INSPECTION OF MONOLITHIC CONCRETE STRUCTURES

Inspection of construction and certification for cost sharing of monolithic (poured) concrete structures is new to most district conservationists and work unit technicians. Continuous inspection is not normally provided for CO-01 installations. Frequency of inspection should be related to the complexity of the work, the experience of the contractor doing the work and the consequences of failure should it occur. There are several key times to inspect monolithic concrete structures and items that should be checked during the inspections. Key times for inspection and items to be checked are:

1. Prior to excavation:

   a. Tank location and orientation

   b. Grade lines and elevations for tank

   c. Location and elevation of bench mark

   d. Location and manner where excavated material will be placed

2. Completion of excavation and prior to steel tying or placement of forms:

   a. Correct elevations and location.

   b. Uniform bottom condition--either all on rock or all on earth.

   c. Check for overexcavation and uncompacted backfill.

   d. Check need for pumps or other water control measures to provide dry working conditions.

   e. Is drain fill which is to be covered with concrete slabs properly protected so it will be operative?

3. Reinforcing steel placed and forms set:

   a. Are forms strong enough and well braced? Form design is not an SCS responsibility, however, if they appear to be inadequate we should warn the owner and contractor.

   b. Are forms the correct width as shown on the plans?

   c. Is steel properly placed according to the design and tied? Placement at the correct distance from the face

of the concrete is very important. This distance should be verified by measurement. Spacing between bars in a line is not so critical as to require measurement between each bar. If the correct number of bars are present and appear to be uniformly spaced, this is adequate.

d. Are adequate facilities available for handling concrete? Items: Vibrators, wheelbarrows, concrete bucket for crane, floats for finishing, material for curing concrete, etc.

4. <u>When concrete placement starts:</u>

a. Is the correct mix being delivered. The driver should furnish a delivery ticket showing weight of cement, fine and coarse aggregate.

b. Is the concrete well mixed? Worn out or overloaded mixers discharge dry or lumpy concrete. All mixers are supposed to carry a plate giving agitating and mixing capacities. A mixer loaded to agitating capacity will not mix properly.

c. Is the concrete of proper consistency? It should be stiff enough so it piles up rather than flows when placed in the forms or on the subgrade.

d. Is the concrete cool? In normal spring, summer and fall weather the concrete should be cooler than 90°F when being placed. When the concrete comes out of the chute, stick hand into it. If the concrete feels hot reject it. Inform the owner and/or contractor that if the load of concrete is used in the structure we will not approve. If pour is delayed, continue checking temperature. Truck should be unloaded within an hour after arriving on job.

e. Cold weather concreting methods are described in Chapter 17 of the Engineering Field Manual.

5. <u>When forms are removed:</u>

a. Check for honeycomb (unconsolidated concrete with voids). If present, call area engineer.

b. Check application of curing compound or other curing methods.

c. Check for understanding of time lapse before backfilling.

6. When backfill starts:

a. Check drainage system for proper installation.

b. Is correct material being used for backfill?

CHAPTER 17 OF THE ENGINEERING FIELD MANUAL HAS A SECTION ON CONCRETE AND REINFORCING STEEL. THIS CHAPTER SHOULD BE STUDIED BEFORE STARTING CONCRETE INSPECTION.