DESIGN STRUCTURE MODIFICATION WISMA SEHATI MANOKWARI BUILDING USING DUAL SYSTEM

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Abstract

Because of the Indonesian archipelago is a region prone to earthquakes, then the infrastructure development should be qualifies in earthquake requirement. For that resistant design and special supervision is needed to reduce the risk caused by the earthquake. One of the structural system that can be used for resistant building by strong earthquake is the dual system.

Dual System (dual system) is one of the structural system which is the gravitation load is entirely borne by the space frame (frame), while the lateral load is shared by the space frame and shear wall (Wall Scroll / wall structure). According SNI 03-1726-2002 Article 5.2.3 space frame is carrying at least 25% of lateral load and the rest is borne by the shear wall. Because the shear wall and the space frame in the dual system is a single unitary structure, the same lateral deflection is needed, or at least the space frame able to follow the lateral deflection occurs. Shear wall is made of reinforced concrete in which reinforcement will receive a lateral force of an earthquake, as the load that has been planned.

With this system, the main frame dimension can be minimized by using a shear wall. Use of this dual system is more efficient than the moment resisting frame system, because in a
moment resisting frame system, higher that building structure, bigger that dimension is used so more structure ability is thrown to withstand its own weight. And so the building frame system, when the building is located in strong earthquake areas and the building’s build higher, thicker shear wall is needed, so the shear wall is also getting weight.

In this final submission, the author will modify the Wisma Sehati Building that the previous structural design was using a system of Ordinary moment resisting frame structures (SRPMB). In this final, the building is planned to re-built by using the Dual System which consists of 10 floors with 1 basement floors, and it’s designed as an office building in strong earthquake areas.

Keywords: Dual System, Shear wall, Space Frame, a strong quake zone