GMR LOGISTICS & WAREHOUSING PARK

GMR Hyderabad Aerotropolis Limited (GHAL)

SURVEY NOS. 139, 140, 144, 146, 147, 148, 149, 150, 151, 152, MAMIDIPALLI, SAROOR NAGAR, RANGA REDDY DISTRICT

Conceptual Plan

Logistics & Warehousing Park - Construction Project

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SUBMITTED TO

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2. PROJECT DESCRIPTION/CONCEPTUAL PLAN

This chapter details the need for the project, description of the proposed project and alternatives, and identifies the valued ecosystem components.

GMR Hyderabad Aerotropolis Limited (GHAL) has envisaged Logistic & warehousing within RGIA. Logistics & Warehouse has emerged as new area of potential growth and GHAL to cater to the demand from the segment has identified a land parcel of appx 26.66 hectares towards north east of existing airport terminal within the overall RGIA (Rajiv Gandhi International Airport) campus. The proposed Logistics & Warehouse park will spur demand for wide array of spin off businesses and will offer the full spectrum of services required for such large-scale development coming within the planned development zone.

Logistics is the management of the flow of goods and other resources between the point of origin and the point of consumption in order to meet the requirements of consumers. Logistics involves the integration of information, transportation, inventory, warehousing, material-handling and packaging.

Companies that are located within the facility get benefited in the form of reduced costs (less tied-up capital, economies of scale, and/or logistics outsourcing) or an ability to provide better services in cooperation with other companies operating within the park. The concept of a Logistics Park is a recent phenomenon. It can be traced back to the Foreign Trade Policy of 2004, which led to the development of FTWZs. While FTWZs were aimed at facilitating import and export of goods, the need for one-stop solution that could additionally cater to the domestic market led to the development of Logistics Parks as a part of the infrastructure industry since 2005.

The proposal is to set up a Logistics & Warehousing Park with the following facilities

WAREHOUSE FACILITIES

Warehouse can be utilized by manufacturers or traders who wish avail a common facility as a godown for storing their products/ raw materials toward any transshipment.

- Warehouse Facility for general goods and raw materials
- For ICD/CFS facility, the equipment's for handling Containers will be provisioned required. CFSs are involved in export/import transaction both at the Airport of embarkation as well as at the Airport of disembarkation.

OTHER BUILDINGS

Individual plots are proposed for processing or assembling the goods/products to ensure value addition of imported products.

2.1 THE PROJECT LOCATION

The project will be spread over an area of **26.66 hectares** in Survey Nos. 139, 140, 144, 146, 147, 148, 149, 150, 151, 152 Mamidipalli village, Saroor nagar mandal, Ranga Reddy district. The proposed project will be implemented within the existing Airport area only. The site is surrounded by open lands in all the directions. e connectivity to the site is by a 36m wide road towards the South & West direction and further connects to main access road of RGIA connecting NH-7 and Srisailam Highway The nearest railway station is Umda nagar Railway station located at a distance of appx 10kms.

2.2 PROJECT DESCRIPTION

2.2.1 DESIGN STAGE

The principles of low impact development are adopted during the design stage to ensure storm water percolation, treated water reuse, energy conservation, and optimized usage of renewable resources. The Area Statement for the proposed Cargo Logistic Park is presented in table 2.1.

It is proposed to develop Warehouse Logistic Park. 5 Warehouse in Ground + Mezzanine floor, Project Admin Office in G + 1 floor, Amenities block and Drivers Rest area in Ground floor. The water requirement of the project during operation will be drawn from existing Airport water supply system which subsequently getting water from HMWSSB. The sewage generated from the project will be treated in the dedicated Sewage Treatment Plant. The treated sewage shall be completely reused for landscaping and flushing. Water conservation measures will be incorporated in the plumbing designs. Water recycling/reuse will be adopted by way of using treated sewage for toilet flush systems and green belt development. The required power will be drawn from the TSCPDCL. Construction materials will be drawn from local sources. The parking provision exceeds the guidelines prescribed by FAR and Building policy of Telangana. The layout of the project site is presented in fig. 2.1.

Table 2.1 Area Statement for the proposed Building

Land Use	No. of floors	Total Site Area (m^2)	Total Built up area (m^2)
Warehouse (5 nos.)	Ground + Mezzanine	133633.3	143641.3
Project Admin Office	G + 1	1200.0	2400.0
Amenities Block	Ground	1080.0	1080.0
Drivers Rest Area	Ground	75.0	75.0
Utility		5546.0	
Surface Parking		33878.0	
Road		60026.6	
Open area		4345.0	
Green area		26823.0	
Total		**266606.9**	**147196.3**

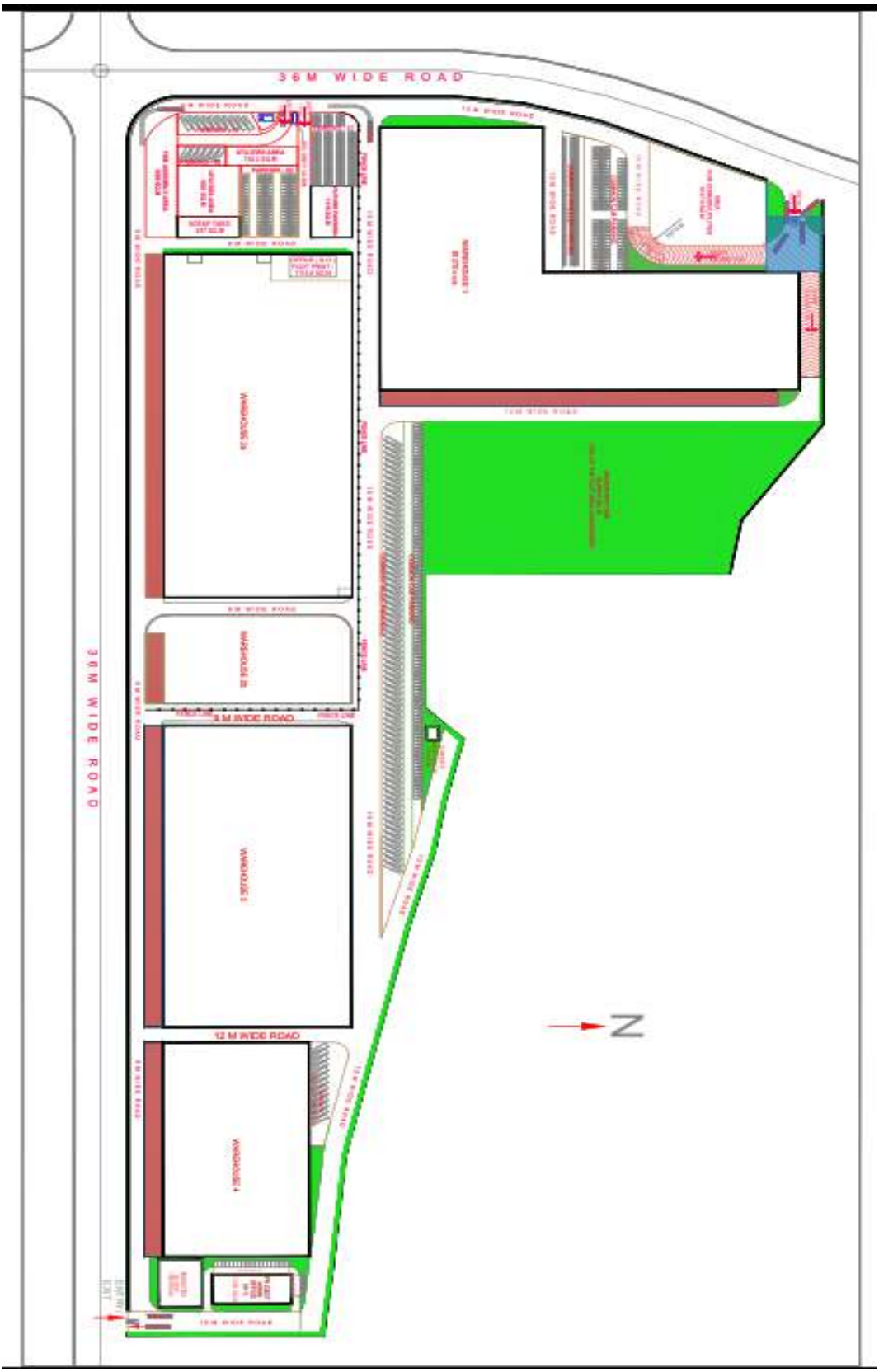
PARKING PROVISION

It is proposed to provide Surface parking. The parking provision follows the guidelines prescribed by HADA and Building policy of Telangana. The number of parking spaces provided is presented in table 2.2.

Table 2.2 Parking Space Provision of the Project

Description	Parking Nos.
Truck Parking	102
4-Wheeler	365
2-Wheeler	617

Fig 2.1 Site layout



2.2.1.1 Storm water drains: Storm water drains will be provided all over the proposed site to meet the expected increase in the runoff during rainy season due to the impervious nature of the roads and other paved areas. The site is uneven and it is proposed to maintain the levels as much as possible, hence storm water outlets from the site are anticipated. The expected runoff is calculated for the design of the storm water management plan is presented in table 2.3.

Rainwater pipes shall be designed for rainfall intensity of 40mm/hour. The storm water drain has been proposed taking into consideration the site profile (contour).

CALCULATION FOR STORM WATER DRAIN

Quantity of storm water:

(a) Without project:			
Area of Catchment, 'A'	:	26.6607	Ha
Run off Coefficient, 'C'	:	0.6	
Maximum intensity of rainfall, 'I'	:	40	mm/hr
Therefore Q	:	1.777	m^3/sec
(b) With project:	:		
Area for catchment for roof and road	:	19.601	Ha
Area of Catchment, 'A'	:	19.601	Ha
Run off Coefficient, 'C'	:	0.9	
Maximum intensity of rainfall, 'I'	:	40	mm/hr
Therefore Q =	:	1.960	m^3/sec
Area for catchment for open areas	:	7.059	Ha
Run off Coefficient, 'C'	:	0.6	
Maximum intensity of rainfall, 'I'	:	40	mm/hr
Therefore Q =	:	0.471	m^3/sec
Total Discharge	:	**2.431**	**m^3/sec**
But, Discharge, Q = A/V	:		
Where,	:		
A= Area of the Drain,	:		
V= Max. Permissible Velocity	:	6	m/sec for concrete drain
Area of drain, 'A' = Q/V	:	0.405	m^2
Taking depth of drain as 0.6 m at the starting point	:	**0.6**	
Width of drain = Area/depth =		**0.675**	**m** **675** **mm**

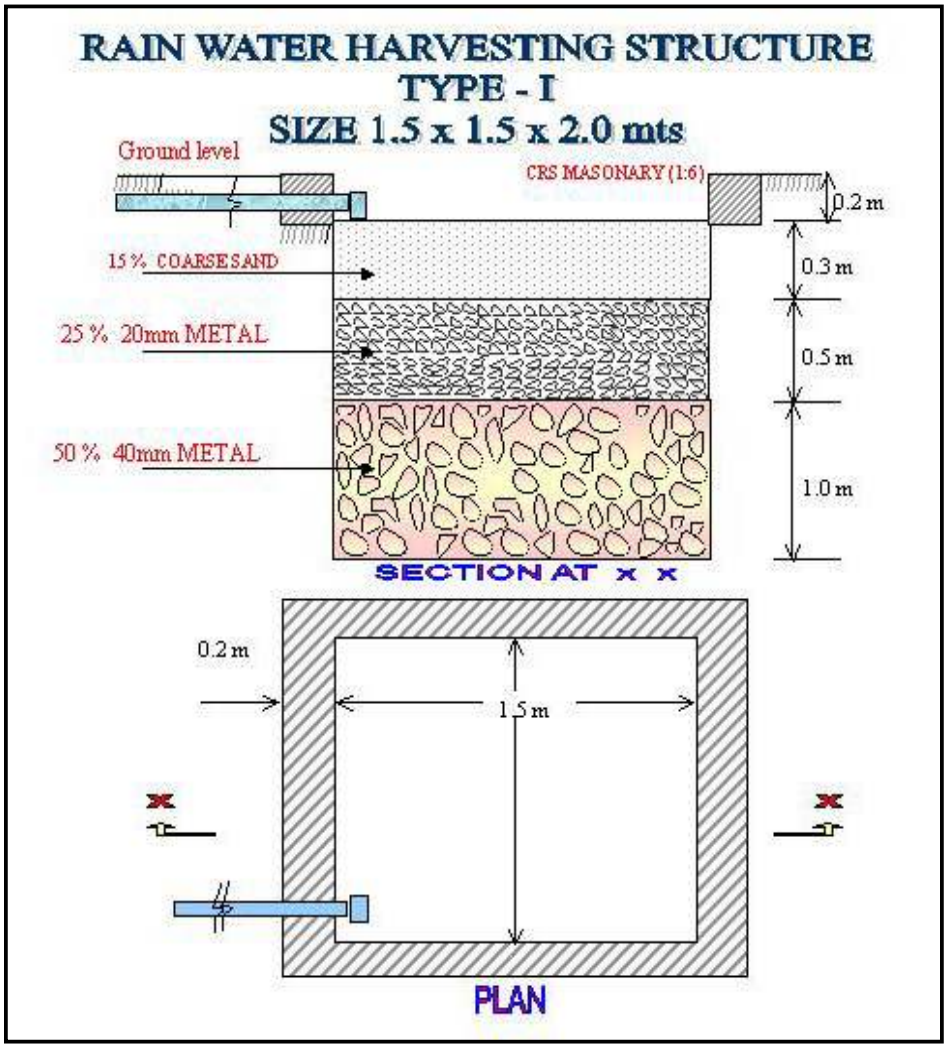
Width of the drain is to taken 681 mm and depth varies according to the slope of ground.

Table 2.3. Storm Water Calculation

Land Use	Area in Hectares	Vol./hr (KL) after develo pment C=0.8	Vol./hr (KL) before Develo pment C=0.6	Difference in Discharge (KL)	Remarks
Roof Area	13.60	4351.63	3263.72	16.24	Harvested about 22 nos. of RHP of size 1.5m X 1.5m X 2.0m
Road Area	6.00	1920.85	1440.64	16.40	
Open Area	7.06	847.10	1694.21	-13.68	
TOTAL	**26.66**			**18.96**	

**C=0.3 after development of greenery*

Fig 2.2 Rainwater Harvesting Structures



Rain water harvesting facilities like recharge pits, bio swales, rain gardens shall be developed apart from roof top rainwater harvesting.

Rainwater Harvesting:

The quantity of rainwater, which can be harvested, depends upon the annual rainfall, the area of the plot (catchment area) and soil characteristics. The amount of water infiltrated into soil varies with the condition of soil surface and the moisture content of the soil at the time of rainfall. The total amount of water infiltered depends on the infiltration opportunity time, which depends mainly on the slope of the land and the field structure like contour bunds, terraces and other structures, which tend to hold the runoff water over long periods on the land surface.

Roof top water shall be used for domestic purpose/landscaping after filtration and disinfection.

2.2.1.2 Domestic Water

Water is required for the construction as well as during occupation stage as the same is an important resource. It is proposed to draw domestic water from the drawn from existing Airport water supply system which subsequently getting water from HMWSSB, which has been encouraging the bulk consumers. The water requirement during construction will be from existing Airport water supply system which subsequently getting water from HMWSSB /bulk suppliers/municipal tankers. The water requirement of the project during occupation stage is in the order of 396.0 KLD. The water requirement for the project during the occupation stage is presented in table 2.4. The Water Balance for the project is presented in table 2.6.

Table 2.4 Water Requirement of the Project

Description	Total No. of Persons	Water requirement lpd*	Total Water Requirement in KLD
Employees	8000	45	360.0
Visitors	2400	15	36.0
Total			**396.0**
*** Water requirement as per NBC**			

The piping for landscaping shall generally be in HDPE, detailing of which would depend on the finally approved landscape design. Pumping requirements of landscaping would also likewise depend on the landscaping design, and shall generally be centralized and operated from the STP with timer, using Drip/Pressurized sprinkler systems. A separate flushing water line will be proposed to each toilet in the building to recycle the treated sewage. The total saving is as follows;

Table 2.5 Water Savings Proposed

Description	No. of Persons	Water Requirement in KLD	Treated water reuse KLD	Effective Water Requirement in KLD
Employees	8000	360.0	160.0	200.0
Visitors	2400	36.0	24.0	12.0
Total		**396.0**	**184.0**	**212.0**

The effective water consumption is reduced by **184.0** kl/day and the requirement will be in the order of 212.0 kl/day. The water balance of the project during occupation stage is tabulated in table 2.6.

Table 2.6 Water Balance during occupation stage

Input	KLD	Output	KLD
Domestic water from RGIA Supply System	212.0	Treated water for HVAC	122.2
Recycled water (Flushing)	184.0	Recycled water (Flushing)	184.0
		Water requirement for green belt during non-monsoon	70.0
		Losses (5%)	19.8
Total	**396.0**	**Total**	**396.0**

The water used is about 396.0 KL/day would generate 376.2 KL/day of wastewater which has to be treated for reuse. The Sewage Treatment flow chart is shown in fig 2.5.

Treatment plant for treating sewage in the project site has been proposed for a capacity of **400 m^3/day.**

PROCESS DESCRIPTION:
The raw sewage will be collected in a collection sump and pumped to mechanical bar screen chamber for removal of large floating matter followed by grit removal in Grit Chamber. The raw sewage will then be collected in an equalization tank for homogenization of hydraulic load. The tank contents will be kept in suspension by means of course bubble serration through pipe grid. The equalization tank, with air flow indicator for continuous monitoring of air supply to the tank in order to avoid septic conditions, will be covered from top (RCC or FRP) to avoid nuisance. The equalized effluent will then be pumped to two Fluidized Aerobic Bio Reactors (FAB) in series where BOD/COD reduction can be achieved by virtue of aerobic microbial activities. The oxygen required will be supplied through coarse air bubble diffusers. The bio-solids formed in the biological process will be separated in the down stream Tube Settler. The clear supernatant will gravitate to the chlorine contact tank where sodium hypochlorite will be dosed for disinfection of treated water prior to disposal.

The biological sludge generated in the FAB and settled in the tube settlers will be collected in a sludge sump and then pumped to sludge drying bed for de watering. The dried sludge will then be disposed off suitably as manure. The schematics of the

process are shown. The two main components of the treatment system viz. The FAB reactor and tube settler are described in the following sections.

Fluidized Aerobic Bio Reactor (FAB)

Conventional effluent treatment plants are large sized, power intensive and require a lot of monitoring. Scarcity of open space and rising land a power costs have forced the industries to look out for space saving, compact and efficient treatment options. This has led to the development attached growth processes where the bio mass is retained within the aeration tank obviating the need for recycle. These plants are not only compact but also user friendly. The endeavor to have a continuously operating, no-clogging biofilm reactor with no need for back washing, low head-loss and high specific biofilm surface area culminated in the most advanced technology of aerobic biological fluidized bed treatment where the biofilm (biomass) grows on small carrier elements that move along with the water in the reactor. The movement is normally caused by aeration in the aerobic version of the reactor.

The reactor combines all the advantages and best features of Trickling filters, rotating biological contractors, activated sludge process and submerged fixed film reactors while eliminating the drawbacks of these systems. The plants are more compact and more energy efficient.

The Fluidized Aerobic Bio Reactor (FAB) consists of a tank in any shape filled up with small carrier elements. The elements are made up of special grade PVC or polypropylene of controlled density (shown in plate). For media of specific gravity 0.92-0.96 the overall density could be expected to increase up to 9.5% when full of biomass such that they can fluidize using an aeration device. A biofilm develops on the elements, which move along the effluent in the reactor. The movement within the reactor is generated by providing aeration with the help of diffusers placed at the bottom of the reactor. Then thin biofilm on the elements enables the bacteria to act upon the biodegradable matter in the effluent and reduce the BOD/COD content in the presence of oxygen available from the air that is used for fluidization.

Table 2.7 Characteristics of Waste water

Parameter	Quantity in mg/l
PH	6 – 7
Total Suspended Solids	400 – 600
BOD	200 – 300
COD	450 – 500

Design of the unit

Basic data

Flow	:	376.2	KLD
Capacity	:	400	m^3
Peak factor	:	3.5	
Peak flow Q peak	:	1225	m^3/day
Influent BOD	:	200	mg/lit

Influent Suspended Solids	:	200	mg/lit
Influent COD	:	350	mg/lit
Effluent BOD	:	20	mg/lit
Effluent COD	:	200	mg/lit
Effluent Suspended Solids	:	100	mg/lit

1. Bar Screen Chamber

Average flow	:	0.004	m^3/sec
Peak factor	:	3.5	
Peak flow	:	0.014	m^3/sec
Velocity at peak flow	:	0.75	m/Sec
Effective area of screen Required			
At average flow	:	0.005	m^2
At Peak flow	:	0.0175	m^2
Provide Effective area of screen	:	0.0175	m^2

Considering the bar of dia. 10 mm(w) and clear spacing of 20 mm (b)

Overall area required	:	0.34	m^2
Considering screen depth as	:	0.024	m
Number of clear spacing	:	0.3	
Number of bars	:	3	Consider 5 Nos.

Hence Provide 5 bars

Provide a screen of 0.5 m X 0.5 m at an inclination of sin 60^0. In a screen channel of one-meter (1 m) length.

2. Grit Chamber:

The flow from the bar screen chamber is let into the Grit Chamber of minimum 2 hours capacity. This tank is provided to even out the flow variation, and to provide a continuous feed into the secondary biological treatment units.

Peak flow Q	:	0.014	m^3/sec

Providing a flow through velocity of 0.30 m/sec

Cross sectional area of Channel	:	0.046	m^2
Surface area of channel	:	0.66	m^2
Assuming depth d	:	0.2	m
Width of channel	:	0.1	m (say 0.3m)
Length of channel	:	4. 6	m (say 4.6 m)

Provide two channels each of 0.3 m wide and 4.6 m long with depth of waste water 0.2 m.

3. Equalization tank:

The flow from the bar screen chamber is let into the equalization tank of minimum 2hours capacity. This tank is provided to even out the flow variation, and to provide a continuous feed into the secondary biological treatment units.

Average flow	:	14.58	m^3/hr
Peak factor	:	3.5	
Peak flow	:	51.04	m^3/hr
Hydraulic retention tank = 2 hrs at Peak flow			
Hence required volume of the tank	:	102.08	m^3
Provide tank of	:	102.08	m^3 Capacity
Assuming depth	:	3	m
Area	:	34.02	m^2
Assuming length to width ratio (1:1) ; l=b			
length of the tank	:	5.8	m
width of the tank	:	5.8	m
Air required for agitation	:	0.01	m^3/ m^2 min
Total air required	:	61.25	m^3/hr
Air blower required	:	100	m^3/hr @ 3.8 mwc
Effluent transfer pump	:	14.58	m^3/hr @ 8 mwc

4. Fluidized Aerobic Bio Reactor (FAB):

The polypropylene media have been provided with a specific surface area of 350 – 520 m^2 /m^3. This allows micro-organisms to get attached and biomass concentration can be increased to four folds as compared to Activated Sludge Process. This enables to consider higher Organic loading rates.

The micro-organisms attached to media are kept in a fluid state thereby maintaining the CSTR (continuous Stirrer tank reactor) regime as well as two tanks are provided in series making the plug – flow system. This will enhance the efficiencies and have the merits of both CSTR and plug-flow regimes.

Organic loading rate	:	3.2	kg BOD/ m^3 d
Organic load	:	60	kg/day
Volume of the tank	:	21.86	m^3
Assume the depth	:	3	m
No. of tanks in series	:	1	
Size of the tank	:	1.8 m dia. x 3.0 SWD	
Specific gravity of media	:	0.92 to 0.96	
Specific surface area of media	:	350 – 520 m^2 /m^3	
Media filling	:	30 – 50 % of tank volume	
Oxygen required	:	2	kg / kg BOD
Oxygen in air	:	23%	
Specific gravity of air @ 30 deg.	:	1.65	
Aeration	:	Coarse bubble	
Oxygen transfer efficiency	:	12%	
Air required	:	77.7	m^3/hr

Air blower required	:	80	m^3/hr @ 6.5 m wc

5.Tube settler

Surface loading rate	:	48	m^2 /m^3 d
Surface area required	:	7.29	m^2
Tank size	:	3.0 m x 6.0 m x 2.7 m SWD With 55 deg. hopper bottom	
Tube Modules	:	3.0m x 6.0 m x 0.6 m ht.	
Tube inclination	:	60	deg.
Settling area for 60 deg slope	:	11	m^2 /m^3
Cross sectional area of tubes	:	120 mm x 44 mm Hexagonal	
Hydraulic radius	:	1/61 cm (1.5 cm)	
Shape factor	:	0.6 – 0.7 *for media settleable solids*	

6. Pre-Filtration tank

The flow from each individual settling tank i.e., the supernatant liquid is let into the respective Pre-Filtration Tank, which has a minimum 1.5 hours holding capacity. This tank is provided to hold the treated effluent and give an even flow to the pressure sand filter.

Average flow	:	14.58	m^3/hr
Peak factor	:	2	m^3/hr
Peak flow	:	29.16	m^3/hr
Provide min 1.5 hours holding capacity.			
Hence required volume of the tank	:	43.75	m^3

7. Pressure Sand Filter:

Vertical down flow type with graded/sand bed under drain plate with polysterene strains.

Flow	:	400	m^3/day
Rate of filtration assumed as	:	10	m^3/m^2/hr
Requirement of treated water for usage in 20 hrs	:	17.5	m^3/hr
Dia. of filter of 1 nos.	:	2286	mm

Provide pressure sand filter of 2500 mm dia. and 2800 mm HOS with sand as media layer, under drain pipe, laterals face piping etc for each stream.

8. Activated Carbon Filter:

Vertical down flow type with graded/sand bed under drain plate with polysterene strains.

Flow	:	400	m^3/day
Rate of filtration assumed as	:	10	m3/m2/hr
Requirement of treated water for usage in 20 hrs	:	17.5	m^3/hr
Dia of filter of 1 nos.	:	2286	mm

Provide Activated Carbon filter of 2500 mm dia with granular Activated carbon as media and 2800 mm HOS with sand as media layer, under drain pipe, laterals face piping etc for each stream.

9.Final Treated Water Holding Tank

It is always preferred to provide one final holding tank of minimum one day holding capacity, so that the treated effluents can be stored and used back for gardening or other tertiary purposes.

Capacity: 400 m^3

10. Sludge Filter Press:

The biomass in the aeration tank stabilizes BOD in wastewater by consuming the organic matter in the wastewater. The metabolic activity results in growth of the biomass population in the Fluidized Aerobic Bio Reactor (FAB). Sludge holding tank has been provided with filter press for dewatering sludge. The filtrate drains off through the media, which is again let into equalization tank. The dewatered sludge is collected in trays, which can be used as manure in the garden.

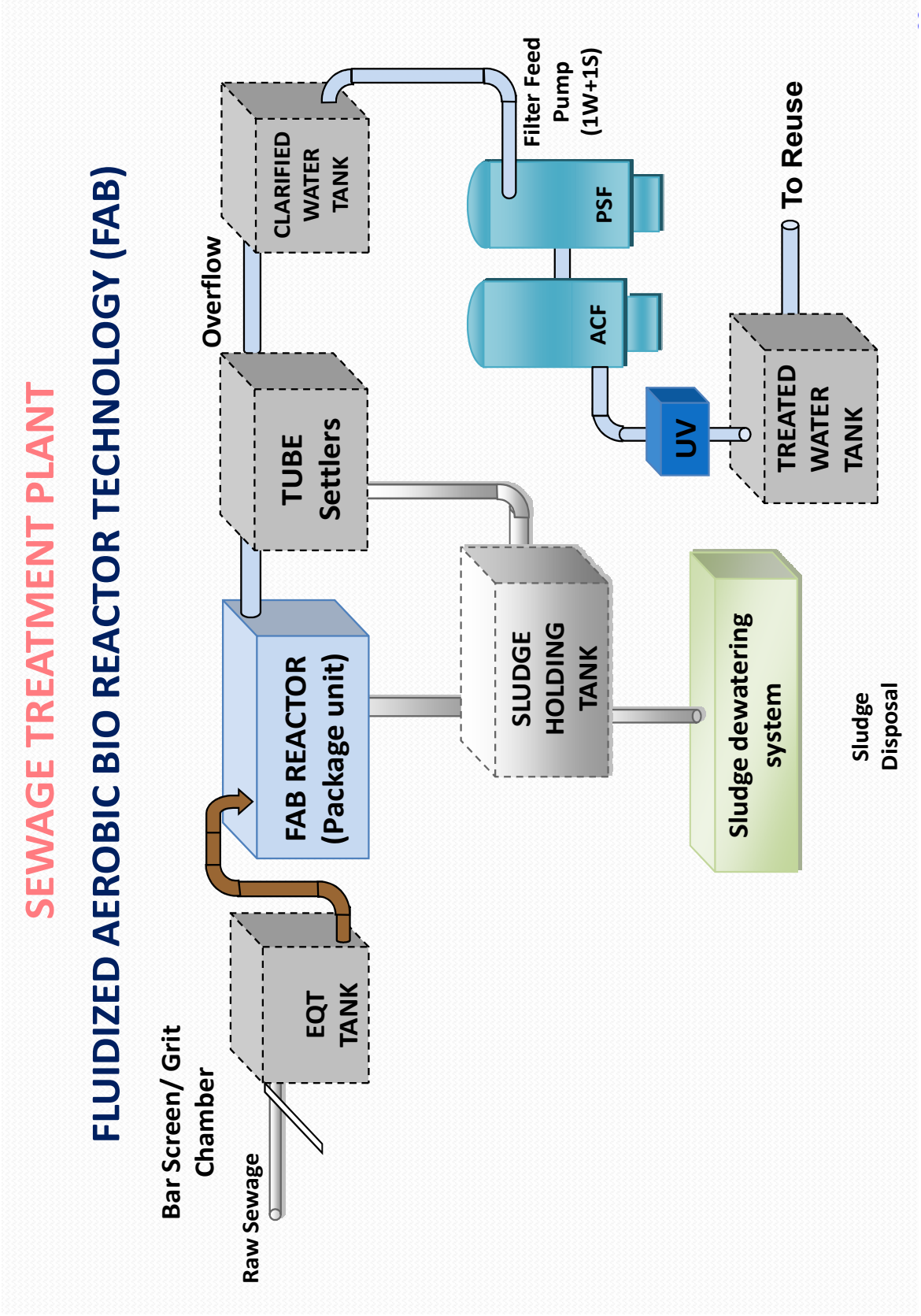
No. of plates	:	24
Size of plates	:	600 mm X 600 mm
Plate moc (material of construction)	:	PP (poly propline)
Type of operation	:	Hydraulic
Power pack capacity	:	2 HP

Characteristics of Treated Waste water

Parameter	Quantity in mg/l
pH	5.5 – 9
Total Suspended Solids	20
BOD	10
COD	50

Disposal of Treated Wastewater: The treated water shall be used for toilet flushing, HVAC make up water requirement and for green belt development for the greening of site. Hence the recycled water is utilized completely and is considered as a zero discharge.

Fig: 2.3 Sewage Treatment Hydraulic Flow Diagram



2.2.1.3 Solid Waste

Municipal Solid Waste Composition

In India the biodegradable portion dominates the bulk of Municipal Solid Waste. Generally, the biodegradable portion is mainly due to food and yard waste.

Table 2.8 Composition of Municipal Solid Waste

Type	(%)	Solid waste in kg
Paper	8	211.2
Plastics	9	237.6
Metals	1	26.4
Glass	1	26.4
others	4	105.6
Biodegradable	48	1267.2
Inerts	25	660.0
Rags	4	105.6
Total	**100**	**2640.0**
(Source: NSWAI - National Solid Waste Association of India)		

Design Stage

The total number of people anticipated to stay in the project is in the range of 10400. The anticipated solid waste/garbage is in the range of 300 g/head, and the total garbage will be in the order of 2640.0 kg/day. The solid waste from the office building is at the segregation point and finally sent to the main collection point. Solid waste shall be treated at the existing facility of RGIA. The capacity of the existing SWM facility is being expanded and the solid waste from the Project shall be accommodated within that capacity. All the biodegradable waste will be composted. Recyclable waste will be segregated and sold. The solid waste management plan is enclosed in Fig 2.6**.** The table 2.8 presents the anticipated garbage quantity after occupation. Return goods which do not meet customer requirements are returned to the concerned sellers.

Table 2.9 Solid Waste Generation

Land Use	No. of Persons	Total Solid waste in Kgs/day
Employees	8000	2400.0
Visitors	2400	240.0
Total		**2640.0**

2.2.2 Construction Stage

The sequence of construction operations and the approximate time requirement is presented in the following table 2.10. The time schedule of the entire project is approximately 6 months.

Table 2.10 Construction Sequence

S.No	Description of work	
1	Clearing and Grubbing	
2	Leveling by way of cut and fill	
3	Foundation Excavation.	
4	Foundation PCC & Concrete & Plinth Beam.	
5	Column lifting up to GF Roof.	
6	1st floor slab reinforcement & shuttering & Concreting.	
7	Stair case slab	
8	1st floor column lifting up to 1st floor roof.	
9	1st floor roof shuttering, reinforcement & concreting.	
10	Deshuttering of GF Roof & cleaning.	
11	Deshuttering of 1st Roof & cleaning.	
12	Brick work in GF floor.	
13	Brick work in 1st floor.	
14	Staircase up to terrace.	
15	Staircase headroom slab.	
16	Plumbing works (concealed works).	
	Electrical conduit junction boxes & board fixing. Plastering works.	a. Internal (GF & FF).
		b. External (GF & FF).
17	Fixing of door & window frames.	
18	Plinth filling & floor PCC.	
19	Floor Tiling Works, bathroom, kitchen & platform works.	
20	Staircase stone works.	
21	Terrace waterproofing works.	
22	Parapet wall in terrace & miscellaneous works.	
23	Fixing of door & window shutters.	
24	Fixing of sanitary fittings.	
25	Electrical wiring & fixtures.	
26	Painting works.	
27	External development & compound wall.	

The clearing and grubbing activity involves clearing of few trees and shrubs mainly as the greenery is not disturbed in the layout plan. The cut and fill operation for the entire area is presented in table 2.11. There is excess cut material which would be used for construction of roads and the purpose of aggregate for the construction purpose.

Table 2.11 Earth Work Quantities

S. No.	Area	Qty. of fill (m^3)	Qty of cut (m^3)	Surplus fill (m^3)	Surplus cut (m^3)
1	Site	2319	3864	---------	1546

The cut material contains mainly granite stones, which is suitable for masonry works. The excess cut material in the order of 1546 m^3 will be used for above purpose. The construction of this magnitude would require huge quantities of construction materials. The material requirement for the project is presented in table 2.12.

Table 2.12 Material Consumption

Land Use	BUA per unit in (m^2)	Ready Mix Concrete (m^3)	Cement (bags)	Sand (m^3)	Aggregate (m^3)	Water (m^3)	Block (Nos) x 1000	Reinforcement steel (MT)
Total BUA	147196	117757	294393	52991	29439	176636	11776	11187
Total	**147196**	**117757**	**294393**	**52991**	**29439**	**176636**	**11776**	**11187**

Thus aggregate requirement will be met from within the plant site. The lead distance for various construction materials is presented in table 2.13.

Table 2.13 Lead Distance for Construction Materials

S.No	Material	Source	Lead Distance (Km)
1	Sand	ROBOSAND and or Krishna or Godavari river bed areas permitted by Govt. of Telangana	200 – 340
2	Aggregate	Within the site	0 – 5
3	Cement	Manufacturing units	100 – 150
4	Reinforcement Steel	SAIL/TATA god owns	5-10
5	Bricks	Local suppliers/ Manufacturers	50
6	Plumbing Material	Local suppliers	2 – 9
7	Electrical Material	Local Suppliers	2 – 8
8	Sanitary Material	Local suppliers	2 – 8
9	Flooring and Pavement Tiles	Manufacturers	50– 110
10	Paints	Local Manufacturers	10 – 30
11	Ready Mix Concrete	Local Batch Plants	3 - 7

2.2.2.1 Water Requirement

The water required for this project is in the order of 177000 m^3 for the entire project implementation period. The peak demand for water may be 200 m^3/day, however typical daily consumption will be in the order of 120 m^3/day. The required water will be drawn from existing Airport water supply system which subsequently getting water from HMWSSB /bulk suppliers/municipal tankers. The project authorities explored the possibility of using treated wastewater to meet partial requirement of water and could not identify a reliable source. The water supply and plumbing will be optimized and low water consuming faucets and flush tanks will be used to conserve water.

2.2.2.2 Construction Debris

The construction debris consists of various types of materials. The construction debris will be in both hazardous and non-hazardous categories. The hazardous debris consists of empty containers of adhesives, thinners, paints, and petroleum products. These empty containers will be sold to authorized recyclers. The non hazardous wastes contain recyclable debris like iron and other metal, glass, plastics, cartons of paper, wood etc. These wastes will be sent for reuse/recycle. The waste percentage will be in the order of 2%. Construction debris containing bricks, demolished RCC will be used for land filling in the place of sub grade.

2.2.2.3 Paints

All the paints used in the premises will be ensured to have an albedo of at least 0.4 to increase the reflectivity and reduce the heat dissipation and heat island effects.

2.2.2.4 Work Force:

The labor/work force requirement is approximately 15000 man-days of various skilled and unskilled employees. Sufficient labor force and skilled employees are available, as Hyderabad is a favorite destination of skilled employees and migrating people from the rural areas. The peak labor force requirement will be in the order of 100 people. The labor force will be provided with temporary toilet facilities connected to a septic tank followed by sewer lines. The water requirement for the labor force will be approximately 1000 lt/day.

2.2.2.5 Material preparation and transport

Most of the construction material except aggregate will be drawn from outside. The material will be transported by trucks and the approximate number of truck trips are 100. The material transport within the site will be facilitated by 63 no. of trippers.

2.2.3 OCCUPATION PHASE

A number of facilities will be provided by **M/s GMR Hyderabad Aerotropolis Limited (GHAL)** for the proposed project are shown in table 2.14

Table 2.14 Amenities Proposed

Amenity	Nos. or Description
Sewage Treatment Plant	1
Garbage Collection Bin	1
DG Set	1000 kVA X 3
Green area	26823.0 m^2

The project authorities shall operate the sewage treatment plant. The major requirement of resource is for electricity and water. The electricity will be drawn from TSCPDCL. Transformers will be provided to reduce voltage fluctuation and to provide quality energy. The power requirement during operation phase is presented in table 2.15.

Table 2.15 power requirement Statement

S.No	Description	Total area in m^2	Power allocated in watts per m^2	Total Power required in (KW)	
1	Commercial & Common area	147196	70.00	10303.74	
	Total			**10303.74**	
Maximum demand in kw at 0.6 diversity factor				**6182.2**	
Consumption of power for 12 hours per day				**74186.9**	
Maximum demand in kw at 0.1 diversity factor				**1030.4**	
Consumption of power for 12 hours per day				**12364.5**	
Total consumption of power per day				**86551.4**	**KW**
Total consumption of power per year				**315.9**	**Lakh Units**

Table 2.16 Energy Saving by using copper wound transformers for Comm.

Power loss using CU. wound transformer	1.20%	
Savings in power loss using CU wound transformer	**3.8**	**Lakh Units**

Table 2.17 Energy Saving by using HF Ballast

Power loss using conventional ballast				25%	
Power loss using HF ballast				14%	
Savings in power loss using HF ballast				11%	
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Parking	33878	2.00	67.76	
2	Common Area	147196	3.50	515.19	
	Total			**582.94**	
Maximum demand in kw at 0.8 diversity factor				**466.4**	
Consumption of power for 12 hours per day				**5596.3**	
Maximum demand in kw at 0.2 diversity factor				**116.6**	
Consumption of power for 12 hours per day				**1399.1**	
Total consumption of power per day				**6995.3**	**KW**
Total consumption of power per year				**25.5**	**Lakh Units**
Savings in power loss using HF ballast				**2.8**	**Lakh Units**

Table 2.18 Electrical Power savings using LED for lighting

Savings in power Using LED as against Fluorescent Lamps					50%
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Parking	33878	2.00	67.76	
2	Common Area	147196	3.50	515.19	
	Total			**582.94**	
Maximum demand in kw at 0.8 diversity factor				**466.4**	
Consumption of power for 12 hours per day				**5596.3**	
Maximum demand in kw at 0.2 diversity factor				**116.6**	
Consumption of power for 12 hours per day				**1399.1**	
Total consumption of power per day				**6995.3**	**KW**
Total consumption of power per year				**25.5**	**Lakh Units**
Savings in power using LED				**7.7**	**Lakh Units**

Table 2.19 Electrical Power savings using Solar Power for External lighting

S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	External Lighting			50.00	
	Total			**50.00**	
Maximum demand in kw at 1.0 diversity factor				**50.0**	
Consumption of power for 6 hours per day				**300.0**	
Maximum demand in kw at 0.5 diversity factor				**25.0**	
Consumption of power for 6 hours per day				**150.0**	
Total consumption of power per day				**450.0**	**KW**
Total consumption of power per year				**1.64**	**Lakh Units**
Savings in power using Solar Power				**1.64**	**Lakh Units**

Table 2.20 Electrical Power savings using water Cooled Chillers

Savings in power by using Water Cooled Chillers as against Air					40%
S.No	**Description**	**Total area in m^2**	**Power allocated in watts per m^2**	**Total Power required in (KW)**	
1	Commercial	147196	30.00	4415.89	
	Total			**4415.89**	
Maximum demand in kw at 0.6 diversity factor				**2649.5**	
Consumption of power for 12 hours per day				**31794.4**	
Maximum demand in kw at 0.1 diversity factor				**441.6**	
Consumption of power for 12 hours per day				**5299.1**	
Total consumption of power per day				**37093.5**	**KW**
Total consumption of power per year				**135.4**	**Lakh Units**
Savings in power using water Cooled Chillers and heat recovery wheel				**54.16**	**Lakh Units**

Table 2.20 Total Saving

S. No.	Description	Savings in lakh kwh units	Savings in percentage
1	With Cu wound Transformer	3.8	1.2
2	with HF Ballast	2.8	0.89
3	With LED	7.7	2.4
4	With Water Cooled Chillers	54.2	17.1
5	With Solar Power for External lighting	1.6	0.5
	Total Saving	**70.1**	**22.2**
	Total Consumption	**315.9**	

2.2.3.1 Domestic Water

The domestic water will be drawn from Source will be from existing Airport water supply system which subsequently getting water from HMWSSB. The wastewater will be treated and reused for gardening and flush tanks. The piping for landscaping shall generally be in HDPE, detailing of which would depend on the finally approved landscape design. Pumping requirements of landscaping would also likewise depend on the landscaping design, and shall generally be centralized and operated from the STP with timer, using Drip/Pressurized sprinkler systems. A separate flushing water line will be proposed to each toilet in the building to recycle the treated sewage.

2.2.3.2 Solid Waste

The solid wastes anticipated during occupation stage include garbage, sludge from STP, hazardous waste of used oils, and batteries from generators. The quantity of wastes is presented in **table 2.22.**

Table 2.22 Solid Waste Generated during Occupation Phase

S.No	Type of Waste	Quantity	Collection/storage	Disposal
1	Garbage	2640 kg/day	Segregation at source into bio-degradable, non-bio-degradable and Domestic Hazardous wastes. Disposal of recyclable waste to Authorized Waste Pickers / Authorized Recyclers. Balance segregated waste given to Authorized Agency of Local Body.	Existing RGIA Facility
2	Sewage Treatment Plant Sludge	20 kg/day	Stored in HDPE bags.	Existing RGIA Facility
3	Used Batteries	250 nos. year		Sent to Authorized recyclers or returned to seller
4	Used Lubricant	10 KL/year	Stored in HDPE Carboy	Sold to authorized recyclers
5	Transformer Oil	1000 l/year	Stored in HDPE Drum	Sold to TSTRANSCO authorized contractors
6	E-Waste		Stored in designated area	e-waste management facility.
7	Packing waste	250 TPM	Stored in bags	Sold to recyclers/reused for packing
8	Plastic Waste	100 TPM	Stored in designated area and disposed.	To scrap vendors/reused as packing material
9	Cotton, Paper, Aluminum foil etc.,	100 TPM	Stored in bags	Sold to recyclers/reused as packing material
10	Perishable wastes	80 TPM	Stored in HDPE bags	Sent to Vermicompost facility at RGIA.

GMR LOGISTICS & WAREHOUSING PARK

GMR Hyderabad Aerotropolis Limited (GHAL)

SURVEY NOS. 139, 140, 144, 146, 147, 148, 149, 150, 151, 152, MAMIDIPALLI,

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