**WHY LÉOGÂNE?**

- Notre Dame has led a diverse, integrated approach to public health intervention focused specifically on lymphatic filariasis for over a decade, making Léogâne a “home” to many Notre Dame facilities housing our faculty, staff, researchers and alumni.
- Longstanding ties between Haiti and Notre Dame/Congregation of Holy Cross led to founding of Committed to Haiti Initiative in Spring 2010.
- Located approximately 20 km west of quake epicenter.
- It is estimated that 62% of buildings in Léogâne collapsed and another 31% were damaged, making the need for assessment and rebuilding dire.

**OBJECTIVE**

To develop a plan for culturally-appropriate, long-term rebuilding of Léogâne’s residential housing stock, which is sustainable (uses locally available materials and construction technologies) and resilient to earthquakes and hurricanes.

**Deficiencies**

- Lacking internal conference transfer
- Insufficient shear
- Insufficient strength to resist them
- Column fails in shear, immediately transfers forces and fails neighboring columns
- Underdesigned and/or inadequately detailed columns
- Generally results from using CMU as formwork
- Economic constraints lead to widely spaced transverse reinforcement — lack of confinement
- Lateral systems not adequately tied together
- Larger “mansion” employed same flat slab/column systems used in smaller homes, with slabs inadequate to engage undersized columns over plan and with insufficient reinforcement to facilitate transfer of shear from slab to column
- Excessive mass
- Heavy partitioning CMU wall, provision for adding floors later leads to use of heavy slab roof
- Poor materials, construction practices, construction in stages with variable material quality and workmanship

**Constraints**

- Size columns to CMU width (default formwork)
- Sound design and construction is available but too costly
- Compromise transverse reinforcement
- Higher quality materials available but too costly
- Use of lower grade materials (aggregates, CMU)

**Requirements**

- Privacy valued (partitioned, multi-room houses)
- Low income: at least four rooms, single story
- Higher income: multi-story houses, built typically in stages
- Security is important
- Barred windows/doors, masonry walls
- Implementable by workers with no code enforcement, oversight or licensure
- Various labor models: skilled foreman, apprentice, master builder
- Use of lower grade materials (aggregates, CMU)

**Viable Solutions**

- Short-term solutions
  - Shelters finally reached Léogâne in late July – early August, 2010; NGOs provide temporary housing that is not sustainable as long-term solution
  - Repairs are underway, often without proper understanding so immediate education and outreach is needed
  - Local builders already attempting to modify CMU wall design to improve performance
  - Long-term solutions require appropriate partners to change practices and execute outreach and education
  - Entrepreneurs seeking to capitalize, introducing permanent housing that is not affordable or sustainable using imported materials or labor force
  - Introduce MRF systems with reusable, community formwork to eliminate CMU as formwork element
  - Introduce alternate partitioning system (eliminate use of CMU); pressing agricultural waste into panels (local business initiatives); retain CMU only for property boundaries (fences), etc.
  - Explore alternate reinforcing materials (e.g., bamboo) for lower-income construction
  - Encourage non-engineered housing that is single story with lighter roofing systems

**SITE VISITS**

March 6-10, 2010: Determine cause of poor performance/collapse of buildings, primary focus on residential housing.

August 18-22, 2010: Talk with (i) local architects and engineers to understand methods of knowledge dissemination and (ii) local families to understand housing requirements.