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JOHNSON,G.P. Army,Dept.of, Corps of Engineers
RECIP.NAME RECIPIENT AFFILIATION
NRC - No Detailed Affiliation Given

SUBJECT: Forwards memp for record re stone shore revetment.Revetments considered structurally sound & stable.W/photos.

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DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NCBED-DC Re: R.E. GINNA Nuclear Generating Plant 2 November 1981

Project Officer
United States Nuclear
Regulatory Commission
Washington, DC 20555



Dear Sir:

Enclosed is a Memorandum for Record (MFR) concerning the stone shore revetment at the R.E. GINNA Nuclear Generating Plant, town of Ontario, NY. The MFR was prepared by Buffalo District, Corps of Engineers in response to Coastal Engineering Research Center Interagency Agreement No. NRC-03-81-110 Proposed Work Directive 1.

The MFR expresses our preliminary opinions and findings and will be followed by a more detailed letter report in accordance with the Statement of Work for CERC-GINNA Nuclear Power Plant - Document No. 50-244. If you have any questions concerning the content of the MFR, please contact either Messrs. Richard Gorecki (FTS 473-2230) or Jonathan Kolber (FTS 473-2169) of my Engineering staff.

Sincerely,

1 Incl
as stated

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

CF:
Mr. N. Parker
U.S. Army Coastal Engineer
Research Center
Kingman Building
Fort Belvoir, VA 22060

NRC Contracting Officer, DC
US Nuclear Regulatory Commission
Washington, DC 20555

J.P. Knight, DE
US Nuclear Regulatory Commission
Washington, DC 20555

Director, Division of Engineering
ATTN: C. Poslusny
US Nuclear Regulatory Commission
Washington, DC 20555

Mr. B. L. Grenier
US Nuclear Regulatory Commission
Washington, DC 20555

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NCBED-DC . 2 November 1981

MEMORANDUM FOR RECORD

SUBJECT: Trip Report Concerning Stone Revetment at R.E. GINNA Nuclear Generating Plant

1. In response to several FONECONS between Mr. Charles Johnson of North Central Division, Corps of Engineers, and Mr. Richard Gorecki of Buffalo District, Corps of Engineers, the District Corps office was requested to make a site inspection of a stone shore revetment at the R.E. GINNA Nuclear Generating Plant. The purpose of the site inspection was to make visual observations of the revetment in order to provide a technical opinion of the adequacy of the stone shore revetment which protects the main building complex from wave attack by Lake Ontario. The R.E. GINNA Nuclear Generating Plant is located in the town of Ontario, NY on the south shore of Lake Ontario, approximately 20 miles east of the city of Rochester, NY. The licensee of the R.E. GINNA Nuclear Generating Plant is the Rochester Gas and Electric Corporation.

2. The stone revetment was constructed in two reaches; a 420-foot long west reach and a 400-foot long east reach. The east and west stone revetment reaches are separated by the generating plant's discharge canal (see Incl A and B). The revetment was initially constructed with two layers of 5-ton minimum armor stone laid up on a 1-1/2 sideslope to a minimum elevation of 257.0 (msl). Due to high lake levels experienced on Lake Ontario during the early 1970's, the crest elevation of the revetment was raised to a minimum of 261.0 (msl) by placement of a cap stone along the top of the revetment (see Incl C and D for typical cross sections of the revetment).

3. The site inspection request was in response to a Nuclear Regulatory Commission (NRC) site visit which has resulted in questions related to the adequacy of the existing stone revetment along the lake shore. The NRC site visit indicated that portions of the revetment on the west side of the discharge canal appeared to have been degraded in terms of the number and sizes of stones at several locations. Therefore, the Corps of Engineers was requested to provide a technical opinion of the adequacy of the existing revetment and to suggest ways that the revetment may be repaired if not found adequate.

4. On 21 October 1981, Mr. Richard Gorecki of the Buffalo District Coastal Engineering Section and Mr. Jon Kolber of the Buffalo District Geotechnical Section met Mr. Gary Goetz of Rochester Gas and Electric Corporation at the R.E. GINNA plant site. Mr. Goetz, the project engineer for the revetment construction project, guided the Corps representatives on an inspection of both the east and west reaches of the stone revetment.

Incl. 1

5. The inspection team walked the length of the west revetment reach and back again without noting any significant displacement of stones in the sideslope of the structure nor any unusual depressions in the structure sideslope or crest. The fence which is adjacent to the back side of the revetment appeared to be plumb and have an alignment that runs parallel to the revetment thereby indicating that there has been no appreciable movement of the fill behind or under the revetment. The armor stones on the sideslope of the revetment are covered and obscured by stone in the 4- to 9-inch range in several areas. Therefore, it was impossible to positively determine the existence of two layers of armor stones as required by the final design at these locations, particularly at the west end of the revetment where a larger concentration of the estimated 4- to 9-inch stone had been placed. Photographs were taken of the west revetment reach to depict the condition of the wall and are attached as Inclosure E.

6. The inspection team also walked the length of the east revetment reach and back, again without noting any significant displacements of stones in the sideslope of the structure nor any depressions in the structure sideslope or crest. There were no apparent depressions or slippages evident in the backslope of the compacted earth dike, thereby indicating that there has been no appreciable movement of the fill behind or under the revetment. However, a large void, large enough for a person to crawl into, was observed roughly 100 feet east of the west end of the east revetment reach. This void extends for about 25 to 30 feet directly under the capstones which bridge the void with little rock to rock contact over the void. The two layers of 5-ton minimum armor stones on the sideslope of the east revetment are also covered and obscured by stone in the 4- to 9-inch range in a few areas. The main concentration of the 4- to 9-inch stone on the east revetment was placed in the area adjacent to the discharge canal. It was again impossible to determine the existence of two layers of armor stones in these areas where the 4- to 9-inch stones exist. Photographs were taken of the east revetment reach to depict the condition of the wall and are attached as Inclosure F.

7. The east and west ends of the revetment reaches terminate and tie into the natural high bluff away from the main (reactor) building complex. Although erosion had occurred in these bluff areas, probably during the high lake levels of the early 1970's, we observed no evidence of current active bank erosion since the bluff faces are covered with vegetative growth probably several years old. There is the possibility that the revetment ends can be flanked by erosion during high lake levels or during an extreme infrequent storm, thereby causing damage to the revetment. Since the main building complex is far enough away from the ends of the revetment, there would be no immediate danger to the facility even if the revetment is flanked and damaged.

8. Based on our visual observations, we see no evidence where the existing revetment is in any immediate or foreseeable future danger of failing. It is our opinion that the revetments are structurally sound and stable,

and, except for possibly the area in the east revetment reach where the large void exists, there is no evidence of any structure stability problem. A determination could not be made at the time of the inspection as to whether two layers of armor stones exist in the areas where the smaller stones had been placed. According to Mr. Gary Goetz, this small stone had been placed to form a roadway in the lee of the structure during the early 1970's for equipment used to place the cap stone. Upon completion of the cap stone placement, the roadway stone was dumped over the face of the revetment to fill the voids between armor stones, thereby making a more aesthetically looking revetment.

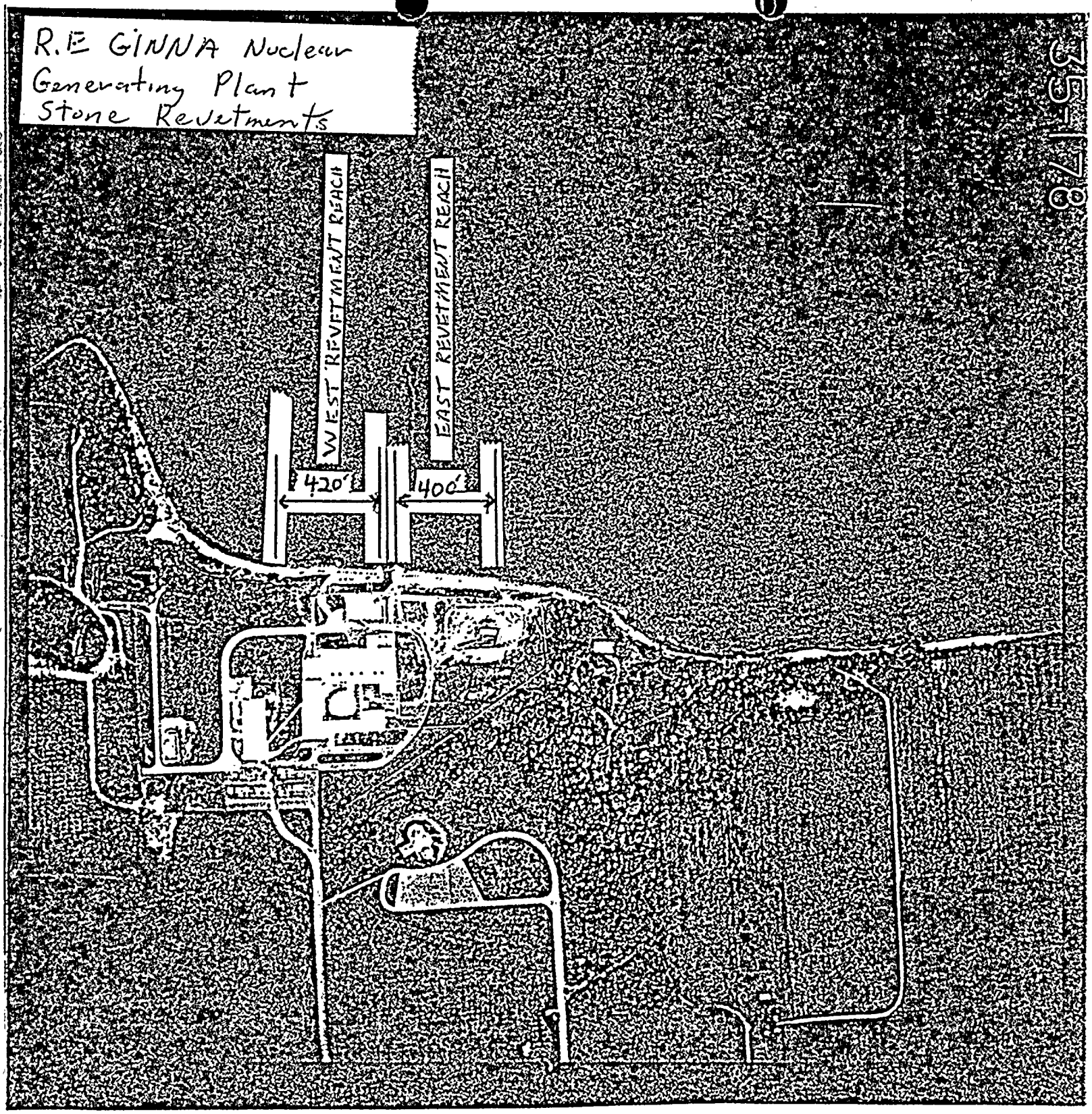
9. These preliminary findings have been already discussed between Mr. Gary Staley of NRC and Mr. Richard Gorecki of Buffalo District, Corps of Engineers. In order to verify that the revetment is of adequate design in the areas where the small stone had been placed, it will be necessary to have the licensee remove the small stone. After the small stones are removed, another site visit will be required to visually inspect the revetment and insure that the armor stones are in place. This second site visit has been tentatively set by Mr. Gary Staley for 13 November 1981.

10. The area in the vicinity of the large void in the east revetment reach will be reexamined during the 13 November 1981 inspection. Our assessment of structural adequacy and any recommendations will be presented in the future letter report.

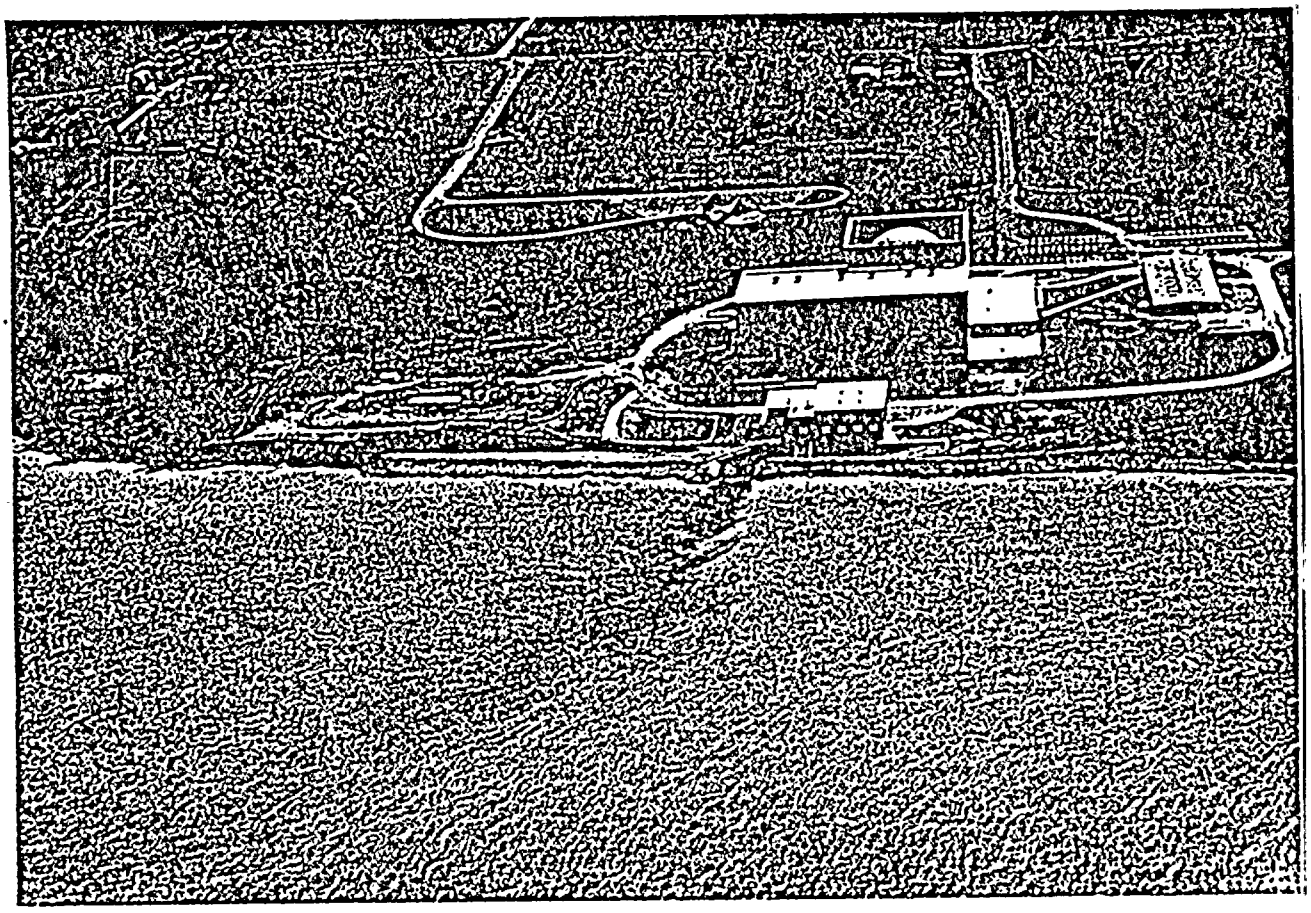
6 Incl
as

RICHARD J. GORECKI
Buffalo District,
Corps of Engineers
Coastal Engineering Section

JONATHAN E. KOLBER, P.E.
Buffalo District,
Corps of Engineers
Geotechnical Section

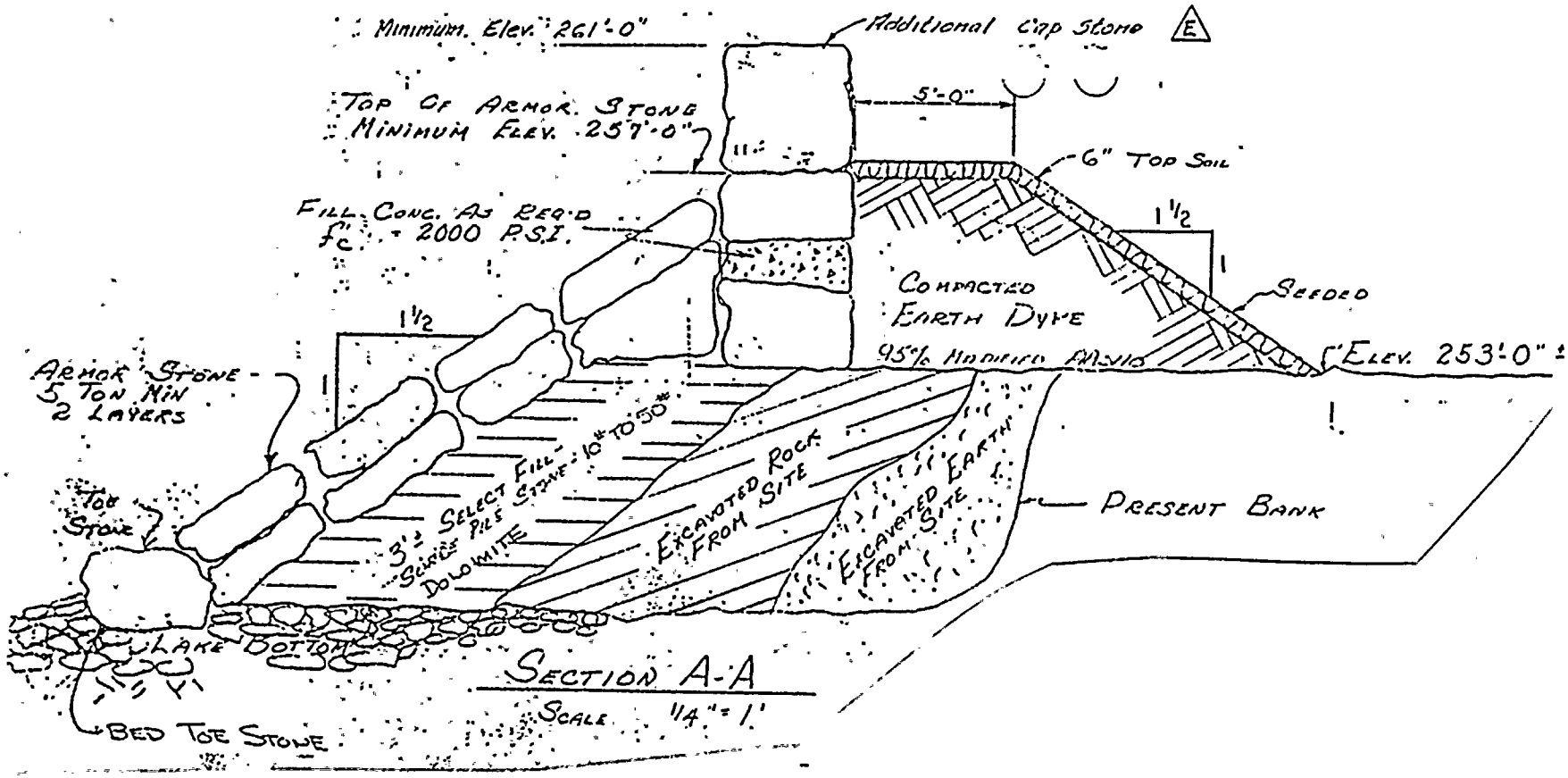

R.E GINNA Nuclear
Generating Plant
Stone Revetments
WEST REVETMENT REACH
EAST REVETMENT REACH
420'
400'

Inclosure A



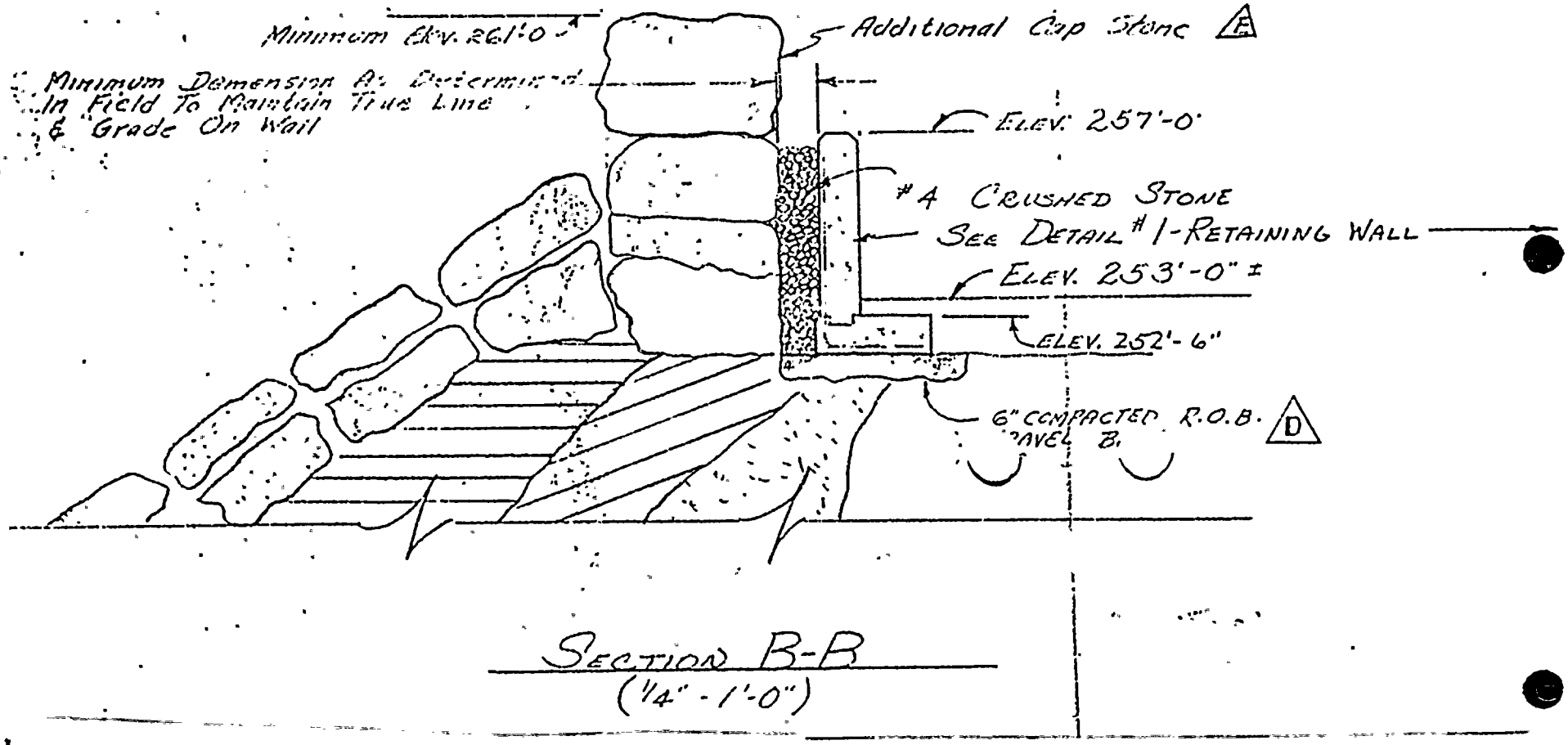
R.E. GINNA Nuclear Generating Plant

Inclosure B




TYPICAL SECTION – EAST REVETMENT REACH

Inclosure C




TYPICAL SECTION — WEST REVETMENT REACH

Inclosure D

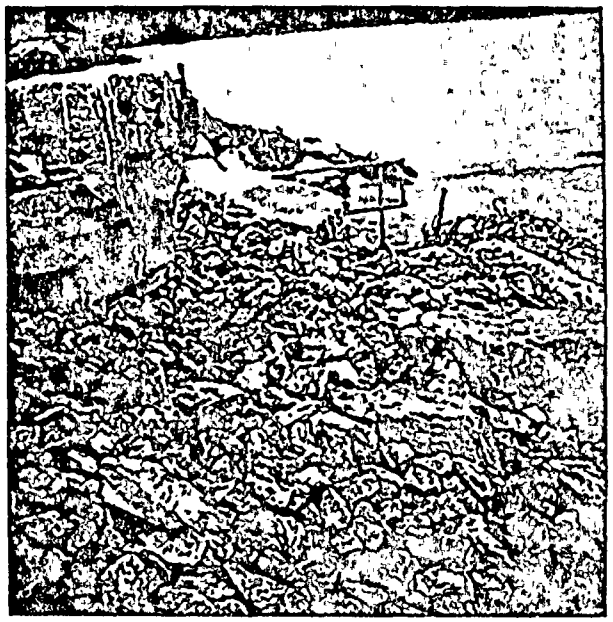
WEST END OF WEST REVETMENT - LOOKING WEST. NOTE SMALL STONE FILL OBSCURING TOP ARMOR STONES.

NEAR CENTER OF WEST REVETMENT - LOOKING WEST. NOTE LAID-UP REVETMENT ON RIGHT AND CAP STONES ON LEFT.

WEST REVETMENT NEAR EAST END - LOOKING EAST. NOTE SMALL STONE FILL OBSCURING TOP ARMOR STONES. SCREEN HOUSE IS AT RIGHT.

INCLOSURE E

WEST REVETMENT NEAR EAST END. LOOKING EAST. NOTE LAID UP REVETMENT



EAST REVETMENT @ WEST END. NOTE SMALL STONE FILL OBSCURING ARMOR STONES. CAP STONE @ LEFT. DISCHARGE CANAL VISIBLE IN REAR. LOOKING WEST.

EAST REVETMENT APPROX. 100 L.F. EAST OF WEST END. NOTE LARGE VOID UNDER CAP STONE (THIS VOID EXTENDS A TOTAL LENGTH OF ABOUT 25 L.F. TO RIGHT & LEFT OF PHOTO).

EAST REVETMENT NEAR EAST END - LOOKING EAST. NOTE SMALL STONE FILL OBSCURING TOP ARMOR STONES, LAID UP REVETMENT @ LEFT, CAP STONES @ RT.

INCLOSURE F

EAST REVETMENT - LOOKING EAST, NEAR EAST END NOTE LAID-UP REVETM-

WEST END OF WEST REVETMENT - LOOKING WEST. NOTE SMALL STONE FILL OBSCURING TOP ARMOR STONES.

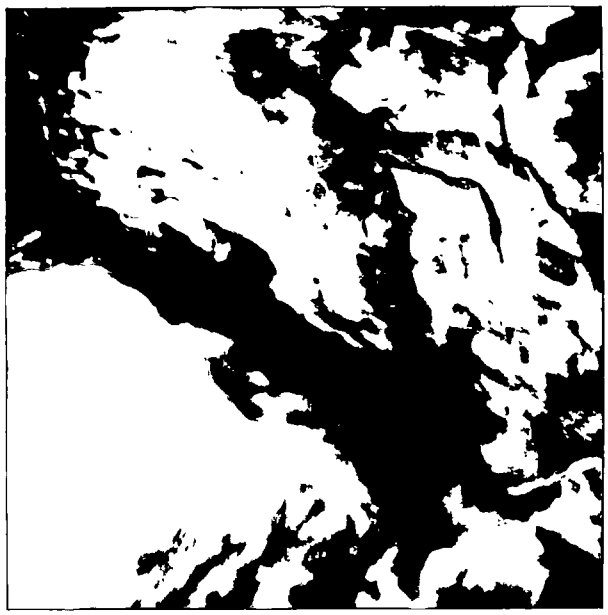
NEAR CENTER OF WEST REVETMENT - LOOKING WEST. NOTE LAID-UP REVETMENT ON RIGHT AND CAP STONES ON LEFT.

WEST REVETMENT NEAR EAST END - LOOKING EAST. NOTE SMALL STONE FILL OBSCURING TOP ARMOR STONES. SCREEN HOUSE IS AT RIGHT.

INCLOSURE E

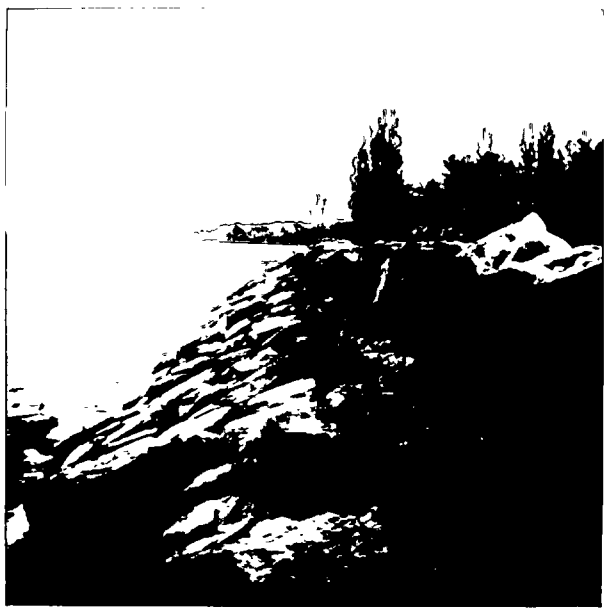
WEST REVETMENT NEAR EAST END. LOOKING EAST. NOTE LAID UP REVETMENT.

EAST REVETMENT @ WEST END. NOTE SMALL STONE FILL OBSCURING ARMOR STONES. CAP STONE @ LEFT. DISCHARGE CANAL VISIBLE IN REAR. LOOKING WEST.



EAST REVETMENT APPROX. 100 L.F. EAST OF WEST END. NOTE LARGE VOID UNDER CAP STONE (THIS VOID EXTENDS A TOTAL LENGTH OF ABOUT 25 L.F. TO RIGHT & LEFT OF PHOTO).

EAST REVETMENT NEAR EAST END - LOOKING EAST. NOTE SMALL STONE FILL OBSCURING TOP ARMOR STONES, LAID UP REVETMENT @ LEFT, CAP STONES @ RT.



INCLOSURE F

EAST REVETMENT - LOOKING EAST, NEAR EAST END. NOTE LAID - UP REVETMENT, ROW OF CAP STONES.