

1. CONTRACT (Prog. Inst. Ident.) NO. **NRC-04-79-188**

2. EFFECTIVE DATE **JUN 1 1979**

3. REQUISITION/PURCHASE REQUEST/PROJECT NO. **RES-79-188, dtd. 1/12/79**

4. CERTIFIED FOR NATIONAL DEFENSE UNDER DDSA REG. 2 AND/OR DMS REG. 1. RATING: _____

5. ISSUED BY CODE _____

6. ADMINISTERED BY CODE _____
 (If other than block 5)

7. DELIVERY FOR DESTINATION: NATION OTHER (See below)

U. S. Nuclear Regulatory Commission
 Division of Contracts
 Washington, D.C. 20555

8. CONTRACTOR NAME AND ADDRESS CODE _____ FACILITY CODE _____

9. DISCOUNT FOR PROMPT PAYMENT: **Net**

10. SUBMIT INVOICES (4 copies unless otherwise specified) TO ADDRESS SHOWN IN BLOCK 12: **12**

(Street, city, county, State, and ZIP code)

Chiapetta, Welch & Associates, Ltd.
9748 Roberts Road
Palos Hills, IL 60465

11. SHIP TO/MARK FOR CODE _____

12. PAYMENT WILL BE MADE BY CODE _____

U. S. Nuclear Regulatory Commission
 Office of Nuclear Regulatory Research
 ATTN: James Costello
 Washington, D.C. 20555

U. S. Nuclear Regulatory Commission
 Office of the Controller
 Washington, D.C. 20555

13. THIS PROCUREMENT WAS ADVERTISED, NEGOTIATED, PURSUANT TO: 10 U.S.C. 2304 (a)(1) 41 U.S.C. 252 (c)(1)(D)

14. ACCOUNTING AND APPROPRIATION DATA

B&R No. 60-19-10-06 Fin. No. B6609 \$41,493.00

15. ITEM NO.	16. SUPPLIES/SERVICES	17. QUANTITY	18. UNIT	19. UNIT PRICE	20. AMOUNT
	The Chiapetta, Welch & Associates, Ltd. proposal, "CWA Proposal 77-009," entitled: "AUTOMOBILE IMPACT FORCES ON CONCRETE WALL PANELS," dated September 1978 is incorporated herein by reference.				

21. Estimated TOTAL AMOUNT OF CONTRACT \$ **41,493.00**

CONTRACTING OFFICER WILL COMPLETE BLOCK 22 OR 26 AS APPLICABLE

22. CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 4 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

26. AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

23. NAME OF CONTRACTOR BY **Richard L. Chiapetta**
 (Signature of person authorized to sign)

27. UNITED STATES OF AMERICA BY **Kellogg V. Morton**
 (Signature of Contracting Officer)

24. NAME AND TITLE OF SIGNER (Type or print) **Richard L. Chiapetta**
Principal

25. DATE SIGNED **5/29/79**

28. NAME OF CONTRACTING OFFICER (Type or print) **Kellogg V. Morton**

29. DATE SIGNED **6-4-79**

CONTRACT PROVISIONS

CONTRACT NO. NRC-04-79-188

This contract consists of:

1. Cover Page
2. Contents of Contract
3. Special Provisions
 - ARTICLE I - STATEMENT OF WORK
 - ARTICLE II - PERIOD OF PERFORMANCE
 - ARTICLE III - CONSIDERATION
 - ARTICLE IV - ALLOWABLE COST/COMPENSATION
 - ARTICLE V - PRIVATE USE AND PROTECTION OF UNCLASSIFIED GOVERNMENT INFORMATION
 - ARTICLE VI - WORK FOR OTHERS
 - ARTICLE VII - AUTHORIZED REPRESENTATIVE
 - ARTICLE VIII - ORDER OF PRECEDENCE
 - ARTICLE IX - GENERAL PROVISIONS/ALTERATIONS
4. General Provisions (2/15/78)

ARTICLE I - STATEMENT OF WORK

The Contractor shall provide the necessary personnel, facilities, and materials to accomplish the tasks set forth below.

Scope

Task I - Conduct preliminary investigation involving the collection of data, review of pertinent literature, and definition of impact conditions and structural components of interest.

- A. Consult with the Office of Nuclear Regulatory Research regarding design practice and rationale for missile impact conditions, definition of structural components and parameter ranges of interest, and definition of the range of credible vehicle impact conditions.
- B. Review recent literature and design experience regarding soft missile impacts on nuclear power plants.
- C. Review recent literature regarding high speed vehicle impact and identification of recent and current test data in this area. This activity will include consultation with the National Highway Traffic Safety Administration (NHTSA) regarding recent data, analyses and test programs.

Task II - Define vehicle impact forces on structural components.

- A. Collect and assess vehicle impact data from both high speed dynamic tests and quasi-static crush testing.
- B. Develop data in a common format and summarize in terms of vehicle size and type, impact velocity and impact orientation.
- C. Select one or more available lumped parameter vehicle impact analyses and evaluate correlations between dynamic test results and quasi-static crush data. Selection will be determined in consultation with the NRC technical contract monitor.
- D. Examine results for design priorities and relative severity in terms of vehicle size, type and impact conditions.
- E. Develop preliminary impact force-time definitions.

Task III - Assess structural response for representative structural components subjected to the impact loadings developed in Task II.

- A. Define structural components of interest and define ranges of structural parameters (spans, thickness, reinforcement, etc.).

- B. Assess the significance of vehicle-structure dynamic interaction and the extent of the approximations associated with the use of uncoupled force-time histories to represent vehicle impact based on a simple, lumped parameter model of vehicle-structure interaction.
- C. Determine sensitivity of structural response to certain characteristics of force signature.
- D. Construct envelope of force signatures.

Task IV - Prepare a final report at the end of one year which will include the results of Tasks I-III and outline areas which need further investigation. A detailed outline of the approach and content of the final report will be determined in consultation between the principal investigators and the NRC cognizant technical contract monitor. All data obtained under this contract will be made available to the NRC, its contractors, and the public; this can usually be accomplished by providing the data in an appendix to the final report.

Report Requirements

To assure that formal NRC contractor documents will carry the registered NRC designation "NUREG" as the prime identification, the technical reports listed below are to be documented, produced and disseminated in accordance with NRC Manual Chapter 3202 which is incorporated herein by reference.

Specific Reports

- A. A quarterly progress report shall be submitted within fifteen (15) days after the quarter being reported on in 15 copies to the COAR and one copy to the CO. This report shall include but not be limited to the following:
 - 1. description of the work accomplished during the reporting period;
 - 2. funds committed during the report period;
 - 3. plans for the next period;
 - 4. preliminary of interim results, conclusions, trends or other items felt to be of interest to the Nuclear Regulatory Commission; and
 - 5. problems or delays that may have been experienced or can be foreseen and specific recommendations for action to facilitate the execution of the contract work.

NOTE: The final report will eliminate the need for the fourth quarterly report.

- B. The Contractor shall submit one reproducible copy of a final report to the COAR. A copy shall also be furnished to the CO. This report shall as a minimum contain a recapitulation of the contract effort and recommendations for future consideration.

ARTICLE II - PERIOD OF PERFORMANCE

The performance of work described in ARTICLE I hereof shall commence as of the effective date of this contract, or as agreed upon, and shall continue to completion thereof, estimated to occur within twelve (12) months from the effective date of this contract.

ARTICLE III - CONSIDERATION

A. Estimated Cost, Fixed Fee and Obligation

1. It is estimated that the total cost to the Government for full performance of this contract will be \$41,493.00, of which the sum of \$37,721.00 represents the estimated reimbursable costs, and of which \$3,772.00 represents the fixed fee.
2. There shall be no adjustment in the amount of the Contractor's fixed fee by reason of differences between any estimate of cost for performance of the work under this contract and the actual cost performance of that work.
3. The amount presently obligated by the Government with respect to this contract is \$41,493.00.

ARTICLE IV - ALLOWABLE COST/COMPENSATION

Allowable cost and compensation for the contractor's services under this contract shall be determined in accordance with General Provisions Clause No. 5, entitled, "Allowable Cost, Fee, and Payment," in Appendix A hereto and shall constitute full and complete compensation for the performance of the work under this contract.

ARTICLE V - PRIVATE USE AND PROTECTION OF UNCLASSIFIED GOVERNMENT INFORMATION

- a. Except as specifically authorized by this contract, or as otherwise approved by the Contracting Officer, records or other information, documents and material furnished by the Commission to the Contractor in the performance of this contract shall be used only in connection with the work performed under this contract. The Contractor shall, upon completion or termination of this contract, transmit to the Commission all records or other information, documents and materials, and any copies thereof, furnished by the Commission to the Contractor in the performance of this contract.
- b. The Contractor shall be responsible for safeguarding from unauthorized disclosure any information or other documents and materials exempt from public disclosure by the Commission's regulations and made available to the Contractor in connection with the performance of work under this contract. The Contractor agrees to conform to all regulations, requirements, and directions of the Commission with respect to such material.
- c. The Contractor's duties under this clause shall not be construed to limit or affect in any way the Contractor's obligation to conform to all security regulations and requirements of the Commission pertaining to classified information and material.

ARTICLE VII - CONTRACTING OFFICER'S AUTHORIZED REPRESENTATIVE (COAR) (PROJECT OFFICER)

The following authorized representative will represent the Government for the purpose of this contract:

James Costello, Office of Nuclear Regulatory Research

The authorized representative is responsible for: (1) monitoring the Contractor's technical progress, including the surveillance and assessment of performance and recommending to the Contracting Officer changes in requirements; (2) interpreting the statement of work; (3) performing technical evaluation as required; (4) performing technical inspections and acceptances required by this contract; and (5) assisting the Contractor in the resolution of technical problems encountered during performance. Within the purview of this authority, the representative is authorized to approve payment vouchers for supplies/services required under the contract. The Contracting Officer is responsible for directing or negotiating any changes in terms, conditions, or amount cited in the contract.

For guidance from the authorized representative to the Contractor to be valid, it must: (1) be consistent with the description of work set forth in this contract; (2) not constitute new assignment of work or change to the expressed terms, conditions, or specifications incorporated in to this contract; (3) not constitute a basis for an extension to the period of performance or contract delivery schedule; (4) not constitute a basis for any increase in the contract price.

If the Contractor receives guidance from the COAR which the Contractor feels is not valid under the criteria cited above, the Contractor shall immediately notify the COAR. If the COAR and the Contractor are not able to resolve the question within 5 days, the contractor shall notify the Contracting Officer.

ARTICLE VIII - ORDER OF PRECEDENCE

In the event of any inconsistency between the provision of this contract, the inconsistencies shall be resolved by giving precedence in the following order: (a) the Schedule; (b) FPR Changes and NRC additions to General Provisions; and (c) the General Provisions.

ARTICLE IX - GENERAL PROVISIONS/ALTERATIONS

- A. This contract is subject to the provisions of Appendix A, General Provisions Cost-Type Research and Development Contract with Concerns Other than Educational Institutions, dated 2/15/78 which is attached hereto and by this reference made a part hereof.
- B. In addition to those general provisions set forth in Appendix A hereto which are by their terms self-deleting, the following deletions and/or modifications to Appendix A are as follows:

1. Clause 23 entitled, "Nuclear Hazards Indemnity - Product Liability" is deleted in its entirety.
2. Clause 53 entitled, "Private Use of Information and Data" is deleted in its entirety.