



Major Project 2021-22

Following students have carried out their Project work/ Internship/ Field Project/Industrial Training for the academic session 2021-22

S.No.	Uni. R.No	Enrollment No	Name of the Students	Page No.
1	18102002	GGV/18/1012	ADITYA KHARE	1-5
	18102010	GGV/18/1065	ATHARAW KUMAR	1-5
	18102031	GGV/18/1280	SATYAM GUPTA	1-5
2	18102003	GGV/18/1018	AJAY KUMAR MEENA	6-10
	18102017	GGV/18/1162	MANOJ KUMAR PATLEY	6-10
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3	18102005	GGV/18/1029	AMAN	11-15
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	18102024	GGV/18/1229	PRINCE SINGH	11-15
4	18102019	GGV/18/1188	NITESH SAHU	16-20
	18102009	GGV/18/1062	ASHUTOSH CHANDRA	16-20
	17102216	GGV/17/1016	ADITYA MARKAM	16-20
5	18102030	GGV/18/1274	SANJAY KUMAR DEWANGAN	21-25
	18102029	GGV/18/1272	SANDEEP PAINKRA	21-25
	18102004	GGV/18/1022	AKASH PATRE	21-25
6	18102011	GGV/18/1069	AYUSH VERMA	26-30
	18102028	GGV/18/1254	RAUSHAN KUMAR	26-30



	18102015	GGV/18/1136	JYOTI KUMARI	26-30
7	18102039	GGV/18/1344	VISHAL TIWARI	31-35
	18102018	GGV/18/1174	MURARI KUMAR	31-35
	17102230	GGV/17/1152	NITISH KUMAR	31-35
8	18102021	GGV/18/1197	PANKAJ KUMAR	36-41
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9	18102033	GGV/18/1297	SHORYA BHARDWAJ	41-45
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*Total 27 students in 9 groups.

**COMPARATIVE STUDY OF FLY ASH BASED GPC
WITH RECYCLED & NATURAL AGGREGATE**

A MAJOR PROJECT REPORT

Submitted in partial fulfilment of the requirements

for the award of the degree of

BACHELOR OF TECHNOLOGY

in

CIVIL ENGINEERING

by

ADITYA KHARE

ATHARAW KUMAR

SATYAM GUPTA

Under the Guidance of

MR. NIKHIL KUMAR VERMA

Assistant Professor




**DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G), 495009
(A Central University)**

May 2022



CERTIFICATE

It is certified that the major project entitled **COMPARATIVE STUDY OF FLY ASH BASED GPC WITH RECYCLED & NATURAL AGGREGATE** submitted by **ADITYA KHARE, ATHARAW KUMAR, and SATYAM GUPTA** in partial fulfilment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Engineering & Technology, GGV, Bilaspur is accorded to the students' own work, carried out by them in the department of Civil Engineering during 8th semester session 2021-22 under my supervision and guidance.


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Dr. A. K. Parashar

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ABSTRACT

In the present study, an alternative/ supplementary binder for OPCC (Ordinary Portland Cement Concrete) i.e., GPC (Geopolymer Concrete) is developed with parameters like curing period (24, 48 and 72 hrs), curing temperature (60°C and 90°C), alkalinity ratio (1:2), Molarity of NaOH (14 M), also natural aggregates were replaced by 50 % recycled aggregates and then compared with the controlled OPCC. M25 grade of concrete mix-design is taken as per IS 10262:2019 for controlled OPCC and GPC. The compressive strength of the geopolymer concrete was tested at various ages such as 7 and 28 days. The result shows that the strength of Geopolymer concrete is increasing with the increase in the curing period and temperature up to a specific point. The maximum compressive strength in this present study for (class F) fly ash based GPC was found to be 31.09 MPa, which was achieved at 90°C for duration of 48 hrs of curing temperature and curing period respectively.

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ANALYSIS OF BEARING CAPACITY OF SOIL IN C++

**SUBMITTED IN THE PARTIAL FULFILLMENT FOR THE AWARD OF
DEGREE OF**

BACHELOR OF TECHNOLOGY

IN

CIVIL ENGINEERING

MAJOR PROJECT

Ajay Kumar Meena (18102003)

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UNDER THE GUIDANCE OF

Mr. Vinod Kumar (Assistant Professor)



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SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

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

SESSION: 2021-22

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I.T., G.G.V. Bilaspur (C.G.)

ABSTRACT

The field of engineering is a creative one. The problems encountered in this field are generally unstructured and imprecise influenced by intuitions and past experiences of a designer. The conventional methods of computing relying on analytical or empirical relations become time consuming and labor intensive when posed with real life problems. To study, model and analyze such problems, approximate computer based Soft Computing Techniques (SCT).

In contrast to conventional computing techniques which rely on exact solutions, soft computing aims at exploiting given tolerance of imprecision, the trivial and uncertain nature of the problem to yield an approximate solution to a problem in quick time.

So, this project introduces a

- i. A soft approach towards determination of bearing capacity of soil of Bilaspur City (CG) in a comprehensive manner.
- ii. Using C++programming language deals with human efforts in qualitative as well as quantitative manner.
- iii. Combination of IS Code: 6403-1981 with C++ program work precise as well as time saving.
- iv. Data base of Bilaspur city helps on determination of bearing capacity of soil in different areas of city up to 8 km diameter which not only save time but works smartly.
- v. This program is very easy handle and any person having diploma can also use it.
- vi. Effects of water table at different places have to be taken in account in determination of bearing capacity of that area.
- vii. By using C++ program, type of soil failure can also be predicated in early stages/before construction of foundation.
- viii. Type of soil failure can also be considered in design of foundation in particular.

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WIND LOAD ANALYSIS & DESIGNING OF A G+5 STOREY RESIDENTIAL BUILDING FOR DIFFERENT WIND ZONES

A Major Project Report Submitted to Civil Engineering Department for the partial fulfillment of the Requirements for Award of Degree of Bachelor of Technology in Civil Engineering

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**DEPARTMENT OF CIVIL ENGINEERING
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DEPARTMENT OF CIVIL ENGINEERING
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Certified that the major project entitled **WIND LOAD ANALYSIS & DESIGNING OF A G+5 STOREY RESIDENTIAL BUILDING FOR DIFFERENT WIND ZONES IN INDIA** submitted by **Aman, Aniket Bhushan and Prince Singh** in partial fulfillment of the requirements of the award of degree of Bachelor of Technology in Civil Engineering, School of Studies, Engg. & 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 2021-22 under supervision and guidance.

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(Professor, Civil Engg.)

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DR. A. K. Parashar
Head of the Department
Department of Civil Engineering
G.G.V. Bilaspur

ABSTRACT

Civil engineering structures are an integral part of our modern society. Traditionally, these structures are designed to resist static loads. However, they may be subjected to dynamic loads like earthquake- s, winds, waves, and traffic. Wind-induced vibrations in structures increases the importance of structural design as the use of high-strength, lightweight materials, longer floor spans, and more flexible framing systems are used, results in structures that are more prone to vibrations. The diversity of structures that are sensitive to the effects of wind increases the need to improve the performance of constructed structures. For long span bridges, tall buildings and high towers or mast structures, wind load may be taken as a critical loading. The impact of wind loads is to be considered for the design of tall multistoried buildings. This study presents the wind effects on buildings with different aspect ratio. The effect of wind on the elevated structures is of prime importance as Wind flows relative to the surface of ground and generates loads on the structures standing on ground. This project covers comparison of wind zones with same G+5 residential building.

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ANALYSIS AND DESIGN OF RCC CHIMNEY

**A Major Project Report Submitted in Partial Fulfilment of Academic
Requirement for The Award of the Degree of**

BACHELOR OF TECHNOLOGY

In

CIVIL ENGINEERING

Submitted By

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SESSION 2021-22



DEPARTMENT OF CIVIL ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

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I.T., G.G.V. Bilaspur (C.G.)

ABSTRACT

Industrial Chimneys are generally intended to support critical loads produced by seismic activity and wind. So, it is essential to evaluate the dynamic response of chimney to seismic activity and wind loads. Response to earthquake and wind are more critical as chimney is a slender structure. The prime focus of this project is to analyse the 80 m height chimney to understand the variation of lateral deflection at the top of chimney, by varying the top diameter of chimney considering various loads such dead load, wind load and earthquake load using STAAD Pro. The project also focuses to develop a friendly user generalised programme in MS Excel for the analysis and design of reinforced concrete chimney and validate with the results available in the literature. Further, the effect of earthquake zone, wind, height and top diameter on the base shear force and bending moment are estimated using the developed programme in MS Excel. Further, comparison has been made for wind and seismic analysis. The seismic analysis was carried out as per IS 1893 (Part 4): 2005 and wind analysis as per IS 875 (Part-3): 2015. From the results it was concluded that the lateral deflection decreases with increase in top diameter. Further, the MS Excel program developed in the present project was verified with the results available in the literature and found to be correct. Therefore, a generalized programme is developed in MS Excel which is a more user friendly and it can be easily applied for the design of RCC chimney.

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COST-EFFECTIVE SMART DRIP IRRIGATION SYSTEM

A Major Project Report Submitted in Partial Fulfilment of Academic

Requirement

For The Award of the Degree of

BACHELOR OF TECHNOLOGY

In

CIVIL ENGINEERING

Submitted By

SANJAY KUMAR DEWANGAN

SANDEEP PAINKRA

AKASH PATRE

Under The Esteemed Guidance Of

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(H.O.D, Department of Civil Engineering)



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(2021- 2022)


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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)




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(Dr. Ashish Kumar Parashar)
Guide & Internal Examiner

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(External Examiners)

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ABSTRACT

Water availability is a critical variable for virtually every economic activity including agriculture and industry, the energy sector and public use. Specifically, Farmers could waste thousands of cubic meters of water daily through Irrigation. This project developed a cost-effective smart drip irrigation system capable of making autonomous decision of irrigating the soil with an appropriate amount of water required through monitoring of soil Moisture level. The soil moisture level was measured using soil moisture sensor. The threshold values of the soil moisture level required for soil to be irrigated was established. The soil moisture sensor, humidity & temperature sensor and water Pump are connected to the micro controller. The water pump is connected to the drip pipes. The system is able to start the water pump to irrigate soil and stop it as appropriate requirement on whether the soil irrigation factors value indicates need for irrigation or not. The system was installed in a real field to test and evaluate its performance. The field was of area 65 m² and the crops were of three types i.e., Brinjal, chilli & cowpea. To increase the viability and Universal application of the project the system was also installed and tested in MIG house garden where plants were grown in 5 pots i.e., Rose1, Rose2, Asparagus, Tomato, & Shame Plant. The system is implemented with a NodeMCU. The results of performance evaluation conducted on the system revealed that the system is able to monitor and water the plants effectively. Also, the system can be checked and monitored using the blynk application installed in our smart phone.

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A Major Project Report
on
**PLANNING, ANALYSIS AND DESIGN OF SPORTS
STADIUM**

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

by

AYUSH VERMA
RAUSHAN KUMAR
JYOTI KUMARI
B. Tech, VIII Semester

Under the Guidance of

Dr. V V S SURYA KUMAR DADI



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

SESSION 2021-2022

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

Certified that the major project entitled “**PLANNING, ANALYSIS AND DESIGN OF SPORTS STADIUM**” submitted by **RAUSHAN KUMAR, AYUSH VERMA and JYOTI KUMARI**, 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 2021-22 under supervision and guidance.

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

ABSTRACT

Planning, analysis and design of different structural elements of the sports stadium with reinforced concrete structure is the main objective of project. Therefore, surveyed the existing sports ground for obtaining a reference for the area of ground. It compiles standards for multi-purpose sports events. The stadium is having area of $178.4\text{m} \times 120\text{m}$, which gives an unobstructed view of the play court from anywhere in the stadium. This large area is to be divided into two sections, one of which shall be constructed into a stadium while the other part shall be converted into the ground. The plan of the stadium is drawn using AutoCAD 2019 software. The stadium structure is composed of special moment – resisting framed. Wind speed is taken as 39m/sec . and the Seismic zone III has been taken in this study. The grandstand structure is made of reinforced concrete and the roof is of structural steel using Pipe and Tube sections supported on Girders.

Dead loads, live loads, wind and seismic loadings data are considered based on IS:875 (PART 1-3) 1987 and IS:1893 (Part 1):2016. IS 456:2000 and SP16:1987 code is used for Design of R.C.C components such as Beam, Column, Seating Platform, and Footing and IS 800:2007 code is used for Design of Roof members. Integral modelling and Analysis of roof and other elements is carried out with software program of Staad. Pro V8i SS6 and also the designs are carried out as per provisions of relevant Indian standards. The quantity of Reinforced Cement Concrete, the Structural Steel, and the Masonry has been estimated for the designed components.

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A Major Project Report
on
DESIGN OF
WASTEWATER TREATMENT PLANT
FOR A SMALL TOWN- MAHOBA (U.P.)

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

by

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DEPARTMENT OF CIVIL ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)
Session 2021-22

DEPARTMENT OF CIVIL ENGINEERING
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Session 2021-2022



CERTIFICATE

This is to certify that the Major Project work entitled **WASTEWATER TREATMENT PLANT FOR A SMALL TOWN- MAHOBA (U.P.)**, presented by **Mr. Vishal Tiwari (Roll No.:18102039)**, **Mr. Murari Kumar (Roll No.:18102018)** and **Mr. Nitish Kumar (Roll No.:17102230)**, students of B. Tech VIII Semester, Civil Engineering Department, Guru Ghasidas Vishwavidyalaya, has been completed successfully and satisfactorily.

This Project report is submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Civil Engineering, SOS, Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

We wish success in all future endeavors to graduating students.

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ABSTRACT

The world is facing today, the water scarcity. Due to the mismanagement of water, the fresh water is being harnessed with great pace and generation of waste water and hence its safe disposal has become a concern. To Cope up with the present problem of water scarcity, the wastewater treatment and its recycling are given the prime importance everywhere. The wastewater if treated to the desired degree, will be helpful to reuse/ recycle it for activities like irrigation, air conditioning, washing and other industrial usage etc. As a result, the fresh underground / surface water may be spared and the water scarcity problem may be properly addressed. In context to the above, the wastewater generated in the municipal vicinity are required to be properly disposed by adopting proper sanitation techniques and giving the pretreatment to it.

The present work emphasizes the wise approach to systematically put the wastewater to pretreatment to treat the water to the desired degree as per the standards, prior to its disposal, so that the water may also be made eligible for its reuse/ recycle for irrigation etc. purpose and thus the waste be transformed successfully to a resource. The project work undertaken encompasses the following three objectives ; i) The design of the water supply treatment plant (starting from the source to the supply reservoir) for the small Mahoba town at U.P., carried out earlier, have been transformed to Excel spreadsheet for design with desired input data; ii) The complete treatment plant, (including the primary, secondary and partial tertiary treatment units), for the treatment of the waste water (for Mahoba Town), has been designed, to treat the waste water to an extent so that the treated water is suitable for irrigation and specific industrial usage, has been carried out, and iii) Excel spreadsheet for the above waste water treatment plant design have been prepared for quick design of desired units with varied input data within the specified range.

For the design purpose, the wastewater generated has adopted as 80 % of the water supply and the treatment plant has been designed with the design period of 25 years. The design discharge of 26400 cum per day has been adopted and various treatment units have been successfully designed as per standards and have been proposed for a population of 1 lakh people (Mahoba town). The salient design units include receiving chamber, Screens (Coarse/ Fine), pumping units, Grit chamber, Skimming Tank, PST, ASP, Aeration tank, SST, Sludge drying beds and disinfecting tank. The proposed treatment plant is efficient for bringing down the wastewater characteristics to the desired standard of disposal as applicable for Mahoba Town in U.P. The excel spreadsheet may be used readily for the design of water and Waste water treatment plant with limiting input data.

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A

MAJOR PROJECT REPORT ON

**‘Cost Estimation and Planning of
G+3 Residential Building’**

**In partial fulfilment of the requirements for the award of
the degree of BACHELOR OF TECHNOLOGY in Civil
Engineering**

Submitted by:
**Pankaj Kumar
Tamchi Zarbom
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Supervised by:
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(Department of Civil Engineering)



SESSION 2021-22

DEPARTMENT OF CIVIL ENGINEERING
INSTITUTE OF TECHNOLOGY,
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(A Central University established by the Central Universities Act No. 25 of 2009)
Session 2021-2022

CERTIFICATE

We hereby submit the project report entitled “Cost Estimation and Planning of G+3 Residential building” in the Department of civil engineering of Guru Ghasidas Vishwavidyalaya, under the supervision of **Mr. Prakhar Modi**, Assistant Professor, Department of Civil Engineering Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

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ABSTRACT

In a construction project after Designing and Analysis of the structure, we move towards planning, scheduling, and architectural model of a G+3 residential building. In this project, the main aim was to find out a detailed estimate of quantities of all the structural aspects of the G+3 building. It also aims in finding out the probable cost or the estimated cost of the project based on the computation of these quantities.

The structural aspects considered for the estimation of quantities are earthwork in excavation and backfilling, concrete work in foundation and R.C.C structures such as beams, columns, slabs, staircases etc. steel reinforcement in beams, columns, and other R.C.C structures and brickwork in the superstructure. The total cost of materials required in this project is Rs 50,72,630.99 and the total cost spent on human resources like Manson, labour, steel fixer and painter are Rs 8,80,211.86. Hence, the total cost required for civil work is Rs 59,52,842.85. If other expenses like electrical, sanitary, and water supply along with supervision charge are included then the total cost of construction of this building is approximately Rs 95,00,000.

This project also engages the planning and scheduling. Scheduling is an effort that requires extensive use and control of data. A project coding system such as a work breakdown structure is a key element in developing and controlling the schedule of the project. This project is based on the critical path method (CPM) logic to schedule the project and the resources. On daily basis, the activities were observed and monitored through primavera. All the important steps like creating EPS, WBS and linking activities according to their interdependence and availability of resources and scheduling has been made according to the calendar. The project has been started on 02/03/2022 and is expected to finish by 26/05/2023.

The project also deals with architectural modelling. It forecasted the visualization of the building before its construction. This shows all the building-related information such as beams, columns, slabs, staircase etc. Which helps in the customization of architectural design according to requirements during construction. This project visualizes the building along with the site and its

atmosphere. Cost estimation, planning, scheduling, and architectural modeling of G+3 residential building has been clearly exhibited in this report.

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A

MAJOR PROJECT REPORT ON

**“EXAMINING TRAVEL TIME RELIABILITY UNDER
HETROGENEOUS TRAFFIC CONDITIONS AND
MICRO-SIMULATION USING VISSIM”**

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**DEPARTMENT OF CIVIL ENGINEERING
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ABSTRACT

The present study has been carried out for examining travel time reliability under heterogeneous traffic conditions on five different urban arterial road sections in the two different cities of Bilaspur (C.G.) and Chamba (H.P.) in India. Travel time reliability indices along with descriptive statistics over selected periods were calculated and a new reliability measure called Reliable Buffer Index (RBI) is calculated in this research work for evaluating the performance of selected urban arterial road sections. This new measure has the credibility of explaining inherent causes and factors that affect travel time variations in short time intervals for a given traffic volume. The study also focuses on the determination of best fit or potential statistical distributions for analyzing travel time variations using car travel time data. The study results indicated that Buffer Time (BT) and Buffer Time Index (BTI) are the most effective measures that can capture the travel time variations. The study also presents a brief discussion on applications and limitations of existing travel time reliability measures that are commonly used. The results indicate that planning time (PT) and planning time index (PTI) is most effective parameter of calculation travel time reliability. Micro simulation modelling has been done to analyse traffic behaviour in urban area. The methodology and study results can be helpful for transportation planners in comparing the performance or efficiency of different road facilities in a network in terms of travel time reliability in developing countries like India.

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