



# Project RESTORE

San Isidro  
Elementary School

Sharing Session 31-Jan-15

# Engineers Without Borders (Singapore) - WHO We Are

Official Singapore Chapter  
of Engineers Without  
Borders-International.

**ENGINEERS  
WITHOUT  
BORDERS**  
INTERNATIONAL

Officially registered with the Registry of Society  
and gazetted by Government of Singapore in  
December 2013.

Our main objective

To improve the quality of life of the  
underprivileged and those in poverty  
through humanitarian engineering in  
Singapore / overseas.



Core Team

# Our Partnership



## Roles for each organization

- **EWB(SG)** Technical expertise on structural works, participate in walls restoration (building) as well as refurbishing the comfort rooms and classrooms' lightings and ventilation.
- **Coast2Coast** Walls restoration (building and painting) and interaction with students.
- **Lions Club (Bohol Island)** Liaison with local contractors, accommodation and transport for the Singapore teams.

# What we hope to achieve



To build structurally safe buildings that would minimize damages particularly during typhoons and earthquakes – The school will also serve as a safe shelter for the community to stay during such events and in peaceful times, a safe place for the students to learn and play.

## How?

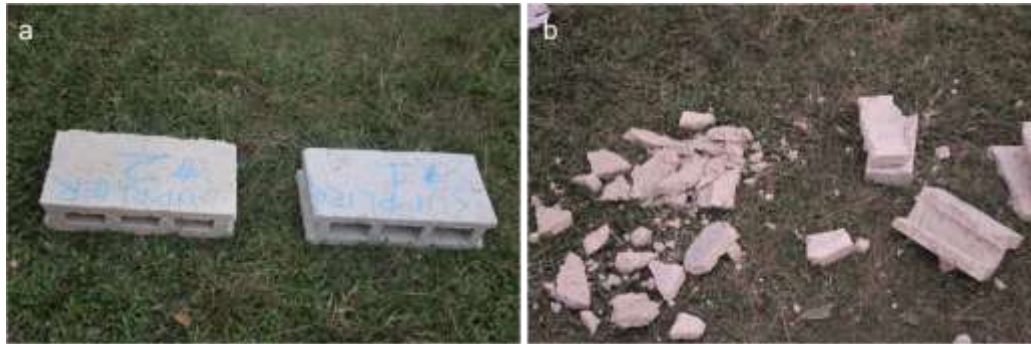
The techniques adopted were based on:

- good practices for construction engineering
- Recommendations from Build Change for the construction/ reinforcement of masonry and timber structures in areas affected and susceptible to earthquakes.

# Research – Problems identified

After our recce trip in July-14, research was done and 2 main findings were established:

- 1) Poor quality of building materials
- 2) Poor methods of construction



Concrete hollow blocks before (a) and after (b) the “dropping test”

Low strength and brittle characteristics



Seashell found in existing structure



Little or no reinforcement found in existing structure

Low strength against earthquakes / typhoon

# Our Solutions



Plinth beam construction using rebar



Vertical rebar for the concrete hollow block walls



Plinth beam completion



Hollow blocks filled with concrete.



Connection of the horizontal rebar onto vertical rebar



Welding of horizontal rebar to steel column

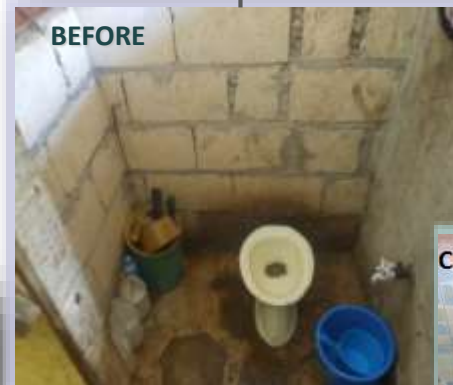


Plastering of walls

**\* Proper connection between structural elements provide resistance strength to support the load against earthquake / typhoon.**

# Other Refurbishments

Comfort Rooms refurbishment funded by charitable donations



# Fixtures in the Classrooms



What we found:

Missing / Broken /  
Inadequate  
Lighting and  
Ventilation Fans





# Let there be Light and Wind!

Lightings and ceiling fans funded by charitable donations



# Project RESTORE Continues...



## Post-Project Assessment Review: 23 to 26 Jan '15



Comfort Rooms identified for refurbishment.



(a) & (b) Drains clogged with accumulation of water after rain.

(c) & (d) Drains - 1 day later.

EWB (SG) will be funding the above projects through to completion.  
In partnership with Lions Club (Bohol Island).

# Beyond Engineering... Say Cheese!



One of the wishes of the principal – to have dental kits for all the students so that they can participate in the Provincial Dental Health Programme.

We are proud to have delivered on that wish – funded by charitable donations.



**“Science can amuse and fascinate us all,  
but it is Engineering that changes the world.”**  
~ Isaac Asimov

THANK YOU

Humanitarian Engineering



Humanitarian Engineering

For more information about Engineers Without Borders (Singapore), past and upcoming projects, volunteering and partnership opportunities, please visit us at [www.ewb.sg](http://www.ewb.sg)