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May 23, 1994  
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SUPERSEDING  
MIL-M-29219A(YD)  
19 February 1988

FEDERAL SPECIFICATION

MIXING PLANT, ASPHALT, DRUM TYPE  
PORTABLE, DED, 70 TPH (63 500 KG/HR) CAPACITY

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. This specification covers a portable (semitrailer mounted) asphalt drum mixing plant having a mixing capacity of not less than 70 tons per hour (tph) or 63 500 kilograms per hour (kg/hr) complete with a diesel engine driven (DED) power source.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified (see 6.2), the following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

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\*Beneficial comments (recommendations, additions, deletions) and any pertinent\*  
\*data which may be of use in improving this document should be addressed to: \*  
\*Commanding Officer (Code 156), Naval Construction Battalion Center, \*  
\*1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization \*  
\*Document Improvement Proposal (DD Form 1426) appearing at the end of this \*  
\*document or by letter. \*  
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## Federal Specifications

- W-B-131 - Battery, Storage, Vehicular, Ignition, Lighting and Starting.
- TT-P-664 - Primer Coating, Alkyd, Corrosion-Inhibiting, Lead and Chromate Free.
- TT-V-119 - Varnish, Spar, Phenolic-Resin.
- MMM-A-260 - Adhesive, Water-Resistant, (for Sealing Waterproofed Paper).
- VV-F-800 - Fuel Oil, Diesel.
- PPP-B-601 - Boxes, Wood, Cleated Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock Corner.
- PPP-B-1055 - Barrier Material, Waterproof, Flexible.
- PPP-P-40 - Preservation and Packing of Hand Tools.

## Federal Standards

- FED-STD-123 - Marking for Shipment (Civil Agencies)
- FED-STD-595 - Colors Used in Government Procurement

## Military Specifications

- MIL-P-116 - Preservation, Methods of.
- MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
- MIL-V-173 - Varnish, Moisture-and-Fungus-Resistant, (for Treatment of Communications, Electronic, and Associated Equipment).
- MIL-C-3600 - Compressors, Rotary, Power-Driven; and Compressors Reciprocating, Power-Driven; Air and Gas (Except Oxygen and Refrigerant), Packaging of.
- MIL-C-5501 - Caps and Plugs, Protective, Dust and Moisture Seal.
- MIL-T-5624 - Turbine Fuel, Aviation, Grades JP-4 and JP-5.
- MIL-V-13811 - Varnish, Waterproofing, Electrical, Ignition.
- MIL-E-16298 - Electric Machines Having Rotating Parts, Accessories and Associated Support Items; Packaging of.
- MIL-E-17555 - Electronic and Electrical Equipment, Accessories, and Provisioned Items (Repair Parts) Packaging of.
- MIL-G-19826 - Generator Sets, Diesel Engine, Alternating Current, for Facilities Construction, 10 kW through 1000 kW.
- MIL-C-52950 - Crates, Wood, Open and Covered.

## Military Standards

- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.
- MIL-STD-2073-1 - DOD Materiel, Procedures for Development and Application of Packaging Requirements.

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

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2.1.2 Other Government documents, and publications. The following other Government documents and publications, form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

Department of Transportation (DoT)

Federal Motor Carrier Safety Regulations.

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

2.2 Other publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

American National Standards Institute, Inc. (ANSI)

ANSI B15.1 - Mechanical Power - Transmission Apparatus.

(Application for copies should be addressed to the American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036.)

American Society for Testing and Materials (ASTM)

ASTM C27 - Fireclay and High-Alumina Refractory Brick.

ASTM D3951 - Practice for Commercial Packaging.

ASTM D4675 - Guide for Selection and Use of Flat Strapping Materials.

ASTM D3953 - Strapping, Flat Steel and Seals.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

National Electrical Manufacturers Association (NEMA)

NEMA ICS 1 - Industrial Controls and Systems, General Standard for.

NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies.

NEMA ICS 6 - Industrial Controls and Systems, Enclosures for.

NEMA MG 1 - Motors and Generators.

NEMA WC 7 - Cross Linked Thermosetting-Polyethylene-Insulated Wire and Cable.

(Application for copies should be addressed to the National Electrical Manufacturers Association, 2101 L Street N.W., Suite 300, Washington, DC 20037.)

National Fire Protection Association (NFPA)

NFPA 70 - National Electrical Code.

(Application for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.)

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Society of Automotive Engineers, Inc. (SAE)

SAE J534 - Lubrication Fittings.

SAE J700 - Upper Coupler Kingpin-Commercial Trailers and Semitrailers.

SAE J702 - Brake and Electrical Connection Locations--Truck-Tractor and Truck-Trailer.

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

Tire and Rim Association, Inc. (TRA)

TRA Yearbook.

(Application for copies should be addressed to the Tire and Rim Association, Inc., 175 Montrose West Avenue, Suite 150, Copley, OH 44321.)

(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Description. The asphalt mixing plant, hereinafter called the plant, shall be diesel engine driven (DED) (generator set), portable type. The plant shall consist of all units, components, and accessories to provide a complete plant capable of mixing not less than 70 tph (63 500 kg/hr) of high quality asphaltic mix and to recycle reclaimed asphaltic material. The plant shall include, but not be limited to, the following basic units:

- a. Two-compartment cold-aggregate feed unit of hopper and frame construction with gathering conveyor used for blending and feeding predetermined amounts of cold-aggregate to the cold-aggregate conveyor.
- b. Cold-aggregate conveyor system to receive cold-aggregate from the feeder bin gathering conveyor and discharge into the drum mixer dryer.
- c. Drum mixer of the single rotating type with burner and blower to heat and dry the aggregate and mix with asphalt.
- d. Dust collection system for air pollution control with fines recovery capability.
- e. Conveyor for conveying hot asphalt mix from the drum mixer to the surge bin.
- f. One surge bin system to receive the hot asphalt mix, manually controlled or power operated dual discharge gates for truck loading.

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- g. One complete set of insulated piping and accessories necessary for interconnecting all the component units in accordance with the approved arrangement plant submitted by suppliers.
- h. Wheel mounted combination asphalt and fuel oil storage tank with not less than 6,000 gallons (22 710 liters (L)) capacity, with pumps and metering system.
- i. Plant control complete with motor controllers, circuit breakers, switches, relays, transformers, and auxiliary equipment, properly wired and operable as a central control for the plant.
- j. Interconnecting power and control cables of the proper size and number necessary to provide power and control circuits from the control centers for operation of the plant.
- k. DED generator set with capacity to provide power to all electric loads imposed by system requirements specified herein.
- l. Recycling capability with all necessary components and accessories.

The above units shall be semitrailer mounted on not more than two trailers, and grouped at the discretion of the supplier, as long as the plant can be interconnected mechanically and electrically, and operated to rated capacity.

3.2 Capacity. The plant shall have a rated capacity of not less than 70 tph (63 500 kg/hr) at a mix discharge temperature of 300 degrees Fahrenheit (oF) or 149 degrees Celsius (oC) with uniformly graded nonsticky material having a free moisture content of 6 percent.

3.3 Recycling capability. The plant shall be equipped with all necessary components and accessories to recycle reclaimed asphaltic material.

3.4 First article. When specified (see 6.2), the supplier shall furnish one complete plant for first article inspection and approval (see 4.2.1 and 6.4).

3.5 Standard commercial product. The plant shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the plant being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

3.6 Material. Materials shall be as specified herein. Materials not specified shall be selected by the supplier and shall be subject to all provisions of this specification. All materials shall be new and unused. Materials in contact with hot oil or asphalt shall be noncopper base or of materials noncorrosive when in contact with hot oil or asphalt under high temperatures.

3.7 Safety. All exposed parts which are subject to high operating temperatures or which are energized electrically, and all moving parts which are of such nature or so located as to be a hazard to operating or maintenance personnel, shall be enclosed or guarded. Protective devices shall not impair the operating functions. Each trailer shall conform to all applicable requirements of DoT Federal Motor Carrier Safety Regulations, except that lights

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are not required. Reflectors are required. Steel walkways and ladders shall be provided where necessary for inspection, servicing, and maintenance. Walkways shall be provided with safety tread and handrails.

3.8 Maintainability. The plant design, together with component and accessory location and installation, shall permit ready accessibility to all items requiring periodic maintenance service in the field, which will be accomplished with the use of conventional, general-purpose tools associated with equipment of this nature. The replacement and adjustment of components and accessories shall be accomplished with minimum drainage requirements and minimum disturbance to other elements of the plant.

3.9 Mobility. The asphalt plant, loaded with rated payload, shall be capable of being towed safely when driven on a public highway at 55 miles per hour (mph) or 88 kilometers per hour (kph) and at speeds up to 20 mph (32 kph) when driven on an unpaved (dirt or gravel) road. The semitrailer shall trail the towing vehicle by not more than 3 inches or 75 millimeters (mm) from either side and shall negotiate a 90-degree turn without weaving.

3.9.1 Braking ability. The combined service brakes of the towing and towed vehicle shall control, decelerate, and stop the combination in conformance to DoT Federal Motor Carrier Safety Regulation requirements. When actuated, the emergency breakaway system shall produce smooth emergency brake application.

3.9.2 Ground clearance. Exclusive of the running gear, the ground clearance of each unit shall be not less than 10 inches (254 mm).

3.10 Servicing and adjusting. Prior to delivery of the component units, the supplier shall adjust and service each component unit for travel, including at least the following: Adjust brake system, inflate all tires, and completely lubricate the chassis and components.

3.11 Vehicular component units. The semitrailer component units shall be specified herein.

3.11.1 Intervehicular connections.

3.11.1.1 Truck-tractor and semitrailer. The semitrailer shall be furnished with airbrake standard commercial couplings, for connecting the truck-tractor airbrake system to the semitrailer system. The coupling shall be installed on the front of the semitrailer, symmetrical about the centerline, in accordance with SAE J702. Coupling clearance shall permit connection of the truck-tractor hoses to the semitrailer without interference with the upper fifth-wheel plate or other components. The airbrake couplings shall be protected with spring covers.

3.11.2 Chassis frame. The framing members of the component units shall support the weights and maintain alignment under all conditions of transport and of plant operation as specified herein.

3.11.3 Semitrailer upper fifth-wheel plate and kingpin. The upper fifth-wheel plate shall cover a 36-inch (915 mm) diameter lower fifth-wheel and the entire width of the gooseneck. The fifth-wheel plate and kingpin shall be compatible with a fifth-wheel height of 48 inches +/-1 inch (1220 mm +/-25 mm).

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Both longitudinal and transverse reinforcing members shall be provided. At the front of the plate, a front coupling ramp shall be furnished. Ramps that are not flush with the front crossmember shall include at least four vertical gussets and shall be provided with holes for water drainage. A 2-inch (50.8 mm) throat diameter kingpin, conforming to SAE J700, shall be installed not less than 24 inches (610 mm) nor more than 36 inches (915 mm) from the front of the semitrailer. The center of the kingpin shall be within 1/8 inch (3 mm) of the longitudinal centerline of the semitrailer. The swing clearance rearward from the kingpin to any part of the semitrailer below the upper fifth-wheel plate shall be not less than 74 inches (1880 mm).

3.11.4 Landing jacks. Landing jacks shall be provided on the semitrailers for raising, leveling, and supporting each vehicular component unit. The landing jacks shall be hand or power operated hydraulic units, and shall be permanently installed on the vehicular component unit. The landing jacks shall be of such strength, design, and location that coupling and uncoupling the trailer, with a towing vehicle, will not cause excess stress. Operating jacks shall be furnished to raise each vehicular component unit into position for plant operations. Operating jacks shall be of such strength, design, and location that operation of the plant under load will not cause excess or uneven stresses. All jacks shall be equipped with square metal mud pads having a ground bearing area of not less than 100 square inches (645 square centimeters).

3.11.5 Running gear. The axle, or the forward axle on tandem axles, shall be in alignment with the longitudinal centerline of the vehicular component unit so that the two diagonal measurements, from the kingpin to the outer center of each hub, do not differ in excess of 1/8 inch (3 mm). The rear axle of tandem axle assemblies shall be in alignment with the front tandem axle so that the parallel measurements between hub centers on each side do not differ in excess of 1/8 inch (3 mm). Stub axles or through axles may be furnished. The length of axle tubes of through axles may be increased during manufacture, providing the mounting pads are increased at least an equal distance to insure that the structural rigidity is equal to that of the axles. Axle assembly for the component units shall be either of the single or tandem axle type, as applicable for load distribution and weight. All units shall be equipped with suitable size wheels and tires, in accordance with the recommendations of the TRA, to withstand the maximum loads, stresses, travel speeds, and with not more than 18,000 pounds (8163 kg) per axle, and shall be compatible with the brake system in accordance with the loadings.

3.11.6 Brake system. Each wheel component unit shall be equipped with a service and emergency breakaway, waterproof, all airbrake system, complying with all applicable DoT Federal Motor Carrier Safety Regulations construction and performance requirements. The brake system includes service and emergency line filters, an air reservoir, and an emergency relay valve. All brake system components shall be located, installed, and protected so that damage from ground obstructions and debris is prevented and that maximum efficiency and ease of maintenance is obtained.

### 3.12 Electrical components.

3.12.1 Diesel engine driven generator set. The DED generator set shall generate necessary power for the electrical loads specified. The generator set shall be in accordance with MIL-G-19826. The generator shall be rated

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200 kilowatts (kW) at 0.8 power factor, 60 Hertz (Hz), 460 volts (V). An hourmeter capable of registering not less than 9,999 hours of engine operating time shall be provided. Batteries furnished shall be dry charged in accordance with W-B-131, without electrolyte, with sealed caps to prevent intrusion of atmospheric moisture.

3.12.1.1 Electric motors. All electric motors shall be 3-phase, single speed, induction type, and connected for 460V, alternating current (ac), 60 Hz operation. All motors shall be totally enclosed, nonventilated, or totally enclosed fan-cooled machines conforming to NEMA MG-1. Motors shall be suitable for the respective applications in an ambient temperature of 120oF (49oC). All motors, 25 horsepower (hp) or 18.65 kW and larger, shall be arranged for sequence starting from nonreversing reduced voltage or current motor starters. The remaining motors may be across-the-line start with overload protection controlled from the motor control center (see 3.12.1.2).

3.12.1.2 Motor controls. The motor controls shall be combination motor control unit, rated for 460V, 3 phase, ac, conforming to NEMA ICS-1 and ICS-2, in an ICS-6 type 4 enclosure. Provision shall be made for remote control stations (start-stop pushbuttons), where required. All motor controllers, components, and accessories shall be suitable for continuous operation under conditions as follows:

- a. At ambient temperatures from +125oF (51.7oC) to +32oF (0oC) and at any possible relative humidity.
- b. Exposure to severe dust conditions.
- c. Exposure to salt air.
- d. At any altitude from mean sea level (msl) to 5,000 feet (1524 meters (m)) above msl.

The motor controls shall have a manually operated main circuit breaker on the incoming power supply to the control center. The main circuit breaker may be either integral with the control center, or in a separate enclosure and shall provide overload, ground fault, and short circuit protection. The main circuit breaker shall have a shunt trip, with remote trip pushbutton(s) located at the operator position(s), for emergency trip operation. The termination for the incoming power supply to the main circuit breaker shall have screw pressure type terminals for not less than three sets of power supply cables. One set of terminals (one per phase) shall be suitable for terminating conductors from No. 4 American Wire Gage (AWG) to No. 1 AWG; the other terminals shall be suitable for terminating conductors from 300,000 to 600,000 circular mils or 152 to 304 square millimeters (mm<sup>2</sup>). The plant control center shall have an instruction plate permanently affixed in a conspicuous location. In addition to instructions for connecting and operating the plant, the instruction plate shall show the power supply requirements of the plant in bold type, as follows:

POWER SUPPLY REQUIRED

460 VOLTS, 3 PHASE

INPUT CAPACITY, MAXIMUM	KVA (      KW)
OPERATING LOAD (AT RATED CAPACITY)	KVA (      KW)



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3.12.1.3 Motor controllers. Motor controllers (starter) shall be ac general purpose, class A, magnetic controllers for single speed, nonreversing, nonjogging, squirrel-cage induction motors, conforming to NEMA ICS-2. Controllers for motors of 25 hp (18.65 kW) and larger shall be reduced voltage or current motor controls. Controllers for motors of less than 25 hp (18.65 kW) may be full-voltage (across-the-line) controllers. Insofar as consistent with plant operation, the controllers shall be interlocked to provide sequence starting, with the larger motors to be started first, in order to reduce the required power input capacity to a minimum. The starting sequence shall be included in the connecting and operating instructions.

3.12.1.4 Power and control cables. All power, control and grounding cables, fittings, and accessories required to completely connect the plant for operation shall be furnished in the length required for each circuit. In addition, three sets of power cables (one three-conductor cable or three one-conductor cables each) not less than 100 feet (30 m) in length shall be furnished to connect the motor control center to the incoming power supply source. One set of power supply cables shall have adequate load capacity to supply the standby loads, such as the hot oil heating system, and asphalt storage transfer pumps, but the individual conductors shall be not smaller than No. 4 AWG. The other sets of power supply cables shall have adequate load capacity to supply the maximum power input required to operate the complete plant, but all the individual conductors shall be not smaller than 400,000 circular mils (203 mm<sup>2</sup>) copper. All power and control cables, for the power supply and for interconnecting the plant, shall be heavy-duty portable cables, conforming to NEMA WC7. All portable cables shall be rated for conductor operating temperature of not less than 167°F (75°C). The load on any conductor shall not exceed the allowable ampacities of NFPA 70. The grounding system for the complete plant shall include the grounding conductors, fittings, ground rods, and clamps. The grounding conductors shall be of suitable size and type for the application.

### 3.13 Drive components.

3.13.1 V-belt drives. V-belt drives shall be in accordance with ANSI B15.1 and shall have provisions for adjustment.

3.13.2 Chains, gears, and bearings. All chains, gears, and bearings shall have provisions for lubrication. Bearings shall be lubricated antifriction type with dust shield provisions.

3.14 Cold-aggregate feeder(s). The cold-aggregate feeder(s) shall be of hopper and frame construction and shall consist of a two-bin aggregate hopper. Belt-conveyor feeder(s), all supported by a rigid steel frame and mounted on a pneumatic-tired semitrailer chassis. The cold-aggregate feeder(s) shall discharge the materials into the cold-aggregate conveyor.

3.14.1 Hoppers. The two-bin aggregate hopper shall be of welded steel construction. The bin side plates and divider plates shall have a wide opening for receiving the amount of aggregate being dumped into each hopper. Hopper and bin extensions shall be provided for each hopper. Bins and bin extensions shall be provided with reinforcing to prevent damage to the edges while bins are being charged. Each bin shall be provided with an individual, adjustable, control gate, or by other suitable means, to regulate the flow of aggregate. The gate

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shall be provided with an adjustment lever and position locking device when control gate is used for regulating aggregate flow.

3.14.2 Belt-conveyor feeder(s). The belt-conveyor feeder(s) shall consist of a suitable steel frame conveyor belt, head-end (drive) pulley, foot-end mounted under the belt to support the aggregate as it is discharged from the aggregate hoppers. Steel dustpans shall prevent dust and aggregate from falling onto the backside of the conveyor belt. Steel side plates and rubber flashing shall be provided to prevent spillage of aggregate from the sides as it is discharged from the hopper. Pulleys and rollers shall be mounted on steel shafts and supported by antifriction or bronze bearings with dustproof seals. Self-aligning bearings for head and tail end pulley shafts shall be furnished and shall be provided with labyrinth seals. The belt-conveyor feeder(s) foot-end section shall be provided with a takeup adjustment mechanism to obtain belt tension.

3.15 Cold-aggregate conveyor. Cold-aggregate conveyor shall be of the belt conveyor drive type of not less than 14 inches (355 mm) in width and manufacturer's standard length, and shall be electric motor driven.

3.16 Drum mixer. The drum mixer unit shall be semitrailer mounted and shall include, but not be limited to, the drum mixer, aggregate feed system, burner and blower, asphalt feed system, hot mix discharge system, dust and fines collection system. The drum mixer shall, in addition, be capable of mixing recycled material as specified in 3.3.

3.16.1 Drum. The drum mixer shall be a single cylinder constructed of heavy-gage steel plate capable of withstanding the abrasion wear and heat distortion at peak production for long usage without replacement. The drum shall be provided with replaceable lifting flights which shall lift and drop the aggregate in a thin veil through the hot gases produced by the burner and then mix with hot asphalt. Suitable means shall be provided to discharge the hot mix into the hot-mix conveyor. The drum shall be fitted with steel supporting tires attached to the outer circumference. Each tire shall revolve on not less than two adjustable trunnions made of hardened cast steel. Means shall be provided for controlling the longitudinal movement of the drum along the longitudinal axis of the drum in both the uphill and downhill direction. The drum shall be driven by a positive or friction drive arrangement. All bearings used in the driving mechanism shall be of the antifriction type.

3.16.2 Burner and fuel system. The burner fuel system shall include burner, fuel piping, valves, fuel pump, strainers, sediment and moisture bowl, relief valve, pressure gages, and other items which may be required to provide a complete operating burner fuel system.

3.16.2.1 Burner. The mixer burner shall be low pressure, air atomizing, and oil burning. The burner shall meet the performance requirements specified herein, when operated with fuel oil conforming to VV-F-800, grade DF-A, DF-1, or DF-2, and jet fuel conforming to MIL-T-5624, grade JP-4 or JP-5. The burner shall have the capacity of drying the wet aggregates to meet the specified production requirement, and shall operate in conjunction with the forced draft blower for efficient combustion.

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3.16.2.2 Fuel piping and pipe fittings. Fuel pipe shall be black iron, and pipe fittings shall be malleable iron. Unions shall be installed, where required, for disassembly of piping, valves, and accessories. On the discharge line of the fuel oil pump, a tee-off line with stop valve shall be provided for refilling the fuel tanks of auxiliary generator sets.

3.16.2.3 Fuel control device. A control device shall be installed in the fuel supply system to the burner in a location accessible to the operator and shall contain an advance temperature detector as described in 3.16.2.6. The control device shall provide an infinitely variable range of adjustment and shall maintain a steady flow of fuel at any setting. The control device shall include a calibrated dial and indicating pointer to facilitate burner operating procedures. A gate type, shutoff valve shall be installed in the fuel supply piping line to the burner. The relief valve shall have a capacity not less than the capacity of the fuel pump. A fuel tank return line shall be connected to the discharge of the relief valve. All low points in the fuel oil system shall be provided with drains to permit complete drainage of the piping.

3.16.2.4 Fuel pump. The fuel pump shall be of the positive displacement type for pumping the required fuels to supply the heat demand. This capacity shall be developed when pumping against a discharge pressure not less than the combined friction loss created by the burner and fuel supply system. The pump shall be self-priming, with an electric motor drive, and shall be permanently mounted on the mixer frame.

3.16.2.5 Strainer. An oil strainer shall be provided and installed in the fuel supply line in such a manner as to permit easy accessibility for cleaning. The strainer shall have the capacity to remove all foreign matter which might foul the burner.

3.16.2.6 Advance temperature detector. An advance temperature detecting device shall be provided for compensating the sudden surge of fuel temperature relationship demand in the mixer, when charged with a large load of aggregate with higher or lower than normal moisture content. The device shall be capable of overriding the set fuel control until temperatures are stabilized.

3.16.2.7 Pressure gage. An oil pressure gage shall be installed in the burner fuel supply system. The gage shall operate with the fuel oils specified for the fuel pump, shall have a heavy-gage metal case, and an indicating dial with a range of 0 to 200 pound-force per square inch gage (psig) or 0 to 1380 kilopascals (kPa). Gages shall have increments of 5 psig (35 kPa) graduation and provided with a shutoff cock or valve.

3.16.2.8 Combustion chamber and ignition cone. The combustion chamber shall consist of a steel cylinder lined with firebrick conforming to ASTM C27 or plastic refractory with equal rating. The ignition cone shall consist of a steel refractory lined cone.

3.16.2.9 Temperature indicator. A temperature indicator shall be provided to indicate the temperature of the mix as it is discharged from the drum mixer. The indicator shall have a range of 100oF (38oC) to 500oF (260oC) and shall be graduated to 25-degree increments.

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3.16.2.10 Level indicator. A level indicator shall be provided and shall be mounted on the mixer assembly in such a manner as to indicate the angle of the longitudinal axis of the mixer drum above the horizontal. The indicator shall include a graduated scale in increments not greater than 10 and with a range of 00 to 100. The indicator shall be mounted in a location where it will be visible and legible to the operator.

3.16.2.11 Gearboxes. The main drive shall be provided with a gearbox to the power source. Gears shall run in an oil bath. Gearboxes shall be provided with oil seals to prevent loss of oil and entry of foreign material.

3.16.2.12 Forced draft blower. A centrifugal type blower shall be provided to supply air for atomization to the burner. The forced draft blower shall have a centrifugal type wheel, steel shaft, housing, and drive. The forced draft blower shall have a capacity to provide a sufficient quantity of air to the burner to assure efficient operation of the burner at maximum burner capacity. The forced draft blower shall be provided with antifriction type bearings, and the intake shall be provided with an expanded metal or wire mesh screen.

3.16.3 Discharge conveyor and discharge chute. Means shall be provided at the end of the mixer drum to discharge the hot mix into a discharge chute which will, in turn, direct the mix into the boot of the hot-mix conveyor. The conveyor discharge shall be of such a height as to eliminate the need for a hot-aggregate conveyor pit.

3.17 Collection system. Control system shall be mounted on the mixer drum semitrailer or on a separate semitrailer. The system shall include all the necessary components for a complete system such as a motor, exhaust fan, steel stack, conveyor, collector, duct work, instruments, accessories, and other components of the operation of the unit.

3.18 Surge bin (silo) system. The surge bin system shall be complete with batcher, surge bin, loading and unloading panel. The bin or cone shall be constructed of not less than 3/16-inch (4.76 mm) steel plate and shall be insulated. Capacity shall be not less than 20 tons (18 180 kg), using material weighing 100 lb per cubic foot (1611 kilograms per cubic meter (kg/m<sup>3</sup>)). Air or electric operated discharge gates shall be provided. Driveway truck clearance shall be not less than 12 feet (3.7 m) wide by 10 feet (3.1 m) high. High and low level indicators for the bin and a weighing system for weighing the mix being loaded into the trucks, shall be provided.

3.19 Fuel oil and asphalt storage tank. A semitrailer mounted combination fuel oil and asphalt storage tank, with finned heating coils submerged in the asphalt tank, shall be provided. The tank shall have two compartments with double wall insulated bulkhead to provide capacities for not less than 4,000 gallons (15 140 L) of liquid asphalt and 2,000 gallons (7570 L) of fuel oil.

3.19.1 Fuel oil and asphalt storage tank construction. The tank shall be constructed of not less than 1/4 inch (6.35 mm) thick steel plate with 3-1/2 inch (89 mm) fiberglass insulation and covered with a 16 gage steel outside jacket. The tank shall be reinforced with adequate angle rings spaced at intervals and channel stiffeners on the tank heads. The tank shall be supported on saddles spaced at intervals and two full length channels or beams. Each tank

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compartment shall be provided with an 18-inch (458 mm) manhole with locking cover and internal and external ladders. Level indicators for each tank compartment shall be provided.

3.19.2 Heating system. The tank shall be equipped with a complete heating system for heating the liquid asphalt and fuel oil. The system shall include not less than 300,000 British thermal units (Btu) (317 megajoules) per hour automatic type burner, for the hot oil system. A 120-gallon (455 L) expansion tank shall be furnished mounted and piped. All operating components, accessories, and controls shall be provided on one side of the semitrailer for transporting the jacketed asphalt piping.

3.20 Piping and accessories. All piping and accessories, which are required for interconnecting of component units to form a complete operating plant, shall be furnished by the contractor in accordance with the arrangement plan of the plant approved by the Government. Where sectionalization is required on the hot oil asphalt lines for assembly and disassembling of the plant, flange connections with fiber gaskets shall be installed. Wire braided piping, fittings, valves, and other accessories to make up a complete plant shall be of steel, iron body, or malleable iron. Burner fuel piping shall be capable of withstanding 100 psig (690 kilopascals (kPa)); and asphalt pipe, 50 psig (345 kPa).

3.21 Plant control. The plant control shall include all controls, such as weighing scales, thermometers, gages, indicating light signals, levers, drier burner controls, and other accessories for the operation of the drum mixer plant shall be located in the plant control. The control system shall be the manufacturer's standard for the plant.

3.22 Scalping screen. When specified (see 6.2), a single deck scalping screen mounted over the tail section of the aggregate feed conveyor for scalping out oversize material and other debris shall be provided. The unit shall include driver, motor, and screen cloth.

3.23 Lubrication. Means for lubrication shall be in accordance with the manufacturer's standard practice. The lubricating points shall be easily visible and accessible. Hydraulic lubrication fittings shall be in accordance with SAE J534. Where use of high pressure lubricating equipment, 1,000 psig (6895 kPa) or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location. The unit shall be lubricated as specified in section 5.

3.24 Fungus resistant. When specified (see 6.2), electrical components and circuit elements, including terminal and circuit connections, shall be coated with varnish conforming to MIL-V-173, except that:

- a. Components and elements inherently inert to fungi or in hermetically sealed enclosures need not be coated.
- b. Current-carrying contact surfaces, such as relay contact points, shall not be coated.

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3.25 Lifting and tiedown attachments. The plant shall be equipped with lifting and tiedown attachments. Lifting and tiedown attachments shall conform to type II or type III of MIL-STD-209. A nonferrous transportation plate shall be provided and mechanically attached to the plant. Transportation plates shall be inscribed with a diagram showing the lifting attachments and lifting slings, the capacity of each attachment, and the required length and size of each sling cable. A silhouette of the item furnished showing the center of gravity shall be provided on the transportation plate. Tiedown attachments may be identified by stenciling or other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for the tiedown of the plant on the carrier when shipped.

3.26 Cleaning, treatment, and painting. Surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. Surfaces to be painted shall be cleaned and dried to insure that they are free from contaminants such as oil, grease, welding slag and spatter, loose mill scale, water, dirt, corrosion product, or any other contaminating substances. As soon as practicable after cleaning, and before any corrosion product or other contamination can result, the surfaces shall be prepared or treated to insure the adhesion of the coating system. The painting shall consist of at least one coat of primer and one finish coat of acrylic-based enamel or polyurethane enamel. The primer shall be applied to a clean, dry surface as soon as practicable after cleaning and treating. Painting shall be with manufacturer's current materials according to manufacturer's current processes and the total dry film thickness shall be not less than 2.5 mils (0.0635 mm) over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects. Unless otherwise specified (see 6.2), the color of the finish coat shall be green No. 14064, conforming to FED-STD-595. The end item, allied equipment, and attachments shall be the same color. All wheels shall be the same color. When repainting is required to provide the green No. 14064 color, the base color shall not be visible at any location. The repaint coating material shall be compatible with the original paint material.

### 3.27 Data plates.

3.27.1 Instruction plates. The plant shall be equipped with instruction plates suitably located, describing any special or important procedures to be followed in operating and servicing the equipment. Plates shall be of a material which will last and remain legible for the life of the equipment. Plates shall be securely affixed to the equipment with nonferrous screws or bolts of not less than 1/8-inch (3 mm) diameter.

3.27.2 Identification plate. An identification plate will be furnished by the contracting officer for each plant. The contractor shall stamp all necessary data in the blank spaces of the plate provided for that purpose, and securely affix a plate to each plant in a conspicuous place with nonferrous screws, rivets, or bolts not less than 1/8-inch (3 mm) in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

3.28 Special maintenance tools. Such special tools as are required for field maintenance and operation of the equipment shall be provided and packed in the toolbox and shipped with the equipment. Special tools are defined as those not normally included in a mechanic's tool kit, but which are designed

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specifically for a certain purpose on a specific piece of equipment. A manufacturer designed toolbox of sufficient size to store tools required for field servicing shall be provided to carry those tools and accessories. The toolbox shall be made of sheet steel not less than 0.0747-inch (1.89 mm) (US revised standard gage No. 14) nominal thickness.

### 3.29 Workmanship.

3.29.1 Steel fabrication. The steel used in fabrication shall be free from kinks, sharp bends, and other conditions which would be deleterious to the finished product. Manufacturing processes shall not reduce the strength of the steel to a value less than intended by the design. Manufacturing processes shall be done neatly and accurately. All bends shall be made by controlled means to insure uniformity of size and shape.

3.29.2 Bolted connections. Boltholes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided in accordance with good commercial practice, and all bolts, nuts, and screws shall be tight.

3.29.3 Riveted connections. Rivet holes shall be accurately punched or drilled and shall have the burrs removed. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads, when not countersunk or flattened, shall be of approved shape and of uniform size for the same diameter of rivet. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the member.

3.29.4 Welding. Welding procedures shall be in accordance with a nationally recognized welding code. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings. Welder's certification shall be kept on record by the contractor, and upon request, shall be made to the government for review.

3.29.5 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the casting's ability to perform its intended function.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, 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 of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a 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 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First article inspection (see 4.2.1).
- b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on the plant when a first article is required (see 3.4 and 6.2). This inspection shall include the examination of 4.3 and the tests of 4.4. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract. When a first article test is specified by the contract and the contractor desires to deliver the test unit as a contract item, it shall be delivered only after the contractor, at his own cost and expense, completely cleaned, devoid of foreign material, reconditioned or overhauled, making such replacements and modifications thereto as are required to make the unit acceptable as a contract item.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.3, and the packaging inspection of 4.5.

4.3 Examination. Each plant shall be examined for compliance with the requirements specified in section 3 of this specification. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.4 Tests. The component units shall be arranged in the order as shown in the approved arrangement plan of the plant in accordance with manufacturer's specifications, and the piping accessories shall be connected to the components units for compatibility and subjected to tests in accordance with 4.4.1 through 4.4.5. Nonconformance to the requirements as specified in section 3 shall constitute failure and cause for rejection.



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4.4.1 Test conditions. Prior to being tested, the plant shall be lubricated. Oils shall be those designated for use in the ambient temperature at which the tests are being performed. During all plant tests, the motors shall be run at normal operating speeds. Where individual components are tested with the use of power sources other than the plant power supply, the components will be operated at the normal plant operating speeds. As services and adjustments are performed, the plant shall be checked for ease of maintenance.

4.4.2 Compatibility. Assemble and operate all the component units in the arrangement as shown in the approved arrangement plan. The test may be conducted with load or without load for at least 1/2 hour, provided that operating with or without loads will cause no damage to any unit or to the plant. All component units shall assemble and operate compatibly without modifications. The piping, hose, valves, fittings, and accessories shall be valves, and accessories, before disassembled for shipment, for the purpose of easy identification when reassembled in the field.

4.4.3 Drum mixer test. The unit shall be tested to conform to 3.16 and to demonstrate the 70 tph (63 500 kg/hr) capacity of drying and mixing aggregate having 6 percent free moisture content.

4.4.4 Road test. Hook the semitrailer unit, loaded with rated payload to a truck-tractor. The tractor/trailer combination shall be driven a distance of not less than 20 miles (32 km) on a public highway at 55 mph (88 kph) and on an unpaved road at 20 mph (32 kph). The trailer shall trail the towing vehicle by not more than 3 inches (75 mm) from either side. Continue test by making a sharp 90-degree turn to verify conformance to 3.9 and 3.9.1. After the road test, check for ground clearance to verify conformance to 3.9.2.

4.4.5 Lifting and tying down attachment tests. When lifting and tying down attachments are required, they shall be tested to conform to 3.25. Engineering calculations furnished by the contractor and included in the first article test report in lieu of actual testing may be provided to prove conformance to specification requirements.

4.5 Preparation for delivery inspection. The preservation, packaging, packing, and marking of the item shall be inspected to verify conformance to the requirements of section 5.

## 5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be level A or commercial as specified (see 6.2).

### 5.1.1 Level A.

5.1.1.1 Disassembly. Disassembly shall be the minimum needed to safeguard parts and assemblies vulnerable to pilferage, damage, and loss; to accomplish reduction in cube; and to meet carrier limitations of height, width, and weight. Removed nuts, screws, pins, and washers shall be installed in mating parts and secured to prevent loss. Gaskets and related items shall be individually preserved by method IC or III and placed in the toolbox or packaged with other removable parts. Keys shall be secured in keyways of the primary components, attached with shipping documentation, or packaged separately. Disassembly

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should be limited to parts and components easily removed and installed using no special tools or skilled personnel. Disassembly required to preserve equipment components shall be the minimum necessary to perform preservation.

5.1.1.2 Matchmarking. Parts removed and mating parts on the equipment and attachments shall be matchmarked to facilitate reassembly. Large parts shall be matchmarked by stenciled letters or numerals using lusterless white enamel overcoated with varnish. Small parts and mating parts on the basic unit and attachments shall be matchmarked with weatherproof tags attached to mating parts and locations with wire or twine. Markings shall be applied to the tags with a waterproof material.

5.1.1.3 Methods of preservation. Cleaning processes, drying procedures, preservatives, and methods of preservation specified in the following paragraphs are listed in MIL-P-116 and shall conform to the requirements of MIL-P-116 and any applicable specifications.

5.1.1.4 Cleaning and drying. Prior to the application of preservative compounds or paint, surfaces shall be cleaned by process C-1 and dried by any applicable procedure of MIL-P-116.

5.1.1.5 Unprotected surfaces. Unprotected exterior metal surfaces requiring the application of a contact preservative in accordance with MIL-P-116 and not specifically provided for herein shall be preserved as follows:

5.1.1.5.1 Unfinished (not machined) surfaces. Unfinished exterior metal surfaces shall be coated with type P-1 preservative.

5.1.1.5.2 Machined surfaces. Exposed machined surfaces shall be coated with type P-6 or P-11 preservative and wrapped or covered, as applicable, with barrier material conforming to MIL-B-121, type I, grade A, class 2. The material shall be secured in place with waterproof tape.

5.1.1.6 Gears.

5.1.1.6.1 Exposed gears. All unpainted surfaces of exposed gears shall be coated with type P-1 preservative or with primer conforming to TT-P-664.

5.1.1.6.2 Enclosed gears. Enclosed gears shall be filled to the operating level with the approved lubricant required for operation. Gear mechanism shall be operated to ensure coating of all interior surfaces with preservative. The gear housing shall be identified with a weatherproof tag to indicate, "This housing is filled to the operating level with lubricant required for operation. Do not drain until first required lubrication change." Markings shall be applied to the tags with a waterproof material. The tags shall be attached in a conspicuous location.

5.1.1.7 Drive chains.

5.1.1.7.1 Enclosed chains. Enclosed chains and chain housings shall be preserved and tagged as specified in 5.1.1.6.2 for enclosed gears.

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5.1.1.7.2 Exposed drive chains. Exposed drive chains shall be coated with enough type P-9 preservative to ensure penetration of the preservative to the inner surface of the rollers, pins, and bushings. After the excess preservative has drained, the entire chain and the unpainted surfaces of the sprocket shall be coated with type P-3 preservative.

#### 5.1.1.8 Brakes.

5.1.1.8.1 Brake drum assemblies. All metal surfaces enclosed within brake drums and the braking surface of face of the brake drums shall be coated with a thin film of primer conforming to TT-P-664. Care shall be exercised to prevent the primer from coming in contact with brake lining, rubber, and rubber impregnated parts.

5.1.1.8.2 Air-actuated brake systems. The air-actuated brake systems shall be drained. Interior surfaces of the air supply tanks shall be fogged with type P-10, grade 30 preservative. Excess preservative oil shall be drained. Threaded openings and the threads of drain plugs shall be coated with P-10. The drain plugs shall be reinstalled. Air line filters shall be drained and closed. The exhaust ports of relay emergency, quick-release, and relay valves not equipped with exhaust check valves shall be closed by inserting caps or plugs as applicable conforming to MIL-C-5501 or by sealing the ports with waterproof tape. Attach a waterproof tag to the valves and service lines indicating, "Remove (plugs, caps, or tape) from exhaust ports and valves before operating." Markings shall be applied with a waterproof material.

5.1.1.9 Hydraulic systems. The hydraulic fluid supply tanks shall be filled to the operating level with hydraulic fluid required for operation. The pistons shall be retracted as far as practicable into the cylinders and secured. When the pistons cannot be fully retracted, the exposed portions of the piston rods (ramshafts) shall be coated with type P-6 or P-11 preservative and the coated surfaces wrapped or covered with barrier material conforming to MIL-B-121, type I, grade A, class 2, extending the wraps approximately 2 inches (50 mm) onto the ram cylinders. The wraps shall be secured in place with waterproof tape. When the pistons can be fully retracted, any remaining uncoated surfaces of the piston rods shall be coated with type P-1 preservative, with no wrapping required. The hydraulic control valves shall be secured in the neutral position and preserved as specified herein for piston rods. Hoses shall not be disconnected. A weatherproof tag shall be attached to the control lever indicating: "The hydraulic supply tank is filled to the operating level with fluid required for operation. Do not drain." Markings shall be applied to the tag with a waterproof material.

5.1.1.10 Conveyor belts. Metal facings shall be coated with varnish conforming to TT-V-119 or MIL-V-13811. Each belt shall be completely rolled with a tube or piece of round wood placed in each end fold of the belt to prevent sharp bends. Prior to rolling, belt surfaces shall be dusted with powdered talc to prevent surfaces from adhering together. When required, to hold belt in compact roll, strapping conforming to ASTM D3953, type 1 or 2, grade 1 or 2, shall be placed around the roll. Suitable protective cushioning shall be placed under the strapping, and the strapping not tensioned so tight as to damage the belting. Each rolled belt shall be wrapped with waterproofed barrier conforming to PPP-B-1055, class E-1 or E-2, with all laps, seams, and folds sealed with adhesive conforming to MMM-A-260.

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5.1.1.11 V-belts, flat belts, and pulleys. Unpainted surfaces of pulleys shall be coated with primer conforming to TT-P-664. The belts for each unit shall be preserved method IC-1 or IC-3. Large flat belts shall be preserved and packaged as specified for conveyor belts.

5.1.1.12 Pumps and burners. The interior surfaces of the pump, piping, valves, jets, and nozzles and burners shall be coated with type P-10 preservative in a manner to insure thorough coating of all interior surfaces. Excess preservative shall be drained. All openings shall be sealed with metal or plastic caps or plugs, or sealed with waterproof tape.

5.1.1.13 Refractory linings. Installed refractory linings shall be blocked, braced, and cushioned to prevent breaking or loosening due to shock and vibration during shipment and handling.

5.1.1.14 Fuel tanks. The interior surfaces of fuel tanks, if uncoated or not fabricated of corrosion-resistant material, shall be fogged with type P-10 preservative. Excess preservative shall be drained and threads of drain plugs shall be coated with P-10 before reinstalling.

5.1.1.15 Electrical components. Electrical motors shall be preserved level A by the alternate requirements of MIL-E-16298. Other electrical components shall be preserved level A in accordance with MIL-E-17555.

5.1.1.16 Air compressors. The air compressors, parts, and accessories shall be preserved in accordance with MIL-C-3600, level A.

5.1.1.17 Wire rope. The wire rope shall be coated with type P-1 and secured to prevent movement.

5.1.1.18 Openings. Openings in the equipment which will trap free falling water shall be sealed by any suitable means to prevent the entry of water.

5.1.1.19 Piping equipment. Loose piping equipment required to complete the water-supply system shall be preserved method I or III as applicable. Exposed threaded surfaces shall be protected against damage by the use of metal or plastic thread protectors.

5.1.1.20 Lubrication. Lubricate all grease fittings with type P-11 preservative. Wheel bearings should be lubricated with compound specified by the manufacturer. Lubricate control mechanisms, linkage, hinges, fasteners, and all pivot points with P-9.

5.1.1.21 Rubber tires. Tires shall be inflated to 10 psig (70 kPa) above the specified operating pressure.

5.1.1.22 Maintenance tools. Maintenance tools shall be preserved in accordance with level A preservation and packaging requirements of PPP-P-40.

5.1.1.23 Consolidation. The tool boxes shall be utilized for the consolidation of loose components. The remainder of the components that will not fit in the tool boxes shall be consolidated, along with disassembled components, in boxes conforming to PPP-B-601, overseas type or PPP-B-621, class 2. Boxes shall be placed or secured to the equipment with appropriate

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strapping in accordance with ASTM D4675. Arrangement and location on the equipment shall be such so as not to increase cubage or interfere with lifting or mobility of the equipment.

5.1.2 Commercial. The complete plant shall be preserved and packaged in a manner that will provide protection against deterioration and damage from the contractor's plant to the initial destination. This level may conform to the contractor's standard practice when such meets the requirements of the level except the unpainted interior surfaces of all storage tanks require the application of a contact preservative. ASTM D3951 may be used as a guide.

5.2 Packing. The packing shall be level A, B, or Commercial as specified (see 6.2).

#### 5.2.1 Level A.

5.2.1.1 Trailer mounted units (except wheel-mounted conveyors). Trailer-mounted units shall be shipped mobile and uncrated. Movable components shall be blocked and braced as needed, to prevent movement during shipment.

5.2.1.2 Components not trailer mounted. Components not trailer mounted shall be packed in accordance with the level A requirement of MIL-STD-2073-1. Containers shall be selected from MIL-STD-2073-1, appendix C, table VII for level A requirements. Only wood boxes or covered crates shall be used.

5.2.1.3 Piping and accessories. Piping suitable for bundling shall be bundled in secured lifts. The piping shall be nested, arranged, and secured with bolts or steel straps, or a combination of both, to form compact nonshifting bundles. Suitable wood blocking shall be used, as required, under strapping to eliminate large voids or irregular shaped bundles. Strapping shall be 0.023 by 3/4-inch (0.5842 by 19 mm) flat steel strapping conforming to ASTM D3953. Strapping shall be spaced not to exceed approximately 36 inches (914 mm) on center, with end straps not more than 18 inches (457 mm) from each end. Metal edge protectors shall be used under strapping when strapping bears on the pipe. The bundles shall be packed in open type crates conforming to MIL-C-52950, style A or B, type V. Short pieces of pipe, hose fittings, and accessories shall be packed in close-fitting boxes conforming to PPP-B-621, class 2; or PPP-B-601, overseas type. The contents in the boxes and crates shall be cushioned, blocked, and braced to prevent movement.

5.2.2 Level B. Level B requirements shall be the same as level A except that components not trailer mounted shall be packed in containers designated for level B in MIL-STD-2073-1, appendix C, table VII.

5.2.3 Commercial. The complete plant shall be prepared for shipment in a manner which will insure arrival at destination in satisfactory condition. Loose components that are subject to damage during shipment shall be blocked, braced, or otherwise secured to prevent movement and damage during shipment. The toolbox lids shall be closed and secured in a manner to prevent pilferage. When sufficient space is available, packaged and unpackaged components required for each unit or section shall be placed and secured on the unit or sections for which intended in any available space that will not interfere with lifting or mobility of the units. Boxed and crated components shall be shipped at the same

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time as the mobility units. Packing and containers shall comply with applicable carrier rules and regulations. ASTM D3951 may be used as a guide for packing.

### 5.3 Marking.

5.3.1 Military agencies. Shipments to military agencies shall be marked in accordance with MIL-STD-129.

5.3.2 Civil agencies. Shipments to civil agencies shall be marked in accordance with FED-STD-123.

## 6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This completely equipped plant is intended primarily for use in asphaltic paving of airfield, road, street, parking lot, large floor surfaces, or other uses.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. When specifications and standards shall be other than as specified (see 2.1.1).
- c. When first article is required for inspection and approval (see 3.4, 4.2.1, and 6.4).
- d. When scalping screen is required (see 3.22).
- e. When fungus resistance is required (see 3.24).
- f. Color of finish coat required if other than specified (see 3.26).
- g. Level of preservation, packaging, and level of packing required (see 5.1 and 5.2).

6.3 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (DD Form 1423) incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 227.405-70 are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.4 First article. When a first article inspection is required, the item will be tested and should be a first production item. The first article should consist of one complete plant or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.5 Supersession data. This specification replaces military specification MIL-M-29219A(YD) dated 19 February 1988.

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6.6 Subject term (key word) listing.

Asphalt plant  
Circulation  
Diesel engine  
Mobile equipment

MILITARY INTERESTS:

Custodian

Navy - YD1

CIVIL AGENCY COORDINATING ACTIVITY:

GSA-FSS

Preparing activity:

Navy - YD1

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