M/s. SAGAR CEMENTS LIMITED.,

Mattampally (V & M),
Suryapet (Dist). Telangana.

ENVIRONMENTAL STATEMENT (AUDIT) REPORT

FOR THE FINANCIAL YEAR 2024-2025

LAWN ENVIRO PRIVATE LIMITED
(Formerly M/s. Lawn Enviro Associates)
[Environmental Engineers & Consultants in Pollution Control]
Recognised by Central Pollution Control Board, GOI, New Delhi & Laboratory Accredited by NABL
ISO 9001, 14001 & 45001 Certified Company

Corporate Office : "LAWN HOUSE", #184-C, Vengalrao Nagar, Hyderabad-500038. (T.S.) INDIA.
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ACKNOWLEDGEMENT

M/s. LAWN ENVIRO PRIVATE LIMITED express sincere debt of gratitude to M/s. SAGAR CEMENTS LTD., for the opportunity given by assigning the preparation of Environmental Statement (Audit) Report for the financial year 2024-2025, for their Cement Plant, Waste Heat Recovery Power plant and 18 MW Coal Based Captive Power Plant at Mattampally (V & M), Suryapet District. The Environmental Statement (Audit) Report is prepared for the financial year 2024-2025 Special mention needs to be made of Executives of M/s. SAGAR CEMENTS LTD. Especially for their co-operation and assistance during the preparation of this statement. We also wish to acknowledge our gratitude to all of them who helped during the data collection and report preparation.

CONTENTS

Acknowledgement	2
Contents	3
List of Tables	4
List of Figures	4
Form – V	5
1. INTRODUCTION	13
2. OBJECTIVE OF THE STUDY	13
3. BENEFITS OF ENVIRONMENTAL AUDIT	14
4. LOCATION	15
5. RAW MATERIALS AND PRODUCTS	15
5.1. Raw materials	15
5.2. Products	17
6. PROCESS DESCRIPTION	17
7. WATER REQUIREMENT	39
8. POLLUTION CONTROL IN THE PLANT	40
8.1 Waste Water Sources and Monitoring	40
8.2 Air Pollution Control	41
8.2.1 Stack Emissions	41
8.2.2 Ambient Air Quality	43
8.2.3 Noise Pollution	44
9. GREENBELT DEVELOPMENT	44
10. HOUSEKEEPING	46
11. AUDITORS COMMENTS	46

APPENDIX

A.	National Ambient Air Quality Standards	47
B.	Standards for Stack Emissions	49
C.	Ambient Air Quality Standards In Respect of Noise	50
D.	General Standards for Discharge of Effluents	51
E.	Test Characteristics for Drinking Water IS 10500: 2012	53
F.	Plant Species For Green Belt Development	55

LIST OF TABLES

8.1. AVERAGE VALUES OF STACK EMISSIONS MONITORING DATA	42
8.2. AVERAGE VALUES OF AMBIENT AIR QUALITY DATA	43
8.3 AVERAGE VALUES OF AMBIENT NOISE LEVELS DATA	44

LIST OF FIGURES

Fig 1 Location map of M/s. SAGAR CEMENTS LTD.	16
Fig.2 to 20 Process flow sheets of M/s. SAGAR CEMENTS LTD.	18 to 36

FORM – V

(See Rule 14)

ENVIRONMENTAL STATEMENT (AUDIT) REPORT

FOR THE FINANCIAL YEAR ENDING 31st MARCH, 2025

PART – A

i) Name and address of the owner/ occupier of the industry operation or process.	:	M/s. SAGAR CEMENTS LIMITED, Mattampally (Village & Mandal), Suryapet (Dist).
ii) Date of the last environmental audit report submitted	:	September 2024
iii) Production Capacity (Units)	:	3.30 MTPA Cement 2.65 MTPA Clinker 8.8 MW Waste Heat Recovery based Power Generation 18.0 MW Coal Based CPP
iv) Year of Establishment	:	19857

PART – B

WATER AND RAW MATERIAL CONSUMPTION

Financial Year

2024-2025

i) Water consumption (m^3 /day) : 1,185.62

1. Process & Cooling	–	320.29
2. 8.8 MW WHRBPP	–	511.12
3. 18.0 MW CPP	–	162.33
4. Domestic	–	191.88

Name of Products	Water consumption per unit of products (KL/MT)	
	During the previous financial year (2023-2024)	During the current financial year (2024-2025)
WHRBPP		
Specific water consumption:	4.05 LT/KWh	4.97 LT/KWh
CPP Specific water consumption:	0.40 m^3/MWH	0.46 LT/KWh

ii) Raw material consumption:

Name of raw materials	Name of product	Consumption of raw material per unit of output (Ton/Ton)	
		During the previous financial year (2023-2024)	During the current financial year (2024-2025)
1. Lime Stone	Clinker	1.4086	1.4086
2. Laterite (AL)	Clinker	0.0193	0.0193
3. Laterite (Iron)	Clinker	0.0645	0.0645
4. Iron Ore	Clinker	0.0051	0.0051
5. Chrome Sludge		0.0027	0.0072
6. Iron Sludge	Clinker	0.0002	0.0002
7. Bed Ash in Raw Meal / Waste Lime Powder		0.0000	0.0016
8. Pet Coke	Clinker	0.0748	0.0855
9. Domestic Coal		0.0436	0.0091
10. Imported Coal		0.0000	0.0000
11. Organic Residue -Organic Waste	Clinker	0.0023	0.0005
12. Spent Carbon	Clinker	0.0035	0.0049
13. Dolochar		0.0000	0.0003
14. Plastic waste		0.0008	0.0016
15. Bio Mass		0.0037	0.0118
16. Liquid Organic Solvent		0.0065	0.0132
17. Fly ash - PPC		0.3217	0.3432
18. Lime stone as Performing improver in OPC		0.0323	0.0331
19. Gypsum	Cement	0.0237	0.0200
20. Coal Captive Power Plant	Power Generation MWH	0.8483	0.8140

PART – C

POLLUTION DISCHARGED TO ENVIRONMENT

(Parameter's as specified in the consent issued)

Pollutants	Quantity of Pollutants Discharged (kg/day) 2024-2025	Concentrations Of Pollutants in Discharges (mg/l) 2024-2025	Percentage of variation from prescribed standards with reasons
a) Waste water: There is no generation of Process wastewater from Cement unit. Entire WHR waste water utilized for VRM water spray and cooler Water spraying and concrete roads water sprinkling for dust suppression.			

b) Air:

Stack Attached to	Pollutants	Pollutants in Emissions discharged (2024-2025) (kg/day)	Concentrations Of Pollutants in Emissions (2024-2025) (mg/Nm^3)	TGPCB Prescribed Limits	Percentage of variation from prescribed standards with reasons
RABH (Kiln – 2 VRM)	SPM	253.16	16.20	<30	46.00 % less attached to Bag Filters
	SO_2	17.97	1.15	<100	--------
	NO_x	4,638.92	296.85	<800	--------
Kiln –1 cooler ESP	SPM	63.16	18.10	<30	39.66 % less attached to RABH
Kiln –2 cooler ESP	SPM	117.81	17.95	<30	40.16 % less attached to ESP
Coal Mill-1	SPM	8.55	20.60	<30	31.33 % less attached to Bag Filters
Coal Mill –2	SPM	16.61	18.76	<30	37.46 % less attached to Bag Filters
Coal Mill –3	SPM	20.98	16.85	<30	43.83 % less attached to Bag Filters
Cement Mill – 1	SPM	Not In Operation	Not In Operation	<30	---------
Cement Mill –2	SPM	9.17	15.75	<30	47.50 % less attached to Bag Filters
Cement Mill –3	SPM	13.58	16.10	<30	46.33 % less attached to Bag Filters
Cement Mill –4	SPM	12.66	13.86	<30	53.80 % less attached to Bag Filters
Packing Plant –I	SPM	Not In Operation	Not In Operation	<30	---------
Packing Plant-II	SPM	1.04	15.59	<30	48.03 % less attached to Bag Filters

Packing Plant-III	SPM	23.45	19.62	<30	34.60 % less attached to Bag Filters
Lime Stone Crusher	SPM	24.06	19.20	<30	27.50 % less attached to Bag Filters
18MW CPP	SPM	76.88	21.75	<30	52.35 % less attached to Bag Filters
	SO_2	168.44	47.65	<100	34.82 % less attached to Bag Filters
	NO_x	230.41	65.18	<100	38.30 % less attached to Bag Filters
	Mercury	0.035	0.01	<0.03	66.66 % less attached to Bag Filters

PART - D

HAZARDOUS WASTE

(As specified under Hazardous and other wastes Management and Transboundary Movement Rules, 2016)

Hazardous Wastes	Total Quantity per year	
	During the previous financial year (2023-2024)	During the current financial year (2024-2025)
a) From Process		
Lube Oils	15,260.0 Ltr's	8,470.0 Ltr's
Waste Grease along with Cotton waste	1,070.0 kg's	5,490.0 Kg's
b) From Pollution control facilities	Nil	Nil

PART - E

SOLID WASTE

	Total quantity MT per year	
	During the previous financial year (2023-2024)	During the current financial year (2024-2025)
Cement Plant		
a) From Process	Not Applicable	Not Applicable
b) From Pollution Control Facility	Not Applicable	Not Applicable
c) Quality recycled or re-utilized	Not Applicable	Not Applicable
Captive Power Plant		
d) From Process (Bed Ash)	4,220.60 T	2,841.11 T
e) From Pollution Control Facility (Fly Ash)	40,939.82 T	32,149.18 T
f) Quality recycled or re-utilized within the Cement Unit		
Bed Ash	4,220.60 T	2,843.16 T
Fly Ash	41,018.76 T	32,149.18 T

PART - F

Please specify the characteristics (in terms of concentration and quantum) of Hazardous as well as solid wastes and indicates disposal practice adopted for both these categories of wastes.

There is no hazardous waste as well as solid waste generated in the process. The dust collected in the pollution control equipment is recycled into the process. Bed ash and Fly Ash generated from CPP will be reused within the Cement Plant.

PART – G

Impact of the pollution control measures on conservation of natural resources and consequently on the cost of production.

The industry has taken a number of pollution control measures with respect to air, water, noise and solid wastes. The industry has developed greenbelt of about 1,38,034 plants and the same is well maintained. Regular monitoring of stack emissions, ambient air quality, water quality is conducted and installed eleven online stack monitoring stations at Limestone crusher stack, RABH (connected to kinl-1,2 & Raw mill), kiln – 1 cooler ESP, kiln – 2 cooler ESP, coal mills – 1, 2 & 3 and cement mills – 1,2,3 & 4 and CPP ESP. Also installed three Ambient Air Quality Monitoring station at up wind direction (Colony Gate), Down wind direction (Commercial Building)a\ and AAQM-3 near Periphery of the plant. The industry has regularly modified existing pollution control facilities like ESPS, Bag filters to improve their operational efficiency. The industry has made an investment of about Rs. 2,56,31,572 /- (Rupees Two crores fifty six lakhs thirty one thousand five hundred and seventy two only) by pollution control equipments maintenance, Damaged bags replacement, purchase of online SO_2 & NO^x analyzers for RABH Stack and SO_2 & NO_x analyzers for measuring Ambient air quality monitoring station at colony main gate, and also installed two dust collectors at belt discharge, Analysis charges and green belt development works. Provision of pollution control equipment is ensuring the pollution usage of raw materials three by conserving the natural resources and enchancing the productivity thus reducing the cost of production. The provision of greenbelt ensure that pollutants do not disperse beyond the premises. And enchances the aesthetic quality of the plant area.

PART – H

Additional investment proposal for environmental protection including abatement of pollution.

Greenbelt development programmes for further increasing area under greenbelt. By adopting advance technologies under computer control and inter locking facilities for pollution control equipments are provided. Industry has developed greenbelt around 0.26 acre of land during the financial year 2024-2025, present green belt total area is 59.21 acres.

PART – I

Any other particulars in respect of environment protection and abatement of pollution.

The Management's objective is to achieve the production without affecting the physical, chemical and biological environments of the near by vicinity. Industry has taken lot of efforts to raise the plantation in and around the plant premises even though the land is unfavorable for plantation due to rocky nature of the soil.

1. INTRODUCTION

M/s. SAGAR CEMENTS LTD. has setup a cement plant to manufacture Portland cement at Mattampally (V & M) of Suryapet District, T.S. The Plant is established in the year of 1984. Present capacity is 3.30 MTPA. 8.8 MW Waste Heat recovery based Power Plant and 18MW coal Based CPP the plant facilities are established in 135.53 acres of area and the remaining land of 59.21 acres are used for greenbelt development. The necessary limestone for the unit is drawn from captive mines located at 1.5 km away from the plant site.

2. OBJECTIVE OF THE STUDY

The objective of the present study is to review the performance of pollution control systems installed by the industry so as to identify efficient pollution prevention and control systems, which could be beneficial to both environment and its components. And also Inserted by rule 2 of the Environment (Protection) second Amendment & Rules, 1992 vide G.S.R. 329 (E), dated:13-3-1992. Every person carrying on an Industry, operation or process requiring consent under section 25 of the water (prevention and control of pollution) Act 1974 (6 of 1974) or under section 21 of the Air (Prevention and Control of Pollution), Act 1981 (14 of 1981) or both or authorization under the Hazardous wastes (Management, Handling & Tranboundary, Movement) Rules, 2016 issued under the Environmental (Protection) Act 1986 (29 of 1986) shall submit an environmental audit report for the financial year ending 31st March in Form – V to the concerned state pollution control board on or before the 30th day of September every year beginning 1993.

3. BENEFITS OF ENVIRONMENTAL AUDIT

Environmental audit creates awareness in the conservation of natural resources and helps to improve production safety and health. The benefits of audits are:

1. It helps in reduction of raw material consumption by way of waste minimization and adoption of recovery of waste and recycle the same.
2. Determined the performance of process systems and helps to improve the systems.
3. Efficiency of pollution control systems can be calculated.
4. This gives the awareness of environmental organization in the industry.
5. Data available will help the management for use in the plant modification and adopting pollution control for different types of technology.
6. It helps to identify pollution creating systems and exposure to it by the employees for taking remedial measures.
7. The management will be assisted in complying with local, regional and national laws regulations by adopting standards.
8. It helps to identify hazardous wastes, handling measures taken and exposure to litigation can be reduced.
9. To determine the impact on the surrounding environment due to the disposal of its pollutants and identify suitable preventive measures.
10. Energy saving systems can be adopted by considering fuel consumption data.

M/s. SAGAR CEMENTS LIMITED, has entrusted the task of preparation of Environmental Statement (Audit) to M/s. LAWN ENVIRO PRIVATE LIMITED (LEPL), Hyderabad. An in-depth study was conducted by LEPL, to review the process efficiency, waste water generated and the present treatment systems, emissions generated and air pollution control equipment provided, mode of solid waste collection and disposal and the other associated problems leading to the pollution and impact on environment.

4. LOCATION

M/s. Sagar Cements Limited is located at Mattampally (V & M), Suryapet District. The entire demand of water requirement for the process and colony consumption is being met from bore well within the plant premises. The location map is shown in Fig.1. The land is flat terrain and no major hills or mountains are there in the area.

5. RAW MATERIAL AND PRODUCTS

Raw material, Fuels and AFR used/produced in the financial year 2024-2025 are as follows:

5.1 Raw Materials

1.	Lime Stone	-	26,42,534.00 MT/year
2.	Laterite (AL)	-	41,597.00 MT/year
3.	Laterite (Iron)	-	1,19,724.68 MT/year
4.	Iron Ore	-	2,766.86 MT/year
5.	Chrome Sludge	-	13,361.90 MT/year
6.	Iron Sludge	-	381.65 MT/year
7.	Bed Ash in Raw Meal/ Waste Lime Powder	-	2,958.91 MT/year
8.	Pet Coke	-	1,59,415.00 MT/year
9.	Domestic Coal	-	16,893.00 MT/year
10.	Imported Coal	-	00.00 MT/year
11.	Organic Residue Organic Waste	-	882.11 MT/year
12.	Spent Carbon	-	9,205.77 MT/year
13.	Dolochar	-	574.96 MT/year
14.	Plastic Waste	-	2,999.00 MT/year
15.	Bio Mass	-	21,972.825 MT/year
16.	Liquid Organic Solvent	-	24,644.00 MT/year
17.	Fly Ash – PPC	-	2,38,093.00 MT/year
18.	Lime Stine as Performing improver in OPC	-	28,873.00 MT/year
19.	Gypsum	-	31,345.84 MT/year
20.	Coal –Captive Power Plant	-	88,601.00 MT/year

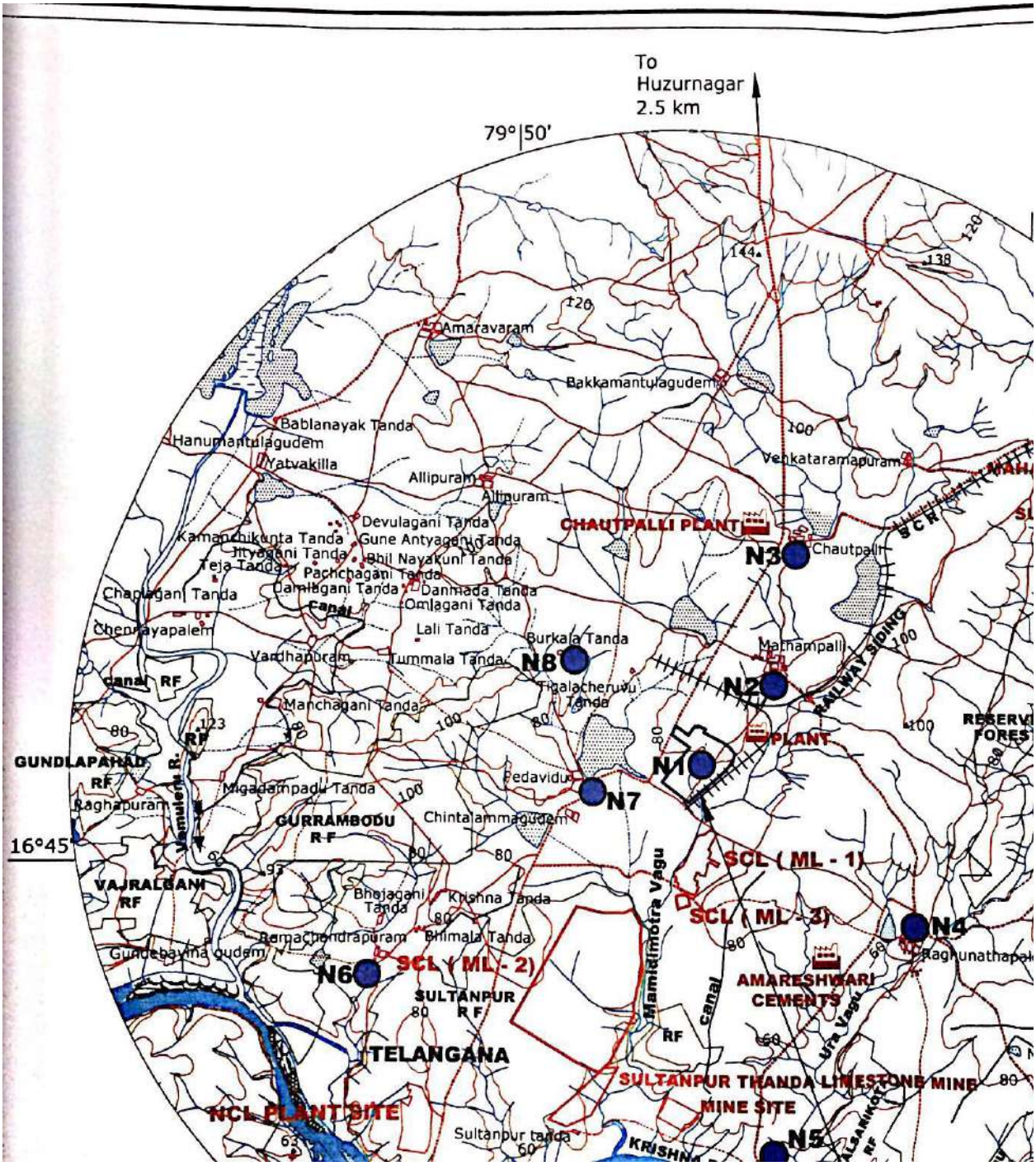


Fig.1 LOCATION MAP OF M/s. SAGAR CEMENT LIMITED

5.2 Products

1. Clinker Production	-	18,63,952.00 MT/year
2. Cement Total	-	15,67,032.00 MT/year
Cement PPC	-	6,93,817.00 MT/year
Cement OPC	-	8,73,215.00 MT/year
3. CPP Power – 18MW	-	10,88,41,150.00 Kwh/year
4. WHR Power	-	4,27,55,320.00 Kwh/Year
5. Solar Power – 1.35 MW	-	14,08,006.00 Kwh/Year

6. PROCESS DESCRIPTION

The plant uses dry manufacturing process which when compared to the wet process is very energy efficient. The cement manufacturing involves mostly unit operations and does not involve any hazardous chemical reactions.

A brief description of manufacturing process is given in the following sections. The manufacturing process involves mining of limestone crushing, raw material blending i.e., grinding of limestone along with laterite and iron ore, grinding of raw coal, clinker formation, clinker grinding and cement packing. The manufacturing process flow sheets are shown in figs. 2 to 19.

Limestone Crushing

The material is received from mines through dumpers is discharged into hopper. The material from hopper is fed in regulated quantity to the Impact Crusher, which is the primary crusher. The primary Crusher material is fed to the secondary crusher for required size where material is screened and grit size is crushed. The material from this crusher is fed to the belt conveyor. The discharge material from secondary crusher is of 70 mm. size and is transported to stacker and reclaims through belt conveyors.

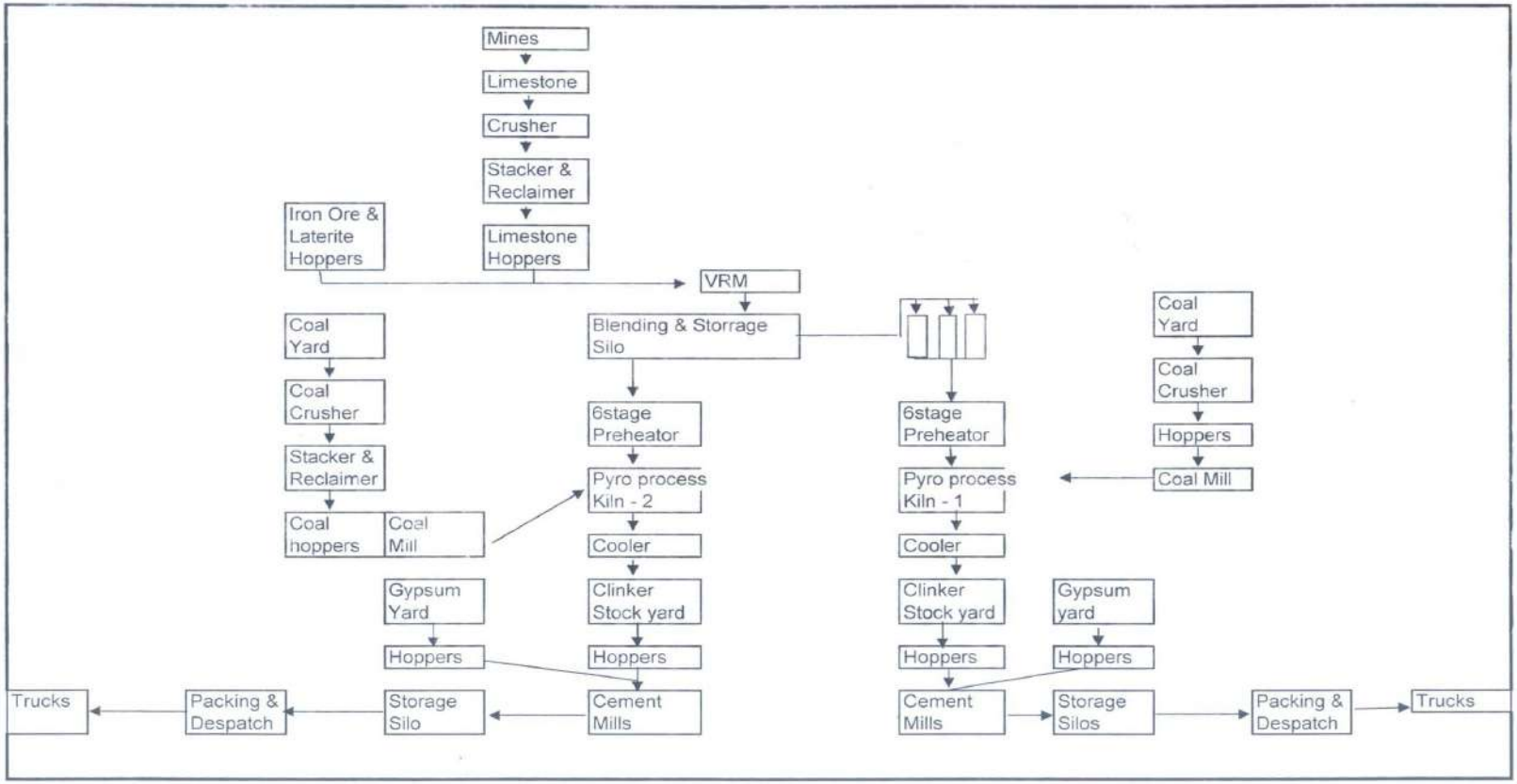


Fig. 2 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

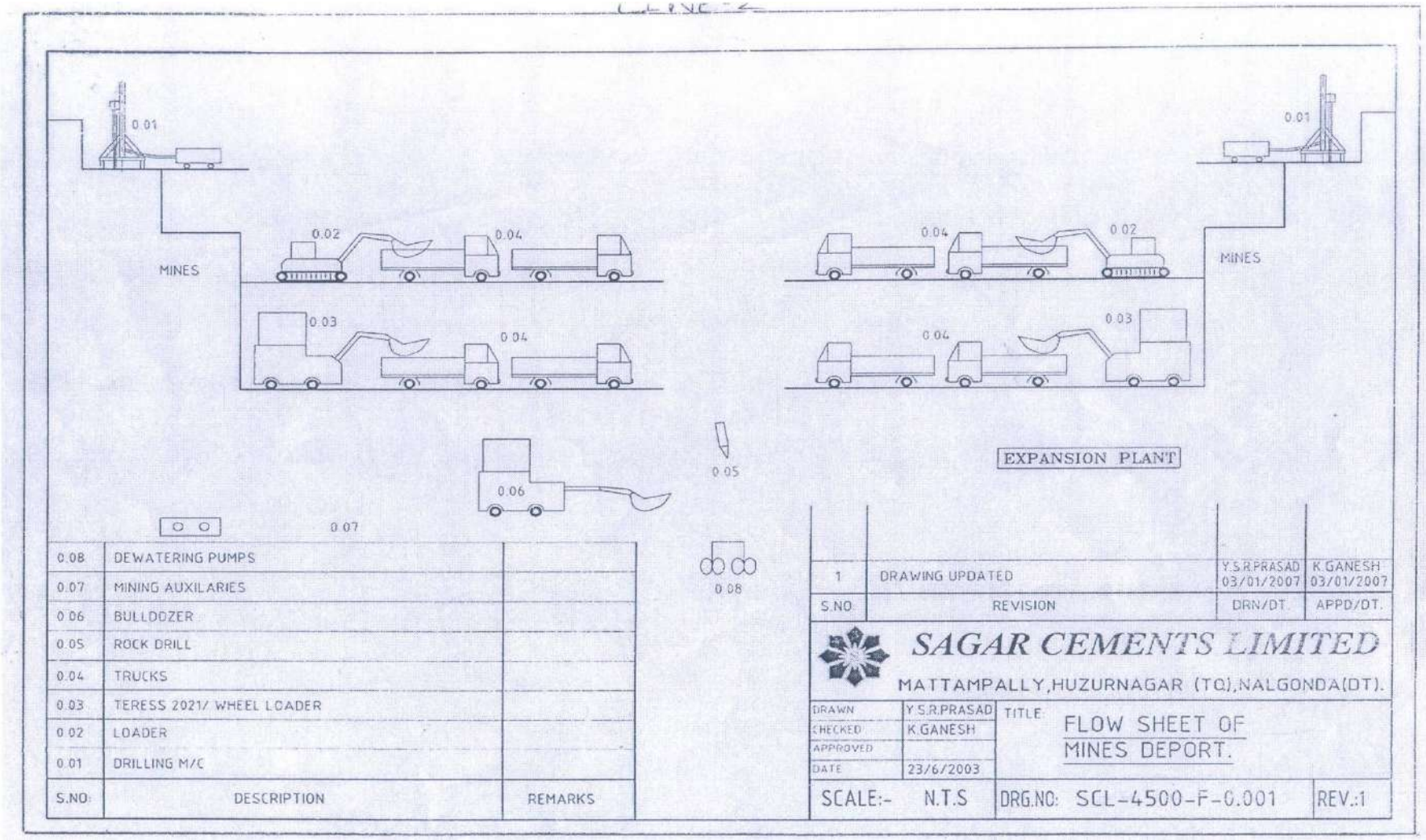


Fig. 3 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

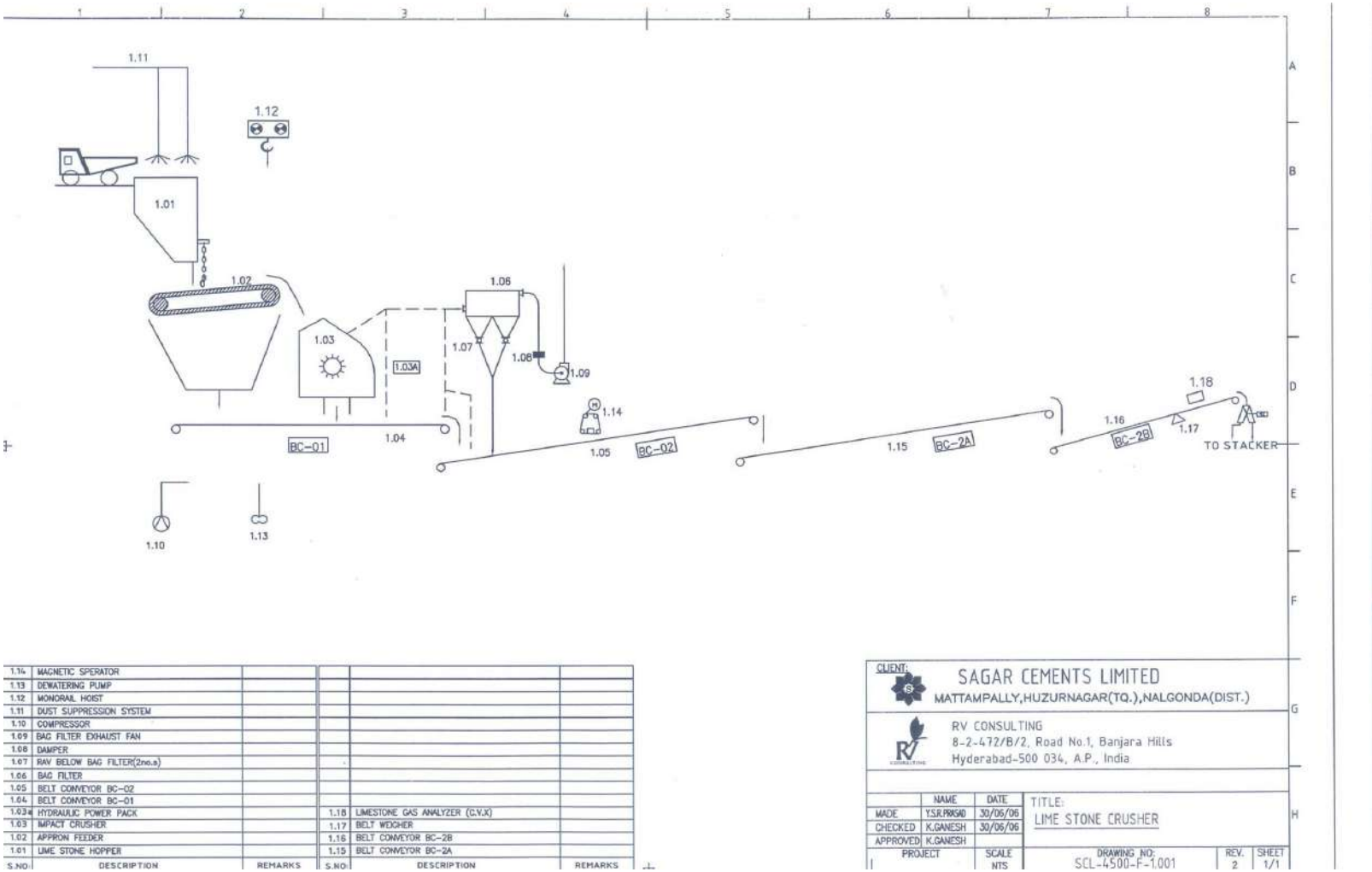


Fig. 4 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

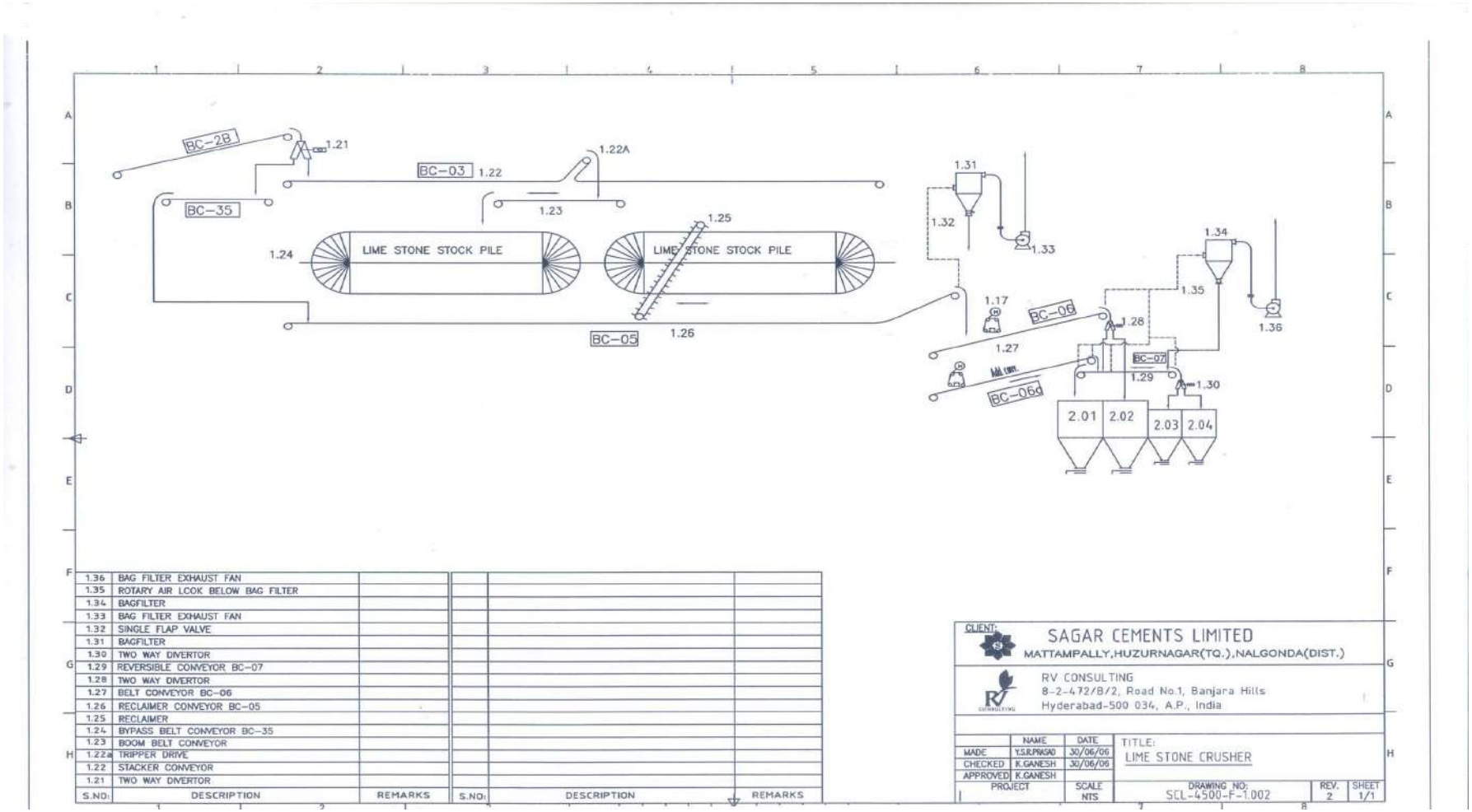


Fig. 5 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

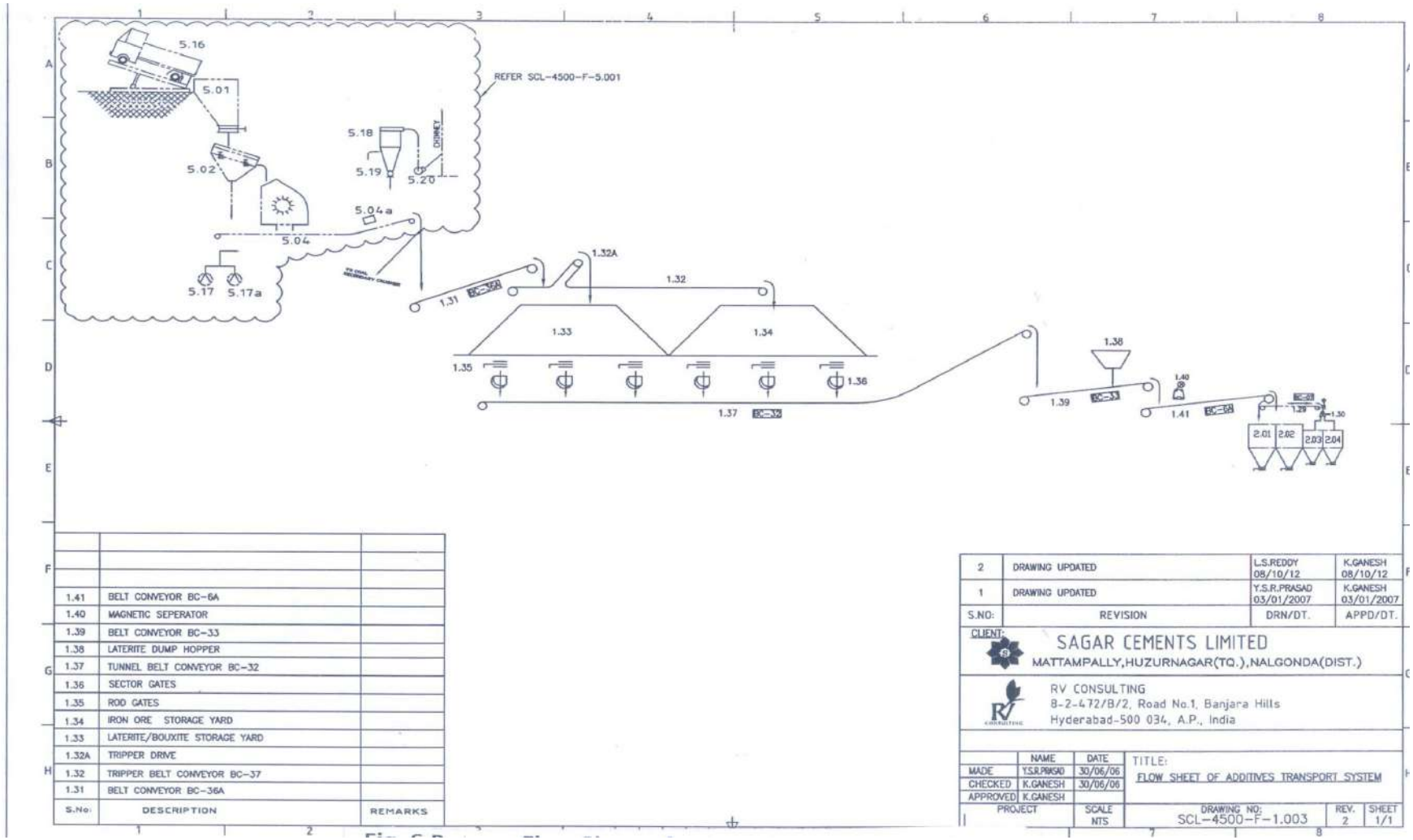
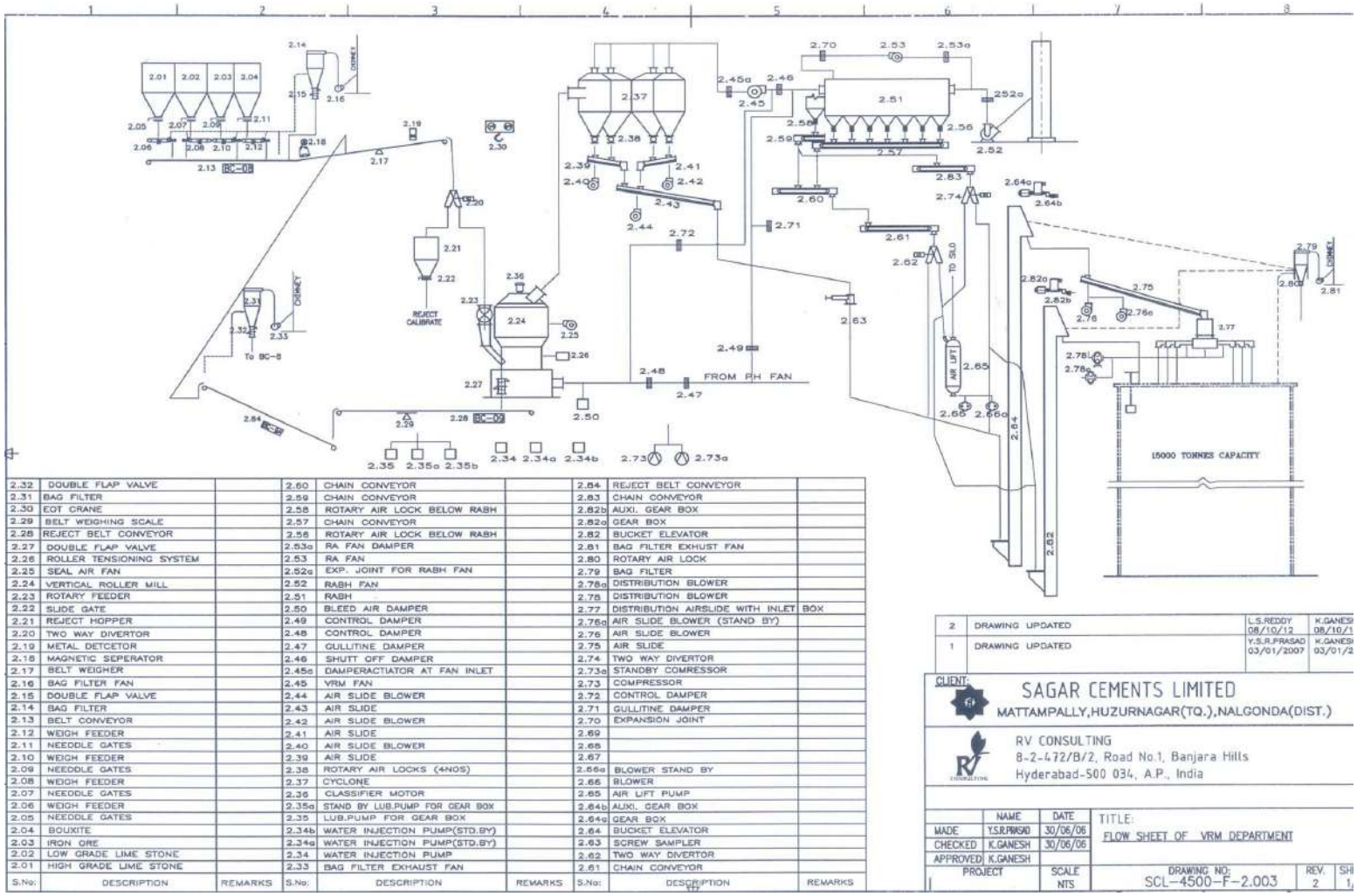


Fig. 6 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED



S.No:	DESCRIPTION	REMARKS	S.No:	DESCRIPTION	REMARKS	S.No:	DESCRIPTION	REMARKS
2.32	DOUBLE FLAP VALVE		2.60	CHAIN CONVEYOR		2.84	REJECT BELT CONVEYOR	
2.31	BAG FILTER		2.59	CHAIN CONVEYOR		2.83	CHAIN CONVEYOR	
2.30	EOT CRANE		2.58	ROTARY AIR LOCK BELOW RABH		2.82b	AUXI. GEAR BOX	
2.29	BELT WEIGHING SCALE		2.57	CHAIN CONVEYOR		2.82a	GEAR BOX	
2.28	REJECT BELT CONVEYOR		2.56	ROTARY AIR LOCK BELOW RABH		2.82	BUCKET ELEVATOR	
2.27	DOUBLE FLAP VALVE		2.53a	RA FAN DAMPER		2.81	BAG FILTER EXHUST FAN	
2.26	ROLLER TENSIONING SYSTEM		2.53	RA FAN		2.80	ROTARY AIR LOCK	
2.25	SEAL AIR FAN		2.52a	EXP. JOINT FOR RABH FAN		2.79	BAG FILTER	
2.24	VERTICAL ROLLER MILL		2.52	RABH FAN		2.78a	DISTRIBUTION BLOWER	
2.23	ROTARY FEEDER		2.51	RABH		2.78	DISTRIBUTION BLOWER	
2.22	SLIDE GATE		2.50	BLEED AIR DAMPER		2.77	DISTRIBUTION AIRSLIDE WITH INLET BOX	
2.21	REJECT HOPPER		2.49	CONTROL DAMPER		2.76a	AIR SLIDE BLOWER (STAND BY)	
2.20	TWO WAY DIVERTOR		2.48	CONTROL DAMPER		2.76	AIR SLIDE BLOWER	
2.19	METAL DETCETOR		2.47	GULLITINE DAMPER		2.75	AIR SLIDE	
2.18	MAGNETIC SEPERATOR		2.46	SHUTT OFF DAMPER		2.74	TWO WAY DIVERTOR	
2.17	BELT WEIGHER		2.45a	DAMPERACTIATOR AT FAN INLET		2.73a	STANDBY COMRESSOR	
2.16	BAG FILTER FAN		2.45	VRM FAN		2.73	COMPRESSOR	
2.15	DOUBLE FLAP VALVE		2.44	AIR SLIDE BLOWER		2.72	CONTROL DAMPER	
2.14	BAG FILTER		2.43	AIR SLIDE		2.71	GULLITINE DAMPER	
2.13	BELT CONVEYOR		2.42	AIR SLIDE BLOWER		2.70	EXPANSION JOINT	
2.12	WEIGH FEEDER		2.41	AIR SLIDE		2.69		
2.11	NEEDDLE GATES		2.40	AIR SLIDE BLOWER		2.68		
2.10	WEIGH FEEDER		2.39	AIR SLIDE		2.67		
2.09	NEEDDLE GATES		2.38	ROTARY AIR LOCKS (4NOS)		2.66a	BLOWER STAND BY	
2.08	WEIGH FEEDER		2.37	CYCLONE		2.66	BLOWER	
2.07	NEEDDLE GATES		2.36	CLASSIFIER MOTOR		2.65	AIR LIFT PUMP	
2.06	WEIGH FEEDER		2.35a	STAND BY LUB.PUMP FOR GEAR BOX		2.64b	AUXI. GEAR BOX	
2.05	NEEDDLE GATES		2.35	LUB.PUMP FOR GEAR BOX		2.64a	GEAR BOX	
2.04	BOUXITE		2.34b	WATER INJECTION PUMP(STD.BY)		2.64	BUCKET ELEVATOR	
2.03	IRON ORE		2.34a	WATER INJECTION PUMP(STD.BY)		2.63	SCREW SAMPLER	
2.02	LOW GRADE LIME STONE		2.34	WATER INJECTION PUMP		2.62	TWO WAY DIVERTOR	
2.01	HIGH GRADE LIME STONE		2.33	BAG FILTER EXHAUST FAN		2.61	CHAIN CONVEYOR	

	NAME	DATE
MADE	Y.S.R.PRASAD	30/06/06
CHECKED	K.GANESH	30/06/06
APPROVED	K.GANESH	
PROJECT	SCALE NTS	

Fig. 7 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

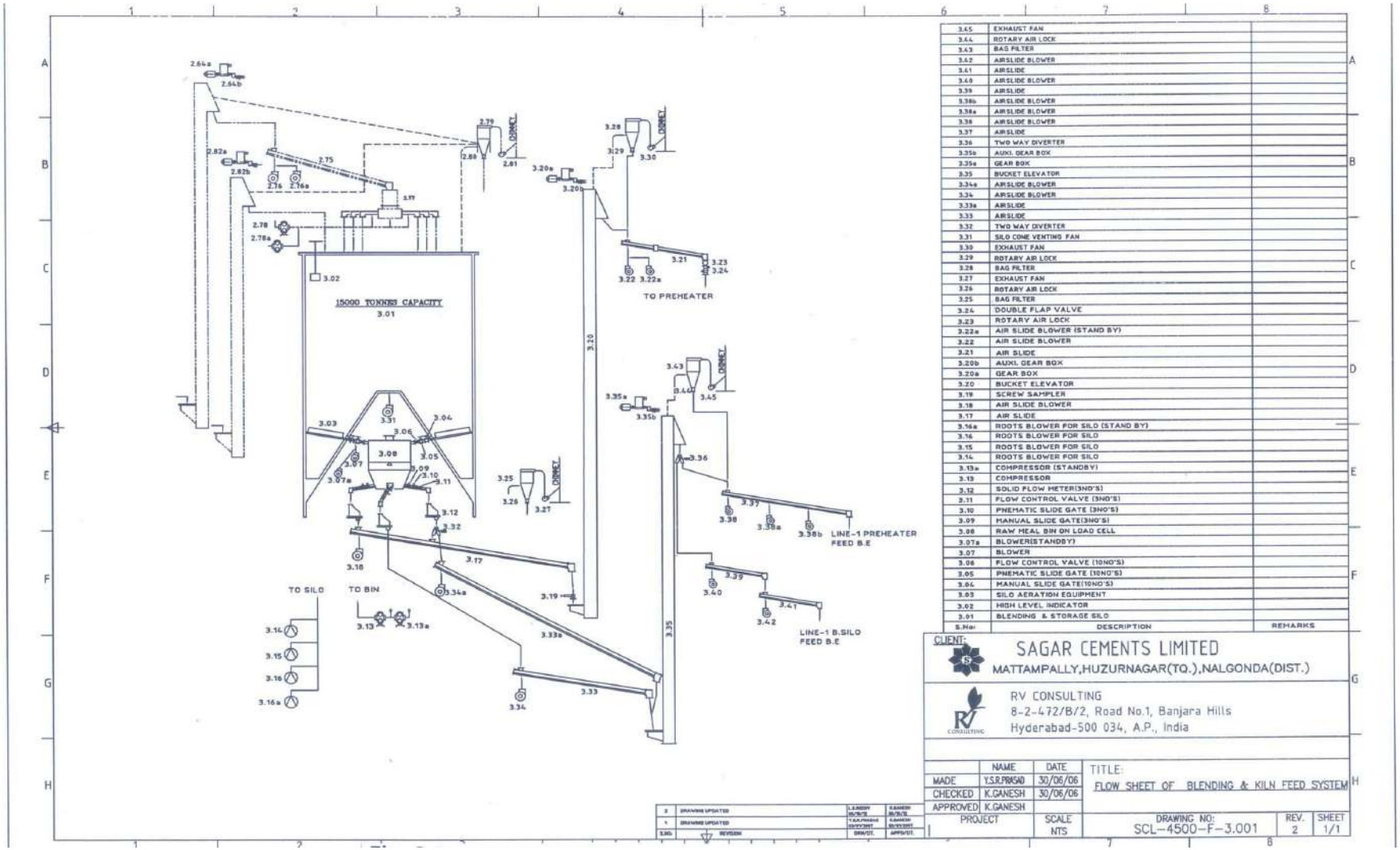
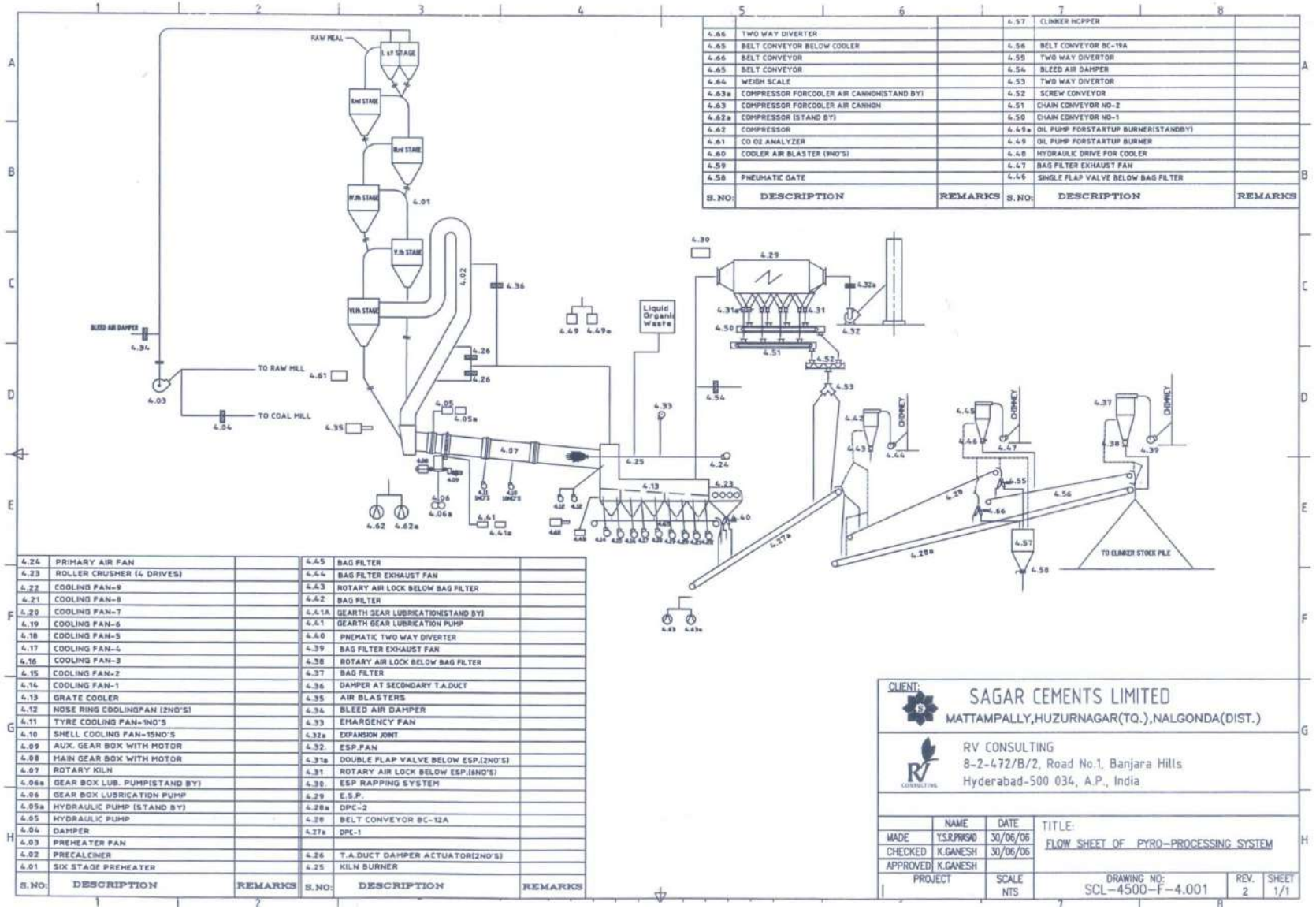


Fig. 8 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED



S.NO:	DESCRIPTION	REMARKS
4.66	TWO WAY DIVERTER	
4.65	BELT CONVEYOR BELOW COOLER	
4.66	BELT CONVEYOR	
4.65	BELT CONVEYOR	
4.64	WEIGH SCALE	
4.63a	COMPRESSOR FORCOOLER AIR CANNON(STAND BY)	
4.63	COMPRESSOR FORCOOLER AIR CANNON	
4.62a	COMPRESSOR (STAND BY)	
4.62	COMPRESSOR	
4.61	CO O2 ANALYZER	
4.60	COOLER AIR BLASTER (9NO'S)	
4.59		
4.58	PNEUMATIC GATE	

S.NO:	DESCRIPTION	REMARKS
4.57	CLINKER HOPPER	
4.56	BELT CONVEYOR BC-19A	
4.55	TWO WAY DIVERTOR	
4.54	BLEED AIR DAMPER	
4.53	TWO WAY DIVERTOR	
4.52	SCREW CONVEYOR	
4.51	CHAIN CONVEYOR NO-2	
4.50	CHAIN CONVEYOR NO-1	
4.49a	OIL PUMP FORSTARTUP BURNER(STANDBY)	
4.49	OIL PUMP FORSTARTUP BURNER	
4.48	HYDRAULIC DRIVE FOR COOLER	
4.47	BAG FILTER EXHAUST FAN	
4.46	SINGLE FLAP VALVE BELOW BAG FILTER	

S.NO:	DESCRIPTION	REMARKS
4.24	PRIMARY AIR FAN	
4.23	ROLLER CRUSHER (4 DRIVES)	
4.22	COOLING FAN-9	
4.21	COOLING FAN-8	
4.20	COOLING FAN-7	
4.19	COOLING FAN-6	
4.18	COOLING FAN-5	
4.17	COOLING FAN-4	
4.16	COOLING FAN-3	
4.15	COOLING FAN-2	
4.14	COOLING FAN-1	
4.13	GRATE COOLER	
4.12	NOSE RING COOLINGFAN (2NO'S)	
4.11	TYRE COOLING FAN-1NO'S	
4.10	SHELL COOLING FAN-15NO'S	
4.09	AUX. GEAR BOX WITH MOTOR	
4.08	MAIN GEAR BOX WITH MOTOR	
4.07	ROTARY KILN	
4.06a	GEAR BOX LUB. PUMP(STAND BY)	
4.06	GEAR BOX LUBRICATION PUMP	
4.05a	HYDRAULIC PUMP (STAND BY)	
4.05	HYDRAULIC PUMP	
4.04	DAMPER	
4.03	PREHEATER FAN	
4.02	PRECALCINER	
4.01	SIX STAGE PREHEATER	

S.NO:	DESCRIPTION	REMARKS
4.45	BAG FILTER	
4.44	BAG FILTER EXHAUST FAN	
4.43	ROTARY AIR LOCK BELOW BAG FILTER	
4.42	BAG FILTER	
4.41A	GEARTH GEAR LUBRICATION(STAND BY)	
4.41	GEARTH GEAR LUBRICATION PUMP	
4.40	PNEMATIC TWO WAY DIVERTER	
4.39	BAG FILTER EXHAUST FAN	
4.38	ROTARY AIR LOCK BELOW BAG FILTER	
4.37	BAG FILTER	
4.36	DAMPER AT SECONDARY T.A.DUCT	
4.35	AIR BLASTERS	
4.34	BLEED AIR DAMPER	
4.33	EMARGENCY FAN	
4.32a	EXPANSION JOINT	
4.32	ESP.FAN	
4.31a	DOUBLE FLAP VALVE BELOW ESP.(2NO'S)	
4.31	ROTARY AIR LOCK BELOW ESP.(6NO'S)	
4.30	ESP RAPPING SYSTEM	
4.29	E.S.P.	
4.28a	DPC-2	
4.28	BELT CONVEYOR BC-12A	
4.27a	DPC-1	
4.26	T.A.DUCT DAMPER ACTUATOR(2NO'S)	
4.25	KILN BURNER	

	NAME	DATE
MADE	Y.S.R.PRASAD	30/06/06
CHECKED	K.GANESH	30/06/06
APPROVED	K.GANESH	

PROJECT | SCALE NTS | REV. 2 | SHEET 1/1

Fig. 9 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

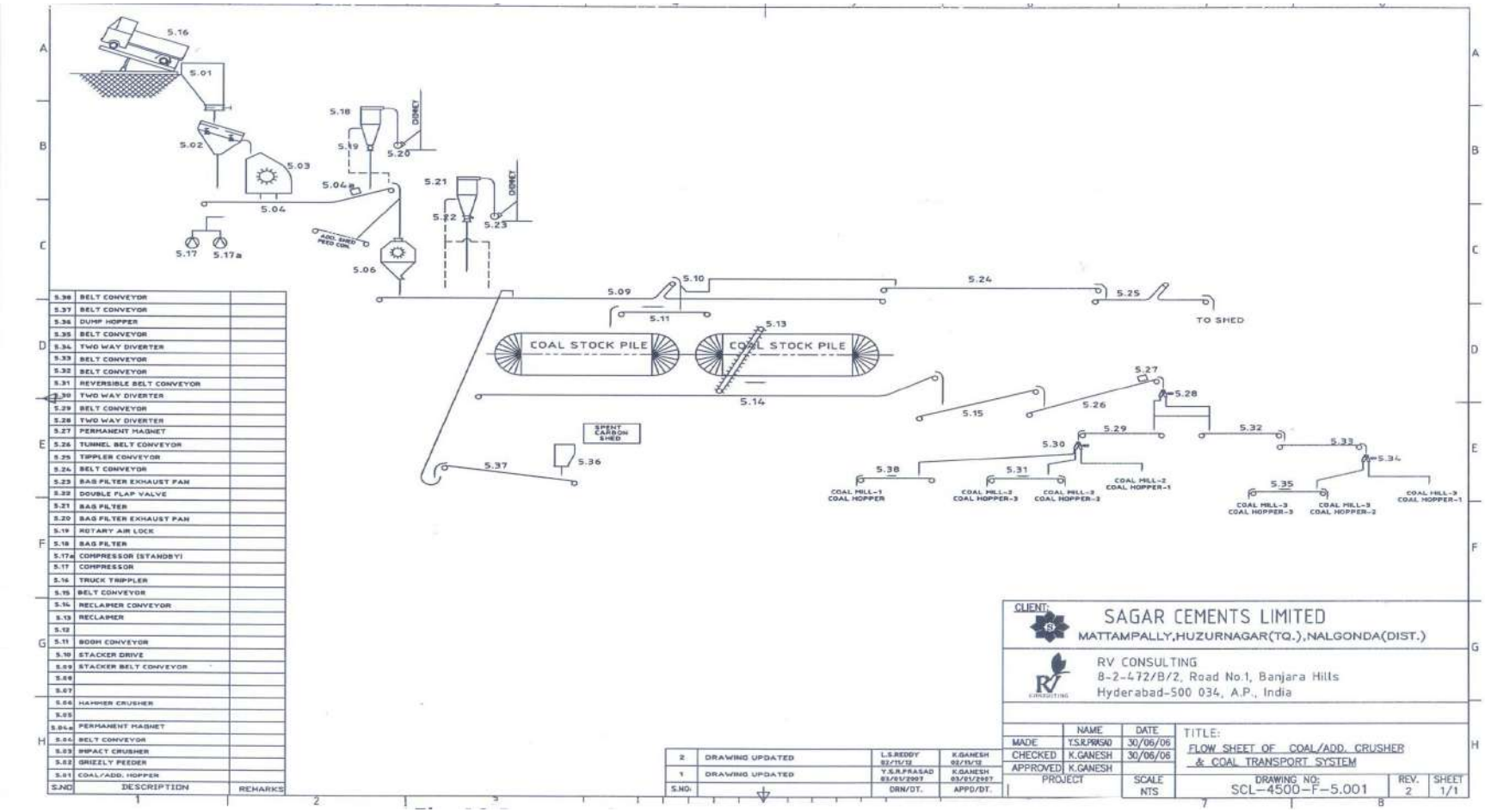


Fig. 10 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

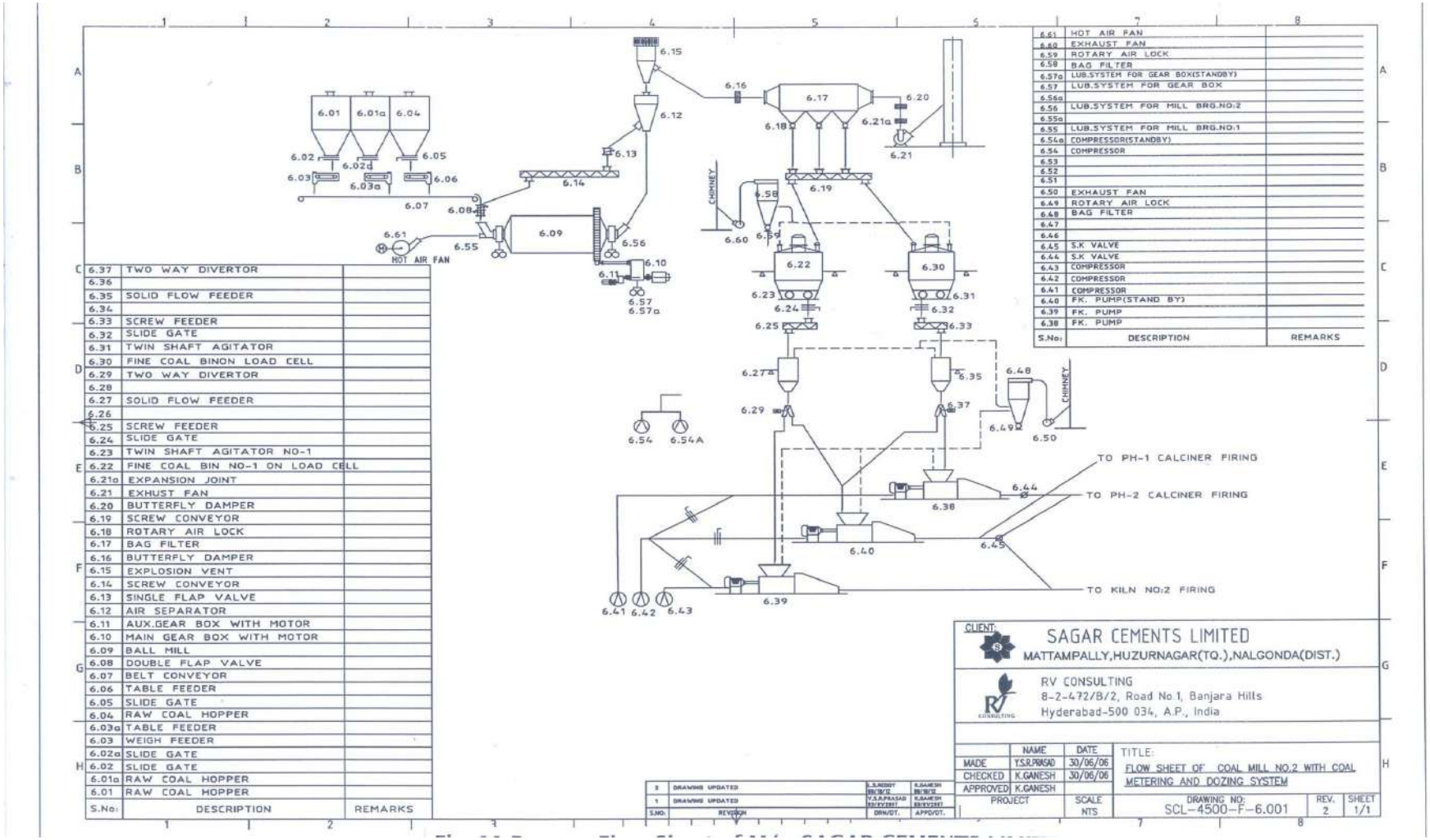
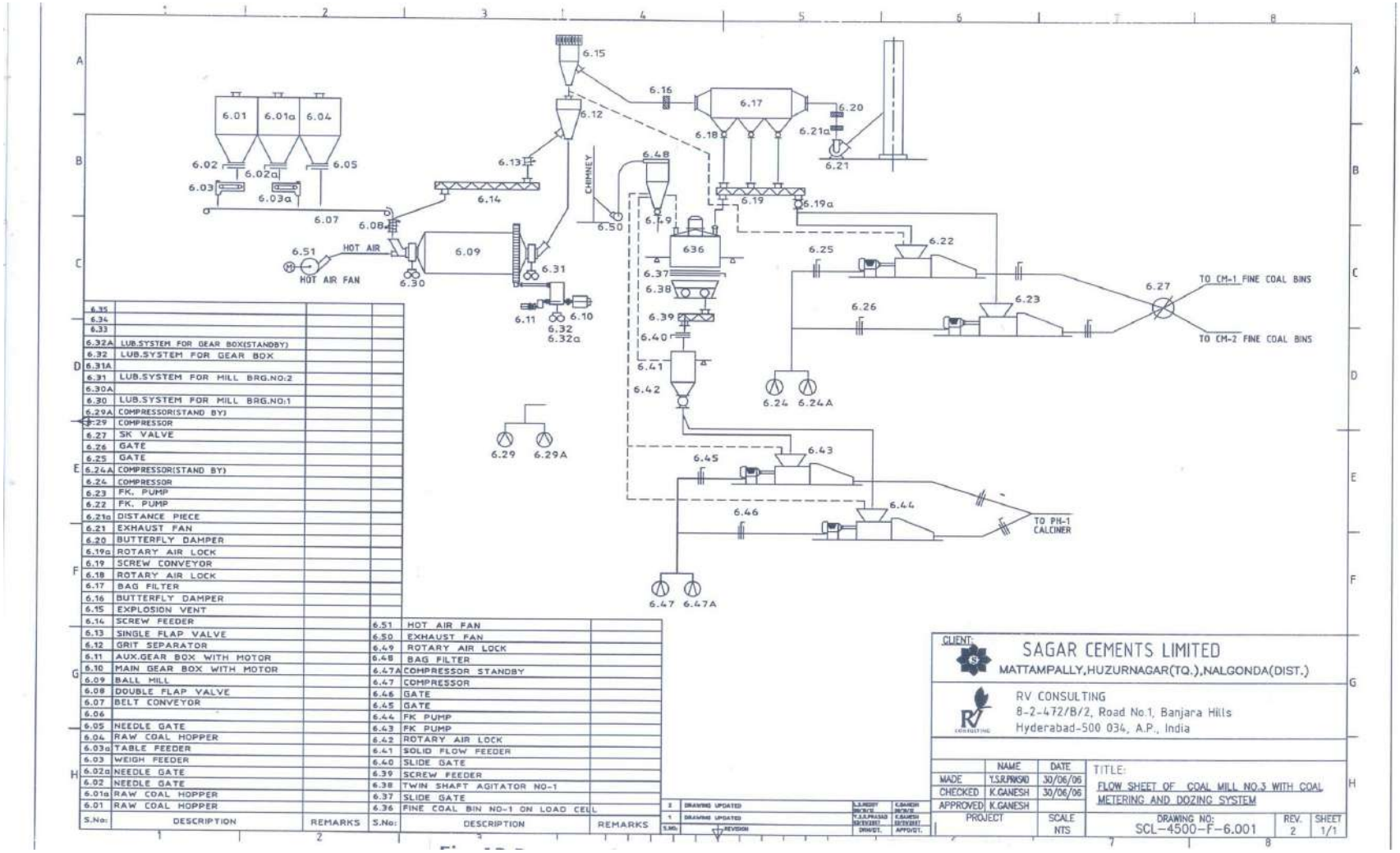


Fig. 11 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

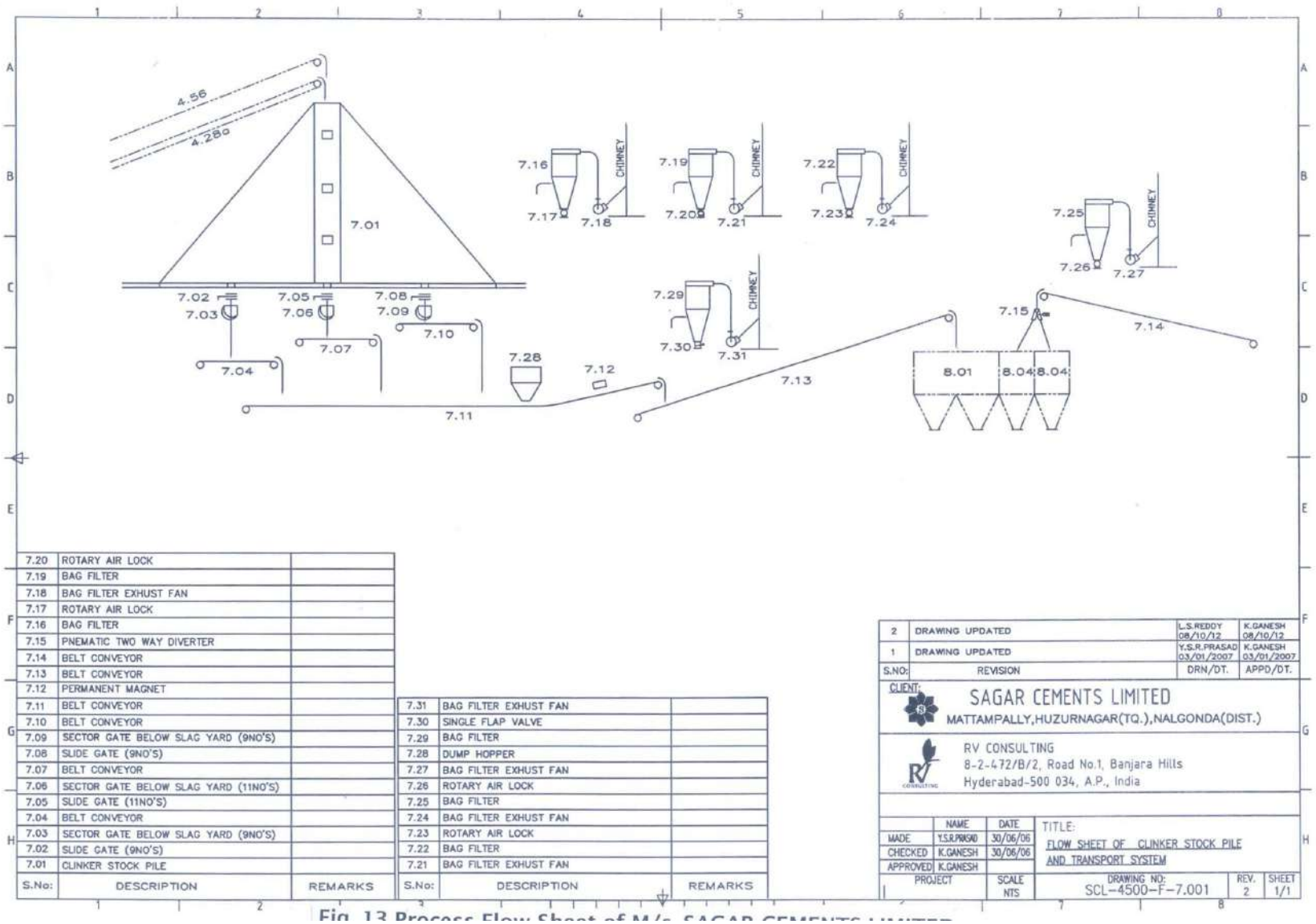


S.No:	DESCRIPTION	REMARKS
6.35		
6.34		
6.33		
6.32A	LUB.SYSTEM FOR GEAR BOX(STANDBY)	
6.32	LUB.SYSTEM FOR GEAR BOX	
6.31A		
6.31	LUB.SYSTEM FOR MILL BRG.NO:2	
6.30A		
6.30	LUB.SYSTEM FOR MILL BRG.NO:1	
6.29A	COMPRESSOR(STAND BY)	
6.29	COMPRESSOR	
6.27	SK VALVE	
6.26	GATE	
6.25	GATE	
6.24A	COMPRESSOR(STAND BY)	
6.24	COMPRESSOR	
6.23	FK. PUMP	
6.22	FK. PUMP	
6.21a	DISTANCE PIECE	
6.21	EXHAUST FAN	
6.20	BUTTERFLY DAMPER	
6.19a	ROTARY AIR LOCK	
6.19	SCREW CONVEYOR	
6.18	ROTARY AIR LOCK	
6.17	BAG FILTER	
6.16	BUTTERFLY DAMPER	
6.15	EXPLOSION VENT	
6.14	SCREW FEEDER	
6.13	SINGLE FLAP VALVE	
6.12	GRIT SEPARATOR	
6.11	AUX.GEAR BOX WITH MOTOR	
6.10	MAIN GEAR BOX WITH MOTOR	
6.09	BALL MILL	
6.08	DOUBLE FLAP VALVE	
6.07	BELT CONVEYOR	
6.06		
6.05	NEEDLE GATE	
6.04	RAW COAL HOPPER	
6.03a	TABLE FEEDER	
6.03	WEIGH FEEDER	
6.02a	NEEDLE GATE	
6.02	NEEDLE GATE	
6.01a	RAW COAL HOPPER	
6.01	RAW COAL HOPPER	

S.No:	DESCRIPTION	REMARKS
6.51	HOT AIR FAN	
6.50	EXHAUST FAN	
6.49	ROTARY AIR LOCK	
6.48	BAG FILTER	
6.47A	COMPRESSOR STANDBY	
6.47	COMPRESSOR	
6.46	GATE	
6.45	GATE	
6.44	FK PUMP	
6.43	FK PUMP	
6.42	ROTARY AIR LOCK	
6.41	SOLID FLOW FEEDER	
6.40	SLIDE GATE	
6.39	SCREW FEEDER	
6.38	TWIN SHAFT AGITATOR NO-1	
6.37	SLIDE GATE	
6.36	FINE COAL BIN NO-1 ON LOAD CELL	

S.No.	REVISION	DRN/DT.	APPD/DT.
2	DRAWING UPDATED		
1	DRAWING UPDATED		

Fig. 12 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED



S.No:	DESCRIPTION	REMARKS
7.20	ROTARY AIR LOCK	
7.19	BAG FILTER	
7.18	BAG FILTER EXHUST FAN	
7.17	ROTARY AIR LOCK	
7.16	BAG FILTER	
7.15	PNEMATIC TWO WAY DIVERTER	
7.14	BELT CONVEYOR	
7.13	BELT CONVEYOR	
7.12	PERMANENT MAGNET	
7.11	BELT CONVEYOR	
7.10	BELT CONVEYOR	
7.09	SECTOR GATE BELOW SLAG YARD (9NO'S)	
7.08	SLIDE GATE (9NO'S)	
7.07	BELT CONVEYOR	
7.06	SECTOR GATE BELOW SLAG YARD (11NO'S)	
7.05	SLIDE GATE (11NO'S)	
7.04	BELT CONVEYOR	
7.03	SECTOR GATE BELOW SLAG YARD (9NO'S)	
7.02	SLIDE GATE (9NO'S)	
7.01	CLINKER STOCK PILE	

S.No:	DESCRIPTION	REMARKS
7.31	BAG FILTER EXHUST FAN	
7.30	SINGLE FLAP VALVE	
7.29	BAG FILTER	
7.28	DUMP HOPPER	
7.27	BAG FILTER EXHUST FAN	
7.26	ROTARY AIR LOCK	
7.25	BAG FILTER	
7.24	BAG FILTER EXHUST FAN	
7.23	ROTARY AIR LOCK	
7.22	BAG FILTER	
7.21	BAG FILTER EXHUST FAN	

S.NO:	REVISION	DRN/DT.	APPD/DT.
2	DRAWING UPDATED	L.S.REDDY 08/10/12	K.GANESH 08/10/12
1	DRAWING UPDATED	Y.S.R.PRASAD 03/01/2007	K.GANESH 03/01/2007

CLIENT: SAGAR CEMENTS LIMITED
MATTAMPALLY,HUZURNAGAR(TQ.),NALGONDA(DIST.)

RV CONSULTING
8-2-472/B/2, Road No.1, Banjara Hills
Hyderabad-500 034, A.P., India

	NAME	DATE
MADE	Y.S.R.PRASAD	30/06/06
CHECKED	K.GANESH	30/06/06
APPROVED	K.GANESH	

TITLE: FLOW SHEET OF CLINKER STOCK PILE AND TRANSPORT SYSTEM

PROJECT | SCALE NTS | DRAWING NO: SCL-4500-F-7.001 | REV. 2 | SHEET 1/1

Fig. 13 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

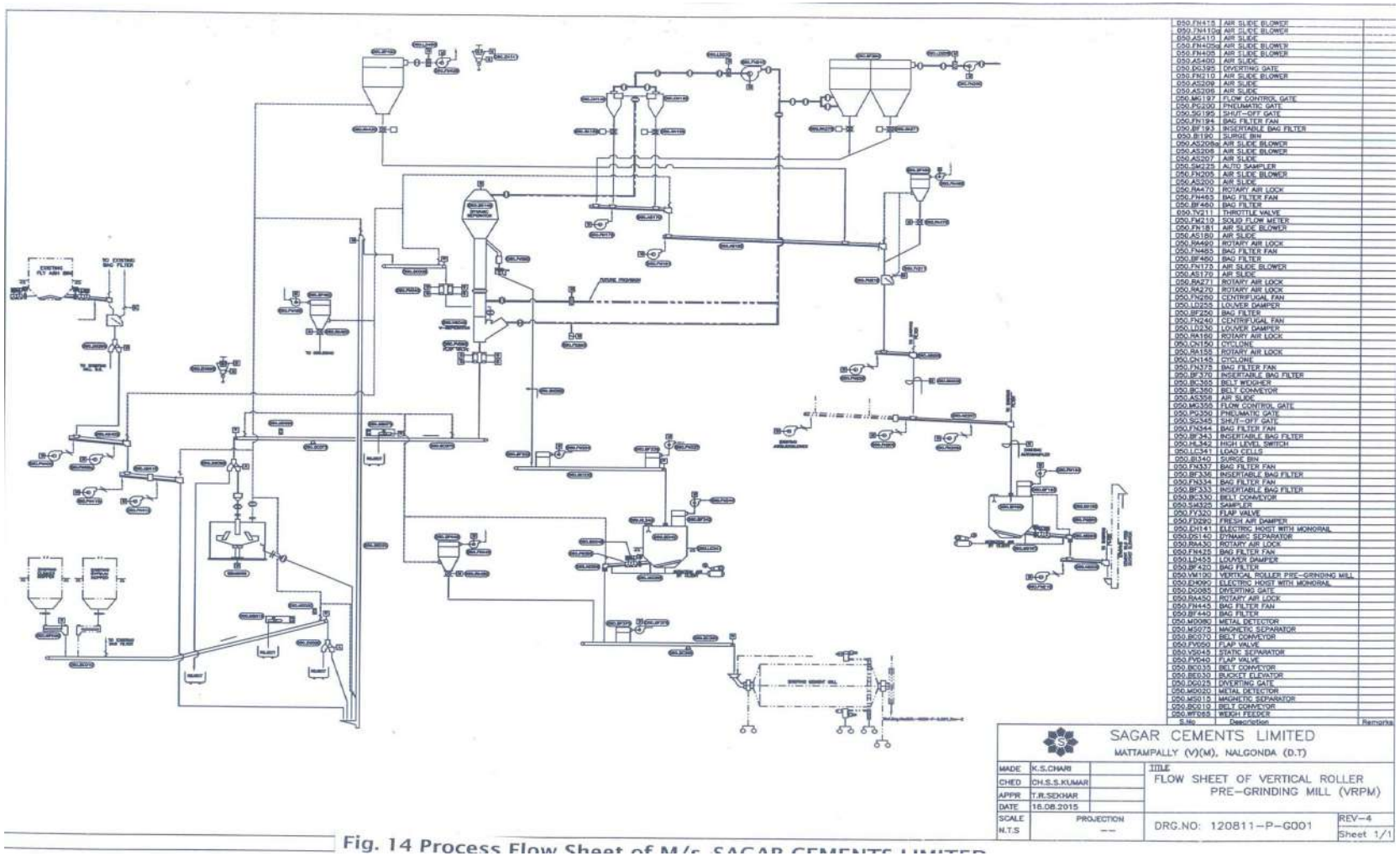
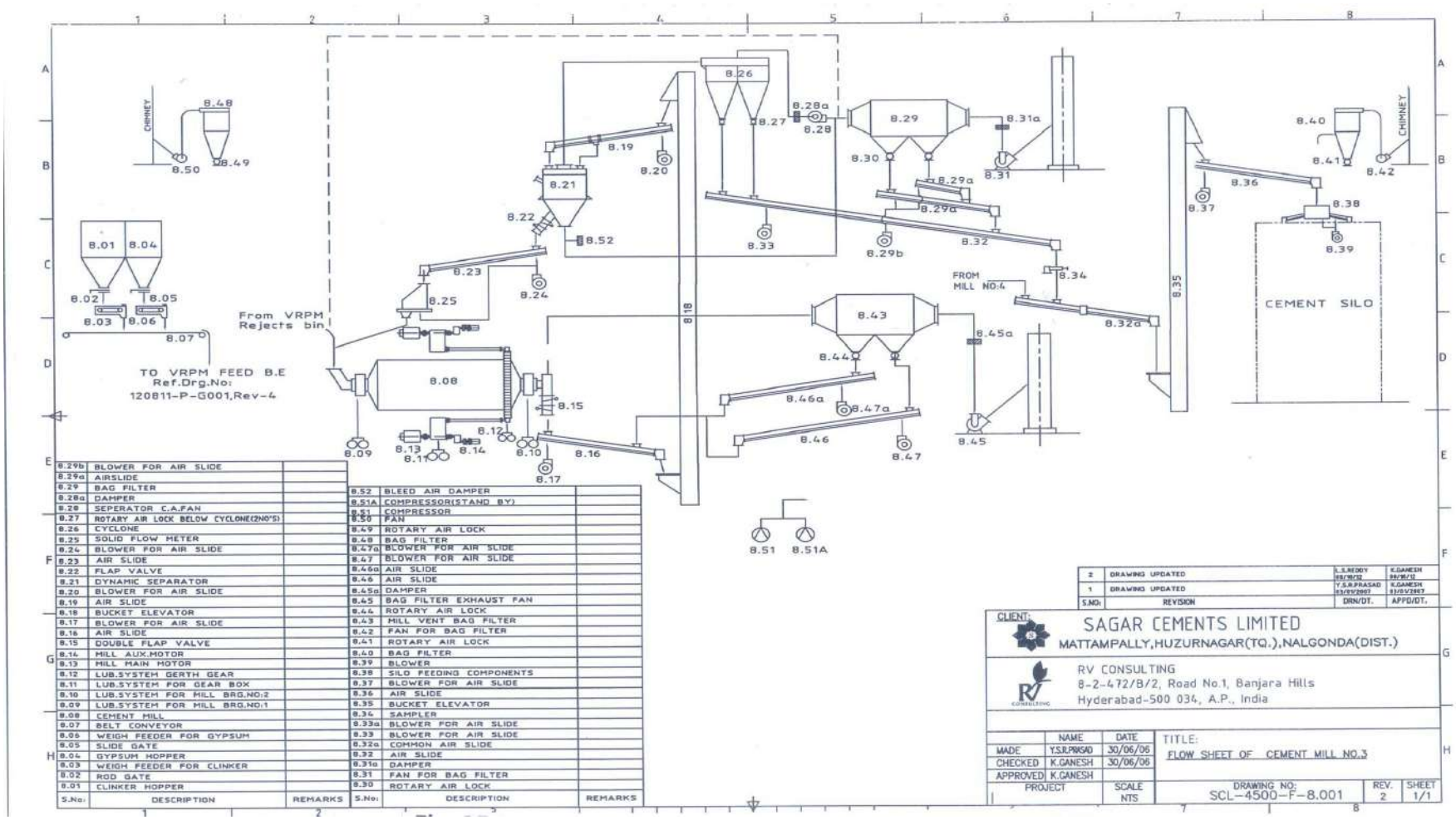


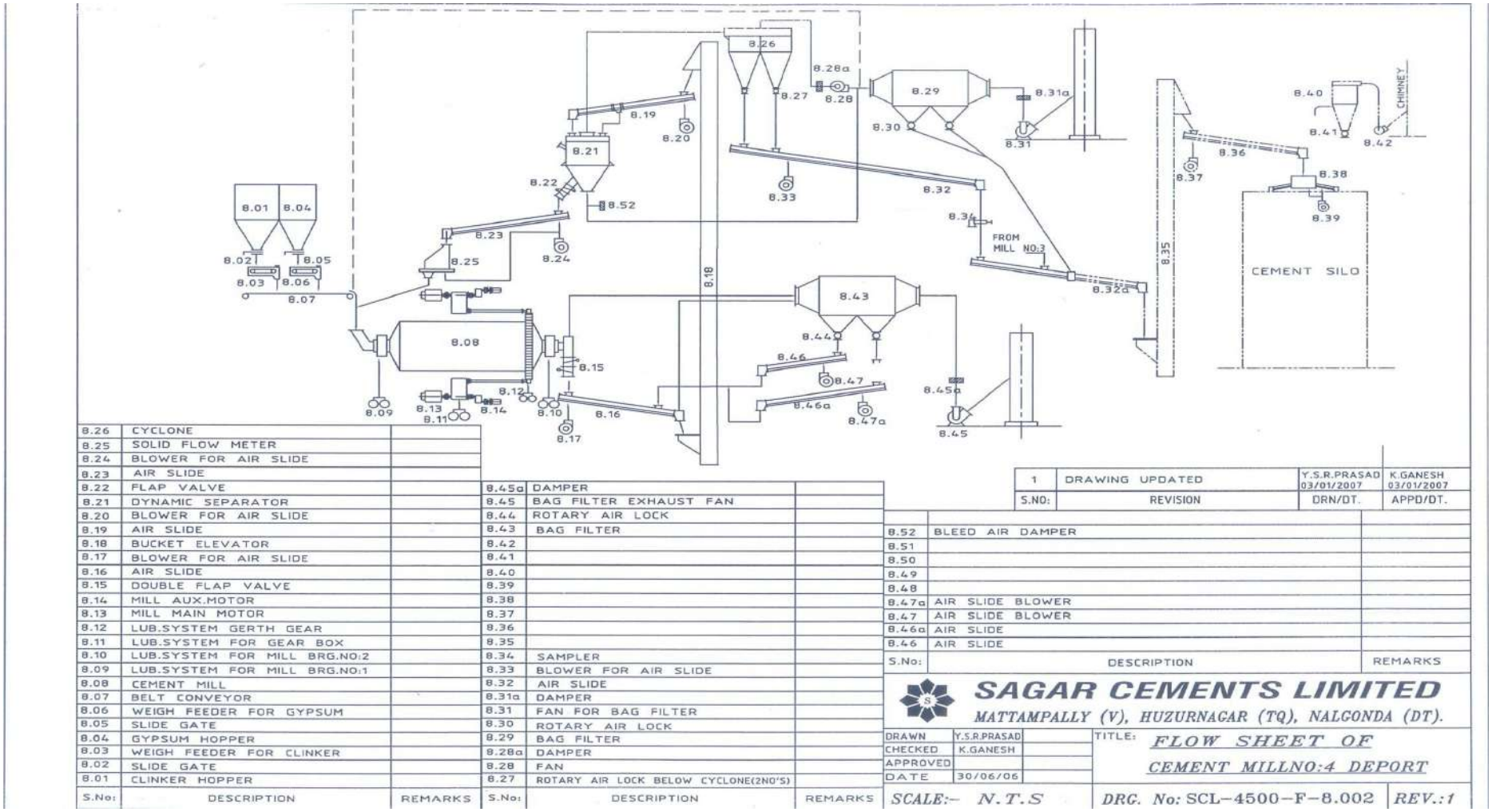
Fig. 14 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED



S.No:	DESCRIPTION	REMARKS
8.29b	BLOWER FOR AIR SLIDE	
8.29a	AIRSLIDE	
8.29	BAG FILTER	
8.28a	DAMPER	
8.28	SEPERATOR C.A.FAN	
8.27	ROTARY AIR LOCK BELOW CYCLONE(2NO'S)	
8.26	CYCLONE	
8.25	SOLID FLOW METER	
8.24	BLOWER FOR AIR SLIDE	
8.23	AIR SLIDE	
8.22	FLAP VALVE	
8.21	DYNAMIC SEPARATOR	
8.20	BLOWER FOR AIR SLIDE	
8.19	AIR SLIDE	
8.18	BUCKET ELEVATOR	
8.17	BLOWER FOR AIR SLIDE	
8.16	AIR SLIDE	
8.15	DOUBLE FLAP VALVE	
8.14	MILL AUX.MOTOR	
8.13	MILL MAIN MOTOR	
8.12	LUB.SYSTEM GERTH GEAR	
8.11	LUB.SYSTEM FOR GEAR BOX	
8.10	LUB.SYSTEM FOR MILL BRG.NO:2	
8.09	LUB.SYSTEM FOR MILL BRG.NO:1	
8.08	CEMENT MILL	
8.07	BELT CONVEYOR	
8.06	WEIGH FEEDER FOR GYPSUM	
8.05	SLIDE GATE	
8.04	GYPSUM HOPPER	
8.03	WEIGH FEEDER FOR CLINKER	
8.02	ROD GATE	
8.01	CLINKER HOPPER	

S.No:	DESCRIPTION	REMARKS
8.52	BLEED AIR DAMPER	
8.51A	COMPRESSOR(STAND BY)	
8.51	COMPRESSOR	
8.50	FAN	
8.49	ROTARY AIR LOCK	
8.48	BAG FILTER	
8.47a	BLOWER FOR AIR SLIDE	
8.47	BLOWER FOR AIR SLIDE	
8.46a	AIR SLIDE	
8.46	AIR SLIDE	
8.45a	DAMPER	
8.45	BAG FILTER EXHAUST FAN	
8.44	ROTARY AIR LOCK	
8.43	MILL VENT BAG FILTER	
8.42	FAN FOR BAG FILTER	
8.41	ROTARY AIR LOCK	
8.40	BAG FILTER	
8.39	BLOWER	
8.38	SILO FEEDING COMPONENTS	
8.37	BLOWER FOR AIR SLIDE	
8.36	AIR SLIDE	
8.35	BUCKET ELEVATOR	
8.34	SAMPLER	
8.33a	BLOWER FOR AIR SLIDE	
8.33	BLOWER FOR AIR SLIDE	
8.32a	COMMON AIR SLIDE	
8.32	AIR SLIDE	
8.31a	DAMPER	
8.31	FAN FOR BAG FILTER	
8.30	ROTARY AIR LOCK	

Fig. 15 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED



8.26	CYCLONE	
8.25	SOLID FLOW METER	
8.24	BLOWER FOR AIR SLIDE	
8.23	AIR SLIDE	
8.22	FLAP VALVE	
8.21	DYNAMIC SEPARATOR	
8.20	BLOWER FOR AIR SLIDE	
8.19	AIR SLIDE	
8.18	BUCKET ELEVATOR	
8.17	BLOWER FOR AIR SLIDE	
8.16	AIR SLIDE	
8.15	DOUBLE FLAP VALVE	
8.14	MILL AUX.MOTOR	
8.13	MILL MAIN MOTOR	
8.12	LUB.SYSTEM GERTH GEAR	
8.11	LUB.SYSTEM FOR GEAR BOX	
8.10	LUB.SYSTEM FOR MILL BRG.NO:2	
8.09	LUB.SYSTEM FOR MILL BRG.NO:1	
8.08	CEMENT MILL	
8.07	BELT CONVEYOR	
8.06	WEIGH FEEDER FOR GYPSUM	
8.05	SLIDE GATE	
8.04	GYPSUM HOPPER	
8.03	WEIGH FEEDER FOR CLINKER	
8.02	SLIDE GATE	
8.01	CLINKER HOPPER	
S.No:	DESCRIPTION	REMARKS

8.45a	DAMPER	
8.45	BAG FILTER EXHAUST FAN	
8.44	ROTARY AIR LOCK	
8.43	BAG FILTER	
8.42		
8.41		
8.40		
8.39		
8.38		
8.37		
8.36		
8.35		
8.34	SAMPLER	
8.33	BLOWER FOR AIR SLIDE	
8.32	AIR SLIDE	
8.31a	DAMPER	
8.31	FAN FOR BAG FILTER	
8.30	ROTARY AIR LOCK	
8.29	BAG FILTER	
8.28a	DAMPER	
8.28	FAN	
8.27	ROTARY AIR LOCK BELOW CYCLONE(2NO'S)	
S.No:	DESCRIPTION	REMARKS

1	DRAWING UPDATED	Y.S.R.PRASAD 03/01/2007	K.GANESH 03/01/2007
S.NO:	REVISION	DRN/DT.	APPD/DT.

8.52	BLEED AIR DAMPER	
8.51		
8.50		
8.49		
8.48		
8.47a	AIR SLIDE BLOWER	
8.47	AIR SLIDE BLOWER	
8.46a	AIR SLIDE	
8.46	AIR SLIDE	
S.No:	DESCRIPTION	REMARKS

SAGAR CEMENTS LIMITED

MATTAMPALLY (V), HUZURNAGAR (TQ), NALGONDA (DT).

DRAWN	Y.S.R.PRASAD
CHECKED	K.GANESH
APPROVED	
DATE	30/06/06

TITLE: FLOW SHEET OF CEMENT MILLNO:4 DEPORT

SCALE:- N.T.S | DRG. No: SCL-4500-F-8.002 | REV.:1

Fig. 16 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

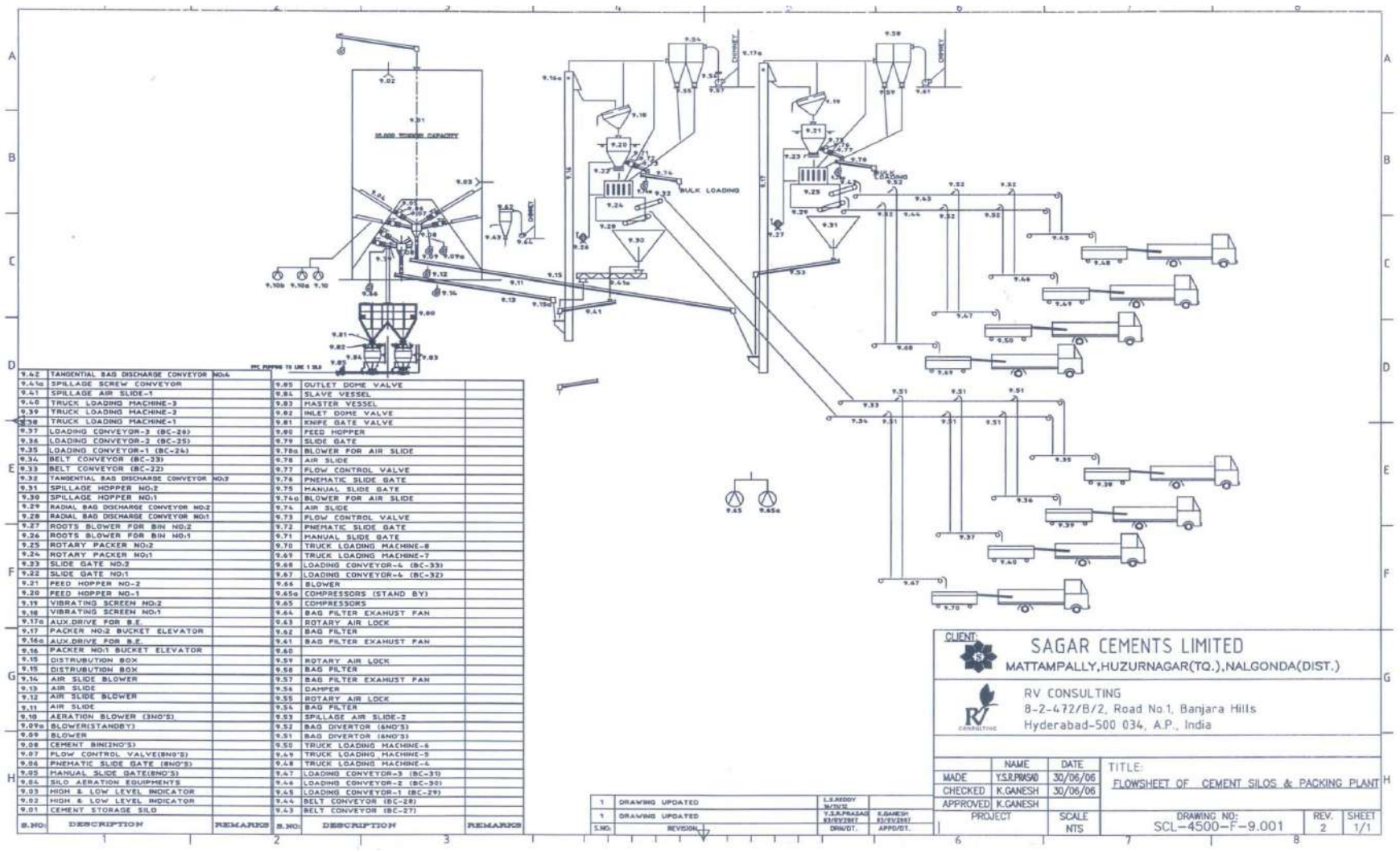


Fig. 17 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

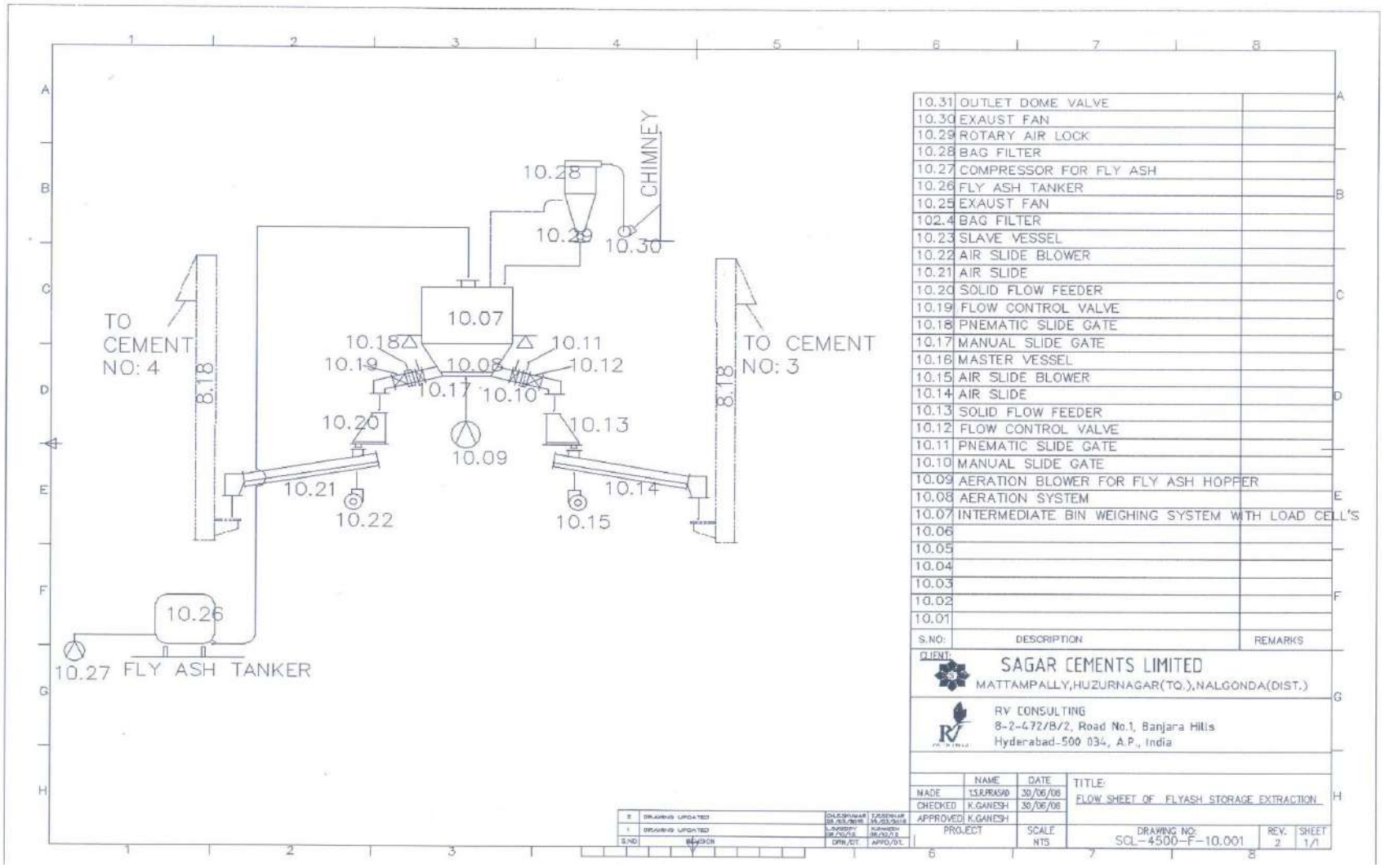


Fig. 18 Process Flow Sheet of M/s. SAGAR CEMENT LIMITED

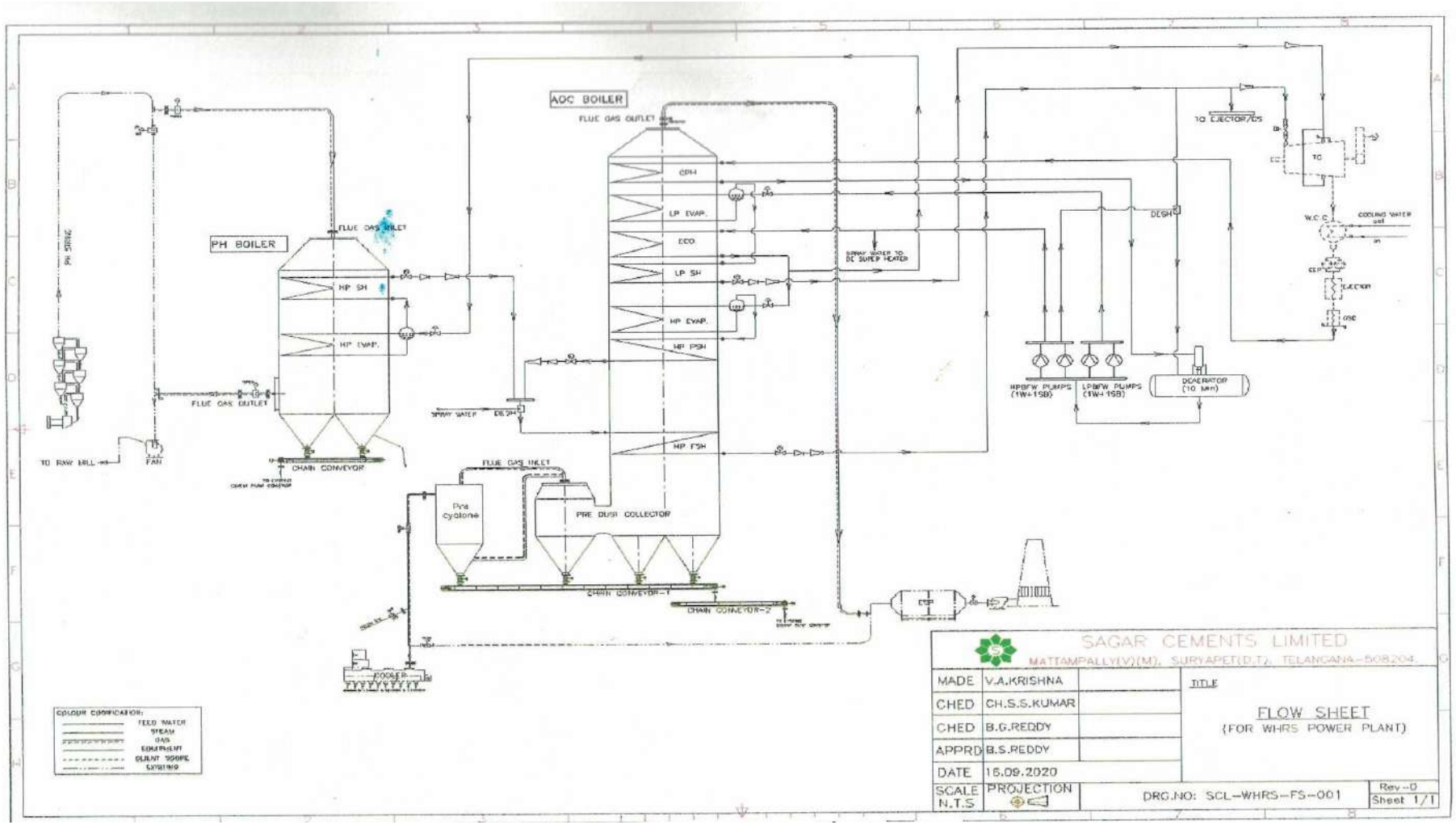


Fig. 19 Process flow sheet of WHRS Power Plant M/s. SAGAR CEMENT LIMITED

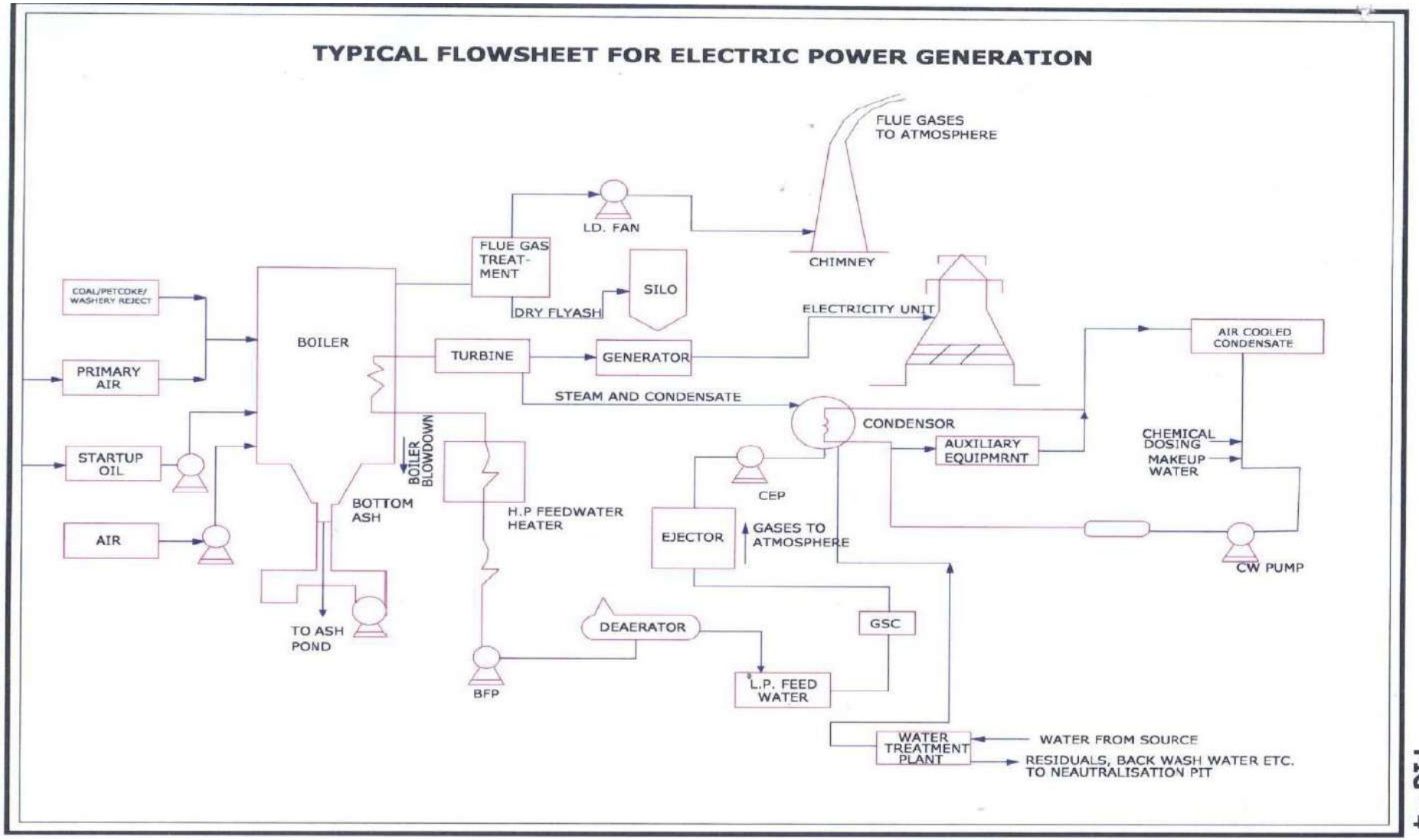


Fig. 20 Process flow sheet of WHRS Power Plant M/s. SAGAR CEMENT LIMITED

VRM for Raw Mill

The main function is to reduce 70 mm size limestone to powder of -212 microns size. 70 mm size material from closed hoppers is extracted in precise and regulated quantities with the help of weigh Feeders and conveyed to the mills by means of belt conveyor. In side the mill the above size raw material is ground to powder form. For the purpose of drying the material hot gas from preheater exit is extracted with help of mill fan. The ground raw material is lifted to the silo with help of bucket elevator.

Coal Mill

The main function is to powder the coal pieces of about 10 mm size to powder form. Raw coal received from external sources is stored under closed shed. The coal extracted from the storage shed is transported to coal mill feed hopper through the coal crusher. The feed hopper is also of closed type. The coal is extracted in regulated quantities from the closed hopper fed to mill. Hot air required for drying process is extracted from pre heater exist gases with the help mill fan. The raw coal is ground to powder form in the mill this ground coal is lifted by the hot gases traveling through the mill. These gases are traveling through dust collectors. Total material is collected in Dust collector. Collected material is transported to line coal bins.

Kiln

The main function is production of clinker from raw meal by controlled burning. The fine powder raw material is burnt with help of coal. The powder is converted to small balls type material called clinker. In this section there is preheater and kiln. Raw mill powder is extracted from the storage silos and transported to closed kiln feed bins with the help of bucket elevators. From the bins precise and regulated quantities are extracted and transported to the top of the preheater with the help of bucket elevators. The fine coal is extracted from the closed bins precise and regulated quantities and conveyed to the kiln and pre calciner. 6 stage on line precalciner for draws the air from Kiln & Cooler through PC & preheater. This air is helping to provide required oxygen for burning of coal and to convey the kiln feed from preheater to preheater bottom through different cyclones. The hot gases started from cooler are further heated in kiln burning zone, PC by the heat produced by coal burning. These very hot gases are traveling from cooler, Kiln, PC to the top of preheater. The raw material fed to the preheater top is slowly traveled through the cyclones, kiln, and cooler in opposite direction of hot gas flow. In the process the raw material heated by the heat absorbed from the hot gases and attains required temperature and finally the powder is converted to ball like material called clinker in the burning zone and discharged to the cooler from the kiln outlet. The hot clinker discharged the cooler is cooled by cold air being pumped into the cooler with help of fans. The cooled clinker is transported to a closed clinker storage shed.

Cement Mill

The main function is grinding the clinker in to fine powder which is cement. The clinker is extracted from storage shed and transported to closed mill feed bins with the help of belt conveyors. The clinker from bins is extracted in regulated quantities and fed to the mills along with 3 to 4% Gypsum. In the mill clinker is ground to the required fineness. The small quantity of air is used for mill venting and to help moving the ground material to mill outlet. This fine material is transported to storage silos by means of bucket elevator.

Packing House

The main function is to fill the bags with exact 50kg quantity of cement and loading to the trucks.

The cement is extracted from the cement silos and filled the packing machine bin with help of bucket elevator. Bags are filled with 50 kg by the automatic packing machine. The filled bags are transported by the belt conveyor and loaded in to the trucks.

7. WATER REQUIREMENT

The total consumption is 1,185.62 m^3/day and the breakup details are given below:

1. Process & Cooling	-	320.29
2. 8.8MW WHRBPP	-	511.12
3. 18.0MW CPP	-	162.33
4. Domestic	-	191.88

Most of the process and cooling water will be evaporated/consumed. The domestic requirement includes requirements of colony, plantation, drinking as well as sanitation. The water requirement is being met by borewells.

8. POLLUTION CONTROL IN THE PLANT

The industry has given top priority of pollution prevention and control. Therefore all the sources that release particulate matter are provided with bag filters/ESP for the control of particulate emissions into atmosphere. With respect to the gaseous pollutants like sulphur dioxide and nitrogen oxides their emissions are significant from only the diesel generators. Currently there are no standards for either the emission loads or emission concentrations of gaseous pollutants from diesel engines. Further their control at the source of generation is not technologically feasible and their treatment is difficult and expensive. Therefore all stacks are provided as an effective measure for good atmospheric dispersion of the pollutants and air pollution control.

At crushers and all transfer points high pressure very fine droplets of water is being sprayed and water is also sprayed in storage yards and vehicle moving places to avoid dust emissions.

It is found from the data generated that the flue gas emissions from the stacks and the ambient air quality data for PM_{10}, $PM_{2.5}$, SO_2 and NO_2 are well within the limits and comply with the standards prescribed by Telangana Pollution Control Board (T.G.P.C.B).

8.1 Waste water Sources and Monitoring

Most of the water consumed for process as well as cooling is consumed / evaporated. The only source of waste water is from sanitary facilities of the plant and colony water throw sewage treatment plant for treatment. Treated water used for Green belt development.

8.2 Air Pollution Control

The sources of air emissions are from kiln, Cement mills, coal mill and cooler. The stack details are furnished in Table 8.1. Stack emissions monitoring is carried out once in a quarterly for the parameters Suspended particulate matter. It is noticed from the collected emissions data that the parameters monitored are within the limits prescribed by Telangana Pollution Control Board.

Also installed 11 no's of on line stack monitoring analyzers, these are installed RABH stack, Cooler-1&2 ESP stacks, coal mills 1,2,3, cement mills 1, 2, 3 & 4 CPP ESP and Limestone Crusher Stack, also installed 2 online Ambient Air Quality Monitoring Stations at up & down wind direction. Above analyzers data uploaded to T.G.P.C.B & C.P.C.B web site for on line monitoring.

8.2.1 Stack Emissions

The emission from Kiln is passed through RABH, which reduces the particulate matter to the minimum levels. The emission from Raw mill is passed through RABH. The emission from cooler is passed through ESP, which reduces the particulate matter to the lower levels. Cement Mills, Coal Mill is attached to bag filters. Packing Plant is also attached to bag filter, reduces the particulate matter to the minimum levels. The emission from Coal fired boiler is passed through ESP, which reduces the particulate matter to the lower levels.

Table 8.1
Average Values of Stack Emissions Monitoring Data

Source	Stack Dia (m)	Velocity	Emissions passes through	SPM Concen-tration (mg/Nm^3)	SO_2 Concen-tration (mg/Nm^3)	NOx Concen-tration (mg/Nm^3)	Mercury
RABH (Kiln – 2 VRM)	5.00	13.81	RABH	16.20	1.15	296.85	--
Kiln –1 cooler ESP	2.250	8.36	ESP	18.10	--	--	--
Kiln –2 cooler ESP	3.80	14.68	ESP	17.95	--	--	--
Coal Mill-1	0.80	10.75	Bag Filter	20.60	--	--	--
Coal Mill –2	1.20	15.36	Bag Filter	18.76	--	--	--
Coal Mill –3	1.50	14.31	Bag Filter	16.85	--	--	--
Cement Mill – 1	0.580	Not In Operation	Bag Filter	Not In Operation	--	--	--
Cement Mill –2	0.50	6.25	Bag Filter	15.75	--	--	--
Cement Mill –3	1.40	10.68	Bag Filter	16.10	--	--	--
Cement Mill –4	1.40	11.01	Bag Filter	13.86	--	--	--
Packing plant-I	0.680	6.91	Bag Filter	Not In Operation	--	--	--
Packing plant-II	1.270	9.65	Bag Filter	15.59	--	--	--
Packing plant-III	1.270	8.99	Bag Filter	19.62	--	--	--
Lime Stone Crusher	1.400	9.28	Bag Filter	19.20	--	--	--
18MW CPP	3.500	8.32	ESP	21.75	--	--	0.01

8.2.2 Ambient Air Quality

Ambient air quality monitoring is carried out on monthly at the following locations in the factory premises and Buffer Zone Villages to know the status of the ambient air quality.

1. Plant Main Gate
2. Mattampally Village
3. Pedaveedu Village
4. Gullapally Village
5. Ramachandrapuram Village

Note: The Ministry of Environment and Forest (MOEF) New Delhi, has given amendment on 16th November 2009 for revised standards for Ambient Air Quality Standards. M/s. Sagar Cements Ltd. has following the same Standards.

Ambient air quality is monitored for 8 hours at each station for the estimation of Particulate Matter – PM_{10}, Particulate Matter – $PM_{2.5}$, Sulphur dioxide and Nitrogen dioxide. Average values for the parameters monitored are presented in the table 8.2. The analyzed values for PM_{10}, $PM_{2.5}$, SO_2 and NO_2 are within the limits prescribed by T.G.P.C.B.

Table 8.2
Average values of Ambient air quality data

S.No.	Location	Parameters				
		PM_{10}	$PM_{2.5}$	SO_2	NO_2	Co
1	Plant Main Gate	62.18	26.45	12.09	24.27	0.04
2	Mattampally Village	53.91	21.55	10.18	20.73	0.03
3	Pedaveedu Village	55.82	22.27	9.00	19.82	0.02
4	Gullapally Village	50.55	19.18	6.82	16.73	0.01
5	Ramachandrapuram Village	51.64	19.55	10.27	21.27	0.01

Note: All the values are expressed as ($\mu g/m^3$)

8.2.3 Noise Pollution

Noise Levels are measured at various places in the factory premises by using a sound level meter and the results are given in the table 8.3

Table 8.3

Average values of Ambient Noise Levels Data

S.No.	Location	Noise Levels in dB(A)	
		Day Time	Night Time
1	Near Main Gate	63.44	58.21
2	Near Gullapally Village	53.01	45.38
3	Near Ramachandrapuram Village	52.33	44.78
4	Near Mattampally Village	54.37	46.54
5	Near Pedaveedu Village	54.70	46.96

Note: 1. Day time is reckoned in between 6 am and 10pm – Limit <75 dB(A)
2. Night time is reckoned in between 10 p.m. and 6 a.m. Limit <70 dB (A)

9. GREENBELT DEVELOPMENT

Greenery / plantation recharge oxygen into environment. Greenbelt development may have the following benefits.

a. Mitigation of fugitive emissions including odour

b. Noise pollution control

c. Improving the local echo-system

d. Arresting the soil erosion

e. Improving the landscape of the area

f. Aesthetics

Spatial and compositional design of greenbelt for environmental management is done after considering the following factors.

i) Topography of the area

ii) Climate and soil quality of the area

iii) Flora and fauna spread over the area

iv) Pollutants source identification and their nature and concentration levels

Keeping in view of the above factors, the greenbelt with a functional scope is arranged as specified below.

a) Curtain Plantation: A green belt of 50-60 m thickness along the outer periphery of the project land area is developed. Plantation density is 1,500 to 2,000 plants/ha.

b) Lung Plantation: Free and empty places around office block, store and laboratory are planted with trees and shrubs. Enough open space is made available for developing lawns and gardens.

c) Ornamental Plantation: Flowering trees and shrubs are planted near office block and in lawns to improve the landscape of the area.

d) Avenue Plantation: Trees are planted in two rows on either side of the road to improve the landscape and give healthy air and shadow to the passers by.

The factory is growing various types of trees within the premises and is taken lot of interest in greenbelt development around the plant. The industry has developed greenbelt of about 50 different plants and the same is well maintained. Greenbelt is developed constantly and it is proposed to plant about 1,000 new plants next financial year.

10. HOUSE KEEPING

Proper cleaning of the different sections is required to maintain healthy environment, to avoid unnecessary loss and a good quality product. Stores to be maintain properly. Factory premises are to be clean and green to have good house keeping. M/s. SAGAR CEMENTS LTD, is invested Rs. 2,56,31,572/- (Rupees Rupees two crore fifty six lakhs thirty one thousand five hundred seventy two only) by pollution control equipment's maintenance, Damaged bags replacement, analysis charges, AMC and greenbelt development works. House keeping & Green belt developed has been found to be well.

11. AUDITOR'S COMMENTS

1. The audited figures show that the water consumption has been decreased slightly.
2. The consumption of basic raw materials Whole have remains same compared to 2024-2025.
3. Emissions from the stacks are within the prescribed limits of T.G.P.C.B.
4. The unit generates hazardous waste like waste oil, it is sent to recyclers Authorized by T.G.P.C.B.
5. The audit activities have enabled the plant authorities to run efficiently pollution control facilities.

DEVI REDDY NAGARJUNA REDDY
Auditor's Signature

Digitally signed by DEVI REDDY NAGARJUNA REDDY
DN: c=IN, o=PERSONAL, title=6948, pseudonym=9ec927375e4d45b3a61e251ff984b161, 2.5.4.20=708a08f0e57cb1c60448c3127ef636cffc15803db2b4f10a110be4e28dca3f61, postalCode=500038, st=Telangana, serialNumber=6c3a063acbbd3a05fe5a5df8901d1117b94ea46c8ca028c5afc4e7ac279d0fd9, cn=DEVI REDDY NAGARJUNA REDDY
Date: 2025.09.11 18:32:51 +05'30'

APPENDIX-A

MINISTRY OF ENVIRONMENT AND FORESTS

NOTIFICATION

New Delhi, the 16th November, 2009.

NATIONAL AMBIENT AIR QUALITY STANDARDS

G.S.R. 826 (E) In exercise of the powers conferred by section 6 and section 25 of the Environment (Protection) Act, 1986, (29 of 1986), the Central Government hereby makes the following rules further to amend the Environment (Protection) Rules, 1986, namely:-

1. (1) These rules may be called the Environment (Protection) seventh Amendment Rules, 2009.
   (2) They shall come into force on the date of their publication in the Official Gazette.
2. In the Environment (Protection) Rules, 1986, (hereinafter referred to as the said rules), In rule 3, in sub-rule (3B), for the words, brackets, figures and letters, "In columns (3) to (5) of Schedule VII" the words, brackets figures and letters "in columns (4) and (5) of Schedule VII" shall be substituted.
3. For Schedule VII to the said rules and entries relating thereto, the following Schedule and entries shall be substituted, namely:--

S. No.	Pollutant	Time weighted average	Concentration in Ambient Air		
			Industrial , Residential, Rural and Other area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
1.	Sulphur dioxide (SO_2), µg/m^3	Annual Average*	50 µg/m^3	20 µg/m^3	1. Improved West and Gaeke Method 2. Ultravoilet Fluorescence
		24 hours**	80 µg/m^3	80 µg/m^3	
2.	Nitrogen Dixodie (NO_2) µg/m^3	Annual Average*	40 µg/m^3	30 µg/m^3	1. Modified Jacob & Hochheiser (Na-Arsenite) Method 2. Chemiluminescence
		24 hours**	80 µg/m^3	80 µg/m^3	
3.	Particulate Matter (Size less than 10 µm) or PM_{10} µg/m^3	Annual Average*	60 µg/m^3	60 µg/m^3	1.Gravemetric 2. TOEM
		24 hours**	100 µg/m^3	100 µg/m^3	3. Beta attenuation
4	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$ µg/m^3	Annual Average*	40 µg/m^3	40 µg/m^3	1. Gravimetric 2. TOEM
		24 hours**	60 µg/m^3	60 µg/m^3	3. Beta attenuation
5.	Ozone (O_3) µg/m^3	8 hours	100 µg/m^3	100 µg/m^3	1. UV photometric 2. Chemilminescence
		1 hour	180 µg/m^3	180 µg/m^3	3. Chemical Method
6.	Lead (Pb) µg/m^3	Annual Average*	0.50 µg/m^3	0.50 µg/m^3	1. AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper 2. ED-XRF using Teflon filter
		24 hours**	1.0 µg/m^3	1.0 µg/m^3	

7.	Carbon Monoxide (CO) mg/m^3	8 hours**	02 mg/m^3	02 mg/m^3	Non dispersive infra Red (NDIR) spectroscopy
		1 hour	04 mg/m^3	04 mg/m^3	
8.	Ammonia (NH_3) $\mu g/m^3$	Annual Average*	100 $\mu g/m^3$	100 $\mu g/m^3$	1. Chemiluminescence 2. Indophenol blue method
		24 hours**	400 $\mu g/m^3$	400 $\mu g/m^3$	
9.	Benzene (C_6H_6 $\mu g/m^3$)	Annual Average	05 $\mu g/m^3$)	05 $\mu g/m^3$)	1. Gas chromatography based continuous analyzer 2. Adorption and Desorption followed by GC analysis
10.	Benzo (a) Pyrene (BaP) particulate phase only, ng/m^3	Annual Average	01 ng/m^3	01 ng/m^3	Solvent extraction followed by HPLC/GC analysis
11.	Arsenic(As) ng/m^3	Annual Average	06 ng/m^3	06 ng/m^3	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12.	Nickel (Ni), ng/m^3	Annual Average	20 ng/m^3	20 ng/m^3	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

- Annual Arithmetic mean of minimum 104 measurements in a year at particular site taken twice a week 24 hourly at uniform intervals.
-

** 24 hourly / 8 hourly or 01 hourly monitored values, as applicable, shall be complied with the 98% of the time in a year. 2 % of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits Specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

APPENDIX-B

Standards for Stack Emissions

PARAMETERS		**(mg/Nm^3)**
1. Suspended particulate matter concentration	(SPM)	30
2. Sulphur dioxide concentration	(SO_2)	100
3. Oxides of Nitrogen Concentration	(NOx)	800
4. Oxides of nitrogen Concentration (18MW CPP Plant)		100
5. Ammonia concentration	(NH_3)	50
6. Hydrochloric acid fume (Acidmist) concentration	(HCL)	35
7. Chlorine concentration	(Cl_2)	07

APPENDIX-C
AMBIENT AIR QUALITY STANDARDS IN RESPECT OF NOISE

G.S.R. 158 (E) dt. 09-3-2009

The Environment (Protection) Rules, 1986 (See rule 3)

Area Code	Category of Area	Limits in dB(A)	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note : 1. Day time is reckoned in between 6 am and 10 pm.
2. Night time is reckoned in between 10 pm and 6 am.
3. Silence Zone is defined as areas upto 100 m around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the competent authority. Use of vehicular horns, loud speakers and bursting of crackers shall be banned in these zones.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the competent authority and the corresponding standards shall apply.

APPENDIX-D

GENERAL STANDARDS FOR DISCHARGE OF EFFLUENTS
[Schedule II inserted vide G.S.R. 919 (E) dt. 12-9-1988 Published in the Gazette No. 488 dt. 12-9-1988]
The Environment (Protection) Rules, 1986 (See rule 3)

Sl. No.	Parameter	Standards			
		Inland Surface Water	Public Sewers	Onland for Irrigation	Marine Coastal areas
1	2	3			
		a.	b.	c.	d.
1	Colour and Odour	See Note 1	---	See Note 1	See Note 1
2	Suspended Solids, mg/L, max	100	600	200	a. For process waste water 100 b. For cooling water effluent- 10% above total suspended matter of influent cooling water
3	Particle size	Shall pass 850 micron IS sieve	---	---	a. Floatable solids max- 3 mm b. Settleable solids max-850 µ
4	Dissolved Solids (inorganic), mg/L, max	2100	2100	2100	---
5	p^H value	5.5 – 9.0	5.5 – 9.0	5.5 – 9.0	5.5 – 9.0
6	Temperature ^OC, max	Shall not exceed 40 in any section of the stream within 15 m downstream from the effluent outlet	45 at the point of discharge	---	45 at the point of discharge
7	Oil & Grease, mg/L, max	10	20	10	20
8	Total Residual Chlorine, mg/L, max	1.0	---	---	1.0
9	Ammonical Nitrogen (as N), mg/L, max	50	50	---	50
10	Total Kjeldahl Nitrogen (as N), mg/L, max	100	---	---	100
11	Free Ammonia (as NH_3) mg/L, max	5.0	---	---	5.0
12	Biochemical Oxygen Demand (5 day at 20 ^OC), mg/L, max	30	350	100	100
13	Chemical Oxygen Demand, mg/L, max	250	---	---	250
14	Arsenic (as As), mg/L, max	0.2	0.2	0.2	0.2
15	Mercury (as Hg), mg/L, max	0.01	0.01	---	0.01
16	Lead (as Pb), mg/L, max	0.1	1.0	---	1.0
17	Cadmium (as Cd), mg/L, max	2.0	1.0	---	2.0

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Sl. No.	Parameter	Standards			
		Inland Surface Water	Public Sewers	Onland for Irrigation	Marine Coastal areas
1	2	3			
		a.	b.	c.	d.
18	Hexavalent Chromium (as Cr^{+6}), mg/L, max	0.1	2.0	---	1.0
19	Total Chromium (as Cr), mg/L, max	2.0	2.0	---	2.0
20	Copper (as Cu), mg/L, max	3.0	3.0	---	3.0
21	Zinc (as Zn), mg/L, max	5.0	15.0	---	15.0
22	Selenium (as Se), mg/L, max	0.05	0.05	---	0.05
23	Nickel (as Ni), mg/L, max	3.0	3.0	---	5.0
24	Boron (as B), mg/L, max	2.0	2.0	2.0	---
25	Percentage Sodium, max	---	60.0	60.0	---
26	Residual Sodium Carbonate, mg/L, max	---	---	5.0	---
27	Cyanide (as CN), mg/L, max	0.2	2.0	0.2	0.2
28	Chloride (as Cl), mg/L, max	1000	1000	600	---
29	Fluorides (as F), mg/L, max	2.0	15.0	---	15.0
30	Dissolved Phosphate (as P), mg/L, max	5.0	---	---	---
31	Sulphate (as SO_4), mg/L, max	1000	1000	1000	---
32	Sulphide (as S), mg/L, max	2.0	---	---	5.0
33	Pesticides	Absent	Absent	Absent	Absent
34	Phenolic Compounds (as C_6H_5OH), mg/L, max	1.0	5.0	---	5.0
35	Radio Active Materials: a. Alfa Emitters µc/mL, max b. Beta Emitters µc/mL, max	10^{-7} 10^{-6}	10^{-7} 10^{-6}	10^{-8} 10^{-7}	10^{-7} 10^{-6}

Note : 1. All efforts should be made to remove colour and unpleasant odour as far as practicable.

2. The standards mentioned in this notification shall apply to all the effluents discharged, such as industrial mining and mineral processing activities, municipal sewage, etc.

3. Omitted by Rule 2 of the Environment (Protection) Fourth Amendment Rules, 1992 vide Notification G.S.R. 797 (E) dated 01-10-1992, Gazette No. 396 dated 01-10-1992.

APPENDIX-E
TEST CHARACTERISTICS FOR DRINKING WATER (IS:10500-2012)

Sl. No.	Substance of Characteristic	Require-ment (Acceptable Limit)	Permissible Limit in the Absence of Alternative Source	Methods of Test (Ref. To IS)	Remarks
1	2	3	4	5	6
i.	Colour, Hazen units, max	5	15	3025 (Part 4)	Extended to 15 only if toxic substances are not suspected, in absence of alternative sources.
ii.	Odour	Agreeable	Agreeable	3025 (Part 5)	a. Test cold and when heated b. Test at several dilutions
iii.	Taste	Agreeable	Agreeable	3025 (Part 7 & 8)	Test to be conducted only after safety has been established
iv.	Turbidity, NTU, max	1	5	3025 (Part 10)	---
v.	p^H value	6.5 – 8.5	No relaxation	3025 (Part 11)	---
vi.	Total Hardness (as $CaCO_3$) mg/L, max	200	600	3025 (Part 21)	---
vii.	Iron (as Fe), mg/L, max	0.3	No relaxation	3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
viii.	Chlorides (as Cl), mg/L, max	250	1000	3025 (Part 32)	---
ix.	Residual, free Chlorine, mg/L, min	0.2	1	3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is requierd, it should be min. 0.5 mg/L
x.	Dissolved Solids, mg/L, max	500	2000	3025 (Part 16)	---
xi.	Calcium (as Ca), mg/L, max	75	200	3025 (Part 40)	---
xii.	Copper (as Cu), mg/L, max	0.05	1.5	3025: 1964 (Part 42)	---
xiii.	Manganese (as Mn), mg/L, max	0.1	0.3	3025:(Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiv.	Sulphate (as SO_4), mg/L, max	200	400	3025 (Part 24)	May be extended to 400 provided that magnesium does not exceed 30
xv.	Nitrate (as NO_3), mg/L, max	45	No relaxation	3025 (Part 34)	---
xvi.	Fluoride (as F), mg/L, max	1.0	1.5	3025: (Part 60)	---

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Sl. No.	Substance of Characteristic	Require-ment (Acceptable Limit)	Permissible Limit in the Absence of Alternative Source	Methods of Test (Ref. to IS)	Remarks
1	2	3	4	5	9
xvii	Phenolic compounds (as C_6H_5OH), mg/L, max	0.001	0.002	3025: (Part 43)	---
xviii.	Mercury (as Hg), mg/L, max	0.001	No relaxation	IS 3025 (Part 48)/ Mercury Analyser	---
xix.	Cadmium (as Cd), mg/L, max	0.003	No relaxation	IS 3025 (Part 41)	---
xx.	Selenium (as Se), mg/L, max	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	---
xxi.	Arsenic (as As), mg/L, max	0.01	0.05	3025 (Part 37): 1988	---
xxii.	Cyanide (as CN), mg/L, max	0.05	No relaxation	3025 (Part 27)	---
xxiii.	Lead (as Pb), mg/L, max	0.01	No relaxation	IS 3025 Part 47	---
xxiv.	Zinc (as Zn), mg/L, max	5	15	39 of 3025: 1964 (Part 49)	---
xxv.	Anionic detergents (as MBAS), mg/L, max	0.2	1.0	Annex K of IS 13428	---
xxvi.	Chromium (as Cr^{+6}), mg/L, max	0.05	No relaxation	IS 3025 (Part 52)	---
xxvii	Polynuclear aromatic hydrocarbons (as PAH), g/L, max	0.0001	No relaxation	APHA 6440	---
xxviii	Mineral Oil, mg/L, max	0.05	No relaxation	Clause 6 of IS 3025 (Partc39) infrared Partition Method	---
xxix	Pesticides, mg/L, max	Absent	0.001	---	---
xxx	Radioactive materials: a. Alpha emitters, Bq/L, max b. Beta emitters, pci/L, max	 0.1 1.0	 No relaxation No relaxation	 Part – 2 Part - 1	 --- ---
xxxi	Alkalinity, mg/L, max	200	600	13 of 3025: 1964 (Part - 23)	---
xxxii	Aluminum (as Al), mg/L, max	0.03	0.2	31 of 3025: 1964(Part - 55)	---
xxxiii	Boron, mg/L, max	0.5	1.0	29 of 3025: 1964 (Part - 57)	---

Note: Atomic Absorption Spectrophotometer method, may be used.

APPENDIX-F
PLANT SPECIES FOR GREEN BELT DEVELOPMENT

Sl. No.	BOTANICAL NAME	COMMON NAME	SIZE AND TYPE SUITABLE SIZE
1.	Acia auriculaeformis (Mimosaceae)	H: Vilaiti	M: Semi evergreen fragrant white flowers. Suitable in green belts on road sides.
2.	Adina cordifolia (Rubiaceae)	T: Pasupukadamba H: Haldu	L: Deciduous a light demander, suitable on open areas & near flares.
3.	Aequle marmelos (Rutaceae)	T: Bilavamu H: Bael	M: Deciduous, good for green belts for green belts near temples.
4.	Anogeissus latifolia (Combretaceae)	T: Chirimanu H: Dhaura	M: Deciduous, good for green belts near temples
5.	Artabotrys hexapetius (Annonaceae)	T: Monaranjani H: Hara Champa	S: Evergreen shrub with fragrant flowers good for gardens & inside boundary wall and long canals.
6.	Averrhoa carambola (averrhoaceae, Oxalidaceae)	T: Kamaarakkarmel H: Kamrak	S: Semi evergreen good in narrow belts (green belts <50m width) along channels
7.	Azadirachta indica (Meliaceae)	T: Vepachettu H: Nim	L: Evergreen, suitable in green belts and out side office & hospital buildings
8	Bauhinia Variegata (Caesalphiniaceae)	T: Devakanchanamu H: Rachanaram	M: Deciduous, good in green belts, garden and as a second row avenue tree.
9.	Borassus flabellifer (Arecacese; Palmae)	T: Taadi H: Tad	L: A tall deciduous, palm, can be used as wind break when of different age.
10.	Bosellia serrata (Burseraceae)	T: Phirangi saambraani H: Kunder	M: Deciduous suitable on green shallow soils.
11.	Burera serrata (Bureraceae)	T: Chitreka	M: Deciduous suitable on shallow soils as a green belt or avenue tree.
12.	Butea monosperma (Fabaceae)	T: Mlduga H: Palas	M: Deciduous for green belt and as a second row avenue tree.
13.	Caesalpinia pulcherrima (Leguminosae)	T: Pamiditangedu H: Gulutora	M: A large shrub suitable for gardens outside office and along channels
14	Callistemon lanceolatus (Myrtaceae)	T: Bottle Brush	M: Deciduous for some time, ornamental plant in garden
15.	Careva arobora (Lecythidaceae)	T: Araya H: Kumbi	L: Deciduous, good in green belts.
16.	Carrisa carandas (Apocynaceae)	T: Vaka H: Karaunda	S: semi evergreen, large bushy shrub, good as a hedge to protect against noise.
17.	Caryota urenus (Palmae)	T: Jilugujattu H: Mari	M: A lofty palm, good as a wind break.
18.	Cassia fistula (Leguminosaae)	T: Rela H: Amaltas	M: Deciduous good ornamental tree in green belt.
19	C. Siamea	T: Sima Tangedu	L: Evergreen good as avenue tree
20.	Casuarina equisetifolia	T: Sarugudu H: Jungli s aru	M: Evergreen, suitable for covering low-lying areas and in green belt.
21.	Cadrela toons	T: Nandichettu H: Mahanim	L: Deciduous, good in open spaces, in green belts and along ponds.
22.	Cestrum diurnum	H: Din-ka-maja	S: A shrub with white fragrant flowers, suitable (solanaceae) around boilers and waste disposal sites.

(Contd..)

PLANT SPECIES FOR GREEN BELT DEVELOPMENT

Sl.No.	BOTANICAL NAME	COMMON NAME	SIZE AND TYPE SUITABLE SIZE
23.	Cleistanthus collinus (Euphorbiaceae)	T: Kadishe H: Garari	S: Deciduous tree suitable in green belts.
24.	Cocus nucifera (palmae)	T: Kobbarichettu H: Nariyal	L: A tall stately palm suitable on sea shore river banks and hill slopes.
25.	Clestanthus collimus (Leguminosae)	T: Errasissu H: Shisham	M: Deciduous, suitable on areas around flare sites and in green belts.
26.	Delomix reqia (Leguminosae)	T: Shimasankesual H: Gulmohar	M: Deciduous ornamental, suitable on road sides.
27.	Dillenia inidica	T: Peddakalinga H: Chalta	L: Evergreen, white fragrant flowers, goon in green belts and around waste disposal sites.
28.	D. pentagyna	T: Chinnakalinga H: Aggai	L: Deciduous, good in green belts and onsite around flare.
29.	Emblica officianallis (Euphorbiaceae)	T: Amalakamu H: Amla	M: Deciduous, good as isolated trees in garden
30.	Erythrina suberosa (Leguminosae)	T: Barijama H: Dauldhak	M: Deciduous, good in green belts
31.	E. variegata	T: Badisa H: Dadap	M: Deciduous, good in gardens outside office buildings.
32.	Ficus bengalensis (Moraceae)	T: Marri H:Bargad	L: Deciduous, widely spread avenue tree (15 m apart)
33.	F. religiosa	T: Bodhi H:Pipal	L: Deciduous, widely spaced avenue tree also a single tree in isolated sites.
34.	Emelina arborea (Verbenaceae)	T: Gumartek H: Sewan	M: Deciduous, good in green belts around flare sites.
35.	Grewia tiloifolia (Tiliaceae)	T: Charachi H: Dhamim	M: Deciduous, good in green belts for use as timber
36.	Hamelen patens		S: Evergreen shrub with dense atractive foliage of greenish bronze leaves; good in gardens.
37.	Hardwicka binata (Leguminosae)	T: Yepi H: Anjan	M: Deciduous, good for green belts on shallow soils.
38.	Hibiscus mutabilis (Malvaceae)	H: Sthal Kamal	S: Large bushy shrub, semi evergreen good in green belts & in gardens, along channels.
39.	H.Rosa sinensis	T: Java Pusphamu	S: Evergreen woodly showy shrub good for gardens.
40.	Lxora arborea	T: Korivipala H: Navari	S: Much branched evergreen, good in green belts and in gardens.
41.	Lxora coccinea	T: Mankana H: Rangan	S: Much branched evergreen, good in garden and in green belts.
42.	Jasminum sambur (Oleaceae)	T: Boddumalle H: Moghra	s: Much branched evergreen, good in garden and in green belts.
43.	Kydia calycina (Malvaceae)	T: Potri H: Pula	S: Deciduous, good along canals and in green belts.
44.	Lagersteoemia speciosa (Lythaceae)	T: Varagogu H: Jarul	M: Deciduous, good along road sides and in garden

(Contd..)

PLANT SPECIES FOR GREEN BELT DEVELOPMENT

Sl.No.	BOTANICAL NAME	COMMON NAME	SIZE AND TYPE SUITABLE SIZE
45.	Lannea coramandelica (Anacardiaceae)	T: Appriyada H: Jhingan	L: Deciduous, good on well drained green belts and around flares.
46.	Lawsonia alba (Lythraceae)	T: Goranti H: Mehndi	S: Glabrous much branched shrub, good along canal sides.
47.	Locbnera rosea (Apocyenaceae)	T: Bilaganuueru H: Sadabahar	S: An erect perennial herb; good in garden and along small channels.
48.	Madhuca indica (Sapotaceae)	T: lppa H: Mahua	M: Deciduous, good in green belts
49.	Mallotus philippensis (Euphorbiaceae)	T: Kunkuma H: Sidur	S: small evergreen good along channels
50.	Melia azedarach (Meliaceae)	T: Turaka Vepa H: Bakain	M: Deciduous good along small roads, and canals.
51.	Millingtonia hortensis (Bignoniaceae)	T: Kavuki H: Akas Nim	L: Semi evergreen flowers fragrant, good along roadsides.
52.	Mimusops elengi (Sapotaceae)	T: Pogada H: Maulsari	M: Evergreen, good for avenues
53.	Moringa oleifera (Moringaceae)	T: Muluga H: Sainjna	M: Deciduous, with fragrant flowers, good in green belts.
54.	Murrava koenigi (Rutaceae)	T: Karepaku H: Mitha neem	S: Semi evergreen good in green belts and along small channels
55	Oreodoxa reqia (Palmae)	Royal palm	L: Semi evergreen good medium and small road sides as an ornamental plant.
56.	Pandanus odoratissimus (Pandanaceae)	T: Mugali H: Kewada	S: A densely branched shrub good in gardens near seashore
57.	Peltophorum inerme (Leguuminosae, Caesalphiniaceae)	T: Kondachinta	M: Semi evergreen, suitable on road sides, in in gardens & outside buildings.
58.	Plumeria acuuminata (Apocynaceae)	T: Vaala Ganneru H: Golainchi	M: Semi evergreen, fragrant white flowers, good in green belts.
59.	Plumeria alba	T: Veyui Varahaalu	S: Semi evergreen good for gardens
60.	Plumeria rubra	T: Nurruvarahalu H: Golainchi	S: semi evergreen good for gardens
61.	Pterocarpus marsupium (Leguminosae, Paplionaceae)	T: Vegi H: Bija	M: Deciduous, good on open areas with adequate light
62.	Pogamia pinnata (Leguminosae, Paplionaceae)	T: Ganuuga H: Karanj	M: Deciduous, good along roads & canals.
63.	Rauvolfa serpentina (Apocynaceae)	T: Paataalagani H: Chandrabhaga	S: An erect evergreen perennial shrub good along canal.
64.	Salmalia malabarica	T: Booruga H: Semul	M: Deciduous, Good for avenues
65.	Samanea saman (Leguminosae)	T: Nidraganneru	L: Deciduous, good tree along road sides for shade.
66.	Saraca indica (Leguminosae, Caesalpinaceae)	T: Ashoka H: Asok	M: Evergreen tree good on road sides within campus

(Contd..)

PLANT SPECIES FOR GREEN BELT DEVELOPMENT

Sl.No.	BOTANICAL NAME	COMMON NAME	SIZE AND TYPE SUITABLE SIZE
67.	Spathodia campanulata (Bignoniaceae)	T: Patadiya H: Runugtora	L: In gardens and avenues and in green belts, it is deciduous.
68.	Sykzygium cumini (Myyrtaceae)	T: Neeredu H: Jaman	L: Evergreen tree, good in green belts and within campus and road sides.
69.	Tabernamontana coronaria (Apocynaceae)	T: Gandhitagarapu H: Chandni	S: An evergreen shrub good in gardens and along canals.
70.	Tabebuia pentaphylla (Bignomiaceae)		M: Deciduous, good in gardens
71.	Tamarindus indica (Leguminosae,Caesalphiniaceae)	T: Chintachettu H: Imli	L: Semi evergreen tree along state & national highways suitable site.
72.	Ticoma stans (Bignomiaceae)	T: Pachgotla	L: Evergreen tree, good in garden and along canals.
73.	Tectona grandis (Verbenaceae)	T: Adviteeku H: Sagwan	M: Deciduous, good in green belts and on inner sides of roads.
74.	Terminalia alata (Combretaceae)	T: Tani H: Sain	L: Deciduous, good in green belts near flare site
75.	Terminalia arjuna	T: Yerramadi H: Arjuna	L: Evergreen tree for road sides and in green belts.
76.	Terminalia bellirica	T: Tani H: Bahora	L: Deciduous, good in green belts.
77.	Terminalia bellirica	T: Badamchettu d H: Deshi Badam	L: Deciduous tree good near sea shore.
78.	Thespesia populanea (Malvaceae)	T: Gangaraavi H: Paras Pipal	M: Compact quick growing evergreen tree good along road sides.
79.	Thevetia peruviana (Apocynaceae)	T: Pachaganneru H: Pile, Kaner	S: An evergreen large shrub, has shady yellow, flowers, good around the waste treatment.
80.	Vitex negundo (Verbenanceae)	T: Vaavili H: Sambhaluu	S: A large shrub suitable on areas along channels and streams and on waste lands.
81.	Xylia xyicarpa (Eguminosae, Minosaceae)	T: Eravalu H: Jambu	L: Deciduous is green belts and on waste lands
82.	Zanthoxyium (Rutaceae)	T: Rhetsamaramu H: Badrang	M: Deciduous in green belts and on waste lands

NOTE: H Denotes Name in Hindi
T " Name in Telugu
S " Small size
L " Large size
M " Medium size