

## ► GEM Building Taxonomy Tester (TaxT) v4.0: User Guide

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The GEM Building Taxonomy, its Glossary and GEM in general are made possible thanks to the contributions of professionals and academic researchers, disaster risk professionals, engineers and students, worldwide. GEM's mission is to increase earthquake resilience worldwide by bringing data, tools and knowledge together, sharing it and making it accessible where it is most needed. We invite you to join us in this collaborative endeavour.

### User Information

TaxT v4.0 is a Windows-based computer application which enables a user to record information about a building or a building typology using 13 attributes of the GEM Building Taxonomy v2.0. The attributes have been divided into the following four groups, which are shown as separate tabs on the TaxT screen:

1. **Structural system** (attributes: Direction; Material of the Lateral Load-Resisting System; and Lateral LoadResisting System);
2. **Building information** (attributes: Height; Date of Construction or Retrofit; and Occupancy);
3. **Exterior attributes** (attributes: Building Position within a Block; Shape of the Building Plan; Structural Irregularity; and Exterior Walls), and
4. **Roof/floor/foundation** (attributes: Roof; Floor; and Foundation).

An application of TaxT starts when a user clicks on the **Structural System** tab and starts entering the information about a building or a class of buildings (building typology). It is important to note that the user is not expected to enter information about any attribute (s)he is not familiar with or is unable to contribute information. The Taxonomy provides an opportunity to describe characteristics of an individual building in detail, and at the same time it can describe general characteristics of a class of buildings found in a village, city, or a country/region. As a result, the user who wishes to describe a building typology may not need to enter any information about attributes such as Building Position within a Block. This decision should be made by the user and there is no specific guideline.

The user will proceed by providing building information by scrolling through each section (tab) on TaxT screen.

In case the user would like to get further explanation on an attribute, TaxT enables a direct link to online glossary (Internet access required) by clicking on the Glossary box. The glossary URL is

<http://www.nexus.globalquakemodel.org/gem-building-taxonomy/overview/glossary>

Finally, the user can click on **Create a Report** tab, to generate a report which summarizes attribute values (s)he has chosen as representative of the building typology under consideration. Users are encouraged to include a photo of the building and a brief text summary. The report can be saved as a 1-page document in Adobe Acrobat.

A **taxonomy string** is shown at the bottom of the TaxT screen display and the user does not need to enter any information related to the string - TaxT generates a taxonomy string on the fly. Taxonomy string is a combination of unique IDs for selected attribute values and delimiters (e.g. "/" and "+"). The string summarizes each building description in the GEM Building Taxonomy language, which is used to communicate building information in the Global Earthquake Model (mostly in computer-based form).

The users are encouraged to review a report describing the GEM Building Taxonomy v2.0, which can be accessed at the following web page <http://www.nexus.globalquakemodel.org/gem-building-taxonomy/posts>

### **TaxT v4.0 can be used only on computers with Windows-based operating systems.**

The characteristics of a building, such as height, materials, structural system, etc. determine its vulnerability (likelihood of damage or collapse) in an earthquake. A common building classification scheme (or taxonomy) has been developed within the scope of GEM to document variations in building design and construction practices around the world. The GEM Building Taxonomy serves to describe and classify buildings in a uniform manner

around the globe. Information on global building stock collected using the GEM Building Taxonomy will be used to assess seismic vulnerability and associated risk.

The taxonomy describes characteristics of an individual building or a class of buildings with similar characteristics, commonly referred to as a building typology, by means of the following 13 attributes: i) direction, ii) material of the lateral load-resisting system, iii) lateral load-resisting system, iv) height, v) date of construction or retrofit, vi) occupancy, vii) building position within a block, viii) shape of the building plan, ix) structural irregularity, x) exterior walls, xi) roof, xii) floor, and xiii) foundation. Each attribute describes a specific building characteristic that can potentially affect seismic performance of an individual building or a building typology.

The current version of the taxonomy, that is, GEM Building Taxonomy v2.0, was completed in August 2013, and it supersedes the previous version 1.0 (Basic Building Taxonomy) from March 2012. The taxonomy was developed by an international team chaired by Charles Scawthorn (USA) and Svetlana Brzev (Canada), with significant contributions from Andrew Charleson and Luke Allen (New Zealand), Marjorie Greene (USA), Kishor Jaiswal (USA), and Vitor Silva (Portugal). The taxonomy was developed in conjunction with other GEM researchers and builds on the knowledge base from the EERI and IAEE World Housing Encyclopedia and the USGS PAGER project.

The Building Taxonomy is accompanied by an electronic Glossary that contains text and graphic illustrations which describe the attributes included in the taxonomy. The Taxonomy and Glossary can be accessed at the following web pages:

1. Online version of the GEM Building Taxonomy v2.0 in tabular form:  
<http://www.nexus.globalquakemodel.org/gem-building-taxonomy/overview>
2. Online glossary (review individual terms and provide comments):  
<http://www.nexus.globalquakemodel.org/gem-building-taxonomy/overview/glossary>

If you have any questions regarding the GEM Building Taxonomy and the Glossary, please contact us at [buildingtaxonomy@globalquakemodel.org](mailto:buildingtaxonomy@globalquakemodel.org)

### **Credit**

We welcome and appreciate contributions to the GEM Building Taxonomy v2.0 in the form of TaxT reports, as well as photographs and/or drawings illustrating buildings around the world. Contributions that are accepted and published will be released under [CC-BY v 3.0 unported](#).

Contributions are going to be credited in the manner specified by the author or licensor.

### **Submission of TaxT Reports and Building Photos**

To submit your contribution(s) to the GEM Building Taxonomy, please use the following online form:  
<http://www.nexus.globalquakemodel.org/gem-building-taxonomy/overview/gem-taxonomy-form-taxt>

We can only accept documents that you have created yourself (or for which you have obtained the necessary permissions to make the submission), as we need the copyright owner's authorisation to use any contributions we receive from you.

By uploading your files online you agree that each contribution is released under [CC-BY v 3.0 unported](#).

### **FAQ**

*How will TaxT reports be used?*

The main use of the TaxT reports will be to provide a resource on the building typologies in different countries around the world, and to start to use this information to test the data inside the [Global Exposure Database](#).

*How will the photos/ drawings be used?*

Photos and/or drawings will be used to enrich the glossary for [GEM Building Taxonomy](#), which has around 800 photographs showing construction from over 30 countries. The glossary was created with contributions from more than 100 individuals and organizations.

**More questions?**

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