Bulletin Information on Damages to Adobe Houses by Peru Earthquake August 15, 2007 and Activities after the Earthquake

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1. Serious Damages to Adobe Houses in Peru

Adobe is material of houses for low income groups commonly used in Latin America including Peru. It is one of the most vulnerable materials against earthquakes and most seriously damaged one by Peru Earthquake this time. Adobe houses are constructed usually by residents themselves with almost no engineering interventions.

2. Model Houses by Project for Dissemination of Seismic Adobe Houses, Which Showed Good Performance during the Earthquake

Japan International Cooperation Agency (JICA) has been implementing a pilot project for dissemination of seismic adobe houses in Peru from FY2004 to FY2006 and constructed seven model houses by residents for their training in five towns/villages in Peru (Provincia Canete and Provincia Yauyo, Departamento Lima and other areas) in cooperation with SENCICO (National Services of Training for the Construction Industry) and CIDAP, Peruvian NGO. Those model houses proved to be safe enough while adobe houses in the neighborhood heavily suffered from the Earthquake.

This is bulletin information prepared by Building Research Institute (BRI), which takes role of technical support for the pilot project, with quick reports and photos from JICA Peru Office.

Photo 1 Model house in Canete in Lima State with almost no damage

Photo 2 Damage by the Earthquake in Canete in Lima State

Photo 3 Adobe houses damaged by the Earthquake

3. Activities after the Earthquake

JICA Peru Office is preparing for detail survey on damages of adobe houses and having discussions on reconstruction of houses with relevant local government in the affected area.

<Reference>

Peruvian Government and JICA agreed to implement the second phase of the pilot project from FY2007 to FY2009 for targeted area of all the states of Peru before the seismic event and have already started activities.

<Annex> Outline of the Seismic Design and its Construction Procedures

The seismic design applied to the model houses was developed by researchers in Pontificia Universidad Catolica del Peru (PUCP) and their partners and adopted into a Peruvian official standard (Norma Tecnica E.080). The key points of the seismic design are as follows.

1. Ring beams on the top of adobe walls
2. Vertical and horizontal reinforcement of canes inside of adobe walls
3. Foundation of concrete

Photo 4 Completed model house with many buttresses and raised foundation of concrete for prevention of humidity from ground (red pars H:30cm)

Photo 5 Setting of vertical reinforcement Nails are placed on center lines of walls drawn on concrete (t:10cm) in every 80cm for fixing vertical reinforcement of canes

Photo 6 Casting of concrete for foundation Foundation: W:55cm, H:80cm, no reinforcement Vertical reinforcements are anchored to foundation

Photo 7 Setting of horizontal reinforcement of crashed canes in every four layers connected to vertical reinforcement with nylon strings

Photo 8 Ring beams on top of adobe walls Composed of two main members of timbers (7.5x7.5cm) and connecting members

Photo 9 Wooden roof beams (5x20cm) connecting walls facing each other at intervals of 60cm