

Dated this the 14th day of February 2024.
BEFORE THE NATIONAL GREEN TRIBUNAL, SOUTHERN
ZONAL BENCH, CHENNAI

Appeal No.01 of 2024 (SZ)

Petitioner ::: Prathapan K.R.,
Alappuzha

Vs.

Respondents ::: Kerala State Pollution Control Board
Through the Member Secretary
Kerala and Others.

STATUS REPORT FILED BY THE RESPONDENT

Report filed by Smitha C.V, aged 42 years, D/o. Sri.C.I.Vishwanathan, residing at Chakkalaparambil House, Poovathur P.O., Thrissur, Environmental Engineer, Kerala State Pollution Control Board (hereinafter referred to as Board), District Office, Alappuzha.

1. The Honourable Tribunal during hearing on 29.01.2024 had directed this respondent to report regarding the allegations made in the appeal.
2. I may humbly submit that The Pollution Control Board has granted consent to establish the Unit of Quick Lime Shell Kiln, namely M/s. GRB Lime Industries (consent no PCB/ALP/ICE-1826/15714321/21 valid upto 31/03/2026) on 11.06.2021. A true copy of the ICE consent granted is attached herewith and marked as **Annexure R1(a)**. The proposed unit is in a residential area near the Kayipuram Junction, Thanneermukkom South Village, Cherthala. As per the consent application, the built-up



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area of the proposed unit is 171.1 sq. m and is situated at 1214.1 Sq. m of land. The unit is surrounded by residential buildings on three sides and a public road on one side. Based on the CPCB letter no. B-29012/ESS(CPA)/2015-16 dated 07.03.2016, the category of lime kiln units changed from RED to Orange and the same was implemented in Kerala State Pollution Control Board as per the minutes of the 199th Board meeting held on 27.07.2016 vide circular no. PCB/T4/115/97(3) dated 31.08.2016. A true copy of the relevant pages of the Circular is attached herewith and marked as **Annexure R1(b)**.

3. As the capital investment of the unit is about 14 Lakhs, the unit comes under small scale. According to the circular no. PCB/TAC/18/2004 dated 09/08/2004, the minimum distance required from an industry in small scale orange category to the nearest residential and public buildings are 10 m and 15 m respectively. A true copy of the Circular is attached herewith and marked as **Annexure R1(c)**.
4. The nearest residential building is 15 meters away from the proposed unit as per the site plan produced and inspection conducted. Also there is no public building found within a radius of 15m. Hence the unit satisfies the siting criteria for small scale orange category units. The nearest water body (Vembanad Lake) is approximately at a distance of 500 m. No natural streams were found near the proposed unit. As per the project proposal submitted by the unit, a contemporary-style chimney is proposed to be placed vertically to the kiln. A true copy of the project proposal submitted is attached herewith and marked as **Annexure R1(d)**. The chimney's height is 30 meters and the



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29/02/2024
DISTRICT OFFICE, ALAPPUZHA

M/s Fine lime, Ponnadu, Mannancherry was selected. Water samples were collected from nearby water sources to ascertain the extent of pollution attributed due to the operation of the kiln. The results obtained are as follows:

**Sampling of water bodies near Fine lime ponnadu,
Mannancherry**

Sl No:	parameter	unit	Sample No and Value		
			Lake	Thodu	Limit(as per CPCB's outdoor bathing water quality criteria)
1	pH	-	7.57	7.26	6.5-8.5
2	Turbidity	mg/l	0.60	2.24	
3	Fluoride	mg/l	0.68	0.07	
4	Sulphate	mg/l	28.4	BDL	
5	Chloride	mg/l	460	140	
6	Total Hardness	mg/l	80	140	
7	TDS	mg/l	142	220	
8	Dissolved Oxygen	mg/l	6.9	2.8	5 or more
9	BOD	mg/l	4.4	3	3 or less

Lake - Fine lime ponnadu, Mannancherry

Thodu - Fine lime ponnadu, Mannancherry



Signature
Kerala State Pollution Control Board
District Office, Alappuzha

It is humbly submitted that ambient air quality monitoring near an operational lime kiln was also conducted to ascertain the extent of air pollution, if any. M/s Khalid's Kandathil Lime, Mannancherry, shares the same capacity (12 tons, 9 tons of lime+ 3 tons of fuel) of the proposed unit. Khalid's Kandathil Lime is situated close to the lakeside, experiencing prevailing winds from the west to the east between 6 am and 10 pm. However, during the night from 12 am to 6 am, the wind direction reverses, blowing from east to west. The operational hours of the unit are decided by favorable wind conditions, allowing the blower to discharge smoke effectively towards the lake. Typically, the unit operates during midday when the wind blows in the direction of the lake (from west to east). The area's average temperature and humidity are around 31 degrees Celsius and 70%, respectively. In contrast, the GRB Lime unit is located within a residential area and lacks the consistent strong winds observed at Khalid's Kandathil Lime near the lake. As a result, mechanical methods, such as maintaining specific chimney heights or using blowers, are essential to expel smoke and wind outside. Despite these efforts, there remains a possibility of smoke lingering indoors. The average temperature and humidity in this area are approximately 30 degrees Celsius and 68%, respectively. Air monitoring was done at Khalid's Kandathil Lime on 25.09.2023 for a time period of 4 hours (the full operational time period of the kiln). 3 stations were established from the unit at a distance of 10 m, 10 m, and 15 meters (upwind & downwind side). The results indicated that the air parameters from PM10 machines were within the limit from all 3 stations since there was a heavy breeze to the backwater. GRB Limes is in a prime residential area this could not be the case in that scenario. The results obtained as follows:



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 DISTRICT OFFICE, ALAPPUZA
 KERALA STATE POLLUTION CONTROL BOARD

POINT-1 (West side-upwind)

Respirable Suspended Particulate Matter, RSPM (PM10) - 27 $\mu\text{g}/\text{m}^3$

POINT-2 (East side-down wind)

Respirable Suspended Particulate Matter, RSPM (PM10) - 30 $\mu\text{g}/\text{m}^3$

POINT-3 (Northside)

Respirable Suspended Particulate Matter, RSPM (PM10) - 48 $\mu\text{g}/\text{m}^3$

8. It is humbly submitted that Water samples were taken from wells of residences nearby and lake near to KHALID's Kandathil Lime and tested. The water quality parameters such as BOD, pH, suspended solids, oil, and grease were within limit, same would be the case with GRB limes also when established.

Sl No:	parameter	unit	Sample No and Value		
			K1	K2	Limit (as per IS 10500 (2012): Drinking water)
1	pH	-	7.32	7.5	6.5-8.5
2	Turbidity	mg/l	0.54	0.79	1-5
3	Fluoride	mg/l	0.08	0.07	1-1.5
4	Sulphate	mg/l	BDL	BDL	200-400
5	Chloride	mg/l	120	120	250-1000
6	Total Hardness	mg/l	360	280	200-600
7	Ca Hardness	mg/l	200	120	200
8	Mg Hardness	mg/l	160	160	100

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9	Calcium	mg/l	80.16	48.096	75
10	Magnesium	mg/l	38.88	38.88	30
11	TDS	mg/l	443	561	500-2000
12	Dissolved Oxygen	mg/l	1.9	0.86	4-5
13	BOD	mg/l	1.1	3.4	3

K1- Well water sample collected from near Kandathil lime

K2- Well water sample collected from Khalid's Residence.

Sl No:	parameter	unit	Sample No and Value		
			K3	K4	Limit(as per CPCB's outdoor bathing water quality criteria)
1	pH	-	7.52	7.24	6.5-8.5
2	Turbidity	mg/l	1.45	0.98	
3	Fluoride	mg/l	0.09	0.07	
4	Sulphate	mg/l	BDL	BDL	
5	Chloride	mg/l	100	100	
6	Total Hardness	mg/l	80	100	
7	Ca Hardness	mg/l	40	20	
8	Mg Hardness	mg/l	40	80	
9	Calcium	mg/l	16.032	8.016	
10	Magnesium	mg/l	9.72	19.44	
11	TDS	mg/l	134	114	
12	Dissolved Oxygen	mg/l	7	5.6	5 or more



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13	BOD	mg/l	3.3,	3.8	3 or less
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K3- vembanad lake (near to kiln 1 of Kandathil Lime)

K4- vembanad lake (near to kiln 2 of Kandathil Lime)

9. It is humbly submitted that the study conducted regarding air and water pollution near two operational units give results that there is no exceedance of ambient air quality standards with respect to the parameters monitored, nor there is water pollution due to the operation of lime kiln.

All the facts stated above are true to the best of my knowledge, information and belief.

Dated this the 14th day of February, 2024.



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Environmental Engineer
Kerala State Pollution Control Board
District Office, Alappuzha.

ENVIRONMENTAL ENGINEER
KERALA STATE POLLUTION CONTROL BOARD
DISTRICT OFFICE, ALAPPUZHA

Solemnly affirmed and signed by the Deponent before me
on this 14th day of February 2024

FILE NO. :PCB/ALP/CE-2140/2021

Date of issue :11/06/2021



KERALA STATE POLLUTION CONTROL BOARD

CONSENT TO ESTABLISH

ISSUED UNDER

Section 25 of Water (Prevention & Control of Pollution) Act, 1974
Section 21 of the Air (Prevention & Control of Pollution) Act, 1981

and

Environment (Protection) Act, 1986

As per Application No. :15714321

Dated:09-06-2021

TO

M/s GRB LIME INDUSTRIES

KAYIPURAM

MUHAMMA P O

ALAPPUZHA

688525

Consent No. :PCB/ALP/ICE-1826/15714321/21

Valid Upto :31/03/2026



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1. GENERAL

1.1. This integrated consent is granted subject to the power of the Board to withdraw consent, review and make variation in or revoke all or any of the conditions as the Board deems fit.

1	VALIDITY	31/03/2026
2	Name and Address of the establishment	GRB LIME INDUSTRIES KAYIPURAM MUHAMMA P O ALAPPUZHA - 688525 688525
3	Communication	Telephone :91-9447766285 Fax :-9447766285 E-mail:jibin.grb@gmail.com
4	Occupier Details	JIBIN G KUDILVELI KAYIPURAM MUHAMMA P O ALAPPUZHA - 688525
5	Local Body	MUHAMMA
6	Survey Number	186/10, 186/10-2, 186/10-2-2
7	Village	THANNEERMUKOM SOUTH
8	Taluk	CHERTHALA
9	District	Alappuzha
10	Capital Investment(Rs in Lakhs)	RS 14/- LAKHS
11	Scale	Small
12	Category	ORANGE
13	Annual fee(Rs)	RS.3750 /-
	Total Fee remitted(Rs)	RS.18750/-
14	RAW MATERIAL	PRODUCTS
	LIME SHELL @12000 Kilogram CHARCOAL @500 Kilogram	BURNED LIME SHELL @9000 Kilogram
15	Total Power Required (HP)	24 HP

2. CONDITIONS AS PER

The Water(Prevention and Control of Pollution)Act, 1974

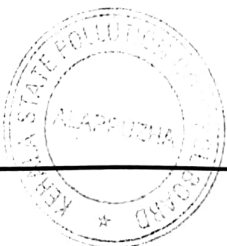
2.1 In case of generation of trade effluent from the industry, effluent treatment system consisting of treatment units having adequate capacity established as per the proposal submitted along with the application shall be made functional before commissioning. Additional facilities required, if any, to achieve the standards laid down by the Board u/s 17(1) (g) of the Water Act shall also be made along with.

2.2 Water Consumption : 1000 L/DAY

2.3 Effluent Generation : 800 L/DAY

2.4 The characteristics of effluent after treatment shall confirm to the following tolerance limits:

SI.NO.	Characteristics	Unit	Tolerance Limit	
			Sewage	Trade Effluent



2.5 Mode of disposal of treated effluent :

3. CONDITIONS AS PER

The Air(Prevention and Control of Pollution)Act, 1981

3.1 Adequate air pollution control measures shall be provided before commissioning of the industry. Additional facilities required, if any, to achieve the standards laid down by the Board shall also be made along with.

Stack No.	Sources of Emission	Emission Rate(Nm3/Hr)	Stack Height above		Control Equipment
			Ground Level	Roof Level	

3.2 Emission characteristics shall not exceed the following:

Sl.No.	Parameter	Limiting Standards (mg/Nm3)

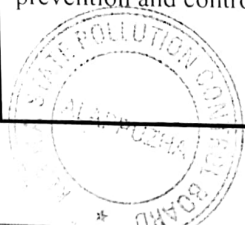
4. CONDITIONS AS PER

The Environment (Protection) Act, 1986.

- 4.1 The construction activities shall be carried out strictly in compliance with the provisions of the Noise Pollution (Regulation and Control)Rules 2000.
- 4.2 Used lead acid batteries shall be disposed of as per the Batteries (Management and Handling) Rules, 2001
- 4.3 Hazardous waste generated, if any, shall be handled as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- 4.4 e-waste shall be disposed off safely as per the E-Waste (Management) Rules, 2016.

5. SPECIFIC CONDITIONS

- 5.1 Condition no. 2.1, 2.4, & 3are deleted.
- 5.2 This consent is granted subject to the power of the Board to review and make variations in all or any of the conditions as per section 21 of the Air (Prevention and Control of Pollution) Act 1981 and section 25 of the Water (Prevention and Control of pollution) Act 1974.
- 5.3 For renewal of the consent in case of continuance of establishment of the unit, application in the prescribed form shall be submitted through the web portal of the Board [http:// krocmms. nic.in](http://krocmms.nic.in) for renewing the Consent on or before two months in advance to expiry date. Late application will be accepted with 10% (for application before expiry date) & 50% of yearly fee as late fee for application after due date.
- 5.4 The date of commissioning shall be intimated, at least one month in advance, to the District Office of the Board.
- 5.5 Consent to Operate shall be obtained before commissioning the unit under the Air (Prevention and Control of Pollution) Act and the relevant Rules under Environment (Protection) Act.
- 5.6 No change or alteration of the unit is to be made without the prior permission of the Board. Any change in the particulars furnished in the references or in the identity of the occupier / authorised agent is to be intimated to the Board forthwith.
- 5.7 The applicant shall comply with the instructions that the Board may issue from time to time regarding prevention and control of air, water, land and sound pollution.



True copy

[Signature]
 ENVIRONMENTAL ENGINEER
 KERALA STATE POLLUTION CONTROL BOARD
 DISTRICT OFFICE, ALAPPUZHA

- 5.8 The suspended particulate matter at the boundary of the premises shall not exceed the limits specified as per the National Ambient Air quality standards applicable to the adjoining area (100mg/m²). Proper dust extraction and dust suppression system shall be installed in the unit.
- 5.9 The sound level measured at 1 m outside the boundary of the premises shall not exceed the limits applicable to the adjoining area. Periodic preventive maintenance and lubrication, Covering with sound absorbing material shall be provided for noise making equipments.
- 5.10 There shall not be any fugitive emission from the premises.
- 5.11 All operations likely to produce dust or noise shall be carried out within sufficiently closed premises. Anti-vibration rubber pads shall be installed in the foundation of each equipment to minimize noise and vibration.
- 5.12 Sewage if any shall be treated and disposed by Septic tank as per IS 2470 (Part 1): 1985 and soak pit with sealed bottom, honey comb side wall and 65 cm thick 2 mm sand envelope all around.
- 5.13 Signboard showing the name of the establishment shall be displayed at the entrance of the unit.
- 5.14 Arrangements of rain water harvesting including open well / Bore well/ Ground water recharging shall be provided.
- 5.15 The kiln shall be fully enclosed during firing and the fumes generated shall be dispersed through a chimney of minimum height 30m above ground level with facilities for water scrubbing with scrubbed water recycling facilities.. Draught fans of adequate capacities shall be provided for completely sucking the fumes from Kiln and pass through air pollution control equipments.
- 5.16. The solid waste generated shall be properly collected and sold to outside parties.
- 5.17. Meat collection/boiling raw shell and washing of lime shell shall not be done in the unit.
- 5.18 The location of the unit shall be as shown in the drawing attached. No change or alteration to it shall be made without prior permission of the Board.
- 5.19 This consent is issued based on the information furnished in the application, affidavit and other documents submitted. If any information is found false or in the case of non-compliance to the consent conditions/Board's Norms, this consent will be cancelled and consent fee paid will be lapsed automatically.

DATE : 11/06/2021

ANIKAR K R Digitally signed by ANIKAR K R
Date: 2021.06.13 05:12:07
07'00'

SIGNATURE & SEAL OF ISSUING AUTHORITY
ASSISTANT ENVIRONMENTAL ENGINEER in
Full Additional Charge of ENVIRONMENTAL
ENGINEER



Ullas

ALAPPUZHA DISTRICT OFFICE, ALAPPUZHA

To

JIBIN G
KUDILVELI
KAYIPURAM
MUHAMMA P O
ALAPPUZHA - 688525

1. This digitally signed document is legally valid as per the Information Technology Act 2000
2. For verifying this document please go to krocmms.nic.in and search using date of issue/name of the unit/Application Number in "Consent Granted Applications" link in the home page of the Board's Online Consent Management and Monitoring System.

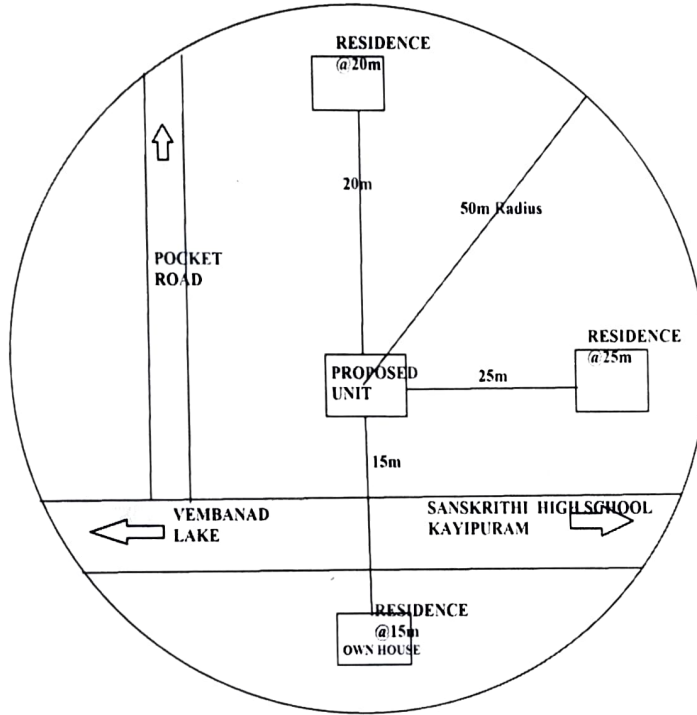


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STATE COUNCIL FOR EDUCATIONAL RESEARCH AND TRAINING
ALAPPUZHA

True copy

PROPOSED SITE PLAN OF M/S. GRB LIME INDUSTRIES, KAYIPURAM, MUHAMMA P O , ALAPPUZHA - 688525



SY.NO: 186/10, 186/10-2-2, 186/10-2

NAME & ADDRESS OF APPLICANT:

JIBIN G
KUDILVELI
KAYIPRAM
MMUHAMMA P O
ALAPPUZHA - 688525

TALUK : CHERTHALA
VILLAGE : THANEERMUKHAM SOUTH
PANCHAYATH : MUHAMMA

SIGNATURE OF APPLICANT



True copy

OFFICE OF THE DISTRICT OFFICER
ALAPPUZHA DISTRICT OFFICE, P.O. PONDAL
SUBDISTRICT OFFICE, ALAPPUZHA



KERALA STATE POLLUTION CONTROL BOARD

കേരള സംസ്ഥാന പരിസ്ഥിതികരണ നിയന്ത്രണ കൗൺസിൽ

Pattom P.O., Thiruvananthapuram. - 695 004

തലപ്പാലം: തിരുവനന്തപുരം - 695 004

No. PCB/T4/115/97 (3)

Dated 31/8/2016

CIRCULAR

Sub - Re categorization of industries under Red, Orange, Green and White categories as per CPCB direction

- Ref
- 1 GO (Rt) No 2536/2002/H&FWD dated 21.10.2002
 - 2 Circular No PCB/GEN/C/1/2003 dated 21.07.2003
 - 3 Circular No PCB/GEN/C/1/2005 dated 30.03.2005
 - 4 CPCB's Letter No B-29012/ESS (cpa)/2015-16 dated 07.03.2016
 - 5 Minutes of the 199th Board Meeting held on 27.07.2016

The Government of Kerala had vide G O cited first above amended the Water Rules 1976 notifying the list of Red, Orange and Green Category of Industries for consent management. As per this notification, the Board subsequently added few more industries in the list vide circulars cited second and third above. The same is followed now.

The Central Pollution Control Board (CPCB) vide reference cited 4th above issued directions under section 18(1) (b) of the Water Act 1974 and Section 18 (1) (b) of the Air Act 1981 regarding harmonisation of classification of industrial sectors under red/orange/green/white categories for compliance by all SPCBs and PCCs. The CPCB direction and the final document on criteria of classification of industrial sectors attached with the direction cited 4th above were placed before the Board in its 199th meeting held on 27.07.2016 and it was decided to adopt the categorisation of Central Pollution Control Board.

Now therefore, in compliance with the directions issued by the CPCB vide reference 4 and the decision of the Board Meeting held on 27.07.2016 (ref 5) the following orders are issued.



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Subramanian

Environmental Engineer
Kerala State Pollution Control
District Office, Alappuzha

1. The revised classification list attached along with the CPCB direction shall be in force with effect from 1st October 2016. Revised classification list is attached as Annexure I. All applications received on and after 1st October 2016 shall be processed as per the new classification criteria
2. Further addition of any new or left over Industrial sectors which are not listed in the CPCB's revised list of Red/Orange/Green/White categories shall be categorised based on the relative pollution scoring methodology as enumerated in the final document on Revised Classification of Industrial sectors by a committee constituted as under.

- | | |
|---|------------|
| 1. Member Secretary, Kerala State Pollution Control Board | - Chairman |
| 2. Chief Environmental Engineer-1 | - Member |
| 3. Chief Environmental Engineer-2 | - Member |
| 4. Environmental Engineer-1, Head Office | - Convenor |

3. As per the final document on revised categorisation of industries there is no necessity of obtaining 'Consent to Operate' for white category of industries. An intimation to the SPCB/PCC shall suffice. So such industries need not be brought under consent preview. But such industries shall require one time registration of the Board which is valid for a period of 15 years, without shifting the location, as decided by the Board in its 199th meeting

The above order supersedes the earlier Government Order and circular issued in respect of categorisation of industries in to red/orange/green

Sd/-

CHAIRMAN

To

1. The Chief Environmental Engineer
Regional Office, Ernakulam
2. The Senior Environmental Engineer
Regional Office/District Office,
Thiruvananthapuram/Kozhikode/Ernakulam/Palakkad
3. The Environmental Engineer
District Office, TVPM/KLM/PTA/ALPA/IDK/KTM/
EKM-1/EKM2/ESC/TSR/MLPM/KKD/WND/KNR/KSGD

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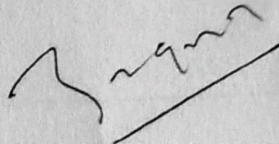
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Environmental Engineer
Kerala State Pollution Control
District Office, Alappuzha

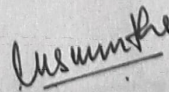
- 4 All Technical Officers in Head Office
- 5 AEE-5 – IT cell (for uploading in website)

- Copy to:-
- 1. CA to Chairman
 - 2. CA to Member Secretary
 - 3. Stock file

FORWARDED / BY ORDER



ASSISTANT ENVIRONMENTAL ENGINEER



Environmental Engineer
Kerala State Pollution Control
District Office, Alappuzha

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42	35	dispersible form., Slags from copper processing for further processing or refining " Insulated Copper Wire," Scrap/copper with PVC sheathing including ISI-code material namely "Druid" "Jelly filled Copper cables " Zinc Dress-Hot dip Galvanizers SLAB., Zinc Dress-Bottom Dress., Zinc ash/Skinning arising from galvanizing and die casting operations," Zinc ash/Skinning/other zinc bearing wastes arising from smelting and refining," Zinc ash and residues including zinc alloy residues in dispersible from."	20	20	20	20	20	20	50	R-O	i. This score is valid for the foundries having capacity < 5 MT/hr as such units require the coal/coke @ < 500 kg/hr. ii. The units having capacity of 5 MT/hr and more, the coal/coke consumption will be more than 500 kg/hr and the normalized score will be 62.5 and classified accordingly as Red
43.	40	Lime manufacturing (using lime kiln)	20	20	20	20	20	20	50	R-O	Mainly air polluting
44.	41	Liquid floor cleaner, Black phenyl, liquid soap, Glycerol mono-stearate manufacturer	20	20	20	20	20	20	50	C-O	Both air and water pollution are generated



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KERALA STATE POLLUTION CONTROL BOARD

PATTOM P.O., THIRUVANANTHAPURAM - 695 004

www.keralapcb.org

Email: kspcb@asianetindia.com
Telephone: 318153, 318154 & 318155
Annex: 304642, 304643
FAX: 318152

In reply please refer to: No. PCB/TAC/18/2004

Date: 9-8-2004

CIRCULAR

Sub:- Siting criteria for industries other than stone crushers.

Ref:- 1) Minutes of the meeting of the Committee held on 17.5.2004.
2) Decision of the 143rd Board meeting held on 23-7-2004.

The Committee constituted to study and recommend norms for siting criteria of industries other than stone crushers have finalised the criteria in the meeting held on 17.5.2004. In the 143rd meeting of the Board held on 23.7.2004 it was decided to implement the siting criteria in consent administration as stated below:

Criteria for industries other than stone crushers

❖ Distance from:

- i. In the case of industry having air pollution (including sound pollution) potential, distance shall be measured from the main building or the building housing the equipment, operation or process of most pollution potential.
- ii. In the case of industry having water pollution potential, distance shall be measured from the major wastewater outlet.
- iii. In the case of industry having air and water pollution potential, the shorter of the above two distances shall be taken.

❖ Distance to:

- i. The horizontal distance to the nearest residence shall be measured and denoted d_R .
- ii. The horizontal distance to the nearest educational Institution / court / public office / hospital / place of worship / community hall / similar establishment (excluding other industries) shall be measured and denoted d_d .

C. S. S. S.

KERALA STATE POLLUTION CONTROL BOARD
DISTRICT OFFICE, ALAPPUZHA

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NOTE: Where d_R and/or d_D are/is considerably more than the minimum distance mentioned below, it is not necessary to measure the same but it is sufficient to state as \gg the minimum distance mentioned.

SI No	Industry		Minimum distance, m	
	Scale	Category	d_R	d_D
1	SMALL	Red	25	50
		Orange	10	15
		Green	3	5
2	MEDIUM	Red	50	100
		Orange	15	25
		Green	6	10
3	LARGE	Red	100	100
		Orange	40	60
		Green	15	30

For industries having noise potential, proposed in silence zones as per the Noise (Management and Handling) Rules, the minimum distance shall be two times the d_D subject to a minimum of 100m.

It is desirable to have a minimum set back of 3m between the boundary and the plant building to avoid construction of factory building along or too close to the boundary wall. The setback can be utilised for the development of greenbelt. In case of industries falling in green/orange categories of Small Scale Industries, the requirement of minimum set back may be dispensed with.

Where necessary, the minimum distance may be enhanced for reasons to be recorded in writing.

The above criteria will be implemented with immediate effect and will be reviewed after 6 months.


Sd/-
MEMBER SECRETARY

To

1. CEE, RO, EKM/KKD
2. EE. DO., TVPM/KLM/PTA/ALPA/TSR/IDK/PLKD/MLPM/KNR
3. All Technical staff in the Head Office.

FORWARDED/BY ORDER,


ENVIRONMENTAL ENGINEER.


DISTRICT OFFICE, ALAPPUZHA

True copy



Aquasmart Solutions

Near, Cheramankulangara Temple, Thathampally Ward, Alappuzha-688013
Customer Care:7012310225 Email:aquasmartwatersolutions@gmail.com

Alappuzha,
 09-.6-2021

The Environmental Engineer,
 KSPCB, Alappuzha

SUB:-AFFIDAVIT FOR THE CONSTRUCTION OF WATER SCRUBBER

Dear Sir,

We are submitting the proposal for the erection of Water Scrubber for GRB Lime industries. We hope you are satisfied with the proposal and design We are submitting. It would be a great pleasure if you are approving the proposal. Further more If the Pollution Control Board recommends any changes in the scrubber, We are ready to do it if the customer is ready to pay for the extra work to be performed.

Your's faithfully

For Aquasmart Solutions,

Sebin B



Sebin B Abraham,
 Operations Engineer,
 Aquasmart Solutions, Alappuzha

Chennu



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PROJECT PROPOSAL

For Water Scrubbing Unit

Prepared for
GRB LIME INDUSTRIES,
KAYIPPURAM, MUHAMMA

Near Chermankulangara Temple,

Thathampally Ward,

Alappuzha-688013

Email: aquasmartwatersolutions@gmail.com

M. M. M. M.

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COMPANY PROFILE

AQUASMART SOLUTIONS is an Environmental Management Systems Company. Over the past 4 years we have devoted ourselves creating sustainable business that makes green concepts easy and affordable to its satisfied customers throughout the regions. AQUASMART through its strategic partnership with world class manufactures provides you the best services for your large project applications economically.

AQUASMART provides comprehensive range of products and services. The key process technology enables us to deliver the expertise needs to attain success from a wide range of customized services to our clients, maximizing the reliability efficiency for

- **Water Treatment and Wastewater Treatment Systems**
- **Incinerators For Solid Waste Management**
- **Biogas For Food Waste Management**

We serve through our regional offices through our distributor's network in the regions.

OUR BRANCHES

In addition to our Head Office in Alappuzha, We have Customer Service Branches in association with our sister concerns in the following places.

● KOLLAM

CKP JUNCTION, ELABALLUR ROAD NEERAVIL, KERALA

● KOTTAYAM

MATTAKANDATHIL BUILDING, KOTTAYAM - KUMILY RD, MANARCADU, KOTTAYAM.



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PROJECT OVERVIEW

DESIGN CRITERIA

- | | |
|---------------------------------|----------------------------------|
| 1. Capacity of Lime Kiln | : 9 tpd |
| 2. Water consumed for Scrubbing | : 1000 litres |
| 3. Waste Water Generation | : $0.9 \times 1000 = 900$ litres |
| 4. Design Capacity | : 1000 liters/day |

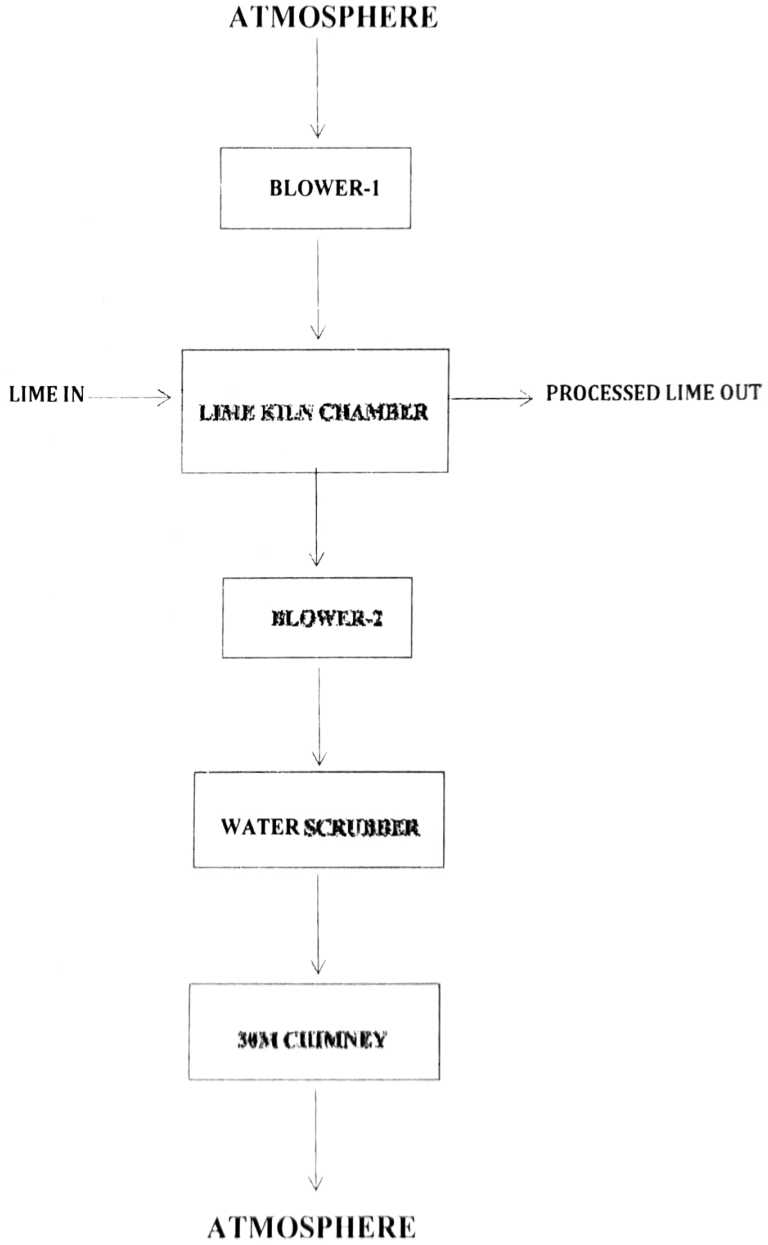


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ENGINEER IN CHARGE
KERALA STATE POLLUTION CONTROL BOARD
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FLOWCHART

1. LIME KILN PROCESS

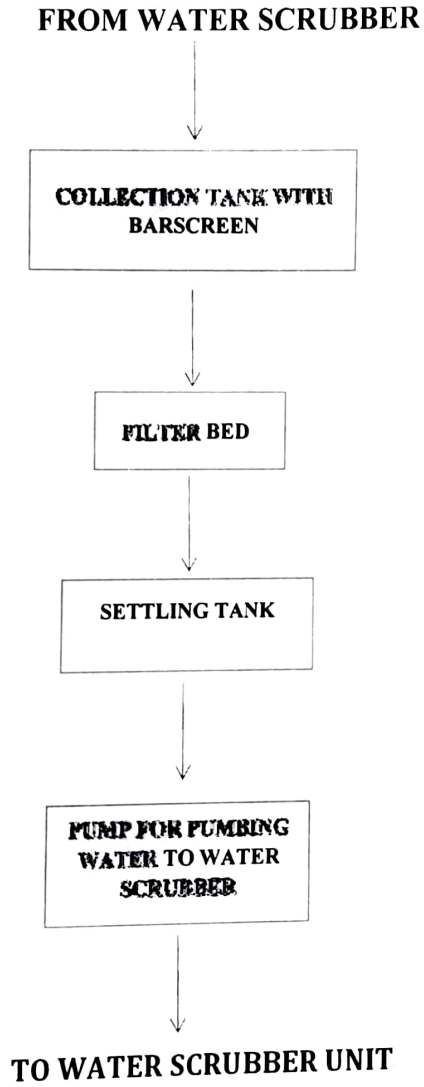


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2. WATER SCRUBBING PROCESS



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WATER TREATMENT ENGINEER
KERALA STATE POLLUTION CONTROL BOARD
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PROCESS DESCRIPTION

1.LIME KILN PROCESS

BLOWER-1

This blower consumes fresh air from the Atmosphere and supplies it to the Lime Kiln chamber

LIME KILN CHAMBER

In this chamber,Lime is processed at required temperature under favourable physical and chemical conditions to process the lime

BLOWER-2

This blower consumes air from the Lime kiln and transfers it to the 30m high Chimney with water scrubber and the chimney releases the effluent air to the atmosphere

WATER SCRUBBER

Water scrubber placed inside the bottom of the chimney will sprinkle water and the sprinkled water will absorb the harmful chemicals from the smoke coming out of the Lime Kiln chamber via Blower-2.The detailed description of the Water Scrubber will be discussed in the water scrubber section.

30M HEIGHT CHIMNEY

A steel chimney is of 30m height with 50cm diameter with brick mortar support upto 3m(hood) & remaining with steel structural supports will collect the treated air and release it in to the atmosphere through it top.



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2. WATER SCRUBBING PROCESS

COLLECTION TANK WITH BARSCREEN

The water is collection in the collection tank with barscreen which remove the high sized particles in the Water.

FILTER BED

In this module, the water is allowed to pass through a Multimedia cum Activated Carbon filter bed which will remove harmful impurities from the water.

SETTLING TANK

In this settling tank, the output water from the filter bed is collected and is allowed to settle to remove further impurities.

WATER SCRUBBER

Water scrubber placed inside the bottom of the chimney will sprinkle water and the sprinkled water will absorb the harmful chemicals from the smoke coming out of the Lime Kiln chamber via Blower-2. This water is then collected back into collection tank with bar screen from which the water will be filtered through filter bed to reuse the water again.

EXPECTED OUTPUT AIR PARAMETERS

<u>Particulars</u>	<u>Unit</u>	<u>Value</u>
Temperature of stack gas	degree Celsius	35-55
Velocity of gas emission	m/s	5-9
Particulate matter	mg/Nm ³	<40
Sulphur Dioxide	mg/Nm ³	NIL



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UNIT SIZE AND SPECIFICATION

CIVIL WORK CLIENTS SCOPE

SL No:	ITEM	QTY	L (m)	B (m)	H (m)	MOC
1	BLOWER-1 CHAMBER	1	2	2	2.5	BRICK MORT AR
2	LIME KILN CHAMBER	1	5	5	4	
3	BLOWER-2 CHAMBER	1	2	2	2.5	
4	COLLECTION TANK	1	1.5	1.5	1	RCC
5	FILTER BED	1	1m DIA			RCC
6	SETTLING TANK	1	1.5	1.5	1	RCC
7	CHIMNEY	1	40cm dia & 30m			STEEL

MECHANICAL EQUIPMENTS

SL No:	ITEM	QTY	SPEC
1	BLOWER-1	1	10HP
2	BLOWER-2	1	10HP
3	WATER SCRUBBING PUMP	1	3 HP

Prepared by



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DESIGN OF STEEL CHIMNEY OF HEIGHT 30m

STEP 1 : DIMENSIONING OF CHIMNEY:

Total height of Chimney = 30 m
 Height of Flared portion = (1/3)h = 10 m = 3 m
 Diameter of Cylindrical portion = 0.6 m
 Diameter of Flared portion = 1.6 * dia = 0.96 m = 1.2 m

STEP 2 : COMPUTATION OF WIND PRESSURE:

For this the entire chimney is divided into 6 sections as shown in fig 1

Design Wind Pressure ,

$V_z = V_b \cdot k_1 \cdot k_2 \cdot k_3$
 $V_b = 39 \text{ m/s}$ (IS: 875 PART 3 -1987)
 $k_1 = k_3 = 1$
 Therefore $V_z = 39 \text{ k2}$

Design wind pressure

$P_z = 0.6 V_z^2 = 0.9126 \text{ k2}$

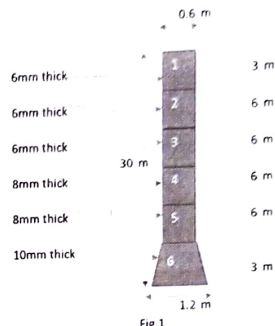
Also Wind force , Fz =

$F_z = \frac{k \cdot P_z \cdot D \cdot dz}{0.7 \cdot P \cdot D \cdot dz}$

Sample Calculation

Section 1

Height H = 30 m
 Diameter D = 0.6 m
 $k_2 = 1.1$ (IS: 875 PART 3 -1987)
 $dz = 3$
 Design wind pressure $P_z = 1.104246 \text{ kN/m}^2$
 Wind Force $F_z = 1.39134996 \text{ kN}$



Design Wind Pressure & Wind Force

Sections	H	D	k2	Pz	dz	Fz
1	30	0.6	1.1	1.104246	3	1.39135
2	27	0.6	1.08	1.064457	6	2.682431
3	21	0.6	1.05	1.006142	6	2.535477
4	15	0.6	1.02	0.949469	6	2.392662
5	9	0.6	0.98	0.876461	6	2.208682
6	3	0.9	0.98	0.876461	3	1.656511

STEP 3 : DETERMINATION OF OVERTURNING MOMENTS

Design Wind Pressure & Wind Force

Sample Calculation:

Moment at Section 1 = Force * distance $F_z \cdot (dz/2) = 2.087025 \text{ kNm}$

Sections	Moment
1	2.087025
2	18.48242
3	48.44451
4	95.27804
5	155.9156
6	208.8481

STEP 4 : DESIGN OF CHIMNEY SHELL

Stress due to Chimney Height, $f_s = 0.0785 \text{ h}$ N/mm²
 Stress due to lining, $f_l = 0.002 \text{ h/t}$ N/mm²
 Stress due to wind, $f_w = 0.004Mw / (3.1414 \cdot d^2 \cdot t)$ N/mm²



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Minimum Thickness of shell as per IS 6537 part 2:1989=

adding thickness for corrosion = $D/500$
 Total Thickness of shell = $= 1.2 \text{ mm}$
 $= 4 \text{ mm}$
 $= 5.2 \text{ mm}$
 Thickness of shell, $t = 6 \text{ mm}$

Design of section 1:

Therefore $D/t = 100$

$h = 3 \text{ m}$
 $he/D = 5$

Taking Efficiency in rivetted joint in compression $n1 = 1$

Permissible Tensile stress = $0.6fy$

Taking Efficiency in rivetted joint in Tension $n2 = 0.7$

$fs = 0.2355 \text{ N/mm}^2$
 $fl = 0.000001 \text{ N/mm}^2$
 $fw = 1.230299 \text{ N/mm}^2$

Total Stress, $fcmax = 1.4658 \text{ N/mm}^2$
 Also, $ftmax = 0.994799 \text{ N/mm}^2$

$h = 6 \text{ m}$
 $he/D = 10$

$D = 0.6 \text{ m}$
 $oc = 126 \text{ N/mm}^2$
 $M1 = 2.087025 \text{ kNm}$
 (IS 6533 :1989 part 2)
 Effective $t = 6 \text{ mm}$
 $oc\ n1 = 126 \text{ N/mm}^2$
 150 N/mm^2
 $atn2 = 105 \text{ N/mm}^2$
 $fy = 250 \text{ N/mm}^2$

$< 126 \text{ N/mm}^2$ Hence Safe
 $< 105 \text{ N/mm}^2$ Hence Safe
 $D = 0.6 \text{ m}$
 $oc = 126 \text{ N/mm}^2$
 $M1 = 18.48242 \text{ kNm}$
 (IS 6533 :1989 part 2)
 Effective $t = 6 \text{ mm}$
 $oc\ n1 = 126 \text{ N/mm}^2$
 150 N/mm^2
 $atn2 = 105 \text{ N/mm}^2$
 $fy = 250 \text{ N/mm}^2$

$< 126 \text{ N/mm}^2$ Hence Safe
 $< 105 \text{ N/mm}^2$ Hence Safe

$D = 0.6 \text{ m}$
 $oc = 126 \text{ N/mm}^2$
 $M1 = 48.44451 \text{ kNm}$
 (IS 6533 :1989 part 2)
 Effective $t = 6 \text{ mm}$
 $oc\ n1 = 126 \text{ N/mm}^2$
 150 N/mm^2
 $atn2 = 105 \text{ N/mm}^2$
 $fy = 250 \text{ N/mm}^2$

$< 126 \text{ N/mm}^2$ Hence Safe
 $< 105 \text{ N/mm}^2$ Hence Safe

$D = 0.6 \text{ m}$
 $oc = 126 \text{ N/mm}^2$
 $M1 = 95.27804 \text{ kNm}$
 (IS 6533 :1989 part 2)
 Effective $t = 8 \text{ mm}$
 $oc\ n1 = 126 \text{ N/mm}^2$
 150 N/mm^2
 $atn2 = 105 \text{ N/mm}^2$
 $fy = 250 \text{ N/mm}^2$

$< 126 \text{ N/mm}^2$ Hence Safe
 $< 105 \text{ N/mm}^2$ Hence Safe

$D = 0.6 \text{ m}$
 $oc = 126 \text{ N/mm}^2$
 $M1 = 155.9156 \text{ kNm}$
 Effective $t = 8 \text{ mm}$

Design of section 2:

Therefore $D/t = 100$

$h = 6 \text{ m}$
 $he/D = 10$

Taking Efficiency in rivetted joint in compression $n1 = 1$

Permissible Tensile stress = $0.6fy$

Taking Efficiency in rivetted joint in Tension $n2 = 0.7$

$fs = 0.471 \text{ N/mm}^2$
 $fl = 0.000002 \text{ N/mm}^2$
 $fw = 10.89536 \text{ N/mm}^2$

Total Stress, $fcmax = 11.36637 \text{ N/mm}^2$
 Also, $ftmax = 10.42436 \text{ N/mm}^2$

Design of section 3:

Therefore $D/t = 100$

$h = 6 \text{ m}$
 $he/D = 10$

Taking Efficiency in rivetted joint in compression $n1 = 1$

Permissible Tensile stress = $0.6fy$

Taking Efficiency in rivetted joint in Tension $n2 = 0.7$

$fs = 0.471 \text{ N/mm}^2$
 $fl = 0.000002 \text{ N/mm}^2$
 $fw = 28.55798 \text{ N/mm}^2$

Total Stress, $fcmax = 29.02899 \text{ N/mm}^2$
 Also, $ftmax = 28.08698 \text{ N/mm}^2$

Design of section 4:

Therefore $D/t = 75$

$h = 6 \text{ m}$
 $he/D = 10$

Taking Efficiency in rivetted joint in compression $n1 = 1$

Permissible Tensile stress = $0.6fy$

Taking Efficiency in rivetted joint in Tension $n2 = 0.7$

$fs = 0.471 \text{ N/mm}^2$
 $fl = 1.5E-06 \text{ N/mm}^2$
 $fw = 42.12472 \text{ N/mm}^2$

Total Stress, $fcmax = 42.59572 \text{ N/mm}^2$
 Also, $ftmax = 41.65372 \text{ N/mm}^2$

Design of section 5:

$h = 6 \text{ m}$



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Therefore D/t = 75

he/D = 10
 Taking Efficiency in rivetted joint in compression n1 = 1
 Permissible Tensile stress = 0.6fy
 Taking Efficiency in rivetted joint in Tension n2 = 0.7
 fs = 0.471 N/mm2
 fl = 1.5E-06 N/mm2
 fw = 68.93405 N/mm2
 Total Stress, fmax = 69.40506 N/mm2
 Also, ftmax = 68.46305 N/mm2
 h = 3 m
 he/D = 3.333333

oc = 126 N/mm2 (IS 6533 :1989 part 2)
 oc n1 = 126 N/mm2
 150 N/mm2 fy = 250 N/mm2
 atn2 = 105 N/mm2

< 126 N/mm2 Hence Safe
 < 105 N/mm2 Hence Safe
 M1 = 208.8481 kNm Effective t = 8 mm
 D = 0.9 m (IS 6533 :1989 part 2)
 oc = 126 N/mm2

Design of section 6:

Therefore D/t = 112.5

Taking Efficiency in rivetted joint in compression n1 = 1
 Permissible Tensile stress = 0.6fy
 Taking Efficiency in rivetted joint in Tension n2 = 0.7
 fs = 0.2355 N/mm2
 fl = 7.5E-07 N/mm2
 fw = 41.03857 N/mm2
 Total Stress, fmax = 41.27407 N/mm2
 Also, ftmax = 40.80307 N/mm2

oc n1 = 126 N/mm2 fy = 250 N/mm2
 150 N/mm2
 atn2 = 105 N/mm2
 < 126 N/mm2 Hence Safe
 < 105 N/mm2 Hence Safe

So providing a thickness of 6mm for the first 3 sections and 10mm for next two sections and 10mm for base section of the chimney

STEP 5 : CALCULATION OF ACTUAL WEIGHT

Weight density of steel = 78.5 kN/m3
 Weight of sections, Ws = density*3.1414*D*t*L = 9.319 kN
 Weight of lining, Wl = 20*3.1414*(0.6-0.1)*30*0.1 = 105.559 kN
 Total Weight = 114.878 kN

Increasing the weight by 5% to account for lap stiffness, platform and ladder etc and for stack monitoring

STEP 5 : DESIGN OF BASE PLATE:

Maximum compressive force per unit length = 115.45239 kN
 $f_c = (W_s + W_l / (3.1414 * d)) + (4M_w / (3.1414 * d^2))$
 $f_c = 368.940825$ kN/m
 Allowable bearing stress, oc = 4 N/mm2
 Therefore Width of plate = 92.23521 mm

STEP 5 : DESIGN OF ANCHOR BOLTS:

Maximum uplift force per unit length of circumference, ft = (4Mw/3.1414d) - (Ws/3.1414d)
 ft = 489.1667 kN

Let us provide 36mm anchor bolts with this maximum force resistance
 Area of bolt = 3.1414*d*d/4 = 1017.8136 mm2
 Taking permissible strength at root of thread as 120N/mm2
 Strength of each bolt = 122.137632 kN
 Spacing of bolts = 249.685089 mm
 Provide 36mm anchor bolts at a spacing of 200mm

Also scrubber frame with steel material is placed at a height of 4 m from the ground level so that easy access to the scrubbers are ensured

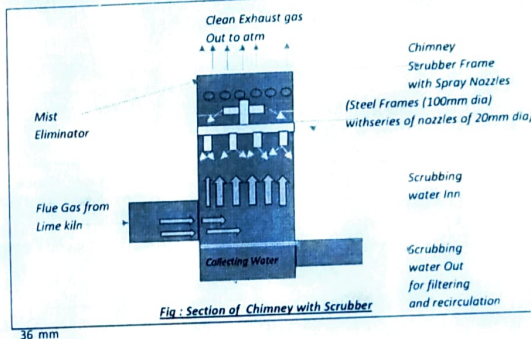


Fig - Section of Chimney with Scrubber

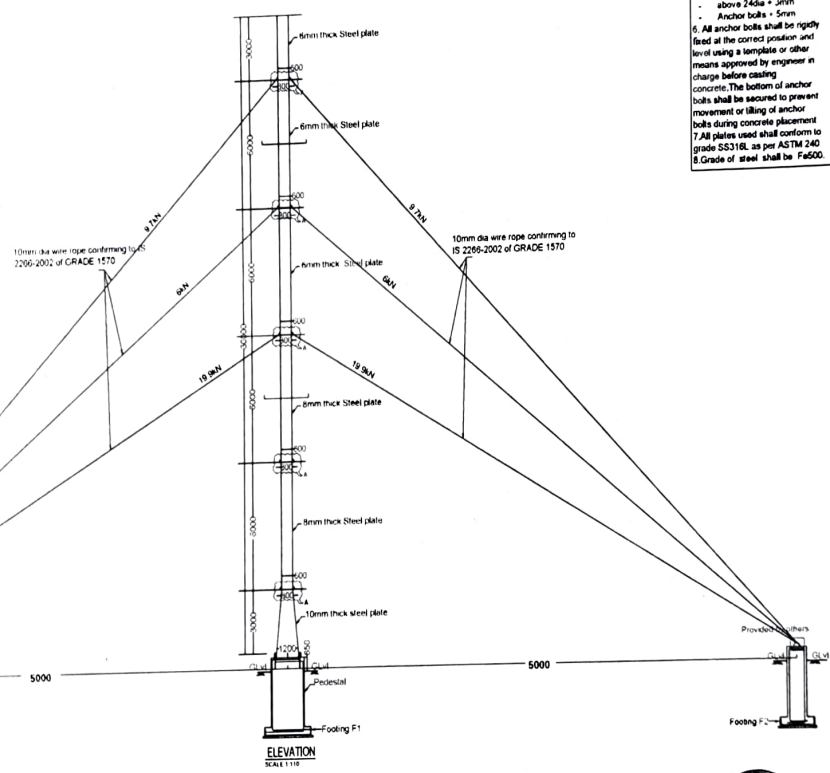
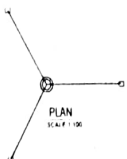
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 Sebin Abraham
 Aquasmart Solutions



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- General Note -
- All works shall be carried out in accordance with the project specification.
 - All dimension elevations and coordinates are in mm uno.
 - All RCC concrete shall be of M30.
 - All pcc shall be of M7.5.
 - All rods shall be of upto
 - upto 24dia + 2 mm
 - above 24dia + 3mm
 - Anchor bolts + 5mm
 - All anchor bolts shall be rigidly fixed at the correct position and level using a template or other means approved by engineer in charge before casting concrete. The bottom of anchor bolts shall be sacriced to prevent movement or tilting of anchor bolts during concrete placement.
 - All plates used shall conform to grade S355JR, as per ASTM 240.
 - Grade of steel shall be Fe500.

FOR EXECUTION PURPOSE FOLLOW ONLY THE DRAWINGS APPROVED & SIGNED BY THE STRUCTURAL CONSULTANT

All revisions starting with alphabet A, B, C... are only for approval information. Revision with numerical 1, 2, 3... are issued as Good For Construction (GFC).

REFERENCE DRAWINGS

LEGEND

CLIENT

GRB LIME INDUSTRIES
KAYIPURAM MUHAMMA

ARCHITECT

STRUCTURAL CONSULTANT

AQUASMART SOLUTIONS
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KOLLAM
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Email: aquasmart@rediffmail.com

REV	DATE	BY	CHK	DESCRIPTION	APP
1	20/10/2018	DM	PC	ISSUED FOR CONSTRUCTION	ES
2	20/10/2018	DM	PC	FOR INFORMATION ONLY	ES
3	20/10/2018	DM	PC	INTERNAL REVIEW	ES

REVISION NOTES

PROJECT

GRB LIME INDUSTRIES

TITLE

CHIMNEY DETAILS

CHECKED AND APPROVED BY:

SEBIN ABRAHAM
MANAGER
AQUASMARTSOLUTIONS



Sebin Abraham

ENVIRONMENTAL ENGINEER
KERALA STATE POLLUTION CONTROL BOARD
DISTRICT OFFICE, ALAPPUZHA

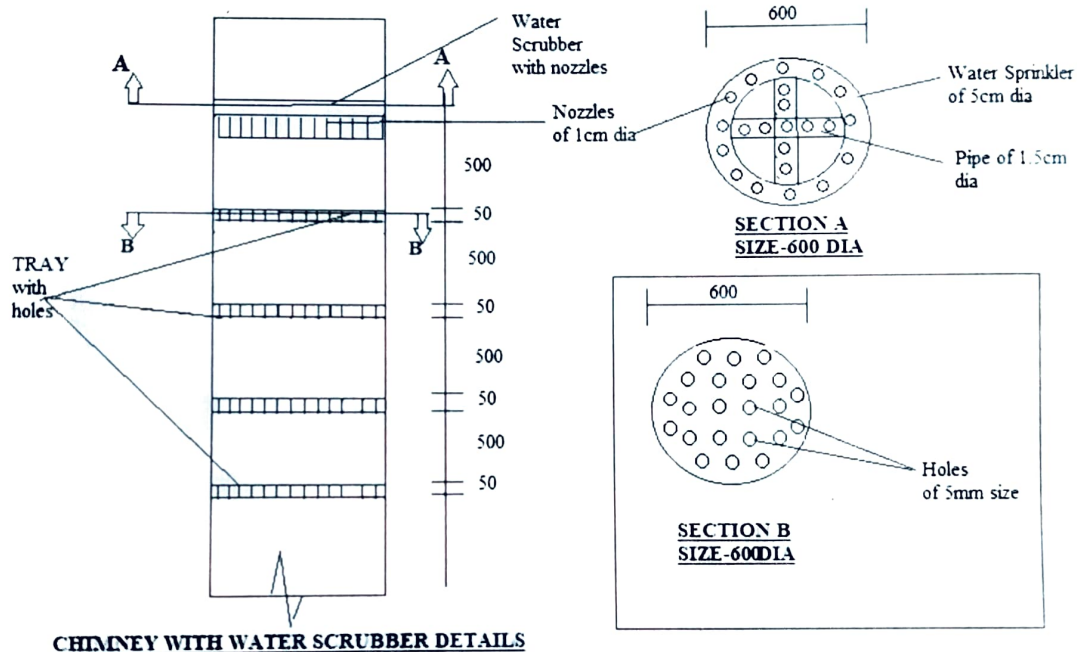
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CHIMNEY WITH SCRUBBER DETAILS

Description:

The Chimney is provided with water scrubber with 5cm dia pipe consist of 25 number nozzles of 1.5cm diameter

Four Steel plates (50mm size) of same diameter as chimney with holes/pores are provided at a distance of 500mm apart from each other is provided for good contact of the gas with the sprinkled water to achieve standard air quality



CHIMNEY WITH WATER SCRUBBER DETAILS



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