science and Technology* 68, no. 4 (August 1, 2013).
- [4] *Community resilience mechanism in an unexpected extreme weather event: An analysis of the Kerala floods of 2018*, India International Journal of Disaster Risk Reduction, Volume 49, 2020.
- [5] *The rain deluge and flash floods of summer 2022 in the United Arab Emirates: Causes, analysis and perspectives on flood-risk reduction 2023*, Journal of Arid Environments.
- [6] *Is code IS 456: 2008 for the structural detailing.*