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ADEQUACY REPORT (TECHNICAL)

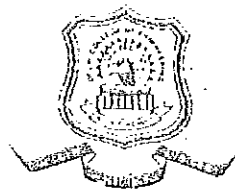
On

SEWAGE TREATMENT PLANT

FOR

**M/S ASSET-11 (WORLD MARK-I) COMMERCIAL AND
RETAIL COMPLEX, HOSPITALITY DISTRICT, DIAL, IGI
AIRPORT, NEW DELHI**

DEVELOPED BY: M/S ASPEN BUILDTECH LIMITED



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**ADEQUACY REPORT ON SEWAGE TREATMENT PLANT FOR
M/S ASSET-11(WORLDMARK-I) COMMERCIAL AND RETAIL
COMPLEX, HOSPITALITY DISTRICT, DIAL, IGI AIRPORT,
NEW DELHI, DEVELOPED BY: M/S ASPEN BUILDTECH LIMITED**

1.0 INTRODUCTION

M/S ASSET-11(WORLDMARK-I) COMMERCIAL AND RETAIL COMPLEX, HOSPITALITY DISTRICT, DIAL, IGI AIRPORT, NEW DELHI, DEVELOPED BY: M/S ASPEN BUILDTECH LIMITED, is Operating the commercial Complex (MALL) provides various facilities for tourist, visitors and entrepreneurs. The commercial complex provides space to manufactures and dealers to showcase and sell their product. The water requirement of the Complex is for domestic use of the Guests/ visitors, employees housed and process water for cooking and washing operation in the Complex. The Commercial Complex (Mall) has the facilities of central air conditioning, so a part from this water is used for flushing and gardening.

A concerted effort has been made by the management to contain the wastewater discharge and treat the same to control the effluent quality in order to comply with the requirements of DPCC. A detailed analysis of the control system has been made in order to determine the effectiveness of the control system and the same was further checked by monitoring specific stream and analyzing the same.

The Commercial Complex was visited on 04.01.2014 by a team of experts from Delhi Technological University, Delhi, to inspect the



operations of the unit, and also check the sewage treatment facilities installed at the site. Detailed discussion with the plant personnel were held regarding the general concept of pollution control system, its operation and maintenance. The report is being submitted on the basis of the visit and study of the processing involved in plant, for effluent generation, its treatment system, sampling and analysis of the treated and raw wastewater generated and previous experience on the treatment of such effluent stream.

2.0 MANUFACTURING PROCESS

The Mall activities being a service-oriented unit do not have a specific manufacturing system. The major wastewater is expected to be produced from domestic use by the visitors/ guests, kitchen, laundry and the employee stationed therein.

3.0 WASTEWATER QUANTITY AND CHARACTERISTICS

3.1 WASTEWATER QUANTITY

Wastewater is generated mainly as domestic wastewater because of use by visitors/guests, occupants and maintenance personnel stationed in The Mall activities. Apart from this a small quantity of wastewater is expected to be generated from floor washing, laundry



and kitchen as well. The total wastewater quantity from the process system has been estimated on the basis of the working of various washing systems and the amount of water used in various steps. The total water requirement for the Commercial Complex has been estimated to be about 296 KLD including the amount for domestic purpose, central cooling, flushing and hardening. The water requirement for cooling operation, flushing and gardening is met from the treated wastewater of Sewage Treatment Plant. The estimated amount of wastewater generated from the operation is about 134 KLD. The Commercial Complex has installed effluent treatment plant with the capacity to treat about 325 KLD, which shall be recycled to the extent of 100%. The unit has provided dual plumbing system and wastewater treatment facilities to the extent of tertiary treatment level so as to make it enable to use the treated wastewater for reuse. The STP operates on the basis of continuous operation. Domestic water consumption within the Mall activities is obtained from DDA/MCD Tanker.

3.2 WASTEWATER CHARACTERISTICS

The wastewater discharged from the individual process steps depend on the material being used at the particular time. The major contaminants in the wastewater suspended solids, oil & grease, Biochemical Oxygen demand and COD.



4.0 WASTEWATER TREATMENT

The Commercial Complex has a well designed and installed sewage treatment plant system for the combined effluent from the sources mentioned above at the premises. The sewage treatment plant has been designed and installed on the basis of physico-chemical treatment followed by secondary biological treatment. The treatment plant has been designed on the basis of continuous operation

Entire sewage generated is pumped to the inlet of bar screens and oil & Grease trap where extraneous & floating matter is removed. The treated sewage from oil & grease trap flows to the equalization tank. The equalized effluent from equalization tank is taken to Clarifier, for the removal of suspended solids. Clarified effluent is then taken to aeration tank for the biological treatment. Effluent from aeration tank goes to the secondary settling tank for the removal of suspended solids generated in the aeration tank. The treated effluent from secondary settling tank taken to the clear water tank from where it is pumped to dual media filter followed by activated carbon filter for the removal of dissolved gases and odours. Treated effluent from activated carbon filter is passed through Ultraviolet system for disinfection. Sludge is collected from the bottom of the settling tank and is sent to the sludge holding tank and then passed through the filter press for its conditioning



before its final disposal. Finally, treated effluent is reused depending upon requirements.

5.0 TREATMENT PLANT PROCESS UNITS

The sewage treatment plant for the combined stream consists of the following units:

1. Bar Screen
2. Sewerage Transfer Pump
3. Filter Feed Pump
4. Softener Feed Pump
5. Irrigation Pump
6. Sludge feed pump
7. Dosing System Pumps
8. Centrifuge (Basket type)
9. Pressure Vessel
10. Pressure Sand Filter
11. Activated Carbon Filter
12. Softener
13. Brine tank
14. Air Blower
15. UV System
16. MBBR/Tube deck Media
17. Tube Settler

5.1 DETAILED SPECIFICATIONS OF PROCESS UNITS

5.1.1 Bar Screen

Number	:	2
Size	:	300mm x 450mm
Material of Construction	:	SS-304



5.1.2 Sewerage Transfer Pump

Number : 2
Size : 6 LPS, 8m head
Material of Construction : SS Impeller

5.1.3 Filter Feed Pump

Number : 2
Size : 6 LPS, 30m head
Material of Construction : SS Impeller

5.1.4 Softener Feed Pump

Number : 2
Capacity : 4 LPS, 20m head
Material of Construction : SS Impeller

5.1.5 Irrigation Pump

Number : 2
Size : 3 LPS, 30m head
Material of Construction : SS Impeller

5.1.6 Sludge Feed Pump

Number : 1
Size : 1 cum/hr
Material of Construction : SS Impeller



5.1.7 Dosing System Pumps

Number : 1
Capacity : 0-6 LPH

5.1.8 Centrifuge (Basket Type)

Number : 1
Capacity : 50 kg/batch
Material of Construction : SS

5.1.9 Pressure Vessel

Number : 2
Capacity : 100 liter
Material of Construction : FRP

5.1.10 Pressure Sand Filter

Number : 1
Size : 1300 mm dia
Material of Construction : MS

5.1.11 Activated Carbon Filter

Number : 1
Size : 1300 mm dia
Material of Construction : MS



5.1.12 Softener

Number : 1
Size : 900 mm dia
Material of Construction : MS

5.1.13 Brine tank

Number : 1
Capacity : 500 liter
Material of Construction : HDPE

5.1.14 Air Blower

Number : 2
Size : 350 cum/hr
Material of Construction : CI

5.1.15 UV System

Number : 1
Size : 6 LPS
Material of Construction : SS-316

5.1.16 MBBR/Tube Deck Media

Number : 1
Size : 18 cum
Material of Construction : PVC/PP

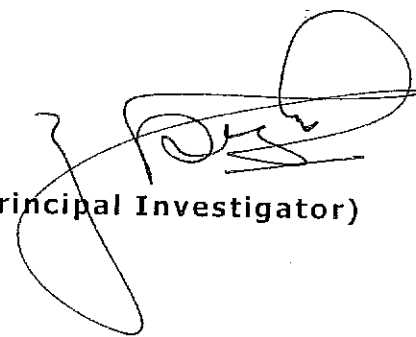


5.1.17 Tube Settler

Number : 1
Size : 4.5 cum
Material of Construction : PVC

6.0 CONCLUSIONS

The effluent treatment plant as designed and installed for treating the wastewater generated from The Commercial activities operations of M/S ASSET-11 (WORLDMARK-I) COMMERCIAL AND RETAIL COMPLEX, HOSPITALITY DISTRICT, DIAL, IGI AIRPORT, NEW DELHI, DEVELOPED BY: M/S ASPEN BUILDTECH LIMITED is adequate for the operation of the commercial complex unit and the treated wastewater comply with the requirements of DPCC as stipulated above. The unit has to take proper care in the operation of the system so that the treatment capacity matches with plant effluent generation.


(Principal Investigator)

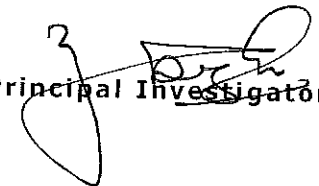
**SUMMARY OF ADEQUACY REPORT FOR EFFLUENT TREATMENT
PLANT OF M/S ASSET-11(WORLDMARK-I) COMMERCIAL AND
RETAIL COMPLEX, HOSPITALITY DISTRICT, DIAL, IGI
AIRPORT, NEW DELHI, DEVELOPED BY: M/S ASPEN BUILDTECH
LIMITED**

1. Name of the Unit : M/S ASSET-11(WORLDMARK-I)
COMMERCIAL AND RETAIL COMPLEX
2. Address of the Unit : M/S ASPEN BUILDTECH LIMITED,
HOSPITALITY DISTRICT, DIAL, IGI
AIRPORT, NEW DELHI.
3. Activity/Process : Commercial Complex
4. Production Capacity (max) :
5. Manufacturing Process :
6. Source of water : DJB
7. Rate of Water Consumption
Industrial : Nil
Domestic : 296 KLD
Others : Nil
8. Rate of effluent discharged
Industrial : Nil
Domestic : 134 KLD
irrigation : 25 KLD
9. Location of effluent discharge : Sewer
10. Source of trade effluent : Toilets
11. Whether effluent is treated : Yes
12. Whether unit has installed STP : Yes
13. Details of STP : It consists of Bar Screens, Equalization
Tank, MBBR Reactor, Pressure sand filter,
Activated Carbon Filter, UV system etc.
14. Whether effluent discharge
rate is monitored : No
15. Whether manufacturing Process: Yes
Characteristics of raw materials
Have been studied thoroughly.
16. Whether influent characteristics: No
have been monitored
17. Whether any by pass : No



arrangement

18. Whether design aspects have been considered while evaluating performance of STP : Yes
19. If modifications have been suggested to upgrade STP : No
20. Whether existing STP will be able to give effluent as per required parameters : Yes


(Principal Investigator)