SUMMARY

of

ENVIRONMENT IMPACT ASSESSMENT REPORT

for

New Standalone Cement Grinding Unit

( 2 x 1.0 million tons per annum)

proposed at

Gaithulapalem, Tallapalem & Narasapuram Villages,
Kasimkota Mandal, Visakhapatnam District,
Andhra Pradesh

by

Chettinad Cement Corporation Private Limited

Submitted to

ANDHRA PRADESH POLLUTION CONTROL BOARD
1.0  PROJECT DESCRIPTION

Chettinad Cement Corporation Private Limited is planning to establish a new Standalone Cement Grinding Unit with a capacity of 2 x 1.0 million tons per annum to manufacture Ordinary Portland Cement (OPC) / Portland Pozzolana Cement (PPC) / Portland Slag Cement (PSC) at Gaithulapalem, Tallapalem & Narasapuram Villages, Kasimkota Mandal, Visakhapatnam District, Andhra Pradesh. Total land identified for proposed project is 89 Acres. Survey Nos. of the proposed site are are 1,2,3,9,10,11,12,13 & 14 in Gaithulapalem Village, Survey Numbers 181, 182, 183 & 184 in Tallapalem Village & Survey Number 68 in Narasapuram Village. Around 50 percent of land has already been procured. The total project cost for the proposed Cement Grinding Unit will be **Rs.150 Crores**.

As per the Ministry of Environment, Forest & Climate Change (MOEF & CC), New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all the Stand Alone Grinding Units are falling under **Sl. No. 3 (b)**, classified as **Category ‘B’** for the grant of Environmental Clearance at State Level with applicability of General Conditions. The State Level Environment Impact Assessment Authority (SEIAA), Andhra Pradesh has accorded Terms of Reference (TOR) for the proposed project vide letter no. SEIAA / AP / AP / VSP / IND / 06 / 2016 / 122 dated 8th Aug 2016 & 23rd Sep 2017. The EIA Report has been prepared by incorporating the TOR stipulated by the Expert Appraisal Committee of MoEF & CC.

**Pioneer Enviro Laboratories & Consultants Private Limited (Hyderabad)** has been engaged to carry out the Environment Impact Assessment (EIA) Study for the proposed Cement Grinding unit in compliance with the Standard Terms of Reference approved by State Level Environment Impact Assessment Authority, Andhra Pradesh. The report contains the following

a. Characterization of status of environment within an area of 10 km radius from the proposed project site covering major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.

b. Assessment of air emissions, liquid waste and solid waste from the proposed plant along with the noise level assessment.
C. Environmental Management Plan (EMP) along with Environmental Monitoring Program.

1.1 RAW MATERIALS REQUIREMENT AND THEIR SOURCES

The following will be the raw materials requirement of the proposed Cement Grinding Unit and their sources.

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Quantity (million tons per annum)</th>
<th>Source</th>
<th>Mode of Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinker</td>
<td>1.9</td>
<td>Chettinad Cement’s Dachepalli Unit, Guntur District, its other existing Units and its subsidiary viz., M/s Anjani Portland Cement Limited located at Suryapet District, Telangana State and other nearby Cement Plants</td>
<td>By Rail &amp; Road</td>
</tr>
<tr>
<td>Gypsum</td>
<td>0.1</td>
<td>Coromandel Fertilizers, Vizag</td>
<td>By Road in covered trucks</td>
</tr>
<tr>
<td>Fly Ash</td>
<td>0.6</td>
<td>NTPC, Simhadri, Vizag Steel Plant &amp; other nearby Power Plants</td>
<td>By Road in Bulkers</td>
</tr>
<tr>
<td>Slag</td>
<td>1.3</td>
<td>Vizag Steel Plant, Vizag</td>
<td>By Road in covered trucks</td>
</tr>
</tbody>
</table>

1.2 PROCESS DESCRIPTION

The raw materials for manufacturing the Cement are Clinker, Gypsum, Fly Ash & Slag. The process of manufacturing PPC involves grinding of Clinker, Fly Ash and Gypsum in the ratio of 65:30:5, OPC involves grinding of Clinker -Gypsum in the ratio of 95:5 & SPC involves grinding of Clinker-Slag – Gypsum in the ratio of 30:65:5 in the Cement Mill. All ingredients are selected in such a way that they qualify respective BIS specifications.

Clinker and Gypsum from storage will be transported to respective feed hoppers with the help of closed conveyors. Measured quantities of Clinker and Gypsum in desired proportion will be fed to the Cement Mill. Weigh feeders will be installed under each feed hopper to ensure accurate measurement of input quantities of materials to the Cement Mill. While
producing PPC, Fly Ash of desired dosage will be extracted from Ash Silo and fed through a solid flow meter to the Cement Mill and the ground Cement will be stored in a separate Cement Silo. While producing PSC, the Slag of desired quantity will be mixed with Clinker, Gypsum and fed to Cement Mill (OR) Slag alone ground in Cement Mill.

The additives like Slag and Gypsum contain moisture varying between 10% to 20% and the same has to be removed while the grinding takes place in the Cement Mill. For the purpose of removing the moisture content, generally Hot Air Generator /Furnace is used to supply the hot air at required temperature to the Cement Mill. The fuel like Furnace Oil/HSD/ Coal or Wooden Chips/Rice Husk will be used in the Hot Air Generator or Furnace.

The hot air generated will be taken through duct to the Cement Mill, where the grinding of Clinker along with the additive(s) as required takes place and then will be vented out through Bag House and Stack provided for Cement Mill.

Cement produced will be sent to silos and then to packing section for bagging and dispatch. Cement will be packed for dispatch in 50 kg bags using electronic packers or dispatched in bulk.

1.3 WATER REQUIREMENT

Water required for the proposed Cement Grinding unit will be 450 KLD. The water will be required for equipment cooling, domestic consumption, greenbelt development & dust suppression. The water requirement for the proposed project will be sourced from ground.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Purpose</th>
<th>Water Requirement (KLD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cooling</td>
<td>304</td>
</tr>
<tr>
<td>2</td>
<td>Dust Suppression</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Domestic</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><strong>SUB-TOTAL</strong></td>
<td><strong>340</strong></td>
</tr>
<tr>
<td>4</td>
<td>Greenbelt</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>450</strong></td>
</tr>
</tbody>
</table>
1.4 POWER REQUIREMENT

The total power requirement will be 2 x 10 mva the same will be sourced from APEPDCL. Also Standby DG Sets of 500 kva capacity (4 numbers) will also be provided to meet the power requirement during emergency situations like power cut.

1.5 WASTE WATER GENERATION

There will be no wastewater generation from the process and the only domestic wastewater generation from the plant will be 8.8 KLD of sanitary wastewater, which will be treated in septic tank followed by Subsurface dispersion trench.

2.0 DESCRIPTION OF ENVIRONMENT

2.1 ENVIRONMENTAL SETTING WITHIN 10 KM RADIUS OF THE PROPOSED PROJECT

<table>
<thead>
<tr>
<th>Geographical Aspect</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude</td>
<td>22m to 28 m above MSL</td>
</tr>
<tr>
<td>Land Requirement</td>
<td>89 Acres</td>
</tr>
<tr>
<td>Nearest Habitation</td>
<td>Gobburupalem – 0.1 Km</td>
</tr>
<tr>
<td>Nearest Surface Water body (River / Canal / Nallah)</td>
<td>Sharada River - 1.2 Km</td>
</tr>
<tr>
<td></td>
<td>Mamidivaka Gedda (Seasonal) – 0.14 Km</td>
</tr>
<tr>
<td></td>
<td>Eleru Canal – 1.4 km</td>
</tr>
<tr>
<td>Nearest Railway Station</td>
<td>Narsingapalli – 1.5 Km</td>
</tr>
<tr>
<td>Reserve Forests</td>
<td>Gobburu RF (1.0 Km), Bayyavaram RF (1.1 Km), Panduru RF (4.5 Km), Panchadarla RF (5.6 Km), Mallam RF (5.9 km), Pangidi RF (6.4 Km), Gokivada RF (6.8 Km).</td>
</tr>
<tr>
<td>National Parks / Sanctuaries</td>
<td>None Present</td>
</tr>
<tr>
<td>Places of Tourist / Historical importance</td>
<td>None Present</td>
</tr>
<tr>
<td>Defence installations</td>
<td>None Present</td>
</tr>
<tr>
<td>National / State Highway</td>
<td>NH # 5 (adjacent to the Site Boundary)</td>
</tr>
<tr>
<td>Airports / Airstrips</td>
<td>Visakhapatnam Airport at 35 Km</td>
</tr>
</tbody>
</table>

2.2 BASELINE DATA

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio economic details of the villagers within 10 km radius of the proposed project site.
2.2.1 AMBIENT AIR QUALITY

Ambient air quality has been monitored for PM$_{2.5}$, PM$_{10}$, SO$_2$, NO$_x$ & CO at 8 stations including project site area for one season as per MoEF & CC guidelines. The following are the concentrations of various parameters at the monitoring stations.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{2.5}$</td>
<td>14.3 μg/m$^3$ to 29.0 μg/m$^3$</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>25.8 μg/m$^3$ to 51.5 μg/m$^3$</td>
</tr>
<tr>
<td>SO$_2$</td>
<td>9.5 μg/m$^3$ to 19.7 μg/m$^3$</td>
</tr>
<tr>
<td>NO$_2$</td>
<td>10.3 μg/m$^3$ to 27.1 μg/m$^3$</td>
</tr>
<tr>
<td>CO</td>
<td>328 μg/m$^3$ to 928 μg/m$^3$</td>
</tr>
</tbody>
</table>

2.2.2 WATER QUALITY

Ground water samples collected at 8 stations and surface water samples at collected from 2 places have been analyzed for various physico-chemical and bacteriological parameters. The ground water samples show that they are complying with BIS: 10500 and surface water is complying with BIS: 2296, 1982 class C (SWS).

2.2.3 NOISE LEVELS

Noise levels have been measured at Eight (8) locations during day time & Night time. The Max. noise levels observed during the day time was 60 dBA & during night time it was 48 dBA at the monitoring stations.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 PREDICTION OF IMPACTS ON AIR QUALITY

The likely emissions from the proposed plant activities are PM. Due to vehicular movement for transportation of Raw Materials & Product are PM, NO$_x$ & CO. The predictions of incremental Ground Level Concentrations have been carried out using Industrial Source Complex model. Meteorological data such as wind direction, wind speed, maximum and minimum temperatures, etc. collected at the site have been used as input data to run the model.
It was observed from the results that the maximum predicted incremental rise in 24 hourly Ground Level Concentrations (GLCs) of PM during operation of Plant are 5.6 $\mu g/m^3$ at a distance 750 m in the downward wind direction.

It was also observed from the results that the maximum predicted incremental rise in 24 hourly Ground Level Concentrations (GLC) of PM$_{10}$, NO$_X$ and CO due to Vehicular movement during operation of the Cement Grinding Unit is 1.8 $\mu g/m^3$, 14.2 $\mu g/m^3$, 10.7 $\mu g/m^3$ respectively.

The net resultant Ground Level Concentrations (maximum baseline concentration + max. incremental rise in concentration ) of PM, NO$_X$ and CO during operation of the Plant, due to Vehicular movement are 58.9 $\mu g/m^3$, 41.3 $\mu g/m^3$ & 938.7 $\mu g/m^3$ respectively, which are well within the National Ambient Air Quality Standards Hence there will not be any significant impact on air environment due to the proposed Plant activities.

3.2 PREDICTION OF IMPACTS ON NOISE QUALITY

The major sources of noise generation from the proposed plant are compressor, D.G.Set, Cement Mill etc. Required control measures like acoustic enclosure, silencer etc., will be provided. The Ambient noise levels will be within the standards prescribed by MoEF&CC i.e. the noise levels within the project site will be less than 75 dBA during day time and less than 70 dBA during night time. Greenbelt development in the proposed Plant will further attenuate the noise levels. Hence there will not be any significant impact due to noise generated from the proposed activities on the environment in surrounding areas.

3.3 PREDICTION OF IMPACTS ON WATER ENVIRONMENT

Water required for the project will be sourced from groundwater source. There will be No wastewater generation from the process. Sanitary waste water from Domestic consumption will be treated in septic tank followed by dispersion trench. Air emission control systems such as Bag House/ Bag Filters, Dust Suppression Systems, etc. will be provided and operated to comply with the norms. The dust collected in the Air Pollution Control Equipment will be recycled in the process. The incremental GLCs are within the NAAQS. Hence there will not be any significant impact on water environment on account of air emission/waste water.
3.4 PREDICTION OF IMPACTS ON LAND ENVIRONMENT
The control measures like Bag, House/Bag Filters, water sprinkling etc., will ensure that there will not be any significant impact on land due to air borne dust. No industrial wastewater generation is envisaged from the plant operation. Sanitary waste water from Domestic consumption will be treated in septic tank followed by dispersion trench. There will not be any solid waste generation from the Plant as the dust collected from Pollution control systems will be recycled into the process. The waste/used oil will be disposed to CPCB/APPCB authorized dealers. Hence, there will not be any significant impact of air emission, waste water and hazardous waste on the land environment.

3.5 PREDICTION OF IMPACT ON HUMAN, BIOLOGICAL ENVIRONMENT & AGRICULTURE
No National Park/Sanctuary/Migratory route for Bird/Tiger Reserve/Elephant Corridor is located within the study area. However, Gobburu, Bayyavaram, Panduru, Panchadarla, Mallam, Pangidi, Gokivada Reserved forests are located within 10 km radius from the proposed project site. The vegetation existing is scanty in the proposed project site and the surrounding study area is having agricultural lands (predominantly single crop). There are no rare endemic and endangered species and medicinal plants present in proposed project site and its surroundings. For the proposed project, all required Environmental protection measures will be put in place to comply with norms. Interlocking systems will be provided so that whenever the Pollution Control System fails, the raw material feed will stop. The net resultant GLCs during operation of the proposed project will be within the National Ambient Air Quality Standards. Zero effluent discharge will also be implemented. The dust collected in Air Pollution Control Systems will be recycled. 33% of the plant area will be developed with greenbelt as per MoEF norms. All the norms of MoEF/CPCB/APPCB will be strictly followed. Hence there will not be any significant impact on flora & fauna, human beings, cattle and on agriculture in the area due to the proposed plant activities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME
Ambient Air Quality, Stack Monitoring, Groundwater analysis, soil quality analysis & noise level monitoring will be carried out regularly as per CPCB norms and the analysis reports will be
submitted to Ministry of Environment & Forest, Chennai & Andhra Pradesh Pollution Control Board regularly. Online monitors will be installed to the major stack.

5.0 ADDITIONAL STUDIES

The risk assessment & natural disaster management plan for the project has been prepared.

6.0 PROJECT BENEFITS

Chettinad Cement Corporation Private Limited will carry out CSR activities covering health, education and infrastructural needs of the local people. The local areas will be benefited by way of generation of employment opportunities, increased demand for local products and services. There will be an overall improvement in the income level of the local people. Also, from this proposed project, the Government will receive additional revenue in terms of duties, taxes etc., Thus, this project is expected to yield a positive impact on the socio-economic environment of the region.

210 persons will be benefitted by way of direct and indirect employment during operational phase. Priority will be given to locals for Semi-Skilled and Unskilled workers.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 AIR ENVIRONMENT

Control Measures Proposed

- Bag House will be provided to Cement Mill
- Bag filters will be provided for Clinker Silo, Ash Silo & Cement Silo
- The emission from each Cement Mill will be sent through Bag House then discharged through stack of 50 m height. The outlet dust emissions will be less than 30 mg/Nm$^3$

Fugitive Emission Control Measures

- Water Sprinkling at unloading areas
- Gypsum and Slag will be stored in shed
- Conveyers will be covered with GI sheets
- Material transfer points to be provided with dust extraction system (Bag Filters)
- Internal roads will be paved
- Planting of trees along the roads and boundary of the project site
7.2 WATER ENVIRONMENT

There will be no wastewater generation from the proposed Cement Grinding process. The sanitary wastewater (8.8 KLD) generated will be treated in septic tank followed by subsurface dispersion.

7.3 SOLID & HAZARDOUS WASTE GENERATION, STORAGE & DISPOSAL

- There will not be any solid waste generation from the Plant
- Dust collected from the various Air Pollution Control Measures like Bag House/ Bag Filters will be totally recycled in the process for Cement manufacturing
- Municipal (organic) solid wastes from the Plant will be composted and used as manure for the green belt. Inorganic wastes (Non-biodegradable) will be sent to APPCB authorized recyclers
- Waste/used oil will be stored in HDPE drums & disposed to APPCB authorized dealers
- Lead acid batteries will be procured on buy and return policy (i.e., the used or exhausted lead acid batteries will be returned to the supplier for replacement)

7.4 NOISE ENVIRONMENT

- All plant and machinery will be in compliance with MoEF norms on noise control/ OSHA Standards
- Silencers / Acoustic enclosures will be provided to D.G. Set
- Ambient Noise levels will be less than 75 dBA during day time & 70 dBA during night time
- 30 Acres of extensive greenbelt will be developed to attenuate noise levels
- Ear plugs will be provided to all employees who will enter into the noise prone areas

7.5 LAND ENVIRONMENT

All required pollution control systems such as Bag house, Bag filters will be installed and operated to comply with the norms. Water Sprinkling arrangement will be ensured for the roads and raw material storage sheds. Sweeping machines will be used to collect the spilled dust, if any, from the Packing Plant floor and road. Dust collected from the various Air Pollution Control Measures like Bag House/ Bag Filters will be totally recycled in the process for Cement manufacturing.
The domestic waste water will be treated in septic tank followed by dispersion trench. As zero discharge system will be implemented, the surface or ground water will be not affected.

And the Hazardous Waste (Used Oil) from the plant will be disposed to CPCB/APPCB authorized dealers. Hence there will not be any adverse impact on land environment due to the proposed activities.

7.6 GREENBELT DEVELOPMENT
Greenbelt will be developed in the plant premises over an area of 30 Acres as per CPCB/MoEF guidelines and in consultation with local DFO.

7.7 IMPLEMENTATION OF CREP RECOMMENDATIONS
All the CREP recommendations will be strictly followed in the proposed project.