

ATPD 2218D  
11 Sep 2003

## PURCHASE DESCRIPTION

PLS Bituminous Distributor Module, 2800 Gallon

1. SCOPE. This purchase description establishes the performance, configuration, and system requirements for the Palletized Load System (PLS) Bituminous Distributor Engineer Mission Module.

1.1 Executive Summary. The Bituminous Distributor Engineer Mission Module is a demountable unit capable of repeated use with the PLS Load Handling System and compatible for transport and operation on the PLS Truck and transport on the PLS Trailer. When loaded on a PLS Truck the Bituminous Distributor Engineer Mission Module will provide a means of spreading measured amounts of bituminous materials for road preparation and repair and other Engineer applications. It shall be able to be transported and perform these functions throughout the PLS mission profile. The Engineer Mission Module must be certified for the transport of bituminous materials over public highways and meet all EPA, SAE, DOT, OSHA, FMVSS, and FMCSR requirements applicable to a bituminous distributor in the 2800 gallon capacity class at the time of manufacture.

BENEFICIAL COMMENTS (RECOMMENDATIONS, ADDITIONS, DELETIONS) AND ANY PERTINENT DATA WHICH MAY BE OF USE IN IMPROVING THIS DOCUMENT SHOULD BE ADDRESSED TO: U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENTS COMMAND, ATTN: AMSTA-DSA-HT, WARREN, MI 48397-5000, BY USING A LETTER.

AMSC N/A

FSC

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

2. APPLICABLE DOCUMENTS. The following documents of the issue in effect on the date of invitation for bid or request for proposal form a part of this specification to the extent listed herein.

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government Documents.

2.2.1 Specifications, Standards, and Handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

COMMERCIAL ITEM DESCRIPTION

A-A-50271                      Plate, Identification

FEDERAL STANDARDS

FED-STD-595                    Colors

MILITARY STANDARDS

MIL-STD-209                    Interface Standard for Lifting and Tiedown Provisions  
MIL-STD-1366                    Transportability Criteria

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government Documents. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the solicitation (see 6.2).

PURCHASE DESCRIPTIONS



STANAG 2413            Demountable Load Carrying Platforms

(Application for copies of NATO publications should be addressed to NATO, MIL Agency for Standardization (MAS), 35 Chesam Place, London SW1, England)

SAE STANDARDS AND RECOMMENDED PRACTICE

J163	Low Tension Wiring and Cable Terminals and Splice Clips
J185	Access Systems for Off-road Machines
J300	Engine Oil Viscosity Classification
J336	Sound Level For Truck Cab Interior
J516	Hydraulic Hose Fittings
J517	Hydraulic Hose
J534	Lubrication Fittings
J753	Maintenance Interval Chart
J754	Lubricant Types-Construction and Industrial Machinery
J1128	Low Tension Primary Cable

(Applications for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

2.4 Order of Precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained."

2.5 Revisions. Revisions from the previous version of this Purchase Description are highlighted in yellow.

### 3. REQUIREMENTS.

3.1 System Description. The Bituminous Distributor Engineer Mission Module, hereafter referred to as Module, is intended to be loaded onto and operated on the PLS Truck, hereafter referred to as Truck (6.3.13), from which it will provide a means of spreading bituminous materials for road preparation and repair and other Engineer applications. It shall be able to be transported and perform these functions throughout the PLS mission profile. The Module shall also be transportable on the PLS Trailer, hereafter referred to as PLST (see 6.3.14). The Module will have a capacity of 2800 gallons and will be powered by a slave connection to the Truck. The Module must be certified for the transport of bituminous materials over public highways.

3.2 First Article Test (FAT). The Government shall conduct a FAT consisting of a First Production Unit Inspection (FPUI) and Production Verification Testing (PVT), on a sample quantity of production units. Modules selected for FPUI and PVT shall be made with production hard tooling and processes and be fully representative of the vehicles proposed to be furnished under this contract. All requirements of Section 3 shall be tested and verified in accordance with this specification.

### 3.3 Materials, Processes and Workmanship.

3.3.1 Material. All material shall be new and unused. Recycled material is acceptable when processed to make new material.

3.3.1.1 Ozone depleting substance. Class 1 ozone depleting substance shall not be used in the design, manufacture, test, operation or maintenance of the Module system. Section 326 of Public Law 102-484, National Defense Authorization Act for Fiscal Year 1993 establishes policies for elimination of OZONE DEPLETING CHEMICALS utilized in the manufacture or assembly of components of end items procured under DOD acquisition authority. Any chemical substance, identified as an Ozone Depleting Substance, must be replaced by a NON-DEPLETING substance, or certified to be of such a necessity to the mission requirements of the end item as to prevent the accomplishment of the mission if it cannot be replaced.

3.3.1.2 Radioactive material. No radioactive material shall be used in any part of the Module.

3.3.1.3 Asbestos material. No asbestos material shall be used in any form in any part of the Module.

3.3.1.4 Dissimilar metals. Dissimilar metals (6.3.15) shall not be used in intimate contact with each other unless protected

against galvanic corrosion (6.3.16).

3.3.1.5 Metal Fabrication. Metal used in the fabrication of the Module shall be free from kinks and sharp bends. The straightening of material shall be done by methods that will not cause injury to the metal. Flame-cut material and welds shall be free of slag. All bends of a major character shall be made with controlled means in order to insure uniformity of size and shape. Precautions shall be taken to avoid overheating.

3.3.2 Standard Components, Parts and Accessories. The commercial Module and all components, parts and accessories shall be the standard or optional commercial types to the maximum extent practicable. The Module shall be complete in all respects as normally delivered to users of Bituminous Distributors.

3.3.3 Corrosion Protection. The Module shall be capable of operation in a military environment including extended periods in high humidity, salt spray, road de-icing chemicals atmospheric contamination, gravel impingement, and temperature extremes for a ten-year service life. Surfaces not painted or subject to relative movement or wear shall be alternatively protected from corrosion. There shall be no corrosion requiring repair or replacement of parts between scheduled maintenance. Dissimilar metals shall be electrically insulated from one another to prevent galvanic corrosion. No actions beyond normal washing, scheduled maintenance and replacement of damaged paint shall be necessary to keep the corrosion prevention in effect. Such capability shall be achieved by a combination of production techniques, materials selection and design features. Compliance will be verified during FPUI, PVT and FPT.

3.3.4 Painting. All Modules shall be painted using best commercial practice to meet the Corrosion requirements of 3.3.3. Color shall be 383 Green (color chip 34094) or 686 Tan (color chip 33446) in accordance with (IAW) Fed-STD-595 as specified by the contracting officer. The contractor will make available to the Government documentation which shows compliance to samples of color chips for 383 Green or 686 Tan IAW Fed-STD-595. Compliance will be verified during FPUI and QCI.

3.3.5 Plates. Compliance for the following requirements will be verified during FPUI, PVT, QCI and FPT.

3.3.5.1 Identification, and Data Plates. An Identification Plate shall be provided and shall contain, as a minimum, the model number, nomenclature, national stock number, serial number, USA registration number, contract number, contractor's name, and date of manufacture. A sample Identification plate is provided

in Appendix B, format is optional. The Module shall also have a Transport Data Plate. The Transport Data Plate shall show the Module tare weight, gross weight, and shipping weight (tare weight plus 500 pounds). A Module side and end view shall be used to indicate overall dimensions, lifting and tiedown provisions, and center of gravity locations. Procedures for lifting shall be depicted. Additional Data Plates shall be provided as required. Identification and data plates shall be constructed IAW A-A-50271, Composition A or C, installed in a readily visible location and shall be attached with rivets, screws, or bolts.

3.3.5.2 Instruction, Lubricating, Caution, Warning and Operating Plates. A Lubricating Plate IAW SAE J753 shall be provided except that it shall reference military lubricants. The lubricating plate shall be installed adjacent to the Identification Plate. Instruction, Caution, Warning and Operating plates shall be provided as required. Cautions and warnings shall comply with ANSI Z535.4. Instruction, Lubricating, Caution, Warning and Operating Plates shall be constructed IAW A-A-50271 or equivalent. Rigid metal plates shall be attached with rivets, screws, or bolts. Flexible plates shall use a fastening system adequate to ensure the plate remains attached for the service life of the module.

3.3.5.3 Warranty Data Plate. Each module shall be furnished with a warranty data plate. The plate shall be attached by rivets, screws, or bolts in a conspicuous protected location. The data plate shall contain the following information:

- a. Date the warranty commences.
- b. Warranty period.
- c. Contract number.
- d. Manufacturer's name.
- e. Date of manufacture.

The warranty plate shall have the word "WARRANTY" across the top in bold letters and be approximately 3" X 4". Background material shall be alternating blue and neutral (natural color of material), 45 degree diagonal strips of equal width. The width of each stripe will be approximately equal to the character height. Blue color will approximate FED-STD-595, color number 35250.

3.3.6 Markings. Module markings such as safety and instructional markings shall be letters or numerals one inch in height. Painted markings, letters and numerals shall be lusterless black paint. Color shall conform to Chip No. 37030 of

FED-STD-595. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.3.7 Welding. Welding of the Bitumen Tank shall be IAW ASME Section VIII, Division 1. All other welding shall be accomplished IAW the appropriate AWS standards, or equivalent, as follows:

- AWS D1.1 - Steel
- AWS D1.2 - Structural Aluminum
- AWS D1.3 - Sheet Metal
- AWS D14.3 - Specification for Welding Earthmoving and Construction Equipment

3.3.8 Workmanship. All parts, components, and assemblies of the Module including castings, forgings, molded parts, stampings, machined surfaces, and welded parts shall be clean and free from defects that compromise, limit or reduce the capability of the Module to meet the requirements specified herein. Any components, parts, or assemblies which have been repaired or modified to overcome deficiencies shall not be used without prior specific approval of the Procurement Contracting Officer (PCO). Welded, bolted and riveted construction utilized shall be in accordance with the highest standards of the industry. Any area in which hydraulic or electric lines pass shall be radiused so as to prevent wearing and cutting. All hydraulic lines shall be mounted and secured to prevent chafing due to relative motion. All lubricants provided shall be clean and used IAW their intended use. Wherever possible, components, wiring, fuel lines, and hydraulic lines shall be mounted in protected locations to minimize the possibility of damage from normal use. No evidence of fluid leaks, beyond weep (6.3.7.1) or seep (6.3.7.2), shall be present with the exception of packed joints which shall exhibit no more than one drip (6.3.7.4) per minute. Compliance will be verified during FPUI, PVT, QCI, and FPT.

#### 3.4 PLS Compatibility.

3.4.1 Interface. An M1077 Flatrack (provided as Government Furnished Material) shall form the basis of the Module, i.e., the components of the Module shall be mounted on the M1077. As a part of producing the Module the M1077 shall be modified by the addition of strengthening material added to the cross-members, see Attachment 1. Additional modifications to accommodate the components of the Module are permissible, however, interface points between the PLS and the Module shall be maintained in accordance with STANAG 2413H, Annex A "Interoperable Flatrack Main Dimensions", except when the Spraybar assembly (3.6.4.2) and Speed and Distance Indicating Device (3.6.7) are deployed. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.4.2 Compatibility. The Module shall have rear mounted rollers so that it is compatible with the PLST. The rollers shall be removable for shipping. A storage location for the rollers shall be provided on the Module. The gross weight (6.3.5) of the Module shall not exceed 36,250 pounds. The Module shall be capable of being transported throughout the PLS mission profile without degradation to the Module, Truck or PLST. The Module shall be capable of withstanding the static and dynamic loads imposed during PLS Load Handling System loading/unloading operations. The vertical center of gravity, measured from the ground with the Module off of the Truck, shall not exceed 36 inches when at tare weight and 44 inches when at gross weight. The lateral center of gravity shall be located as close as practicable to the lateral midpoint. The longitudinal center of gravity, when loaded to gross weight, shall be located as far forward as practicable but no further back than 130 inches from the front of the module. The Truck and/or PLST with Module in any loading configuration shall meet all of the performance requirements of ATPD 2304. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.4.3 Loading Indicators. At the top of each leg of the A-frame, vertical spring-mounted wires shall be furnished with a length of 9 +/- 1 inches, to serve as a sight aid to the truck operator. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.4.4 Power Interface. Electrical, pneumatic, and hydraulic power shall be provided to the Module, to the maximum extent practicable, through the Universal Power Interface Kit (UPIK) of the Truck. Additional power requirements, if any, shall be met by a self-contained onboard (the Module) power supply(s). The maximum power available through the Power Interface kit and the performance characteristics of each system will be verified during FPUI, PVT and FPT and are as follows.

3.4.4.1 Electrical. 12-Volt Direct Current (VDC) and 24 VDC are available on separate pins. Maximum current available is 25 Amps for the 12 VDC supply and 25 amps for the 24 VDC supply. Ground connections to the Truck electrical system shall be made through the interface connectors (see Electrical Schematic 3123995, Attachment 2). An adequate number of pins shall be available for connection of Truck mounted accessories.

3.4.4.2 Pneumatic. 120 pounds per square inch (psi) dry, filtered air is available. Maximum flow rate is 20 cubic feet per minute (CFM). Connection is through a quick-disconnect fitting (see Air Schematic 3123996, Attachment 3). Pneumatic hoses shall not exhibit any leaks.

3.4.4.3 Hydraulic. The PLS Hydraulic system uses 10 weight, API Engine Service Classification CD (or better) engine oil as the working fluid. The maximum flow rate available is 30 gallon per minute (GPM) at 3600 psi. Hydraulic hoses shall be provided to hook up to the PLS hydraulic system and shall be compatible with the connectors on the vehicle (see Hydraulic Schematic 3123997, Attachment 4).

### 3.5 Manpower and Personnel Integration (MANPRINT).

3.5.1 Safety and Design. The Module and furnished accessories shall comply with all Federal Motor Vehicle Safety Standards and Federal Motor Carrier Safety Regulations, applicable to hot products and distributors in the 2800 gallon payload capacity class at the time of manufacture, except as specified herein. The Module, parts and components shall be free of sharp projections and/or edges that may cause operator or maintainer injury. Operators and maintenance personnel shall not be unknowingly exposed to rotating or moving parts, hot surfaces, electrically energized components, components containing high pressures, or any other inherently hazardous components or systems. Insulation, enclosures, or guards shall be used as appropriate. All platforms, hand holds and steps, with the exception of the catwalk on the top of the bitumen tank (see 3.6.9), shall be IAW SAE J185 and an integral and permanent part of the Module. All step surfaces and work areas shall be provided with a non-skid surface. A minimum 20-pound ABC rated fire extinguisher and mounting bracket, located on the Module, shall be provided. Compliance will be verified during FPUI, PVT and FPT.

3.5.2 Human Factors. The Module shall be operable by individuals with MOS 62H (Concrete and Asphalt Equipment Operator) and maintainable by individuals with MOS 44B (Metal Worker), MOS 44E (Machinist), MOS 62B (Construction Equipment Repairer), MOS 63G (Fuel and Electrical System Repairer), MOS 63S (Heavy Wheel Vehicle Mechanic, and MOS 63W (Wheel Vehicle Mechanic), wearing the full range of Army clothing including MOPP IV (6.3.10) equipment, but excluding arctic clothing. All operator tasks are to be with a crew of one. The Module should be designed so as to maximize operator and maintainer productivity, with special emphasis on Preventive Maintenance Checks and Services (PMCS) and required travel operations. Compliance will be verified during FPUI, PVT and FPT.

3.5.3 Noise. Under all operating conditions of the Module the steady state noise level at the crew positions shall be minimized, but shall not exceed 103 dBA. Steady state noise levels of 85 dBA or higher at any crew position and under any operating condition shall require warnings (3.3.5.2) requiring

hearing protection to be placed on the module. Steady state noise levels shall be tested IAW SAE J336 or equivalent. Compliance shall be verified during FPUI, PVT and FPT.

### 3.6 Performance Characteristics.

3.6.1 Distribution. Bitumen distribution shall be accomplished through a spray bar assembly. The width of bitumen distribution shall be variable from 8 feet to 12 feet in increments of 1 foot. The rate of bitumen application shall be from 0.1 gallon through 1.0 gallons per square yard in increments of 0.1 gallon per square yard. The spray bar shall apply bitumen to the surface being sprayed at all combinations of specified widths and rates. The accuracy of distribution over a given area shall be within plus or minus 5 percent. The application at all rates and widths shall be accomplished without streaking or puddling. The forward speed for any distribution rate shall be not less than 188 fpm and shall be not more than 1,350 fpm. Compliance will be verified during FPUI, PVT and FPT.

3.6.2 Bitumen Tank. The bitumen tank shall comply with the following requirements:

3.6.2.1 Tank. The tank shall be an elliptical cylinder with a minimum capacity of 2,800 gallons plus not less than 4 percent for contents expansion. The tank material and construction shall be chosen to meet the service life and performance requirements of this specification. All seams shall be bitumen tight. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.2.2 Surge Plate. A minimum of two internal surge plates shall be provided and welded in place. The surge plates shall be the full size of the tank cross section and shall be dished or reinforced to withstand and mitigate the surge pressures generated by bitumen material "sloshing" during vehicle operation throughout the PLS mission profile. "Sloshing" of bitumen material, at any loading, shall not adversely impact Truck or PLST stability. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.2.3 Manhole. A manhole shall be provided with a diameter of not less than 20 inches. The manhole shall comply with DOT regulations. A quick clamp type, bitumen tight cover which can be opened with one hand shall be provided. The cover shall be domed to prevent accumulation of water. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.2.4 Thermometer Well. A well for use with a pencil type thermometer shall be provided in one side of the tank. The well shall be inclined at a slight angle from the horizontal, and

shall be located so that a thermometer inserted in the well will register the average temperature reading of the contents of the tank. A well cap shall be furnished, shall be screwed on the outside end of the well tube, and shall be provided with a retaining chain. The thermometer shall be secured to the well cap. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.2.5 Insulation. The cylinder and heads of the tank shall be covered with an insulating material having a resistance to heat transfer equivalent to or better than 2 inches of fiberglass. The insulating material shall be installed to prevent packing or shifting during use or travel. The insulation shall be protected by a weather tight sheath. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.2.6 Overflow. A minimum 3-inch overflow shall be provided for the tank. The overflow shall be taken off not less than 4 inches above the top of the tank in a dome near the front of the tank and shall conduct the fluid to a point beneath the tank. The manhole may serve as the overflow dome. The bottom of the overflow shall be provided with an extension to prevent any discharge coming in contact with any part of the chassis including the drive train. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.2.7 Drain. A 3 inch outlet that will completely drain the tank shall be located such that the discharge will clear the Module. The outlet shall be fitted with a 3 inch, lever operated type plug valve or a quick-acting gate valve. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.3 Heating System. The heating system shall consist of burners, flues, fuel system, blower, and a portable burner capable of heating the bituminous material in the bitumen tank. The heating system shall operate on both Diesel Fuel and JP-8. Compliance will be verified during FPUI, PVT and FPT.

3.6.3.1 High pressure burners. Two self contained, hydraulically driven diesel fuel oil burners with electronic push button ignition and automatic outfire control shall be provided. Each burner shall be capable of producing a minimum 675,000 BTU per hour at a maximum fuel usage rate of 5 gallons per hour. The burners shall be located so as to be accessible for adjustment and cleaning. The heat supplied shall be sufficient to raise the temperature of the contents of the tank at the rate of 1°F per minute minimum. The fuel consumption for each burner shall be adjustable to include all flow rates from shutoff to maximum required fuel consumption. The contractor shall provide a certification of compliance. Compliance shall be verified

during FPUI, PVT and FPT.

3.6.3.2 Heating flues. Two 8" to 6" return flues, one for each burner, running the full length of the tank shall be provided. The inlet and exhaust opening of each individual set of flues shall be in the same horizontal plane, allowing heating with a minimum of material in the tank. The external stack of the flues shall be constructed of corrosion resistant material. The flues shall be supported in the tank in a manner which will minimize vibration and yet allow for expansion and contraction. Compliance will be verified during FPUI, PVT and FPT.

3.6.3.3 Fuel system. The fuel system shall consist of a fuel tank, fuel pump, and fuel line.

3.6.3.3.1 Fuel tank. Fuel tank shall be located in a manner which will not allow spills or overflows to run onto any hot surface or electrical equipment of the Truck or Module. The tank shall be mounted in a protected location near the front of the Module and be accessible for refueling without obstruction. When the fuel tank is located at a level which is higher than the burner fuel intake, a fuel shutoff valve shall be installed in the fuel supply line to permit burner service or maintenance without draining the fuel tank. Fuel tank filler necks shall be sized to accept a fuel nozzle of minimum 2 inches diameter with sufficient air release clearance. Fuel lines shall be adequately supported and shall be protected against damage. Grommets shall be used where fuel lines pass through frames, bulkheads, or areas where abrasive action could occur. Construction and mounting shall be such that leaks will not develop from operation over the mission profile, vibration, or tightening of mounting devices. The filler cap shall not protrude from the body of the Module and fuel type shall be stenciled near the fuel cap in letters not less than 1 inch high. A fuel tank gauge shall be provided and the lens protecting the gauge shall not allow frost over problem which makes the gauge unreadable. A fuel tank drain petcock valve located at the lowest point shall be furnished. The fuel tank shall have a capacity of not less than 25 gallons. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.3.3.2 Fuel pump. Pumps shall be provided to supply fuel to the burners at constant pressure under all burner operating conditions. The pumps shall be connected to the power source so that pumping will be accomplished only when the burner blower is operating. Compliance will be verified during FPUI, PVT and FPT.

3.6.3.3.3 Fuel line. The fuel line shall be of seamless metal tubing or fuel and oil resistant hose, and shall be equipped with a filter. Compliance will be verified during FPUI, PVT and FPT.

3.6.3.4 Blower. Blowers shall be provided to supply enough air for efficient combustion when both burners are operating at full capacity. Compliance will be verified during FPUI, PVT and FPT.

3.6.3.5 Portable burner. A diesel fuel burning portable burner shall be furnished. The portable burner shall connect to the fuel pump of the lower tank mounted burner. A switch, fuel solenoid valve and pressure relief valve shall be provided to allow the fuel pump to provide pressurized fuel to the portable burner. The portable burner shall have 25' of hose with quick coupler hook up to fuel pump. The portable burner and hose shall be stored in the tool box when not in use. The burner shall be used for heating the pump and spray bar piping. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.4 Circulating System. The circulating system consisting of the bitumen pump, spray bar and piping system shall comply with the following:

3.6.4.1 Pumping unit. The bituminous pumping unit shall consist of a constant displacement hydraulic motor, a positive displacement bitumen pump, hydraulic lines, filters, valves, safety devices and be computer controlled. The bitumen pump shall be of the positive displacement, rotary type having a minimum capacity of not less than 400 gallons per minute. Provision shall be made for heating the pump with the portable burner. The pump shall supply bitumen through the spray bar to the ground at a maximum rate which will apply not less than 1.0 gallons per square yard over the full 12 foot width when the distributor is traveling at a forward speed of not less than 188 feet per minute (fpm). The pump shall supply bitumen to a 12-foot spray bar with sufficient pressure to produce an even, fan like spray from all nozzles at all rates of application within the distribution range. The pump shall be equipped with a bypass or other means to prevent damage to the lines when the discharge is closed. The pump driveline shall be inherently protected from damage at stall. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.4.2 Spraybar and Piping. The spray bar shall be a full-circulating type and shall consist of an 8 foot long center section with two 1 foot long non-removable folding wings and two 1 foot long removable extensions to make a total spray bar length of 12 feet long. All spray bar pivot points shall have lubrication fittings to prevent damage/seizure of pivot points. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.4.2.1 Circulation. The spray bar shall circulate bitumen through the full 12-foot length with the temperature of the bitumen varying no more than 10°F throughout the length of the

spray bar. Compliance will be verified during FPUI, PVT and FPT.

3.6.4.2.2 Fold-up Extensions. Provisions shall be made for travel to fold up the end sections of the spray bar with or without extensions. When folded, the spray bar shall not exceed a width of 96 inches. The spray bar shall lock in this folded position. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.4.2.3 Spraybar adjustments. The spray bar shall be adjustable for both positive and negative road crown. When the spray bar is set for no crown, the elevation of the spray bar nozzle shall not vary by more than +/- 1/2 inch throughout the length of the 12-foot spray bar. Adjustment of the 8 foot main section of spray bar (laterally and vertically) and the two 1 foot non-removable extensions (folding) shall be remotely controllable from the cab. Lateral adjustment from the center shall be not less than 8 inches to the right and left. The vertical adjustment range shall be from 2 inches below normal operating height to raised travel position. The normal operating height shall be established by the contractor and shall be marked so as to be obtainable by the operator without measuring. Compliance will be verified during FPUI, PVT and FPT.

3.6.4.2.4 Spraybar Stowage. The spraybar assembly shall have provisions for completely stowing the assembly such that the Module can be loaded and unloaded from the Truck or PLST without damage or interference. When the spraybar assembly is stowed the Module shall meet the dimensional requirements of 3.7.1 and shall automatically cut off the flow of bitumen. The spraybar assembly shall be configured so that it can be deployed into operating position by the operator without the need for special tools or adjustments and shall not interfere with the operation of the truck. Compliance will be verified during FPUI, PVT and FPT.

3.6.4.2.5 Breakaway. A break-away system shall be furnished in the hydraulic main spray bar lift mechanism which will allow the spray bar to raise up after striking the ground but not allow it to fall to the ground. The extended portions of the spray bar shall breakaway without damage to the spray bar or other parts of the distributor when they strike an obstruction while the distributor is moving forward or backward. Compliance will be verified during FPUI.

3.6.4.2.6 Nozzles. Drip-less spraybar nozzles shall be provided that permit application rates of 0.1 to 1.0 gallons per square yard over the full width of the spraybar and with a variety of bituminous materials. As delivered, the module shall be capable of an application rate of 0.2 to 0.55 gallons per square yard. Any additional nozzle sets required to meet the overall

application rate requirement shall be provided in an appropriate stowage container that fits in the stowage box. An individual, drip-less valve shall be furnished for each nozzle so that flow from any individual nozzle can be stopped without stopping the flow from an adjacent nozzle or nozzles. All nozzle valves shall be linked together so that they can be opened or closed simultaneously by a single lever operation. The spray bar end sections shall fold up or fold back and lock in this position to allow application of bitumen through the center section only. When an end section, with or without extensions, is folded up or back, as applicable, the nozzle valve linkage shall automatically shut off all valves in the end section, and nozzle valve linkage in the folded end section shall automatically become inoperative without manual disconnect. The spray bar ends shall shut off at any point up from the folded down position. Nozzle valve linkage in the unfolded center section of the spray bar shall remain responsive to the single lever operation. When the folded end section is extended, the nozzle valve linkage in the end section shall automatically become responsive to single lever operations. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.4.2.7 Flushing. Provisions shall be made by reverse pumping or equivalent valving to transfer the unsprayed bitumen from the spray bar piping back into the tank. Piping shall be arranged so that the spray bar, all piping, and the pump can be flushed and cleaned by introducing a flushing oil into the circulating system. No flushing oil shall enter the bitumen tank during flushing. Compliance will be verified during PVT and FPT.

3.6.4.2.8 Piping. All piping and connections for loading, transferring, circulating, and hand-spraying bituminous materials shall be furnished. All flexible hose incorporated in piping shall be seamless steel and shall have a single, wire-braid, protective covering. The hose bursting pressure shall be not less than 700 pounds per square inch (psi). All couplings used with the flexible hose shall be those furnished by the hose manufacturer. The couplings shall be installed as recommended by the hose manufacturer, and any hose bending radius shall be not less than that recommended by the hose manufacturer. Left load line shall be furnished. Loading and transfer line piping shall be not less than 3-inch inside diameter pipe. All valves subjected to pumping pressure shall be the leak proof type. The system shall be arranged so that the pump and all the pipes may be drained without draining the bitumen tank. The contractor shall provide a certificate of compliance for hose and valve burst pressure. Compliance will be verified during FPUI, PVT, and FPT.

3.6.5 Metering Device. A microprocessor based bitumen metering device protected from heat, shock, and vibration shall be

furnished. The device shall control the application rate of bituminous material IAW best commercial practice. The device shall determine application rate using, as a minimum, vehicle speed, application rate set point, asphalt spray width, and asphalt pump speed (flow rate). Key features must include a hardened power supply and input/output protection from transients and surges, EEROM program memory accessible through an RS-232 port, and built-in diagnostics. Overall application accuracy shall be +/- 2% over normal distribution scenarios. Compliance will be verified during FPUI, PVT and FPT.

3.6.6 Controls. All necessary controls for spray application and spray bar circulation shall be accessible to the operator while seated in the cab. All other controls necessary to perform the operations specified herein shall be accessible without removal of any housing or part. All controls shall be clearly identified with permanently affixed identification. Material used for identification marking shall be corrosion resistant. Compliance will be verified during FPUI, PVT and FPT.

3.6.6.1 Cab Mounted Controls. A cab mounted control box shall be provided that is readily removable and visible to the operator when seated in the driver's seat of the Truck. Removal or installation of the control box shall be accomplished by the operator in five minutes or less and without the use of tools. A storage space for the control box, for use when not mounted in the cab of the Truck, shall be provided on the Module. Switches and displays on the control box shall be protected from damage during handling. Threads on strain relief connections shall have thread locking compound applied to prevent loosening. Interconnection between the control box and the Module shall be IAW 3.4.3.1. Controls shall be provided to permit the following operations/indicators:

- a. Master Power
- b. Turn bitumen flow from the spraybar on or off
- c. Vertically raise/lower the spraybar
- d. Shift spraybar laterally
- e. Vertically raise/lower the spraybar wings
- f. Adjust application rate
- g. Adjust circulation rate
- h. Low tank level warning light

- i. Digital display of all distribution parameters

Note: Compliance will be verified during FPUI, PVT and FPT.

3.6.6.2 Module Mounted Controls. Module mounted controls shall be provided for all functions not included on the Cab mounted control box. The controls shall be located in a readily accessible location(s) and shall be protected from adverse environmental conditions. Controls shall be provided to permit the following operations:

- a. Pump bitumen from an external source into the bitumen tank.
- b. Pump bitumen from an external source to another external source without bitumen entering the tank.
- c. Pump bitumen from the bitumen tank back to the bitumen tank without the bitumen entering the spray bar.
- d. Pump bitumen from the bitumen tank through the spray bar back to the bitumen tank.
- e. Pump bitumen out of the bitumen tank to an external source without the bitumen entering the spray bar.
- f. Pump bitumen out of the bitumen tank to the hand spray attachment.
- g. Withdraw bitumen from the spray bar and all piping and return it to the bitumen tank.
- h. Pump flushing oil through all piping and the spray bar without the flushing oil entering the bitumen tank.
- i. Withdraw bitumen from the hand spray attachment or blow out hand spray attachment.
- j. Controls for storing/deploying the spraybar mechanism between the transport and operation positions.

Note: Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.7 Speed and Distance Indicating Device. Speed and distance measurement shall be provided by a radar system. The readout of the radar system shall be part of the digital display on the cab mounted control box (see 3.6.6.1). The measurement portion of the radar system shall be configured so that it can be deployed into operating position by the operator without the need for special tools or adjustments and shall not interfere with the

operation of the truck. The radar system shall not require periodic calibration or adjustment by the operator. The radar system shall provide the following information to the operator:

a. Traveling speed indicator reading in fpm from 0 to not less than 1,500, graduated in increments of not more than 20. The accuracy of this indicator shall be such that the indicated speed shall be within 5 percent of the actual speed.

b. Trip indicator reading to 9,999 feet, with zero reset. The accuracy of this indicator shall be such that the indicated distance traveled shall be within 5 percent of the actual distance traveled.

Note: Compliance will be verified during FPUI, PVT and FPT.

3.6.8 Accessories. A power wash down system, one filling hose, a tank gauge, thermometers, a complete hand spray attachment, and fittings shall be furnished with each Module. Provisions shall be made to carry the accessories on the Module when they are not in use. Provisions for storing a second filling hose shall be provided. Accessories shall remain in their carrying places when the Module is transported and operated as specified herein. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.8.1 Filling hose. The filling hose shall be a 15-foot length of 3 inch, flexible, galvanized steel hose, high temperature type. The hose shall be fitted on both ends with hose end components for a 3 inch quick disconnect coupling with tethered dust caps to seal the ends of the hose when not in use. Compliance will be verified during FPUI, PVT and FPT.

3.6.8.2 Tank gauge. A rear mounted tank gauge of the mechanical type shall indicate the amount of bitumen in the tank. The gauge shall be calibrated in gallons from zero to tank capacity in increments of not more than 50 gallons. The gauge shall have accuracy such that the indicated amount of bitumen shall be within 25 gallons of the actual amount of bitumen in the tank. The gauge shall be protected from breakage and shall be located and sized so as to be readable from the ground when the Module is loaded on the Truck. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.8.3 Thermometer. The thermometer shall be an armored, pencil type, with a range of from 50°F to 450°F, and suitable for use in the thermometer well as specified in 3.6.2.4. A supplemental four-inch dial type thermometer shall be furnished and located adjacent to the pencil type thermometer. Compliance will be verified during FPUI, PVT and FPT.

3.6.8.4 Hand Spray Attachment. The hand spray attachment shall consist of a spray tube with nozzle, handle and control valve, cutoff valve, and a half coupling for connection to the hose. The hose shall be flexible, minimum 1 inch diameter, 25 feet in length, insulated, compatible with all bituminous materials, and furnished with quick disconnect couplings on each end. The hand spray attachment point to the circulation system shall be equipped with a faucet end half coupling for connection to the hose and a chain secured dust cap. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.8.5 Fittings. All components shall be compatible with 3 inch, quick disconnect couplings. Two double adapters for a 3 inch, quick disconnect coupler and one faucet end with chain secured dust cap for a 3 inch quick disconnect coupler shall be provided. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.8.6 Distribution chart. In order to adjust the rate of application of bitumen, three variables shall be controlled. These variables are bitumen pump rate (gpm), vehicle speed (fpm), and width of spray bar (ft). Charts shall provide combinations of settings for pump rate and vehicle speed given predetermined values for rate of application and width of the spray bar. These charts shall be included in the operator's manual and affixed to the cab mounted control box. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.9 Platforms, Catwalks, and Steps. A catwalk shall be provided on top of the bitumen tank from front to rear. The catwalk shall be exempt from the handrail, guardrail, and foot barrier requirements of SAE J185. A single set of steps shall be provided at the front of the Module for access to the top catwalk and manhole. All Platforms, Catwalks, and Steps shall have non-slip surfaces. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.10 Lubricants. Selection of lubricants shall conform to SAE J754 and SAE J300 or the military equivalents. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.10.1 Lubrication. All surfaces requiring lubrication shall be provided with means of lubricating. A lubrication data plate (see 3.3.5.2) identifying the lubrication points shall be mounted on each distributor. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.10.2 Lubrication fittings. To the maximum extent practicable all surfaces requiring lubrication, i.e., each point

where two moving surfaces are in contact under pressure, shall be permanently lubricated (6.3.8). All other surfaces requiring lubrication shall be provided with accessible lubrication fittings IAW SAE J534. When used, lubrication fittings shall be located in a protected position and be accessible to a grease gun with a flexible 10-inch extension. Accessibility shall be provided without removal or adjustment of accessories or parts. The contractor shall provide a certificate of compliance. Compliance will be verified during FPUI, PVT, and FPT.

3.6.11 Electrical System. All electrical connections on the Module shall be waterproof or protected from corrosion through the proper choice of materials and/or application of boots, covers, or corrosion resisting compounds. All wiring provided shall be IAW SAE J1128. Wiring not protected from accidental contact with troops, terrain, or vegetation shall be a minimum of 14 gage. Electrical splices and terminals shall conform to SAE J163. Tethered protective caps or plugs shall be provided for all connectors when not in use. Electrical connectors which use removable pins/sockets shall have a pin/socket in all positions. All multi-conductor electrical cords shall be strain relieved as close as practicable to where individual wire connections are made to prevent inadvertent damage to the connections. The contractor shall provide a certificate of compliance. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.12 Lighting. Two rear mounted work lights, one on either side of the Module, shall be provided. The work lights shall be of sufficient intensity that under any lighting condition a driver seated in the cab of the Truck can see the right and left spray bar tips and the ground below in the right and left outside rear view mirrors of the Truck. The work lights shall be protected from brush damage. Direct illumination shall be provided for the rear control panel (3.6.6.2). The rear mounted work lights and control panel lights shall be operable from a single switch mounted on the rear control panel. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.13 Hydraulic Hoses. Hydraulic pressure hoses shall be single or double wire braid, rubber covered, conforming to SAE J517, and hose fittings shall conform to SAE J516. Hydraulic hoses shall be routed to prevent chafing or crushing. The contractor shall provide a certificate of compliance. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.6.14 Stowage. To secure and stow tools and equipment four stowage boxes shall be provided. Storage boxes shall be designed so rodents cannot enter. Storage box door latches shall be designed so they remain latched over uneven terrain. The stowage boxes shall be equipped with a hasp, compatible with padlocks

with a 0.323" diameter shackle, to secure the contents of the stowage box. Compliance will be verified during FPUI, PVT, and FPT.

3.6.14.1 Padlocks. Four (4) padlocks with chains conforming to NSN 5340-00-158-3807 shall be provided. The padlocks on each module shall be keyed alike such that one key can open all four locks. Two keys shall be provided with each lock.

3.6.15 Placard Kit. A placard kit, conforming to FMCSR 172.504, will be supplied with each module. Mounting provisions shall be provided and shall permit installation of the placards with common hand tools. The placard kit shall consist of four placards, two of which mount to the each side of the module, one which mounts to the rear of the module, and one which mounts to the front skid plate of the Truck. The materials which must be identified are road asphalts (UN1999), bitumen or cut backs (UN 3256), and elevated temperature non flammable (UN3257). Compliance will be verified during FPUI, PVT, and FPT.

3.6.16 Personnel Protection Equipment.

A clear face shield meeting OSHA requirements shall be provided for the operator. A protective bag and suitable stowage location shall be provided to minimize scratching and damage of the face shield. Two pairs of Insulated, Heat Protective Gloves (NSN 8415-01-092-3910) shall also be provided. Compliance will be verified during FPUI, PVT, and FPT.

3.7 Dimensions and Weight. The dimensions and weight for the Module alone and with the Spraybar Assembly (3.6.4.2) and Speed and Distance Indicating Device (3.6.7) stowed, shall be as stated below. Compliance will be verified during FPUI, PVT, QCI and FPT:

- a. Overall height shall not exceed 98 inches.
- b. Overall width (6.3.12) shall not exceed 96 inches.
- c. Overall length shall not exceed 240 inches (for transport).
- d. Tare weight (6.3.4) of the Module shall not exceed 11,000 lbs.

3.8 Reliability, Maintainability, and Durability.

3.8.1 Mission Reliability. The Module shall demonstrate a Mean Time Between Essential Function Failure of at least 120 hours based on Truck engine operating hours.

3.8.2 Maintainability. Scheduled daily maintenance (operator) shall not exceed 1/2 hour (30 minutes) as a combination of before and after operation maintenance. Operator services shall be completed with on-board tools (BII), either existing PLS BII or Module BII. Scheduled quarterly maintenance shall not exceed 2 hours. All scheduled and unscheduled maintenance must be performed with existing PLS common or special tools as documented within the PLS DA Technical Manuals. The mean time to repair for all essential unscheduled maintenance demands shall not exceed one hour.

3.8.3 Durability.

3.8.3.1 PLS Transport. There shall be no evidence of permanent deformation or fatigue cracking whatsoever after completing 2500 miles on a Truck and 2500 miles on a PLST. The mileage will be run over the following mission profile with the Module at gross weight for 75% of the mileage and at Tare weight for 25% of the mileage (evenly split between the three terrain types):

PERCENT	TERRAIN	TOTAL MILES	MISSION CYCLES
75	Secondary Roads	1875	19
20	Trails	500	5
5	Rough Trails	125	3*

\*There will be a cycle at the beginning, middle and end of test.

At the conclusion of each mission cycle, the Module will be unloaded from the Truck and/or PLST. There shall be no evidence of permanent deformation or fatigue cracking after completion of the test. Compliance will be verified during PVT and FPT.

3.8.3.2 Fatigue Strength. There shall be no evidence of fatigue cracking or deformation of any kind after completion of 1000 fatigue cycles (6.3.6.2) on the Truck, or a simulation of the Truck, while loaded to 39,875 pounds (36,250 pounds gross weight + 10%). Compliance will be verified during PVT and FPT.

3.8.3.3 Load/Transfer/Unload Cycles. There shall be no evidence of permanent deformation or fatigue cracking after completing 100 Load/Transfer/Unload cycles (6.3.6.3) while loaded to gross weight. All components shall be in serviceable condition after completion of 100 cycles. Compliance will be verified during PVT and FPT.

3.9 Transportability. The Module shall be transportable worldwide without special permits by highway, rail, marine, and air modes worldwide. The transportability criteria shall be as specified in MIL-STD-209 and MIL-STD-1366. Preparation, by two

crewmembers, for transport by any mode shall not exceed 15 minutes using authorized on-board equipment. Compliance will be verified during FPUI, PVT and FPT.

3.9.1 Lifting and Tiedown Provisions. The Module shall be equipped with lifting and tiedown provisions that meet the requirements of MIL-STD-209 except that the testing shall be conducted at the tare weight plus 500 pounds instead of the gross weight. Lifting slings shall not adversely contact any part of the Module. Cable guides, if required, shall prevent the lifting slings from slipping fore or aft for any lifting scenario. The guides shall be positioned on center with the front and rear lifting provisions and not add to the Module width. The guides shall be able to accommodate up to 2-inch diameter lifting slings. Radiuses shall be 3-inch minimum. Compliance will be verified during FPUI, PVT, QCI and FPT.

3.9.2 Cargo Aircraft Transport. The Module shall be capable of being transported on the C-130, C-141, C-5, and C-17 aircraft while secured to a 463L pallet train while at tare weight plus 500 pounds. Compliance will be verified during PVT and FPT.

3.9.3 Rail Transport. The Module alone (without Truck) loaded on a 50-inch high railcar shall meet the dimensional requirements of the Association of American Railroads (AAR) Outline Diagram for Single Loads, Without End Overhang, on Open-Top Cars, which applies to standard-gauge rail lines in the Continental United States (CONUS). The Module shall meet rail impact requirements for commercial rail transport. Rail impact testing shall be performed IAW Appendix A, with the Module at tare weight plus 500 pounds, without degradation or damage. Compliance will be verified during PVT and FPT.

3.9.4 Reserved

3.10 Environmental conditions: The Module shall be capable of being transported and stored (empty) in a temperature range of +120°F to -50°F. Additionally the Module shall be capable of meeting all bituminous spreading operations in the temperature range of +120°F to +30°F. Compliance will be verified during PVT and FPT.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility For Inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or this specification, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any inspections set forth in this specification where such inspections are deemed necessary to assure supplies and service conform to prescribed requirements.

4.1.1 Responsibility for Compliance. All items must meet all requirements of Sections 3 and 5. The inspections set forth in this specification shall become part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government, for acceptance, comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Government Verification. All quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of (a) surveillance of the operation to determine that practices, methods, and procedures of the written quality assurance system plan are being properly applied, and (b) Government product inspection to measure the quality of the product offered for acceptance. Deviation from the prescribed procedures or instances of poor manufacturing practices, which might have an adverse effect upon the quality of the product, will immediately be called to the attention of the contractor. Failure of the contractor to promptly correct deficiencies shall be cause for suspension of acceptance until corrective action has been made, or until the conformance of the product to prescribe criteria has been demonstrated.

4.1.3 Parts and Components. The contractor, when requested, shall make available for Government inspection, legible drawings and printed specifications to which the end item or any of this parts/components were manufactured. Such drawings and specifications shall be annotated to reflect the latest revision incorporated therein. Upon completion of inspection(s) by the Government, all drawings and specifications will be returned to the contractor. The Government reserves the authority to inspect

end items or any parts/components during all manufacturing processes and reject such material that does not conform to either Government or contractor drawings/specifications. All deficiencies detected during any contractor or Government inspection (end item or in-process) shall be corrected by the contractor at no cost to the Government. During any Government inspection, the contractor shall provide inspection assistance upon request.

4.1.4 Certification Requirements. In 4.7 (inclusive) of this document, the contractor is required to certify that specified requirements have been met. This is usually done in lieu of a government examination or test. Details as to the requirements for a certification and recertification shall be found in the contract.

4.2 Classification of Inspections. The inspection requirements specified herein are classified as follows (ref Table I):

- a. First Production Unit Inspection (FPUI) (4.4.1).
- b. Production Verification Test (PVT) (4.4.2).
- c. Quality Conformance Inspection (QCI) (4.5).
- d. Follow-On Production Test (FPT) (4.6).

TABLE I

CLASSIFICATION OF EXAMINATIONS AND TESTS

The examinations/tests referenced in this table may be modified at the discretion of the Government by the deletion or addition of inspections to assure adherence to specifications/contractual requirements.

TEST LOCATION

First Production Unit Inspection (FPUI)	Place of Manufacture
Production Verification Test (PVT)	Government Proving Ground
Quality Conformance Inspection (QCI)	Place of Manufacture
Follow-on Production Test (FPT)	Government Proving Ground

<u>TITLE</u>	<u>RQMTS</u>	<u>METHOD</u>	<u>FPUI</u>	<u>PVT</u>	<u>QCI</u>	<u>FPT</u>
Materials	3.3	4.1.4		X		
Corrosion	3.3.3	**	X	X		X
Painting	3.3.4	**	X		X	
Plates*	3.3.5	**	X	X	X	X
Markings	3.3.6	**	X	X	X	X
Welding*	3.3.7	4.3.1	X	X	X	X
Workmanship	3.3.8	**	X	X	X	X
Interface	3.4.1	**	X	X	X	X
Compatibility	3.4.2	**	X	X	X	X
Loading Indicators	3.4.3	**	X	X	X	X
Power Interface	3.4.4	**	X	X		X
Safety and Design	3.5.1	**	X	X		X
Human Factors	3.5.2	**	X	X		X
Noise*	3.5.3	**	X	X		X
Distribution	3.6.1	**	X	X		X
Tank	3.6.2.1	**	X	X	X	X
Surge Plate	3.6.2.2	**	X	X	X	X
Manhole	3.6.2.3	**	X	X	X	X
Thermometer Well	3.6.2.4	**	X	X	X	X
Insulation	3.6.2.5	**	X	X	X	X
Overflow	3.6.2.6	**	X	X	X	X
Drain	3.6.2.7	**	X	X	X	X
Heating System	3.6.3	**	X	X		X
High Pressure						
Burners*	3.6.3.1	**	X	X		X
Heating Flues	3.6.3.2	**	X	X		X
Fuel Tank	3.6.3.3.1	**	X	X	X	X
Fuel Pump	3.6.3.3.2	**	X	X		X
Fuel Line	3.6.3.3.3	**	X	X		X
Blower	3.6.3.4	**	X	X		X
Portable Burner	3.6.3.5	**	X	X	X	X
Pumping Unit	3.6.4.1	**	X	X	X	X
Spraybar/Piping	3.6.4.2	**	X	X	X	X
Circulation	3.6.4.2.1	**	X	X		X
Foldup Extensions	3.6.4.2.2	**	X	X	X	X
Spraybar Adj.	3.6.4.2.3	**	X	X		X
Spraybar Stowage	3.6.4.2.4	**	X	X		X
Breakaway	3.6.4.2.5	**	X			
Nozzles	3.6.4.2.6	**	X	X	X	X
Flushing	3.6.4.2.7	**		X		X
Piping*	3.6.4.2.8	**	X	X		X
Metering Device	3.6.5	**	X	X		X
Cab Controls	3.6.6.1	**	X	X		X
Module Mounted						
Controls	3.6.6.2	**	X	X	X	X
Speed/Distance						
Indicator Device	3.6.7	**	X	X		X
Accessories	3.6.8	**	X	X	X	X

<u>TITLE</u>	<u>RQMTS</u>	<u>METHOD</u>	<u>FPUI</u>	<u>PVT</u>	<u>QCI</u>	<u>FPT</u>
Filling Hose	3.6.8.1	**	X	X		X
Tank gauge	3.6.8.2	**	X	X	X	X
Thermometer	3.6.8.3	**	X	X		X
Hand Spray Attach	3.6.8.4	**	X	X	X	X
Fittings	3.6.8.5	**	X	X	X	X
Distribution charts	3.6.8.6	**	X	X	X	X
Platforms/Catwalks and Steps	3.6.9	**	X	X	X	X
Lubricants	3.6.10	**	X	X	X	X
Lubrication	3.6.10.1	**	X	X	X	X
Lubrication fittings	3.6.10.2	**	X	X		X
Electrical Sys*	3.6.11	**	X	X	X	X
Lighting	3.6.12	**	X	X	X	X
Hydraulic Hoses*	3.6.13	**	X	X	X	X
Stowage	3.6.14	**	X	X		X
Placard Kit	3.6.15	**	X	X		X
Personnel Protection Equipment	3.6.16	**	X	X		X
Dimensions & Weight	3.7	**	X	X	X	X
PLS Transport	3.8.3.1	**		X		X
Fatigue Strength	3.8.3.2	**		X		X
Load/Transfer/ Unload Cycles	3.8.3.3	**		X		X
Transportability	3.9	**	X	X		X
Lift and Tiedown*	3.9.1	**	X	X	X	X
Cargo Aircraft Transport	3.9.2	**		X		X
Rail Transport	3.9.3	**		X		X
Environmental conditions	3.10	**		X		X

\* Indicates Certification Requirements (4.1.4) apply.

\*\* Indicates that the Method is included in Sect 3.

4.3 Inspection Conditions. Unless otherwise specified the inspections cited in Table I may be conducted at any ambient temperature between 30 degrees F and 120 degrees F at any ambient humidity, solar radiation, and precipitation and within the mission profile.

4.3.1 Welding. Certification shall be furnished that the Module (except Bitumen Tank) was welded IAW AWS D1.1, D1.2, D1.3, and D14.3 (where steel stock, sheet metal or aluminum have been used) and the Bitumen Tank was welded IAW ASME Section VIII, Division 1. Welds shall be visually examined. Other records, such as welder certifications, shall be examined to validate compliance with AWS D1.1, D1.2, D1.3 and D14.3 and ASME Section VIII,

Division 1.

#### 4.4 First Article Test

##### 4.4.1 First Production Unit Inspection

4.4.1.1 In-Process Inspection. During fabrication of the first production unit, in-process inspections will be conducted by Government representatives to evaluate conformance of materials and workmanship to requirements of specified documents. The Module and all components shall be available for inspection. These inspections shall be made at the contractor or subcontractor's facilities prior to application of primer and paint. Processing and welding procedures, quality system, inspection records, calibration procedures, radiographic procedures and welder certifications will be reviewed and evaluated during the in-process inspections.

##### 4.4.1.2 Completed First Production Unit Inspection

4.4.1.2.1 Contractor Inspection. The first production unit shall be inspected by the contractor at the place of manufacture. The First Production Unit Inspection shall include as a minimum the inspections referenced in Table I. Upon completion of testing, the contractor shall submit the Module (and make available all inspection records and certifications) to the responsible Government inspection element at contractor's or subcontractor's plant for preliminary inspection. The Government at its option may elect to witness and participate in the contractor inspections and road tests.

4.4.1.2.3 Provisional Inspection. The first production unit shall be subject to provisional inspection at the contractor's or sub-contractor's plant by representatives of Government procuring activity. At the time of this inspection the contractor shall make available his inspection plan, inspection records and certifications pertinent to the Module and components. The contractor shall provide inspection assistance upon request.

4.4.1.2.4 Repair of Defects. Defects found as a result of above inspection shall be corrected by the contractor at no additional cost to the Government. Failure of the contractor to promptly correct defects shall be cause for suspension of acceptance of production units until corrective action has been accomplished.

4.4.1.2.5 Unit Disposition. After successful completion of inspection, the first production unit shall be shipped to the Government test site at contractor expense. No configuration changes may be implemented on production units after Government conditional approval of the first production unit without written authorization for the Government.

#### 4.5 Quality Conformance Inspection

4.5.1 Final Inspection of Each Production Unit. Each production Module shall be subjected to a complete final inspection by the contractor as described in 4.5.1.1. The government at its option may elect to participate in the final inspection.

4.5.1.1 Quality Conformance Examination. Each Module shall be inspected by the contractor and shall include, as a minimum, those examinations/tests referenced in Table I. The purpose of the final inspection is to verify conformance of produced end items to the requirements of this specification. The inspections shall be conducted utilizing a contractor/sub-contractor prepared and government approved Final Inspection Record (FIR).

4.5.1.2 Examination or Test Failure. If any Module fails to pass any examinations or tests (4.5.1.1) specified herein, the Government shall withhold acceptance until evidence has been provided by the contractor that corrective action has been taken to correct such deficiencies.

4.6 Follow-on Production Test (FPT). The Government may randomly select Module's at any time during the production contract period and subject these Module's to all applicable tests referenced in Table I (minimum) as well as a 2,500 mile (1,250 miles on Truck and 1,250 miles on PLST) durability test. Tests shall be conducted by the Government at a Government test site. The test Module's shall be subjected to Quality Conformance Inspection by the contractor in accordance with 4.5.

4.6.1 Test Deficiencies. Deficiencies found during or as a result of the FPT, shall be prima facie evidence that all Module's produced since PVT or the last acceptable FPT are similarly deficient. This shall be cause for rejection of all Module's produced since the last acceptable test, unless evidence to the contrary is produced which is satisfactory to the PCO or until corrective action has been taken to repair and correct the deficiency. Such deficiencies on all Modules shall be corrected by the contractor at no additional cost to the Government. Corrective action carried out as a result of FPT deficiencies shall be successfully demonstrated during a full retest of that portion of the FPT.

4.7. Method Of Inspection. The examinations and tests depicted in Section 4 are the minimum required to determine a conformance to the requirements delineated in Section 3 of this purchase description. Additional examinations and tests by the contractor may be required to determine conformance to specification requirements.

5. PREPARATION FOR DELIVERY.

5.1 Preservation, Packaging, Packing and Marking. Preservation, packaging, packing and marking for the desired level shall be in accordance with applicable packaging requirements specified in the contract or purchase order.

5.2 Servicing and Adjusting. Prior to acceptance of the Modules by the Government, contractor shall service and adjust each Module including at least the following: adjustment of electrical system; complete lubrication of mounted equipment with standard commercial lubricants; and check of the continuity of the electrical system.

6. NOTES.

6.1 Intended Use. The Bituminous Distributor Module is intended to be transported and operated on the PLS Truck and transported on the PLS Trailer. The Bituminous Distributor Module will be used to spread bituminous material at engineering and construction sites for purposes of preparing and repairing roads under worldwide climatic conditions in a military environment.

6.2 Ordering Data. As specified in the contract or purchase order.

6.3 Definitions.

6.3.1 Standard Components, Parts and Accessories. Standard Components, Parts and Accessories are defined as components, parts and accessories of the latest model/series which have been manufactured, and marketed at the required rated capacity to the commercial Bituminous Distributor truck industry for at least one year preceding the issuance of the request for technical proposals. The standard components, parts and accessories shall be as represented in the manufacturer's technical data and information. The technical data and information herein referenced shall be identical to the specification and technical material furnished by the offerors to their commercial customer.

## 6.3.2 Reserved

6.3.3 Weights, Payloads and Ratings. Component rating shall be manufacturer's current published rating for on/off road operating conditions as specified in Section 3. Component rating shall not be raised to meet the requirements of this specification.

6.3.4 Tare Weight. The tare weight shall include the weight of the Module, all attachments, accessories, equipment, BII, and a full complement of fuel, lubricants, coolant, and hydraulic fluid (as required).

6.3.5 Gross Weight. Gross weight is defined as the tare weight plus the maximum payload. Gross weight shall not exceed 36,250 pounds.

6.3.6 Load Cycle.

6.3.6.1 LHS Cycle. An LHS cycle shall start when a Module loaded to a predetermined payload is on the ground, and the Truck Load Handling System (LHS) is in a secure non-load/unload position at the front of the Truck. Next the LHS shall attach to the Module, load and secure it to the Truck. Next the LHS shall unsecure the Module and unload it to the ground, and finally the

LHS will return to it's original position.

6.3.6.2 Fatigue Cycle. A fatigue cycle is that portion of the LHS cycle which creates the highest stress on the Module. To reduce test time only this portion of the cycle is performed.

6.3.6.3 Load/Transfer/Unload Cycle. A Load/Transfer/Unload cycle shall start when a Module loaded to a predetermined payload is on the ground, and the Truck LHS is in a secure non-load/unload position at the front of the Truck. Next the LHS shall attach to the Module, load and secure it to the Truck. Next the LHS shall unsecure the Module and transfer and secure it to the PLST. Next the LHS will unsecure the Module from the PLST then transfer and secure it back to the Truck. Next the LHS will unload the Module to the ground, and finally the LHS will return to it's original position.

6.3.7 Fluid Leaks. The following definitions shall be used for the classification of defects for leaks:

6.3.7.1 Weep. Any non-recurring evidence of fluid beyond the seal.

6.3.7.2 Seep. Any recurring evidence of fluid beyond the seal that does not result in formation of a droplet.

6.3.7.3 Droplet. Any non-recurring evidence of fluid beyond the seal that results in formation of a droplet.

6.3.7.4 Drip. Any recurring evidence of fluid beyond the seal where droplet forms and falls.

6.3.8 Permanently Lubricated. Through choice of materials and/or sealing methods the lubricating qualities of a joint are maintained for a minimum 10 years and/or 50,000 miles without need for additional lubrication or maintenance. During this period there shall be no degradation in the performance of the lubricated joint.

6.3.9 Terrain Conditions.

6.3.9.1 Primary Roads. Two or more lanes, all weather, maintained, hard surface (paved) roads with good driving visibility used for heavy and high density traffic. These roads have lanes with a minimum width of 108 inches (2.75 M), road crown to 20 degrees and the legal maximum GVW/GCW for the country or state is assured for all bridges. These roads are surfaces having Root Mean Square (RMS) value of 0.1 inch (2.54 mm).

6.3.9.2 Secondary Roads. Two lanes, all weather, occasionally

maintained, hard or loose surface (e.g., large rock, paved, crushed rock, gravel) intended for medium-weight, low-density traffic. These roads have lanes with minimum width of 98.5 inches (2.5 M) and no guarantee that the legal maximum GVW/GCW for the country or state is assured for all bridges. These roads are surfaces having a RMS value varying between 0.3 inch (7.63 mm) - 0.6 inch (15.24 mm).

6.3.9.3 Trails. One lane, dry weather, unimproved, seldom maintained loose surface roads, intended for low density traffic. Trails have a minimum width of 98.5 inches (2.5 M), no large obstacles (boulders, logs, stumps) and no bridging. These are surfaces having an RMS value varying between 0.5 inches (12.7 mm) - 1.5 inches (38.1 mm).

6.3.9.4 Rough Trails. Vehicle operations over terrain not subject to repeated traffic and on which no roads, routes, well-worn trails or man made improvements exist (this definition does not apply to vehicle test courses which are used to simulate cross-country terrain). These are surfaces having an RMS value varying between 1.5 inches (38.1 mm) - 2.0 inches (50.8 mm).

6.3.10 Mission-Oriented Protective Posture MOPP IV. The highest level of individual protection during chemical or germ warfare to facilitate mission accomplishment. Overgarments, overboots, mask/hood and gloves will be worn at this level of protection.

6.3.11 Definitions of Recurring Major and Minor Defects. The inspector shall verify that an inspection of each vehicle is performed by the contractor. The Government inspector shall assure that all deficiencies encountered during the inspection are enumerated on the deficiency sheet for the vehicle. The defects noted on the deficiency sheet shall contain sufficient description to allow the Government inspector and the contractor's representative to classify the deficiency IAW the classification of defects of the vehicle specification and definitions contained in ANSI/ASQC Z1.4. Corrective action shall be taken for recurring deficiencies.

6.3.12 Width. For the purposes of meeting the requirements of paragraph 3.2.2.1, width shall be measured IAW SAE J1100 with a tolerance of no more than one inch. All exterior dimensions terminate at the outside surface of sheet metal, bumpers, or integral moldings, unless otherwise specified.

6.3.13 Truck. The M1074 and M1075 PLS Truck is referred to as the "Truck" in the body of this document.

6.3.14 PLS Trailer. The M1076 PLS trailer is referred to as the "PLST" in the body of this document.

6.3.15 Dissimilar Metals. Two metal specimens that are in contact or otherwise electrically connected to each other in a conductive solution and generate an electric current.

6.3.16 Galvanic Corrosion. The accelerated corrosion caused by the more active metal (anode) of a dissimilar metal couple in an electrolyte solution or medium, and decreased corrosive effects on the less active metal (cathode), as compared to the corrosion of the individual metals, when not connected, in the same electrolyte environment. A listing of galvanic series and ways of preventing galvanic corrosion can be found in MIL-STD-889.

## APPENDIX A

## RAIL IMPACT PROCEDURE

A.1 Scope. This appendix details the procedure for conducting rail impact testing. This appendix is a mandatory part of this purchase description.

A.2 Purpose. This procedure is intended to test equipment that will be transported by rail, to determine the effect of normal railroad car impacts that occur during rail shipment, and to verify the structural integrity of the test item and the adequacy of the tiedown system and the tiedown procedures. All test items shall be tested at their tare weight unless otherwise specified in the transportability requirements for this item.

A.3 Test conditions. This test is conducted by mounting the test item on a rail car in its rail shipment configuration and then performing a series of at least four impacts. The first three shall be at 6.4, 9.7 and 12.9 km/h (4, 6 and 8 mph), respectively, in the same direction. The fourth shall be conducted at 12.9 km/h in the reverse direction. All four impacts shall have a tolerance of +0.8/-0.0 km/h (+0.5/-0.0 mph). If the test commodity can be shipped in two orientations (such as lengthwise and crosswise on the rail car), the four impacts shall be repeated for each orientation.

A.4 Failure Analysis. A test item shall be classified as not having survived the rail impact test and will be deemed a test failure if any item that is attached to or included as an integral part of the test item breaks free, loosens or shows any sign of permanent deformation beyond specification tolerances. A test item that passes this procedure should be capable of rail transport without damage to the item or tiedowns.

A.5 Rail Impact Procedure.

Step 1. Position from one to five rail cars on a level section of track. The first rail car shall have a standard draft gear, the remaining cars may be either standard or cushioned draft gear. Satisfy the following conditions:

- a. Adjust the total weight of the car assemblage (see above) to at least 114,000 kilograms (250,000 pounds).
- b. Compress the couplers between cars to take up any slack.
- c. Set all of the air and hand brakes on the car(s) to be

used.

d. Secure any load in or on the car(s) to prevent sliding or shifting: any movement greater than 5 cm shall be justification for retest.

Step 2. Mount the test item on the test car. The test car shall be a cushioned draft gear railcar. The test item manufacturer is responsible for the development of transportation instructions, and shall coordinate these with, and obtain approval from the Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), well in advance of rail impact testing. Mounting of the test item shall incorporate the standard loading and bracing method as shown in Section 6 of the Association of American Railroads (AAR) "Rules Governing the Loading of Department of Defense Material on Open Top Cars.\*" No exotic or unusual tiedown methods shall be used; any non-standard loading and bracing must be approved by the Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), ATTN: MTTE-DPE, 720 Thimble Shoals Blvd, Suite 130, Newport News, VA 23606-2574 prior to testing. The arrangement of the test item and its blocking and tiedown to be tested shall be identical to that proposed and approved by MTMCTEA (if non-standard).

\*This requirement is mandatory for all equipment developed for use in the U.S. Equivalent European standards may apply for non-U.S. commodities.

Step 3. Situate the test car between the buffer cars and the locomotive, and pull the test car at least 65 meters (200 feet) from the buffer car(s) along a level section of track (a minimum distance to achieve the required locomotive speeds).

Step 4. Position the knuckles of the buffer and test cars for coupling.

Step 5. Install a timing device to measure the test car speed (+/- 0.1 km/h (0.6 mph)) just prior to impact with the buffer car(s). Suggested methods include electronic timing (microswitches) and radar. The use of torpedoes and a stopwatch is permissible but not recommended because of the inaccuracies involved.

Step 6. Push the test car toward the buffer car(s) and, by using the locomotive's speedometer or other means, release the test car when the desired test speed is reached, thus allowing the test car to freely impact the buffer car(s).

NOTE: Any impacts below the required test speeds shall be

repeated. Impacts above the required test speed shall be accepted providing the requirements of paragraph 3 are satisfied. Retesting shall be accomplished with new tiedown material to eliminate additive effects and, if possible, a new test item.

Step 7. Repeat Step 6 until the test car(s) has impacted the buffer car three times at the same end, once each at speeds of 6.4, 9.7 and 12.9 km/h (4, 6, and 8 mph)  $+0.8/-0.0$  km/h ( $+0.5/-0.0$  mph). Reverse the test car and repeat the 12.9 km/hr impact, for a total of 4 impacts.

NOTE: Adjustments of the lading or securing mechanisms, or reconditioning of the bracing or items of securement are not allowed during the test. If the tiedowns or chock blocks become loose during the test, a decision to completely retest will be made by MTMCTEA or the test director.

Step 8. Repeat steps 1-7 for any other shipping orientation.

Step 9. Record the pertinent information for each impact, to include the following:

- a. Complete test item identification.
- b. The number and speed of impact.
- c. Observations of tiedowns, blocking, fittings, etc.
- d. Observations of the test item's physical condition.
- e. Results of any operational checks.

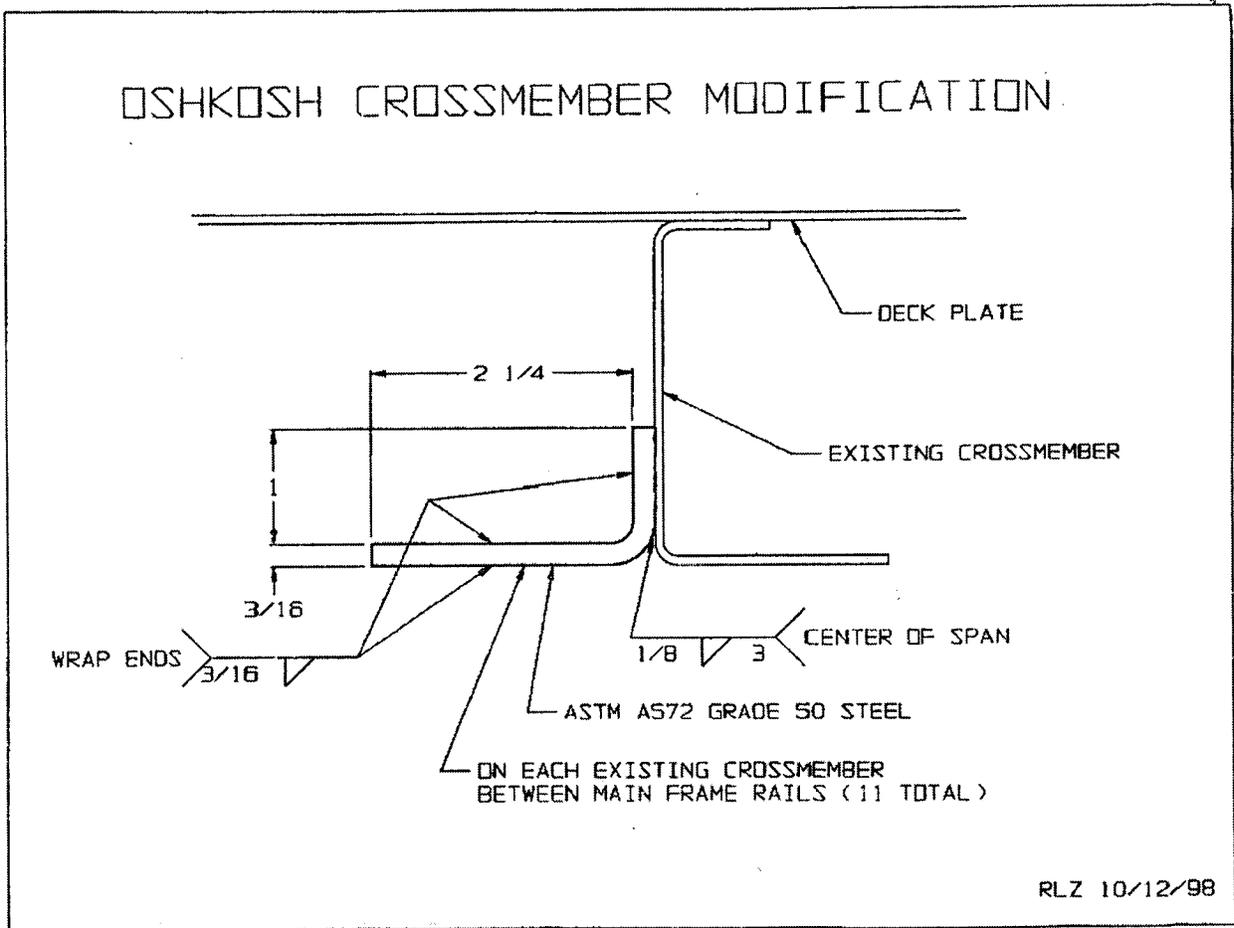
NOTE: Cargo requiring extraordinary attention, i.e., nuclear, one-of-a-kind, high value, or key military equipment, may justify changes to the test procedure and criteria; these shall be identified by the developer Program Manager, and approved by the Commander, Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), ATTN: MTTE-DPE, 720 Thimble Shoals Blvd, Suite 130, Newport News, VA 23606-2574.

APPENDIX B

SAMPLE IDENTIFICATION PLATE

ENGINEER MISSION MODULE BITUMINOUS DISTRIBUTOR	
MODEL NO.	_____
NSN	____ - ____ - ____ - ____
SERIAL NO.	_____
USA REGISTRATION NO.	_____
CONTRACT NO.	_____
MANUFACTURER	_____
DATE OF MANUFACTURE	_____

ATTACHMENT 1



ATTACHMENTS 2-4

For a copy of Attachments 2-4 please contact the US Army TACOM,  
AMSTA-AQ-ATBC, Warren, MI 48397-5000.