SUSTAINABLE CONSTRUCTION WASTE MANAGEMENT

• 30th MARCH 2021 •

"UPLIFTING THE MALAYSIAN CONSTRUCTION INDUSTRY"

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MANAGER
CIDB MALAYSIA

OUTLINE

Construction Waste Management – Why It's Important?

Sustainable Construction

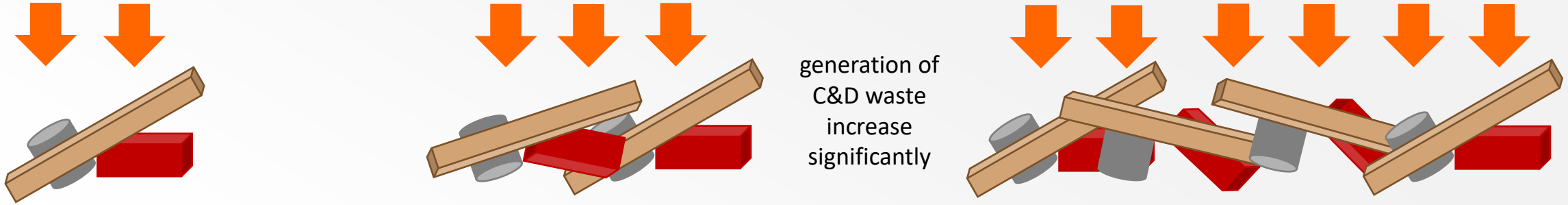
CIDB's initiative towards waste management

CONSTRUCTION WASTE MANAGEMENT WHY IT'S IMPORTANT?

SECTION 1

Source: Department of Statistics Malaysia

MALAYSIA GDP FROM CONSTRUCTION



generation of C&D waste increase significantly

CURRENT ISSUES & CHALLENGES OF CONSTRUCTION WASTE MANAGEMENT

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Low market demand for the recycled waste

Lack of waste segregation facility

Lack of C&D waste data

The increasing activities of **illegal dumping**

Lack of **information and skill development** of the proper construction waste flow

Source: SWCorp (2019)

CONSTRUCTION WASTE MANAGEMENT
REALITY IN MALAYSIA

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The waste is not being separated or sorted

WHAT IS C&D WASTE?

"**Construction and Demolition waste**" is defined as any substance, matter or thing which is generated as a result of construction work and abandoned whether or not it has been processed or stockpiled before being abandoned.

It is a mixture of surplus materials arising from site clearance, excavation, construction, refurbishment, renovation, demolition and road works.

Source: EPD (2015)

TYPE OF C&D WASTE

Metal waste

Timber/wood waste

Concrete waste

Brick waste

Packaging material waste

Tile waste

Soil waste

Plastic material waste

Cardboard waste

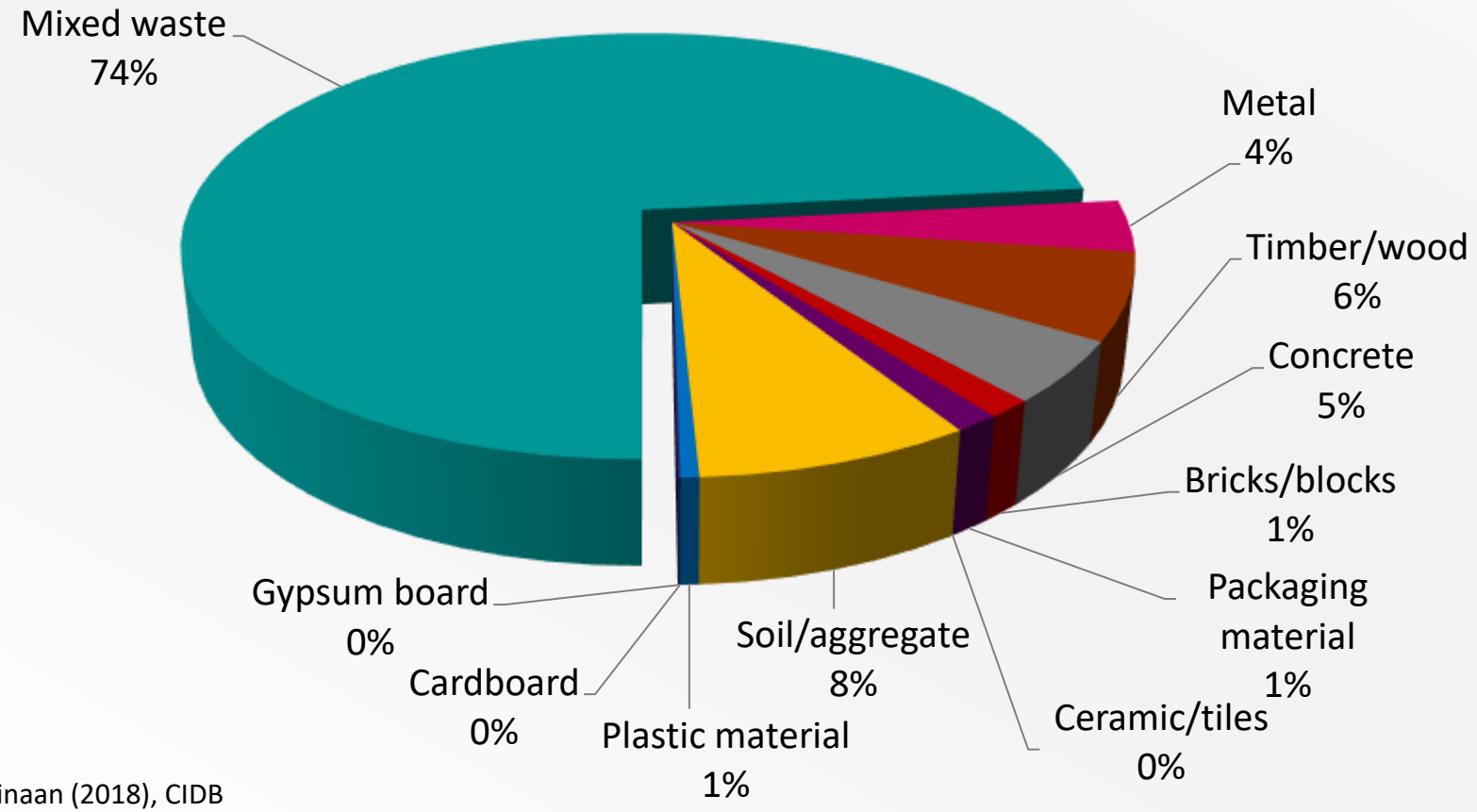
Gypsum board waste

Mixed waste

Source: Laporan Akhir Kajian Sisa Binaan (2018), CIDB

COMPOSITION OF C&D WASTE GENERATION

Composition of C&D waste generation from all states in Peninsular Malaysia.

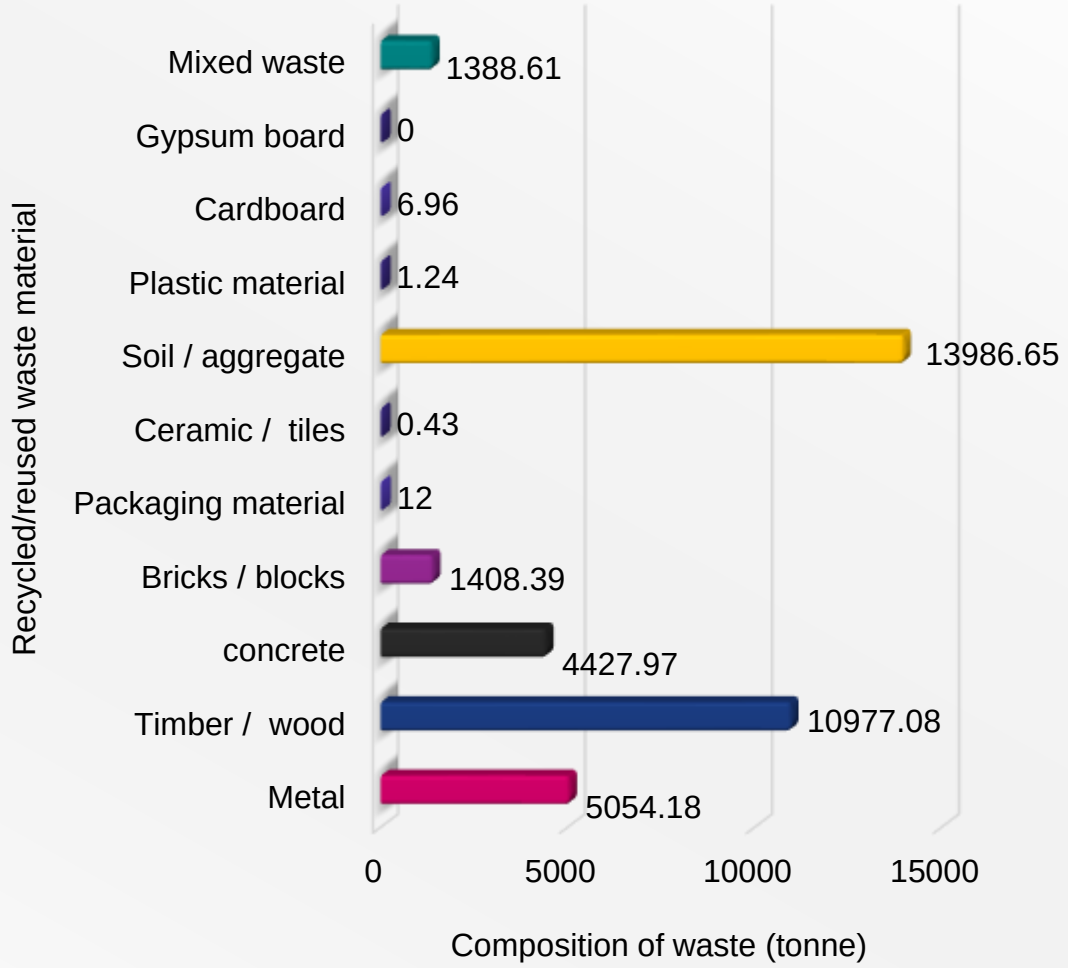


Source: Laporan Akhir Kajian Sisa Binaan (2018), CIDB

C&D WASTE COMPOSITION: RECYCLED/REUSED

Composition of C&D waste recycled/reused from all states in Peninsular Malaysia.

Total of C&D waste = 271,948 tons
Total of recycled C&D waste = 37,263.51 tons
C&D waste recycling rates = 13.7%



Source: Laporan Akhir Kajian Sisa Binaan (2018), CIDB

AUTHORITIES AND LAW UNDER THEIR JURISDICTION IN HANDLING SOLID WASTE IN MALAYSIA

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REGULATION ON SOLID WASTE MANAGEMENT IN MALAYSIA

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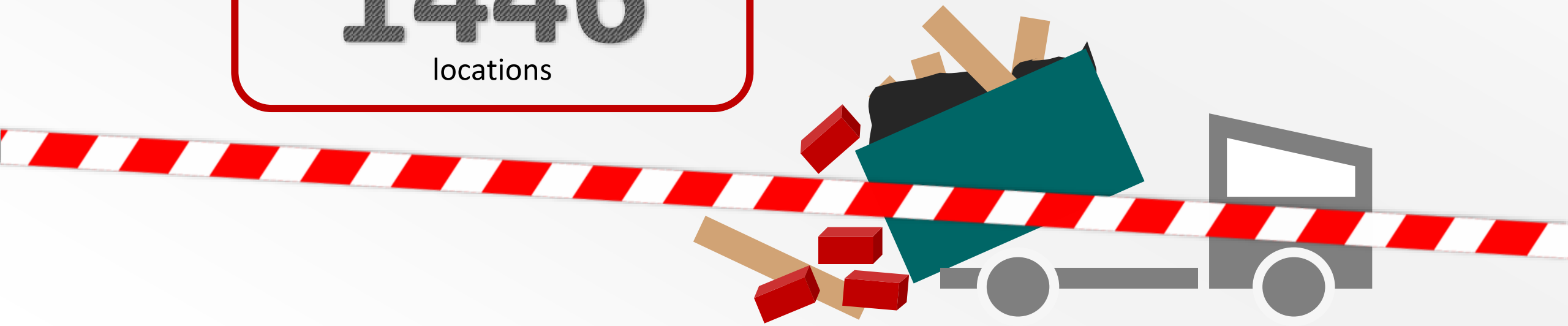
Total of illegal dumping extermination location for the period of 2014 to December 2018:

1446

locations



Source: SWCorp (2019)

REGULATION ON SOLID WASTE MANAGEMENT IN MALAYSIA

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CASE LAW

Yahya Yusof, 54 was charged (RM17,000) with disposing construction debris at the end of the road of Tiara Titiwangsa 3, Taman Titiwangsa, here, at about 4pm on Oct 9, 2017.

The charge under **Section 71(1) of the Solid Waste and Public Cleansing Management Act 2007**, carries a fine of between RM10,000 and RM100,000, a jail term of between six months and five years, or both, upon conviction.

New Straits Times
By Khairah N. Karim - April 25, 2018 @ 6:01pm

REGULATION ON SOLID WASTE MANAGEMENT IN MALAYSIA

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MINISTRY OF HOUSING AND LOCAL GOVERNMENT

DEPARTMENT OF NATIONAL SOLID WASTE MANAGEMENT

WARTA KERAJAAN PERSEKUTUAN

FEDERAL GOVERNMENT GAZETTE

PERATURAN-PERATURAN PENGURUSAN SISA PEPEJAL DAN PEMBERSIHAN AWAM (SKIM BAGI SISA PEPEJAL PEMBINAAN) 2018

SOLID WASTE AND PUBLIC CLEANSING MANAGEMENT (SCHEME FOR CONSTRUCTION SOLID WASTE) REGULATIONS 2018

Solid Waste and Public Cleansing Management (Scheme for Construction Solid Waste) Regulations 2018

This regulations provides:

- scope of preliminary
- duties of construction solid waste generator or person in possession of construction waste
- duties of the licensee for collection services
- duties of the licensee for transfer station
- duties of the licensee for transportation services by long-haulage
- duties of the licensee for treatment and disposal facilities.

This act applies in Johor, Malacca, Negeri Sembilan, Wilayah Persekutuan Kuala Lumpur, Wilayah Persekutuan Putrajaya, Pahang, Kedah and Perlis.

LEGAL IMPACT:

Fine not exceeding RM10,000

REGULATION ON SOLID WASTE MANAGEMENT IN MALAYSIA

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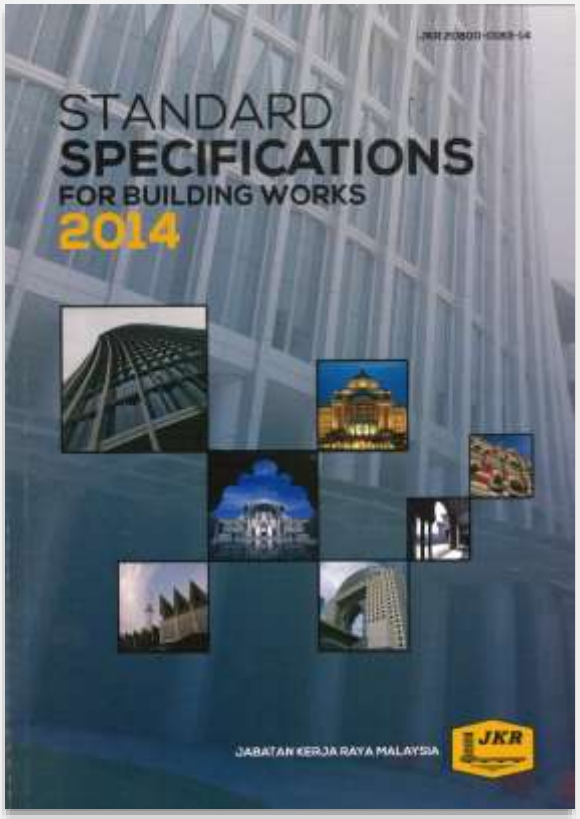
MINISTRY OF WORKS



Standard Specifications for Buildings Works (2014 Edition)

Clause 38

The contractor shall ensure all waste generated on site shall be managed in accordance with the Solid Waste and Public Cleansing Management Act 2007 and the Environmental Quality Act 1974 waste.

Clause 44

(clearance, cleaning and making good) completion states it is the duties of the contractor to gather up and clear away all rubbish/garbage/construction waste as it accumulates during the progress of the works at least twice each week at times approved by the Superintending Officer.

This standard is only applied to contract works awarded using JKR procurement approach.

REGULATION ON SOLID WASTE MANAGEMENT IN MALAYSIA

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LOCAL AUTHORITY

Act 133 Street, Drainage and Building 1974	Act 171 Local Government Act 1976	Uniform building By Law 1984
Its purpose is to ensure uniformity of the law and policy with regard to local government matters relating to streets, drainage and buildings.	The Act is purposely for ensuring uniformity of law with respect to local government.	This Law is made in exercise of powers conferred by Section 133 of the Street, Drainage and Building Act 133, 1974.
a) Materials not to be deposited without permission. b) Duty of owner or occupier to keep street clean. c) Depositing dirt on streets, etc.	a) Committing nuisance in streams. b) Pollution of streams with trade refuses.	a) Materials not to be deposited in a street without permission. b) No person shall deposit any building materials in any street without a temporary permit.
LEGAL IMPACT: A fine of RM1 000.00. A further fine of RM100. 00 for every day the offence is continued.	**LEGAL IMPACT:** A fine of RM2,000.00 or 1 year jail or both. A further fine of RM500.00 for each day of the offence is continued.	**LEGAL IMPACT:** A fine of RM2 000.00. A further fine of RM100.00 for every day the offence is continued after conviction.

The Law is applied only to West Malaysia.

SUSTAINABLE CONSTRUCTION

SECTION 2

WHAT IS SUSTAINABLE CONSTRUCTION?

A sustainable construction approach takes account of the need for your company to prosper in business, without seeking profitability at the expense of the environment or society.

TRIPLE BOTTOM LINE OF SUSTAINABILITY

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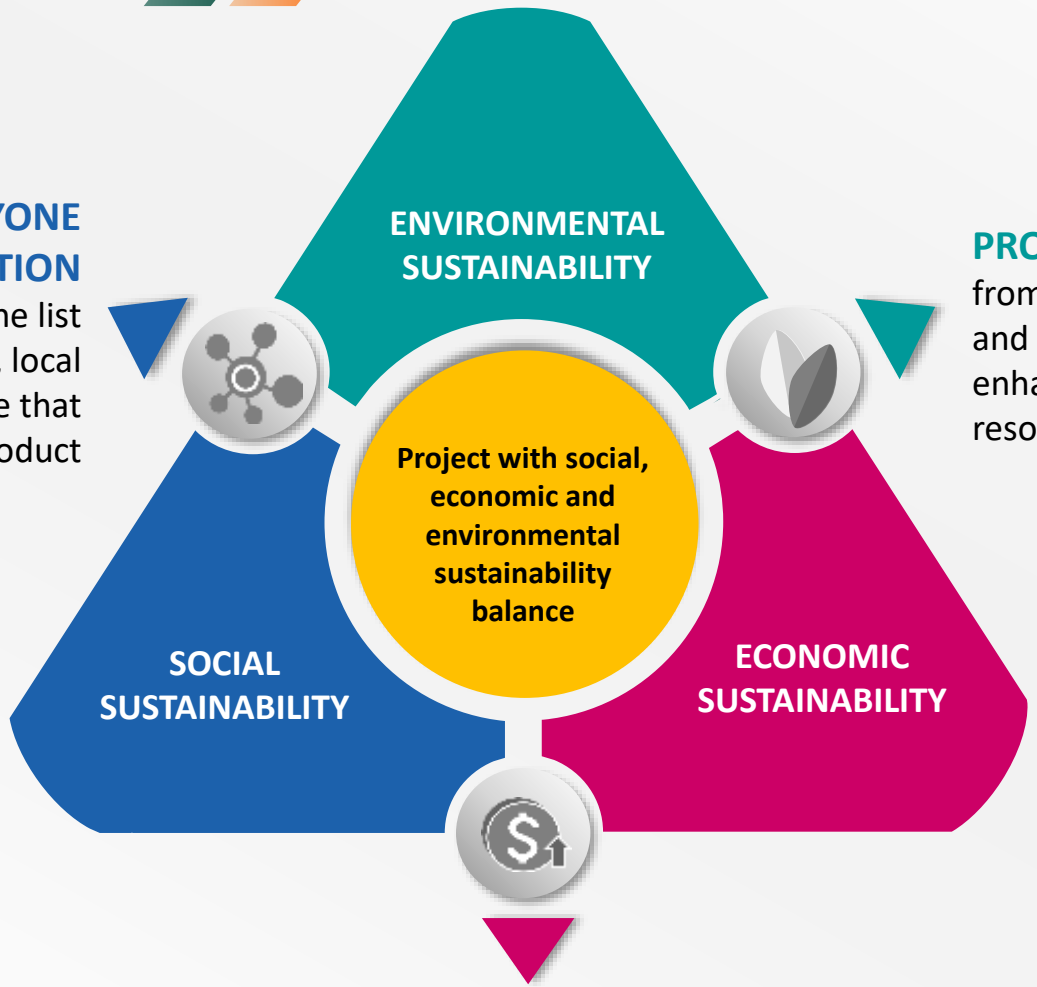
RECOGNISING THE NEEDS OF EVERYONE IMPACTED BY CONSTRUCTION
from inception of a project to demolish. The list will include construction site workers, local communities, the supply chain and people that will use the finished product

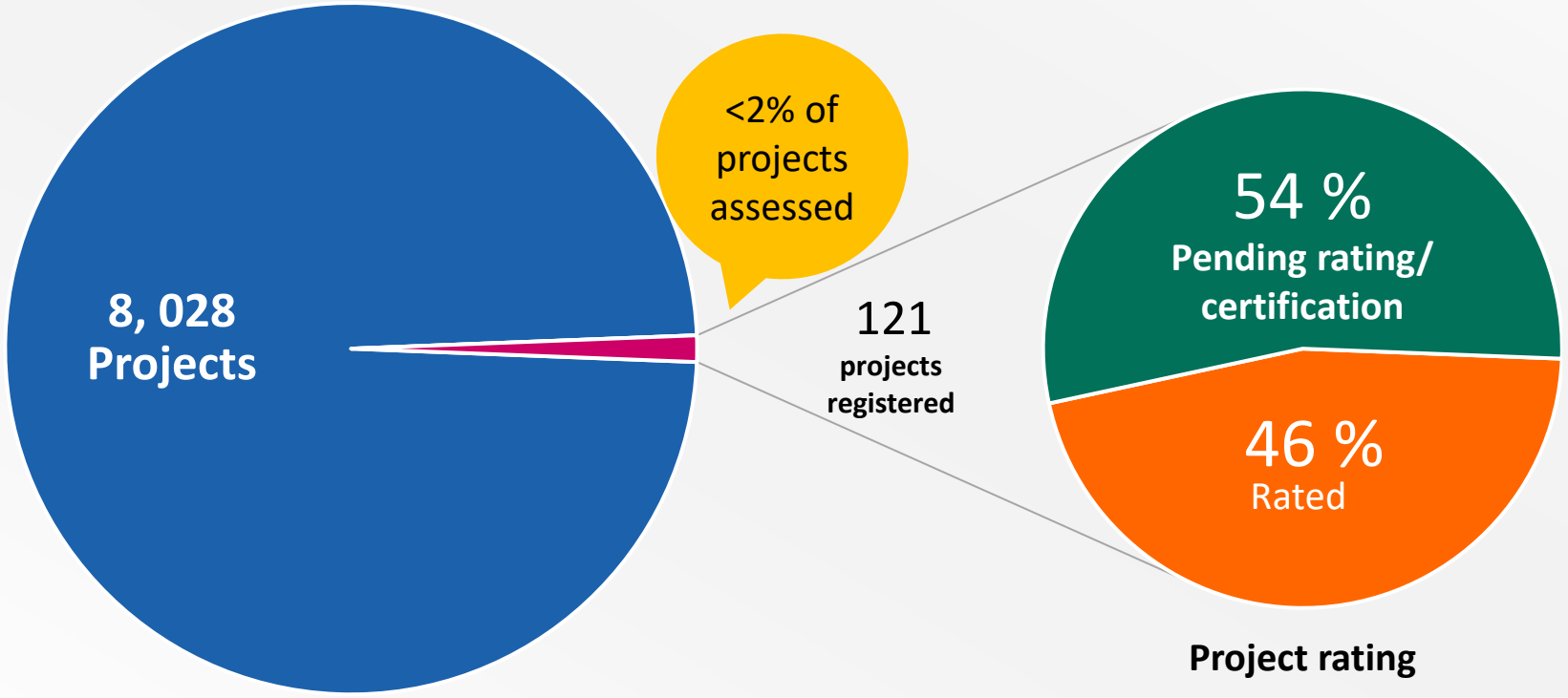


PROTECTING THE ENVIRONMENT
from the impact of emissions, effluent and waste and where possible, enhancing it and using natural resources, carefully.

Increasing profitability by making **MORE EFFICIENT USE OF RESOURCES**, including labor, materials, energy and water.

MALAYSIA LACK OF SUSTAINABILITY – RATED CONSTRUCTION

In Malaysia, less than two per cent of buildings and infrastructure are rated for environmental sustainability.



Source : Department of Statistics, Malaysia; CIDB statistics (2014 project data – as of March 2015); Green Building Index (GBI) (2014)

CIDB'S INITIATIVE TOWARDS WASTE MANAGEMENT

SECTION 3

SUSTAINABLE RATING TOOLS

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MALAYSIAN SUSTAINABILITY RATING TOOLS

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Sustainability Rating Tool

Building

- green building index
- greenPASS performance assessment system
- GreenRE
- pH jkr
- MyCREST MALAYSIAN CARBON REDUCTION & ENVIRONMENTAL SUSTAINABILITY TOOL
- METERAI HIJAU MELAKA

Township

- green building index
- LOW CARBON CITIES FRAMEWORK & ASSESSMENT SYSTEM
- GreenRE

Infrastructure

- MyGHI
- Sustainable INFRASTAR

MyCREST

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MyCREST

Malaysian Carbon Reduction and Environmental Sustainability Tool

Aims to guide, assist, quantify, hence reduce, the built environment's impact in terms of reduced carbon emissions and environmental impact while taking into account a more holistic life cycle view of the built environment.

It also aims to integrate socioeconomic considerations relating to the built environment and urban development.

MyCREST TOOLS

Each tool is the basis of the 'star' rating for each phase of the project . MYCREST awards different star rating of the different phase of the project and will award on overall star rating. In this way, all three phases of the project are assessed.

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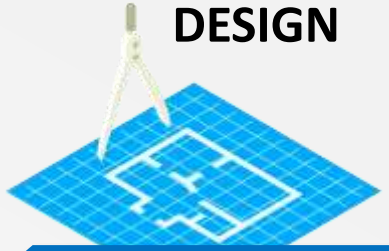
DESIGN

CONSTRUCTION

OPERATION & MAINTENANCE



DIFFERENT PHASE OF THE PROJECT

Provisional Design Certification

Design & Construction Certification

Design, Construction & O&M Certification

O&M Certification

WASTE ELEMENT SUB-CRITERIA IN THREE STAGES OF THE BUILDING PROCESS:

Design stage, construction stage and operation & maintenance stage.

Stage	Design				Construction	Operation & Maintenance			
Core criteria	Lowering the embodied carbon	Lowering the embodied carbon	Demolition & disposal factors	Lowering the embodied carbon	Avoiding carbon emission – Demolitionisposal Factors	Waste management and reduction	Waste management and reduction	Waste management and reduction	Waste management and reduction
Sub Criteria name	**EC4**	**ECReq 1**	**DP1**	**EC10**	**DP6**	**WM1**	**WM2**	**WM3**	**WM4**
	Solid Waste Management – Route and Recyclers	Recycling Facility	Responsible Sourcing of Materials	Construction Waste Management	Demolition Waste Recycling	Solid Waste Management Policy	Solid Waste Management: On-Going Consumables	Solid Waste Management: Removable Asset	Solid Waste Management : Organic waste
Sub criteria Title	Establish waste management route and provide recycler details	Provide facilities to reduce construction waste and reduce landfill disposal	Provide at least three product agreement of any building component or assemblies that sourcing from manufacturer or supplier can collect or has buyback program within the life cycle or at the end materials life for recycling or reuse purpose	Produce and execute a construction waste management plan, which recycles or salvages 50-75% of non-hazardous construction debris and avoids landfill disposal	Produce and execute a construction waste management plan which recycles or salvages 50-75% of non-hazardous demolition debris and reduce landfill disposal	1.1 Establish solid waste management policy 1.2 Establish waste minimisation awareness program 1.3 Establish solid waste stream audit	**1 point :** Reuse or recycle 50% of the on-going consumables waste **2 points :** Reuse or recycle 75% of the on-going consumables waste	**1 point :** Reuse or recycle 50% of the removable asset waste **2 points :** Reuse or recycle 75% of the removable asset waste	**2 points:** Compost organic waste

*EC, embodied carbon; EC Req, embodied carbon impacts; DP, demolition & disposal; WM, waste management

MyCREST RATING

MyCREST star ratings awarded and their respective scores.

MYCREST RATING	Percentage SCORE (%)
★★★★★	80 – 100
★★★★	70 – 79
★★★	60 – 69
★★	50 – 59
★	40 - 49

C&D WASTE MANAGEMENT TRAINING BY CIDB

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WASTE MANAGEMENT TRAINING BY CREAM & EPIC

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WHY JOIN?

To gain knowledge and to build capacity on sustainable waste management and construction best practices

HOW LONG?

2 DAYS TRAINING

WHERE?

ONLINE PLATFORM (MICROSOFT TEAMS)

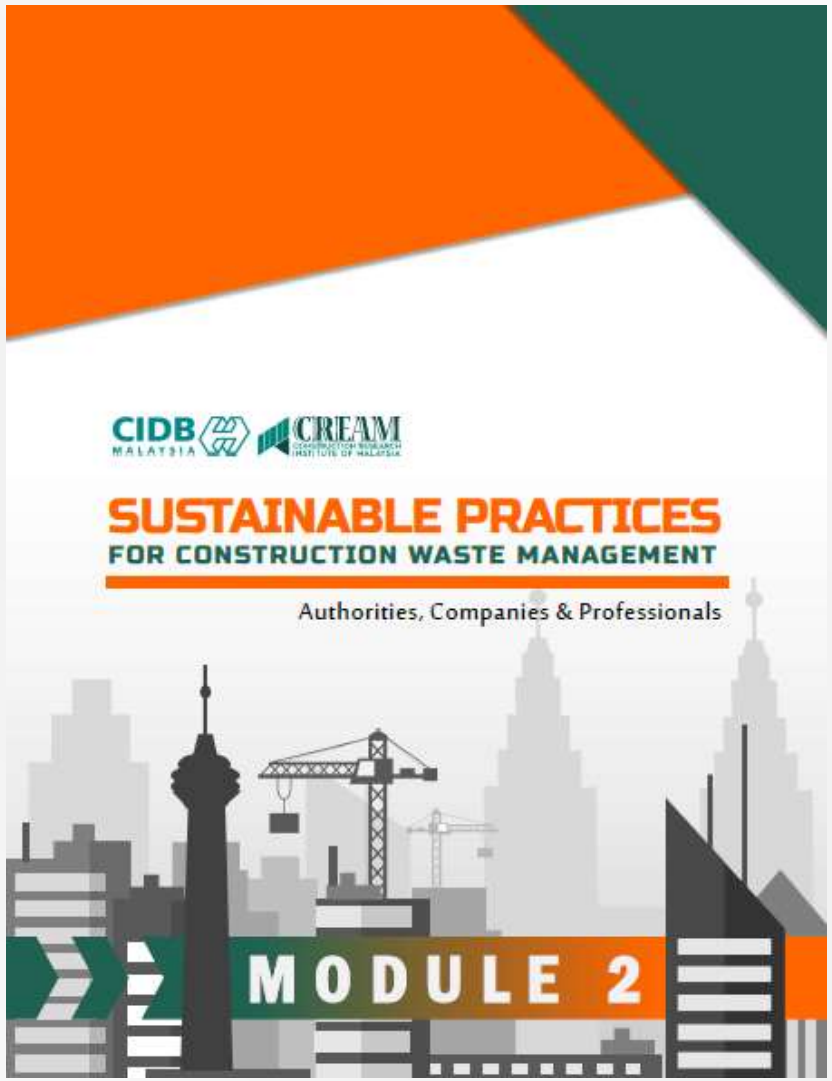
How MUCH?

RM250/PERSON

IS IT WORTH IT?

TOTALLY YES!!

WASTE MANAGEMENT TRAINING BY CREAM & EPIC



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WASTE MINIMIZATION TOOL
BUILDING INFORMATION MODELLING (BIM)

WHAT IS BIM?

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Building Information Modelling in the Malaysian context is defined as:

> A modelling technology and associated set of processes to produce, communicate, analysis and use of digital information models throughout the construction project life-cycle

Source: CIDB (2016)

MyBIM Centre and 12 MyBIM Satellites

myBIM SATELLITE

ABM Wilayah Sabah

ABM Wilayah Sarawak

ABM Wilayah Selatan

ABM Wilayah Tengah

ABM Wilayah Utara

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myBIM Centre

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12 BIM TRAINING MODULES

BENEFIT OF BIM

National Level

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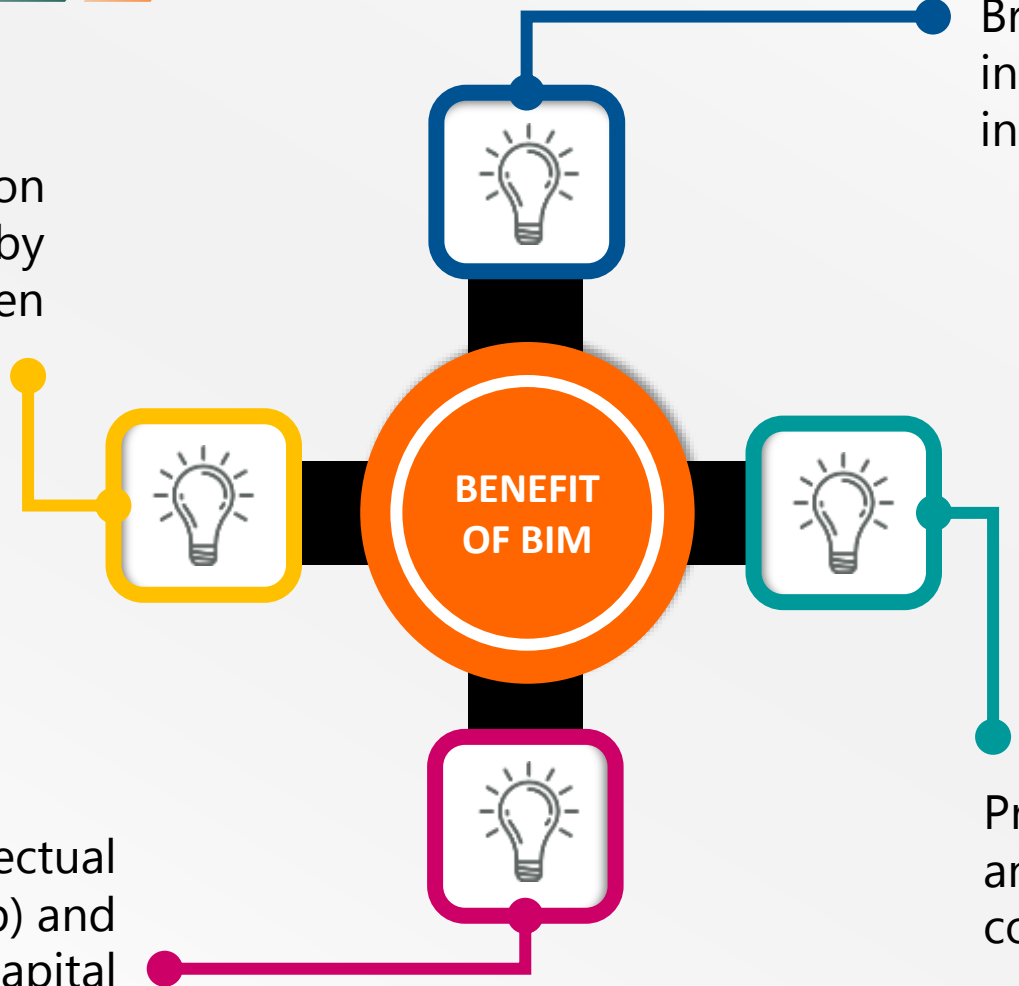
Brings our construction industry in line with the international standard

Transforms the construction industry from skill-driven by knowledge driven



Promotes transparency and accountability of the construction process

Appreciates intellectual property (ownership) and human capital

BENEFIT OF BIM

Organisational/Project Level

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Construction Stage

a) Better outcomes through collaboration.
b) Improved multi-party communication.
c) Reduces project risk
d) Increased prefabrication
e) Enhanced project performance
f) Reduces waste
g) Improved safety and quality
h) Reduces unbudgeted construction changes
i) Ensure project documentation is coordinated, timely and in an accessible form
j) Improve coordination between client-consultant contractor

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WASTE MINIMIZATION TOOL
INDUSTRIALISED BUILDING SYSTEM (IBS)

INDUSTRIALISED BUILDING SYSTEM (IBS)

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Some of Malaysia's most iconic structures such as Petronas Twin Towers, KL Tower and LRT system were constructed using IBS technology.

INDUSTRIALIZED BUILDING SYSTEM (IBS)

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CIDB MALAYSIA

IBS existed in Malaysia since the 1960s where CIDB has been promoting IBS in Malaysia since 1998 to effectively coordinate the construction sector towards industrialisation.

The **Industrialized Building System**, or IBS as it is commonly known, is a building method that **uses different means to a similar end when compared to conventional construction practices.**

INDUSTRIALISED BUILDING SYSTEM (IBS)

1 2 3

1 USING MOULDS TO CAST BUILDING COMPONENTS
such as beams and columns

2 DONE IN A MORE CONTROLLED ENVIRONMENT
compared to traditional construction technique

3 THE COMPONENTS ARE PRODUCED OFF-SITE
for instance in a factory, before being transported to the site to be installed.

4 THE ELEMENTS ARE DESIGNED FROM THE BEGINNING
to fit snugly with one another for easy installation

5 TAKES A SHORT TIME TO SECURE THE ELEMENTS TOGETHER
using various techniques such as welding plates and grouting at the site.

6 AT ALMOST EVERY STEP OF THE WAY IS MONITORED AND STANDARDISED
there is less chance of quality being compromised.

7 SAVES MONEY IN THE LONG RUN
as it reduces the need for future maintenance.

INDUSTRIALISED BUILDING SYSTEM (IBS)

There are five IBS Groups (Structural Classifications) :

I

PRE-CAST CONCRETE FRAMING, PANEL AND BOX SYSTEM

Precast columns, beams, slabs, 3-D components (balconies, staircase, toilets, lift, chambers), permanent concrete formwork.

BENEFIT OF INDUSTRIALISED BUILDING SYSTEM (IBS)

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"Not only can IBS **shorten the construction period**, but also **reduce wastage, cut costs on building materials and manpower**, especially during this period of labour shortage."

-Dato' Ir Ahmad 'Asri bin Abdul Hamid
CEO of CIDB Malaysia

"Construction companies **can reduce the number of workers** by up to 50% and also save 14% in **labour costs** through using IBS in their project."

-Ir Noraini Bahri, General Manager of the IBS & Mechanisation Division, CIDB

Source: HEIGHTS, Volume 3 (2016)

C&D WASTE MANAGEMENT SYSTEM

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SYSTEM'S OBJECTIVES

C&D Waste Management System MALAYSIA

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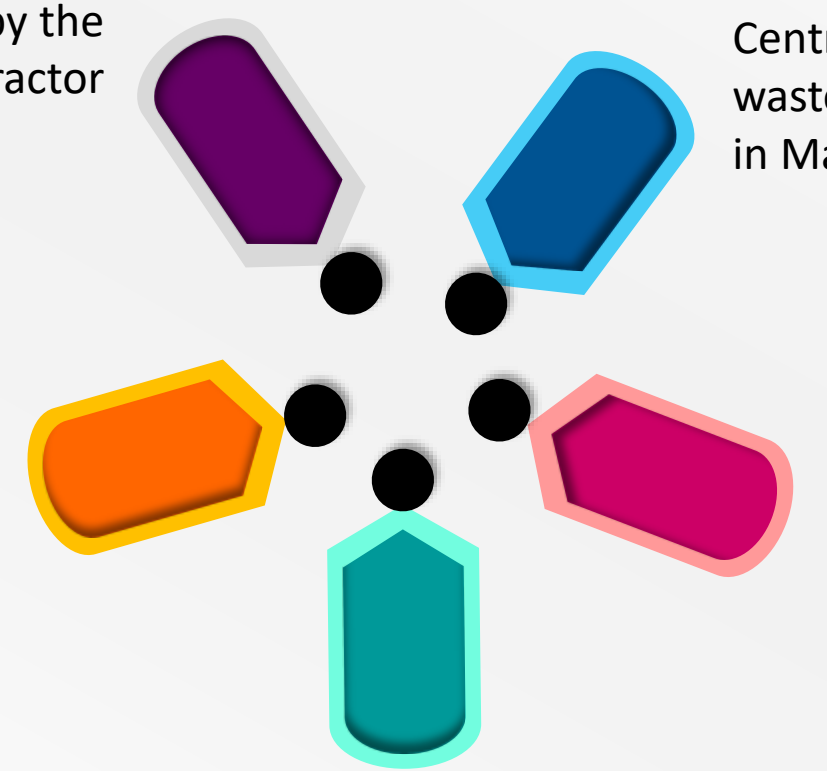
Towards self-reporting by the construction contractor

Central of construction solid waste data repository (C&D) in Malaysia



Become liaisons medium between SWCorp and construction contractor

Promoting practices of waste management

As a support planning facilities planning

URL: http://cndwaste.swcorp.my/

PROPERTIES OF SYSTEM

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Cost-benefit calculator

Planning facility modules

Carbon emission calculator

Records and analyses construction waste data

Survey module

Web-based application

LAST BUT NOT LEAST!

IMPORTANCE OF C&D WASTE MANAGEMENT

THANK YOU!

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