

SPEC. NO.: MAXI-675A-0519-2075

TITLE: SPECIFICATIONS FOR M-B COMPANIES, INC.
TRUCK MOUNTED, TWO (2) COLOR, 675-GALLON,
AIRLESS PAINT APPLICATION STRIPING UNIT

CUSTOMER: SARATOGA COUNTY, NY

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SECTION 1 GENERAL PROVISIONS

It is the intent and purpose of this specification to describe a truck-mounted self-contained "airless" application-stripping machine. The machine shall apply reflectorized lines utilizing a waterbase (latex), low VOC traffic paint and glass beads. The equipment must be capable of applying this material at ambient temperatures of 70° Fahrenheit on clean, dry pavement. The machine shall be capable of applying three (3) lines of this material in two (2) colors in either a solid or skip pattern, or combination of these patterns.

The machine shall operate in a range of 5 to 10 MPH. All truck parts and materials shall conform to the truck manufacturers' recommendations and the applicable Federal SAE Standards.

MATERIALS & WORKMANSHIP:

All equipment furnished and the parts thereof shall be of the manufacturer's latest listed and published stock models, which meet all the applicable requirements of the specification.

GUARANTEE:

The machine shall be guaranteed against defective materials and workmanship for a period of 365 days after acceptance of the machine, if properly serviced, maintained and operated under normal conditions according to the manufacturer's instructions.

All guarantee claims (parts) will be repaired or replaced by the line striper manufacturer. All replacement parts shall be shipped to the user within one (1) working day, if the parts are available. The vendor shall agree to sell all parts needed for the operating life of the equipment, which shall be a minimum of ten (10) years.

The manufacturer will assume no field expense for service or parts unless authorization is granted in advance.

The manufacturer will assume no liability for normal maintenance items, consumable or damage resulting from neglect or abuse of the equipment.

FINISH:

The complete machine and all components, including tanks, compressor, etc., shall have the following minimum protective coatings applied: one (1) prime coat and one (1) finish coat of paint, unless chromium plated or galvanized. The prime coat material shall be specifically compounded for the respective metals to which it is applied.

Finish Coat Color – platform and above deck: White to match chassis, PPG Delta Grade High Solids Urethane with Enhancer™ or equal, unless otherwise stated. Below deck: components shall be painted black.

All fasteners shall be chromium or cadmium plated.

SECTION 2 CHASSIS

The chassis shall be a new, current model year (No Exceptions), automotive chassis assembled to meet the specific requirements of this specification.

Manufacturer	Peterbilt
Model	520
Cab Type	Tilt
Wheelbase	200"
GVWR	43,000 lbs
Front Axle GAWR	20,000 lbs
Rear Axle GAWR	23,000 lbs
Low Speed Control	Chassis shall be set up for low speed cruise control from the factory (see below).
*For additional chassis details, please see chassis specification pages.	

When fully laden with striping material, the chassis manufacturer's GVW rating shall not be exceeded.

LOW SPEED CONTROL:

The striping machine shall be equipped with a low speed RPM control which, when activated will set the RPM at a certain speed and will maintain a constant speed. Speed can deviate slightly on declines and inclines.

FENDERS FOR REAR WHEELS:

Lightweight high density polypropylene ribbed fenders shall be supplied over the rear wheels. The fenders shall be easily removed and reinstalled on the vehicle to facilitate maintenance and serviceability. Mudguards shall be installed on the fenders' rear edge.

OVERALL HEIGHT:

The overall height of the striper shall not exceed 12'-0".

AUXILIARY EQUIPMENT:

The following auxiliary equipment shall be provided:

-Mud flaps, front and rear	-Piped ¼ inch air supply for a hand take-off mounted at the right hand corner of the platform
-One (1) 5 Lb. dry powder fire extinguisher (mounted in chassis cab)	
-One (1) 10 Lb. dry powder fire extinguisher (mounted on equipment deck)	

DIGITAL SPEED METER SYSTEM:

A digital speed meter shall be included on the striping unit that will allow the truck operator to read the speed in three (3) digits, to aid in maintaining a desired speed.

The signal source shall be a logic level pulsing unit driven by a pulse generator mounted off the driveline. The 12-volt DC power for the system shall be provided by the truck alternator and be separately fused.

REAR BACKUP CAMERA SYSTEM:

There shall be a rear view backup camera system installed on the vehicle. A 7" minimum color monitor shall be mounted in the truck cab. The camera shall be mounted at the rear of the unit. The system shall be pre-wired for 12-volt operation, including a 65 foot interconnect cable.

SECTION 3 PLATFORM

PLATFORM:

The steel platform shall not exceed 96 inches' total width, including all projections, and shall be at least 229 inches long. The platform framing shall be constructed of 4-inch structural channel cross members and 6-inch structural longitudinal members to support all required equipment mounted on it. The spacing of the cross members shall not exceed 18 inches. Perimeter tubing shall be 2"x5".

The platform shall be supported by a minimum of ten (10) equally spaced risers. The risers shall be manufactured into a built-in structural channel and shall allow an 8-inch opening from the top of the chassis rail to the bottom of the platform. This opening will facilitate accessibility to material and control plumbing in the area located between the chassis rails.

The risers shall be welded to the bottom of the platform and fastened to the chassis rails vertical flange by at least two (2) 5/8-inch diameter, grade #8 bolts, in order to transfer the loading on the rails, a soft aluminum spacing shall be placed between the risers and the chassis rails top flange. Provisions shall be made to permanently secure these spacers in their locations.

The platform shall have 1/8-inch medium pattern steel safety tread surface.

LADDER:

Ladders with skid resistant steps shall be furnished on sides, one (1) left and two (2) right. Safety chains shall be provided to secure the ladders in the stored position.

RAILING:

A steel railing shall be installed around the platform where necessary, and bolted in place. Railing shall be constructed of 1¼ inch square tubing. The height of the railing shall be 42 inches with a 21-inch-high cross member. Corners shall be rounded for operator safety.

REAR BUMPER:

The rear bumper shall have a minimum 12-inch width and extended across the rear of the truck platform. It shall be at least 15 inches above the road surface. The bumper support shall be at least 4"x5.4 channel steel on both sides.

REAR STEPS:

Rear steps constructed with safety tread surface shall be provided at the rear of the platform with hand rails or both sides and a grab bar on the platform to assist the operators mounting from the rear. A safety chain shall also be provided across the open rear access, behind the operators' stations.

TOOL BOX:

One (1) weatherproof tool box of adequate size shall be supplied and mounted on the truck. The box shall have a full face, bottom hinged door with a latch with integral lock. Any special tools needed for adjustments or disassembly of the various machine components shall be furnished in these boxes.

OPERATOR ENCLOSURE (HIGH VISIBILITY):

An aluminum and tinted safety glass, high visibility, housing shall be supplied to provide protection from the weather for the operators. The overall dimensions shall be 96" wide, 60" deep, and 75" high. Windows and doors shall be provided for easy viewing of the gun carriages and access to the remainder of the platform. Interior enclosure lighting shall be provided that will provide sufficient lighting of the controls and gauges.

The construction shall be as follows:

Insulation - Rear shelter shall be insulated with minimum 1" thick foam insulation, covered with a 14% perforate 32% vinyl covering. This insulation shall be attached to the shelter walls and ceiling by means of an industrial grade adhesive to secure the insulation to the shelter's inner walls.

Air Conditioning/Heater Unit - The enclosure shall be equipped with a roof mounted combination air conditioner and hot water heater with circulating fan. Cooling BTU's of air conditioner shall not be less than 25,000 (no exceptions).

Frame - 1-1/2" aluminum square tubing, 1/8" thick, welded and bolted structure.

Roof - 1-1/2" aluminum square tubing braces covered with 11-gauge aluminum sheeting with a sufficient interior head liner. Roof panels shall be insulated with 1" thick foam insulation.

Sides - Two (2) vertical tinted safety glass sliding windows shall be provided on each side. In addition to the above side windows, a removable "bubble" type window shall be installed on each side of the shelter. This "bubble" window shall project out approximately 6" allowing the operator to view the spray guns.

The front corners of the enclosure shall be angled to provide maximum visibility while seated in the operators' seats.

Front – One (1) aluminum hinged door, 22" x 68", shall be provided on the front right side. The door shall hinge in such a manner as not to obstruct the operator's mounting or dismounting from the deck area. A horizontal sliding window shall be provided in the top portion of the panel beside the door. Aluminum sheeting, 11-gauge, shall cover the bottom portion.

Back – One (1) aluminum-hinged door, 22" x 68", shall be provided in the center of the rear panel. In the upper portions of the panel, two (2) sliding windows shall be placed on either side of the door. The balance of the bottom of the area shall be covered with eleven-gauge aluminum sheeting behind the operators.

The entire shelter shall be bolted to the deck, enclosing the operators and the controls.

*33K BTU for dual air conditioner.

OPERATOR SEATS:

Two (2) air suspension, high back operator seats with armrests shall be mounted on the vehicle platform. They shall be fitted with foam rubber cushions and back. They shall swivel from side to side, and shall be fitted with seat belts in accordance with SAE and Federal Standards.

SECTION 4 PAINT & GLASS SUPPLY

PAINT SUPPLY:

The machine shall have a new paint storage capacity of 675 gallons in a non-pressure compartmentalized container with one (1) 400-gallon section for yellow paint, one (1) 275-gallon section for white paint. The container shall be constructed of minimum 10-gauge stainless steel sheet, with bracing as necessary.

One (1) quick opening inspection lid assembly using stainless steel construction shall be installed over each paint color compartment. The lid(s) shall be hinged to a 10 inch I.D. (minimum) neck ring. The lids shall be latched. Adjustments shall be provided to insure a proper seal due to wear on the Teflon gasket. Bolting of inspection lid will not be acceptable. Venting using stainless steel construction shall provide for normal operation of the paint supply.

With specified capacity of paint in each compartment, there shall be four inches remaining at the top of each compartment, providing a splash area for sudden stops, thus reducing the possibility of paint washing on the lid gaskets or splashing on the platform.

The bottom of the container shall be sloped.

The internal structure of each paint container section shall include stainless splash baffles, beginning a minimum of 2 inches from the top of the tanks.

Two (2) lids shall be provided, one (1) lid for each compartment.

Two (2) air driven agitators shall be provided. The agitator shafts and paddles shall be stainless steel construction.

The unit shall have a paint supply designed for two-color application. A stainless steel strainer shall be inserted in each system. The strainer shall be cylindrical in design and made from a #16 gauge perforated stainless steel material. The perforation shall be 1/8 inch in diameter and on approximately 3/16 inch centers (33 holes per square inch). No wire strainers are acceptable. The strainer shall be readily accessible and where necessary, valving shall be provided to isolate the strainer from the feed line for cleaning.

PAINT LOW LEVEL MONITORING SYSTEM:

A paint application monitoring system shall be incorporated into both the white and yellow systems to allow monitoring of paint levels in the tank. An audible alarm and light shall activate at the operators station when tank level of near empty is reached. Dip stick and tank float type of monitoring systems are not acceptable.

FILL/SUPPLY PUMPS:

Two (2) air operated diaphragm type, Wilden T-8 or equal, pumps shall be furnished to transfer paint at the rate of 25 GPM from the storage container to the paint tanks on the striping unit. The pump shall be equipped with Teflon balls and Teflon diaphragms. The pump construction shall have stainless steel wetted parts. Two (2) 12-foot sections of 2-inch diameter suction hose and a strainer assembly shall be provided (one for each color).

Provisions shall be provided to clean the pump by recirculating solvent from a solvent bucket.

GLASS SUPPLY:

A pressurized tank having a capacity of 4,000 lbs. of glass spheres is to be provided. This tank is to be of all steel ASME certified construction with a top opening of not less than 14 inches in diameter. A 0-160 PSI pressure gauge, pressure regulator, 110 PSI pressure relief valve, and auto evacuating moisture trap are to be included and mounted on the tank. In addition, the tank shall have a minimum 2-inch sight glass for viewing the bead levels. These sight glasses shall meet all ASME and maximum pressure requirements. The sight glasses shall allow the operator to determine bead levels at $\frac{3}{4}$ full stage, $\frac{1}{2}$ full stage and $\frac{1}{4}$ full stage.

A vacuum glass fill unit having a minimum loading capacity of 250 pounds of glass beads per minute is to be supplied. By creating a vacuum in the glass tank, glass is to be drawn into the tank without contaminating the vacuum unit. The speed of the unit is to be controlled and a muffler is to assure quiet operation at all times.

The glass filling system on this unit shall include a 12-foot-long, 2 inch I.D. fill hose with all the necessary fittings, including quick disconnect fittings and a new, unused 55-gallon drum with a combination bag splitter and strainer top.

The glass spheres are to be conveyed under pressure to glass sphere dispensing guns through rubber pressure hoses. A finned tube-type air cooler and moisture separator are to be supplied to remove moisture from air used to operate the glass system.

CLEANER SYSTEM:

An air-operated, gun cleaning system shall be installed on the striping machine. It shall consist of a 20 gallon ASME certified stainless steel pressure tank with safety valve and valves and piping necessary to introduce cleaner into each paint line.

An injector system shall be piped into the paint hose after the main line valve at the outlet of the heat exchanger. This system must be as close as possible to the outlet of the heat exchanger to clean the paint manifolds and hoses for overnight storage.

All piping shall be solvent resistant type. The tank construction shall be with a 4 inch threaded top opening and a full steel skirt support.

CLEANER SYSTEM GARDEN HOSE ATTACHMENT:

The plumbing system shall have four (4) garden hose connections for flushing of the paint system. One (1) garden hose fitting at each fill pump for flushing and one (1) at each high pressure pump for flushing.

PAINT HEATING SYSTEM:

The paint heating system shall be capable of maintaining a paint temperature of 110° Fahrenheit at the paint spray guns, at an ambient temperature of 70° Fahrenheit.

The heat source shall be two heat exchangers, one for each color, constructed of stainless steel tubes and a stainless steel shell which extracts heat from the auxiliary engine cooling water. A third heat exchanger shall be located between the engine and the paint heat exchangers to act as a buffer in case of leaks.

The paint heating system shall include two shell and tube type heat exchangers. They shall be 4-pass type units each having a minimum heat transfer area of 64 square feet. Structural steel brackets and covers shall be provided for mounting the exchangers in a vertical position with the inlet and outlet extending below the vehicle platform.

Each heat exchanger shall be provided with a fiberglass insulation blanket and an aluminum cover to retain heat within the exchangers.

Three 12-volt DC electric motor driven circulating pumps shall be provided. The pumps shall have a minimum rating of 25 GPM when pumping the heated water/ethylene glycol solution. The pumps shall control:

PUMP A: Circulation to the white paint heat exchanger
PUMP B: Circulation to the yellow paint heat exchanger
PUMP C: Recirculation system.

A digital thermostatic heat control shall monitor the paint temperature in each heat exchanger. These controls shall turn off or on the pump feed to the heat exchangers on the temperature setting required by the paint manufacturer.

Incorporated in the water/glycol system will be an expansion tank at a convenient location to both fill or check the fluid level of the system. A 14-pound automotive type pressure cap shall be used to regulate the system. An overflow tube from the cap neck down through the platform shall safely vent any overflow to the ground.

Three (3) automatic air vents shall be installed in the heating system to vent any excess air that gets trapped into the heating system. One air vent shall be in the expansion tank line at the top of the intermediate exchanger and one on each paint heat exchanger. (MANUAL AIR VENTS WILL NOT BE ACCEPTED).

**SECTION 6
PAINT APPLICATION SYSTEM**

PAINT APPLICATION SYSTEM:

The unit shall have a paint supply designed for two-color application and appropriate plumbing to allow single color loading of both tanks. The material supply shall be so arranged as to permit the simultaneous operation of two (2) and/or three (3) spray guns on the left carriage and one (1) spray gun on the right carriage for berm or edge striping.

A stainless steel strainer shall be inserted in each system. The strainer shall be cylindrical in design and made from a #16 gauge perforated stainless steel material. The perforation shall be an 1/8 inch in diameter and on approximately 3/16 inch centers (33 holes per square inch). No wire strainers are acceptable.

The strainer shall be readily accessible and where necessary, valving shall be provided to isolate the strainer from the feed line for cleaning. The strainers should be removed for cleaning with a single clamp sealed lid.

HIGH PRESSURE PAINT PUMPS:

Two (2) hydraulic driven, 13 GPM @ 2,000 PSI airless pumps, ARO or equivalent, one (1) for yellow and one (1) for white paint shall be provided and plumbed to deliver paint to the spray guns.

A minimum two-quart high pressure surge tank shall be incorporated into the paint plumbing design after each high pressure pump. This accumulator tank shall minimize any hour-glassing of the painted line on the road.

A high pressure manifold shall be provided with a 3/4-inch inlet and multiple 3/8 inch outlets.

A grounding strap shall be installed on the vehicle to discharge any static electricity build-up from the airless pumps.

PROCESS PLUMBING:

Air piping, tubing or hose used on the vehicle shall be firmly attached to the frame or bed, except where flexible conductors are required for proper operation or services.

All plumbing on the low-pressure side shall be constructed of industrial style, stainless steel, 2-inch tube process-clamp type piping, fittings and ball valves, with at least one-bolt clamp on the low-pressure side. All elbows shall be smooth 90° long radius style. Use of pipe thread fittings shall be minimized.

All plumbing on the high-pressure side shall be schedule 80 stainless steel threaded plumbing with full port ball valves. The high pressure paint hoses to the guns shall be designed to meet working pressure requirements of at least 2,000 PSI.

Paint plumbing shall be stainless steel. Valves will be ball type with Teflon seals, and valve construction on the low-pressure side shall be stainless steel with 4-bolt construction.

All material conductors other than pipe shall be non-metallic, paint and solvent resistant, Teflon lined, (no exceptions) insulated flexible hose. They shall be capable of withstanding the respective pressures produced in each system and shall not be less than 3/8-inch diameter.

The pumps, hoses fittings, valves and all components that are in contact with the marking materials shall be stainless steel.

A zippered vinyl jacket shall protect all airlines, paint and bead hoses to each gun carriage.

SECTION 7 SPRAY EQUIPMENT

PAINT SPRAY GUNS:

The paint spray guns shall be Kamber Model 50A, (no substitutions permitted) airless type, capable of processing paint in quantities which will yield a 4 inch wide line of 0.015 inches (15 mils) wet film thickness, and be put down at speeds up to 15 MPH.

The paint guns shall have an air powered opening and air powered closing with a spring assist of the gun with a built in exhaust port on the gun to ensure immediate and complete shut off of the gun. (No exceptions) This guarantees a flat beginning and end to the line.

Each paint gun shall have a Reverse-A-Clean Tip No. 661-LM-12 (0.061") and a fixed tip No. 018-6208-ST (0.062") and adapted shipped with the truck.

GUN "FLUSH ON THE FLY":

Provisions shall be made to allow flushing of airless paint guns.

REMOTE ELEVATORS:

All paint and bead guns shall be mounted on electric elevators which will permit remote vertical adjustment for each individual gun to change line width anywhere from 4 inches to 8 inches. The controls shall be mounted at the operator's stations.

BEAD GUNS:

There shall be installed pneumatically actuated glass sphere guns, high capacity (35 lbs. per minute at 30 PSI tank pressure), air atomized glass guns, Kamber Model 90HO designed to remove bead pulsation by fluidizing bead flow out of the gun nozzle. Gun outlet shall be fitted with a closed spooned glass deflector with adjustable side curtains to insure precise adjustment of beads on the paint line, thus minimizing waste of glass outside the paint line. The closed spoon material deflector must also be equipped with a hardened steel replaceable insert (either circular or rectangular shaped) to prevent wear of the deflector at the material outlet.

The glass guns atomizing air by-pass (coupling tube assembly) must be constructed of brass (plastic will not be acceptable). This assembly must also house a filter screen to prevent glass beads from being trapped in the atomizing air system.

In order to prevent glass from migrating into the air operation chamber, the gun shall employ a dual sealing system; this shall consist of a wiper seal, backed up by a needle "O" ring. The gun must also be equipped with internal stainless steel springs to prevent rusting due to condensation within the gun.

All gun inlets must be threaded (not soldered) to allow replacement of such parts due to wear or other damage.

The glass guns must be equipped with an interchangeable material tip system. This system must offer six (6) different tips sized from 5mm to 10mm tip orifice dimensions to provide the operator an infinite range of application speeds. Tips must be constructed of hardened steel to prevent excess wear.

AIR NOZZLES:

Each carriage shall also have a multi-channel flat jet nozzle, mounted directly in front of each paint spray gun row, to remove dirt and debris from the road surface prior to the application of paint and

glass beads. The "on/off" air supply to these nozzles shall be controlled by means of a valve actuated on the operator console. Each air nozzle shall have a manual adjustment air flow control.

GLASS SENSOR SYSTEM:

There shall be installed a sensor system to detect the flow of glass from the glass guns. This system shall signal the operators when there is no glass flow from the guns, while the unit is in operation. In order to detect and identify which gun may be malfunctioning, and/or signal the operator when to fill the glass system, a particulate matter blockage sensor shall be installed in each glass gun line.

SECTION 8 CARRIAGE ASSEMBLIES

SPRAY GUN CARRIAGE ASSEMBLY:

Two gun carriage assemblies shall be supplied, mounted behind the vehicle's rear wheels, to support and align the spray guns.

The main carriage, mounted on the left-side of the vehicle, shall have provisions for attaching three (3) paint spray guns (2-yellow and 1-white), two (2) glass sphere guns, and two (2) air nozzles.

One (1) wheel mounted on a caster axle, and mounted on the front of each carriage, shall support the carriage and maintain it at a fixed height from the road surface. The entire unit shall be mounted with linear bearings to allow vertical motion but yet keep the spray guns normal to the road surface.

A pneumatic lift cylinder controlled from the operator's position, shall be used to raise the carriage and a safety chain shall be provided to support it during transporting.

The cross slide supporting the carriages shall allow the carriages to be positioned for transport within the width of the vehicle's platform, and permit its use anywhere from this location outward for a distance of 4 feet. The slide mechanism shall consist of a rectangular tube within a rectangular tube telescoping design with UHMW, self-lubricating material bearing areas.

The second spray gun carriage shall be provided and mounted along the right side of the striping unit to align and support one (1) paint spray gun (white), one (1) glass sphere gun, and one (1) air nozzle. The design of this carriage shall be identical to the main carriage, and it shall also extend 4 feet from the edge of the platform.

Each carriage slide shall be equipped with a hydraulic cylinder for moving the carriage to any point within its operating range. The cylinder shall be double-action, controlled by a power steering control, and the steering wheel shall be conveniently located for the operator.

A tilting and telescopic steering column shall be conveniently located for each operator.

Each column shall include a steering wheel with knob. The power steering control unit and hydraulic hoses shall be located under the equipment platform, out of the way of the operators.

Stacked body, quick acting solenoid valves with a manual override feature shall be mounted on each carriage. Valves shall be equipped with balanced spool designed to minimize back pressure or restriction in exhaust. The valves shall be of a one-piece aluminum design body.

LEFT CARRIAGE		BERM CARRIAGE	
A	A	A	AIR NOZZLES
Y	Y	W	PAINT GUNS
W			PAINT GUNS
G	G	G	GLASS GUNS

A pneumatic lift system, with auto lock, shall be provided to raise the gun carriage for transport. The control switch shall be located in the gun box.

**SECTION 9
AIR COMPRESSOR**

AIR COMPRESSOR:

The air compressor shall be a Boss DUS Tier IV Final unit capable of supplying at least 250 cubic feet of free air per minute at 110 PSI.

All containers shall be ASME approved for 110 PSI working pressure. All necessary safety valves, piping and fittings shall be included.

The compressor engine shall be diesel powered, liquid-cooled, four-cycle, four cylinder, overhead valve construction, heavy duty industrial type. It shall include as standard equipment: a fin-tube type radiator, lubricating oil filter, 12-volt electrical system, pushbutton starting, and recommended air filter to be shared with the compressor air intake. The air compressor engine and chassis engine shall have a common fuel tank.

A Schmidt or approved equal, model number 1200-080-03 coalescing moisture extractor shall be installed in the main air supply line. It shall have a rating of 800 CFM.

A common skid base shall be provided under the engine and compressor so they may be handled and mounted as a package unit. The compressor shall be mounted to the platform longitudinal members. A complete cover with hinged or sliding access panels shall be supplied for weather protection.

The operating control panel shall be located at the end of the compressor unit and the unit mounted so that it is at the curb side of the vehicle and include, in addition to operating controls, gauges showing oil and air pressures, water temperature, and voltmeter and an electric hour meter.

An electric cooling fan shall be installed into the main airline to remove heat from the compressed air.

The unit shall be furnished with the following accessory items as a standard part of the package: hour meter, oil level gauge, automatic moisture trap for controls, automatic blowdown valve, minimum pressure valve and a hydraulic pump.

HYDRAULIC PUMP:

A pressure compensated piston type hydraulic pump shall be provided, capable of delivering sufficient flow to power all hydraulic functions. This pump shall be directly mounted to the auxiliary engine. (Belt driven systems are not acceptable.)

HYDRAULIC SUPPLY:

A 35-gallon minimum hydraulic reservoir shall be provided.

The reservoir shall be equipped with an internal baffle, sight level gauge, and vented cap. The reservoir shall be located to insure flooded inlet suction to the pump. The return port on the reservoir shall be equipped with a 50 gallon per minute return filter.

The 6-micron absolute return filter shall be a canister type with replaceable element and indicator gauge.

All high-pressure hydraulic hose shall be rated at a minimum of 2,000 PSI working pressure. A shut-off valve will be installed in the low pressure plumbing to isolate the reservoir and limit fluid loss when maintenance is performed.

SECTION 10 GUIDANCE SYSTEM

LASER GUIDANCE SYSTEM (cab mounted):

There shall be supplied a GL-3000-P Laser System using an ultrahigh visibility green laser to establish visual line control for the paint striping machine. The operator adjusts the laser spot to the desired reference point on the road via a remote control panel located in the cab of the truck.

The control shall have a three function switch for:

Laser On Steady mode.
Laser On Blinking mode.
Laser Off.

There shall be a corresponding green light located on the laser status panel indicating the laser status:

1. Light On Steady mode.
2. Light Blinking mode.
3. No Light (Off).

To position the laser spot to the desired location; i.e., center line, road edge, bike lane, etc., the operator shall push the proper buttons for the direction that he/she wants the laser spot to move in; left, right, forward, back, and the laser tracks simultaneously.

The system shall have an automatic shutdown feature designed to minimize power consumption. All functions shall shut off after the laser function mode has been in the OFF position for two hours.

The laser, all optics, mechanical mechanisms, and electronics shall be located in a rugged, weatherproof housing that is typically mounted to the roof of the truck. This permanent installation shall eliminate the need to remove the laser at the end of the day. Two cables shall run from the laser housing, one for 12V DC power, the other for system control in the cab.

Specifications -

Laser - 532mm Class IIIA

Power - 12V DC 4.0 amps/hour (Max Operating)

Operating Temperature - +36° - +120° F.

Power/Control Cable Length - Approximately 20 Feet (from laser box) to DB15 Connector for Control Box

Laser Box – Approximately, 6-1/8 H x 6-1/2 W x 12 L Inches.
Shipping Weight - 25 Lbs. - Approximate

OPTICAL SIGHT:

An optical sight shall be mounted inside the chassis cab. The sight shall include the necessary light source, lens system and mirrors to project a virtual image of a luminous sighting pattern onto a distant target. A housing, and adjustment mounts shall be provided for positioning and clamping the optical sight in the best location for the vehicle operation.

SECTION 11 TRAFFIC CONTROL LIGHTING

LIGHTING, PLATFORM LED:

Marker and clearance lighting shall be LED and recessed flush mounted in grommets.

STROBE LIGHTS:

One (1) amber LED strobe light shall be mounted on each side of the platform and recessed into the tubing for better visibility by oncoming traffic at intersections.

LIGHTBAR:

One (1) amber LED lightbar shall be mounted on top of the truck cab.

The control switch shall be a lighted rocker switch, located in the truck cab.

STROBE LIGHT BEACON:

Two (2) amber LED beacon strobe lights shall be mounted at the rear behind the operators' enclosure.

The control switches shall be lighted rocker switches, located on the operators control center.

NIGHT LIGHTING SYSTEM:

Seven (7) 12 volt high-output rectangular LED work lights shall be provided on the unit for night time striping operations. Two (2) lights shall be mounted on the deck area to illuminate the equipment, two (2) lights shall be mounted on the front of the carriage to illuminate the road in front of the guns, two (2) lights shall be mounted behind the carriages, illuminating the carriage/guns and one (1) light shall be mounted near the paint fill pump. This system shall include a 130-amp alternator, driven by the auxiliary engine, and all necessary wiring and switches.

SECTION 12 CONTROL & ELECTRICAL SYSTEM

CONTROL CENTER:

A control center shall be provided. This shall consist of an integral sheet metal covered framework providing space for electrical controls, spray equipment connections, heater thermostat control, and any other auxiliary parts required by the spray equipment.

The control center shall be mounted in an inclined position so that it can be observed from either operator's position. This control center shall have mounted on it, all the necessary regulators, gauges, valves, switches, and indicators required for operation of the striping equipment. All parts shall be of the panel type and located behind the panel if at all possible. An easily removable back plate with four (4) recessed latches shall allow access to the interior for service. Both a 110 PSI safety valve and a condensate drain shall be located on the panel air manifold. All of the gauges shall be of the liquid-filled type. All control center switches shall be lighted rocker or push button type.

The spray equipment shall be electrically controlled by means of toggle switches and solenoid valves. The switches shall be located in two (2) separate control panels within easy reach of the rear equipment operators. The switch sections shall also house additional switches and indicator lights for the skipline mechanism control.

Each control panel shall be located within a non-metallic enclosure with a clear hinged and latched cover. Each enclosure shall be mounted to the canopy railing and friction hinged to "flip" out of the way when necessary.

All line pattern combinations, skipline mechanism actuation, and skipline mechanism reset shall be controlled by toggle switches. Pre-selected combinations shall be obtained by activating only on switch that also simultaneously actuates or resets the skipline mechanism. One (1) toggle switch shall be an "OFF" switch connected in such a way that when activated, it will turn off and cancel any of the above selected patterns, as well as automatically reset the skipline mechanism to a ready position. Provision shall be made so that any glass sphere guns may be controlled from the same system for simultaneous spray gun and glass gun operation.

All electrical wiring shall be enclosed in conduit type protective case. Any wires passing through the deck shall have grommets around them.

All electrical controls shall be 12-volt power only.

All electrical wiring shall terminate in the operator control center.

INTERCOM SYSTEM (WIRELESS):

A David Clark Model 9900 wireless intercommunication system shall be furnished to provide a means of vocal communication between the driver of the vehicle and the operators of the striping equipment. This system shall provide open communications for all operator stations.

Three (3) under helmet headsets for the rear operators and one (1) single ear headset for the front cab operator shall be provided. The headsets shall be equipped with noise cancelling microphone and on/off/microphone controls for hands free communication.

AUTOMATIC VOLUME CONTROL:

The machine shall be equipped with an automatic volume control system that will maintain constant wet film thickness of paint applied to the road irrespective of travel speed of the truck, colors of paint being applied, number of guns operating continuously or intermittently, or number of pumps (up to two per color) utilizing an open-loop controller.

SECTION 13 SKIPLINE SYSTEM

SKIPTIMER SYSTEM:

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It is the stated intent of this specification to describe a highly reliable, easy to use, simple to install, compact skip-setting mechanism that requires little or no maintenance and no clutches, cams, gears, bearings or devices that must be adjusted while at rest.

The skip timer control boxes shall use mid-sized IP67 rated toggle switches and shall use sealed push-buttons for menu navigation.

The skip timer control box shall have a full color, 4.3" screen. The color menu system shall provide an animated preview of skip timer patterns, reflecting current settings and switch positions and shall provide guided calibration processes for distance and pump calibrations. The color menu system shall have a descriptive information system to provide the operator with information about errors, warnings, and skip timer operation. There shall be a switch test menu, for in-field diagnosis of switch failure, incorporated into the color menu system.

The skip timer system shall communicate using CAN bus serial communications protocol. It shall have an operating temperature range from 33° Fahrenheit to 140° Fahrenheit and a storage temperature range of 10° Fahrenheit to 160° Fahrenheit.

The skip timer output boxes shall directly drive all loads (air dusters, material guns, bead guns, double-drop bead guns, etc.). All outputs shall be solid state. To simplify diagnostics, the skip timer output boxes shall have driver indicator LEDs for all driver outputs.

- The skip timer shall accept motion signals from a magnet-wrapped driveline collar. All motion signal sources will maintain a 0.1' resolution during normal road marking operations. The skip timer system software shall be field upgradeable via USB drive, and the hardware shall be field upgradeable using hub expansions ports for adding more driver output boxes, sensor input boxes, or data logging equipment.

The skip timer shall separately track skip and solid distance painted per gun, and paint consumption from pump strokes, into internal, non-volatile counters.

**SECTION 14
TECHNICAL SERVICES**

TECHNICAL INFORMATION:

For the purpose of standardization of the unit, the availability of replacement parts, and whether or not components meet the specifications, the bidder will provide literature or system diagrams and details on the following components:

A. Chassis	I. Gun Carriage System
B. Paint Handling Equipment	J. Auxiliary Engine
C. Glass System	K. Compressor
D. Cleaner System	L. Guidance System (s)
E. Paint Heating System	M. Message Board
F. Paint Pumps	N. Intercom System
G. Paint Guns	O. Skip Timer System
H. Glass Guns	

A computer generated engineers' detailed layout of equipment body components and vehicle weight distribution shall be provided with the bid submittal. The layout drawing shall show the location of material and glass bead supply equipment, air compressor package/engine equipment, and other components necessary for the successful construction and operation of the striping unit.

Failure to supply information as requested for the previous items with the bid, will cause the bid to be irregular and not acceptable.

TECHNICAL MANUALS:

The successful bidder shall supply one (1) set of electronic version and two (2) printed version operator's manuals, service manuals, parts books, wiring diagrams and applicable technical information for each machine purchased.

TECHNICAL SERVICES:

The services of at least one (1) competent technician, trained in the use and operation of the striping machine, shall be furnished for a period of three (3) consecutive days to be scheduled at the discretion of the Authority for each machine purchased. This service shall be provided to instruct the purchaser's personnel in the use, operation and maintenance of the machine on acceptance.

PRE-CONSTRUCTION MEETING:

Successful bidder shall attend a pre-construction meeting at the customer's location.

PRE-DELIVERY CONFERENCE:

The successful bidder shall include in his bid, travel and living expenses at his manufacturing facility for up to four (4) agency personnel for a pre-delivery inspection visit. Travel for distances in excess of 200 miles shall be by air transportation.

SPARE PARTS KIT:

The following items shall be included as spare parts:

- Three (3) additional dual, under helmet headsets for the rear operators.
- Four (4) additional paint guns Kamber Model 50A. Each paint gun shall have a Reverse-A-Clean Tip No. 661-LM-12 (0.061") and a fixed tip No. 018-6208-ST (0.062") and adapted shipped with the truck.
- Four (4) additional bead guns Kamber Model 90HO. The glass guns must be equipped with an interchangeable material tip system. This system must offer six (6) different tips sized from 5mm to 10mm tip orifice dimensions to provide the operator an infinite range of application speeds. Tips must be constructed of hardened steel to prevent excess wear.