

Department of Civil Engineering
Updated Roll List of session 2024-25 (7th Semester) Attendance

Group No	Roll No.		Name of Students	Minor Project
1	21024129	Dr. Adheesh Kumar Vivek	RUDRA PRATAP	FOOD DELIVERY RIDER's SAFETY : THE FOCUS IN COMPLIANCE OPERATION
	21024108		BABLU YADAV	
	19102250		MAHENDRA YEKKUDU	
2	21024115	Mr. Prakhar Modi	MONALISA	Morphometric analysis of Mahanadi river basin
	21024146		AKRITI SAGAR	
3	21024137	Dr. Balbir Pandey	SHUSHANT KUMAR SINHA	Response of soft clay to electrokinetic treatment
	21024127		RAVI KUMAR	
4	21024147	Dr. Kundan Meshram	ARYAN SAURABH	Smart Road Care: Multimodal Pothole Detection and Maintenance Optimization
	21024141		VINAY KHAROLE	
5	21024114	Mr. Vinod Kumar	MD SUHAIL AKHTAR	Effect of stone column on an embankment construction
	21024107		ATUL CHOUDHARY	
6	21024112	Prof. M. Chakradhara Rao	KAJAL KUMARI	pushover analysis of multi storeyed building
	21024111		HIMANI CHANDRAKAR	
7	20102035	Dr. Sonal Banchhor	NITIN SHARMA	CONCRETE WITH INDUSTRIAL WASTE (FLY ASH) FOR THE DEVELOPMENT OF SUSTAINABLE CONCRETE
	21024140		VIKAS MEENA	
8	21024105	Dr. Nikhil Kumar Verma	ANKIT KUMAR BHARDWAJ	A Study on the properties of LC ³ Concrete
	21024102		AJAY CHOUDHARY	
9	21024118	Mr. Rochak Pandey	NITI KUMARI	Prediction model for LC3
	21024120		NIVEDITA MARKO	



10	21024106	Dr. Ashish Kumar Parashar	ANKIT KUMAR MISHRA	Impact on rainfall run-off from Kusmunda Opencast Mining
	21024113		MANENDRA KASARE	
	21024126		RAMPRATAP CHAUDHARY	
11	21024119	Dr. Umank Mishra	NITIN ANAND	Vehicle Detection and Adaptive Traffic Signal Control Using AI
	21024117		NIRAJ KUMAR	
	21024124		RAHUL KUMAR VISHWAKARMA	
12	21024136	Ms. Ayushi Nayak	SHUBHAM RAJPUT	EFFECT OF WASTEWATER ON CONCRETE PROPERTY
	21024109		BIPENDRA NISHAD	
	21024135		SHUBHAM KUMAR	
13	21024133	Ms. Preeti Singh	SHEETAL	Sustainable Green building design project
	21024142		ERAM WARSI	
14	21024110	Dr. Bijoli Mondal	HEMA	WQI Assessment Of GGv Using GIS
	21024143		BRAHMA SHANKAR PANDEY	
15	21024104	Dr. VVS Surya Kumar Dadi	ANIKET RANJAN	Analysis Design and detailing of multistorey Residential Building
	21024123		PREM RANJAN SINGH	
	21024125		RAHUL SINGH	
16	21024103	Prof. R.K. Choubey	ANIKET KUMAR SINGH	THE PERFORMANCE EVALUATION OF FIBER REINFORCED CONCRETE USING HYBRID FIBER (STEEL & GLASS FIBER)
	21024139		SUSHANT KUMAR	
	21024121		PEMENDRA SAHU	
17	21024132	Prof. Shailendra Kumar	SAUGAT SINGH	Planning, analysis and designing of an integrated water supply system of ggV
	21024122		PIYUSH SINGH GOUR	
	21024131		SANSKAR KUMAR	

A Minor Project Report
on
"FOOD DELIVERY RIDER'S SAFETY : THE FOCUS IN COMPLIANCE OPERATION"

Submitted in partial fulfilment of the Requirements for Award of Degree of Bachelor of
Technology in Civil Engineering.

Submitted by :-

RUDRA PRATAP

(Roll no. : 21024129)

(Enroll no : GGV/21/01029)

BABLU YADAV

(Roll no. : 21024108)

(Enroll no : GGV/21/01008)

MAHENDRA

(Roll No : 19102250)

(Enroll no: GGV/19/1305)

Under the guidance of
Dr. ADHEESH KUMAR VIVEK
(Assistant Professor)
Department of Civil Engineering



Session : 2024-25

DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES, ENGG. & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
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No 25 of 2009)

CERTIFICATE

Certified that the minor project entitled "FOOD DELIVERY RIDER'S SAFETY : THE FOCUS IN COMPLIANCE OPERATION" submitted by Rudra Pratap , Bablu Yadav & Mahendra in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering & Technology , Guru Ghasidas Vishwavidyalaya, Bilaspur (CG) is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under my supervision and guidance.

Signature *Dr. Adheesh Kumar Vivek*
Dr. Adheesh Kumar Vivek
(Supervisor)

Signature *K. Meshram*
(External Examiner 1)
Signature *[Signature]*
(External Examiner 2)

Signature *[Signature]*
Dr. M. Chakradhar Rao

HOD

Department of Civil Engineering
School of Studies in Engineering & Technology, G.G.V

ABSTRACT

Food delivery is the last step of an online-to-offline transport service. The customer generally initiates the service using an app-or-website-based platform to select food to be delivered. The order is then prepared, packed and delivered within a period that is often transparent to customer. Delivery riding jobs are attracting a numerous number of riders in urban setting worldwide. The safety of food delivery riders is influenced by a complex interplay of environmental, organizational, technological, and individual variables. Environmental factors, such as traffic congestion, adverse weather conditions, and poor road infrastructure, increase riders' exposure to accidents and physical harm. Organizational practices, including strict delivery deadlines, pay-per delivery compensation models, and inadequate compliance with safety standards, create pressure to prioritize speed over safety. Technological elements, such as algorithm-driven route optimization and real-time tracking, often amplify stress while neglecting rider well-being. Individual factors, such as lack of experience, physical fatigue, and unfamiliarity with traffic rules, further exacerbate safety risks. In addition to these variables, food delivery riders face significant challenges, including unstable incomes, absence of legal protections, and exposure to physical and mental health risks from demanding workloads. These challenges are compounded by limited access to training, protective gear, and infrastructure, such as bike lanes and safe parking spaces. Addressing these issues requires a multifaceted approach that combines robust safety protocols, policy reforms, and organizational accountability to create a safer and more sustainable environment for food delivery riders. Methodologically, a questionnaire was designed on the basis of review of literature and survey was undertaken among 234 delivery riders by following interview method. The data collected was analysed using graphical representations and results were formed on the basis of collected data.

The study has found that riders having more age are mature enough to understand the risk involved and are aware of the severity of the accident hence indulge very less in adapting the risky riding behaviour on the road. Education has a very strong impact on the riders ability to make decision on the road, riders holding a master's degree are more aware of the severity of traffic crash than others thus follow the safety measures accordingly. Fatigue is a very significant factor which affect the safety of food delivery riders. As per the study, long working hours causes fatigue resulting in exhaustion, thus there is a significant increase in the occurrence of traffic crash to the riders working for longer hours. Food delivery riders working specifically during peak hours and deliberately completing specific number of trips work under time pressure and hence get indulged in traffic crash. Riders having more working experience are found to get careless on the road in reference to safety hazards thus are at higher risk of getting involved in a traffic accident. Policymakers play a pivotal role in ensuring the safety and well being of food delivery riders by establishing and enforcing comprehensive safety protocols. Their responsibilities include developing regulatory frameworks to protect riders' rights, such as mandating safety training, providing protective gear, and ensuring access to health insurance and fair wages. Policymakers should promote safer working conditions by setting limits on working hours, enforcing road safety rules, and encouraging the use of technology to enhance rider safety, such as real-time alerts and optimized routes. Additionally, policymakers should address infrastructure gaps by advocating for the creation of bike lanes and safe parking areas. iv Collaboration with stakeholders, including delivery platforms and rider unions, is essential to design inclusive policies that balance efficiency with safety. Regular monitoring and enforcement ensure compliance and adaptability to evolving challenges in the gig economy. By implementing these measures, policymakers can create a safer and more sustainable environment for food delivery riders while fostering a culture of accountability and fairness.

A Minor Project Report on

**“THE MORPHOMETRIC INVESTIGATION OF THE MAHANADI RIVER BASIN:
IMPLICATIONS FOR MANAGING SOIL AND WATER RESOURCES”**

Submitted in partial fulfilment of the Requirements for Award of Degree of Bachelor
of Technology in Civil Engineering.

Submitted by:-

MONALISA

(Roll no: 21024115)

(Enroll no: GGV/21/01015)

AKRITI SAGAR

(Roll No: 21024146)

(Enroll no: GGV/21/01046)

Under the guidance of

Dr. PRAKHAR MODI

(Assistant Professor)

Department of Civil Engineering



Session : 2024-25

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(A Central University established by the Central University Act 2009 No 25 of 2009)

CERTIFICATE

Certified that the major project entitled "THE MORPHOMETRIC INVESTIGATION OF THE MAHANADI RIVER BASIN: IMPLICATIONS FOR MANAGING SOIL AND WATER RESOURCES" submitted by Monalisa & Akriti Sagar in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (CG) is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under my supervision and guidance.

Signature

Dr. Prakhar Modi

(Supervisor)

Signature
12/12/24

(External Examiner 1)

Signature
12/12/24

(External Examiner 2)

Signature
12/12/24

Prof. M. C. RAO

HOD

Department of Civil Engineering

School of Studies in Engineering & Technology, G.G.V

ABSTRACT

This project aims to utilize the ESRI Geographic Information system (GIS) software and its calibration and uncertainty analysis tool, ArcGis a comprehensive geospatial platform for professionals and organizations, for the Morphometric analysis of River basin and this study focuses on the Mahanadi River Basin, one of the largest river basins in India, to evaluate its morphometric characteristics using advanced geospatial techniques with ArcGIS and study the hydrological behaviour of the river basin in order to properly apply soil and water conservation strategies. The evaluation of basin characteristics from the morphometric parameters helps in understanding the physical behaviour of the catchments with respect to floods. The advanced technologies, such as Remote sensing and Geographic Information System (GIS), were used for extraction of drainage networks using For this study, SRTM DEM with 30 m resolution was used to estimate the Morphological parameters for the Mahanadi River basin. The total area of the river basin is 1,41,589km². Mahanadi River basin is a fifth-order drainage basin. Of these drainage networks, 839 are first-order, 200 are second-order, 44 are third-order, 6 are fourth-order, and 1 is a fifth-order stream. As the stream order rises from one to five, the number of streams for each respective order decreases. The bifurcation ratio of 5.58 indicates that the basin is more elongated in shape than circular. It also indicates a more efficient stream network for rapid runoff. The study underscores the importance of morphometric analysis in identifying the hydrological potential, erosion susceptibility, and flood risks associated with the basin. Moreover, it emphasizes the utility of GIS-based tools as efficient and reliable methods for conducting regional-scale hydrological studies. The insights derived from this research can significantly contribute to sustainable water resource management, flood control strategies, and environmental conservation efforts in the Mahanadi River Basin. These findings also serve as a foundation for future research focusing on sediment transport dynamics, climate change impacts, and integrated watershed development in the region.

Keyword : *Morphologic parameters · Watershed planning · Digital elevation model*

A Minor Project Report on

"THE RESPONSE OF SOFT CLAY TO ELECTROKINETIC TREATMENT"

Submitted in partial fulfilment of the Requirements for Award of Degree of
Bachelor of Technology in Civil Engineering.

Submitted by :-

SHUSHANT KUMAR SINHA
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(Enroll no : GGV/21/01037)

RAVI KUMAR
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Under the guidance of

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(Assistant Professor)
Department of Civil Engineering



Session : 2024-25

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CERTIFICATE

Certified that the minor project entitled “**THE RESPONSE OF SOFT CLAY TO ELECTROKINETIC TREATMENT**” submitted by **Shushant Kumar Sinha & Ravi Kumar** in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering & Technology , Guru Ghasidas Vishwavidyalaya, Bilaspur (CG) is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under my supervision and guidance.

Signature
Dr. Balbir Kumar Pandey
(Supervisor)

Signature *K. Meshram*
(External Examiner 1)

Signature
(External Examiner 2)

Signature.....
06/12/24

Prof. M. C. RAO
HOD
Department of Civil Engineering
School of Studies in Engineering & Technology, G.G.V

Abstract

In this study, the response of soft clay to electrokinetic treatment was investigated. About 60% of the world's population resides in Asia, which has only 30% of the total land area. As the population increases, the demand for land for accommodation also rises, necessitating work on problematic land. Electrokinetic treatment is a modern technique used for land reclamation, addressing issues such as excessive pore water pressure, low strength, high water content, and delayed dissipation of excess pore water pressure.

In this study, COMSOL Multiphysics software was used to couple an electrokinetic model with a soil mechanics model to understand the effect of electrokinetic treatment on soft clay. The study was conducted at voltage gradients of 0 V/cm, 0.5 V/cm, 1 V/cm, and 2 V/cm to analyze the movement of the electroosmotic term, velocity term, and TDS (Total Dissolved Solids) concentration in the model. The results show the movement of the electroosmotic term, velocity term, and TDS concentration at different times, helping us understand the soil behavior. This comprehensive analysis provides valuable insights into how electrokinetic treatment can improve the properties of soft clay, making it more suitable for construction and land reclamation projects.

A

Minor Project Report On

“Evaluate The Pavement Condition Index For Urban Roads”

Submitted by:

ARYAN SAURABH

ROLL NO -21024147
Enrollment No. – GGV/21/01047

VINAY KHAROLE

ROLL NO- 21024141
Enrollment No. – GGV/21/01041

Student of Department of Civil Engineering 4th Yr. (8th Semester)

Supervised by:

Dr. KUNDAN MESHAM

(Assistant Professor)
(Department of Civil Engineering)



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SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY,
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SESSION 2024-25

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TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR
(C.G.)

(A Central University Established by the Central University Act 2009 No. 25 of 2009)



CERTIFICATE

Certified that the major project entitled "Evaluation of the Pavement Condition Index for Urban Roads" submitted by ARYAN SAURABH AND VINAY KHAROLE in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, Institute of Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under supervision and guidance.

K. Meshram

Supervisor
(Dr. Kundan Meshram)

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External Examiner 1

External Examiner 2

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12/12/24

(HOD Civil Engineering)

Abstract

The condition of road infrastructure is crucial for ensuring safety, efficient transportation, and economic development, with potholes being one of the most significant challenges affecting vehicle safety, ride comfort, and maintenance costs. This study focuses on developing a systematic approach for assessing road conditions by identifying and analyzing potholes, examining parameters such as size, severity, and distribution over a six-month period. Data samples were collected from road segments within Guru Ghasidas Vishwavidyalaya(GGU) Bilaspur, Chhattisgarh(C.G), to evaluate the current state of these roads. A key aspect of this research is the incorporation of time series analysis to track changes in road conditions over time, allowing for the identification of trends and patterns in pothole formation and severity. This temporal analysis provides deeper insights into the dynamics of road deterioration and facilitates predictive maintenance planning by understanding the influence of factors such as traffic load and weather conditions. The outcomes of this project offer actionable insights for urban planners and road maintenance agencies, highlighting the urgent need for proactive measures to improve road infrastructure. This research underscores the importance of integrating systematic assessments with predictive analysis to ensure safer travel conditions and sustainable infrastructure management

SLOPE STABILITY ANALYSIS USING PLAXIS SOFTWARE

A minor project report submitted in partial fulfilment of the requirement for the award
of the degree of

BACHELOR OF TECHNOLOGY

IN

CIVIL ENGINEERING



VIIth Sem/2024-25

Md Suhail Akhtar (21024114)

Atul Choudhary (21024107)

**Under the Guidance of
Mr. Vinod Kumar
(Assistant Professor)**

DEPARTMENT OF CIVIL ENGINEERING

(SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY)

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established by the Central University Act 2009 No. 25 of 2009)

Koni, Bilaspur Chhattisgarh – 495009, India



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SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDHYALAYA

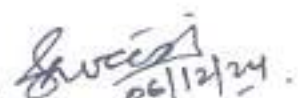
(A Central University Established by the Central University Act 2009 No. 25 of 2009)

CERTIFICATE

Certified that the Minor project report entitled “**SLOPE STABILITY ANALYSIS USING PLAXIS SOFTWARE**” submitted by **Md Suhail Akhtar and Atul Choudhary, B. Tech 7th Semester**, in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering and Technology Guru Ghasidas Vishwavidyalaya, Bilaspur is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under my supervision and guidance.


Mr. Vinod Kumar
(Guide)

External Examiner 1:


06/12/24

External Examiner 2: *K. Meshram*

External Examiner 3:


Prof. M. Chakradhara Rao
Head of Department
Department of Civil Engineering
(School of Studies in Engineering and Technology)
Guru Ghasidas Vishwavidyalaya (A Central University),
Bilaspur (CG)-495009

ABSTRACT

Earth slope failure is one of the most common prevalent geological events movements, lead to put human lives and properties at risk. Hence, to avoid such problems it required an appropriate stabilizing method. Soil nailing system is considered as one of the most essential and cost-effective methods to Overcome the slope failures. This study focuses on utilizing PLAXIS, a powerful finite element analysis software, to evaluate slope stability under various conditions. The research emphasizes the integration of advanced soil behavior models and realistic boundary conditions to simulate complex scenarios accurately.

Key parameters such as soil strength, groundwater levels, and external loading were considered in the analysis. The study demonstrates the use of the safety factor (FS) approach and identifies potential failure mechanisms through detailed simulations. The application of PLAXIS enables precise stress-strain behavior assessment, offering a more comprehensive understanding compared to traditional limit equilibrium methods.

The findings highlight the advantages of PLAXIS in analyzing heterogeneous soil profiles, dynamic loading conditions, and the impact of stabilization techniques like reinforcement or drainage. The study underscores the software's capability to predict failure zones and provide insights into effective mitigation strategies for real-world slope stability challenges.

PLANNING, ANALYSIS, AND DESIGN OF RESIDENTIAL BUILDING (G+2)

A MINOR PROJECT

Submitted in partial fulfillment of the requirements for the award of the
of

BACHELOR OF TECHNOLOGY

in

CIVIL ENGINEERING

by

KAJAL KUMARI

HIMANI CHANDRAKAR

Under the Guidance

Of

Dr. M. CHAKRADHARA RAO

(Professor)



**DEPARTMENT OF CIVIL ENGINEERING SCHOOL OF STUDIES, ENGG. &
TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G)**

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Session 2024-2025

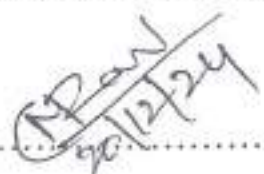


CERTIFICATE

This is to certify the minor project work entitled “**PLANNING, ANALYSIS, AND DESIGN OF RESIDENTIAL BUILDING (G+2)**” presented by **Kajal Kumari (21024112)** and **Himani Chandrakar (21024111)** students of B. Tech VII semester, Civil Engineering Department, GURU GHASIDAS VISHWAVIDYALAYA, has been completed successfully and satisfactorily.

This project report is submitted in partial fulfillment of the requirement for the award of the Degree of Bachelor of Technology, SOS, Engineering & Technology, GURU GHASIDAS VISHWAVIDYALAYA, Bilaspur (C.G).

We wish success in all future endeavors to graduating students.

Signature.....

Dr. M. Chakradhara Rao

Professor (Supervisor)

Department of Civil Engineering

Signature.....

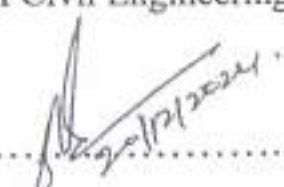
External Examiner - 1

Signature.....

Dr. M. Chakradhara Rao

Head of Department

Department of Civil Engineering

Signature.....

External Examiner - 2

ABSTRACT

The planning, analysis, design, and modeling of multistorey buildings are critical processes in modern construction to ensure structural integrity, functionality, and aesthetic appeal. This study focuses on utilizing ETABS (Extended Three-Dimensional Analysis of Building Systems), a leading structural analysis and design software, for the comprehensive development of a multistorey building. The project encompasses the detailed planning of architectural layouts in compliance with relevant codes and standards, followed by structural analysis to determine the building's ability to withstand various loads, including dead loads, live loads, wind, and seismic forces.

The design phase employs ETABS to optimize structural components such as beams, columns, slabs, and foundations, ensuring safety, efficiency, and cost-effectiveness. The modeling phase provides a realistic 3D representation of the building, allowing for visual assessment and refinement. This paper highlights the systematic approach and benefits of using ETABS for designing multistorey structures, including enhanced accuracy, reduced design time, and the ability to evaluate multiple scenarios. The findings demonstrate the effectiveness of ETABS in modern civil engineering projects, making it an indispensable tool for professionals in the field.

The main objective of the present project was the planning, analysis, and design of a residential building. The building consists of three floors(G+2). The plan area of each floor was 733.53m². Except for the ground floor each floor contained four flats, two of which are 2 BHK and the other two are 3 BHK. The whole building was analyzed for various load contributions dead load, live load and seismic load using ETABS software. The structural elements viz. Columns and beams were designed by using the ETABS. All the calculations are done manually for the design of the slabs, footings, and staircase as per the provision of BIS (IS 456: 2000). The detailing was done as per the guidelines of SP34 (1987).

A Minor Project Report
on
**Bio-CONCRETE WITH INDUSTRIAL WASTE (FLY ASH) FOR THE
DEVELOPMENT OF SUSTAINABLE CONCRETE**

Submitted in the partial fulfillment for the award of degree of
Bachelor of Technology in Civil Engineering

by
Nitin Sharma
Vikas Meena
B. Tech, VIIth Semester

Under the Guidance of
Dr. Sonal Banchhor



DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University)
SESSION 2024-25

DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University)



CERTIFICATE

Certified that the minor project entitled "**Bio-CONCRETE WITH INDUSTRIAL WASTE (FLY ASH) FOR THE DEVELOPMENT OF SUSTAINABLE CONCRETE**" submitted by **Nitin Sharma and Vikas Meena** in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is accorded to the students' own work, carried out by them in the Department of Civil Engineering during session 2023-24 under supervision and guidance.

Signature _____

Dr. Sonal Banchhor

Assistant Professor

Project Supervisor

Signature _____

(External Examiner/s)

Signature _____

M. Chakradhara Rao

Head of Department

Department of Civil Engineering

SOS, Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.)

ABSTRACT

Fractures in concrete are unpreventable, and also it's intrinsic weak point of concrete. By means of the splits, bath among others salts can easily run. It initiates oxidation, even further lowering the lifetime on the concrete. Therefore, there seemed to be a necessity to create an intrinsic bio material, a self-repairing method which is able to rectify the splits as well as fissures produced within concrete. Bio-concrete is a substance which could effectively rectify fractures within concrete. This particular method is extremely appealing as the pastime of break remediation is natural and eco-friendly. The undertaking covers the plugging of man-made break of cement concrete by using *Bacillus megaterium*, *Bacillus subtilis*, *Bacillus sphaericus*, *Bacillus pasteurii* etc, the impact on compressive toughness, drinking water absorption as well as liquid permeability of cement concrete cubes as a result of the blending of bacteria also is talked about within this specific task. It was actually discovered that the usage of *Bacillus Megaterium* as well as *Bacillus subtilis* advances the compressive power as well as stiffness of concrete. Additionally, it demonstrates that there's decrease in water absorption as well as liquid permeability in comparison with traditional concrete. The bacteria that are likely to be created with concrete must have the home of alkali resistance also additionally, it need to develop endospore, such which it is able to stand up to the stresses manufactured in concrete while blending, placing and transporting. This particular analysis is focused on look into the suitability of blending these self-healing calcite depositing bacteria with concrete with fly ash to be able to boost the compressive sturdiness of concrete, bring down its seepage and permeability of water by bio mineralization procedure. Sizable increased power is found to concrete examples when casted with bacterial fix. The analysis has invented ways or methods to evaluate the outcome of utilization of bacteria in concrete. Outcomes are in contrast to typical concrete. Natural adjustments of building substances are definitely the demand on the hour for long term and strength improvement sustainability. In this project bacteria is used, the research is carried out by using M25 grade concrete with replacement of 2.5% Bacteria by keeping Fly ash as 5% constant and is carried out to determine the optimum percentage of replacement at which maximum compressive strength is achieved, the properties of the material are analyzed.

Keywords: Self-healing concrete, Natural and also natural self-healing procedure, Biological precipitation of calcium carbonate

“STUDY ON THE PROPERTIES OF LC³ CONCRETE”

Minor Project Report

Submitted in the partial fulfillment for the award of degree of
Bachelor of Technology in Civil Engineering

by

Ankit Kr. Bhardwaj (21024105)

Ajay Choudhary (21024102)

B.Tech VII Semester

Under the Guidance of

Dr. Nikhil Kumar Verma



DEPARTMENT OF CIVIL ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University established by the Central Universities Act No. 25 of 2009)

Session 2024-2025

DEPARTMENT OF CIVIL ENGINEERING
**SCHOOL OF STUDIES OF ENGINEERING &
TECHNOLOGY**
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University Established By The Central University Act 2009 No. 25 Of 2009)



CERTIFICATE

Certified that the minor project entitled "STUDY ON THE PROPERTIES OF LC³ CONCRETE" submitted by ANKIT KR. BHARDWAJ and AJAY CHOUDHARY B.Tech VII Semester, in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering & Technology, GGV, Bilaspur is accorded to the students' own work, carried out by them in the department of civil engineering during session 2024-25.

Sign _____

Dr Nikhil Kumar Verma
Guide

06/12/2024

Sign _____

External Examiner

06/12/24

Sign _____

Prof. M. Chakradhara Rao
Head of Department
Civil Engineering

School of Studies of Engineering & Technology
Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.)

ABSTRACT

The present investigation has been carried out to study the workability, compressive strength, split tensile strength, ultrasonic pulse velocity and sorptivity index on a concrete with different proportions of cement replaced by LC^2 . The tests were carried out on M35 grade concrete with replacements of cement (by wt) with LC^2 as 15%, 25%, 35% and 45%. The purpose of this project was to compare and based on that it was concluded the mechanical properties and durability of the concrete and at certain proportion the strength was supposed to give an maximum value. Based on the maximum value, the concrete can be used for commercial purposes on gaining both strength and economy. With the advent of material like LC^2 in the concrete, the concrete started to change its property on further more replacements of cement with different amounts of LC^2 in an increasing order by weight. The compressive strength gave an maximum value at 25%, whereas the split tensile strength and ultrasonic pulse velocity (UPV) values kept gave maximum value at 15% and further decreases. Workability of the concrete decreases with addition of calcined clay. Sorptivity Index increases with addition of calcined clay means the durability of the concrete increases. From the experimental results it can be concluded that the replacement of cement by 15% LC^2 had shown better performance than the replacement of cement by limestone and Calcined Clay in all the mixes. With the use of LC^3 helps to protect the environment by CO_2 emissions.

Keywords: Ultrasonic Pulse Velocity (UPV), Limestone Calcined Clay (LC^2), Carbon Dioxide (CO_2)

"STUDY OF THE PROPOSED TO BE DEVELOPED FOR A RESIDENTIAL
IN THE AREA OF THE CITY"

Submitted in partial fulfillment for the award of degree of

B.A. POLITICAL SCIENCE

in

CIVIL ENGINEERING

By

DEVANTA SHARMA (21024120)

OFFI KUMAR (21024118)

B. Tech VII Semester (2024-25)

Under the supervision of

MR. RIM HAK PANDY



DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
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DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G)
(A Central University Established by the Central University Act 2009 No. 25 of 2009)



CERTIFICATE

Certified that the minor project entitled "BUILDING INFORMATION MODELLING OF G+1 RESIDENTIAL BUILDING USING REVIT " submitted by NIVEDITA MARKO ,NITI KUMARI in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under supervision and guidance

Signature.....
Mr. ROCHAK PANDEY
(Assistant Professor & Guide)

Signature.....
(External Examiner 1)

Signature.....
(External Examiner 2)

Signature.....
Prof M. CHAKRADHAR RAO
HEAD OF THE DEPARTMENT,
Department of Civil Engineering,
School of Studies of Engineering & Technology,
Guru Ghasidas Vishwavidyalaya

ABSTRACT

Building Information Modeling (BIM) is a model-based design concept, in which buildings will be built virtually before they get built out in the field, where data models organized for complete integration of all relevant factors in the building lifecycle which also manages the information exchange between the AEC (Architects, Engineers, Contractors) professionals, to strengthen the interaction between the design team. BIM is a shared knowledge about the information for decisions making during its lifecycle. In this project we will be using BIM software Revit for 3D modelling of a G + 1 residential building.

This report covers the learning path of REVIT software. It covers the areas from opening the rivet software to floor plans of the residential building.

MINOR PROJECT REPORT

On

WATER CHARACTERIZATION OF PONDS OF GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G)

A report submitted in partial fulfillment of the requirements of the award of degree

of

BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING

by

Ankit Mishra (21024106)

Manendra Kasare (21024113)

Under the Guidance of:

Dr. Ashish Kumar Parashar

(Associate Professor)



2024-25

DEPARTMENT OF CIVIL ENGINEERING

**SCHOOL OF STUDIES IN ENGINEERING AND
TECHNOLOGY GURU GHASIDAS VISHWAVIDYALAYA**

(A Central University Established by the Central University Act 2009 No. 25 of 2009)



DEPARTMENT OF CIVIL ENGINEERING

**SCHOOL OF STUDIES IN ENGINEERING &
TECHNOLOGY**

GURU GHASIDAS VISHWAVIDYALAYA

(A Central University Established by the Central University Act 2009 No. 25 of 2009)

CERTIFICATE

Certified that the Minor project report entitled "Water Characterization of Ponds of Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G)" submitted by Ankit Mishra, Manendra Kasare, B. Tech VII Semester, in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering and Technology Guru Ghasidas Vishwavidyalaya, Bilaspur is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under my supervision and guidance.

Dr. Ashish Kumar Parashar
(Guide)

Dr. M. Chakradhar Rao
(Head of Department)

Examiner

ABSTRACT

Ponds are critical for maintaining ecological balance and supporting biodiversity, yet they are often subjected to anthropogenic pressures that degrade water quality. This study focuses on the comprehensive characterization of pond water at Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G), aiming to assess water quality, identify contaminants, and evaluate the influence of environmental and anthropogenic factors.

Water samples were systematically collected from ponds within the university campus and analysed for key water quality parameters, including pH, hardness, alkalinity, chloride (Cl), dissolved oxygen (DO), total dissolved solids (TDS), and nutrient concentrations such as nitrates and silica. Standard methodologies were employed for testing, and the results were compared against national water quality standards to assess pollution levels.

The findings revealed significant variation in water quality across the ponds. Elevated nutrient levels in some ponds indicated potential pollution sources, such as agricultural runoff, surface drainage, and waste disposal. Dissolved oxygen levels in certain ponds suggested organic matter decomposition, further highlighting the impact of anthropogenic activities. The study underscores the critical need for routine monitoring and conservation measures to mitigate pollution and preserve the ecological health of these aquatic systems.

This research emphasizes the importance of ponds as essential water resources and biodiversity hotspots while addressing the challenges posed by contamination. The results provide valuable insights into the current status of pond water quality and lay the foundation for sustainable water management practices. By identifying contamination patterns and sources, the study offers actionable recommendations for protecting these ecosystems. The findings will aid in developing effective conservation strategies, contributing to the long-term sustainability of water resources at Guru Ghasidas Vishwavidyalaya.

MINOR PROJECT REPORT
ON
RUNOFF ESTIMATION USING ARC
SWAT IN ArcGIS SOFTWARE

A Report submitted in partial fulfilment of the
requirements of the award of degree
of

BACHELOR OF TECHNOLOGY
IN
CIVIL ENGINEERING



2024 - 2025

DEPARTMENT OF CIVIL ENGINEERING
GURU GHASIDAS VISHWAVIDYALAYA,
BILASPUR, C.G

Submitted by - Niraj Kumar
Nitin Anand
Rahul Vishwakarma

Guided by - Dr. Umank Mishra

DEPARTMENT OF CIVIL ENGINEERING SCHOOL
OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA,
BILASPUR (C.G)

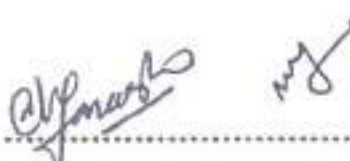
(A Central University Established by the Central
University Act 2009 No. 25 of 2009)



CERTIFICATE

Certified that the minor project entitled "RUNOFF ESTIMATION USING ARC SWAT IN ArcGIS SOFTWARE" submitted by NIRAJ KUMAR, NITIN ANAND, RAHUL VISHWAKARMA in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under supervision and guidance

Sign 
Dr. Umank Mishra
(Associate Professor & Guide)

Sign 
External Examiner

Sign 
Prof. M. C. Rao
HEAD OF DEPARTMENT
Department of Civil Engineering
SoS, Engineering & Technology
Guru Ghasidas Vishwavidyalaya

ABSTRACT

This study focuses on estimating runoff for the Kosi River Basin in Bihar, India, using the ArcSWAT model integrated into ArcGIS. Runoff estimation is a crucial aspect of hydrological modeling, aiding in flood management, water resource planning, and agricultural development. The project involves delineating the watershed, defining hydrological response units (HRUs), and integrating soil, land use, and weather data to simulate runoff patterns.

Key steps in the methodology include:

- Collection and preprocessing of input data such as Digital Elevation Models (DEM), land use/land cover, and soil data.
- Watershed delineation to identify sub-basins and flow paths.
- HRU analysis to capture the unique combinations of land use, soil, and slope.
- Integration of weather data (precipitation and temperature) for hydrological simulations.
- Calibration and validation of the SWAT model using observed discharge data.

The results reveal that the discharge in the study area ranges between 81 to 82.5 cubic meters per second (cumec), showing a slightly increasing pattern over time. This trend highlights potential changes in the basin's hydrology, influenced by rainfall patterns and land use dynamics.

The findings provide critical insights into the hydrological processes of the Kosi River Basin, contributing to effective water resource management and flood mitigation strategies. The study demonstrates the capability of ArcSWAT in modeling complex hydrological systems, offering a reliable tool for sustainable watershed management.

EFFECT OF WASTEWATER ON CONCRETE PROPERTIES

A Minor Project Report to Civil Engineering Department

for

The Partial fulfillment of the Requirement for Award of Degree of
Bachelor of Technology in civil engineering

Submitted By

SHUBHAM RAJPUT

SHUBHAM KUMAR

BIPENDRA NISHAD

B. Tech (VII Semester)

Under the guidance of

Ms. AYUSHI NAYAK

(Assistant Professor)



DEPARTMENT OF CIVIL ENGINEERING

SCHOOL OF STUDENTS IN ENGINEERING & TECHNOLOGY,

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

2024-2025

DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDENTS IN ENGINEERING & TECHNOLOGY,
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University established by the central university Act No. 25 of 2009)

CERTIFICATE

Certified that the Minor Project Report entitled "*Effect of Wastewater On Concrete Properties*" submitted by Mr. Shubham Rajput, Mr. Shubham Kumar, Mr. Bipendra Nishad of B.Tech VIth Semester, in partial fulfillment of the requirements for the award of degree in Bachelor of Technology (B. Tech) in Civil Engineering, is according to the students own investigation carried out by them in the Department of Civil Engineering, School of Studies in Engineering & Technology, GGV, during the session 2024-25.

Sing.....



Ms. Ayushi Nayak
(Guide)

Sing.....



(Examiner)



Prof. M. Chakradhara Rao

(HOD)

Civil Engineering

ABSTRACT

Concrete has a vital role in development of infrastructure and living accommodation. This study investigate the effect of using wastewater on the properties of concrete. Wastewater samples were collected from Kali Mandir, GGV. Campus. The collected wastewater samples were mixed together and chemical analysis was carried out. Five water samples, including a controlled potable (tap) water were analysed for pH, total dissolved solids (TDS), chloride, hardness, alkalinity, and sulfates. Chemical analysis results showed that although the chemical compositions of wastewater were much higher than those parameters found in tap water, the water composition was within the ASTM standard limits for all substance indicating that the wastewater produced can be used satisfactorily in concrete mixtures. M20 concrete mixtures were prepared using different proportions of wastewater and water-to-cement ratio of 0.45. The percentage of wastewater replaced ranged between 25-100% of tap water used in concrete. For each concrete mixture, nine 100mmx100mmx100mm cubes, three 200mmx100mm diameter cylinders were used to determine the compressive and tensile strengths at 28-days of curing. cube compressive strength was also determined at 7-days of curing. Results indicated that the strength of concrete mixture prepared using wastewater was comparable to the control mixture.

A Minor Project Report

On

Design of RCC Overhead Intze Water Tank

Submitted to the
Department of Civil Engineering
School of Studies of Engineering and Technology
In partial fulfilment
Of the requirement for the award of the Degree of
Bachelor of Technology in Civil Engineering

Submitted by

SHEETAL
GGV/21/01033

ERAM WARSI
GGV/21/01042

Under the supervision of
Ms. PREETI SINGH
Assistant Professor
(Civil Engineering)



DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University)
Session 2024-2025



DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
A central University established by the Central University Act 2009 no 25 of 2009

CERTIFICATE

Certified that the Minor project report entitled "**Design of RCC overhead Intze water tank**" submitted by **Sheetal** and **Eram Warsi**, B. Tech VII Semester, in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya Bilaspur is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under my supervision and guidance.

Signature.....
Ms. Preeti Singh
(Guide)

Signature.....
External Examiners

Signature.....
Prof. M.Chakradhara Rao
HOD

Department of Civil Engineering
Guru Ghasidas Vishwavidyalaya (A Central University)
Bilaspur (C.G)

ABSTRACT

The design of an RCC Overhead Tank Water Tank represents a critical engineering endeavor aimed at addressing the growing demands of water storage and distribution in modern infrastructure. This report elaborates on the comprehensive design approach adopted for an mize-type overhead water tank, which combines advanced structural analysis, meticulous material selection, and adherence to industry standards. The design is guided by IS 3370 and other relevant codes, ensuring the tank's capacity to withstand the conditions typical in water storage systems, including hydrostatic pressure, seismic forces, and environmental influences.

The tank comprises a conical bottom, a cylindrical shell, a hemispherical dome, and a supporting pedestal. Each structural component was rigorously analyzed for both static and dynamic load cases, ensuring a high factor of safety and long-term reliability under internal pressures. Reinforcement detailing was carried out with precision to optimize material usage while ensuring compliance with strength and durability requirements.

Special attention was given to ensuring the tank's resilience in varying environmental conditions, including soil characteristics, temperature variations, and seismic activity. The materials chosen for construction were selected for their superior strength-to-weight ratio, durability, and cost-effectiveness, contributing to the overall efficiency of the design. Furthermore, the construction methodology was designed with sustainability and long-term maintenance in mind, utilizing efficient formwork, precise reinforcement placement, and effective curing techniques to achieve a high-quality finish.

A Minor Project Report on
WATER QUALITY INDEX(WQI) ASSESSMENT

submitted in partial fulfillment of the requirements of the award of the degree

BACHELOR OF TECHNOLOGY

in

CIVIL ENGINEERING

Submitted by

BRAHMA SHANKAR PANDEY (21024143)

HEMA (21024110)

UNDER GUIDANCE OF

DR. BIJOLI MONDAL

(Associate Professor)

Department of Civil Engineering



Guru Ghasidas Vishwavidyalaya

Established under the Central Universities Act, 2009 | NAAC-Accredited 'A++' Grade | Approved

by UGC | | Located in

Koni, Bilaspur, Chhattisgarh – 495009

December, 2024

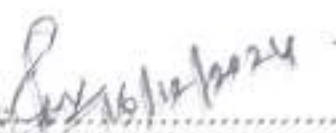
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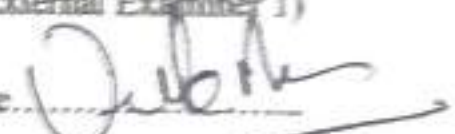


CERTIFICATE

Certified that the minor project entitled "WATER QUALITY INDEX (WQI) ASSESSMENT" submitted by **HEMA & BRAHMA SANKAR PANDEY** in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under supervision and guidance.

Signature 
DR. BHOLA MONDAL
(Associate Professor & Guide)

Signature 
Prof M. CHAKRADHAR RAO
HEAD OF THE DEPARTMENT,
Department of Civil Engineering,
School of Studies of Engineering & Technology,
Guru Ghasidas Vishwavidyalaya

Signature 
(External Examiner 1)
Signature 
(External Examiner 2)

Abstract

This project aims to assess the Water Quality Index (WQI) across various departments within the university campus to determine the overall water quality. The study focuses on the analysis of 10 water samples collected from different locations, including the Civil Department building, Auditorium, Admin Block, Chemistry Department, SVNS Boys Hostel, Central Library, Raj Mohini Girls Hostel and others. Six key parameters—pH, Total Dissolved Solids (TDS), chlorides, alkalinity, turbidity, acidity, and hardness—were measured to calculate the WQI for each location.

The objective of this project is to identify potential variations in water quality across the campus, highlighting areas where water quality is within acceptable limits and areas that may require treatment or further investigation.

Key results indicate that showing that almost all departments have higher water quality, while others may be at risk of contamination due to environmental or infrastructural factors.

In conclusion, the water quality across the campus varies significantly between departments, with some samples showing acceptable water quality while others require immediate attention. Based on the findings, it is recommended that regular monitoring and appropriate water treatment measures be implemented, especially in areas where WQI indicates poor water quality.

**PLANNING, ANALYSIS AND DESIGN OF HEAD OVER
HEAD WATER TANKS FOR AN INTEGRATED
WATER DISTRIBUTION SYSTEM OF CGU**

A Minor Project Report

**Submitted in the partial fulfillment for the award of degree of
Bachelor of Technology in Civil Engineering**

by

PIYUSH SINGH GOUR

SANKAR KUMAR

SAUGAT SINGH

B. Tech. VIIIth Semester

Under the Guidance of

Prof. SHAILENDRA KUMAR



**DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)**

(A Central University)

SESSION 2024-25

DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A Central University)



CERTIFICATE

Certified that the minor project entitled "PLANNING, ANALYSIS AND DESIGN OF RCC OVER HEAD WATER TANKS FOR AN INTEGRATED WATER DISTRIBUTION SYSTEM OF GGV" submitted by PIYUSH SINGH GOUR, SANSKAR KUMAR and SAUGAT SINGH in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya Bilaspur, is accorded to the student's own work, carried out by them in the Department of Civil Engineering during session 2024-25 under supervision and guidance.

Signature _____

Prof. SHAILENDRA KUMAR

Professor Project

Supervisor

Signature _____

(External Examiner/s)

Signature _____

Prof. M.CHAKRADHARA RAO

Head of Department

Department of Civil Engineering

SOS, Guru Ghasidas Vishwavidyalaya, Bilaspur, (C.G.)

ABSTRACT

This project focuses on the planning, analysis, and design of an overhead reinforced cement concrete (RCC) water tank to meet the water supply needs of the university, GGV. The population of the university is estimated to be 27,105 using conventional population forecasting methods, which forms the basis for determining the required water storage capacity. The overhead water tank is initially planned using AutoCAD, a widely used drafting software, which allows for precise layout and design of the tank. Structural analysis is then carried out using STAAD PRO, a premier analysis software, to assess the tank's ability to withstand the loads and environmental conditions. Based on the results of the analysis, the key features of the Intze type overhead water tank are manually designed to ensure structural stability and functionality. The final design, along with detailed drawings, is presented in this report. The project concludes with a comprehensive design that meets the water supply requirements of GGV, ensuring the safety and reliability of the overhead water tank.