State Strategy on Solid Waste Management – Himachal Pradesh

Department of Urban Development, H.P.

May, 2019

A guidebook on Solid Waste Management for Urban Local Bodies

State Level Strategy for Solid Waste Management Strategy for Urban Local Bodies in Himachal Pradesh.

Background:

The Ministry of Environment, Forest and Climate Change had notified "Solid Waste Management Rules, 2016" in April, 2016 which specifically defines the roles and responsibility of different stakeholders. Accordingly, state Government has taken following steps at State level till date for compliance of above rules as required under rule-11 of SWM Rules, 2016:

- ✓ H.P. **State Policy** on Solid Waste management notified
- ✓ H.P. State Solid Waste Management **Action Plan** has been prepared
- ✓ Draft **bye-laws** on SWM, incorporating all provisions of SWM Rules, 2016 prepared and circulated to all ULBs
- ✓ Scheme for **registration of rag-pickers** & scrap-dealers developed
- ✓ **Waste Characterization study** conducted in the State through NEERI
- ✓ **ULB wise Action Plans** prepared
- ✓ **Composting guidelines** prepared & circulated to ULBs

In addition, a Plastic Waste Management Action Plan also has been prepared for the State.

Further, in order to establish Solid Waste processing & disposal facilities in the State on PPP mode, the State Govt. had earlier adopted cluster-based approach in the year 2017. The Department of Urban Development jointly with H.P. State Pollution Control Board had identified 5 major clusters and 25 sub-clusters for management of non-biodegradable and biodegradable waste separately. Total 8 clusters were finalized where the adequate land parcels were identified for setting up of these facilities. The pre-feasibility studies for finalized clusters was conducted by HPSPCB and the Tender documents were prepared by H.P. Infrastructure Development Board (HPIDB). The main reasons for adopting cluster-based approach were:

- ❖ To identify common land parcel for cluster of ULBs as finding land parcel in each ULB is difficult.

- ❖ To attract private investment in Solid Waste Management and outsourcing the Operation & Maintenance part by developing the SWM facilities on PPP mode.
- ❖ To address the problem of lack of technical manpower & adequate capacity in ULBs to maintain & operation SWM facilities.

Despite lot of efforts, the State had to abandon the cluster approach due to following reasons:

- × Large land parcel required but adequate land parcels not available.
- × Land identification, transfer and tendering on PPP mode, a time-consuming process.
- × Lesser turn out of developers due to small projects.
- × Smaller land parcels identified in the meanwhile within the ULBs

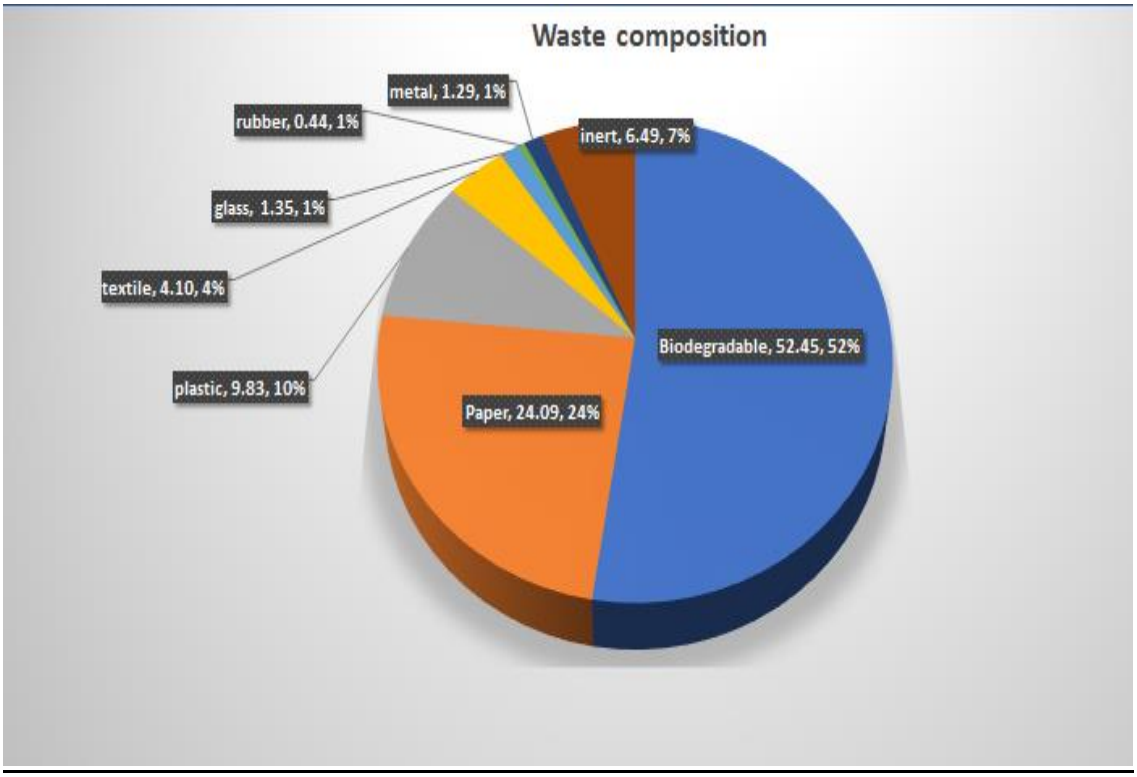
Keeping in view the above factors, the decentralized approach has now been adopted by the State.

State Profile:

• **No. of ULBs**	-	54 (2-Municipal Corporations, 31-Municipal Councils & 21-Nagar Panchayats)
• **Population (Urban)**	-	7.13 lacs
• **Total Urban Area**	-	279.88Sq Km.
• **% of total State population**	-	10.38
• **% Decadal Growth (2001 – 2011)**	-	15.95
• **Total waste generation**	-	370 TPD (approx..) (Quantity shows steep variations during summer & winter season due to huge influx of tourists)
• **Total biodegradable/ wet waste generated**	-	190 TPD (approx..)
• **Total non-biodegradable/ dry waste generated**	-	150TPD (approx..)

- **Average temperature** - The average temperature in H.P. varies from 22 degrees to 37 degree Celsius in summer and from 0 degree to 15 degree Celsius in winters.

Waste Characteristics as per NEERI study:



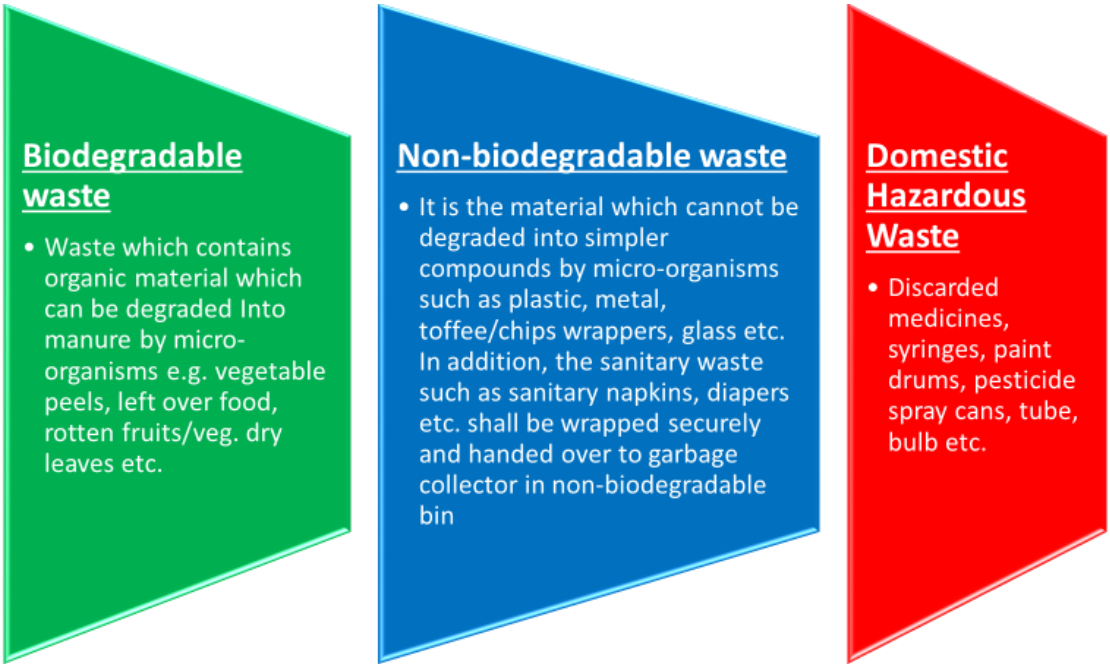
Strategy for Management of Solid Waste in the State:

Collection: As per the SWM Rules, 2016 the garbage collection is to be done from the door step of the waste generators and in case of multistory buildings, complexes, the waste shall be collected from the entry gate or any other designated location. In SWM Rules, 2016 the duties of waste generators have been defined as below:

- **Rule 4(1)(a)** – Segregation of waste at source into three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes
- **Rule 4(1)(b)** - wrap securely the used sanitary waste like diapers, sanitary pads etc., and hand over the same separately to authorized person of ULB.
- **Rule 4(2)** – Not to throw, burn or burry the solid waste on streets, open public places or in the drain/water bodies.

- **Rule 4(3)** – Shall pay user fee for solid waste management, as specified in the bye-laws of the local bodies.
- **Rule 4(4)** – Not to organize an event or gathering of more than one hundred persons at any unlicensed place without intimating the local body, at least three working days in advance.
- **Rule 4(5)** - Street vendors to keep suitable containers for storage of waste generated during the course of his activity.
- **Rule 4(6)** – The Bulk Waste Generators i.e. the waste generators generating more than 100Kg waste per day or as specified by ULB in its by-laws, shall manage the biodegradable portion of their waste within their own premises.

To comply with the provisions of SWM Rules within the ULBs, the State Govt. has adopted a strategy of segregation of waste at source into 3 main streams as below:



All the ULBs shall develop mechanism to collect & transport the waste in segregated manner only by making necessary changes, in their collection/transportation system as per locally feasible method.

The door to door collection of segregated waste has been started in most of the ULBs however the source segregation needs to be improved.

The commonly found items in household waste and their segregation into 3 components is illustrated in the picture below:

Further, in order to assist ULBs, for management of Solid Waste in scientific manner, following strategy has been developed to be adopted by all ULBs for management of Solid Waste in scientific and sustainable manner:

For Bio-degradable waste:

Aerobic Microbial Composting Pits: The Aerobic microbial composting pits are the best suitable method for managing organic/biodegradable/wet waste. These pits shall be developed in the ULBs. ULBs shall practice following:

- Construction only the aerobic honeycomb model pits for composting
- Put only the segregated biodegradable waste in compost pits
- Use enzymes/microbes to decompose the waste faster (Suggestive list of microbes suppliers is at **Annexure-A**.

Note: The detail guidelines for developing aerobic pit composting facility has already been issued to all the ULBs and is also available on DUD website.

The suggestive design for developing honeycomb aerobic compost pits is enclosed at **Annexure-B**.

Aerobic honeycomb composting pit model

For Non-Biodegradable waste:

Development of Material Recovery Facility (MRF): To manage the non-biodegradable waste, MRF is to be developed in all ULBs. MRF shall be used for following:

- To sort/ segregated dry/non-biodegradable waste further into recyclable and non-recyclable and shall sell/hand over the same to recyclers duly authorized by H.P. State Pollution Control Board (list attached at **Annexure-C** & available on HPSPCB website) or sell the same to the scrap-dealers registered with the ULB.
- The recyclable waste shall be channelized for recycling through rag-pickers/ scrap-dealers.
- Non-recyclable combustible material in non-biodegradable waste shall be tied up and shall send the same to nearby cement industry for co-processing or hand over the plastic waste to HPPWD for road construction.

The suggestive design for developing MRF is enclosed at **Annexure-D**.

***Figure 1**: Concept of MRF*

***Figure 2**: MRF at Kerala*

Figure 3: *Solid & Liquid Resource Management Centre, Ambikapur, Chhatisgarh*

Figure 4: *SLRM model Ambikapur, Chhatisgarh*

Figure 5: *MRF at Panaji Municipal Corporation*

<u>Separate collection & treatment of sanitary waste</u>: For managing sanitary waste, ULBs may install waste incinerators at the Waste Processing / Material Recovery Facilities (MRF) sites., till then all the ULBs may store the sanitary waste separately in suitable containers. All the waste generators have to wrap securely sanitary waste and hand over to authorized waste collector along with non-biodegradable waste. The Department shall install sanitary waste disposal incinerators in all the ULBs where sanitary waste such as sanitary napkins, diapers etc. shall be disposed of.

Sanitary waste incinerator

For Domestic hazardous waste:

To manage the domestic hazardous waste, hazardous waste deposition centers/kiosk shall be developed in all ULBs, where waste generators can deposit their domestic hazardous waste. Atleast one kiosk shall be developed in each ULB and in bigger ULBs even more kiosks shall be developed keeping in view the requirement of ULB. In addition, the domestic hazardous waste shall also be collected from the door step of generators through door to door garbage collection (atleast once in a week). All ULBs shall store this waste separately & securely at their dump sites and shall compulsorily have tie-up with hazardous waste treatment, storage & disposal facility (TSDF). At present there is only one authorized TSDF in the State of H.P. i.e. M/s Shivalik Solid Waste Management, Dabhota, Nalagarh. The hazardous waste TSDF shall lift all the hazardous waste and dispose of this waste at their facility. The suggestive design for developing hazardous waste collection center/kiosk is enclosed at **Annexure-E**.

Operation & Maintenance of above equipment/machineries: The operation & maintenance of solid waste processing facilities is vital aspect in order to sustain the waste management system. Hence, necessary capacity building at ULB level shall be done by the equipment suppliers by providing them training on operating the machineries. Dedicated manpower shall be deployed by all ULBs in these facilities which shall supervise, operate, maintain records etc. ULBs shall also make efforts to integrate rag-pickers and encourage them to provide their support in managing these facilities.

Further to assist the ULBs, the centralized procurement by the Directorate or Urban Development shall be done in order to have uniformity in specifications and outcome desired out of the machineries.

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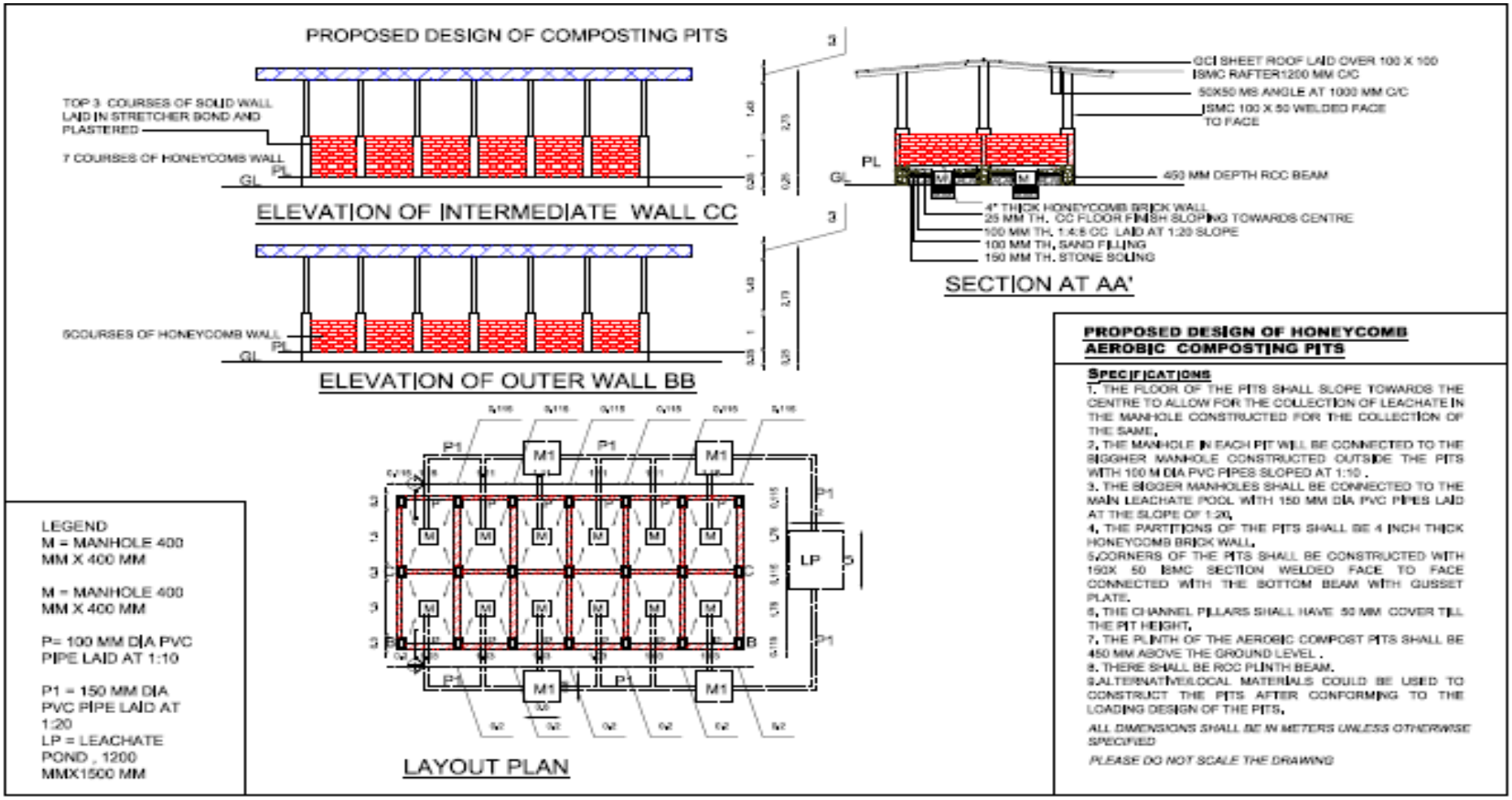
Annexure-A

List of suppliers of enzymes/microbes to fasten the aerobic composting process

S.No.	Supplier agency	Contact details
1	NARMADA BIOTECH LTD.	8989521999 pranayhiran@rediffmail.com
2	Excel Industries Limited	022-66464342 owc@excelind.com
3	Eco Support Pvt. Ltd.	9920461282/9892831668 ecosupindia@gmail.com
4	Ecoman Enviro Solutions Pvt Ltd	7720999222 parimal@ecoman.in; vaibhav@ecoman.in
5	Shudh-Labh Solutions Pvt Ltd	080-49516689 09880710830 ramanan@sudh-labh.in
6	Smart Enviro Systems	Mr. Rakeshprashar, Email ID: prashar_rakesh@yahoo.inMobile Number: 09871443052
7	Alfa Therm Limited	Vijay Saroj -9958692424 vijay@alfatherm.in
8	Vermigold Ecotech Pvt Ltd	Mr. Amol Chorghe 919619664810, amol.c@vermigold.com

Annexure-B


PROPOSED DESIGN OF COMPOSTING PITS
TOP 3 COURSES OF SOLID WALL LAID IN STRETCHER BOND AND PLASTERED
7 COURSES OF HONEYCOMB WALL
PL
GL
ELEVATION OF INTERMEDIATE WALL CC
5COURSES OF HONEYCOMB WALL
PL
GL
ELEVATION OF OUTER WALL BB
P1
M1
LP
LAYOUT PLAN
GCI SHEET ROOF LAID OVER 100 X 100 ISMC RAFTER1200 MM C/C
50X50 MS ANGLE AT 1000 MM C/C
ISMC 100 X 50 WELDED FACE TO FACE
PL
GL
450 MM DEPTH RCC BEAM
4" THICK HONEYCOMB BRICK WALL
25 MM TH. CC FLOOR FINISH SLOPING TOWARDS CENTRE
100 MM TH, 1:4:8 CC LAID AT 1:20 SLOPE
100 MM TH, SAND FILLING
150 MM TH. STONE SOLING
SECTION AT AA'
LEGEND
M = MANHOLE 400 MM X 400 MM
M = MANHOLE 400 MM X 400 MM
P= 100 MM DIA PVC PIPE LAID AT 1:10
P1 = 150 MM DIA PVC PIPE LAID AT 1:20
LP = LEACHATE POND , 1200 MMX1500 MM
PROPOSED DESIGN OF HONEYCOMB AEROBIC COMPOSTING PITS
SPECIFICATIONS
1. THE FLOOR OF THE PITS SHALL SLOPE TOWARDS THE CENTRE TO ALLOW FOR THE COLLECTION OF LEACHATE IN THE MANHOLE CONSTRUCTED FOR THE COLLECTION OF THE SAME.
2. THE MANHOLE IN EACH PIT WILL BE CONNECTED TO THE BIGGHER MANHOLE CONSTRUCTED OUTSIDE THE PITS WITH 100 M DIA PVC PIPES SLOPED AT 1:10 .
3. THE BIGGER MANHOLES SHALL BE CONNECTED TO THE MAIN LEACHATE POOL WITH 150 MM DIA PVC PIPES LAID AT THE SLOPE OF 1:20,
4. THE PARTITIONS OF THE PITS SHALL BE 4 INCH THICK HONEYCOMB BRICK WALL,
5.CORNERS OF THE PITS SHALL BE CONSTRUCTED WITH 150X 50 ISMC SECTION WELDED FACE TO FACE CONNECTED WITH THE BOTTOM BEAM WITH GUSSET PLATE.
6. THE CHANNEL PILLARS SHALL HAVE 50 MM COVER TILL THE PIT HEIGHT,
7. THE PLINTH OF THE AEROBIC COMPOST PITS SHALL BE 450 MM ABOVE THE GROUND LEVEL .
8. THERE SHALL BE RCC PLINTH BEAM.
9.ALTERNATIVELOCAL MATERIALS COULD BE USED TO CONSTRUCT THE PITS AFTER CONFORMING TO THE LOADING DESIGN OF THE PITS,
ALL DIMENSIONS SHALL BE IN METERS UNLESS OTHERWISE SPECIFIED
PLEASE DO NOT SCALE THE DRAWING

Annexure-C

List of Authorized Recyclers/ Utilizers/ Co-processors of Hazardous waste

S. No.	Name and Address of the Facility	Type of Hazardous Waste Recycled	Authorized Recycling/ Utilization/ Co-processing Capacity (MTA)	Quantity Recycled/ Utilized/ Co-processed (MT)	Registration valid upto (DD/MM/YYYY)
1	M/s Rama Metal Company, Village Johron, Behind DIC, Industrial Area, KaLa Amb, Distt. Sirmour (HP)	Lead acid batteries plates and other lead scrap/ residue	550	589.624	10.12.2018
2	M/s Radha Krishna Industries, Village Meerpur Gurudwara, KaLa Amb, Distt. Sirmour (HP)	Lead acid battery plates and other lead scrap	10500	140	20.11.2016
3	M/s Sri Balaji Smelters, Plot No. 90, Industrial Area Lodhimajra, Tehsil Baddi District Solan (HP)	Lead acid batteries plates/ lead scrap/ ashes/ residues	7000	500	01.05.2017
4	M/s Sai Industry, Plot No. 22, Trilokpur Road, IA, Kala Amb, Distt. Sirmour (HP)	Battery Scrap	4800	86.043	16.06.2018
5	M/s Ras Industry, Plot No. 22, Trilokpur Road, IA, Kala Amb, Distt. Sirmour (HP)	Battery Scrap	4800	119.224	16.06.2018
6	M/s Neel Kanth Industries, Plot No. 38, Sector-5, Parwanoo, Distt Solan (HP)	Brass dross, Copper dross, Zinc dross, Zinc ash & Zinc skimming	4000	Nil	01.12.2016
7	SK Engineers, Village Johron, Trilokpur Road, Kala Amb, Tehsil Nahan, Distt. Sirmour (HP)	Lead acid battery plates & Lead scrap	1200	516.233	08.02.2020
8	Span India Scaffoldings, Village Johron, PO Kala Amb, Tehsil Nahan, Distt. Sirmour (HP)	Lead acid battery plates, Lead scrap	1200	488.15	08.02.2020
9	Ekta Enterprises, Plot No. 43, Trilokpur Road, Ind. Area, Kala Amb, Tehsil Nahan, Distt. Sirmour (HP)	Lead acid battery plates, Lead scrap	5000	493	16.11.2019
10	Geon International, Plot No. 65, Bhatoli kalan, Industrial Area, Baddi, Distt. Solan (HP)	Lead acid battery plates, Lead scrap, Lead ash and Lead residue	12000	6544.018	19.04.2021
11	Indo Plast (P) Ltd., Plot No. 46-48, Sector-5, Parwanoo, Distt. Solan (HP)	Zinc ash, Zinc Dross/ Zinc Skimming/Zinc Scrap; Brass Ash/Brass Dross/Brass scrap; Copper Ash/Copper Dross/Copper Scrap; Aluminium Ash/	6000	Nil	07.03.2021

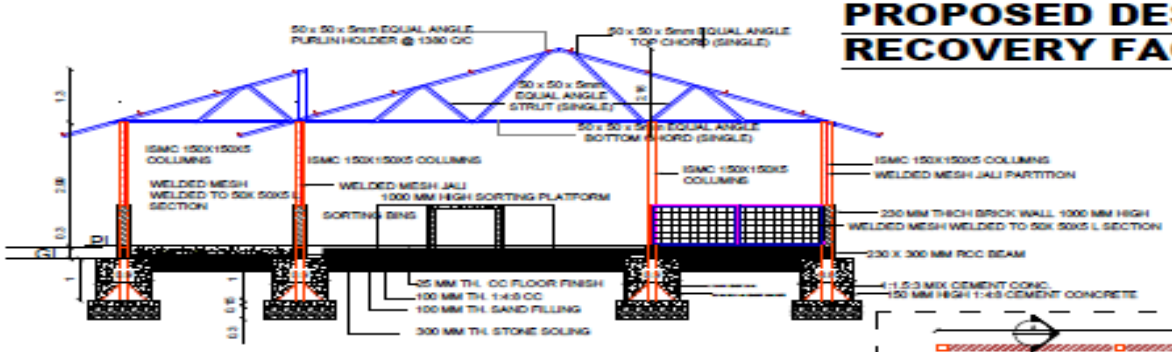
		Aluminium Dross/ Aluminium Scrap			
12	Sarika Industries, Plot No. 111, HPSIDC, Industrial Area, Baddi	Lead acid battery plates, Lead scrap/ ashes/residues	5500	121	14.09.2020
13	Rama Krishna Industries, Village Jattan, Kala Amb, Distt.Sirmour,HP	Lead acid battery including grid plates and other lead scrap	27700	150	31.03.2021
14	K.K. Enterprises, VPO Daslehra, Tehsil Jhandutta, Distt.Bilaspur, HP	Lead acid battery plates and other lead scrap	35	Authorisation granted on 19/12/2017	31.03.2022
15	M Rauf Enterprises Khasra No 1747 -53 Morepen Road, Vill. & P.O. Thana Tehsil Baddi Distt Solan (HP)	Cleaning & Washing of Contaminated Drums	28800 Nos.	27321 Nos.	_
16	Enviro Enterprises Plot No 18 C Ind Area Lodhimajra Tehsil Nalagarh Distt Solan HP	Cleaning & Washing of Contaminated Drums	28800 Nos.	4591 Nos.	31.03.2020
17	Gulshan Trading Co., Village Gullerwala, P.O. Baddi, Distt. Solan, H.P.	Cleaning & Washing of Contaminated Drums	43200 Nos.	840 Nos.	_
18	Him Trading Co Village Sheetalpur Tehsil Baddi Distt Solan (HP)	Cleaning & Washing of Contaminated Drums	28800 Nos.	3019 Nos.	31.03.2022
19	Lucky Enterprises Plot No 42 Ind Area Lodhimajra Tehsil Baddi Distt Solan HP	Cleaning & Washing of Contaminated Drums	21600 Nos.	Not Submitted	31.03.2022
20	Salam Traders Co Village Dattowal Tehsil Nalagarh Distt Solan HP	Cleaning & Washing of Contaminated Drums	38400 Nos.	Not Submitted	_
21	Super Trading Co Vill Gullerwala Sai Raod Tehsil Baddi Distt Solan (HP)	Cleaning & Washing of Contaminated Drums	21600 Nos.	7064 Nos.	_
22	Kamal Enterprises Village Kotla PO Barotiwala Tehsil Baddi Distt Solan (HP)	Cleaning & Washing of Contaminated Drums	43200 Nos.	25542 Nos.	_
23	Shiv Shakti Enterprises Mauja Chakjangi Khasra No 42 Vill Chakjangi Baddi Tehsil Nalagarh Distt Solan HP	Cleaning & Washing of Contaminated Drums	43200 Nos.	Not Submitted	_
24	Balaji Trading Co Vill Suraj Majra Tehsil Baddi Distt Solan (HP)	Cleaning & Washing of Contaminated Drums	9000 Nos.	4187 Nos.	_
25	KK Enterprises Sheetalpur Road Baddi Tehsil Baddi Distt Solan HP	Cleaning & Washing of Contaminated Drums	21600 Nos.	8049 Nos.	31.03.2020
26	M/s Shivalik Solid Waste Management Ltd. Village Majra, PO Dhabhota, Tehsil Nalagarh	Cleaning & Washing of Contaminated Drums	28800 Nos.	26802 Nos.	31.03.2018

Annexure-D

PROPOSED DESIGN OF MATERIAL RECOVERY FACILITY CENTRE

NOTE:
THE SAID STRRUCTURE CAN ALSO BE CONSTRUCTED BY USING LOCAL MATERIALS AVAILABLE LIKE BAMBOO.

THE SIZE OF THE MRF MAY VARY WRT REQUIREMENT OF THE TOWN.



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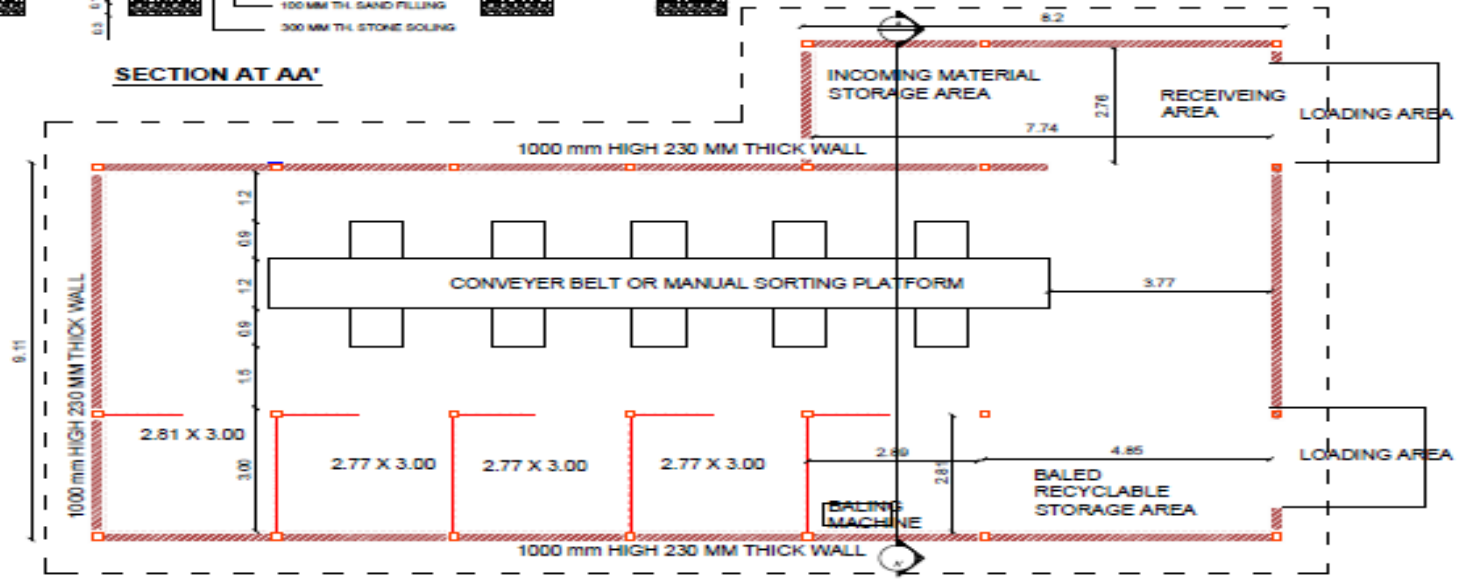
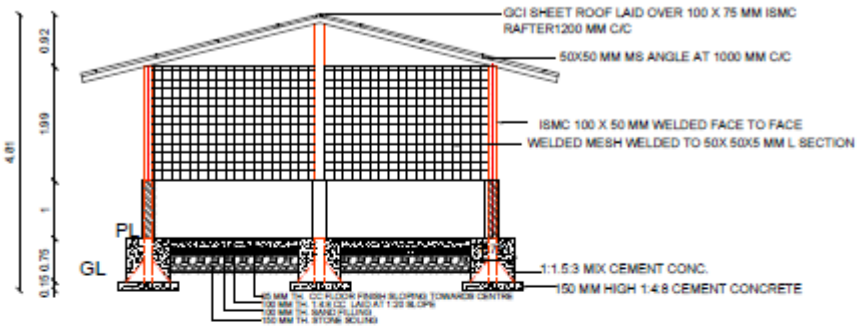


CONCEPTUAL FLOOR PLAN OF MATERIAL RECOVERY FACILITY CENTRE

Annexure-E



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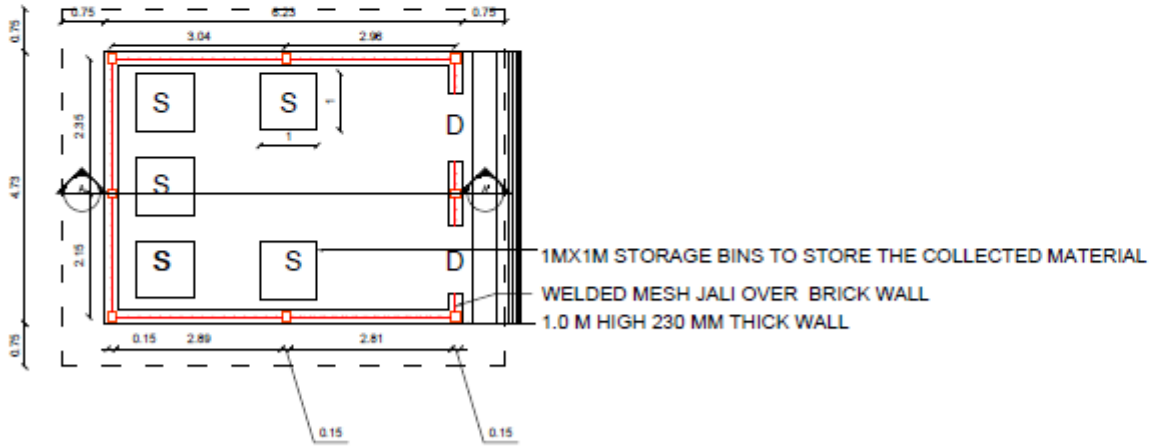

LAYOUT PLAN

CONCEPTUAL FLOOR PLAN OF HAZARDOUS WASTE COLLECTION CENTRE

SPECIFICATIONS

a. Flammable, ignitable, reactive and non-compatible wastes should be stored separately and never should be stored in the same storage shed.

b. Storage area may consist of different sheds for storing different kinds of incinerable hazardous wastes and sheds should be provided with suitable openings.

c. Adequate storage capacity (i.e. 50 % of the annual capacity of the hazardous waste incinerator) should be provided in the premises.

d. Storage area should be designed to withstand the load of material stocked and any damage from the material spillage.

e. Storage area should be provided with the flameproof electrical fittings and it should be strictly adhered to.

f. Automatic smoke, heat detection system should be provided in the sheds.Adequate fire fighting systems should be provided for the storage area, along with the areas in the facility.

g. There should be at least 15 m distance between the storage sheds.

h. Loading and unloading of wastes in storage sheds should only be done under the supervision of the well trained and experienced staff.

I. Fire break of at least 04 meter between two blocks of stacked drums should be provided in the storage shed. One block of drum should not exceed 300 MT of waste.

j. The storage and handling should have at least two routes to escape in the event of any fire in the area.

k. Doors and approaches of the storage area should be of suitable sizes for entry of fork lift and fire fighting equipment;

LEGEND

S = 1M X 1M STORAGE BINS

ALL DIMENSIONS ARE IN METERS.

SCALE = 1:100