

# *REPORT*

## TEQIP Summer internship 2019

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**Year:** THIRD

**College name :** CHAIBASA ENGINEERING COLLEGE JHARKHAND

**Topic name:** GW MODELING (STORM WATER DRAINAGE)

**Software used:** STORMCAD

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# **INTRODUCTION:**

## **STORMWATER:**

- It originates due to precipitation events.
- It can be infiltrate into the soil, be held on the surface and evaporate, or runoff and end up in nearby streams, rivers, or other water bodies.
- In natural landscape (forests), the soil absorbs much of the storm water and plants help in holding storm water.
- In developed environments, unmanaged storm water can create problems like flood and water pollution.

Storm water harvesting is needed to fulfill the water demand.

## **STORMCAD:**

- ***Creating a schematic network:*** Storm CAD is an efficient tool for laying out a gravity sewer model.it is easy to prepare schematic model.
- ***Automated design:*** it can automatically design all or parts of a storm sewer system.
- ***Scenario management:*** this allows us to calculate multiple “what if?” situations in a single project.
- ***Reporting:*** this allows the user to presents his results.

## **Analysis of pilot road project:**

Area based development (ABD) comprises of 22 wards of out of 54 wards of total Ujjain area. Under ABD 51 roads are to be developed with total length of 25Kms of different carriage ways as per the site conditions and RFP. Out of 51 roads under development road no. R22 is selected as a pilot road project.

For stormwater drain design, the catchment area under R22 is earmarked with help of contour of total area ABD. The data of 30 years is collected from IMD for calculation of IDF curves for the hydraulic design of stormwater drain. As per RFP, the drains are proposed with closed conduit of RCC NP4 pipes. Accordingly, for every 15m and at change of alignment a stormwater chamber is proposed on both sides of road.

For R22, the drains from both the sides are proposed to be linked to the existing outlet at chainage 450m.

## **Summary of design considerations adopted**

- (1) As per IRC 86 “geometric design standards for urban roads plains” recommends that camber or cross slope on straight sections of roads are given in table 3.1 of IRC: SP 50-2013. Hence a fall of 1.8% is adopted in the design.
- (2) Spacing of manholes for storm water pipe is proposed for every 15m interval as per page no.41 of IRC: SP 50-2013.
  - a. When two or more storm water drains converge.
  - b. When pipe size changes
  - c. When there is change in alignment
  - d. When there is change in gradient.
- (3) The coefficient of manning’s regosity for various surfaces as indicated in table 6.3 of IRC: SP 50-2013 is followed during the design of storm water drains.
  - a. Concrete pipes up to 600mm dia: 0.015
  - b. Concrete pipes above 600mm dia: 0.013
- (4) The minimum and maximum velocities of the drain section are adopted as per the table 6.4 of IRC: SP 50-2013.

For storm pipes: minimum velocity-0.75 m/s  
Maximum velocity-1.8 m/s
- (5) Minimum sections of drain adopted are 450mm as per clause 6.8.5 of IRC: SP 50-2013.
- (6) Rainfall intensity is considered as per IDF curve.
- (7) Time of Concentration is considered as per the equations from IDF curves.
- (8) 2 year Return Period is considered during the design of storm water discharge.

**Thank you**

