King Saud University

College Of Engineering

Civil Engineering Department

The headquarters of

The General Auditing Bureau

Prepared By:

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2- General information about the project:

Description: The headquarters of The General Auditing Bureau [12 Floors]

Owner: The General Auditing Bureau.

General Contractor: ALRashied and ALMangour

Subcontractor: Aeed ALOtibai Excavating work

Consultant: ALOtishan

Type of contract: General Contactor.

Scope: Construction of the head quarters.

Total cost: 200 millions riyals.

Duration of project: 36 months.

Total distance: About (5,000) square meters.

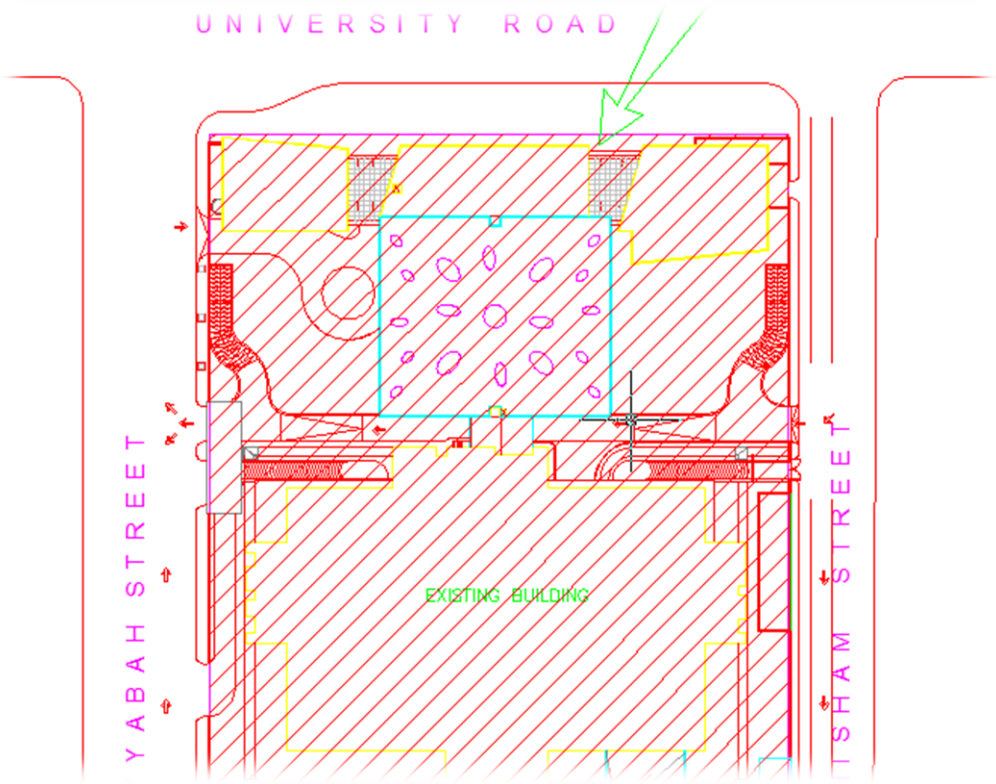
Total equipment: About 18 per day.

Location : Riyadh- ALMalaz- University Road

The contractor procedure in this project is to divide the project into so many zones. Each zone specialized in one area or task in the project. Also, each zone contains its own staff and equipment. In this project we are focusing in zone-(H), which is constructing the main gate, parking, roads, and utilities, from starting to finish. The total estimated number of the equipment used in zone-H is about 120 per day depending on the activities in that day. The type of equipment used in this zone is as following:

A. Backhoe.
B. Bulldozer.
C. Loader.
D. Truck

3D for Project after finishing



location of project

3- Equipment used in the project:

A. Backhoe :

1) Min backhoe (size 5 '):
   - Production per day: 20 cubic meters
   - Cost per day: 900 S.R

B) Bulldozer:

Model 2009 Kamatsu 155:

- Production per day: 400 cubic meters
- Cost per day: 1200 S.R

C) Loader :

Cat 966 :

- Bucket Capacity : 2.8 cubic meters
- Production per day: 60 truck (on truck 25 cubic meters)
- Cost per day: 900 S.R
- Working time: 8 hours

D) Truck:

1) Large size 25 m3 :
   - Production per day : 22 cubic meters
   - Cost per day: 400 S.R
   - Travel time : 2 hours
   - Dumping area : (laban Wadi)

4- Example:

1) Loading and Hauling Activity (Loader and truck)

- Loader:

  Bucket size= 2.8 m3

  Cycle time= 0.75 min

  Loading time required for each truck = 5min

  Number of buckets to load one trucks= 7 buckets

  Bucket fill factor = 0.88 (calculated)

  Note: there is no travel time because haul distance is less than 10 m.

- Truck:

  Truck capacity = 25 m3. (But for traffic and safety consideration, truck's load should not exceed 22 m3)

  Cycle time:

  Spot maneuver and dump time: 2 min

  Travel time: 2 hours

The exact Production for one hour can be known by counting the number of trucks been loaded and multiply them by the allowable capacity. 12 trucks only observed within one hour. However, the production was 264 LCM/hr ($12 \times 22 = 264$).

5- CONSTRUCTION IMPROVEMENT:

1) Work improvement:

An important component of work improvement, is preplanning, that is, detailed planning of work equipment and procedures prior of the start of work. physical models as well as traditional work improvement which include time studies, flow process charts layout diagrams and crew balance charts, may be used to advantage in the preplanning process.

2) Human factors:

In attempting to improve construction productivity and cost-effectiveness, it is important to remember that people are the essential element in the construction process. Workers who are fatigued, bored, or hostile will never perform at an optimum level of effectiveness. Some major human factors to be considered include environmental conditions, safety conditions, physical effort requirements, work hours, and worker moral and motivation.

3) Computer in construction:

Perhaps the most existing development in construction use of computer is the wide availability of electronic mail and internet with its almost unlimited recourses. Electronic communications permit contractors to exchange information among projects and between project sites and the main office.

4) Some field observations regarding time and cost reduction:
   - In highway or wide area construction the use of scrapers can reduce cost and working hour because they are capable of excavation, hauling and dumping. In other words, scrapers can excavators, loaders and trucks.
   - The proper selection between different types of cranes should be considered according to weights, location and height.

- In leveling and compacting processes, it is recommended to use grader and compactor consecutively in order to achieve the desired level and dry density because some environmental conditions such as rain will change the moisture content of soil. After grader finish leveling the compactor starts the compacting process.
- Maintenance of equipment Make maintenance for equipment every 250 hours of work, including maintenance, to make sure networked structure and change the engine oil and hydraulic system .The benefits of periodic maintenance:

  -A longer lifespan of the stomach.

  -Productivity of the best.

  -Lower cost.

6- Some picture in the field:

Group Pic(2)

Group Pic(2)

General Pic to project