

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code
Cost Plus Fixed Fee

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2. Amendment/Modification No. P00003	3. Effective Date 2014MAR19	4. Requisition/Purchase Req No. SEE SCHEDULE	5. Project No. (If applicable)
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6. Issued By U.S. ARMY CONTRACTING COMMAND RACHEL HEANEY WARREN, MICHIGAN 48397-5000 HTTP://CONTRACTING.TACOM.ARMY.MIL EMAIL: RACHEL.HEANEY@US.ARMY.MIL	Code W56HZV	7. Administered By (If other than Item 6) DCMA CHICAGO 1523 WEST CENTRAL ROAD BLDG 203 ARLINGTON HEIGHTS IL 60005-2451	Code S1403A
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8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code) COMPUTATIONAL DYNAMICS INC 1809 WISCONSIN AVE BERWYN, IL 60402-1602	<input type="checkbox"/>	9A. Amendment Of Solicitation No.
	<input type="checkbox"/>	9B. Dated (See Item 11)
	<input checked="" type="checkbox"/>	10A. Modification Of Contract/Order No. W56HZV-14-C-0004
	<input type="checkbox"/>	10B. Dated (See Item 13) 2014JAN17
Code 6LPQ3	Facility Code	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers

is extended, is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendments; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting And Appropriation Data (If required)

ACRN: AB NET INCREASE: \$49,113.00

**13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS
It Modifies The Contract/Order No. As Described In Item 14.**

<input type="checkbox"/>	A. This Change Order is Issued Pursuant To: The Contract/Order No. In Item 10A.	The Changes Set Forth In Item 14 Are Made In
<input type="checkbox"/>	B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).	
<input checked="" type="checkbox"/>	C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:	10 U.S.C. 2304(b)(2)
<input type="checkbox"/>	D. Other (Specify type of modification and authority)	

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the Issuing Office.

14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)	16A. Name And Title Of Contracting Officer (Type or print) LYNN M. BYRNE LYNN.M.BYRNE@US.ARMY.MIL (586)282-6553		
15B. Contractor/Offeror (Signature of person authorized to sign)	15C. Date Signed	16B. United States Of America By _____ /SIGNED/ (Signature of Contracting Officer)	16C. Date Signed 2014MAR19

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SECTION A - SUPPLEMENTAL INFORMATION

Buyer Name: RACHEL HEANEY
Buyer Office Symbol/Telephone Number: CCTA-ASG-C/(586)282-9712
Type of Contract: Cost Plus Fixed Fee
Kind of Contract: Research and Development Contracts
Type of Business: Other Small Business Performing in U.S.
Surveillance Criticality Designator: C
Weapon System: No Identified Army Weapons Systems

*** End of Narrative A0000 ***

Modification P00003

1. This modification P00003 to contract W56HZV-14-C-0004 is a bilateral supplemental agreement.
2. The purpose of this modification is to add scope and funding for a SBIR Phase III project that is derived from efforts made under prior SBIR funding agreements.
3. The parties have negotiated and agree that the cost-plus-fixed fee to perform the Phase III project scope contained at Section C.7 through C.12.2 is \$49,113 (Est. Cost: \$45,900 + Fixed Fee: \$3,213).
4. As a result of this modification, the contract is revised as follows:
 - a. Section B:
 - i. SubCLIN 0006AA is added and funded in the amount of \$49,113 for the Phase III project.
 - ii. Section B.1 through B.1.4.1 is revised throughout to reflect the correct CLIN number 0005 instead of CLIN 0001 for the Phase II effort. This correction is made for clarification as CLIN 0005 and its subCLINs were established by Modification P00002.
 - iii. Section B.1.1.1 is established to identify the Estimated Cost for the Phase III effort.
 - iv. Section B.2.3 is updated to reflect the additional funds allotted by this modification P00003.
 - b. Section C: Sections C.7 through C.12.2 are added for the SBIR Phase III effort.
 - c. Section F: Section F.1.1.1 is added to clarify the period of performance for the SBIR Phase III project.
 - d. Section I: Clause 252.232-7007 is corrected to reflect Contract Line Item 0005 instead of 0001. This correction is made for clarification as CLIN 0005 was established by Modification P00002.
 - e. Section J: CDRL A003, Block 16(b) is revised to include submission dates for the SBIR Phase III project final technical report.
5. The obligated amount of the contract is increased by \$49,113 from \$496,612 to \$545,725.
6. In consideration of this modification P00003, agreed to herein as complete negotiated agreement for the SBIR Phase III project efforts under the contractor's proposal titled "Add-on Project Budget" submitted on 22 February 2014, the contractor hereby releases the Government from any and all liability under this contract for further equitable adjustments attributable to such facts or circumstances giving rise to the proposal.
7. Except as specifically stated above, all other terms and conditions of contract W56HZV-14-C-0004 remain unchanged and in full force and effect.

*** END OF NARRATIVE A0003 ***

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B.1 ESTIMATED COST AND PAYMENT

B.1.1 The ESTIMATED COST for performance of the work required for the Phase II effort* under this contract is stated in Section B under CLIN 0005*, which shall constitute the estimated cost for the purpose of the contract clause entitled LIMITATION OF FUNDS, FAR 52.232-22.

Phase II Effort:

Est. Cost: \$929,169

Fixed Fee: \$ 64,805

Total Amount: \$993,974

B.1.1.1 The ESTIMATED COST for performance of the work required for the Phase III project effort under this contract is stated in Section B under CLIN 0006, which shall constitute the estimated cost for the purpose of the contract clause entitled LIMITATION OF FUNDS, FAR 52.232-22.

Phase III Effort:

Est. Cost: \$45,900

Fixed Fee: \$ 3,213

Total Amount: \$49,113

B.1.2 The contractor will be paid for the fixed fee stated in Section B under CLIN 0005* for the performance of work under the contract and in accordance with the terms of the contract clause entitled FIXED FEE, FAR 52.216-8. The fixed fee together with the reimbursement of cost shall constitute full and complete consideration for the contractor's service in connection with the work required and performed under this contract.

B.1.3 Allowable cost shall be determined, and payment thereof shall be provided, in accordance with the contract clause entitled ALLOWABLE COST AND PAYMENT, FAR 52.216-7.

B.1.4 PAYMENT: The contractor may submit cost vouchers for payment under this contract in accordance with the contract clause entitled ALLOWABLE COST AND PAYMENT, FAR 52.216-7.

B.1.4.1 The fee will be payable at the time of reimbursement of cost at the same rate to such cost as the total fee of this contract bears to the total estimated cost thereof, subject to any withholding pursuant to provisions of this contract.

B.2 FUNDING

B.2.1 The Government shall provide funds under this contract covering the estimated cost and fee hereof on an incremental basis as provided for in the following funding schedule and pursuant to the contract clauses entitled LIMITATION OF FUNDS, FAR 52.232-22 and LIMITATION OF GOVERNMENT'S OBLIGATION, DFARS 252.232-7007.

It is estimated that the incremental amounts are sufficient for the performance of work in each of the cited periods. The Government may, at its discretion, allot such funds on an incremental basis within each fiscal year. The contractor shall plan and execute the work required by this contract as to expend and/or commit funds compatible with the schedule set forth below. Whenever the contractor has reason to believe that the funds allotted to this contract for any fiscal year are either insufficient or excessive for the performance of work required in that fiscal year, the Contracting Officer and the Contracting Officer's Representative shall be notified.

B.2.2 Funding Schedule for Phase II effort*:

<u>Performance Period</u>	<u>Amount</u>
Award through twelve (12) months	\$496,612
After date of contract award	
Twelve (12) months and one (1) day	
after date of contract award	
<u>through Completion</u>	<u>\$497,362</u>
TOTAL	\$993,974

B.2.3 Funds Allotted: The amount of funds currently allotted to this contract is \$545,725*.

Phase II Effort: \$496,612

Phase III Effort: \$ 49,113

Total: \$545,725

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B.3 INDIRECT RATES

B.3.1 General and Administrative Overhead Rate (G&A): Under this contract, the contractor WILL NOT be reimbursed for G&A costs in excess of 70% of total costs. If the actual G&A rate is lower than 70%, the actual rate will be used. If the actual G&A rate is higher than 70%, the contractor will be compensated for G&A costs at a rate of 70%.

B.3.1.1 If the DCAA actual cost audit determines a G&A rate for a fiscal year (during performance of this contract) that is higher than 70%, the higher rate may be used only if the total G&A rate for the entire contract is 70% or lower. For example, if the actual rate for the first contractor fiscal year is lower than 70%, the compensation rate for the second contractor fiscal year may exceed 70% if appropriate, as long as the overall effective rate for the life of the contract does not exceed 70%.

B.3.2 Fringe Rate: Under this contract, the contractor WILL NOT be reimbursed for fringe costs in excess of 25% of direct labor costs. If the actual fringe rate is lower than 25%, the actual rate will be used. If the actual fringe rate is higher than 25%, the contractor will be compensated for fringe costs at a rate of 25%.

B.3.2.1 If the DCAA actual cost audit determines a fringe rate for a fiscal year (during performance of this contract) that is higher than 25%, the higher rate may be used only if the total fringe rate for the entire contract is 25% or lower. For example, if the actual rate for the first contractor fiscal year is lower than 25%, the compensation rate for the second contractor fiscal year may exceed 25% if appropriate, as long as the overall effective rate for the life of the contract does not exceed 25%.

All Changes made by Modification P00003 are noted by an asterisk

*** END OF NARRATIVE B0001 ***

Name of Offeror or Contractor: COMPUTATIONAL DYNAMICS INC

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

STATEMENT OF WORK

C.1 Scope: Integration of computational geometry, finite element, and multibody system algorithms for the development of new computational methodology for high-fidelity vehicle systems modeling and simulation

C.2 Background: Develop the technology and software capability to model and simulate wheeled and tracked vehicles, commercial and military, by integrating computational geometry (CG) methods used in CAD systems, nonlinear large displacement finite elements, and flexible multibody systems (MBS) algorithms with the goal of developing MBS vehicle models with significant details. Such vehicles cannot be efficiently or accurately modeled using existing technology. New large displacement finite element meshes consistent with CAD geometry and suited for integration with computational MBS algorithms will be developed in order to build the foundation for a new computational environment that can be used in the analysis of wheeled and tracked vehicles and their interaction with the terrain. The computational frame work will be of general purpose that accommodates modeling and simulation of any MBS system.

C.2.1 The mission of the agency/command: This research will support TARDECs mission in modeling and simulation of ground vehicles for evaluating mobility and reliability.

General purpose MBS technology currently used by the Army Research Centers for vehicle simulations is only suited for rigid body or small deformation analysis. This twenty-five year old technology cannot capture many details that are important in modern vehicle systems. Such old technology also fails to capture the effect of excessive thermal and impulsive loading conditions that characterize military applications, and therefore, such technology cannot be used effectively in accurate performance evaluation. In order to overcome these serious modeling shortcomings and enhance TARDEC capabilities for vehicle simulation, it is necessary to successfully integrate large deformation finite elements (FE), computational geometry, and MBS algorithms. Such a successful integration will lead to a new generation of computational algorithms that can be effectively and systematically used in developing vehicle models that include significant details that cannot be captured using existing MBS simulation tools.

Despite the large number of FE investigations, the implementation of large deformation FE formulations in MBS algorithms remains one of the main challenges in developing accurate vehicle dynamic models. Existing large deformation vehicle component models range from very simple discrete spring-damper models to detailed inefficient finite element models. The simplified discrete spring-damper models cannot capture significant modes of deformations, effect of distributed inertia, and effect of stress and wear; such models do not allow for straight forward implementation of general constitutive equations such as the Neo-Hookean or Mooney-Rivlin material models that are necessary to model rubber-like materials. On the other hand, existing finite element beam, plate, and shell formulations that employ simplifying assumptions do not capture deformation modes that can be significant in the case of excessive compressive and/or tensile forces.

C.3 TasksC.3.1 Floating Frame of Reference (FFR) Preprocessor Development:

C.3.1.1 The contractor shall develop a comprehensive Floating Frame of Reference (FFR) Preprocessor that will be part of Pre-SIGMASAMS, preprocessor to the new software, and that will allow for developing very detailed flexible body models.

C.3.1.1.2 The FFR Preprocessor library shall include a comprehensive set of finite elements such as triangular, quadrilateral, and tetrahedron elements, beams, plates, shell, and brick elements, planar and spatial elements, plane stress and plane strain elements, that can be effectively used in the analysis of small deformations.

C.3.1.1.2 The FFR Preprocessor shall be designed to allow for dealing with large scale flexible bodies such as vehicle body structure.

C.3.1.1.3 The FFR Preprocessor shall have an efficient eigenvalue solver in order to determine the modal characteristics that are required for the analysis of the small deformation problems.

C.3.1.1.4 The FFR Preprocessor shall be capable of evaluating the inertia shape integrals for lumped and consistent mass that represent the dynamic coupling between the rigid body motion and the elastic deformations of the deformable bodies in the system.

C.3.1.1.5 The FFR Preprocessor shall eliminate the need for another commercial FE code to study the deformations in flexible MBS applications.

C.3.2 Absolute Nodal Coordinate Formulation (ANCF) Preprocessor Development:

C.3.2.1 The contractor shall develop a comprehensive Absolute Nodal Coordinate Formulation (ANCF) preprocessor, which will be part of Pre-SIGMASAMS.

C.3.2.1.1 The ANCF preprocessor shall have a comprehensive library of ANCF finite elements such as triangular, quadrilateral, and tetrahedron elements, beams, plates, shell, and brick elements, planar and spatial elements, plane stress and plane strain elements,

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gradient-deficient and fully-parameterized elements, that allows for modeling large deformation problems.

C.3.2.1.2 The ANCF preprocessor shall perform the Cholesky transformation that leads to an identity inertia matrix, and shall have structure designed to allow for the integration of computer aided design and analysis.

C.3.2.1.3 The ANCF preprocessor shall be designed to allow the user of the ANCF Preprocessor to adjust the degree of continuity at the nodal points as well as choose from a comprehensive library of linear ANCF joints such as spherical, revolute, bracket, and primitive joints.

C.3.2.1.4 The ANCF preprocessor shall define the ANCF meshes which have constant inertia and linear connectivity conditions, thereby allowing for the elimination of the algebraic constraint equations at a preprocessing stage.

C.3.2.1.5 The unique ANCF feature of constant inertia and linear connectivity conditions shall lead to significant reduction in the problem dimensionality, and to significant reduction in the number of non-zero elements of the matrices constructed during the dynamic simulations.

C.3.2.1.6 The ANCF Preprocessor shall be designed to also allow for converting B-spline and NURBS surfaces to ANCF/FE meshes. The relationship between the B-spline and NURBS knot multiplicity and the ANCF connectivity conditions shall be defined for different ANCF elements.

C.3.2.1.7 The ANCF Preprocessor shall show that B-spline and NURBS geometry can be converted to ANCF/FE representation without any geometric distortion.

C.3.3 Graphics and Animation Preprocessor Development:

C.3.3.1 The contractor shall develop animation and graphics preprocessor which will be part of Pre-SIGMASAMS.

C.3.3.1.1 The graphics capability shall be designed to explain:

- a) The computational geometry of the flexible bodies,
- b) The ANCF finite element mesh of the flexible bodies,
- c) Animation of the mode shapes obtained using the FFR Preprocessor, and
- d) Graphics and visualization of the type of elements and continuity conditions obtained using the ANCF Preprocessor.

C.3.4 Main Processor Development:

C.3.4.1 The contractor shall define the structure of the main processor to allow for efficient implementation of differing formulations that employ appropriate coordinates. These different formulations shall be used in the analysis of rigid bodies, flexible bodies modeled using the FFR formulation, and very flexible bodies modeled using ANCF finite elements. Types of coordinates shall be global coordinates, orientation parameters, local deformation coordinates, gradient vectors, and joint coordinates.

C.3.4.2 The structure of the SIGMASAMS code shall allow for efficient implementation of coordinate transformations when it is desired to use the modal coordinates and Cholesky coordinates for the FFR and ANCF flexible bodies, respectively.

C.3.4.3 The structure of the SIGMASAMS code shall allow for a sparse matrix implementation which is necessary for efficient MBS simulations.

C.3.4.4 The FFR Preprocessor and the ANCF Preprocessor shall be interfaced with the Main Processor.

C.3.5 Floating Frame of Reference Main Processor Implementation:

C.3.5.1 The contractor shall implement the FFR Main Processor to allow for efficient simulation of small deformation problems in MBS applications. Such efficient implementation of the FFR formulation shall require the use of component mode synthesis method in order to reduce the number of elastic coordinates and filter out high frequency modes.

C.3.5.2 The implementation of the FFR Main Processor in the new software SIGMASAMS shall allow for the use of the nodal or the modal coordinates. The SIGMASAMS code shall also allow for the use of different methods for scaling the mode shapes; that is, the mode shapes can be orthonormal with respect to the mass matrix or the stiffness matrix.

C.3.5.3 The contractor shall implement joint constraints and generalized force elements that can be used with the FFR formulation.

C.3.6 ANCF Main Processor Implementation:

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C.3.6.1 The ANCF Main Processor implementation shall allow for systematically developing large deformation models that cannot be developed using existing MBS commercial computer programs.

C.3.6.2 The ANCF Main Processor implementation shall include the development of a standard library of ANCF finite elements as defined under the ANCF preprocessor development section.

C.3.6.3 The ANCF Main Processor implementation shall include the development of different elastic force formulations in order to be able to resolve the locking problem of some ANCF finite elements.

C.3.6.4 The ANCF Main Processor implementation shall include the development of nonlinear constitutive models that are suited for the analysis of large deformations.

C.3.6.5 The ANCF Main Processor implementation shall include the development of ANCF soil models in order to be able to study vehicle/terrain interaction through tires and tracks.

C.3.6.6 The ANCF Main Processor implementation shall include the development of a standard library of ANCF joint constraints as defined under the ANCF preprocessor development section and also include translational, cylindrical, and universal joint constraints.

C.3.7 Main Processor Integration Methods:

C.3.7.1 The SIGMASAMS software shall provide multiple explicit and implicit numerical integration methods. This shall include the explicit predictor-corrector Adams method, and the implicit BDF, Park, and HHT numerical integration methods at a minimum.

C.3.7.2 The results obtained using the implicit integration methods shall be compared with the results of the explicit integration method (Adams) in order to understand the performance of the two different approaches when different MBS applications are considered.

C.3.7.3 The implicit and explicit integration methods shall be implemented for the use with the rigid body formulation, the FFR formulation, and the ANCF formulation.

C.3.7.4 The contractor shall ensure that the nonlinear kinematic algebraic constraint equations are satisfied at the position, velocity, and acceleration levels.

C.3.7.5 Integration methods shall exploit sparse matrix techniques.

C.3.7.6 Integration methods shall be proven robust.

C.3.8 Post-Processing Capabilities Development:

C.3.8.1 This task shall be focused on developing Post-SIGMASAMS, a collection of post-processing capabilities necessary for the analysis of the simulation results and also for making SIGMASAMS, the new software, an effective design tool for complex physics and engineering systems.

C.3.8.1.1 Strain and stress results that require the use of the derivatives of the displacement field and the constitutive equations, respectively, shall be made available to the users.

C.3.8.1.2 Contour graphics shall be used to show regions with different stress levels.

C.3.8.1.3 The contractor shall develop motion animation capabilities to visualize the dynamics of complex MBS applications.

C.3.8.1.4 The postprocessor shall plot displacements, velocities, accelerations, and forces resulting from the SIGMASAMS simulations.

C.3.8.1.5 The postprocessor shall perform spectral analysis of the SIGMASAMS simulation results.

C.3.9 Software Validation:

C.3.9.1 The contractor shall develop a set of validation problems that test the rigid, flexible, and very flexible body formulations implemented in SIGMASAMS. The set shall include vehicle mobility performance on rigid ground and soft soil terrain.

C.3.9.2 The accuracy and efficiency of the results of the validation problems using SIGMASAMS shall be compared and reconciled with independently derived results such as from literature and other commercial MBS software as provided by the contractor.

C.3.10 Documentation and Manuals:

C.3.10.1 The contractor shall develop a set of software documents and supporting material that will allow the user to have access to

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all the formulations and procedures implemented in SIGMASAMS. The set of software documentation and materials shall include text books and technical papers that explain the methods implemented, short course documents, and an online help manual that will help the user in developing accurate models.

C.3.10.2 The contractor shall develop documents for three short courses lasting 2 days each. The first course shall cover the basic rigid MBS approaches and formulations. The second and third short courses shall cover flexible and very flexible MBS dynamics, respectively.

C.4 Meetings and Demonstrations:

C.4.1 Start of Work Meeting: The contractor shall conduct a start of work meeting with the Contracting Officers Representative (COR) within 15 days of award of contract. The meeting can be held as a web-conference at a time mutually agreed between the contractor and the COR. At this meeting, the contractor shall present his/her plans, schedule, deliverables, and resources, to accomplish the scope of this project that is consistent with this Statement of Work.

C.4.2 Program Management Review Meetings: The contractor shall travel to TARDEC every six months throughout the duration of the contract to conduct a one-day Program Management Review (PMR) meeting, for a total of four PMRs as described below. Each PMR will review the progress and status of the project. The contractor shall discuss the problems encountered and the measures taken to solve these problems and demonstrate progress towards accomplishing the statement of work as described below

C.4.2.1 Program Management Review Meeting One: The first PMR shall be held no later than six months after contract award. The contractor shall coordinate and mutually agree upon the date and time for the PMR with the COR. During this PMR the contractor shall discuss the problems encountered to date and the measures taken to resolve these problems. The contractor shall demonstrate to the COR the progress made to date for the Pre-SIGMASAMS consisting of FFR Preprocessor, ANCF Preprocessor, and Graphics and Animation Preprocessor meeting the requirements of the statement of work. The contractor shall provide an oral presentation of the monthly progress reports submitted in accordance with (IAW) CDRL A001. The contractor shall record and submit meeting minutes IAW CDRL A004.

C.4.2.2 Program Management Review Meeting Two: The second PMR shall be held no later than 12 months after contract award. The contractor shall coordinate and mutually agree upon the date and time for the PMR with the COR. During this PMR the contractor shall discuss the problems encountered to date and the measures taken to resolve these problems. The contractor shall demonstrate to the COR the progress made to date for the SIGMASAMS Main Processor consisting of Main Processor, FFR Main Processor, ANCF Main Processor, and Main Processor Integration Methods meeting the requirements of the statement of work. The contractor shall provide an oral presentation of the monthly progress reports submitted IAW CDRL A001. The contractor shall record and submit meeting minutes IAW CDRL A004.

C.4.2.3 Program Management Review Meeting Three: The third PMR shall be held no later than 18 months after contract award. The contractor shall coordinate and mutually agree upon the date and time for the PMR with the COR. During this PMR the contractor shall discuss the problems encountered to date and the measures taken to resolve these problems. The contractor shall demonstrate to the COR progress to date for the Post-SIGMASAMS consisting of post-processing capabilities developed that meets the requirements of the statement of work. The contractor shall provide an oral presentation of the monthly progress reports submitted IAW CDRL A001. The contractor shall record and submit meeting minutes IAW CDRL A004.

C.4.2.4 Program Management Review Meeting Four: The final PMR shall be held no later than 24 months after contract award. The contractor shall coordinate and mutually agree upon the date and time for the PMR with the COR. During the final PMR the contractor shall discuss the problems encountered to date and the measures taken to resolve these problems. The contractor shall demonstrate to the COR the validation problems and their solutions in comparison to benchmark data meeting the requirements of the statement of work. The contractor shall present on the documentation and manuals demonstrating the working links and completeness of the materials in meeting the requirements of the statement of work. The contractor shall provide an oral presentation of the monthly progress reports and the final technical report, submitted IAW CDRL A001 and A003, respectively. The contractor shall record and submit meeting minutes IAW CDRL A004.

C.4.3 Ground Vehicle Systems Engineering and Technology Symposium (GVSETS): The contractor shall write a technical paper and make a technical presentation annually during the contract at the National Defense Industrial Association (NDIA) GVSETS conference. The paper and presentation shall be on the accomplishments of the project to date towards the statement of work at the time of the Call for Papers for the conference. The contractor shall submit the paper and presentation to the COR to obtain TARDEC OPSEC approval prior to submission of the documents for publication and presentation at the conference. The contractor shall submit the documents to the COR for OPSEC approval no later than 30 days prior to the GVSETS due date.

C.5 Period of Performance: The total period of performance of the contract is 24 months after the contract award.

C.6 Deliverables/Performance:

C.6.1 The contractor shall deliver Progress Status and Management Reports (monthly progress reports) documenting the code developments during that period as listed in Contract Data Requirement List (CDRL) DD Form 1423, Data Item No. A001. This report shall explain the status of the project as measured against the contractor schedule presented at the start of work meeting. The report shall summarize any problems encountered and the measures taken to solve these problems.

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C.6.2 The contractor shall deliver a Research and Development Project Summary (project summary report) as listed in CDRL Data Item No. A002. The project summary report shall summarize the entire project.

C.6.3 The contractor shall deliver a Scientific and Technical Report (draft/final technical report) as listed in CDRL Data Item No. A003. The final technical report shall describe the entire project in technical details such as goals, developments, results, validation, and conclusion. The report shall be of the quality of a scientific journal paper(s).

C.6.4 The contractor shall deliver meeting minutes as listed in CDRL Data Item No. A004. The meeting minutes shall capture the essence of contractor meetings with the COR such as goals, issues, conclusions, and next steps.

C.6.5 The contractor shall deliver the executable code and three associated perpetual licenses and maintenance for the SIGMASAMS IAW CDRL Data Item No. A005.

C.6.6 The contractor shall deliver one set of software documentation and materials as described under C.3.10.1 IAW CDRL Data Item No. A006.

SBIR PHASE III PROJECT -- STATEMENT OF WORK C.7 through C.12.2

C.7 Scope: The Contractor shall perform a comparison between the recursive and non-recursive solutions in Tracked Vehicle Simulations.

C.8 Background: TARDEC uses two types of computer programs for vehicle mobility simulations; the first is based on the augmented formulation (DADS), while the second is based on the recursive approach (RecurDyn). Both approaches are implemented in the general purpose multibody system computer code SAMS/2000 developed by the University of Illinois at Chicago and Computational Dynamics Inc.

C.9 Objective:

C.9.1 The objective of this investigation is to use SAMS/2000 to perform a numerical study to compare the solutions obtained using recursive and non-recursive formulations in the simulations of tracked vehicle systems.

C.9.2 This research will support TARDEC's mission in modeling and simulation of ground vehicles for evaluating mobility and reliability. In the recursive methods, joint variables are used as degrees of freedom and the constraints are eliminated. In the non-recursive methods, the sparse matrix augmented form of the dynamic equations is used that contain all generalized coordinates along with the constraint Lagrange multipliers. This comparative numerical study will focus on comparing the efficiency of the two approaches when the track links are considered rigid as well as flexible. An M113-like notional tracked vehicle will be used as an example. In this comparative study, the number of the joint degrees of freedom depends on how the joint is modeled. A perfect joint leads to a one degree of freedom revolute joint, while a bushing element connection leads to six degrees of freedom joint. Both types of joints will be considered in this comparative study in order to shed light on the performance of the recursive and non-recursive approaches in tracked vehicle dynamics.

C.9.3 This comparative study will also be concerned with the type of link deformation such as small and linear vs. large and nonlinear. The former will be modeled using component modes and ANCF elements will be used for the latter. Some ANCF elements have larger number of coordinates and higher degree of stiffness. Both the dimensionality and stiffness can affect the computational time. It is also an objective of this project to examine how the increase in the dimensionality and stiffness will influence the computational time when the recursive and non-recursive methods are used in the dynamic simulation of tracked vehicles.

C.10 Tasks:

C.10.1 The contractor shall theoretically and numerically demonstrate the differences in the results of modeling and simulation of a M113-like notional tracked vehicle traversing a non-flat terrain using:

(1) Recursive vs. non-recursive formulations.

(2) Revolute joint vs. bushing connectivity of track links to examine the performance of the recursive and non-recursive approaches in tracked vehicle dynamics.

(3) Rigid vs. flexible track links to examine the performance of the recursive and non-recursive approaches in tracked vehicle dynamics.

(4) Linear flexible track links using component mode synthesis vs. Nonlinear flexible track links using ANCF elements of varying degrees of freedom and stiffnesses.

(5) ANCF elements that are gradient deficient vs. fully parameterized.

C.10.1.1 The theoretical demonstration shall provide a rigorous explanation and prove-out in an abstract and generic form of the topic

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Name of Offeror or Contractor: COMPUTATIONAL DYNAMICS INC		

under discussion.

C.10.1.2 The numerical demonstration shall provide a solution to a specific example problem with assumed numerical properties. The numerical solution could be in the form of a numerical value, graphical demonstration, or in a tabular form, or a combination of all the above.

C.10.1.3 The comparisons shall highlight the accuracy and efficiency of the solutions in each of the 5 cases above.

C.10.1.4 It is expected that the investigation shall result in at least 16 modeling and simulation scenario: 2 connectivity types x 4 link types x 2 formulation types. The connectivity types are revolute joint and bushing; Link types are rigid, linear flex, ANCF gradient deficient, and ANCF fully parameterized; Formulation types are recursive and non-recursive. The contractor may expand this list further if desired.

C.10.2 The results of this investigation shall be documented in a final technical report as describe in C.12.2 below.

C.11 Period of Performance SBIR Phase III Project

C.11.1 Total period of performance for the Phase III portion of the contract: 5 months after award.

C.12 Deliverables SBIR Phase III Project

C.12.1 The contractor shall deliver a Progress Status and Management Reports (monthly progress reports) as listed in Contract Data Requirement List (CDRL) DD Form1423, Data Item No. A001 for the duration of the project.

C.12.2 The contractor shall deliver a final technical report at the conclusion of the project which is five (5) months after the contract award in accordance with CDRL Data Item No. A003. The final technical report shall describe the entire project in technical details such as goals, developments, results, validation, and conclusions. The report shall be of the quality of a scientific journal paper(s).

Sections C.7 through C.12.2 are added by Modification P00003

*** END OF NARRATIVE C0001 ***

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Name of Offeror or Contractor: COMPUTATIONAL DYNAMICS INC

SECTION F - DELIVERIES OR PERFORMANCE

F.1 PERIOD OF PERFORMANCE

F.1.1 All effort required under this contract, including delivery of the final technical report and R&D project summary, shall be completed within twenty-four (24) months after contract award date.

F.1.1.1 All effort required for the Phase III project effort as stated in Section C.7 through C.12.2, including delivery of the final technical report, shall be completed within five (5) months after award of Modification P00003.

F.1.2 If there is any conflict between Section B and Section F of this contract, Section F will prevail.

F.2 MATERIAL/HARDWARE DELIVERABLES: All materials/hardware required to be delivered under the contract shall be packaged and marked in accordance with Section D and be shipped FOB destination to the following address:

US Army TARDEC
ATTN: Dr. Paramsothy Jayakumar, MS 157, RDTA-RS
6501 E. 11 Mile Rd.
Warren, MI 48397-5000

F.2.1 DATA DELIVERABLES: Delivery of data set forth in the contract shall be in accordance with the Contract Data Requirements List, DD Form 1423.

All changes made by Modification P00003 are noted by an asterisk

*** END OF NARRATIVE F0001 ***

CONTINUATION SHEET

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Name of Offeror or Contractor: COMPUTATIONAL DYNAMICS INC

SECTION G - CONTRACT ADMINISTRATION DATA

LINE	PRON/ AMS CD/ MIPR/ <u>ITEM</u>	OBLG <u>STAT</u>	JO NO/ <u>ACCT ASSIGN</u>	ACRN	PRIOR AMOUNT	INCREASE/ DECREASE	CUMULATIVE AMOUNT
0006AA	R33JL034R3	2	R.0005410.1.107	AB \$	0.00 \$	49,113.00 \$	49,113.00
					NET CHANGE \$	49,113.00	

ACRN	ACCOUNTING CLASSIFICATION	INCREASE/ DECREASE
AB	021 201320142040 A60FL 633005221RK02 2550 L034810758 R.0005410.1.107	021001 \$ 49,113.00
		NET CHANGE \$ 49,113.00

	PRIOR AMOUNT OF AWARD	INCREASE/DECREASE AMOUNT	CUMULATIVE OBLIG AMT
NET CHANGE FOR AWARD:	\$ 496,612.00	\$ 49,113.00	\$ 545,725.00

LINE	ACRN	EDI/SFIS ACCOUNTING CLASSIFICATION	
0006AA	AB	021 201320142040 A60FL 633005221RK02	2550 L034810758 R.0005410.1.107 021001

CONTINUATION SHEET**Reference No. of Document Being Continued**

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PIIN/SIIN W56HZV-14-C-0004

MOD/AMD P00003

Name of Offeror or Contractor: COMPUTATIONAL DYNAMICS INC

SECTION I - CONTRACT CLAUSES

<u>Status</u>	<u>Regulatory Cite</u>	<u>Title</u>	<u>Date</u>
---------------	------------------------	--------------	-------------

I-1 CHANGED	252.232-7007	LIMITATION OF GOVERNMENT'S OBLIGATION (MAY 2006) -- ALTERNATE I (MAY 2006)	MAY/2006
-------------	--------------	--	----------

(a) Contract line item 0005* is incrementally funded. The sum of \$496,612.00 is presently available for payment and allotted to this contract. An allotment schedule is contained in paragraph (j) of this clause.

(b) For item(s) identified in paragraph (a) of this clause, the Contractor agrees to perform up to the point at which the total amount payable by the Government, including reimbursement in the event of termination of those item(s) for the Government's convenience, approximates the total amount currently allotted to the contract. The Contractor is not authorized to continue work on those item(s) beyond that point. The Government will not be obligated in any event to reimburse the Contractor in excess of the amount allotted to the contract for those item(s) regardless of anything to the contrary in the clause entitled "Termination for Convenience of the Government." As used in this clause, the total amount payable by the Government in the event of termination of applicable contract line item(s) for convenience includes costs, profit, and estimated termination settlement costs for those item(s).

(c) Notwithstanding the dates specified in the allotment schedule in paragraph (j) of this clause, the Contractor will notify the Contracting Officer in writing at least ninety days prior to the date when, in the Contractor's best judgment, the work will reach the point at which the total amount payable by the Government, including any cost for termination for convenience, will approximate 85 percent of the total amount then allotted to the contract for performance of the applicable item(s). The notification will state (1) the estimated date when that point will be reached and (2) an estimate of additional funding, if any, needed to continue performance of applicable line items up to the next scheduled date for allotment of funds identified in paragraph (j) of this clause, or to a mutually agreed upon substitute date. The notification will also advise the Contracting Officer of the estimated amount of additional funds that will be required for the timely performance of the item(s) funded pursuant to this clause, for a subsequent period as may be specified in the allotment schedule in paragraph (j) of this clause or otherwise agreed to by the parties. If after such notification additional funds are not allotted by the date identified in the Contractor's notification, or by an agreed substitute date, the Contracting Officer will terminate any item(s) for which additional funds have not been allotted, pursuant to the clause of this contract entitled "Termination for Convenience of the Government."

(d) When additional funds are allotted for continued performance of the contract line item(s) identified in paragraph (a) of this clause, the parties will agree as to the period of contract performance which will be covered by the funds. The provisions of paragraphs (b) through (d) of this clause will apply in like manner to the additional allotted funds and agreed substitute date, and the contract will be modified accordingly.

(e) If, solely by reason of failure of the Government to allot additional funds, by the dates indicated below, in amounts sufficient for timely performance of the contract line item(s) identified in paragraph (a) of this clause, the Contractor incurs additional costs or is delayed in the performance of the work under this contract and if additional funds are allotted, an equitable adjustment will be made in the price or prices (including appropriate target, billing, and ceiling prices where applicable) of the item(s), or in the time of delivery, or both. Failure to agree to any such equitable adjustment hereunder will be a dispute concerning a question of fact within the meaning of the clause entitled "Disputes."

(f) The Government may at any time prior to termination allot additional funds for the performance of the contract line item(s) identified in paragraph (a) of this clause.

(g) The termination provisions of this clause do not limit the rights of the Government under the clause entitled "Default." The provisions of this clause are limited to the work and allotment of funds for the contract line item(s) set forth in paragraph (a) of this clause. This clause no longer applies once the contract is fully funded except with regard to the rights or obligations of the parties concerning equitable adjustments negotiated under paragraphs (d) and (e) of this clause.

(h) Nothing in this clause affects the right of the Government to terminate this contract pursuant to the clause of this contract entitled "Termination for Convenience of the Government."

(i) Nothing in this clause shall be construed as authorization of voluntary services whose acceptance is otherwise prohibited under 31 U.S.C. 1342.

(j) The parties contemplate that the Government will allot funds to this contract in accordance with the funding schedule in Section B of this contract.

(End of clause)

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MOD/AMD P00003

Name of Offeror or Contractor: COMPUTATIONAL DYNAMICS INC

SECTION J - LIST OF ATTACHMENTS

<u>List of</u> <u>Addenda</u>	<u>Title</u>	<u>Date</u>	<u>Number</u> <u>of Pages</u>	<u>Transmitted By</u>
Exhibit A	CONTRACT DATA REQUIREMENTS LIST (DD FORM 1423)	17-MAR-2014		

CONTRACT DATA REQUIREMENT LIST

Form Approval OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 440 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either these addresses. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

- A. CONTRACT LINE ITEM NO.: 0002
- B. EXHIBIT : A
- C. CATEGORY.....: Reports
- D. SYSTEM/ITEM.....: Integration of computational geometry, finite element, and multibody system algorithms for the development of new computational methodology for high-fidelity vehicle systems modeling and simulation
- E. CONTRACT/PR NO.: W56HZV-14-C-0004
- F. CONTRACTOR.....: Computational Dynamics, Inc

- 1. DATA ITEM NO.: A001
- 2. TITLE OF DATA ITEM: Contractor's Progress Status and Management Report
- 3. SUBTITLE: Monthly Reports
- 4. AUTHORITY: DI-MGMT-80227(T) (see 16a. below)
- 5. CONTRACT REFERENCE: C.6.1
- 6. REQUIRING OFFICE...: RDTA-SIE-EA-ANYT
- 7. WAWF/DD250 REQ\ '85 . : DD
- 8. APP CODE : N/A
- 9. DIST. STATEMENT REQUIRED: A
- 10. FREQUENCY : Monthly
- 11. AS OF DATE: Date of Award
- 12. DATE OF FIRST SUB: 30 Day After Contract (DAC)
- 13. DATE OF SUBS. SUB: Monthly

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

Dr. Paramsothy Jayakumar, CONTRACTING OFFICER'S REPRESENTATIVE,
E-MAIL: Paramsothy.jayakumar.civ@mail.mil

Rachel Heaney, CONTRACT SPECIALIST,
E-MAIL: rachel.r.heaney2.civ@mail.mil

15. TOTAL:

16. REMARKS:

- a. DI-MGMT-80227 is tailored by deleting 10.2, 10.3(j) 10.3(k), and 10.3(l)

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

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- 1. DATA ITEM NO.: A002
- 2. TITLE OF DATA ITEM: Research and Development (R&D) Project Summary
- 3. SUBTITLE: Project Summary Report
- 4. AUTHORITY: DI-MISC-81612A
- 5. CONTRACT REFERENCE: C.6.2
- 6. REQUIRING OFFICE .: RDTA-SIE-EA-ANYT
- 7. WAWF/DD250 REQ . . : DD

- 8. APP CODE : A
- 9. DIST. STATEMENT REQUIRED: A
- 10. FREQUENCY: SEE ITEM 16
- 11. AS OF DATE: Date of Award
- 12. DATE OF FIRST SUB: SEE ITEM 16
- 13. DATE OF SUBS. SUB: SEE ITEM 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

Dr. Paramsothy Jayakumar, CONTRACTING OFFICER'S REPRESENTATIVE,
E-MAIL: <mailto:Paramsothy.jayakumar.civ@mail.mil>

Rachel Heaney, CONTRACT SPECIALIST,
E-MAIL: rachel.r.heaney2.civ@mail.mil

15. TOTAL:

16. REMARKS:

The contractor shall submit a publicly releasable SBIR Phase II R&D Project Summary Report at the end of contract. The summary is an unclassified, non-sensitive, and non-proprietary summation of results that is intended for public viewing on the Army SBIR / STTR Small Business Portal. It should address the Data Item requirements on a summary basis and must not exceed 700 words.

Since the Department of Defense (DOD) will be publishing the summary, it must not contain any proprietary, classified, or ITAR restricted data. The summary must be submitted electronically and be in HTML format.

The Contractor shall deliver one (1) draft "SBIR Phase II R&D Project Summary" 23 months after contract award. The COR shall review the draft report and return it to the Contractor within fifteen (15) days of receipt with comments. The Contractor shall submit one (1) final "SBIR Phase II R&D Project Summary" within fifteen (15) days after receipt of draft comments (24 months after contract award).

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

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- 1. DATA ITEM NO.: A003
- 2. TITLE OF DATA ITEM: SCIENTIFIC AND TECHNICAL REPORT
- 3. SUBTITLE: DRAFT/FINAL TECHNICAL REPORT
- 4. AUTHORITY: DI-MISC-80711A(T) (see 16a. below)
- 5. CONTRACT REFERENCE: C.6.3, C.12.2*
- 6. REQUIRING OFFICE .: RDTA-SIE-EA-ANYT
- 7. WAWF/DD250 REQ .. : DD
- 8. APP CODE : A
- 9. DIST. STATEMENT REQUIRED: A
- 10. FREQUENCY: SEE ITEM 16
- 11. AS OF DATE: Date of Award
- 12. DATE OF FIRST SUB: SEE ITEM 16
- 13. DATE OF SUBS. SUB: SEE ITEM 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

Dr. Paramsothy Jayakumar, CONTRACTING OFFICER'S REPRESENTATIVE,
E-MAIL: Paramsothy.jayakumar.civ@mail.mil

Rachel Heaney, CONTRACT SPECIALIST,
E-MAIL: rachel.r.heaney2.civ@mail.mil

15. TOTAL:

16. REMARKS:

- a. DI-MISC-80711A is tailored by deleting 10.2.
- b. The Draft of the Final Technical Report (C.6.3) shall be delivered 22 months after date of contract award. The draft report shall include a completed Standard Form (SF) 298 (Report Documentation Page) as the report's cover sheet. The Government will review and respond within 30 days of receipt. The contractor shall submit the Final Technical Report (with the completed SF 298) within 30 days after receipt of draft comments/approval. The draft of the Final Technical Report for the Phase III Project effort (C.12.2) shall be delivered 4 months after the date of award of Modification P00003. The COR will review and comment within 15 days. The contractor shall submit the Final Technical Report (with the completed SF 298) within 15 days after receipt of draft comments/approval.*
- c. You may download the SF 298 form, from the following internet address:

<http://www.dtic.mil/dtic/forms/sf298template.doc>

Instructions for completing the SF 298 are provided in Attachment 001 to the contract.

Here are some additional instructions for completing the SF 298 form that apply when submitting reports under the SBIR Program:

For each unclassified report, the Contractor shall fill in Block 12a (Distribution/Availability Statement) of the SF 298 with one of the following statements:

- (a) Approved for public release; distribution unlimited.
- (b) Distribution authorized to U.S. Government Agencies only; contains proprietary information

Note: After reviewing the Contractor's entry in Block 12a, TARDEC has final responsibility for assigning a distribution statement. The contractor shall mark the actual report itself in accordance with the appropriate legends set forth in DFARS 252.227-7018, "RIGHTS IN NONCOMMERCIAL TECHNICAL DATA AND COMPUTER SOFTWARE -- SMALL BUSINESS INNOVATIVE RESEARCH (SBIR) PROGRAM".

Block 13 (Abstract) of the SF 298 must include the first sentence, "Report developed under SBIR contract for topic (insert topic number)." The abstract must identify the purpose of the work and briefly describe the work carried out, the finding or results, and the potential applications of the effort. Since the Department of Defense (DOD) will be publishing the abstract, it must not contain any proprietary or classified data.

Block 14 (Subject Terms) of the SF 298 must include the term "SBIR Report."

- 17. PRICE GROUP:
- 18. ESTIMATED TOTAL PRICE:

- =====
- 1. DATA ITEM NO.: A004
 - 2. TITLE OF DATA ITEM: Report, Record of Meeting/ Minutes
 - 3. SUBTITLE: Meeting Minutes
 - 4. AUTHORITY: DI-ADMN-81505
 - 5. CONTRACT REFERENCE: C.6.4
 - 6. REQUIRING OFFICE...: RDTA-SIE-EA-ANYT
 - 7. WAWF/DD250 REQ\85 . : DD
 - 8. APP CODE : N/A
 - 9. DIST. STATEMENT REQUIRED: A
 - 10. FREQUENCY : SEE ITEM 16
 - 11. AS OF DATE: Date of Award
 - 12. DATE OF FIRST SUB: SEE ITEM 16
 - 13. DATE OF SUBS. SUB: SEE ITEM 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

Dr. Paramsothy Jayakumar, CONTRACTING OFFICER'S REPRESENTATIVE,
E-MAIL: Paramsothy.jayakumar.civ@mail.mil

Rachel Heaney, CONTRACT SPECIALIST,

E-MAIL: rachel.r.heaney2.civ@mail.mil

15. TOTAL:

16. REMARKS:

The Contractor shall submit meeting minutes within seven (7) days after each meeting with the COR. This requirement shall apply to in-person meetings and web meetings.

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

- =====
- 1. DATA ITEM NO.: A005
 - 2. TITLE OF DATA ITEM: Executable Code and Related License
 - 3. SUBTITLE: SIGMASAMS executable code & related Licenses/Maintenance
 - 4. AUTHORITY: DI-MISC-81612A
 - 5. CONTRACT REFERENCE: C.6.5
 - 6. REQUIRING OFFICE .: RDTA-SIE-EA-ANYT
 - 7. WAWF/DD250 REQ ..: DD
 - 8. APP CODE: A
 - 9. DIST. STATEMENT REQUIRED: B
 - 10. FREQUENCY: SEE ITEM 16
 - 11. AS OF DATE: Date of Award
 - 12. DATE OF FIRST SUB: SEE ITEM 16
 - 13. DATE OF SUBS. SUB: SEE ITEM 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

Dr. Paramsothy Jayakumar, CONTRACTING OFFICER'S REPRESENTATIVE,
E-MAIL: <mailto:Paramsothy.jayakumar.civ@mail.mil>

15. TOTAL:

16. REMARKS:

The contractor shall deliver the executable code for SIGMASAMS and three perpetual licenses for the new software (SIGMASAMS) at no cost to the government 24 months after contract award.

The contractor shall provide maintenance for the executable code and three associated licenses for a period of 24 months after delivery of the licenses to the Government. Maintenance shall include providing copies of all new releases and any updates of the SIGMASAMS executable code at no additional cost to the Government.

17. PRICE GROUP:

18. ESTIMATED TOTAL PRICE:

- =====
- 1. DATA ITEM NO.: A006
 - 2. TITLE OF DATA ITEM: Software Documentation
 - 3. SUBTITLE: SIGMASAMS Documentation and Materials
 - 4. AUTHORITY: DI-MISC-80711A(T) (see 16a. below)
 - 5. CONTRACT REFERENCE: C.6.6
 - 6. REQUIRING OFFICE .: RDTA-SIE-EA-ANYT
 - 7. WAWF/DD250 REQ ..: DD
 - 8. APP CODE: A
 - 9. DIST. STATEMENT REQUIRED: A
 - 10. FREQUENCY: SEE ITEM 16
 - 11. AS OF DATE: Date of Award
 - 12. DATE OF FIRST SUB: SEE ITEM 16
 - 13. DATE OF SUBS. SUB: SEE ITEM 16

14. DISTRIBUTION ADDRESSEES: SUBMIT REPORTS ELECTRONICALLY TO THE E-MAIL ADDRESSES SHOWN IMMEDIATELY BELOW:

Dr. Paramsothy Jayakumar, CONTRACTING OFFICER'S REPRESENTATIVE,
E-MAIL: <mailto:Paramsothy.jayakumar.civ@mail.mil>

15. TOTAL:

16. REMARKS:

- a. DI-MISC-80711A is tailored by deleting 10.2.
- b. The Contractor shall deliver one set of software documentation and materials as described under C.3.10.1 24 months after date of contract award.

***** THE FOLLOWING INSTRUCTION APPLIES TO ALL REPORTS DELIVERABLE UNDER THE CONTRACT *****

Prepare the reports in Contractor format. Submit the reports using any of the following electronic formats:

- (1) Files readable using these Microsoft* Office 2007 & lower Products: Word, Excel, PowerPoint, or Access. Spreadsheets must be sent in a file format that includes all formulae, macro and format information. Print or scan images of spreadsheets are not acceptable. Please see security note below for caution regarding use of macros.
- (2) Files in Adobe PDF (Portable Document Format). When scanning documents, scanner should be set to 200 dots per inch.
- (3) Files in HTML (Hypertext Markup Language) Format. HTML documents must not contain active links to Internet websites or web pages for reference information. All linked information must be contained within your electronic report, and be accessible offline.
- (4) Other electronic formats. Before preparing your report in any other electronic format, please e-mail the COR, with an e-mail copy-furnished to amsta-id@tacom.army.mil, to obtain a decision as to the format's acceptability. This e-mail must be received by the COR not later than ten (10) calendar days before the draft report's due date. All alternate methods must be at no cost to the Government.
- (5) Please note that we can no longer accept .zip files due to increasing security concerns.

NOTE. Macros: The virus scanning software used by our e-mail systems cannot always distinguish a macro from a virus. Therefore, sending a macro embedded in an e-mail message or an e-mail attachment may cause the e-mail report to be quarantined.

d. Acceptable media: The Contractor shall submit reports via e-mail. If e-mail is not workable, another acceptable media is a 650 megabyte CD ROM. Identify the software application and version used to create each file submitted.

- (1) E-MAIL. Maximum size of each e-mail message shall be three and one-half (3.5) megabytes. Previously "zipped" files were accepted, but due to security concerns these zipped attachments cannot be received through our mail system. You may use multiple e-mail messages if necessary, however, you must annotate the subject lines in this manner: "Message 1 of 3, 2 of 3, 3 of 3."
- (2) 650 MEGABYTE CD ROM to be delivered via U.S. Mail or other carrier. The Contractor shall label all submitted disks with the Contract number, the Contractor's name and address, and a contact's phone number. Exterior mailing envelopes containing disks must be addressed to the following address:

U.S. Army TARDEC
Dr. Paramsothy Jayakumar, RDTA-SIE-EA-ANYT, MS 157
6501 East 11 Mile Road

Warren, MI 48397-5000

NOTE: Please select only one type of electronic media to transmit each report. For instance, do not submit a report via e-mail and CD-ROM.

* Registered Trademark