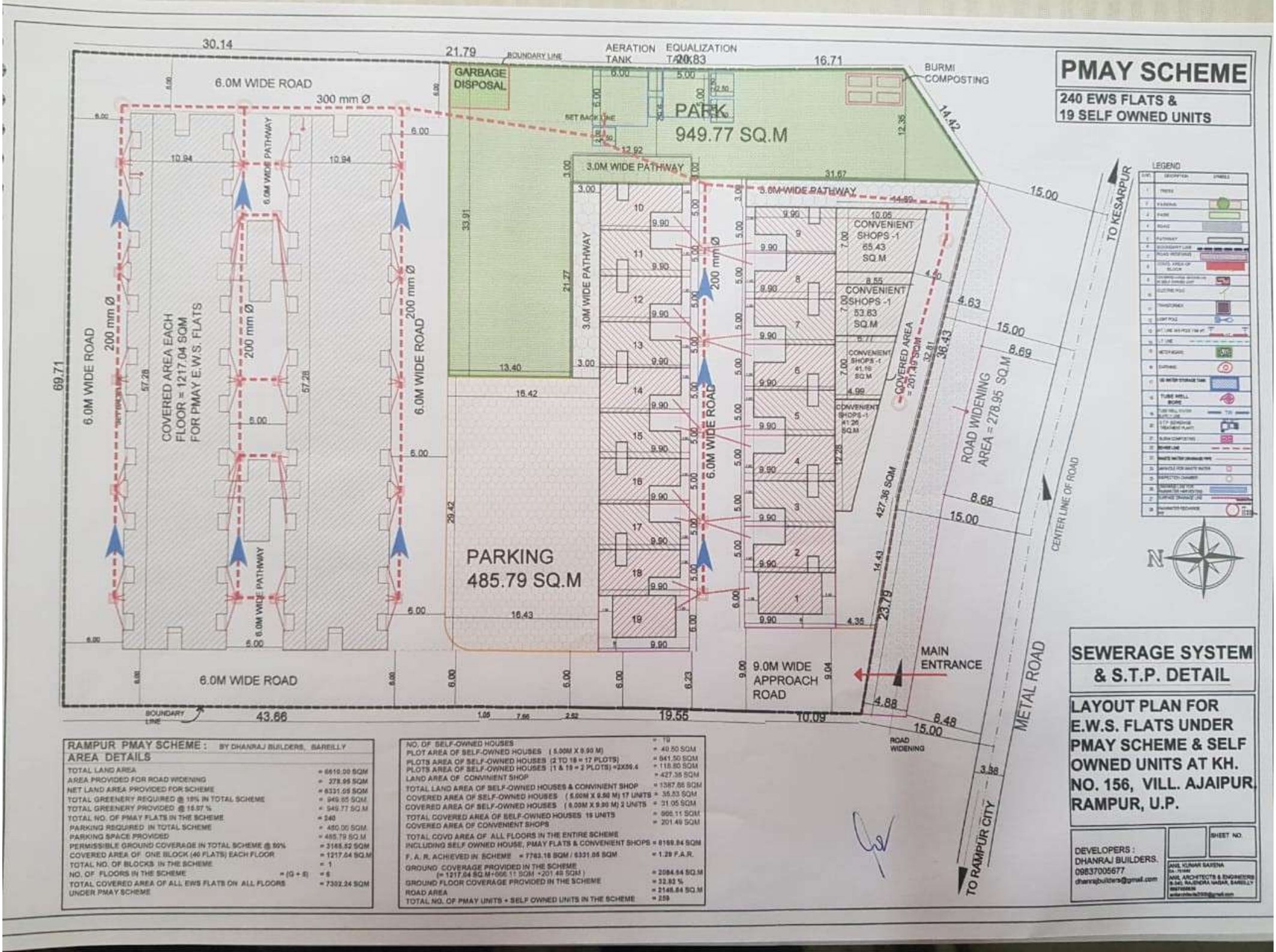
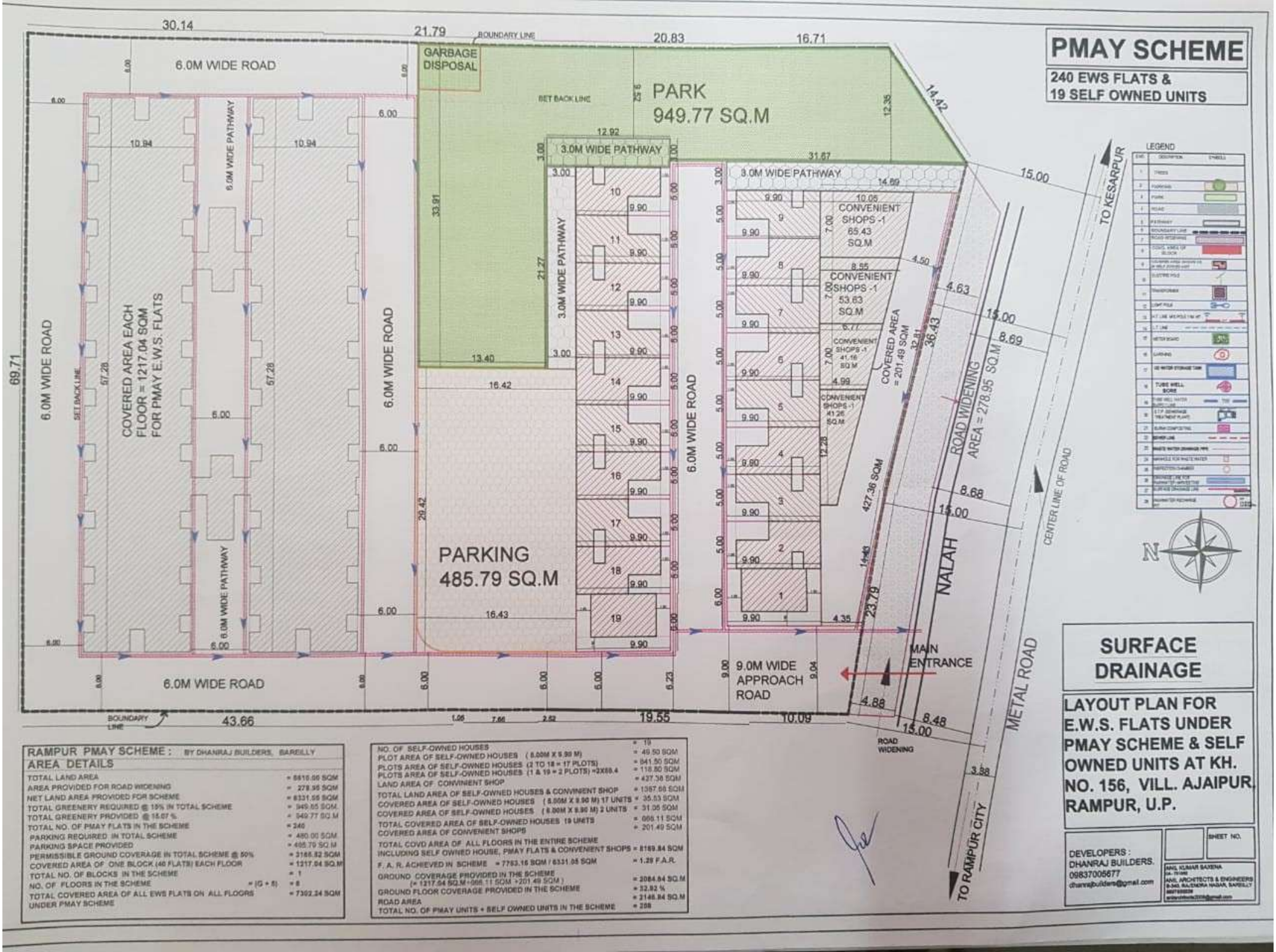

PMAY SCHEME
240 EWS FLATS &
19 SELF OWNED UNITS
SEWERAGE SYSTEM
& S.T.P. DETAIL
LAYOUT PLAN FOR
E.W.S. FLATS UNDER
PMAY SCHEME & SELF
OWNED UNITS AT KH.
NO. 156, VILL. AJAIPUR,
RAMPUR, U.P.
DEVELOPERS :
DHANRAJ BUILDERS.
09837005677
dhanrajbuilders@gmail.com
SHEET NO.
ANIL KUMAR SAXENA
ANIL ARCHITECTS & ENGINEERS
6.0M WIDE ROAD
300 mm Ø
200 mm Ø
COVERED AREA EACH
FLOOR = 1217.04 SQM
FOR PMAY E.W.S. FLATS
6.0M WIDE PATHWAY
3.0M WIDE PATHWAY
GARBAGE
DISPOSAL
BOUNDARY LINE
AERATION
TANK
EQUALIZATION
TANK
BURMI
COMPOSTING
SET BACK LINE
PARK
949.77 SQ.M
PARKING
485.79 SQ.M
CONVENIENT
SHOPS -1
65.43
SQ.M
CONVENIENT
SHOPS -1
53.83
SQ.M
CONVENIENT
SHOPS -1
41.16
SQ.M
CONVENIENT
SHOPS -1
41.26
SQ.M
COVERED AREA
= 201.49 SQM
427.36 SQM
ROAD WIDENING
AREA = 278.95 SQ.M
ROAD
WIDENING
9.0M WIDE
APPROACH
ROAD
MAIN
ENTRANCE
CENTER LINE OF ROAD
METAL ROAD
TO KESARPUR
TO RAMPUR CITY
LEGEND
N
RAMPUR PMAY SCHEME : BY DHANRAJ BUILDERS, BAREILLY
AREA DETAILS
TOTAL LAND AREA = 6610.00 SQM
AREA PROVIDED FOR ROAD WIDENING = 278.95 SQM
NET LAND AREA PROVIDED FOR SCHEME = 6331.05 SQM
TOTAL GREENERY REQUIRED @ 15% IN TOTAL SCHEME = 949.65 SQM
TOTAL GREENERY PROVIDED @ 15.07 % = 949.77 SQ.M
TOTAL NO. OF PMAY FLATS IN THE SCHEME = 240
PARKING REQUIRED IN TOTAL SCHEME = 480.00 SQM
PARKING SPACE PROVIDED = 485.79 SQ.M
PERMISSIBLE GROUND COVERAGE IN TOTAL SCHEME @ 50% = 3165.52 SQM
COVERED AREA OF ONE BLOCK (40 FLATS) EACH FLOOR = 1217.04 SQ.M
TOTAL NO. OF BLOCKS IN THE SCHEME = 1
NO. OF FLOORS IN THE SCHEME = (G + 5) = 6
TOTAL COVERED AREA OF ALL EWS FLATS ON ALL FLOORS UNDER PMAY SCHEME = 7302.24 SQM
NO. OF SELF-OWNED HOUSES = 19
PLOT AREA OF SELF-OWNED HOUSES (5.00M X 9.90 M) = 49.50 SQM
PLOTS AREA OF SELF-OWNED HOUSES (2 TO 18 = 17 PLOTS) = 841.50 SQM
PLOTS AREA OF SELF-OWNED HOUSES (1 & 19 = 2 PLOTS) =2X59.4 = 118.80 SQM
LAND AREA OF CONVINIENT SHOP = 427.36 SQM
TOTAL LAND AREA OF SELF-OWNED HOUSES & CONVINIENT SHOP = 1387.66 SQM
COVERED AREA OF SELF-OWNED HOUSES (5.00M X 9.90 M) 17 UNITS = 35.83 SQM
COVERED AREA OF SELF-OWNED HOUSES (5.00M X 9.90 M) 2 UNITS = 31.05 SQM
TOTAL COVERED AREA OF SELF-OWNED HOUSES 19 UNITS = 906.11 SQM
COVERED AREA OF CONVENIENT SHOPS = 201.49 SQM
TOTAL COVD AREA OF ALL FLOORS IN THE ENTIRE SCHEME INCLUDING SELF OWNED HOUSE, PMAY FLATS & CONVENIENT SHOPS = 8169.84 SQM
F. A. R. ACHIEVED IN SCHEME = 7763.18 SQM / 6331.05 SQM = 1.29 F.A.R.
GROUND COVERAGE PROVIDED IN THE SCHEME (= 1217.04 SQ.M +906.11 SQM +201.49 SQM) = 2084.64 SQ.M
GROUND FLOOR COVERAGE PROVIDED IN THE SCHEME = 32.93 %
ROAD AREA = 2146.84 SQ.M
TOTAL NO. OF PMAY UNITS + SELF OWNED UNITS IN THE SCHEME = 259



RAMPUR PMAY SCHEME : BY DHANRAJ BUILDERS, BAREILLY

AREA DETAILS

TOTAL LAND AREA	= 6610.00 SQM
AREA PROVIDED FOR ROAD WIDENING	= 278.95 SQM
NET LAND AREA PROVIDED FOR SCHEME	= 6331.05 SQM
TOTAL GREENERY REQUIRED @ 15% IN TOTAL SCHEME	= 949.65 SQM.
TOTAL GREENERY PROVIDED @ 15.07 %	= 949.77 SQ.M
TOTAL NO. OF PMAY FLATS IN THE SCHEME	= 240
PARKING REQUIRED IN TOTAL SCHEME	= 480.00 SQM
PARKING SPACE PROVIDED	= 485.79 SQ.M
PERMISSIBLE GROUND COVERAGE IN TOTAL SCHEME @ 50%	= 3165.52 SQM
COVERED AREA OF ONE BLOCK (40 FLATS) EACH FLOOR	= 1217.04 SQ.M
TOTAL NO. OF BLOCKS IN THE SCHEME	= 1
NO. OF FLOORS IN THE SCHEME = (G + 5)	= 6
TOTAL COVERED AREA OF ALL EWS FLATS ON ALL FLOORS UNDER PMAY SCHEME	= 7302.24 SQM

NO. OF SELF-OWNED HOUSES	= 19
PLOT AREA OF SELF-OWNED HOUSES (8.00M X 9.90 M)	= 49.50 SQM
PLOTS AREA OF SELF-OWNED HOUSES (2 TO 18 = 17 PLOTS)	= 841.50 SQM
PLOTS AREA OF SELF-OWNED HOUSES (1 & 19 = 2 PLOTS) =2X59.4	= 118.80 SQM
LAND AREA OF CONVINIENT SHOP	= 427.36 SQM
TOTAL LAND AREA OF SELF-OWNED HOUSES & CONVINIENT SHOP	= 1387.66 SQM
COVERED AREA OF SELF-OWNED HOUSES (8.00M X 9.90 M) 17 UNITS	= 35.53 SQM
COVERED AREA OF SELF-OWNED HOUSES (8.00M X 9.90 M) 2 UNITS	= 31.06 SQM
TOTAL COVERED AREA OF SELF-OWNED HOUSES 19 UNITS	= 666.11 SQM
COVERED AREA OF CONVENIENT SHOPS	= 201.49 SQM
TOTAL COVD AREA OF ALL FLOORS IN THE ENTIRE SCHEME INCLUDING SELF OWNED HOUSE, PMAY FLATS & CONVENIENT SHOPS	= 8189.84 SQM
F. A. R. ACHIEVED IN SCHEME = 7783.16 SQM / 6331.05 SQM	= 1.29 F.A.R.
GROUND COVERAGE PROVIDED IN THE SCHEME (= 1217.04 SQ.M +666.11 SQM +201.49 SQM)	= 2084.64 SQ.M
GROUND FLOOR COVERAGE PROVIDED IN THE SCHEME	= 32.92 %
ROAD AREA	= 2146.84 SQ.M
TOTAL NO. OF PMAY UNITS + SELF OWNED UNITS IN THE SCHEME	= 259

PMAY SCHEME
AT VIL. AJAIPUR
RAMPUR (U.P)

REPORT
FOR
PHE SYSTEM
240 EWS FLATS &
19 SELF OWNED HOUSES
DEVELOPED BY

DHANRAJ BUILDERS,
BAREILLY

email :dhanrajbuilders@gmail.com,
mobile : 9837005677

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PROJECT DESCRIPTION

NAME OF PROJECT	:	PMAY SCHEME
LOCATION	:	AT VIL. AJAIPUR, RAMPUR
NATURE OF BUSINESS	:	RESIDENTIAL EWS FLATS & LIG TYPE HOUSES
AREA STAEMENT	:	TOTAL LAND AREA = 6331.05 SQM
		GREENRY REQUIRED = 949.65SQM
		GREENRY PROVIDED = 949.77 SQM
		NO. OF EWS FLATS GR FL= 40
		COVD. AREA GR FLOOR(PMAY) = 1217.04SQM
		TOTAL COVD AREA ALL FL(PMAY)= 7302.24SQM
		ROAD AREA = 2146.84SQM
		PARKING AREA = 485.79 SQM
		TOTAL LAND AREAFOR
		SELF OWNED and Convenient Shop = 1387.66SQM
		NO. OF SELF OWNED HOUSES = 19
		COVD. AREA SINGLE HOUSE =(I) 35.53X17 , (II) 31.05X2 SQM
		TOTAL COVD. AREA
		SELF OWNED HOUSES + CONVENIENT SHOPS = 867.6 SQM

DESIGN BASIS

NO. OF EWS FLATS	=	240	
NO. OF COMMERCIAL BUILDING	=	NIL	
NO. OF SELF OWNED HOUSES		=	19
MEMBERS IN THE EWS FLATS		=	04
MEMBERS IN THE SELF OWNED HOUSE		=	04
TOTAL POPULATION		=	240X4 + 19X4
		=	1036
WATER CONSUMPTION PER CAPITA		=	86 LTRS.
TOTAL WATER CONSUMPTION	=	89096 LTRS/DAY	
WASTE WATER GENRATION @85%		=	75731.60 L/DAY
		=	75.73cum/DAY
SAY,		=	76 KLD.

hence the treatment plant has been designed to treat 76 KLD per day considering the duration of treatment for 24 hrs. a day, thus arriving the flow rate 3.33 cum/hr.

CHARACTERISTICS OF WASTE WATER:

	PARAMETERS	CONCENTRATION
1.	Ph	7.0- 8.0
2.	BOD (days @ 27* C) 400	
3.	COD	600
4.	Suspended Solids	300
5.	Oil	50
6.	Coliform	10^7

all parameters except Ph expressed as Mg/L.

Treated water Quality at the outlet of the plant shall be as per the following CPCB new guidelines-

	PARAMETERS	CONCENTRATION
1.	Ph	7.0- 8.0
2.	BOD (days @ 27* C)	< 10
3.	COD	< 50
4.	Suspended Solids	< 10
5.	Oil	< 10
6.	Coliform	$< 10^3$

all parameters except Ph expressed as Mg/L.

Treated water Quality at the outlet of the plant shall be as per the following CPCB new guidelines-

Expected characteristics of treated effluent

S.No.	Parameter	Expected conc.
1.	Ph	7.0-8.0
2.	BOD (3days at 27 deg. C)	<10
3.	COD	<50
4.	Suspended solids	<10
5.	Oil	<10
6.	Coliform	<10cu.

*All parameters except Ph expressed as mg/l.

I- PHE SYSTEM

A. WATER SUPPLY SYSTEM

i) WATER REQUIREMENT

During construction phase water will be supplied by private water tankers / bore wells, whereas during operation phase water supply will be provided through tube-wells. Total water requirement is approx. 90KLD, out of which domestic water requirement is approx. 89 KLD. Fresh water requirement is approx. 59 KLD which is 66% of the domestic water demand. Daily water requirement calculation is given below in Table 1:

Table 1: Calculations for Daily Water Demand

A. Total Water requirement-Domestic

Description	No. of Houses	Person/unit	Water Consumption /day	No. of Persons	Assumption (Fresh Water)	Total water requirement (KLD)	Fresh Water (KLD)	Flushing Water (KLD)
2-3 BHK	240 FLATS+ 19HOUSES	4	135	1036	66%	89.09	59	30.60
TOTAL	259					90	59	31
SAY						**90**	**59**	**31**

B. Horticulture and Landscape Development

	No.	Water requirement (KLD)		KLD
Green Area (SQM)	951.23	7		7
Road washing (SQM)	1151.89	5		9
Total				16
Say				**16KLD**

Table 2: Waste Water Calculations

Domestic Water Requirement	**90 KLD**
• Fresh(66% of domestic)	59 KLD
• Flushing (34% of domestic)	31 KLD
Waste Water Generated (85% of total Domestic water Requirement)	76 KLD
Proposed, STP SAY	**100 KLD**

ii) **Bore Wells**

Treated (Potable) water will be supplied by Municipal Authority. However to meet the present water requirements of the colony, tube-wells are proposed. Total 2 no tube-wells are proposed to meet total daily water demand (90 KLD per day) of the colony. Anticipated yield of one tube-well 15000 litersper day. One tube-well will yield 180 m3 of water for 12 hours running a day. Depth of tube-well of diameter 450mm would be in the range 125-175 m.

We have proposed (90KLD) ½ day water storage in under Ground tank & ½ day water storage in overhead water tank placed on terrace at every block and water to be transferred from the underground tank to Over Head In house individual tank, there would be 2Nos (1 Working +1Standby) 12HP Pumps. In case of Power failure we have proposed a Diesel Generator of 65KVA to feed the U.G. Water Transfer Pumps and Tube-well Pumps.

Diesel Generator Size Capacity for water supply

	Description	Load(HP)	Load(KW)	Quantity	Total(KW)
1)	2 Nos. Tube-well Pumps (1Working +1Standby) @10HP	10 HP	7.46KW	2	14.92 KW
1)	2 Nos. Water Transfer Pumps (1Working +1Standby) @10HP	10 HP	7.46KW	2	14.92KW
	Total Load				**29.84 KW**
	Total DG Capacity(Power Factor@0.8, Loading@0.85)				**28 KVA**

Hence we have proposed 40KVA DG Set for water Supply in case of power failure.

B. SEWAGE SYSTEM

i) SEWAGE NETWORK

An external sewage network shall collect the sewage from all units, and flow by gravity to the proposed sewage treatment plant. The sewage network, having manhole & piping shall be proposed.

The alignment and slope of the sewer line will follow the road network, drains or natural ground surface and will be connected to the trunk sewers. The discharge point will be a treatment plant.

ii) Wastewater Generation & Treatment

It is expected that 76 KLD of wastewater shall be generated from project site during operation phase. Wastewater will be treated in the STP provided within the complex generating 100 KLD of recoverable water from STP.

iii) SEWAGE TREATMENT TECHNOLOGY

a) MBBR TECHNOLOGY

Following are the benefits of providing the Sewage Treatment Plant in the present circumstances:

- Reduced net daily water requirements, source for Horticultural purposes by utilization of the treated waste water.
- Reduced dependence on the public utilities for water supply and sewerage systems.
- Sludge generated from the Sewage Treatment Plant shall be rich in organic content and an excellent fertilizer for horticultural purposes.

b) Wastewater Details

(a)	Daily load	:	251KLD
(b)	Duration of flow to STP	:	24 hours
(c)	Temperature	:	Maximum 32°C
(d)	pH	:	7 to 9.5
(e)	Color	:	Mild
(f)	T.S.S. (mg/l)	:	100-400 mg/l
(g)	BOD (mg/l)	:	200-300 mg/l
(h)	COD (mg/l)	:	500-700 mg/l

c) Final discharge characteristics

(a)	pH	:	6.5 to 7.5
(b)	Oil & Grease	:	<10 mg/l
(c)	B.O.D.	:	<20 mg/l
(d)	C.O.D.	:	<100 mg/l
(e)	Total Suspended Solids	:	<10 mg/l

d) Treatment Technology

The technology is based on attached growth aerobic treatment followed by clarification by a tube settler. Lime will be dosed in for suppression of foaming tendencies. The clarified water will be filtered in a pressure sand filter after dosing of coagulant (alum) for removal of unsettled suspended impurities. This water will be passed through an activated carbon filter for removal of organics. The filtered water from ACF is then chlorinated & stored in the flushing tank.

The attached growth fluidized aerobic bed reactor (FAB) process combines the biological processes of attached & suspended growth. It combines submerged fixed film with extended aeration for treatment of the waste water.

The waste water after screening is collected in an equalization tank. The equalization tank is required for preventing surges in flow & facilitating equalization of characteristics over the entire quantity of effluent in a given time. A provision for pre-aeration is made in the equalization tank in order to ensure mixing & to prevent the sewage from going septic.

The equalized sewage is then pumped into the FAB reactor for biological processing. The water enters the bottom of the reactor & flows up through the fixed film media which grossly enhances the hydraulic retention time & provides a large surface area for growth of biological micro – organisms. The FAB reactor is aerated by fine pore sub – surface diffusers which provide the oxygen for organic removal. The synthetic media floats on the water & the air agitation ensures good water to micro-organism contact.

The FAB treatment is an attached growth type biological treatment process where in, the majority of biological activity takes place on the surface of the PVC media. Continuous aeration ensures aerobic activity on the surface of the media. Micro – organisms attach themselves on the media & grow into dense films of a viscous jelly like nature. Waste water passes over this film with dissolved organics passing into the bio-film due to concentration gradients within the film. Suspended particles & colloid may get retained on this sticky surface where they are decomposed into soluble products. Oxygen from the aeration process in the waste water provides oxygen for the aerobic reactions at the bio-film surface. Waste products from the metabolic processes diffuse outward & get carried away by the waste water or air currents through the voids of the media.

The aerated effluent passes into a tube deck settler for clarification. The theory of gravity tube settler system is that the carrier fluid maintains laminar flow in the settling media at specified maximum viscosity. These two parameters of a carrier fluid, flowing through a hydraulic configuration, will determine the velocity gradients of the flow, the height of boundary layer at the inclined surface and the residence time within the media.

The carrier fluid must be viscous Newtonian, exhibiting a Reynolds number of less than 1000 and preferably, a number under 400. The laminar flow, through the inclined tubes, will produce velocity gradients sufficiently large to form an adequate boundary layer, where the velocity of fluid approaches zero. Boundary layers are necessary in functioning tube settlers, to allow suspended solids to separate from the viscous carrier fluid. Under gravitational forces, they will settle to the hydraulic surface of the tube and subsequently from the clarifier media.

Since the tubes are inclined at 60 degrees, solids settled on the tubes are continually discharged down. This downward rolling action increases particle contact and hence further agglomeration, which increases the sludge settle ability. Studies show that these agglomerated sludge particles can have a settling rate in excess of ten times the settling rate of the individual floor particles in the influent. These heavy agglomerated masses quickly slide down the 60 degree inclined tube and settle at the bottom of the tank.

At the bottom of the Tube deck, where the sludge leaves the Tube surface, the larger agglomerated captures smaller particles in the upcoming stream. This solid contact phenomenon greatly enhances the capture efficiency

e) Stages of Treatmentschematic :

The treatment process consists of the following stages:

- Equalization
- Bio- Degradation
- Clarification & Settling
- Filtration

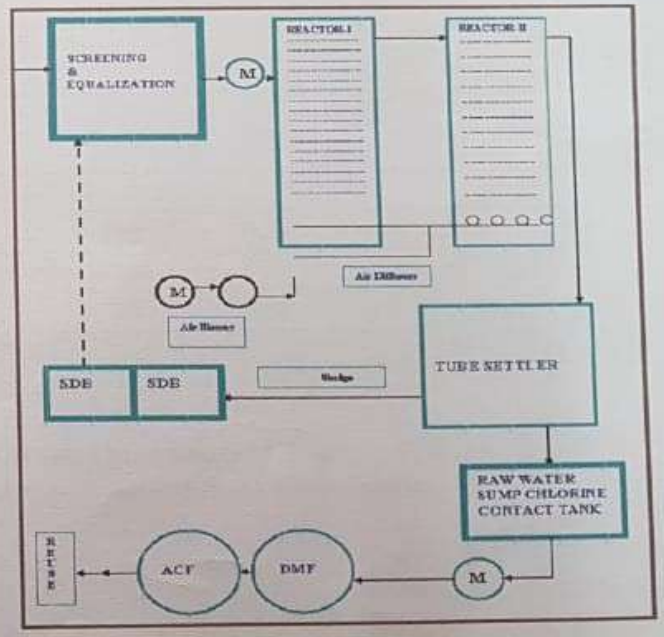

Figure 2: Schematic Diagram of STP

C - DRAINAGE SYSTEM

I) DRAINAGE NETWORK

Open drain shall be proposed for collect the runoff from the terrace and open surface area. The alignment and slope of the drain line will follow the road network, drains or natural ground surface and will be connected to the trunk drain. The discharge point will be a rain water harvesting pit. The rain water harvesting pit containing the de-silting chamber to remove the silt from the storm water to avoid the choking the recharging pit.

ii)RAIN WATER HARVESTING PIT

The storm water disposal system for the premises shall be self-sufficient to avoid any collection/stagnation and flooding of water. The amount of storm water run-off depends upon many factors such as intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains shall be located near the carriage way along either side of the roads. Taking the advantage of road camber, the rainfall run off from roads shall flow towards the drains. Storm water from various blocks shall be connected to adjacent drain by a pipe through catch basins. The water table becomes more than 25 m in future; rainwater harvesting can be carried out. Therefore, it has been calculated to provide 5rainwater harvesting pits at selected locations, which will catch the maximum run-off from the area.

1) Since the existing topography is congenial to surface disposal, a network of storm water pipe drains is planned adjacent to roads. All building roof water will be brought down through rain water pipes.
2) Proposed storm water system consists of pipe drain, catch basins and seepage pits at regular intervals for rain water harvesting and ground water recharging.
3) Annual rainfall of 1087.90 mm/yr shall be considered for designing the storm water drainage system.

Peak hourly rainfall has been considered as 25 mm/hr. The recharge pit of 3.0 m diameter and 3.5m depth is constructed for recharging the water. Inside the recharge pit, a recharge bore is constructed having 300 mm diameter and 30 m depth. The bottom of the recharge structure will be kept 5 m above this level. At the bottom of the recharge well, a filter media is provided to avoid choking of the recharge bore. Design specifications of the rain water harvesting plan are as follows:

- Catchments/roofs would be accessible for regular cleaning.
- The roof will have smooth, hard and dense surface which is less likely to be damaged allowing release of material into the water. Roof painting has been avoided since most paints contain toxic substances and may peel off.
- All gutter ends will be fitted with a wire mesh screen and a first flush device would be installed. Most of the debris carried by the water from the rooftop like leaves, plastic bags and paper pieces will get arrested by the mesh at the terrace outlet and to prevent contamination by ensuring that the runoff from the first 10-20 minutes of rainfall is flushed off.
- No sewage or wastewater would be admitted into the system.
- No wastewater from areas likely to have oil, grease, or other pollutants has been connected to the system.

iii) RAIN WATER HARVESTING DETAILS

S. No.	Type of Surface	Catchment's Area		Run off Coeff. [C]	Intensity of Rainfall (mm/hr)	Discharge (Run Off) [Q=10CIA] m^3/hr	Total (m^3/hr) [Q]
		sq. m	Ha.				
1	Building/Roof Top (Ground covered)						
(a)	Area	2084.64	0.2	0.9	25	10X0.90X25X0.2/1000	0.045
2	Paved Surface/ Road Surface						
(a)	Area	2146.84	0.21	0.7	25	10X0.70X25X0.21/1000	0.03
3	Landscape/Greens Area						
(a)	Area	949.77	0.09	0.2	25	10X0.20X25X0.09/1000	0.004
Grand Total (1+2+3)							0.080

VOLUME OF STORM WATER DRAINAGE

Considering 15 min (0.250 Hr) Retention Period

Volume Required = 0.08 X 0.250

Volume = 0.02

= Say 0.02Cu.m/hr

VOLUME OF 1 RAIN WATER HARVESTING PIT

Dia of Pit (D) = 3.0 m

Hight of Pit (H) = 3.65 m

Volume of Pit = $\pi r^2 h/4$

= 3.14 x 3.0 x 3.0 x 3.65/4