

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code
Cost Plus Fixed Fee

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2. Amendment/Modification No. 0001	3. Effective Date 2014MAY01	4. Requisition/Purchase Req No. SEE SCHEDULE	5. Project No. (If applicable)
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6. Issued By U.S. ARMY CONTRACTING COMMAND ANDREW POMORSKI WARREN, MICHIGAN 48397-5000 HTTP://CONTRACTING.TACOM.ARMY.MIL EMAIL: ANDREW.G.POMORSKI@US.ARMY.MIL	Code W56HZV	7. Administered By (If other than Item 6)	Code
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8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code)	<input checked="" type="checkbox"/>	9A. Amendment Of Solicitation No. W56HZV-14-R-0212
		9B. Dated (See Item 11) 2014APR25
	<input type="checkbox"/>	10A. Modification Of Contract/Order No.
		10B. Dated (See Item 13)
Code	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 2 signed 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)

**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 type="checkbox"/>	C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:	
<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)	
15B. Contractor/Offeror	15C. Date Signed	16B. United States Of America By _____ /SIGNED/ (Signature of Contracting Officer)	16C. Date Signed
(Signature of person authorized to sign)			

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Name of Offeror or Contractor:

SECTION A - SUPPLEMENTAL INFORMATION

Buyer Name: ANDREW POMORSKI
Buyer Office Symbol/Telephone Number: CCTA-ASG-C/(586)282-4465
Type of Contract: Cost Plus Fixed Fee
Kind of Contract: Research and Development Contracts
Weapon System: No Identified Army Weapons Systems

*** End of Narrative A0000 ***

EXTERNAL SUSPENSION UNIT (ESU)
RFP: W56HZ-14-R-0212

Instruction to Offerors:

1. It is the Army Contracting Command Warren's intent to solicit and negotiate the requirements of this solicitation with Horstman Systems, Inc., 44215 Phoenix Drive, Sterling Heights, MI, 48314 (Cage Code 5UTD0) and L3 Combat Propulsion Systems, 76 S Getty St, Muskegon, MI 49442 (Cage Code 02978).
2. Provide amounts for CLIN's 0001AA, 0005AA, 0006AA, 0006AB, 0006AC and 0006AD.
3. Submit cost support for Base Effort, Option Year One, and Option Year two material, travel and Other Direct Costs (inclusive of catalog pricing, online quotes and subcontractor quotes) with your proposal.
4. Proposal is due by 3:00 PM Warren, MI local time on 27 May 2014.

ESU OVERVIEW

The objective of the procurement is for development and subsequent production of external hydropneumatic in arm suspension (ESU) units for evaluation of functionality and applicability with respect to improving mobility performance. It is proposed that this technology shall provide a beneficial alternative suspension option for existing and future military vehicle systems, providing latitude with respect to suspension system design considerations while meeting the performance requirements defined in the scope of work. This procurement includes a base effort and two separate options.

COST TARGET

The cost target for the base effort under this solicitation is \$1M (FY13 dollars). The base effort scope of work in Section C contains all of the capabilities desired at this cost target.

BASE EFFORT OVERVIEW

The base effort consists of the preliminary design and development for passive ESU and an ESU that intergrates height management capability along with real time controllable damping. The Period of Performance for the Base Effort will be 12 months after contract award.

OPTION 1 OVERVIEW

The first option (Option 1) is for detailed design phase based upon the base efforts agreed upon preliminary designs. The contractor shall produce level II drawings suitable to facilitate prototype production and also manufacture three (3) prototype ESUs for laboratory test and evaluation. The Period of Performance for Option 1 will be 12 months after award of the option.

OPTION 2 OVERVIEW

The second option (Option 2) consists of the production of a vehicle set of ESUs for an on vehicle Proof of Principle (POP) evaluation. The Government will supply a Abrams Fighting Vehicle (AFV) test asset as GFE for performance and durability testing of the ESUs. The Period of Performance for option 2 will be 12 months after award of the option.

ACQUISITION STRATEGY

A limited source strategy is being utilized for this procurement for a single award to Horstman Inc or L3 Combat Propulsion Systems. All proposal submission requirements are located in Section L. A Cost-Plus-Fixed-Fee completion contract (CPFF) will be awarded for the base effort. All proposals shall clearly identify why the acceptance of the proposal would be advantageous to the Government. Any proposed deviations from the terms and conditions of the solicitation shall be clearly identified and explicitly defined and may be cause for rejection of the proposal.

NOTICE REGARDING SUBCONTRACTING

Offerors who are Other than Small Business Concerns shall submit a Small Business Subcontracting Plan in accordance with the Section I clauses. The Small Business Subcontracting Plan must be a separate stand-alone file and be clearly labeled as the Small Business Subcontracting Plan.

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Name of Offeror or Contractor:

PRE-PROPOSAL QUESTION SUBMISSION

The deadline for Government receipt of Pre-proposal offeror questions is 13 May 2014, 1:00 P.M. local time, Warren, MI.

All questions regarding this solicitation shall be submitted in writing to the Contract Specialist, Justin Eagle, via email at justin.s.eagle.civ@mail.mil. All questions and correspondence related to this solicitation shall reference the solicitation number W56HZV-14-R-0212 in the e-mail subject line.

Since the solicitation and associated information are posted on the FEDBIZOPPS and Army Single Face to Industry ASFI website, the Government will post amendments to the solicitation and answers to any industry-generated questions on that website. Offerors are responsible for periodically reviewing the aforementioned website for the most current information pertaining to this solicitation.

*** END OF NARRATIVE A0001 ***

W56HZV-14-R-0212 Amendment 0001

1. The purpose of this Amendment 0001 to Solicitation W56HZV-14-R-0212 is to a) add hardware subCLIN's, b) revise terminology from Bradley Fighting Vehicle (BFV) to Abrams Fighting Vehicle (AFV) and c) update weight requirements.

2. As a result of Amendment 0001 the following changes are hereby made to the Solicitation:

- a) Section A Instruction to Offerors, Paragraph 2 added subCLIN's 0006AB, 0006AC and 0006AD
- b) Section A Option 2 Overview Bradley Fighting Vehicle revised to state Abrams Fighting Vehicle (AFV).
- c) Section C Paragraph C.2.1 Bradley Fighting Vehicle revised to state Abrams Fighting Vehicle (AFV).
- d) Section C Paragraph C.6.5 80,000lbs Bradley Fighting Vehicle weight revised to 140,000lbs for Abrams Fighting Vehicle.

3. Except as provided by this Amendment 0001, all other terms and conditions of Solicitation W56HZV-14-R-0212 remain unchanged.

*** END OF NARRATIVE A0002 ***

Name of Offeror or Contractor:

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

Statement of Work

ENHANCED CAPABILITY MEDIUM TRACKED COMBAT SUSPENSION SYSTEM

Introduction Combat vehicle weights have continually increased over time, well beyond the original design specifications were based on. This has been detrimental to the mobility of the majority of presently fielded Army vehicles, both combat and tactical. The primary reason for the weight growth is attributed to the addition of armor packages, in an effort to increase the survivability of the crew and vehicle systems. The focus on survivability is also requiring the reexamination of existing suspension systems, soliciting modifications to regain baseline mobility; this includes regaining ground clearance and adequate suspension component response.

External suspension units incorporate both the spring and damper in a complete assembly that mounts external to the hull; this eliminates the torsion bar by providing the springing action with a fluid/gas volume that is compressed. An external in arm unit has the spring and damper element integrated within the road arm casing itself. This rising spring rate is beneficial for minimizing the effects of full jounce excursions. The adjustability of gas/fluid pressures provide a means to adjust the spring characteristics at any given wheel station. Controlled porting of the damping oil allows for variable damping. These two features, when properly understood and controlled, can enhance mobility for virtually any vehicle system. Other advantages of the external suspension unit are interior volume savings, ease of maintenance, and lower weight.

GOALS AND OBJECTIVES

This effort shall explore the development and subsequent production of external hydropneumatic in arm suspension (ESU) units for evaluation of functionality and applicability with respect to improving mobility performance. It is proposed that this technology shall provide a beneficial alternative suspension option for existing and future military vehicle systems, providing latitude with respect to suspension system design considerations. This suspension system shall address the requirements of a heavy weight tracked combat vehicle; the target weight for the heavy weight class combat vehicle is 70T. The development of this ESU system shall be able to address this technology gap.

This effort shall be broken out into a Base Effort plus two (2) Option Efforts. The total Period of Performance (POP) for the Base and Option Efforts shall be 36 months.

C.1. BASE EFFORT

C.1.1. The baseline effort shall incorporate preliminary considerations for both a passive ESU unit design and an ESU that integrates height management capability, along with real time controllable damping (semi active). These parallel design efforts will be the bases for trade analyses of cost, weight, reliability and overall mobility benefit. All design efforts shall consider two different damping mechanisms; one manner of damping will incorporate a rotary damper and the other will utilize linear actuated ported damping. Additionally, the Contractor shall investigate the springing mechanism to include evaluation of compressible fluid technology and air / gas technology.

C.1.2. A Start of Work meeting shall be scheduled to occur within two (2) weeks of contract award (for both Base and Option Efforts) and can be in person at a mutually agreed upon facility or can be conducted by phone/video conference. The Contractor shall provide applicable read ahead material to the Government in any case. All meetings and design reviews, relevant to this effort, will be conducted as described above.

C.1.3. The ESUs shall be designed to support a nominal maximum static vertical load of 12,000 lbs. The ESUs must also withstand a combined loading of four (4g) vertical and two (2g) laterally.

C.1.4. The ESUs shall provide a total of 23 inches of wheel travel (minimum); the recommended distribution of this travel is 17 inches jounce and six (6) inches rebound. The design loaded static road arm angle below horizontal shall be between 30 and 40 degrees.

C.1.5. The initial baseline design of the damped ESU shall not exceed 300 lbs. Note: this weight requirement may be traded during the initial design review.

C.1.6. ESU mounting fixture shall accommodate integration to a vertical hull plate. The resulting plane of the wheel hub mounting surface shall be parallel to the hull; this plane shall be offset by a distance between 12 and 15 inches.

C.1.7. The distance from the hull mounted pivot to the wheel hub spindle centerline shall be 21 inches minimum.

C.1.8. The Contractor shall, in an effort to maximize commonality, develop ESU designs which shall utilize the existing Abrams Fighting Vehicle (AFV) hub spindle design.

C.1.9. The Contractor shall design two (2) sprung passive ESUs; one shall integrate damping capability and the other shall be un-damped. Both units shall contain spring elements.

C.2.0. In parallel, the Contractor shall design an ESU with height management and semi active features.

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C.2.1. The Contractor shall incorporate vehicle performance modeling and simulation as a contributor to the system trade studies. The Contractor shall determine the optimum suspension configuration; that is the number of damped versus un-damped wheel stations/units that will be required for the Abrams Fighting Vehicle (AFV) to exceed the current threshold cross country performance requirement by 10% (Required: 30 kph/18 mph average speed on Perryman 3). Additionally the Contractor shall also determine the optimum camber angle set point for the ESU to ensure the least amount of energy loss during operations.

C.2.2. The Contractor shall prepare a Preliminary Design Review (PDR); it shall work in conjunction with the Government to make a determination/agreement of the down selected design approaches. The PDR will occur at nine (9) months, following contract award.

C.2.3. The Contractor shall provide to the Government a final report of this effort within two (2) months of completing this effort.

C.2.4. The contractor shall travel to TARDEC, three (3) times during the base effort for a period of one (1) to two (2) days to discuss developments in component design, attend the PDR, and to discuss the results of the final report and potential next phase of work.

C.2.5. Performance for Base Effort shall not exceed 12 months.

C.3. DELIVERABLES - BASE EFFORT

C.3.1. IAW CDRL A001 - Contractor's Progress Status and Management Report shall be submitted monthly.

C.3.2. IAW CDRL A002 - Scientific and Technical Reports. The contractor shall document all prototype ESU design, material, and manufacturing work. The contractor shall communicate these to the COR and provide detailed reports.

C.3.3. IAW CDRL A003 - Final Technical Report. The Contractor shall submit a final technical report for the base effort within two (2) months of the completion of the base effort period of performance.

C.3.4. IAW CDRL A004 - Start of Work Meeting. The contractor shall conduct a Start of Work Meeting within (14) Days After Contract Award (DAC). The location, date of the meeting and agenda shall be requested by the contractor and approved by the COR.

C.4. OPTION ONE

C.4.1. The second phase (Option 1) shall be the detailed design phase for the agreed upon preliminary design(s). Option Period 1 can be exercised anytime during the base period, first twelve (12) months after initial award date.

C.4.2. The Contractor shall conduct detailed design for representative ESU based on the PDR; the Contractor shall produce level two (2) drawings, suitable to facilitate prototype production, IAW CDRL A004 (DI-SESS-81002D).

C.4.3. The Contractor shall manufacture three (3) prototype ESUs for the purpose of laboratory test and evaluation.

C.4.4. The Contractor shall conduct relevant laboratory testing of these ESUs; the testing shall consist of functionality testing, spring and damper characterization and preliminary durability testing. The detailed nature of this testing will be determined and agreed upon at the Start of Work Meeting IAW CDRL A004 amongst both Contractor and Government personnel. All testing results shall be made available to the Government IAW CDRL A002.

C.4.5. The Contractor shall iterate the design of the laboratory tested units to correct any deficiencies in performance from the laboratory testing. Additionally, the Contractor shall account for cost during this design turn of the ESU components by designing for manufacturing.

C.4.6. The Contractor shall present a Critical Design Review (CDR) at the completion of this effort. This CDR shall occur within one (1) month of completion and shall include a final report that summarizes this effort.

C.4.7. The contractor shall travel to TARDEC, three (3) times during the Option One effort for a period of one (1) to two (2) days to discuss developments in component testing, design and material development activities, attend the CDR, and to discuss the results of the final report and potential next phase of work.

C.4.8. Performance for Option 1 shall not exceed 12 months.

C.5. DELIVERABLES - OPTION ONE

C.5.1. IAW CDRL A001 - Contractor's Progress Status and Management Report shall be submitted monthly.

C.5.2. IAW CDRL A002 - Scientific and Technical Reports, the contractor shall document all prototype ESU design, material, and manufacturing work. The contractor shall communicate these to the COR and provide detailed reports.

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C.5.3. IAW CDRL A003 - Final Technical Report, the Contractor shall submit a final technical report for the base effort within two (2) months of the completion of the base effort period of performance.

C.5.4. IAW CDRL A004 - Start of Work Meeting. The contractor shall conduct a Start of Work Meeting within (14) Days After Contract Award (DAC). The location, date of the meeting and agenda shall be requested by the contractor and approved by the COR.

C.5.5. The Contract shall supply the Government three prototype ESUs. The Contractor shall deliver the ESUs to TARDEC upon completion of preliminary functionality testing (ref. C.4.4), within 30 days.

C.6. OPTION TWO

C.6.1. The third phase (Option 2) (12 month period of performance) shall consist of the production of a vehicle set of ESUs (with spares) for an on vehicle Proof of Principle (POP) evaluation.

C.6.2. The contractor shall manufacture/produce a vehicle set of fourteen (14) ESUs and shall also provide four (4) spares. The spares shall consist of two (2) for the right side of the vehicle and two (2) for the left side of the vehicle.

C.6.3. The Government shall provide the test vehicle as GFE and the ESUs shall be integrated at the appropriate facility; this facility shall be determined at the applicable Start of Work meeting. The vehicle shall be provided in a timely manner and the Government shall be responsible for any vehicle shipments.

C.6.4. The Contractor and the Government shall collaborate on the development of a test plan for POP; this plan shall be finalized prior to the integration of the ESUs to the GFE test vehicle. The data shall be shared by the Contractor and the Government.

C.6.5. The Government shall be responsible for supplying the Abrams Fighting Vehicle test asset and conducting performance and durability testing. The test weight of the Abrams Fighting Vehicle shall be set at 140,000 lbs.

C.6.6. The Contractor shall be present at the test site during the initial break-in and performance testing of the suspension elements.

C.6.7. The contractor shall, at the completion of vehicle testing, perform an inspection analysis of the ESU components. Should a component fail during testing the Contractor shall perform a failure root cause analysis, and generate a failure report for the Government within one (1) month of the Contractors receipt of the failed part. The contractor shall analyze the components performance, reasons for component and system failures (if applicable), and propose suggestions to enhance the design for potential follow on work; this information will be compiled within a written Technical report CDRL A002 (Contractors chosen format) and will be relayed to the Government during a mutually agreed upon meeting.

C.6.8. The contractor shall travel to the Government Test facility at the initial installation and break-in phase of the ESUs.

C.6.9. Performance for Option 2 shall not exceed 12 months.

C.7. DELIVERABLES - OPTION TWO

C.7.1. IAW CDRL A001 - Contractor's Progress Status and Management Report shall be submitted monthly.

C.7.2. IAW CDRL A002 - Scientific and Technical Reports, the contractor shall document all prototype ESU design, material, and manufacturing work. The contractor shall communicate these to the COR and provide detailed reports.

C.7.3. IAW CDRL A003 - Final Technical Report, the Contractor shall submit a final technical report for the base effort within two (2) months of the completion of the base effort period of performance.

C.7.4. IAW CDRL A004 - Start of Work Meeting. The contractor shall conduct a Start of Work Meeting within (14) Days After Contract Award (DAC). The location, date of the meeting and agenda shall be requested by the contractor and approved by the COR.

C.7.5. The contractor shall provide one vehicle set, 14 complete manufactured, operational ESUs.

C.7.6. The contractor shall provide two (2) Left Hand Side (LHS) spare ESUs, one (1) damped and one (1) undamped.

C.7.7. The contractor shall provide two (2) Right Hand Side (RHS) spare ESUs, one (1) damped and one (1) undamped.

*** END OF NARRATIVE C0001 ***