Sudan University of Science & Technology
College of Graduate Studies

Plant Redesign for Production of
Soil-Cement Blocks

BY
Eldooma Babikkir Adam Ali

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بسم الله الرحمن الرحيم

صدق الله العظيم
سورة الحديد (الأية 25)

Dedicated To

The soul of my father

My father
My brothers
My sister
My wife
My children
My friends

With my love & respect

Acknowledgements

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Eldooma Babikkir Adam
M.S.c Student
Mechanical engineering
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Abstract

Sudan as one of the underdeveloped countries is in need of development and rehabilitation in the field of buildings. Nowadays building materials are one of the problems of buildings in Sudan for its scarce and high price. Also using of burning wood in fired –brick manufacturing process affect the environment and future energy. This research is designed to study the technical and economical benefits to

produce alternative for the existing material (fired-bricks), and also to redesign and manufacture a complete production line consists of a vibrator mixer and hydraulic press to produce soil-cement blocks which contain soil and percentage of cement and water in high quality and productivity level. An available machines were redesigned, and soil samples were taken from Omdurman and Khartoum North. The produced blocks were tested in the laboratories of the institute of technical research for water absorption and in the laboratory of highway researches-university of Khartoum for compressive strength, An evaluation for the operation of the redesigned machines and economical study showed that the produced soil-cement blocks are of higher quality and lower cost than the available fired-bricks.
المحلية (تراب ونسبة قليلة من الأسمنت والماء) تكون ذات جودة عالية وتكلفة منخفضة. تم إعادة تصميم وتنفيذ خط الإنتاج باستخدام الأساليب العلمية الهندسية. بعد الاطلاع على واقع الدراسات والتجارب العالمية والاستفادة من الآلات المحلية حيث تم تصميم وتنفيذ خط إنتاج مكون من هزاز وخلاط وماكينة ضغط هيدروليك من المواد المحلية كما تم إنتاج طوب من أنواع مختلفة من التربة أخذت من منطقة أمدرمان ومنطقة الخرطوم بحري وأجريت عليها عمليات اختبارات ضبط الجودة بمعامل معهد أبحاث التقانة (امتصاصية الماء) ومعهد أبحاث البناء والطرق بجامعة الخرطوم (قوة الضغط) وقد تم التوصل إلى أن الطوب المنتج أكثر جودة كما تم اجراء حسابات الكلفة وتطبيق مبادئ دراسة العمل ودراسة الوقت وبمقارنة كلفة الإنتاج تم التوصل إلى أن الطوب المقترح أقل تكلفة مقارنة بالطوب الأحمر مما يشكل بديلاً ناجحاً لمواد البناء الحالية.

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