The State of Building Codes in Trinidad and Tobago

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Outline

- Natural hazards and risks to buildings
- Culture, Technology, Results
- Role of Building Codes in Safe Buildings
- Status of building codes
- TTBS codes, standards and enforcement activities
- Challenges to code development
- Getting involved
Building damage caused by recent disasters

Haiti (2011) 70% GDP 2444/100000

Mexico (2017) 0.2% GDP 0.26/100000

Dominica (2017) 200% GDP 86/100000

Puerto Rico (2017) 73% GDP 1.9/100000
Technology

- the application of scientific knowledge for practical purposes

Culture

- the customs, and social behaviour of a particular people

Results

- a thing or outcome that is caused or produced by something else
Results

A safe, sustainability, comfortable building

Culture

Societal norms and attitudes towards regulation and quality

Technology

- Documented best practice/Building Codes
- Engineering analysis & modelling
- Expected forces (seismic/wind)
- Inspection tools
What do we want in a building?

- Comfort
- Sustainability
- Safety
Weather and climate

Soil type

Design

Seismic conditions

Materials

Construction

Safe and Resilient Building

STRUCTURAL & FIRE REQUIREMENTS
Water & Sewerage
Ventilation
Design
Lighting
Accessibility
Construction

Habitable Building

HEALTH/WELFARE/OCCUPANCY REQUIREMENTS
SUSTAINABILITY REQUIREMENTS

Water conservation

Energy Efficient (EE) HVAC

Design

Construction

EE Lighting

Renewable Energy

Sustainable Building
What do we want in a building?

- Comfort
- Sustainability
- Safety
Are buildings in Trinidad and Tobago capable of withstanding natural disasters?
Are we prepared?

- **Earthquakes**
  - Largest earthquake - Magnitude 7.5 (1766)
  - Recent Magnitude 6.9 in August 2018
  - 6 Earthquakes greater than Magnitude 6.0 since 1988

- **Storms**
  - Brett (2017), 66km/h winds & $20M damage
  - Alma (1977), 147 km/h winds & $5M damage
  - Increased frequency of Category 5 storms
Fatalities caused by buildings

Crushed by falling gate

A 52-year-old Claxton Bay man died on Tuesday three days after being crushed by a gate at his home.

Carpenter crushed by wall

AN Erin carpenter was killed on Tuesday when high winds knocked over a wall and it crushed him on a jobsite. Percival Laing, 72, of St Francis Village, Erin died on spot.

Pathologist rules accidental electrocution in girl’s death

The death of eight-year-old Breanna Jessica Jagial has been ruled as an “accidental electrocution” by attending pathologist Dr Valery Alexandrov following an autopsy done yesterday at the Forensic Science Center. St James.

Fire incidents rise, 14 deaths this year

WITH three months to go before year’s end, the Trinidad and Tobago Fire Service (TFTS) is reporting a drastic increase in reports of structural fires leading to losses which have run into the tens of millions of dollars. For this year so far, 14 lives including those of three children, have been lost.
What is a Building Code?

- A code of practice is a set of written rules which explains how people working in a particular profession should behave.

- **building code**, is a systematic statement of a body of rules that govern and constrain the design, construction, alteration, and repair of buildings.

- Can become law when formally enacted by an appropriate authority.
Need for a National Building Code

- Investment in built infrastructure at risk
  - Huge economic and social costs in the event of disasters

- Many residential buildings and small commercial buildings built by informal construction sector

- Need for clearly defined and objective requirements to guide building professionals and regulatory agencies
Status of building codes?

- A formal and accepted National Building Code does not exist at this time.

- Existing elements of a Building Code in place
  - *Guide for the Design and Construction of Small Buildings*
  - *Electrical Wiring Code*
  - *Accessible Buildings and Facilities*
  - *MOWT Structural Design Guidelines*
  - *National Plumbing Code*
access to adequate, **safe** and affordable housing...

**reduce the number of deaths**, people affected and economic losses caused by **disasters**,

ensure **universal access** to safe, inclusive and accessible, public spaces and **green** areas,

The foundation of Trinidad and Tobago will be strong families and **safe, sustainable communities**

Strengthen environmental governance - “**national building codes** must also be developed.”

“**provide for the structural and fire safety of buildings and the safety, health and general welfare of persons occupying buildings.**”

Preparation and review of the National Spatial Development Strategy and the development of codes and standards
TTBS Mandate

- National Standards Body established under Standards Act No. 18 of 1997, operates under the Ministry of Trade and Industry
- To ensure industrial efficiency and development; promote public and industrial welfare, health and safety; and protect the environment.

- Standards Development
  - Based on consensus and internationally accepted approaches
  - Expert driven
  - All comments/feedback considered

- Key international and regional partnerships
  - ISO, ASTM, ICC, CSA, NFPA, UL, CROSQ, Regional NSBs
Small Building Guide

- TTS 599:2006, *Guide to the design and construction of small buildings*
- Applies to
  - Single or multiple family
  - Residential or general purpose use
  - Comprising not more than 2 storeys, and
  - A gross floor area of 300 m² or less
- Intended to
  - Improve quality of design and construction
  - Simplify the approval process for small non-complex buildings
  - Provide construction guidance to the (informal) industry
- Voluntary but used informally by regulators and professionals
TTBS Codes and Standards

- Small buildings
  - TTS 599, Guide to the Design and Construction of Small Buildings

- Electrical installations
  - TTS 171, Trinidad and Tobago Electrical Wiring Code - Low voltage installations, high voltage installations and renewable energy systems

- Accessibility
  - TTS/ICC/ANSI A117.1, Accessible buildings and facilities

- Energy Efficiency
  - CARICOM Regional Energy Efficiency Building Code
TTBS Standards for Construction Products

1. Steel reinforcing bars: TTS/ASTM A615 & TTS/ASTM A706
2. Roofing Sheets: TTS 69, Roofing Sheets: TTS 69
3. Purlins & Framing members: TTS 598, Cold formed steel framing members
5. Concrete blocks: TTS/ASTM C90:2010, Concrete blocks
6. Clay blocks: TTS 587 & TTS 588, Hollow clay blocks
TTBS Enforcement Activities

- Mandatory Product Certification Schemes
  - Cement
  - Roofing Sheets

- Inspection Scheme
  - Cement
  - Steel bars
  - Paints
  - Electrical products and components
Challenges to Code Development

- Technical work is voluntary
- Risk-targeted seismic hazard maps
- Soil maps
- Need to ensure a robust regulatory framework
- Need for improved stakeholder input and feedback
What’s in your best interest?

- Codes are MINIMUM REQUIREMENTS
- A building built to code is the most unsafe building that it is legal to build
- Seek professional guidance in building design and resilience plans
- What building resilience do you want?
  - Life safety? (catastrophic damage, but inhabitants saved)
  - Damaged? (major damage and non functional but can be repaired)
  - Functional? (minor damage, but functional)
- Affects choice of
  - Design wind speeds (ASCE 7)
  - Seismic forces (ASCE 7)
  - Flood hazard (ASCE 24)
  - Building use and Classification (IBC)
Building damage caused by recent disasters

Haiti (2011)  70% GDP  2444/100000

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How to get involved?

- Participate in code and standards development projects
  - Voluntary technical expertise
  - Comment on draft standards
  - Stakeholder requests

- Voluntarily use Codes and Standards
  - Future proof projects
  - Safety, Welfare and Sustainability

- Utilize TTBS Conformity Assessment services
  - Verify product quality
  - Incorporate standards in procurement processes
Thank you kindly.

I’m pleased to address any questions/concerns at this time.