



**A GUIDANCE NOTE ON THE
BEST PRACTICABLE MEANS**

FOR

CEMENT WORKS

(CONCRETE BATCHING PLANT)

BPM 3/2

Environmental Protection Department
Air Management Group

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1. INTRODUCTION

This note lists the minimum requirement for meeting the best practicable means for Cement Works (Concrete Batching Plant). It should be noted that in granting a licence under the Ordinance, the Authority, i.e., the Director of Environmental Protection, will also consider all other relevant aspects and may impose more stringent and/or additional control requirements by taking into account individual process characteristics, local topography and air quality and any other factors.

2. EXHAUST FROM DUST ARRESTMENT PLANT

Wherever possible the final discharge point from particulate matter arrestment plant, where it is not necessary to achieve dispersion of the residual pollutants, should be at low level to minimise the effect on the local community in case of abnormal emissions and to facilitate maintenance and inspection.

3. EMISSION LIMITS

All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist or smoke.

Particulates : 50 mg/m³

(All figures are expressed at reference condition, 0°C, 101.325 kilopascals, without correction for water vapour content. The introduction of dilution air to achieve the emission concentration limits shall not be permitted.)

4. FUGITIVE EMISSION CONTROL

(a) Boundary Ambient Standards

Total suspended particulates : 260µg/m³ (24-hour average)

Respirable suspended particulates : 180µg/m³ (24-hour average)

Odour : 2 odour units

(Note : An odour unit is the measuring unit of odour level and is analogous to pollution concentration. In this context, the odour level is defined as the ratio of the volume which the sample would occupy when diluted with air to the odour threshold, to the volume of the sample. In other words, one odour unit is the concentration of odorant which just induces an odour sensation.)

(b) Engineering Design/Technical Requirements

To be agreed with the Authority. As a general guidance, the loading, unloading, handling and storage of fuel, raw materials, products, wastes or by-products should be carried out in a manner acceptable to the Authority so as to prevent the release of:

- (i) visible dust emission; and/or
- (ii) other noxious or offensive emissions.

Without prejudice to the generality of the above general requirements, the following control measures shall be implemented:-

Cement and other dusty materials

- (1) The loading, unloading, handling, transfer or storage of cement, pulverised fuel ash and/or other equally dusty materials shall be carried in a totally enclosed system acceptable to the Authority. All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits stipulated in Section 3 above.
- (2) Cement, pulverised fuel ash (PFA) and/or other equally dusty materials shall be stored in storage silo fitted with audible high level alarms to warn of overfilling. The high-level alarm indicators shall be interlocked with the material filling line such that in the event of the silo approaching an overfilling condition, an audible alarm will operate, and after 1 minute or less the material filling line will be closed.
- (3) Vents of all silos shall be fitted with fabric filtering system to meet the emission limits stipulated in Section 3 above.
- (4) Vents of cement/PFA weighing scale shall be fitted with fabric filtering system to meet the emission limits stipulated in Section 3 above.
- (5) Seating of pressure relief valves of all silos shall be checked, and the valves reseated if necessary, before each delivery.

Other raw materials

- (6) The loading, unloading, handling, transfer or storage of other raw materials which may generate airborne dust emissions such as crushed rock, sand, stone aggregate, shall be carried out in such a manner to prevent or minimise dust emissions.
- (7) The materials mentioned in item (6) above shall be adequately wetted prior to and during the loading, unloading and handling operations. Manual or automatic water spraying system shall be provided at all unloading areas, stock piles and material discharge points.

- (8) All receiving hoppers for unloading materials mentioned in item (6) above shall be enclosed on three sides up to 3 metres above the unloading point. In no case shall these hoppers be used as the material storage devices.
- (9) The belt conveyor for handling materials mentioned in item (6) above shall be enclosed on top and 2 sides with a metal board at the bottom to eliminate any dust emission due to wind-whipping effect. Other type of enclosure will also be accepted by the Authority if it can be demonstrated that the proposed enclosure can achieve a same performance.
- (10) All conveyor transfer points shall be totally enclosed. Openings for the passage of conveyors shall be fitted with adequate flexible seals.
- (11) Scrapers shall be provided at the turning points of all conveyors to remove dust adhered to the belt surface.
- (12) Conveyors discharged to stockpiles of materials mentioned in item (6) above shall be arranged to minimise free fall as far as practicable. All free falling transfer points from conveyors to stockpiles shall be enclosed with chute(s) and water sprayed.
- (13) Aggregates with a nominal size less than or equal to 5 millimeters should be stored in totally enclosed structure such as storage bin and should not be handled in open area. Where there is sufficient buffer area surrounding the concrete batching plant, ground stockpiling may be used. The stockpile shall be enclosed at least on top and 3 sides and with flexible curtain to cover the entrance side.
- (14) Aggregates with a nominal size greater than 5 millimeters should preferably be stored in a totally enclosed structure. If open stockpiling is used, the stockpile shall be enclosed on 3 sides with the enclosure wall sufficiently higher than the top of the stockpile to prevent wind whipping.
- (15) The opening between the storage bin and weighing scale of the materials mentioned in item (6) above shall be fully enclosed.

Loading of materials for batching

- (16) Concrete truck shall be loaded in such a way as to minimise airborne dust emissions. Without prejudice to the generality of this requirement, the following control measures shall be implemented:-
 - (i) Pre-mixing the materials in a totally enclosed concrete mixer before loading the materials into the concrete truck is recommended. All dust-laden air generated by the pre-mixing process as well as the loading process shall be totally vented to fabric filtering system to meet the emission limits stipulated in Section 3 above.

- (ii) If truck mixing batching or other types of batching method is used, effective dust control measures acceptable to the Authority shall be adopted. The dust control measures must have been demonstrated to the Authority that they are capable to collect and vent all dust-laden air generated by the material loading/mixing to dust arrestment plant to meet the emission limit stipulated in Section 3 above.

(17) The loading bay shall be totally enclosed during the loading process.

Vehicles

- (18) All practicable measures shall be taken to prevent or minimise the dust emission caused by vehicle movement.
- (19) All access and route roads within the premises shall be paved and adequately wetted.
- (20) Vehicle cleaning facilities shall be provided and used by all concrete truck after loading and other vehicles leaving the premises to wash off any dust and/or mud deposited on the wheels and/or vehicle body.

Housekeeping

- (21) A high standard of housekeeping shall be maintained. All spillages or deposits of materials on ground, support structures or roofs shall be cleaned up promptly by a cleaning method acceptable to the Authority. Any dumping of materials at open area shall be prohibited.

5. MONITORING REQUIREMENTS

Parameters and sampling frequency will be determined by the Authority. However, the following parameters should be monitored continuously:-

(a) Process Monitoring

Total monthly raw input, product output and material stock (by manual recording), and other essential operating parameter(s) which may significantly affect the emission of air pollutants.

(b) Ambient Monitoring

At site boundary and/or any other locations acceptable to the Authority : Total suspended particulates and/or respirable suspended particulates (at least one 24-hour sample per 6 calender days);

6. COMMISSIONING

Commissioning trials (to be witnessed by the Authority whenever appropriate) should be conducted to demonstrate performance and capability of the air pollution control measures and a report of commissioning trial should be submitted to the Authority within 1 month after completion of the trial.

7. OPERATION AND MAINTENANCE

Requirements include not only the provision of the appliances, but the proper operation and maintenance of equipment, its supervision when in use and the training and supervision of properly qualified staff. Specific operation and maintenance requirements may be specified for individual equipment.

Malfunctioning and breakdown of the process or air pollution control equipment which would cause exceedance of the emission limits or breaches of other air pollution control requirements should be reported to the Authority within 3 working days.