



**Technical Guideline (9)** 

# **Requirements for Temporary and**

# Permanent Concrete Batching Plants

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# 1.0 Background:

Massive infrastructural projects development has been taking place in Dubai, huge mixed-use complexes, industrial, Commercial and educational cluster developments are under construction throughout the emirate, that brought a big boom to the construction industries have lead to the installation of numerous concrete batching plants which are now widespread in designated areas in Dubai. The significant environmental impacts of the operation of such batching plants is a concern--thus, thorough environmental assessment is necessary to identify and address such impacts prior to the construction and operation of the batching plant's facilities.

The federal law No. 24 / 1999 & local order 61/1991 with regard to Environment Protection Regulations in the Emirate of Dubai requires all involved parties in industrial activity to comply with Environmental Protection & Safety regulations, prevent pollution of environmental aspect such as soil, water, air as well as noise pollution. The following guidelines are for environment compliance required to be complied by the concrete batching plant companies in effort to conserve the environment.

The consists of this guide of several chapters presented legislative framework, main guideline objectives, General Requirement, Requirements for Environmental Permit, Requirement for Public Safety, Environmental Health & Safety Protection Checklist, and Technical Checklist for Ready Mix Batching Plants

# **2.0 Relevant Legislations**

Relevant provisions of the following laws were used in the preparation of this Technical Guideline

- Federal Law No. (24) of 1999 for the Protection and Development of the Environment as amended by Federal Law No. 20 of 2006; and
- Local Order No. 61 of 1991 on the Environment Protection Regulations in the emirate of Dubai





## **3.0 Definitions of Terms**

The words, terms, and phrases, when used in these guidelines, shall have the following meanings.

Responsible authority- Environment Department

**EPSS** –means the Environmental Planning & Studies Section of Environment Department of Dubai Municipality

**Temporary batching plant:** refers to a plant that supports specific projects (concrete supplying) in Dubai with definite timetable of operation in an approved location.

**Permanent batching plant:** supports numerous development projects and established in an approved permanent location for indefinite period such as industrial zone.

## **4.0 General Requirements**

Procedure to apply and obtain Environmental Clearance for the construction and operation of Temporary or Permanent Ready Mix Batching Plants.

- a. The company shall apply and secure its Environmental Clearance for permanent batching plant or "No- Objection Certificate (NOC) for temporary batching plant" thru *DM e-service system* ( CIP System) using the procedures outlined in the attached *Annex (A)*, aside from the clearances issued by appropriate government agencies. The plant owner shall ensure that restrictions and instructions set by concerned authority shall be complied with, such as the restrictions on the use of residential roads and other sensitive areas in the transport of materials, among other restrictions.
- b. An Environmental Impact Assessment (EIA) Summery Report shall be prepared and submitted to EPSS by the Proponent of the batching plant addressing all the possible significant environmental impacts of the project and identifying measures to mitigate such impacts ( as per EPSS – TG3, Annex II).
- c. As part of the Summery EIA requirement, batching plant operators shall identify and estimate the dust emission loading from the batching plant operation and activities, noise generation and reduction and the factors influencing them which can be done using published emission factors to include but not limited to material transfer, storage piles, paved and unpaved roads, source emissions such as aggregates driers, cement silos.





- d. Summery EIA shall include Environmental Management Plan (EMP) showing the specific environmental mitigation program for the identified impacts and responsible persons involved inside the plant to be evaluated and approved by Environment Department.
- e. Safety & Health Management Plan for batching plant operation and maintenance shall be submitted along with the Summery EIA Report.
- f. Approval of designated plot number for batch plant (temporary and permanent) and plot plan showing corner coordinates in DLTM (Dubai Local Transverse Mercator) shall be secured from Planning and Building Departments of Dubai Municipality and from concerned authorities.
- g. Affection Plan identifying neighboring premises shall be submitted (with clear indication on any nearby residential / public unit.)
- h. Commitment letter/undertaking shall be submitted to Environment Department by the batching plant's management stating that they shall abide by the instructions and requirements of Dubai Municipality in regards to maintaining the cleanliness of the vicinity surrounding the project site, roads and streets used by concrete transit mixers and trucks, maintenance of all batching plant equipment to avoid environmental violations as well as compliance with other regulations stipulated in Local Order No.11 of 2003 on public health and safety of the community in the Emirate of Dubai. An <u>Environmental Guaranty Fund (EGF) of AED 300,000.00 only</u> shall be deposited to Dubai Municipality as a guarantee that the batching plant's company will adhere with the commitment given. Undertaking shall also include the removal of batching plant in case required by any Dubai Municipality Departments or Landlord of the plot that batching plant occupied it, specifying the reasons without any right to claim for any compensation.
- i. For temporary batching plants, a baseline testing (ground water and soil) shall be conducted as reference prior to erection of the plant, test results shall be submitted along with the EIA or when plot land received & started plant erected.
- j. Ground water sampling and soil testing shall be conducted once the area is vacated and totally cleared up (within maximum of 3 month from plant evacuation), analysis report and results shall be submitted by at EPSS subject for evaluation, in case of the results of analysis report and testing failed base on DM standards, the cleaning & reclaimed of the area shall be undertaken at the expense of the proponent or by Dubai Municipality Environment Department, the cost shall be deducted from the EGF.





- k. Environmental Guaranty Fund (EGF) shall be returned only to the proponent if all the requirements are satisfied.
- I. DM-Environment Department reserved the right to deny issuance of environmental permit to any batching plant operator for non-compliance with the general requirements of this guideline and specific environmental, safety and buffer zone requirements.

## **5.0 Environmental Protection Requirements**

#### **Buffer Distance Requirement**

- a. Proponent of permanent concrete batching Plant shall determine the plant's primary impact zone and shall establish a safe buffer zone around the plant's facilities. The use of buffer zones around batching plant facilities is one of the approaches in preventing or minimizing its immediate and adverse environmental impacts to sensitive areas such as residential, institutional and public areas due to dust emission and noise pollution or any other adverse impacts.
- b. The required buffer zone for temporary concrete batching plant shall not be less than 500 meters from sensitive areas such as nearest residential areas, institutional zones and inhabited areas. However, it should be noted that the buffer distance is based on the assumption that good pollution control technologies are also being used and with best practices being implemented. A batching plant(s) with efficient air pollution control facilities & effective Environmental Management Plan would require a larger or less buffer distance subject to evaluation of the summery EIA report for the project.
- c. Buffer zones should not be considered as a primary means of control, but as a means of providing an additional safeguard in the case of unintentional or accidental emissions.
- d. Permanent concrete batching plant shall be allowed only inside industrial areas (subject to DM Planning Department approval).





## 6.0 Air Emission Control Requirement

The batching plant operation shall comply with Source, Ambient Air Quality and Noise Level Guidelines of Dubai Emirate, Local regulations & Federal Lows.

#### **Suggested Specific Emission Controls**

As a minimum requirement, the following controls shall be implemented or improved accordingly to control emissions:

#### • Dusts Emission from Paved Plant Yard Surfaces

Dust deposits on paved surfaces can be thrown into the air by wind or by vehicle movements. Dust emissions from paved surfaces can be minimized through the use of the following measures:

- The movement and handling of fine materials should be controlled in good manner to prevent spillages onto paved surfaces.
- Minimize mud and dust track-out from unpaved areas by cleaning the trucks before leaving the plant's yard specially its wheels by the use of wheel wash facilities. Wheel wash facilities shall be installed at the main gate.
- Regular cleaning of paved surfaces, using a mobile vacuum sweeper or a water flushing system.
- Observing speed controls on vehicle movements at plant yard at 10-15 km/hr.

#### • Dusts Emission from Unpaved Plant Yard Surfaces

Dust emissions from unpaved surfaces are caused by the same factors as for paved surfaces, but the potential emissions are usually much greater. Dust emissions can be controlled using the following procedures:

<u>Wet suppression</u> of unpaved areas should be applied during dry windy periods, using a water cart and/or fixed sprinklers. As a general guide, the typical water requirement is at least up to 1 liter per square meter per hour. It is important to check that available water supplies and the application equipment are able to meet this requirement. <u>Untreated wastewater generated from the plant's activities shall not be used for wet suppressions</u>. Likewise, treated wastewater intended for dust suppression should be used only after taking permit from Environment Department - ECS to ensure that treated wastewater quality fit with requirement & allowable limits to use for this





purpose (wet suppression of unpaved areas can achieve dust emission reductions of about 70% or more).

- Surface improvements. These include paving with concrete or asphalt, or the addition of gravel to the surface. Paving can be highly effective but is expensive and unsuitable for surfaces used by very heavy vehicles or subject to spillages of material in transport. In addition, dust control measures will usually still be required on the paved surfaces. The use of gravel can be moderately effective, but repeated additions will usually be required.
- Speed controls. Observe speed limits vehicle movements at plant yard at 10-15 km/hr (Speed controls on vehicles have an approximately linear effect on dust emissions. In other words, a speed reduction from 30 km/hr to 15 km/hr will achieve about a 50% reduction in dust emissions).

#### • Materials Loading/Unloading activities

Loading /unloading activities and transferring of fine materials from one place to another are a major source of uncontrolled dusts emission. Fine materials taken by shovel from stockpiles and transferred to loading bays / feeding area are potential sources of dust, either through wind entrainment or spillages. Dust emissions due to such activities can be minimized with the following controls:

- Limiting load size to avoid spillages.
- Minimizing travel distances through appropriate site layout and design.
- Minimizing drop heights at transfer points.
- Minimize dust dispersion by providing special (covered) area for loading /unloading process.





#### Material Handling/Storage (Stockpiles Management)

Fine material stored in stockpiles can be subject to dust pick-up at winds in excess of about (5 m/sec (10 knots). Aggregates with 5mm or smaller in size shall be stored in a totally enclosed areas. Dust emissions can also occur as material is dropped onto the stockpile from a conveyor. The options for dust control can include the following:

- Wet suppression using sprinklers.
- Covered storage of fine materials, enclose stockpiles on at least the top and 3-sides and install a flexible curtain to cover stockpile entrance sides.
- Limiting the height and slope of the stockpiles can reduce wind entrainment. A flat shallow stockpile will be subject to less wind turbulence than one with a tall conical shape. Angle of stockpile shall not exceed 40° maximum at any conditions.
- Limiting drop heights from conveyors.
- Use of wind breaks. Wind speed near the pile surface is the primary factor affecting particle uptake from stockpiles. Although a large, solid windbreak is the most effective configuration, aesthetic and economic considerations may preclude that from being appropriate.

A 50% porous windbreak is almost as effective as a solid wall in reducing wind speeds over much of the pile, when constructed to the following specifications:

- Height equal to the pile height;
- Length equal to the pile length at the base; and
- Located at a distance of one pile height from the base of the pile.

#### • Transfer Conveyors

Dust emissions from conveyors can be caused by wind pick-up and through losses during loading, discharge, and at transfer points. The following options should be considered for minimizing these emissions:

- All conveyors and transfer points must be provided with dust-tight covers. The covers can be retracted for maintenance.
- Provide scrapers at the turning points of all conveyors to prevent dust collection on the belt surface.
- The use of water sprays or sprinklers at conveyor transfer points.





- Minimizing drop heights at transfer points, including use of conveyors that can be raised and lowered.
- Regular clean-up of spillages around the transfer points and any other places shall be undertaken.

#### • Fixed Plant

This includes equipment such as *aggregates driers*, *silos*, *mixers* and other processing *equipment* which are considered as point sources of dust emissions, which should be controlled using standard equipment such as cyclones and fabric filters. However, there is also the potential for fugitive emissions from this type of plant, and these emissions should be controlled using the following procedures:

- Silos shall not be filled up with cement more than <u>90%</u> of its loading capacity to avoid overfilling.
- Fixed dust control systems should achieve efficiencies to comply with vent emission standard of <u>100 mg/Nm<sup>3</sup></u> or less.
- The vent must be provided with efficient filter bags such as cotton, sateen or Dacron fabrics of adequate size sufficient to allow filtering velocity based upon the volumetric filling rate.
- Install audible and visual high-level alarms on all storage silos; connect/interlock the high level-alarm indicator to an automatic delivery shutdown to avoid overfilling and possible filter damage.
- Silos shall be equipped with *pinch valves* that could be activated to close when a problem is detected. The valve should shut-off the flow of materials to avoid damage and accidents to occur while not interfering with the flow of normal operation.
- Relief valves shall be provided to silos and pipe system where overpressure or overloading is possible.
- Pumps, motors and compressors shall be fitted with cut-off device when related operational parameters are exceeded.
- Maintenance access to top of silos, usually a vertical ladder, shall be fitted with cylindrical enclosure for vertical ladder with separation distance not less than 6 feet from the ground.





- Minimize drop heights into hoppers and loading chutes.
- The use of sprinklers or water sprays around hoppers and other transfer points.
- Hooding or enclosure of significant fugitive sources, with the emissions being ducted to bag filters or other dust control equipment.
- The required cloth area and number of filters may be determined based on the following formula or any equivalent determination:

$$Af = Q / P \times V$$

Where:

Af = Filter cloth are in square meter

Q = Filling rate, kgs/min.

P = Density of cement, kgs/m<sup>3</sup>

V = Filtering velocity, m/min (0.90 to 1.80)

For more than one filter bag, the number can be determined by the following formula:

#### Nc = Af / 3.14 DL

Where:

Nc = Number of bags

Af = Total filter cloth area, square meter

D = Diameter of filter cloth, meter

L = Length of filter cloth, meter

- As the filling operation goes on, dust layer accumulates on the cloth surface which becomes blinded and there is danger in rupturing the bags or silo. Therefore, proper maintenance and regular inspection of the filters are necessary.
- The filter design must include a dust removal device to prevent blinding of the filter cloth. It can be either manual or mechanical cleaning equipment (*shaking mechanism*) or air jet.
- In case of a single filter atop of silo, the pulley arrangements as shown in *Figure 1* allows it to be shaken from the ground so that the accumulated layer of dust on the inside of the cloth tube can be removed after the filling operations.
- In case of multiple bag filters, semi automatic or automatic cleaning device are fitted.
  Pressure indicator shall be fixed and preset at cleaning cycles.





- The filters must be protected against weather conditions. It shall be enclosed with metal sheets. The space between the filter cloth and metal sheets must be sufficient to allow to cleaning the air discharges.
- If visible dust is observed, the filter cloth has leak or it is already ruptured. Inspection should be made, ensure tightness of fittings or change ruptured bags. Always maintain spare filter cloth on the site to ensure on time replacement of damaged filter cloth.







# 7.0 Requirement for Wastewater Generation and Re-use.

Wastewater generated from batching plant operation mainly comes from washing of transit mixers and haul trucks. Proper handling and disposal of this wastewater shall be provided to prevent possible land/ground contamination since wastewater generated from batching plants operations contains high chromium concentrations. Ground contamination shall be avoided by the following measures:

- a. Designation and use of proper transit mixers washing area which must be paved; and shall be equipped with at least 3-chamber sedimentation tank of adequate capacity to accommodate wastewater based on the rate of generation or in case emergency situations.
- b. Not allowing in any way the washing of transit mixer outside the designated washing area especially on unpaved ground.
- c. Installation of a wastewater chromium removal, PH corrector & TDS concentration reducer plant prior to the commissioning of a new concrete batching plant and the same shall be operational once the batching plant is already operational. Treated wastewater quality must comply with the DM standards.
- d. As a part of Resources Conservation & Waste Minimization Policy, it is highly recommended to re- used the treated wastewater effluent for other purpose like production process (if possible), transit mixers washing, irrigation, dust suppression...ect.
- e. A permit to re-use the treated wastewater shall be obtained from Environment Department if the company intends to use the treated effluent for irrigation, dust suppression and others.
- f. Untreated or partially treated wastewater with quality exceeding the DM standards shall not be used for any other purposed such as for irrigation and dust suppression, likewise it should be dispose as per DM provisions.

# 8.0 Requirement for Spoiled/Waste Ready Mix Collection and Disposal.

Spoiled, rejected and excess concrete mixtures from project sites which are usually sent back to the batching plants shall be reclaimed again to re- used the aggregates in production process again and this is shall be considered priority for each operator to reduce the products cost & resources conservation or properly stored and timely disposal of this waste shall be done to avoid huge accumulation inside the batching plant's premises. Following measures shall be done to address the matter:





- a. A designated and proper reclaiming equipment or storage area shall be allocated inside the plant's premises for the reclamation or collection of rejected concrete mixture. The company shall not dump this waste beyond the boundary of the plant's premises as a temporary storage.
- b. Timely and regular disposal of rejected concrete mixture to DM designated disposal site shall be undertaken to avoid accumulation of huge amount of dried concrete which will be very difficult to remove from the site.
- c. In case there is huge accumulation of solidified concrete waste, it shall be removed using hydraulic hammer and shall be re-used or disposed as per DM provisions.

# 9.0 Concrete Supply Stage (Spillage Control from Transporting Concrete Mix)

Concrete spillages on roads from transit mixers transporting the concrete mix is a serious problem and accidents hazards to motorists particularly when the spilled concrete dries-up on the road pavement. Concrete spillages from transit mixers shall be avoided by the following:

- a. Ensure that transit mixers shall only carry concrete mix based on its allowable carrying capacity or reduce 10% of its maximum load in order not to cause concrete to spill during transport.
- b. All transit mixers shall be equipped with concrete anti-spill containment provision to the transit mixer drum nozzle.
- c. Environment Department Circular No. 1 dated 22/04/2006, and Circular No. 2 dated 16/11/2006 for batching plant operators shall be followed regarding provision for cover/containment unit for outlet nozzle of transit mixers to avoid any dripping or spilling of concrete over to the roadway including adequate clean-up of cement deposits on vehicle tires and mixer nozzle. Building Department circulars numbers 142, 152, 158 and 161 for Consultant Office, Contracting Companies and Concrete Batching Plants shall be also followed.
- d. Awareness shall be provided to all transit mixers driver in concrete spillage control/prevention on roads while transporting concrete mix.





- e. In case of any accidents involving transit mixer trucks resulting to concrete spillages that pose danger on the roads and other facility, it shall be reported to Dubai Municipality within 24 hrs.
- f. Limit work life span of transit mixers truck to not more than 5 years (recommended).

# **10.0 Refrigerant Usage Requirement**

Refrigerant to be used for water chiller and ice making equipment shall have low ozonedepleting and global warming potential and shall comply with EPSS Technical Guideline No. 5 & Green Building Regulations

The use of ammonia refrigerant for the plant requires risk assessment and shall consider the following:

a. toxic, fire and explosion hazards in ammonia refrigeration systems.

b. control or mitigating measure to lower the risk to acceptable level

c. safety management plan to include contingency plan in case of ammonia leak.

d. P& ID of the ammonia system including details of the receiver, compressor and plant room.

# 11.0 Fuel Quality, Fuel-Burning Equipment Emission and Required Fuel Bulk

### **Storage Requirement**

- Diesel fuel with less than 0.5% sulfur shall be used in any standby power generator engine.
  Emission of visible black smoke shall not be allowed in normal operation except during cold start and upset condition only at short duration.
- All bulk storage of liquid fuel, lube oil or similar products shall be contained within concrete bunds that can hold up to <u>110%</u> of the stored volume. Fuel loading valves shall be provided with impervious spillage catch basin. For further guidance, see Environment Department -Environment Control Section (ECS) Technical Guideline No. 6, regarding "Bunding of Storage Tanks & Transfer Facilities".





• The operation of the batching plant, smoke emissions from motor vehicles and heavy equipment shall not result in any complaint from the public.

# **12.0 Requirement for Public Safety and Protective Equipment**

This is the outline subjects regarding safety issues, and shall follow – up all the details of safety as per Dubai Municipality – Public Health & Safety Department.

- a. All main operation process shall be put under control system (gates, weighing, conveyor etc.) in control room only with only one operation switch (on/off system).
- b. Safety procedure to prevent overturning of tipper truck during off-loading of aggregates.
- c. Control room shall be equipped with all energy cut-off switches and emergency shutdown systems.
- d. The Switch of mixer chamber room gate shall be kept in the control room to avoid dual usage and to ensure unified switch system for the mix chamber to prevent potential/unintentional use during maintenance works.
- e. Emergency shutdown system shall be provided to all mixing chamber gates. Once the mixing chamber is opened it shall work immediately.
- f. Audible and visual alarm equipment shall be provided at the site when work is started.
- g. If possible, clean mixing chamber with automatic device.
- h. Workers shall be provided with complete and necessary Personal Protective Equipments (PPE).
- Providing proper facilities to reach elevated platform at work site as per Construction Site Safety Practices of Dubai Municipality.
- j. Adequate illumination shall be provided all over the worksite during the night.
- k. Transit mixer route inside the concrete batching plant shall be regulated by:
  - Providing separate pedestrian lane from transit mixer lane.
  - Providing separate in and out lane for transit mixers.





 Preventive maintenance and emergency maintenance for mixers, concrete pump and other vehicles shall be done inside the batching plant premises to avoid traffic incidents.

## **13.0 Other Requirements**

- a. Handling and storage of chemicals which are commonly used in concrete ready mix plant shall comply with the provisions of The Code of Practice for the Management of Dangerous Goods in the Emirates of Dubai.
- b. Labor accommodations in the work site or the use of mobile houses (porta-cabins) as a labor dwelling are not allowed at the batching plant's premises for reasons relating to the health and safety of these workers and to ensure compliance with the requirements and regulations of Dubai Municipality.
- c. Consequences for non compliance with the fore-going requirements
  - Issuance of "Warning Letter" to the batching plant management citing the violation committed and giving instruction to rectify the compliance with the specified date given.
  - Imposition of Fine together with a directive letter citing the major environmental health and safety violation committed and instruction to rectify the violation within the specified time given.
  - Issuance of Closure Notice instructing the batching plant's management to cease and desist with their batching plant operation.
  - Block the license transaction from Department of Economic Development (DED), until comply with Environment Department requirement.
  - Stop site operation for limited time.
  - Finally, if the company not responding and take proper actions, Cancellation of company's license as decided by DM and DED.





Procedures for applying for "No-Objection Certificate (NOC)" for temporary batching plant and Environmental and Safety Clearance for permanent batching plant "using DM e-service system.

ANNEX (A)

- Access the public Dubai Municipality portal <u>www.dm.gov.ae</u>.
- Click on the button "Register Now" which can be found in the "log in" area in the left hand side of the home page.
- Select the option" Apply for public user registration" if the applicant is individual (for initial approval of DED), the username and password will be automatically sent to the e-mail you have provided.
- Select the option" Apply for company and admin user registration, if the applicant is a company (valid DED).
- Complete and submit the online registration form and select the services that you wish to have access (Environment Protection and Safety Clearance for Industrial Projects).
- Dubai Municipality will send an e-mail to the e-mail account that you provided in the registration form.
- Access the public Dubai Municipality portal <u>www.dm.gov.ae</u> and through available services Environment Protection and Safety Clearance for Industrial Projects submit your application.
- It is strongly suggested to read "Service Information" prior to the commencement of application.
- Click on button "Request for Clearance" and fill in the electronic form apparent on the service.
- Attach Environmental Impact Assessment (EIA) Summery of the project through access <u>www.environment.dm.gov.ae</u> / Environment & Coasts link and select EPSS - <u>EIA Requirements</u> for New Industrial Activities (Category B Projects) and or Expansion Modification of Existing Premises to answer relevant question with your activities.
- Attach the other required documents as indicated on "Service Information" to include: colored scanned copies of all required permits/clearances obtained from other concerned government agencies such as RTA; DM Planning Department; Sewerage and Irrigation





Department; General Project Department; others, to include Non Objection from Specialized Department.

- Customer will receive automatic confirmation and reference No. (CIP-07-00000)
- Customer will always received (SMS) on his mobile phone informing the progress/status of his application (Pending Amendment/Rejected/Approved...etc.) in order for him to follow-up his application through the CIP service.
- For further information; clarification and details about the e-services application you may contact **Telephone No. 800900**.

For further information, please visit Dubai Municipality website www.dm.gov.ae or contact the Environmental Planning & Studies Section at Tel. No: 046066757, Fax: 047033565

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