

SUPPLEMENTAL AGREEMENT
BETWEEN
CORNELL UNIVERSITY
AND
THE U. S. NUCLEAR REGULATORY COMMISSION

THIS SUPPLEMENTAL AGREEMENT, effective the 1st day of January, 1981, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), as represented by the UNITED STATES NUCLEAR REGULATORY COMMISSION (hereinafter referred to as the "Commission"), and CORNELL UNIVERSITY

(hereinafter referred to as the "Contractor"),

WITNESSETH THAT:


WHEREAS, the parties desire to modify Contract No. NRC-04-76-234 as hereinafter provided, and this supplemental agreement is authorized by law, including the Energy Reorganization Act of 1974, as amended, and the Atomic Energy Act of 1954, as amended.

NOW, THEREFORE, said contract is hereby modified as follows:

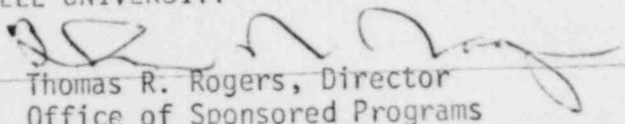
1. Appendix A, attached to this supplemental agreement and made a part hereof, provides for the research to be performed by the Contractor during the contract period specified therein.
2. In Article II - The Period of Performance, the date "December 31, 1981" is substituted for the date "December 31, 1980".
3. In Article III - Consideration, the sum "\$ 364,001.00" is substituted for the sum "\$314,001.00".

IN WITNESS WHEREOF, the parties have executed this document.

UNITED STATES OF AMERICA

BY: 
Kellogg V. Morton, Chief
Research Contracts Branch
Division of Contracts
U. S. Nuclear Regulatory Commission

CORNELL UNIVERSITY

BY: 
Thomas R. Rogers, Director
Office of Sponsored Programs
(title)

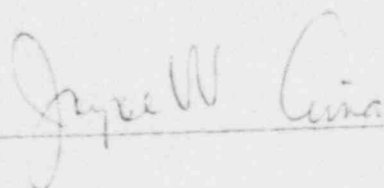

I, Joyce W. Cima, certify that I am the
(attester)

Ass't. Secretary of the Corporation of the Contractor named under this
(title)

document; that Thomas R. Rogers who signed this
(signatory)

document on behalf of said Contractor was then Director, Office of Sponsored Programs
of said Contractor; that this document was duly signed for and on behalf of
said Contractor by authority of its governing body and is within the scope
of its legal powers.

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of said
Contractor.

(SEAL)

CONTRACTOR: CORNELL UNIVERSITY

APPENDIX A

For the Contract period January 1, 1981 through December 31, 1981

Article A-I RESEARCH TO BE PERFORMED BY CONTRACTOR

- (a) The unclassified scope of work under this contract entitled, "Seismic Shear Transfer in Secondary Containment Vessels" is as follows:

This continuation proposal is the terminal phase of the Cornell research program on membrane shear and punching shear in reinforced concrete containment structures. A number of rather specific tasks will be completed in this terminal phase, including:

- a. Completion of Report #3 on membrane shear stiffness and strength in the presence of uniaxial tension (S. Hilmy M.S. thesis). This report will contain the results of experiments on 12 specimens, comparison of these results with earlier NRC-sponsored work on similar specimens loaded with biaxial tension and shear, comparison with even earlier Cornell NSF work on uniaxially reinforced specimens, and analytical results.
- b. Completion of Report #4 on punching shear strength and stiffness in the presence of biaxial tension (W. C. Jau M.S. thesis). This study will be primarily analytical, with limited additional test results; it will also contain the punching shear results of J. Abrams in an Appendix to the report. Verification of earlier results will be provided in this phase of the research.
- c. Completion of Report #5, which will be a summary report on the total NRC-sponsored program conducted at Cornell. Preliminary design recommendations will be formulated and presented in this report.
- d. Preparation of a series of papers for submission to technical journals, including two papers for the SMIRT V conference that are scheduled for later publication in a special edition of Nuclear Engineering and Design.
- e. Development of further interaction of the principal investigators with the ACI-ASME Committee 359 on Nuclear Containment Structures. Tasks include refinement of proposed changes in design rules for containment structures subjected to loadings producing membrane and punching shear stress states, to be discussed at a 359 meeting in Quebec in September 1981.

(b) The Principal Investigator expects to devote the following approximate amount(s) of time to the contract work:

R. N. White: 100% of his time for 2 to 3 months of the academic year and
100% of his time for 1 month of the summer.

ARTICLE A-II WAYS AND MEANS OF PERFORMANCE

(a) Items for which support will be provided as indicated in A-III, below

- | | |
|--|--------------|
| (1) Salaries and Wages | \$ 25,600.00 |
| (2) Equipment to be purchased or fabricated by the Contractor | \$ -0- |
| (3) Travel | |
| (i) Domestic | \$ 620.00 |
| (ii) Foreign | \$ -0- |
| (4) Other direct costs including fringe benefits. | |
| (5) Indirect costs based on a predetermined rate of 72 percent applicable to salaries and wages. | |

(b) Items, if any, significant to the performance of this contract, but excluded from computation of Support Cost and from consideration in proportioning costs:

None

(c) Time or effort of Principal Investigator(s) including indirect costs and fringe benefits contributed by Contractor but excluded from computation of Support Cost and from consideration in proportioning costs:

None

Article A-III ESTIMATED NRC SUPPORT COST

The total estimated cost of items under A-II(a) above for the contract period stated in this Appendix A is \$50,000.00 ; the Commission will pay 100 percent of the actual costs of these items incurred during the contract period stated in this Appendix A, subject to the provisions of Article III and Article B-XXVIII. The estimated NRC Support Cost for the contract period stated in this Appendix A is \$50,000.00 .

The estimated NRC Support Cost is funded as follows:

- | | |
|---|--------------|
| (a) Estimated unexpended balance from prior period(s) | \$ -0- |
| (b) New funds for the current period | \$ 50,000.00 |
| (c) The new funds being added in A-III(b) constitute the basis for advance payments provided under Article B-X. | |