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KINGS COLLEGE OF ENGINEERING

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DEPARTMENT OF CIVIL ENGINEERING **10/03/2022**

ACADEMIC YEAR 2021-2022/EVEN

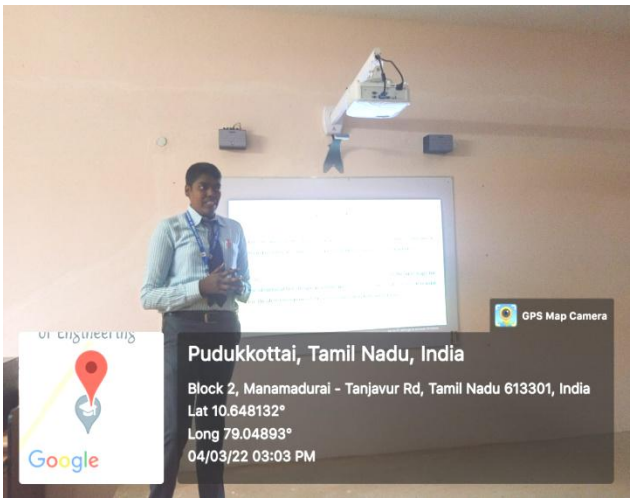
INTERNAL STAFF SEMINAR – REPORT

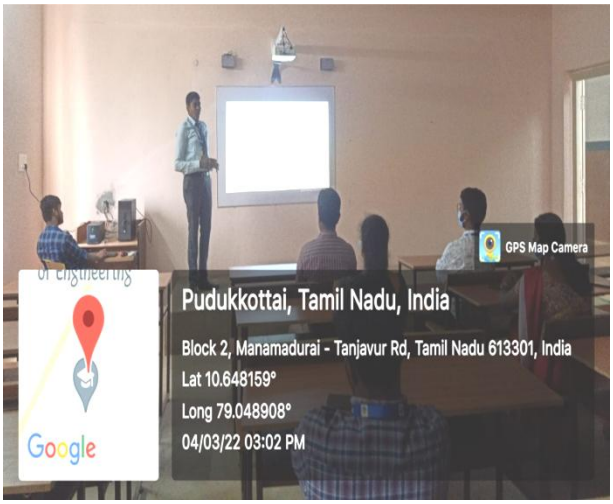
Background & Objective

Department of Civil Engineering had organized an Internal staff Seminar for the staff members for accessing online journals. The purpose of this seminar is to equip the faculty in new techniques through accessing online journals such as Springer, MAT, etc.

Seminar Session

A Seminar was held in the Department of Civil Engineering on 4th March, 2022 at 03:00PM. Mr.R.Sundharam/AP delivered his seminar talk on **"MODELING THE TEMPERATURE DEVELOPMENT ON FOAMED CONCRETE FILLED STEEL HOLLOW SECTION COLUMN"**. The paper was referred from MAT Journal, Journal of Construction and Building Materials Engineering.





Seminar talk by Mr.R.Sundharam /AP

Theme

Fire is one of the harsh environmental hazards that affect structures. Structural fire design is very crucial in the design of steel structures. Temperature distribution within the structural member is the first stage for the structural fire design available in EN1993-1-2 and EN1994-1-2; it is used for

the determination of stresses on the structure under fire. It is widely used in the construction of high-rise structures. Concrete-filled steel tube (CFST) columns have good properties at ambient temperature and high fire resistance ratings. These good characteristics make it more attractive in the construction industry, especially in high-rise structures. As a result of the benefit in reducing member size and self-weight of the structure, CFST columns have become acceptable in the construction of high-rise buildings. Higher load bearing capacity is achieved with a small cross-section size in CFST columns due to the combined action of steel tube and concrete core. However, a further decrease in self-weight of the structure can be achieved by incorporating lightweight concrete into the CFST columns as in-filled material. A numerical model was developed for predicting the temperature response of high-strength CFST columns exposed to standard fire. The effects of gap thermal conductance and emissivity influence at the steel-concrete interface were observed in the modeling. It was concluded that the thermal response of CFST columns filled with high-strength concrete can be accurately simulated. The main objective of this research paper is to understand the temperature distribution along the structural members and how to reduce the member size and self weight of the structural elements by using CFST columns in high-rise buildings.

Outcome

The Seminar clearly underlined the thermal response of FCFHS column under fire and predicted the temperature distribution for foamed concrete-filled steel hollow columns by the ABAQUS software. Staff members also got a thought about the temperature development on FCFHS column. This presentation shows to be effectual in such a way that, it underlined the sensitivity analysis and Finite element analysis for temperature development on foamed concrete filled hollow section (FCFHS) columns and for determining the value of gap thermal conductance between steel and foamed concrete that depict the best prediction of the temperature distributions respectively. At the end of seminar, discussions were done among the faculty membes how to develop a different numerical model for predicting the temperature response of high-strength CFST columns exposed to standard fire. Staff members shared their views regarding seminar and gave their feedback.