

DEKALB COUNTY HIGHWAY DEPARTMENT

**SNOW PLOW, FRAME, HYDRAULIC SYSTEM, DUMP BODY,
WING, SPREADER AND PRE-WET TANK SYSTEM**

Sealed proposals for the furnishing and installing of snow plow, frame, hydraulic system, dump body, wing, spreader, and pre-wet tank system on 2020 Kenworth Model T370 as specified will be received by the Highway Committee of the DeKalb County Board until 9:00AM, Thursday, February 6th, 2020 at the office of the DeKalb County Engineer, 1826 Barber Greene Road, DeKalb, Illinois and at that time publicly opened and read.

The County reserves the right to reject any and all bids and to waive any technicalities.

The bids shall not include taxes for which we are exempt.

Proposal for furnishing & installing
Snow plow, frame, hydraulic system,
dump body, wing, spreader
and pre-wet tank system
as specified

Total Bid amount for (1) truck _____

Proposal submitted by:

Name _____

Address _____

Signature _____

**SPECIFICATIONS FOR SNOW PLOW, FRAME, HYDRAULIC SYSTEM, DUMP BODY,
WING, SPREADER AND PRE-WET TANK SYSTEM**

PUSH FRAME AND PLOW LIFT: Shall be Bonnell model HFF/SP quick Hitch with Bonnell-QAC coupler and Even Lift by telescoping lift arm. Side plate hitch type. The lifting device and push frame shall be constructed that a suitable power reversible type snowplow may be used. The push frame side plates shall not be less than **5/8"** thick and shall extend back as far as practical from the front end of the truck frame so as to reinforce the frame. **Push frame shall have 11" ground clearance to bottom of push frame (Drawing included).** Hitch shall be provided with a double acting hydraulic cylinder with nitrated rod of sufficient capacity to raise the plow specified. Hitch shall be compatible with plow Bonnell model **12TA3762MXIQA**. Plow hitch shall be tilt type, **if necessary**, for access to engine compartment or fixed type, and shall have hydraulic cushion block for reversing cylinders installed. Unit shall have auxiliary **ABL 3800 full LED combination drive lights with 5 integrated functions including directional signals and hardened glass lens.** Auxiliary lights shall be hood mounted with Stainless Steel brackets, with spacing on 60" centers (+/- 5"). **Height shall be 75" from ground to bottom of light.** Auxiliary lights shall be controlled by switch on control box. High and low beam on both original and auxiliary unit will be controlled by original dimmer switch. Truck is supplied with stationary grill. **Install "Load Share Air Bag" (P/N 6926) on right front suspension. 2 Heavy Duty Tow Hooks mounted on side plates of plow hitch.**

The successful bidder shall include in their proposal an extension to the front frame to accommodate the installation of the Monroe Para-Glide Double Function Patrol Wing (DFPW-9-TE) and pin and loop plow hitch as put forth in these specifications. The Kenworth T370 in this bid will come with a 6" front frame extension from the manufacturer, to which the successful bidder shall add to. The extension shall be constructed of heavy duty plate steel strong enough to allow for the size, weight and applied force/pressure of the plow and wing assembly to be safely operated with no damage to the truck. The plow hitch and wing mount spacing/height drawings are included in the bid packet for reference.

Any questions shall be directed to the DeKalb County Highway Department prior to bid submission.

POWER REVERSIBLE SNOW PLOW:

Shall be Bonnell model **12TA3762MXIQA** reversing table and $\frac{3}{4}$ " A frame, Painted Yellow (L6806EB) to match cab and chassis color.

Cutting Edge Holes	Standard AASHTO Punch for (2) 6 ft. cutting edges
Cutting Edge Length	12 feet
Cutting Edge Materials	1" x 8" Hi Carbon Steel
Cutting Edge Bolts	5/8" GR 8 Counter sunk
Cutting swath at 35 degrees	9'9"
Cutting swath at 28 degrees	10'7"
Reversing Cylinder	Two - 4" Dia., 2" <u>nitrated rods</u> , 12" stroke
Moldboard Material	10 gauge
Moldboard Bottom Angle	4" x 7" x 3/4"

Carbide Frog Protector	2 (outsides)
Moldboard Ribs	Seven – 1/2" x 3" with the left one doubled (looking at the plow from the back)
Level Raise Lift System	Chains
Springs	8
Flap	Minimum height 16", Anti-Sail
Snow Plow Jack	Swivel Jack, Top wind, 2,000 lbs. Lift Capacity Center/ground 10" Retracted. 10" Travel, Weld-On Tubular Mount (Bulldog part# TWS158DTSF)
A-Frame	Shall have gussets behind stops QA Loop Welded on the lower side of plate

WING: Shall be The Monroe Para-Glide Double Function Patrol Wing direct hydraulic model Monroe **DFPW-9-TE** or comparable. Mounted on the right front of truck, Painted Yellow (L6806EB) to match cab chassis color. All hydraulic cylinders shall have nitrated rods.

Wing lock valves for heel and toe cylinders.

Overall length: 9'8"

Overall height, front: 29"

Overall height, rear: 39"

Moldboard thickness: 3/16" hi-tensile steel

Cutting edge: **Carbide and Shoe**

Rear mount for push bar top frame cross beam with lower pipe brace support.

Push bars: 1 - adjustable spring cushioned

1 - hydraulic extension and hydraulic cushion block

Clearing width: 60"-90"

Front lift height: 14"

Rear lift height: 96"

Weight: 1700#

REPLACEMENT TAILGATE SPREADER: Shall be Monroe RTS-35 Replacement Tailgate Spreader

3/16" STAINLESS BODY with 1/4" endplates

3" X 3" X 1/4" Outside tube type frame

Full width auger located below the dump body floor

Full bottom opening below floor level

Auger to have One Way 3/8" X 9" fighting with a 4" pitch Left (drivers) Side Discharge

Main Auger shall also include additional fighting on the discharge side of the auger to slow down the leakage of salt from the auger discharge. This shall be P/N 05052386 with a description of: SPIRAL, 9.0 x 2.875 x 6.0 P x 18.0, LH .375 x 3 HRS STK

[Agitator bar shall run opposite auger \(fighting angled to passenger side except last 6\)](#)

Both auger and agitator are to be direct driven by low speed high torque hydraulic motors

18" poly spinner with all stainless steel brackets attached to truck dump body

[Anti-flow plate shall be 20"](#)

TRUCK MOUNTED HYDRAULIC PRE-WETTING SYSTEM: Shall be Monroe Model LDS455. Behind the cab 120 gallon stainless steel frame and mounts. 2 in. male bulk fill kit. Flush kit. Spinner disconnect kit.

HYDRAULIC - PUMP SYSTEM: The pump shall be mounted and shall be continuous and of sufficient capacity to allow the operation of the plow hoist, dump body hoist, spreader, auger and plow simultaneously without any functional loss of power to any of the other components.

(I) Hydraulic Pump - Load sensing, 24 GPM @ 1000 RPM min 5.5 cubic inch. Driveline to be Spicer 1350 series with guard. Pump to be of side port design to avoid multiple sharp bends in plumbing. Install shut off valve on pressure side of pump.

(II) Hydraulic Valve - of design to operate hydraulic equipment simultaneously without functional loss to any other components. To be mounted outside of frame in **Stainless** valve enclosure left hand side. Spinner hose hookups to be inside left rear frame rail and Auger hose hookups to be **recessed mounted** in upper right rear corner post of dump body.

HYDRAULIC CONTROL VALVE: **(ADD-A-FOLD 4020)**

The hydraulic valve shall be of modular manifold design. Each hydraulic function requires an individual manifold stacked together to form the manifold base. The manifold base shall consist of an inlet section with SAE #16 inlet porting, SAE #20 outlet porting, and SAE #4 load sense porting. There shall be a main system relief in the inlet section to protect the system from high pressure in case the pump compensators fail. The dump body manifold shall be stacked next to the inlet section, and capable of 40 GPM with SAE #12 porting. The hydraulic control valves shall be pulse-width modulated, proportionally controlled. Each hydraulic valve segment shall be individually mounted to the manifold base assembly and be serviceable without removing any hydraulic hoses or any other hydraulic valve segments. Each hydraulic valve segment shall have individual pressure compensation to achieve independent simultaneous operations. All segments shall have heavy-duty continuous duty coils and connections shall be with Din connectors. All coils shall operate at 12 VDC and require a maximum of 1400 mille-amps. Each segment shall be equipped with a manual override except for the auger and spinner sections. The dump body segment shall be rated to 40 GPM, with all other segments rated to 20 GPM. If a double acting hoist is utilized, the dump body segment shall be equipped with a down side relief to protect the body down function. This relief shall be set to the hoist manufacturer's specifications. Valve segments shall be **Force America Add-A-Fold® 4020** model or prior approved equal.

The valve is to be arranged as follows:

Hoist	4-way 40 GPM with 500 PSI down side work port relief valve
Plow lift	4-way 21 GPM
Plow angle	4-way 21 GPM
Wing toe	4-way 21 GPM
Wing heel	4-way 21 GPM with 1500-psi (A) port relief valve
Push bar	4-way 21 GPM
Auger	4-way 14 GPM (for momentary reversing for clean out)
Spinner	4-way 7 GPM (for momentary reversing for clean out)
Liquid	2-way proportional cartridge 7 GPM

CONTROL JOYSTICK:

The control console shall be equipped with a Hall Effect joystick for activation of the hydraulic functions. The unit shall be designed for severe duty conditions encountered in military, construction and agricultural applications. There shall be three safety interlock zones on the joystick activated by capacitive sensors. Mechanical trigger style contact type safety interlocks are not acceptable. All three interlock zones must be programmable to control specific functions. The joystick shall have proportional control with X, Y and Z axis movement. The single joystick shall provide one point-of-control for hydraulic functions. The joystick shall communicate through a Can Buss communication system to all of the modules of the control system. The single joystick shall be fully proportional and operate all of the cylinder functions. The joystick shall be equipped with left side buttons for spreader rate increase/decrease and standby, right side buttons for spinner speed increase/decrease and blast. The joystick face shall be equipped with five programmable control switches with LED colored backlighting for activation and control of multiple cylinder, spreader and anti-ice functions.

CONTROL CENTER:

Controls for all valve functions and electronic spreader control will be integrated into a single, self-contained control center. The control center shall be a padded armrest style that is ergonomically designed. Control center shall be modular in design for ease of installation and service, and wiring and connectors shall be keyed and color-coded throughout. All components must be durable for long life and trouble free operation.

The electronic controller shall be fully proportional to operate all cylinder functions. Controls for spreader must be located on armrest at the operator's fingertips.

To ensure longevity of performance all lighting to be LED technology. The use of incandescent lamps or EL backlighting is unacceptable.

Controller shall communicate all joystick data over the spreader control CAN bus. For ease of service and diagnostics the joystick control shall have the following easily accessible through the spreader control calibration menus:

- Unique MIN/MAX adjustments for each joystick function (forward, back, left and right)
- On-screen output status indicators for each PWM output
- Audible and visible output error status indicators with flashing error codes for each joystick function

The joystick outputs shall be communicated over the spreader control CAN bus to the Valve Module. Spreader control outputs and joystick control outputs shall be operated on the same Valve Module, or multiple modules as necessary.

The electronic spreader control shall be designed for precise, closed-loop control of granular and pre-wet liquid applications and operate on a CAN Bus protocol. The Central Processing Unit (CPU) shall have keyed and color coded connections to prevent incorrect installation. The CPU shall be mounted in the cab with visual access to diagnostic LED's. Mounting of the CPU unit outside of the cab is unacceptable. The unit shall have USB connectivity for file and data transfer, Ethernet connection, a CAN bus communication port for spreader-only data use, a J1708 connection for a road and air temperature sensor, and a RS-232 connection for AVL communication. The CPU shall have on-board diagnostics, which provide real-time status of CAN bus communication, processor activity, and power status. The CPU shall have a built-in audible alarm for diagnostic purposes. The CPU operating system shall NOT be Windows-based.

The spreader control interface shall have two, color-coded, continuous rotation encoders for granular and spinner control. These encoders shall have integrated push buttons for blast mode and stand-by. The controller shall have a third multifunction 4-way joystick that has an integrated rotary encoder and push button, that can be used for menu navigation, pre-wet liquid control, or an additional conveyor function. There shall be four, two-way soft keys included in the interface that are generically-labeled and user-configurable for different functions depending on the equipment needs. The controller shall also utilize iButton technology that is capable of using a Supervisor key to provide access to the calibration parameters without the access code. The entire operator interface shall be backlit and encased in flexible silicone material with wear-limiting coating applied to the base silicone material. The operator interface shall communicate on the spreader control system CAN bus.

The spreader control display shall be a remotely-mounted, 7" diagonal color TFT LCD, with a low-profile 16:9 widescreen format and minimum of 800X480 pixel resolution. LCD shall have variable LED backlighting. CCFL backlighting is unacceptable. The display shall include a scratch-resistant polycarbonate lens with anti-glare coating. A power status LED shall be immediately visible on the front of the display and shall report display diagnostics including loss of CAN communication. Display unit shall have a built-in audible alarm. To avoid driver distraction, the display shall have no integrated dials or pushbuttons and shall not be touch screen. LCD shall communicate on the spreader control system CAN bus.

The operator menus shall be color-coded to match the encoder knobs on the operator interface. The display shall be capable of displaying the following on-screen simultaneously: Granular material name, granular material set point and actual application rate including units of measure, pre-wet liquid name, pre-wet liquid set point and actual application rate including units of measure, spread width, road temperature, air temperature, material usage total, liquid usage total, vehicle speed, and current date and time. The operator shall have the option of selecting five data items to be displayed onscreen during operation. The display will also provide four warning light indicators for low oil level, body up, oil temp, and filter bypass. These warning lights are to be functional regardless of spreader operation or status.

The display must provide visual indication that the spreader control is connected to a compatible AVL device, if equipped. The spreader control shall warn operator if communication with the AVL device fails at power-up.

A proportional PWM driver and input module (Valve Module) shall be remotely-mounted inside the hydraulic valve enclosure for control of both spreader control and joystick control outputs. The entire Valve Module shall be of rugged design for the mobile environment, and must meet a minimum of IP67 requirements for dust and water ingress. The Valve Module shall include a minimum of eight proportional PWM outputs with potted valve output connections. All outputs shall be protected against short-circuits. Outputs shall have adjustable PWM frequency. There shall be a minimum of five switch-to-ground type inputs for monitoring hydraulic system inputs such as oil level, body up, Hi and Low filter bypass, and oil temperature warnings. A minimum of two switch-to-ground type pulse train inputs shall be included in the Valve Module for connection of feedback sensors such as auger feedback and prewet liquid flowmeter feedback. A keyed and color-coded connection shall be provided for CAN bus connection to the CPU module inside the cab. A second CAN bus connection must be provided for daisy-chaining of multiple Valve Modules within the valve enclosure. Diagnostic LED's shall be included for every input and output on the Valve Module, as well as a power status LED and CAN bus activity LED's. The Valve Module shall be potted.

The integrated spreader control and joystick control system shall be equipped with a qualified ESTOP device that immediately disconnects battery power from all outputs. All spreader control and joystick-operated outputs shall immediately cease to function and the system display shall inform the operator that the ESTOP device has been activated. The ESTOP device must remove power from all output devices, while

maintaining power to the display and CPU for diagnostic purposes. Resetting of the ESTOP device shall not result in spreader control and joystick-operated outputs returning to an ON state without operator acknowledgement.

(A) One 10 micron return line filter with spin-on element with 1-1/4" NPT ports mounted as close as possible to the reservoir with a by-pass and condition indicator gauge. Shut off valve to be installed between filter and hydraulic reservoir.

(B) **Stainless** hydraulic reservoir with low oil level sensor (with warning light, warning buzzer mounted in control box) and shut off valve on the suction side of reservoir to be installed.

(C) Suction hose to be 2" I.D. minimum

(D) Pressure hose from pump to valve body to be 1" 2-wire.

(E) Dump body hose to be 1" 2-wire from valve body to "T" for cylinder. 3/4" from "T" to cylinder kept short as possible, 3/4" return lines.

(F) Snow plow lift hose to be 1/2" 2-wire

(G) Shuttle hoses to be 3/8" 2-wire

(H) Pump drain hose to be 1/2" 2-wire

(I) All hoses to have swivels on at least 1 end

HYDRAULIC LINES: All hydraulic lines connecting spreader, power reversible plow and wing to truck shall be equipped with quick couplers. These couplers to be reversed, male-female to prevent incorrect hook-up. The hose, fitting and couplers shall be of sufficient size and strength to withstand the maximum output capacity and pressure of the pump(s).

PINTLE HITCH: Holland PH-775-01552 swivel type pintle hook. 50 ton pintle hitch mounted not to interfere with hydraulic lines. Remount factory tow hooks to rear upper frame. **Must have Air lines and Glad hands.**

CAB: Install customer supplied switch panel for the purpose of controlling the **Strobe Lights, Scene Lights, Spreader Light and Wing Light.** Switch panel shall be installed on the dashboard as close to the driver as possible to allow ease of access for operating switches.

14 gauge jacketed 2 wire shall be run from control box to left rear corner of dump body for spreader light and from control box a 15 ft. loop of wire **in cab** for wing light.

All electrical (relays, circuit breakers, solenoids and wire connections) for control box mounted in cab.

CHIPPER BAR: Per County specification. (Drawing available). Contact Highway Department for drawing and specifications.

STAINLESS DUMP BODY: Shall be a western style under body, for mounting on chassis having a 115" CT. Lights, reflectors and mud flaps to meet minimum DOT and State of Illinois standards.

12' 6" x 7' 8-10 yard capacity
34" sides
44" tailgate, angle iron across top and loop, air operated
Extend tail gate lever rod past body for manual release
50" sloped front to accommodate Crysteel Marathon hoist
Double-ribbed head sheet for added strength
Full depth rear corner posts, boxed stainless steel construction
Full depth rear apron
Tailgate, double-acting, w/full length 3/8" proof coil chains, tubes welded solid in tailgate for
(4) 3/8" shield bolts

All seams shall be continuous welds throughout including cab shield

7 ga. Stainless Steel construction throughout

1/4" AR400 Floor

9" radius sides to floor

Boxed top rail

2 center supports for sideboards per side at 8" tall each

2 Body safety strut

Half cab shield.

Grab handles on drivers side cab shield horizontal and vertical of minimum 1" pipe.

Lights shall be recessed (all oval) L.E.D. strobe, stop-tail-turn and back up on upper rear corners, mounted in conjunction with Light Bar on pintle hitch plate. (NOTE :) DeKalb County Highway Dept. to be notified prior to installation for spacing between strobe lights, stop-tail-turn and back up lights recessed on rear corners.

Minimizer 4000 poly fenders (4) (P/N 4-PM4001) with plastic mounting kit (P/N B4578BTPA)

Fenders mounted

Mud Flaps shall be installed on the rear of the truck using "Fast Flap" brackets:

Minimizer P/N- 101227

Junction box to rear of frame

All rear lights and wiring will be continuous from light to junction box, i.e., no splices

Ladder, one step below box 14" wide minimum

2 Steps on inside of box at front corners, 14" long

1 Stainless Steel Shovel Holder (**Buyers SH675SS**) ship loose

Full length shields on tailgate. Shields must stay inside box (at top) when tailgate is open.

Vibrator for box. Mounted at the front of box in center under floor.

Aluminum Crysteel toolbox mounted to fit under sloped front

Undercoating

***** To be included and shipped loose with truck for stock/replacement: *****

One (1) Upper/ Beater Motor P/N- 05006768

One (1) Lower/Main Auger Motor P/N- 05006774

HOIST: Shall be a Crysteel Marathon Telescopic Hoist M53117

Inverted hoist

3 stages

117" stroke

Double acting

Floating cradle

Trunnion mounted

NTEA Performance Class 80

49° Dump Angle

Lighting:

Whelen State of Illinois (D.O.T. approved), 72" (or approved length) Justice light bar (P/N 01-0684859-41) with (2) 8" riser legs (P/N 01-0441414-00) on cab with rear strobes 500 Vert LIN L.E.D. flashing Amber (left rear) flashing White (right rear) (P/N 5V02ZAD) with 5 Grommet (2) in box. With scene lights option installed in light bar mounted on cab of truck (P/N JHTLS2). Also to include stop-turn-taillights option (P/N JHBTTLED) installed in light bar mounted on cab of truck.

Light bar and all strobes to be L.E.D. (P/N 01-0684859-41) and (above P/N) or Similar as approved by the DeKalb County Highway Department. All lights to be constructed with clear domes to allow for Amber/White L.E.D. lighting combinations for better visibility.

Customer supplied switches for strobes, wing light, plow lights and work lights to be installed at the direction of customer.

Lights to include shipped loose for installation by DeKalb County Highway: (4) ABL Model ST2000 LED Asymmetrical Flood Pattern.

For questions on bidding specifications to match existing DCHD fleet, or to schedule an appointment for viewing please contact us @ 815-756-9513.

All installation to be to the satisfaction of DeKalb County Engineer.

Delivery Date: _____

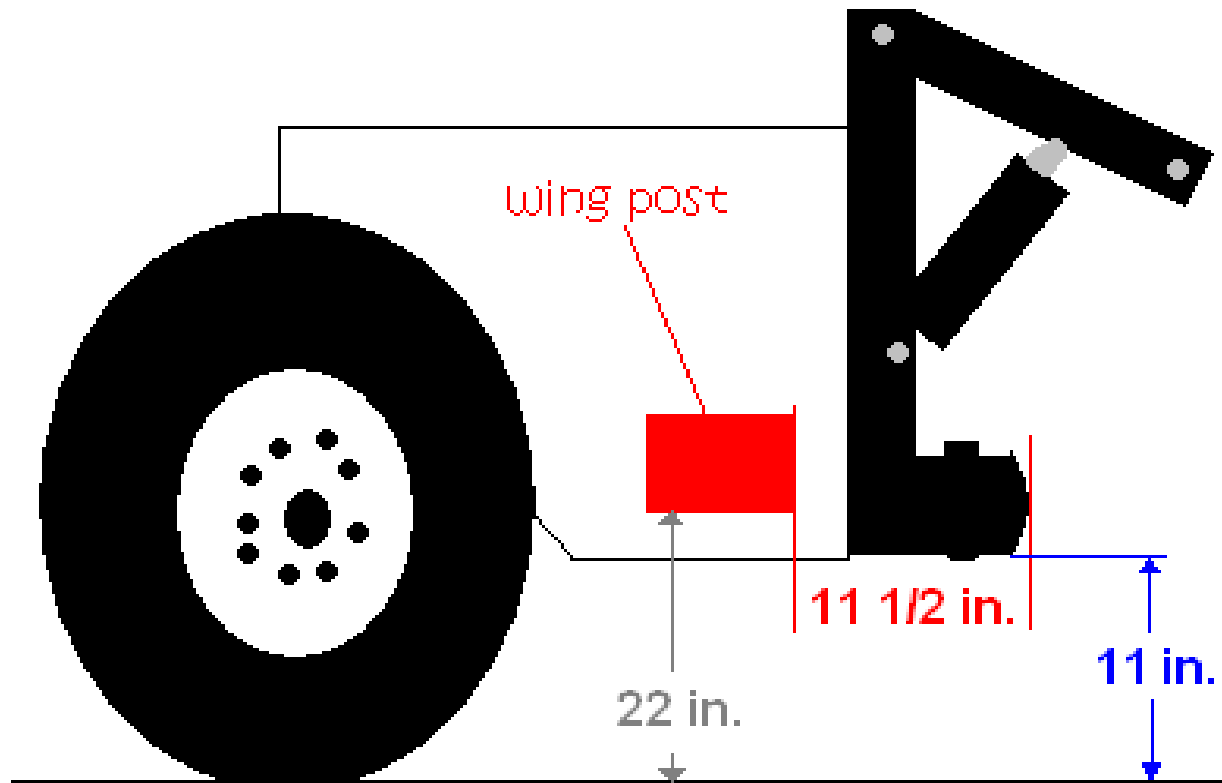
INSPECTION – Materials or equipment purchased are subject to inspection and approval at the County’s destination. The County reserves the right to reject and refuse acceptance of items which are not in accordance with the instructions, specifications, drawings or data of Seller’s warranty (expressed or implied). Rejected materials or equipment shall be removed by, or at the expense of the Seller promptly after rejection.

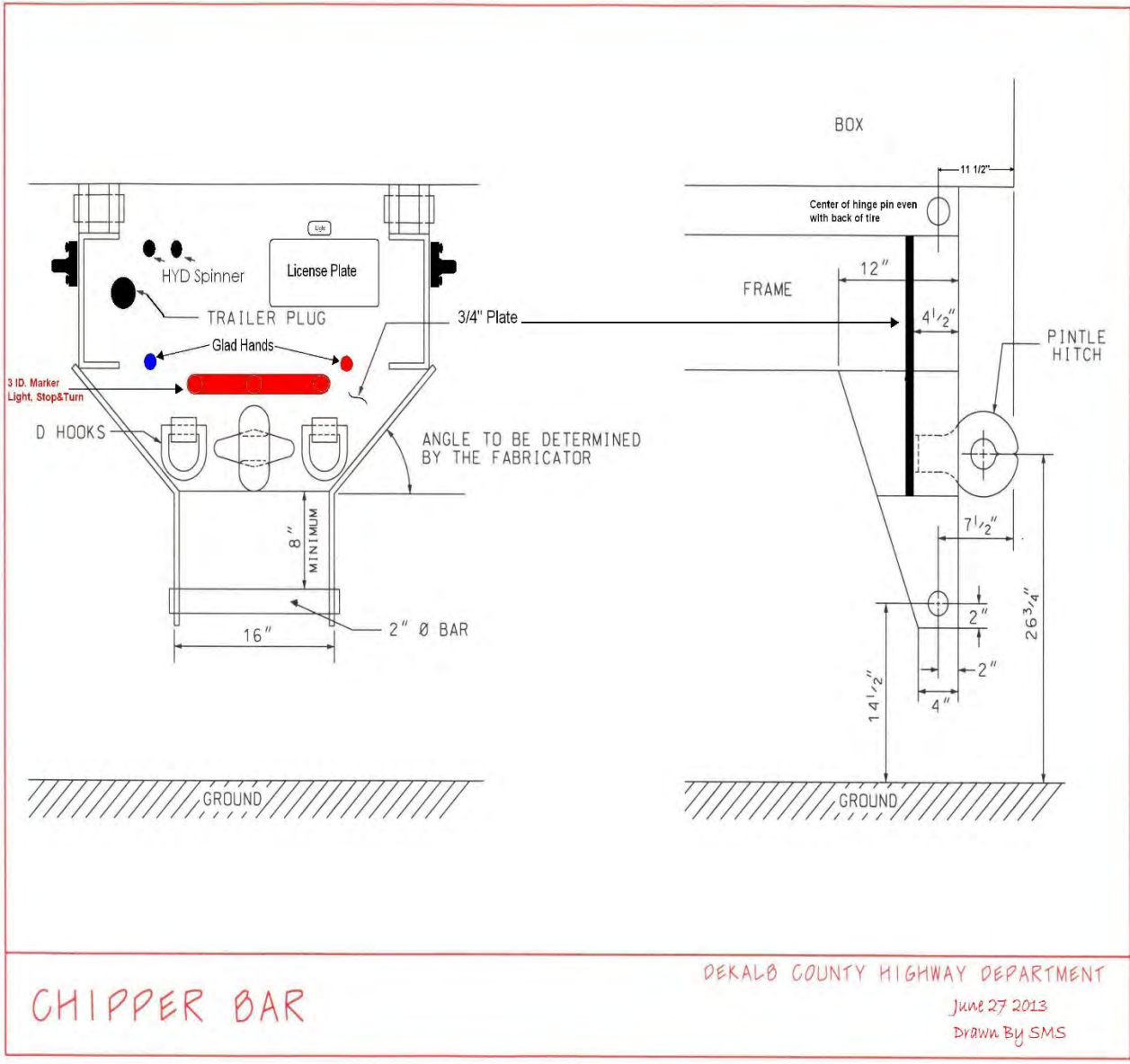
BOX WARRANTY:

Minimum – 5 year extended warranty on complete basic unit

Note: Warranty to be dealer registered, warranty coverage and proof of warranty registration must be provided at time of vehicle delivery. Warranty to begin upon date of delivery and acceptance by the DeKalb County Highway Department.

PLOW FRAME/ WING MOUNT SPACING AND HEIGHT:





CHIPPER BAR

DEKALO COUNTY HIGHWAY DEPARTMENT

JUNE 27 2013

DRAWN BY SMS