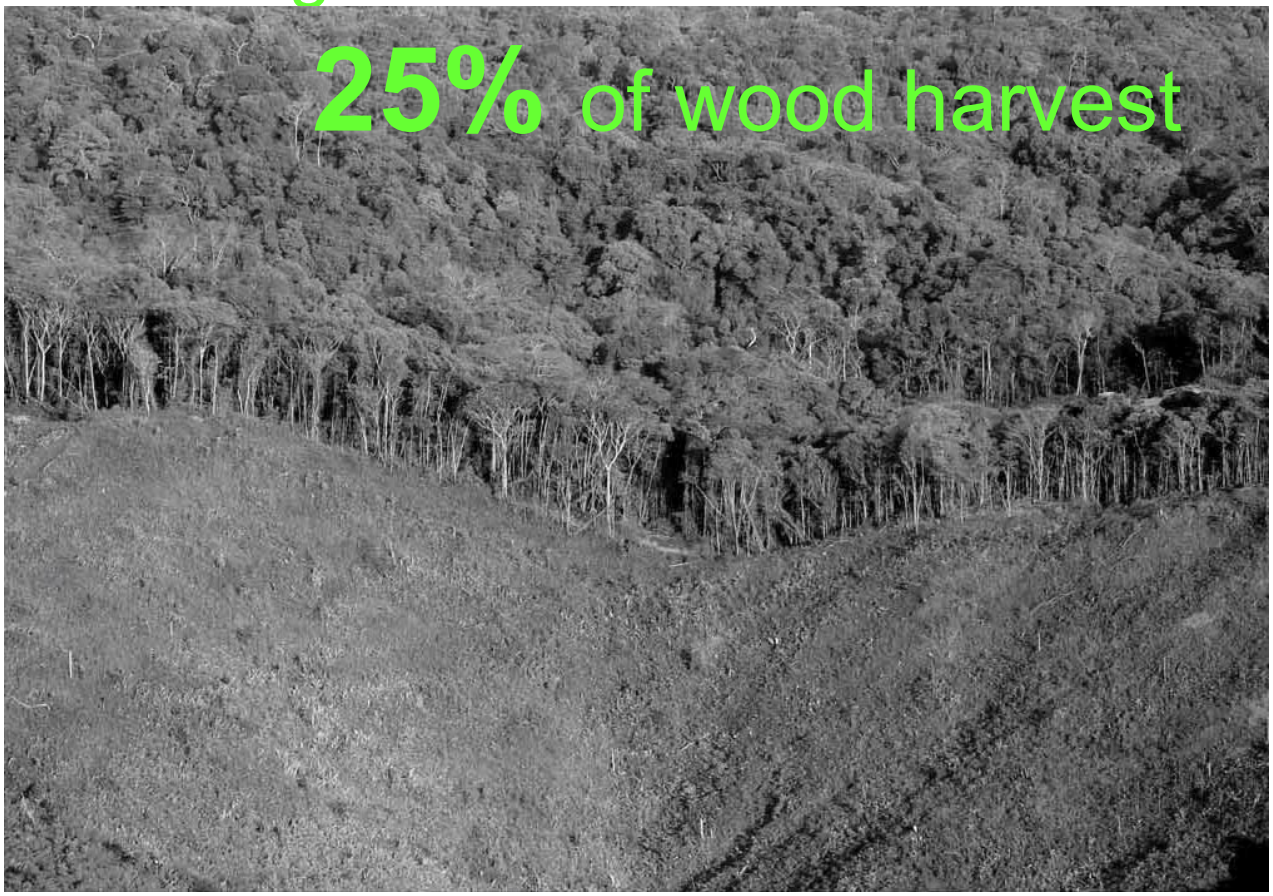
Construction Waste Management

worldwide buildings consume

17% of fresh water consumption

MALAYSIA GREEN BUILDING CONFEDERATION

worldwide buildings consume



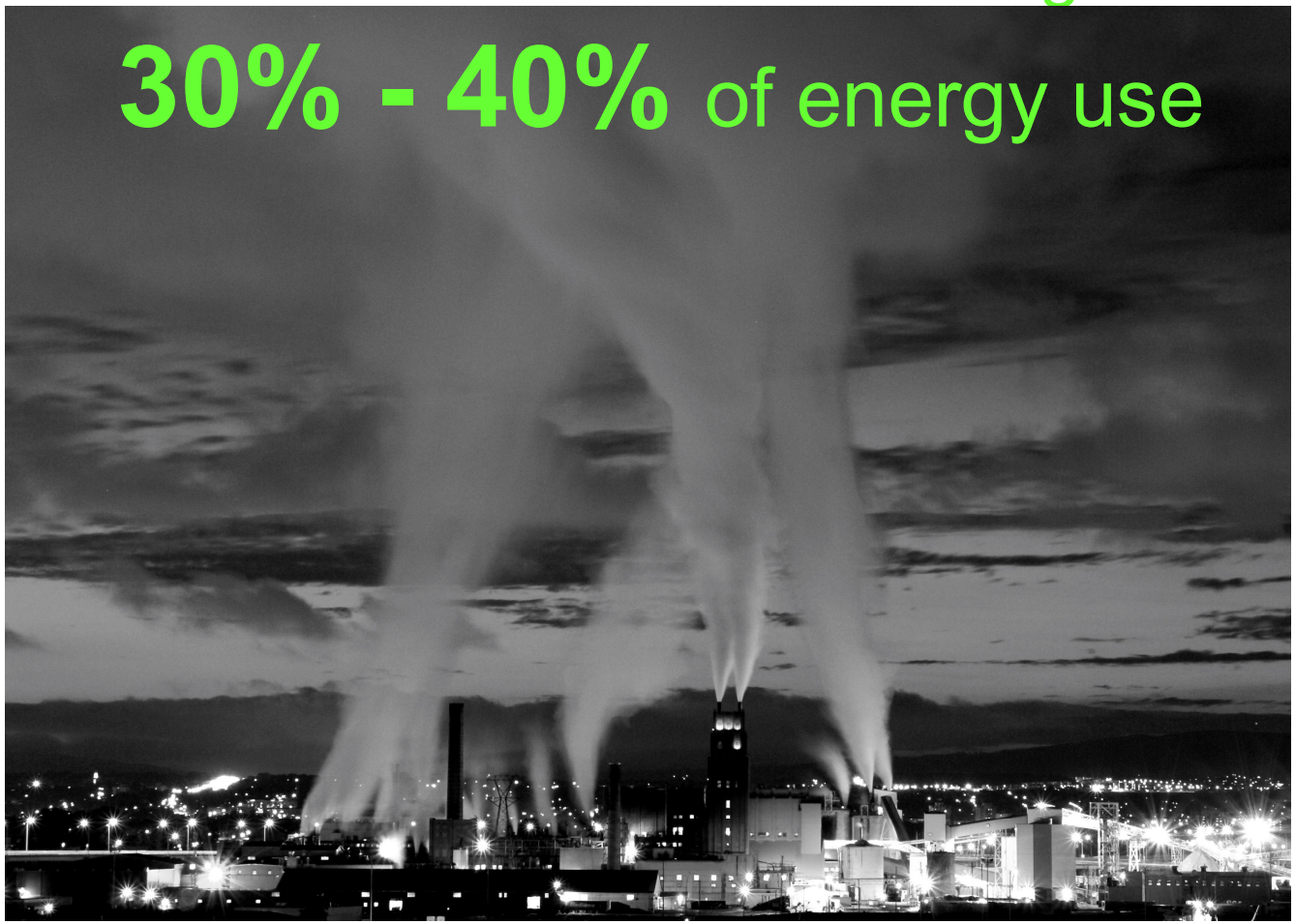
MALAYSIA GREEN BUILDING CONFEDERATION

worldwide building contribute

40% - 50% of solid waste generation

MALAYSIA GREEN BUILDING CONFEDERATION

worldwide buildings consume



MALAYSIA GREEN BUILDING CONFEDERATION

worldwide buildings contribute

MALAYSIA GREEN BUILDING CONFEDERATION

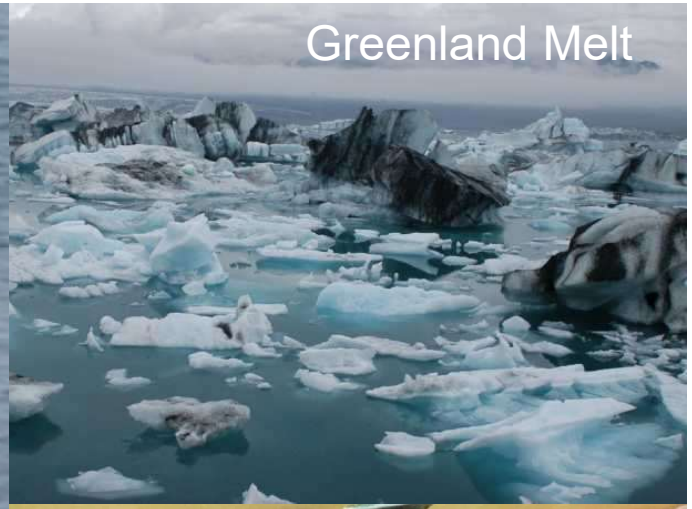
How important of 1 degree ?

Up 1 degreeC

MALAYSIA GREEN BUILDING CONFEDERATION

How important of 1 degree ?

Up 2 degreeC



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How important of 1 degree ?

Up 3 degreeC

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Something nearer to us…

will be closed on 2019… what's next?

What is C&D Waste?

Define as waste generated from construction industry during construction activities, building renovation, civil construction and building construction site cleaning, road construction and demolition activities, including soil excavation.

What is C&D Waste?

Classified into different categories:

- Cement and mortar, concrete, stones, gravels, rocks and bricks, asphalt
- Organic materials e.g. wood, paper and paper products
- Excavation waste e.g. marine clay
- Hazardous waste e.g. asbestos (separate disposal)
- Other materials e.g. plastics and ferrous and non-ferrous metals, glass and etc.

C&D Waste in Jelutong Dumpsite (2018)

Bil.	Bulan	Jenis Sampah Dan Beratan Yang Direkod 2018								Jumlah Beratan	Kitar Semula Kayu	Sisa Kebun Kompos	CATATAN
		Sisa Binaan	Tanah Korekan	Sisa Pukal			PASIR PARIT KONTRAKTOR JPP(R&D)	SAMPAH JPS	Sisa Kebun	Bulanan	Metrik Tan	Metrik Tan	
				Swasta	SISA PUKAL JPP KONTRAKTOR ZON	SISA PUKAL JPP KONTRAKTOR R&D							
1	Januari	2188.51	1456.70	165.37	4549.77	786.13	533.86	-	487.36	10167.70	-	-	
2	Februari	2296.11	512.64	179.79	4098.53	689.23	176.02	3.14	414.23	8369.69	-	-	
3	Mac	2221.73	1919.37	170.64	6099.60	831.46	767.65	382.79	560.86	12954.10	-	-	
4	April	5040.96	4172.01	400.35	6461.19	1360.52	311.95	536.04	531.06	18814.08	-	-	
5	Mei	9859.15	7555.96	285.11	5293.14	1182.98	233.06	559.57	525.32	25494.29	-	-	
6	Jun	6149.78	8874.46	168.64	5034.64	1301.15	516.76	2137.04	505.72	24688.19	-	-	
7	Julai	774.2	3929.76	28.90	1521.32	472.61	45.32	159.60	263.18	7194.89	-	-	DATA SEHINGGA 10.7.2018
8	Ogos										-	-	
9	September										-	-	
10	Oktober										-	-	
11	November										-	-	
12	Disember												
JUMLAH BERATAN TAHUNAN		**28530.44**	**28420.90**	1398.80	33058.19		2584.62	3778.18	3287.73	107682.94	0.00	0.00	

What's other countries methods?

JAPAN

1991, Japanese Government has established Recycling Law. The law empowers minister to select materials for recycle and encourage reuse of those materials in the country.

Several positive steps:

- Compulsory requirement of Waste Management Report for public or private construction projects
- Waste management clauses of contracts for contractors
- Submission of sorting report and obligation to sort on side under Construction Recycle Act
- Establishment of Standard for Recycle Construction Waste

What's other countries methods?

HONG KONG

2005, HK Government has introduced Construction Waste Disposal Charging Scheme (CWDCS). The scheme is to ensure the disposal of construction waste to be done properly.

A survey conducted revealed that waste dumped to landfills has reduced by approximately 65% after the implementation of CWDCS.

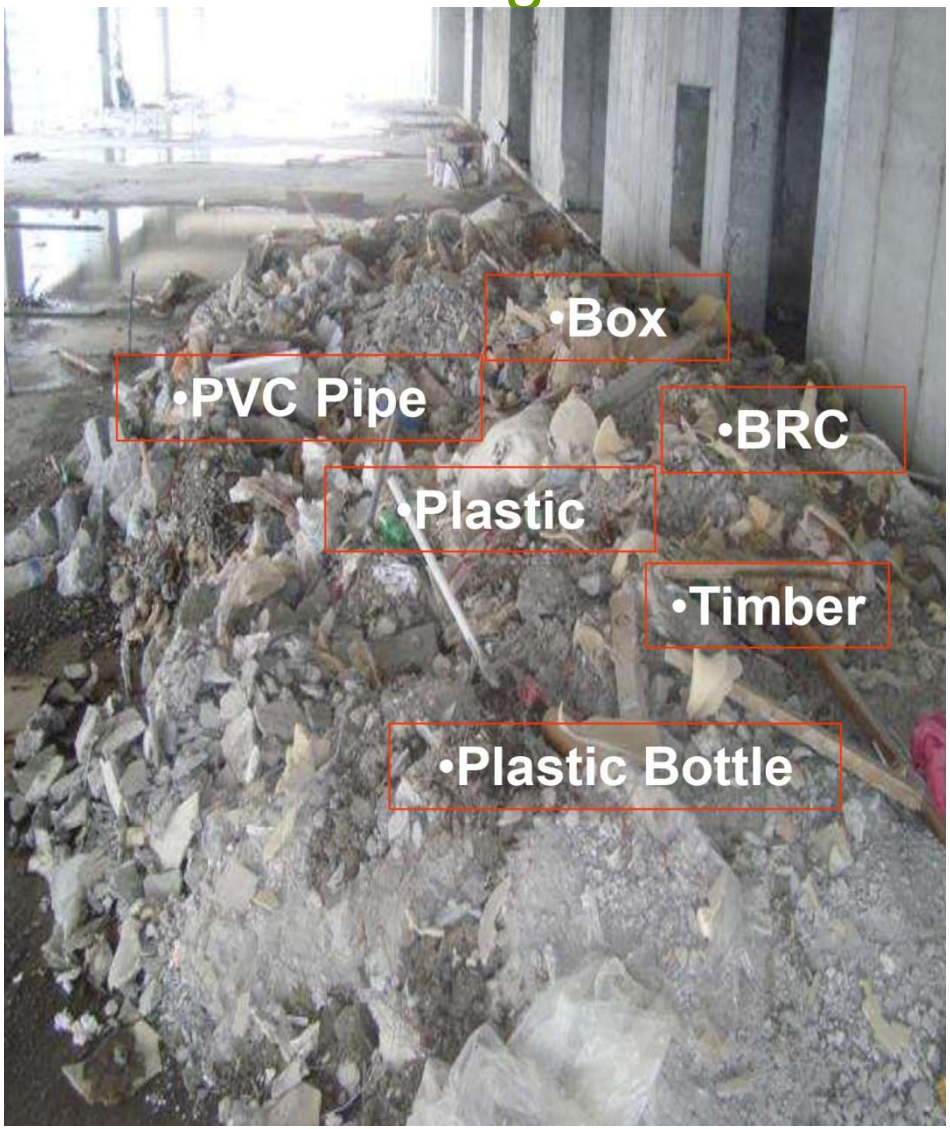
What's the challenges?

Challenges	Action Plan
Lack of Education and Awareness	- Training on awareness to staff and site team
Upfront Cost	- Allow in budget tender - Cost saving from better management of the material supply/storage & recovery/disposal
Insufficient Environmental Officer	- Training - Appoint a designated person
Resistance to change or adopt eco-friendly construction practices	- Company policy and objective - Sub contractual requirement (ISO14001, 3Rs, 5-S Practices)

What's the challenges?

Challenges	Action Plan
Limited space to provide segregation waste bin	- Early planning e.g. plan into site amenities plan
Sourcing waste contractor	- Pre-planning
Ditto recyclers (manufacturer refuse to take back timber pallet)	- Establish the contractual agreement - Carry out 3R effort internally
Handling, monitoring & recording	- Establish Construction Waste Management Plan

Construction Waste Management Plan



Construction Waste Management Plan

1. Project Information
2. Project Objective
3. Management
4. Distribution
5. Instruction & Training
6. Waste Management On Site
7. Segregation
8. Management of Waste
9. Ways of Minimizing Waste and Reducing Waste to Disposal
10. Measurement & Tracking of Waste Management Performance
11. Construction Waste Management Plan Implementation Checklist

1. Project Information

Item	Description
Project Title	
Location	
Nature of Project	

2. Project Objective

Objective

- To fulfill **GBI** requirement, we are committed to implement the waste management measures stated in this plan to achieve the target of 50% (or 75%) solid waste diversion from landfill.

3. Management

A Waste Management Manager is engaged to be responsible for ensuring the instruction of workers, implementation and overseeing of the construction waste management plan. The Waste Management Manager will monitor the effectiveness and accuracy during the routine site visits. The Waste Management Manager will conduct independent site inspections and waste audit together with the Sustainability Consultant on a regular fortnightly basis.

The Waste Management Manager will be present at the site full time for the duration of the project.

4. Distribution

The Waste Management Manager shall distribute copies of this plan to the Client, Sustainability Consultant, Site Manager and each Subcontractor where relevant/applicable. This will be undertaken every time the plan is updated.

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5. Instruction & Training

The Waste Management Manager will provide on-site briefing via recommendations of appropriate separation, handling, recycling, reuse and return methods to be used by all parties and at appropriate stages of the Project where applicable.

Toolbox talks will be carried out regularly on waste issues and all subcontractors will be expected to attend. This will ensure that everyone feels they are included and that their participation is meaningful.

(Please fill in here who will be the instructors and fill in the Training Log as well.)

6. Waste Management On Site

Surplus or waste materials arise from either the materials imported to site or from those generated on site.

Imported materials are those, which are brought to the project for inclusion into the permanent works.

Generated materials are those, which exist on the project such as topsoil, sub-soil, trees and materials from demolition works etc.

6. Waste Management On Site

However, there are other considerations to waste management such as waste reduction, segregation of waste, disposal of waste, financial impacts of waste disposal and recording, monitoring, education and reviewing.

This plan outlines the procedures that have been put in to place and demonstrate how they benefit the environment, how we can measure the effects and how these procedures and practices are sustainable.

(This need to be further illustrated here…)

7. Segregation

A specific are will be laid out and labeled to facilitate the separation of materials for recycling, re-use and return. Recycling and waste bins are to kept clean and clearly marked to avoid contamination of materials.

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7. Segregation

Planning need to be done to situate the skips. Site amenities plan need to be planned before construction start.

The workers are to be instructed to deposit the waste materials into the correct skip. Skips for segregation of waste identified currently are:

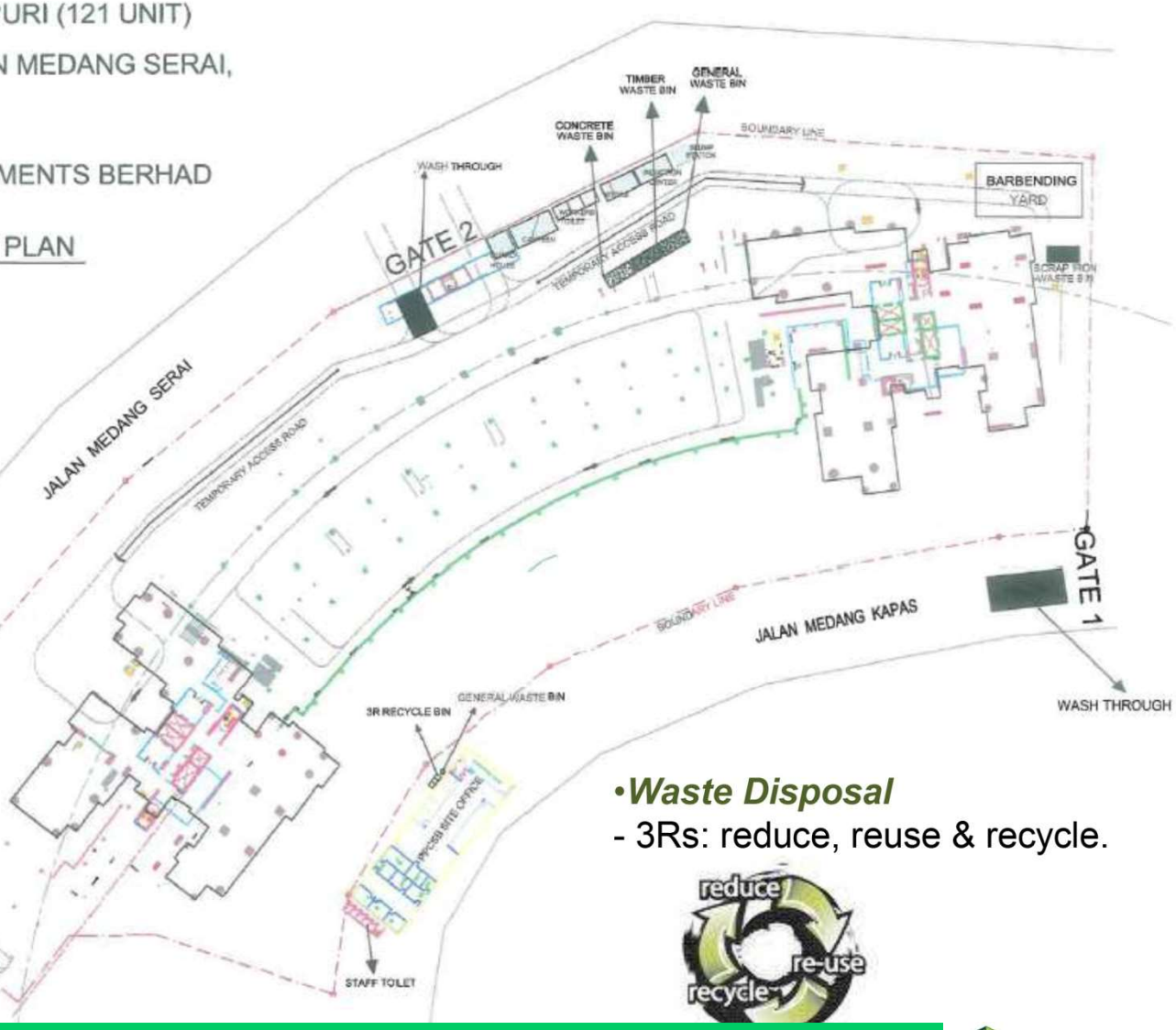
1) Metal
2) Domestic Waste (further segregation in glass, aluminium, paper, plastics)
3) Concrete Waste

Due to constraint of space, other materials could be segregated as the work progresses, like cardboards, plastic etc.

7. Segregation

CADANGAN MEMBINA 2 BLOK PANGSAPURI (121 UNIT)
DIATAS LOT 50354 (SUB LOT 132), JALAN MEDANG SERAI,
BUKIT BANDARAYA, KUALA LUMPUR
UNTUK TETUAN BANDARAYA DEVELOPMENTS BERHAD

CONSTRUCTION WASTE MANAGEMENT PLAN



During Construction
Dedicated area and storage for collection of non-hazardous materials for recycling. Make arrangement with licensed waste collector to provide segregation bins for metal, tiles, timber, concrete, glass, bricks and plastic.

- ***Waste Disposal***
- 3Rs: reduce, reuse & recycle.

8. Management of Waste

Waste materials on the project site basically falls into 3 categories of management:

1) Re-use
2) Recycle
3) Landfill

8. Management of Waste

Re-Use

If surplus materials are used in the permanent works, they are classified as materials which have been re-used. If they are surplus to requirements and need to be removed from site, they can be removed and used in their present form, they are considered removed from site for re-use.

Materials that re-used included:

1) Waste concrete that could be crushed to be used as hardcore for pavement
2) Waste concrete that are used for the temporary access road

8. Management of Waste

•Reuse excess concrete for concrete barrier, lintol & wheel stopper; concrete waste e.g.borepile cutoffs reused for logistic road.

8. Management of Waste

Recycle

If the surplus materials can not be re-used in its present form but could be used in a different form, it is sent for recycling.
Materials that will be sent for recycling will be:

1) Steel re-bars
2) Steel/ Aluminium
3) Timber

8. Management of Waste

•Transfer usable plywood and timber to other project site for reuse

•Returned timber pallet to the manufacturer

•Sell paper box to recycler

8. Management of Waste

Landfill

If either of the above can not be satisfied then the only option left is to send the surplus materials to landfill.

8. Management of Waste

Waste Types	Waste Management Measures
Enabling Works	
Concrete	Re-use on-site
Bricks	Re-use on-site
Timber	Recycle
Metals	Recycle
Cardboards	Recycle
Construction Works	
Plasterboard	Return/recycle
Bricks	Recycle
Timber	Recycle
Cardboard	Recycle
Metals	Recycle
Plastics	Recycle
Glass	Recycle
Ceramics	Recycle

8. Management of Waste

The skips need to be monitored to ensure that contamination of segregated skips does not occur.

We will continually review the type of surplus materials being produced and where we can change the site set up to maximize on re-use or recycling and the use of landfill will be the last resort.

The plan will be communicated to the whole project team (including the client) at regular intervals during site meetings.

9. Ways of Minimizing Waste and Reducing Waste to Disposal

Please describe ways that are being looked at to minimize waste produced, thus reducing waste to be removed from the project site. The actions are meant to reduce the amount of waste and surplus materials which traditionally would have been sent to landfill. This table should also include measures to re-use or recycle the waste produced during construction, identifying the facilities where the waste materials can be sent to.

The table would be updated progressively to reflect more measures to reduce waste.

9. Ways of Minimizing Waste and Reducing Waste to Disposal

Current Action Table

Material Type	Minimize	Destination		
		Re-Use	Re-cycle	Disposal
Metal formwork	Metal formwork instead of timber formwork			
Concrete		Re-used on site for the temporary access road		
Waste metal re-bar.			Sent for recycling	
Packaging	Reduce/ send back			
Wood Pallet	Reduce/ send back			
Bricks		Re-used on site		
Add as necessary				

10. Measurement & Tracking of Waste Management Performance

The plan will be communicated across to all the workers on site and the Waste Management Manager will be in charge of ensuring the proper implementation of the Waste Management Plan. This is to ensure the successful achievement of the Waste Diversion target of 75%.

Waste collection form is to be used to record the quantity of waste and the type of waste that are being sent out of site. One person should be in charge of using the waste collection form to visually estimate the quantity of waste leaving the site in the truck to be sent for re-use on another site, recycling or to the landfill. (Waste Collection Form)

10. Measurement & Tracking of Waste Management Performance

The waste collection form should also include waste receipt from the receiving facility (recycler, landfill). And if the waste is sent for re-use on another site by the sub-contractor, the sub-contractor has to endorse the form to confirm that the waste sent out is indeed re-used on another project site.

10. Measurement & Tracking of Waste Management Performance

The waste data on the waste collection form should then be recorded into the excel spreadsheet provided in soft copy so that the waste data can be recorded and updated throughout the entire construction process. This waste data input in the excel spreadsheet will be summarized on a fortnightly basis to be reported to the client and sustainability consultant during the regular site progress meeting.

11. Construction Waste Management Plan Implementation Checklist

Construction Waste Management Plan Implementation Checklist

Checklist	Yes	No
1. For off-site or disposal, are all the waste destination details verified		
2. Has a waste segregation/collection area been prepared?		
3. Has the waste area been adequately labeled?		
4. Has the CWMP document control/filing system been set up?		
5. Have all the necessary personnel been appointed and briefed?		
6. Have the training for the staff been conducted?		

WASTE TRACKING FORM A (DAILY BASIS RECORD)

Date		Waste Form A No	
Person In Charge		Vehicle Reg No	
No of Trip		Container/ Lorry Type	
Waste Dump Company/ Hauler			
Destination of Waste			

CATEGORY OF WASTE

- ○ Construction Waste
- ○ Scheduled Waste
- ○ Domestic Waste
- ○ E-Waste

TYPE OF WASTE

○ Bricks	○ Metal	○ Binders
○ Tiles & Ceramics	○ Wood Packaging	○ Plastic
○ Concrete	○ Plastic Packaging	○ Timber
○ Insulation	○ Cardboard Packaging	○ Asphalt and Tar
○ Glass	○ Gypsum	○ Mixed Waste
○ Electrical Waste	○ PVC waste	○ General Waste

TYPE OF HANDLING

- ○ Reuse
- ○ Recycle
- ○ Disposal

DIRECTION OF MANAGEMENT

- ○ On-Site
- ○ Off-Site

RECORD

Material	Unit	Quantity	Volume (m3)	Total
1.				
2.				
3.				
4.				
5.				
GRAND TOTAL				
Remarks:				

Waste Receipt No.		Waste Recipient Signature		PIC Signature	

* Kindly attach photocopy of waste receipt together with *Waste Tracking Form A* as record.

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Thank you