ADDENDUM FOUR
REVISION OF SECTION VI TECHNICAL SPECIFICATIONS

Date: September 17th, 2021

To: All Bidders

From: Rob Taylor, Procurement Officer
AS Materiel Purchasing

RE: Addendum for ITB 6581 OF to be opened October 29th, 2021 at 2:00 p.m. Central

1. **Section VI Technical Specifications**

Section VI, LL. HYDRAULIC SYSTEM is now removed in its entirety and replaced with the following.

LL. HYDRAULIC SYSTEM (Revised)

YES	NO	NO & PROVIDE ALTERNATIVE	
			1. The truck hydraulic pump shall be directly driven via a Spicer Number 1350 driveshaft connected to an OEM supplied PTO drive flange mounted on the engine front crankshaft dampener.
			2. Driveshaft shall pass under or through the engine radiator; under if possible.
			A. Drive flange attachment bolts and the hydraulic pump shaft set screw shall be safety wired.
			B. The driveline grease zerks shall be easily serviced.
			C. A heavy duty PTO shield is required from pump to front of chassis, which shall be attached to snow plow hitch or be a part thereof.
			3. The truck hydraulic pump shall be a minimum 8.75 cubic inch (145cc) variable displacement load-sense designed for continuous operation. The pump shall be a Parker P2145 or equivalent. Indicate brand & model supplying: _____
			A. The hydraulic pump shall be capable of producing a nominal 60 GPM flow at 1,800 engine RPM with a minimum 3,000 PSI operation pressure.
			4. Hydraulic system pressure will be set to operate at 2500 p.s.i.
			5. Hydraulic pump outlet port shall have an electronically operated valve to be operated by low hydraulic oil sensor. Valve will close when hydraulic oil is low.
			6. ½ inch hydraulic hoses from hydraulic stack valve to the front of the snow plow hitch for raise-lower and plow angle functions.
			A. Hoses to be rigidly mounted with ISO 16028 flat face interchange couplings. Couplers (one male and one female) placed so as not to interfere with plow hitch or plow function.
			1. Example of couplers: Faster FFH0812NPT/Faster FFH0812NPTM (FPQ Premier) Parker FEM-501-8FP-ZP/Parker FEM-502-8FP-ZJ (XTR) Stucchi Part #2317188/2317189 (Z plated).
			2. Couplers to meet ISO 9227 standards to a minimum of 400 hours salt spray test.
			B. Hoses with one of the above listed couplers (one male and on female) shall be installed to plow cylinder.
			C. Plow up-down couplers to be mounted on plow hitch on passenger's side of truck. Plow angle couplers to be mounted on plow hitch on driver's side of truck.

			D. Plow angle circuit will have pressure relief valve. To be mounted inside frame rail near hitch.
			E. Only steel wire braided hoses are acceptable.
			F. Hydraulic oil to be multi-purpose, all season type. Please state ISO grade furnished: _____
			7. The hydraulic control valve(s) to be a stack valve type load independent proportional valve which is closed center, load sensing and pressure compensated to control three (3) functions simultaneously. A valve assembly utilizing a modular manifold with individual valve sections would also be acceptable. The control center console shall be floor mounted.
			A. The valve is to be controlled by electrical proportional actuation.
			B. Each valve section shall be equipped with adjustable trim control, flow control, spool stroke limiters or other means to control oil flow for each function independently.
			C. Valve is to be arranged as follows:
			1. Closed center inlet with relief.
			2. Hoist = 4 way, 26 gpm, 500 psi down port relief
			3. Plow lift = 4 way, 10 gpm
			4. Plow angle = 4 way, 10 gpm
			5. Wing toe = 4 way, 10 gpm, 500 psi down port relief (if required).
			6. Wing heel = 4 way, 10 gpm, 500 psi down port relief, 2000 psi up port relief (if required).
			7. Auger = 4 way, 17 gpm motor spool or cartridge valve.
			8. Spinner = 3 way, 10 gpm motor spool or cartridge valve.
			9. Prewet = 3 way, 6 gpm motor spool or cartridge valve.
			10. Tow plow steering = 4 way 10gpm
			11. Tow plow raise/lower = 3 way 10 gpm
			12. Trailer spreader = 4 way 15 gpm motor spool
			13. Trailer spinner = 1 way 10 gpm motor spool
			14. Trailer pre wet = 4 way 6 gpm motor spool
			15. Endcover
			D. Hydraulic control valve to be mounted behind cab a weatherproof enclosure with hydraulic oil tank. Location and hose routing to be reviewed during pilot inspection.
			E. Pressure and return hoses for anti-ice, pre-wet, spreader auger and spinner shall be routed from stack valve to rear of dump at lower horizontal rib ½" flat face couplers as previously stated shall be used. Function shall have individual pressure and return couplers. Two function/four couplers per side.
			8. The control center shall be a full proportional control of all hydraulic functions, spreader control functions with one single joystick or multiple joysticks to be located in the integral armrest. The control center with integral armrest shall be floor mounted.
			A. A drawing of proposed design must be submitted with bid packet. Drawings to include switch locations.
			B. Control of hydraulic functions with a fully proportional joystick(s) is to be located in the armrest. The armrest should be height adjustable and swing to left and right
			C. Joystick operation is described as follows:
			1. Shall operate proportionally and shall have the ability to run

			three (3) functions simultaneously.
			2. Hoist function: with operator activated safety lock.
			3. Plow function: lift-forward/backwards axis
			4. Plow angle-left /right axis
			5. Wing function- dual axis with operator activated safety lock.
			6. Wing lift- forward/backward axis
			7. Wing heel- left/right axis
			8. Benching Wing rear slide forward/backward axis.
			D. Spreader control, harness and wiring to back of truck will be set up for granular pre-wet, anti-ice, and total liquid use even if functions are not utilized.
			E. Spreader control System shall be Force America brand, Model 6100 or Certified Power brand, Model XDS. Would also be accepted. State System to be provided: _____
			1. It shall be capable of controlling the application rates of granular, with pre-wetting agents, and/or anti-icing agents simultaneously or independently, regardless of vehicle speed.
			2. Hydraulic system must be capable of operating chassis spreader and trailer spreader simultaneously with working ether truck blade raise or tow plow blade raise
			3. Control must be GPS compatible. The spreader controller shall provide a standard output of real-time streaming data including but not limited to: Ground speed, surface and air temperature, material selected, material application rate, lane(s) material being applied to and pre-wet rate.
			a. The output shall be in standard format such as ASCII through a standard 9 pin, USB or other connector that meet NDOT approval.
			b. The data shall be formatted so that 3rd party devices can read informational data in real time. All hardware, software and information necessary for 3rd party device to read the data output shall be if requested at no additional charge to NDOT.
			4. It must be possible to reprogram the controller by upgrading the software.
			5. The control shall be installed onto the control console, mounted onto the dash or other pre-approved area. Installation shall position the control so it is easy for the operator to see and reach.
			6. Anti-ice feature shall include a 3-lane selective lane switch box mounted in, under or near the console or through the soft keys of controller. Box shall have four (4) switches, the first to allow selection of either anti-ice or granular system, the remaining three (3) shall be lane selections switches, left, center and right.
			a. Anti-ice system shall adjust pump output to maintain selected rate as lanes are activated or deactivated.
			b. Anti-ice system to close valves to prevent gravitational flow of liquid when truck is stopped or 'pass' button is pushed.
			c. Anti-ice system to provide an audio alarm for insufficient application of liquid. Display shall show actual rate being applied.
			d. An electronic display capable of being reset to indicate gallons remaining in tank or gallons used since reset.
			7. Control shall allow up to a minimum of ten different preprogrammed application rates plus a manual override

			feature. It shall be capable of four granular products and tow liquid products. A blast feature shall be incorporated.
			8. Controller blast button shall immediately cause full hydraulic flow to the auger section, causing maximum spreader material output. The blast system shall be equipped with a timer. Blast feature shall also work with Anti-Ice function.
			9. Controller shall default to 'pass or stand by' upon startup of truck even if console master switch is 'on'. This will eliminate material being spread when truck starts to move in year or is started in shop bay.
			10. A data lock key shall be part of the controller to prevent data or programs from being changed or deleted without key access. Password program also acceptable.
			11. A key shall be provided for each controller.
			12. Granular rates may be selectively displayed in pounds-per-lane-mile or kilograms-per-kilometer. Liquid pre-wet rates may be selectively displayed in gallons-per-ton or liters-per-metric ton.
			13. Controller shall have a non-volatile memory to store all program and data when it is disconnected from a power source.
			14. A LCD color display, minimum of seven (7) inches diagonal shall provide the operator with instant access to:
			a. Total distance.
			b. Total granular applied.
			c. Total liquid applied.
			d. Vehicle speed.
			e. Distance traveled.
			f. Low oil indicator.
			g. Body up indicator.
			15. All spreader control harnessing shall meet ISO IP68 and NEMA 6 standards. The connectors should be die cast E-coated, and be designed to have NO corrosion after 500 hours in a 35C salt spray. Each should have three sealing points (1) the lock ring itself, (2) a raised portion of the molded plastic around each pin, and (3) a Viton O-ring that seals the whole connector. Wiring to be equivalent to Daniel Woodhead, Brad Harrison electrical connectors and wiring.
			9. Switch panel to be Wired-Rite System Inc., Touchguard or Force America brands. Switches will have built-in bus bar connecting, silk screen backlit function indicators and magnetic automatic reset internal circuit breakers. Wiring shall include adequate slack to allow entire panel to be easily removed for service or replacement
			A. Main 12 volt battery feed into truck cab control box shall be protected by an 80 amp manual resetting waterproof circuit breaker (Wired Rite DB-80R or equivalent) installed close to the battery enclosure installed on the truck cab fire wall or within battery cover enclosure.
			B. The power feed line to the 80 amp breaker shall be a minimum of 4-gauge fine strand copper.
			C. The positive/negative wires into the cab from the breaker and truck frame ground shall be 4-gauge.
			D. Switch circuits will be either a battery or ignition type. Battery circuits shall be always hot. Ignition circuits will receive power through a Bosch model 0332002150 75 amp relay when the ignition switch is in both the accessory or run positions.
			E. The switches and lamps shall be labeled and function as follows: Right to left.

			1. Plow/Truck Lights, (if OEM chassis supplied this is to be changed to an auxiliary switch SPST off/on) Battery DPDT, 2 position, ON/ON
			2. Cab/Hood Plow Lights Battery DPDT, 2 position ON/ON
			3. Amber /Blue strobe light Switch Ignition SPST, ON/OFF
			4. Clear /White strobe light Switch Ignition SPST, ON/OFF
			5. Wing light Switch Battery SPST, ON/OFF
			6. Spreader switch Battery SPST, ON/OFF
			7. Auxiliary switch Ignition SPST, ON/OFF
			8. Auxiliary Switch Ignition SPST ON/OFF
			9. Winter/Summer DPDT, 2 position, ON/ON
			F. Trailer warning lights switches connected to six pin trailer plug **1.** Rear beacon/strobe lights Battery SPST ON/OFF **2.** Wing light battery SPST ON/OFF
			G. A guarded/protected switch is also required to allow temporary over ride of low hydraulic oil shut down solenoid. This will allow operator to possibly operate any function to allow unit to be moved off roadway.
			H. The body up indicator lamp shall function as a dump body height warning system. In both the winter and summer mode, it shall illuminate whenever the body is raised.
			1. In addition, in the winter mode, working through an adjustable angle mercury switch, this system shall also include a flasher and audible alarm that will engage when the body attains the pre-set height adjustment of the mercury switch.
			2. Alarm must be loud enough to be heard over any truck noise.
			I. The Winter/Summer switch shall control power to the dump body height warning circuit. In the winter mode it will power the height warning feature of the dump body up lamp circuit causing it to function as designed. In the summer mode, it will not allow power to the dump height warning circuit.
			J. Switch panel to be located on the armrest portion of the control console and not interfere with the operation of the joystick.
			10. Hydraulic reservoir to be minimum 50 gallon oil capacity with five gallon expansion space for total 55 gallons.
			A. Reservoir to be sturdily mounted, and complete with suction strainer return filter and adequate shut-off valves for servicing.
			B. Return filter shall have a 10 micron rating. Filter shall be interchangeable with such filters as Donaldson P550388, Wix 51759, or Baldwin TB287-10. Please state fliter to be provided: _____
			C. Suction strainer shall be 100 mesh with 5 PSI relief valve.
			D. A gate-type or ball valve shut-off valve, of at least the size of the suction line, is required between the reservoir and the suction line itself.
			11. Reservoir tank shall be mounted between the cab and body within the confines of 12 inch channel upright for cab shield.

			A. The 7 gauge steel reservoir will be 12 inches wide.
			B. The approximate height will be 32 inches and approximate width of 33.5. inches.
			1. The reservoir must be of such height to allow visibility through rear cab window and to accommodate other chassis/body requirements.
			C. Reservoir will have a 45 to 70 degree filler pipe. Filler pipe will extend a minimum of three (3) inches through upright.
			1. Filler neck shall be removable from top of tank.
			D. A sight gauge with Fahrenheit temperature scale for checking proper oil level shall be furnished.
			1. Sight gauge location shall be on same side of reservoir as filler tube.
			E. A hydraulic oil low level alarm or indicator light is required.
			1. Alarm or light to be mounted in the cab.
			12. Bottom rear of tank on each side will have flat steel plates welded to back of tank with holes for bolting to upright flange.
			A. Upper part of tank will have ¼-inch x 6-inch flat plate welded to center of tank with holes for bolting to angle iron cross member between uprights. Bolts to be Grade 8.
			B. Tank shall be mounted so as to have adequate clearance from chassis components and so that it can be conveniently removed without moving the twelve inch uprights that secure the tank.
			13. The filter will be mounted on the same side of tank as filler tube.
			A. Reservoir will have a 1-inch magnetic drain plug and baffle(s) as needed.
			B. All components of hydraulic system shall be of size that will not restrict flow and withstand a minimum working pressure of 2,500 PSI.
			14. Vendor will minimize the number of critical rub points for hydraulic hoses, where critical rub points exist; they shall be wrapped with spiral metal or adequate rubber wrap.
			15. System shall permit the dump body to be raised or lowered while vehicle is traveling at highway speeds up to 35 MPH as well as when vehicle is not moving.
			A. Partially or fully raised box shall not creep up or down when vehicle is not moving or when hydraulic valve has been returned to neutral position and vehicle is traveling at 35 MPH or less.
			16. Hydraulic hook up for TowPlow **A.** Coupler stack to be located rear passage side of RDS body. Couplers to be ISO interchange . **B.** II Faster 3P508G-4-12G-MC/Faster 2P508G-4-12G-FC
			17. Hydraulic circuit for steering and moldboard lift shall have pressure relief valve also mounted at rear passage side of RDS body.
			18. Detailed literature and manufacturer's specification and date sheets on PTO, Joystick Control, Spreader control crankshaft drive, hydraulic pump, valves, filters and flexible cable control system will be provided with bid. NO BID WILL BE CONSIDERED WITHOUT THE INCLUSION OF THIS INFORMATION NECESSARY TO EVALUATE THE BID.
			19. Hydraulic/spreader system training and support shall be provided by company representative.
			A. Training for operators and mechanics shall be provided by spreader control/hydraulic system representative.
			1. Training shall be done at any of the units, assigned locations and/or district within the State of Nebraska.

			2. Training session shall be a minimum of four (4) hours for operators. An additional four (4) hours of training shall be provided to mechanics for diagnostic procedures and repair of controller system.
			3. Training shall include basic operation, calibration procedures, and basic trouble shooting. Training to be required and provided annually for each NDOT District.
			B. Technical support shall be provided for systems.
			1. Vendor shall make a representative available to travel within the State of Nebraska and assist mechanic with system failures.
			2. Vendor representative shall travel to any of the units assigned location to make repairs during warranty.
			20. The Hydraulic/Spreader control system shall be free of RFI emissions.
			A. The hydraulic/spreader control system and/or installed components and equipment shall be compatible with use of NDOT mobile and/or two-way communication devices. Main communication radio operates in low band range of 47 MHz to 48 MHz, but all frequencies apply including low band, high band, UHF and VHF.
			B. The hydraulic/spreader control system and/or installed components and equipment shall be manufactured to meet all current SAE and/or ISO Standard applicable and/or relevant to Electromagnetic Compatibility
			C. NDOT will conduct testing of radio/two-way when installed in chassis. NDOT will notify vendor if normal operational parameters are not met due to degradation of signals caused by electromagnetic emissions from control system and/or installed components and equipment. Vendor shall be required to work with NDOT personnel to reduce interference level to a point acceptable to NDOT normal radio operation parameters. Vendor shall have 30 days to resolve RFI issue.
			D. Vendor and/or manufacturer will be responsible for any and all cost to replace and/or modify any parts found to cause radio frequency interference. If NDOT and vendor cannot resolve source of RFI, the unit will sent to an independent accredited lab for testing to ensure SAE and/or ISO Standards compliance. Testing shall be done to SAE and/or ISO Standard which were current at time of bid. Should the unit fail testing at the accredited lab, the vendor shall be responsible for all cost incurred for testing.
			E. If after testing by NDOT and/or accredited lab, the vendor is unable or unwilling to incur cost and correct the RFI issue to the satisfaction of NDOT, ALL ORDERS AND CORRESPONDING CONTRACT WILL BE CANCELED.
NOTES/COMMENTS:			

This Addendum will become part of the proposal and should be acknowledged with the ITB.