

Survey of Houses Damaged by Quake, Sept. 28, 2018 Sulawesi-Indonesia

(Term: November 2018)

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(Keywords) *MSRB, Precast, Bad job, Reinforcement*

1. Introduction

An M7.4 quake struck Central Sulawesi Province, Indonesia on September 28, 2018. The capital, Palu City, located on the moving fault sustained severe damage.

A tsunami destroyed the coastal zone, and liquefaction caused landslides damaging housing complexes. Most high-rise buildings collapsed.

NILIM surveyed the damaged houses and buildings between November 2-4 in order to support reconstruction.

2. Damaged buildings

Most detached low-rise houses survived within the city, even nearby the fault. Conversely, most high-rise hotels, hospitals, and shopping malls, which were constructed after 2006, collapsed.

As for damaged publicly operated rental houses, drawings were provided by the city, and we precisely checked the damage on-site (Figs. 1, 2).

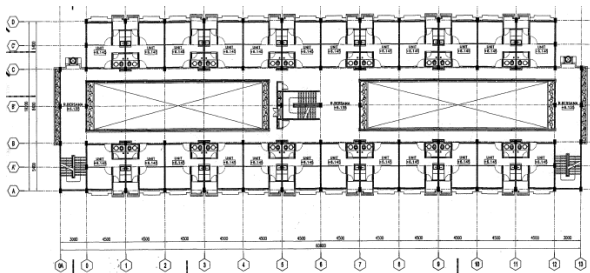


Fig. 1 Standard floor plan for MSRB of Palu

3. Review of past technical cooperation on the MSRB

The Building Research Institute under the Ministry of Construction provided technical cooperation to the Indonesian Research Institute for Human Settlement in the fields of quakeproof buildings and housing since the 1980s, including a project for developing Appropriate Technologies on MSRB (1993-98), which resulted in a proto-type design for the five-storied MSRB.

The damaged houses were based on the prototype through several outreach efforts for improvements by the Indonesian side, which included prefabrication. The houses were constructed through a national budget based on the technical standards provided by the Ministry of Public Works using stable pile foundations and precast columns, beams, and floor panels. The reinforcement bar was provided as part of the design, while construction



skills were seemingly poor (photo), especially the setting of the hoop bars, which caused displacement of the vertical bars (photo, Fig. 2).

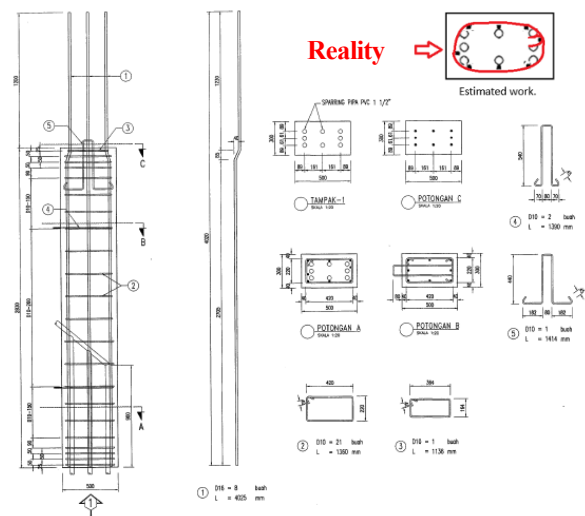


Fig. 2: Reinforcement of broken column

We sent the reports in English to the city and the Ministry of Public Works on Nov. 12. The next week, reconstruction of Lere MSRB was decided. NILIM is now providing 3D data of the buildings for structural analysis and an improved design.

1) Research Institute for Human Settlements,
Ministry of Public Works (Bandung)

<http://www.puskim.pu.go.id>

Now assisting in the reconstruction of houses in Lombok (June) and Sulawesi (Sept.).