

## ***Municipal Solid waste (MSW) as a construction material***

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Generally bricks are made using top soil from Agricultural fields or Quarries; approximately half an acre land (about 4000 m<sup>2</sup>) top soil is required for the making of about 1 lac bricks. The requirement of Bricks for Mumbai is about 40 lac bricks per day and therefore about 20 acre (4 hectors = 40,000m<sup>2</sup>) area top soil is used only for Mumbai for brick making. Top soil is developed over a period of millions of years of geological fines. This soil is very fertile. The process of making bricks is responsible for the degradation of the environment at large. This is happening since ages.

A study was carried for making construction bricks using screened MSW obtained from Deonar dumping ground. with addition of brick making natural soil and / or fly ash.

MSW generation is inevitable. MSW generated in the urban area is disposed off on the land. At this moment there is tremendous scarcity of land for disposal of the MSW in Mumbai.

“An innovative concept of making of bricks using screened MSW – deposited in Deonar dumping ground. with Agricultural soil and/or fly ash has been studied in detail in this research project.

The present study is aimed at making use of MSW for Building bricks making which may be a solution to take care of both the problems, stated above.

MSW is a complex mixture of dry and wet wastes generated by city dwellers. MSW screened to separate grains less than and greater than 10 mm has shown presence of partially decomposed organic and inorganic substances in it. Grains greater than 10mm (glass, metal, plastic, paper, wood, cloth, debris) etc. can be recycled and grains less than 10mm can be used for brick making.

The scope of this research project work included

- i) Study on MSW
- ii) Study on natural brick making soils
- iii) Mix Design
- iv) Analysis of MSW , Fly ash and natural brick making clays
- v) Preparation of bricks – using local method.
- vi) Tests on burnt bricks.
- vii) Conclusion and recommendations
- viii) Future work suggestions

The characteristics of brick making MSW – has been studied to evaluate its

- i) Micro-biological – properties to understand its effect on workers handling this method.
- ii) Physical properties from the point of view of raw materials for brick making.
- iii) Chemical properties to know it's chemical contents – raw materials for brick making.
- iv) Engineering properties of bricks made using MSW and other methods.

The project work is going on over last one and half years.

After analysis about 15 blends of MSW, Natural soil and Fly ash were used to prepare bricks. These bricks were tested for its engineering properties. The results are encouraging and strengths obtained in a few blends are up to 30-62 Kg/cm<sup>2</sup>. The final conclusions of the study are awaited.

Sr. No./ID	MSW	A.S.	T.F.A.	D.F.A.	% W	Crushing strength kg/cm	
	Farming						
1/01	100	15	10	-	9.10	13.2/17.1	
2/02	80	24	-	-	21.50	17.2/48.3	
3	80	-	16	-	14.06	<b>63.48/43.50</b>	
4	80	-	44	-	22.30	12.4/20.9	
5/01	80	4	13	-	11.86	10.9/26.6	
6	100	15	-	17	27.70	<b>58.1/6</b>	
7	80	-	-	27	17.70	22.8/16.74	
8	80	-	-	75	27.05	<b>62.9/70.5</b>	
9	80	4	-	22	32.81	30.5/35.9	
10	80	8	-	-	26.60	17.2/27.3	
11	80	4.5	3	-	26.29	10.9/36.8	
12	60	9	-	-	34.50	17.6/13.0	
13	40	2	-	-	21.50	-	
14	30	-	-	-	27.05	-	
15	60	-	8	-	15.50	<b>36.9/49.8</b>	
16	-	-	40	-	22.70	<b>40.0/30.7</b>	
17	-	-	-	40	21.16	29.9/26.2	
18	-	20	-	40	30.13	28.3/33.65	
19	-	10	-	40	29.40	12/25.3	
20	08	8	-	-	22.45	<b>58.2/60.0</b>	
21	9	6	-	-	18.22	25.9/13.2	
22	6	9	-	-	28.00	10.0/8.6	
23	6	7	-	-	21.96	11.1/15.1	