

No. 342 /PW/CE/EE(D)/AE(C)/F.No.734(B)/2017-18

GOVERNMENT OF PUDUCHERRY  
COMPUTER DESIGN CENTRE,  
PUBLIC WORKS DEPARTMENT

Puducherry, the 28/03/2018

CIRCULAR

Sub: PW-CDC-An alternate material to sand -Use of crushed stone sand -  
Instructions issued - Reg

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Sand resulting from the natural disintegration of rock which have been deposited by streams / rivers are known as Natural Sand or River Sand. Extensive use of this river sand as fine aggregate in construction works result in scarcity of river sand. Further excess mining of sand affects the river system and lowers the ground water level. Therefore it is imperative to find alternate material to river sand. In this connection a circular has already been issued in the Chief Engineer, PWD, Circular No.87/PW/CE/EE(D)/F.No.734/2017-18; dt: 06/07/2017 for the use of quarry dust an alternate to rive sand.

The sand manufactured by crushing hard stones are called Manufactured Sand (M-Sand) or Crushed Stone Sand. In stone crusher units stone boulders are crushed and converted into 40mm, 20mm, 12mm and 6mm stone jellies. The other crushed particles are left unutilized as quarry debris and dust. The particles of sizes ranging from 4.75mm to 150 microns are collected and commercially sold as Manufactured Sand or M-Sand in open market.

The quarry dust is not M-Sand and it should not be used as an alternate to sand except for filling basement. Most of the M-Sand now sold in the open market produced by compression crushing is flaky and more angular in shape. The surface texture is very rough and concrete results in honey combing. The process of manufacturing M-Sand shall be such that it should give cubical particles and the Manufactured Sand shall comply with Bureau of Indian Standards to ensure good quality.

In the circular under reference, the filed officers of PWD have been permitted to use Crushed Stone Sand in the construction work as an alternate material to Natural Sand subject to certain conditions. Regarding this, it is reiterated specifically that the Crushed stone sand should comply with all the provisions furnished in the following IS Codes and detailed in the following paragraphs.

IS 383:2016	Gradations details for concrete shall be as in Table-9. The information to be furnished by the supplier and the Description & Physical and Chemical characteristics of aggregates for concrete shall be as in Clause 4,5,6&7 of IS 383-2016.
IS 2116:1980	Gradation of sand to be used on masonry works shall confirm to the requirements in Table-1.
IS 1542:1992	Gradation details of sand (Natural and crushed stone sand) for internal wall, external wall and ceiling plastering shall be as in Table-1

The tables mentioned above are enclosed in the Annexure for ready reference.

Since the quality of the fine aggregate depends on the source and the nature of the rock to be crushed, the information of the fine aggregate to be furnished by the supplier should be as per the IS 383:2016.

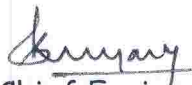
In the circular under reference it is already instructed to make proper Mix Design and adequate number of cubes shall be tested for 28 days compressive strength as per IS 456:2000. It is now instructed that the description and physical characteristics of aggregates for concrete should be as IS 383:2016. Wherein the trade groups of Rocks used as concrete aggregate, particle shape and surface texture are described. Further for Reinforced Cement Concrete produced using M Sand, the following test shall be conducted before field adoption.

- (i) Consistency of concrete IS 1199-1959 (2004)
- (ii) Drying shrinkage IS 1199 - 1959 (2004)
- (iii) Bond strength (Pull out test) IS 2770 (Part-I) - 1967 (2002)
- (iv) Compressive strength and flexure strength IS 516-1959 (2004)

The Gradation of sand to be used on **masonry works** shall confirm to the requirements in **Table-I of IS 2116-1980** enclosed in the Annexure.

Gradation details of crushed stone sand for internal wall, external wall and ceiling plastering shall be as in **Table-1 of IS 1542:1992** enclosed in Annexure.

The field officers are requested to adopt M-Sand confirming to the above IS Codal provisions in the detailed estimate itself depending on their availability in the open market. Even for the on-going works, M-Sand can be substituted without exceeding the expenditure over and above the estimate value.

  
Chief Engineer  
PWD, Puducherry

To

- 1) The Superintending Engineer, Circle-I, PWD, Puducherry
- 2) The Superintending Engineer, Circle-II, PWD, Puducherry
- 3) The Superintending Engineer, Circle-III, PWD, Karaikal
- 4) The Executive Engineer, SBDI / SBDII / BRS / BRN / BRC/ Irrigation / NH/ PHD/ Planning, PWD, Puducherry
- 5) The Executive Engineer, I&PH / B&R, PWD, Karaikal
- 6) The Executive Engineer, PWD, Mahe / Yanam

Copy to:

- 1) The P.S. to the Chief Engineer,  
PWD, Puducherry
- 2) The P.S. to the Development Commissioner,  
Chief Secretariat, Puducherry