

EBASCO SERVICES INCORPORATED

WATERFORD STEAM ELECTRIC STATION - UNIT NO 3

PROCEDURE FOR: Inspection of Concrete Placement,
Curing and Finishing

PROC. NO. OCIP-7

ISSUE SUMMARY

NOTATIONS IN THIS COLUMN INDICATE WHICH CHANGES HAVE BEEN MADE

| ISSUE/DATE | PREPARED | APPROVED | REMARKS |
|------------------------|--|-----------------------------------|---|
| "A" 11/4/72 | M G Vinson | <i>[Signature]</i> | |
| "B" "DRAFT" 8/26/75 | <i>C. Satterfield</i> C. Satterfield | <i>[Signature]</i> | Update of QC 4.0-5, Inspection of Concrete Placement, Curing, and Finishing |
| "B" 9/12/75 | <i>C. Satterfield</i> C. R. Satterfield | <i>J. O. Booth</i> J. O. Booth | |
| "C" DRAFT 12/18/75 | <i>W. C. Griggs</i> W. C. Griggs | <i>J. O. Booth</i> J. O. Booth | Revised paragraph 6.1, 6.2, 6.3 and attached forms. |
| "C" 12/19/75 | <i>W. C. Griggs</i> W. C. Griggs | <i>J. O. Booth</i> J. O. Booth | |

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PDR FOIA
GARDE84-455 PDR

FREEDOM OF INFORMATION
ACT REQUEST

84-455

NOTATIONS IN THIS COLUMN INDICATE WHICH CHANGES HAVE BEEN MADE

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1.0 PURPOSE

C 1.1 The purpose of this procedure is to outline the instructions for those Quality Control inspection and testing functions relative to concrete placing, curing and finishing.

C 2.0 SCOPE

2.1 This procedure covers the inspection of concrete placing, curing, and finishing activities and the testing of the concrete for permanent plant structures.

2.2 The degree of placing, curing, and finishing inspection by Ebasco is of a surveillance nature and is not intended to be a total inspection. Contractors performing safety-related work shall be responsible for inspection and documentation of that work.

3.0 REFERENCES

3.1 Ebasco Specification LOU - 1564.472, Concrete Masonry

3.2 ANSI N45.2.5 - 1974, Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants

C 4.0 DEFINITIONS

4.1 None

C 5.0 RESPONSIBILITY

5.1 The Quality Control Civil Supervisor shall be responsible for implementing the requirements of this procedure.

5.1.1 He shall assign Civil Inspectors to monitor field activities of the Contractor who has a QA/QC program.

5.1.2 He shall assign Civil Inspectors to perform inspection of the work of Contractors who do not have a QA/QC program.

5.1.3 He shall assign Civil Inspectors to sample and test the concrete as required.

5.1.4 He shall be responsible for reviewing test reports for acceptance.

5.1.5 He shall be responsible for assuring that the inspection results are properly recorded.

5.2 The Quality Control Civil Engineer shall be responsible to provide technical assistance to the Quality Control Civil Supervisor.

5.3 The Quality Control Civil Inspectors are responsible for performing the inspections and tests as instructed in this procedure.

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6.0 PROCEDURE

- 6.1 The Quality Control Civil Inspector shall observe placement activities and shall complete Form No. QCIP-7-1, Concrete Placement Inspection. The Placement No., Date, Weather, Ambient Temperature, Design Mix Designation, and Location Description should be entered in the spaces at the top of the form.
- 6.1.1 Visual Inspection - The inspector shall make a visual inspection of the placement area shortly before start of concrete placement. He should make a general check for cleanliness, standing water, etc.
- 6.1.2 Time Started - He should record the time that the placement started.
- 6.1.3 Method of Placement - He should describe the method of placement. This should include the equipment used, for example, pumps, cranes and buckets, conveyors, etc.
- 6.1.4 Time Completed - He should record the time that the placement was completed.
- 6.1.5 Method of Finish for Unformed Surfaces - He should describe the method of finishing for unformed surfaces, for example, screeding and bull-floating, or "steel trowel".
- 6.1.6 Protection of Fresh Concrete - He should describe how fresh concrete is being protected from damage. For example, hand-rails may be put around placement or temporary enclosures may be erected.
- 6.1.7 Time Curing Started - He should record the time that the curing procedure started.
- 6.1.8 Method of Curing - He should describe the method of curing, for example, continuous water spray, ponding of water, etc.
- 6.1.9 Remarks - Any statements that are pertinent to the placement activities should be recorded. For example, if it begins to rain, this should be noted. If there is an equipment break down, this should be stated. If the effectiveness of a vibrator is suspect, the inspector should use a tachometer to verify the speed of the vibrator; and this information should be recorded. If the forms are hit by a bucket or if they give-way, this should be described.
- 6.2 The Quality Control Civil Inspector shall observe the curing activities and shall complete Form No. QCIP-7-2, Concrete Curing Record. The Placement No. and Location Description should be entered in the spaces at the top of form.
- 6.2.1 Time of Start - The placing inspector should record when the curing procedure started.
- 6.2.2 Time of Finish - This information should be recorded by the curing inspector.

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- 6.2.3 Elapsed Time - Same as above
- 6.2.4 Method of Curing - The placing inspector should describe the method of curing, for example, continuous water spray, ponding of water, etc.
- 6.2.5 Remarks - Any statements that are pertinent to the curing procedure should be denoted here. For example, if the curing is interrupted, this should be recorded. The date of form removal should be recorded.
- 6.2.6 The table on the form shall be completed by recording the temperature of the concrete. A brief description of the location where the temperatures were observed should be recorded in space provided.
- 6.3 The Quality Control Civil Inspector shall ensure that control is maintained on the consistency of the delivered concrete. This control shall be by means of sampling and testing. The test results shall be recorded on Form No. QCIP-7-3, Concrete Test Record. The Placement No. and date should be entered in the upper right-hand corner.
 - 6.3.1 Ticket Number - The inspector should record ticket number for the batch of concrete being sampled.
 - 6.3.2 No. of Yards - The number of yards in the batch being sampled should be recorded. This information is on the batch ticket.
 - 6.3.3 Time Batched - The time that the concrete being sampled was batched should be entered here. This information is on the batch ticket.
 - 6.3.4 Drum Rev. @ Mix Speed - Prior to discharging of concrete from truck, the number of drum revolutions at mixing speed should be recorded. This number should be a minimum of 50 and a maximum of 100.
 - 6.3.5 Total Drum Rev. - At the start of discharging of concrete from truck, the number of total revolutions of the drum should be recorded. This number should not exceed 300.
 - 6.3.6 Water Added - When the amount of water in a batch of concrete is below the allowable w/c ratio, additional water may be added to the load of concrete. The inspector should determine the actual amount of additional water added and record this figure in gallons.
 - 6.3.7 Slump - The first batch of concrete produced each day and every 50 cu. yds. placed thereafter shall be tested for slump in accordance with ASTM-C-143. The inspector should record the test result in inches.

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- 6.3.8 Air Content - The first batch of concrete produced each day and every 50 cu. yds. placed thereafter shall be tested for air content in accordance with ASTM-C-231. The result of the test should be recorded.
- 6.3.9 Unit Weight - The unit weight of the first batch of concrete produced each day and every 50 cu. yds. placed thereafter shall be determined in accordance with ASTM-C-138. This result shall be recorded.
- 6.3.10 Concrete Temperature - The temperature of the first batch of concrete produced each day and every 50 cu. yds. placed thereafter shall be determined and recorded.
- 6.3.11 Cylinder Set No. - A set of compression cylinders (4 cylinders), shall be fabricated from the first batch of concrete produced each day and every 150 cu. yds. placed thereafter in accordance with ASTM-C-31. The sets shall be numbered, and this number shall be recorded.
- 6.3.12 Time Completed Discharging - The time that the truck completed discharging its load should be entered here.
- 6.3.13 Rejected - Yes or No - The inspector should indicate whether the load of concrete was rejected by entering Yes or No.
- 6.3.14 Remarks - This column should be used to record the reason for rejection of concrete and the approximate amount rejected. Other statements which are pertinent to the test record should be entered here.
- 6.3.15 Particular attention should be given to the notes at the bottom of the form. The inspector should record the ID's of the testing equipment used.

7.0 ATTACHMENTS

- 7.1 Concrete Placement Inspection, Form No. QCIP-7-1
7.2 Concrete Curing Record, Form No. QCIP-7-2
7.3 Concrete Test Record, Form No. QCIP-7-3

Placement No. _____

Date _____

WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION UNIT NO. 3
CONCRETE PLACEMENT INSPECTION

Weather _____ Ambient Temp. _____

Design Mix Designation _____ Location Description _____

A. Visual Inspection _____

B. Time Started _____

C. Method of Placement _____

D. Time Completed _____

E. Method of Finish for Unformed Surfaces _____

F. Protection of Fresh Concrete _____

G. Time Curing Started _____

H. Method of Curing _____

I. Remarks _____

Inspector _____

Placement No. _____

WATERFORD STEAM ELECTRIC STATION
1980 - 1165 MW INSTALLATION UNIT NO. 3
CONCRETE CURING RECORD

Location Description _____

A. Time of Start _____ Date _____ Hour _____ B. Time of Finish _____ Date _____ Hour _____

C. Elapsed Time _____ Days _____ Hours _____

D. Method of Curing _____

E. Remarks _____

| | DATE | SHIFT | TIME | TEMP #1 | TEMP #2 | TEMP #3 | INSPECTOR |
|---|------|-------|------|---------|---------|---------|-----------|
| 1 | A | | | | | | |
| | S | | | | | | |
| 2 | S | | | | | | |
| | G | | | | | | |
| 3 | A | | | | | | |
| | S | | | | | | |
| | G | | | | | | |
| 4 | A | | | | | | |
| | S | | | | | | |
| | G | | | | | | |
| 5 | A | | | | | | |
| | S | | | | | | |
| | G | | | | | | |
| 6 | H | | | | | | |
| | S | | | | | | |
| | G | | | | | | |
| 7 | D | | | | | | |
| | S | | | | | | |
| | G | | | | | | |

Location of: Temp. #1 _____

Temp. #2 _____

Temp. #3 _____

Date _____

Waterford Steam Electric Station
1980 - 1165 MW Installation - Unit No. 3
Concrete Inst. Record

[illegible]

- (1) Drum rev. @ mix speed shall be a min. 50 and a max. 100.
- (2) Total drum rev. shall not exceed 300.
- (3) Record ID of air meter used _____.
- (4) Record ID of unit weight bucket and scale used _____ and _____.
- (5) Record ID of thermometer used _____.
- (6) Place an asterisk after cylinder set number if concrete was produced from back-up plant.

Form No. QCIP-7-3 (12-18-75)

Inspector _____