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* INCH-POUND *

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SUPERSEDING
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FEDERAL SPECIFICATION

CENTRAL MIX PLANT, CONCRETE, MOBILE, 150 CUBIC YARDS PER HOUR 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 complete central mix concrete plant in mobile units, electric-motor-driven, with automatic controls, capable of producing not less than 150 cubic yards of concrete mix per hour.

* 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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).

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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, 621 Pleasant Valley Road, Port Hueneme, CA 93043-4300, by using *
* the end of this document or by letter. *

FSC 3895

Federal Specifications

TT-V-119 - Varnish, Spar, Phenolic-Resin
TT-P-664 - Primer Coating, Alkyd, Corrosion-Inhibiting Lead and Chromate Free-VOC-Compliant
* MMM-A-260 - Adhesive, Water-Resistant, (For Sealing Waterproofed Paper)
* PPP-P-40 - Packaging and Packing of Hand Tools
* PPP-T-60 - Tape, Packaging, Waterproof
PPP-B-601 - Boxes, Wood, Cleated-Plywood
PPP-B-621 - Boxes, Wood, Nailed and Lock Corner
PPP-B-1055 - Barrier Material, Waterproofed, Flexible

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-S-196 - Support Items, Accessories, and Kits, Mechanical; Packaging of
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-S-5786 - Suppressor, Electrical Noise, Radio Frequency
MIL-V-13811 - Varnish, Waterproofing, Electrical, Ignition
MIL-E-16298 - Electric Machines Having Rotating Parts, Accessories and Associated Support Items: Packaging of
* MIL-T-22085 - Tape, Pressure-Sensitive, Adhesive, Preservation and Sealing
MIL-B-22191 - Barrier Materials, Transparent, Flexible, Heat Sealable
* MIL-P-62669 - Primer Coating, VOC Compliant Synthetic (For Brake Drums)

Military Standards

MIL-STD-129 - Marking for Shipment and Storage
MIL-STD-209 - Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment
* MIL-STD-2073 - 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.)

* 2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in 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.)

(Copies of specifications, standards, handbooks, drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

* 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.

Concrete Plant Manufacturers Bureau (CPMB)

Concrete Plant Mixer Standards of the Plant Mixer Manufacturers Division

(Application for copies should be addressed to the Concrete Plant Mixer Standards of the Plant Mixer Manufacturers Division, Concrete Plant Manufacturers Bureau, 900 Spring Street, Silver Spring, MD 20910.)

National Electrical Manufacturers Association (NEMA)

NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies
NEMA MG 1 - Motors and Generators

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

Society of Automotive Engineers, Inc. (SAE)

SAE J551 - Performance Levels and Methods of Measurement of Electromagnetic Radiation from Vehicles and Devices (30 to 1000 MHz)
SAE J700 - Upper Coupler Kingpin - Commercial Trailers and Semitrailers

(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 central mix concrete plant shall consist essentially of an aggregate bin with three compartments; covered conveyor belts, a weighing means, a cement bin or silo, control console panel, water delivery system, air and hydraulic systems, instruments, delivery conveyors or gravity discharge, and when specified (see 3.8.4 and 6.2) a tiltable concrete mixer. All equipment shall be mounted on not less than two or more than five semitrailer chassis frames with kingpins. The plant shall be capable of being erected and ready for operation in not more than 16 working hours. The plant shall be capable of being erected with the use of one standard commercial truck crane having a maximum rated capacity of 25 tons.

3.2 First article. When specified (see 6.2), the contractor shall furnish a complete plant for first article inspection (see 4.2.1 and 6.4).

3.3 Safety. All rotating or reciprocating parts that are of such a nature or so located as to become a hazard to operating or maintenance personnel shall be enclosed or properly guarded.

* 3.4 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.

3.5 Materials. Materials shall be as specified herein and in applicable specifications and standards, and other referenced documents. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification. Materials shall be free of defects which adversely affect performance or serviceability of the finished product.

3.6 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to insure interchangeability of component parts, assemblies, accessories, and spare parts.

3.7 Performance. The assembled plant shall be rated (based on a 90-second mix time) for not less than 150 cubic yards of pavement quality, 1-inch slump concrete per hour, utilizing a six bag mix and 2-1/2- to 3-inch maximum sized aggregate; and not less than 150 cubic yards of structural quality, 3-inch, slump concrete per hour, utilizing a six bag mix and 1-1/2-inch maximum sized aggregate. Batching accuracy shall be within 2 percent for each size of aggregate, and within 1 percent for cement of the preset requirement. The batching of aggregates and cement shall be synchronized with the demand cycle of the mixer. Each trailer-mounted unit of the plant shall be capable of being towed cross country over reasonably hard, level to rolling terrain at speeds up to 5 miles per hour (mph) without damage, malfunction, or permanent set. Each trailer-mounted unit of the plant shall be capable of being towed over paved highways at speeds up to 35 mph without damage, malfunction, or permanent set.

3.8 Construction. The equipment shall be designed and constructed to facilitate field maintenance. All adjustments and replaceable accessories shall be readily accessible. Conditions which can be hazardous to personnel or deleterious to equipment shall not be permitted.

3.8.1 Aggregate bin. An aggregate bin having three approximately equal compartments, for sand and two different sizes of aggregates, shall be furnished. Total capacity shall be not less than 30 tons (20 cubic yards). The aggregate bin shall be fabricated from sheet steel reinforced with structural steel, with partitions to form the three compartments. The interior of the compartments shall be free from obstructions, and the sides shall be sloped from top to bottom or the lower portion of the sides shall be sloped, to insure free flow of the material and prevent bridging. Each compartment shall be furnished with a content indicator of the high-low type located so as to be visible to the plant operator. The sand compartment shall be furnished with a moisture sensing device located so as to be visible to the plant operator. The moisture sensing device shall be the direct reading, pen or dial type calibrated to show the percentage of free moisture by weight. A separate conversion chart, table, or dial scale shall be furnished to facilitate converting the amount of free moisture in volume per 100 pounds of sand. A means shall be provided to weigh the aggregate and shall have a capacity of not less than 15,000 pounds (lb) and shall be calibrated in increments of 15 lb or less.

3.8.2 Cement bin. The cement bin, or silo, shall have a capacity of not less than 260 barrels of cement. The cement bin shall be provided with a loading means, mechanical, or pneumatic. Means such as air injection or mechanical vibration, shall be provided to insure free flow of the dry cement from the bin. The cement bin, equipped with air vent, shall be provided with a batch hopper, not less than 4 cubic yards capacity, to hold a full batch of cement for the mixer provided. Manufacturer’s standard weighing system shall be provided to weigh the cement for the mixer if provided. The cement bin shall be provided with a constant indicator of the high-low type, located so as to be visible to the plant operator.

3.8.3 Batch conveyor or delivery conveyor(s). Material transfer shall be accomplished either by a motor-driven batch conveyor of the inclined trough or channeled belt type at least 36 inches in width (with 3-piece trough-type idlers or rollers), with a foldable, demountable, droppable, or retractable discharge head or by motor-driven conveyor(s), for each material being delivered to the

batcher. The batch conveyor shall be covered to guard the materials against inclement weather. All troughing idler bearings shall be either of the antifriction or bronze bearing type with dustproof seals. Idlers shall be designed to insure true running and self-centering of the conveyor belt to assure efficient movement of material, without spillage and pileup at receiving points when the plant is operating at full capacity. An accessible adjustment for maintaining proper belt tension shall be provided, as well as a cleaning device capable of removing foreign material adhering to the pulley side of the belt. The height of the conveyor(s) discharge head(s) shall be compatible with the charging height of the mixer.

3.8.4 Mixer. When specified (see 6.2), the plant shall be supplemented with a powered tiltable-type mixer having a capacity rating of not less than 6 cubic yards. Mixer shall be electric motor-driven and compatible with the plant capacity in producing or exceeding the specified production. The mixer shall be equipped with a stand or other means so as to have a discharge height of not less than 10 feet above ground level, to facilitate unloading into dump trucks without spillage. The rotation speed of the mixer's drum shall be not less than 11 revolutions per minute (rpm), and shall not exceed 14 rpm. The liner and the edge of the mixing blades shall be fabricated of abrasion-resistant steel. The mixer shall be furnished with a slump meter. The mixer shall comply with current concrete plant mixer standards in effect on the date of manufacture.

3.8.5 Water system. A water system, consisting of a pump of adequate capacity to supply all demands of the plant, discharge metering controls, recorder of the digital readout (in gallons), cycling timer, piping, hose, and all the necessary accessories shall be provided with the plant. The required amount of water shall be discharged to the mixer while the mixer is being charged with aggregate. The suction and discharge connections of the pump shall have not less than 3-inch National Taper Pipe Thread. The pump shall have a constant speed motor drive, relief valve, bypass valve, and automatic start-stop controls. A system for adding measured amounts of admixtures shall be provided with the water system.

3.8.6 Air system. Air required to operate the plant shall be supplied by compressor(s) of adequate capacity to satisfy all demands. The compressor(s) shall be equipped with an oiler, strainers, relief valve, moisture separator, drain, and receiver with an unloading valve.

3.8.7 Hydraulic system. Hydraulic power required to operate the plant shall have a constant speed motor-driven pump of adequate capacity, with a relief valve and automatic start-stop controls, to satisfy the operational demands of the plant.

3.8.8 Electrical system.

3.8.8.1 Motors. All motors for driving components of the plant shall be totally enclosed, fan-cooled, conforming to NEMA MG 1, and rated for 230/460 volts (V), 3-phase, 60 Hertz, alternating current.

3.8.8.2 Power panel. The power panel enclosure shall be type 3S in accordance with NEMA ICS 2 (dust- and weather-tight) with doors. The power panel shall contain master switch circuit breakers, motor starters, and all items necessary for 460V, 3-phase hookup of the plant. The power plant shall be furnished with two 50-foot, rubber covered, 4-conductor (one conductor for each phase, plus an equipment ground (green) conductor) cable with lugs for connecting to an electrical system of sufficient capacity to meet the electrical requirements of the plant. The cables shall be portable power cables, with extra-heavy-duty jacket, rated for 600V. The power plant 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 applicable power supply requirements for the plant, in bold type, as follows:

POWER SUPPLY REQUIRED
480 VOLTS, THREE PHASE, THREE WIRE

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

3.8.9 Control panel and controls. The plant shall be furnished with a dust-and weather-tight control panel with keylocked door(s) or cover(s). The control panel, or console, shall contain all the necessary controls to enable automatic and manual operation of the plant by one operator at the control panel. Automatic batching, mixer charging, water introduction, and mixing time cycle controls shall be provided with manual override controls. The mixer shall be discharged by activation of discharge control at the control panel or at the mixer. The control panel shall be provided with preset type controls to control the amount of three sizes of aggregate, cement, water, and mixing time per batch of concrete. A digital type batch counter and a water readout (gallons per batch) shall be provided.

3.8.10 Weighing system. The weighing system furnished may be the manufacturer’s standard system complying with CPMB Standard.

3.8.11 Semitrailer units. The plant shall be separated into not less than two or more than five semitrailer units for transporting the plant. The semitrailer units shall be designed to withstand shock loads incumbent with performance requirements specified herein. Each semitrailer unit shall be equipped with full air service brakes controlled from the towing vehicle. Service brakes, lighting, reflectors, and associated equipment shall conform to DoT Federal Motor Carrier Safety Regulations. The kingpin shall conform to SAE J700. Support jacks, legs, or braces shall be provided in sufficient number and location to support the plant semitrailer unit in its operating position when the semitrailer is unhooked from the towing vehicle. Jacks, legs, and braces shall be retractable or removable to preclude interference with travel capabilities. Axle and suspension ratings shall be at least equal to the imposed load. The plant semitrailer units shall conform to table I.

TABLE I. Dimensions and clearances.

Maximum overall height (feet)	13-1/2
Maximum overall width (feet)	11
Maximum length centerline of kingpin to rear (feet)	60
Kingpin height from ground level (inches)	48 to 52
Centerline of kingpin to front of trailer (inches)	24 to 36
Minimum swing clearance (radius from center of kingpin to any portion of semitrailer 6 inches or more below upper fifth wheel plate) (inches)	82
Angle of departure, not less than (degrees)	23
Vertical road clearance, except for axle assembly, not less than (inches)	12

3.8.12 Tires and rims. The tire and rim ratings shall conform to TRA recommendations for the type and size of tires furnished. Tire and rim sizes shall be the same for all wheels. Tires shall be tube or tubeless type with highway tread. Tires shall be of rated capacity at least equal to the load imposed on each tire, measured at each wheel at the ground. Tires shall be not less than 100 level quality and shall be of domestic make. When tube-type tires are furnished, inner tubes shall be heavy-duty type, and shall be of proper size for the tires furnished.

3.9 Toolbox. A toolbox shall be provided. The toolbox shall be large enough to store all tools required for field service or maintenance, but shall not have external closed dimensions less than 14 inches in length, 6 inches in width, and 6 inches in height. The toolbox shall be a nominal 0.0747-inch (US revised standard gage No. 14) thick steel, with a hinged lid and a trunk drawbolt to keep the lid secure when vibrated. The toolbox shall be mounted in a protected, accessible location.

3.10 Dissimilar metals. Intimate contact which can be expected to cause galvanic corrosion shall be avoided. When such contact cannot be avoided, an interposing insulating material shall be provided to minimize the corrosive effect.

3.11 Lubrication. Lubrication shall be in accordance with the equipment manufacturer’s recommendations and shall be compatible with lubricants specified herein. Pressure lubrication shall not damage seals or other parts. All parts requiring lubrication shall be lubricated prior to delivery and tagged to show the type and temperature rating of the lubricant used.

3.12 Radio noise suppressors. Unless otherwise specified (see 6.2), the plant shall be equipped with radio noise suppressors conforming to MIL-S-5786. Electromagnetic radiation from the plant shall be within the limits of SAE J551.

3.13 Fungus resistance. 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.

3.14 Lifting and tiedown attachments. When specified (see 6.2), 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.

3.15 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 diameter.

3.16 Prime equipment accessories. Prime equipment shall be shipped with all required accessories and tools unless written deviation is received from the contracting officer.

3.17 Identification plate. Unless otherwise specified (see 6.2), identification plates shall be furnished by the contractor. 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 in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

3.18 Marking. The empty weight of the plant shall be conspicuously marked on each side of the plant by stenciling or other suitable means. Block or stencil-type letters not more than 1-inch and not less than 3/4-inch high shall be used.

3.19 Cleaning, treatment, and painting. Surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. The color of the finish coat shall be as specified (see 6.2), and shall conform to FED-STD-595. 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. 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 over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects.

3.20 Workmanship.

3.20.1 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.

3.20.2 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.

3.20.3 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.

3.20.4 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.

3.20.5 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.

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 one plant when a first article is required (see 3.2 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.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.3, the tests of 4.4, and the packaging inspection of 4.5. This inspection shall be performed on the samples selected in accordance with 4.3.

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. Every unit shall be tested in accordance with 4.4.1. The first article shall be tested in accordance with 4.4.2. Failure to pass any phase of the required tests shall constitute cause for rejection.

4.4.1 Acceptance tests. Each plant shall be erected to function as a complete plant to determine conformance to 3.7. All controls shall be operated at least 25 times to determine ease of operation and responsiveness.

4.4.2 First article tests. The following tests shall be performed on the first article when a first article sample is required (see 3.2).

4.4.2.1 Road test. Each trailer-mounted unit shall be towed for not less than 5 miles over hard surface rolling terrain, at speeds up to 5 mph with an

average speed of not less than 3 mph. Each unit shall be towed for not less than 20 miles over paved roads at speeds up to 35 mph.

4.4.2.2 Production test. The assembled plant shall be operated for 8 hours to satisfy the contracting officer that the plant is capable of meeting the production performance specified in 3.7.

4.4.2.3 Measurement of electromagnetic radiation. To determine conformance to 3.12, electromagnetic radiation shall be measured in accordance with SAE J551. When suppressed to conform to 3.12, the manufacturer may furnish, upon approval of the contracting officer, a certification in lieu of the test that the plant meets the requirements, together with a list of the suppression devices installed. The list shall be sufficiently detailed to allow visual determination that the devices are installed.

4.4.2.4 Lifting and tying down attachments. When required, the lifting and tying down attachments shall be tested to conform to 3.14.

* 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. 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 necessary 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 should be limited to parts and components easily removed and installed using no special tools or skilled personnel. Disassembly required to preserve equipment attached to 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 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:

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

* 5.1.1.3.2 Machined surfaces. Exposed machined surfaces shall be coated with type P-6 or P-Il preservative and wrapped or covered, as applicable, with barrier material conforming to MIL-B-121, type I, grade A, class 2 or MIL-B-22191, type II. The material shall be secured in place with waterproof tape.

* 5.1.1.3.3 Unpainted surfaces. Unpainted exterior metal surfaces, including threaded surfaces and surfaces exposed by disassembly, requiring the application of a contact preservative in accordance with MIL-P-116 and not specially provided for herein shall be preserved with P-1 preservative.

* 5.1.1.4 Air compressors. Air compressors shall be preserved and packaged in accordance with level A of MIL-C-3600.

5.1.1.5 Electric motors. Electric motors shall be preserved and packaged in accordance with level A of MIL-E-16298, using the alternate method specified for electric machines attached to mechanical equipment.

* 5.1.1.6 Control panels. Openings into motor starters, switches, and junction boxes shall be sealed with waterproof tape.

* 5.1.1.7 Electric wiring. Exposed ends of wires and terminals, and openings in sockets, junction boxes, coupling plugs, and switches shall be sealed with waterproof tape.

5.1.1.8 Gears.

* 5.1.1.8.1 Exposed gears. All unpainted surfaces of exposed gears shall be coated with type P-1 preservative or a thin film of primer conforming to TT-P-664 or MIL-P-62669.

* 5.1.1.8.2 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 waterproof material. The tags shall be attached in a conspicuous location.

5.1.1.9 Drive chains.

5.1.1.9.1 Enclosed chains. Enclosed chains and chain housings shall be preserved and tagged as specified in 5.1.1.8.2 for enclosed gears.

* 5.1.1.9.2 Exposed chains. Exposed chains shall be coated with enough type P-9 preservative to ensure penetration of the preservative to the inner surfaces 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.

5.1.1.10 Brakes.

* 5.1.1.10.1 General. Clean all surfaces as required to remove contaminants. Coat unpainted exterior surfaces of rods, levers, cables, clevises, linkage, and associated parts with type P-1 preservative. Remove brake drum covers and spray enclosed metallic components with primer TT-P-664 or MIL-P-62669 (see 6.2). Spray coat brake drum friction surfaces with a very thin coat (0.5 to 0.6 mil thick) of primer. Coat friction surfaces of cams, adjusting screws, and anchor pins with type P-6 or P-7 preservative. Back off all brake shoe adjusters for maximum clearance between brake drum and brake shoes. Do not apply coating of any type to contact surfaces of electric brakes. Adjust brake shoes to provide maximum clearance to drum surfaces and lined surfaces. In a conspicuous location in the operator's compartment, attach a weatherproof warning tag marked, "Brakes preserved. Do not apply brakes when vehicle is being moved. Use tow bar or similar arrangement for moving vehicle. Adjust brakes before placing equipment into operation." Markings shall be applied with waterproof material.

* 5.1.1.10.2 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.

* 5.1.1.11 Conveyor belts. Metal lacings shall be coated with varnish conforming to TT-V-119 or MIL-V-13811. Each belt shall be compactly rolled with a tube or piece of round wood placed in each 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 the belt must be held in a compact roll, flat strapping shall be placed around it. 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 barrier material 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.

* 5.1.1.12 V-belts, drive belts, and pulleys. Drive belts shall be removed or released from tension. Removed belts shall be preserved method IC-1 or IC-3. Unpainted surfaces shall be coated with primer conforming to TT-P-664 or MIL-P-62669. A weatherproof tag shall be attached in a conspicuous location indicating: "Belts have been (removed or released from tension). (Install or tension) prior to operation." Markings shall be applied to the tags with a waterproof material.

* 5.1.1.13 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 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.

5.1.1.14 Water systems. Interior surfaces of the water system, such as pumps, piping, and valves, shall be coated with type P-21 preservative in a manner to insure thorough coating of all interior parts and surfaces. Excess preservative shall be drained and all openings sealed with caps, plugs, or tape conforming to PPP-T-60.

5.1.1.15 Scales. The component parts of the torque level assembly of level balance type scales, such as pivot pins, pivot loops, and U-bolts, shall be coated with type P-l preservative. The loops and pins shall be secured in place with waterproof tape. The weighing beams, including poises, weights and linkage shall be coated with type P-7 or P-10 preservative and where practicable, the coated surfaces and parts covered or wrapped with barrier material conforming to MIL-B-121, type I, grade A, class 2, shall be secured with tape. The dial glass of springless dial-type scales shall be covered with a fitted piece of 1/4-inch thick plywood secured in place with waterproof tape.

5.1.1.16 Instruments. The dial glass of instruments not protected by a metal housing shall be covered individually or in groups with a fitted piece of plywood secured with tape conforming to PPP-T-60, type IV or MIL-T-22085, type II.

5.1.1.17 Rubber tires. Tires mounted on the wheels (road tires) of the vehicle shall be inflated to 10 pounds above pressure value recommended for maximum load. Tires mounted on rims (spare tires) shall be inflated to two-thirds of the specified operating pressure.

5.1.1.18 Service parts. The preservative application criteria and applicable methods of preservation of MIL-P-116 shall be used to preserve service parts. When specified (see 6.2), the service parts shall be preserved in accordance with level A requirements of MIL-S-196, or when parts are not specifically covered in MIL-S-196, requirements in MIL-STD-2073 shall be used.

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

5.1.1.20 Technical publications. Technical publications for each piece of equipment shall be preserved method IC-1 or IC-3.

* 5.1.1.21 Commercial. The complete plant shall be prepared for shipment in a manner which will ensure arrival at destination in a satisfactory condition. Preparation for delivery shall comply with applicable carrier rules and regulations. The equipment shall be lubricated for operational services required in the operator's manual.

* 5.2 Packing. Packing shall be level A or commercial as specified (see 6.2).

5.2.1 Level A. The complete plant shall be shipped uncrated. Disassembled components for each plant requiring additional protection from mechanical damage shall be packed in close-fitting boxes conforming to PPP-B-621, class 2, or PPP-B-601, overseas type. The contents shall be cushioned, blocked, and braced to prevent movement within the boxes. The repair parts, maintenance tools, and technical publications shall be packed separately in a container as specified for disassembled components. The disassembled components, repair parts, tools, and publications shall be positioned and secured to the plant with bolting or strapping in such a manner as not to interfere with towing or lifting the plant with slings.

* 5.2.2 Commercial. The complete plant shall be prepared for shipment in a manner which will insure arrival at destination in satisfactory condition. Packing shall comply with applicable carrier rules and regulations.

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

6.1 Intended use. This specification is a replacement for MIL-C-28527D to be used either as a concrete mix plant or, when not using the mixer unit, as an aggregate plant of 150 cubic yards per hour capacity.

* 6.2 Ordering data. 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 tiltable mixer is required (see 3.1 and 3.8.4).
d. When first article is required for inspection and approval (see 3.2, 4.2.1, and 6.4).
e. When electromagnetic radiation is not to be suppressed (see 3.12).
f. When fungus resistance is required (see 3.13).
g. When lifting and tying down attachments are required (see 3.14).
h. When identification plate is not to be furnished by the contractor (see 3.17).
i. When color of paint finish coat shall be as specified (see 3.19).
j. Level of preservation and packaging and level of packing required (see 5.1 and 5.2).

k. When brake drums are to be preserved (see 5.1.1.10.1).
l. When repair parts are to be preserved and how (see 5.1.1.18).

6.3 Subject term (key word) listing.

Mixer, concrete, trailer-mounted
Semi-trailer, plant, concrete mixing

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

* 6.5 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

6.6 Supersession data. This specification replaces military specification MIL-C-28527D dated 12 February 1987.

MILITARY INTERESTS:

Military Coordinating Activity

Navy - YD

Custodians

Army - ME
Navy - YD
Air Force - 99

Review Activity

DLA - CS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FCAE

PREPARING ACTIVITY:

Navy - YD

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein.