

Assab Referral Hospital Construction



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[June 2000- Early 2006]

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1. ASSAB REFERRAL HOSPITAL CONSTRUCTION

On account of inadequate regional healthcare facility at Assab, In January 2000, Southern Red Sea regional Eritrean Defense Force (EDF) needed to construct a referral hospital facility for the region at the outskirts city of Assab.

Enterprise: The Southern Red Sea Eritrean Defense Force (EDF) construction department, Assab, Eritrea

Construction Period: June 2000 – April 2006

The construction work incorporated ground plus one complex consists of an outpatient building (OPD) and 200-bed healthcare facility center. Besides that, there were additional service buildings. The healthcare facility encompasses sectors such as obstetrics and gynecology, orthopedics, surgical theatre, Internal medicine, dentistry or Odontology, and pediatrics. Based on the data attained from the design documents, the surface area of the construction site was about 124 m².

Figure 1 demonstrates a bird's eye view of Assab hospital facility.



Figure 1 Building complex of Assab referral hospital.

Given that the region was a wasteland and situated by the side of the Red Sea, the ground was composed of a substantial quantity of salt. For that reason, all of the footings were constructed with salt resisting cement (Sulphate resisting cement). In Assab, it is common to notice premises ruined by salt. The salt moves up via capillaries and degenerate the wall surface and the columns of the building. Eventually, the reinforcement bars be corroded and fail to bear the load. Due to this reason, the usage of salt resisting cement was absolutely necessary for the construction of the foundation.

Sulphate Resisting Cement reduces the heat and has high sulfate, chloride, and saltwater resisting capability.

1.1 LAY-OUTING

After transferring the salient points to the ground using surveying instruments such as theodolite and surveying level, the batter-boards and construction lines were set to get started the excavation. The excavation or dirt removal from the foundation area was done by a mechanical excavator.

1.2 LEAN CONCRETING

5 cm deep lean concrete were cast before the foundation formwork placed. Figure 2 shows the lean concreting at Assab hospital construction site.



Figure 2 Lean concreting at Assab construction site

1.3 FOUNDATION PLACEMENT

Mainly because the geological formation of the site was rocky and robust, the excavation depth did not actually need to be greater than 1.5 to 2m depth. The kind of the foundation utilized for the site was a Spread footing foundation with an individual foot size of around 120m*85cm and 45 cm depth. The girder beam and all the columns were cast in-situ.

Figure 3, 4, and 5 demonstrate foundation and columns placement at the Assab hospital construction site.



Figure 3 Constructing the foundation and columns of Assab referral hospital



Figure 4 Single spread foot foundation utilized at Assab hospital



Figure 5 Foundation formwork placement

1.4 CONCRETE MIXING RATIO

The standard mortar mix employed was B25, and for the foundation, beam, and columns concrete mix implemented with identical mix ratio. Which is a mix ratio of cement: sand: gravel of 1:2:4. Figure 6 shows concrete mixing machinery utilized at Assab hospital.



Figure 6 Movable concrete mixer utilized at Assab hospital

1.5 SLUMP TEST

Standard Concrete mixing procedure was considered for this construction and the concrete pastes were inspected employing a fairly easy method known as slump test technique. Examining the concrete mix consistency is essential simply because it assists to prevent the effect of excess water in the mortar or concrete mix. The presence of excessive water can damage the structures as it simply leaves cracks in the building as soon as the water evaporates. Later, this will likely bring deterioration to the reinforcement bar, eventually causing untimely failure. Hence, validating the concrete consistency is actually vital to avoid cracks in the building. Figure 7 shows the slump test procedure.

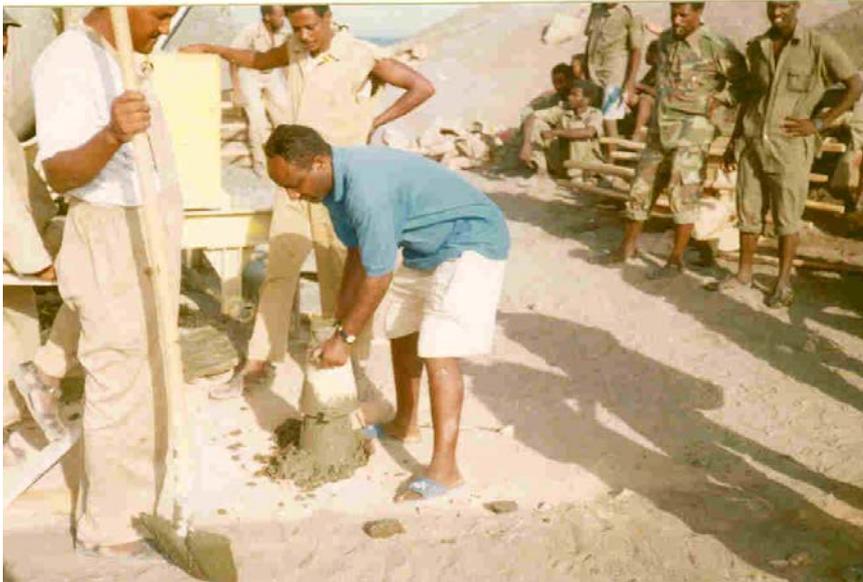


Figure 7 Slump test

Figure 8 and 9 shows the skeleton of the OPD



Figure 8 Outpatient department construction in progress



Figure 9 First floor reinforcement placement

1.6 THE FLOORS AND THE ROOFS

The first floor is 15 cm thick reinforced slab. It has got a terrace at the left corner of the building for outdoor lounging. The roofing, similar to the roof, it is 15 cm thick concrete slab. Besides that, there exists a 50 cm parapet wall above the rooftop. Figure 10 shows the completed OPD building.



Figure 10 Assab referral hospital completed OPD building

1.7 THE RESPONSIBILITIES OF THE ENGINEERS

The primary tasks of the engineers were regulating the concrete mix, assisting the foremen interpreting drawings, guiding the reinforcement bars cutting, bending and positioning (Bar scheduling), transmitting the design from the paper to the ground, guiding the excavation and supervising the construction in general.

Together with other pieces of machinery, there were concrete mixing machines both movable and stationed, vibrators, vehicles, and trucks etc.

The number of skilled and non-skilled personals took part in the construction were the following, two trained engineers, a co-engineer/aide engineer, a technician, a carpenter foreman, a mason foreman, several carpenters, and masons. Furthermore, 100s of non-skilled laborers used to come regularly from another infantry brigade. Almost all participants in this particular project were serving in the national military except the four permanent members of the military (the patrons) who were employed and paid by the construction department of the defense force.

1.8 COST OF THE PROJECT

The cost of the project could be estimated based upon the resources both human and materials. Nevertheless, due to the unavailability of the original plan, and material records at hand, it is difficult to estimate the cost at the moment.

1.9 POINTS TO HIGHLIGHT

Location: Assab Sekir, Eritrea

Construction surface Area: around 124 m²

Type: ground plus one building complex (OPD and 200 beds health facility center)