

Rathmalana, Sri Lanka | 12<sup>th</sup>. December 2024

## ESTIMATION OF ELECTRICAL DEMAND FACTOR FOR MULTI STORIED APARTMENT BUILDINGS: CASE STUDY

N. Botenne<sup>1</sup>, Diluma Madhushanka<sup>1</sup>, Nuwan Fernando<sup>1</sup>,  
Chamila Sumathiratna<sup>1</sup> and Dimuthusiri Suraweera<sup>2</sup>

<sup>1</sup>*Department of Building Services Technology, University of Vocational Technology, Sri Lanka*

<sup>2</sup>*Department of Electromechanical Technology, University of Vocational Technology, Sri Lanka*  
*Chamilas@uovt.ac.lk*

**Abstract.** Electricity plays a vital role in our daily lives, and understanding the demand factor is essential for accurately sizing electrical infrastructure such as transformers, cables, switchgear, and generators. However, the demand factors used for designing these systems often differ significantly from the actual demand in residential buildings, particularly in apartments. This study compares the designed and actual demand factors for low-rise and high-rise apartments. For low-rise apartments, the de-signed demand factor was 0.416, while for high-rise apartments it was 0.544. The installed capacity for low-rise apartments was found to be 45.67 kVA, and for high-rise apartments, it was 22.06 kVA. Corresponding actual demand factors were 0.24 for low-rise and 0.27 for high-rise apartments, showing a considerable difference from the designed values. These findings suggest that the current systems are underutilized, leading to inefficiencies. Additionally, the demand factors used in other countries are not fully compatible with local conditions, and a more realistic approach to designing electrical systems could lead to significant cost savings by optimizing system capacities.

**Keywords:** Demand Factor, Designed Demand, High-rise