

Environmental Guideline on Stone crushing plant set up temporarily for the purpose of a project by a public department



Department of Environment

This environmental guideline provides guidance to ensure that all environmental issues are duly taken into consideration by the prospective developers.



1.0 Background

The construction sector has witnessed a major expansion in the last decade, with some large construction sites accommodating their own temporary stone crushing plant, batching plant and block making plant.

This guideline applies for stone crushing plants set up temporarily for the purpose of a project by a public department. The temporary nature of the plant refers to the duration of the project.

A **stone crushing plant** is primarily involved in the manufacture of aggregates of various sizes (coarse aggregates, crusher run, rock sand and other fine aggregates) from basalt boulders. Coarse aggregates are usually used in ready mix concrete and asphaltic concrete. Crusher run is used for the bases and sub-bases for road making. Fine aggregates are used for the production of concrete and plastering.

The processes involved in stone crushing include pre-processing, crushing, washing, screening and recycling of wastewater.

- Pre-processing consists of removal of stone boulders by mechanical means and screening of the boulders in a feed hopper to remove soil and small rocks.
- Crushing entails primary, secondary and tertiary crushing of the boulders into the aggregates.
- Washing and screening consists of further screening the aggregates through a vibrating screen and sand classifier.
- Recycling of wastewater consists of channeling the effluents from the process to a sedimentation pond for recycling.

The mechanical equipment used include:-

- Hoppers
- Conveyors
- Crushers
- Screens /sand classifiers
- Loaders

The operation of a stone crushing plant is associated with several environmental issues, namely:-

- Site selection
- Dust and air emissions
- Noise
- Wastewater / effluents
- Solid wastes
- Waste Oil, hydrocarbon and oil spills from vehicles and equipment
- Energy and water consumption

2.0 Objectives of the guideline

This guideline is meant to ensure that prospective developers:-

- adopt appropriate mitigating measures to safeguard the environment.
- comply with provisions of relevant laws/ regulations/standards.
- adopt eco-friendly practices to optimize use of resources.

3.0 Applicable Legislation

A stone crushing plant set up temporarily for the purposes of a project by a public department does not warrant a Preliminary Environmental Report (PER) Approval or an Environmental Impact Assessment (EIA) Licence.

Note:-

According to Part B of the Fifth Schedule of the Environment Protection Act (EPA), item 42 “Stone crushing plant, other than a stone crushing plant set up temporarily for the purposes of a project by a public department” warrants an Environmental Impact Assessment (EIA) Licence.

4.0 Location and Siting

- (i) In accordance with the Planning Policy Guidance of the Ministry of Housing and Lands, the site for stone crushing plants should normally:-
- satisfy a distance of up to 1 km from the settlement boundaries and sensitive land uses
 - be at least 50 m from the coastline
 - be at least 35 m from the river
 - be up to 1 km from a lake.
- (ii) While locating the stone crushing plant within the project site, consideration should be given to its layout, with a view to avoiding disturbances to the surrounding environment.
- (iii) The site should not be located within any Environmentally Sensitive Area (ESA) and its prescribed buffer zone as per ESA Study 2009 such as wetland, steep slope and in areas that are likely to be affected by hazards such as inland flooding, landslide and storm surges, amongst others.
- (iv) On-site wastewater disposal facility such as septic tanks and absorption pits/leaching fields shall be located not less than 30 m from any water course as per Rivers and Canals Act 1863.
- (v) Existing natural drains and watercourses on or in the vicinity of the site shall not be tampered with.

5.0 Mitigation of Environmental Impacts

5.1 Dust nuisances and air pollution

The main sources of dust nuisances are:-

- from rock dust from the crushers
- during unloading of boulders from lorries on the feeder
- during crushing of boulders
- during discharge of crushed materials onto and from conveyor belts
- during screening
- during discharge of finished products in storage bins
- from vehicular movement within the premises

Air emissions are from operation of the equipment and exhaust of vehicles.

Necessary abatement measures should be taken such that all emissions from the plant comply with the Environment Protection (Standards for Air) Regulations 1998.

Mitigating measures include: -

- Well-designed sprinklers to be located at all points to contain dust pollution, using preferably harvested rain water.
- The unloading area, crushers and conveyor belts to be enclosed and provided with dust suppression equipment.

- Jets of water to be provided at the mouth of the crushers to ensure that the stones are thoroughly wet during the crushing.
- The premises and access roads should be kept clean and free of dust at all times.

Monitoring of dust emissions, notably particulate matter (PM10), should be carried out on a regular basis.

5.2 Noise abatement

Noise from the stone crushing plant arises from:-

- Use of mechanical equipment and electric motors

As such, necessary precautions shall be taken to ensure noise emitted from the plant is within permissible limits as per the Environmental Standards for Noise Regulations under the EPA which stipulates:-

Industrial Noise		Neighborhood Noise	
Time	Noise exposure limits	Time	Noise exposure limits
07.00-21.00 hrs.	60 dB (A) L_{eq}	07.00-18.00 hrs.	60 dB (A) L_{eq}
21.00-07.00 hrs.	55 dB (A) L_{eq}	18.00-21.00 hrs.	55 dB (A) L_{eq}
		21.00-07.00 hrs.	50 dB (A) L_{eq}
A tonal character adjustment of +5 dB (A) should be applied to the measured value where the noise has a definite continuous note such as a whine or hiss.			

Mitigating measures include:-

- Noise generating equipment such as generators, compressors should be provided with appropriate noise attenuating materials/ structures.
- Proper and regular maintenance of equipment should be carried out.
- Appropriate noise abatement measures to prevent noise nuisance to the surrounding environment.
- Provision of protective equipment and regular medical screening for staff to the satisfaction of Ministry of Labour, Industrial Relations, Employment and Training.

Noise monitoring using calibrated noise meter should be carried out on a regular basis.

5.3 Wastewater management

Wastewater generated on-site arises from both domestic and industrial sources.

- Domestic wastewater is generated by staff employed at the plant
- Industrial wastewater comprises effluents from cleaning of stone crusher, washing of aggregates, sprinkling of water for dust abatement and runoff.

Mitigating measures include:-

- Provision of appropriate domestic wastewater treatment and disposal facility to the satisfaction of the Wastewater Management Authority.
- Installation of grease traps or oil water separators for removal of floatable solids from wash water.

Note:- Maintenance of the grease trap or oil water separator is to be carried out by the owner / promoter.

- Wash water should be channeled into a sedimentation tank. The effluent from the sedimentation tank should be treated and reused for dust abatement and the settled solids be reused.

5.4 Solid wastes

Solid wastes are mainly domestic wastes generated by the staff as well as other materials such as soil and unusable raw materials.

Mitigating measures include:-

- Domestic solid wastes to be regularly collected in bins or waste handling receptacles and disposed of to the satisfaction of the Local Authority.

- No waste of any type to be disposed of in any watercourse including drains, canals and the surrounding environment.
- The unusable raw materials such as soil to be reused during backfilling as well as in fields as far as possible.

5.5 Waste Oil, hydrocarbon and oil spills from vehicles and equipment

Where fuelling is proposed on site, a dedicated platform/ bay must be provided. Necessary measures need to be taken to prevent any hydrocarbon and oil spill at the fuelling bay or from storage tanks.

Where servicing is proposed on site, a dedicated workshop must be provided for such activity.

Mitigating measures include:-

- Waste oil shall be collected and disposed of as per the provisions of the Environment Protection (Collection, Storage, Treatment, Use and Disposal of Waste Oil) Regulations 2006.
- Proper disposal of waste oil at approved oil recycling companies
- Hazardous wastes shall be collected and disposed as per the provisions of the Environment Protection (Standards for hazardous wastes) Regulations 2001.
- Necessary bunded wall to be provided around any fuel storage tank
- Provision of a separate collector drain with an oil interceptor to properly manage wastewater from washing of any workshop area
- Contingency plans should be developed for any accidental spillage of petroleum products or any other unforeseen circumstances.

5.6 Decommissioning of the stone crushing plant

Decommissioning of the stone crushing plant entails dismantling of equipment and machinery and reinstatement of the site.

Mitigating measures include:-

- All necessary measures should be taken to avoid disturbance to the surrounding environment.

5.7 Other mitigating measures

- Necessary precautions should be taken to avoid disturbance to the neighbourhood by way of traffic, dust, mud or other nuisances during construction and operation phase.
- Precautionary measures should be taken for safe haulage of the materials such that there is no spillover during transportation on the road networks.
- Provision to be made for adequate parking, loading and unloading facilities.
- Safe storage of materials on site and stored materials not unduly visible or intrusive in the street scene.
- Provision for a proper drainage scheme for evacuation of stormwater to avoid any risks of flooding/water-logging of site and adjoining areas to the satisfaction of the Local Authority.
- Installation of bait stations/ traps to control pests and rodents.

5.8 Eco-friendly Measures and Sustainability

Best environment friendly practices and initiatives need to be adopted such as rain water harvesting for washing of premises and irrigation; energy efficient appliances and energy-saving devices (LED lamps); sensor lights.

Note:

- a. Relevant organizations need be consulted with regard to traffic implications, fire, amongst others prior to embarking on the project to ensure compliance with their respective laws/regulations/standards.
- b. Non-compliance with environmental laws namely standards for air and noise is an offence under the EPA.

Copies of this guideline are available at the Department of Environment and on the website of the Ministry at <http://environment.govmu.org>; the government's portal at <http://www.govmu.org>, including the websites of Local Authorities.