Professional Empowerment of Social and Technical Organization, Nepal (PESTO, Nepal) Latamandu, Doti



Installation Completion Report of Reservoir Tank of 50 m³ At Latamandu, Bairkot Doti, Nepal

| Submitted by: | Submitted to: |
|---------------|--------------------------|
| PESTO, Nepal | Nepal Relief Association |
| Latamandu | Aachen, Germany |
| Doti, Nepal | |
| | |

Name of the Project

Drinking Water Storage Tank in Latamandu

DATA OF THE PROJECT

Project Implementation

Project Description:

In the contest of Nepal all Nepalese people are facing the problem of drinking water, due to the poor economic condition of the country. So, Reservoir Tank system for collecting water is one of the good alternatives for them.

Survey:

Our task started from the survey of location by the Civil engineer with survey of the site where surveys of the transmission lines, distribution lines and the location of the reservoir tank was done in detail.

Instruments used during Survey:

Abney LevelMeasuring tape 50 meterBamboo sticks (2 nos. of equal size)

Construction Detail (Civil Works)

1. Earthwork Excavation



Earthwork Excavation

Earthwork excavation was done by the excavator in 8 hrs. During excavation the ground was of boulder mixed soil so it was so difficult to excavate. It was costly then the ordinary excavation.

2. Boulder Soling



Boulder for Soling

Soling surface

Boulder Soling was done by the above shown boulders with the raised height of 1ft from the excavated ground. After boulder was placed it was hammered by the 10 kg hammer of hammer to make it pack and tight.

3. Base Plain Concrete Cement (P.C.C. 1:2:4)



P.C.C Surface

Base P.C.C.

Base Plain concrete Cement was carried out by the mixture of the cement, sand aggregate and the water. It was done for making the bottom of the tank well leveled and easy for stone masonry.

4. Stone Masonry (1:4 c/m)



Inner masonry wall

Inner masonry wall



Outer masonry wall

Outer masonry wall

During stone masonry the ratio used was 1bag cement with 4 bag of sand. The inner wall was of 35 cm width and the height of the inner wall was 2 m above the base pcc. Outer wall was a type of retaining structure with 1:4 c/m the base width of the wall was 1.10 meter and at the top it wa 35 cm width. The height of the wall from the surface of pcc was 2.3 m above.



Completed stone masonary

Mortar used during stone masonary wall

5. Washout and Outlet P.C.C (1:1.5:3 with 2% wpc)



Washout and outlet pipe concreting

Washout and outlet pipe

Washout and the distribution pipes are set up first in the require position and then they are hung upon the plywood and after shuttering was complete the concreting was done with 2% water proof compound.

6. Core wall P.C.C (1:1.5:3 with 2% wpc)



Core wall gap for PCC

Core wall after PCC

One of the most civil works during the construction of stone masonry tank in Nepal is the core wall concreting. It was done with the great care when preparing and placing mortar with 2% water proof compound. It prevents the tank from leakage of water from the tank.



People preparing mortar for core wall PCC

During preparation of the mortar 1 bag of the cement was mixed with 1.5 bag of sand, 3 bags of aggregates and 200 gram of the water proof compound.

7. Shuttering work / Form Work

A. Preparation for Formwork



Cutting wood for support

Cutting plywood



Transporting plywood

Measuring for formwork



Making Drainage



Installing main support wood



Fixing Beam plywood



Installing plywood on slab

Fixing Plywood

B. Beam Shuttering



Beam Shuttering Work

Beam Shuttering Finished

C. Slab shuttering



Preparing supports for slab

D. Placing Reinforcement bars

slab formwork



Placing Reinforcement Bars

Close View of Mat



Beam Reinforcement

Slab Reinforcement

E. Material used for Formwork and Plain Concrete Cement:



Binding wire for Reinforcement

Reinforcement Bar for slab & Beam



Plywood 10mm thick

Wood for face



Wood for Support for Plywood



Cement Bags

Sand



Aggregates

Ring for beam

8. Plain Concrete Work for Slab (1:2:4 c/m)



Placing Concrete on slab & Beam

Supplying Cement Mortar



Transporting aggregates





Measuring Sand by tin can

Transporting Re-bar

9. Reinforcement work



Transporting Re-bars



Placing Re-bars



Placing Re-bars

Straighting Re-bar



Measuring Re-bar

Cutting Re-bar

Reinforcement work mainly deals with cutting, bending & placing the rebar. Here we have used 8mm diameter bars and 10mm diameter bars for the slab. 12mm diameter bars have been used in the beam reinforcement where as 8 mm bars have been used in the ring purpose for the beam.

During placing the re-bars the spacing between the reinforcement has have been adopted 100mm c/c both ways. Ring spacing in the beam has been adopted 250 mm. All the reinforcement has been tighten by the binding wire both in the slab and beam.



Tighting Reinforcement Bars

Ready for Placing Concrete

10. Inner wall Plaster Work (1:4 c/m with 2% wpc)



20 mm Plastering inner wall tank

20mm Plastered inner surface

During plastering work the sand have been screened properly and then only it was mixed with cement and water. 400 gm of water proof was added in the mortar for water proofing.

11. Tank Base Plaster Work (1:4 c/m with 2% wpc)



Plastering tank base

Plastering tank base



Screening sand for plaster work

12. Outer plaster work (1:4 c/m)



Plastering outer surface

Plastered outer surface

Outer plastering work was carried out in the ratio 1 bag cement/ 4 bags of sand. Then the ratio was mixed with water and it was ready for plastering. After plastering the tank was buried by the mud.

13. Punning plaster (1:1 c/m)

A. Inner wall



Punning plaster work

after punning

B. Tank base



Punning plaster work

Tank base

14. Cement pointing work:



Pointing works

Pointing works

During cement pointing work first of the plaster work is carried out and then the design of pointing is done after then the pointing job starts as shown in above pictures.

15. Fencing work

Angle posts



Fixing angle post

Fixed angle posts

The main work for the protection of the reservoir tank is the boundary work so these type of the angle posts are fixed at a 1 meter distance around the catchment area and after angle are fixed then the barbed wire are fixed in it.

GI Barbed wire Fencing



Fixing barbed wire

Fixed barbed wire

16. Valve Chamber Work



Excavation for Valve Chamber

Valve chamber is a structure situated just in the opening of the outlet pipe. Through the outlet pipe the water flows towards the distribution pipeline. From this valve chamber we can easily distribute the water to any line by using various types of GI pipe fittings.



Stone Masonary work at valve chamber

Stone masonary work for the valve chamber is carried out by the mortar of mud and water. Typical type of rectangular valve chamber is to be made so as to make easy for the water master to open or close the system and also for the maintenance purpose for the water tank. Its size differs according to the type of distribution pipeline and size of the tank.

17. Valve Chamber Fittings:



Distribution lines from valve chamber

Valve chamber is the small structure built for the security of the pipe line water distribution. From valve chamber we can easily open or close the system. It is the combination of the various types of the GI fittings. Here we have branched main pipe line into three small sub line distribution of 40 mm series. Each of the pipeline reach to the required taps from this starting pipeline.

18. Reinforcement for valve chamber



Valve chamber ready for placing concrete for slab



Valve Chamber slab pcc

19. Miscellaneous works:

• Boundary masonry work (lead height up to 1m height)



Stone Masonary work

Stone Masonary Work



Entrance Gate Fixing

Plaster work for Boundary work:



External Plaster work for boundary work



Inside plaster and pointing work on boundary wall

Painting works:



Enamel coating work on angle posts



Double coat paint on angle posts

Base soling work for Mid Portion of tank and Boundary



Soling Works for PCC



Complete soling between tank and boundary wall

Base soling work is carried out by the small sized stone with the sand. Base soling has been done upto 6 inch height. This was carried out in order to remove the weeds and grasses from tank side. To keep water safe and hygienic this job must be done.



Plain concrete work between void

Plain concrete cement work is carried out in the ratio (1:2:4). Void between the boundary wall and tank side this work is carried out. This reduces the weeds and grasses to grow in this space between tank and boundary wall.

20. Outside boundary work:



Excavation for step outside boundary



Mud Masonry work outside the boundary

Outside boundary for the protection and for walking around the tank 1 feet width and 1 feet height wall have been constructed.



21. PCC work around the outside boundary:

PCC & Masonry work around the boundary

22. Plaster and punning work outside the boundary



Plaster work in steps

Punning work in steps

23. Glass Rip-rap Work above top of boundary wall



Glass rip-rapping works

Glass rip-rap is done for the preventive measures works for the tank. Animal's people can't enter inside the tank from boundary.

24. Drainage work



Drainage work outside the tank

The overflow water from the tank reach to the drain and the monsoon rainfall is also collected by the drain from tank portion to the safe pass out. The drain is constructed around the tank.



Drainage system around the tank

25. Entrance gate for the tank



Only gateway to the tank

Bill of Back up Fund

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Overall view of the tank The-End

Recently, PESTO Nepal has successfully completed Reservoir Tank of the 50 m3 Latamandu Bairkot Doti. The project was sponsored by Nepal Relief Association Aachen Germany.