SPECFICATIONS
A-A1

TRUCK – EJECTOR – CONVENTIONAL CAB - 62,000 LB GVWR
HEAVY DUTY TANDEM AXLE TRUCK, TYPE IV, STAINLESS STEEL, HORIZONTAL EJECTOR BODY, UNDERTAILGATE SPREADER WITH IOWA SPINNER, AUTO TARP, TRAILER AIR BRAKE

052700 thru 052761

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL GATE SPREADER, W/ IOWA SPINNER, AUTO TARP (052700)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL GATE SPREADER, W/ IOWA SPINNER, AUTO TARP, RIGHT WING PLOW OPTION (052701)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, LEFT WING PLOW OPTION (052702)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, DUAL WING PLOW OPTION (052703)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION (052704)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION, RIGHT WING OPTION (052705)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION, LEFT WING OPTION (052706)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION, DUAL WING OPTION (052707)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION (052708)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION, RIGHT WING OPTION (052709)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION, LEFT WING OPTION (052710)

TRUCK, TYPE IV, EJECTOR BODY, AUTO, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION, DUAL WING OPTION (052711)

TRUCK – EJECTOR – CONVENTIONAL CAB - 62,000 LB GVWR
HEAVY DUTY TANDEM AXLE TRUCK, TYPE IV, STAINLESS STEEL, HORIZONTAL EJECTOR BODY, UNDERTAILGATE SPREADER WITH IOWA SPINNER, AUTO TARP, TRAILER AIR BRAKE

052700 thru 052761

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP (052750)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, RIGHT WING PLOW OPTION (052751)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, LEFT WING PLOW OPTION (052752)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, DUAL WING PLOW OPTION (052753)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION (052754)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION, RIGHT WING OPTION (052755)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION, LEFT WING OPTION (052756)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW ANTI-ICE OPTION, DUAL WING OPTION (052757)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION (052758)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAIL SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION, RIGHT WING OPTION (052759)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION, LEFT WING OPTION (052760)

TRUCK, TYPE IV, EJECTOR BODY, MNL, STAINLESS STEEL, UNDERTAILGATE SPREADER W/ IOWA SPINNER, AUTO TARP, TOW PLOW GRANULAR OPTION, DUAL WING OPTION (052761)

I. GENERAL TRUCK SPECIFICATIONS:

A. Intent Statement
B. Weight Distribution
C. Power train Overview
D. Vehicle Components

1. Axle Front
2. Axle Rear
3. Brakes
4. Cab
5. Chassis
6. Drive Line
7. Electrical
8. Engine
9. Engine Accessories
10. Exhaust
11. Fast Lube Oil Change System (FLOCS)
12. Frame and Frame Extension
13. Instrumentation
14. Paint
15. Steering
16. Suspension: Front
17. Suspension: Rear
18. Tank- Fuel
19. Wheels/Tires
20. Transmission

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. Ejector Body and Equipment Mandatory Minimum Specifications

1. Stainless Steel Ejector Body Structure
2. Central Hydraulic System/Hydraulics
3. Tarping System
4. Tow Plow Anti Ice Hitch Upgrade Option
5. Tow Plow Granular Hitch Upgrade Option

F. General Plow Mounting/Accessories
G. Wing Plow Specifications Option

1. Intent Statement
2. Specifications
3. Minimum Alterations
4. Plow Identification
5. Paint
6. Conspicuity Tape
7. Wing Plow Light

H. Installation Practices
I. Safety

II. DRAWINGS:

III. MANUALS:

IV. TRAINING:

V. WARRANTY:

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

A. INTENT STATEMENT:

Intent: The purpose of these specifications is to describe a conventional cab, tandem axle stainless steel cross member less full ejection body truck, equipped with dual rear wheels, approximately 14 foot long and maximum 96 inch wide material body, and 12 cubic yard approximate load capacity body, hoist, hydraulic power system and snow plow hitch. Unit shall be capable of one-man operation while plowing snow and simultaneously spreading granular and liquid materials during winter operations, and of hauling, stockpiling and unloading maintenance materials into a chip spreader or paver during summer operations. Further, it shall be capable of being loaded with a front-end loader or self-propelled belt loader. The body shall be capable of having the following components connected and or mounted to it: wing plow, slide in anti-ice insert, under tailgate spreader, tarp, paver, and chipper.

NOTE: All references made to stainless steel shall be AISI Type 304 stainless steel, except where otherwise noted. The body shall be reinforced to withstand SEVERE duty service and be capable of being utilized for extended use while spreading salt, anti-skid and liquid material and summer operational material such as stone, dirt, rock, blacktop, millings, etc. or excavation with rip rap being dropped in the bed.

NOTE: Pennsylvania Department of General Services, PCID No. 1075, "*General Requirements for Bidding PennDOT Vehicles/Equipment"*, most current version effective at the time and date of bid opening is included as a part of this specification. PCID No. 1075 may be reviewed and downloaded from the Department of General Services website, http://www.dgs.state.pa.us. Delivery as required per Department of General Service PCID NO. 1075 Section "G". All units must be delivered within **270** days after receipt of the purchase order by the successful bidder.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

B. WEIGHT DISTRIBUTION:

Weight distribution charts shall be submitted with the pilot model for all models being delivered. Weight distribution charts shall be submitted for two modes listed below.

1. Summer mode including the portion of the wing plow post and plow frame assembly that remains on the vehicle all year.

2. Winter mode with front plow, loaded pre-wet tank, spreader and complete wing plow.

Each item listed on Drawing EQN-507B shall be noted and individually calculated in the vendor's submission. Engineering certified weigh slips shall be provided with the pilot model and signed by the Manufacturer's Engineering Department. It is understood that the components specified are minimum and manufacturer's Engineering Department recommends or deems necessary, particular weight distribution, a larger component or a larger GAWR totally. The burden of responsibility is hereby placed upon the Manufacturer's Engineering Department to supply a unit that is totally engineered.

1. Frame
2. Axle
3. Tires
4. Steering unit and components
5. Rims
6. Suspension
7. Brakes
8. Any other items as required

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

B. WEIGHT DISTRIBUTION: (Continued)

1. The dynamic and static loads created by the unit, plus operational stresses, must be reviewed to ensure the Commonwealth of a properly designed/engineered unit.

2. Front and rear axle legal weight distribution apply to non-emergency applications only! Winter weight distributions are required for payload information purposes only since winter plowing and spreading operations are exempt from legal weight restrictions. However, the total weight rating shall not exceed the manufacturer's GVWR for the vehicle that is offered. The weight imposed on the front and rear axles using the total GVWR shall be shown. (Overweight shown on the axles in these winter modes is for information only).

In addition to the Engineering Certified weight distribution provided at the pilot model inspection, the following information is required with the pilot model.

The vehicle shall be certified for 62,000 LB Gross Vehicle Weight Rating (GVWR). The GVWR shall be identified in the cab or on the door as the final complete certification label (minimum rating).

ACTUAL TRUCK WEIGHT: (LB)

"Chassis only" (shall be signed by a certified weigh master.)

_____ Front Axle

_____ Rear Axle

_____ Total

"Chassis with body" (shall be signed by a certified weigh master).

_____Front Axle

_____Rear Axle

_____Total

THE ABOVE MAY BE PERFORMED BY THE BODY COMPANY.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

B. WEIGHT DISTRIBUTION: (Continued)

Truck GAWR's as Built (LB)

	Front GAWR	Rear GAWR
Axle	_____	_____
Tires	_____	_____
Springs	_____	_____
Rims	_____	_____

C. POWER TRAIN OVERVIEW:

ENGINE
DIESEL, MIN. 425 HP AT GOVERNED RPM, MIN. PEAK TORQUE OF 1540 LB/FT TORQUE, MIN. 12.4 LITER (actual engine liters).

OPTION per Invitation to Bid Tow plow (anti-ice & granular) and Dual Wing upgrade equipped chassis shall be increased to a MIN. 455 HP at Governed RPM. If additional HP and torque is available, it may be included in an effort to give the Department the maximum HP and or Torque available.

TRANSMISSION
AUTOMATIC ALLISION 4500 RDS 6 SPEED.

MANUAL – EATON RTO 14908LL
MANUAL – EATON RTO 16908LL
MANUAL - Mack – TM - 310

REAR AXLE
DANA DT463P
MERITOR RT46 -164 –P
MACK S462

NOTE: All rear axles must provide axle shafts with a minimum diameter of 2.19 inch at the spline. All rear axle(s) shall have an extended breather tube to prevent debris buildup from entering axle housing.

NOTE: Lubricants for front axle hubs, automatic transmission and all rear differentials shall meet or exceed all appropriate MIL and SAE specifications for synthetic lubricants and shall have all plugs identified as synthetic oil, or painted red.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS:

1. AXLE FRONT:

The front axle shall be rated at 20,000 LB minimum capacity. The front axle, drag links and tie rods shall have grease zerks installed. Kingpin or bushings shall be grooved to permit grease flow. Sufficient tire clearance at maximum turning angles. Complete “Stemco” oil seal assembly, including hub, plug type window, and "Guardian" seal or SKF Scot, Chicago Rawhide seal with Stemco plug type window or approved equal. Each unit shall receive a front-end alignment prior to delivery. A setback axle is unacceptable.

2. AXLE REAR:

(See power train overview for acceptable models.)

NOTE: Aluminum or lightweight housing is unacceptable.

NOTE: All rear axles must provide axle shafts with a minimum diameter of 2.19 inch at the spline. All rear axle(s) shall have an extended breather tube to prevent debris buildup from entering axle housing. There shall be a torque-proportioning traction-assist device, which is full locking within the differential housing. The device shall provide maximum traction to the rear wheels when actuated and shall be a self-relieving designed to prevent gear damage and/or axle shaft breakage under extreme service conditions. The traction-assist device shall be driver actuated by a dash mounted traction control switch.

NOTE: Lubricants for all rear axles shall meet or exceed all appropriate MIL and SAE specifications for synthetic lubricants and shall have all fill plugs identified as synthetic oil, or painted red.

Stemco guardian or SKF Scotseal, Chicago Rawhide rear wheel seals, or approved equal. All axles shall have magnetic drain plugs.

NOTE: Rear axle selection shall be made after the award and may be a mix of ratios as required. The successful vendor/manufacturer shall present three (3) computer runs showing the three most likely ratios for consideration for a top speed range of 55 MPH to 65 MPH max. This information shall be presented at the pre-build meeting. The rear axle ratios must be "identical" throughout the entire build.

3. BRAKES:

Full air antilock in compliance with the most current FMVSS requirements.

The ABS shall incorporate a diagnostic fault switch that is capable of illuminating a fault light for diagnostic purposes. The switch shall be easily accessible and can be either dash or under-dash mounted. A dash-mounted display that will show all SAE message descriptions for the ABS is an acceptable means of diagnostics in lieu of the fault switch.

Rear brakes: 16.5 inch x 7 inch "S" cam with quick-change type single or double pin. **(No substitute, standardization).**

Steer-axle-brake: 16.5 inch x 6 inch or a power front disc brake system providing equal performance. Quick-change type single or double anchor pin if drum type brakes are furnished.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

3. BRAKES: (Continued)

Drum brakes shall have automatic slack adjusters and they shall be clearance-sensing type only, with adjustment on application of the brake. **(No substitute, standardization).** Backing plates shall be installed on all drum brakes.
Air compressor: Per truck manufacturer's recommendation. Compressor shall be fitted with a safety valve to prevent mechanical failure.
Buzzer-type, low air pressure indicator.
Parking brake: Rear wheel spring-type, MGM E 30/30 or Haldex 30/30 gold seal chambers. Parking brake shall provide modulated emergency braking via the foot valve in the event of a rear service system failure.
All brake chambers, front and rear, shall be equipped with rubber boots on the brake chamber push rods.
Rear service brake chambers and spring brake chambers shall be mounted to provide adequate clearance for backing into bituminous paving machines.
Air tank: Automatic drain valve, with heater on wet (first) tank. Each of the remaining air tanks shall have a manual drain valve.
Air dryer: With heater, mounted outboard away from road splashing and a minimum of 20 inches above road surface. Dryer shall be compatible with the body company clearance requirements for sub-frame, valve body, etc. Per: Haldex DRYest or Bendix AD-IP installation made in concurrence with the air compressor manufacturer's recommendations.
Air dryer shall be placed to accommodate the changing of filter cartridges without disconnecting any hoses or removing dryer base from its mounting location. Final mounting location shall be determined at Pre Build meeting.
System shall be equipped with anti-compounding valve to prevent mechanical failure of the foundation brakes, slack adjusters, etc.
Trailer air brake: Unit shall be equipped with factory installed trailer air brake control package. To include dash mounted, graduated, hand operated, trailer service brake trolley control valve. Body builder to mount and install Phillips STA-LOCK glad hands (1 each part numbers 12-4906 and 12-4908), location to be determined at pre build meeting Ref: EQN-81X.

4. CAB:

Aluminum or galvanized steel cab.
Grab handles shall be supplied on all cab entry locations. Three points of contact shall be achievable at all cab entry locations. Handrails shall be coated with non-skid paint (non-skid tape is unacceptable) or have OEM anti-slip rubber inserts, both non-skid paint or rubber inserts must extend the full length of the grab handle.
Exterior grab handles shall be supplied if available from OEM.
Hood: Fiberglass, tilting. Fenders shall be part of tilting hood. Grille shall be fixed. Hood shall be a one piece design, high visibility, and without any access panels.
Air suspension system for the cab shall be factory installed.
Air deflector: Clear or smoke, hood mounted. Manufacturer's standard full width for the truck model. Access to front-end hood tilt handle shall not be blocked.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

4. CAB: (Continued)

Fenders: Front fenders shall have extension to cover the width of the front tires. Not to exceed 96 inch truck width.
Deluxe fresh air hot water heater and defroster, manufacturer's highest output.
Air Conditioning: Highest output available as OEM option.
AM/FM radio with weather band.
Air horn(s): Minimum 1 horn with snow-shield (not required if under hood mount).
All controls and knobs shall be properly identified. Ref. EQN-556
Brake pedal, clutch pedal and throttle shall be suspended if available from the factory.
CB Power connections One (1) pair, on the dash, Ref: EQN-78.
Cab floor covering shall be heavy-duty rubber with closed cell rubber or heavy felt backing.
Cruise control
Cup holder in the cab within easy reach of the operator.
Dome light shall be provided
Dual sun visors.
Windshield: Manufacturer's standard heated windshield. One (1) or two (2) piece construction is acceptable, must be tinted. Safety glass throughout.
Drivers and passenger's side windows shall be power.
Driver's and passenger's doors shall be equipped with power door locks.
Dual windshield wipers, arctic type with the heaviest arms, linkages and motor available. Wipers shall be minimum 2-speed electric with intermittent feature.
Washer system shall be electric. Minimum capacity of two (2) quarts of washer fluid and shall be filled with an anti-freeze type solvent.
Mirrors: Drivers and passengers side power mirrors, west coast style minimum 6 inch X 16 inch manufacturers standard heavy-duty breakaway arms. Mirrors shall be heated with a lighted toggle switch mounted within accessible reach of the operator, automatic on/off is acceptable. The wires shall be fitted in such a way that the mirror glass/element can be changed by unplugging the two-wire lead. There shall be a heated convex mirror both sides, minimum 5.5 inch X 8.8 inch or 8" diameter, minimum. A blind-spot elimination heated mirror shall be mounted on the right front fender and it shall be 8-inch minimum diameter, stainless steel or aluminum head with mirror. Mirror shall be a conventional convex mirror, and shall not be of the half-round cross view type. All arm/s and hardware shall also be stainless steel. Fender type washers stainless, or aluminum, with rubber pads to be placed on both sides of the fender shall be included. Pedestal system shall be single, double or triple mounting assemblies (stainless steel or aluminum). Mirror shall be mounted in rubber or vinyl. Ref: Grote (800-628-0809)
Seats: Driver's seat shall be high back adjustable Bostrom air 915 Series with lumbar support or National 195 Series with lumbar or DuraForm Air Command Series (fabri form cushions with lumbar support), with body cloth insert and three-point retractable seat belt (Seatbelt shall be High Visibility Orange). Seat belts shall be equipped with a comfort lock. A bellow-type or protective skirt shall cover the seat suspension mechanism. **Note:** If due to cab configuration a Bostrom 915 or National 195 seat cannot be used, a Bostrom 910 may be substituted. All other requirements must be met.
There shall be an inside armrest on the driver's seat plus an outside armrest installed on the seat or the driver's door. **(No substitute, standardization).**

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

4. CAB: (Continued)

Color coordinated to cab interior. Passenger seat shall be the manufacturer's standard non-suspension (static) high back type and shall have a three-point retractable seat belt (Seatbelt shall be High Visibility Orange). Color coordinated.

NOTE: Seat Safety Switch: Drivers seat shall be equipped with a factory safety switch to work in conjunction with the central hydraulic system. Switch shall be rated at 50 lbs. and shall allow operation of the hydraulic system when occupied and shut down the hydraulic system when unoccupied. It shall be the sole responsibility of the OEM to ensure seat safety switch compatibility with the selected hydraulic system manufacturer control system. Aftermarket installation of this switch is unacceptable.

Steering wheel diameter shall be 18 inch (approx), Manufacturers standard.

Steering Column: Steering wheel and column shall be tilt and telescopic, infinitely adjustable to multiple positions.

Per Invitation to bid: There shall be either a RoadWatch road/air temperature system or a Vaisala Surface Patrol DSP100 road/air temperature system installed with control system integrated temperature display, per invitation to bid.

Steps: Drivers and passenger entrance steps: Shall be aluminum, serrated. The outer step edge must be serrated in lieu of plain. (Overlay is not acceptable). Step design material must be the same, both left and right side. Ref: Bustin No. NST4 full size, Ohio Grating No. JA21195G4 serrated, IKG. Industries Type B54 or Mack Part # 85QM423OM4. Top of the first step shall be approximately 21 inch above the ground.

Wiring Pass Through: All wiring entering the cab shall be made through a rubber boot assembly and be weather tight. There shall be no connectors in the wiring at the pass through point. Wiring shall be protected against sharp edges from rubbing and chaffing. Boot design shall be pre-approved.

5. CHASSIS:

The GVWR rating of the truck shall be 62,000 LB. A label stating this shall be affixed on the door or in the cab as the completion certification label.

(CA) dimension: 127.00-130.00 inch cab to axle. Wheel base dimension 213.00 inch approximate. Wheelbase and CA dimension may be adjusted to provide the optimum legal weight distribution and to meet the vehicles intent statement.

***NOTE**: Final body mounting shall place the floor end at 19 inch + or – 1 inch from the rearmost part of the rear drive tire.

The frame AF shall incorporate a cross member at the rear of the frame to reinforce the body pivot point. (Local installation is acceptable).

Front Bumper: Heavy duty swept back design, mounted to the frame with the inner face of the bumper against the chassis frame.

Frame mounted tow hooks or eyes: Two (2) front. These may be installed by the body company after completion of the plow hitch mounting, using grade 8 bolts (minimum) of sufficient length, and grade 8 elastic type self-locking nuts, or by full welding.

License plate bracket: Front and rear. Securely mounted to prevent damage when backing into material piles.

There shall be a centralized on board chassis lubrication system installed. Ref: EQN-501.

SPECFICATIONS
A-A1

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

6. DRIVE LINE:

Main driveline: Spicer Life XL or Meritor RPL Series. **"Factory balanced"** greasable, (one zerk minimum). Heavy-duty driveline shall be engineered and be compatible to engine, drive train and transmission torque. Heavy-duty center bearing, if required, with due consideration to drive shaft angles, length, location, proper bolting based upon engine and transmission selection. Inter-axle driveline: Spicer Life XL Series.

7. ELECTRICAL:

All copper system, negative ground.

Alternator: Delco 36SI (No substitute, standardization**)** 160 amp minimum, high performance, solid state, brushless, with battery cable from battery negative terminal to starter motor or frame. All alternator and starter bolts shall be grade 8

Batteries: Three (3), heavy-duty, 12 volt, maintenance-free, BCI Group Size 31, with stud-type posts and anti-corrosion treatment on each terminal. 2500 total cold cranking amperes (CCA) at 0 degrees F. 540 minutes of total reserve capacity at 80 degrees F as per SAE.

Battery Mounting: Mounting shall include the following:

a.) 0.25 inch thick rubber shock pad under the battery.

b.) Box with cover. Cover shall be constructed of fiberglass, poly, or aluminum (if aluminum there shall be an insulated liner).

c.) Mounting bolts shall be grade 8 with self-locking nuts.

Mounting of accessories within the battery box is prohibited.

Cables shall conform to RCC Practice 105 with “sealed” terminal ends for stud-type battery posts.

Starter motor: Delco 39MT (No substitute, standardization) starter with thermal over crank protection and high torque capacity. Suitable for the diesel engines offered as per starter manufacturer’s recommendation.

Electrical system: System shall be circuit-breaker-equipped, in an easily accessible location and weatherproof. Fuses acceptable in circuit so identified by manufacturer as safety factor. Any fuse or circuit breaker liable to be damaged during truck operation shall have an easily removable protective cover. All wire splices in the cab shall be insulated with heat shrink materials

Electrical chassis wiring: Factory heavy duty harness to power components in rear light module. Trailer light plug shall have brake lights operate in conjunction with the turn signals. Per EQN: 80A

Flasher: (All) heavy-duty electrical, Ref: Tridon Model EL 12 or OEM Heavy Duty Electronic Flasher.

Note: If an audible alarm is supplied for the 4-way and turn signal circuit, it shall have on/off capability.

Lights: All lights shall meet all Federal and State regulations. The head Lights shall be Halogen with (DRL’s) daytime running lights. Body lights shall have their own dedicated complete circuit. The chassis manufacturer shall route the dedicated body circuit/harness to the rear center portion of cab, with 4’ of extra wire coiled on floor between seats. All pass-through points shall be properly sealed and protected. This shall be the access/connection point for the Whelen Model # PADOTS3V. Pass-through point and/or routing location determined at Pre-build Meeting.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

7. ELECTRICAL: (Continued)

Plow Lights: Plow Lights shall be Grote model 64-261-4. **(No substitute, standardization).** Bracket design shall be either molded fiberglass or aluminum, with two (2) brackets mounted to the truck hood. Brackets shall be designed/constructed to provide sustained support of the light assembly while offering minimum vibration/jiggle. Aluminum brackets shall be 3 leg design. Brackets shall be designed to be adjustable in height a minimum of six inches vertically. Design of adjustable brackets shall be pre-approved. The height and width of the bracket will be governed by the application and shall meet all Federal and State lighting regulations. Final design shall be approved at the pre-build meeting. The factory chassis plow light circuit shall be used and all areas were the wires might contact a rub point shall be protected by grommets, loom, etc. All connections shall be made using sealed connections and dielectric grease. Ref: EQN-124.

GPS Combo Radio Antenna: There shall be a roof mount base with built-in GPS, PCTEL model GPPB-204-54-12-S1-M1 and a low profile black antenna, PCTEL model BMLPU700 Assembly shall be mounted in the body cab protector with the antenna cable routed to the floor area between the seats, (centered, forward most position as practical) with the antenna cable routed (within protective conduit) to the floor area between the seats. There shall be a minimum of 4 feet of antenna cable coiled at the base of the floor to allow for connection of radio on spreader control pedestal. Antenna shall be prewired with a MINI - UHF MALE connection. **(No substitute, standardization).** Antenna shall be mounted to not interfere with cab shield.

Power Distribution Center: There shall be a 4-way power/ground distribution center located near the console for connection of 800 MHz state radio. The lugs shall be labeled and configured in the following manner: (1) lug shall be a 30 ampere constant hot circuit, (1) lug shall be a 10 ampere ignition controlled circuit. (2) lugs shall be chassis ground. All connections shall be enclosed in a weatherproof enclosure. Ref: EQN-562

Each circuit shall be supplied individually, labeled, properly sized, protected from weather and sealed to be watertight.

8. ENGINE:

Automatic idle shutdown shall be set to five (5) minutes.

ECM shall be set to a maximum of sixty five (65) miles per hour.

The engine components facing wheel areas, on both sides, and the areas to the rear of wheels shall be shielded. The shield shall protect the engine, fan, radiator, belts and areas behind tires from stones and debris.

Replaceable heavy-duty oil filter(s) as recommended by the manufacturer and **bearing a legible OEM part number.**

Diesel Fuel Filter: There shall be a DAVCO 382 or a 482 filtration unit installed and mounted (Higher than fuel tank) per manufactures recommendations in a location to accommodate filter replacements, yet be protected from road debris**(No substitute, standardization)**. Mounting location to be determined at pre-build meeting.

Davco 382 Unit shall be equipped with engine coolant heat and 120 volt heater circuit. The 120 volt circuit and engine block heater shall be powered via the same electrical connection. **(No substitute, standardization)**

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

8. ENGINE: (Continued)

Davco 482 shall be equipped with a 12 volt and 120 volt heater circuit. 12 volt heater circuit will activate with the ignition key switch, the 120 volt heater circuit and engine block heater shall be powered via the same electrical connection. **(No substitute, standardization)**

Cooling System: The truck engine radiator and frame construction shall accommodate the installation of a front mounted crankshaft driven hydraulic pump. The engine crankshaft pulley or vibration damper shall be drilled and tapped to accommodate a power take off drive shaft adapter plate required under hydraulic system section of these specifications. The system shall be the largest factory engine cooling capacity, compatible with engines and transmissions referenced for continuous high engine output under extreme temperatures and/or operating conditions due to prolonged snow plowing operations in low gears. The water pump shall be adequately sized to provide proper cooling and be of sufficient size to accommodate the larger pulley to adequately handle the specified options. Shall be fitted with provisions for visually monitoring coolant without necessitating removal of the cap from the radiator or expansion tank (e.g. sight glass, transparent expansion tank). The antifreeze solution shall meet all applicable EPA requirements. A non-charged spin-on coolant filter shall be installed if required by engine manufacturer.

9. ENGINE ACCESSORIES:

The oil dipstick must have tubing and dipstick with sufficient length to provide reasonable access for checking the oil level.

Engine Heater: Immersion in-block type, for cooling system, with waterproof plug, flush-mounted in an accessible location at the front/side of the vehicle, outside the cab/hood, 110 volt, 3-prong plug. The electrical cable from the heater to plug shall be one piece and waterproof. Location to be determined at the pre-build meeting.

Air Cleaner: Air filter shall be manufacturer's heaviest duty air cleaner that meets all the requirements of the extended engine warranty.

The air intake system shall be fitted with inside/outside air.

Fan: Thermostatically controlled viscous type or manufacturer’s recommended automatic fan.

A screening system shall be installed that will protect the radiator from stones and bugs.

Engine Vibration Dampener: At PTO flange yoke. Ref: EQN-90.

Governor: Set at manufacturer’s recommended maximum rpm.

Hoses: The air induction system and large radiator cooling system hoses shall be clamped with 0.500 inch wide, 150-inch LB stainless steel, constant torque, spring-loaded worm clamps. Ref: Wittek Manufacturing (Tel: (312) 492-9400) or Breeze Clamp Co, Constant Torque clamps with liner for silicone hoses. Cooling system hoses under 1 inch OD may use factory standard hose clamps, as a minimum acceptable standard.

Air intake hoses shall be 0.250-inch minimum thickness, molded hoses. Ref: Gates, Goodyear or equal. Silicone or premium rubber, radiator and heater hoses. Hoses shall not be painted.

Lubricating Oil Lines: High quality flexible wire-braid type, "Aeroquip" or approved equal system, minimum standard if hoses are used.

Drive Belts: Cog belts or serpentine (cog belts not required for power steering).

Engine Brake: Engine shall be equipped with a minimum 2 stage, full engine compression brake. **Brake lights shall activate when engine brake is activated**, Ref: Jacobs.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

10. EXHAUST:

Vertical tailpipe with elbow and muffler system or horizontal muffler and vertical tail pipe with elbow. Exhaust system shall neither interfere with the operation of the dump body or equipment, nor shall it be close to any fluid tank, and **PERMIT WING PLOW AND PRE-WET TANK INSTALLATION**. The tail pipe shall be installed in a manner that will keep the muffler and tail pipe away from dump truck body. The flex in the body, when operating on an uneven terrain, must be considered in the design. The muffler, DPF and tail pipe shall be shielded or insulated to protect personnel from burns when entering or exiting the cab. The shield shall be 180 degrees to 360 degrees and shall be of non-rustable material such as stainless steel or aluminum. Ref: Riker or equal.

11. FAST LUBE OIL CHANGE SYSTEM (FLOCS):

This FLOCS system shall be installed with all fittings, brackets, clamps. Hose from oil pan to FLOCS fitting shall be hydraulic hose with a 100R2 rating and properly secured. The system shall be compatible with all fittings presently used by the Department. The final placement of the male half of the snap coupler, on the equipment, shall be determined at the pre-build meeting. Ref: EQN-351A.

12. FRAME AND FRAME EXTENSION:

Frame rails: shall be a single rail 0.50 inch thick and have a Resisting Bending Moment (R.B.M.) with a minimum of 3.2 million inch LB per rail, including extension, for the entire length of the frame, including any frame liners. Frame material shall be of at least 120,000-PSI yield strength. Minimum frame RBM shall be approved by manufacturer‘s Engineering Department. **If a larger RBM is required to perform the specified operational duties, the vendor shall bid a frame concurrent with the intent and spirit of this contract. Ref: Snow removal operations, full payload snowplow, right and/or left patrol wing plow, etc.** Mainframe and any required liners shall be either straight channel or offset channel, full length. **Bolt-on or welded extension will not be accepted.** Front frame shall accommodate the Department's standard hydraulic PTO shaft and pump (Ref: EQN-90) and the plow frame. It shall provide easy service accessibility.

13. INSTRUMENTATION:

All instruments and gauges shall be illuminated and dash-mounted, except where specified otherwise. All standard instruments shall be supplied, including, but not limited to the following:

Oil pressure gauge with warning light or audible alarm.

Air pressure gauge(s) for dual circuit, dual indicator with low-pressure audible alarm and warning light.

Coolant temperature with warning light or audible alarm.

Transmission oil temperature gauge with warning light or audible alarm.

Fuel gauge.

Hour meter that records only when the engine is running. In – dash, integral with instrument panel and readable from the operator’s seat.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

13. INSTRUMENTATION: (Continued)

DEF level gauge.
Speedometer with odometer and a dual speedometer lead to interface with the ground speed spreader control system.
Tachometer.
Voltmeter.
Parking brake indicator light.
Hydraulic fluid level gauge.
Air Restriction Gauge: Flush, dash-mounted with indicator slide for engine air cleaner, Ref: Filter Minder, manufactured by Engineered Products Company. If the vehicle is OEM equipped with an electronic dash that incorporates an air restriction gauge or indicator light, it shall be acceptable.

14. PAINT:

Cab shall be painted PennDOT yellow Ref: DuPont F9885, PPG 85246, Sherwin Williams 73266, Sikkens 4017, or NAPA 73266 for shade only. Cab paint shall be base coat, clear coat. Frame and all underside components shall be painted black. Front bumper and plow frame shall be primed and painted black (with hardener) low VOC. All bare metal surfaces shall be coated using etching primer prior to paint. All surfaces shall be properly cleaned and prepared prior to paint, with all weld splatter and debris removed.

15. STEERING:

Power Steering: Dual integral or single integral type hydraulic power steering with right wheel power-assist cylinder. Glidecoat steering shaft, Bendix wedge lock lube-for-life shaft, ZF type steering shaft or prior approved equal. The steering system (e.g. flow, pressure, relief valve etc.) shall be selected considering the full front-GAWR axle loading. Hydraulic supply pump shall be vane or roller type design with sufficient oil flow to permit one (1) steering wheel revolution per second with front axle loaded to rated capacity, with plow on, in a "park" condition. Ref: Vickers V-20, Eaton or Borg Warner. The pump shall not be the integral filter type unit. Power steering reservoir shall be remote mounted, minimum 1.5-quart capacity, incorporating a filter that is easy to remove and replace. The remote filter referenced above shall be factory mounted, certified and engineering approved in conjunction with the appropriate pump.

16. SUSPENSION: FRONT:

10,000 LB capacity at ground, each front spring. The six (6) front spring pins or bearings/bushing shall be furnished with 360-degree grease grooves to insure adequate lubricant penetration. Spring hangers shall be heavy castings with sufficient pin and bearing surface to render trouble free service. Maintenance free front spring bushings are acceptable.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

17. SUSPENSION: REAR:

23,000 LB capacity at ground, each rear spring. Suspension shall be tailored to axle loads and shall be adequate to sustain maximum GVW, without overload or permanent set. The spring hanger brackets shall be severe duty castings with sufficient bearing surface/wall thickness to prevent premature bolt wear. The spring center bolts shall be a minimum of .4375-inch size, preferably .5000 inch. The rear spring hanger pins shall be the grease able type. Bolts must be of sufficient length to go through the washer, spring bracket and truck frame with sufficient length to install a self-locking nut.

18. TANK - FUEL:

Safety- type fuel tank as per the requirements of FMVSS. **Dual tanks are unacceptable.** Trucks with no wing and trucks with a right wing shall have one (1) 100 GAL minimum total capacity tank, frame mounted, under the left door. Left wing and dual wing trucks shall have one (1) 80 GAL minimum total capacity tank, frame mounted, under the left door. Tank mounting hardware and brackets shall be for “severe duty” applications. Heavy-duty aluminum or stainless steel, minimum 1.9-inch wide straps with rubber shims/liners shall be utilized. The fill pipe shall be accessible with the dump body in the down position; pipe can be located at either end of tank to avoid interference with steps. System shall be a top or side draw for suction and return lines.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

D. VEHICLE COMPONENTS: (Continued)

19. WHEELS/TIRES:

The truck shall be equipped with hub piloted steel disc wheels for tubeless tires. The wheel end shall be equipped with outboard cast brake drums, and 15 degree tubeless steel wheels, hub piloted, 10 hole - 285.75mm bolt circle with 22mm two-piece flange nuts.

Front: Wheels: 22.5 x 12.25, 10 hole - 285.75mm bolt circle with 220mm bore, tubeless steel disc wheel rated at 10,500 LBS at a maximum inflation pressure of 120 PSIG. Accuride part number 29807. **(No substitute, standardization).**

Rear: Wheels: 22.5 x 8.25, 10 hole - 285.75mm bolt circle with 220mm bore, tubeless steel disc wheel rated at 7,500 LBS at a maximum inflation pressure of 120 PSIG. Accuride part number 28828 or 29169. **(No substitute, standardization).**

The dual rear wheel/tire assembly shall have clearance between the tires, which permits the use of dual tire chains.

Wheel-Guard Separators: The wheel ends shall be equipped with the Accuride part number 5903 Wheel Guard Separator as follows:

Front axle - between the wheel and the brake drum.

Rear axle - between the inner dual and the brake drum and between the inner and outer duals.

Paint: The wheels shall be topcoat painted with TGIC Polyester Powder Paint MLD-82008 High Gloss Gray or equal applied over Cathodic Electro-Disposition Gray Primer.

Tires: All tires shall be radials.

Front Tires: 425/65R22.5 (Load Range L).

Rear Tires: 12R22.5 (Load Range H).

MANUFACTURER	FRONT TIRE	REAR TIRE
Goodyear	G-296	G-282 MSD / G622 RSD
Michelin	XZY3	XDN-2
Bridgestone	M844F	L320

20. TRANSMISSION: See POWER TRAIN OVERVIEW for acceptable transmission.

AUTOMATIC:

Dash mounted console with push button shift selector. There shall be external oil cooler. The oil cooler for transmission is required due to prolonged transmission torque converter operation in low gears. Cooler size must be provided to keep the transmission fluid at an acceptable operating temperature under these prolonged conditions (Water to oil type cooler). Automatic transmission cooler lines shall be stainless steel. An Allison approved cooling system shall be installed regardless of whether retarder is incorporated in the system or not.

MANUAL:

Clutch: Nine (9) spring six (6) paddle externally lubricated with an extended lube hose if applicable, Eaton/Fuller EZ pedal or Meritor with torque limiting clutch brake. Clutch adjustment shall be set to specifications prior to delivery to the Department. There shall be a neutral safety device to ensure that the vehicle cannot be started in gear. Geared for PTO application, right and left side or right side and bottom. Magnetic drain plug. Input transmission shaft: Minimum 2.00 inch., 12 to 1, minimum 1st gear and reverse ratio.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS:

Intent: The purpose of these specifications is to describe a conventional cab, tandem axle stainless steel cross member less full ejection body truck, equipped with dual rear wheels, approximately 14 foot long and maximum 96 inch wide material body, and 12 cubic yard approximate load capacity body, hoist, hydraulic power system and snow plow hitch. Unit shall be capable of one-man operation while plowing snow and simultaneously spreading granular and liquid materials during winter operations, and of hauling, stockpiling and unloading maintenance materials into a chip spreader or paver during summer operations. Further, it shall be capable of being loaded with a front-end loader or self-propelled belt loader. The body shall be capable of having the following components connected and or mounted to it: wing plow, slide in anti-ice insert, under tailgate spreader, tarp, paver, and chipper.

NOTE: All references made to stainless steel shall be AISI Type 304 stainless steel, except where otherwise noted. The body shall be reinforced to withstand SEVERE duty service and be capable of being utilized for extended use while spreading salt, anti-skid and liquid material and summer operational material such as stone, dirt, rock, blacktop, millings, etc. or excavation with rip rap being dropped in the bed.

Longitudinal Members: Shall be one piece 8 inch formed stainless steel 0.250 inch, reinforced internally, full-length construction (no splicing) with end caps, all joints fully weld.

Body Mounting: Two (2) rear rigid body mounts per side, two (2) front spring loaded body mounts per side. Final mounting of body shall be 19 inch + or – 1 inch from the rear of the rear most drive tire to the end of the bed.

Sub Frame: Longitudinal members shall be full length rubber cushioned, mated to frame rails. Ref: EQN-79A

Front bulkhead: There shall be a front extension approximately 24 inch one-piece design fabricated using minimum 7ga. inch stainless steel, front extension shall be integrated with long sills and provide anchoring for horizontal double acting ejector cylinder. Entire front bulkhead and cylinder assembly shall accommodate a minimum of two (2) 120 gallon liquid tanks one tank per side of cylinder.

Under ride protection shall be supplied in accordance with EQN-118.

Spinner and auger hydraulic lines shall be supplied in reference to EQN-100 for placement of the quick couplers **only**. Lines shall be properly sized. Each side shall have 1 each male and female series 5600 quick couplers. Lines shall have a permanent metal tags identifying each line, IE: Spinner, Auger & returns. **Hydraulic hoses shall be full run front to back along the outside of the long sills within Hycon clamps**, clamps shall be evenly spaced with no more than 12 inches of hose unsupported.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

Body Sides: Shall be constructed using a minimum of 7 ga. stainless steel, 48" high from top of bed floor to top of bed rails (one piece per side). Top rails shall be 3/16 inch X 3 inch X 4 inch stainless steel boxed continuous welding. Top rail shall have a minimum 0.250 inch inverted angle full width (Dirt Shredding) fully welded. Top rails shall be one-piece construction: NO SPLICING. Horizontal side braces shall be of one piece heavy duty design formed 7 ga. minimum stainless steel and fully welded. Top of all horizontal side braces shall be of dirt shredding design. Maximum overall width not to exceed 96 inch. Ref: EQN-79A.

Rub rails shall be stainless steel 7ga. 3 inch X 4 inch formed one piece fully welded , width shall cover the outer rear dual tires and must be full length of the body, both sides, in addition to the front and rear corner posts, with continuous welding and shall have one bottom drain hole per brace. Maximum overall width not to exceed 96 inch. Ref: EQN-79A.

Ladder: shall be slide out design with three (3) steps with positive lock for travel. Body steps shall be 12 inch in width X 2 inch (minimum) depth located on outside of the body on the driver's side in line with the ejector blade (fully retracted) steps. Steps shall be placed evenly without interfering with horizontal side braces and flush with the outside edge of side posts. Steps shall have a serrated edge Ref. Bustin part # DE0602.
There shall be hand holds, 3/4" stainless steel stock, both sides of steps welded to the driver's side front corner, anti-slip paint is required on all handholds, for the entire length, (tape is unacceptable). All handrails, ladders, and step configurations shall be built for three points of contact location to be determined at pre-build meeting.

Tarp Rail: There shall be 0.50 inch stainless steel round stock from the rear of the side steps to the front of the rear corner post on the driver's side, and from the back of the front corner post to the front of the rear corner post on the passenger's side (tarp anchoring). Each shall be welded 1 ½ inch standing away from the side of bed using 3/16 inch X 1 inch X 1 ½ stainless flat at 12 inch intervals.

Ejector blade: Shall be constructed of structural and plate stainless steel full width with replaceable heavy duty UHMW wipers and guides both side and bottom. Ejector blade shall be 48 inch in height properly braced for severe duty. Ejector blade shall be designed to move material to the rear of the bed without spillage over top of the ejector blade and to fully evacuate the truck bed. Blade position indicator shall be electronic.

Ejector Cylinder: Custom with Thermal Chemical Process with ONC, Properly sized for flow (extend and retract) and load evacuation requirements. Cylinder shall incorporate a metal identification tag with the manufacturers model number, serial number and manufacturers address. Cylinder shall be fitted with a bleeder.

Ejector Cylinder Mounting: The ejector cylinder shall be mounted to a heavy-duty mount with minimum 2" diameter pins and 2.125 inch x ½ inch greasable wall bushings shall be used. Note: the cylinder bases shall be fabricated (bolt together or cast mounts will not be accepted).

Ejector Guides: Internal full length both sides, heavy duty structural stainless steel members attached to sides and floor fully welded to control rearward and forward movement of the ejector blade with replaceable heavy duty wear blocks.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

Ejector Steps: There shall be 2 steps mounted on the back side of the ejector blade on the driver's side. Steps shall be Bustin part # DE0602, installed and evenly spaced. Ref: EQN-81Y.

Floor: Shall be a minimum of 0.250 inch thick stainless steel X 95.50 inch wide X full length one piece and fully welded. Floor shall be fully welded to the floor and side sheets, entire bed length, both sides. Maximum overall width not to exceed 96 inch. Ref: EQN-79A

Front and Rear Corner Posts: Shall be constructed using formed 7 ga. stainless steel X 10 inch face full length, shall be minimum 4 inch full depth one-piece construction from the top of the tailgate to the bottom of the rear bolster and shall be free of holes. There shall be two-spreader chain holders on each rear corner post (top and bottom banjo style) fully welded. Rear corner post shall have the Whelen tail light intergraded without being obstructed by the tailgate. Final location of Whelen light box to be determined at pre build meeting. Ref: EQN-79A.

Rear Bolster: Shall be formed one-piece design fully welded, full depth and width 7 ga. minimum stainless steel. Not to exceed 96 inch wide. Ref: EQN-81X.

Cab Shield: No top gussets, one-half (1/2) cab shield constructed using 12ga. stainless steel integrated with sides.

Pre-wet: Twin 120 gallon minimum poly tanks and plumbing kit with stainless steel tank enclosure and mounting hardware. Pre-wet tanks shall be securely mounted to the body frame rails between the cab and too the front and sides of the ejector cylinder and the front bed bulkhead. Final mounting location shall be determined at pre-build meeting. Pre-wet tanks shall empty simultaneously from each tank. Pre-wet liquid supply line shall be plumbed to the rear module. Ref: EQN-81X. Tank fill shall be at ground level utilizing a two inch male cam lock fitting with dust cap. Pre-wet pump shall be an Oberdorfer part # 25-N4000-RS3-02, Pump shall be driven hydraulically via a love joy connection. Hydraulic motor / pump assembly shall be housed in a NEMA enclosure large enough to facilitate servicing of unit, an electronic flow meter shall be installed to properly calibrate pre-wet. There shall be a low level switch to automatically shut down the pre-wet motor when empty and an indicator to the operator shall be supplied. Location of pre-wet enclosure to be determined at prebuild meeting. Pre-wet pump shall have a flushing system utilizing a common garden hose. Each tank shall include an anti-splash vent tube mounted at the highest most point of the tank and shall have a non-collapsing one inch minimum hose. Hoses shall be full run front to back along the outside of the long sills within Hycon clamps; clamp spacing shall be evenly spaced with no more than 12 inches of hose unsupported. P type clamps shall secure pre-wet hose at 12 inch intervals to below the frame rail of the truck. All hose connections shall utilize appropriate sized worm type hose (screw) clamps.

Shovel Holder: There shall be a Buyers stainless steel shovel holder model SH675SS (No substitute) welded to the curb side of the pre-wet tank enclosure, a hook to hold shovel in upright position shall be located above to accommodate up to a 51 inch shovel handle (location of holder to be determined at the pre-build meeting) Ref. EQN-557

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

Tailgate Cylinders: shall be 2 1/4 inch diameter bore, 1 ¼ inch rod, and 20 inch stroke approximate, hydraulically operated and incorporate piloted counter balance valves to prevent tailgate drop. Tailgate lift cylinders shall incorporate a tailgate interlock as not to allow ejector blade operation when latches are in the closed / latched position. Tailgate hydraulic circuit shall include an adjustable load sense pressure relief; both sides, to protect against tailgate damage from forcefully lowering onto obstructions. System pressure will be determined at the pre-build meeting.

Tailgate: High lift tailgate design shall be 5454-H32 sheeting with 6061-T6 extrusion frame work horizontal and vertical braces as required of 0.250 inch thick aluminum, two (2) panel assembly minimum of 48" tall. Inverted angle dirt shedder on top, all other horizontal braces shall be of dirt shredding design. 1.50" stainless steel latch pin shall be full length. There shall be two (2) (one per side) wings that extend the full length of the tailgate without contacting the ejector blade (fully extended) and mounted to the inside with stainless steel hardware. Top pins shall be minimum 1.50" stainless steel. There shall be two (2) ¾" stainless steel round stock hand holds welded to the gate one (1) to each side. Solid welded construction with stainless steel heavy duty flush mount offset top hardware. Bottom latch pins shall be stainless steel and have grease fittings as required. Conspicuity required on the tailgate, Ref: EQN-79A, EQN-122, EQN-81X.

Tailgate Hinges: Shall be stainless steel construction severe duty attachment brackets with grease able fittings. Stainless steel shall be fully welded. Tailgate shall hinge for spreader operation and tailgating of material. Tailgate hinges shall have two (2) positive external stops. One (1) shall allow tailgate to hinge back without contact to the spreader top cover in the raised position, without the use of tailgate chains or props. One (1) shall maintain tailgate angle in the high lift position and also provide high lift ability for full evacuation of material. Overall height of the fully raised tailgate shall not exceed 12 feet.
All pins shall be of non-rotating design. No tailgate pins shall be field removable. Ref: EQN-79A

Tailgate Latches: Shall be stainless steel construction bolted into the rear corner post, and grease able. Air operated tailgate latches shall be a spring-over-air system and fail in the closed position. The actuator(s) shall be APSCO C-6063 mounted to the bottom of the body and on the outside of the frame rails. **(No substitute, standardization).** Latch mechanism shall be operated via an in cab dash mounted pneumatic switch; (under dash mounted switches are unacceptable). Shall be dual linkage design, with a greasable cross over shaft. All air piping and connections must be D.O.T. approved, with minimum .25" nylon tubing and brass compression fittings. **Note: Tailgate hinge and latch design shall be approved prior to build.** Ref: EQN-78A

Tailgate movement shall be monitored and shall control the ejector blade as follows.

1. A latched tailgate will NOT allow the ejector blade to operate.
2. With tailgate unlatched and ejector blade joystick placed in "detent", blade will automatically maintain material in the spreader, for a winter spreading mode and tailgating of stone, dirt etc. Detent shall disengage any time the high lift tailgate is elevated.
3. Ejector blade shall not operate for full evacuation of material from the bed until the high lift tailgate is moved to the fully opened/raised position.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

Hitch Assembly: Pintle plate shall be made using ¾ inch steel. It shall be inserted within the frame rails, directly in front of the rear light module, with sufficient clearance for body. It shall extend the full width of frame rails and extend a maximum of 5 inches below the frame rails. The lower portion of the plate shall be channeled towards the front of the vehicle, with proper gussets added between frame rails and plate. There shall be two (2) safety chain hooks mounted to the plate. Ref: EQN-81X

Pintle Hook: There shall be one of the following manufacturer's 25-ton pintle hooks with spring loading, swivel design mounted to the hitch assembly, Holland PH760, Buyers BP760A, Wallace Forge. Pintle hook mounted as Ref: EQN-81X.

Rear Light Module: There shall be a rear light module containing the following components:

(1) One grommet mounted back-up alarm, Ecco model 450. **(No substitute, standardization).**
(1) One license plate lamp, Trucklite Model 36140C. Shall be recessed with license plate. EQN: 81X
(1) One 7-way female electrical trailer plug connection. *Note turn signals shall work with brake lights for trailers Ref EQN-80A
(2) One 3-lamp cluster.
(3) Two License plate mounting holes, with stainless steel hardware included.

All lamps shall be LED. Module construction shall be a minimum ¼-inch thick aluminum and shall be fully enclosed to eliminate material entering housing. It shall be a one-piece design that bolts between the chassis frame rails, minimum of (4) bolts. License plate and license plate lamp shall be recessed into the rear module a minimum of ¾" to a maximum of 1". All electrical connections shall be made within the sealed module and powered through the original chassis harness, with a compression fitting used at the wire pass-through location. All electrical connections shall be coated with di-electric grease. Component placement on the module as per EQN: 81X.

Body Lighting System: Whelen Model # PADOTS3V. Ref: EQN-81X. Whelen control panel shall be mounted within the cab under the passenger seat facing the door for easy accessibility. Whelen light kit shall include flasher that turns both the rearward facing yellow strobe lights off when the turn signal, four ways and brake lights are on, then returns to normal operation. System shall also be equipped with a photo cell mounted in the dash of the cab that will dim all the flashing yellow strobe lights at night and return to full power in the daylight.

Wiring Pass Through: All wiring entering the cab shall be made through a rubber boot assembly and be weather tight. There shall be no connectors in the wiring at the pass through point. Wiring shall be protected against sharp edges and from rubbing / chaffing. Boot design shall be pre-approved.

Chain Boxes: Shall be aluminum with safety grating overlaid. There shall be a minimum of four (4) ¾" drain holes in the box floors. Final position of these boxes to be behind the swept back front bumper and outboard of the frame channels. Note: two (2) boxes with no wing, one (1) with left or right wing, zero (0) with dual wing applications. Ref: EQN-32

Splash Guards: Both front and rear splashguard assemblies shall be properly braced. Ref: EQN-66.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

Rear: 7ga. stainless steel splashguards shall be attached to the dump body on each side, behind the rearmost dual wheel, and extend downward to accommodate a 30-inch or 36-inch flap in order to meet Pennsylvania State Inspection Requirements. Mud flap sizes permitted are 30 inch or 36 inch. **(No substitute, standardization)**. The rubber splashguards shall be bolted to these metal splashguards using self-locking nuts and metal strips. Flaps shall meet Federal Regulation of 22 degree. Unmarked flaps shall be heavy duty anti sail/anti spray and be razor split.

Front: The forward splashguards shall be 7ga. stainless steel and extend downward 3/4 of the length of the rear splash guard/mud flap, with a ¼" length, unmarked mud flap attached for the remaining distance. Forward splashguard shall have a 1-inch lip for entire length-outside extremity (90 degree) with bottom outside corner rounded and have rolled edges. Splashguards shall be full length and width.

Spray Suppression: Spray suppression shall be installed full length between front and rear splashguards (both sides). It shall be bolted/screwed to the body. Ref: EQN-79A, sheet 1.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

Spreader**:** Unit shall be equipped with a stainless steel under tailgate spreader with an Iowa type spinner assembly. Spreader and spinner shall meet the following specifications and be installed. Mounting location of spreader and Iowa spinner to be determined at pre-build meeting.

NOTE: All references made to stainless steel shall be AISI Type 304 stainless steel.
7 gauge 0.1875-inch
10 gauge 0.1350 inch
Per EQN-9, EQN-3A
All nuts, bolts and hardware brackets, or angle stock, unless otherwise specified, shall be stainless steel (no substitutes), with all edges deburred and rounded.

DIMENSIONS:
Overall width of vertical trough end plate shall be 96 inch.
Overall height shall be approximately 18 inch.
Overall depth shall be approximately 18 inch.
Inside trough width opening shall be 81 inch + or – ½ inch. Per EQN-9.

TOP COVER:
Two-position top cover. When raised, normal spread mode. When lowered with spreader not in use, allows full dump-over capability.
Spreader material, full width, shall be a minimum 0.135-inch thick stainless steel.
Properly secured to prevent material leakage in spreading positions.

AUGER:
Per: EQN-6 and EQN-3. (Material is specified in drawing.)

AUGER BEARING:
1-1/4 inch shaft diameter.
2 bolt flanged type ends self-aligning, anti-friction, thrust, re-lube type, with retaining collar with set screw with Zerk fitting cover, eccentric type, or equal, per EQN- 10.

AUGER MOTOR:
NOTE: The auger motor is a standard, no substitute. It is the responsibility of the successful Vendor to ensure that the spreader's assembly is designed and manufactured in such a way as to ensure compatibility and serviceability with the Department's hydraulic system/s.
Auger Motor: White Hydraulics: Model RE (no substitution), with a 50 pulse auger motor sensor installed. Kit # W80509
Displacement cu in: 32
Housing: 08 (A style 4 bolt)
Output Shaft: 14 1-1/4 inch straight
Rotation: 1 clockwise
Options: 25 Options
Note: Porting is 7/8 inch 'o' ring
Fitting Per EQN-9

STAINLESS STEEL SPREADER, URETHANE SPINNER ASSEMBLY:
Spinner frame shall be an “Iowa” type.
Urethane spinner disc shall be per EQN-9B No Substitute without prior approval.
Spinner height shall be 12 inches from the ground to the disc lip.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

DISC:

Ref: C.U.E. Inc. Spinner Part #CC1229S per EQN-9B (No substitute without prior approval).

HUB:

REF: C.U.E., Inc., hub Part #20559-0650 (4 bolt type hub mounted to spinner disc with locking type nuts for use with spinner motor (bolt pattern shall match for referenced spinner). No Substitute without prior approval

SPINNER MOTOR:

Gerotor type hydraulic drive motor
Hydraulic port opening: ½ inch NPT.
Flange mount: 4 bolt.
Shaft keyway: 1 inch woodruff.
Displacement: 3.0 cubic inch/rev. maximum.

PAINT:

All carbon steel surfaces shall be properly prepared by thorough cleaning, removal of dirt, grease, rust and corrosion and shall be painted with proper undercoat and a sealer. All stainless steel shall be unpainted.

COUPLERS:

One (1) l/2 inch spinner - 5100-S5-lOB Aeroquip female or Parker 6125-08 female, no substitute.
One (1) 3/4 inch auger - 5100-S5-12B Aeroquip female or Parker 6125-12 female, no substitute.
One (1) 1 inch return - 5100-S5-16B Aeroquip female or Parker 6125-16 female, no substitute.
Hydraulic couplers shall be anodized steel.
NOTE: All necessary hardware and fittings shall be supplied to ensure that the system is fully functional.

Hoses shall be full run front to back along the outside of the long sills within Hycon clamps; clamp spacing shall be evenly spaced with no more than 12 inches of hose unsupported. Spinner and auger hydraulic lines shall be supplied in accordance with EQN-100. Lines shall be properly sized. Each side shall have 1 each male and female series 5600 quick couplers. Lines shall have a permanent metal tags identifying each line, IE: Spinner, Auger & returns. Hydraulic hoses shall be full run front to back along the outside of the long sills within Hycon clamps, clamps shall be evenly spaced with no more than 18 inches of hose unsupported.

SAFETY:

Appropriate decals, instructional and WARNING/S, shall be provided and fixed.
There shall be a lock out system that will prevent the lower auger inspection pan from being lowered (opened) while the hydraulic line is connected to the auger motor.
Note: Lock out to be plumbed with 3/4 inch hoses and couplers.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. EJECTOR BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

1. STAINLESS STEEL EJECTOR BODY STRUCTURE: (Continued)

TROUGH: Per EQN-9

There shall be hinged trough bottom with spring loaded latches.
Bottom shall be separate from the anti-spill/cover.
Separate one piece bottom shall be full spreader width, minimum 7-gauge stainless steel.
Separate anti-skid/cover plate shall be minimum 10-gauge stainless steel.
Bottom shall be properly secured to prevent material leakage in spreading positions.
Bottom shall be hinged by bolts or pins (stainless steel) with a minimum of three (3) center hinge points and two (2) end points. End pieces, one piece formed front wall and rear wall, shall be minimum seven (7) gauge stainless steel.

ANTI-FLOW PLATE OPENING:

Anti-flow plate shall be mounted over the trough opening.
Anti-flow plate shall be arched to provide a minimum of 3/4 inch clearance between the shield and the outer periphery of the auger flight. Anti-flow plate shall butt against end plate. Anti-flow plate shall be minimum 10-gauge stainless steel. Anti-flow plate length shall be 14 inch.
Discharge opening shall be approximately 6 inch wide by 7 inch long rectangular opening.
Discharge opening shall begin from end plate on roadside.

QUICK DETACH:

There shall be quick detach bracket per EQN-3A.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL:

Hydraulic Control Approved Manufacturer's:
Component Technology Freedom XDS.
Cirus Spreadsmart RX Touch.

INTENT: The purpose of these specifications is to describe a conventional cab, tandem axle stainless steel cross member less full ejection body truck, equipped with dual rear wheels, approximately 14 foot long and maximum 96 inch wide material body, and 12 cubic yard approximate load capacity body, hoist, hydraulic power system and snow plow hitch. Unit shall be capable of one-man operation while plowing snow and simultaneously spreading granular and liquid materials during winter operations, and of hauling, stockpiling and unloading maintenance materials into a chip spreader or paver during summer operations. Further, it shall be capable of being loaded with a front-end loader or self-propelled belt loader. The body shall be capable of having the following components connected and or mounted to it: wing plow, slide in anti-ice insert, under tailgate spreader, tarp, paver, and chipper.

NOTE: All references made to stainless steel shall be AISI Type 304 stainless steel, except where otherwise noted. The body shall be reinforced to withstand SEVERE duty service and be capable of being utilized for extended use while spreading salt, anti-skid and liquid material and summer operational material such as stone, dirt, rock, blacktop, millings, etc. or excavation with rip rap being dropped in the bed.

Intent/Installation Practices: The pressure compensated, load sensing central hydraulic system shall operate all functions (plows, ejection blade, tailgate, spreader, and pre-wet circuits) from an electric/hydraulic system independently and simultaneously, without interruption of any other hydraulic functions.

All controls and components shall be of the latest design and installed to provide simple and convenient operation.

All system operations shall be achieved from a single pump matching all required flow and pressure demands.

Hydraulic tool operation shall be included through both spreader circuits and will not require any type of cooling.

This system shall provide the most fuel efficient, safest, simplest and consistent operation possible.

All hydraulic components shall be installed and serviced by a single manufacturer.

Hoses shall be full run front to back along the outside of the long sills within Hycon clamps; clamp spacing shall be evenly spaced with no more than 12 inches of hose unsupported.

Full responsibility for a serviceable system lies with the successful bidder.

All wiring shall be securely clamped at approximately 12 inch intervals, shielded from exhaust and include a protective sleeve where necessary to prevent damage and/or failure.

Upon start up, the hydraulic system shall be operated at maximum flow for not less than 15 minutes and then have a new hydraulic filter installed on the truck.

It shall be the sole responsibility of the successful truck manufacturer and hydraulic control manufacturer to ensure that the chassis and the ground speed control wiring harness is totally compatible.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

Per Invitation to bid:

AVL Hardware option: Unit shall be equipped with a complete AVL hardware system installed and completely functional to work in conjunction with the Departments current AVL solution. Shall include but not limited to; GPS Transponder / Advanced Telematics System box, modem, GPS antenna, all wiring and connectors. All hardware shall be mounted within the truck cab and location shall be determined at pre build meeting.

NOTE: Seat Safety Switch: Drivers seat shall be equipped with a factory safety switch to work in conjunction with the central hydraulic system. Switch shall be rated at 50 lbs. and shall allow operation of the hydraulic system when occupied and shut down the hydraulic system when unoccupied. It shall be the sole responsibility of the OEM to ensure seat safety switch compatibility with the selected hydraulic system manufacturer control system. Aftermarket installation of this switch is unacceptable.

NOTE: All electronic control modules shall be mounted within the cab in a location to provide access for servicing and to prevent damage / corrosion to modules and connections.

System Operation: The system shall communicate over a CAN Open system bus using CAN Open protocol and not a proprietary communication protocol. The system shall consist of four primary modules that reside on the Bus and allow flexibility in mounting configurations. The system shall be expandable and allow for additional modules to be added to the CAN Bus. All four primary components of the system shall be software upgradeable using a laptop and interface cable or a USB thumbs drive. The configuration file of a calibrated system shall be saved for transfer to other systems or as a backup providing the ability to use specific configurations for varying vehicle use or operator skill level. The original configuration file shall be maintained at the factory as a secondary backup and is traceable by part number. The in-cab control system panel shall be contained in an enclosure and mounted in an easily accessed position in the cab.

Control System Requirements: Central hydraulic system shall be capable of the following requirements in their entirety.

- All functions shall be recorded and time stamped, to include capturing all error messages.
- System shall allow data to be downloaded in a common format (Excel).
- System shall be ground speed controlled and shall respond at one MPH.
- System shall have multiple level security and be individually password protected; Administrator and Technician. Operator shall not require a password to access the system and switch between automatic and manual operation.
- System shall be calibratable to various pounds per lane mile.
- System shall capture and store storm totals by event (Event Log).
- System shall capture and store annual storm totals.
- Stored data shall be capable of being cleared at various levels of password protection.
  Operator shall be capable of clearing storm totals.
- System shall be programmable to a minimum of six material types.
- Materials shall be programmable to various weights.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

- System shall have a programmable minimum / maximum setting for the auger and spinner.
- System shall have a feeder (Auger) sensor, and capability of turning the sensor on or off.
- Each unit shall be capable of having an individualized seven digit equipment number stored for identification purposes.
- System shall have a programmable pre-wet maximum / minimum settings at one gallon increments and capable of being set to various gallons per ton of dry material.
- System shall be capable of showing auger jam.
- System shall be capable of providing in cab (controller screen) information for blade location, fully retracted/stowed and fully extended.

Tailgate movement shall be monitored and shall control the ejector blade as follows.

- A latched tailgate will NOT allow the ejector blade to operate. System shall be capable of allowing operation of the ejection blade only when the tailgate latches are in the unlatched position.
- System shall be capable of a “detent” mode, engaged by the ejector joystick to operate the ejection blade during a spreading operation to maintain a “loaded” spreader of salt/anti-skid material with no operator input.
- System shall also allow operator to disengage detent mode at any time by momentary moving ejector joystick to the retract position.
- System shall be capable of disengaging detent when cylinder reaches full extend.
- With tailgate unlatched and ejector blade joystick placed in “detent”, blade will automatically maintain material in the spreader, for a winter spreading mode and tailgating of stone, dirt etc. Detent shall disengage any time the high lift tailgate is elevated.
- Ejector blade shall not operate for full evacuation of material from the bed until the high lift tailgate is moved to the fully opened/raised position.
- System shall be capable of controlling high lift tailgate with three position (spring center “OFF”) rocker switch.
- System shall only allow full evacuation of material when tailgate is in the fully lifted position.
- System shall be capable of working in conjunction with the following products;
    - Wojanis hydraulic plow balance valve or Moray Jr (HYD1300025C) plow saver
    - Roadwatch road temperature sensor.
    - Vasila road temperature sensor.
    - Pre-wet flow meter.
- System shall have a manual override in the event of sensor failures.
- Shall be capable of operating when truck is moving in forward and reverse directions.
- Each hydraulic valve section shall have individual overrides located at each valve section.
- No tools shall be required to calibrate the system.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

- Shall be equipped with a pause button to disable the system momentarily, without the need to reengage the ejector blade "detent" mode when the pause is deactivated.
- Shall be equipped with a blast button to allow full calibrated material to be dispensed.

Console Assembly: Shall be ergonomically designed for easy accessibility for operator from the driver's seat. Assembly shall be secured to the floor of truck as to not interfere with any original truck manufacture equipment. **Assembly shall be properly braced as to not allow any excessive movement that could be detrimental to the integrity of the floor or mounting location.** Console shall have a padded arm rest and be adjustable to accommodate various operators. Console shall not come in contact with the driver's seat. Console shall be capable of housing all hydraulic controls and switches, including all wing options and tow plow functions. Console base shall be of steel construction conforming to drawing EQN-509 or prior approved equal. Base shall include an adjustable bracket for mounting of state radio. Ref. EQN-556

Display: The display shall be manufacturer's latest design and largest available screen, with an auto dimming backlight, user adjustable position. The display shall automatically resize to provide maximum readability with varying display content including a status window that provides the operator with system status messages. The display shall incorporate "soft key" or "touch screen" switches that are defined by the system program via the display. The keys shall include a "plus" pattern navigation buttons used to navigate in the system software easily. When configured, the display shall incorporate granular rates, pre-wet rates, road/air temperature, hydraulic pressure where designated, system status, error messages, plow float indication, ejection blade stowed, ejection blade position, auto/manual mode indication and material currently being used. Active functions that are not in use shall show "off" and the graphic be "grayed out" for ease of operator interpretation.

Consideration should be made when mounting display screen as not to block operator vision to passage side mirrors.

Software: The system shall incorporate two (2) levels of security and access that is password protected and defined by the user. The two levels of access called technician and administrator shall give the user varying levels of access to system setup, data configuration fields and parameters based upon access given. The "administrator" shall have full access to all menus in the system and have the ability to make system configuration changes as well as system parameter changes. Spreader and liquid functions, when controlled utilizing closed loop feedback, shall incorporate an "auto trim" feature that will allow the system to automatically set the PWM minimums and maximums when engaged. The system shall have "over speed" protection for the liquid functions that will alert the operator and shut down the liquid function when the driver has exceeded a user defined speed. The software shall incorporate a "test speed" mode for use in testing the system safely without requiring the truck to be moving, the drive axles engaged or the parking brake to be off.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

Control Console: The control console shall contain individual joysticks to control hydraulic functions including tow plow and wing options. Body ejector blade stick shall contain an interlock button to protect against unintended operation. The plow stick shall be a two axis joystick. All joystick functions shall be protected by a software based safety system to protect against unintended operation due to a joystick failure. The console shall contain the operator interface for the spreader control, joysticks, low oil override switch, plow balance control switch, wing float control switches, tarp switch, blade indicator light, and blade limit indicator light. All controls shall be securely attached, within easy reach of operator and console mounted. All controls shall be connected to the valve/s via an electronic cable and utilize CAN network communications. Console base shall be of steel construction conforming to drawing EQN-509.

Base shall include an adjustable bracket for mounting of state radio. Unit shall be capable of adjustment vertically and horizontally to allow for comfortable positioning for the operator. **Console base shall be properly braced to eliminate floor flex.** Additional supports brackets shall be vendor's responsibility. Ref: EQN-509.

Wire Harness Kit: All wiring for the kit shall be included and be TPE type wiring only to the following specification: Wiring and harness system shall meet ISO rating IP68 and NEMA 6. The connectors shall be zinc die cast E-coated, similar to a MIL spec connector. Each shall have three sealing points- the lock ring itself, a raised portion of the molded plastic around each pin, and a viton O-ring that seals the entire connector. The cable jacket shall be TPE-thermoplastic elastomer, and molded to the connectors. Connectors and harness shall be rated and tested for a temperature range from – 30C to + 70C. Connectors shall be tested to be water tight when submerged in 6' of water for 24 hours, in 275' of water for 1 hour, and when subjected to a 1000-psi pressure wash. The connectors shall be designed to have NO corrosion after 500 hours in a 35C salt spray. Cabling shall be rated excellent in low temperature flexibility and in its resistance to oxidation, heat, oil, weather, sun, ozone, abrasion, electrical priorities, flame, water, acid, alkali, gasoline, benzol, toluol, degreaser solvents, alcohol, and weld slag.

Combination Tank/Valve Enclosure: Combination tank/valve enclosure shall be frame mounted, in a location not to interfere with body, wing plow or exhaust components. Final mounting location shall be determined at pre-build meeting. Unit shall be constructed of ten gauge 304 stainless steel. The oil reservoir portion shall not be less than 40 GAL capacity, filled with ISO 32AW hydraulic oil and a baffle plate to prevent oil flow from venting directly to suction port. Tapered outlet shall be below oil level at all times to prevent air entrapment. A magnetic drain plug shall be installed into reservoir. Tank shall be clearly labeled **"HYDRAULIC FLUID ONLY"**. Lockable tank filler cap assembly, model 57XL-40 (40 micron with chain) L.C. as manufactured by Lenz. Tel: (937) 277-9364. An oil level sight gauge/thermometer shall be provided on the reservoir. A suction strainer shall be installed in the suction port of the tank. There shall be a provision for a low oil float to be installed. Low level float shall thread into the side of the assembly and shall have an M12 connector. The valve portion must be of weather-tight design and utilize a gasket to seal the lid to the body of the unit. Lid shall be retained by two rubber fasteners. Handles (two) shall be welded to the lid and constructed of stainless steel.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

Combination Tank/Valve Enclosure: (Continued)

A mounting location for the hydraulic control system module(s) shall be provided as part of the enclosure design. Stainless steel shields to protect exterior wiring shall be provided. The valve shall be installed in the enclosure by the hydraulic system supplier and pre-plumbed to the outside of the enclosure through the use of bulkhead style fittings. No hoses shall enter the weather-tight area of the enclosure. Valve to be pre-wired inside the enclosure and **di-electric grease** shall be applied to all connections as required. Return oil flow shall be through the reservoir mounted filter assembly. Return filter shall be provided as part of the tank/valve enclosure assembly. It shall be rated @10 micron. There shall be a pressure switch with boot to activate a warning message on the control system screen. Cab mounted filter contamination indicator set at 23 PSI. Return filter housing shall have provisions for a service filter switch; connection shall be made via an M12 connector. Suction line/strainer shall have be 125 micron with 3 PSI bypass rated above 47gpm submerged at all times. Shall have a ¼ turn, 2.5 inch full flow ball valve in the suction line as close to the tank as possible Strainer integral mounted in a 4 inch NPT female opening in the bottom of reservoir with a 3" female NPT opening. There shall be a 5600 series complete quick coupler (with dust cover) located in the pressure line entering the main valve assembly located inside the valve enclosure.

Quick disconnect shall be bracket mounted to the inside of the enclosure, easily accessible so that a shop pressure gauge (not to be installed or included) maybe easily visible for test purposes. Final location shall be determined at the pre-build meeting. REF: EQN– 08.

Wire harness covers shall be installed on the enclosure to protect the wiring harness where it enters/exits the modules.

Directional control valve: The hydraulic control valve shall be a Sauer Danfoss PVG32 with aluminum manifold to control spinner and pre-wet functions. (One Manual control lever is to be supplied per unit to control manual override of valve.)

Sections shall be provided as follows: (non-wing)

Ejector blade – PVG 32 Turbo Spool (34 GPM) section, double acting with 1500 psi retract relief and 2000 psi extend relief.

Plow raise/lower, double acting.

Plow angle, double acting, motor spool.

Tailgate lift/ lower, double acting, motor spool with adjustable load sense pressure relief, both sides. Pressure setting will be determined at pre-build meeting.

Return manifold: There shall be a return line manifold mounted on the chassis, location to be determined at the pre-build meeting. Ref: EQN – 23. Return manifold shall be an 8 port header block with 8 # 16 SAE openings and 2 #24 SAE openings at each end. Header shall be an Alamo, Damon or Hycoa or equal.

There shall be a 3 port valve block to control spinner, auger, and pre-wet as part of the main valve assembly. There shall be two (2) return lines from the control valve to the return manifold.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

Ejector Speed requirements:
Blade speed shall be tested at 1200 rpm at normal operating temperature.
Blade speed full eject shall be 36 seconds maximum.
Blade speed full retract shall be 38 seconds maximum.

Hydraulic Pump: Rexroth Part Number R910979162, Model A10V01OO LH rotation: KEYED Crankshaft Driven, **(No substitute, standardization)**. Pump shall include low oil shut down with console-mounted override switch. Shutdown shall be direct mounted to the pump. Remote mounted valve will be unacceptable. Valve shall be a normally closed, energize to open cartridge valve. Valve shall be controlled by the hydraulic control system. The pump shall match system flow and pressure (horsepower) requirements to provide maximum fuel economy. Ref: EQN-90. An unloader or by-pass system is not an acceptable means of regulating excess oil flow.

Pump Mounting Bracket: Regardless of design the bracket shall be a minimum of 5/8" formed steel channel. The pump bracket shall be sloped to match the engine crankshaft. Width dimensions shall be full frame rail width. Bracketry to attach pump-mounting bracket to the truck frame rails shall be a minimum of 5/8" thickness. Brackets shall either be fully welded or use ¾" grade 8 (eight) bolts of sufficient length and grade 8 (eight) locknuts, minimum of four (4) bolts per mounting side. Ref: EQN-90.

Hydraulic Pump Driveline: Hydraulic pump SHALL BE DRIVEN by a Spicer 1310 series or NEAPCO factory balanced drive shaft. Driveline shall be capable of 130-foot pounds of torque and have a tubular shaft of 1141 steel. Tubular shaft shall have 16-spline heat treated to 40 Rockwell hardness.

A groove shall be machined the length of the shaft to provide proper phasing of universal joints at time of shaft assembly. Driveline installation shall be in accordance to manufacturer's recommended procedures. Slip assembly shall provide a minimum of 2.25 inch of travel to allow ease of engine drive belt replacement. The truck engine radiator and frame construction shall readily accommodate the installation of a front mounted crankshaft driven hydraulic pump. The engine crankshaft pulley or vibration damper shall be drilled and tapped to accommodate a power take off drive shaft adapter plate required under hydraulic system section of these specifications. Loc-tite shall be used for the installation of all mounting bolts. Ref: EQN-90.

Hydraulic Hose: All hoses and hose ends shall be matched and assembled on a hose machine to prevent hose failure. All hydraulic plumbing practices shall conform to JIC H11 standards. Pressure hose from hydraulic pump to valve body shall be 100R17, pressure hoses shall be 100R2, return lines shall be 100R1 and suction lines shall be 100R4. Velocity in pressure lines shall not exceed twenty (20) feet per second, return lines not to exceed ten (10) feet per second, and not to exceed four (4) feet per second in suction lines. All hoses shall include JIC female swivel ends with the exception of the suction line. All hydraulic components shall have SAE porting wherever possible.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

2. CENTRAL HYDRAULIC CONTROL: (Continued)

Hydraulic Hose: (Continued)
All hydraulic hoses shall be securely clamped at approximately 18 inch intervals, shielded from exhaust and include a protective sleeve where necessary to prevent damage and/or failure. All hoses shall have JIC swivel connections at each end and be located in such a manner to aid in easy component replacement. Hoses shall be full run front to back along the outside of the long sills within Hycon clamps; clamp spacing shall be evenly spaced with no more than 12 inches of hose unsupported.
Ref: EQN-94.

Hydraulic Alarm and Shutdown System: There shall be a low hydraulic oil alarm system to alert the operator of a low hydraulic oil situation and allow ample time to take preventative action and avoid damage to the central hydraulic system pump. It shall be operated via a 12 volt system. All wiring shall be routed to prevent damage from heat, sharp edges and moving parts. An in-tank float switch shall be mounted to provide a signal to the control system. The on screen message and audible alarm shall come on whenever the oil level drops below a safe reserve, and the pump mounted low oil shutdown manifold shall deactivate to prevent pump damage. A console mounted low-oil override switch shall be provided to allow momentary operation in an emergency.

All electronics associated with the hydraulic system shall be protected against and shall not cause interference to the operation of the vehicle or the land mobile radio communications system when properly installed in the vehicle.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

3. TARPING SYSTEM:

Tarp System: Ref: Aero, Roll Rite.

Tarp Spool: Shall have a one piece aluminum wind deflector, mounted onto the upper portion of the attached cab protector. It shall include an extruded aluminum roll pipe. Extrusion shall have a steel Stub shaft to connect it to a greasable bearing on the idler end of the roll pipe. The steel stub shaft shall be corrosion resistant.
Gear Motor: Shall be a 12 volt Electric Gear Motor designed to operate at fewer than 35 amps. Gear case to be chrome plated. Gear case output shaft shall be corrosion resistant. Gear motor to have a minimum of a 3 year non-prorated limited warranty against wear out and manufacturing defects.
Power supply from chassis to bed shall be made through a spring loaded contact plate mounted between the bed rail and chassis frame rail. All wiring shall be protected from corrosion.
Ref. EQN-550

Controls: System to be operated by a low voltage rocker switch and control relay assembly, to be located inside the cab of the truck. **Ref. Rite Touch Controller from Roll Rite or prior approved equal,** control relay assembly location to be decided at prebuild meeting. For safety there is to be a weather resistant automatic reset circuit breaker mounted at the power supply to protect the complete tarp system from overload and short circuit. Location to be determined at pre-build meeting Ref. EQN-556.

Pivots: Shall be mounted on the flat face of the shedder rail. Pivots shall contain coated spiral torsion spring or coated double helix spiral spring. The spring must have the ability to be preloaded with tension. Pivot arms shall be American made aluminum extrusion
Bow Set: Shall be a 3 piece aluminum straight arm extrusion set. Arms shall connect to the pivots in a telescopic fashion. Shall provide the following for varying truck configurations:

- 30° or 45° offset elbows.
- Pivot tube mounted tension bow (in cases where there is more than an 8” drop behind bulkhead).

Tarp: The tarp material shall be fabric and suitable for covering asphalt and winter material/salt. Material shall be able to withstand heat up to 400 degrees. Tarp to have 18” Rear Corner reinforcements.
Shall be equipped with the following:

- 12” Side Flaps
- 12” Tail Flap
- Full Flap Length Shock Cords (for tie down purposes)

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

E. DUMP BODY AND EQUIPMENT MANDATORY MINIMUM SPECIFICATIONS: (Continued)

4. TOW PLOW, ANTI ICE UPGRADE OPTION: **(Option per Invitation to Bid)**

The following shall be supplied in lieu of base hitch assembly.

Intent: Vehicle shall be capable of towing / operating a Viking Cives TP26 tow plow. It is understood that the components specified are minimum and if the vendor's Engineering Department recommends or deems necessary, additional components, it shall be the successful vendor's responsibility to ensure complete 100% compatibility and successful integration / operation. The burden of responsibility is hereby placed upon the vendor's Engineering Department to supply a unit that is totally engineered.

Hitch: Shall install a heavy-duty 1" hitch plate attached and be reinforced to chassis frame. Incorporate ICC bumper.
Provide and install, at 26" from ground to center of hitch eye, a Holland PH400 pintle hitch. Install (2) heavy-duty 1" diameter D-ring safety chain loops rated at 47,000 lbs.

Hydraulics: Shall supply and install any additional circuits to operate tow plow (with anti-icing package), including all hydraulic components, valves, hoses, fittings and electrical components to control plow lift, steering and anti-icing system on tow plow. All functions shall be operated through the Central hydraulic controller.

Truck shall be a complete turnkey to operate a Viking Cives TP26 tow plow.

5. TOW PLOW, GRANULAR UPGRADE OPTION: **(Option per Invitation to Bid)**

The following shall be supplied in lieu of base hitch assembly.

Intent: Vehicle shall be capable of towing / operating a Viking Cives TP26 tow plow that is equipped with an **8 cu yd. granular hopper and a 225 gallon pre-wet system**. It is understood that the components specified are minimum and if the vendor's Engineering Department recommends or deems necessary, additional components, it shall be the successful vendor's responsibility to ensure complete 100% compatibility and successful integration / operation. The burden of responsibility is hereby placed upon the vendor's Engineering Department to supply a unit that is totally engineered.

Hitch: Shall install a heavy-duty 1" hitch plate attached and be reinforced to chassis frame. Incorporate ICC bumper.
Provide and install, at 26" from ground to center of hitch eye, a Holland PH400 pintle hitch. Install (2) heavy-duty 1" diameter D-ring safety chain loops rated at 47,000 lbs.

Hydraulics: Shall supply and install any additional circuits to operate tow plow with an **8 cu yd. granular hopper and a 225 gallon pre-wet system**, including all hydraulic components, valves, hoses, fittings and electrical components to control plow lift, steering, spreader and anti-icing system on tow plow. All functions shall be operated through one (1) Central hydraulic controller. Control system shall control and capture all of the data from the tow plow. All electrical connections, mounting and functionality shall be installed as per the current systems installation standards. All newly installed modules and valving shall be mounted in a vendor supplied weather tight enclosure on the tow vehicle. This enclosure shall not interfere with the operation of any other components and shall be securely mounted in an easily accessible location.

Truck shall be a complete turnkey to operate a Viking Cives TP26 tow plow.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

F. GENERAL PLOW MOUNTING / ACCESSORIES:

Front Plow Hitch: Side-mounting plates shall be constructed using ¾" Steel. Lower plow mount bracket center shall be 16" to 17" from ground (both sides). Trucks that do not have a wing, "X" braces shall be installed using .31" wall 2" x 2" steel tubing. There shall be a minimum of five (5) 7/8" grade eight (8) bolts per side with washers and lock nuts to mount the plow frame to the truck frame. Lift height shall be sufficient to afford unrestricted lift for PennDOT plows, (16" minimum lift). Side strengthening bars (two per side) shall be fabricated using ¾" steel, 16" long by 2" wide and mounted to the external side of the plow hitch. All grease zerks shall be surrounded by a short length of pipe (welded in place) or be in a recessed hole. The zerks for the plow arm bushings shall be mounted on the underside of the bracket. Ref: EQN-50.

The hydraulic connections on the plow hoist cylinder shall be positioned as to keep them from being stuck and damaged, while connecting or disconnecting the front plow. All other hydraulic connections mounted to the plow frame shall also be positioned to keep them from damage.

Plow Saver: There shall be a Wojanis part number WSC-072-4-00 or a Moray Jr. part number HYD1300025C plow saver device installed. **(No substitute, standardization)**. Plow saver shall have the following specifications:

Valve to be designed to offset a specific (adjustable) plow weight when activated. Valve to be of cartridge and manifold design, and electrically activated. The valve shall be activated by a single solenoid.

The plow balance system shall not alter the operation of any other hydraulic function on the vehicle or have an adverse effect on the performance of other hydraulically operated equipment including wing plow, ejection blade, plow hoist or angle, or spreader functions. All normal operations of the plow lift/lower function must be maintained without additional tasks. Operation of any electrical switches beyond the normal up/down command to raise or lower the plow shall not be acceptable. The use of a relay circuit to allow the plow to remain in the up position shall not be acceptable.

To guarantee safe operation of the vehicle, the plow balance system must operate with the following parameters: The system will remain electrically activated when lifting the plow from the road surface. Plow lift must be immediate. It is not necessary to turn off the system for plow lift. Plow lowering and return to balance mode must be done by activating the plow lever or switch to the lower mode.

The plow balance system must be able to hold the plow in the up position indefinitely.

The plow balance manifold shall be of cartridge style valving utilizing "floating" style cartridge valves. The valve body must be constructed of aluminum and have minimum construction hole plugs. All solenoid valve coils shall have manual override capabilities. Manifold must include a pressure test point for use when checking balance pressures. The pressure test point must be capable of tapping into the system at pressures of up to 5000 PSI.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

G. WING PLOW SPECIFICATIONS:

1. INTENT STATEMENT:

The purpose of these specifications is to describe a full floating patrol wing plow with tripping action and telescoping action mechanism and a capability to lower the assembly into the travel position for improved visibility and to allow emergency egress.

It shall be the responsibility of the vendor to certify through proper chassis stress analysis the adequacy of the existing truck frames to accommodate the patrol wing plow in addition to a front mounted plow weighing approximately 3500 LB.

The aforementioned plow will be used for "severe duty" high-speed plowing by the Pennsylvania Department of Transportation. The attached drawings and written text are to be considered minimum and the manufacturer shall reinforce the plow, framing and hydraulic cylinders by means of gussets, or increased material strength or thickness to present a plow designed to meet the severe duty" operational setting.

The Patrol Wing shall be designed to be attached or detached independently from the frame assembly. It shall be installed in such a manner as to ensure quick access to the engine and all accessories. (Hood on dump truck shall tilt without obstruction.)

All parts not specifically mentioned, which are necessary in order to provide a complete snowplow shall be furnished by the successful bidder. The plow fabrication and assembly shall be to the latest engineering techniques.

All steel unless otherwise specified, shall be hot-rolled steel (HRS) as per ASTM A-36.

When wing assembly is disconnected from the truck, no parts may extend past the bodyline of the truck.

Areas of the wing plow tubes and cylinders that are likely to be stepped on when in the down position shall be coated with anti-skid paint, tape is unacceptable.

All bolts shall be grade 8.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

G. WING PLOW SPECIFICATIONS: (Continued)

2. SPECIFICATIONS:

Shock Absorbing Rear Wing Brace: The rear wing brace shall be a minimum of a single fixed hinge pin type with an adjustable bottom wing brace, or the formed type wing tube support to attach to a single fixed hinge pin. The rear wing brace shall be equipped with a telescoping arm and an adjustable type tension spring. If required by manufacturer. The rear wing "A" frame support strut/girder arrangement of MC 7 inch x 22.7 LB/feet, minimum channel, or fabricated from 7 inch x 12.25 LB/feet channel, 6 inch/feet x 8.2 LB/feet channel, .500 inch plate, 6 inch x 4 inch x .3750 inch structural tubing and other component pieces. It shall be attached in such a way that the load is properly distributed to both chassis frame rails. "A" frame shall be detachable for summer use. Ref: EQN-60A. One (1) top wing brace cylinder constructed of 3 inch x 15 inch minimum single acting ram, chrome plated piston rods. Adjustable trip-spring mounted from wing lift cylinder housing to the back of wing. The rear brace shall be equipped with a 3 inch x 24 inch or 3 inch x 15 inch DA cylinder to actuate the telescoping strut with crossover relief. Bottom wing brace constructed of four in/10cm O.D. square outer tubing with a 3 inch O.D. square inner tube. Wear guides are welded to inner side of four in/10cm tube and to the outside of the 3 inch tube to prevent binding. The rear wing lift cylinder will be a double acting 3 inch x 27 inch minimum cylinder, chrome plated piston rods with neoprene packing. Cylinder shall float with a 500-PSI relief on the down side. The tripping spring/eyon rubber compression will be mounted to allow the wing to trip in any of the telescoping positions. The spring/eyon rubber compression shall be adjustable and have a quick release handle to remove tension for detaching the wing. The spring/eyon rubber compression will also be mounted to have tension on the wing in all telescoping positions. The telescoping strut cylinder shall have incorporated in the hydraulic system an adjustable pressure relief valve for safety, when contacting heavy objects.

Front Wing Mast: Wing mast shall not block the O.E.M. headlight. Minimum 7 inch x 15.3 LB/feet I Beam shall be used for the wing post. 5/8” inch minimum steel wing post slide lift with 10” minimum lift from ground to bottom of plow edge for travel. Front wing post cylinder double acting ram - direct (no cables) with float and 500 PSI relief on the down side is required. Cylinders shall be chrome plated piston rods with adjustable chevron type packing, neoprene wipers and bleed screw. All hydraulic hoses, shall be SAE 100RZ, 022700. Front wing post and support strut/girder arrangement shall be attached in such a way that the load is properly distributed to both chassis frame rails without the use of bracing tubes. Support struts shall be 1.250-inch diameter schedule 80 ASTM A106 Grade A or B seamless pipe brace, minimum of two. One strut shall be mounted to chassis frame. One strut shall be mounted to plow frame. Horizontal support girder 7 inch cross channel or 7-inch ship and car channel at 22.7 LB/feet or tubing 7 inch x 4 inch x .3750 inch. Bolts shall be minimum grade 8, .6250 inch N.C. Hinge assembly shall be detachable from the slider assembly of the wing mast. Formed wing post mounted on cross tube mounted to truck frame members. Wing slide plate bears on flanged surfaces of formed channel enclosing single acting cylinder, which provides full power up.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

G. WING PLOW SPECIFICATIONS: (Continued)

2. SPECIFICATIONS: (Continued)

Hydraulic Power: The front wing mast shall have a double acting cylinder vertical lift type, hydraulically controlled by a double acting cylinder direct lift. The front cylinder shall have quick connect coupler/s.

Double Acting Cylinder: A 3 inch x 15 inch minimum double acting cylinder from rear "A" frame to mold board to raise the rear of the wing and fold the wing close to the truck for transport.

Snow Leveling Wing: The wing assembly shall in no way interfere with the turning of the right or left front tire. The wing shall not be less than 11 feet long overall, 27 inch (minimum) high at the front and 34 inch (minimum) high at the discharge end. The moldboard shall be fabricated from 0.1719 inch thick (eight USS gauge) minimum steel and weigh a minimum of 755 LBS. It shall be drilled to accept standard AASHTO spacing as shown on attached drawing EQN-16A.

Steel Blade: The cutting edge shall be of ½" x 6" C1090 steel, at least 10 feet long. Per attached plow blade drawing, EQN-16A. The wing plow shall have two cast wing shoes. The patrol wing shall be hydraulically operated with the controls conveniently mounted, (to be discussed at pre-build meeting) in the truck cab with the addition of three valves to the existing valve bank. These valves shall provide lift to the front of wing, the rear of the wing and the folding of the wing toward the cab and control in and out of the strut. The front of the wing shall be controlled by a single acting ram mounted within wing post that permits the front of the wing to be vertically lifted for transportation purposes. The rear of the wing shall be hydraulically controlled and attached to tele-strut and a 3"/7.6cm x 24"/61cm single acting cylinder with 3/8" quick disconnects, (male, female, cap and plug) which shall be connected to a 7" sloped channel located under the dump body and at the rear of the truck cab. The 7" channel shall be adequately supported by brackets and cross braces to the truck frame. Bottom bracing shall extend to the rear with bridge type bracing.

Tripping: The wing shall be of the full tripping type consisting of a special spring-loaded front end. Tripping actuation shall be accomplished through a .8750-inch diameter wire torsion spring at the front end and a tension spring attached to the front and rear of the wing or eyon rubber compression system. Each spring shall be adjustable and shall automatically return the wing to its normal plowing position after it has passed over the obstruction encountered. Provision for locking out the tripping action shall be supplied for operations requiring a rigid wing.

Knuckle: The wing knuckle link at the rear of plow mold board connection shall be of a cast design. The use of welded together components is unacceptable.

Plow Markers/Guides: There shall be a two vertical plow guides on the front wing post. One shall be mounted to the stationary plow frame and the other one shall be mounted to the lift frame. Guides shall be mounted in close proximity of one another. Guides shall be visible from driver seat and the tops of the guides shall align when the wing plow is in the down position. Ref. EQN-60A

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

G. WING PLOW SPECIFICATIONS: (Continued)

3. The following minimum alterations shall be the responsibility of the successful vendor:

a. Add two Timbren load booster or active ride control stabilizers.

b. Brace right hand side plate to truck frame.

c. Add additional steel to side plates to provide increased strength and more substantial mounting for the 7 inch cross channel.

4. PLOW IDENTIFICATION:

Each unit shall bear the manufacturer's model number, serial number and weight affixed to the plow, by means of a permanently affixed non-rusting metallic tag located on the right hand backside of the moldboard as viewed from truck operator's seat.

5. PAINT:

Color: PennDOT yellow Ref: DuPont F9885, PPG 85246, Sherwin Williams 73266, or NAPA 73266 for shade only. All metal surfaces shall be cleaned prior to primer and final painting. Frame and mounting hardware shall be primed and painted black (with hardener) low VOC. All bare metal surfaces shall be coated using etching primer prior to paint. All surfaces shall be properly cleaned and prepared prior to paint, with all weld splatter and debris removed.

6. CONSPICUITY TAPE:

The rear of the wing plow shall have a strip of retro-flective sheeting across the top and down the outside in order to outline the plow when viewed from the rear. Material shall be: 2 in/5.08 cm wide Reflexite Conspicuity II System of 3M Scotchlite Conspicuity Series 980, red/silver continuous backing. Ref: EQN-60A.

7. WING PLOW LIGHT:

The rear of the wing plow shall have a Whelen part # PAWINGWR light permanently mounted facing rearward and set to be a red steady burn. Light shall be controlled by a COMUS part # CB08-90 mercury switch. Light shall be wired to be on only when the plow is in the down position. There shall be a Deutsch connector installed at the front wing hinge point to allow for easy removal. All wiring connections shall be sealed and water tight. The wing plow manufacturer shall weld a 1/2" ID steel pipe on the rearward face of the plow, **prior to painting**. Pipe shall serve as a conduit to run the wiring for the light. Pipe shall be mounted toward the top and run across the entire length of plow webbing. Ref: EQN-60A There shall be Whelen part # PAWINGIL to illuminate the wing plow. Light shall be mounted on the curb side of truck, location to be determined at pre build meeting. Light shall be controlled by a dedicated, illuminated, dash mounted switch.

I. GENERAL TRUCK SPECIFICATIONS: (Continued)

H. INSTALLATION PRACTICES:

Any place steel and aluminum contact each other Mylar or an approved equal shall be used as a buffer. Laminate rubber is unacceptable.

All welding shall be in accordance with standard welding practices as set forth by the American Welding Society.

All vertical and horizontal seams of the body sides shall be continuous welds with full penetration, no stitch welding.

All corners shall be angled or rounded for safety.

All mounting procedures shall be in accordance with NTEA standards.

All hoses shall be routed as to not interfere with any components, shall be protected from rubbing / chaffing other hoses or components.

All hydraulic circuits shall be tested for proper operation and flow. Control systems shall be tested/calibrated and programmed for Department material spread rates prior to delivery. Material spread rates will be disclosed at the pre-build meeting.

All electrical connections shall be treated with di-electric grease.

The use of any of the following items or practices WILL NOT BE ACCEPTED.

The use of accumulators or auxiliary pumps.
Non-steel fittings on hydraulic pressure lines.
Excessive use of elbows on hydraulic lines.
Use of thread tape on hydraulic fittings.
Use of galvanized fittings or components on hydraulic system.
Improper hydraulic line size.
Use of high-pressure hose for hydraulic suction line.
Scotchlok-type wire splices.
Non-insulated wire splices.
Improper hose or wire routing near exhaust, over-sharp edges or through holes without grommets, or sharp edges.
Improperly prepared, primed and painted surfaces.
Non-fused electric circuits.
Hydraulic circuits without pressure relief protection.
Laminated Rubber
All zerk fittings shall be threaded.

SPECFICATIONS
A-A1

I. SAFETY:

Anti-slip paint is required on all handholds, for the entire length, (tape is unacceptable).

All handrails, ladders, and step configurations shall be built for three points of contact.

There shall be two wheel chocks per truck Ref: buyers WC1467 or equal with a rope. Mounting location will be determined at pre-build meeting. EQN-82.

All corners shall be angled or rounded for safety.

Compliance shall be made per EQN-118.

Cab and body shall have reflective enhancement per EQN-122 and 127A.

Emergency triangle warning kit, with hold down. Warning Triangle Flare Kit, Ref: KD 610-4645, KD Lamp Co. (Tel: (513) 621-4211) or equal, stowed (fastened) in the cab. Ref: EQN-66A

Fire extinguisher: Rechargeable with vehicle mount, 3A: 40B: C minimum. Mounted in the cab for easy and quick access.

There shall be a permanent decal, 2 inch high red letters on white background affixed by the driver side door handle stating the overall maximum height of the completed and unloaded unit.
Example: HT-__' __" Ref: EQN-552

There shall be a permanent decal, "THREE POINTS OF CONTACT" located at each entry point of the truck cab and at the bed area Per EQN-552-1. Exact location to be determined at pre-build meeting.

II. DRAWINGS:

EQN-3	dated	Rev.	10-02-06	2 sheets	AUGER DRIVE SLEEVE
EQN-3A	dated	Rev.	05-23-02	1 sheet	QUICK DETACH SPREADER KIT
EQN-6	dated	Rev.	09-14-07	3 sheet	SPREADER AUGER DETAIL
EQN-9	dated	Rev.	06-03-02	sheets 1, 2 & 3	SPREADER WITH QUICK DISSCONNECT
EQN-9B	dated	Rev.	05-23-07	1sheet	URETHANE SPINNER
EQN-10	dated	Rev.	04-04-07	2 sheets	SPREADER BEARING
EQN-16A	dated	Rev.	06-14-07	2 sheets	STEEL CUTTING EDGES
EQN-23	dated	Rev.	11-03-09	1 sheet	RETURN MANIFOLD
EQN-32	dated	Rev.	07-17-07	1 sheet	DUMP TRUCK CHAIN BOXES
EQN-50	dated	Rev.	04-27-15	4 sheets	FRONT PLOW HITCH ASSEMBLY
EQN-60A	dated	Rev.	05-20-13	sheets 1 & 3	SNOW PLOW PATROL WING
EQN-66	dated	Rev.	07-20-09	2 sheets	SPLASH GUARDS – RUBBER
EQN-66A	dated	Rev.	07-20-09	1 sheet	TRIANGLE STORAGE BOX
EQN-78	dated	Rev.	10-27-06	1 sheet	CB RADIO CONNECTIONS
EQN-78A	dated	Rev.	06-03-02	sheets 2 & 3	AIR TAILGATE, HARDWARE
EQN-79A	dated	Rev.	04-27-15	sheets 1, 2 & 8	TYPE IV DUMP BODY
EQN-80A	dated	Rev.	11-12-09	1 sheet	7-WAY CONNECTOR
EQN-81X	dated	Rev.	06-30-14	2 sheets	TYPE IV REAR MODULE
EQN-81Y	dated	Rev.	07-02-12	1 sheet	DUMP BODY STEP CONFIGURATION
EQN-82	dated	Rev.	09-28-11	1 sheet	CHOCK AND HOLDER
EQN-90	dated	Rev.	07-20-09	2 sheets	PUMP ASSEMBLY
EQN-94	dated	Rev.	04-18-13	2 sheets	HOSE AND CLAMP HYCON
EQN-100	dated	Rev.	08-01-13	1 sheet	REAR HOSE MANIFOLD
EQN-118	dated	Rev.	06-26-09	1 sheet	UNDERRIDE PROTECTION
EQN-122	dated	Rev.	06-30-14	2 sheets	DUMP BODY REFLECTIVE SHEETING
EQN-124	dated	Rev.	04-22-15	1 sheet	AUXILARY SNOW PLOW LIGHT
EQN-127A	dated	Rev.	01-02-09	1 sheet	CONSPICUITY TAPE STRIPING REQUIRMENTS
EQN-351A	dated	Rev.	06-19-13	2 sheets	FAST LUBE OIL CHANGE SYSTEM
EQN-501	dated	Rev.	06-08-09	2 sheets	CENTRALIZED LUBE SYSTEM
EQN-507B	dated	Rev.	07-20-09	1 sheets	CONVENTIONAL DUMP TRUCK WEIGHT DISTRIBUTION DATA

II. DRAWINGS: (Continued)

EQN-508	dated	Rev.	11-30-09	1 sheet	VALVE ENCLOSURE/TANK COMBO
EQN-509	dated	Rev.	11-30-09	1 sheet	SPREADER CONTROL BASE
EQN-550	dated	Rev.	05-28-13	1 sheet	WIRELESS CONNECT AND TARP
EQN-552	dated	Rev.	05-29-13	1 sheet	MAX TRAVEL HEIGHT STICKER
EQN-552-1	dated	Rev.	03-23-15	1 sheet	THREE POINTS OF CONTACT DECAL
EQN-556	dated	Rev.	05-28-13	1 sheet	STANDARD DUMPTRUCK DASHBOARD
EQN-557	dated	Rev.	05-20-13	1 sheet	SHOVEL HOLDER
EQN-562	dated	Rev.	01-08-14	1 sheet	POWER DISTRIBUTION/STATE RADIO & SPREADER CONTROL

NOTE: Drawings appear in SAE.
The above referenced drawings shall become part of these specifications.
These drawings reflect the intent of the Department and any discrepancies shall be resolved at the pre-build meeting between the vendor and the Chief of the Equipment Division.

DRAWINGS APPEAR AT THE END OF THE SPECIFICATIONS.

III. MANUALS:

The successful vendor shall furnish all applicable manuals per unit:

1 Operator's

1 Parts

1 Service

1 Engine

1 Transmission (Automatic)

1 Body and Sub-frame (Parts and Service)

1 Complete set of manuals for any additional items/equipment added to a piece of equipment.

1 Electrical System Charts

1 Control System/Hydraulic and Electrical System Schematics
1 Lube System Grease/Electrical Schematics

The manuals listed above shall be official O.E.M. publications supplemented with technical manuals for all components as published by sub-vendors/manufacturers.

Parts Manual presented must be relative to "all" items utilized to build these units, with appropriate part numbers.

Delivery of these manuals shall be completed with delivery of each unit.

Manuals may be supplied on CD Disc in lieu of paper manuals.

Manuals may be supplied on a dedicated website in lieu of paper manuals.

IV. TRAINING:

See training information attachment in the bid package.

V. WARRANTY:

Per PCID No. 1075 Section E.1., and the additional specific warranty items stated below. This warranty is in effect as follows, starting from date of acceptance by the Department. Warranty shall not be voided due to Department operation as explained in the Intent Statement. It is understood that the components specified are minimum and if the manufacturer's Engineering Department recommends or deems necessary a more robust component, other than specified, be installed to meet the vehicles intent statement and to not void the warranty, it shall be the bidders/vendors responsibility.

NOTE: WARRANTY REPAIRS SHALL BE COMPLETED AT THE MANUFACTURER'S LOCATION OR IN-HOUSE FIELD REPAIR COMPLETED BY PENNDOT. IT SHALL BE THE DEPARTMENTS DISCRETION TO REPAIR INTERNALLY OR TRANSPORT THE UNIT TO THE DEALERSHIP. THE MANUFACTURER SHALL REIMBURSE THE DEPARTMENT AT THE MANUFACTURERS STANDARD PUBLISHED IN-HOUSE LABOR RATE. THE LABOR RATE SHALL BE MUTUALLY AGREED UPON BETWEEN THE DEPARTMENT AND VENDOR/BIDDER. ALL IN-HOUSE WARRANTY DOCUMENTATION SHALL BE DELIVERED WITH THE PILOT MODEL. ALL WARRANTY DOCUMENTATION SHALL BE DELIVERED WITH THE PILOT MODEL.

BUMPER-TO-BUMPER WARRANTY:

1 year starting from the Departments acceptance date.

BRAKE WARRANTY:

Manufacturer's service and warranty policy for automatic slack adjusters shall be for two (2) years 100% parts only.

RADIATOR WARRANTY:

Manufacturer's service and warranty policy for radiator shall be for two (2) years, 100% parts and labor plus an additional three (3) years, 100% parts only.

ENGINE WARRANTY:

The successful vendor and or supplying OEM shall provide the Department with a 100% parts and labor engine warranty FOR 60 months / 150,000 miles / 5,400 hours minimum. In addition to the engine warranty, the engine block shall be warranted against external perforation from corrosion for 10 years, 100% parts and labor.

NOTE: The oil pan shall be warranted against corrosion, rust, rust thru etc. regardless of atmospheric conditions for 10 years, 100% parts and labor.

EMISSION WARRANTY: The successful vendor and or supplying OEM shall provide the Department with a 100% parts and labor warranty for all emission related components to include the diesel particulate filter (DPF) FOR 60 months / 150,000 miles / 5,400 hours minimum. Shall be warranted against corrosion, rust, rust thru etc. regardless of atmospheric conditions.

VI. WARRANTY: (Continued).

TRANSMISSION WARRANTY:

Manufacturer's service and warranty policy for automatic and manual transmissions shall be five (5) years 100% parts and labor. This warranty shall include all internal and external components related to the automatic or manual transmission. This warranty shall also include, but not limited to, the transmission cooler, cooler hoses or lines, and all electronic transmission controls (harnesses, connections and modules) regardless of atmospheric conditions.

DIFFERENTIAL/AXLE WARRANTY:

Manufacturer's service and warranty policy for differential and axles shall be for three (3) years 100% parts and labor.

DUMP BODY WARRANTY:

Constructability and durability of body shall be guaranteed for five (5) years, parts and labor. A decal shall be affixed to the driver's door, on the inside, stating the company's name, address and phone number.
Body hoist assembly 3 years, 100% parts and labor.
Tailgate spring-over-air cylinder system, 3 years 100% parts and labor.

CENTRAL HYDRAULIC SYSTEM:

Complete Central Hydraulic system and components 1-year 100% parts and labor including but not limited to the following:

Saur Danfoss Valve
Controller
Electronic Joysticks

All wiring harnesses shall be warranted for 5 years 100% parts and labor.

HYDRAULIC PUMP

Manufacturer's service and warranty policy for hydraulic pump shall be three (3) year 100% parts and labor.

BODY ELECTRICAL/LIGHTING:

Wiring harness shall be 5 years 100% parts. First year shall include 100% labor.
All LED lights shall be 5 years 100% parts.

WING PLOW WARRANTY:

The manufacturer's standard service and warranty policy shall be for a minimum of two (2) years. This warranty shall start on the final date of acceptance of the entire order and continue for the two (2) years
thereafter, (2) full winter plowing seasons.