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MECHANIZED STABILIZATION AND FUGITATIVE EMUSSION

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ABSTRACT: -

Aim of the project is to recycle the waste material using some chemical components without affecting the nature and the process is made by machine not by manually. If the waste material like sludge waste or hazardous waste or medical waste or pharmaceutical waste like solid waste if it is exposed to into air the environment gets polluted. So, to overcome this we are introducing a machinery process called **MECHANIZED STABILIZATION AND FUGITATIVE EMUSSION SYSTEM**. In this the waste materials are first tested and gives the report by laboratory and gives a notice how amount of the lime, cement and fly ash should be taken and gets mixes with waste material and are gets dumped on to a platform called landfill. In this landfill the materials which are used for dumping a material is laying a sheet called HDPE (HIGH DENSITY POLY EYTHELENE) sheet on this sheet we are preparing a process of black soil, geotextile, sand, metal, leachate collecting pipes and this process is of 2 layers primary and secondary. On this layer we are going to unload the material which has been mixed by machinery. After few days or few months, the leachate is going to formed and it is collected into sumps and it is used as a sprinkler for SD (spray dryer) plant and gets formed into rock salt and is utilized for land fill. So, in this way we are going to recycle the waste material without disturbing the nature. The FUGITIVE EMUSSION SYSTEM is nothing but an exhaust fan which takes the chemical air into water droplets and gets filled in a drum its mixes with water and utilizes for an SD (spray dryer) plant. By this we can recycle a waste material which will be environmental free for using. The name it self-indicating us that WASTE MANAGEMENT PROJECT. In this for time saving process we are introducing a project of **MECHANIZED STABILIZATION AND FUGITATIVE EMUSSION SYSTEM.** This is the best way to protect an environment form pollution by recycling.

KEY WORDS: Sludge waste or hazardous waste or medical waste or pharmaceutical waste, soild waste, laboratory, lime, cement and fly ash, landfill, HDPE (HIGH DENSITY POLY EYTHELENE), black soil, geotextile, sand, metal, leachate collecting pipes, rock salt, exhaust fan SD (spray dryer) plant.

INTRODUCTION

All quality equipment supplied by "MACAHNIZED STABILIZATION" EQUIPMENT PVT LTD" are thoroughly inspected, tested and carefully loaded at the factory premises, before it is shipped. The total weight of the machine is approx. **15 tons.** To transport the complete machine generally Two Container of 40 ft. are required. Upon receipt of the equipment before unloading it, carefully inspect for any loss or damage that may have incurred during transportation. This should be followed by visual inspection and checking of material against the packing list given to the vehicle driver. If any loss of material or damage is noticed, immediately bring it to the drivers notice and get it signed by the vehicle driver on the transporter's copy. Also ask for respective forms from the vehicle driver for the future claim of the goods lost. Carefully unload the

equipment and preserve it from dusty, rusty, rainy atmosphere. Once the civil work, foundation, underground water tank, D.G. set and other required utilities are available, please call our after-sales service department who can either guide you or assist you to depute Service Engineer for erection & commissioning of the equipment. Please give at least three to seven days advance notice for the proper planning and prompt service to our esteem and valuable customers.

1.1Selecting a title

The main title is selected for the purpose of reducing a time or time managing and fast-moving process for the further conditions. It is totally of environmental free due to recycling process which have been going on.

Understanding the title

The title MECHANIZED STABILIZATION AND FUGITATION SYSTEM is the process of cutting and mixing the waste material into pieces and gets mixed well with chemical components to easy way to form leachate source with time saving process easily. Fugitive system is nothing but an exhaust fan with gets the chemical air into water droplets and forms into leachate.

Developing the title

The mechanism which we are introducing is the best way to reduce the pollution and gets an eco-friendly nature. The mechanism of the project is to develop a fasting moving process in order to save the time and gets faster to accomplish the product.

MECHANIZED STABILIZATION:

The process how it is started and the procedure of it is: -

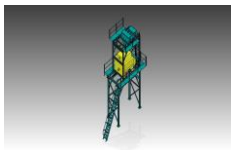
SKIP HOIST ASSEMBLY WITH AGGREGATE BUCKET:

Skip Hoist assembly with Aggregate Bucket is fitted with the chassis in inclined position, which collects the dry material from weighing conveyor in Aggregate Bucket and fed the material to Twin Shaft Mixer. Aggregate bucket is well designed as shown in picture which is driven by planetary gear box with dual speed electric brake motor of 20 HP. Aggregate Bucket is pulled up by wire rope & guided smoothly in track by 4 nos. Guide rollers. Total 4 nos. sensors are fitted in the track to define different four position of Aggregate Bucket. Two sensors are for Bottom & top position and other two nos. are used to change the bucket speed slow & fast. One discharge window is provided at bottom of Aggregate bucket. When filled Bucket is pulled up to top by wire rope, discharge window opens by mechanical arrangement to discharge the Aggregate in to Mixer. Aggregate bucket holds at the top as per pre set time and then starts to travel towards bottom to collect & bring material for next cycle. To avoid accident or mechanical damage, one limit switch is provided just nest to top sensor, as an Additional safety feature. This limit switch stops, over travelling of the bucket in case of top sensor's signal is not sensed/dropped.

MIXER MODULE WITH PLATFORM, RAILING & LADDER

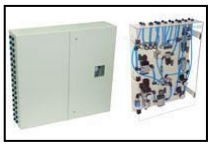
The Complete Mixer module comprising of Twin Shaft Max mech make mixer mounted on Heavy duty Structure made from I Beam & pipes, Cement & Water hopper, Additive jar, waiting hopper, Discharge hopper with necessary Plate form, railing & ladder for operation & Maintenance etc as shown in picture & listed below. As shown in picture Mixer Module structure is made from heavy duty I beam & Channel, well designed to absorb load & vibration as well as it is made sturdy for its longer life. Specious & comfortable Plate form of chequered plate is provided at all four sides of Mixer for easy operation, observation & maintenance. Plate form & Ladder are equipped with necessary railings for operator's safety.

Discharge height is designed to discharge the concrete directly in to Transit Mixer. The Mixer module is bolted in required different part for easy transportation & simple erection.



PNEUMATIC SYSTEM:

A separate pneumatic cabinet is provided, which is fitted at the lower Side frame of the Mixer Module structure, which consists of electrical, operated pneumatic valves, FRL unit, and pressure gauge with quick release type pneumatic piping.



AIR COMPRESSOR

The air compressor is mounted on the structure of the plant of 10.98 CFM having maximum pressure of 12 kg/cm^2 with 7.5 HP electric motor & tank volume of 225 lit. It is fitted with pressure adjusting device for Automatic switching on & off of compressor.

BHS' MAKE TWIN SHAFT MIXER

We provide indigenously manufactured MAXMECH make Twin Shaft Mixer of 2.25 m3 Batch size/capacity with standard specification for MCP-60-TS-SK Model. Twin Shaft Mixer is located at the top of the chassis & below the Cement Hopper & Water Hopper weighing frame. Twin Shaft Mixer is having dual Mixing shaft, manufactured from special grade of heavy Steel bar in horizontal position & both are rotating in opposite direction to each other. The two drive shafts rotation is well synchronized to ensure perfect timing clearance for the mixing arms and paddles. Different type of Mixing Paddle arms and mixing tips made of special grade material for anti-wear are bolted on both shaft for easy replacement. These Paddle arms & tips are bolted on the shaft at different angle to ensure homogeneous & proper mix quality. Twin Shaft Mixer tank from inside, is lined with special grade hardened anti wear liners for loner life. The mixer shafts are provided necessary bearing housings, oil seals & mechanical seals at the end plate of Mixer tank in such a way to avoid grout entering the bearings. These mechanical seals are automatically greased by a Grease Pump at regular interval during the operation. Inline Helical Gear box is connected with Spur Gear, for mechanical power transmission from connected electrical motor. At the bottom of Mixer eccentric door opening & closing system is provided for uniform discharge of material. The discharge door is operated by two pneumatic cylinders. The discharge width can be opened-controlled to three different widths to give gradual feeding of the mixed concrete into transit

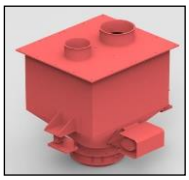
mixer. The mixer top is fully enclosed with a bolted steel cover having two open able cover for inspection cleaning & maintenance. The open able doors that give access to the Mixer are fitted with safety interlock limit switches for operator's safety which does not allow mixer to run, when the inspection cover is open. One aggregate inlet hopper is fitted at the top of mixer to receive material (Aggregate, Sand) collected by Aggregate Bucket. For receiving cement & water suitable provision is there on the top cover of Mixer Mixing arm made of special steel with required hardness for mixing aggregates up to 50 mm size & Replaceable side and Bottom liners are assembled in mixer for homogeneous mixing. One Conical discharge Hopper is mounted below the Mixer Discharge Gate, which deliver the Mix to Transit Mixer or Dumper.

CEMENT WEIGHER:

A Cement Hopper- Weigher is a steel fabricated vessel of 500 kg storage capacity. It is mounted at the top of Twin Shaft Mixer on separate structure. It is suspended on 3 nos. of shear beam type load cells. Cement Hopper is equipped with one vibration motor and one pneumatically operated butterfly valve for Discharge the cement in to Twin Shaft Mixer. This butter fly Valve is operated by Electromagnetic pneumatic actuator, having limit switch and indication of flap position.

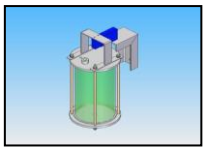
WATER WEIGHER

It consists of 2000 kg steel container of weighing capacity suspended on 3No. load cell (Shear beam type) of 500 kg each higher accuracy. Discharge of the vessel is of 200 diameter pneumatically operated butterfly valve with limit switch, indicating the flap position. One mono block water pump of 5 H.P. having connection of 2-inch X 2 ½ inch (cap. 850 to 450 lpm at 15 to 24mtr. head), with pneumatically operated feeding valve with suitable piping. Electromagnetic pneumatic actuator for operating the valve.



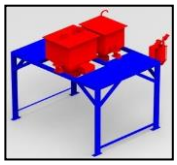
ADDTIVE FEEDING & WEIGHING

For Additive feeding 1 HP Mono block pump with suitable suction & discharge steel piping is provided with the Plant. Suction line will collect the additive from the Additive Barrel put on ground level and deliver the additive to acrylic container/vessel of 15 lit capacities, mounted above the Mixer. This Additive container is suspended on a load cell for weighing/ to measure the required quantity of additive. Acrylic additive container is provided a pressure relief valve for container's safety, which release the air pressure in case of discharge line is blocked & high air pressure is generated in the container.



CEMENT & WATER WEIGHER MOUNTING FRAME

As shown in below picture, one steel fabricated structure is mounted on the top of Mixer Module, which accommodates Water weigher & Cement weigher& Additive weigher. It is bolted with Mixer module for easy maintenance & transportation.



OPERATOR CABIN WITH ELECTRICAL CONTROL PANEL:

Fully Insulated Sandwich panel type cabin of suitable size with sufficient lights, Fan, interiors & provision for A/c. etc is provided for operation of the Plant, which gives enough comfort to Plant operator. Three nos. Glass window of large size are given on all three walls of cabin, from where all the operations can be seen easily. The complete plant can be operated from this Cabin by panel board. Fully Automatic Electronic control panel equipped with Printer for easy operation of the plant is mounted in above Control Cabin. The Dust proof electric / electronic control panel is provided in operator cabin from where operator can operate the Plant. All push buttons with light indications positioned according to the flow of material. All operations are carried out manually by operating the appropriate push buttons on the panel. A selector switch is provided to operate the plant in MANNUAL or AUTO mode. Single Integrated power & Control Panel with PLC of “B & R” make with operating software. Powerful recipe management (99 recipes) storage. Online batch weight information. User friendly Program software for concrete production and reporting system is provided as standard supply. Panel is also facilitated with push button station for manual operation. Possibility to enter 4 Aggregate components, Cement, 1 Water component & 1 Additive component. Emergency cut-off switch. Possibility to switch to manual operation. The control panel is powder coated to avoid frequent maintenance. PLC has large production data storage capacity. It is also equipped with online printout systems with printer.

MANUAL OPERATION:

Selector switch is put on MANNUL position & the plant is operated. In this mode depending upon the sequence of operation each and every push button is required to be operated one after the other. All inputs (Aggregate cement, Water & Additive) are feuded manually as per mix design. For every cycle the above sequence is repeated.

AUTO OPERATION:

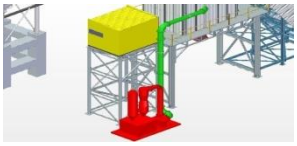
Selector switch is put on AUTO position & no. of batches & recipes to be selected, and then the plant is run by pressing one start push button only. Plant will stop automatically as soon as reselected numbers of batches are completed.

CEMENT FEEDING SYSTEM (optional):

For Cement feeding from ground level to Cement Hopper/Weigher mounted on the Plant above the Mixer, we provide Cos ben make heavy duty cement screw conveyor of 219 mm diameter, 10mt. long driven by 20 HP geared Motor Unit. Silo is fabricated vessel of Mild steel with necessary bolted legs & discharge connection suitable to screw conveyor inlet. Storage capacity of silo is 50 Cum with suitable silo accessory. This Cos ben make Screw Conveyor is connected in bottom of silo collect the cement from silo and deliver it to Cement Weigher.

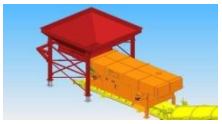
WET SCRUBBER MACHINE

Wet Scrubbers are effective air pollution control devices for removing particles dust from mixer exhaust pipe. A Wet Scrubber operates by introducing the dirty gas stream with a typically water.



BAG SLITTING MACHINE

The Machine is provided with Multi cut Blade, in multi cut, the bags are impaled onto a high-speed cutting knife. To impale the bags against the knife the machine literally “drops” the bag from a height of about 2 feet onto the blade. The moment the bag is slit, the material spills out. The rotating knife is adjustable for cutting depth. Bags are conveyed across the rotating knife. A set of adjustable rollers exert pressure on the bags, to ensure that they are fully cut by the knife cutter.



PROCEDURE HOW IT IS GOING TO WORK

Firstly, we get the permission from higher authorities of the area and how amount of waste is there and what type it is then the waste material is collected from an industrial companies like sludge waste pharmaceutical waste solid waste or any waste etc… The waste material is collected and tested by laboratory for sample collection and it is tested. In laboratory the sample fingerprint analysis is done. According to lab instructions the stabilization process is done. In this stabilization the waste material is analysed. Waste material is filled in an aggregate bucket and is cutted into some number of pieces and is collected by conveyer belt. Hydraulic cylinders are used for pushing the conveyer belt. The material is entered into bag cutting pullers. The material is dumped into conveyer belt. Conveyer belt takes the container box to the load. Next the material weight is checked it loads the amount of 15 tons. Next the waste material is dumped into the mixer and gets mixes with the quantity of lime fly ash and cement. These fly ash lime and cement is stored in siloes. The material of lime fly ash and cement is collected in siloes by the vacuum cleaner which is attached to it according to the quantity the control panel gives the indication and gets mixed. Then the weight of the material is checked and gets loaded by the container. The container gets unloaded at landfill. In this process the chemical smell is exhausted to avoid this we are using a fugitation system which is used as an exhaust fan in this it is collected the chemical air and forms into water droplets called leachate water and is utilized for SD (spray dryer) plant. In this landfill process there are of few steps of laying. On soil it is dig into 7 feet after that the black soil is placed on it after that HDPE sheet is placed. On this sheet we are going to place a materials like geotextile, sand, metal, leachate collecting pipes. It is of 2 layers primary and secondary on this we are placing a mixed waste material. After a few days or few months, the leachate is going to form and is collected by sumps. This leachate is used for SD plant for sprinkling and this leachate becomes a powdered salt. This salt is again used for landfill where the material is directly unloading. In this way the recycling process is going to happen. This project is an environmental free. Till now it is utilized by manually and it is too time taken process for stabilization now by introducing this machinery project it is going fast and this process is very easy way to control and fast-moving process for upcoming generation.

LAYING OF LANDFILL

FUGITATIVE SYSTEM OVER VEIW INTRODUCTION:

In today's world the Pollution of Air is Growing day by day, the main purpose of this system is to reduce the purify Air & Reduce the Environmental harmful gases from the targeted area. In this system the parts mainly that comprises are.

SUCTION HOODS

CYCLONE

WET SCRUBBER

BLOWER FAN UNIT

CARBON/NEUTRALIZING FILTER

SUCTION HOOD:

The primary function of suction hood is to suck the polluted air from the targeted area and these hoods shall act as input for the System and shall pass the air to next stage.

CYCLONE:

The primary function of this cyclone is to prefilter the dust particles that are contained in the air that has been passed through the hood. After prefiltering the air is circulated to Wet Scrubber for Scrubbing process.

WET SCRUBBER:

The primary function of the Wet scrubber is to remove the micro dust particles and to neutralize the gases in the air passing though the scrubbing process. In the scrubbing process water or any neutralizing Agent shall be spayed in the chamber to neutralize the Gases and to settle the micro dust particles and the wetted air shall be passed through Mist Eliminator / Water Drop Eliminator to filter the water / Liquid out from the scrubber.

BLOWER FAN UNIT:

The primary function of the Blower Fan unit is to generate required Suction to the entire System. The suction can be adjusted by adjusting the damper at the inlet of the fan. Suction of the Fan is Major part in the System any failure in the Suction shall affect the entire process.

CARBON/NEUTRALIZING FILTER:

The primary function of this unit is to filter remaining gases escaped from the process. In this unit the air shall be passed through the carbon / Neutralizing Agent Granules Sized about 8 – 12mm Approx. This is the final stage of filter and optional this can be used depending on the scrubbing process.

OPERATIONAL STEPS FOR FUGITATION SYSTEM: -

The system process shall be started as mentioned below. Before starting the Fujutation system below check points are to be checked. Check the suction hoods direction pointing towards the targeted area**.** Check water colour in the tank and water level. Open the Bottom side door of the cyclone to remove the dust already present. Check the valves are open at pump (only 50% - 60% of the inlet valve has to be opened and outlet should be 100 % opened). Check water spraying from the view glass by Turing on the pump. Check the position of the Inlet Damper attached to the Blower. (This must be closed before turning on the blower). Check the carbon filter unit so that no material jams the outlet. Open the duct damper of the suction hood towards the targeted area. Close the remaining duct damper (this can increase the suction capacity of the hood). Close the bottom side plate/door of the cyclone (if already opened). Turn on the pump of the scrubber. (If water level in the scrubber is below 65% of the level gauge, then first fill the tank and turn on the pump.) After waiting for at least 5 minutes. Turn on the Blower with Damper Closed. After settling the current to normal, slowly open the Damper of blower from closed to fully open position. Thus, the Entire System Shall be Turned on to Operational condition. If Any neutralizer has to be added to the system it can be added through Auxiliary Neutralizing Agent Valve (N5) The system process shall be stopped as mentioned below. To stop the process first turns off the Blower. After turning off the blower wait for 5 minutes and Close the Inlet Damper. After closing the Damper turn off the pump and wait until all the water is settled. After some time Open the Bottom Gate / Door of the Cyclone and remove the dust. Reclose the Gate of the Cyclone. Thus, the System is Shut downed

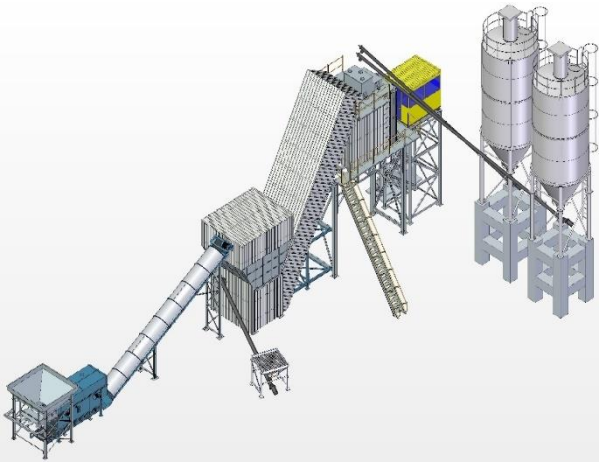
REFERENCES & WEBSITES

1.OPERATIONAL MANUAL OF AN INDUSTRY OF RAMKY ENVIRO PVT LTD Ramky Group

2. 4R Principle | Reduce, Reuse, Recycle & Recover | Waste Management (dreamcivil.com)

CONCLUSION

Here by we are concluding that mechanized stabilization process is going to happen for environmental free purpose to get reduce for pollution of air which we breathe by this process we can save our time and fast completion of loading. Till now it is used as manually now it will become easy way to work on it. By recycling the waste, it gets pollution free environment. A FES system is used as exhaust fan which gets turned the chemical air into chemical water droplets by this the air is getting an environmental free.



MACHANIZED STABILIZATION

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