

TERRA SENSING TOWER (TST)

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<http://tst.allshookup.org>

OVERVIEW

Terra Sensing Tower (TST) represents the future of early 21st century intelligent and ecological building design. 1 O'Connell St will be re-engineered to become a data responsive built environment and earth sensing instrument that reflects building health, dynamic inner earth and biospheric conditions.

Near-realtime lighting control, autonomous sound generation, kinetic musical chimes, climate sensing technology and vertical growing vegetation will be introduced to 1 O'Connell St. TST will highlight how the built environment can directly connect, and respond with both local and global datasets generated by natural systems.

Terra Sensing Tower is an ecologically sensitive, networked and total intelligent building that is in harmony with nature. A living, breathing, data collecting, data reflecting, art-science, architectural retrofit that highlights and inspires the future of ecologically sustainable, and networked building design.

"The only way to make truly sustainable architectures is to connect our buildings to nature - not insulate them from it" - Rachel Armstrong

STATE OF THE ART

Terra Sensing Tower re-purposes an existing thirty-six story high skyscraper to become a networked building icon that examines, models, emulates and reflects the natural world becoming a living organism itself. The history and ecology of life on earth is today informing the emerging field of Biomimicry and TST will demonstrate how architects, media-artists, engineers and scientists will design the future built environment. This future we deserve should engage and respond with natural systems, creating harmonious architecture which is at one with both nature, and the human condition.

Terra Sensing Tower is themed around the concept; "Theory of Multiple Intelligence" proposed by Howard Gardner in 1983. An intelligent building is much like the human condition in that it differentiates intelligence into specific sensory modalities; Spatial, Linguistic, Logical-Mathematical, Bodily-Kinesthetic, Musical, Interpersonal, Intrapersonal and Naturalistic.

A truly intelligent building that generates its own local ecological data, makes public and responds to a multi-field array of global ecological datasets must use technology to serve rather than dominate. Terra Sensing Tower incorporates a series of architectural modalities (interventions) that make up the totality of the Terra Sensing Tower design for 1 O'Connell St, Sydney, Australia.

TERRA SENSING TOWER MODULES

1. Lightning/Seismic Data Activated Rooftop Lights

Interface existing 950m of Neon Blue Rooftop Lights with the frequency of global Lightning Strikes. Install additional full spectrum RGB LED's which will be interfaced with globally reported Seismic Events. The TST Spire Rooftop lights will be triggered in near-realtime control mode between sunset to sunrise with 15 minute spectacle performances on the hour between 8pm-12pm daily (Daylight Saving Dependant). These four nightly light controlled performance spectacles correspond and reflect the previous 24hrs of global lightning strikes and globally detected seismic events.

Data Sources:

Global Lightning Network (GLN) - <http://www.uspln.com/unidatainfo.html>

Global Seismic Network (GSN) - <http://earthquake.usgs.gov/earthquakes/map>

2. Biosphere Monitoring Weather Sensing Station

An array of sensor technology that measures; Temperature, Air Pressure, UV Index, Air Quality, Precipitation, Humidity, Wind Speed and direction will be installed on the rooftop spire of TST measuring the biospheric conditions directly above the CBD of Sydney. Data collected from this instrumentation will be made public and open via <http://cosm.com>

3. Biophilia Wintergarden Atrium - Alleviate Sick Building Syndrome!

Built environments which incorporate natural plant life are becoming a vital installation element for improving indoor air quality. The cultivation of indoor plant life growing vertically inside the six story Wintergarden Atrium will be designed to create an indoor bio-filter of vines and leafy foliage highlighting natural solutions towards creating cleaner indoor air.

4. Exterior Carbon Dioxide Filter - Vertical Vegetated Climbing Facade

Vertical green growth on the exterior of urban skyscrapers could significantly alleviate climate change by absorbing excessive atmospheric carbon dioxide. Living green walls and vertical gardens can also have a positive impact on both physical and mental health of societies inhabiting the built environment. It is proposed to culture the vertical growth of natural vines on three wire ropes on the north-easterly exterior of 1 O'Connell St.

5. Kinetic Sound Chimes Triggered by Seismic and Wind Data

31 custom designed, aluminium constructed wind chimes using five-tone clappers producing 12ET tones will be installed in the 2nd floor amphitheatre alongside the Wintergarden Atrium. This wind chime array will be mechanically driven by servo motor's triggered by globally detected seismic events and data collected locally from wind sensors installed on the spire of the Terra Sensing Tower.

6. Ecological Music – Seismic Foyer Entry Muzak, and Magnetosphere Lift Muzak

Earthquakes are essentially sound waves and using techniques of audification and sonification the "Sounds of Seismic" will be broadcasted inside the foyer of 1 O'Connell St. These art-science music compositions are generated by processing global seismic data in near-realtime and performed as auditory display highlighting this planet we inhabit is dynamic and constantly changing.

A Very Low Frequency (VLF) antenna will be installed on the rooftop spire generating "Sounds of the Magnetosphere" which will be piped into the passenger lift system, (7 high rise and 5 low rise). This atmospheric radio signal generating spheric's is the electromagnetic impulse caused by lightning discharges that can be received thousands of kilometres from their source.

7. Open Data Publication

All software developed and data collected from the Terra Sensing Tower will be made public under a creative commons licence and development will be designed for non-proprietary systems.

SUMMARY

An intelligent built environment should be productive, safe, healthy, thermally comfortable, aurally pleasing, visually aesthetic to visit and work from within. Terra Sensing Tower will respond to technological change during its ten year timeline of commission, plan for digital legacy, meet demand for limited environmental impact, whilst creating a pleasing visual and aural experience from both inside the building, and externally from a distance. Natural organic growth will thrive and prosper.

TECHNICAL DESIGN and IMPLEMENTATION TEAM

Rene Christen (AUS) - DMX Lighting Design Software - <http://renechristen.net>

Geo Homsy (US) - Technical Direction, Hardware Design - <http://homsy.org>

Ryan McGee (US) - Auditory Display Software - <http://lifeorange.com>

Stock Plum (NL) - Data Aggregation Development - <http://is.gd/v2stock>

D.V. Rogers (NZ/AUS) - Concept Direction - <http://allshookup.org>

Mr Snow (NZ/AUS) - Data Dissemination - <http://houseoflaudanum.com>

THREE URL REFERENCES

Terra Sensing Tower - <http://tst.allshookup.org>

Sounds Of Seismic - <http://sos.allshookup.org>

Parkfield Interventional EQ Fieldwork - <http://pieqf.allshookup.org>

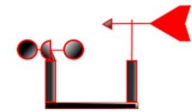
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Lightning/Seismic Data
Activated Rooftop Lights



VLF Antenna



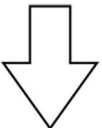
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1 O'Connell St, Sydney, NSW, Australia

Terra Sensing Tower Concept Illustration