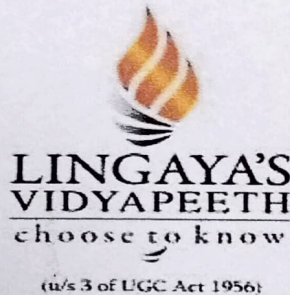


**Preparation of Bricks using Construction and Demolition waste  
and Sludge**

**A Major Project Report Submitted in  
Partial Fulfillment of the requirement  
For the award of the degree of  
Bachelor of Technology  
In  
CIVIL Engineering**

**By  
NARESH KUMAR  
(18CE61L)**

**Under the Supervision of  
Guide Name  
RAMEEZUT TAUHEED  
(Associate Professor)**



**DEPARTMENT OF CIVIL ENGINEERING**

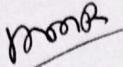
**Lingaya's Vidyapeeth  
Faridabad (Haryana)  
Session 2018-2022**

## Certificate

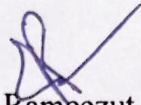
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This is to certify that the project report entitled "Preparation of Bricks using Construction and Demolition waste and Sludge" being submitted by NARESH KUMAR (18CE61L) for the partial fulfillment of the award of the degree of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING by Lingaya's Vidyapeeth, Faridabad is a record of a bonafide work carried out by them under my supervision during the year 2019-2022.

The contents of this report have not been submitted to any other University or institute for award of any degree or diploma.



**Dr. Maniraj M**  
(Head of Department)  
Department of Civil Engineering  
Lingaya's Vidyapeeth  
Faridabad



Guide Name:- Kameezut Tauheed  
Designation: Associate Professor  
Department of CIVIL Engineering  
Lingaya's Vidyapeeth  
Faridabad.

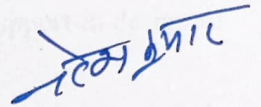


## DECLARATION

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I NARESH KUMAR (18CE61L) the student of Bachelor of Technology in Civil Engineering during session 2019-2022 at Lingaya's Vidyapeeth, Faridabad, Haryana, hereby declare that the work presented in this report entitled "**Preparation of Bricks using Construction and Demolition waste and Sludge**" is the outcome of our own bonafide work and is correct to the best of my knowledge and this work has been undertaken taking care of Engineering Ethics.

It contains no material previously published without referring or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.



**Submitted by:**  
**NARESH KUMAR**  
**(18CE61L)**

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## ACKNOWLEDGEMENT

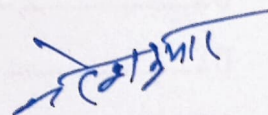
I would like to thank my guide, Professor Rameezut Tauheed for his very valuable guidance, his support and his critical suggestions throughout the completion of our project.

It was a privilege to study under his supervision. His vision and broad knowledge played an important role in the project work. I also like to thank him for pushing me to the stage that I thought I could never accomplish.

Allow me to express my sincere gratitude to for his tremendous and selfless support in design of the project and time management skills while fabricating the product.

It is my great honor to have had the opportunity to work with these great minds and their remarkable characters. Their spirit of enthusiasm and commitment even in the times when we students found it hard to do is commendable.

Also I appreciate the moral support of any Other Acknowledgment Name during our project work.



Submitted by  
**NARESH KUMAR**  
(18CE61L)



## ABSTRACT

The disposal of sewage wastes comprises as one of the major worldwide environmental problems as these wastes render the environment unfriendly. The growing demand for waste utilization has made solid wastes like sludge and demolition waste an essential composition of this study. The possibility of reduction of the production costs provides a strong logic for use of this waste.

Generally sludge, bio degradable materials are dumped in the land, and they decompose over the period of time. This study involves the usage of sludge, construction and demolition waste as an essential ingredient. The sludge was checked for its physical characterization such as bulk density, compressive strength and chemical properties such as water absorption percentage, presence of toxic metals such as Pb, Zn, Cu and Fe for the commercial purpose. The study was performed by using different ratios as 3:2:2:3, 3:2:3:2, 2:3:2:3 of fly ash, cement, sludge and demolition waste respectively for making brick samples. The test results showed a common trait that with the increase in content of sludge, the strength decreased. A maximum compressive strength of 15.88 MPa was achieved for the ratio 2:3:3:2 and a minimum of 11.67 MPa was achieved for 2:1:5:2, respectively.

Moreover the bulk density of the sample also decreased. A maximum of 2.61 g/cm<sup>3</sup> was achieved for a 30% sludge content and a minimum of 1.983 g/cm<sup>3</sup> for a sludge content of 50%. This was attributed due to the organic properties present in the brick. Moreover the water absorption percentage increased with the increased sludge percentage. With a minimum of 0.22 % was achieved for 30% to a maximum of 0.28% for 50%.

**Keywords:** brick kiln, construction and demolition waste, curing, environment, sludge