

# Initial Environmental Examination

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June 2023

## Bangladesh: South Asia Subregional Economic Cooperation Dhaka-Northwest Corridor Road Project, Phase 2 - Tranche 3

Elenga – Hatikamrul Road

Volume 4 of 5, Appendixes O-P

Prepared by Roads and Highways Department, Government of Bangladesh for the  
Asian Development Bank.

## **CURRENCY EQUIVALENTS**

(As of 02 June 2023)

Currency unit – Bangladeshi Taka (Tk)

Tk 1.00 = \$ 0.0093

\$ 1.00 = Tk 107.50

## **ABBREVIATIONS**

AADT	Annual Average Daily Traffic
AAQ	Ambient air quality
AAQM	Ambient air quality monitoring
ADB	Asian Development Bank
AH	Asian Highway
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BOD	Biochemical oxygen demand
BOQ	Bill of quantity
BUET	Bangladesh University of Engineering and Technology
CITES	Convention on International Trade of Endangered Species
COD	Chemical oxygen demand
CSC	Construction Supervision Consultant
DO	Dissolved oxygen
DPR	Detailed project report
EA	Executing Agency
ECC	Environmental Clearance Certificate
ECR	Environmental Conservation Rules
EHS	Environment Health and Safety
EMOP	Environment Monitoring Plan
EMP	Environment management plan
IEE	Initial Environment Examination
EHS	Environment Health and Safety
GHG	Greenhouse gas
GIS	Geographical information system
GOB	Government of Bangladesh
GRC	Grievance redress committee
GRM	Grievance redress mechanism
HFL	Highest flood level
IA	Implementing Agency
NOx	Oxides of nitrogen
PAP	Project Affected Persons
PCU	Passenger Car Units
PD	Project Director
PIU	Project Implementation Unit
PM	Particulate Matter
PPE	Personal protective equipment
PPTA RHD	Project Preparedness Technical Assistance Roads and Highways Department

RRTC	Road Research and Training Centre
SASEC	South Asia Subregional Corridor
SO <sub>2</sub>	Sulphur Dioxide
SPM	Suspended Particulate Matter
SPS	ADB Safeguard Policy Statement, 2009
TA	Technical assistance
TDS	Total dissolved solids
TSS	Total Suspended Solids

### WEIGHTS AND MEASURES

dB(A)	–	A-weighted decibel
ha	–	hectare
km	–	kilometre
km <sup>2</sup>	–	square kilometre
KWA	–	kilowatt ampere
Leq	–	equivalent continuous noise level
µg	–	microgram
m	–	meter
MW (megawatt)	–	megawatt
PM 2.5 or 10	–	Particulate Matter of 2.5 micron or 10-micron size

### NOTE

In this report, "\$" refers to US dollars.

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## APPENDIX O: EOT

**Government of the People's Republic of Bangladesh**  
Office of the Project Director (ACE, RHD),  
SASEC Connectivity Project-2  
Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-Lane Highway  
Roads and Highways Department  
Sarak Bhaban, Tejgoan, Dhaka-1208, Bangladesh  
E-mail: [pd.sasecii.rhd@gmail.com](mailto:pd.sasecii.rhd@gmail.com)

Memo No – 35.01.0000.069.14.006.21- 1045

Date: 02 October 2022

**Subject: L3592/3593/3883- SASEC Dhaka-Northwest Corridor Road Project Phase-2  
- Revised Extension of Time for Completion of Contract Package WP-06**

Ref: 1. ADB's letter dated 26 September 2022  
2. PD, RHD, SASEC-2's memo no: 35.01.0000.069.14.006.17-817; dated 28 July 2022  
3. Letter of Hego-Mir Akter JV, vide memo HEGO-MAH/SASEC-II/WP06/SITE/2022-073/C592; dated 27 July 2022

In pursuant to Clause 8.4 [Extension of Time for Completion] of the General Conditions of the Contract (GCC), your claim vide ref.3 for reconsideration of Extension of Time (EOT) for completion of Package WP-06 has been reviewed by this office and recommended to ADB for their 'No objection'. ADB agreed the reason of 2<sup>nd</sup> and 3<sup>rd</sup> wave of Covid 19 Pandemic for revised Extension of Completion Time. The additional time allowed for revised Extension of Time -1 (EOT 1) for Completion as agreed by ADB for the interim period is as below:

Package name	Reason for delays	Approved EOT for 1 <sup>st</sup> wave (Days)	Approved EOT for 2 <sup>nd</sup> and 3 <sup>rd</sup> wave (Days)	Total EOT for Covid-19 pandemic (Days)	Original Completion Date	Completion Date after approval of EOT-1	Completion Date after approval of revised EOT-1
WP-06	COVID-19 Pandemic	131	129	260	31-Mar-2022	9-Aug-2022	16-Dec-2022

Hence, the proposal for revised Extension of Time for additional 129 days from 09 August 2022 to 16 December 2022 for Contract Package WP-06 is hereby approved with the following conditions:

1. This Extension of Time shall not entitle the Contractor to any financial claim or any other consequential claim whatsoever.
2. This EOT is without prejudice to Contractor's obligations under the Contract.
3. Performance Security shall remain valid up to 28 days beyond the new completion date.

  
(Dr. Md. Waliur Rahman)  
ID No. - 005083

Project Director (ACE, CC), RHD  
SASEC Roads Connectivity Project-2

Authorized Representative  
HEGO-MIR AKTER JV



**Copy To:**

1. The Country Director, Asian Development Bank (BRM), Sher-e-Bangla Road, Agargaon, Dhaka;
2. The Additional Project Director-1 (SE), BBA, SASEC Road Connectivity Project-2;
3. The Team Leader, SASEC Road Connectivity Project-2;
4. The Project Manager-2, (EE), BBA, SASEC Road Connectivity Project-2;
5. The Resident Engineer, WP-06, SASEC Road Connectivity Project-2;
6. The Project Manager, WP-06 (HEGO-MIR AKTER JV), SASEC Road Connectivity Project-2;
7. Office Copy.



# HEGO-MIR AKHTER JOINT VENTURE

Site Office: Base Camp-01, Beside West Railway Station of Bangabandhu Bridge, Soidabad, Sirajganj  
Email: mahl.sasecwp06@gmail.com, sasecwp06@gmail.com, Mobile: 01917063532

Ref: HEGO-MAH/SASEC II/WP-06/SITE/2023-002/C 659

Date: January 10, 2023

To  
The Project Director (ACE, RHD)  
SASEC Road Connectivity Projects 2, WP-06  
Sarak Bhaban, Tejgaon, Dhaka

Subject: Improvement of Road from West side of Bangabandhu Bridge to Hatikamrul intersection (19.80 km) to a 4-Lane Highway along with slow moving vehicular traffic (SMVT) Lane on both sides & structures.

(Package No. SASEC-II/ICB/MP-1/WP-06, LOT-2).

**-Communication of Courteous thanks to the ADB's NOL of EOT for 129 days against 2<sup>nd</sup> and 3<sup>rd</sup> wave of COVID19 pandemic i.e., EOT to reconsideration up to 16-Dec-2022**

**-Request for Further Extension of Time (EOT) up to 30<sup>th</sup> September-2023, Rationale to submitted VO-1 and other valid reasons.**

Dear Sir

We have received your letter of EOT reconsideration by the ref.: Memo No: 35.01.0000.069.14.006.21-1045 dated: 02 October, 2022 with thanks. We also would like to draw your kind attention to the captioned subject and reference to the ADB's NOL for EOT up to 16-Dec-2022 considering 2<sup>nd</sup> and 3<sup>rd</sup> wave of COVID-19 pandemic. For EOT consideration against several waves of COVID-19, we are absolutely thankful to your esteem as well as to ADB NOL.

Nevertheless, by the analysis and evaluation of factual scenario and proposition of this Contract WP-06, there are events, causes, reasons are still left to take into consideration for determination of rationale EOT for successful completion of the works under contract and specification.

Out of such events and causes the most significant events arose thereof as under which have generated the Extension of Time are the variation of items by quantity increased and new items which are furnished herein below for your kind ready references:

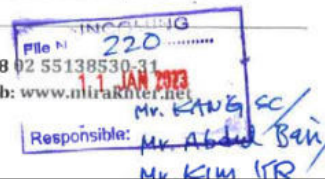
#### Major Scope Changes as per Variation Events or Activate

SL.	Original Scope	Revised Scope	Remarks
1	Contract Length-19.80 kilometer	Contract Length-19.015 kilometer	
2	2-Lane plus SMVT Bridges, L/S: 7 Nos SMVT Bridges, R/S: ZERO	2-Lane plus SMVT Bridges, L/S: 7 Nos SMVT Bridges, R/S: 4 Nos	
3	Number of Flyover: 1 No (Kodda only)	Number of Flyover: 2 Nos (Kodda and SEZ)	
4	SMVT Underpass -Zero	SMVT Underpass -4 Nos	
5	Addition of Viaduct Structure: Zero	Addition of Viaduct Structure: 3 Nos (3-Places)	
6	Pile: 1000mm diameter pile: 14,294 Rm 750mm diameter pile: Zero	Pile: 1000mm diameter pile: 15,662 Rm 750mm diameter pile: 10,080 Rm	
7	Permanent Steel Casing: Zero	Permanent Steel Casing: 783.38 Rm	
8	Concrete Class-35: 183 Cum (For Structure)	Concrete Class-35: 245.15 Cum as per VO-1 and as per field condition 973 Cum (For Structure)	
9	PC Girder: 196 Nos	PC Girder: 233 Nos	
10	SMVT Road Width- 3.6 meter	SMVT Road Width- 4.2 meter	
11	Rigid Pavement Area- Zero	Rigid Pavement Area- 61,405 Sq. meter	
12	Aggregate Base-1- 101,695 Cum Aggregate Base-2- 52,055 Cum	Aggregate Base-1- 127,653 Cum Aggregate Base-2- Zero	

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## HEGO-MIR AKHTER JOINT VENTURE

Site Office: Base Camp-01, Beside West Railway Station of Bangabandhu Bridge, Soidabad, Sirajganj  
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13	Lean Concrete for rigid pavement -Zero	Lean Concrete for rigid pavement -5918 Cum	
14	Cladding – 22,932 Cum	Cladding – 127,130 Cum	
15	Standard Compaction in Earthwork and ISG	Modified Compaction in Earthwork and ISG	
16	Widening of Pavement from Ch. 107+700 to Ch. 109+714 due to Hatikumrul interchange. Width: 10m	Widening of Pavement from Ch. 107+700 to Ch. 109+714 due to Hatikumrul interchange. Width: 13.65m	
17	Precast RCC Wall Panels- 4,486 Sqm	Precast RCC Wall Panels - 10,634 Sqm	
18	Reinforced earth – 33,240 Cum.	Reinforced earth – 96,773 Cum.	
19	Repair works of Existing Bridge: Zero	Repair works of Existing Bridge: 1No	
20	Supply, installation of Street Light: Zero	Supply, installation of Street Light: 220 Nos	
21	No. of scope of New Jersey Barrier (NJB)	1.2 Meter NJB -	
22	Semi-Continuous or Finger Type Expansion Joint	Modular Sinus Type Expansion Joint	

Referenced to above it is obvious that there shall be positive requirements of Extension of Times (EOT) for successful completion of the varied works as stated above.

According to our meticulous computation as attached herewith, to complete the above varied items of works this WP-06 contract would be requiring extension of time up to 30<sup>th</sup> September-2023.

Therefore, we do humbly request your honor to kindly sanction the EOT up to September 2023 for successful completion of the contract WP-06 of SASEC Road Connectivity Project-II.

This is for your kind information & necessary action please.

Your kind response in this regard is highly appreciated.

Thanking you and assuring you of our best services at all times.

Sincerely yours

Liu Xiaomei  
Authorized Representative  
HEGO-Mir Akhter JV

Encl: As stated above

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## APPENDIX P: Waste Management Plan

SASEC Dhaka-Northwest Corridor Road Project Phase -2

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**Government of the People's Republic of Bangladesh**  
Ministry of Road Transport and Bridges  
Road Transport and Highways Division  
Roads and Highways Department

**SASEC ROAD CONNECTIVITY PROJECT-2**  
**SASEC Dhaka-Northwest Corridor Road Project, Phase 2**  
**ADB Loan: 3592/3593/3883-BAN**

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### **Guideline for Hazardous Waste Management**

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**PROJECT IMPLEMENTATION CONSULTANTS are**  
**Korea Consultants International Co., Ltd. (South Korea) in joint venture with**  
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Consulting Services Ltd. (Bangladesh), Development Technical Consultants Pvt. Ltd.  
(Bangladesh), Philkoei International, Inc. (Philippines)



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Project Implementation Consultants (PIC)

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## Abbreviations

ADB	Asian Development Bank
CEMP	Construction Environmental Management Plan
EHS	Environment, Health and Safety
EMP	Environmental Monitoring Plan
MSDS	Material Safety Data Sheet
PIC	Project Implementation Consultants
PPE	Personal Protective Equipment
RHD	Roads and Highway Department



## PREAMBLE

Hazardous waste management is one of the vital environmental issues since last few decades. It has been noted that the generation of waste increases with increasing population, industrialization and construction etc. The hazardous waste management guideline Indicate the cause of potential threat to environment and public health. Rapidly growing construction sector has contributed to the generation of large quantity of hazardous waste material. Therefore, to reduce environmental hazard, proper attention is required during storage, segregation, transportation and disposal of hazardous waste, because it cannot be disposed as off in the environment. This guideline explains about hazardous wastes, types and management.

Hazardous wastes that are disposed of causes potential hazard to human health or the environment (soil, air, and water) when it is not properly managed. They are non-biodegradable, persistent in the environment and are deleterious to human health or natural resources. The management of hazardous waste is a process which includes the collection, recycling, treatment, transportation, disposal, and monitoring of wastes disposal sites. Toxic and hazardous substances from construction materials sources contaminate the land, air, and water. The potential health risk associated with these substances vary from minor, short term discomforts, such as headaches and nausea to serious health problems, such as cancers and birth defects, to major accidents that cause immediate injury or death. It is therefore important to take necessary steps in managing the waste. In view of this, management of hazardous wastes including their disposal in an environment friendly and economically viable way is very important and therefore suggestions are made considering the waste types. Hence in this guideline about hazardous waste, types and management.



## CHAPTER 1: PROJECT DESCRIPTION

### 1.1 Background

Road transport being the predominant mode of transport in Bangladesh accounting for about 80% of total traffic moved, road quality does not correspond to the Asian Highway standards. Most of Bangladesh's road network needs to upgrade for handling modern diversified vehicles. However, Bangladesh has already taken many steps to strengthen its regional and international transport connectivity; specially aiming to facilitate trade between Bangladesh and the north-eastern states of India, the Indian state of West Bengal & Assam, Bhutan, Nepal and Myanmar. The Road Master Plan 2009 targeted to expand the major roads and highways of Bangladesh to four lanes.

Environmentally sustainable development is currently the goal of all nations in the world for sustainable living. The challenge of sustainable development is that it must meet the need of present generation without compromising the prospect of future generation. However, the human activities for better living and rapid economic gain without sufficient conservation practices have already created multifarious environmental problems of complex nature that need to be addressed locally, regionally and globally with an approach of common but differential responsibility.

In this perspective, GoB requested loan assistance from the Asian Development Bank to partly finance the South Asia Sub-Regional Economic Cooperation Dhaka-Northwest Corridor Road Project Phase 2. The scope of civil works under the Investment Program includes the Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-lane highway with Slow Moving Vehicular Traffic (SMVT) lane on both sides' road network.

The outcomes of investment projects are considered environmentally sound and sustainable when people and environment are protected from the potential adverse impacts of the development interventions. Although the country safeguard systems comprising policy frameworks, institutional arrangements and administrative procedures for delivering safeguards are already in place to address environmental issues in the country, but effective and proper implementation of this mechanism often hampers due to lack of focus to environmental sustainability from borrower agency. In consequence, EA involves inadequate human resources with environmental management expertise and knowhow for implementation of environmental management activities.

### 1.2 Project Details

The Government of Bangladesh is emphasizing on improved connectivity with the country and the in line with this objective the GoB announced its National Land Transport Policy in 2004 defining long term (20 years) Road Master Plan (RMP). The Road Master Plan (RMP) has identified many feasible and priority projects. One of the priority roads identified is Elenga - Hatikamrul -Rangpur Road.

According to the Bangladesh Road Master Plan, this project road is the backbone highway network of Bangladesh south-north axis, which provides sub-regional connectivity along the South Asian countries. The Elenga - Hatikamrul -Rangpur Road (N-5) is the part of SASEC Corridor (Corridor 4 & 9), Asian Highway (AH2), BIMSTEC-2 and SAARC Highway Corridor (SHC) 4.

The alignment of SASEC Road Connectivity Project-2 starts from the Elenga (end of SASEC-1) and ends after Modern More of Rangpur City. The road passes through Bogra town and several Upazila towns, markets and developed areas like: Hatikamrul, Sherpur, Mokamtola, Gobindogonj, Polashbari, Dhaperhat, Pirgonj, Shati Bari and Mithapukur amongst others. The Length of the road is about 190.4km and the average width of the entitling carriageway is 7.3m.



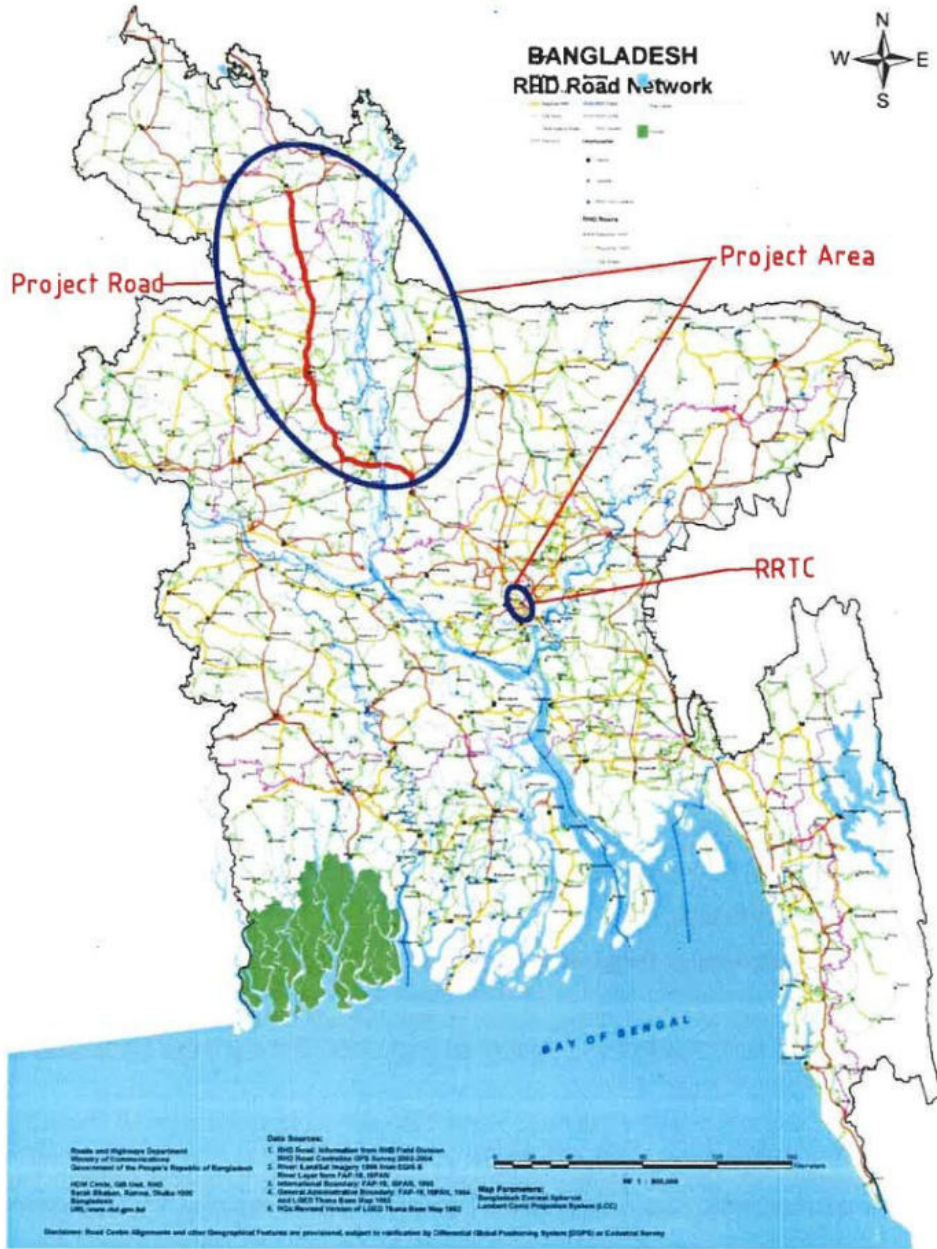


Figure 01: The project location (Road, RRTC & ROU)



### 1.3 PURPOSE

The purpose of this guideline for the Construction Hazardous Materials Management Plan is to identify all hazardous materials, including goods or substances, to be used for SASEC Road connectivity Project-2 execution to prevent adverse environmental impact and to minimize risk to public health due to handling, use, storing and transporting of such hazardous substances. The main aim of this Plan is to ensure hazardous materials are handled, used, stored, transported, and removed from the site Stoke Yard, Storage Rea in an appropriate manner that minimizes environmental impact generated on workers and, especially, on the surrounding community, sensitive habitats, terrestrial fauna and vegetation and rock art.

This document is issued following the Public Environmental Review commitments and in compliance with the requirements set forth in the Commonwealth Approval, condition and all applicable statutory laws and regulations of Bangladesh of Contractor as submitted Company Corporate and Project requirements and Contractor requirements. This Plan needs to be read together with the Construction Environmental Management Plan, in which general issues such as roles, responsibilities, environmental monitoring, inspection, auditing and reporting are described.

### 1.4 SCOPE

This Construction Hazardous Materials Management Plan will be applied to product, chemical or material with hazardous properties to be introduced in the site to perform any activity by Contractor or any of its Subcontractors (as per contract clause) during the execution of the SASEC Road connectivity Project-2.

This Project will be performed by means of modular construction and therefore, this Construction Hazardous Materials Management Plan is applicable to all hazardous materials and/or chemicals used, stored, and handled by the Contractor and its Subcontractors as part of the construction phase of the SASEC Road connectivity Project-2 in the Construction Site.

Burrap peninsula where the modules are going to be installed erected and hooked up. Any hazardous material issue related to yards where modulars are being construction is subject to document's requirements unless it forms part of the final object being shipped to site.



## Chapter Two: PROCEDURE

Hazardous materials to be transported, stored, and handled during construction of the SASEC Road connectivity Project-2 have to be properly managed both to minimize risk to health and to avoid environmental impact on the project surrounding area and community.

Hazardous materials are sometimes called as dangerous goods according to definitions stated in regulatory texts but they shall be referred to as "hazardous material" along the whole document.

Table 0 HAZARDOUS SUBSTANCES / MATERIALS (not limited)

Hazardous material	Type	Location
Gasoline, kerosene, diesel, lubricants, Paint, fuel oil, Admixtures, Batteries, Acid, Bituminous etc.	Liquid	Storage and Construction site Area.
Bentonite, Cement, Asbestos, Plastic, Geotextiles	Solid,	Storage And Construction site Area
Compressed Gas, propane Gas, Acetylene.	Gases	Storage and Construction site Area
Other Hazardous Material (if any)		Storage and Construction site Area

### 2.1 ENVIRONMENTAL IMPACTS

None of the above mentioned materials are extremely dangerous or hazardous in normal working conditions and they are all used in huge quantities at site. Some materials may be us large quantities for project scope of work but due to prefabrication and modularization strategy, all of them will be used in small quantities in site. Therefore, the environmental impact due to the use, storing, transport and handling of hazardous materials during construction activities may be considered.

In any case, impacts that may affect the surrounding environment are mainly:

- Air pollution because of gases and vapors' generation during engines operation.
- Ground and soil contamination due to accidental spill or leak.
- Health impact when long term exposed to some of the chemicals.
- Fire or explosion involving hazardous materials use and storage.

The worst scenario which will be responsible for a moderate impact would be a non-expected spill of stored material such as painting or diesel fuel or an accidental fire or explosion. Such events have already been analyzed and assessed and shall be dealt with as per Construction Environmental Management Plan.



## Chapter 3: MITIGATION MEASURES

The most important of all mitigation measures is to minimize the number of workers exposed to the hazardous material effect and impact by means of signaling affected areas, identifying very clearly any hazardous container, barricading areas for especially hazardous activities or materials, promoting awareness campaigns, ensuring appropriate training is undertaken by all involved personnel and selecting least hazardous material that can be used for the same purpose.

In addition to these, the following mitigation measures will be implemented on site in order to minimize environmental and health impact due to hazardous materials use:

- All hazardous materials have to be taken by consent from competent authorities prior to being allowed access to the site.
- A complete and updated Hazardous Register shall be kept at site, storage area and made available for all workers as well as consult with the worker about handling method of hazardous waste.
- A full set of Material Safety Data Sheet (MSDS) will be available for all workers and kept updated and in force at all times.
- All containers where hazardous materials are will be clearly marked and identified so that no mistake is possible.
- Labelling shall be clear and visible, including all required information.
- Appropriate storing and handling will be ensured at any time.
- Awareness and training will be undertaken by all involved personnel.
- Monitoring and inspection activities will be carried out by Contractor HSE Teams in order to ensure compliance with these measures.
- Site assessments shall be performed followed by reports' issuance and results distributed amongst the whole workforce.
- Health surveillance controls will be undertaken as deemed necessary by Site Management team.

General safety provisions are included in the Construction HSE Plan and summarized below:



- Contractor approval of hazardous material use.
- No hazardous material will be introduced in the site without prior providing full information and recommendation on handling, using and storing the product as per Material Safety Data Sheets (MSDS).
- Required PPE shall be made available prior to starting operations which involve the handling and use of the chemical.
- Appropriate training has been provided to all affected personnel.

### 3.1. Hazardous Material Register

A hazardous material register shall be prepared and issued by Contractor EHS Team to provide accurate information on existing hazardous materials to all affected workers. Main information included in this register will be provided by each Contractor while requesting approval to introduce a hazardous material or chemical on site. This hazardous material register will consist of a list of all hazardous materials and chemicals in the site, reference to where it is stored and used, reference to its MSDS and information on responsible person for such product (it shall be either the EHS representative of the worker using it or its foreman, as designated). The Register will be reviewed and updated on a weekly basis and whenever changes occur.

### 3.2 MSDS and Labelling

Hazardous materials use, handling, storing and transport can be performed safely if products are correctly identified and hazards known and understood. Therefore, an appropriate labelling and

identification is as important as the correct handling of the product.

All approved hazardous materials entering the site will be identified on the container or package or any containment device in which the product is presented by means of an appropriate label. Minimum information that shall be contained in such a label is:

- ✓ Complete product commercial name
- ✓ Chemical composition / name
- ✓ Reference to MSDS
- ✓ Expiry date (if applicable).

All products labelling shall be according to WA statutory regulations and standards. Any hazardous material found to be non-identified or incorrect labelled will be removed from the site until deviation corrected and verified. In addition to containers' labelling, MSDS of all hazardous materials (and non-hazardous chemicals) shall be provided prior to introducing the product on site and made available to all workers for consulting and use.

MSDS complete information shall include:

- ✓ Complete product identification and composition;
- ✓ Hazard degree and classification;
- ✓ Main risks and hazards;
- ✓ Physical, chemical and toxicological properties;
- ✓ Precautions for use and safe handling;
- ✓ Storage procedures and conditions;
- ✓ Exposure controls and personal protection;
- ✓ Emergency measures: firefighting and spilling;
- ✓ Transportation measures and criteria;
- ✓ Applicable regulation.



MSDS will be filed and kept and Contractor HSE department, first aid station and where stored. MSDS provided by manufacturers shall never be modified at site. Additional information may be attached if deemed necessary but original MSDS cannot be altered in any way.

### 3.3 Handling, Storing and Transporting

Handling of all hazardous chemicals will be carried out by properly trained workers and supervisors. No handling will be allowed prior to undertaking the appropriate training or induction session. All manufacturers' recommendations, directions for use and safe practices shall be followed according to provided information. No material will be used for a different purpose than the one for which it was designed and manufactured. Required PPE as per MSDS information will be worn at all times by workers using and handling hazardous materials.

Where spills or leaks can happen, storing area will be designed taking into account this environmental risk. Storing area will be provided with a second container that may consist of a double container for the hazardous material, drip tray prepared to contain the whole quantity of hazardous material or an isolating material used to protect the ground and to prevent soil contamination due to an accidental leak or spill.

In case a minor spill takes place while handling, using or being stored, action will be taken by using

6

remediate spill kits available, always following MSDS recommendations while dealing with the chemical and using proper PPE as required. The source shall be isolated as soon as possible and affected area contained immediately to avoid impact. Further detailed response action shall be performed as per Construction Environmental Management Plan.

Especially dangerous or hazardous activities due to the materials involved such as radiographic testing, welding activities or refueling of small machinery and equipment, will be performed taking into account specific mitigation measures:

- Radiographic testing will be performed outside normal working hours, in barricaded areas with only authorized personnel present and provided previous notification to Contractor. Affected areas will be signaled and properly protected so that non- authorized personnel cannot access the area.
  - Welding activities will be carried out in an isolated area as far as reasonably practicable. Whenever this is not possible, safety devices will be put in place to ensure no hazards are posed on affected workers.
  - Refueling of small equipment shall be performed protecting the ground soil from accidental spills by means of drip trays and provided with spill remediation kits and firefighting equipment in the vicinity.
  - Drip trays will be located under any stationary rotating machinery together with firefighting equipment where spills can occur, such as generators, generator driven welding machines etc.
- Firefighting equipment will be provided and available at storing and use areas as required. This firefighting equipment will be inspected as per general equipment inspection program.



Handling of hazardous wastes, persons handling hazardous wastes are advised to have protective precautions to protect themselves from health effects. Exposure of hazardous waste leads to dermatitis in the skin, asthma on long exposure, eye irritation and tightening of the chest.

Transport of hazardous waste, generated often requires transport to a particular site for an approved treatment, storage, or disposal facility (TSDF). Because of potential threats to public safety and the environment, transport is given special attention by governmental agencies to avoid any occasional accidental spill.

### 3.4 Disposal and Treatment

The existing waste management policy neither includes any waste to energy recovery targets, nor does it explain any recycling or reuse targets. Besides, there are no provisions for incentives for waste minimization. Some synopsis of policies are as bellow:

**The Dhaka Municipal Ordinance, 1983:** The ordinance authorizes Dhaka City Corporation (DCC) to take the responsibility of removal, collection and disposal of refuse, management of latrines and urinals, control on dyeing and tanning skins, bricks, kilns, medical practice on infectious diseases and direction towards house scavenging, cleaning drainage, cleansing of streets etc. i. 78(1) The Corporation shall make adequate arrangement for removal of refuse from all public streets, public latrines, drains and all buildings and land vested in the corporation and for the collection and proper disposal of such refuse. The occupiers of all buildings and lands within the corporation shall be responsible for removal of refuse from such buildings and lands subject to the general control and supervision of the Corporation. The Corporation may provide public-dustbin or other suitable receptacles at suitable places. The Corporation may, by public notice, require that all refuse accumulating in any premises or land shall be deposited by the owner or occupier of such premises of land in such dustbins or receptacles. All refuse removed and collected by the staff of the Corporation or under

their control and supervision and all refuse deposited in the dustbins and other receptacles provided by the Corporation.

**The Environment Policy, 1992:** The Environment Policy, 1992 intends to restrict disposal of municipal, industrial or agricultural wastes in any water bodies like rivers, ponds and drains. It also discourages open

truck transportation during daytime collection of waste.

**Urban Management Policy Statement, 1998:** The policy considers the interest of providing economic, efficient and reliable services; municipalities shall endeavor to contract out solid waste disposal, public sanitation, drain cleaning and road maintenance.

**The penal Code:** It provides with six month imprisonment or fine to Taka 2000(BDT) or both for causing public nuisance with respect to negligence about spread of life threatening infectious disease, causing damage to climate, negligence about poisonous substances. It also empowers a magistrate of jurisdiction to pass conditional order for removal of nuisance.

**Environment Conservation Rule, 1997:** According to Environment Conservation Rule, 1997, landfill activity by industrial, household and commercial waste is categorized as

Red Category activity and therefore undertaking any landfill project must consider environmental impact assessment and NO Objection Certificate (NOC) need to be obtained.

**The Factory Act, 1965:** The act address with cleanliness, disposal of wastes and polluted liquids, air circulation and temperature control, control of dust, sand and smoke, artificial ventilation, heavy traffic arrangement of sufficient light, drinking water, toilet, latrines etc. within the mills and factories.

**National Environmental Management Action Plan (NEMAP):** The Ministry of Environment and Forest (MoEF) has formulated this action plan. NEMAP has recommended for actions in the areas of sanitation, solid waste management, water supply and environmental awareness etc. Based on the findings and recommendations of NEMAP, the government has taken up projects like community-based water supply and sanitation, community based solid waste management and community-based wastewater treatment (GoB, 1995).

**National Policy for Water Supply and Sanitation 1998:** The Ministry of Local Government Rural Development & Cooperatives has prepared this policy. Special emphasis has been given on participation of private sector and NGOs in water supply and sanitation in urban areas.

**Local Level Legal Framework:** There is no adequate legislation in the country to address the growing problems of solid waste. The responsibility of removal and disposal of municipal solid waste lies with the City Corporations and municipalities. The six City Corporation Ordinances and Pourshava (small town municipality) Ordinance 1977 are the only local law that gives some idea about disposal of municipal waste.



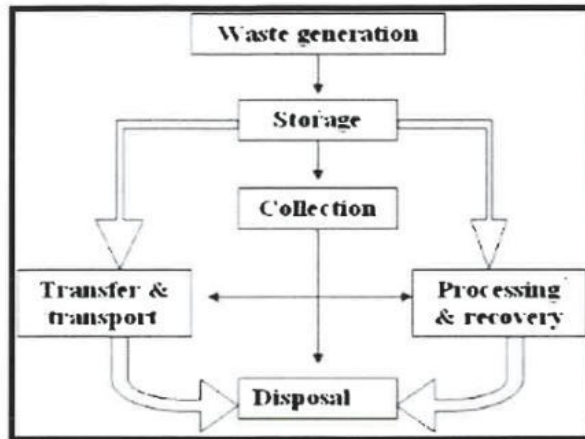


Figure 2: Steps involved in hazardous waste disposal

### 3.4.1 Secure landfill

Disposal of some hazardous wastes in regular landfills resulted in unfavorable amounts of hazardous materials seeping into the ground. These chemicals eventually enter natural hydrologic systems. So to prevent the chemicals entering the soil, landfill requires a barrier for collecting hazardous substances that may remain in the disposed waste. Now, hazardous wastes are stabilized and made into solid and placed in landfill and this process depends upon the type of hazardous waste. A landfill is a disposal facility where hazardous wastes are placed into and stored in the soil [10]. An example of a recommended design is shown in Figure 2. The wastes are dumped in sealed drums before disposal. The hazardous-waste landfill setup consists of two impermeable liners and also includes leachate collection systems. Double leachate collection system is made up of network of pipes placed above each liner. The upper layer reduces the accumulation of leachate trapped in the fill, and the lower layer acts as a backup. The leachate collected is transferred to treatment plant for further process. An impermeable cap or cover is placed over a finished landfill is placed to reduce the amount of leachate in the fill and minimize the potential for environmental degradation.

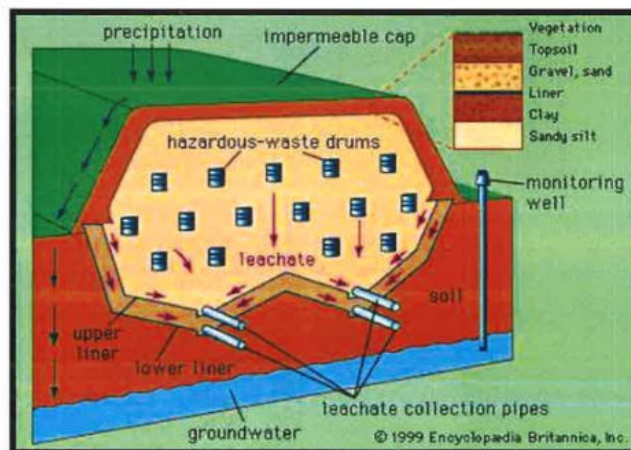


Figure 3: Secure land fill method.

The main components in the leachate from landfill sites are grouped as follows:



Major elements and ions such as calcium, magnesium, iron, sodium, ammonia, carbonate, sulphate and chloride.

- Trace metals such as manganese, chromium, nickel, lead and calcium
- Wide variety of organic compounds
- Biological agents
- Hazardous waste mainly from industries will give rise to leachate. Heavy metals concentration in the leachate is of greater concern compared to other components of leachate.

### 3.4.2 Deep well disposal

Another alternative disposal of liquid industrial waste is injection into deep well as shown in the Figure 3 . Deep well injection is a liquid waste disposal technology. This alternative uses injection wells to place treated or untreated liquid waste into geologic formations that have no potential to allow migration of contaminants into potential potable water aquifers. In order to force the liquid into the pores and fissures of the rock, high pressures are applied. The rock unit selected are of porous and permeable (commonly, sandstone or fractured limestone), and must be separated by low permeability layers (for example, shale) above and below. Deep-well injection is a cost effective and requires little or no pretreatment of the waste, but it poses a danger of leaking hazardous waste and eventually polluting underground water resources.

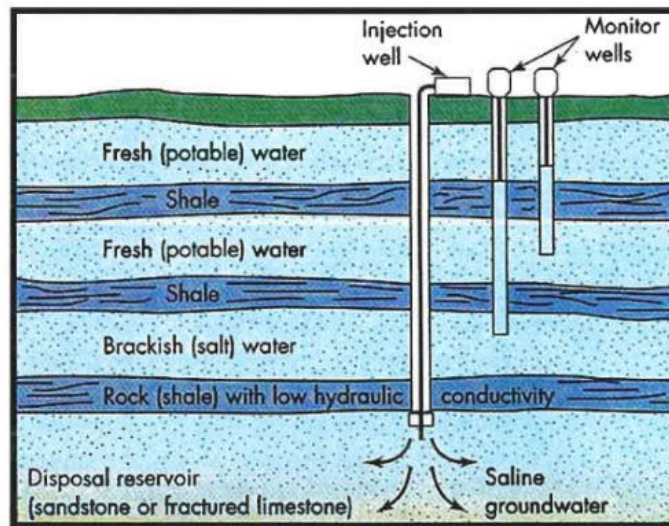


Figure 4: Deep well disposal method.



### 3.4.3 Bedrock disposal

Bedrock disposal is mainly meant for solid hazardous waste and a variety of bed rock types are being investigated as host rocks. The design of a bedrock disposal site or repository for hazardous wastes

is shown in Figure 4. It is based on the multiple barrier (or multi barrier) concept: surrounding solid hazardous waste sealed with several different types of materials to prevent waste leakage or invasion by ground water. A major concern is the nature of the host rock as well as some potential drawbacks. The method is widely used for high-level radioactive wastes. Sealed into stainless steel canisters, or spent fuel rods encapsulated in corrosion resistant metals such as copper or stainless steel and buried in stable rock structures deep underground. Many geological formations such as granite, volcanic tuff, salt, thick basalts such as the Columbia River plateau basalt or shale will be suitable.

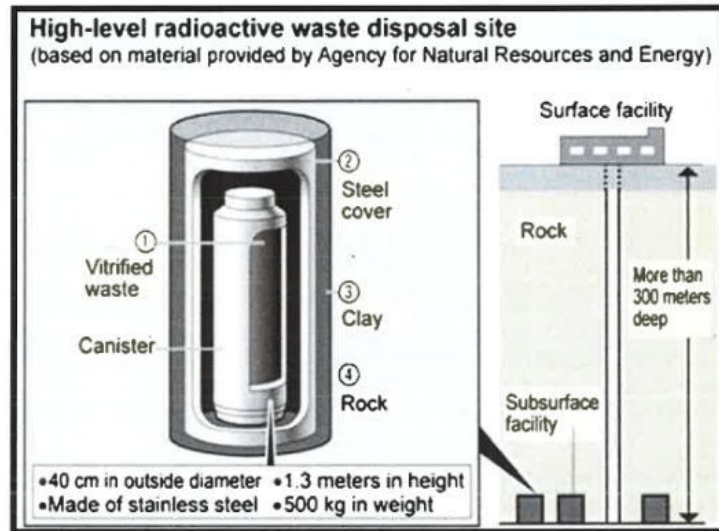


Figure 5: Bedrock disposal method.

### 3.5 Training and Awareness

All workers and supervisors with potential for exposure to hazardous materials, that is, involved in the use, storing, transport and handling of any hazardous material present on the construction site of the SASEC Road connectivity Project-2 will be trained on the identification and use of such material, risks and hazards and, especially, on what to do in case of abnormal conditions or emergency situation of any kind. The EHS personal of the Contractor train to the worker or engaged person about Handling, Storing and Transporting of hazardous materials

As part of the Hazardous waste management Program to be put in place by Contractor for construction activities, training sessions including hazardous materials information will be organized by Contractor to ensure awareness of all workforce. Minimum issues addressed during training sessions shall include:

- ✓ Information on what hazardous materials can a worker or supervisor be exposed to while performing their tasks and duties.
- ✓ Hazardous material identification.
- ✓ Labelling: what information is explained on each part of the label, what pictures mean, what critical information has to be searched for and why each piece of information is provided in any container's label.
- ✓ Procedure to be followed in the normal use, handling, storing and transport of hazardous materials.
- ✓ General materials' hazardous properties.

- ✓ Procedure to be followed in the cleaning up and disposal of the hazardous material.
- ✓ MSDS availability, location, information contained therein.
- ✓ Personal protective equipment to be used.

All training sessions shall be recorded in writing and an attendance list signed by all participants. The record of such training will be kept at Contractor HSE department and made available upon request.

Hazardous materials issues shall also be raised during toolbox meetings in which employees' will be given the opportunity to share past experiences and suggestions in the best use and handling of the hazardous material for all workforce to be aware.



## Chapter 4: MONITORING AND REPORTING

The correct implementation of all provisions described in this Hazardous Materials Management Plan will lead to minimum impact due to chemicals handling. The site HSE team will monitor this performance as part of periodic HSE inspections.

Monitoring on hazardous materials conditions, such as:

- ✓ Labelling conditions (legible, clearly visible, according to contained product).
- ✓ Hazardous materials' use, handling and storing.
- ✓ Conditions of storing areas.
- ✓ Availability of MSDS.
- ✓ Training records.

Identified deviations will be reported to all affected and involved personnel and actions follow up will ensure appropriate corrective actions are implemented. Serious deviations or incidents will be reported in writing and included in the Monthly HSE Report.

### 4.1 AUDIT

As part of Project Environmental Management system, compliance of this Construction Hazardous Materials Management Plan will be audited during internal EHS Audits performed on a periodic basis by Contractor to EHS Team. HSE Internal Audits procedure is described in the Project Construction EHS Plan.

The main prospective of hazardous waste management program is to change the way of managing hazardous waste so that they can be stored, transported and dispose in an environmentally safe manner. The focus of managing hazardous waste comes in an effort to address potential threats to public health and environment. Hazardous waste management must have an initiative beyond disposing directly into the land surface. Industries are encouraged to generate less amount of hazardous waste as a part of manufacturing process. Because the toxic wastes cannot be completely eliminated and only possible way is to minimizing, recycling, and treating wastes. Therefore, steps should be taken to use the modern technology without causing any threat to environment. Minimizing, recycling, and treating wastes.



ATTACHMENTS

Attachment 01. HAZARDOUS REGISTER

<b>Product name</b>	<b>Date of entry</b>	<b>Date of exit</b>	<b>Storing location</b>	<b>Use location</b>	<b>MSDS reference</b>	<b>Responsible contact info</b>

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**❖ Reduction / Minimization of Generation of Construction and Demolition Materials**

- The various waste management options would be categorized in terms of preference from an environmental viewpoint. The options considered to be more preferable would have the least negative environmental impacts and are relatively environmentally sustainable. Hence, the hierarchy of waste management is as follows:
- Avoidance and minimization, i.e. not generating waste through changing or improving practices and design;
- Reuse of materials, thus avoiding disposal;
- Recovery and recycling, thus avoiding disposal; and
- Disposal, according to relevant legislations, guidelines and good practice.

This hierarchy would be used to evaluate waste management options, thus allowing maximum waste reduction. Waste reduction measures would be introduced at the planning stage and carried through the demolition and construction activities, whenever possible, by careful purchasing control, reuse of materials and good site management. By reducing or eliminating over-ordering of construction materials, waste is avoided and costs are reduced both in terms of purchasing of raw materials and disposing of wastes.

The generation of Construction & Demolition materials can be reduce/minimize through the implementation of proper planning of works and make use of the construction material inventory. A proper planning of works starts from best estimation of the construction materials usage during construction before ordering. Having estimated the amount, a further step shall be taken to check whether the required materials are in the inventory of the construction material. If no such amount of the materials in the inventory, order will then be made. This can greatly avoid and minimize the over-ordering and enhance the reuse of the construction materials on site.

When ordering, the Purchase Officer will check with the producer whether the packaging materials is necessary or not during delivery and/or storage. If it is not necessary, order the materials without packaging.

Good management and control can prevent the generation of a significant amount of waste. Waste reduction can be best achieved at the planning and design stage, as well as by ensuring the implementation of good site practice:

Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;

Any unused chemicals or those with remaining functional capacity shall be recycled;

Use of reusable non-timber formwork to reduce the usage of timber;

Prior to disposal of Construction & Demolition waste, the wood, steel and other metals shall be separated for reuse and/ or recycling to minimize the quantity of waste to be disposed of to landfill;

Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and

Plan and stock construction material carefully to minimize amount of waste generated and avoid unnecessary generation of waste.

#### ❖ **Control of Using Timber**

The used of timber in temporary works construction shall be avoided, reduced or minimized as far as possible. Where using the timber for a temporary works construction process/ activity with an estimated quantity exceeding 10m<sup>3</sup>, a method statement will be submitted to the Engineer Representative prior to commencement of the relevant temporary works.

The method statement shall include the justification for and the measures taken to minimize the use of timber in the temporary for Engineer Representative Consideration. In addition, a summary table containing the description, justification and estimated quantity for every work process/ activity requiring the use of timber for temporary work construction irrespective of the quantity of timber used shall be provided to Engineer Representative also.

#### ❖ **Reuse of materials**

Many construction materials for temporary structure construction can be reused by having a good sorting process. To enhance and facilitate the reuse of the construction material, all the materials shall be sorted as far as possible before disposed. The reuse materials shall also be sorted according to the main features or conditions such as the length or volume whatever it is suitable for identifying the classification/ condition of reused material on site.

During the operation of the Project, some construction materials will be generated such

as soil, hard rock and broken concrete due to the job nature. Such materials shall be identified whether they can be reused on site or not.

#### ❖ **Recovery and Recycling**

For Construction & Demolition materials that cannot be reused on site any more shall be collected and stored properly for recycling. The storage area shall in a dry and covered condition to prevent cross contamination.

Arrangement will be made with the recycling company to facilitate the recyclable material sorted from the Site are collected with reasonable care.

#### ❖ **On-site Sorting of Construction & Demolition Materials**

A system shall be devised for on-site sorting of Construction & Demolition Materials. The system shall include the identification of the source of generation, estimated quantity, for on-site sorting and/or collection, temporary storage areas, frequency of collection for recycling / disposal of the Construction & Demolition Materials. The Construction & Demolition Materials shall be sorted at source into:

- (1) Hard rock and large broken concrete suitable for reused on site or recycling at designated location as approved by the Engineer;
- (2) Metals suitable for reused or recycled;
- (3) Paper and plastics;
- (4) Chemical wastes; and
- (5) Materials suitable for disposal at public fill reception facilities or sorting facilities, where disposal at the sorting facilities should first be approved by the Engineer.

Designated areas shall be located for the temporary storage of Construction & Demolition Materials prior for sorting and shall be marked on a layout plan.