

A Report
On
Industrial visit on 07.04.2018
At
Hindustan Waste Treatment Pvt, Ltd.,
Saligao Seminary, Goa



Submitted by
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Submitted to,
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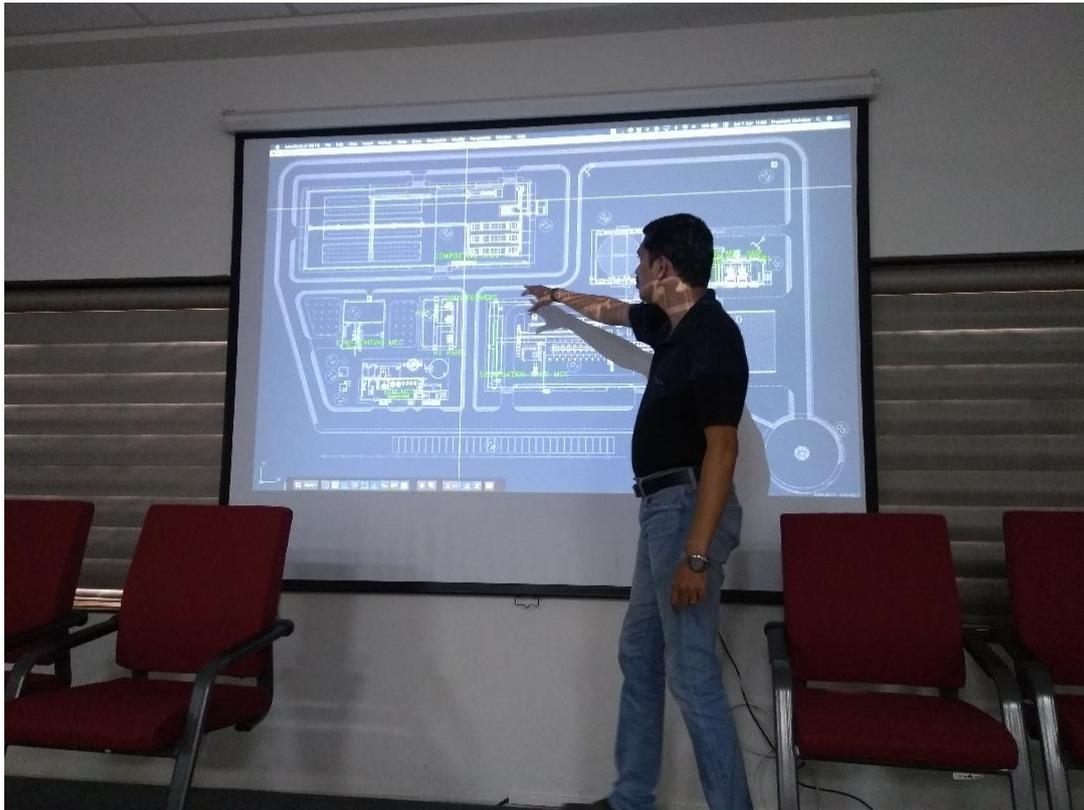
Introduction:

A study visit was organized on 07.04.2018 of final year Diploma in Electrical Engineering students at **Hindustan Waste Treatment Pvt, Ltd., Saligao Seminary, Goa**. Visit was started on 06 April 2018 at 10.30 am from Mangaon railway station by Mandovi Express. The visit was coordinated by Mr. Prashant Mohokar and Mrs. Mangal Pawar, distinguished Alumni of the Electrical Engineering Department. The visit comprised with 29 students (13 girls and 16 boys), five faculties (Dr. N. S. Lingayat, Mrs. D. S. Shet, Mr. P. V. Gaikwad, Miss. R. R. Jadhav and Mr. S. S. Cherphale) and the schedule of the visit was as follows:

Date	TIME	Activity
06-04-2018	10.30 AM	Departed from Mangaon by Mandovi Express
06-04-2018	7.00 PM	Reached Youth Hostel, Panjim, Goa
07-04-2018	8.00 AM to 2.00 PM	Visit at Hindustan Waste Treatment Pvt, Ltd., Saligao Seminary, Goa.
07-04-2018	2.00 PM to 8.00PM	Lunch and Sightseeing
07-04-2018	8.30 PM	Stay at Youth Hostel, Panjim, Goa
08-04-2018	8.30 AM	Departed from Thivim by Mandovi Express
08-04-2018	6.00 PM	Reached IoPE Lonere

About the waste treatment plant

The Saligao village-based plant is operated by Hindustan Waste Treatment Private Limited (HWTPL) and has attained the desired capacity of 100 tons a day. The facility also generates 4 MW of electricity, which is used to power the plant. "Weekend rush for Diwali, which saw tourist thronging on the beaches and littering, has also helped the plant scale up its garbage input," Kandaswamy said. Union Defence Minister Manohar Parrikar had opened the plant in May this year. The state government has entered ten-year-long agreement with HWTPL on BOOT (building-owning-operating-transferring the plant) basis. Fresh waste brought in from Calangute and Candolim village panchayats is being treated at the plant. Around 30-odd staff are actively associated with different jobs in waste segregation at the plant, while others are giving finishing touches to leftover civil works at the site. Presently, work at the garbage treatment plant (GTP) is being conducted in only one shift from 9.30 am to 6 pm. He further said that once work at the GTP gains full steam work at the plant will be undertaken in two shifts. "We require 30 staff per shift," he added. Mr. Richard had explained detailed process in seminar hall then we proceed towards the plant.



Presentation by Mr. Prashant Mohokar at the seminar hall



Prof.(Mrs.) D. S. Shet with students at the seminar hall

The plant relies on a combination of state-of-the-art waste treatment technologies borrowed from different parts of the world. The machinery that has

been installed has come from Germany and Italy. It's a fully automated process where machines will be used to sort and separate garbage.

In a whirlwind tour around the country's first of its kind treatment plant, the HR and Administration official, Nathan Vaz, who is well acquainted with the functioning of the units at the GTP, gave a detailed explanation of various processes involved in treating the waste at the state-of-the-art plant. The process to treat the waste begins right from the time the vehicles enter the gate of the GTP, where two weighing bridges access the amount of waste brought. The vehicles then empty the mixed waste at the tipping floor. A wheel loader later sweeps the waste from the floor and tips it into a conveyor belt, which further leads it into the bag shredder. Another conveyor belt then takes the waste further to the ballistic roller screen, where technology separates the garbage into dry and wet waste. Wet waste is channelled into the Orex machine and the dry waste is led to the manual sorting station.



Mr. Nathan giving brief introduction about the Plant our students

In the manual sorting station, 20 persons on either side of the conveyor belt manually separate dry waste into separate compartments – metal glass, coconut waste, PET bottles, plastic, paper, card board, thermocol/foam, clothes, rubber and RDF.



Manual Waste Segregation

A chain belt conveyor then feeds dry waste such as wrappers, paper, cardboards etc into a bailing machine, which compresses and bails the stock in uniform size. All the bailed scrap is then wrapped into a bail wrapper, which is now ready for transport and sale.

In the Orex machine, the pre-sorted organic or wet waste is compressed and the liquid fallout is routed to the fermenter, where it is further processed to extract methane gas, while the 'dry' part of the sludge like the plastic, chips packets etc is further treated and sent to be used as Refuse Derived Fuel (RDF).

All waste water that is accumulated from various sources while treating the garbage will be treated at the Effluent Treatment Plant (ETP) at the site. The treated water will then be used for cleaning and gardening.

From the fermenter, the waste liquid is routed to the ETP, while the dry compost waste is routed to three composting tanks in the composting shed, which dries it further. The compost is then further dried in the open. Later the compost is put into bags and is ready for use.

The more than 50,000 tons of old waste that was stacked near the GTP is being sorted and capped by the authorities.



Plant Machinery

“Most of this waste has turned into compost and could be good manure for plants. But since it was mixed garbage, some glass pieces and metal may find its way in it,” an official said. “It can be used as compost for lawns at roadside dividers and places where people don’t walk,” the official added.

Trial runs of the plant began around nine days back. Initially, only dry waste was treated at the site for first four days. For the last five days, mixed garbage has been treated at the plant.

According to the Goa State Infrastructure Development Corporation, which is entrusted with the project, the plant has been built at a cost of Rs 146 crore. GSIDC is executing the project which is contracted to SMC Infrastructure Pvt Ltd of Thane, Maharashtra.

It may be recalled the foundation stone for the Saligao-Calangute GTP was laid in November 2014.

A total of 1.46 lakh sq. mtr. of land was acquired by the government to set up the garbage treatment plant. Of the total area, 8,080 sq mt has been acquired from Saligao comunidade and 1.38 lakh sq. mtr. from Calangute comunidade.

The GTP will also have a gym, health centre, administrative block, gents and ladies rest room, guest room, canteen, fire-fighting unit and other allied facilities. Elaborate space has also been earmarked for truck, car and two-wheeler parking facilities.

COST

Cost of the plant: Rs. 145.95 Cr Total capital grant: Rs. 299 Cr. 10 years.
Total operational support grant: Rs. 70 Cr for 10 years.

SIZE

Area of 1,21,580 sq m acquired from the comunidades of Calangute and Saligao Plant occupies 50,000 sq m (35,000 sq m for plant and 15,000 sq m for landfill) Plant capacity is 100 tonnes of garbage per day.

The plant sorts and treats garbage through:

- A plastic bag opener sourced from Germany
- Material segregation and organic extrusion machine from Germany
- Biomethanation composter from Italy
- Screening and wind sifter from Germany
- Biogas electricity generator from USA



Mr. Prashant Mohokar explaining students PLC and SCADA system



Mr. Prashant Mohokar explaining control panels

The plant has minimum human intervention and most of the processes are computer-controlled

- Composting and maturation of dewatered sludge will produce manure
- The functioning of the plant and selection of technology has been done on the basis that all issues of odor, unsightly garbage mounds and leachate generation are addressed and minimized
- Mechanical units, manual sorting station, baler press, organic extrusion – single-step automatic segregation and homogenization, bio-methanation units, sludge dewatering, in-vessel composting drums, and compost screening technology
- The garbage is put on a conveyor belt and is manually sorted in bins by a handful of workers



Acknowledgement

Faculty and students of the Electrical Engineering Department are thankful to Mr. Prashant Mohokar, distinguished Alumni of the Electrical Engineering Department for arranging the plant visit. The department is also thankful to Mrs. Mangal Pawar for financial support of Rs. 10 000/-.