SPECIFICATIONS FOR TRUCK, 37,000 LB. GVWR, 4X4, REG. CAB, CA – 84", CONVENTIONAL CHASSIS, WITH MOUNTED ROTARY DRILL

ACCEPTABLE BRANDS/MODELS: INTERNATIONAL, FREIGHTLINER OR EQUAL

SPECIAL INSTRUCTIONS

All bidders are expected to quote upon a manufacturer's latest standard conventional model truck, complete with all standard equipment plus any optional or special equipment that may be required to meet all of these specifications contained in this document.

Specifications require complete chassis pre-delivery service. It shall be the responsibility of the successful bidder to perform the pre-delivery inspection (PDI) and inspect the unit for specification compliance prior to delivery to the State of Tennessee Department of Transportation.

The delivery requirement is an integral part of these specifications and failure to follow shall be considered as noncompliance. It shall be the responsibility of the successful bidder to guarantee delivery within the quoted time.

Units not fully complying with all specifications shall be rejected and returned at the vendor's expense.

DOCUMENTS

Owner's manual, warranty papers, extra key, invoice and manufacturer's statement of orgin are to be furnished with the unit. Manufacturer's statement of origin is to be executed in the name of:

Tennessee Department of Transportation
505 Deaderick Street
Nashville, TN. 37243-0346

MILEAGE, ODOMETER READING

The maximum mileage allowable for any vehicle to be considered acceptable shall be 300 miles. It shall be the responsibility of the successful bidder to make any

required arrangements to insure that the mileage/odometer reading does not exceed the maximum miles listed when the vehicle is delivered to the using agency for acceptance.

TRUCK, CAB & CHASSIS SPECIFICATIONS

1. GVWR: 37,000 lbs.
2. Engine: Turbo-charged diesel, 230 hp, 660 lbs. torque at mfg.'s rated RPM. Emergency shutdown feature to be included.
3. Transmission: Automatic 5-speed with overdrive
4. CA: 84" (minimum)
5. Wheelbase: 150" (minimum)
6. Front Axle and Springs: 14,000 lbs.
7. Single Rear Axle: 23,000 lbs.
8. Rear Springs: Main minimum 23,500 lbs. Total capacity at ground with auxiliary springs for stability. (NOTE: Total sum of rear spring and auxiliary spring rating shall not be used to meet the minimum required for rear spring rating).
9. Brakes: Air system with 13.2 CFM gear driven air compressor.
10. Slack Adjusters: Automatic on front & rear
11. Hood: Fiberglass tilt type
12. Steering: Power
13. Air Conditioner/Heater: Required, Factory installed.
14. Mirrors: Minimum 16" x 7" west coast type with 8" spot mirrors, driver and passenger side. Remote and heated.
15. Instrumentation: Full package including tachometer and hour meter.

16. Front Tow Hooks: Tw0 (2) required, frame mounted.
17. Batteries: Dual, 1100 CCA with box, maintenance free.
18. Exhaust System: Horizontal
19. Front & Rear Tires: 11R22.5, 16 ply, tubeless radial (special service drive tire designed for off-road service)
20. Wheels: Steel disc., 10-hole, 8.25 – 22.5
21. Shock Absorbers: Required
22. Fuel Tank: 45 gallons, step type
23. Fuel/Water Separator: Required
24. Alternator: 130 amp/hrs.
25. Horn: Air
26. Engine Block Heater: Required
27. Truck Winch: The truck shall be equipped with a front frame mounted winch assembly that has a maximum pulling capacity of not less than 20,000 lbs. A winch engagement lever shall be provided in the cab convenient to the driver. The winch shall be equipped with an oil bath type gear box. The winch shall be complete with two (2) vertical and two (2) horizontal roller guides, not less than 150' of 9/16" steel wire rope and tail chain at least 18" long with safety hook.
28. Paint: Mfg.'s bright white
29. Warranty: Standard manufacturer's warranty shall apply and will begin on the date vehicle is placed in service which is approximately 30 days or less from receipt of vehicle.

SPECIFICATIONS FOR ROTARY DRILL RIG

ACCEPTABLE BRANDS/MODELS: CME 55, MOBILE DRILL B57 OR DIEDRICH D-90 OR EQUAL

GENERAL SPECIFICATIONS

The drill shall be a self-contained unit having a single engine power source. The power shall be appropriately directed to the hydraulic system and mechanically-driven drill head. The drill unit shall be thoroughly field tested and ready for immediate and continuous operation at time of delivery. The drill unit shall be furnished with all standard equipment advertised whether or not specifically called for in the specifications. The drill shall meet the following minimum specifications.

ROTARY DRIVE

The drill transmission shall have at least five (5) speeds forward and one (1) speed reverse. The transmission shall be mounted stationary on the drill main base frame. The maximum drill spindle torque shall exceed 9,400 foot pounds in the first gear. Rotational speeds of the drill spindle shall range from at least 68 RPM in the first gear to more than 550 RPM in fifth gear at 2,500 engine RPMS. The transmission shall power a single speed right angle drive. The right angle output shall turn a rotary drive bar that has a square cross section of at least1.75 inches a side and shall be made of heat-treated alloy steel. The rotary drive bar shall power a rotary box that has flange type bearings that can be greased. The rotary box shall be greased packed and shall not run on oil and shall have removable access panels on the front and rear to facilitate inspection and maintenance procedures.

VERTICAL DRIVE

The vertical drive shall consist of two (2) double-acting hydraulic fed cylinders with an overall stroke or travel of at least 72 inches. The feed cylinders shall have a point of thrust centered upon the axis of the drill spindle. The feed slide bushings shall be split for ease of removal and replacement. The vertical drive shall have a maximum downward thrust of not less than 18,000 lbs. and an upward or retract force of not less than 27,000 lbs. The feed cylinders shall have a

minimum piston rod diameter of 1.75 inches to withstand compressive forces when retracting augers from the ground without rotation.

Hydraulic gauges shall be provided on the control panel at the left rear of the drill to indicate in pounds per square inch the hydraulic feed pressure and systems pressure. The minimum rate of feed shall not be less than 55 feet per minute down and 35 feet per minute up.

A rapid retract capability shall be furnished to increase the rate of retract to a minimum of not less than 90 feet per minute. Two (2) feed levers shall be provided. One feed lever shall be of the spring return type permitting standard rates of feed and retract as well as the rapid retract. The first feed lever shall not be affected by the dial control settings used with the second feed lever. The second feed lever shall have a detent position and be used for drilling when a controlled rate of feed is required. Feed rate, once set, shall not be affected by changes in engine RPM nor by changes in formation resistance unless the adjusted down pressure setting is reached. A feed rate control shall be furnished for changing the rate of feed. A separate pressure control shall be furnished for changing the maximum bit pressure. The feed rate and pressure controls shall be operated by dials located on the front of the control panel within easy reach of the operator.

DRILL POWER UNIT

The power unit shall be a self-contained electric starting, water-cooled, heavy duty, 4 cylinder industrial type turbo-charged diesel engine having not less than 239 cubic inch displacement and a minimum 110 gross horsepower. The unit shall be equipped with an 11.1 CFM/20 PSI air compressor with dryer, heavy-duty type air cleaner, all-speed mechanical governor and a replaceable full flow oil filter. The unit shall have a 12-volt electric starting system consisting of a starter, alternator, battery and regulator. The unit shall have keyed ignition switches on the drill control panel. If the drill engine is provided with a separate fuel tank, the fuel supply for the drill shall have a capacity of not less than 40 gallons or the drill engine fuel supply may be provided by the truck carrier fuel tanks.

The power unit shall be equipped with a dry disc clutch not less than 13 inches in diameter and with a transmission having not less than five (5) speeds forward and one (1) reverse.

UPRIGHT DRILL FRAME WITH ANGLE-HOLE FEATURE

The upright drill frame shall be hydraulically actuated permitting 90 degree fold over for traveling. The drill frame movement shall be controlled by two 3.00 inch minimum ID double-acting hydraulic cylinders that have a minimum of 1.375 inch diameter piston rods and restrictor provided to prevent the drill frame from falling in an emergency. The drive train to the rotary shall not have to be disconnected when folding the upright drill frame over to the horizontal travel position. The depth of the upright part of the base frame shall be at least 10 inches for rigidity.

The angle-hole feature shall be a direct coupled mechanical drive system and shall include no more than two (2) universal joints. The drill rig shall be capable of drilling holes from vertical to 30 degrees from horizontal. Quick disconnect telescoping braces shall be provided for support of the upright drill frame in angle-hole positions.

AUGER AND ROD GUIDES FOR ANGLE DRILLING

Telescoping auger and rod guides shall extend from the bottom of the upright drill frame to stabilize augers and drill rods during angle drilling. Pins shall secure the telescoping guide supports in a stored position or at the desired amount of extension.

HYDRAULIC SYSTEM

This system shall have a heavy-duty engine driven tandem hydraulic pump run independently of the gear train with capacities of not less than 25.0 GPM and 21 GPM at 2,000 PSI. The system shall be equipped with a full-flow, replaceable element hydraulic oil filter in the high pressure line from the pump and in the low pressure return line. A hydraulic oil cooler shall be furnished. The hydraulic oil reservoir shall have adequate capacity and shall be equipped with a vented filler

cap, level indicator sights and a magnetic drain plug. The hydraulic pump shall be driven from a point in the line or power transmission so that hydraulic power will be available whenever the engine is running.

DRILLER'S CONTROL PANEL

All controls and gauges needed for the various drilling operations shall be placed in such a manner as to be easily accessible and convenient for the drill operator while permitting a view of the drilling operation at all times. The driller's control panel shall be mounted on the left rear of the drill and shall include the following instrumentation and controls:

A) Keyed ignition switch and starter button

B) Push-button emergency engine shut-off switch

C) Electric engine throttle switch

D) Transmission gear selector and lock-out clutch handle

E) Hydraulic gauges for systems pressure and pull-down pressure

F) Feed rate and feed pull-down pressure controls

G) Feed and detent feed levers

H) Hydraulic controls for all standard and provided optional components

The drill controls shall be arranged in groups and situated for convenience according to frequency of use. For safety and convenience, the hydraulic levers shall have directional control that corresponds with cylinder movement. For example, moving the feed lever up shall extend the feed cylinders.

SAFETY SHUT-DOWN SYSTEM

Push button emergency shut-off switches shall be located on the control panel, on the right side of the main drill frame. Two (2) emergency multi-directional wobble shut-off switches with extended levers shall be located near the bottom of and parallel to the feed cylinders. When any emergency shut-off switch is

activated, a drive line brake is engaged to stop the spindle rotation in less than one revolution. The clutch is released and the engine is shut down. The system shall also include a lock-out type of clutch handle that positively locks the clutch handle in the down or disengaged position. A mast-raising alarm shall be included to alert the drill crew to any overhead obstructions.

MAST WITH QUICK DISCONNECT

The mast shall be an integral part of the upright drill frame with provision for being disconnected and connected without the use of bolts. The mast shall completely disconnect from the drill frame so that the drill and the slide base are operable when the mast is not needed. The mast when disconnected from the upright drill frame shall be stored on a suitable rack or off the carrier, with the mast secured in its rack and the upright drill frame horizontal, the mast shall be separated from the drill by extending the in-out slide base, thereby disengaging cylindrical tapered pins on the mast from like tapered boxes fastened to the top part of the drill frame.

With the mast in a vertical position, the sheaves shall not be less than 26 feet from the ground. The maximum line pull of the draw works shall be evenly distributed on the four (4) cross-braced tubular members. The mast shall be a tapered design with a depth at the base of at least nine (9) inches. Pairs of eight (8) inch diameter sheaves shall be aligned with the rope or wireline they carry. Two (2) hydraulic cylinders shall be provided to raise and lower the upright drill frame and mast.

SLIDING BASE IN-OUT

A sliding base shall be furnished for moving the drill in and out so that the drill spindle can be positioned to facilitate alignment of augers, casing and other down-hole tools. With the slide base extended, the center of the drill spindle shall be at least 24 inches from the rear of the carrier to provide ample working room. The in-out slide base shall have at least 15 inches of travel and shall be hydraulically operated. The in-out slide base shall have a replaceable wear plate between the metal slide surfaces.

SLIDING BASE, SIDEWAYS

A sliding base shall be furnished for moving the drill to either side so that the drill spindle can be positioned to facilitate alignment of augers and drill rods when starting or drilling a hole. The sideways slide base shall have a wear plate between the metal slide surfaces.

HYDRAULIC LEVELING JACKS

Three (3) hydraulically powered leveling jacks individually operated from the control panel at the left rear of the drill shall be permanently mounted on the carrier. The jacks shall provide adequate leveling capability and shall be strong and rigid enough to easily support the total weight of the machine plus the loads generated when retracting drilling tools. Check valves shall be furnished in the hydraulic lines to prevent leakage or slippage of the jacks while the carrier is set up on the drill site.

Two (2) jacks shall be mounted at the rear of the platform, one on each corner. The maximum cylinder travel shall not be less than 36 inches. The minimum outside diameter of the jack cylinders shall be 4.5 inches with a 4 inch bore and 2.5 inch diameter piston rod.

One (1) jack shall be mounted at the center front of the truck. The maximum cylinder travel shall not be less than 36 inches. The minimum outside diameter of the jack cylinders shall be 4.5 inches with a 4 inch bore and 2.5 inch diameter piston rod.

The front leveling jack shall incorporate a tilting mechanism that will allow the jack housing to lean away from the truck grille to allow for tilting of the truck hood. When vertical, the jack shall be secured in position by a minimum one-inch diameter pin and shall pivot on a minimum one-inch diameter pin.

DRILL PLATFORM

The drill platform shall be constructed from structural steel members and 12 gauge safety tread deck plate. A watertight tool box shall be provided on the passenger side below the platform deck ahead of the rear wheels. Drill rod and

auger jacks shall be furnished above the deck. Clearance lights shall be included. The platform width shall not exceed 96 inches. The depth of the platform shall be 8 inches.

An 18 inch high bulkhead located on the platform shall be provided to protect the truck cab.

A folding driller's step that slides from a horizontal storage position beneath the left rear corner of the platform shall be supplied.

A hydraulic underbody auger rack shall be furnished on the driver side of the truck ahead of the rear wheels to facilitate the handling of augers. The rack shall be controlled by a hydraulic lever and shall slide on ball-bearing rollers. The rack shall store a minimum of 60 lineal feet of 4.25 inch ID x 5 foot hollow augers.

The drill platform shall be undercoated.

Dual pipe vises with a 1 5/8 inch hex shank attached shall be provided to fit two hex sockets located on both sides of the drill platform.

DRAW WORKS

The draw works shall include three (3) hydraulic hoists and a hydraulic wireline hoist.

The first hydraulic hoist shall have a maximum pulling capacity of not less than 8,500 lbs. Maximum line speed shall not be less than 72 feet/minute and maximum line speed down shall not be less than 310 feet/minute. One hydraulic lever shall be furnished for controlling hoist or lowering and rotation speed. A hydraulic brake release valve shall be furnished that permits wire rope to lead off the drum when the hoist control lever is positioned to suspend a load. The hoist shall include at least 65 feet of 7/16 inch diameter wire rope and a Shur-lok hook.

The second hydraulic hoist shall have a maximum pulling capacity of not less than 1,800 lbs. Maximum line speed shall be not less than 200 feet per minute. One (1) hydraulic lever shall be furnished for controlling hoisting or lowering and rotation

speed. The hoist shall include at least 60 feet of 3/8 inch diameter wire rope and a Shur-lok hook. A cable guide shall be provided.

The third hydraulic hoist shall have a maximum pulling capacity of not less than 1,800 lbs. The maximum line speed shall not be less than 200 feet per minute. One (1) hydraulic lever shall be furnished for controlling hoisting or lowering and rotation speed. The hoist shall include at least 60 feet of 3/8 inch diameter wire rope and a Shur-lok hook. A cable guide shall be provided.

The hydraulic wireline hoist shall have a maximum pulling capacity of not less than 1,000 lbs. Maximum line speed shall not be less than 200 feet per minute. One (1) hydraulic lever shall be furnished for controlling hoisting or lowering and rotation speed. The hoist shall be capable of holding up to 900 feet of 3/16 inch diameter wireline cable. Cable shall not be included.

QUICK DISCONNECT SPINDLE ADAPTOR ASSEMBLY

A quickly removable spindle adaptor assembly shall be furnished that connects to a heavy-duty hollow-stem auger box and adaptor plate bolted to the bottom of the drill spindle. Two (2) auger connector bolts shall secure the spindle adaptor in place. The spindle adaptor shall have a heavy-duty hollow-stem auger pin up and heavy-duty hollow-stem auger box down with an NW drill rod pin down centered inside. The spindle adaptor shall have a tubular extension through to the top of the drill spindle with an NW rod box thread for attaching a water swivel. The spindle adaptor assembly shall include a large auger drive universal joint with a hollow-stem auger pin up and a 1 5/8 inch hexagon socket down.

MUD PUMP ASSEMBLY

The mud or water pump shall be a progressive cavity type pump and shall have an infinitely adjustable output of 0 to 36 gallons per minute and maximum pressure of 225 PSI. Pump output shall not be affected by changes in the engine RPM. Power for the mud pump shall be supplied by a hydraulic motor operated from the drill hydraulic system. The assembly shall include a pressure gauge, a 1 ½ inch pressure port with sufficient 1 ½ inch high pressure hose to connect to the control panel, service tee with one inch bypass at the operator’s panel and a two inch

suction port with a two inch suction hose. Provisions shall be made for drainage of the mud pump and lines.

STANDPIPE WITH HOSE TO CONTROL PANEL

A 1 ½ inch diameter standpipe shall be mounted on the upright drill frame and connected by a 1 ½ inch high pressure hose to the mud pump output at the control panel.

HYDRAULIC HAMMER

A hydraulic hammer system shall be furnished that will lift a 140 pound drive weight for a 30 inch free fall. No rope or cable shall be attached to the weight for a 30 inch free fall. No rope or cable shall be attached to the weight that might impede free fall. The system shall have a minimum rate of at least 50 blows per minute. The fall height shall be controllable within a tolerance of plus or minus ½ inch. A method for visual verification of the fall height while the hammer is in operation shall be provided. The hammer shall be mounted on one single-acting hydraulic cylinder which is dedicated to the operation of the hammer device and shall be attached to the upright drill frame opposite of the control panel. The hammer device shall be hydraulically raised or lowered by this hydraulic cylinder through 72 inches of vertical travel. A 140 pound drive weight shall be furnished that will prevent the hammer from operating if the anvil is not in place.

HYDRAULIC ROD HOLDER AND BREAKOUT DEVICE

A hydraulic rod holder having two (2) opposed hydraulic cylinders that clamp up to 4.5 inch OD drill rod or pipe between two (2) replaceable jaws shall be furnished. These jaws shall have a minimum of 3.75 inches of vertical height engagement evenly distributed over a minimum of 45 percent of the drill rod circumference. The device shall swing on and off the hole from the pivot point near the right rear leveling jack and shall hydraulically move in and out. The hydraulic extension or retraction of the rod holder shall permit centering of the rod holder jaws on tools that are aligned with the vertical axis of the drill spindle. The rod holder shall store flush with the rear of the platform and out of the way when drilling with auger tools. The rod holder shall be capable of pivoting away

from the carrier so the jaws are a minimum of 55 inches from the platform to allow the holder to be used as drilling tools are advanced. A hydraulic breakout wrench shall be mounted on the rod holder. One set each of AW rods, NQ rod and NW casing jaws shall be furnished.

AIR IMPACT WRENCH SYSTEM

The system shall receive air from the engine driven air compressor, the system shall include a 3 gallon reserve tank, plumbing to the rear of the carrier, regulator, 12 foot airline with quick disconnects, impact wrench with pigtail hose, 1.12 inch and 1.25 inch impact sockets.

DELIVERY

150 Days maximum. Complete unit shall be delivered in first class operating condition, with acceptance subject to inspection and specification compliance.

COLOR

The drill unit and carrier and all parts normally painted shall be primed and painted bright white.

MISCELLANEOUS

All equipment cataloged as standard shall be furnished and shall be included in the purchase price of the unit. The component parts of the unit shall be of proper size and design to safety withstand maximum stresses imposed by a capacity load and the manufacturer's rated loads for chains, bearing and universal joints shall not exceed when the unit is loaded with such loads.

The torque capacity of each driven part shall be equal to or exceed the torque capacity of its driving member.

This machine is to be delivered in first class operating condition with acceptance subject to inspection and approval. The successful bidder, at a time designated, shall provide two (2) days of training to familiarize personnel with the correct operation and servicing procedures for the equipment delivered. A time shall be agreed upon by TDOT representatives and the successful bidder to perform this

training. Training shall be performed during an actual in-field drilling operation so a technician can provide any final adjustments (clutch adjustment, leaking hydraulic connections, etc.).

No deviations from these specifications will be accepted.

All items which require periodic lubrications shall be provided with a suitable lubrication fitting.

Two (2) copies of the manufacturer's service manual containing operating instructions, maintenance instructions and a bill of material or parts list shall be furnished by the manufacturer.

All pressure systems shall be provided with suitable pressure relief valves, with the exception of the spindle and drilling tools, all moving parts which are so located as to be a hazard to operating or maintenance personnel shall be fully enclosed or properly guarded protective devices shall not impair the operating functions.

WARRANTY

The equipment to be furnished under these specifications shall be warranted six (6) months 10% parts and labor against defective design, materials and workmanship with an additional six (6) months, 100% parts warranty for a total of one (1) year. This warranty does not apply to normal wear parts.

Successful bidder shall be responsible for all various components in lieu of a single source responsibility by the manufacturer will not be accepted. The successful bidder through the manufacturer shall be solely responsible for the guarantee of the complete unit.