
* INCH-POUND *

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SUPERSEDING
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FEDERAL SPECIFICATION

DRILL, ROCK, HYDRAULIC DRIFTER, SELF-PROPELLED, TRACK-MOUNTED

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 track-mounted, self-propelled, self-contained, hydraulic drifter rock drill. (The drill is hereinafter identified as a rock drill.)

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).

Federal Specifications

- W-B-131 - Battery Storage (Vehicular, Ignition, Lighting and Starting)
- PPP-B-601 - Boxes, Wood, Cleated-Plywood

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. *

AMSC N/A

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

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- PPP-B-621 - Box, Wood, Nailed and Lock-Corner
- PPP-P-40 - Preservation and Packing of Hand Tools; Tools and Tool Accessories for Power Driven, Metal and Woodworking Machinery

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-T-3351 - Tractor, Full-Track, Low-Speed; Tractor Wheeled, Agricultural; and Tractor Wheeled, Industrial; and Their Attachments, Packaging of
- MIL-T-22085 - Tapes, Pressure-Sensitive, Adhesive, Preservation and Sealing
- MIL-B-22191 - Barrier Materials, Transparent, Flexible, Heat Sealable

Military Standards

- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment

(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 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 Labor (DoL)
Occupational Safety and Health Administration (OSHA)

Occupational Safety and Health Standards

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

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents which are current on the date of the solicitation (see 6.2).

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ASTM:

ASTM D3953 - Strapping, Flat Steel and Seals

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.)

Society of Automotive Engineers, Inc. (SAE):

SAE J534 - Lubrication Fittings

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

(Non-Government standards and other publications are normally available from the organizations that prepare or 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 document and the references cited herein (except for associated detail specifications or standards), the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The rock drill shall consist essentially of a diesel engine, a track-mounted chassis, a hydraulic system for drilling, positioning, tramming, dust control functions, an air compressor system, and detergent injection system for hole cleaning, and an operator's platform with necessary controls and gages to form a complete self-contained and self-propelled rock drill.

3.2 First article. When specified, the contractor shall furnish a rock drill for first article inspection and approval (see 4.2.1 and 6.2).

3.3 Standard commercial product. The rock drill 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 rock drill 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.

3.4 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials

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which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specified.

3.5 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.

3.6 Safety. All rotating or reciprocating parts, excluding the drill steel, feed chain, and crawler assembly, that are hazardous to operating personnel shall be enclosed or guarded to comply with current DoL OSHA requirements which apply. A weather-resistant caution sign shall be placed at the operator's station, and shall read: "CAUTION - EYE AND EAR PROTECTION IS REQUIRED WHILE IN OPERATION." The word "CAUTION" shall be in 3/4-inch (19 millimeter (mm)) or larger letters. The remainder of the sign shall be in letters of not less than 1/2 inch (13 mm). Color of the lettering shall conform to OSHA standards.

3.7 Ease of maintenance. All major assemblies and installed attachments shall be readily accessible for servicing, repair or replacement. Drainage of lubricants and hydraulic fluid shall be to the ground or in a container without draining on or over any part of the rock drill. When drain outlets are located over parts of the rock drill, internal tubes or pipes shall convey the fluid from the drain to the ground or in a container. Drain outlets shall be accessible without the removal or adjustment of accessories or parts other than access opening covers.

3.8 Performance. The rock drill, employing a tungsten carbide button type bit, shall be capable of drilling a 2-1/2 to 3-1/2-inch (64 to 89 mm) diameter hole, 12 inches (305 mm) deep in one-half minute at maximum down pressure, rotation speed and impact frequency when operating in Barre granite or equal with a crushing strength of 17,000 pound-force per square inch (psi) (117 211 kilopascal (kPa)). When crushing strength of the granite is other than 17,000 psi (117 211 kPa), the penetration required shall be inversely proportional to the penetration required at a crushing strength of 17,000 psi (117 211 kPa). The rock drill shall be capable of drilling 30-foot (9.1 meter (m)) deep holes in homogeneous rock with an average specific gravity of not less than 2.6, with the boom and mast at various angles and positions, for 50 hours of throttle time without replacement of parts other than drill steel and bits. The rock drill shall be capable of operating on 35 percent side slopes or 50 percent longitudinal slopes, or any combination thereof, without either track losing all contact with the ground. Boom and mast geometry shall produce a straight line vertical pattern of 22 feet 7 inches (6883 mm).

3.9 Transportability. The rock drill shall withstand impact forces encountered in rail transport and semitrailer transport without damage or permanent deformation.

3.10 Chassis. The rock drill shall be mounted on a self-propelled chassis consisting of two oscillating track assemblies. The chassis shall have a ground clearance of not less than 8 inches (203 mm). The track mountings shall permit tracks to rise over obstructions while maintaining a proportionately level platform when traveling or drilling. Total oscillation of the track frame shall

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be not less than 14 degrees (o). Suitable track rollers shall be provided to assure smooth track operation and maintain even ground pressure. Track rollers and the track rail shall be arranged so as to prevent damage to bearings or grease fittings when the rock drill is operated through abrasive material and loose stone. The track assemblies shall be equipped with track adjusters for maintaining tension on the track. Track frames shall not be spliced. The minimum overall track width shall be 96 inches (2438 mm) from outside-to-outside of tracks and a ground bearing length of not less than 96 inches (2438 mm).

3.10.1 Tracks. Track links and shoes shall be heat treated steel of drop forged or rolled construction, and all similar parts shall be interchangeable. The shoes shall be not less than 15 inches (381 mm) wide. Track links shall be equipped with replaceable pins and bushings. The master pin shall be secured by a lock or a press fit and shall be identified.

3.10.2 Trimming motors. A trimming motor, using a drive gear train or chain drive, shall drive each track. Each motor shall have a self centering "deadman" control valve for forward and reverse movement of the track. The motor and drive train shall be enclosed. The rated horsepower of the motors shall be not less than that required to advance the rock drill up a grade of not less than 40 percent and over level ground at a speed of not less than 1.5 miles per hour (mph) (2.4 kilometers per hour (km/h)).

3.10.3 Brakes. Each track shall be provided with brakes to prevent movement of the track drill when on a 50 percent longitudinal slope.

3.10.4 Platform. A platform, for use by the rock drill operator while manipulating the necessary controls during travel (trimming) and repositioning the mast, shall be furnished.

3.11 Boom. The boom shall provide not less than 50o total vertical lift from horizontal. Total horizontal boom movement (swing) shall be not less than 80o. Boom length shall be extendable not less than 5 feet (1.5 m) for a total length of not less than 15 feet (4.6 m). All boom movements shall be controlled hydraulically. The rock drill shall be capable of drilling regardless of the position of the mast or boom. Boom movement shall be so controlled that the boom can be stopped and fixed without creepage at all points in its range of vertical or horizontal travel.

3.12 Mast. A mounting plate shall be used to secure the steel mast to the boom. The mounting plate shall be hydraulically operated and shall be capable of sliding on the mast a minimum distance of 3 feet (0.91 m). A reversible hydraulic feed motor secured to the mast shall be used to drive the feed mechanism. The mast assembly shall include an adjustable feed chain, upper and lower feed chain idler sprockets, a drifter drill mounting plate, a foot pad, and a drill steel centralizer. Feed chain and idler sprockets shall be arranged so that total travel of the rock drill shall allow the operator to change 12-foot (3.7 m) sectional drill steel and couplings by disengagement of the centralizer only. When operating at rated hydraulic pressure, the hydraulic feed motor shall deliver not less than 5,000 pound-force (22 241 newton (N)) for crowding and retracting. The vertical mast dump from horizontal position shall have a minimum arc of 140o. The mast movement shall be controlled so that the mast can be stopped and fixed without creepage at all points in its range of travel. The mast shall be of such strength to support the rock drill and

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withstand the imposed loads. The mast shall be furnished with a drill steel storage rack suitable for racking up to three 12-foot (3.7 m) sections. A mast cradle shall be provided to support the mast when lowered for transit.

3.13 Drifter. The drifter shall be the variable stroke and variable speed type. The drifter shall be hydraulically actuated and shall produce not less than 250 pound-force foot (339 newton meters (N.m)) or torque at rated hydraulic system pressure. Percussion blows shall be variable, by the operator, to provide 125 pound-force foot (169 N.m), 150 pound-force foot (203 N.m), 175 pound-force foot (237 N.m), and 200 pound-force foot (271 N.m) per blow to the drill steel. Maximum power, at rated hydraulic system pressure, shall be not less than 500,000 pound-force foot (6779 N.m) per minute. Speed shall be infinitely variable from 0 - 150 revolutions per minute (rpm). Means shall be provided for permitting pressurized air to enter the drilled hole for blowing purposes. The chuck shall be designed to prevent the shank from leaving the drifter and shall be hardened for high wearing quality and shall be furnished with a sealed end cap with a water swivel.

3.13.1 Drill steel and bits. When specified (see 6.2), drill unit shall be furnished with the following:

Sectional drill rod 1-1/2 inch by 10 foot (38 mm by 3 m) sections	- 20 each
Drill shanks	- 5 each
Water swivel	- 2 each
Coupling drill steel	- 10 each
Bits - 2-1/2 inch (64 mm) carbide button	- 8 each
Bits - 2-3/4 inch (70 mm) carbide button	- 8 each
Bits - 3-1/2 inch (89 mm) carbide button	- 8 each

Drill bits shall be the carbide button type. Thread shall be I.R. 38 tandem thread.

3.14 Controls. All controls shall be clearly marked as to use and function. The tramming, boom, and mast controls shall be grouped for safe operation and ease of operation when positioning the drill, boom, and mast preparatory to drilling. The drilling controls shall be grouped for safe operation and shall be accessible to the operator when drilling at any position. Drilling controls shall operate the rock drill functions including the rotation, feed, and flushing operations.

3.15 Hydraulic system. The hydraulic system shall be protected against the entrance of dirt or other foreign materials and shall be complete with all operating accessories, including a pump, hydraulic cylinders, hydraulic motors, 10- to 25-gallon (38- to 95-liter (L)) minimum reservoir, relief valves, 25 minimum micron suction and discharge filters, check valves, and an oil cooler. The supply pump shall be the manufacturer's standard pump, capable of supplying sufficient hydraulic oil at rated system pressure, as required, to energize hydraulically powered components. A hydraulic oil cooler shall be provided. Pressure compensated flow control valves shall be provided to control hydraulic functions. A wiper shall be provided on all hydraulic cylinders adjacent to the piston rod seal to prevent dirt and abrasives from damaging the seal or entering the cylinder. When a gear type pump is used, the hydraulic system shall include manufacturer's recommended filters.

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3.16 Air compressor. The air compressor shall be a rotary screw type. The compressor shall be capable of compressing and delivering not less than 185 cubic feet per minute (87 liters per second (L/s)) of free air at a receiver pressure of 100 psi (689 kPa) at not more than 2,200 rpm under the following atmospheric conditions:

- a. Sea level.
- b. 60 degrees Fahrenheit (oF) (16 degrees Celsius (oC)).
- c. Zero humidity.

Under the conditions specified, the air discharge temperature shall not exceed 250oF (121oC). The compressor shall be capable of operating satisfactorily when tilted 18o longitudinally or transversely from a level position.

3.16.1 Safety shutdown. The compressor shall be equipped with a safety shutdown system designed to automatically stop the engine when discharge air temperature exceeds the safe limit established by the manufacturer, but in no case exceeding 250oF (121oC).

3.16.2 Filtration. The compressor intake system shall be equipped with dry type replaceable filtration elements.

3.17 Engine. The rock drill shall be diesel engine powered. The engine shall power the air compressor and hydraulic pump. The engine shall be two stroke or four stroke cycle, liquid cooled or air cooled. The engine furnished shall have the horsepower, torque and speed necessary to meet all performance requirements of the rock drill, without exceeding the continuous horsepower values at which the engine is rated. The engine shall be furnished complete with the following:

- a. A battery charging alternator.
- b. A two stage, dry type, intake air cleaner with service indicator.
- c. Hood and side doors.
- d. An electrical cranking system.
- e. 70 gallon (265 L) (nominal) capacity fuel tank with indicator, or sufficient capacity to operate 10 hours.

Instruments and gages specified in 3.17.1 shall be of the type recommended by the manufacturer. All engine accessories supplied commercially as standard equipment shall be furnished. The diesel engine shall be capable of starting within 5 minutes and shall be ready for full load operation within 15 minutes under any of the environmental conditions specified in 3.16. The diesel engine shall start in any temperature above -20oF (-29oC). Starting aids may be either electric glow plug or ether primer. When an ether priming system is furnished, it shall be the measured shot type, with storage capacity of not less than 12 fluid ounces (355 milliliter (mL)).

3.17.1 Instruments and controls. The following engine instruments and controls, as a minimum, shall be furnished:

- a. Control, starter.
- b. Control, shutoff.
- c. Control, throttle.
- d. Gage, lubricating oil pressure.

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- e. Gage, engine coolant (if liquid cooled).
- f. Ammeter, battery charging indicator, or voltmeter.
- g. Tachometer.
- h. Starting aid controls (see 3.17).
- i. Emergency shutdown.
- j. Hour meter. An engine hour meter having a totalizing mechanism of not less than 9,999 hours shall be furnished to register accurately the number of hours of engine operating time. Meter shall be of strong rugged construction to insure continuous trouble-free performance under the most extreme equipment operating conditions indicated in this specification.
- k. Keyed ignition/starting switch.
- l. Fuel gage.

All instruments shall be mounted on a panel or panels located near the operating controls and shall be visible to the operator. The instrument panel(s) shall be furnished with illumination for night operation.

3.17.2 Storage battery(s). The manufacturer's standard commercial 12-volt (V) potential storage battery(s) normally furnished, which have a capacity of not less than 200 ampere hours at a 20-hour rate, shall be furnished dry charged and moisture sealed in accordance with W-B-131, without electrolyte. When specified (see 6.2), a wet charged battery(s) shall be furnished.

3.18 Housing. A suitable housing shall be furnished to protect the engine, compressor, hydraulic pump, and instrument panel. Supporting members and braces shall be furnished as required. The housing shall be sufficiently rigid to support a 300-pound (136 kilogram) load applied to any single 1 square foot (0.093 square meter) area on the top of the housing. The housing shall include hinged access doors to the engine, compressor, hydraulic pump, and instrument panel. Access doors shall be equipped with devices to hold the doors in an open position and clamps or latches to retain the doors in the closed position.

3.19 Dust suppression system. When specified (see 6.2), dust suppression system with not less than 30-gallon (113 L) (nominal) capacity, shall be provided. The system shall be complete with all controls, components, and accessories as necessary. The system shall be designed to allow water or water with detergent to be metered into the blowing air line, mixing with the rock cuttings and eliminating dust blowing from the hole.

3.20 Dry dust collection system. When specified (see 6.2), the manufacturer's standard hydraulically powered dry dust collection system shall be provided. The system shall be complete with all controls, components, and accessories as necessary.

3.21 Toolbox. A toolbox shall be provided to carry those tools and accessories required to operate the rock drill. The toolbox shall have a hinged lid and trunk drawbolt of a type that will keep the lid closed when the toolbox is subjected to vibration. The toolbox shall be securely fastened in a protected and accessible location.

3.22 Lifting and tiedown attachments. When specified (see 6.2), the rock drill 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

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nonferrous transportation plate shall be provided and mechanically attached to the rock drill. 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. A silhouette of the item furnished showing the center of gravity shall be provided on the transportation plate. Tiedown attachments shall be identified by stenciling or other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for tying down the rock drill on the carrier when shipped.

3.23 Lubrication. Lubrication means shall be provided for all moving parts requiring lubrication. Hydraulic lubrication fittings shall be in accordance with SAE J534. Pressure lubrication fittings shall not be used where normal lubricating pressure may damage grease seals or other parts. The rock drill shall be lubricated prior to delivery with lubricants designated for use in the 0 to 32oF (-18 to 0oC) temperature range. The rock drill shall be conspicuously tagged to identify the lubricants and their temperature range.

3.24 Servicing and adjusting. Prior to acceptance of the unit by the Government, the contractor shall service and adjust the unit for immediate operational use as required in the operator's manual. The servicing and adjusting shall include at least the following:

- a. Proper functioning of the electrical system.
- b. Adjustment of engine to include tune-up (when required).
- c. Complete lubrication with grades of lubricants recommended for ambient temperature at the delivery point.
- d. Cooling system filled to capacity with a clean solution of equal parts by volume of water and antifreeze (ethylene glycol).

The unit shall be conspicuously tagged to identify the lubricants and their temperature range.

3.25 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 products, or any other interfering substances. As soon as practicable after cleaning, and before any corrosion product or other coating interfering material can result, the surface 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 over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects. Unless otherwise specified (see 6.2), the finish color coat shall be Green, No. 14064, conforming to FED-STD-595. The end item, allied equipment, and attachments shall be the same color.

3.26 Instruction plates. The rock drill 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.

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Plates shall be securely affixed to the equipment with nonferrous screws or bolts of not less than 1/8 inch (3.2 mm) diameter.

3.27 Identification plate. An identification plate will be furnished by the contracting officer for each rock drill. 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 rock drill in a conspicuous place with nonferrous screws, or bolts not less than 1/8 inch (3.2 mm) in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

3.28 Workmanship.

3.28.1 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.

3.28.2 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.

3.28.3 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.

3.28.4 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.

3.28.5 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

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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 Material inspection. The contractor is responsible for ensuring that supplies and materials are inspected for compliance 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 rock drill when a first article test is required (see 3.2 and 6.2). This inspection shall include the examination of 4.3 and the tests of 4.4.1 through 4.4.1.8. The first article test 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 this 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 expense, completely cleans, reconditions and/or overhauls the unit so that it is completely devoid of foreign material, and makes such replacements and modifications thereof as 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, the tests of 4.4, and the packaging inspection of 4.5.

4.3 Examination. Each rock drill 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 first article shall be tested in accordance with 4.4.1. Production units shall be tested in accordance with 4.4.2.

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4.4.1 First article tests. The rock drill shall be fueled and serviced in accordance with the manufacturer's recommendations preparatory to testing. The first article shall be tested to verify compliance with the requirements of this specification, as follows:

4.4.1.1 Boom positioning. The boom shall be hydraulically positioned through the total range of lift and swing to verify conformance to 3.11. The boom positioning hydraulic cylinders shall be visually inspected for evidence of fluid leakage. Movement not in accordance with 3.11, binding or lurching, or evidence of internal or external fluid leakage shall constitute failure of this test.

4.4.1.2 Mast positioning. The mast shall be hydraulically positioned through the total dump arc to verify conformance to 3.12. The mast positioning hydraulic cylinders shall be visually inspected for evidence of fluid leakage. Movement not in accordance with 3.12, binding or lurching, or evidence of internal or external fluid leakage shall constitute failure of this test.

4.4.1.3 Trimming ability. Trimming ability shall be verified by negotiating (both directions) a 40 percent slope for not less than 100 yards (91 m) without outside assistance. Slope condition shall be unpaved, compacted earth located less than 5,000 feet (1524 m) above sea level. Trimming forward speed shall be not less than 1.5 mph (3.2 km/h) over a level 1 mile (1.6 km) measured course.

4.4.1.4 Drilling ability. The rock drill shall perform the following tests to verify conformance to 3.8. During the drilling tests, the required drilling speed must be maintained. The performance of the rock drill shall not show significant difference during the test. The rock drill shall be examined for any evidence of damage upon completion of the following tests:

- a. The rock drill shall drill one 30-foot (9.1 m) deep hole at various angles and positions for continuous 50 hours of operation. Normal maintenance will be permitted but no adjustments to the rock drill or its component parts shall be allowed. The rock drill shall move approximately 10 feet (3 m) between each hole.
- b. Drill five holes 30 inches (762 mm) deep in Barre granite, or other rock of similar hardness and uniform density, at an average drilling speed as specified in 3.8. When a dust suppression system is required, all drilling tests shall be performed wet to verify conformance to 3.19. When a dust collection system is required, all drilling tests shall be performed dry and drill dust collected to verify conformance to 3.20.

4.4.1.5 Stability. With the right side of the rock drill downhill, drive forward 50 feet (15 m) on a 35 percent side slope. Repeat this procedure with the left side downhill with no change in the position of the mast or boom. Then drive the track drill forward down a 50 percent longitudinal slope. Inability of either track to maintain ground contact shall constitute failure of this test.

4.4.1.6 Clearance. Place the rock drill through a rigid mockup in accordance with Berne International clearance. Nonconformance to 3.6 and 3.9 shall constitute failure of this test.

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4.4.1.7 Brakes. Place the rock drill facing downhill on a 50 percent slope and apply the brakes or track locks to verify conformance to 3.10.3.

4.4.1.8 Rotation. The drifter shall be tested to determine rotation and blows per minute specified in 3.13.

4.4.2 Production unit operational test. Each rock drill produced in fulfillment of a Government contract shall be completely assembled, adjusted, lubricated, or otherwise serviced for operation. The engine shall be started and subjected to a warmup period as recommended by the manufacturer. The rock drill shall be given a run-in test and all controls operated a sufficient number of times to ascertain that the components and mechanisms actuated by the controls operate promptly, fully, and without restriction or malfunction. The hydraulic system and air compressor system, including hoses, fittings, and seals shall be examined for evidence of leakage or failure. Gear cases, bearings, shafts, and other moving parts shall be tactually examined for excessive heating or abnormal operation insofar as is practicable. Failure to pass any phase of this test shall be cause for rejection.

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

5.1.1.2 Disassembly. Disassembly shall be the minimum necessary to protect parts subject to damage or loss, and to accomplish reduction in cube. Removed bolts, nuts, pins, screws, and washers shall be reinstalled in mating parts and secured to prevent their loss.

5.1.1.3 Matchmarking. Parts removed and mating parts on the equipment and attachments shall be matchmarked to facilitate reassembling. Parts and accessories removed, and mating parts on the equipment, shall be identified with weatherproof tags attached to mating parts and locations. Markings shall be applied to the tags with a waterproof material.

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:

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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 or MIL-B-22191, type II. The material shall be secured in place with waterproof tape.

5.1.1.6 Chassis and engine. The track mounted chassis, engine, hydraulic system (except for brakes and steering), drivebelts and chains, track, and accessories shall be preserved in accordance with the level A requirements of MIL-T-3351.

5.1.1.7 Air system. Interior surfaces of the air system shall be coated with type P-10, grade 30 preservative. The preservative shall be applied through the lubricating system, or by feeding the preservative into the air inlet while operating the air system, until the preservative appears at the exhaust ports. Air inlets and outlets shall be closed with metal or plastic caps, or plugs, with tape conforming to MIL-T-22085, type II.

5.1.1.8 Chucks and chuck adapters. Chucks and chuck adapters shall be coated with type P-10, grade 30 preservative and wrapped with a barrier material conforming to MIL-B-121 and secured in place with waterproof tape.

5.1.1.9 Lubrication. Lubricate all grease fittings with type P-11 preservative. Lubricate control mechanisms, linkage, hinges, fasteners, and all pivot points with P-9.

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

5.1.1.11 Technical publications. Technical publications for each rock drill shall be preserved method IC-1 or IC-3.

5.1.1.12 Consolidation. Tool boxes shall be utilized for the consolidation of loose components, tools, and publications. 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, military overseas type or PPP-B-621, class 2. Boxes shall be secured to the equipment with appropriate strapping. 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 rock drill shall be preserved in accordance with the contractor's standard practice in a manner to prevent deterioration and damage. Any machined surface, cylinder rods and other exposed or unprotected metal material susceptible to rusting, shall be coated with a protective/preservative material prior to delivery to the Government.

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

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5.2.1 Level A. The complete rock drill shall be shipped in a mobile condition. The mast assembly and boom shall be positioned in their normal transport position and shall be secured in position with steel strapping conforming to ASTM D3953, Type I, finish B, or with wire rope. The attachments shall be blocked as required to prevent movement. Containers and components shall be secured to the rock drill and strapping as specified herein.

5.2.2 Commercial. The rock drill 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.

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. The intended use of this self-propelled, self-contained, hydraulically powered, track-mounted drill is to define crevice lines, drill in quarries, develop blast holes, and perform demolition and construction drilling.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in acquisition documents:

- a. Title, number, and date of this specification
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2)
- c. When first article is required for inspection and approval (see 3.2 and 6.4)
- d. When drill steel and bits are required (see 3.13.1)
- e. When wet charged battery(s) are required (see 3.17.2)
- f. When dust suppression system is required (see 3.19)
- g. When dry dust collection system is required (see 3.20)
- h. When lifting and tiedown attachments are required (see 3.22)
- i. When finish color coat is other than green (see 3.25)
- j. Level of preservation 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.

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6.4 First article. When a first article inspection is required, the rock drill will be tested and should be a first article sample 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 rock drill. 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-D-29226A(YD) dated 18 July 1988.

6.6 Subject term (key word) listing.

Self-contained
3-1/2 inch (89 mm) diameter hole

MILITARY INTERESTS:

Custodian

Navy - YD1

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD1

(Project 3820-0207)