July 2016 Vol. 3 Issue 4

civil + structural ENGINEER

CELEBRATING THE DESIGNERS OF THE WORLD AROUND US

AEC FIRMS TEST MIXED REALITY

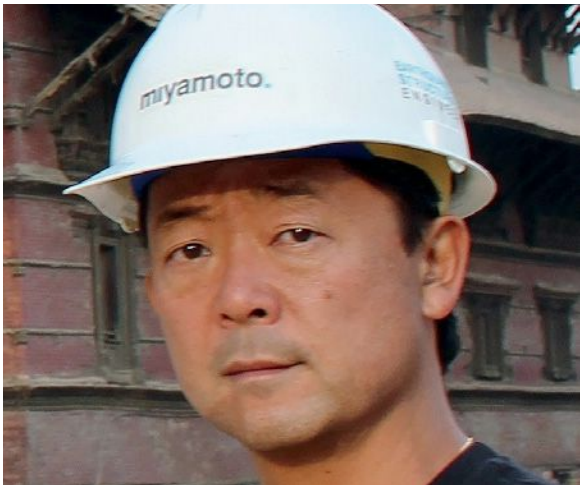
Cardno's drone innovations

Dewberry creates sustainable green space at UVA

Gannett Fleming-designed signature bridge

AIA selects 2016 top 10 green projects

zweig group



LOST CITY

FOLLOW ME TO Portoviejo, Ecuador, for just one morning: I awake to pounding at the thin door of my thatched hotel. Groggy, I find a slender woman waiting in the morning rain. “The mayor is waiting for you,” she says, in a mix of English and Spanish. My team and I had no prior contact with the mayor of Portoviejo, one of the worst damaged cities in the April M-7.8 earthquake that hit coastal Ecuador, but this is how it always starts — a call, a summons.

Engineers can make a significant impact prior to disasters. We don’t have to lose cities.

We meet at the radio station, where the mayor has just broadcast an update. He wants to explore how we might help him. I explain that there are “many similarities in urban disasters. Some do well. Some screw things up pretty badly.”

He is quick and direct: “I think our engineers are doing a good job, but I want another expert opinion. If you tell me we need to take everything down, I will. But I need to know if my town can be saved.”

In two hours, we are downtown under police escort. Downtown has been reduced to a fenced-off, 40-block Red Zone. More than 200 people died here. A broken, eight-story modern office tower tilts precariously over the debris-strewn street like the Leaning Tower of Pisa. It could collapse at any minute. We walk block-to-block conducting our assessment. Owners extracting valuables from businesses stop us— “Can you check my building? Not sure how bad it is. Por favor. Si se pueden.”

We climb countless stairs in countless buildings. In the badly damaged Municipal Building, gaping holes replace entire walls. Desks, cabinets and coffeemakers hang on the edge where walls were. It looks terrible, but it met the intent of the code — minimum life safety. Still, repairing the building may not be feasible since the damage is so severe. The same thing can happen in our cities. U.S. code and practice also provides only minimum life safety — not sustainability — in case of disaster.

At the school that has become the disaster command center, I compliment the local team on the job they are doing. “But you have this huge red zone. This could prolong reconstruction and really hurt your downtown, perhaps indefinitely.” I tell them about Christchurch 2011: A once vibrant city is now mostly empty parking lots. A prolonged red zone is not a good thing. Government cannot reconstruct alone; the private sector has to carry the majority of the burden.

The vice mayor shows up and asks us to oversee the strategy for the most dangerous buildings. I kindly say

no. “But I would be more than happy to work with your engineers tomorrow so they can learn and take it from there,” I tell him.

To me, this is the heart and soul of disaster reconstruction: Work with locals to enhance their capacity so they can do it. It is a subtle distinction, but crucial. Building capacity creates jobs and a knowledge base. We lose so much in disaster. Why not add something back?

Disaster changes everything in less than a minute. Places to work, live, learn, and worship essentially disappear. No power, no water, no police — at least for a while. We engineers can shed light in the darkness. But most importantly, we can make a significant impact prior to disasters here and abroad. We don’t have to lose cities.

H. KIT MIYAMOTO, PH.D., S.E., is the CEO and a structural engineer for Miyamoto International (http://miyamotointernational.com), Global Risk Miyamoto, and a nonprofit organization, Miyamoto Global Disaster Relief. He specializes in high-performance earthquake engineering, and disaster mitigation, response, and reconstruction.

Severe damage to buildings in Portoviejo, Ecuador following the April earthquake.