BUILDING CODES & THE REGULATION OF THE BUILDING INDUSTRY

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WHERE ARE WE?

- No Small Building Code
- No National Building Code
- No Mandatory Registration of Building Professionals
- No licensing of Contractors
- Approval Process poor
- Few Buildings are properly designed for earthquakes
BUILDING CODES- SMALL BUILDINGS


- **Must be Purchased from TTBS**
- **Need to be made into a Code by Law**
- **Building Inspectors need to be Trained to use it**
- **Public Awareness and Training Needed URGENTLY**
NATIONAL BUILDING CODE-LARGE BUILDINGS

Why a National Building Code?

- TO PREVENT THIS
Earthquake Damage
Hurricane Damage
When can we get a National Building Code?

- A Caribbean Building Code has been in the Making for 6 Years and is far from completion
- APETT/TTBS has Completed the Technical Work for the Structural Components Based on the IBC
- TTIA/TTBS Have Started the Architectural Sections
- Government Supports appears available, A National Building Code can be Published in 3-5 Months.
- It MUST however be Passed into Law
WHY DO BUILDINGS FAIL - EARTHQUAKES

Weak Axis Column Failure
WHY DO BUILDINGS FAIL - EARTHQUAKES (2)

Soft-story

Spiral Confinement

Virtually NO Confinement

Olive View Hospital, 1971 San Fernando Valley earthquake
How much can we afford to loose? - POS

Based on a Magnitude 7.5 earthquake

US$4,928,619,629.39
How much can we afford to lose?  – San’dō

Based on a Magnitude 7.5 earthquake

US$6,081,551,866.97
Engineering Professions Act Passed in 1985
Architecture Profession Act Passed in 1992
Neither Act makes it Mandatory for Professionals to be Registered to Practice
Land Surveyors, Doctors and Lawyers Must be Registered before they can Practice
In other Caribbean Countries such as Barbados and St. Lucia there are Greater Levels of Control
IMPROVING THE REGISTRATION PROCESS - ARCHITECTS

For Architects the Registration Process Works, as you must have the Following.

- An Accredited Degree
- To be Practicing for Two Years in T&T
- To Pass their Exam
IMPROVING THE REGISTRATION PROCESS - ENGINEERS

Civil Engineering
- Structural and Geotechnical
- Highways and Transportation
- Project Management and Environmental Engineering

Mechanical Engineering
- Air Conditioning
- Plumbing

Electrical Engineering
- Electronics
- Communication

Chemical /Industrial Engineering
- Petroleum Engineering
Registered Engineers Allowed to Stamp Building Plans  
(THIS IS OUTSIDE OF PLUMBING & ELECTRICAL)

- Civil Engineers  BOETT 04
- Structural Engineers  BOETT 19

- There are only about 17 Registered Structural Engineers
- ONLY REGISTERED STRUCTURAL ENGINEERS should STAMP BUILDING PLANS
- Criteria for licensing Structural Engineers need to be far more stringent
CHANGES NEEDED IN THE REGISTRATION FOR STRUCTURAL ENGINEERS

- Mechanism Needed to Transfer the Appropriate Civil Engineers to the Structural Category
- A special sub-committee should be set up for this
- R.E.’s applying to transfer should prove via portfolio that they are capable of engineering to current codes and standards
- All Engineers wish to register under section 19 should provide a portfolio to the sub-committee
CHANGES NEEDED IN THE REGISTRATION FOR STRUCTURAL ENGINEERS con’t

- Engineers applying to register from overseas should also submit a portfolio or be a Registered Engineer from a jurisdiction that would qualify them.

- For example a Structural Engineer registered in California should be automatically considered subject to an interview.

- A member applying Chartered by the IStuctE should not be automatically considered as Seismic Design is not a requirement for their Charter.
Why More Stringent Requirements for Structural Engineers

- The Caribbean not friendly to Structural Engineers
- Unlike most parts of the world we can be subject to Earthquakes, Hurricanes, Landslides and Tsunamis.
- Earthquakes cause the most concern because they can strike every building and are far more devastating than hurricanes
- The design for large earthquakes is the only area of structural engineering where the building is not designed fully resist the applied forces
- The training required for this level of design is far more extensive and totally different to design for moderate to light earthquake areas
Why More Stringent Requirements for Structural Engineers (Cont’d)

- Seismic Design is getting even more complex as the design methodology is shifting to Performance Based Design.
Code of Practice – Design Loads
Code of Practice – Steel

AISC 341

AISC 360
Code of Practice – Concrete

Reinforced Concrete

Masonry
Code of Practice – Timber

Wood (Timber)
Approval of Building Structures

- At the Regional Corporations and City Councils there are almost no Engineers experienced in Earthquake Resistant Design.
- Ministry of Works is currently the only agency that has some competence in Structural Design.
- Many buildings that have received approvals do not meet code requirement of UBC 97 or IBC.
- Final approvals are not linked to Inspection documentation.
Approval of Building Structures Cont’d

- Building Inspectors should be trained in the Small Building Guide which must be the document on which Small Buildings are Approved.
- Building Inspectors are not qualified to approve “large Buildings.
- It is unlikely that State Agencies will ever develop sufficient numbers of the quality of Structural Engineers needed for the approval of “large “ buildings.
- The French have solved these issues in their Caribbean Island by privatizing the Structural Approval process using a system initiated by Insurance Companies called “Bureau de Control”.
- This may take some time to introduce. We can start by the automatic approval of peer reviewed designs.
Contractor Licensing

- None Exist To Date!
  - Only self-regulation is practiced.
  - Prequalification is the only means of classification available to the public and private sector.
  - Short Listing of Contractors are often based on past relationships
  - The TTCA has prepared a position paper for Contractor Licensing it has been submitted to a Cabinet sub-Committee over a year ago
  - This is very important for the development of the industry and the protection of the public
Has it been done it Right?

Quality Assurance
Quality Assurance

- Classification of members of the project team and assigning clear responsibilities
- Ensuring that work is being checked at regular intervals
- Proper testing of material and recording of results.
- Insist on Quality Assurance Documentation
- Training, Awareness and Certification
- Referenced Technical Specification and Calculations
Inspection

- Special Inspections are required for all buildings (except buildings classified as small) constructed in Trinidad and Tobago.

- For Steel buildings continuous special inspections are necessary for welding in accordance with AISC 341 unless the welder is certified (see exceptions).