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IOWA COUNTY, WI – VARIABLE HEAD CHIP SPREADER

**TITLE:** SPECIFICATIONS FOR A VARIABLE HEAD CHIP SPREADER UNIT  
SELF-CONTAINED HYDROSTATIC PROPULSION SYSTEM

**CUSTOMER:** IOWA COUNTY, WI HIGHWAY DEPARTMENT  
CRAIG E HARDY; PE / RLS  
HIGHWAY COMMISSIONER

The following specifications are intended to describe, define, identify, and explain the minimum requirements for production and fabrication of a new current production model year self-propelled variable head chip spreader application machine. The unit shall meet or exceed all safety references, performance criteria, and technical descriptions herein described and shall optimize productivity for the buying agency. All standard features not specifically mentioned shall be supplied to ensure complete integration and working order for the life cycle of the unit.

The specifications are intended to promote full and open competition for all responsible manufacturers of this type of equipment. Specific references to any brand name or trade of equipment is for the purposes of creating a standard of acceptable product. In some instances; the reference (no exceptions) is listed, in which case the owner will not consider any other alternative products for the BASE BID. If a proposer has an alternative equal product which they would like to have considered; it shall be addressed as a value engineering or alternative bid adjustment. Other deviations or exceptions to the product specifications herein listed shall not be acceptable without the sole determination of the buying agency. It is the proposed bidder's responsibility to codify and justify any alternative products proposed as well as their quality and performance in comparison to the specific products herein listed. The bidder shall provide any and all necessary information necessary for the determination of any alternative products to be provided with their bid, in order for the client/owner to determine if the substitute products proposed are acceptable. Owner cautions bidder's to quote their base bids on the basis of the equipment and products described herein, and address any alternative proposals as a value engineering proposal or alternative bid to their base bid for consideration of the buying agency. All equipment provided shall be subject to a full compliance inspection at time of delivery and the supplier shall be subject to corrective measures and all expenses for any non-compliance discovered. In addition, bidders will participate in a pre-build meeting to finalize the equipment order prior to manufacture. Bidder shall also provide technical services at the time of delivery; to include training on the basic operation and general maintenance of the unit at the buyer's facility in Dodgeville, Wisconsin.

**BIDDERS PRE-APPROVAL REQUIREMENTS:**

The following Chip Spreader equipment manufacture / fabricator are preapproved and invited bidders to provide a proposal for this project:

Etnyre Hydro-static Drive Self-propelled Chip spreader; Aring Equipment Deforest, Wis.

All other bidders shall request pre-approval for bidding on this project from the Iowa County Highway Department at 1215 N Bequette Street; Dodgeville, Wisconsin. A pre-approval request shall be submitted in writing to the Highway Department address listed above c/o Craig Hardy; Iowa County Highway Commissioner. Bidder shall provide the following information for consideration of an ability to bid the project:

1. Name of business and address for doing business in the USA.
2. Summary of business history involved in the manufacture / fabrication of vehicles and equipment as specified herein.
3. List of a minimum of 5 references or clients who have similar type of equipment and machinery as proposed herein in service within the USA.
4. List of financial references for business activity within the last three years, which indicates performance responsibility and ability to complete the project as proposed.

All bidders shall have requested and be on the pre-approved list of bidders held by the Highway Department prior to Monday April 16, 2018; or their sealed bid proposal will be returned unopened and their bid will not be considered for the project.

**GENERAL EQUIPMENT PERFORMANCE REQUIREMENTS:**

1. The equipment shall apply aggregate chips to pavement surfaces in a uniform pattern of coverage for the width as specified.
2. The equipment shall be capable of self-propulsion vertical inclines of 15% or greater, while pulling a loaded 66,000# tri-axle dump truck and applying aggregate.
3. The equipment shall have a fully hydro-static steering system and a 4-wheel hydrostatic drive system.
4. The equipment shall be capable of operation through an infinitely variable speed of 0 to 19 MPH under full load.
5. Overall equipment height shall not exceed 10Ft 0Inches in both operational and storage modes.
6. Manufacturer shall have experience in production of similar models as specified. No one of a kind or prototype models will be accepted.

**SUMMARY:**

1. GENERAL PROVISIONS
2. POWER TRAIN COMPONENTS
3. FRAME ASSEMBLY
4. CONVEYORS
5. SPREAD HOPPER
6. TRUCK HITCH
7. APPLICATION RATE COMPUTER CONTROLLER
8. MISCELLANEOUS ACCESSORIES
9. TECHNICAL SERVICES
10. OPTIONAL EQUIPMENT / ALTERNATE BID ITEMS

**1). SECTION 1 – GENERAL PROVISIONS**

#### A. GENERAL PROVISIONS

It is the intent and purpose of this specification to describe a self-propelled hydrostatic drive variable width head chip spreader machine. The machine shall apply mineral aggregates in a uniform rate and width over the width of the machine head as specified. The equipment must be capable of applying this material at an infinitely variable speed of 0 to 19 MPH, while under full load of materials and pulling a loaded 66,000# tri-axle supply truck up vertical gradients of a minimum of 15%.

The base bid shall include the information as specified in Sections 1 thru 13 herein, with an option for additional equipment and accessories as specified within section 14 as alternative bid items. All parts which are not specifically mentioned, which are necessary to provide a complete and fully operational chip spreader; shall be included in the bid and shall conform in strength and quality of materials and workmanship to what is generally provided as a standard in the industry. The unit shall be a current production model year in standard production by the manufacturer. It is the responsibility of the bidder to conform to all requirements of these specifications, unless deviations have been specifically cited by the specifications. All bidders are encouraged to quote the requirements of these specifications as their BASE BID. Then, if so desired to address any proposed or recommended changes as a bid alternate or value engineering proposal off of the base bid.

The Owner reserves the right to award and accept on the basis of the bid deemed most advantageous or responsive as determined by the Owner.

#### B. MATERIALS AND WORKMANSHIP:

All equipment furnished and the parts thereof shall be of the manufacturer's latest listed and published stock models, which meet all the applicable requirements of the specification. No remanufacture, out-of-date, or non-current model year components, equipment, or parts shall be allowed. The intent of this specification is to provide a standard of acceptance for what the county is anticipating to acquire competitive bids. Any mention of specific brands or manufacturers are for the purposes of establishing a standard of quality or product type, and is not intended to be proprietary. The County may consider alternative products to those as listed herein; however, it is the bidder's responsibility to identify and call out which items within their bid proposal are not within the substantial equivalent of those items as called out herein. For the purposes of bidding, the bidder's may want to quote to the item, equipment, or parts as listed herein and provide other alternatives as an alternate bid under a value engineering proposal wherein the recommendation changes to these specifications and their differences are identified.

For example, if the specification states Kamber paint guns 35-18NB; if the proposed guns are to differ from the Kamber either in brand or model number the bidder shall identify how the components are different as well. In some instances the verbiage (no exceptions) is listed in which case the Owner will not accept any base bids for review where a bidder is not providing a bid based on the specified materials. Bidders are always encouraged to provide alternative or value engineering proposals or recommendations but are requested to do so as an alternative bid item for further consideration not as a part of the Base Bid.

#### C. FINISH:

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

Finish Coat Color –Standard Highway Yellow.

**D. GUARANTEE:**

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

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

The manufacturer will assume no field expense for service or parts unless authorization is granted in advance. The manufacturer will assume no liability for normal maintenance items, consumable or damage resulting from neglect or abuse of the equipment.

**2. SECTION 2 – POWER TRAIN COMPONENTS**

**A. ENGINE:**

The engine shall be a new, current model year (No Exceptions) Cummins Tier 4 Final diesel turbocharged engine assembled to meet the specific requirements. Manufacturer's minimum allowable rating shall be 260 HP including electric start, voltage regulator, and 12-volt batteries.

When fully laden with striping material, the chassis manufacturer's GVW rating shall not be exceeded. The unit shall meet all current OSHA standards for noise levels at platform level and the operator locations.

Provide alternative pricing to the Base Bid as listed in Section 10 to upgrade to the "BIG Chipspreader Option" which includes the 280+ HP engine.

**B. AUXILIARY EQUIPMENT:**

The following auxiliary equipment shall be provided:

- I. Fuel filter, fuel-water separator
- II. Dual 1000Amp 12-volt batteries
- III. Dry Type dual air cleaner system with indicator
- IV. Electrical variable controlled engine throttle/actuator
- V. Proportional hydraulic fan drive; maximum HP/KW, reduced noise, and automatic cleanout.
- VI. Disposable element type oil filter
- VII. Heavy Duty cooling system
- VIII. Control/instrument panel to have lockable enclosure to prevent tampering or accidental operation.

C. DRIVE SYSTEM:

4-Wheel hydrostatic drive package option. Mechanical front wheel drive steer axle, fully oscillating, 75-inch wheel tracking. Gear ratio shall be 20.37:1; 25,000# rated, single speed differential or as recommended for the unit. Mechanical drive rear axle, 95-Inch wheel track. Gear ratio shall be 20.37:1; 25,000# rated; single speed differential. Both axles driven by direct engine bell housing mounted 125cc variable displacement hydrostatic pump and 160 cc hydrostatic motors or approved equivalent. Infinitely variable speed controls from 0 to 19.5 MPH. Unit shall have traction boost option.

Designed to provide optimum traction for a 4-wheel drive unit. Minimum 75 gallon hydraulic reservoir. Hydraulic pump shall have pressure compensating pump for auxiliary systems.

Provide pricing for the traction control boost option as part of Section 10 alternative bid items to the Base Bid.

D. BRAKES:

Mechanical front axle has hydraulic internal drum brakes controlled by foot pedal at the operator station. Rear axle to have hydraulic actuated drum brakes 16 1/2inch X 7 Inch. Shall also include a spring applied fail-safe hydraulically released parking brake in the drive line, which shall have an automatic lock if hydraulic pressure is lost or fails.

E. STEERING:

Full hydrostatic power steering from 1.22cc fixed displacement gear pump, with dedicated flow independent of engine speed or drive system.

F. TIRES AND WHEELS:

Front wheels to be 2 each 385/65R22.5-G tubeless, radial, wide base tires mounted on heavy duty steel disc wheels. Rear tires to be 2 each 425/65R22.5-L tubeless, radial, wide base tires mounted on heavy duty steel disc wheels.

3. SECTION 3 – FRAME ASSEMBLY

A. ASSEMBLY:

The complete power train, diesel engine, hydrostatic pump and motor, front and rear axles shall be mounted to a lower removable main frame. Upper removable main frame assembly shall include both conveyors; left and right access ladders and walkways, 70 gallon built-in hydraulic reservoir, 82-gallon diesel fuel tank for engine, suitably sized Diesel fuel exhaust (DEF) tank, rear 4 cubic yard hopper, and truck hitch. Main frame shall be a minimum of complete 3/16-inch steel construction or as designed by manufacturer for the component parts and heavy duty service life required.

B. RAILING:

Unit shall have one full length walkway with skid resistant surface adjacent to one side or the other of the conveyor system. Adequate protections shall be provided to prevent entanglement or entrapment of workers on the platform from all moving points/parts.

A steel railing shall be installed around the platform where necessary, and bolted in place. Railing shall be constructed of steel round or square tubing. The height of the railing

shall be in compliance with all federal and state regulations for fall protection for workers engaged on the unit. Corners shall be rounded for operator safety.

**C. TOOL BOXES:**

One (1) smooth aluminum weatherproof toolboxes of adequate size shall be supplied and mounted on each side top of deck. The boxes shall have a full face, bottom hinged door with a latch with integral lock. One box shall be 18" X 18" X 24" with three pull out drawers. Any unit specific specialty tools needed for adjustments or disassembly of the various machine components shall be furnished in these boxes.

One (1) smooth steel, lockable toolbox shall be mounted under the main deck. The box shall be 18" X 18" X 24" empty or base unit, or equivalent in cubic area.

**D. OPERATOR'S AREA:**

Power seat pedestal option with electric over hydraulic powered seat and operator's control panel movement system for dual operation from either side of the unit. All controls located to the front of the operator's seat for easy access and optimum visibility for operation of the machine. Foot and parking brake controls at main console operator's station.

Steering system, as specified elsewhere; shall be operable from either location of the main operator's station to the front of the operator's position.

Provide pricing for alternative bid items such as shade canopy and/or a fully enclosed operator's cab with A/C, heater, and power seat as a bid alternative to the Base Bid under Section 10.

**4. SECTION 4 - CONVEYOR**

**A. CONVEYORS:**

Conveyors shall be independently activated by electric switches. Conveyors shall be suitably sized for the material delivery system provided; 20 to 24 inch in width ideally. Conveyors shall be powered by a load sensing 74cc variable displacement pressure compensated hydraulic pump, high torque 19.0 CIR hydraulic motors with direct drive to head pulley. Electric switches for each conveyor control shall have a mechanical manual override to allow operator control. Hooded, adjustable aggregate deflector to be located at the head of each conveyor. Quick, detach, rolling, removable style; trough shape idlers and tail pulley. Idlers and pulley shall be adjustable for proper belt alignment and tensioning. Electric over hydraulic folding wings on the rear receiving hopper bin to ensure material cleanout and direction into the conveyor distribution system.

**B. AUTOMATIC CONVEYOR CONTROLS:**

Conveyor controls located at the main operator's station to automatically start and stop the conveyor belts to control aggregate level and feed into the spread hopper. Controller shall include manual override control to allow start, stop, and speed functions at the operator's station for both auger and conveyor controls.

**5. SECTION 5 – HOPPERS AND DISTRIBUTION SYSTEM:**

**A. HOPPERS:**

Aggregate head spread width shall be variable adjust on the fly between 12 Ft and 24Ft. Struck capacity of hopper to be 0.2 CY per foot of hopper width. Spread roll shall be 6-Inch diameter, machine welded heavy wall tubing. Agitator shall be 2-1/2Inch tubing with quick disconnect pin. Each radial gate shall have an individual, air operated control with manual override. Each gate to have reversible, adjustable wear plates to include (4) Four 6-Inch gates at each end with 12-Inch center gates. Spread roll and agitator to be driven by a high torque 12.0 CIR hydraulic motor with quick coupler hose connection.

A full width rock type screen with 1-1/2Inch openings shall be placed over the top of the spread hopper to retain oversized materials and foreign objects.

Receiving hopper shall be a minimum of 132 inches wide with a capacity of approximately 4 cubic yards. Hopper to have hydraulically folding paver style wings controlled from the operator's station. Shall include heavy duty hopper skirting and an adjustable flow gate for each conveyor belt.

## 6. SECTION 6 – TRUCK HITCH

### A. HITCH DESIGN:

The unit shall be equipped with a positive, self-locking “railroad” style, adjustable truck hitch; which shall be capable of being electrically released from the driver's/operator's control station position. Hitch height shall be adjustable, electrically controlled form the driver's/operator's control station position. The truck hitch shall be the type which allows hooking and unhooking of aggregate trucks without stopping the unit, capable of maintaining positive engagement lock over uneven terrain, and spring loaded – hydraulically adjustable with hydraulic release override.

Provide alternative bid pricing for a rear backup camera, which shall illustrate the hitch location, mounted at the operator's station as listed in Section 10.

## 7. SECTION 7 – APPLICATION RATE CONTROLLER EQUIPMENT

### A. APPLICATION RATE COMPUTER CONTROLLER:

The application rate computer controller shall be capable of monitoring the actual speed of the unit and vary the gate openings in order to maintain the driver/operator set application rate, in Lbs/SY for the selected aggregate; regardless of the unit's operating speed across the 0 to 19.5MPH range. The controller shall be capable of storing five (5) different aggregate/application rate combinations in its' memory. The preset aggregate type together with its' different aggregate/application rate combinations shall be selectable at any time from the controller. In addition, the application rate shall be variable as desired while operating, or a different preset combination shall be selectable at any time during operation.

The computer controller shall be set to control the unit's forward speed for consistent speed when following the oil distributor. The computer speed sensor may or may not operate on the basis of radar ground speed control; as long as it accurately controls unit speed compared to application rates.

The computer controller shall be accessible from the operator’s station regardless of position. The computer shall also monitor fuel level of the unit, engine oil pressure, hydraulic oil temperature, engine coolant temperature, hours on engine, and miles of surface chipped.

8. SECTION 8 – MISCELLANEOUS ACCESSORIES

A. LIGHTING:

Unit shall have head, stop, and tail, lights and turn signals with flasher modes in compliance with all state and federal regulations for on-roadway operation of vehicles or equipment.

Marker and clearance lighting shall be recessed flush mounted in grommets. Marker lights shall be mounted at each outer edge (side) extremity of the main frame assembly (not on any of the movable chip spread hoppers). Marker lighting shall provide indication for the outermost forward and rearward points of the main frame assembly.

B. CONSPICUITY TAPE:

Unit shall have conspicuity alternating red and white retro-reflective tape along both outer (side) edges of the unit for side visibility markings. The retroreflective sheeting shall have a minimum width of two inches and be of Grade DOT-C2. It shall consist of alternating red and white color segments with a length of 12 inches ± 6 inches. White or red sheeting shall not represent more than two thirds of the aggregate of any continuous strip marking the length or width of the truck.

Use sheeting consisting of a smooth, flat, transparent exterior film with retroreflective elements ....ASTM D 4956-90, Standard Specification for Retroreflective Sheeting for Traffic Control, for type 5 sheeting, except for the photometric requirements, ....:

**MINIMUM PHOTOMETRIC PERFORMANCE OF GRADE DOT-C2 RETROREFLECTIVE SHEETING IN CANDELA/LUX/SQUARE METER**

Entrance Angle	Observation Angle			
	0.2 Degree		0.5 Degree	
	White	Red	White	Red
-4 degree	250	60	65	15
30 degree	250	60	65	15
45 degree	60	15	15	4

The letters “DOT-C2” which constitutes certification the retroreflective sheeting conforms to the requirements of this guideline are required to appear at least once on the exposed surface of each white or red segment of sheeting. Retro-reflective tape shall be a continuous strip along both outer edges to outline the true length of the unit.

C. HORN:

An electronic horn shall be furnished with controls at the steering wheel location of the operator’s station.



**D. BACKUP ALARM:**

An electronically activated backup alarm shall be furnished and functioning whenever the unit is placed into the rearward or backing mode. The unit shall provide suitable audible notification to be easily/readily heard by those in the immediate vicinity of the unit. The backup alarm shall self-cycle on/off whenever the unit transmission is engaged to forward or reverse.

**E. STROBE / WARNING / BEACON LIGHTS:**

The unit shall be outfitted with an amber LED post mounted light bar mounted on the deck overhead of the spread hopper gate operator's station on the front of the unit. This light shall be a Federal Signal JETSTREAM LED JLL 5402-SB. The control switch shall be a lighted weatherproof rocker switch located at the operator's station.

The unit shall be outfitted with two (2) LED beacon style strobe lights post mounted to the surface of the deck. The lights shall be positioned at the outermost rear of the unit, but in front of the receiving hopper. Lights shall be controlled by a weatherproof rocker style lighted switch at the driver's/operator's position. Lights shall be minimum 8-inch diameter Federal Signal or Whelen manufacturer, or approved equivalent.

**9. SECTION 9 – TECHNICAL SERVICES**

**A. TECHNICAL INFORMATION:**

For the purpose of determining the degree of standardization for units, the availability of replacement parts, and whether or not components meet the specifications, the bidder will provide parts manuals, wiring diagrams, and detailed specifications on the following components:

- I. Assembly Chassis or Frame
- II. Engine
- III. Hydrostatic Drive System
- IV. Receiving Hopper and Conveyor Distribution system
- V. Variable Width Front Head, Front Hopper, Distribution, and Gate System
- VI. Computer Controller and Operator's Station

An engineer's detailed layout with weight distribution shall be provided with the bid submittal showing the location of equipment, toolboxes, lighting, engine, drive system, conveyors, walkway, and other equipment necessary for the successful construction of the machine.

**B. TECHNICAL MANUALS:**

The successful bidder shall supply with delivery of the unit:

- I. two sets of written and bound or
- II. two electronic format (flash, thumb drive, or CD) versions of the following:
  - a. as-built equipment layout diagram
  - b. operator's manuals,
  - c. service manuals,
  - d. parts books,
  - e. wiring diagrams
  - f. applicable technical information for each machine purchased.

C. SHOP DRAWINGS:

A complete set of shop drawings must be submitted with the bid. The drawings shall show the proposed equipment layout, side profiles, weight distribution, and conveyor design of the distribution systems for the unit. In addition, manufacturer's standard literature for major components shall also be submitted for the following minimal items:

- I. Engine
- II. Hydrostatic Drive System
- III. Conveyor components and Distribution System
- IV. Computer Controller

D. TECHNICAL SERVICES:

The services of at least one competent technician, trained in the use and operation of the chip spreader machine, shall be furnished for a period of two consecutive days to be scheduled at the discretion of the Owner for each machine purchased. This service shall be provided to instruct the purchaser's personnel in the use, operation and maintenance of the machine on delivery and acceptance; and to oversee/supervise the Owner's staff in operation of the unit.

E. PRE-BUILD MEETING:

Successful bidder shall attend a preconstruction or pre-build meeting at a mutually agreed upon time at the customer's location after PO is issued to finalize the machine order and the various options/alternatives.

14. SECTION 14 – OPTIONS / ALTERNATIVE BID ITEMS:

PROVIDE THE FOLLOWING ITEMS AS A BID ALTERNATE TO THE BASE BID LISTED ABOVE:

A. TRACTION CONTROL BOOST:

Provide alternative bid pricing to the BASE BID as defined in the above specifications for providing a traction control boost for the hydrostatic drive system.

Price shall include all labor, equipment, and materials necessary to complete the work to provide the described additional equipment.

B. SHADE CANOPY:

Provide alternative pricing to the above listed BASE BID specification for providing a shade canopy surface mounted to the working platform deck at the operator's/driving station.

Price shall include all labor, equipment, and materials necessary to complete the work to provide the described additional equipment.

C. FULLY ENCLOSED OPERATOR'S CAB:

Provide alternative pricing to the above listed BASE BID specification for providing a fully enclosed operator station cab enclosure, complete with air conditioning, heat controls, and power seat adjustable pedestal.

Price shall include all labor, equipment, and materials necessary to complete the work to provide the described additional equipment.

**D. REAR BACKUP CAMERA:**

Provide alternative pricing to the above listed BASE BID specification for providing a rear backup camera and display screen. The camera shall be so mounted to the rear of the unit to illuminate the hitch connection location. The display shall be properly designed to withstand the elements of exterior exposure, mounted at the operator's control station for ease of accessibility.

**E. BIG CHIP SPREADER OPTION:**

Provide alternative bid pricing to the above listed BASE BID specification for providing a "BIG CHIPSREADER" option which includes such things as a larger frame assembly, larger engine to 280+/- HP, larger wheels as specified, and other components.

Price shall include all labor, equipment, and materials necessary to complete the work to provide the described additional equipment.