



NPR College of Engineering & Technology

NPR Nagar, Natham, Dindigul - 624401, Tamil Nadu, India.

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

An ISO 9001:2015 Certified Institution.

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CRITERIA-1-CURRICULAR ASPECTS

1.3 : Curriculum Enrichment

1.3.3 Percentage of students undertaking project work/field work/internship (Data for the latest completed academic year) (10)

Program name	Program Code	List of students undertaking project work/field work/internship	Page No
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B.E.CIVIL	103	ABITHA D	38
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B.E.CIVIL	103	RAMANASWETHA U B	38
B.E.CIVIL	103	RUBINI PRIYA M	26
B.E.CIVIL	103	SARATH M	30
B.E.CIVIL	103	SURYANARAYANAN V M	30
B.E.CIVIL	103	SURYA PRABHA S	26
B.E.CIVIL	103	SURYA R	9
B.E.CIVIL	103	VISITHRA K	26
B.E.CIVIL	103	YOGESH SURYA K	22
B.E.CIVIL	103	MOUNESH B	34
B.E.CIVIL	103	SIVARAM R	34
B.E.CIVIL	103	SUBASH S	56
B.E.CIVIL	103	SUDHARSAN K	56
M.E.STRU	413	KRITHIKHA S	42



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College code and Name : 9208-NPR College of Engineering and Technology
Year/Semester/Section : IV / 08
Branch : Civil Engineering
Subject Code and Name : **CE 8811-PROJECT WORK**
Academic year : 2020- 2021
Batch : 2017-2021

BATCH NO	REGISTER NUMBER	STUDENT NAME	PROJECT TITLE	GUIDE NAME
1	920817103005	Abitha D	EXPERIMENTAL ANALYSIS OF LEACHATE TREATMENT USING LOW COST ADSORBENTS	Ms.E.MADHUMATHI SURIYA,ME.,
	920817103038	Ramana Swetha U.B		
2	920817103004	Abinaya S	ANALYSIS OF SOIL PROFILE USING QGIS	Dr.A.HEMALATHA M.tech, PhD.,
	920817103008	Ajitha R		
3	920817103022	Karthikeyan D	EXPERIMENTAL STUDY ON PARTIAL REPLACEMENT OF PROSOPIS JULIFLORA IN COARSE AGGREGATE AND ADDITION OF EGG SHELL POWDER BY CEMENT	Dr.A.HEMALATHA M.tech, PhD.,
	920817103032	Naveenchandran V		
	920817103050	Surya R		
4	920817103017	Gokul S	EXPERIMENTAL STUDY AND COMPARATIVE ANALYSIS OF PARTIAL REPLACEMENT OF BLACK COTTON SOIL WITH NORMAL BRICK	Mr. K.SELVAM M.E,
	920817103027	Manikandan K		
	920817103043	Sarath M		
	920817103048	Surya narayanan V.M		
5	920817103010	Arun Pandian N	EXPERIMENTAL STUDIES ON HYBRID FIBER REINFORCED SELF COMPACTING CONCRETE	Mr.C.VIJAYAKUMAR M.E
	920817103011	Bala Krishnan P		
	920817103019	Guhan S		
	920817103030	Muthukumar R		
6	920817103029	Mohan Raj G	EXPERIMENTAL INVESTIGATION ON MODIFIED BITUMINOUS MIXES USING WASTE MATERIALS	Mr.N.KARTHIC M.E,
	920817103033	Niranjan R		
	920817103034	Pothiyalagan K		



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7	920817103003	Abinaya N.S	DAIRY INDUSTRIES WASTE WATER TREATMENT USING NATURAL COAGULANTS	Mr. K. SHANTHA KUMAR, M.E
	920817103041	Rubini Priya M		
	920817103049	Surya Prabha S		
	920817103054	Visithra K		
8	920817103021	Hariharan S	EXPERIMENTAL INVESTIGATION ON PAVER BLOCK USING SILICA FUME AND POLYPROPYLENE FIBRE	Mr.P.MANIKANDAN,M.E .,
	920817103026	Logesh T		
	920817103036	Prem Kumar K		
9	920817103024	Kavimalan R	EXPERIMENTAL INVESTIGATION ON COMPRESSIVE STRENGTH ON CONCRETE	Mr.S.PREMASUNDARI,M .E.,
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	920817103502	Sivaram R		

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**EXPERIMENTAL STUDIES ON HYBRID FIBER
REINFORCED SELF COMPACTING CONCRETE**

PROJECT REPORT

Submitted by

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In partial fulfillment for the award of the degree

Of

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In

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INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

Self-compacting concrete (SCC) offers several economic and technical benefits; the use of steel fibers extends its possibilities. Steel fibers acts as a bridge to retard their cracks propagation, and improve several characteristics and properties of the concrete. Fibers are known to significantly affect the workability of concrete. Therefore, an investigation was performed to compare the properties of Conventional Self Compacting Concrete (CSCC) and SCC with steel fiber and sisal fiber. The content of the cementitious materials was maintained constant (584kg/m^3), while the water/cementitious material ratio is kept constant 0.33.

The self-compacting mixtures had a cement replacement of 30% by weight of Class F fly ash and 10% metakaolin. From previous studies the optimum content of steel fiber is found as 1.5%. The aspect ratio of steel fibers with hook ends was kept as 50, and steel fibers were added at different volume fractions (0, 1.25, 1.5 and 1.750) is used. Sisal fiber of 1 cm length with volume fractions of 0.1% , 0.2% , 0.3% and 0.4% by weight of cementitious material is estimated. Slump flow time and diameter, J-Ring, V-funnel, and L-Box were performed to assess the fresh properties of the concrete. Compressive strength, splitting tensile strength and flexural strength of the concrete by means of BEAM-COLUMN joint were determined for the hardened properties.

The test results of concrete cubes and cylinders were obtained by replacing the various percentage fraction of steel fiber and sisal fiber. All specimens were cured for 28 days before compression, split tensile and flexural strength tests.



CHAPTER 7

CONCLUSION

The following points are concluded from the experimental work

- The workability tests of SCC for filling ability, passing ability, segregation resistance were found out and the obtained results are within the acceptable limits given by the EFNARC guidelines.
- Replacement of Fly ash up to 30% and metakaolin up to 10% does not affect the fresh properties of SCC.
- When the volume fraction of steel fiber exceeds 1% by weight of cement it produces uneven flow, it is overcome by adding Viscosity Modifying Admixture up to 0.3% in Hybrid Fiber Reinforced SCC.
- This study results shows that the dosage of steel fiber 1.75 % and sisal fiber 0.3% has higher compressive strength when compared to all other hybrid mixes and control mixes. That is HFM (3/3) shows 17.23 % increment in strength at 28 days when compared to CM 01.
- The test results shows that the dosage of steel fiber 1.5 % and sisal fiber 0.3% mix that is HFM (2/3) has higher split tensile strength when compared to all other hybrid mixes and control mixes. The HFM (2/3) shows 53.89 % increment in strength at 28 days when compared to the conventional self compacting mix that is CM 01.



- The maximum displacement is produced by HFRSCC specimen HFM 2 and it is 14% more than that of control mix which indicates greater ductility in hybrid fiber mix of 1.5% steel fiber and 0.3% sisal fiber
- The maximum load resisted by HFRSCC specimen HFM 3 is 40.9 % more than that of CM01 which reminds greater stability of HFRSCC on beam column joint.
- The displacement ductility is high for the specimen has 1.5% steel fiber and 0.3 % of sisal fiber which is 40% more than that of control mix CM01.
- The stiffness degradation is high for the specimen HFM 3 which has 1.75% steel fiber and 0.3 % of sisal fiber.
- The first crack loads are higher for the HFRSCC specimens when compared to the control mix.
- All specimens were failed because of the development of tensile cracks at the interface of beam column , and this has ensured that the strong column-weak beam conditions were satisfied.
- The shear resisting capacity at joint is more for the specimen which has 1.75% steel fiber and 0.3 % of sisal fiber. And it is 46% higher than that of control mix CM01.



**EXPERIMENTAL STUDY ON PARTIAL REPLACEMENT OF
PROSOPIS JULIFLORA IN COARSE AGGREGATE AND
ADDITION OF EGGSHELL POWDER BY CEMENT**

A PROJECT REPORT

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In partial fulfilment for the award of the degree

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INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

The concrete project is heavily used as construction materials in modern society. With the growth in urbanization and industrialization and its demand is in increased day by days. In order to minimize the negative impact of concrete, the use of waste materials. Our project deals with the partial replacement Prosopis juliflora in coarse aggregate, added cement by eggshell powder. The substituent to coarse aggregate by Prosopis juliflora level of 10% optimally used. The added cement by Eggshell powder at level of 2.5%, 5%, 7.5% is to be studied for masteries and strength of properties 100% cement concrete mix is of M20 and water cement ratio is 0.55. The strength will be tested during the period of 7 day 28 days respective. We will compare the replace concrete with the conventional concrete about the strength of the concrete.



CHAPTER - 9

CONCLUSION

The main aim of the study is to be obtain the suitability material as replacement of coarse aggregate. From the research on concrete made of prosopis juliflora and eggshell powder the following conclusion are made:

- In this project we tried to replace the cement and coarse aggregate partially by prosopis juliflora and eggshell powder (2.5%, 5%, & 7.5%) respectively to increase the strength of concrete.
- The strength is same with the conventional concrete only at 10% optimum replacement of aggregate by prosopis juliflora .The strength sSo we conclude that the cement and coarse aggregate replaced with prosopis juliflora ash and eggshell powder at 7.5% in concrete is suitable for construction.
- More over it reduces the construction cost by reducing the cost of cement and coarse aggregate and it also reduces the environmental pollution due to prosopis juliflora and eggshell powder.
- The eggshell powder surrounding the surface of the mix, may increase the carbonation process and may reduce the permeability in the long run. Hence a detailed study of carbonation process in the mix is needed.



ANALYSIS OF SOIL PROFILE USING QGIS

A PROJECT REPORT

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INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

Soil survey constitutes a valuable resource inventory linked with the survival of life on the earth. The technological advancements in the field of remote sensing and Geographical Information System have been a boon for such surveys. This project describes the role of remote sensing and Geographical Information System (GIS) technologies for mapping and characterizing soils at various scales. The spectral behaviour of soil and its components, which is fundamental to deriving information from remote sensing data, is also discussed with illustrations. Furthermore, the scope of present day remote sensing data for varying levels information generation is also reviewed. Modeling and mapping of soil properties has been identified as key for effective land degradation management and mitigation. The ability to model and map soil properties at sufficient accuracy for a large agriculture area is demonstrated using GIS and Remote sensing. QGIS is a popular open-source GIS with advanced capabilities. Here is a series of tutorials and tips that show you how to use it to tackle common GIS problems..We are going to use the QGIS software for the above process and we are going to create a terrain and analyze it by the QGIS Software.



professional looking maps. It requires specialized expertise for integration with various external packages, especially when it is implemented on proprietary operating systems. Also it needs numerous auxiliary applications to be installed process that can create confusion.

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**EXPERIMENTAL INVESTIGATION ON PAVER BLOCK
USING SILICA FUME AND POLYPROPYLENE FIBRE**

A PROJECT REPORT

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INTERNALEXAMINER

EXTERNAL EXAMINER



ABSTRACT

Interlocking concrete pavement block is an solid unreinforced precast member laid over a bedding material. It is a load carrying component of the pavement. However the conventional pavement block become brittle due to many operational and environmental constraints. The main objective of this project is to produce high strength interlocking pavement block by using silica fume and polypropylene fibre. The main reason for the use of silica fume is to produce high strength and improved durability. polypropylene fibre are used in order to arrest cracks. In this project work M50 grade is used and the test are conducted for various proportion of silica fume with cement 10%, 20%, 30%, 40% and 2% polypropylene fibre were added. The pavement blocks were casted and tested as per the standards given in the Indian Standard for precast concrete blocks (IS 15658:2006). The test results are then compared with the conventional pavement block.



CHAPTER 13

CONCLUSION

- Based on experimental observations, the following conclusions are drawn
- Higher compressive strength was achieved when 30% cement was replaced by equal proportion of silica fume and 2% polypropylene fiber.
- The abrasion resistance seems to be satisfactory.
- Water absorption is well below the permissible limit.
- All the samples satisfy the requirement given in IS 15658: 2006 for concrete paving blocks to be used in heavy traffic areas.
- There is a saving in cost of cement if cement is replaced by silica fume.
- The percentage of saving is highly beneficial for mass production of paving blocks.
- It is concluded that the use of silica fume and polypropylene fiber in concrete paving blocks as partial cement replacement is possible.

**EXPERIMENTAL INVESTIGATION ON MODIFIED
BITUMINOUS MIXES USING WASTE MATERIALS**

A PROJECT REPORT

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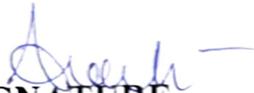
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INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

Increase in road traffic in combination with insufficient maintenance due to shortage in funds causes rapid deterioration of the roads. To alleviate this process, several measures may be effective, such as, use of better quality materials, use of cost-effective construction methods, dedicated funds for maintenance, improved and innovative roadway design. The main purpose of this research is to examine the possibility of incorporating waste materials into a bitumen as a modifier. With this perspective, this project aimed at exploring the potential prospects of crumb rubber and sugarcane waste to enhance bituminous mix properties.

Experimental phase of this research starts with the unmodified bitumen tests with bitumen content of 5%, 6% and 7%. The modified bitumen test is carried out with varying percentage of sugarcane waste (4%, 5%, 6%) and crumb rubber (5%, 6%, 7%). With varying bitumen content (5%, 6%, 7%), the bitumen samples are prepared with varying percentage of crumb rubber (5%, 6%, 7%) and sugarcane waste (4%, 5%, 6%) and marshall stability test is carried out to determine the optimum content.



CHAPTER-6

CONCLUSION

From the Marshall test results, it is concluded that the marshall stability value increases with an increase in bitumen content from 5% to 6% then it decreases. The optimum binder content was found to be 6 %. Also higher value of Marshall stability was found for a modified mix as compared to an unmodified one. While adding optimum content of crumb rubber to the bituminous mixes results in reducing the flow value of bitumen. Addition of sugarcane waste to modified bitumen which in turn leads to the reduction of air voids content in bituminous mixes. The results of the study indicated that the modified mixture have a higher stability and VMA percentage compared to the non-modified mixtures. This would positively influence the rutting resistance of these mixtures.

Optimum value:

Binder Content (%)	Type of bituminous mix
6%	Normal bitumen + 4% of sugarcane waste + 6% of crumb rubber

Table-7.1



**DAIRY INDUSTRIES WASTE WATER TREATMENT USING
NATURAL COAGULANTS
A PROJECT REPORT**

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BONAFIDE CERTIFICATE

Certified that this project report "DAIRY INDUSTRIES WASTE WATER TREATMENT USING NATURAL COAGULANTS" is the bonafide work of N.S.ABINAYA (920817103003), M.RUBINIPRIYA (920817103041), S.SURIYAPRABHA (920817103049) and K.VISITHRA (920817103054) who carried out the project work under my supervision.


SIGNATURE

Dr.A.HEMALATHA, M.Tech.,PhD

HEAD OF THE DEPARTMENT

PROFESSOR

Civil Engineering Department

NPR college of Engineering

& Technology

Natham 624 401


SIGNATURE

Mr. K. SHANTHA KUMAR, M.E

SUPERVISOR

ASSISTANT PROFESSOR

Civil Engineering Department

NPR college of Engineering

& Technology

Natham 624 401

Submitted for the viva-voce Examination held at NPR College of Engineering and Technology, Natham on ...04/8/2021


INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

Dairy industry is one of the large scaled industries which produce lot of organic and inorganic wastes. Dairy effluent contains hazardous element which can affect human immunity when it is directly discharge in water bodies. The collected Dairy industry waste water was tested for basic parameters such as pH, Turbidity etc., Coagulation process is done using natural coagulant such as orange peels and banana peels.

The waste water cannot be disposed directly into river or pond or lake, etc., because when it is mixed with water it is unfit for the aquatic animals and it may cause water pollution, make the drinking water unfit for all purposes. It may cause soil pollution and when it is discharged untreated. So it is essential to treat the water before it is discharged so that it doesn't have any harmful effects.

In this project we are treating the dairy industry waste water using various natural coagulants such as orange peels and banana peels and test results are compared with the original sample without any treatment using natural coagulants.

CHAPTER-8

CONCLUSION

In the developing countries treatment plant are expensive, the ability to pay service is minimal and skills as well as technology are scarce. In order to alleviate the prevailing difficulties, approaches should focus on sustainable water treatment system that are low cost, robust and require minimal maintenance and operator skills. Therefore, locally available materials can be exploited towards achieving sustainable safe water supply. The study was conducted to obtain banana peel and orange peel, as new source of bioremediation for the treatment of dairy cutting industries. The effects of seeds on pH, Turbidity are to be compared accordingly. The chemical coagulant Alum was used for comparing the values with natural coagulants. The result obtained from this research revealed that banana peel is effective in removal of turbidity of dairy industry effluent. While observing dairy factory effluent it was found that banana, shows higher percentage variation in physical parameters such as pH 96%. Turbidity was 93.3% respectively. The change in pH of the effluent and it reduced to accepted level. It was found that removal efficiency of suspended solids was grater in natural coagulants.

EXPERIMENTAL STUDY AND COMPARITIVE ANALYSIS OF PARTIAL REPLACEMENT OF BLACK COTTON SOIL WITH NORMAL BRICK

A PROJECT REPORT

Submitted by

GOKUL.S	920817103017
MANIKANDAN.K	920817103027
SARATH.M	920817103043
SURIYA NARAYANAN.V.M	920817103048

In partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING

NPR COLLEGE OF ENGINEERING AND TECHNOLOGY, NATHAM



ANNA UNIVERSITY: CHENNAI 6005 025

MARCH 2021



Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report “**EXPERIMENTAL STUDY AND COMPARTIVE ANALYSIS OF PARTIAL REPLACEMENT OF BLACK COTTON SOIL WITH NORMAL BRICK**” is the bonafide work of “GOKUL.S (920817103017), MANIKANDAN.K (920817103027), SARATH.M (920817103043), and SURIYA NARAYANAN.V.M (920817103048)” who carried out project under my supervision.


SIGNATURE

Dr. A.HEMALATHA M.Tech., Ph.D.,

HEAD OF THE DEPARTMENT

Department of civil engineering

NPR College of Engineering and
Technology, Natham.

Dindigul – 624 401.


SIGNATURE

Mr. K.SELVAM M.E,

SUPERVISOR

Assistant Professor

Department of Civil Engineering
NPR College of Engineering and
Technology, Natham.

Dindigul – 624 401.

Submitted for viva – voice examination held at NPR College of Engineering and
Technology, Natham on. 24.10/2021


INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

Over a past few decades, there have been a wide ranges of alternatives available in the field of construction, especially with reference to manufacture of bricks. Further, there are some inventions like fly ash brick, concrete blocks etc. There are also researches using black cotton soil as a raw material in the manufacturing of bricks along with few admixtures to alter the properties of the black cotton soil. This project study describes the feasibility of using black cotton soil as a raw material with additional stabilizer in the brick production as partial replacement of clay in context. This project has revealed that the bricks manufactured using this method have good quality with acceptable strength and further, they can be manufactured in a cost effective manner.



10.2 CONCLUSION

1. The Physical & Geotechnical properties of Black Cotton Soil, Red Soil & water are within the permissible limits as per relevant IS codes.
2. The Physical Properties of manufactured bricks is better and are suitable for construction of common buildings.
3. All three proportions arrived during manufacturing of bricks are found effective by means of physical properties (as all proportions strength is $>35\text{Kg/cm}^2$ and other properties are satisfactory) and cost analysis.
4. As per the cost analysis, Black cotton- Red soil bricks are found to be cheaper than Normal Red soil Bricks for manufacturer and leads him towards profit (on bulksell).



**EXPERIMENTAL INVESTIGATION ON COMPRESSIVE
STRENGTH ON CONCRETE**

A PROJECT REPORT

Submitted by

KAVIMALAN R	920817103024
MOUNEESH B	920817103301
SIVARAM R	920817103502

In partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING



NPR COLLEGE OF ENGINEERING AND TECHNOLOGY

NATHAM-624 401

ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2021

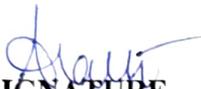


Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

ANNA UNIVERSITY: CHENNAI 600 025

BONAFIDE CERTIFICATE

This is to Certified that this project report “ **EXPERIMENTAL INVESTIGATION ON COMPRESSIVE STRENGTH ON CONCRETE**” is the bonafide work of “**KAVIMALAN R(920817103024), MOUNEESH B (920817103301),SIVARAM R (920817103502)** ” who carried out the project work under my supervision.


SIGNATURE

Dr.A.HEMALATHA. M.Tech., Ph.D

HEAD OF THE DEPARTMENT

Assistant Professor

Department of Civil Engineering

NPR College Of Engineering

& Technology

Natham-624401


SIGNATURE

Mrs.S.PREMASUNDARI,M.E.,

SUPERVISOR

Assistant Professor

Department of Civil Engineering

NPR College of Engineering

&Technology

Natham-624401

Submitted for the viva voice examination held at NPR College of Engineering and Technology,

Natham on -----04/8/21


INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

The grading of aggregates is an important factor in the preparation of concrete and its compression strength. This experimental investigation was conducted to find the impact of different aggregate sizes on the compressive strength of the concrete. The aggregates used in this experiment was 8 mm and 11.2 mm size. The concrete of M 25 grade and the water-cement ratio of 0.4 was used for this experiment. Tests were done on the concrete making materials, on the fresh concrete and hardened concrete. The fresh batches of concrete prepared from each of the coarse aggregate sizes were collected, and the slump test for the collected batches was conducted to determine the workability. In total, 24 concrete cubes of size 150 mm × 150 mm were cast and cured for 28 days. The cubes, after 28 days of curing, were tested in compression testing machine to determine the compression strength of the concrete. The results showed that the workability of the concrete was directly proportional to the aggregate size. And also, the compressive strength increased with an increase in aggregate sizes.



CHAPTER 13

CONCLUSION

Based on the tests results and further analysis, the following conclusions were drawn:

- The compressive strength of the geopolymer concrete paver block is 38.5 MPa , which is 14.4% less than the control concrete paver block of grade M35.
- The strength property of geopolymer concrete is improved by adequate modification in mixing and curing methods by appropriate proportion.



**EXPERIMENTAL ANALYSIS OF LEACHATE
TREATMENT USING LOW COST ADSORBENTS**

A PROJECT REPORT

Submitted by

ABITHA.D - 920817103005

RAMANA SWETHA.U.B -920817103038

In partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING

NPR COLLEGE OF ENGINEERING & TECHNOLOGY

NATHAM-624401



ANNA UNIVERSITY: CHENNAI 600 025

APRIL 2021

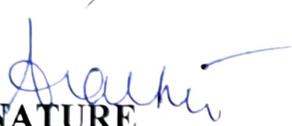


rsf
Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

ANNA UNIVERSITY :CHENNAI 600 025

BONAFIDE CERTIFICATE

Certified that this project report “EXPERIMENTAL ANALYSIS OF LEACHATE TREATMENT USING LOW COST ADSORBENTS” is the bonafide work of, ABITHA.D(920817103005), RAMANA SWETHA.U.B (920817103038) who carried out the project work under my supervision.


SIGNATURE

Dr.A.HEMALATHA.,

Head of the Department
Department of Civil Engineering,
NPR College of Engineering and
Technology, Natham-624 401


SIGNATURE

Ms.E.MADHUMATHI

SURIYA,ME.,
Assistant professor,
Department of Civil Engineering,
NPR College of Engineering and
Technology, Natham -624 401

Submitted for the viva-voce Examination held at NPR College of
Engineering and Technology, Natham on 04/08/2021


INTERNAL EXAMINER

EXTERNAL EXAMINER



ABSTRACT

The aim of the project work is to treat the landfill leachate before disposal. If leachate is directly disposed into environment it creates serious problems on the surrounding soil, ground water aquifers and nearby surface water . Therefore great attention has been directed towards new techniques based on physico-chemical process, and heavy metals removal using low cost materials as filter media with down flow reactor.

Leachate generation is a major problem for municipal solid waste (MSW) landfills and causes significant threat to surface water and groundwater. Leachate can be defined as a liquid that passes through a landfill and has extracted dissolved and suspended matter from it. Leachate results from precipitation entering the landfill from moisture that exists in the waste when it is composed. This paper presents the results of the analyses of leachate treatment from the solid waste landfill.



CHAPTER 8

CONCLUSION

The reactor R1 which is filled with laterite as filter media is more efficient than compare to other reactors in removal of both heavy metals and physico-chemical parameters. Sugar cane bagasse and brick bats filter medias which contains high amount of dissolved organic matter which increases the dissolved solid content and Electrical conductivity. The removal of heavy metals is observed in both laterite and other filter media. The percentage of toxic content removed by laterite soil was 82% when compared to other filter medias. sugarcane bagasse can reduce the toxic content upto 60% which is higher when compared to brick bats 44%. Thus, sugarcane bagasse, laterite soil are the best one to reduce toxic content in leachate.

Leachate control is a very important step to receive the long-term functionality of the drainage system, to reduce treatment costs and to render possible high-tech treatment systems. Nowadays more than 100 leachate treatment plants are under operation in Germany, so there are many experiences concerning the technology, costs, the effluent quality and associated problems. In some cases the treatment of leachate resulted in increasing operation problems in opposite to the treatment of other wastewaters. The selection of the adequate treatment process should not only include the compliance with the effluent limit values and maintenance but also the production of residuals which have to be further treated or disposed.



10/03/2021

To

The Principal,
NPR College of Engineering & Technology,
Natham, Dindigul- 624 401.

Sir,

Sub: Acceptance letter for Internship — reg.

With reference to your letter dated on 08/03/2021 regarding Internship for your student, It is to inform that our competent authority has given consent to accommodate Ms.S.Krithikha, Reg. No: 920820413001 for Internship at our concern from 15/03/2021 to 26/03/2021.

Note : Bring the Bonafide certificate at the time of joining for training.



Key
Chettinadu Constructions



[Signature]
Dr. J.SUNDARARAJAN,
B.E., V.Tech., Ph.D.,
Principal

N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

26/03/2021

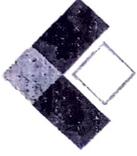
TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. S. KRITHIKHA, student of I year , M.E., Structural Engineering from NPR College of Engineering & Technology, Natham, Dindigul has undergone internship in our construction from 15/03/2021 to 26/03/2021. She completed her training on drafting plan drawing successfully. Her attendance and performance during training was found good.

We wish her all success and well place in life.



Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.



WALLS INFRA Constructions

42B, Renga Residency, 1st Street,
Ramakrishna Layout, TVS Nagar,
Edavarnalavam. Coimbatore - 641025

Mail: vimal@wallsinfra.com

Mobile: +91-9585712310

Date: 26/08/2020

To

The Principal
NPR College of Engineering & Technology
Natham,
Dindigul-624 401.

Sir,

Sub: Internship – reg.

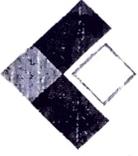
With reference to your request letter regarding Internship training for **Mr.R.Muthukumar of Final year, Civil Engineering** is confirmed. Internship will begin for them from 31/08/2020. The students have to follow the rules and safety practices of our concern during the period of internship.

Bring the Bonafide certificate at the time of joining.

Thank you



Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.



WALLS INFRA Constructions

42B, Renga Residency, 1st Street,
Ramakrishna Layout, TVS Nagar,
Edayarpalayam, Coimbatore - 641025

Mail: vimal@wallsinfra.com

Mobile: +91-9585712310

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. R.Muthukumar , IV year, B.E., Civil Engineering, NPR College of Engineering & Technology, Natham, has completed his internship in site maintenance and site execution during the period 31/08/2020 to 28/09/2020.

Date: 28/09/2020



Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.



caaliber
CONSTRUCTION
Degree of Excellence

Er.S.Senthil Kumar, DCE.,B.E.(Civil)
Proprietor
Registered Engineer- Madurai Corporation
Mobile: +91-98439 73537

Date: 28.09.2020

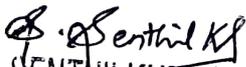
To

The Principal
NPR College of Engineering & Technology
Natham,
Dindigul-624 401

Sir,

Sub: Internship – reg.

It is to inform that your request letter regarding confirmation of Internship for S.Abinaya & N.S.Abinaya of Final year B.E., Civil Engineering. Internship is scheduled for them from 02.10.2020. During the training, the students have to abide the rules and ensure their safety.


Er. S. SENTHILKUMAR, DCE., B.E(Civil)
Proprietor - Caaliber Construction,
12-51, Nathaji Main Road, New Vilangudi,
Madurai - 625 018.




Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

Address: 12-51 Nathaji main road, New Vilangudi, Madurai- 625 018.

Mail: senthilkumar@caaliberconstruction.com

Website: www.caaliberconstruction.com



caaliber
CONSTRUCTION
Degree of Excellence

Er.S.Senthil Kumar, DCE.,B.E.(Civll)
Proprietor
Registered Engineer- Madurai Corporation
Mobile: +91-98439 73537

Date: 02.11.2020

TO WHOMSOEVER IT MAY CONCERN

This to certify that Ms. N. S. Abinaya student from Final year B.E., Civil Engineering, NPR College of Engineering & Technology has successfully completed her Internship in Madurai site. During the period of training from 02.10.2020 to 02.11.2020, her conduct was good.

S. Senthil Kumar
Er. S. SENTHILKUMAR, DCE., B.E(Civil)
Proprietor - Caaliber Construction,
12-51, Nethaji Main Road, New Vilangudi,
Madurai - 625 018.



J. Sundararajan
Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

Address: 12-51 Nethaji main road, New Vilangudi, Madurai- 625 018.

Mail: senthilkumar@caaliberconstruction.com

Website: www.caaliberconstruction.com



caaliber
CONSTRUCTION
Degree of Excellence

Er.S.Senthil Kumar, DCE.,B.E.(Civil)
Proprietor
Registered Engineer- Madurai Corporation
Mobile: +91-98439 73537

Date: 02.11.2020

TO WHOMSOEVER IT MAY CONCERN

This to certify that Ms. S. Abinaya student from Final year B.E., Civil Engineering, NPR College of Engineering & Technology has successfully completed her Internship in Madurai site. During the period of training from 02.10.2020 to 02.11.2020, her conduct was good.

S. Senthil Kumar

Er. S. SENTHILKUMAR, DCE., B.E.(Civil)
Proprietor - Caaliber Construction,
12-51, Nethaji Main Road, New Vilangudi,
Madurai - 625 018.



[Signature]
Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

Address: 12-51 Nethaji main road, New Vilangudi, Madurai- 625 018.

Mail: senthilkumar@caaliberconstruction.com

Website: www.caaliberconstruction.com



Sona Builders
Engineers & Contractors

Er. P. Senthilkumar

Date: 30.09.2020

To

The Principal,
NPR College of Engineering & Technology,
Natham,
Dindigul - 624 401.

Sir,

Sub: Internship – reg.
Ref: your letter dated on 28.09.2020

On behalf of Sona Builders, we would like to notify you of this opportunity for internship to Ms. D.Abitha and Ms. M.Rubinipriya of final year, Civil Engineering is scheduled from 02.10.2020 to 02.11.2020 at Dindigul site.

Thank you

For Sona Builders Engineers & Contractors


With regards,
Er. P. Senthilkumar
Proprietor




Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

2/408/2, F - Block, MVM Nagar Extn., Dindigul - 624 003.
Ph: 0451 2424346, Cell: 96984 46611, E-mail: sonasenthil123@yahoo.co.in

Tin No.33675340834



Sona Builders
Engineers & Contractors

Er. P. Senthilkumar

Date: 02.11.2020

TO WHOM IT MAY CONCERN

This is to certify that **Ms. D.Abitha (920817103005)**, B.E. Civil Engineering from NPR College of Engineering & Technology, Natham has successfully completed her internship during the period 02.10.2020 to 02.11.2020.

For Sona Builders Engineers & Contractors


Er. P. Senthilkumar
Proprietor




Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal

N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

2/408/2, F - Block, MVM Nagar Extn., Dindigul - 624 003.
Ph: 0451 2424346, Cell: 96984 46611, E-mail: sonasenthil123@yahoo.co.in

Tin No.33675340834



Sona Builders
Engineers & Contractors

Er. P. Senthilkumar

Date: 02.11.2020

TO WHOM IT MAY CONCERN

This is to certify that **Ms. M. Rubinipriya (920817103041)**,
B.E. Civil Engineering from NPR College of Engineering & Technology,
Natham has successfully completed her internship during the period
02.10.2020 to 02.11.2020.

For Sona Builders Engineers & Contractors


Er. P. Senthilkumar
Proprietor




Dr. J. SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

2/408/2, F - Block, MVM Nagar Extn., Dindigul - 624 003.
Ph: 0451 2424346, Cell: 96984 46611, E-mail: sonasenthil123@yahoo.co.in

Tin No.33675340834

PUBLIC WORKS DEPARTMENT

Buildings (Construction & Maintenance) Division, Madurai

TO WHOMSOEVER IT MAY CONCERN

This is to Certify that Selvan.V.NAVEEN CHANDRU
(Reg.No.920817103032) Civil Engineering Student of NPR COLLEGE
OF ENGINEERING & TECHNOLOGY, DINDIGUL has undergone the
In-plant Training in the Construction Sites for the works undergone
in this Division from 05.10.2020 to 19.10.2020(07.10.2020-Absent).

Sundarajan
Executive Engineer, PWD,
Buildings (Construction & Maintenance)
Division, Madurai-2
22/10/2020



Dr. J.SUNDARARAJAN,
B.E., M.Tech., Ph.D.,
Principal
N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

PUBLIC WORKS DEPARTMENT

Buildings (Construction & Maintenance) Division, Madurai

TO WHOMSOEVER IT MAY CONCERN

This is to Certify that Selvan.R.SURYA
(Reg.No.920817103050) Civil Engineering Student of NPR COLLEGE
OF ENGINEERING & TECHNOLOGY, DINDIGUL has undergone the
In-plant Training in the Construction Sites for the works undergone
in this Division from 05.10.2020 to 19.10.2020(07.10.2020-Absent).



Selvan R. Surya 25/10/20
Executive Engineer, PWD,
Buildings (Construction & Maintenance)
Division, Madurai-2

*62
22/10/2020*

Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

PUBLIC WORKS DEPARTMENT

Buildings (Construction & Maintenance) Division, Madurai

TO WHOMSOEVER IT MAY CONCERN

This is to Certify that Selvi.R.AJITHA (Reg.No.920817103008)
Civil Engineering Student of NPR COLLEGE OF ENGINEERING &
TECHNOLOGY, DINDIGUL has undergone the In-plant Training in
the Construction Sites for the works undergone in this Division
from 05.10.2020 to 19.10.2020 (07.10.2020-Absent).



Sundarajan 22/10/20
Executive Engineer, PWD,
Buildings (Construction & Maintenance)
Division, Madurai-2

*69
28/10/2020*

Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

TWAD



BOARD

CERTIFICATE

This is to certify that **Thiru.V.M.SURYA NARAYANAN** (Reg. No.920817103048) Student in IV-year Civil Engineering from NPR College of Engineering and Technology, Dindigul has Undergone In-Plant Training in **AUNDIPATTY – SEDAPATTY COMBINED WATER SUPPLY SCHEME** which includes beneficiaries of 529 Rural Habitations, One Municipality and 4 Town Panchayats in Madurai and Theni Districts in **TREATMENT PLANT AT VAIG Aidam** from 01.09.2020 to 07.09.2020.

During the training he was imparted training in civil Engineering Department to acquire knowledge about its function of Head works Intake well, Collection well, 150&100HP Vertical Turbine pump sets, 125KVA Generators, 32 MLD Treatment plant which includes components like Aerator stilling chamber, Flash mixer, Dividing chamber, Clarifloculator, Filter house, Chemical house, Wash water tank, Clear water sump, Pumproom, Generator room and Electrical breakers, Soft starters, Higher duty pumpsets (220HP and 167HP Centrifugal Pump sets), 1000KVA Transformers, 750KVA Generator and Treatment in water Treatment lab & District Laboratory.

His performance during this period was found satisfactory. We wish his all success in his future endeavour.

Date : 07.09.2020,

Place : Vaigai Dam.



Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology
Natham, Dindigul (Dt) - 624 401.

ASSISTANT
TWAD Board, Maintenance Section
Vaigai Dam



TMC ENGINEERING PRIVATE LIMITED

Mail: tmcengg@yahoo.com

Website: www.tmcmachines.com

7/09/2020

To

The Principal,
NPR College of Engineering & Technology,
Natham,
Dindigul-624 401.

Sir,

Sub: In-plant training – reg.

Your request letter regarding one week In-plant training for **Mr.S.Subash, K.Sudarshan of II year Civil Engineering** is accepted by authority. During the period of In-plant Training from 10/09/2020, the students have to follow the rules and safety practices.

Thank you



For TMC Chennai Pvt. Ltd.
(S.Somasundaramoorthy)

Dr. J.SUNDARARAJAN,

B.E., M.Tech., Ph.D.,

Principal

N.P.R. College of Engineering & Technology

Natham, Dindigul (Dt) - 624 401.



TMC ENGINEERING PRIVATE LIMITED

Mail: tmcengg@yahoo.com

Website: www.tmcmachines.com

Date: 21.09.2020

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. S. Subash, II year, B.E., (Civil Engineering)** of NPR College of Engineering & Technology, Natham, Dindigul has successfully completed his In-Plant Training in our research firm on testing of materials from 10.09.2020 to 21.09.2020.

We wish him all success in his future exertion.

For TMC Engg. Pvt. Ltd.
(S.Somasundaramoorthy)




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Date: 21.09.2020

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. K. Sudharsan, II year, B.E., (Civil Engineering)** of NPR College of Engineering & Technology, Natham, Dindigul has successfully completed his In-Plant Training in our research firm on testing of materials from 10.09.2020 to 21.09.2020.

We wish him all success in his future exertion.


For TMC Enge. Pvt. Ltd.
(S. Somasundara moorthy)




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