POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE
Degree in Architecture
Honors theses

Stone materials and their recycling: the sawing mud
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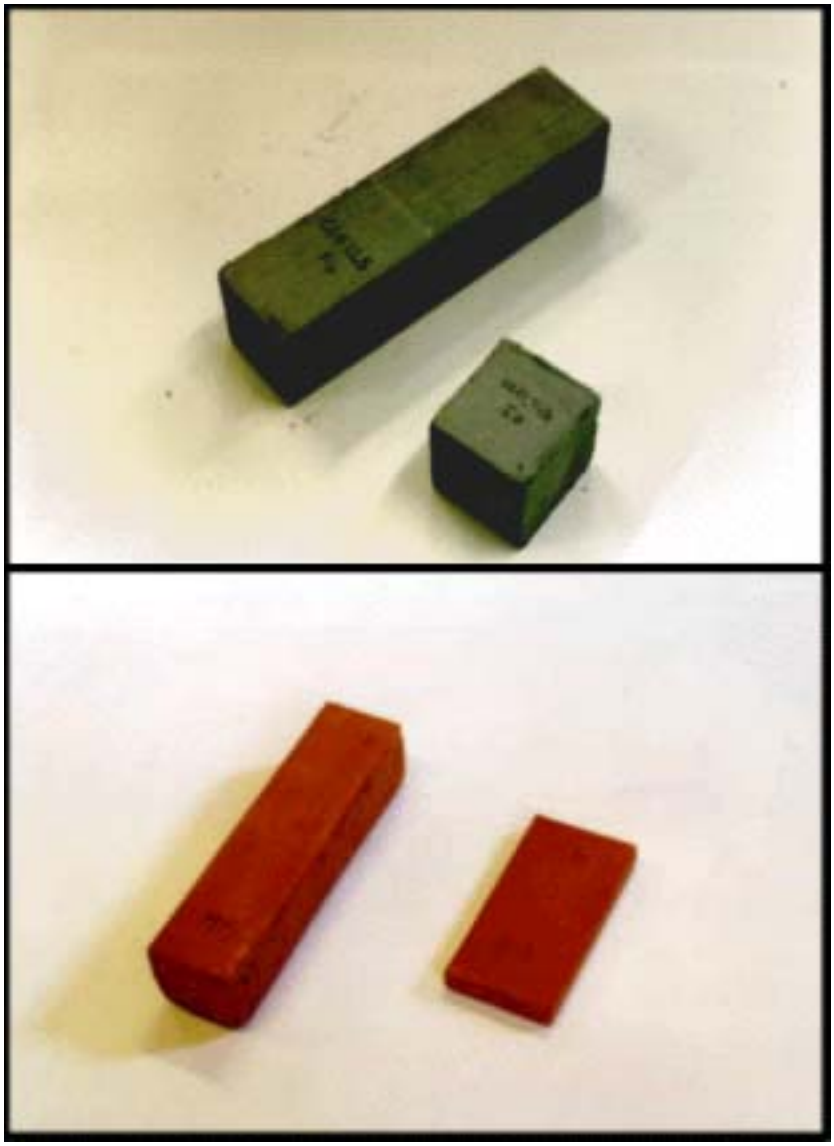
The subject of this thesis is about:

- Recycling process for sawing mud of marble and granite, that is to say the wastes usually called "marmettola";
- Analysis of the possibilities of recycling this wastes, that is to say the insertion in the producing cycle of materials for the building trade as "secondary raw materials".

Mud of marble and granite

A balanced use of resources is not the only way to reduce the degeneration of environment: to devise new technologies is very important for a more balanced exploitation of the potential of all materials along their working cycle.
The research is about *marmettola* (coming from Massa Carrara) mixed with binders and other components for a large number of experiments on specimens subjected to compression, bending, absorption and imbibition tests.



Some specimens for compression,
bending, absorption and imbibition tests

Some producing sectors could recycle *marmettola* with convenience:

Bricks - The mixtures obtained using *marmettola* were pressed into moulds, dried and cooked in furnace. The results obtained were very interesting because appropriate percentages of mud into clay resulted in bricks that are more resistant to the bending test. Moreover, dampness and thinning of mud are suitable for this mixing. There are not additional costs for extra treatments.

Blocks - Mud of granite, fly ashes and quicklime were the components for a material based on hypothetical synergies among industrial wastes. The material is comparable to a scarce performance binder as lime. The tests on the specimens permitted to find out about the hydraulic properties of the mixture, and the singular property to acquire more resistance during ripening into water. The data of compression resistance were higher than those of hydraulic limes.
In this case as well, mud of granite was used without further treatments, it was introduced in the mixture in much larger quantity than the other two components. A possible recycling application could be the realisation of brickwork blocks or things for urban furniture, reducing the costs remarkably.

Plaster - Another experiment was carried out using the same mixture to plaster surfaces of brick walls in very humid rooms. The results obtained were interesting: fineness of components permitted to produce very smooth and regular surfaces.

Plaster with mix of mud of granite,
quicklime and fly ashes

Encouraging results were obtained at the end of these experiments. They permitted to keep optimism in the possibility to apply the achieved results for a real fulfilment. This work, particularly for the content of the first part is also an attempt to realise a topical document. It can give useful information to anybody starting new research in this field.

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