

## C.1 Objective

The Work Directives issued hereunder shall involve research and development efforts on various aspects related to Assured Mobility and Maneuver Support material solutions.

The term "Assured Mobility" encompasses those actions and material and design solutions that give commanders the ability to deploy, move, and maneuver assets where and when they desire, without interruption or delay, to achieve the mission. The imperatives and principles of Assured Mobility are what will enable future forces to have superior situational understanding and, therefore, unsurpassed freedom of movement in global terrain and climate profiles; tropical, arid, temperate, continental, and polar.

The term "Maneuver Support" encompasses those actions and material and design solutions that give commanders the ability to maintain an unprecedented level of freedom of movement at the tactical, operational, and strategic levels in all environments. Materiel items most relevant to Maneuver Support efforts include Survivability, Countermine, Track and Suspension, Power Management, Robotics, Bridging systems and Combat Engineer Equipment for freedom of maneuver through construction of obstacles, unstructured terrain, and for interrogation of Improvised Explosive Devices (IEDs) and route clearance (mobility and counter-mobility operations).

## C.2 General

C.2.1 The contractor, acting as an independent contractor and not as an agent of the Government, shall perform specified research, development, testing, and evaluation efforts related to combat vehicle survivability, threat neutralization and detection, track and suspension improvements, power management, noise reduction, unmanned applications, bridging and gap defeat, route clearance, and crew survivability for tracked and wheeled tactical ground vehicles and the design, analysis, and testing of Assured Mobility and Maneuver Support material solutions.

C.2.2 The contractor shall perform all work In Accordance With (IAW) individually issued Work Directives awarded by the Procuring Contracting Officer (PCO). No work shall commence until the contractor has received a fully executed PCO signed Work Directive. Each Work Directive shall include the following information:

- (1) Work Directive number and title
- (2) Objective of the Work Directive
- (3) Maximum number of hours authorized
- (4) Detailed description of the work to be performed
- (5) Required completion date
- (6) Identification of applicable contract number, contractor's name and address

- (7) Identification of software, prototype hardware, and/or documentations to be delivered.
- (8) Projected material costs
- (9) Contracting Officer signature

C.2.3 The contractor shall notify the PCO and the Contracting Officer's Representative (COR) immediately, by e-mail, if dates by which work must be performed or data must be delivered will not be met.

C.2.4 The Government has the unilateral right to increase, decrease or prioritize the work to be performed hereunder by the issuance of Work Directives or Work Directive revisions signed by the Contracting Officer. It is understood and agreed that such adjustments shall be made within the general scope of work and level of effort of the contract and that the contractor shall be compensated in accordance with the terms and conditions as agreed to in the base contract. The COR has the right to prioritize the work being performed under the contract.

C.2.5 If, at any time, the contractor has reason to believe that any amount in one or more categories of direct labor hours, other direct costs, overhead, material and/or travel which it expects to incur in the performance of a Work Directive are insufficient, the contractor shall provide written notification to the PCO and the COR for appropriate action. As part of such notice, the contractor shall provide a revised statement of total hours, overhead, and other direct costs or travel expense necessary to complete such a Work Directive. The contractor shall not exceed any amount authorized by the Work Directive without the express written permission of the PCO.

C.3 Requirements. As directed by individual Work Directive(s) issued hereunder, the contractor shall provide the necessary services, personnel, equipment and facilities to perform work in one or more of the following areas, whether singly or in combination given the individual Work Directive(s): (i) combat vehicle threat detection and neutralization, (ii) route clearance, (iii) vehicle and crew survivability for tracked and wheeled tactical ground vehicles (iv) bridging and gap defeat, (v) track and suspension improvements, (vi) power management, (vii) noise reduction, (viii) unmanned applications, (ix) construct, maintain, and improve routes, infrastructure, and obstacles, and (x) the design, analysis, and testing of Assured Mobility and Maneuver Support materiel solutions.

C.3.1 Specific efforts may include:

C.3.1.1 Countermine and counter obstacle equipment research, design, development, demonstrator or test-article production or modification, evaluation, and testing.

C.3.1.2 Vehicle survivability, mobility modification, enhancement, and evaluation. Perform dedicated prime mover research, development, engineering, and prototype production in support of counter measure development.

C.3.1.3 Armor integration (to include material and structural engineering, demonstrator or test-article production or modification, evaluation, and testing).

C.3.1.4 Integrated vehicle survivability (engineering analysis and evaluation, demonstrator or test-article production or modification and testing).

C.3.1.5 Sensor development and integration (engineering analysis and evaluation, design, demonstrator or test-article production, and testing).

C.3.1.6 Material research (engineering analysis, evaluation, and testing).

C.3.1.7 Blast and structural modeling, simulation, analysis, and validation.

C.3.1.8 High energy blast testing and analysis.

C.3.1.9 Tele-operation and automation of ground vehicle and robotic platform, systems and sub systems, (engineering analysis and evaluation, design, demonstrator or test article fabrication, and testing).

C.3.1.10 Lane marking (engineering analysis and evaluation, design, demonstrator or test-article fabrication or modification, and testing).

C.3.1.11 Control, communication, and power systems development and integration (engineering analysis and evaluation, design, limited prototyping or modification, and testing).

C.3.1.12 Virtual and hardware prototyping (engineering design and development, fabrication, integration, and test and evaluation) of demonstration or prototype systems, subsystems, or components.

C.3.1.13 Interior impact protective solutions development utilizing passive energy absorbing methodologies and active technologies to prevent, avoid, and abate occupant injury during underbody blast, crash and rollover events.

C.3.1.14 Active protection system development and demonstration of soft kill and hard kill technologies utilizing a modular framework that will allow commonality across the vehicle fleet.

C.3.1.15 Bridge and emplacement system design, development, engineering analysis and evaluation, fabrication of demonstrator or test article hardware, testing and test evaluation.

C.3.1.16 Provide experimental facilities and ranges to develop and conduct ground vehicle evaluations over representative soil, terrain, and climatic conditions consistent with armed services cold region operations.

C.3.1.17 Provide facilities and trained staff for the secure support, maintenance, and care of Government supplied test assets.

C.3.1.18 Establish procedures, metrics, and measurement devices to evaluate standard and asymmetric warfare performance in cold regions environment.

C.3.1.19 Disseminate knowledge to Military Centers of Excellence to assist enhanced capability and criteria development.

C.3.1.20 Evaluate and test noise and vibration performance and assess the results against the aural non-detectability limits; engineering design and development of treatments to address the primary sources.

C.3.1.21 Power management (engineering analysis and evaluation, design, demonstrator or test-article fabrication or modification, and testing) of military technologies.

C.3.1.22 Research and development to provide renewable energy in an expeditionary environment.

C.3.1.23 Track and Suspension design, analysis, and testing of systems, subsystems, and components (rubber and elastomers, track shoe bodies, track pads, ice cleats, pin and bushing assemblies, road wheels, road wheel path, and support rollers); weight and shape optimization, metallic and non-metallic solutions.

C.3.2 Failure analysis (field data collection, engineering evaluation, redesign or modification of failed item) of systems, sub-systems, and components in support of production hardware, user and field evaluation, and vehicle and laboratory testing.

C.3.3 Contractor shall review and mark-up deficiencies or improvements in technical data packages that must be corrected prior to start of production or prior to release of data for other authorized use in accordance with DI-MISC-80750 Technical Data Package Review Report, CDRL A002.

C.3.4 Generation of technical data, to include specifications, standards, and Computer Aided Design (CAD) drawings in accordance with DI-DRPR-80651 Engineering Drawings, CDRL A003.

C.3.5 Concept Design of Prototype or Demonstration hardware. Based on performance requirements, specifications, or engineering drawings, which may either be provided by the Government or generated by the contractor, the contractor shall design systems, subsystems, assemblies, and/or prototype or demonstration hardware to enhance or improve the topic area(s) stated in the Work Directive, and falling within this scope of work.

C.3.6 Fabricate Prototype or Demonstration hardware. The contractor shall fabricate demonstration or prototype hardware, test instrumentation, or test fixtures, based either on designs generated by the contractor or provided by the Government. The contractor shall integrate hardware and subsystems into assemblies and onto Government-designated vehicle platforms. Government vehicle platforms, if necessary, may be provided as Government Furnished Property to the contractor.

C.3.7 Planning and Developing Tests or Test Plans. The contractor shall plan, develop, modify, and upgrade tests, test plans or procedures, or test scenarios for the purpose of testing or evaluating equipment, to include demonstration hardware, whether developed by the contractor or provided by the Government as Government Furnished Property in accordance with DI-NDTI-80566 Test Plan, CDRL A008.

C.3.8 Conduct Testing. The contractor shall design, set up, and conduct tests or sequences of tests. "Set up" may include (a) physical assembly or arrangement and calibration of test equipment and fixtures, (b) instrumentation of test subjects or items, and (c) preparation of test courses in accordance with Test Plans and Standard Operating Procedures. Execution of testing may include data collection, data analysis, and data reduction as well as the physical iterations of tests or test sequences. Soil, environmental, and durability testing is anticipated in support of developmental and product testing. Testing shall be conducted utilizing Government Furnished Equipment and contractor supplied equipment. Documentation of test results, findings, and analyses that will enable evaluation of requirements shall be in accordance with DI-NDTI-80809 Test/Inspection Report, CDRL A009.

C.3.9 Perform Engineering Studies or Assessments. The contractor shall perform engineering or analytical studies in support of engineering design and concept trade-off studies.

C.3.10 Perform Computer Aided Engineering, Modeling and Simulation. The contractor shall develop or improve Computer Aided Engineering (CAE) models, simulations and Computer Aided Design (CAD) drawings. Such models shall be developed using Commercial off the Shelf (COTS) software and model applications shall become the property of the Government. All software developed shall be in accordance with DI-AVCS-80700 Computer Software Product End Items, CDRL A007.

C.3.11 Fabricate, Maintain, or Upgrade Test Instrumentation and Equipment. The contractor shall build new test and test support equipment, or upgrade or maintain and repair such equipment and fixtures owned by the Government. Such instrumentation or equipment shall remain as Government property.

C.3.12 Hardware Installation. The contractor shall demonstrate the installation of hardware, which may include developing, documenting and providing installation methodology, and participating in on-site installation of hardware onto Government designated vehicle systems. Specific tools or material handling equipment that the

contractor does not possess may be provided by the Government and shall remain property of the Government.

C.3.13 Transition to Government Logistics Support. Develop and maintain logistics support files and engineering data for provisioning for use in transitioning production hardware and software. The files include subcontracted parts lists, sources of supply, manuals, drawing packages, and bill of materials as developed to support contractor and Government testing. Data that is generated should adequately support product support analysis that will be conducted by logistics activities.

C.4 Travel. Travel by the contractor shall occur under this contract only to the extent specified and funded by individual Work Directive. If the Government determines that such travel is necessary, the Work Directive shall state the duration of travel and number of people authorized to travel. Contractor travel is subject to the principles and policies set forth in the Joint Travel Regulation.

C.5 Technical Reporting. In addition to, or as modified by requirements of an individual Work Directive, the following shall apply:

C.5.1 Monthly Cost Report. Beginning 30 days after the issuance of a Work Directive, and continuing monthly thereafter until completion of work, the contractor shall prepare and e-mail a status report to the Contracting Officer's Representative (COR). The report shall indicate (a) the amount of funds expended under that Work Directive for the period specified, (b) cumulative amount expended to date, (c) funds remaining available under the Work Directive, (d) labor hours and dollars expended and (e) material and travel expended. (In months where more than one Work Directive is open and being performed, the contractor shall issue one consolidated report per month covering all open Work Directives, but in that event, the report shall report separately on each open Work Directive, using individual sub-sections within the consolidated report. Monthly report shall be provided in accordance with DI-FNCL-80912 Performance and Cost Report, CDRL A001.

C.5.2 Monthly Technical Report. Beginning 30 days after the issuance a Work Directive, and continuing monthly thereafter until completion of work, the contractor shall prepare and e-mail a status report to the Contracting Officer's Representative (COR). The report shall include details from previous work that has been completed, description of the precise nature and results of the research, development, test, and evaluation accomplished. Furthermore shall include the salient characteristics to include pros and cons, and supporting data and analyses. Monthly report shall be provided in accordance with DI-MISC-80711 Scientific and Technical Reports, CDRL A005.

C.5.3 Final Technical Report. The contractor shall prepare and furnish to the COR a final technical report and summary of the results of work in accordance with DI-MISC-80048 Scientific and Technical Reports Summary, CDRL A004.

C.6 Meetings. A start of work meeting and other technical meetings shall be as specified in individual work directives. The Government expects that any meetings required hereunder shall be held either at the contractor's location or at TARDEC (Warren, Michigan). The contractor shall provide minutes in accordance with DI-ADMN-81505 Report, Record of Meeting/Minutes, CDRL A006.

#### C.7 Contractor Manpower Reporting

C.7.1 The contractor shall report all contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the U.S. Army via a secure data collection site. The contractor is required to completely fill in all required data fields using the Army CMR site, which you can access by clicking on the "Department of Army CMRA" link from the following gateway web address:  
<http://www.ecmra.mil/>

C.7.2 Reporting inputs will be for the labor executed during the period of performance during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year, beginning with 2013. Contractors may direct questions to the Army CMR help desk, which can be contacted using the "Send an email" link on the right side of the sign-in screen at the Army CMR site.

C.7.3 Additional information can be found in the clause in this contract entitled CONTRACTOR MANPOWER REPORTING (52.237-4000).