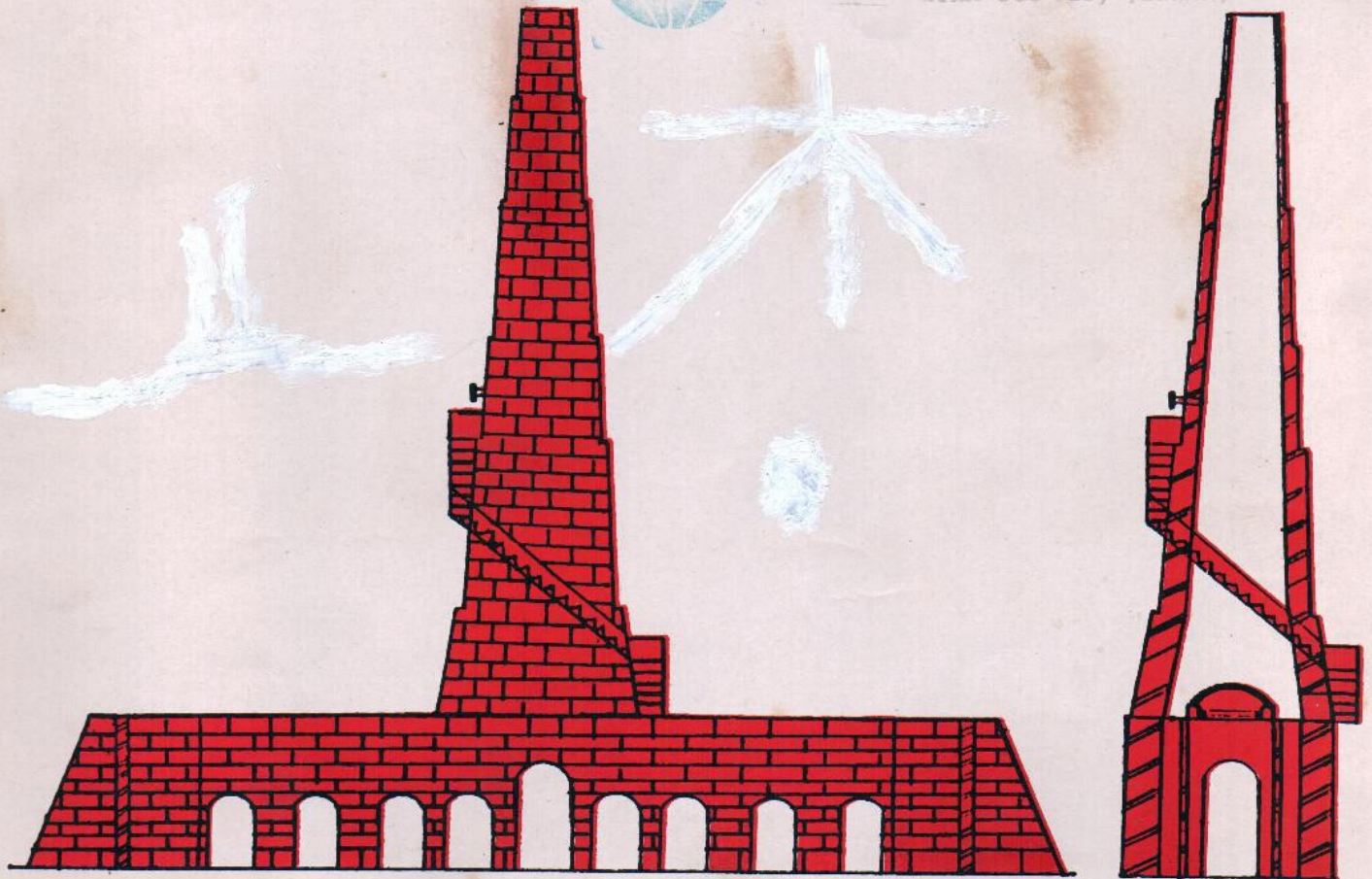


**GUIDELINES
FOR
ESTABLISHMENT, EXPANSION
AND
MODERNISATION
OF
BRICK KILNS**

1999

BIHAR STATE POLLUTION CONTROL BOARD
BELTRON BHAWAN, SHASTRINAGAR
PATNA-800 023, (BIHAR)



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प्राक्कथन

ईट निर्माण के क्रम में, जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1974 की धारा 25; वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 की धारा 21 और पर्यावरण एवं वन मंत्रालय, भारत सरकार के दिनांक 13 नवम्बर, 1987 के प्रासंगिक पत्र में अंकित प्रावधानों/दिशा निर्देशों को सख्ती से क्रियान्वित करने के उद्देश्य से यह गाईडलाईन्स तैयार की गयी है, जिनका उद्देश्य बिहार के औद्योगिक विकास को बिना बाधित किये प्रासंगिक कानूनों एवं दिशानिर्देशों का इस पर्षद् द्वारा अनुपालन करवाना है।

राष्ट्र/राज्य की आधारभूत सुविधा-विकास के लिए ईट-भट्ठा आवश्यक है, परन्तु ईट निर्माण से भूमि, वायु और कुछ हद तक जल प्रदूषण की समस्या जुड़ी हुई है। इन समस्याओं के निदान के साथ-साथ सहन योग्य विकास आवश्यक है। इसी उद्देश्य से यह गाईडलाईन्स तैयार की गई है।

पारदर्शित और कुछ लुप्त प्रतिफल (कन्सीड्रेसन) पर आधारित यह रोचक गाईडलाईन्स अपने आप में एक नवीन एवं असाधारण प्रयोग है। राज्य के लिए यह प्रतिवेदन सामरिक महत्त्व का सिद्ध होगा।

इस प्रतिवेदन को तैयार करने में बिहार राज्य प्रदूषण नियंत्रण पर्षद् के जोनल पदाधिकारी श्री शिव कुमार सिंह की अहम् भूमिका रही है।

रमेश चन्द्र सिन्हा

(डा० रमेश चन्द्र सिन्हा)

अध्यक्ष

BIHAR STATE POLLUTION CONTROL BOARD NOTIFICATION

No. : 1143

Patna, the 27th September '99

GUIDELINES FOR ESTABLISHMENT OF BRICK KILN IN PURSUANCE OF SECTIONS 25 AND 21 OF THE WATER (PREVENTION & CONTROL OF POLLUTION) ACT, 1974 AND THE AIR (PREVENTION & CONTROL OF POLLUTION) ACT, 1981, RESPECTIVELY AND ALSO IN PURSUANCE OF THE LETTER NO DCP 14/3/97, DATED 13.11.1997 OF MINISTRY OF ENVIRONMENT & FORESTS, GOVT. OF INDIA.

In pursuance of the implementation of the provisions under section 25 of the Water (Prevention and Control of Pollution) Act, 1974 and Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, Bihar State Pollution Control Board makes the following guidelines for the establishment and siting of new or existing brick-kiln and also of the proposal for expansion/modernisation/diversification.

1. Notwithstanding anything contained in the Board's Notification No. 139/ch, dated 1.10.1996, these Guidelines for the Brick-Kiln, shall have overriding effect to the extent of provisions relating to grant of N. O. C. to the Brick-kilns.
2. The following factors shall be considered before approving or restricting the proposed location :
 - (i) standards for air quality as in schedule-I
 - (ii) Existing concentration of various pollutants;
 - (iii) The likely emission from the proposed unit;
 - (iv) The topography of the area;
 - (v) Protection of Orchard in the area;
 - (vi) Compatible land use;
 - (vii) Clustering of Brick Kiln;
 - (viii) Proximity to a protected area under the Ancient monuments and Archaeological sites and Remains Act, 1958; and other sensitive area as mentioned in N. A. A. Q. (National Ambient Air Quality) standards;
 - (ix) Proximity to human settlement, state or national highway, railway line and river;
 - (x) Sub soil water; and
 - (xi) Adherence to technological aspects as in schedule - II
3. Procedure for obtaining site clearance :
 - i. The proponent shall make an application to the State Pollution Control Board under section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974 and under section 21 of the Air (Prevention and

Control of Pollution) Act, 1981 for the establishment of Brick kiln at a particular site. Application, in prescribed proforma, duly filled in, along with NOC fee of Rs. 2000 /- in the form of demand draft, payable to the Member-Secretary, Bihar State Pollution Control Board at Patna, shall be submitted to the Member Secretary, Bihar State Pollution Control Board, Beltron Bhawan, Lal Bahadur Shastrinagar, Patna - 800 023;

ii. Application form may be obtained from Board's office at Patna or from its Regional Offices located at Ranchi, Dhanbad, Jamshedpur, Muzaffarpur, Barauni, Bhagalpur and Hazaribagh after the payment of Rs. 50 /- in cash or in the form of demand draft payable to the Member-Secretary, Bihar State Pollution Control Board at Patna - 800 023;

iii. The NOC application shall be accompanied by a location map, showing Mauza; Khata number; Khesra number, map plan, showing front elevation; and sectional elevation of Brick kiln with details of flue system; and

iv. The application, so submitted shall be scrutinised and the site under proposal may be inspected, whenever it is found to be necessary for a just decision.

4. CRITERIA FOR ISSUING NOC FOR ESTABLISHMENT OF BRICK KILN.

Criteria for the approval/clearance of proposed site/location in respect of new brick kiln or existing one with proposal for expansion/modernisation, shall be as follows :

- (i) The distance of proposed brick kilns from residential area, having 200 permanent dwellers or more, shall not be less than 400m;
- (ii) The new brick kiln shall not be at a distance less than 50m away from the National and State Highway's, river and railway track and shall not be less than 400 metre away from orchard (cluster of 15 or more such trees)
- (iii) The new brick kiln must maintain a distance of 400 m from any other brick-kiln;
- (iv) The proposed brick kiln shall not be allowed in a prime agricultural land;
- (v) Coal fines of 10mm size shall be used and use of coal with more than 35 percent ash content should be avoided.
- (vi) Layer of ash on the top of the kiln shall be covered with fire bricks or special tiles for better thermal insulation, as well as for protecting the ash from spreading by winds;
- (vii) To minimise generation of fugitive emission, the passage around the bricks should be paved with fire bricks and the stack flue main and side flue should be inspected regularly and kept clean.
- (viii) Agro wastes should be used as far as possible as fuel.

Area	Cate				
A	Industrial and Mixed use	500	100	120	
B	Commercial	100	50	30	
C	Sensitive	100	30	1000	30

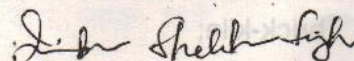
N. B. Concentration of SPM, SO₂, CO, NO_x is given in micrograms per cubic meter.

- (ix) Coal feeding cycle should not be more than 20 minutes. Coal feeding should be done preferably by mechanical feeder to ensure efficient burning of coal and lower emissions.
- (x) All new chimney shall be square type and shall be of height as per stack height regulation. In case of round chimneys curved bricks shall be used.
- (xi) The porthole and platform shall be provided in stack as per the norms of the Central Pollution Control Board (C.P.C.B.).
- (xii) Stack emission shall conform to the emission standard for particulate matter as prescribed by C. P. C. B. schedule - I
- (xiii) Preferably 1 to 3 percent of powdered coal depending upon the physico-chemical properties of clay may be mixed before moulding of bricks;
- (xiv) It is recommended that brick manufacturing unit should utilise fly ash in optimal proportion depending upon the soil characteristics for making bricks in a radius of 50 Km from any thermal power plant, unless some statutory provisions are made by the Central Government to the contrary;

Prior to the commissioning of the brick kiln, the proponent shall make an application in triplicate in prescribed form, duly filled in along with consent fee of Rs. 1000 /- in the form of demand draft, drawn in favour of the Member Secretary, Bihar State Pollution Control Board payable at Patna. The application form for consent may be obtained free of cost from Board's office at Patna or its Regional Offices.

5. These guidelines shall come into effect from the date of their issue.

Issued by Bihar State Pollution Control Board, Patna towards the compliance of the related provisions and also in appreciation of pith and substance of recent guidelines of the Ministry of Environment & Forests, Govt. of India.



(I. S. Singh)

Member Secretary

Schedule - I

EMISSION STANDARDS FOR BRICK KILN.

Based on the studies carried out on stack emissions from different types of brick kilns in various parts of the country and also considering the feasibility of installing pollution control devices, the following standards are prescribed :

Emission Standards for Particulate Matter

Size	Kiln Capacity	Maximum Limit of Particulate Matter (mg/Nm ³)
Small	Less than 15,000 Bricks per day (Less than 4.5 m trench width)	1000
Medium	15,000 - 30,000 Bricks per day (4.5 - 7.00 m trench width)	750
Large	More than 30,000 Bricks per day More than 7.0 m trench width	750

Note : The above particulate matter emission limits are achievable by installing fixed chimney/high draught kilns and/or settling chamber.

Stack Height Regulation

The following stack heights are prescribed for optimal dispersion of particulate matter.

Kiln Capacity	Stack height
Less than 15,000 Bricks per day (Less than 4.5 m trench width)	Minimum stack height 22 m
	or Induced draught fan operating with minimum draught 50 mm W. G. with 12 m stack height.
15,000 - 30,000 Bricks per day (4.5 - 7.0 m trench width)	Minimum stack height 27 m with gravitational settling chamber.
	or Induced draught fan operating with minimum draught 50 mm W. G. with 15 m stack height.
More than 30,000 Bricks per day (More than 7.0 m trench width)	Minimum stack height 30 m with gravitational settling chamber.
	or Induced draught fan operating with minimum draught 50 mm W. G. with 17 m stack height.

AMBIENT AIR QUALITY STANDARD

Area	Category	SPM	SO ₂	CO	NO _x
A.	Industrial and Mixed use	500	120	5000	120
B.	Residential and rural	200	80	2000	80
C.	Sensitive	100	30	1000	30

N. B. : Concentration of SPM, SO₂, CO, NO_x, is given in micrograms per cubic meter.

Schedule - II

TECHNOLOGY

Bricks are good building material for construction activities but quality of bricks differ from place to place. There are large variations in quality of soils available in different parts of the country and also brick manufacturing process.

Brick kilns are seasonal units and mostly established in rural areas of the country. These units are either in small sector or in cottage sector. Clay brick industry in India uses soil as a raw material and slack (small size) coal as fuel.

Quantity of coal required for firing of bricks is variable and depends upon climate, soil moisture and the sub soil water level. In the State of Bihar, clamp kilns and Bulls Trench Kilns are in practice for making bricks. About 20 tons of coal is required to fire one lakh bricks in Bulls Trench Kiln whereas for the same kiln, in dry climates, where the sub-soil water is deep about 13 tons of coal has been found sufficient. Sandy soil also need more coal. Fuel consumption in clamp kilns is very high as compared to. Clamp Kilns are for small consumer need and also at places where brick making clays are present in small pockets.

In addition to above siting conditions and manufacturing process the fuel consumption also depends largely upon the condition of kiln, the manner of setting the bricks and the control of firing process. The loss of heat varies from one type of kiln to another. Large kilns consume less fuel than small kilns for a given number of bricks. It is also well known fact that bricks made out from carbonaceous clays require lesser quantity of external fuel for their firing.

All the operations right from digging of earth to unloading of fired bricks from the kiln are accompanied by evolution of dusts which make the whole work place dusty. Air pollution in brick kiln is produced both through stack emissions as well as fugitive emissions and having adverse effects on surrounding environment. However, these effects can be minimised by proper siting of brick kilns, adopting cleaner technology of brick manufacturing and also operation of the Brick Kilns as per the guide lines. In such case fuel consumption can also be reduced up to 20 % and as a result operational cost will be reduced to a greater extent. Process flow chart and material balance in brick manufacturing are presented in fig 1 and 2 respectively.

The type of kilns used in India for brick manufacturing are as follows :-

- Bulls Trench Kilns with a pair of steel chimney;
- Bulls Trench Kiln with single steel chimney;
- Fixed chimney kiln;
- High draught kiln;
- Hoffman kiln;
- Down draught kiln; and
- Clamps kiln

Clamps and Down draft kilns are intermittent types of kilns. Such types of

kilns are those in which green bricks are set, fired, cooled and then taken out from the kiln and either stocked or delivered to the customer. The process is then repeated with other charge of green bricks. Down draught kilns are the most widely used type of intermittent kilns. These are used not only for firing bricks but also for roofing tiles, glazed tiles and refractory goods.

Bulls trench kiln, Fixed chimney kiln, High draught kiln, Hoffman kiln are of continuous type kilns. Continuous kilns are those, in which firing is done continuously, green bricks are being put in to one part of the kiln and fired bricks are with drawn from other end. Continuous kilns utilise heat from the cooling bricks to preheat green bricks and combustion air consequently, continuous kilns are economical from fuel consumption point of view. Hoffman kiln is generally used for firing roof tiles in the southern part of the country. High draught kiln is basically an archless, top fed, coal fired continuous kiln in which the flame flows in a zig-zag path. The main flue is connected to a induced draft fan (12 kw motor) which in turn is connected to a short masonry chimney to exhaust the flue gases at a convenient height. At present Bulls trench kiln still remains the only form of continuous kiln used in the country for making common building bricks. In such type of kiln, the height of the steel movable steel chimney varies from 12 m to 15 m which discharges the flue gases at a lower level. The height of the steel chimney is limited and can not be increased because of their movement during the operation of the kiln. Therefore, the "Fixed Chimney", kiln are the best suited for maximum production of bricks and at the same time minimise environmental pollution to a greater extent.

Fixed chimney kiln is a continuous type of kiln in which operative practices are similar to Bulls Trench Kiln but the chimney is fixed and taller. Taller chimneys provide necessary draught to continue the burning of fuel and also to disperse the emissions at a height enough to prevent the excessive concentration of pollutants on the ground level. The moving steel chimney is replaced by a fixed tall chimney, generally located at the centre of the kiln. The chimney, in turn, is connected to the trench through a system of flues which open in the inner wall as shown in Fig. 3 and Fig.4.

A cavity is left over the roof of flue passage, which is wide enough to allow a man to reach the flue opening leading to the trench so as to open or close it, as and when required. The height of Masonry chimney is kept between 22 to 30 m depending upon the capacity of kiln and as per stack Height-Regulation prescribed by Central Pollution Control Board, New Delhi. Generally, such type of kilns are known as high capacity kilns holding 8 to 10 lac bricks per circuit. All the operations of the kiln including loading, firing and unloading are same as that of the Bulls Trench Kiln. In Fixed Chimney firing temperature varies from 950°C to 1000°C and flue gas temperature varies from 75°C to 110°C. In the eastern part of the country, the size of kiln is about 59m x 7m x 2.5m. However, this size is variable and mainly depends upon the capacity of kiln to be designed for brick production. Major raw material in the brick industry is coal, about 50% cost is being incurred on the purchase of coal. However, by adoption of "Fixed Chimney" system for brick manufacturing-the fuel consumption can be minimised up to 20% and accordingly air pollutants in stack emission in form of SPM, SO₂, NO_x, CO, etc. will also be reduced considerably.

Further, in the system gravitational chamber is recommended for collecting bigger dust particles of size more than 10 micron. About 70% of this dust contains particles of size bigger than 10 micron. Hence gravitational settling chambers may be efficiently used in brick kilns particularly in fixed chimney and high draught kilns for collecting dust particles. In settling chambers-dust is caught by settlement if the time of passage of the dusty air through the chamber is long enough to allow the dust to settle in the bottom of the chamber. The air velocity inside the chamber should be kept as low as possible since the settling rate of dust particles decreases with increasing turbulence of air/flue gases. It has been reported that a velocity of about 0.30 to 0.50 m/s is suitable for collecting the dust particles in the chamber but higher velocity i. e. 1 to 1.5 m/s are generally used. Thus gravity settling chamber will be the most feasible and suitable technical option for controlling air pollution from brick kiln. However, if the brick production is less than 15,000 per day then gravitational settling chamber is not required as per stack height regulation prescribed by CPCB.

Clay Bricks mainly cause air pollution in the surrounding areas which is a matter of concern of the day. All the kiln operations right from digging of earth to unloading of fired bricks from the kiln are accompanied by generation of dusts which make the whole work place dusty. Air pollution in brick kilns is caused by both through stack emissions as well as fugitive emissions.

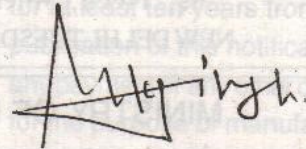
Emissions from Stack are appreciable. Use of thermally low efficient kilns and poor grade coal result in particulate and gaseous emissions. Brick kiln emissions consist of mainly dust particles, coal fines, ash, organic matter and small amounts of acidic gases such as SO_2 , NO_x , H_2S , CO etc.

The Sources of fugitive dust emissions in the Brick kilns are due to covering kiln top by fly ash, unloading of fired bricks from the kilns, mode of transportation, crushing of coal etc. The dust levels in the vicinity of brick kiln units further aggravates when the wind velocity is high. Even in Fixed Chimney the dust concentration in the ambient air quality in work place has been observed as high as 1840 ug/m^3 in the eastern part of the country. Air pollutants after being discharged from the chimney are carried forward by the wind and expand in the lateral as well as in the vertical directions. The dispersion of pollutants changes the quality of air in the neighbour hood of the stack and causes air pollution. The dispersion of stacks emissions and their impact on ground level concentration along the windward direction is a complex phenomenon due to turbulent atmospheric conditions and meteorological parameters which change from point to point and from time to time. The dust concentration in the stack emission in case of Fixed Chimney and particularly in eastern part of the country varies between $680 - 970 \text{ mg/Nm}^3$ during coal feeding period and 283 to 536 mg/Nm^3 during non feeding period. This concentration of dust will be nearly three times in case of Bulls Trench Kilns during coal feeding period.

The air pollutants such as dust SO_2 , NO_x etc. emitted through brick kiln stacks and heat stresses prevalent near the brick works have serious health hazard to the inhabitants of the region where in the concentration of these pollutants exceed certain limits. The ambient air quality standard has been prescribed by CPCB for residential areas and the same has been presented at schedule-I. All the gaseous

pollutants have their specific toxic effect on human body. Further, a dust laden atmosphere is potential health hazard leading to pneumoconiosis or related pulmonary disorder depending on particle size and concentration of dust/particulate matter, duration of exposure and composition of dust particles.

Air pollutants including smoke coming out from chimney as a result of incomplete combustion of coal have long been known for their adverse effect on vegetation. They not only effect the leaves but also flowers and fruits. Brick kiln emissions are aerosols composed mostly of carbonaceous and siliceous particles as well as soot and tar. Particulate matter in the form of dust spoil the growth of plants and trees of the surrounding areas. The reduced light intensity adversely affects the rates of photosynthesis, growth and yield. Both agricultural crops and fruit bearing trees around these kilns have been found to be damaged as a direct effect of these pollutants.



(Shiv Kumar Singh)

Zonal Officer



भारत का राजपत्र The Gazette of India

असाधारण

EXTRAORDINARY

भाग- II खण्ड 3 - उप-खण्ड (ii)

PART II-SECTION 3 - SUB-SECTION (ii)

प्राधिकार से प्रकाशित

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NO. 563] NEW DELHI, TUESDAY, SEPTEMBER 14, 1999/BHADRA 23, 1921

MINISTRY OF ENVIRONMENT AND FORESTS NOTIFICATION

New Delhi,

14 September, 1999

S. O. 763 (E).

Whereas a draft notification containing certain directions was published, as required by subrule (3) of rule 5 of the Environment (Protection) Rules, 1986 under the notification of the Government of India in the Ministry of Environment and Forests number S.O. 453(E) dated 22nd May, 1998 inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which the copies of the Gazette of India containing the said notification are made available to the public.

And, whereas, copies of the said Gazette were made available to the public on the same date;

And, whereas, the objections and suggestions received from the public in-respect of the said draft notification have been duly considered by the Central Government;

Whereas it is necessary to protect the environment, conserve top soil and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal plants on land;

And, Whereas, there is a need for restricting the excavation of top soil for manufacture of bricks and promoting the utilisation of fly ash in the manufacture of building materials and in construction activity within a specified radius of fifty kilometers from coal or lignite based thermal power plants;

And, whereas, the Hon'ble High Court of Judicature, Delhi vide its order dated 25th August, 1999 in CWP No. 2145/99 Centre for Public Interest Litigation, Delhi V/S Union of India directed that the Central Government to publish the final notification in respect of fly ash on or before 26th October, 1999.

Now, therefore, in exercise of the powers conferred by sub-section (1), read with clause (v) of sub-section (2) of section 3 and section 5 of the Environment (Protection) Act, 1986 (29 of 1986); and in pursuance of the orders of the Hon'ble High Court, Delhi stated above, the Central Government hereby issues the following directions which shall come into force on the date of the publication of this notification, namely :-

1. Use of fly ash, bottom ash or pond ash in the manufactures of bricks and other construction activities.

(1) No person shall within a radius of fifty kilometers from coal or lignite based thermal power plants, manufacture clay bricks or tiles or blocks for use in construction activities without mixing atleast 25 per cent of ash (fly ash, bottom ash or pond ash) with soil on weight to weight basis.

(2) The authority for ensuring the use of specified quantity of ash as per para (1) above shall be the concerned Regional Officer of the State Pollution Control Board or the Pollution Control Committee as the case may be. In case of non-compliance, the said authority, in addition to cancellation of consent order issued to establish the brick kiln, shall move the district administration for cancellation of mining lease. The cancellation of mining lease shall be decided after due hearing. To enable the said authority to verify the actual use of ash, the thermal power plant shall maintain month-wise records of ash made available to each brick kiln.

(3) In case of non-availability of ash from thermal power plant in sufficient quantities as certified by the said power plant, the stipulation under para (1) shall be suitably modified (waived/relaxed) by the concerned State/Union Territory Government.

(4) Each coal or lignite based thermal power plant shall constitute a dispute settlement committee which shall include the General Manager of the thermal power plant and a representative of All India Brick and Tile Manufacture's Federation (AIBTMF). Such a committee shall ensure unhindered loading and transport of ash without any undue loss of time. Any unresolved dispute shall be dealt with by a State/Union Territory level

committee to be set up by State/Union Territory Government comprising Member Secretary of the State Pollution Control Board/Pollution Control Committee, representatives of Ministry of Power in the State/Union Territory Government and a representative of AIBTMF.

2. Utilisation of ash by Thermal Power Plants.

All coal or lignite based thermal power plants shall utilise the ash generated in the power plants as follows :-

(1) Every coal or lignite based thermal power plant shall make available ash, for at least ten years from the date of publication of this notification, without any payment or any other consideration, for the purpose of manufacturing ash-based products such as cement, concrete blocks, bricks, panels or any other material or for construction of roads, embankments, dams, dykes or for any other construction activity .

(2) Every coal or lignite based thermal power plant commissioned subject to environmental clearance conditions stipulating the submission of an action plan for full utilisation of fly ash shall within a period of nine years from the publication of this notification, phase out the dumping and disposal of fly ash on land in accordance with the plan. Such an action plan shall provide for thirty per cent of the fly ash utilisation, within three years from the publication of this notification with further increase in utilisation by atleast ten per cent points every year progressively for the next six years to enable utilisation of the entire fly ash generated in the power plant atleast by the end of ninth year. Progress in this regard shall be reviewed after five years.

(3) Every coal or lignite based thermal power plant not covered by para (2) above shall, within a period of fifteen

years from the date of publication of this notification, phase out the utilisation of fly ash in accordance with an action plan to be drawn up by the power plants. Such action plan shall provide for twenty per cent of fly ash utilisation within three years from the date of publication of this notification, with further increases in utilisation every year progressively for the next twelve years to enable utilisation of the entire fly ash generated in the power plant.

(4) All action plans prepared by coal or lignite based thermal power plants in accordance with sub-para (2) and (3) of para 2 of this notification, shall be submitted to the Central Pollution Control Board, concerned State Pollution Board/Committee and concerned regional office of the Ministry of Environment and Forests within a period of six months from the date of publication of this notification.

(5) The Central and State Government Agencies the State Electricity Board the National Thermal Power Corporation and the management of the thermal power plants shall facilitate in making available land, electricity and water for manufacturing activities and provide access to the ash lifting area for promoting and setting up of ash-based production units in the proximity of the area where ash is generated by the power plant.

(6) Annual implementation report providing information about the compliance of provisions in this notification shall be submitted by the 30th day of April every year to the Central Pollution Control Board concerned State Pollution Control Board/Committee and the concerned Regional Office of the Ministry of Environment and Forests by the coal or lignite based thermal power plants.

3. Specification for use of ash-based products.

(1) Manufacture of ash-based products such as cement concrete blocks, bricks, panels or any other material or the use of ash in construction activity such as in road laying, embankments or use as landfill to reclaim low lying areas including back filling in abandoned mines or pitheads or for any other use shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Bureau of Mines, Indian Road Congress, Central Building Research Institute, Roorkee, Central Road Research Institute, New Delhi, Building Materials and Technology Promotion Council, New Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government agencies.

(2) The Central Public Works Department, Public Works Departments in the State/ Union Territory Governments, Development Authorities, Housing Board, National Highway Authority of India and other construction agencies including those in the private sector shall also prescribe the use of ash and ash-based products in their respective schedules of specifications and construction applications, including appropriate standards and codes of practice, within a period of four months from the publication of this notification.

(3) All local authorities shall specify in their respective building bye-laws and regulations the use of ash and ash-based products and construction techniques in building materials, roads, embankments or for any other use within a period of four months from the date of publication of this notification.

(F.N.o 16-2/95-HSMD)

V. Rajagopalan, Jt. Secy.

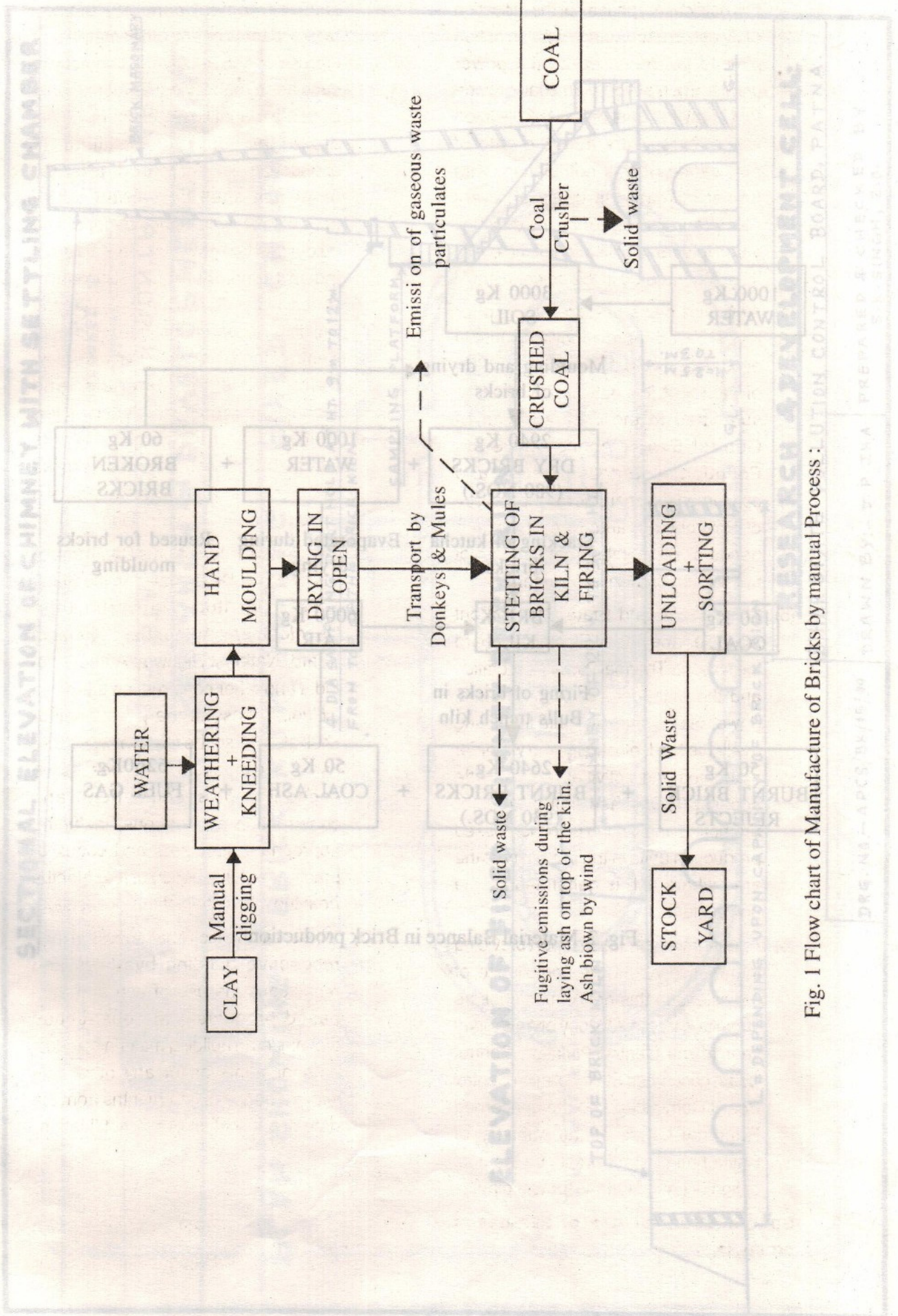


Fig. 1 Flow chart of Manufacture of Bricks by manual Process :

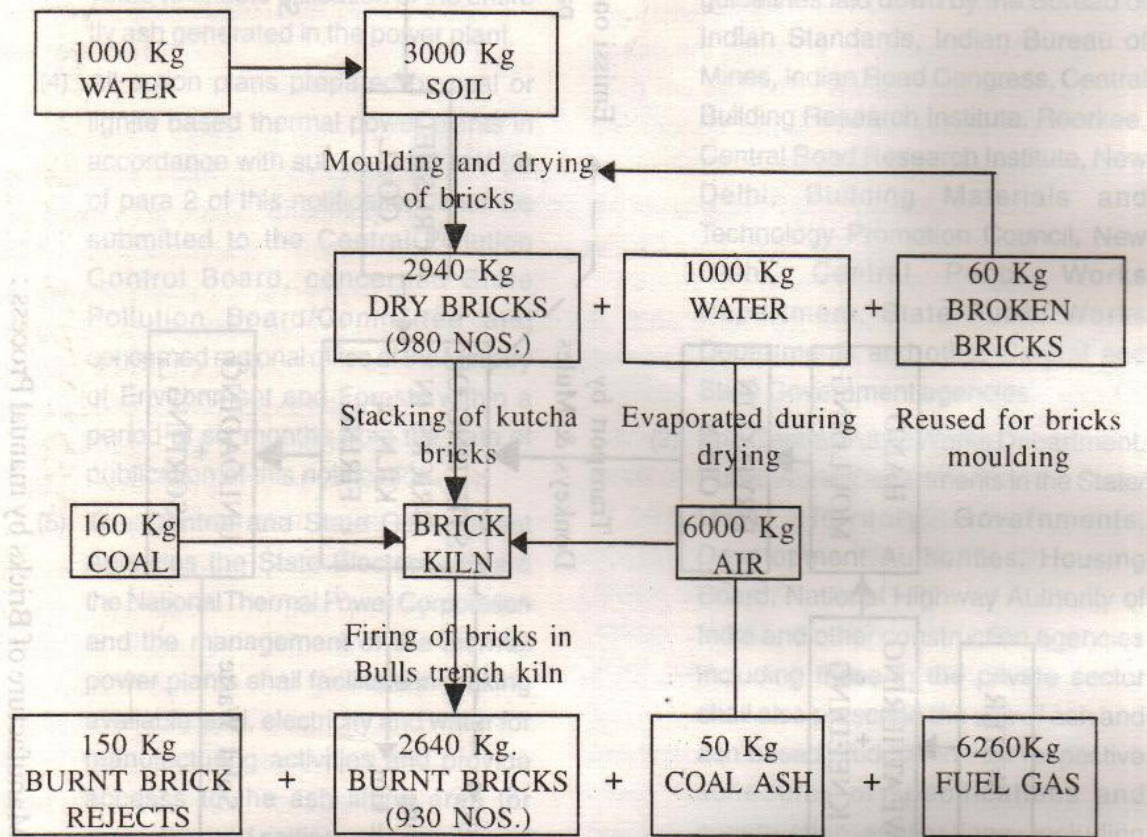


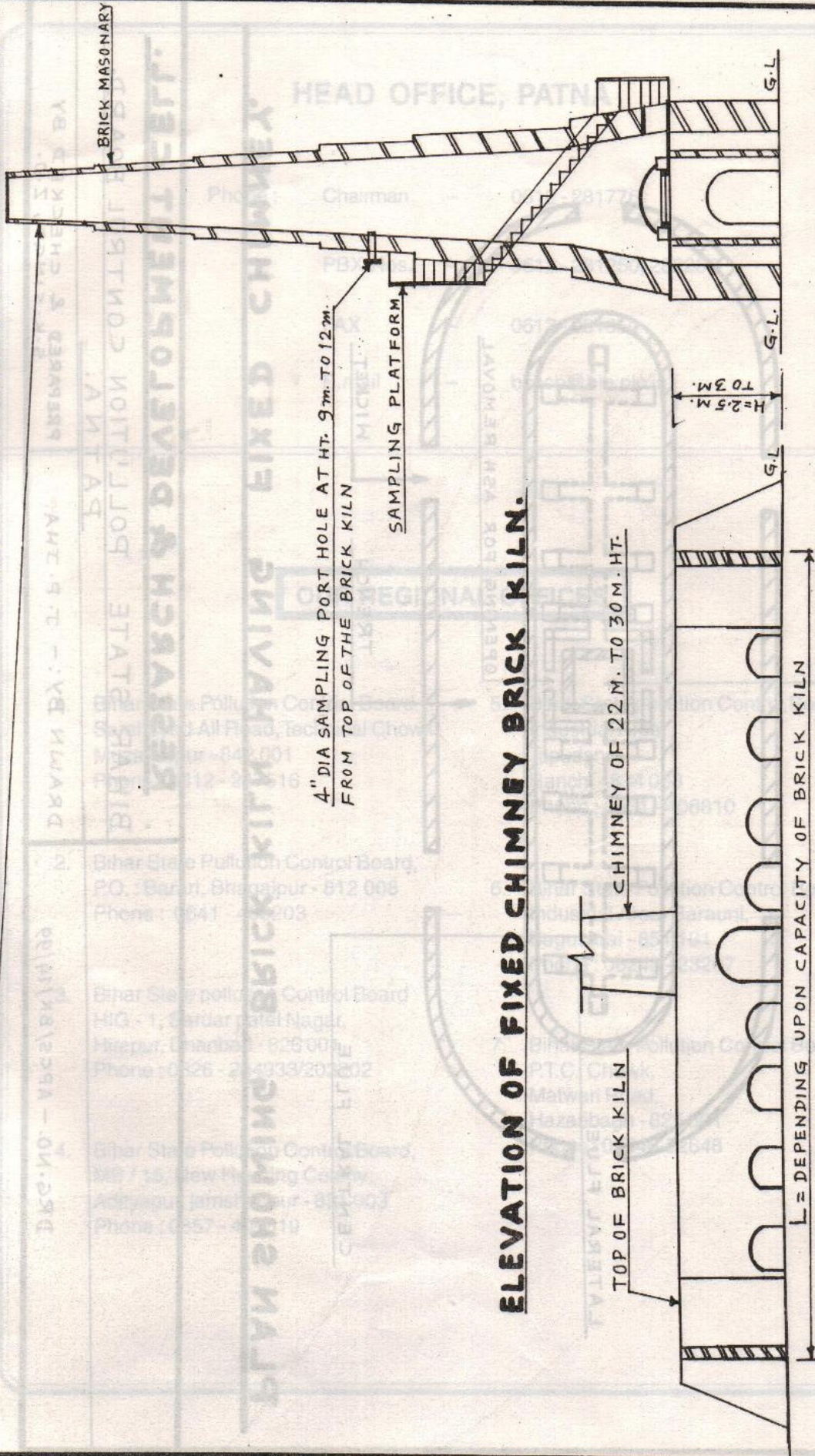
Fig. 2 Material Balance in Brick production

3. Specification for use of ash-based products.

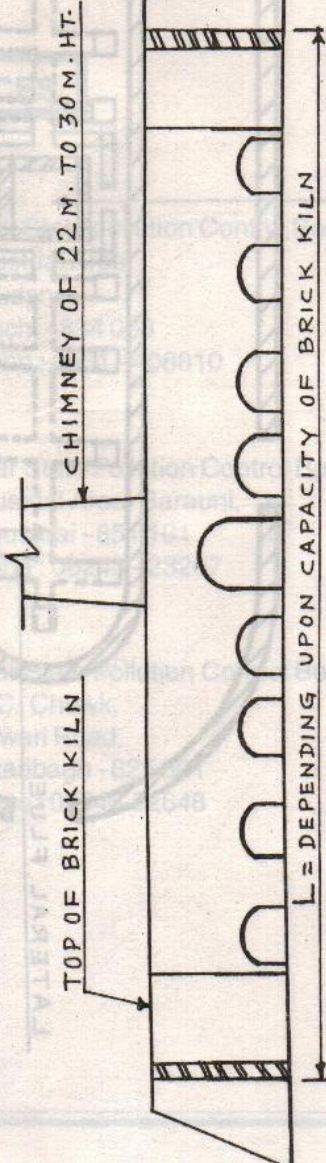
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SECTIONAL ELEVATION OF CHIMNEY WITH SETTLING CHAMBER



ELEVATION OF FIXED CHIMNEY BRICK KILN.



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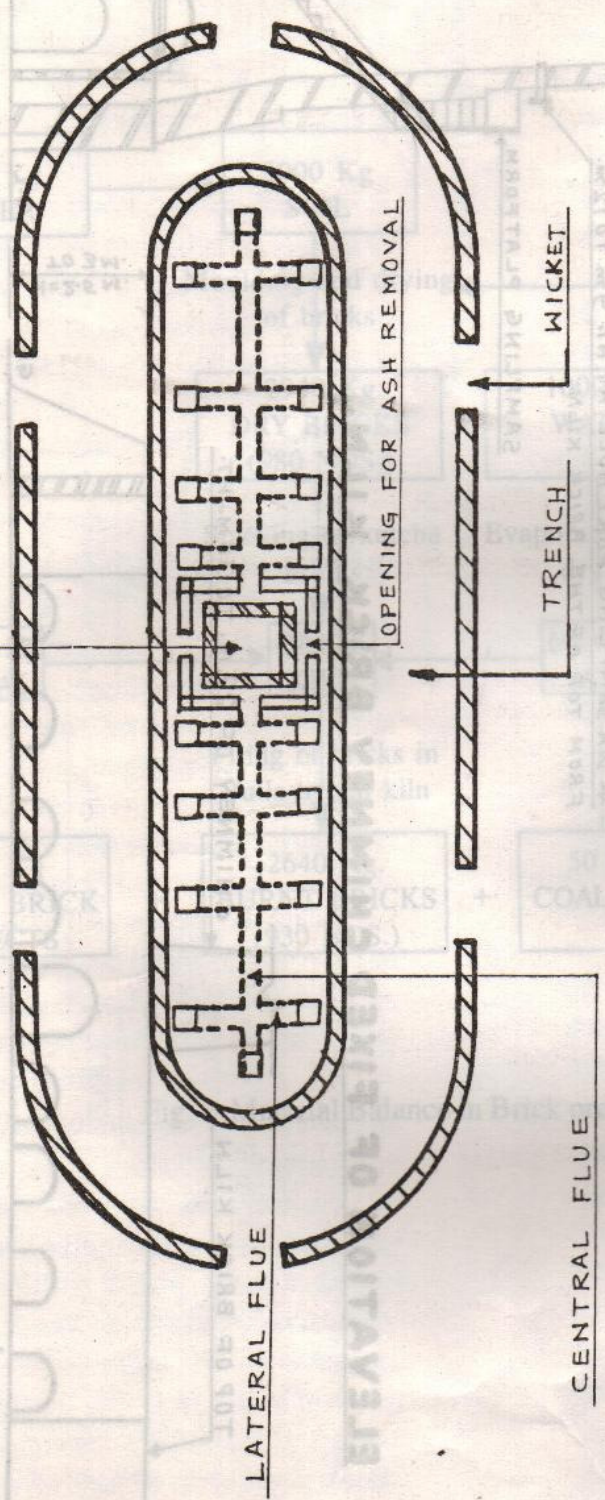
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БИХАР СТАТЕ ПОЛЛУТІОН КОНТРОЛ БОРД
FIXED CHIMNEY WITH GRAVITATIONAL SETTLING CHAMBER



PLAN SHOWING BRICK KILN HAVING FIXED CHIMNEY.

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**GUIDELINES
FOR
ESTABLISHMENT, EXPANSION
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OF
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