

From Carbon Footprint to Social Economic Benefits Mactan Cebu International Airport WGBC / HKGBC Workshop 29.11.2019



Terminal 1

Terminal Z

65,000 SQM

7 Contact Stands

4.1 Millions Passenger Per Annum Opening Day



# Expansion for Growth – 9 MAP

®®



Phase 2

Phase 1

# Tropical Pavilion – Light, Airy, Sustainable, Contextual, Friendly...



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## **Climatic and Locality Considerations**



## Learning from a Tropical Vernacular



High pitched roof / Low eaves / Light weight / Locally sourced material

## Passive Design Approach



Wall / Window ratio 0.6

# Building Systems Performance

## MEP Design

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Baseline ASHRAE 90.1-2007	254 kWh /m2 /yr	
Design Target	176 kWh /m2 /yr	31%
Measured Results (SCADA)	160 kWh /m2 /yr	37%

Solar Power G	Carbon Reduction / yr			
Terminal 1 (55,000m <sup>2</sup> )	165 kWh /m <sup>2</sup>	1.64 MW	70% (peak hours)	130 tons
Terminal 2 (65,000m <sup>2</sup> )	160 kWh /m <sup>2</sup>	5 MW (planned)	3 – 5% (target annual reduction)	TBC

# An Encompassing Sustainability Strategy

- Zero waste
- Low embodied energy
- Locally sourced material
- Local industries involvement
- Local employment
- Long term maintenance
- Create Civic Pride



#### **Conventional Steel Construction**

**Timber Frame Construction** 



Staging to facilitate geometric setting out and site welding Lightweight structure requires less on-site fabrication and no need for formwork

#### Roof Design with Steel Structure



#### Roof Design with Glulam Structure



# **Construction Mockup**

RUBNE

0.0vda



Certificate number: HFA-COC-0287 Date of first issuance: 05.09.2008 Date of issuance: 01.04.2015 Valid to: 30.06.2018



Terminal Roof Area 25,000 sq.m

Construction Period 6 months \*

# Major Cost / Time Savings & Risk Mitigation

tama EVAAIR

# Sustainable Development Principles

#### **Clean Energy**





















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# A Simple, Modest & Easy to Build Solution

Extensive use of Prefabrication to Minimize Waste

Choice of Material with Natural Self-finish



# An Architecture devoid of Decoration

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**Clark International Airport**, The Philippines



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#### Performance beyond Expectations:

# "Simplicity, Add Lightness"

Colin Chapman of Lotus Car