

CPA – Statewide Procurement

Revised June 2022

SNOWPLOW, HIGH SPEED, TRUCK MOUNTED, WITH REVERSIBLE MOLDBOARD

PART I

GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

1. The equipment furnished under this specification shall be the latest improved model in current production, as offered to commercial trade, and shall be of quality workmanship and material. The Contractor represents that all equipment offered under this specification shall be new. USED, SHOPWORN, DEMONSTRATOR, PROTOTYPE, REMANUFACTURED, RECONDITIONED, OR DISCONTINUED MODELS ARE NOT ACCEPTABLE.
2. All parts not specifically mentioned which are necessary for the unit to be complete and ready for operation or which are normally furnished as standard equipment shall be furnished by the Contractor. All parts shall conform in strength, quality and workmanship to the accepted standards of the industry
3. The unit provided shall meet or exceed all Federal and state of Texas safety, health, lighting and noise regulations and standards in effect and applicable to equipment furnished at the time of manufacture.
4. It is the intent of CPA to purchase goods, equipment, and services having the least adverse environmental impact, within the constraints of statutory purchasing requirements, the customer need, availability, and sound economic considerations. Suggested changes and environmental enhancements for possible inclusion in future revisions of this specification are encouraged.
5. Any example shown is an example to show type and class of equipment desired. Contractor are cautioned to read the specification carefully, as there may be special requirements not commonly offered by the equipment manufacturer. DO NOT ASSUME STANDARD EQUIPMENT MEETS ALL OF THE DETAILED SPECIFICATION REQUIREMENTS MERELY BECAUSE IT IS LISTED AS AN EXAMPLE. Contractors are cautioned that any unit which does not meet specifications in every aspect, will not be accepted.

PART II

SPECIFICATIONS

1. **SCOPE:** This specification describes a heavy-duty, 11-foot wide, high-speed snowplow with power reversible moldboard for use in heavy snow conditions where the removal of large volumes of snow from road surfaces must be accomplished rapidly and efficiently with right or left hand discharge at speeds in excess of 35 MPH. The snowplow will be installed on a Customer's medium duty truck having a front gross axle weight rating (GAWR) of 12,000 pounds. The approximate weight of the moldboard furnished to this specification shall be between 1,800 to 2,750 pounds (less hitch and hydraulics) and meet or exceed all requirements:

EXAMPLES: Flink Model FSP 11PA38SD,
Henke Model EXP-11 ECT
or CPA approved equal.

2. **MOLDBOARD:** Moldboard shall be a smooth rolled, curved shape, made from minimum 3/16" thick steel, 11 feet wide at the bottom angle. The shape of the moldboard shall provide the proper lift, roll, and discharge of snow for maximum plowing efficiency.
 - 2.1. Shall include a minimum of six (6) vertical ribs. Ribs shall be made of minimum .50" thick steel plate, measuring 4" wide at the bottom. All ribs shall have drain holes sufficient to prevent pooling of water. All ribs shall be constructed from a single, continuous piece of steel running all the way from the bottom angle to the top of the moldboard sheet – spliced ribs or welded rib bottoms are not acceptable.
 - 2.2. All ribs shall be fully welded to a bottom structural angle braced with a series of triangular steel gussets, spaced at approximately 12" centers across the full width of the bottom angle.
 - 2.3. The top of the moldboard shall be reinforced with angles, welded together at the center, and fully welded to all ribs. Shall include drain holes sufficient to prevent pooling of water
 - 2.4. Moldboard assembly shall attach to push frame assembly at a minimum of four (4) points. There shall be a minimum span of 86" between the outermost hinge points. At each push frame to moldboard attaching point, a bushing shall be welded through the full height moldboard rib and shall serve as the push frame attaching point. Push frame shall connect to moldboard using minimum 1.25" diameter cold-finished steel pins.
 - 2.5. Moldboard height shall be minimum 52", maximum 60" at each end, and minimum 40", maximum 46" in the center, as measured from the ground vertically up to the highest point on the inside surface of the moldboard sheet, with the plow at a 16° attack angle and an 8" cutting edge (1.5" gauge line) installed.
 - 2.6. Shall include a steel integral shield, with the moldboard radius extended forward to prevent snow from blowing over the top of the moldboard. When set at a 16° attack angle, the top of the moldboard curve shall extend forward of the cutting edge by a minimum of 28".
 - 2.7. Shall include a row of horizontal brace angles running the entire length of the moldboard, measuring minimum 4" x 3" x .38" at locations where trip devices attach, and minimum 4" x 3" x .25" at all other locations.
 - 2.8. Plow end ribs shall include holes for sight marker mounting. Shall be equipped with fluorescent orange sight markers 36" in height at both forward corners.

- 2.9. Plow bottom angle shall be drilled to accept carbide or steel edges in 3-foot and 4-foot sections, or full-length cutting edges, with standard AASHTO hole pattern and 5/8" diameter plow bolts.
- 2.10. Shall include a full-length steel cutting edge of C1083 to C1085 high-carbon steel measuring .50" x 6" x 132".
- 2.11. Moldboard shall be equipped with two replaceable carbide tipped wear shoes located immediately behind the cutting edge, which shall serve to prevent damage to the moldboard bottom angle in the case of excessive cutting-edge wear.
- 2.12. Wraparound curb guards to protect the ends of the moldboard and cutting edge when plowing next to curbs, wraparound curb guards made of structural steel, minimum .63" thickness, shall be installed on each end of plow bottom angle, bolted over face of cutting edge.
3. MOLDBOARD TRIP MECHANISM: The snowplow shall be equipped with an adjustable, field repairable, external compression spring type trip assembly that will enable the moldboard to pass over a fixed object and automatically and immediately return to the plowing position without loss of vehicle control.
 - 3.1. Shall include two (2) External Compression Trip (ECT) assemblies, which allow the plow to effectively trip over obstacles when plowing.
 - 3.2. ECT assemblies shall provide for a minimum of three (3) attack angle positions, with a minimum range of 10° to 22° from vertical.
 - 3.3. ECT assemblies shall be attached to the moldboard with two (2) steel ears. ECT ears on moldboard shall be fully welded to horizontal angles, with angles continuously welded for maximum strength.
 - 3.4. ECT assemblies shall be attached to the plow push frame with four (4) fully welded steel ears.
 - 3.5. ECT assemblies shall attach to moldboard and push frame ears with minimum 1" diameter steel pins.
 - 3.6. Each ECT assembly shall include two outer bars and one inner bar made from steel plate.
 - 3.7. ECT springs shall be a minimum of 5.5" outside diameter, minimum .75" diameter wire, minimum 25" free length, and shall have a minimum spring rate of 280 pounds per inch.
 - 3.8. Shall include rubber and steel stops bolted and welded to the moldboard assembly, which contact the push frame front main tube before the trip springs become fully compressed, to prevent damage to the safety trip mechanisms or surrounding structures.
 - 3.9. The safety trips shall be designed to allow the plow moldboard to trip at least 15° past vertical before contacting the rubber and steel stops, at all attack angle settings, to allow the plow to "hop" over obstacles, and to help prevent plow damage due to shock loading.
4. PUSH FRAME ASSEMBLY: The snowplow shall be equipped with the manufacturer's regularly advertised push frame assembly meeting, but not limited to, the following:
 - 4.1. The push frame shall include steel angle rolled in an arc spanning 67" minimum, welded to a push beam square steel structural tubing, minimum 85" long.
 - 4.2. Two support legs of steel angle shall be welded between the circle and the push beam.
 - 4.3. Eight (8) steel ears shall be welded and gusseted to the push beam for attaching the moldboard assembly.
 - 4.4. Stop blocks shall be positioned on the circle to prevent over-stressing of the hydraulic cylinders. To prevent cylinder damage, the stop blocks shall be positioned such that the cylinders can never reach the "fully retracted" or "fully extended" position. To prevent possible "pinching" of hydraulic hoses, stop blocks shall not overhang the circle width.
 - 4.5. The A-frame pivot point shall consist of a cold-rolled steel greaseable bushing, welded to the rear of the push frame front main tube. This bushing shall be gusseted for additional support.
 - 4.6. The push frame shall include four (4) for hydraulic cylinder attachment. The hydraulic cylinders shall attach using minimum 1" diameter steel pins.

5. A-FRAME ASSEMBLY: The snowplow shall be equipped with the manufacturer's regularly advertised A-frame assembly meeting, but not limited to, the following:
 - 5.1. The A-Frame shall be constructed of two (2) channel sides, welded to a backplate. A .75" thick x 25" wide top plate joining the two side channels and the backplate shall serve to retain the rolled semi-circle angle. The top plate shall be cut to conform to the circle radius.
 - 5.2. The front of the A-frame shall include two (2) steel ears. The A-frame shall attach to the push frame assembly at the front using a minimum 1.25" Grade 5 bolt with slotted nut and cotter pin.
 - 5.3. The A-frame shall include four (4) ears, for hydraulic cylinder attachment. The hydraulic cylinders shall attach using minimum 1" diameter steel pins.
 - 5.4. An "emergency manual reverse" function shall be provided, to allow the plow to be transported in case of hydraulic system failure. This system shall include a minimum 1" diameter hitch pin, which can be removed from its storage location on the plow and inserted into one of two holes, which will lock the plow reversing system into either the "full left" or "full right" position.
6. CASTER WHEELS: The push frame shall be equipped with two caster assemblies meeting, but not limited to, the following:
 - 6.1. Caster assemblies shall be screw adjustable type, fully enclosed and lubricated. Caster housings and forks shall be as normally furnished by the manufacturer. Wheels shall be free swivel type and made of cast steel.
 - 6.2. Caster wheels shall be minimum 8 inches in diameter x 2-1/4 inches wide and equipped with heavy duty, roller bearings and oil seals designed to withstand severe winter operations. Wheel hubs shall be equipped with grease zerks to allow greasing of the roller bearings.
 - 6.3. A hand crank with rotating knob or handle shall be installed on the end of the adjusting screw with a self-locking device to secure the hand crank to the caster assembly until needed. Hand crank shall operate without the use of any tools.
7. LEVEL LIFTING SYSTEM: The plow shall be equipped with a level lifting system that effectively level lifts the plow when utilized with an appropriate telescoping arm hitch:
 - 7.1. The level lift system must work in all plowing and transport positions and shall not require the plow to be set on the ground to re-level it after reversing the plow from one side to the other.
 - 7.2. Level lifting system must function effectively with a single or double acting lift cylinder.
 - 7.3. Plow lift chains shall be 3/8" Grade 70 yellow zinc plated minimum. All shackles must be alloy steel and galvanized and shall be appropriately sized and rated for the application. No shackle shall have a load rating of less than 2 tons
8. HYDRALIC REVERSING SYSTEM: The plow shall be equipped with a hydraulic reversing system consisting of but not limited to the following:
 - 8.1. The hydraulic reversing system shall include two heavy duty, double-acting hydraulic cylinders, and minimum 3" bore x 10" stroke x 2" diameter rod, attached with minimum 1" diameter pins at each end.
 - 8.2. Reversing cylinders shall be mounted above the plow push frame, to allow easy and convenient access to the hydraulic cylinders, hoses, and fittings.
 - 8.3. Reversing cylinder rods shall be nitride coated for corrosion resistance and chip resistance. Reversing cylinders shall have a minimum working pressure rating of 3000 psi.
 - 8.4. Reversing cylinders shall include rod wipers and Polypak Type B or Hallite rod seals. Reversing cylinders shall include a wear ring of minimum .38" width in the piston, and a wear ring of minimum .50" width in the head gland.
 - 8.5. Plow shall be equipped with a hydraulic crossover relief valve to help prevent plow damage due to

sudden impacts.

- 8.6. To optimize the discharge of snow, the plow reversing system shall provide for a minimum of 35 degrees of rotation in both left and right directions.
 - 8.7. All hydraulic hoses shall be of 2-wire construction, with a minimum working pressure of 4,000 psi.
 - 8.8. All necessary hydraulic hoses, fittings, and other associated hardware required for operation of the plow shall be provided.
 - 8.9. The two hydraulic hoses running from the cushion valve to the area of the truck bumper shall be minimum .50" ID and minimum 40" in length. On the end of each of these hoses, a Safeway FF491-3-8 female quick coupler portion with matching FF499- 3 plated steel dust cap shall be provided. Other quick couplers and caps may be acceptable, provided they are fully interchangeable with Safeway FF491-3-8, and of equal or higher quality in all aspects.
 - 8.10. All necessary hydraulic hoses, fittings, and other associated hardware required for operation of the plow and truck hitch shall be provided.
9. SWIVEL PLATE ASSEMBLY: Plow shall have a swivel plate at the rear that consist of but not limited to the following:
- 9.1. Swivel plate at the rear that consists of minimum 6" ship & car channel, reinforced with a welded plate at the bolt connection.
 - 9.2. The swivel plate shall include a minimum .60" thick welded grab angles reinforced with stiffeners. It shall include stops to limit swiveling.
 - 9.3. The swivel plate shall be designed to latch to a "Quick Link" style truck hitch.
 - 9.4. The truck portion coupling mechanism shall include a welded coupler bar. Two flat plate gussets shall be welded between the coupler bar and channel to provide support for the coupler bar. Two guide ears shall be provided, which help to guide the truck portion and plow portion couplers together in the event of horizontal misalignment.
10. TRUCK HITCH: A heavy-duty, bumper-to-frame, low profile truck hitch shall be furnished with each snowplow. The truck hitch shall have the following items as a minimum:
- 10.1. The hitch shall have a tilting type frame to allow for easy access to the engine compartment on trucks with a forward tilting hood.
 - 10.2. The hitch shall be equipped with a telescoping lift arm of appropriate length and construction, with appropriate chains and lifting hardware, to hold the moldboard nearly level with the road surface in all transport positions, as described in the "level lifting system" section above.
 - 10.3. The telescoping lift arm shall include an outer tube of minimum 4" x 4" x .38" square steel tubing and an inner tube of minimum 3" x 3" x .38" square steel tubing. The telescoping lift arm shall have two adjustment positions only: operating position (fully extended) and storage position (fully retracted). The inner and outer tubes shall be joined by a minimum 1" diameter hitch pin.
 - 10.4. For optimum safety, the hitch lift arm shall fold down flat (vertical) and pin in storage position when not in use. When pinned in storage position, accidental operation of the hitch lift cylinder shall not result in any damage to the truck hitch or other items.
 - 10.5. The hitch shall include a "Quick Link" type coupling device, which must be fully interchangeable with a Flink Model PF91QL2 or Henke Model QL2 LP Tilt FD. All jaw plates and alignment plates of the coupling mechanism (6 total plates) shall be made from .625" thick T-1 steel (100,000 psi yield) for maximum durability. The main structure of the "Quick Link" coupling device shall be formed by minimum two (2) horizontal angles.
 - 10.6. The lower "non-tilting" portion of the hitch shall include two (2) vertical uprights of angle, joined by two (2) flat bars, which are welded and gusseted to the Quick-Link style coupler assembly. The lower

- “non-tilting” portion shall include 4 welded bushings, two (2) at the tilt pivot points and two (2) at the upper tilt pin attachment points.
- 10.7. The upper “tilting” portion of the hitch shall include two (2) vertical uprights. It shall include an upper horizontal brace at the center with a flat bar, forming a triangular box section. It shall include a cylinder ear mounting angle mounted with the apex pointing forwards for maximum strength, and braced at the center with a flat bar, forming a triangular box section. The upper “tilting” portion shall include four (4) welded bushings, two (2) at the lift arm attachment points and two (2) at the upper tilt pin attachment points.
 - 10.8. The tilting mechanism shall include replaceable bushings at the pivot points.
 - 10.9. Shall include a heavy duty, Single-acting hydraulic lift cylinder, minimum 3” bore x 10” stroke x 2” diameter rod.
 - 10.10. Lift cylinder rod shall be nitride coated for corrosion resistance and chip resistance. Lift cylinder shall have a minimum working pressure rating of 3000 psi.
 - 10.11. Lift cylinder shall include rod wiper and Polypak Type B or Hallite rod seals. Lift cylinder shall include a wear ring of minimum .38” width in the piston, and a wear ring of minimum .50” width in the head gland.
 - 10.12. An appropriate counterbalance valve shall be provided to ensure that the plow will not drop in the event of a hydraulic failure if it is being transported in lifted position. All required hoses and fittings for the installation of the counterbalance valve shall be provided.
 - 10.13. Shall include manufacturer’s standard heavy-duty truck hitch attachments to provide for mounting to standard Class 7 & Class 8 truck frames with integral front frame extensions.
11. ELECTRIC HYDRAULIC PUSH-BUTTON CAB CONTROL: A push-button control head suitable for mounting in the truck cab and electric/hydraulic pump shall be furnished to reposition the snowplow electrically/hydraulically from the operator’s position during snow removal operations.
 - 11.1. Push-button control head shall have UP, DOWN, LEFT, RIGHT functions and be equipped with a minimum 14-foot (4.3 m) control head cable.
 - 11.2. The pump shall include a hydraulic fluid reservoir that is specifically sized to operate all three cylinders throughout their full range of travel simultaneously.
 - 11.3. Four hydraulic hoses shall be provided, along with all hydraulic fittings required to attach pump to all 3 hydraulic cylinders. All 4 hoses shall be .50” minimum ID, minimum 18 feet in length, of 2-wire construction, with a minimum working pressure of 4,000 psi.
 - 11.4. The two hoses that run from the pump to the plow reversing circuit shall be equipped with Safeway FF495-3-8 male quick coupler portions with matching FF494-3 plated steel dust caps. Other quick couplers and caps may be acceptable, provided they are fully interchangeable with Safeway FF495-3-8, and of equal or higher quality in all aspects.
 12. SAFETY PLAQUES OR DECALS: Product safety plaques or decals shall be furnished and affixed at any hazardous area. The safety plaques or decals shall describe the nature of the hazard, level of hazard seriousness, how to avoid the hazard, and the consequence of human interaction with the hazard. Permanent plaques are preferred to decals. Type, size and location of product safety plaques or decals shall be in accordance with the current ANSI 535.4 standard.
 13. PAINTING: The unit shall be painted with lead free black paint except for glass, rubber and those accessories or fixtures constructed of rust-resistant or plated material not normally painted. Lead paint is not acceptable.
 - 13.1. The truck hitch, A-frame, push frame and entire rear and front surface of the moldboard shall be painted with an approved manufacturer’s lead-free primer and finish coat of semi-gloss, black paint as normally recommended and offered by the manufacturer.
 - 13.2. SURFACE PREPARATION: All surfaces of the moldboard, push frame, A-frame, and bumper-to-

frame hitch assembly shall be thoroughly cleaned to remove all dirt, oil, grease, rust, slag, scale, and other foreign matter prior to priming and painting. All welds shall be ground to a smooth finish. The cleaned and prepared surfaces shall be given a shop coat of primer and then thoroughly dried. The primer used shall be compatible with the finish coat in order to ensure proper adhesion of the finish coat. The finish coat shall be first quality air drying paint. The minimum dry film thickness of the finish coat shall be 4 mil.

14. INSTRUCTION ON SAFETY, OPERATION AND PREVENTIVE MAINTENANCE: The Contractor shall provide the Customer a minimum four hours of instruction on setup, installation, adjustment, operation, service, and preventive maintenance of the snowplow by factory-trained personnel after the snowplow has been delivered and is ready for operation but prior to payment. The instruction shall include, as a minimum, the manufacturer's recommended setup, installation, adjustment, operating, servicing, and storing procedures and all safety precautions relating to snowplow operations. Contractor shall coordinate the delivery and training dates with the district equipment supervisor at least ten days before the scheduled delivery of the snowplow(s).
15. MANUAL(S): Manual(s) containing illustrated parts list(s) and operating and service instructions shall be delivered with each snowplow. The manual(s) shall be as detailed as possible and outline all necessary installation, adjusting, operating, service and storing instructions. Parts list(s) shall cover all components of the snowplow. Necessary warnings and safety precautions shall be included in the operating and service manuals.
16. MANUFACTURER'S STATEMENT OF ORIGIN (MSO): Contractor shall furnish MSO to the Customer with each unit at time of delivery. CUSTOMER WILL NOT ACCEPT THE UNIT AND PROCESS PAYMENT WITHOUT THE MSO.
17. DATA SHEET: Data Sheet should be completed and submitted for informational purposes only.

PART III

DELIVERY AND ACCEPTANCE

1. **DELIVERY REQUIREMENTS:** Delivery of all equipment on this order shall be completed within the number of days specified on the purchase order. Any unit(s) not delivered within this time frame may be canceled from the purchase order or, at the Customer's option, an extension may be granted in writing, whichever is in the Customer's best interest.
 - 1.1. If any unit is canceled for non-delivery, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
 - 1.2. **LIQUIDATED DAMAGES:** Unless a delivery extension is granted for acceptable reasons due to circumstances beyond the Contractor's control, liquidated damages of \$160 per unit will be deducted from the invoice for every working day after the expiration of the number of days shown on the purchase order until the units are delivered. This provision is not intended as a penalty but for ease of administration and the avoidance of disputes. The parties agree that \$160 per day is the nearest practicable estimate of cost to rent replacement equipment.
2. **ACCEPTANCE INSPECTION:** All equipment ordered will be subject to acceptance inspection and performance testing upon receipt. Acceptance inspection and performance testing will not take more than five working days, weather permitting. The Contractor will be notified within this time frame of any units not delivered in full compliance with the purchase order specifications. If any units are canceled for non-acceptance, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
3. **WORKING DAY:** A working day is defined as a calendar day, not including Saturdays, Sundays, or regularly observed state and federal holidays.

PART IV

WARRANTY

1. WARRANTY: The unit shall be warranted against all defects in material and workmanship for a period of not less than 12 months or 1,200 hours of use, whichever comes first, and shall cover 100% parts and labor for the unit. If the manufacturer's standard warranty period exceeds 12 months or 1,200 hours, then the standard warranty period shall be in effect. The warranty begins on the date the unit is determined to meet specifications and accepted into the Customer's fleet.
- Warranty
_____ Months
_____ Hours
whichever
comes first

NOTE: A delayed warranty in service start date may be requested.

2. INTENT: During the warranty period the Contractor shall be responsible for labor, materials, and other costs as outlined below associated with required warranty repair. It is the intent of this warranty that the Contractor performs warranty repair work. At the Customer's option, the Customer may perform minor warranty repairs to the unit at the Contractor's expense.
- 2.1. EXCLUSIONS: The Customer will assume the expense for replacement tires and tubes, tire repairs, lubricating oils, hydraulic fluids, greases, filters, fuel, antifreeze, batteries, lights, hoses, belts, cleaning, painting and other minor items normally consumed in day-to-day operations. The Customer will assume responsibility for cost of repairs resulting from collision, theft, vandalism, operator negligence or acts of God.
- 2.2. EQUIPMENT MAINTENANCE: It is the Customer's practice to maintain the equipment in accordance with the manufacturer's published recommendations.
- 2.3. MINOR WARRANTY REPAIRS: It is the intent of this warranty that the Contractor performs minor warranty repairs; however, at Customer's option, warranty repairs deemed by the Customer to be minor in nature may be performed by the Customer at the Contractor's expense. Parts required for repairs made by the Customer will be OEM parts and obtained from the Contractor or any commercial source, at no cost to the Customer. Only the actual time required for repairs shall be reimbursed. The Customer will not request reimbursement for additional time incurred such as mechanic's travel time or diagnostic time. Reimbursement by the Contractor to the Customer for the cost of warranty repairs shall be computed as follows:
- 2.3.1. Labor: Labor for warranty repairs will be calculated at the composite rate for the mechanic in effect at the time of the warranty repairs. Labor rate will not exceed \$40 per hour. The time allowed for each repair will be determined by the manufacturer's standard time schedule. Manufacturer's time schedule shall be furnished to the receiving district with the unit at the time of delivery (if available). If a manufacturer's time schedule is not available, the actual time for repairs, as noted above, will be used.
- 2.3.2. Warranty Repair Claims: The Customer may track and bill warranty repairs through the Customer's fleet management software or on the Contractor's standard forms.
- 2.3.3. Parts: Replaced parts will be held 30 calendar days and will be available for inspection by the Contractor or authorized representative. Copies of invoices for all parts will be provided to the Contractor. The cost of parts other than those furnished to the Customer at no cost by the Contractor will be billed at actual cost.

- 2.4. **MAJOR WARRANTY REPAIRS:** When major warranty repairs are required, the Customer will notify a representative of the Contractor's Texas dealer by telephone at the location and the telephone number designated by the Contractor on the attached Data Sheet as the point of contact. Major warranty repair work for the purpose of this specification means major repairs to the engine and major repairs to any other components of the unit. Diagnosis of the actual repairs required shall be the responsibility of the Contractor. The unit will be made available at a Customer's facility within a 100-mile radius of the FOB point shown on the purchase order. The repair work may be performed by the Contractor or Contractor's authorized representative.
- 2.4.1. At the Contractor's option, the unit may be taken by the Contractor to a commercial repair facility. The Contractor shall be responsible for the cost of the round trip transportation of the unit to and from that location.
- 2.4.2. If mutually agreed upon between the Contractor and the Customer, the Customer may transport the unit to the Contractor's location or authorized repair facility, within the boundaries of the state of Texas. The cost of equipment and manpower necessary to haul the unit for the round trip will be billed back to the Contractor at the rental rate of the equipment and composite hourly rate for the driver in effect at the time for the equipment required. The composite hourly rate for the driver will not exceed \$30 per hour. Rental rate for the truck and trailer will not exceed \$0.80 per mile for the truck and \$8 per hour for the trailer.
3. **RESPONSE TIME:** Warranty repair action shall begin within two working days after notification is made to the Contractor for need of warranty repairs. A representative of the Contractor's Texas dealer will be notified by telephone at the location and telephone number designated by the Contractor on the attached Data Sheet as the point of contact. The Contractor shall notify the Customer immediately of any changes in this location and telephone number. The warranty repairs should be completed and the unit returned to the Customer (or picked up by the Customer at the Contractor's expense as outlined above) within a reasonable period of time. For the purpose of the specification eight working days is defined as a reasonable period of time. Excessive delays incurred for the performance of warranty repairs by the Contractor may adversely affect the Contractor's status as a qualified Contractor.
4. **BILLING AND PAYMENT FOR WARRANTY REPAIR EXPENSES:** Cost will be accumulated for transportation of the unit by the Customer to the Contractor's location or authorized repair facility. Payment for transportation costs as provided for in this section shall be made within 30 calendar days of the billing date.
5. **PARTS AND SERVICE:** The manufacturer of the equipment furnished shall have an authorized dealer within the state of Texas. The authorized dealer shall have factory-trained personnel available for warranty repairs and the performance of service. The dealer shall also maintain an inventory of high-usage parts and a quick source for low-usage parts.

PART V

OPTIONAL EQUIPMENT

1. **OPTION NO. 1 - 10 FOOT MOLDBOARD**: In lieu of the 11-foot-wide moldboard specified in Part II, Para. 2., the moldboard shall be 10 feet wide. Length of cutting edge shall be a minimum 10 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,000 pounds.
2. **OPTION NO. 2 - 12 FOOT MOLDBOARD**: In lieu of the 11-foot-wide moldboard specified in Part II, Para. 2., the moldboard shall be 12 feet wide. Length of cutting edge shall be a minimum 12 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,450 pounds.
3. **OPTION NO. 3 – MUSHROOM TYPE SKID SHOE RUNNING GEAR**: In lieu of the caster wheels referenced in Part II, Para. 6, snowplow shall be equipped with a pair of height adjustable heavy-duty mushroom shoe running gear. The running gear shall include two height adjustment methods: course adjustment through a series of bolt holes, and fine adjustment through a hand crank screw assembly. The screw assembly shall be 1.25” Acme threaded rod minimum. Running gear inner tube shall be 3” x 3” x .25” square tubing minimum. Running gear outer tube shall be 3.5” x 3.5” x .188” square tubing minimum, with a fully welded lower reinforcement collar of 4” x 4” x .188” square tubing minimum near the bottom of the lower tube assembly. Mushroom shoe shall measure 11” diameter x 2.75” height minimum.
4. **OPTION NO. 4 – SPRING LOADED 1X6 RUNNERS TYPE SKID SHOE RUNNING GEAR**: In lieu of the caster wheels referenced in Part II, Para. 6, snowplow shall be equipped with a pair of height adjustable heavy-duty running gear with 1x6 skid shoe runners. The running gear shall include two height adjustment methods: course adjustment through a series of bolt holes and fine adjustment through a hand crank screw assembly. The running gear shall be spring cushioned and include a thrust bearing. The skid shoes shall be 1” thick x 6” wide, brake formed at the front and rear to avoid catching edges and fabricated from abrasion-resistant steel with a minimum Brinnell hardness of 235. Running gear inner tube shall be fabricated from round tubing, 2.88” OD x 2.32” ID x .276” wall minimum. Running gear outer tube shall be fabricated from round tubing, 3.50” OD x 3.00” ID x .25” wall minimum.
5. **OPTION 5 – DOUBLE ACTING CYLINDER w/ LOCKOUT VALVE**: Heavy duty, double-acting hydraulic cylinders, minimum 3” bore x 10” stroke x 2” diameter rod, attached with minimum 1” diameter pins at each end. Cylinder rods shall be nitride coated for corrosion resistance and chip resistance.
6. **OPTION 6 – FEDERAL YELLOW PAINT**: In lieu of black paint referenced in Part II, Para. 13, the entire snowplow (less the hitch) shall be painted with lead free yellow paint meeting Federal Yellow No. 13538 of Federal Standard 595B. The coatings shall meet all requirements of the “Surface Preparation and Painting” section above, except for the difference in topcoat color.

NOTE: Contractor is cautioned that any unit with this option on the purchase order will not be accepted if it is not painted Federal Yellow.

SNOWPLOW, HIGH SPEED, TRUCK MOUNTED, WITH REVERSIBLE MOLDBOARD,
PARALLEL LIFT WITH MECHANICAL FLOAT

PART I

GENERAL INFORMATION, REQUIREMENTS, AND CONDITIONS

1. The equipment furnished under this specification shall be the latest improved model in current production, as offered to commercial trade, and shall be of quality workmanship and material. The Contractor represents that all equipment offered under this specification shall be new. USED, SHOPWORN, DEMONSTRATOR, PROTOTYPE, REMANUFACTURED, RECONDITIONED, OR DISCONTINUED MODELS ARE NOT ACCEPTABLE.
2. All parts not specifically mentioned which are necessary for the unit to be complete and ready for operation or which are normally furnished as standard equipment shall be furnished by the Contractor. All parts shall conform in strength, quality and workmanship to the accepted standards of the industry
3. The unit provided shall meet or exceed all Federal and state of Texas safety, health, lighting and noise regulations and standards in effect and applicable to equipment furnished at the time of manufacture.
4. It is the intent of CPA to purchase goods, equipment, and services having the least adverse environmental impact, within the constraints of statutory purchasing requirements, the customer need, availability, and sound economic considerations. Suggested changes and environmental enhancements for possible inclusion in future revisions of this specification are encouraged.
5. Any example shown is an example to show type and class of equipment desired. Contractor are cautioned to read the specification carefully, as there may be special requirements not commonly offered by the equipment manufacturer. DO NOT ASSUME STANDARD EQUIPMENT MEETS ALL OF THE DETAILED SPECIFICATION REQUIREMENTS MERELY BECAUSE IT IS LISTED AS AN EXAMPLE. Contractors are cautioned that any unit which does not meet specifications in every aspect, will not be accepted.

PART II

SPECIFICATIONS

1. **SCOPE:** This specification describes a heavy-duty, 10-foot wide, high-speed snowplow with power reversible moldboard for use in heavy snow conditions where the removal of large volumes of snow from road surfaces must be accomplished rapidly and efficiently with right- or left-hand discharge at speeds in excess of 35 MPH. The snowplow will be installed on a Customer's medium duty truck having a front gross axle weight rating (GAWR) of 20,000 pounds. The approximate weight of the moldboard furnished to this specification shall be between 1,800 to 2,750 pounds (less hitch and hydraulics) and meet or exceed all requirements.

EXAMPLES: Flink Model FSP 11PA38SD,
 Henke Model EXP-10, PLPM
 or CPA approved equal.

2. **MOLDBOARD:** Moldboard shall be a smooth rolled, curved shape, made from minimum 10 Gauge, Grade 50 steel 10 feet in length. The shape of the moldboard shall provide the proper lift, roll, and discharge of snow for maximum plowing efficiency.
 - 2.1. Shall include a minimum of six (6) vertical ribs. Ribs shall be made of minimum .50" thick steel plate, measuring 4" wide at the bottom. All ribs shall have drain holes sufficient to prevent pooling of water. All ribs shall be constructed from a single, continuous piece of steel running all the way from the bottom angle to the top of the moldboard sheet – spliced ribs or welded rib bottoms are not acceptable.
 - 2.2. All ribs shall be fully welded to a bottom structural angle braced with a series of triangular steel gussets, spaced at approximately 12" centers across the full width of the bottom angle.
 - 2.3. The top of the moldboard shall be reinforced with angles, welded together at the center, and fully welded to all ribs. Shall include drain holes sufficient to prevent pooling of water
 - 2.4. Moldboard assembly shall attach to push-frame assembly at a minimum of four (4) points. There shall be a minimum span of 86" between the outermost hinge points. At each push-frame to moldboard attaching point, a bushing shall be welded through the full height moldboard rib and shall serve as the push-frame attaching point. Push-frame shall connect to moldboard using minimum 1.25" diameter cold-finished steel pins.
 - 2.5. Moldboard height shall be minimum 52", maximum 60" at each end, and minimum 40", maximum 46" in the center, as measured from the ground vertically up to the highest point on the inside surface of the moldboard sheet, with the plow at a 16° attack angle and an 8" cutting edge (1.5" gauge line) installed.
 - 2.6. Shall include a steel integral shield, with the moldboard radius extended forward to prevent snow from blowing over the top of the moldboard. When set at a 16° attack angle, the top of the moldboard curve shall extend forward of the cutting edge by a minimum of 28".
 - 2.7. Shall include a row of horizontal brace angles running the entire length of the moldboard, measuring minimum 4" x 3" x .38" at locations where trip devices attach, and minimum 4" x 3" x .25" at all other locations.
 - 2.8. Plow end ribs shall include holes for sight marker mounting. Shall be equipped with fluorescent orange sight markers 36" in height at both forward corners.

- 2.9. Plow bottom angle shall be drilled to accept carbide or steel edges in 3-foot and 4-foot sections, or full length cutting edges, with standard AASHTO hole pattern and 5/8" diameter plow bolts.
3. CUTTING EDGE: The moldboard shall be equipped with a replaceable cutting edge constructed of high carbon steel, minimum 1/2-inch-thick x 6 inches in height. Length of the cutting edge shall be a minimum of 10 feet. Bolt holes shall be edge punched in accordance with AASHTO Standard Highway Punching.
 - 3.1. 6-inch Carbon Steel curb guards shall be installed to protect the ends of the moldboard when plowing next to curbs. The cutting edge shall be equipped with minimum of two replaceable Carbon Steel wear shoes. Located immediately behind the cutting edge in the size and locations as normally furnished by the manufacturer to prevent damage to the moldboard bottom as the cutting-edge wears.
4. MOLDBOARD TRIP MECHANISM: The snowplow shall be equipped with an adjustable, field repairable, external compression spring type trip assembly that will enable the moldboard to pass over a fixed object and automatically and immediately return to the plowing position without loss of vehicle control.
 - 4.1. Shall include two (2) External Compression Trip (ECT) assemblies, which allow the plow to effectively trip over obstacles when plowing.
 - 4.2. ECT assemblies shall provide for a minimum of three (3) attack angle positions, with a minimum range of 10° to 22° from vertical.
 - 4.3. ECT assemblies shall be attached to the moldboard with two (2) steel ears. ECT ears on moldboard shall be fully welded to horizontal angles, with angles continuously welded for maximum strength.
 - 4.4. ECT assemblies shall be attached to the plow push-frame with four (4) fully welded steel ears.
 - 4.5. ECT assemblies shall attach to moldboard and push-frame ears with minimum 1" diameter steel pins.
 - 4.6. Each ECT assembly shall include two outer bars and one inner bar made from steel plate.
 - 4.7. ECT springs shall be a minimum of 5.5" outside diameter, minimum .75" diameter wire, minimum 25" free length, and shall have a minimum spring rate of 280 pounds per inch.
 - 4.8. Shall include rubber and steel stops bolted and welded to the moldboard assembly, which contact the push-frame front main tube before the trip springs become fully compressed, to prevent damage to the safety trip mechanisms or surrounding structures.
 - 4.9. The safety trips shall be designed to allow the plow moldboard to trip at least 15° past vertical before contacting the rubber and steel stops, at all attack angle settings, to allow the plow to "hop" over obstacles, and to help prevent plow damage due to shock loading.
5. REVERSING FRAME ASSEMBLY
 - 5.1. The reversing frame assembly shall include a lower tube made from 6" x 4" x .38" square steel tubing, 119.5" long, and an upper tube of 5" x 2" x .25" rectangular steel tubing, 43.94" long. There shall be two (2) fully welded vertical supports joining the outer ends of the upper tube to the lower tube measuring 24.5" x 10" x .50" thick.
 - 5.2. At the center of the reversing frame, there shall be a center swivel structure, with a main plate measuring 9.0" x 32.94" x .50" thick, attached to the reversing frame by two (2) full-height welded supports. All holes and slots in center swivel structure shall be reinforced by .38" thick welded stiffener plates for increased strength and wear resistance.
 - 5.3. Between the outer supports and the center swivel structure, there shall be two (2) cylinder attaching structures, each consisting of a formed channel measuring 8" x 4" x .38" thick, and two (2) 1" thick horizontal mounting plates for cylinder attachment.

- 5.4. Across the front of the reversing frame, there shall be ten (10) fully welded ears (14 ears on seven (7)-connection point version) for attaching the push frame assembly to the moldboard assembly. The ears shall measure 63" thick x 4.00" tall.
- 5.5. The reversing frame shall attach to the moldboard assembly using 1.25" diameter cold-finished steel pins pinned through each pair of push frame ears.
- 5.6. There shall be two (2) rollers attached on each end of the reversing frame assembly, between both outer supports. These rollers shall serve as reversing stops, contacting the plow portion flat plate hitch when the plow is fully reversed. The rollers shall be made of 3" O.D. cold-finished round tubing. Each roller shall rotate on a 2" diameter pin assembly secured by a .50" thick fully welded head. The pin shall include an integral grease fitting in one end, with drilled grease path to allow for lubrication of the roller.
- 5.7. If optional running gear is not supplied on the plow, two adjustable parking stands shall be supplied, which support the plow when parked, and allow the plow to be hydraulically lifted off of the flat plate hitch truck portion. Note: if running gear is supplied, the parking stands are not needed. The parking stands shall include two (2) brackets bolted to the reversing frame and two (2) inner tube assemblies with lift handles and welded feet. The brackets shall include an outer tube of 3.00" OD x 2.44" ID round steel tubing welded between two (2) .38" thick steel plates. The inner tubes shall be made of 2" Sch. 80 black pipe with ten (10) adjustment holes, allowing for height adjustments in 1" increments. The welded feet shall be made from .50" x 3.00" flat bar, 13.63" long after forming, braced with a 7"x3" welded gusset.

6. SWIVEL ASSEMBLY

- 6.1. The swivel assembly shall attach the upper and lower arm assemblies to the push frame, in conjunction with the center pivot shaft.
- 6.2. The swivel assembly shall include a 9.0" x 32.94" x .50" thick main plate, stiffened by two fully welded .50" x 2.5" full-height bars. There shall be four .75" thick bushing supports fully welded to the main plate and stiffener bars, spaced approximately equally along the main plate.
- 6.3. Four greaseable 4.00" OD x 3.03" ID x 3" long bushings shall be fully welded to the bushing supports. The center pivot shaft shall install through these bushings.
- 6.4. The swivel assembly shall attach to the push frame using a 1.5" Grade 5 bolt in the center and four (4) 1" Grade 8 bolts spaced above and below the center bolt. The bolts shall be secured using slotted nuts and hardened washers, and the 1" bolts shall be further secured with .38" thick fabricated washers. All five (5) swivel bolts shall be assembled with replaceable bushings which prevent the swivel bolts from being over-tightened.
- 6.5. A .25" thick replaceable wear plate, made from UHMW poly, shall be installed between the swivel plate and the reversing frame.
- 6.6. The swivel assembly shall allow the plow to swivel three (3) degrees each direction (6 degrees total) so that it can effectively follow the contour of the road surface.
- 6.7. The swivel assembly shall automatically center the plow in the unswiveled position when swivel is not required, using two (2) compression springs installed between the push frame and swivel assembly. The two centering springs shall be 7.00" long, 3.63" OD, of .63" diameter wire, with a nominal spring rate of 1499 lbs./inch. The spring force of the centering springs shall be adjustable by means of two (2) screw assemblies made of 1.25" diameter Acme threaded rod.

7. UPPER AND LOWER ARM ASSEMBLIES

- 7.1. The upper arm assembly shall be constructed using two (2) 3" x 3" x .38" thick square steel tubes, joined at the rear by a third 3" x 3" x .38" thick square steel tube. This rear tube shall include four (4) 3" tall x .75" thick ears with 2" O.D. x 1.28" I.D. welded bushings. The upper arm assembly shall also include two 3.5" tall x .75" thick plates spanning from the front tubes to the rear tube, which serve as structural members and to connect the upper arm assembly to the center pivot shaft.
- 7.2. Attached to the upper arm shall be a float link assembly constructed of two (2) parallel steel plates measuring 11" x 3" x .75" thick, joined together by a 1.75" OD tube. This float link assembly shall be attached to the upper arm on one end, and to the lift cylinder on the other end.
- 7.3. The float link assembly shall be able to be restrained from motion by the installation of a .75" diameter float lockout pin, thereby fixing it to the upper arm. By removing the float lockout pin, the linkage is free to rotate independently of the upper arm, thereby disengaging the lift cylinder from the upper arm and allowing the plow to "float" over the ground independently of the lifting system.
- 7.4. The lower arm assembly shall be constructed using two (2) 3" x 3" x .38" thick square steel tubes, joined by a gusseted, triangular steel plate measuring 30" x 10.8" x .50" thick. The rear of each tube shall include two (2) 3" tall x .75" thick ears with 2" OD x 1.28" ID welded bushings, welded to .50" thick steel plates. The upper arm assembly shall also include two 3.5" tall x .75" thick ears at the front, which serve as structural members and to connect the upper arm assembly to the center pivot shaft.
- 7.5. The upper and lower arm assemblies shall include 2.25" OD x 1.28" ID x .50" thick steel bosses welded to each ear at the front of the arm assemblies to maximize the strength of the connection point between the arm assembly and the center pivot shaft.

8. CENTER PIVOT SHAFT

- 8.1. The upper and lower arm assemblies shall be attached to the swivel assembly by a 3" diameter cold-finished solid steel shaft, 35.75" long, with two machined flats at the points of arm attachment. To achieve maximum strength, ensure a direct line of force transmission, and eliminate the possibility of knuckle failures due to off-center loading, the upper and lower arm assemblies shall be attached directly to the center pivot shaft – no exceptions, using 1.25" diameter cold-finished steel pins. Knuckles shall not be used to attach the upper and lower arm assemblies to the center shaft or swivel assembly.
- 8.2. To provide for ease of maintenance, the pins used to connect the upper and lower arm assemblies shall NOT be welded in place. The pins must be able to be removed by removing standard fasteners with standard tools; no torching or cutting shall be required.
- 8.3. The center pivot shaft shall be secured to the swivel assembly using a 4" OD x 3.03" ID x 6.88" long steel bushing and a 1" diameter Grade eight (8) bolt with a nyloc nut and hardened washer.

9. HYDRAULICS

- 9.1. The plow shall be designed to install and uninstall from the truck hitch hydraulically, using its own lift cylinder. No external lifting device shall be required to install and uninstall the plow from the truck hitch.
- 9.2. The hydraulic lift cylinder shall be 4" diameter bore, 2" diameter rod, and minimum 13.13" stroke. The cylinder rods shall have nitride finish for corrosion resistance and chip resistance.
- 9.3. The hydraulic reversing cylinders shall be 4" diameter bore, 2" diameter rod, and minimum 15" stroke. The cylinder rods shall have nitride finish for corrosion resistance and chip resistance.
- 9.4. To minimize maintenance issues, the cylinders shall be of a single-stage, non-telescoping design.

- 9.5. To optimize the discharge of snow, the plow reversing system shall be designed to allow for a full 35 degrees of rotation in both left and right directions, measured with the plow on the ground in plowing position.
- 9.6. Plow lift cylinder shall attach at each end with 1.25" diameter, cold-finished steel pins. The hydraulic reversing cylinders shall attach to the plow portion flat plate hitch and the reversing frame using single piece cast or machined knuckles, which are designed so that the line of force of the cylinder travels directly through the axis of the pins which attach the knuckle to the hitch or reversing frame, regardless of reversing angle or plow position. This ensures maximum strength of the attachment and prevents knuckle failures due to off-center loading. The knuckles shall be 5.88" long and 3.25" across and shall be attached at the top and bottom using 1" diameter pin assemblies with welded heads, which are each secured using two (2) ½" Grade eight (8) bolts. The hydraulic cylinder shall be secured to the knuckle on each end using a 1" diameter clevis pin.
- 9.7. The plow shall come standard with a 750-psi crossover relief valve and 200 psi down pressure relief valve, which are both included in a single, integrated hydraulic manifold. The plow shall also come standard with a hydraulic accumulator, which is plumbed through the integrated hydraulic manifold. All of these components shall be factory-installed on the product. The crossover relief valve helps to prevent damage due to severe shock loading. The down pressure relief valve helps to prevent accidental product damage due to inadvertent application of down pressure. The hydraulic accumulator helps to prevent product damage by preventing excessive pressure buildup in hydraulic cylinders.

10. FLAT PLATE HITCH, PLOW PORTION

- 10.1. The flat plate hitch plow portion serves to attach the plow to the truck. It attaches to the flat plate hitch truck portion at the rear, and to the upper and lower arm assemblies, reversing cylinders, and lift cylinder at the front. It must mate with a standard Henke or Wausau flat plate hitch (see Flat Plate Hitch – Truck Portion section of specification for details).
- 10.2. Flat plate hitch plow portion shall include a main plate measuring 44" x 30.5" x .63". It shall include two (2) full-height outer vertical supports measuring 3.63" x .75" thick, with drilled holes reinforced with 2.0" OD x 1.28" ID cold-rolled steel bushings for attachment of the upper and lower arm assemblies using 1.25" diameter cold-finished steel pins. Outer vertical supports must include an integrated stop which limits the amount of upward travel of the lower lift arm.
- 10.3. Shall include two (2) horizontal bars for mounting cylinder knuckles, measuring 2.75" x 1" thick, and a lower horizontal tube made of 3" x 3" x .38" structural tubing, which span horizontally across the plow portion hitch. There shall be two additional vertical supports measuring 17.5" long x .50" thick which span from the lower structural tube to the upper cylinder knuckle mounting bar. The lower square tube shall have two (2) .75" thick ears welded to it to attach the barrel end of the lift cylinder.
- 10.4. Outside of the outer vertical supports, two reversing stops shall be mounted, which are formed of 1" diameter cold-finished round bar, 30" long, rolled into a smooth arc, and welded to a support plate measuring 28.5" tall x .38" thick. These reversing stops serve as mechanical stops to limit the reversing angle of the plow and protect the reversing cylinders from damage. The reversing stops must be bolt-removable from the main weldment of the plow portion hitch, to allow for easy replacement. Each reversing stop shall be attached with a minimum of five (5) ¾" Grade eight (8) bolts. These reversing stops must be formed into a specific arc shape, which helps to ensure that the plow stays against the stop as the plow is raised or lowered. The structures that the reversing stops bolt to must be designed at the proper angle such that the rollers contact the reversing stops at an angle of 90 degrees to the long axis of the roller.
- 10.5. On the back of the flat plate hitch plow portion, two cast steel or machined steel hooks serve to attach the plow portion and truck portion of the hitch together at the upper end. The hooks must be appropriately welded to the plow portion hitch such that there will be no weld failure of any kind while plowing or transporting the plow.
- 10.6. The flat plate hitch plow portion includes two (2) mounting ears, measuring 4" x 10.5" x .50" thick, which serve to secure the plow portion and truck portion of the flat plate hitch together at the lower end.

For ease of plow engagement, the design of the mounting ears allows for a horizontal misalignment of 1.75" in either direction. Within this range, the two portions will be automatically guided together into a centered position as the truck pulls forward. Each mounting ear is braced at the top and the bottom by full-length, .50" thick welded gussets for severe-duty service. Each mounting ear must include a fully welded bushing at the connection point, measuring 2.5" O.D. x 1.63" I.D. x 1.00" thick.

- 10.7. The plow portion and truck portion flat plate hitch shall be secured at the lower end using two (2) 1.5" diameter cold-finished attaching pins. The pins shall be engaged and disengaged using a spring-loaded mechanism operated with a single lever.

11. SAFETY PLAQUES OR DECALS

- 11.1. Product safety plaques or decals shall be furnished and affixed at the operator's station and at any hazardous area. The safety plaques or decals shall describe the nature of the hazard, level of hazard seriousness, how to avoid the hazard, and the consequence of human interaction with the hazard. Permanent plaques are preferred to decals. Type, size and location of product safety plaques or decals shall be in accordance with current ANSI Z535.4 standard.
- 11.2. A permanent lubrication plaque shall be furnished and visible from the outside of the unit. The plaque shall note all lubrication points and recommended periodic oil changes and lubrication intervals.
12. **PAINTING:** The unit shall be painted with lead free black paint except for glass, rubber and those accessories or fixtures constructed of rust-resistant or plated material not normally painted. Lead paint is not acceptable.
 - 12.1. The Moldboard Face shall be painted Federal Standard Yellow. All other surfaces of the plow, and the entire truck hitch, shall be painted with an approved manufacturer's lead-free primer and finish coat of semi- gloss, black paint as normally recommended and offered by the manufacturer.
13. **SURFACE PREPARATION:** All surfaces of the moldboard, push frame, A-frame, and truck hitch assembly shall be thoroughly cleaned to remove all dirt, oil, grease, rust, slag, scale, and other foreign matter prior to priming and painting. All welds shall be ground to a smooth finish. The cleaned and prepared surfaces shall be given a shop coat of primer and then thoroughly dried. The primer used shall be compatible with the finish coat in order to ensure proper adhesion of the finish coat. The finish coat shall be first quality air drying paint. The minimum dry film thickness of the finish coat shall be four (4) mil. The final color shall be as specified above.
14. **INSTRUCTION ON SAFETY, OPERATION AND PREVENTIVE MAINTENANCE:** The Contractor shall provide the services of a competent factory trained technician thoroughly trained in the use and operation of the unit to the Customer a minimum of four hours instruction on safety, operation and preventive maintenance of the unit. The service shall be provided after the unit has been delivered and is ready for operation but prior to payment.
15. **MANUAL(S):** Original manual(s) containing illustrated parts list(s), operating, and service instructions shall be delivered with each snowplow. The manual(s) shall be as detailed as possible and outline all necessary installation, adjusting, operating, service and storing instructions. Parts list(s) shall cover all components of the snowplow. Necessary warnings and safety precautions shall be included in the operating and service manuals.

PART III

DELIVERY AND ACCEPTANCE

1. **DELIVERY REQUIREMENTS:** Delivery of all equipment on this order shall be completed within the number of days specified on the purchase order. Any unit(s) not delivered within this time frame may be canceled from the purchase order or, at the Customer's option, an extension may be granted in writing, whichever is in the Customer's best interest.
 - 1.3. If any unit is canceled for non-delivery, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
 - 1.4. **LIQUIDATED DAMAGES:** Unless a delivery extension is granted for acceptable reasons due to circumstances beyond the Contractor's control, liquidated damages of \$160 per unit will be deducted from the invoice for every working day after the expiration of the number of days shown on the purchase order until the units are delivered. This provision is not intended as a penalty but for ease of administration and the avoidance of disputes. The parties agree that \$160 per day is the nearest practicable estimate of cost to rent replacement equipment.
2. **ACCEPTANCE INSPECTION:** All equipment ordered will be subject to acceptance inspection and performance testing upon receipt. Acceptance inspection and performance testing will not take more than five working days, weather permitting. The Contractor will be notified within this time frame of any units not delivered in full compliance with the purchase order specifications. If any units are canceled for non-acceptance, the needed equipment may be purchased elsewhere and the Contractor may be charged any additional increase in cost and handling.
3. **WORKING DAY:** A working day is defined as a calendar day, not including Saturdays, Sundays, or regularly observed state and federal holidays.

PART IV

WARRANTY

1. WARRANTY: The unit shall be warranted against all defects in material and workmanship for a period of not less than 12 months or 1,200 hours of use, whichever comes first, and shall cover 100% parts and labor for the unit. If the manufacturer's standard warranty period exceeds 12 months or 1,200 hours, then the standard warranty period shall be in effect. The warranty begins on the date the unit is determined to meet specifications and accepted into the Customer's fleet.

Warranty
____ Months
____ Hours
whichever
comes first

NOTE: A delayed warranty in service start date may be requested.

2. INTENT: During the warranty period the Contractor shall be responsible for labor, materials, and other costs as outlined below associated with required warranty repair. It is the intent of this warranty that the Contractor performs warranty repair work. At the Customer's option, the Customer may perform minor warranty repairs to the unit at the Contractor's expense.
 - 2.1. EXCLUSIONS: The Customer will assume the expense for replacement tires and tubes, tire repairs, lubricating oils, hydraulic fluids, greases, filters, fuel, antifreeze, batteries, lights, hoses, belts, cleaning, painting and other minor items normally consumed in day-to-day operations. The Customer will assume responsibility for cost of repairs resulting from collision, theft, vandalism, operator negligence or acts of God.
 - 2.2. EQUIPMENT MAINTENANCE: It is the Customer's practice to maintain the equipment in accordance with the manufacturer's published recommendations.
 - 2.3. MINOR WARRANTY REPAIRS: It is the intent of this warranty that the Contractor performs minor warranty repairs; however, at Customer's option, warranty repairs deemed by the Customer to be minor in nature may be performed by the Customer at the Contractor's expense. Parts required for repairs made by the Customer will be OEM parts and obtained from the Contractor or any commercial source, at no cost to the Customer. Only the actual time required for repairs shall be reimbursed. The Customer will not request reimbursement for additional time incurred such as mechanic's travel time or diagnostic time. Reimbursement by the Contractor to the Customer for the cost of warranty repairs shall be computed as follows:
 - 2.3.1. Labor: Labor for warranty repairs will be calculated at the composite rate for the mechanic in effect at the time of the warranty repairs. Labor rate will not exceed \$40 per hour. The time allowed for each repair will be determined by the manufacturer's standard time schedule. Manufacturer's time schedule shall be furnished to the receiving district with the unit at the time of delivery (if available). If a manufacturer's time schedule is not available, the actual time for repairs, as noted above, will be used.
 - 2.3.2. Warranty Repair Claims: The Customer may track and bill warranty repairs through the Customer's fleet management software or on the Contractor's standard forms.
 - 2.3.3. Parts: Replaced parts will be held 30 calendar days and will be available for inspection by the Contractor or authorized representative. Copies of invoices for all parts will be provided to the Contractor. The cost of parts other than those furnished to the Customer at no cost by the Contractor will be billed at actual cost.

- 2.4. **MAJOR WARRANTY REPAIRS:** When major warranty repairs are required, the Customer will notify a representative of the Contractor's Texas dealer by telephone at the location and the telephone number designated by the Contractor on the attached Data Sheet as the point of contact. Major warranty repair work for the purpose of this specification means major repairs to the engine and major repairs to any other components of the unit. Diagnosis of the actual repairs required shall be the responsibility of the Contractor. The unit will be made available at a Customer's facility within a 100-mile radius of the FOB point shown on the purchase order. The repair work may be performed by the Contractor or Contractor's authorized representative.
- 2.4.1. At the Contractor's option, the unit may be taken by the Contractor to a commercial repair facility. The Contractor shall be responsible for the cost of the round trip transportation of the unit to and from that location.
- 2.4.2. If mutually agreed upon between the Contractor and the Customer, the Customer may transport the unit to the Contractor's location or authorized repair facility, within the boundaries of the state of Texas. The cost of equipment and manpower necessary to haul the unit for the round trip will be billed back to the Contractor at the rental rate of the equipment and composite hourly rate for the driver in effect at the time for the equipment required. The composite hourly rate for the driver will not exceed \$30 per hour. Rental rate for the truck and trailer will not exceed \$0.80 per mile for the truck and \$8 per hour for the trailer.
3. **RESPONSE TIME:** Warranty repair action shall begin within two working days after notification is made to the Contractor for need of warranty repairs. A representative of the Contractor's Texas dealer will be notified by telephone at the location and telephone number designated by the Contractor on the attached Data Sheet as the point of contact. The Contractor shall notify the Customer immediately of any changes in this location and telephone number. The warranty repairs should be completed and the unit returned to the Customer (or picked up by the Customer at the Contractor's expense as outlined above) within a reasonable period of time. For the purpose of the specification eight working days is defined as a reasonable period of time. Excessive delays incurred for the performance of warranty repairs by the Contractor may adversely affect the Contractor's status as a qualified Contractor.
4. **BILLING AND PAYMENT FOR WARRANTY REPAIR EXPENSES:** Cost will be accumulated for transportation of the unit by the Customer to the Contractor's location or authorized repair facility. Payment for transportation costs as provided for in this section shall be made within 30 calendar days of the billing date.
5. **PARTS AND SERVICE:** The manufacturer of the equipment furnished shall have an authorized dealer within the state of Texas. The authorized dealer shall have factory-trained personnel available for warranty repairs and the performance of service. The dealer shall also maintain an inventory of high-usage parts and a quick source for low-usage parts.

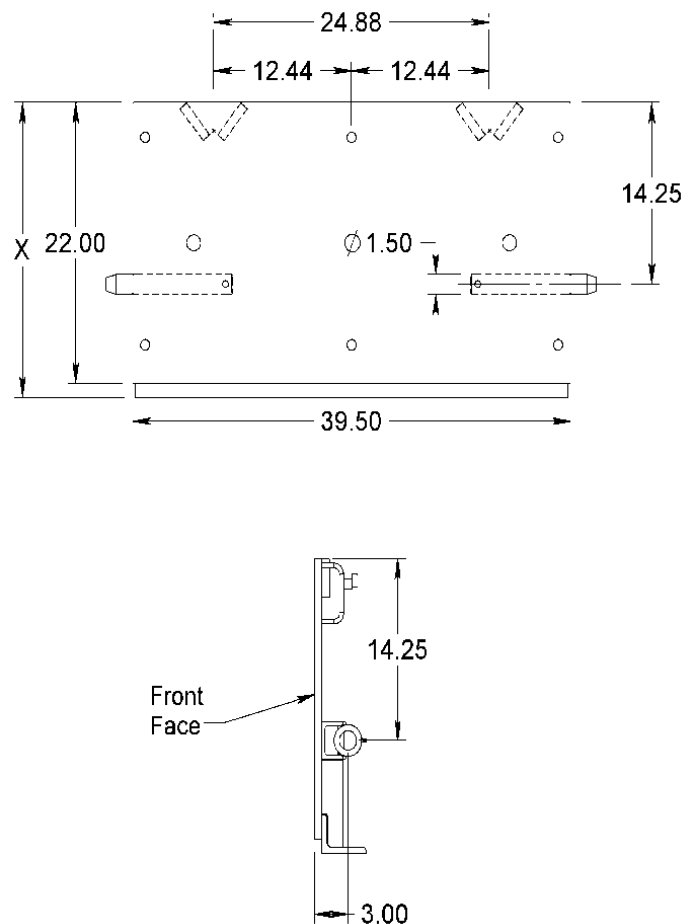
PART V

OPTIONAL EQUIPMENT

1. OPTION NO. 1 – 11 FOOT MOLDBOARD: In lieu of the 10-foot-wide moldboard specified in Part II, Para. 2., the moldboard shall be 11 feet wide. Length of cutting edge shall be not less than 11 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,450 pounds.
2. OPTION NO. 2 – 12 FOOT MOLDBOARD: In lieu of the 10-foot-wide moldboard specified in Part II, Para. 2., the moldboard shall be 12 feet wide. Length of cutting edge shall be not less than 12 feet. The approximate weight of the moldboard (less hitch and hydraulics) shall be a maximum 2,450 pounds.
3. OPTION NO. 3 – MUSHROOM SHOE RUNNING GEAR: The snowplow shall be equipped with a pair of height adjustable heavy duty 11” mushroom shoe running gear. The running gear shall include two height adjustment methods: course adjustment through a series of bolt holes, and fine adjustment through a hand crank screw assembly. The screw assembly shall be 1.25” Acme threaded rod minimum. Running gear inner tube shall be 3” x 3” x .25” square tubing minimum. Running gear outer tube shall be 3.5” x 3.5” x .188” square tubing minimum, with a fully welded lower reinforcement collar of 4” x 4” x .188” square tubing minimum near the bottom of the lower tube assembly. Mushroom shoe shall measure 11” diameter x 2.75” height minimum.
4. OPTION NO. 4 – SPRING LOADED 1X6 RUNNERS TYPE SKID SHOE RUNNING GEAR: In lieu of the caster wheels referenced in Part II, Para. 6, snowplow shall be equipped with a pair of height adjustable heavy duty running gear with 1x6 skid shoe runners. The running gear shall include two height adjustment methods: course adjustment through a series of bolt holes and fine adjustment through a hand crank screw assembly. The running gear shall be spring cushioned and include a thrust bearing. The skid shoes shall be 1” thick x 6” wide, brake formed at the front and rear to avoid catching edges and fabricated from abrasion-resistant steel with a minimum Brinnell hardness of 235. Running gear inner tube shall be fabricated from round tubing, 2.88” OD x 2.32” ID x .276” wall minimum. Running gear outer tube shall be fabricated from round tubing, 3.50” OD x 3.00” ID x .25” wall minimum.
5. OPTION NO. 5 - FLAT PLATE HITCH – TRUCK PORTION
 - 5.1. Truck portion hitch shall include a flat plate measuring 39.5” x 22” x .63” thick, made from ASTM A572 Grade 50 steel plate.
 - 5.2. Truck portion hitch shall include a welded, formed channel near the top of the flat plate, measuring 39” x 4.75” x 2.00”, which serves to reinforce the top of the flat plate. The formed channel shall include two cutouts on its upper surface. Within each cutout, two fully welded flat bars measuring 3.25” x .75” x .75” shall be mounted at angles to each other, forming “pockets” which facilitate the coupling of the plow to the truck hitch, by nesting with the “hooks” on the back of the plow.
 - 5.3. A reinforcing angle measuring 39” x 4” x 3” shall be welded near the bottom of the flat plate, protruding 1.13” past the bottom of the flat plate.
 - 5.4. A channel measuring 39” long, MC3x7.1# minimum, shall be welded to the flat plate. Two steel tubes, 2.5” OD x 7.5” long minimum, shall be welded to the channel, to act as guide bushings for the latch pins.
 - 5.5. Two spring-loaded latch pins, 1.50” diameter x 11.38” long, with tapered ends, shall secure the truck portion hitch to the plow portion hitch. A handle measuring 35” long x .38” thick shall serve to engage and disengage the latch pins through a system of linkages. A latch lock assembly must be provided which allows the lever and latch pins to be locked in the “engaged” position.
 - 5.6. To ensure compatibility between truck portion hitches and snowplows, all dimensions shown in Figure 11 must be held.

- 5.7. Two truck side plates of minimum .50" thickness shall be supplied. Side plates shall be custom designed to weld around the channels and angles on the back of the flat plate hitch, in order to most effectively transfer plowing forces from the plow, through the flat plate hitch, and into the truck frame.
- 5.8. Two cross braces of minimum 2.5" x 2.5" x .38" angle shall be supplied, for the purpose of cross bracing the side plates underneath the truck frame rails, to help prevent frame rail twisting.
- 5.9. Two stiffeners of minimum 2.5" x .5" flat bar shall be provided. These are intended to be welded to the outside of the side plates on standard frame width trucks, and to the inside of the side plates on wide frame trucks, to prevent side plate bending.
- 5.10. On wide frame trucks, two formed channels of .50" thick steel shall be provided. These channels shall bolt inside of the existing truck frame channels as "sleeves", and weld to the hitch side plates.

Figure 11



Authorized Warranty Service Provider

Name and address of firm nearest the FOB point that will provide warranty service and repair parts. If there is more than one line item, Contractor shall provide information on servicing dealer nearest each FOB point:

Firm Name

Address

City, State, Zip

Individual Contact Name

Phone

Email Address

Fax Number

Website – URL

If servicing dealer furnishes parts for minor repairs by Customer personnel, will this affect the warranty? (Y/N)

If answer is “yes” please attach explanation.

Name of Firm Submitting Response

Individual Contact Name

Phone Number

Fax Number

Email Address

Website URL

Contractor’s Signature

Print or Type Contractor’s Name
