



**GREY WATER
PRETREATMENT PLANT SYSTEM - (PTP)**
(**Hypermarket / Wet Market / F&B Retail Shop /
Shopping Mall and Mixed Development**) -
**MBBR WASTE WATER TREATMENT PLANT
(MOVING BED BIO REACTOR)**



**Grey Water
System**



Greywatec Engineering Sdn. Bhd.

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68100 Batu Caves, Selangor, Malaysia.

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Northern Region : 6012-549 7710

Southern Region : 6012-713 0515

- Since 1986 -



MADE IN MALAYSIA



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GREY WATEC

PRETREATMENT SYSTEM – PTP

**(Hypermarket/ Wet Market/ F & B Retail Shop/
Shopping Mall and Mixed Development)**



- Since 1986 -

FROSGOLD

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FROSCO

MBBR WASTE WATER TREATMENT PLANT

FROSGOLD



F&B & Wet Market Waste Water PTP System

Project Reference : KFC & PIZZA HUT, MELAKA



Site Area



Assembly Area

Cover is Opened



Installation Process

Ready To Operate

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F&B & Wet Market Waste Water PTP System

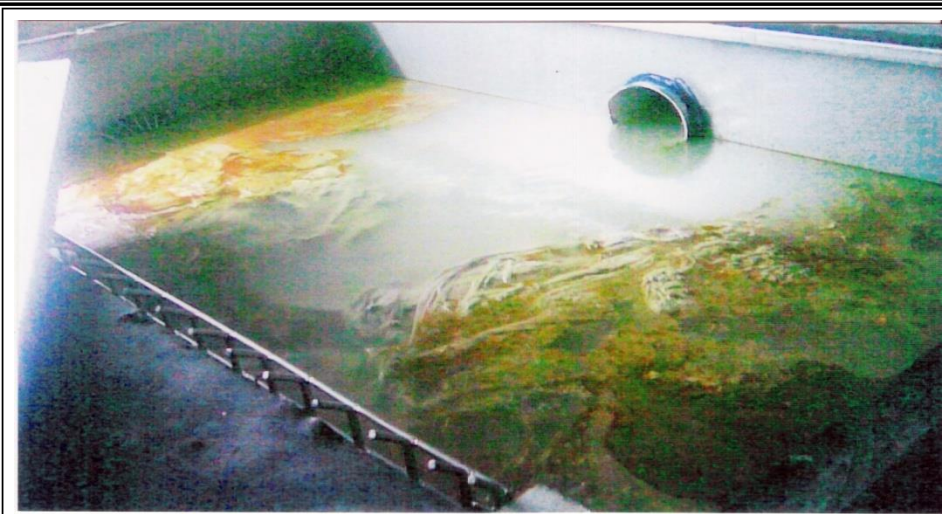
Project Reference : TNB KLANG (TENAGA NATIONAL BHD)



FROSGOLD

GREYWATEC
PRETREATMENT PLANT SYSTEM

Project reference : Jaya One (Shopping Mall)

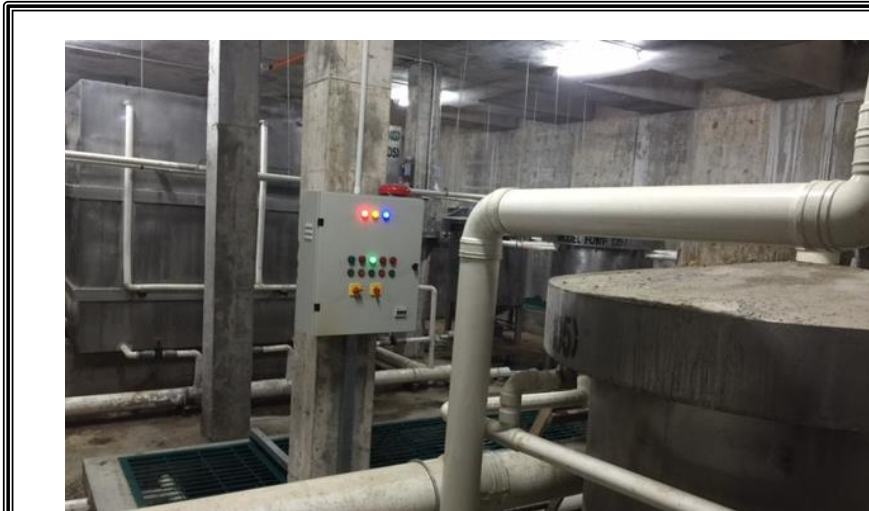


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FROSGOLD

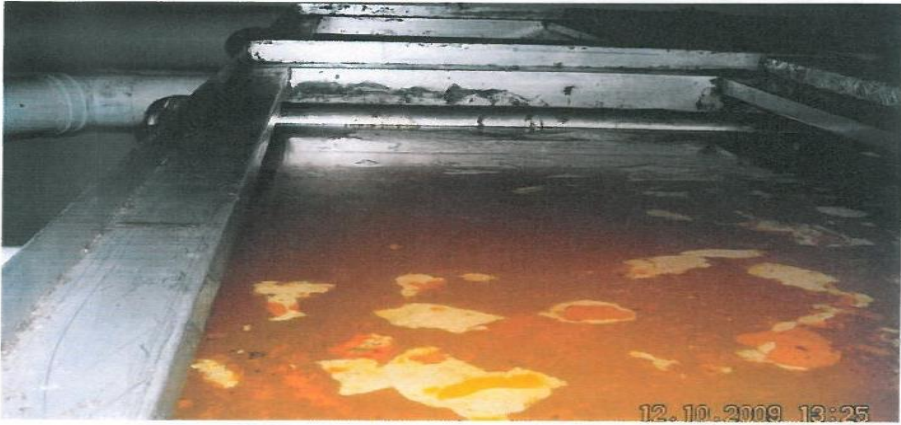
GREYWATEC
PRETREATMENT PLANT SYSTEM

Project reference : Razak Mansion (Pasar Borong)



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Result Of Treatment Waste Water



Note : Waste water from F&B before further removal and treatment



Note : Oil & Grease convert into permanent soluble particles



Note : Final result of treatment





GREYWATEC ENGINEERING SDN. BHD. (1003291-V)

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What is PTP (Pretreatment Plant) Or Grey Water PTP ?

PTP or Grey Water PTP is an advance designed technology for control facilities, management and Pretreatment of the oil, Grease, Sludge, food waste and waste water from and after the discharge from the standard type of the Grease Interceptor or Grease Trap. The system provide for the larger size, longer holding and settlement time from a few numbers of pre-fabricated Stainless Steel Reactor Tanks, come with the aeration water treatment chemical products and treatment of F & B, wet market and retail shops/ waste water (Excluding, Toilet waste) for example seafood and animal blood contamination, rotten fat and oil, sludge, food waste, detergent, soap chemical. etc.

The system treatment require is to comply to the public STP (IWK) Intake/ influent parameter of standard B2 Guide line value :

O & G	= 50 mg/L
BOD	= 250 mg/L
COD	= 500mg/L
TSS	= 300 mg/L
PH	= 6 – 8 Level
Ammonia	= 100mg/L



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**RE: GREYWATEC (FOG) PRETREATMENT SYSTEM (MBBR)
(KITCHEN WASTE WATER & WET MARKET)
Biological Treatment Plant Performance**

A) Biological Treatment Plant Operation

A typical aerobic effluent treatment plant involves three phases of treatment - primary, secondary and tertiary. Primary treatment involves the removal of solids including scum and sludge cakes. Secondary treatment is the major section of the process whereby aeration of the waste water in the presence of the activated sludge bacteria results in the breakdown of impurities. Tertiary treatment may be required to further improve the quality of the effluent prior to discharge and may involve removal of nitrogen, phosphates, suspended solids or pathogens as required.

As the influent enters the aeration tank it mixes with the activated sludge and also a flow of return or recycled activated sludge (RAS). Immediately upon contact with the incoming organic impurities, the resident microbial population in the mixed liquor (MLSS) grows with a concomitant rise in the respiration rate. The soft BOD (easily degradable organic impurities start to decline, followed at a later stage and at a lower rate the more recalcitrant (or hard) BOD). Ideally by the time the mixed liquor reaches the end of the aerobic treatment stage 90-95% of the effluent BOD should have been removed.

If it reaches this state before the point of discharge there is under utilization of capacity. If however it has not reached this stage at outlet, then the effluent will be discharged into the environment with significant BOD still untreated. Under steady state conditions, the activated sludge that is waste corresponds to the net production of sludge resulting from the growth of biomass during passage through the aeration tank.

An ideal biological treatment plant should be characterized by:-

- Rapid throughput of waste water
- High rate of BOD removal
- Good sludge settlement post-treatment
- Low rate of sludge production
- Minimal aeration costs
- High quality effluent – low BOD, suspended solid etc.



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B) Grease Interceptor & Sizing (F&B Kitchen)

The kitchen waste water treatment systems invariably requires a large centralized grease interceptor prior to the pretreatment plant. The grease interceptor selected must be able to perform well and be able to remove the grease and oil to the maximum volume. Grease and oil trapped in the interceptor will then be skimmed away into a collection truck during servicing. Selecting the right size of the grease interceptor is based on calculations made on the actual fixture values of the kitchen only. (The Grease Interceptors removal efficiency performance can only remove base on percentage measurement of 99 %).

C) Biological Treatment Plant Operation (Grey Water FOG PTP)

GREYWATEC Pretreatment System is a specially designed biological treatment for F&B Kitchen, Hypermarket (wet market area) waste water. The Plant consist of several prefabricated Stainless Steel Grade 304 Bio reactors tank and sludge concrete sump pits and is complete with pump, aerator and other treatment equipment and Froscozyme products e.g. (AM S 140 X). (Concrete Chamber by others)

The primary tank CTSR and (RT1) is to further trap and collect solid/sludge cakes or sumps etc. escaping from the grease interceptor effluent.

From RT2 & RT3 reactors are aerated 24 hours a day and enzyme feeding is also recommended. Froscozyme (Amnite S140X) will be dosed into aerated reactors. This is a highly scented, liquid, biological product which rapidly degrades organic solids. The product rapidly reduces COD/BOD levels resulting in reduced operational problems and elimination of malodours.

In this aeration tanks, the bacteria are generally concentrated in flocs formed from accumulations of non-living organic polymers. They have a porous structure but are sufficiently resistance to sheer forces exerted during rapid mixing and aeration within the treatment zone. Fine particulates, colloidal particles and large molecules become absorbed to the flocs thereby allowing the enzymes secreted by the bacteria within the flocs to facilitate their microbial degradation.

Part of the settlement sludge at the bottom of the tank will be dislodged into a sump and the waste water will be pumped back for further treatment once weekly.

The last Reactor (RT Tank 4 & 5 or 6 & 7) is the final stage of the process and treatment may be required to further improve the quality of the effluent prior to discharge and may involve removal of nitrogen, phosphates, suspended solid or pathogens as required.



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D) Recommendation for optimum operation of the plant
Routine Operating Principles

- Regular check service and maintenance the plant
- Maintain of pH in range 6.5 – 8.5
- Maintain of DOT at no less than 2 ppm
- Maintain of temperature at 20 – 27 Celsius
- Maintain of MLSS at 7500 ppm
- Sludge harvesting regime should be a little and often so as to minimize shocks to the biological system, and never more than 10% of total at any one time.

E) PUBLIC STP (IWK) DESIGN INFLUENT VALUES.

- 5-day Biochemical Oxygen Demand(BOD5)=250 mg/l
- Total suspended solid (TSS) = 300 mg/l
- Chemical Oxygen Demand (COD) = 500 mg/l
- Oil and Grease (O&G) = 50 mg/l
- pH = 6~8
- Ammoniacal nitrogen = 30 mg/l

F) CONDITION OF INSTALLATION AND USE

- Environmental Conditions For Operations:-
- Max. water temperature 95° Fahrenheit (35° Celsius)
- Min. water temperature 50° Fahrenheit (+10° Celsius) (Optional 77° F)
- PH range of water treated between PH 6.5-8 (optional 7)
- No industrial oil (Black Oil)
- No Hydrofluoric acid used in car wash area or cleaning procedures
- No black waste water (WC / Toilet)
- No Bleach and / or Quaternary disinfectants allowed in the waste water
- To be preinstalled with Grease, Oil Interceptor and solid sediment Interceptor etc.
- (Removal efficiency for O&G 99% and above)



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G) STRUCTURAL AND ELECTRICAL CONDITIONS:-

- Ventilation System
- Free of Flood water (Rain)
- The floor has to have a sufficient hardness in order to support the pressure
- Extended by the weight of the equipment tank. To allow space for the Servicing / maintenance of the equipment when needed.
- The Installation area has to be freely accessible for installing / fixing/ moving etc. of the equipment, tank and machinery.
- Electric power supply : 150 watts (Amp)

H) SHOPPING MALL / HYPERMARKET & F&B WASTE WATER CONTENT

O&G	- Unremoval or escaping Oil and Grease from Grease Interceptor units.
BOD	- Blood/ Fat & Oil (Rotten) / Sea Food and animal internal organ / Oxygen Shortage
COD	- Detergent / Soap/ Chemical & Other wash & Cleaning agents and Rotten Fat & Oil etc.
TSS (MLSS)	- Suspended Solid Waste
PH	- (3 – 4.5 Level)
Ammonia	- Seafood and Animal Waste

GREYWATER PRETREATMENT SYSTEM (PTP)

MBBR WASTE WATER TREATMENT PLANT

(SYSTEM IS TO REMOVE & TREAT OF FOG/FW/BOD/COD/TSS/AN)

DIMENSIONAL DATA (FGWP MODEL)

NO	MODEL (TYPE) (PTP)	FIXTURE VALUE(FV) IN GPM (G/I)PE/m ³ (KITCHEN WETMART) (G/I)	CENTRALIZE EXTRA LARGE GREASE,WASTE & SLUDGE REMOVAL MODEL: (CTSR)-(PTP)	WASTEWATER TREATMENT TANK (REACTOR TANK)-(RT) WEIGHT/(Kg) MODEL: FGWP(AERATE, BRAKE & REMOVE BOD/COD/Etc)-(PTP)	SIZE OF CONCRETE CHAMBER OR FLOOR AREA (M) (PTP)	INSTALLATION LOCATION (PTP)	TYPE OF BUILDING PROJECT (PTP)
1	GREYWATER FGWP-102 MINI/ CC 9 - 9 - 3.5 (H) (PTP)	FROSCO SIZE GREASE INTERCEPTOR GPM 100 - 500 (G/I)	MODEL: CTSR SIZE: (3 X 3 X 2.5H)M QUANTITY: 1 NOS VOLUME (22.5m ³ /each)	MODEL:FGWP QUALITY: 3 NOS (RT) WEIGHT: 20.000 Kg/each VOLUMN: (22.5m ³ /each)	9 X 15 X 3H Add.Sump Pit Required (1.5 X 1 X 1H) X12 Nos (PTP)	OUTDOOR UNDERGROUND OR (BASEMENT LEVEL)	INDEPENDENT NIG EATING CENTRE/RESTAURANT/SUPER MARKET(WET AREA) AND SMALL FOOD/MEAT PROCESSING FACTORY ONLY
2	GREYWATER FGWP - 103 S/ CC 9 - 9 - 3.5 (H) (PTP)	FROSCO SIZE GREASE INTERCEPTOR GPM 300 - 600 (G/I)	MODEL: CTSR SIZE: (3 X 3 X 2.5H)M QUANTITY: 1 NOS VOLUME (22.5m ³ /each)	MODEL:FGWP QUALITY: 3 NOS (RT) WEIGHT: 20.000 Kg/each VOLUMN: (22.5m ³ /each)	9 X 15 X 3H Add.Sump Pit Required (1.5 X 1 X 1H) X12 Nos (PTP)	OUTDOOR UNDERGROUND OR (BASEMENT LEVEL)	INDEPENDENT NIG EATING CENTRE/RESTAURANT/SUPER MARKET(WET AREA) AND SMALL FOOD/MEAT PROCESSING FACTORY ONLY
3	GREYWATER FGWP - 105 M/ CC 10 - 18 - 3.5H (PTP)	FROSCO SIZE GREASE INTERCEPTOR GPM 650 - 1200 (G/I)	MODEL: CTSR SIZE: (3 X 3 X 2.5H)M QUANTITY: 1 NOS VOLUME (22.5m ³ /each)	MODEL:FGWP QUALITY: 5 NOS (RT) WEIGHT: 20.000 Kg/each VOLUMN: (22.5m ³ /each)	10 X 18 X 3H Add.Sump Pit Required (1.5 X 1 X 1H) X15 Nos (PTP)	OUTDOOR UNDERGROUND OR (BASEMENT LEVEL)	BIGGER SUPER MARKET (WET AREA) C/W / FOOD COURT / MEDIUM SIZE MEAT AND FOOD PROCESSING FACTORY ONLY
4	GREYWATER FGWP - 105 CS/ CC 15 - 20 - 3.5 H (PTP)	FROSCO SIZE GREASE INTERCEPTOR GPM 125 - 1800 (G/I)	MODEL: CTSR SIZE: (3 X 3 X 2.5H)M QUANTITY: 1 NOS VOLUME (22.5m ³ /each)	MODEL:FGWP QUALITY: 5 NOS (RT) WEIGHT: 20.000 Kg/each VOLUMN: (22.5m ³ /each)	15 X 20 X 3H Add.Sump Pit Required (1.5 X 1 X 1H) X15 Nos (PTP)	INDOOR BASEMENT (OUTDOOR UNDERGROUND)	HYPERMARKET C/W FOOD COURT/WET MART AND STAFF CANTEEN
5	GREYWATER FGWP - 107L/ CC 15 - 25 - 3.5H (PTP)	FROSCO SIZE GREASE INTERCEPTOR GPM 1850 - 2500 (G/I)	MODEL: CTSR SIZE: (3 X 3 X 2.5H)M QUANTITY: 1 NOS VOLUME (22.5m ³ /each)	MODEL:FGWP QUALITY: 7 NOS (RT) WEIGHT: 20.000 Kg/each VOLUMN: (22.5m ³ /each)	15 X 25 X 3H Add.Sump Pit Required (1.5 X 1 X 1H) X16 Nos (PTP)	OUTDOOR ABOVE GROUND ONLY	SHOPPING MALL C/W FOOD COURT/RESTAURANT/F&B OUTLET/SUPERMARKET (WET AREA)
6	GREYWATER FGWP - 108 CXL/ CC 20 - 30 - 3.5H (PTP)	FROSCO SIZE GREASE INTERCEPTOR GPM 2550 - 3000 (G/I)	MODEL: CTSR SIZE: (3 X 3 X 2.5H)M QUANTITY: 1 NOS VOLUME (22.5m ³ /each)	MODEL:FGWP QUALITY: 8 NOS (RT) WEIGHT: 20.000 Kg/each VOLUMN: (22.5m ³ /each)	20 X 30 X 3H Add.Sump Pit Required (1.5 X 1 X 1H) X18 Nos (PTP)	OUTDOOR ABOVE GROUND ONLY	MIXED DEVELOPMENT C/W SHOPPING MALL / HYPERMARKET RETAIL SHOPS AND RESTAURANT



GREYWATEC
 PRETREATMENT PLANT SYSTEM

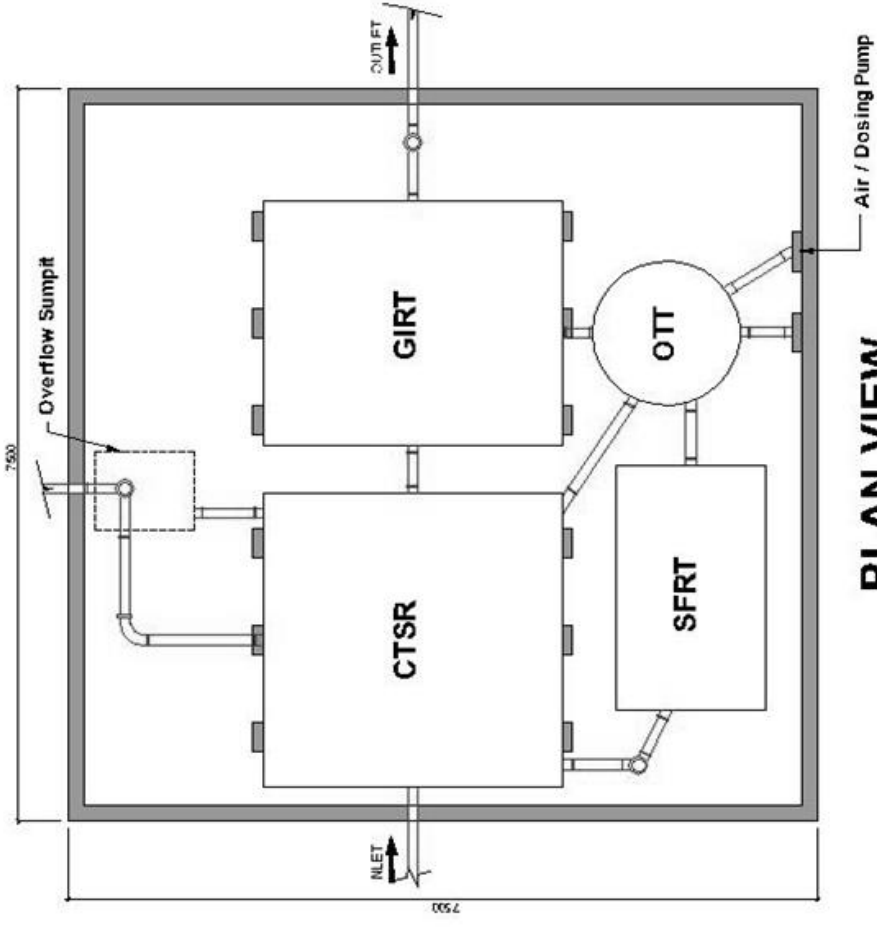
GREYWATEC ENGINEERING SDN BHD
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PROJECT :
MINI PRETREATMENT PLANT
(FGWP-102 MINI)
FOR FOOD COURT / HOTEL /
RESTAURANT / SHOPPING FOG &
FOOD WASTE

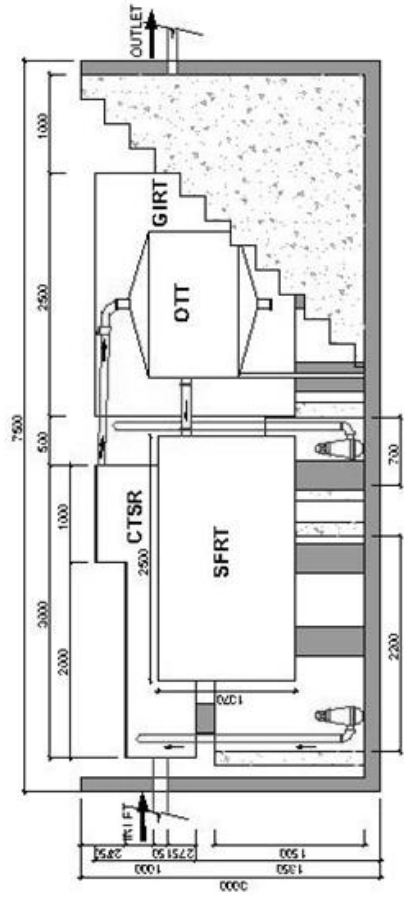
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PLAN VIEW
SECTION VIEW

BASEMENT
INSTALLATION
(MBBR)

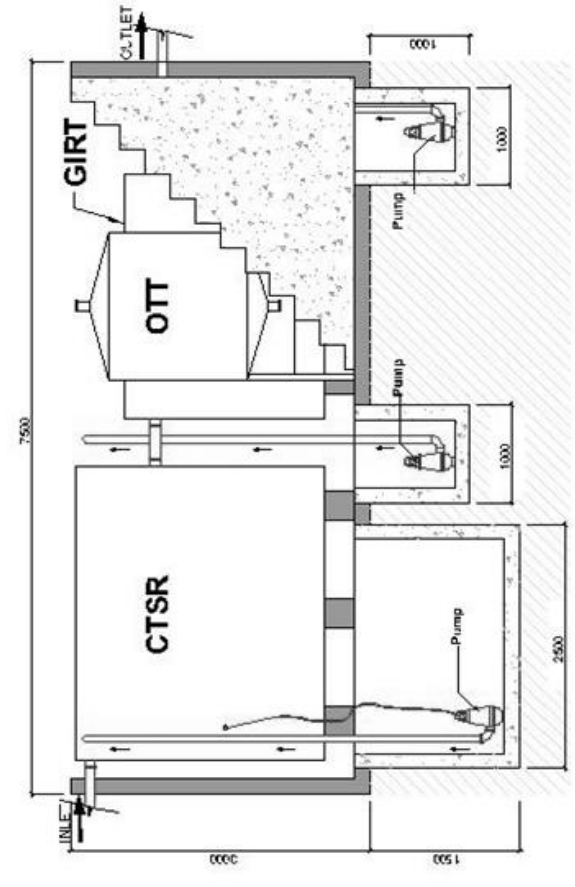
DESIGNED BY : K.C.TOH
DRAWN BY : SYAHIRAH
CHECKED BY : ERICONG
DATE : 13th JUNE 2016
SCALE : NTS
DRAWING NO. : 8622R01
REV: 01
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PLAN VIEW

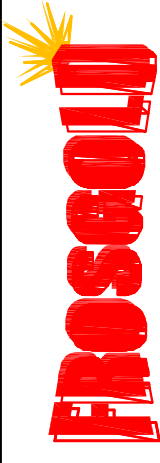


ABOVE FLOOR SLUDGE SUMP PIT



SUNKEN SLUDGE SUMP PIT

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**GREYWATEC
 PRETREATMENT PLANT
 (MODEL FGWP-103S)
 SIZE : 10 X 10 X 3.5 M (H)
 FLOWRATE : 600 GPM OR EQV
 SUMP PIT : 2 NOS**

- 1) CTSR (RT1) + GI
- 2) COAFLOC / AERATION (RT2)
- 3) SAND FILTER (RT3)

**PROPOSAL:
 PLAN VIEW
 SECTION VIEW
 (MBBR)**

LEGEND

WATER FLOW

- FROSCO RT1 - COLLECTION TANK SLUDGE REMOVER (CTSR)
- FROSCO RT2 - COAFLOC / AERATION SYSTEM
- FROSCO RT3 - SAND FILTER
- FROSCO SP1 - SUMP PIT 1
- FROSCO SP2 - SUMP PIT 2

DESIGNED BY : K.C. TOH

DRAWN BY : LILI MARLINA

CHECKED BY : ERIC ONG

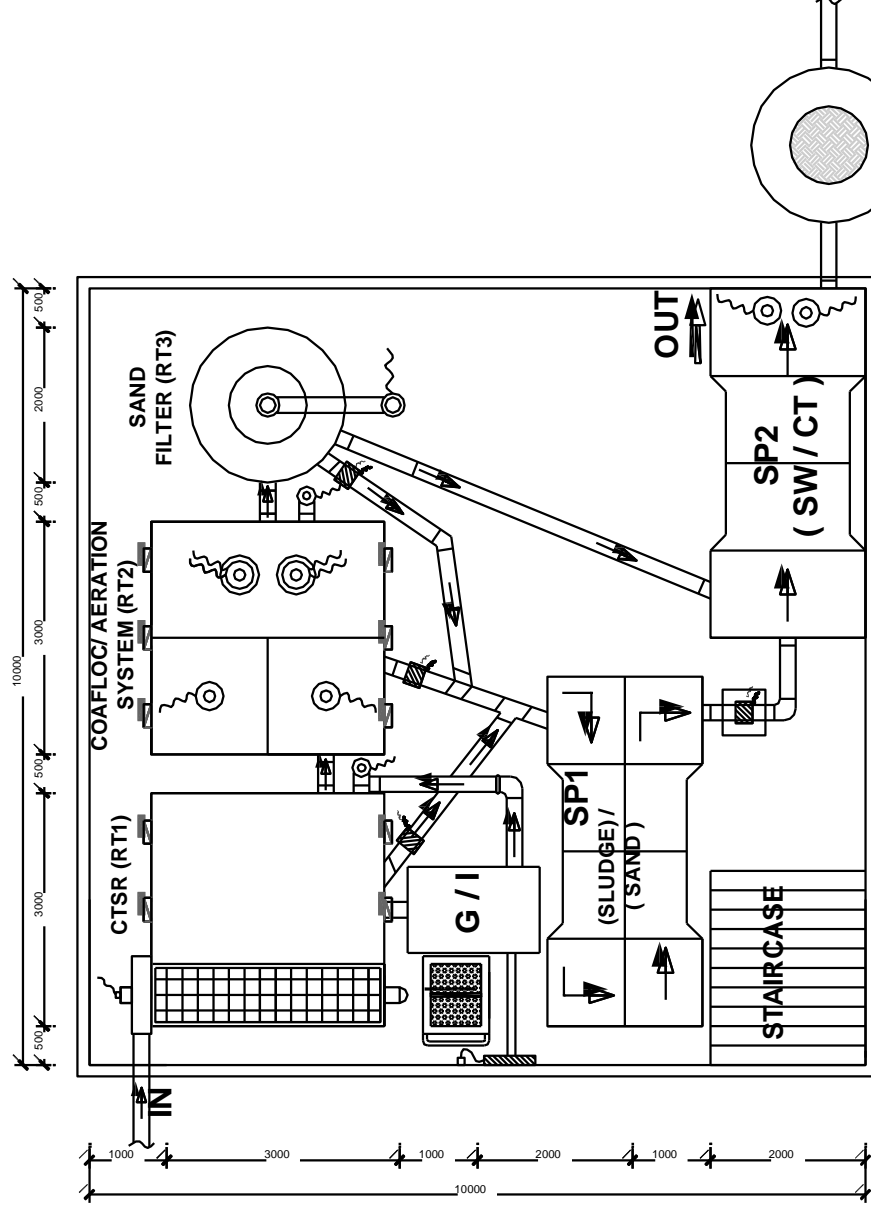
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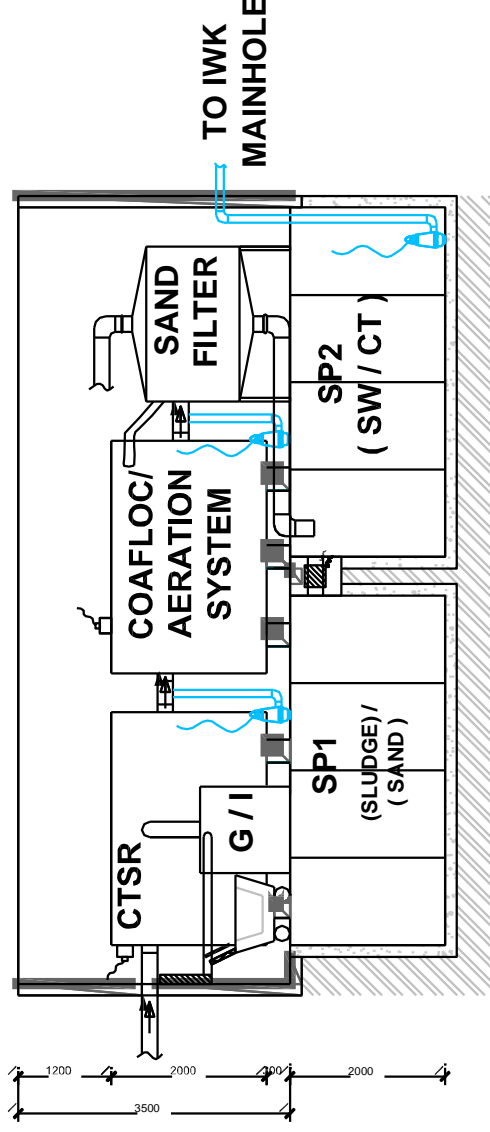
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PLAN VIEW



SECTION VIEW

ALSO AVAILABLE (PTP)

1) MODEL : FGWP - 106 (M)
 SIZE : 15 X 12 X 3.5 M (H)
 FLOWRATE APPROX : 2000
 GPM OR EQUIVALENT
 SUMP PIT : 3 NOS

2) MODEL : FGWP - 108 (L)
 SIZE : 20 X 15 X 3.5 M (H)
 FLOWRATE APPROX : 3000
 GPM OR EQUIVALENT
 SUMP PIT : 3 NOS

NOTE : MORE LARGER SIZE
 ALSO MAY REQUIRE AND
 AVAILABLE SUBJECT TO THE
 ACTUAL INTAKE PARAMETER,
 FLOWRATE (GPM) M3 VOLUME
 / P.E AND ETC.

(MORE DETAIL REFER OUR
 GREYWATEC CATALOGUE)

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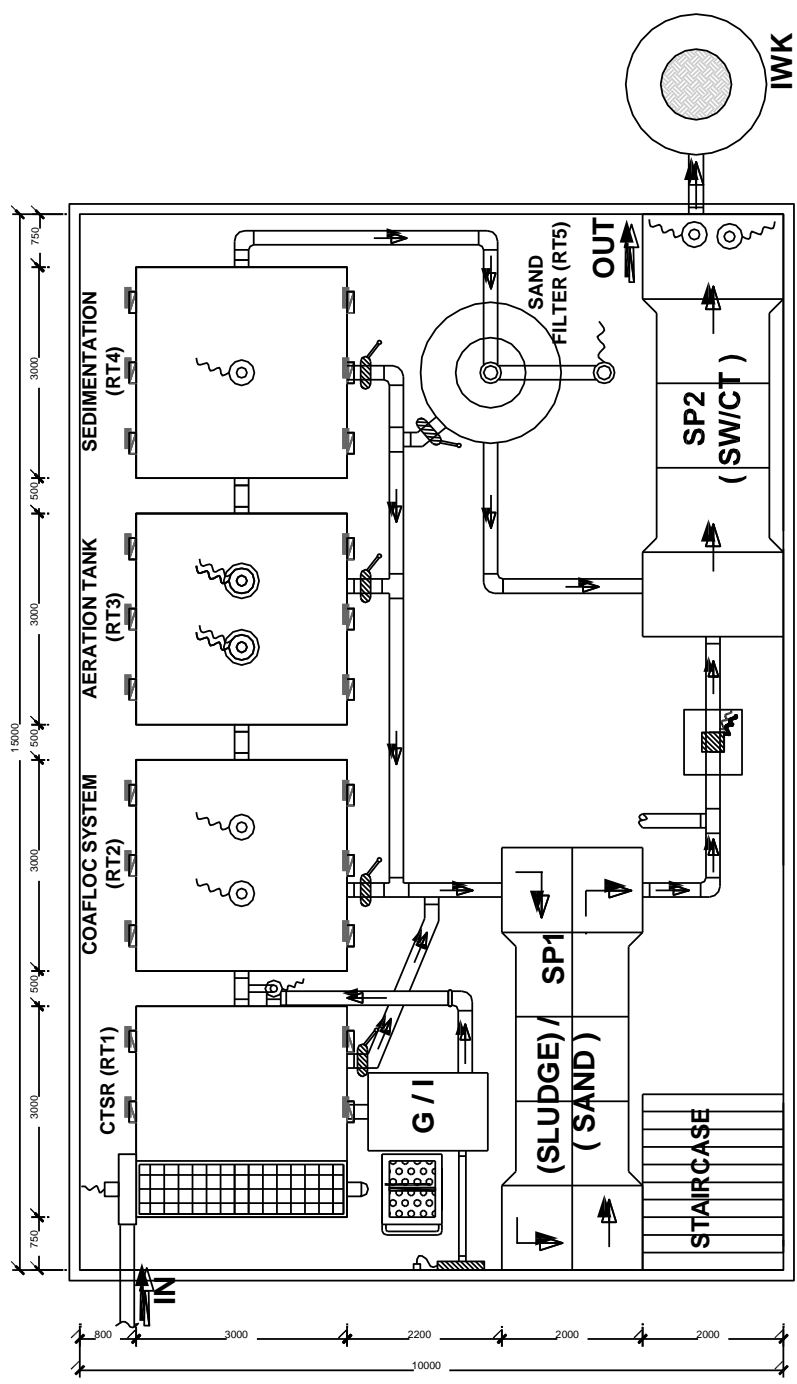
**GREYWATEC
 PRETREATMENT PLANT
 (MODEL FGWP-105 (STRD))
 SIZE : 15 X 10 X 3.5 M (H)
 FLOWRATE : 1000GPM OR EQV
 SUMP PIT : 2 NOS**

- 1) CTSR (RT1) + GI
- 2) COAFLOCCULATION (RT2)
- 3) AERATION TANK (RT3)
- 4) SEDIMENTATION (RT4)
- 5) SAND FILTER (RT5)

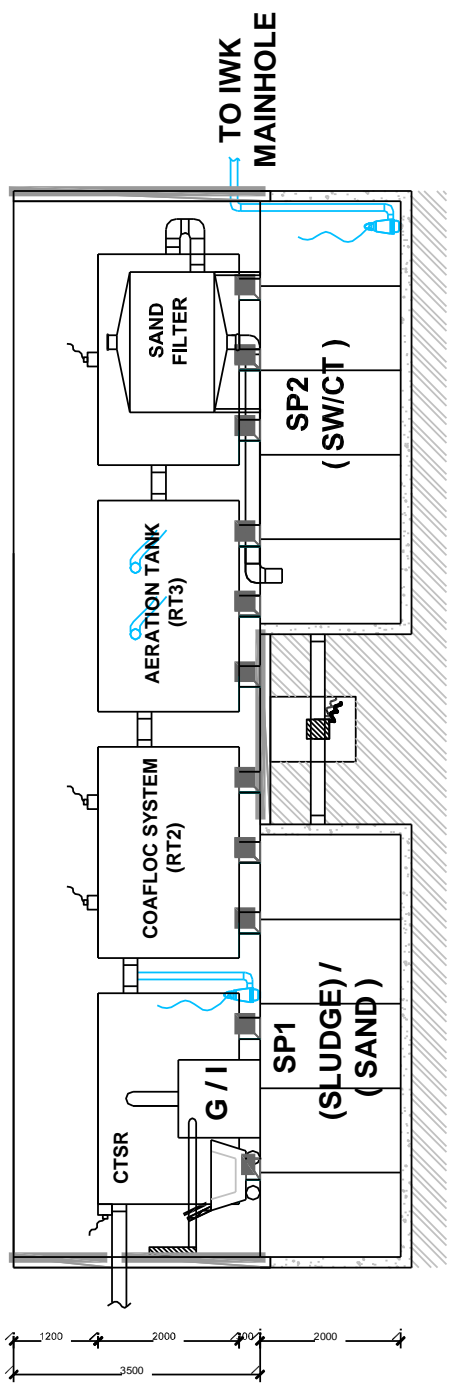
**PROPOSAL:
 PLAN VIEW
 SECTION VIEW
 (MBBR)**

LEGEND

	WATER FLOW
	FROSCO RT1 - COLLECTION TANK SLUDGE REMOVER (CTSR)
	FROSCO RT2 - COAFLOCCULATION
	FROSCO RT3 - AERATION SYSTEM
	FROSCO SP4 - SEDIMENTATION
	FROSCO RT5 - SAND FILTER
	FROSCO SP1 - SUMP PIT 1
	FROSCO SP2 - SUMP PIT 2
DESIGNED BY : K.C. TOH	
DRAWN BY : LILI MARLINA	
CHECKED BY : ERIC ONG	
DATE : 19th NOVEMBER 2019	
SCALE : 1:100	
DRAWING NO : 8049/R00	
REV: 00	
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PLAN VIEW



SECTION VIEW

ALSO AVAILABLE (PTP)

- 1) MODEL : FGWP - 106 (M)
 SIZE : 15 X 12 X 3.5 M (H)
 FLOWRATE APPROX : 2000
 GPM OR EQUIVALENT
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 GPM OR EQUIVALENT
 SUMP PIT : 3 NOS

NOTE : MORE LARGER SIZE
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 ACTUAL INTAKE PARAMETER,
 FLOWRATE (GPM) M3 VOLUME
 / P.E AND ETC.

(MORE DETAIL REFER OUR
 GREYWATEC CATALOGUE)

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Greywater Pre-treatment Plant (Outdoor Underground) (MBBR)

Proposal :
SITE PLAN

LEGEND

WETNET FLOW
↑

GREYWATEC MODRI FGWP - RT 1

GREYWATEC MODRI FGWP - RT 2

GREYWATEC MODRI FGWP - RT 3

GREYWATEC PTP (1) - FOR WET MARKET ONLY

GREYWATEC PTP (2) - FOR F&B AND RETAIL SHOP ONLY

GREYWATEC MODRI FGWP -

DESIGNED BY : K. C. TOH

DRAWN BY : ALHADI

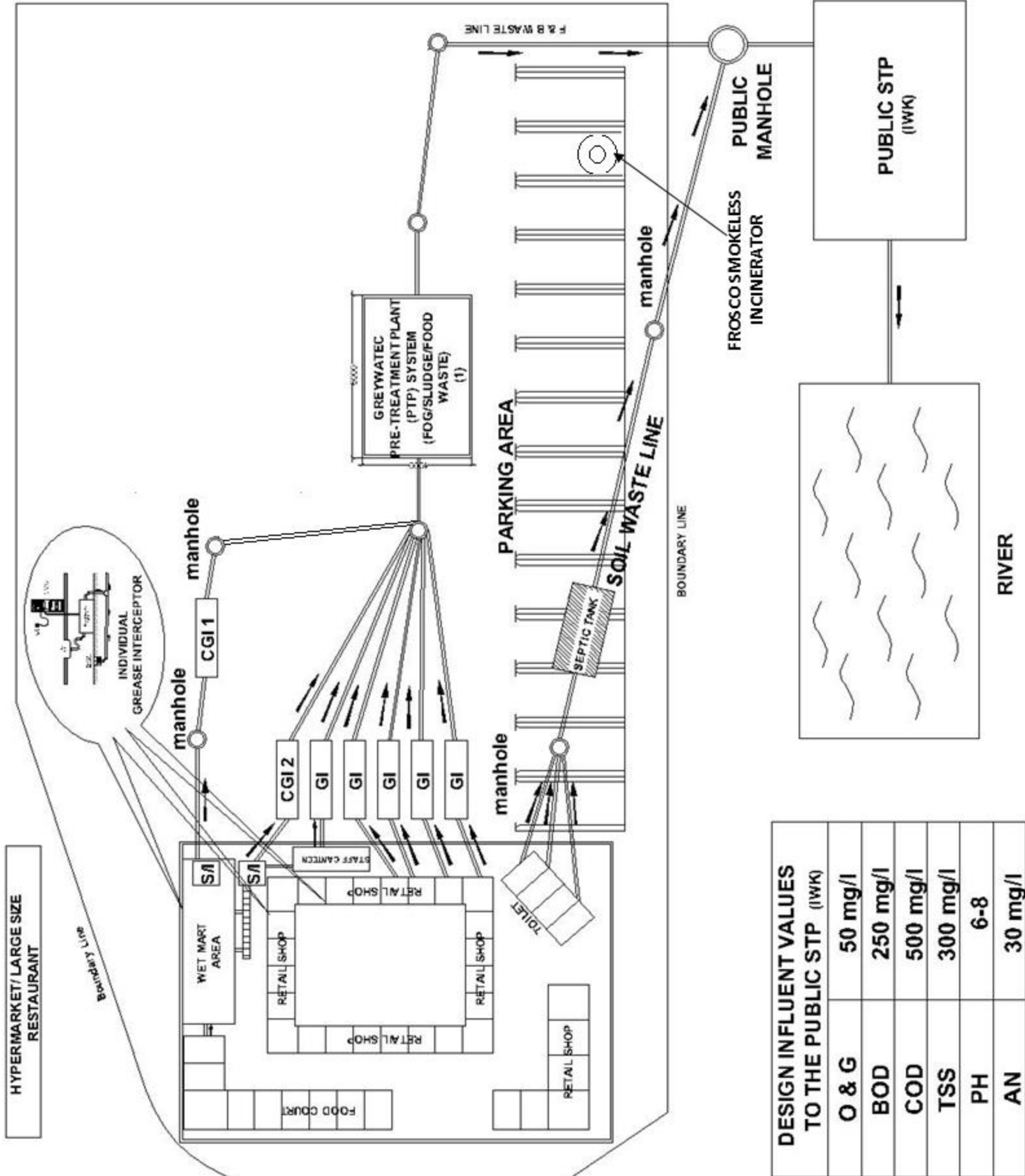
CHECKED BY : K. C. TOH

DATE : 31 / 01 / 2015

SCALE : -

DRAWING NO. : C600SPTP/02713

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DESIGN INFLUENT VALUES TO THE PUBLIC STP (IWK)	
O & G	50 mg/l
BOD	250 mg/l
COD	500 mg/l
TSS	300 mg/l
PH	6-8
AN	30 mg/l

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**Greywater (FW)
 Pre-treatment Plant
 Outdoor Underground**

**Proposal :
 SITE PLAN**

LEGEND

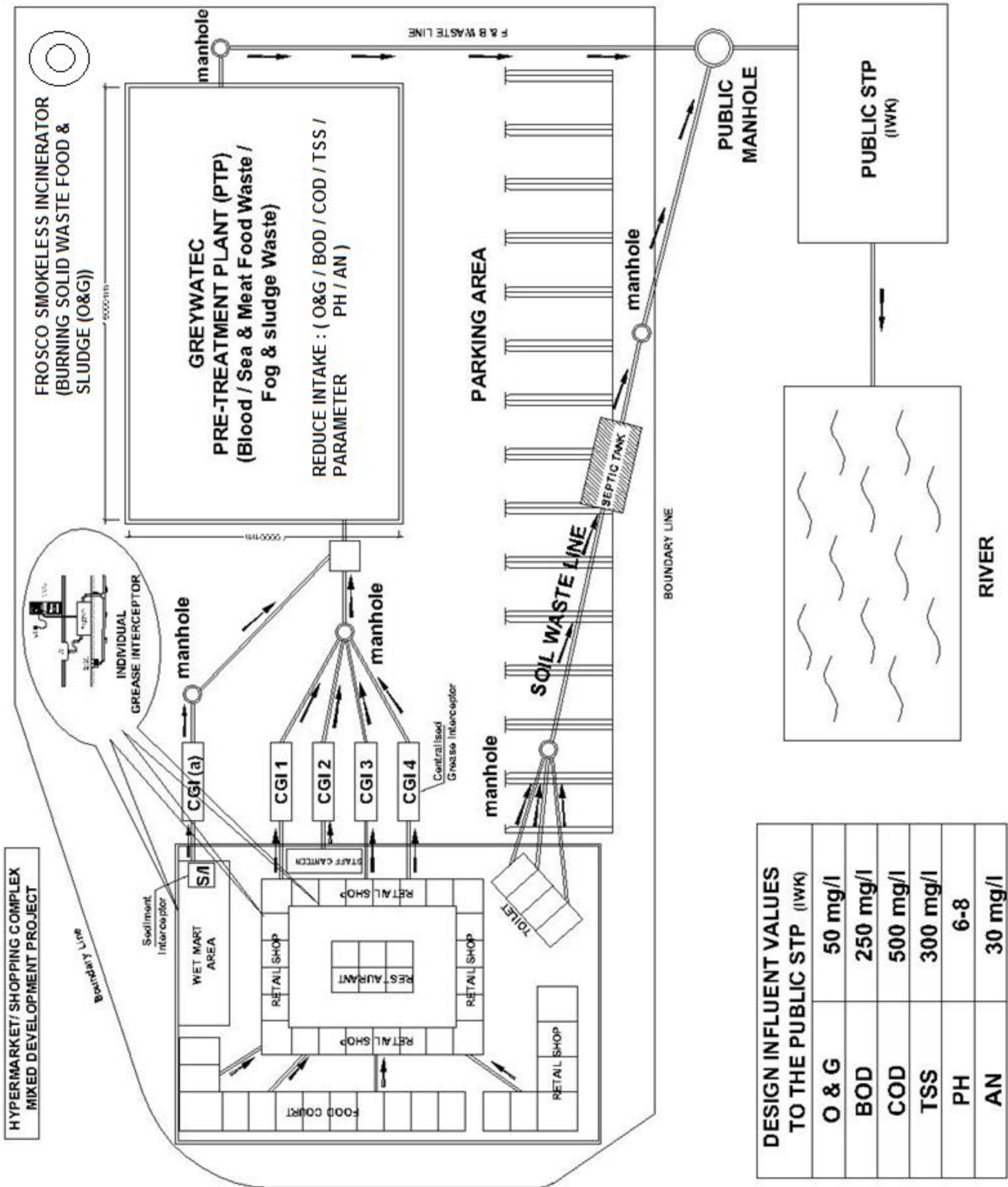


- GREYWATEC Model FGWP - RT 1
- GREYWATEC Model FGWP - RT 2
- GREYWATEC Model FGWP - RT 3
- GREYWATEC Model FGWP - RT 4
- GREYWATEC Model FGWP - RT 5
- GREYWATEC Model FGWP -

DESIGNED BY : K. C. TOH
 DRAWN BY : ALHADI
 CHECKED BY : K. C. TOH
 DATE : 31/01/2015
 SCALE : -

DRAWING NO. : C700-2TP/0713

N. B ALL INTELLECTUAL PROPERTY RIGHTS RESERVED



DESIGN INFLUENT VALUES TO THE PUBLIC STP (IWK)	
O & G	50 mg/l
BOD	250 mg/l
COD	500 mg/l
TSS	300 mg/l
PH	6-8
AN	30 mg/l

In keeping with our policy of updating products we reserve the right to make improvement or changes without notice.

LEGEND

Waste Flow

GREYWATEC Model FOWP - RT 1

GREYWATEC Model FOWP - RT 2

GREYWATEC Model FOWP - RT 3

GREYWATEC PTP (1) - FOR WCT MARKET ONLY

GREYWATEC PTP (2) - FOR F&B AND RETAIL SHOP ONLY

GREYWATEC Model FOWP -

DESIGNED BY : K. C. TOH

DRAWN BY : ALIJANI

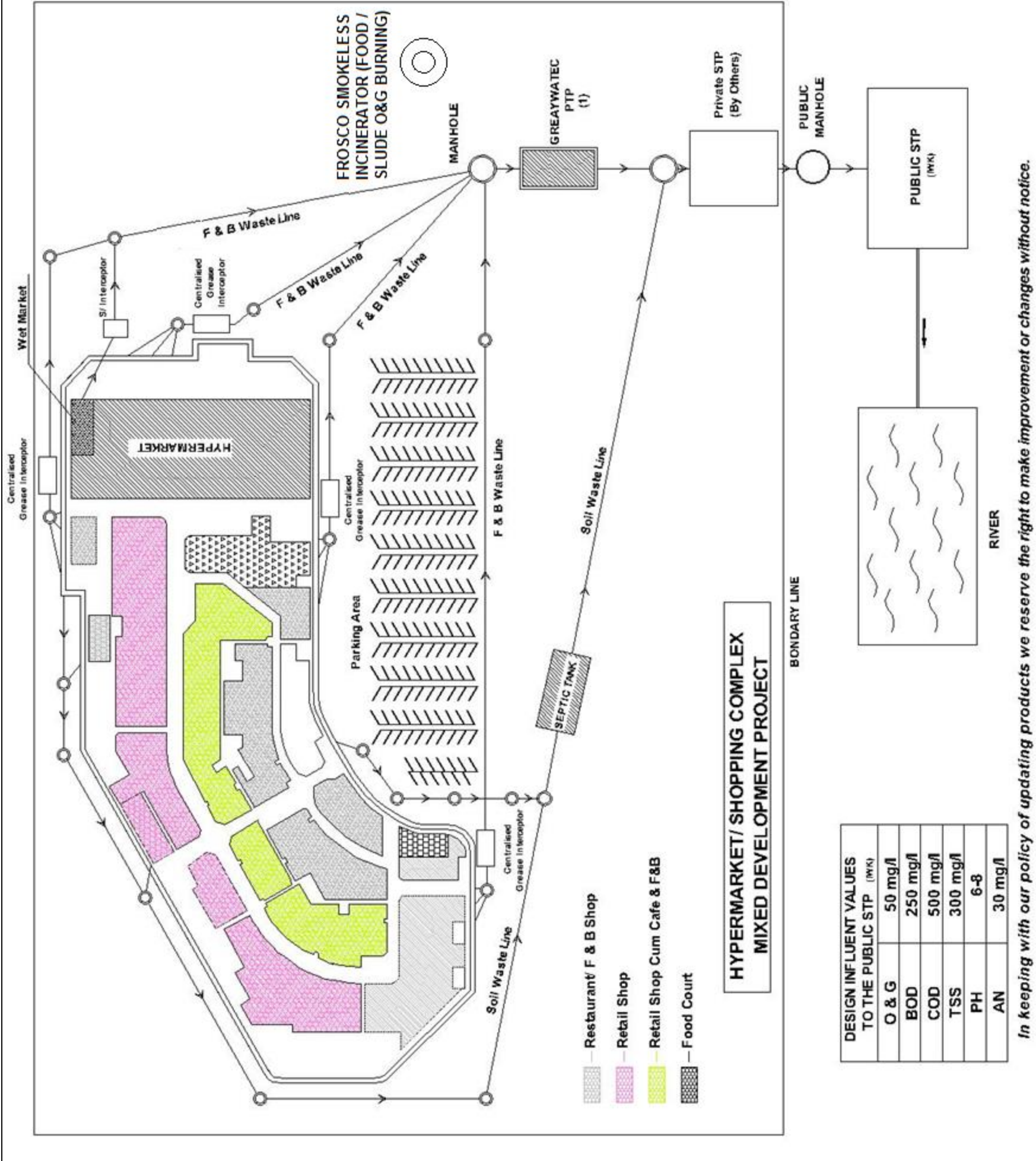
CHECKED BY : K.C. TOH

DATE : 31/01/2015

SCALE : -

DRAWING NO. : C7007PT00313

NO. ALL INTELLECTUAL PROPERTY RIGHTS RESERVED



DESIGN INFLUENT VALUES TO THE PUBLIC STP (MKN)	
O & G	50 mg/l
BOD	250 mg/l
COD	500 mg/l
TSS	300 mg/l
PH	6-8
AN	30 mg/l

In keeping with our policy of updating products we reserve the right to make improvement or changes without notice.



GREYWATEC
PRETREATMENT PLANT SYSTEM

Greywater Engineering Sdn. Bhd.
12, Jalan TIB 1/3, Taman Industri Bolton
68100 Batu Caves, Selangor Darul Ehsan
Tel : 603-6185 9262 (Hunting Line) / Fax : 603-6185 9279
Email : work@froscoweb.com / sales@froscoweb.com

**PROPOSED
GREYWATEC
PRETREATMENT SYSTEM**

(BASEMENT INSTALLATION)
Installation Method

LEGEND



- GREYWATEC Model - Nil -
- GREYWATEC Model - Nil -
- GREYWATEC Model - Nil -
- GREYWATEC Model - Nil -
- GREYWATEC Model - Nil -
- GREYWATEC Model - Nil -
- GREYWATEC Model - Nil -

DESIGNED BY : K.C. TOH

DRAWN BY : ALHAZI

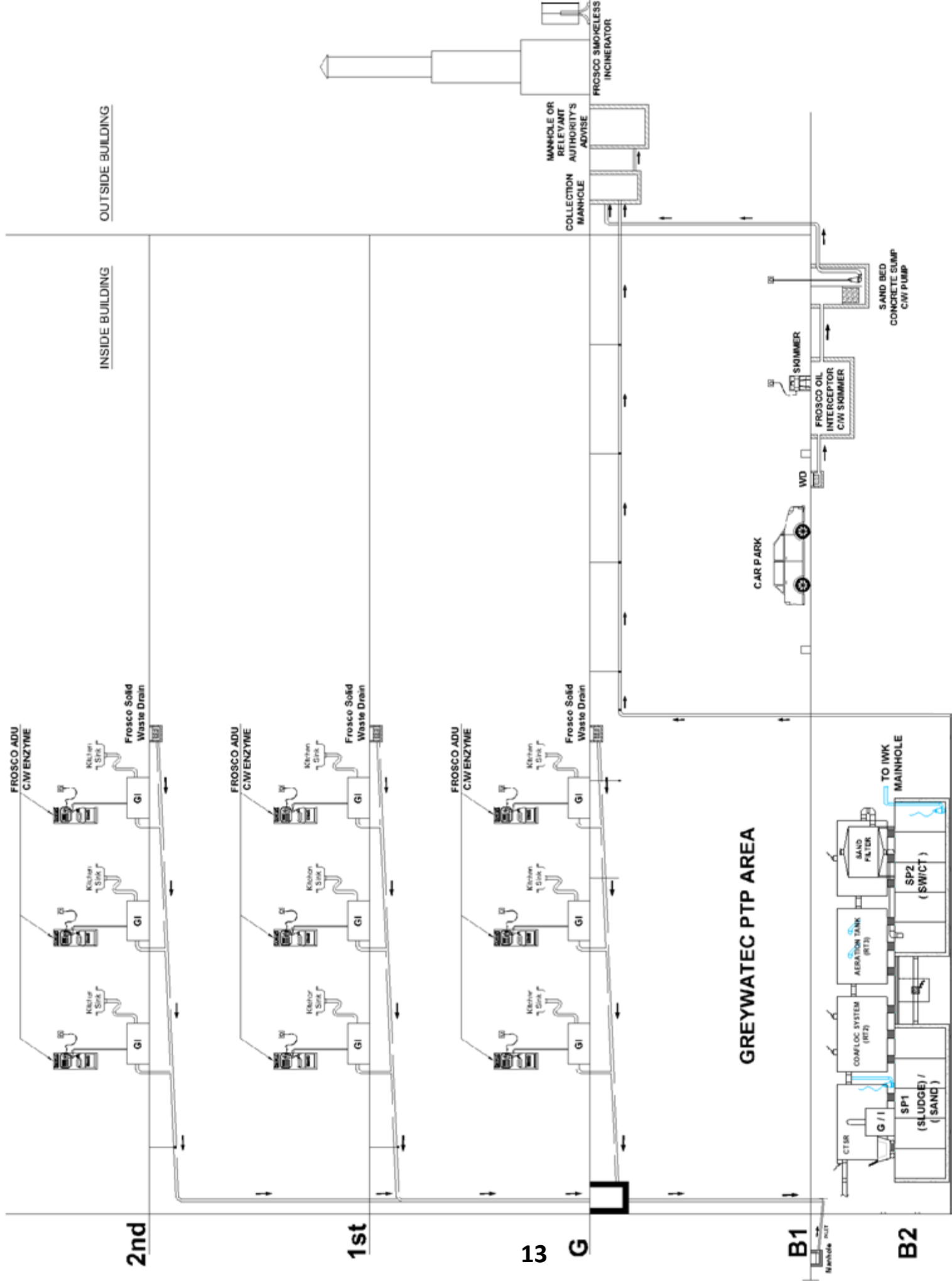
CHECKED BY : K.C. TOH

DATE : 31 / 04 / 2015

SCALE :

DRAWING NO. :

N.B ALL INTELLECTUAL PROPERTY RIGHTS RESERVED



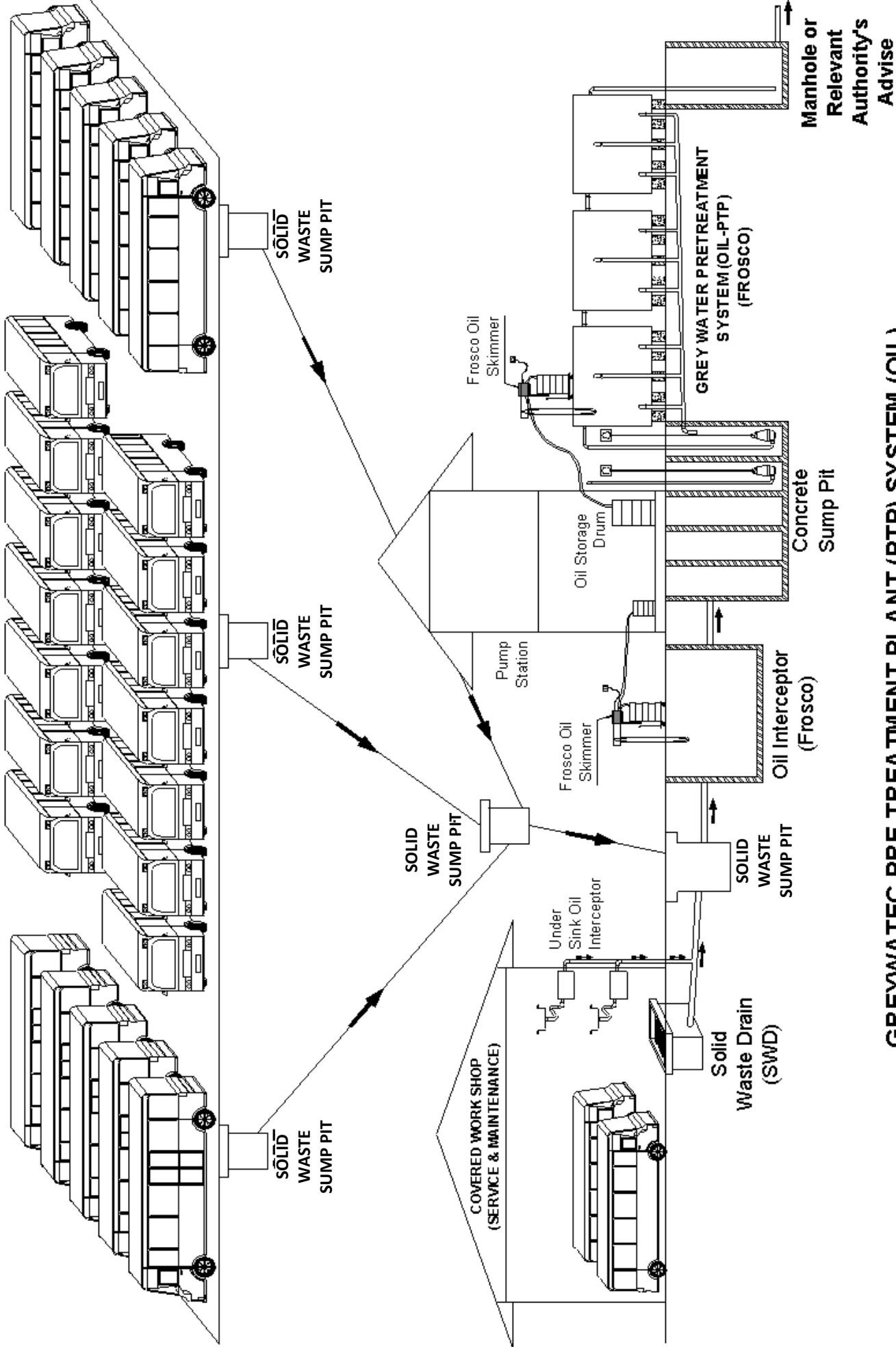
SECTION VIEW

In keeping with our policy of updating products we reserve the right to make improvement or changes without notice.

LEGEND

Water Flow	↑
GPT	⊥
SWD	⊥
GREYWATEC Model:	
GREYWATEC Model:	
GREYWATEC Model:	
GREYWATEC Model:	
GREYWATEC Model:	
GREYWATEC Model:	
GREYWATEC Model:	
DESIGNED BY :	K. C. TOH
DRAWN BY :	ALHADI
CHECKED BY :	K. C. TOH
DATE :	31/01/2015
SCALE :	-
DRAWING NO. :	

BUS PARKING AREA (OPEN)



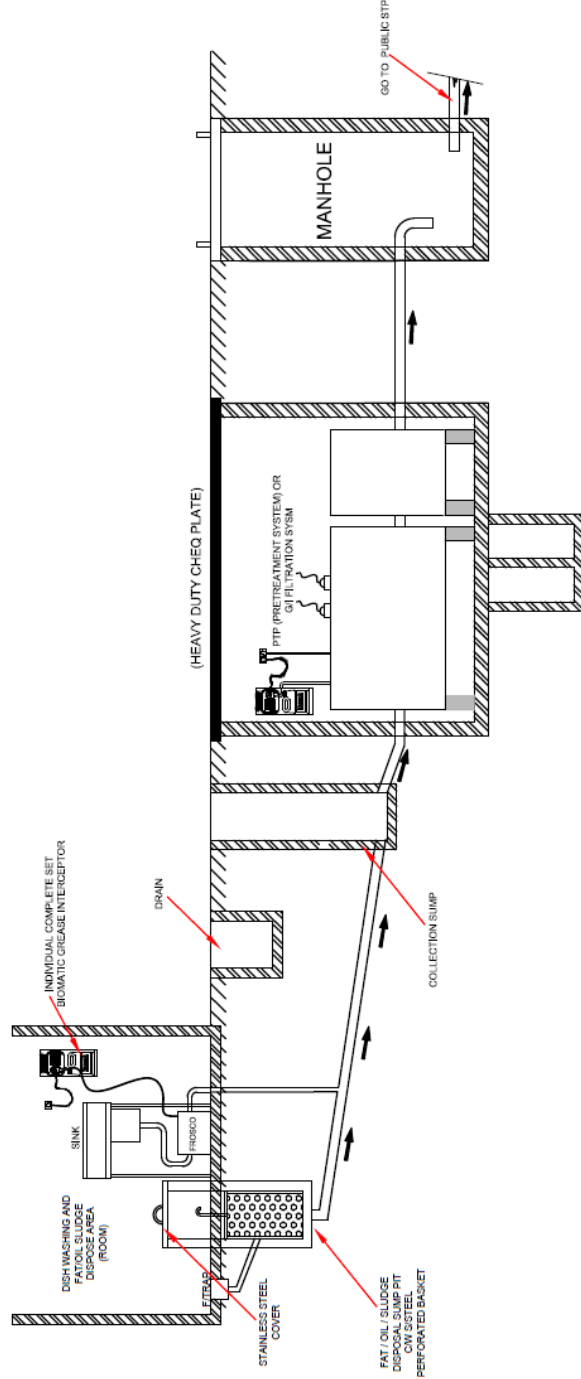
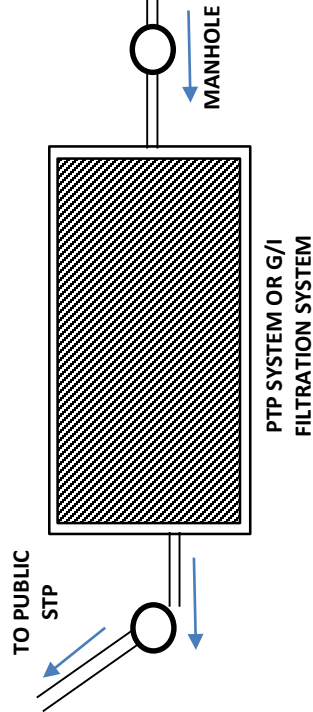
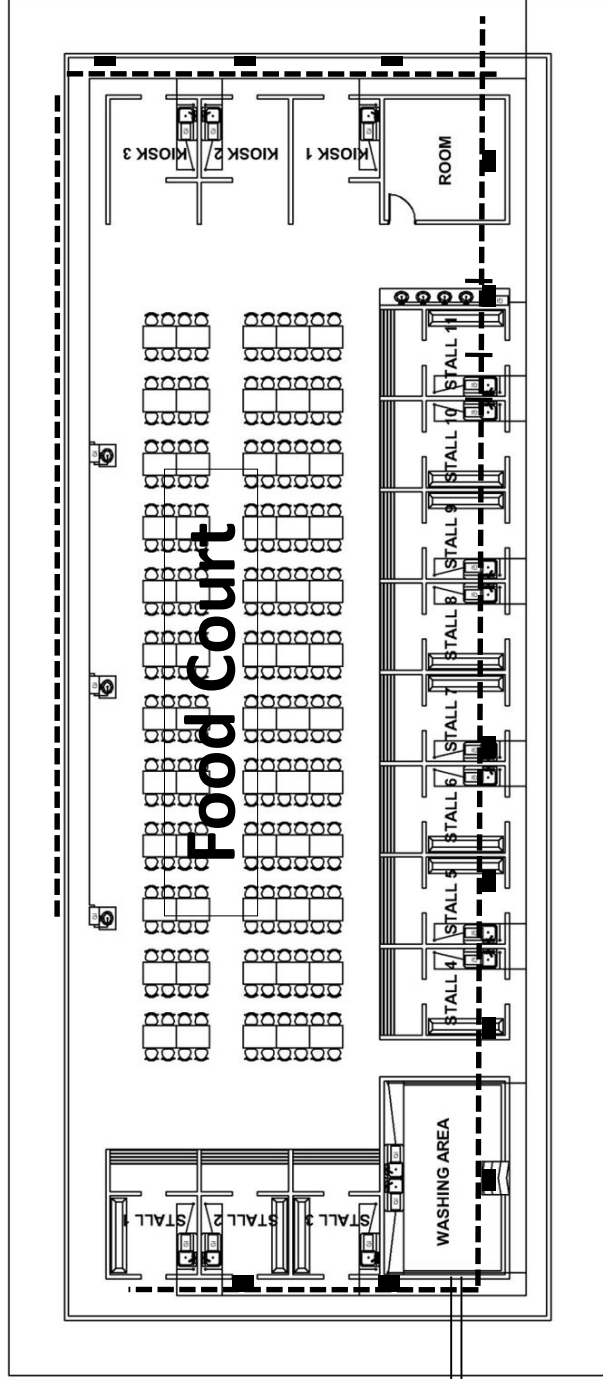
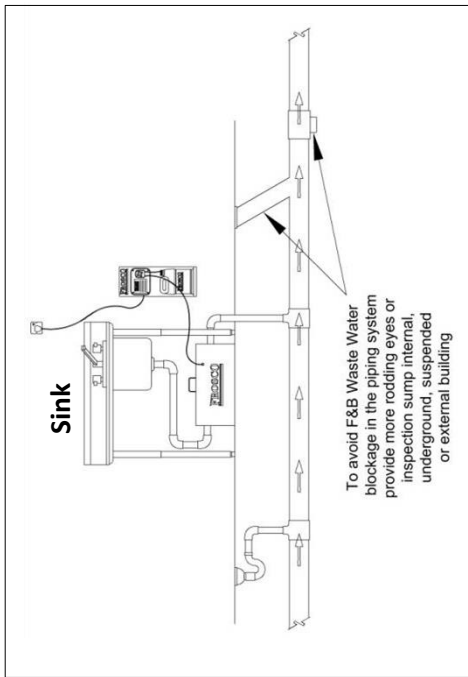
GREYWATEC PRE-TREATMENT PLANT (PTP) SYSTEM (OIL)

SECTION VIEW

In keeping with our policy of updating products we reserve the right to make improvement or charges without notice.



F & B WASTE WATER MANAGEMENT SYSTEM

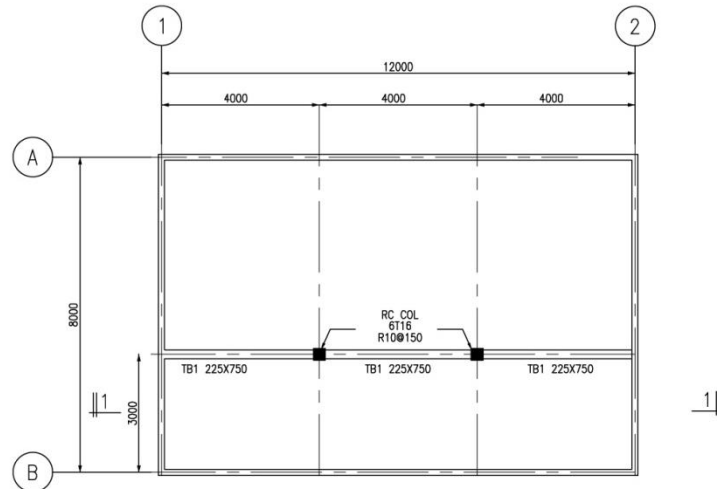


SECTION VIEW

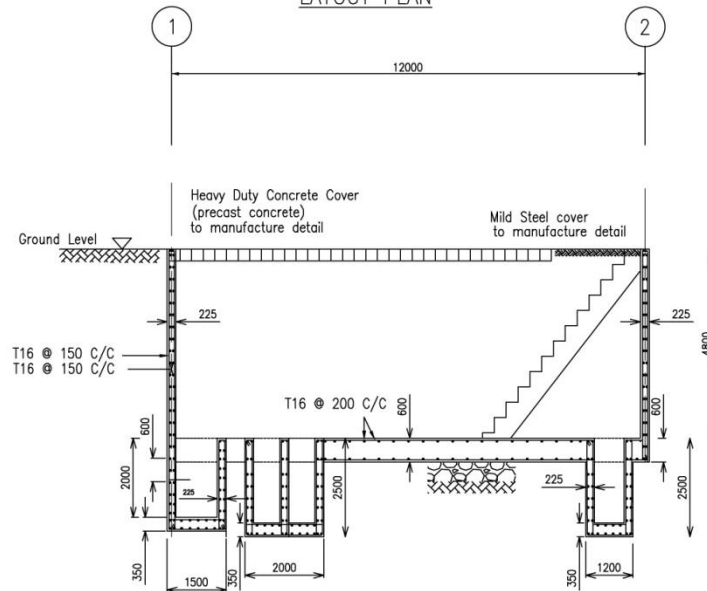
FROSGOLD



Concrete Chamber (PTP) PRETREATMENT PLANT

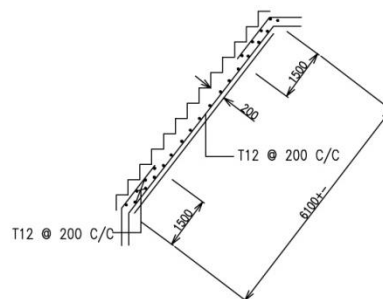


LAYOUT PLAN

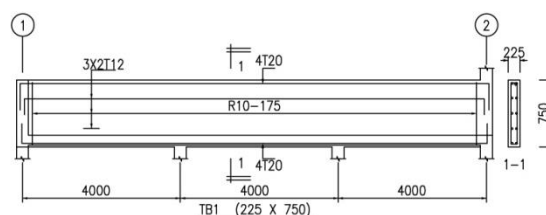


SECTION 1-1 VIEW

NOTE :
ALL SUB BASE SHOULD BE
225mm THK. WELL COMPACTED
CRUSHER RUN
100mm THK. SAND BASE



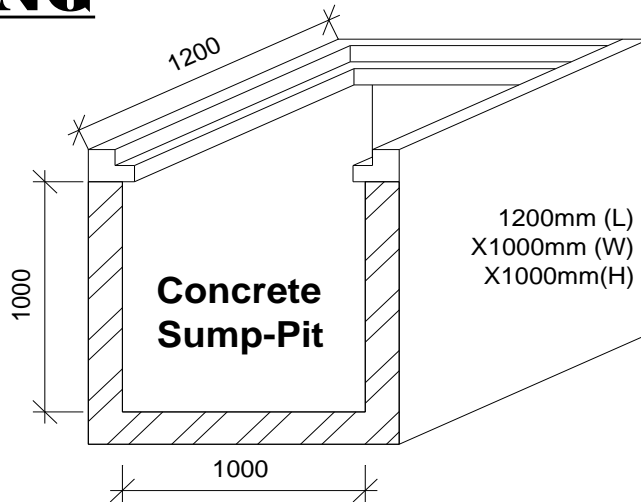
TYPICAL
STAIRCASE
DETAIL



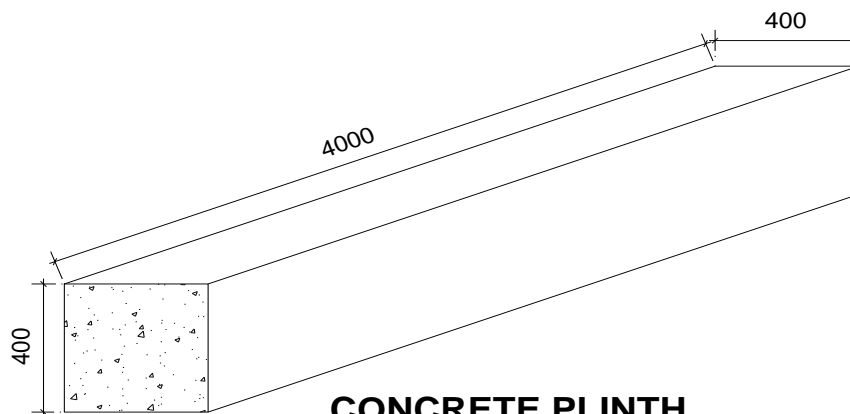


GREYWATEC ENGINEERING SDN. BHD. (1003291-V)
12, Jalan TIB 1/3, Taman Industri Bolton, 68100 Batu Caves, Selangor, Malaysia.
Tel: 603-6185 9262 (Hunting Line) . Fax: 603-6185 9279
Email: sales@froscoweb.com . work@froscoweb.com

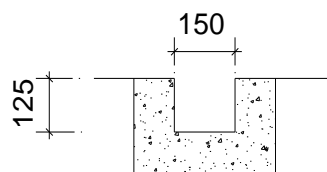
DETAIL DRAWING



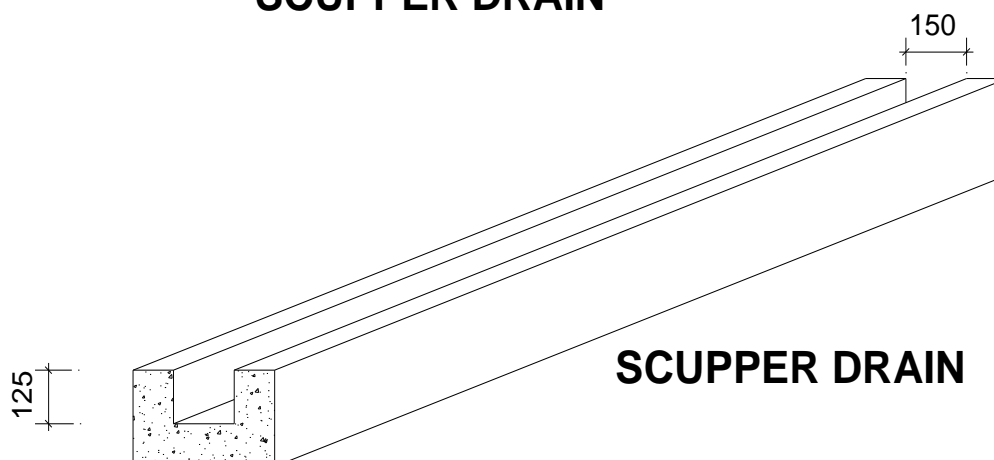
CONCRETE SUMP-PIT



CONCRETE PLINTH
4000mm (L) X 400 (W) X 400 (H)



SCUPPER DRAIN



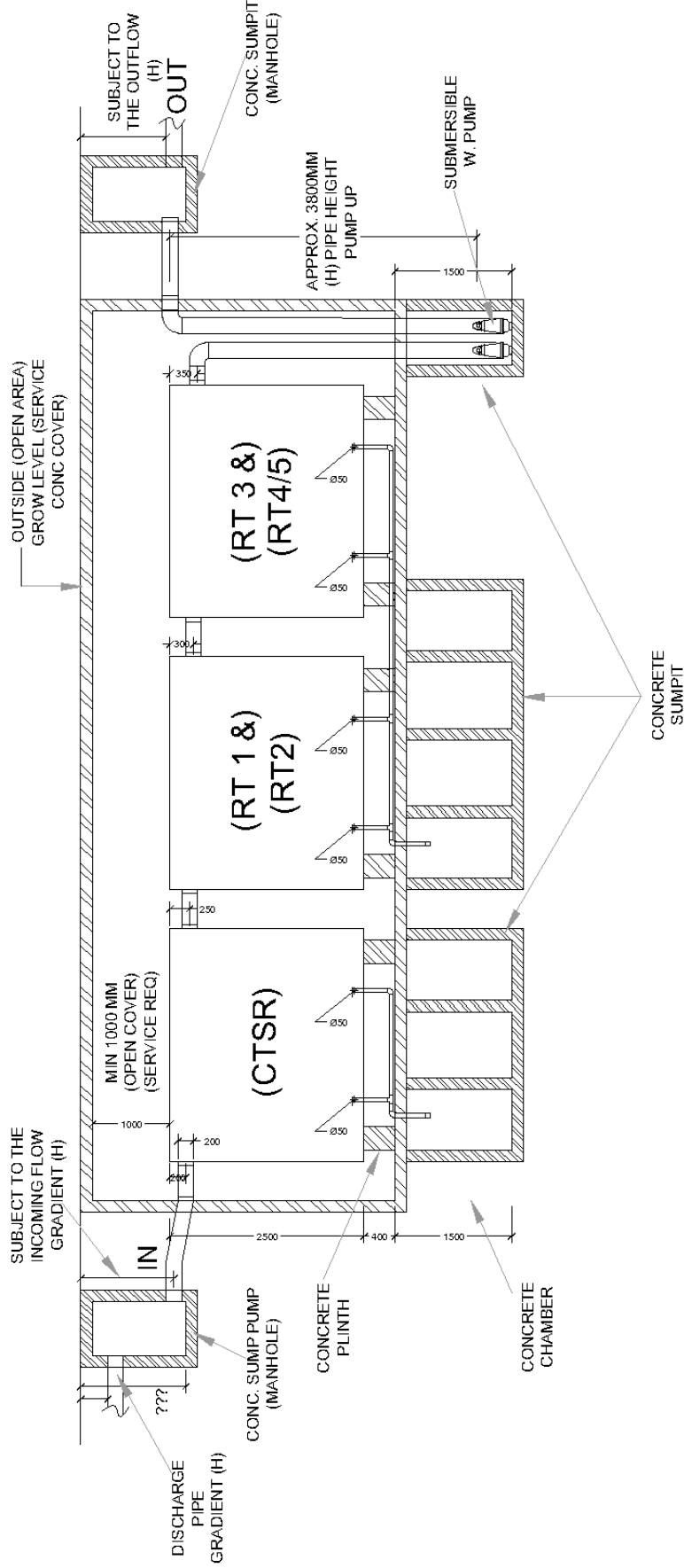
SCUPPER DRAIN

PROJECT :

**GREYWATEC PRETREATMENT
 PLANT (PTP) SYSTEM
 INSTALLATION METHOD**

(MBBR)

**(GREYWATEC PTP SYSTEM INSTALLATION METHOD)
 (SECTION LAYOUT)**



SECTION VIEW

LEGEND

→ WATER FLOW

FROSCO Model: CTSR - COLLECTION TANK SLUDGE REMOVER

FROSCO Model: RT - REACTOR TANK

FROSCO Model:

FROSCO Model:

FROSCO Model:

DESIGNED BY : K.C. TOH

DRAWN BY : LILI MARLINA

CHECKED BY : ERIC ONG

DATE : 18th MAY 2018

SCALE : 1:100

DRAWING NO :

REV:

PROJECT :

**RC CHAMBER WITH PREFABRICATED
STAINLESS STEEL**

**SLUDGE REMOVAL SYSTEM TANK
(CTSR)**

R.C. TYPE

(MBBR)

LEGEND

↑	WATER FLOW	⊗	VALVE

FROSCO Model Heavy Flow Oil Separator (External Pipe)

FROSCO Model :-

FROSCO Model :-

FROSCO Model :-

FROSCO Model :-

FROSCO Model :-

DESIGNED BY : K. C. TOH

DRAWN BY : WAJIBAH ABAS

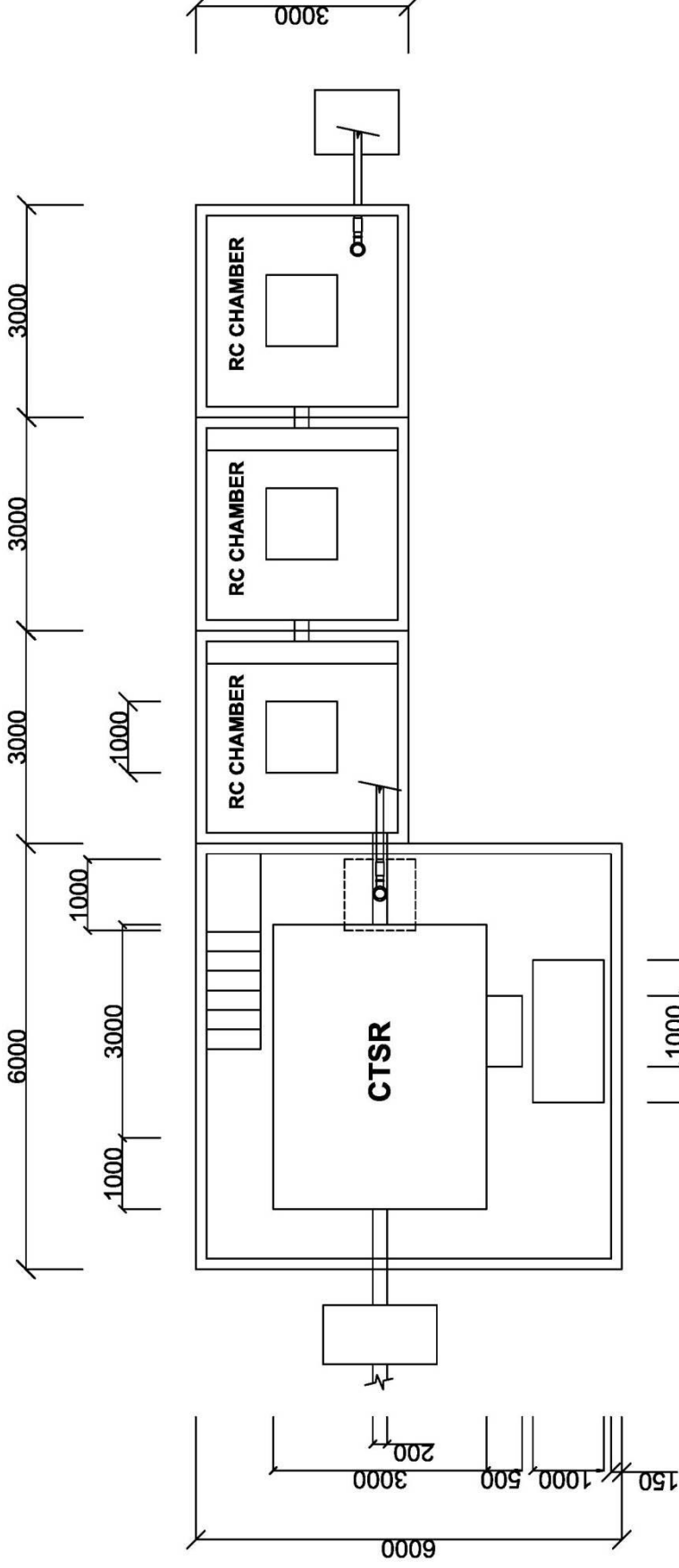
CHECKED BY : K. C. TOH

DATE : 23 MARCH 2016

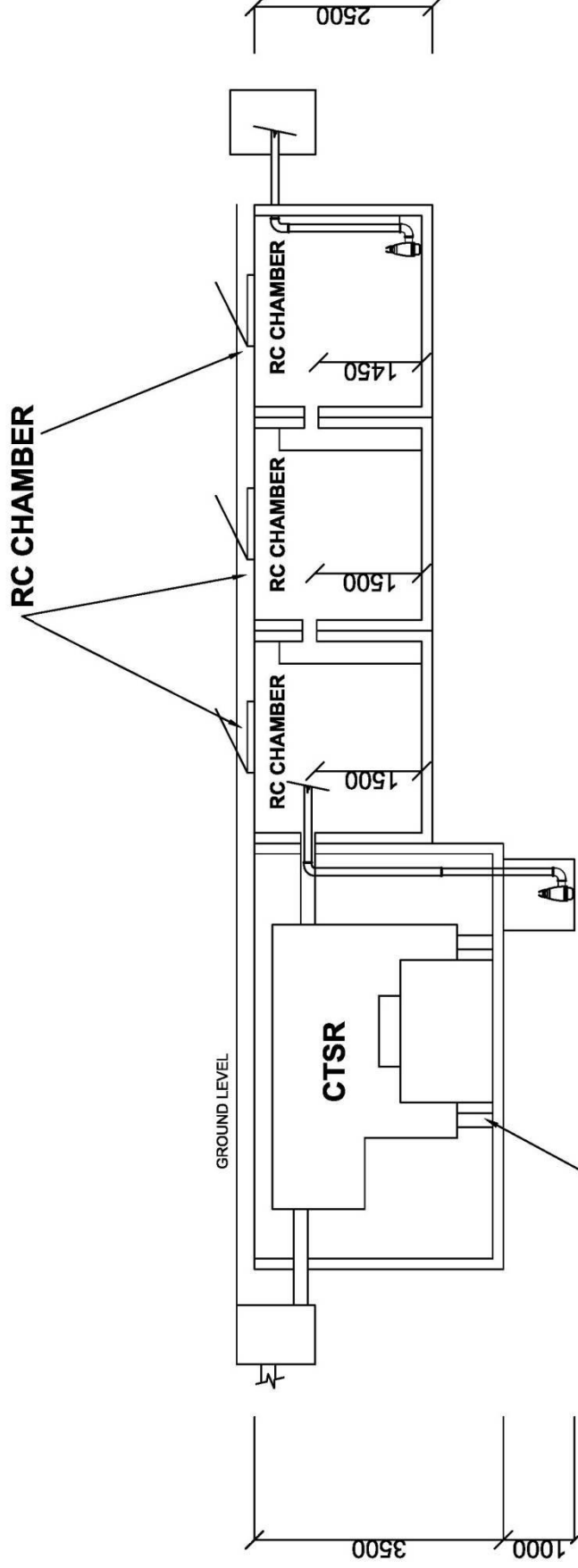
SCALE :

DRAWING NO. :

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PLAN VIEW

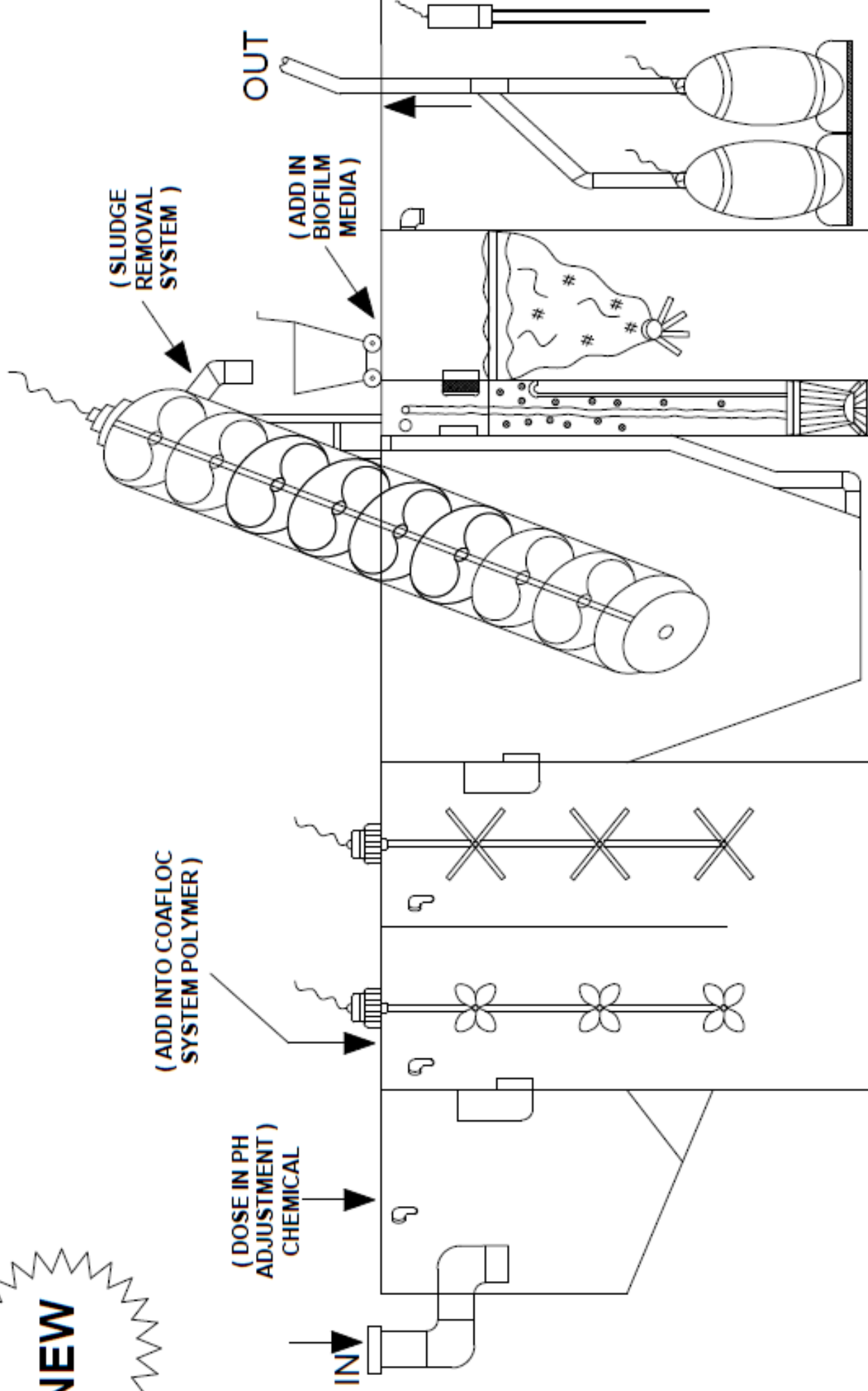


SECTION VIEW

**PREFABRICATED
STAINLESS STEEL
MODEL: FGWP-103 RC/S**

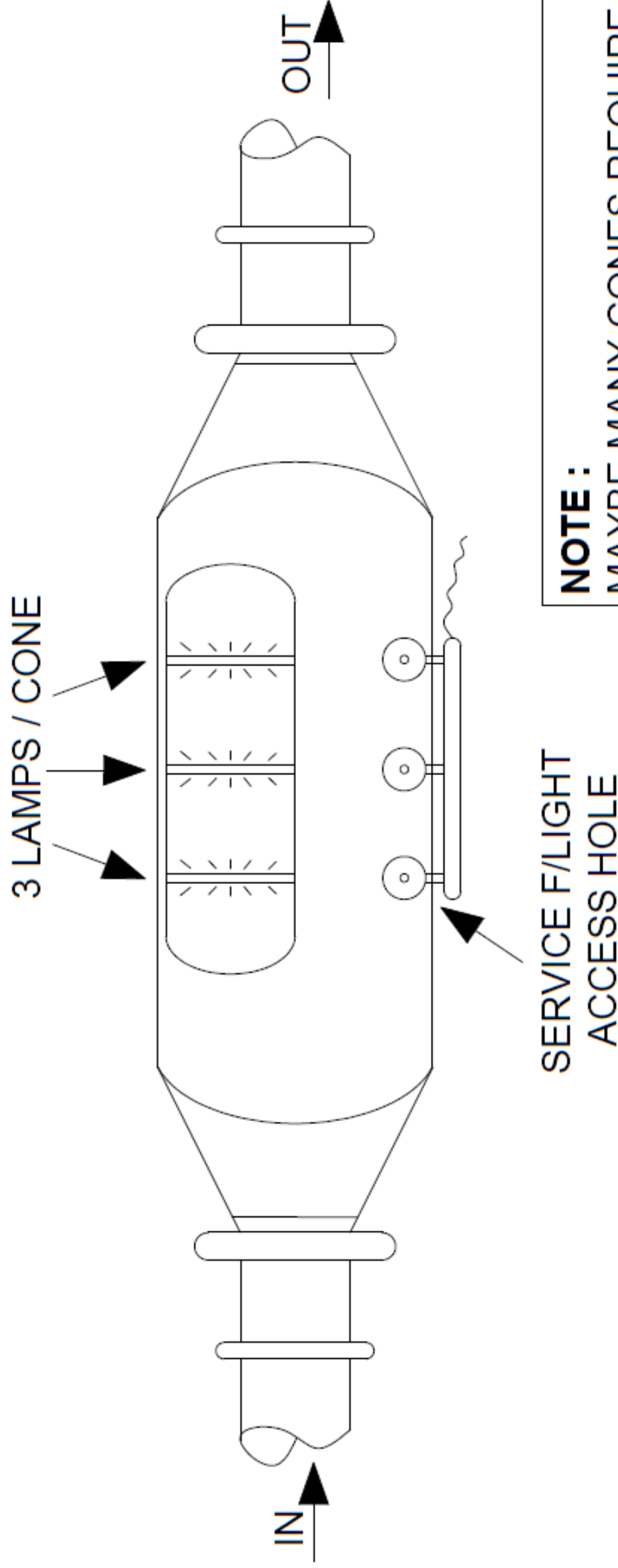
**WASTE WATER TREATMENT SYSTEM CON. SUMP PIT COME
WITH SCREW CONVEYOR SLUDGE REMOVAL SYSTEM**

NEW



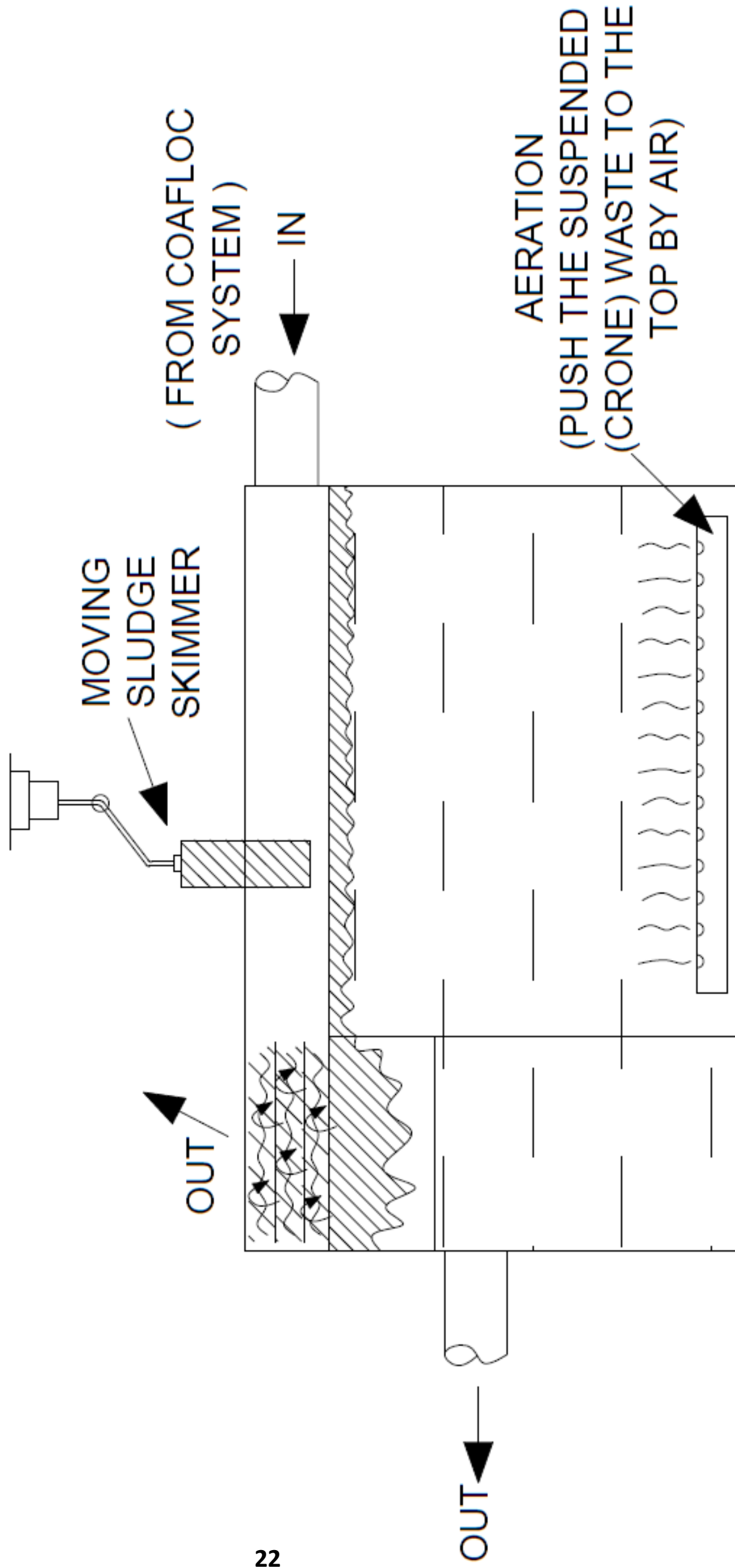
In keeping with our policy of updating products we reserve the right to make improvement or changes without notice.

UV LAMP SYSTEM FOR WASTE WATER TREATMENT



NOTE :
MAYBE MANY CONES REQUIRE
FOR THE TREATMENT (SUBJECT
TO THE FLOW VOLUME)

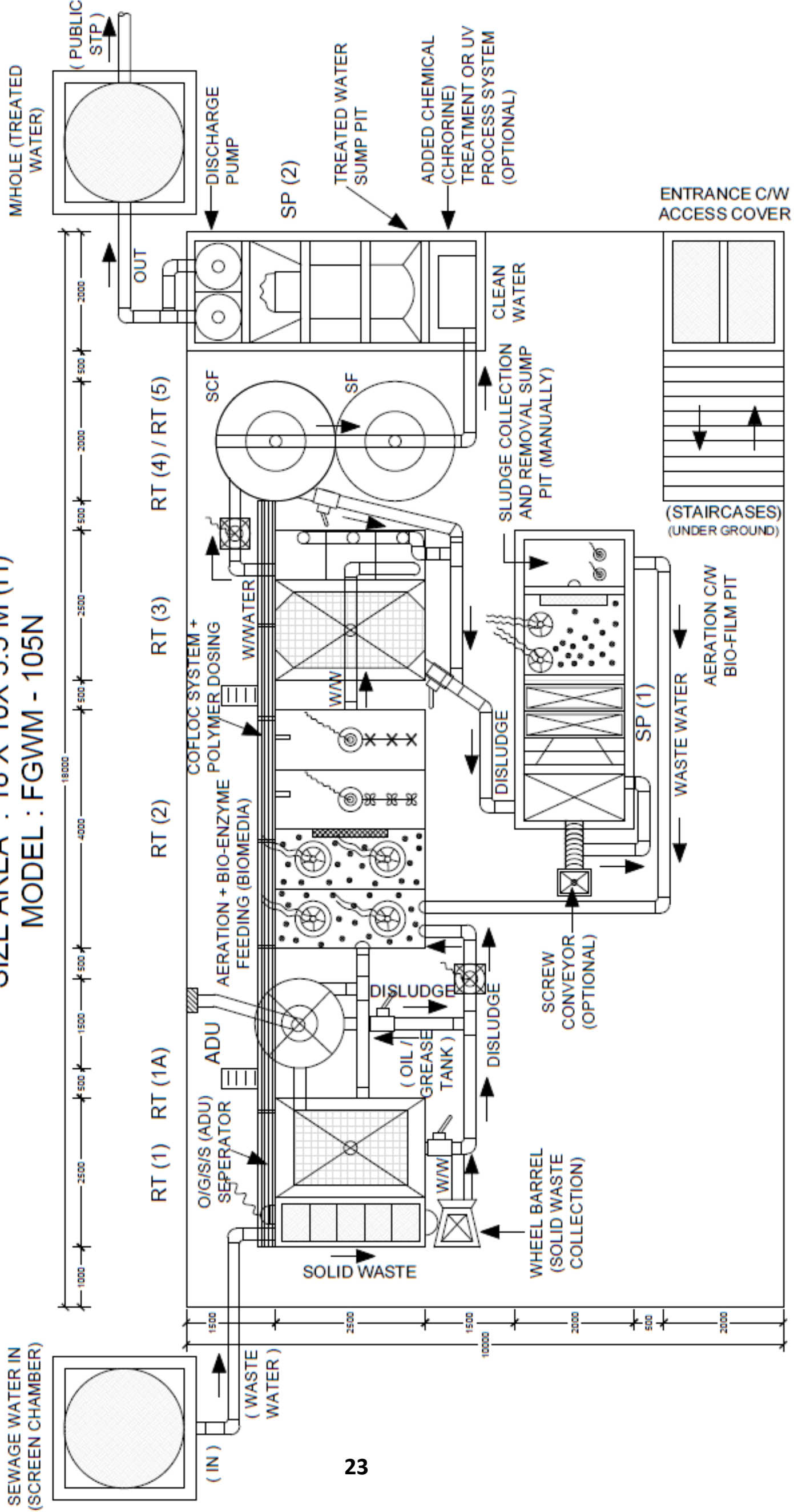
D.A.F (DISSOLVE AIR FLOATATION SYSTEM)



GREYWATEC MBBR WASTE WATER TREATMENT SYSTEM

SIZE AREA : 18 X 10X 3.5 M (H)

MODEL : FGWM - 105N



In keeping with our policy of updating products we reserve the right to make improvement or changes without notice.



GREYWATEC MBBR WASTE WATER TREATMENT SYSTEM

SIZE AREA : 18 X 10X 3.5 M (H)

MODEL : FGWM - 105N

<p><u>PRELIMINARY</u></p> <p>RT (1) OIL / GREASE / SOLID / SLUDGE WASTE REMOVE & HANDLING AND SEPERATION (2.5 X 2.5 (H) M + (1.5 DIA X 2.5(H) M = 4M</p> <p>RT (1A)</p>	<p><u>SELF CLEANING FILTRE</u></p> <p>RT (4) SELF CLEANING FILTRE REMOVING PARTICLES FROM DISCHARGE WATER (2.0 DIA X 2.5 (H) M)</p>
<p><u>PRIMARY / CLARIFIER</u></p> <p>RT (2) SLUDGE / O&G W/WATER AERATION COFLOCULATION + POLYMER DOSING PROCESS ADDED BIOMEDIA PRODUCTS AND BIO-ENZYME FEEDING. (3 X 4 X 2.5 (H) M)</p>	<p><u>SAND FILTRE</u></p> <p>RT (5) SAND FILTRE TANK TO FURTHER REMOVE THE SMALL PARTICLES (2.0 DIA X 2.5 (H) M)</p>
<p><u>SECONDARY CLARIFIER</u></p> <p>RT (3) SETTLEMENTATION PROCESS (2.5 X 2.5 M X 2.5 (H) M)</p>	<p><u>SLUDGE HANDLING / CHRORIMATION</u></p> <p>SP (1) & SP (2) W/WATER AND SLUDGE REMOVAL TREATED WATER C/W CHEMICAL ADDED (2 X 5 X 1.5 (H) M)</p> <p>AREA SUMPITS</p>

In keeping with our policy of updating products we reserve the right to make improvement or changes without notice.

ENVIRONMENT QUALITY ACT 1974

SEWAGE AND INDUSTRIAL EFFLUENTS REGULATIONS

First Schedule

List of discharge to which these regulations do not apply :

- 1) Processing of oil-palm fresh fruit bunches into crude palm oil, whether as an intermediate or final product.
- 2) Processing of natural rubber in technically specified form including prevulcanized or the form of modified and special purpose rubber, conventional sheet, skim, crepe or scrap rubber.
- 3) Mining activities.
- 4) Processing manufacturing, washing or servicing of any other products or goods :
 - that produce effluent of less than 60 cubic meter (13,000 imperial gallons) per day,
 - that the effluent of which does not contain those contaminants listed as parameters (vi) to (xvi) in the first column of the Third Schedule,
 - Where the total load of biochemical oxygen demand of the effluent fixed at 20 degree Centigrade for 5 days or suspended solid or both, shall not exceed 6 kilograms per day (concentration 100 milligrams per liter),
 - In any housing or commercial development or both of less than 30 units, without affecting the generality of the © above.

Second Schedule

Standard methods of Analysis of Effluent

- 1) "Standard Methods of examination of Water and Waste Water" published jointly by the American Public Health Association, an American Water Works Association and the Water Pollution Control Federation of the United States, or
- 2) "Analysis of Raw, Potable and Waste Waters" published by the Department of the Environment of the United Kingdom.

Third Schedule

Parameter Limit of Effluent of Standard A and B :

No	PARAMETER	UNIT	STANDARD	
			A	B
i	Temperature	°C	40	40
ii	pH Value	-	6.0-9.0	5.5-9.0
iii	BOD at 20°C	mg/L	20	50
iv	COD	mg/L	50	100
v	Suspended Solids	mg/L	50	100
vi	Mercury	mg/L	0.005	0.05
vii	Cadmium	mg/L	0.01	0.02
viii	Chromium, Hexavalent	mg/L	0.05	0.05
ix	Arsenic	mg/L	0.05	0.10
x	Cyanide	mg/L	0.05	0.10
xi	Lead	mg/L	0.10	0.50
xii	Chromium, Trivalent	mg/L	0.20	1.00
xiii	Copper	mg/L	0.20	1.00
xiv	Manganese	mg/L	0.20	1.00
xv	Nickel	mg/L	0.20	1.00
xvi	Tin	mg/L	0.20	1.00
xvii	Zinc	mg/L	2.00	2.00
Xviii	Boron	mg/L	1.00	4.00
xix	Iron (Fe)	mg/L	1.00	5.00
xx	Phenol	mg/L	0.001	1.00
xxi	Free Chlorine	mg/L	1.00	2.00
xxii	Sulphide	mg/L	0.50	0.50
xxiii	Oil and Grease	mg/L	Not Detected	10.00

ENVIRONMENT QUALITY (SEWAGE) REGULATIONS 2009

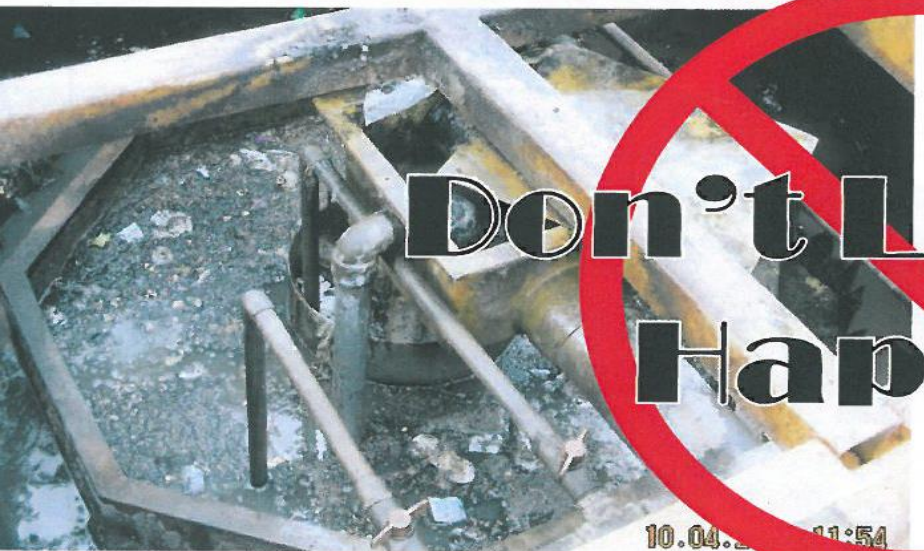
Existing sewage treatment system (approved after January 1999)

All sewerage treatment system which were approved after the Guidelines for Developers : Sewerage Treatment Vol. IV, 2nd edition and were enforced by Department of Sewerage Services, Ministry of Housing and Local Government, beginning January 1999 and up to the date of coming into operation of these regulations.

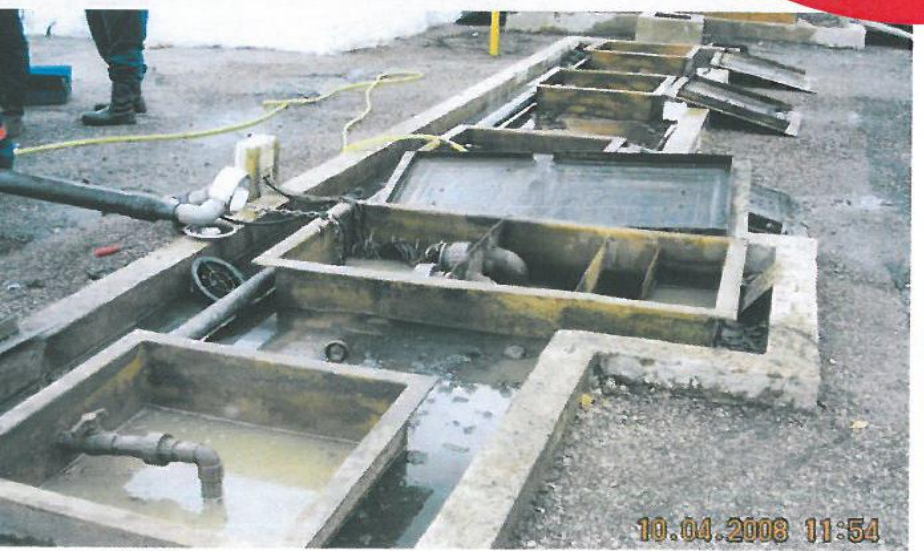
PARAMETER	UNIT	STANDARD	
		<i>A</i>	<i>B</i>
(1)	(2)	(3)	(4)
a) BOD5 at 20oC	mg/L	20	50
b) COD	mg/L	120	200
c) Suspended Solids	mg/L	50	100
e) Oil and Grease	mg/L	20	20
f) Ammoniacal Nitrogen	mg/L	50	50

Note :

Standard A is applicable to discharge into any inland waters within catchment areas listed in the Third Schedule, while *Standard B* is applicable to any other inland waters or Malaysian waters.



Don't Let This Happen



GREYWATEC
PRETREATMENT PLANT SYSTEM

FROSGOLD

FROSGOLD GROUP SINCE 1976

LEADING IN WATER SANITATION ENGINEERING GREEN & CARBON REDUCTION TECHNOLOGIES GREYWATER TREATMENT

**FROSCO BIOMATIC
GREASE INTERCEPTOR**



**FROSCO F.O.G (FATS, OIL & GREASE)
MUNICIPAL WASTE WATER MANAGEMENT &
PRETREATMENT SYSTEM**

**FROSCO
OIL INTERCEPTOR**



**FROSCO
OIL STORAGE TANK**



**FROSCO
DILUTION RECOVERY TRAP &
NEUTRALIZING TANK**



SMOKELESS INCINERATOR

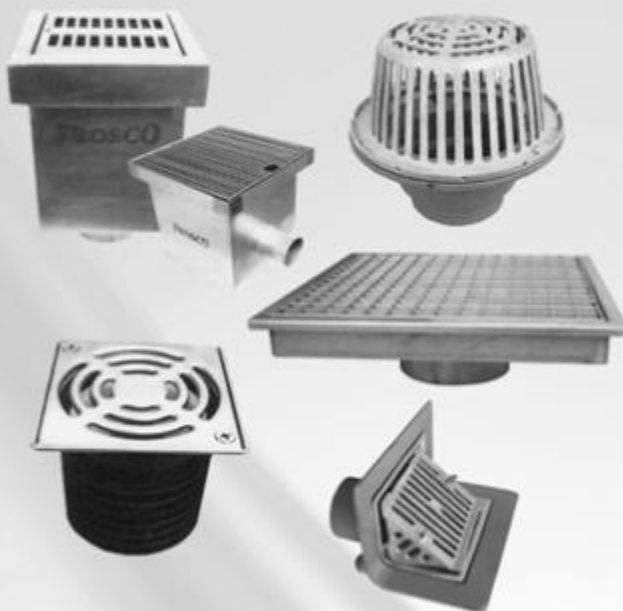


**To Prevent Sanitary Sewer
Line Interference, Blockage
& Overflow**



SG11/03650 SG11/03651
COPYRIGHT FROSCO SINCE 1986

**FROSCO
SEDIMENT INTERCEPTOR &
DRAINAGE PRODUCTS**



**FROSCO RAIN WATER
HARVESTING SYSTEM**



FROSCO (M) SDN. BHD 149888-v
GREYWATEC ENGINEERING SDN. BHD.
12, Jalan TIB 1/3, Taman Industri Bolton,
68100 Batu Caves, Selangor, Malaysia.
Tel : 603-6185 9262 (Hunting Line)
Fax : 603-6185 9279

Email :
work@froscoweb.com
sales@froscoweb.com

Website : www.froscoweb.com

Region :

019-281 5063 (Central)
012-549 7710 (North)
012-713 0515 (South)
016-919 9920 (East Coast)
012-233 3861 (Sabah & Sarawak)

MEMBER OF :



MICCI

MALAYSIAN INTERNATIONAL CHAMBER OF
COMMERCE & INDUSTRY



INTERNATIONAL WATER ASSOCIATION
FEDERATION OF MALAYSIAN MANUFACTURERS
THE ASSOCIATION OF ENVIRONMENTAL CONSULTANTS &
COMPANIES OF MALAYSIA

FROSGOLD

Founded Year 1976

Over 38 years experience in the Building, Construction & Property Industry

Certified ISO 9001:2008 (Quality Management System)

Certified ISO 14001:2004 (Environment Management System)

Pioneer of Biomatic Grease Interceptor System in Malaysia

Collaborated with SIRIM (Standard and Industrial Research Institute of Malaysia) to conduct the 1st test analysis on the Biomatic Grease Interceptor with the highest efficiency result in Malaysia

Our own research, design & manufacturing facilities.

One stop center for developers, architects, design engineers & contractors for their building materials needs



Long track record & excellent service by our team of competent and capable technicians

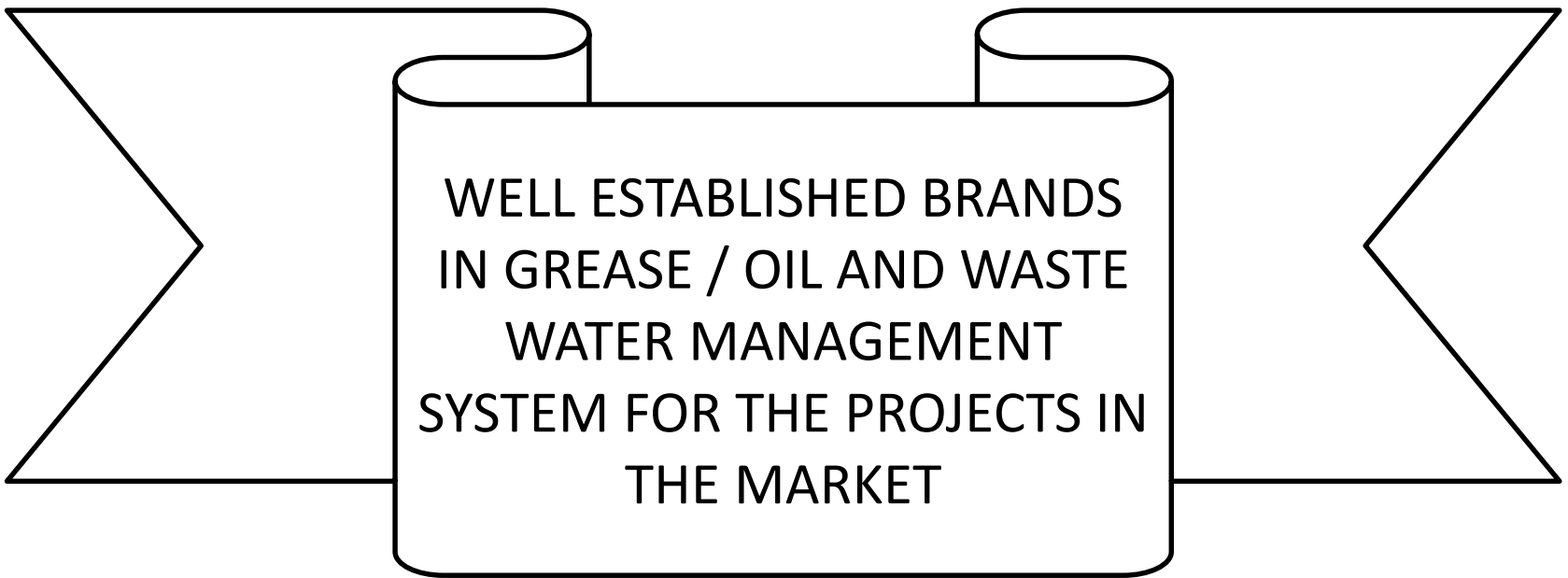
We provide high technical expertise & advice

Consultancy & design for environmental protection related projects

Some of the past projects we have participated & supplied to :

- ✓ **KOMTAR, Georgetown, Penang**
- ✓ **Kuala Lumpur International Airport (KLIA)**
- ✓ **Petronas Twin Towers (KLCC)**
- ✓ **Kuala Lumpur Tower**
- ✓ **Sepang International Circuit (SIC), Formula 1 Racing (F1)**
- ✓ **National Palace, Duta Road, Kuala Lumpur, Malaysia**
- ✓ **Port Klang Free Trade Zone**
- ✓ **Mid Valley City, Kuala Lumpur, Malaysia**
- ✓ **KTM (Keretapi Tanah Melayu, Malayan Railway) National Double Tracking & Electrification Project.**

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GREYWATEC ENGINEERING SDN. BHD**



FROSGOLD

ASSOCIATED BRAND :

FROSCO

GREYWATEC
PRETREATMENT PLANT SYSTEM

CLEARFLOW

FOSSCO tech

 **VTSB TRADING**

In keeping with our policy of updating products we reserve the right
To make improvements or changes without notice.

**MBBR WASTE WATER TREATMENT PLANT
(MOVING BED BIO REACTOR)**

FROSGOLD

GREYWATEC
PRETREATMENT PLANT SYSTEM

Greywatec Engineering Sdn. Bhd.

12, Jalan TIB 1/3, Taman Industri Bolton,
68100 Batu Caves, Selangor, Malaysia.

Tel : 603-6185 9262 (Hunting Line)

Fax : 603-6185 9279

Email : sales@froscoweb.com / work@froscoweb.com / eco@froscoweb.com

Website : www.froscoweb.com

Central Region : 6019-385 1168

Northern Region : 6012-549 7710

Southern Region : 6012-713 0515