



STATE OF CALIFORNIA
Department of General Services - Office of Procurement

PURCHASE ORDER

Purchase Order No.	Rev.	Date
62006		4/26/2008

Form GSOP 1-PIN (04/98)

Supplier No.	Solicitation No.	Delivery Date	FOB Point	Invoice Terms
	56702		Destination	

PAPE' MACHINERY, INC.
2850 EL CENTRO ROAD
SACRAMENTO, CA 95833
Attn: DAVID CONGER

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Agency Billing	Agency Purchase Estimate	Purchase Estimate	Revision
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Phone: 916-922-7181

Agency Contact

Phone

Date Received

Item No.	Quantity	Unit	Commodity Code	Description	Unit Price	Extension
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PURCHASE ORDER CHANGE (POC #2)
JUNE 27, 2008

This Purchase Order (PO) number 62006, issue date April 26, 2008, for a Grader, Articulated Frame is hereby amended to make the following change.

ADDITIONAL INCREASE OF PURCHASE QUANTITY:

FOR A "SIX Wheel, Front Wheel and Articulated Steer, Four Wheel Drive Motor Grader." as described in accordance with Specification number 67016-36102-226-061 of 28 pages.

The purchase quantity on Line # 4 has increased by one (1):

GRADER ARTICULATED FRAME (AS DESCRIBED)	178,734.0000	178,734.00
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"Six Wheel, Front Wheel and Articulated Steer, Four-Wheel Drive Motor Grader"
as described in accordance with Specifications 67016-36102-226-061 of 28 pages,
With standard 12 foot moldboard

With options:

- Ripper
- Air Conditioner
- Engine Block Heater
- Heated Mirrors
- Axle Lock-up

Training required at the ship to location;

Department of Water Resources
Corporation Yard
4300 West Capital Ave.
West Sacramento, CA 95691

Increase in quantity to be billed to: Department of Water Resources
Attn: Accounts Payable
PO Box 942836
Sacramento, CA 94235-001
Attn: Billing Code # 81000

For Predelivery Inspection contact: Department of Water Resources
Jim Pearson
Phone: (916) 653-9051

Sales and/or use tax to be extra unless noted above

Buyer LONNIE WILLIAMS	Phone 916-375-4586	BOC Number
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STATE OF CALIFORNIA

Department of General Services - Office of Procurement

PURCHASE ORDER CONTINUATION

Form GSOP 2-PIN (04/98)

<i>Purchase Order No.</i> 62006	<i>Revision</i>	<i>Date</i> 4/26/2008	<i>Supplier No.</i> 798322	<i>Supplier Name</i> PAPE MACHINERY, INC.
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<i>Item No.</i>	<i>Quantity</i>	<i>Unit</i>	<i>Commodity Code</i>	<i>Description</i>	<i>Unit Price</i>	<i>Extension</i>
<p><u>DELIVERY & DOCUMENTATION INSTRUCTIONS:</u></p> <p>VEHICLE DOCUMENTATION REQUIREMENTS:</p> <p>The original dealer's "Report of Sale" shall be furnished by all California licensed dealers at the time of delivery.</p> <p>A "Manufacturer's Statement of Origin" on the vendor's letterhead may be supplied in lieu of a Dealer's Report of sale.</p> <p>An original weight certificate from a California Weight Master must be supplied at the time of delivery.</p> <p>A Federal Excise Tax Exempt Certificate will be attached to the Purchase Order.</p> <p>All DMV documents shall use the following information:</p> <p>State, Department of Water Resources 1416 9th Street Sacramento, Ca 95814</p> <p>All DMV documents shall be delivered at the time of equipment delivery.</p> <p>DELIVER TO: Department of Water Resources Corporation Yard 4300 West Capital Ave. West Sacramento, CA 95691</p> <p><u>F.O.B. DESTINATION:</u> For the purpose of this order, only F.O.B. Destination will be accepted .</p> <p><u>TERMS & CONDITIONS:</u> State of California, Department of Transportation Specifications # 36102-226-061, of fourteen (14) pages.</p> <p><u>MANUALS, TRAINING, WARRANTY:</u></p> <p>MANUALS: One (1) set of standard operator's manual, complete lubrication instructions, parts books, and shop repair manuals (complete with electrical and hydraulic schematics) shall be supplied.</p> <p>TRAINING: The supplier at his expense, shall provide a qualified factory authorized service representative to provide training for operators, mechanics, and parts personal. This training shall consist of hands-on operation, safety, service and adjustments for the operator; Mechanical repair, adjustments, lubrication and servicing specifications for the shop and field mechanics.</p> <p>WARRANTY: This warranty shall include but not limited to the chassis, engine, drive train, electrical system and all modifications made to the unit prior to delivery, etc, shall be covered (parts&labor) under factory authorized extended warranty for three (3) years or 2000 engine hours whichever occurs first following the date Department of Water Resources puts the unit into service.</p>						

STATE OF CALIFORNIA

Department of General Services - Office of Procurement

PURCHASE ORDER CONTINUATION

Form GSOP 2-PIN (04/98)

<i>Purchase Order No.</i> 62006	<i>Revision</i>	<i>Date</i> 4/26/2008	<i>Supplier No.</i> 798322	<i>Supplier Name</i> PAPE' MACHINERY, INC.
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<i>Item No.</i>	<i>Quantity</i>	<i>Unit</i>	<i>Commodity Code</i>	<i>Description</i>	<i>Unit Price</i>	<i>Extension</i>
<p><u>FEDERAL CERTIFICATION:</u> Final stage manufacturers shall be certified by National Highway Traffic Safety Administration and be registered to manufacture or alter vehicles in accordance with the Code of Federal Regulation, Title 49, Parts 567-568.</p> <p><u>SCPRS REGISTRATION:</u> This Purchase order has been registered into the state contact and procurement registration system (https://www.scprs.dgs.ca.gov/). The registration number is 38600608317267.</p> <p>ALL OTHER TERMS AND CONDITIONS SHALL REMAIN THE SAME.</p>						

STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION
DIVISION OF EQUIPMENT

ITEM NO.	UNIT	CAB	TRANS	ENG	CAP	C.A.	F.A.	R.A.
36301	U	ENC	P.S.	D160	14 ft.			

SPECIFICATION NUMBER: 36301-226-061

SPECIFICATIONS FOR: A SIX WHEEL, FRONT WHEEL AND ARTICULATED STEER, ALL WHEEL DRIVE MOTOR GRADER

PURCHASE ESTIMATE NUMBER: 32-12-4992

It is the intent of these specifications to describe the minimum requirements for a six wheel, front wheel and articulated steer, all wheel drive motor grader equipped with a front scarifier and 14 foot (ft.) blade. These specifications are written in accordance with SAE J1057, J870, and J1234 standards referencing identification terminology, component nomenclature, and specification definitions for graders.

The unit shall comply with Caltrans Equipment Quality Standards for Electrical, Welding, and Paint and Coatings as defined at: <http://www.dot.ca.gov/hq/eqsc/qualstand.htm>. Only technical changes authorized by the Specification Engineer in writing will be accepted. Technical changes made by any other employee will not be accepted.

1. WEIGHT: The SAE operating weight of the base unit with standard equipment, fully enclosed ROPS cab, scarifier, and equipped with 14.00-24, 12PR, tires, less optional counterweights, shall not be less than 33,000 pounds.
2. DIMENSIONS: The following vehicle dimensions are given to insure proper vehicle configuration, use, transport, and storage. All dimensional requirements shall be applicable to the grader equipped with the specified tires and wheels outlined in Section 8, TIRES AND WHEELS of these specifications.
 - a. Vehicle Length 29 ft. (max.)
 - b. Overall Vehicle Height: 11 ft. (max.)
 - c. Overall Vehicle Width (without blade): 102 in. (max.)
 - d. Tread Width: 6 ft. (min.)
 - e. Wheelbase: 235 in (min.)
 - f. Tandem Center Distance: 5 ft. (min.)

g. Ground Clearance @ front axle: 18 inches (min.)

3. ENGINE: The engine shall be a variable horsepower, turbo-charged diesel engine with a minimum SAE J1349 net brake power rating of not less than 165 horsepower (hp) and net torque rating of not less than 540 ft.-lbs. The turbo-charged engine shall maintain the manufactures specified power and torque ratings to a minimum of 7,000 ft above sea level. An altitude compensated diesel engine will not be acceptable. The engine shall be CARB certified not to exceed the following emission levels:

If Engine is 175 hp or greater -NMHC + NOx = 3.0 g/bhp-hr; CO = 2.6 g/bhp-hr;
PM = 0.15 g/bhp-hr.

If Engine is less than 175 hp -NMHC + NOx = 3.0 g/bhp-hr; CO = 3.7 g/bhp-hr;
PM = 0.22 g/bhp-hr.

Emissions equipment shall be warranted by the grader manufacturer for a minimum of 5 years.

The engine shall be equipped with, but not limited to, the following accessories:

- a. Hand throttle control or electric throttle with toggle switch adjustment.
- b. Decelerator pedal or a throttle resume feature.
- c. Starting aid: A cold weather starting aid as recommended by the engine manufacturer.
- d. Engine block heater: The engine supplied shall come equipped with an electrical in block heater. (External tank type heaters are not acceptable.) The block heater shall operate on 120 volt current and be capable of plugging into a standard 120 V, 15 Amp wall outlet. The external receptacle shall be recessed to provide a smooth, non-protruding, and safe exterior environment when not in use. The receptacle shall be weatherproof with a lift cover and boot.
- e. Electric start and shutoff; key type.
- f. Engine hood and side panels with locking capability.

The grader's operating station shall be equipped with, but not limited to, the following engine monitoring instrumentation:

- g. Transmission oil temperature gauge
- h. Engine coolant temperature gauge
- i. Engine oil pressure gauge

- j. Hydraulic oil temperature gauge or high temperature indicator
- k. Voltmeter

The grader may be equipped with an electronic monitor and alarm system in lieu of the previously mentioned analog gauges (items g - k). If an electronic monitor and alarm system is supplied, the electronic monitor system shall monitor, as a minimum, the following engine and equipment conditions:

- l. Engine oil pressure
- m. Engine coolant temperature
- n. Transmission oil temperature
- o. Hydraulic oil temperature
- p. Alternator voltage
- q. Transmission oil filter
- r. Hydraulic oil filter

The grader shall also be equipped with visual and auditory warning devices to alert the operator of conditions critical to engine and equipment operation. These warning lights and sounding devices shall have their own source for actuation, rather than being dependent on another instrument. Warning lights shall be bright enough to stand out during all operating conditions and audible signals shall be distinguishable from the operating noises of the vehicle.

Critical engine and equipment operation conditions for which visual and auditory warning devices are required shall include the following:

- s. Low engine oil pressure
- t. High engine coolant temperature
- u. High transmission oil temperature

NOTE: A gauge is not an acceptable visual warning device unless it is accompanied by a red light which illuminates or flashes upon reaching a critical engine condition.

In addition to all of the above, the grader shall also be equipped with the following engine monitoring instrumentation:

- v. Engine tachometer
- w. Fuel level gauge
- x. Engine hourmeter, electronic - solid state (Ref. Hobbs model 23651-3 or comparable)

All engine monitoring instrumentation and warning devices shall be permanently labeled to identify their functions with a simple and readable lettering style or equivalent international symbols.

Instrument arrangement should consist of subgroups monitoring the engine, operational, and power train performance. Grouped gauges shall be consistent in size, color scheme, pointer design, and label style and size. All gauges and instrumentation shall be back-lighted or adequately illuminated for nighttime operation.

4. **TRANSMISSION:** The transmission shall be a power shift type with not less than eight (8) forward speeds and six (6) reverse speeds. The transmission shall be driven by either a torque converter, or direct drive coupling with an inching control. If the transmission is driven by a torque converter, the engine power rating shall be increased to a minimum SAE J1349 net brake power rating of 170 hp to compensate for the power loss inherent with fluid power transmission. The transmission shall be equipped with electronically controlled shifting.

The transmission shall have neutral locking capability that will - in the event the transmission is engaged - prevent the engine from starting or prevent the machine from moving if the engine is started. The grader shall be capable of traveling at speeds above 24 mph when in the highest forward gear.

5. **AXLES AND DRIVES:** The rear axles shall be tandem drive axles. The tandem axles shall be driven by roller chains and sprockets enclosed within a housing partially filled with lubricating oil. The drive to the tandem axles shall be through a differential assembly with no-spin or lockup capability. A torque-proportioning differential will not be acceptable.

The grader shall be equipped with front wheel drive. The front wheel drive shall have controls to allow the operator to engage and disengage the front wheel drive from inside the cab.

A hydrostatic front wheel drive system shall be capable of providing torque on the front wheels at ground speeds up to 12 mph. The hydrostatic drive shall be

capable of changing operational modes of traction from a normal traction mode to an aggressive traction mode. The aggressive operational mode of traction shall provide adequate torque to stabilize the steering of the front wheels while operating the grader under extremely poor traction conditions.

The front axle shall be capable of leaning the front wheels, from their vertical center line, a minimum of 15° to either side for a total wheel lean of 30°. The front axle shall also be capable of oscillating from its horizontal center line, a minimum of 15° in either direction (up or down) for a total front axle oscillation angle of not less than 30°.

6. **STEERING**: The grader shall employ front wheel steering and vehicle articulation as a means of steering. Front wheel steering shall be controlled using an electric over hydraulic joystick or a steering wheel with tilt and shall provide hydraulic power-assist or full hydraulic steering. Vehicle articulation shall be hydraulically actuated which may be accomplished through electric over hydraulic means such as a joystick.

The front wheels shall have a minimum steering angle of 36° to either side for a total steering angle of not less than 72°. The grader shall articulate a minimum of 20° in either direction for a total articulation angle of not less than 40°. An articulation indicator shall be installed with appropriate markings to indicate the level of articulation. The indicator shall be readily visible to the operator while seated in the operator's seat. The grader shall provide a minimum turning radius of not greater than 26 ft.

An emergency (auxiliary) steering system shall be provided to allow the operator to continue maintaining steering control in the event of an engine or steering power source failure. The emergency steering system shall meet the performance requirements as established by SAE J1511, "Steering of Off-Road, Rubber-Tired Machines".

The steering system shall be equipped with an articulated steering frame lock to prevent accidental machine articulation during shipment or maintenance.

7. **BRAKES**: The service brakes shall be power-assisted or power-actuated and installed to apply braking force on all four rear wheels. The service brakes shall be foot-operated and shall be effective on each of the tandem drive wheels. Power-assisted hydraulic brakes may be equipped with either air or hydraulic type booster system. A power-actuated braking system may be either air or hydraulically actuated.

The service brakes shall be self-adjusting, sealed and immersed in oil to protect against the influence of dust, mud, water, or snow (e.g., wet-disk brakes). All

external brake lines shall be protected/shielded from external impacts or pinching caused by tire chains, pry bars, rocks, etc.

A service braking system utilizing stored energy shall be equipped with a dash mounted gauge and a warning device which actuates before system energy drops below 50% of the manufacturers specified maximum operating energy level. The warning device shall be readily visible and audible to the operator, and provide continuous warning. A gauge is not an acceptable visual warning device.

An emergency (auxiliary) braking system shall be installed to allow the operator to stop the machine in the event of any single failure in the service braking system. The emergency system shall be capable of being applied by a person seated in the operator's seat. In addition to the manual control, the emergency stopping system may also be applied automatically. If an automatic emergency stopping system is used, the automatic application shall occur only after a warning device is actuated.

Hydraulically boosted or hydraulically actuated braking systems shall incorporate an emergency hydraulic power braking source (e.g., auxiliary pump) that is automatically activated in the event of an engine failure. Hydraulic accumulators in conformance with SAE J1473 - Braking Performance requirements will be an acceptable emergency power braking source.

A parking brake shall be installed and may be connected to the service brakes or operated independently on the drive shaft or transmission output shaft. A red warning light shall be installed on the instrument panel, in full view of the operator, to indicate when the parking brake is applied while the engine is running.

The service brakes, emergency brakes, and parking brake shall conform with the braking performance requirements as established by SAE J1473 Standard - "Braking Performance - Rubber-Tired Earthmoving Machines".

8. TIRES AND WHEELS: The grader shall be equipped with 14.00R24, tubeless tires on all wheels. (Ref. : Michelin XMPS or XSNOPLUS, other tires may be acceptable based upon industry availability and approval of the Specification Engineer.) The rim shall be as recommended by the tire manufacturer, all rims shall be the same size. All six tires and wheels shall mount to the axles with a minimum 3.0 inch side and 4.0 inch circumference tire clearance to allow for the installation and use of tire chains. All dimensional requirements shall be applicable to the grader equipped with these specified tires and wheels when inflated to the tire manufacturer's recommended pressure for grader applications.

9. AIR AND OIL FILTRATION: The engine air filtration system shall be a 2-stage unit consisting of a centrifugal pre-cleaner stage and two replaceable, dry element type, final stage filters. The centrifuging action pre-cleaner shall be capable of removing coarse dust and moisture. The air cleaner assembly shall also be equipped with a dust and water evacuator. The two replaceable, dry element type, final stage filters shall consist of an outer primary filter and an inner safety element of the correct capacity as indicated in the engine manufacturer's published instructions.

An engine air intake restriction gauge shall be located either in the cab and mounted in the instrument panel or be visible during operator's pre-operational check. The gauge shall be marked to indicate maximum restriction in accordance with the engine manufacturer's published instructions. The restriction gauge shall maintain the last highest vacuum reading when the engine is turned off and, upon air filter replacement, will reset to zero (Ref., Filter Minder Dash Mount Air Restriction Gauge, Model 3781-325 or comparable). The air cleaner/gauge connections shall be dustproof and waterproof, either tubing or hose routed, as to withstand abrasion, wear, and vibration. The gauge suction line shall incorporate an in-line filter to protect against dust intake due to a cracked or broken connection.

The engine oil filtration system shall utilize full flow filtration with a replaceable element, spin-on type filter of the correct capacity as indicated in the engine manufacturer's published instructions.

10. EXHAUST SYSTEM: The exhaust system shall utilize a vertical exhaust stack. A rain cap may be provided if it is compatible with the required emission devices provided. The exhaust stack shall be constructed so as to restrict rain from entering the exhaust system and wind from turning the turbo charger. This can be through use of a rain cap if compatible with the exhaust system or through an after treatment device (muffler) that restricts air flow back through the system in conjunction with a drain. Other methods maybe acceptable with prior approval from the Specifications Engineer. A simple elbow in the system does not perform the required function and will not be acceptable. The exhaust system shall comply with applicable California Vehicle Code and State fire regulations. Exhaust emitted by each unit shall comply with California emission requirements at the time of purchase.
11. ELECTRICAL SYSTEM: The grader shall be equipped with the following minimum electrical components:
- a. Two multiple beam front driving lights (halogen)
 - b. Two front work lights (halogen)
 - c. Two rear work lights (halogen)
 - d. Right and left side moldboard work lights (halogen)

- e. Rear tail and stop lights
- f. Front and rear mounted turn signals
- g. License plate lamp with bracket
- h. Cab dome light
- i. Electronic backup alarm (Shall sound whenever gear selector is in reverse.)
- j. Horn
- k. Backup light
- l. Master battery shut-off switch (either keyed or inside a lockable compartment.
- m. Amber mini light bar (Ref. ECCO PN 5315, Federal Signal PN 450112-02, or PSE PN 420AH).

Minimum electrical equipment shall comply with all Federal and State regulations. The tail, stop, and directional signal lamps may be in combination. The wires to these lamps shall be in a loom, conduit, or wrapped with electrical tape. Adequate size gauge of wire to the lights shall be used in accordance with SAE standards for distance from power source and load demand. Wiring color code for lights shall comply with SAE standard J560(b). The ends of all stranded conductors cut shall be mechanically stripped and fitted with insulated type terminals. The terminals shall be mechanically crimped securely with appropriate tool(s). All splices shall be sealed against moisture. Scotch Lock wire-type piercing devices shall not be used.

In addition to the mentioned lighting system, the unit shall be equipped with side and rear reflectors or reflector tape in accordance with FMVSS requirements.

The battery system shall be made up of one or two (2) heavy duty, sealed 12-volt batteries (Ref. Delco's Heavy Duty "freedom" 1110 series, Champion's Heavy Duty PC series, or comparable). (The following requirements shall be doubled if only one battery is used.) Each battery shall be not less than 700 CCA (cold cranking amps) at 0° F. and a reserve capacity of not less than 160 minutes at 25 amps and 80° F. The battery system ratings shall be as established by the BCI (Battery Council International) and SAE. Side terminal batteries are not acceptable.

A 24 V system for starting and operating the engine and equipment may be supplied if necessary. The electrical system shall be shielded and/or compatible with the use of a two (2) way mobile radio that will operate at a radio frequency of either 47 MHz or 800 MHz. A 12V, 25 Amp circuit shall be provided in the cab for use with a two-way communication radio. The two (2) way communication radio will be installed by Caltrans.

A minimum 90 amp alternator with a matching regulator shall be furnished with a 12-volt operating system. A minimum 45 amp alternator with a matching regulator shall be furnished with a 24-volt operating system.

12. HYDRAULICS: The hydraulic system shall incorporate full flow filtration, utilizing a replaceable element, spin-on type filter(s) with filtering capability of 25 microns or less. The hydraulic pump shall be of sufficient capacity to permit the simultaneous operation of at least two controls. All hydraulic hoses, lines, and fittings shall be SAE compatible. All hoses shall be the high pressure, crimp type and shall be properly protected and routed to eliminate failure due to abrasion, cutting, kinking, etc. Black pipe, galvanized pipe and pipe fittings shall not be used in the hydraulic system. Fittings and valves shall be of the proper size to match the hydraulic line to which they are attached. Compression fittings shall not be used. All threads shall be North American or metric type threads. Threads shall be of one type and not be mixed, British, etc. threads are not acceptable.

13. EQUIPMENT:

Blade Assembly: The dimension of the moldboard shall not be less than 14 ft. x 24 inch x .75 inch. The moldboard cutting edge shall conform to the requirements as established by SAE J739b and SAE J740b Standards. The blade shall be furnished with hydraulically actuated lift, tilt, and side shift capabilities.

The blade sliding side shift and circle centershift shall accommodate a minimum outside reach of 6 ft. beyond the rear tires to either side of the grader with a straight, non-articulated frame. The blade shall have a minimum lift (clearance) of 18 in. and a minimum depth (penetration) of 12 in. for a total vertical travel of not less than 30 in.

The circle shall be capable of rotating 360° and shall be hydraulically powered. The circle drive shall incorporate a slip clutch to protect against blade impact damage. The circle side shift shall allow the moldboard to be rotated from its normal horizontal position to a vertical, bank cutting position, 90° from ground level, on both the left and right sides of the motor grader.

The blade assembly shall be equipped with accumulators in the hydraulic lift circuit to cushion the blade from minor impacts and absorb any pressure spikes therein created.

Scarifier: A standard scarifier shall be provided to fit the motor grader being supplied. The scarifier shall be installed on the grader between the head frame and the mold board. If a plow of any kind is required, it shall be installed and shall function independently of the scarifier and both shall be provided and installed. Separate hydraulic circuits shall be used for the plow and the scarifier. The scarifier shall be hydraulically raised and lowered, having a minimum

penetration depth of 11 inches below ground level. The scarifier shall be equipped with a minimum of seven (7) removable shanks capable of being locked into working position. The scarifier shall be equipped with not less than nine (9) shank sockets spaced not greater than 6 inches apart. Each shank shall be at least 1 inch thick by 3 inches wide and equipped with the necessary locking devices and replaceable shank tips.

Headplate: The grader shall be equipped with a heavy duty headplate to support the use of a front mounted, reversible, 11 ft. snow plow. The supplier shall provide a dimensioned drawing of the head plate showing the location of attachment mounting points with the bid. The headplate shall be warranted per Section 3 WARRANTY of the ADMINISTRATIVE REQUIREMENTS portion of this specification, for use with such a plow.

14. OPERATOR'S COMPARTMENT: The operator's compartment shall be fully enclosed and equipped with safety glass windows and key type locking doors. The cab shall be constructed to afford the operator visibility throughout the entire operation. The cab shall be equipped with a fully adjustable (fore and aft), fully padded, suspension seat with backrest and headrest (a highback seat is acceptable), an industrial type seat belt, and a recirculating type heater with front and rear window defrosters. The cab shall be furnished with a headliner, floor mat, and front and rear exterior windshield wipers and washers which can be independently operated.

In addition to the fully enclosed cab, the operator shall also be protected by a Rollover Protective Structure (ROPS) in accordance with the State of California, Division of Industrial Safety, Construction Safety Orders, Title 8, Section 1596. A combination cab and safety guard approved by the Division of Industrial Safety will be acceptable. In general, the cab shall provide maximum operator protection and comfort.

15. CONTROLS: Placement of hand and foot operator controls shall be conveniently located as to provide the operator maximum comfort and control during operation. The equipment controls shall have lock valves in each implement circuit to prevent cylinder drift. Controls to lift the blade shall be equipped with a float position. Factory installed electric over hydraulic joystick type controls may be provided in lieu of the conventional type grader controls (to include steering).

An auxiliary four-way hydraulic valve shall be installed with the necessary hydraulic lines, fittings, and controls to actuate a front mounted, reversible plow. Hydraulic lines for the plow shall be routed up to the front headplate of the grader and fitted with not less than ½ inch quick-coupler type hydraulic fittings. Controls to operate the plow shall be conveniently located within the cab.

16. MISCELLANEOUS: Miscellaneous components to be supplied and installed shall include, but not be limited to, the following:
- a. Vandal protection package: The grader shall provide keyed protection from vandalism and theft. Vandal protection shall include the operator's compartment, engine compartment, battery compartment, and all exposed fluid ports.
 - b. Rear drawbar: The grader shall be equipped with a standard, clevis type drawbar permanently fixed to the rear of the machine.
 - c. Transmission bottom guard.
 - d. Mirrors: An OEM right and left exterior rear view mirrors shall be installed.
 - e. Tie-downs: The grader shall provide tie-down capability at or near each of the outside four corners of the machine. Tie-downs shall be compatible for use with ½ inch welded chain. Circular type tie-downs shall have a minimum 3 inch diameter hole, however, "D" ring type tie-downs are preferred. The tie-downs shall be appropriately secured to and located on the grader to provide adequate holding strength during trailer transport of the machine.
 - f. Interior rear view mirror. An OEM interior rearview mirror(s) shall be installed.
 - g. Slow moving vehicle sign. Capable of being removed without tools (i.e. wing nuts, slotted post, etc.)
17. MATERIAL: Construction shall be of all new material free of rust and any defects. All components in the assembly shall be fabricated from a single piece of material. Material which is joined by welding or other means to form a single piece of stock is not acceptable. The finished product shall be free of dents and warpage. The use of any type of body filler is unacceptable. All bolts shall be Grade 5 or better and conform to SAE and ASTM standards. Bolt lengths shall be such that a minimum of two threads shall extend beyond the nut. Nuts shall be the locking type. Nuts and washers shall be compatible with the bolt(s) to which they are attached, as recommended by the fastener manufacturer and in accordance with SAE and ASTM standards. If requested, the supplier shall submit proof of fastener strengths.
18. METAL SHAPING: All breaks shall be free of cracks. Radii shall be at least twice the thickness of the material or in accordance with the requirements established by ASTM for the particular material being formed, whichever is greater. All holes shall be round, of the proper dimension, perpendicular to the

material they are produced in, and finished smooth. Oblong holes or holes drilled, bored, etc. at angles are not acceptable. Holes and slots shall be drilled, punched, saw cut, plasma cut, or milled; torch cut is unacceptable. Sharp corners on all material shall be radiused to prevent personnel injury.

19. **WELDING:** All welding shall comply with the requirements as represented in American Welding Society (AWS), D14.3-82, and American National Standard entitled "Specification for Welding Earthmoving and Construction Equipment."

All welds shall be continuous except as noted. Intermittent or spot welds shall be spaced and proportioned to provide ample strength for the material being welded. Weld sizes not indicated shall be equal to the thickness of the least of the joined plates.

All welds shall be properly fused, displaying proper penetration and a professional finish, and must meet the qualification requirements of applicable AWS specifications. Examples of unacceptable weldments are:

- | | |
|-------------|-----------------------|
| a. Cracks | d. Excessive Splatter |
| b. Undercut | e. Blow Holes |
| c. Overlap | f. Slag Entrapment |

Any weld failing to comply with the AWS specification or failing to pass a quality assurance inspection performed by the State, will be corrected by the manufacturer, at their expense, and be corrected off State property. The State shall determine if a weld is acceptable or deficient.

Any deficient weld shall be corrected by a welder who is certified in accordance with the requirements as established by the American Welding Society (AWS). The welder shall have the proper certification documents indicating that he/she is qualified to perform the type, size, and position of the weld performed, with the welding process utilized, and on the material being welded. The supplier will be required to supply proof of current welding certifications for personnel performing any re-welding on the unit, upon request of the State whether written or verbal.

GRINDING OF WELDS must have prior approval of the Department of Transportation, Division of Equipment, Engineering Specifications. Welds which have been ground without approval shall be subject to complete re-welding upon request, at no additional cost to the State.

All assembly dimensions and tolerances on drawings apply after welding. Excessive warpage of assembled parts is not acceptable. Weld symbols on drawings shall be interpreted per American National Standard Welding Symbols.

In the event of the lack of a weld symbol, the best commercial practice shall prevail. The covering of welds with body fillers or similar materials is unacceptable.

20. PAINT: The basic unit and the primary finish surfaces of any optional equipment shall be finish coated with lead-free paint in factory standard colors. The finish coat shall be free from runs, drips, sags, etc., and shall be evenly applied to provide a gloss finish. The finish or top coat shall be compatible for re-coat or touch-up with lead-free DuPont Imron 5000, poly-urethane enamel, or equivalent. Compatibility and comparability will be determined by Caltrans. All paint and primer shall be lead free (300 ppm lead max).
21. NOISE: Noise emitted by each unit delivered in compliance with these specifications shall comply with all California and Federal laws or regulations pertaining to maximum allowable emission of noise inside the operator's cab. The Time Weighted Average (TWA) noise dose shall not exceed 85 dB (A) inside the cab as measured according to SAE J 1116 "Sound Measurement – Off Road Self Propelled Work Machines Operator Work Cycle."

The supplier may submit documentation to demonstrate compliance with this requirement.

22. LUBRICATION: The equipment shall be certified by the manufacturer for use with re-refined lubrication products. The re-refined lubrication products used by the State will meet or exceed all SAE, API, and NLGI specifications as required by the manufacturer.

Lubrication products used in each unit shall be compatible for top-off and refill with one of the following State contracted lubrication products:

- a. SAE 15W-40 motor oil.
- b. Dexron-III or Mercon automatic transmission fluid.
- c. Tractor hydraulic fluid.
- d. SAE 50 motor oil.
- e. SAE 85W-140 gear lube.
- f. NLGI #2 multipurpose grease.
- g. DOT 3 brake fluid.

For information regarding State contracted lubrication products, contact:

California Department of Transportation
Division of Equipment
PO Box 160048
Sacramento, CA 95816-0048
ATTN: Lubrication Coordinator, Ph: 916-227-9646

23. **SAFETY**: The entire unit and accessories shall comply with the applicable provisions of the California Vehicle Code, the Safety Orders of the Division of Industrial Relations, and all Federal regulations in effect at the time of manufacture. The Specification Engineer shall make determinations were safety compliance is an issue.