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LITERATURE REVIEW STUDY OF STORM WATER SYSTEM FOR UNDERPASS MANISH M. PATEL², DHAVAL M. PATEL¹ ABHIJITSINH PARMAR¹, DIXITKUMAR PATEL¹, KAUSHAL RAVAL¹

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Abstract: Many underpass filled up due to rain. Which causes many problem like traffic jam, water logging nearby areas and create other problems like typhoid, etc. spreading diseases. It is required to crack this all problems. To crack this problem proper study of area i.e. pumping requirement to remove water from underpass, improve sewer network required. The study can be helpful in outcome solution by restructure of rain water drainage lines. Also it can be beneficial to other underpasses which have the mutual problems.

Keywords: Kerb drain, Storm water, Grate drain, Underpass, Sewage network



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INTRODUCTION

Storm water is water that originates during precipitation events and snow/ice melt [1]. Storm water is the water that drains off a land area from rainfall. This includes rain that falls on rooftops, directed through gutters and downpipes onto land or into drains, as well as rain falling on ground surface areas such as roads, driveways, footpaths, gardens and lawns [12]. There is different types of storm like hail storm, flooding, snow storm, ice storm, thunderstorm, tropical storm etc.[13].

An underpass is a road or path that goes underneath a railway or another road[3]. Subway, Tunnel, under-bridge is also like a underpass. Some underpass or subway is use for pedestrian and other underpasses used for vehicular movement [4].

Storm water is a major cause of urban flooding which includes flash flooding snow melt, heavy rainfall & depends on catchment area. Main problems arise due to storm water are blockage of drainage (storm drain) & backflow of valve [2].



Figure:1 underpass for vehicular movement (source : https://upload.wikimedia.org/wikipedia/commons/9/98/Moor_Road_Underpass_-_geograph.org.uk_-_1600451.jpg)



Figure: 2 underpass for pedestrian (source : http://photos.wikimapia.org/p/00/03/06/50/17_big.jpg)

LITERATURE REVIEW

1. Paper title:- Storm water problem at Akhbarnagar Underpass
Author:- Abhishek Rameshbhai Patel
Published Date:- 2015

Every year Under-pass filled with water due to rain, which causes many difficulties to public in traffic, water logging in nearby areas and create many other problems like spread of diseases. To solve this problem proper study of area i.e, different levels of underpass and nearby areas, pumping requirement to remove water from under-pass, sewer network analysis required so it can be implement at other under-pass which have common problems.[23]

2. Paper title:- Drainage system and storm water management for Ndola Central Business Area, Zambia

Author:- David Titus Banda

Published Date:- 2016

Flooding of urban areas is a worldwide problem as cities grow and the amount of impermeable surface increases generating more surface runoff. In the Zambian city of Ndola, the capital of the Copper belt Province, flooding occurs in some parts of the city especially on Dag Hammarskjold Drive at under-bridge, which has been flooding every rainy season consecutively for 8 years now.[25]

3. Paper title:- Seasonal water logging Problem in a Mega city: A study of Kolkata, India.

Author:- Ria Roy

Published Date:- 05 April, 2016

Water logging is become a severe problem in Kolkata Metropolitan region with the increase of the high- rise buildings, which made the land congested and disrupted also. The sewage and drainage system of the Kolkata is disrupted day by day due to unscientific land use system in the city. Mainly in the central portion of this metropolitan city decrease the amount of open surface and there has created submergence due to ongoing high rise. So in this area badly affected in water logging situation after small downpour.[24]

4. Paper title:- Efficient use of Rain water by Altering channel system

Author:- Abhay Dixit

Published Date:- 25 March, 2015

Stagnation of rain water is a common phenomenon in most cities in plains. Rain water collects at depression in road and ditches on ground and drain out a very slow pace due to poor ground slopes and lack of proper drainage of rain water. As water remain on roads, e.g, at location of under-passes, road junction and spots, traffic is hampered. The stagnant water in the ditches become a breeding ground for mosquitoes at times, which take leads to lot of diseases such as diarrhea, typhoid and malaria.[26]

5. Paper title:-Flood Control and Drainage system of Espana Boulevard in Metro Manila
Author:- Tomas U. Ganiron Jr
Published Date:- 2015

The study of drainage system in Metro manila specifically along Espana Boulevard will bring major benefits. As the improvements of the drainage system, it reduce the damage to the houses and public facilities. Minimize the loss of public and private properties will contribute greatly to the improvement and standard of living to the stabilization of people's livelihood and the serious congestion resulting from the long flooding in Metro Manila. [27]

III. PROBLEM STATEMENT

The nearby areas of underpass is also submerged with underpass in the rainy season. There is some gravity inland difference between surrounding areas and underpass due to which it can makes the water logging condition directly/indirectly manner[10]. Some underpass having small size of storm drain filtration channel so it cannot filter bulk of runoff storm-water. Proper maintenance of underpass is required by municipal. Blockage of storm drainage and backflow of suction valve. Its causes major issues such as traffic and water logging in nearby areas[11]. Due to heavily waterlogged in underpass and near nearby areas, act as a breeding places of mosquitoes.



Figure: 3 underpass (source:
https://i.ytimg.com/vi/_MNgGrJygd0/hqdefault.jpg)



Figure: 4 underpass (source:
https://mediaassets.kgun9.com/photo/2016/08/09/StoneUnderpassshotsize_1470767150258_43996236_ver1.0_640_480.JPG)

CONCLUSION

The foremost purpose of this study is to decrease traffic problem, dieses problem, water logging problem at underpass. We can reduce this problem with help of increasing pump capacity, increase number of storm drain pipes. We can use kerb drain system to removal of storm water. Special attention is required to cleaning storm water pipe line.

23. AbhishekRameshbhai Patel. Prof. Hemal S. Parekh, Study of Storm water Problem at Akhbarnagar Underpass (Ahmedabad), National Conference on Recent Research in Engineering and Technology (NCRRET -2015) International Journal of Advance Engineering and Research Development (IJAERD) e-ISSN: 2348 - 4470 , print-ISSN:2348-6406
24. Ria Roy, Md Kutubuddin Dhali, Seasonal Water logging Problem In A Mega City: A Study of Kolkata, India, Quest Journals Journal of Research in Humanities and Social Science Volume 4 ~ Issue 4 (2016) pp: 01-09
ISSN(Online) : 2321-946
25. David Titus Banda, Drainage System and Storm Water Management for Ndola Central Business Area, Zambia, Master Thesis TVVR 16/5007, Division of Water Resources Engineering ,Department of Building and Environmental Technology.
26. Abhay Dixit, Efficient Use of Rain Water by Altering Channel System, The International Journal Of Engineering And Science (IJES) || Volume || 4 || Issue || 3 || Pages || PP.01-05 || 2015 || ISSN (e): 2319 – 1813 ISSN (p): 2319 – 1805.
27. Tomas U. Ganiron Jr, Flood Control and Drainage System of Espana Boulevard in Metro Manila, International Journal of Disaster Recovery and Business Continuity Vol.6, November (2015), pp.17-28 <http://dx.doi.org/10.14257/ijdrbc.2015.6.03>