DESIGN OF CHICKEN MESH RETAINING WALL USING FLEX MSE SYSTEM

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ABSTRACT:
The aim of the project is to design a retaining wall with Flex MSE system with some improvisations as a proposal for college grounds. The design is done by taking into account the requirements of the surroundings. The construction is done with materials like polypropylene bags, barbed wires, chicken mesh etc….Soil from nearby area is used as a basic resource for construction. It is a cost-effective, less time consuming, and less skill needed construction technique. Output generated is a cost effective retaining wall design for different heights and its cost analysis with other concrete retaining walls.

Key word: Flex MSE,design, chicken mesh,retaining wall.

1. INTRODUCTION

Flex MSE is a unique soft building material that exhibits hard material qualities. It claims to offer 'an eco-friendly flood defense solution with enhanced engineering stability and durability'. Developed in Canada and now available in the UK, the Flex MSE system comprises two engineered components: soil-filled geo-textile bags and spiked interlocking plates.It is known as a'a proven erosion control solution'.

Flex MSE is said to be ideal for applications 'where land meets water' and for many landscape projects. It can be built at angles of up to 82 degrees, 'providing a natural solution when near-vertical structures are needed', and 'can be installed in two-thirds the time of concrete block and other conventional retained wall structures', without the need for specialist equipment or skilled labour. Flex MSE has an 'anticipated lifespan' of 120 years. Flex MSE is a Wall System which is used around the world for Retention, Slope Stabilization, Erosion Control and Anywhere Land Meets Water.Flex MSE is 60% of concrete's cost installed.

Fig: 1: Flex MSE retaining walls

Flex MSE walls require minimal initial leveling or sub gradeembedment. The flexible, easily adjusted units conform perfectly to site irregularities such as trees and unexpected bedrock. Flex MSE is used to build everything from small creek banks to massive roadways – providing permanent stability you can build on. It expends only 3% of Green House Gases over comparably sized concrete blocks. It is a solution that installs faster, lastslonger, and costs less. It can be constructed utilizing available soil in almost any region, and requiring only a few skills that are easy to learn. The polypropylene bags used to contain soil can be obtained free or relatively cheap. This can be adapted to any conditions, from regions that flood to the mostdesert likelands. Barbed wire is used between courses instead of mortar to grip the bags.

2. LITERATURE SURVEY

As the population increases and development of urban areas is subject to increasing constraints, transportation demand has led to widening of existing highways to improve traffic flow. An increasingly common practice involves building mechanically stabilized earth (MSE) walls in front of previously stabilized walls (or shored walls). However, due to the high cost of additional right-of-way and often limited space available, construction of earth retaining walls is often done under constrained spaces. This leads to retaining walls that are narrower than those recommended in current design guidelines. These construction techniques are chosen because they are low-tech and low-cost. Combined with good quality control, they can create buildings and site structures strong enough to survive hurricanes and resist earthquake damage.

With the passage of time and development, the rate for all kinds of materials around the world is being increased day by day. Nowadays we can see many projects when started blooms up and as it moves on to its upper stages we see those projects moving onto an utter failure due to a main problem of lacking fund. To control such things from a part some solutions must be brought on viewing from the construction field, we are proposing up the use of chicken mesh retaining wall instead of other forms of retaining walls.

This solution can bring about a new change in the construction field replacing RCC works which will give an economic construction solution. This solution can bring about a of cost effectiveness when compared to other forms of retaining walls. So here a solution to cost effective technique, it is introduced in the form of chicken mesh retaining walls to show how cost less a retaining wall can be.

3. MATERIALS USED

As you might guess from the name, choosing the earth and the bags are important steps in earth bag construction. Essentially, any type of soil can be used. Soil is made up of clay, silt, sand and gravel. Silt is extremely fine-grained, and using too much in an earth bag structure will weaken it. Gravel, or jagged pieces of rock, is sometimes used in earth bags, mostly at a foundational level, but builders primarily use a

mix of clay and sand. Clay serves as the glue to hold sand together, while the loose, gritty particles of sand form the bulk of an earth wall's stability. Coarse, jagged sands are best because there are lots of sides for the other grains to adhere to.

Several other materials are also used which includes: Barbed wire is used between levels to hold earth bagstogether. Plasters are applied to the inside and outside of the home. Commonly used plasters include mud, a combination of clay and sand, and lime. Wooden forms are used to create windows and doors. A tamper is used to compress the soil; they are usually made of a wooden pole with a heavy metal plate attached. You can buy a tamper at garden stores, or you can make your own with pieces of concrete. Wheelbarrows, shovels and various other tools will help you move the dirt. Some builders also use tools such as bag stands or funnels to fill the bags.

4. DESIGN OF RETAINING WALL

Step-1: Finding the angle of cohesion of the soil.

The angle of cohesion is found out by unconfined compression test.

Fig: 2: Result of unconfined test

Step-2: Finding the field density of soil.

Field density of soil is found out by core cutter method.

Step-2: Construction of a model.

A model is constructed according to the studies for testing worst conditions.

Fig: 3: Model of chicken mesh retaining wall (during construction)

Fig:4:Model of chicken mesh retaining wall(completion time)

Step-3: Design proposal for different heights.

Design proposal for different heights is done with design steps.

Step-4: Cost analysis.

Cost analysis is done by a comparison with concrete structures.

5: RESULT

The design proposal of chicken mesh retaining wall using Flex MSE system is done for the college grounds in different heights. The angle of friction and cohesion is found out using unconfined compression test and field density using core cutter method. Cost analysis is done by centre line method. It is seen that this method is cost-effective and less time consuming with less or no need of skilled labours.

6. CONCLUSION

Properly designed and constructed Flex MSE structures provide a relativelymaintenance free solution. However, as with all building systems, a simpleinspection and maintenance routine is suggested. It's easy to posit that earth bag construction uses the least energy of any durable construction method. Unlike concrete, brick or wood, no energy is needed to produce the necessary materials other than gathering soil. With on-site soil being used, practically no energy is expended on transportation. And unlike rammed earth construction, no energy is required to compact the soil. The energy-intensive materials that *are* used — plastic (for bags & twine), steel wire, and perhaps the outer shell of plaster or stucco — are used in relatively small quantities compared to other types of construction. The buildings last a long time; however, when they are no longer useful they may simply erode with no serious threat to the environment, or even be recycled into new earth bag-constructed buildings. To monitor the performance of future MSE walls with independent full-height facing forpossible refinements of the recommendations furnished in this study and to allow the futureuse of different soil reinforcements.

7. REFERENCE

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