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S U L P H U R
AS A BUILDING MATERIAL FOR LOW-COST STRUCTURES

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Availability

The potential of sulphur as a cheap "binder" in concrete-like materials has been the subject of recent extensive research and experimentation mainly in Canada and the U.S.A.

The main reason for the increased attention given to this material is the recent large increase of production of elemental sulphur as a by-product of the process of refining petroleum and natural gas. Until a few years ago surplusses of sulphur were burnt off and the gaseous combustion products were discharged into the atmosphere. Now that attention is drawn to the environmental problems caused by this practice, anti-pollution laws force the recovery of the elemental sulphur, thus creating large stockpiles and availability at extreme low cost in several countries.

Apart from the above source, sulphur is available as a mineral ore in volcanic regions.

Sulphur concrete

As sulphur melts at a low temperature (115^{o}C), it requires little energy and simple equipment to melt it down and combine it with aggregates to form a concrete-like material. It is non porous and impervious and thus forms a durable and waterproof "concrete" when mixed with sand and/or broken stone. A sulphur-aggregate ratio of 3:7 is usual and results in blocks of equal or higher strength than conventional concrete blocks.
Some (cheap) additives are required to render the sulphur concrete self-extinguishing (elemental sulphur is an inflammable material).
Whether the low melting temperature of sulphur would have a negative influence on the stability of building blocks of sulphur concrete in extreme hot climates might require further research.

Applicability in Kenya

From the above it is evident that sulphur could be used for manufacturing cheap building elements in countries where elemental sulphur is available either as a by-product of industrial processes or in mineral form.

HRDU has investigated the availability of sulphur in Kenya, the results of which are as follows:

1. As a by-product of refining petroleum.
   The oil refinery in Mombasa has no facilities for recovery of elemental sulphur.

2. As a by-product of other industrial and mining activities.
   The soda factory at Magadi does not produce sulphur as a by-product.

3. As a mineral.
   Professor I.S. Loupekine (Department of Geology, University of Nairobi) informed HRDU that small occurencies of sulphur are known at Olkaria, Eburru, Central Island (in Lake Turkana), and Ol Kokwa Island (in Lake Baringo). None of these are economical and no deposits have been or are being worked.

Conclusions

At present elemental sulphur is not available in Kenya, neither as a by-product of industrial processes nor as a mined mineral.

Although sulphur as a substitute for cement has great potential for manufacturing of cheap building elements, any research into local application possibilities should await the availability of the material in large quantities at low cost.

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