Statewide Contract 226 Winter Road Maintenance Equipment

Specifications Summary

1. Categories
    a. Heavy Truck Plows
    b. Snowplows
    c. Snowplow Blades
    d. Tailgate Spreaders
    e. V-Box Spreaders- 10', 15', 19'
    f. Pumps
    g. Brine Production Systems
    h. Brine Maker Controller
    i. Tanks
    j. Sprayer 25 Gal.
    k. Rust Preventatives/Rust Encapsulant/Salt Neutralizers
    l. Liquid Applicators
2. The respondent shall submit their bid for each desired contract line item on the provided bid sheet, labelled "Attachment C – SWC226 Bid Sheet".
3. The respondent shall submit a parts discount for components related to each line item on the same bid sheet.
4. The State will award up to two (2) contracts per line item based on the lowest overall cost.
    a. Users will be instructed to request goods from the lowest awarded vendor. If the vendor cannot provide the goods within the user's needed timeframe, the user shall then proceed to the second awarded vendor.

HEAVY TRUCK PLOW SPECIFICATIONS

REV.05/02/2025

10’ Front Mounted Snowplow (Item ID: New/TBD)

Acceptable brands/models: VCM Model MW30R10-TN EXT CURL,
Craig Mfg. Model TT-0600-10 or Equal

General

Full trip rolled formed moldboard with power reverse by use of hydraulic cylinders 35 degrees left and right. Plow bid shall be a standard proven model of manufacturer’s latest current production with additional features outlined in the following specifications. Unit shall be fully assembled and ready for installation.

Moldboard

Shall be 12’ long and 30” high. Top edge shall have a full-length integral snow shield. The front face of the moldboard is to be formed from a single sheet using 12 Ga. Strenx 100XF. The top edge of the moldboard is to extend a minimum of 17.5” forward of the cutting-edge mounting angle. The radius from the cutting-edge mounting angle to the top edge of the moldboard is to be a minimum of 24” overall. Top corners of the moldboard shall be tapered at a 45-degree angle. The outer vertical ribs shall be the cap for the moldboard cut out.

The rubber snow deflector shall be constructed of heavy-duty reinforced rubber 10’ long and 12” high and 3/8” thick. The deflector is to be bolted to the top moldboard reinforcing angle.

The moldboard front sheet shall be no less than 12 Ga. Strenx 100XF material and must be roll formed. Brake formed front sheet is not acceptable.

Moldboard shall have a 2” X 3” X 3/8” full length, one-piece top angle.

Welding must be continuous to eliminate corrosion pockets.

Reinforcement shall be six (6) ribs of 5/16” Strenx 100XF plate with 3” X 4” X 3/8” horizontal reinforcing angle full width of the moldboard. The horizontal brace angle shall be one piece design.

Segmented angles welded between the vertical ribs are not acceptable. The four center ribs shall include 1-5/16” ID X 3/8” wall X 1-1/4” length tubular bushings to accept 1-1/4” diameter push frame mounting pins.

The plow moldboard shall have a double base angle. Lower moldboard reinforcing angle is to be welded to the blade rib braces and moldboard skin. Cutting edge mounting angle constructed from 4” X 4” X ¾” structural angle shall be bolted to the lower moldboard angle. This design will allow the cutting-edge angle to be replaced if damaged and does not require replacement of the entire moldboard.

The moldboard shall be designed to allow the cutting edge (described below) to be perpendicular to the road surface when the moldboard adjustment is set in the center pitch position (15 degrees).

Plow markers shall be included with the package. Markers shall be 48” tall 3/4” diameter and must include galvanized aircraft wire rope reinforcements crimped to the lower portion of the marker and inserted into the steel mounting bracket.

Cutting Edge System

Plow shall include one of the following cutting-edge systems designed to fit a 10’ moldboard with AASHO punching:
Kuper GK-5 low noise and abrasion – resistant rubber – corundum plow cutting edge or
a winter equipment Joma 6000 articulating blade system.
12” AASHO punch for blade sections.
Three (3) four-foot-long sections are required.

Cutting Edge Reinforcement

The cutting-edge mounting angle shall be reinforced using ½” thick gusset plates welded to the cutting-edge angle the full length of the angle at 12” intervals.

Drive-Frame

Truss member shall be made from 3-1/2” X 3-1/2” X 3/8” rolled angle.
The main drive-frame member shall be made from 4” X 4” X 3/8” structural tube.
Two (2) additional pieces of 3-1/2” X 3-1/2” X 3/8” angle shall be ~~electrically~~ welded perpendicular to the main drive angle connecting with the truss member tube to form a rigid structure.
Four (4) hinge points shall be provided for pinning the moldboard to the drive-frame, spanning 86-3/8” (on center).
Hinge points shall be double lugs constructed from ½” plate.
Four (4) 1-1/4” pins shall pin the moldboard to the drive-frame.
A removable screw adjustable jack stand shall be included on the inside of the rolled angle in the center of the truss member. A storage bracket shall be included to pin the jack leg to the main drive member tube when the plow is attached to the vehicle and is in the plowing mode.

Reversible A-Frame

Pivot frame shall be fabricated from two (2) pieces of extra heavy duty 4” ship and car channel welded to form a “V”.
The base or truck side of the A-frame shall have a 1” pivot plate welded continuously to the end of the A frame.
The center of the swivel plates shall be drilled to accept a 1-1/4” swivel bolt.
The A-frame shall be attached to the 4” X 4” X 3/8” tubular pivot beam with a 1-1/4” X 6-1/2” grade 8 bolt.
The front pivot point shall have a bushing and shall be drilled and tapped for a grease fitting. Pivot bolt to be 1-1/4” grade 8.
Power reverse cylinders shall be a minimum of two (2) 3” X 10” heavy duty cylinders with induction hardened Nitrated rods.
Packing for these cylinders shall have minimum 3000 PSI operating pressure.

Ports for these cylinders shall have #8 S.A.E. male boss ratings.
Hoses shall be 3/8” diameter conforming to SAE 100R17 ratings and shall include 3/8” pioneer series 4050-39 or compatible quick disconnect fittings. One reversing hose shall have a female quick disconnect the second hose shall have the male side of the fitting so that the hoses can be coupled together when the plow is removed from the vehicle.

Plow manufacturer shall inspect our new truck hitch frame and locate hydraulic fittings so that they will not be damage during operation.
Special note: The power reverse hoses must include a two port, slim body Multifaster connection with 3/8” body and 3/8” male O-ring face seal threads.

Trip Mechanism

Moldboard trip shall be designed with three compression spring trip assemblies.
Compression springs shall be a minimum of 9/16” diameter spring size with a minimum free length of 14-1/2”.
Trip mechanism shall provide for three (3) spring tension adjustments providing a soft, medium and hard trip. Trip mechanism shall be set at medium trip upon delivery.
Push frame shall have three (3) compression trip arm mounting locations to provide the trip tension adjustments.
There shall be three (3) moldboard attachment positions to adjust the pitch of the moldboard to approximately 8 degrees, 15 degrees, or 22 degrees. Shall be set at 15 degrees upon delivery.
Tripping action of the plow shall allow for full rotation of the moldboard to the road surface (approximately 105 degrees) but be limited to 60 degrees rotation by the rubber bumpers and moldboard stops.

Lifting / Leveling Device

The plow is to be lifted by means of a single lift chain. The lift chain shall be constructed from a minimum of 3/8” proof coiled system 70 material and is to be attached to the plow push frame with a mid-link on each side of the plow frame. The mid-links shall be of proper capacity to carry the weight of the plow and must exceed the pull test weight of the chain. The lift chain shall be attached to the hitch lift arm to lift and allow the plow to lower into plowing position. Both the chain and the mid-link tensile strength shall withstand the weight of the plow under bouncing conditions during travel on rough roads.
Plow lifting chain shall be capable of adjustment that permits the plow to be transported either fully angled to the left or right side of the vehicle and remain level with the road surface. Plow leveling shall be accomplished by means of chains only; the addition of plates, slides, or rollers to level the plow is not acceptable.
NOTE: Cold shuts on any portion of the plow chain system shall not be acceptable.

Hitches / Swivel

Pin swivel shall be constructed from 4" ship and car channel with drive bars for 1-1/4" pin and shall accept plows with pin centers from 30" to 30.5".

Paint

All material shall be blasted to remove all mill scale, rust and contaminants.
Push frame parts shall be top coated black with polysiloxane direct to metal paint.
Moldboards shall be sand blasted and top coated with orange polysiloxane paint

Finished Weight

Plow shall be a minimum of 1,100 lbs. and a maximum of 1700 lbs.

Installation

The snowplow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snowplows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows and spreaders must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within eight (8) hours of F.O.B. delivery location. The supplier of the front mounted snowplow is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snowplow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snowplows and spreader system currently being bid. Franchised dealer address information must be attached. This must be a full-service franchised dealership which includes field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snowplows and spreaders.

Literature

Vendor shall provide engineer drawings and sketches to substantiate the plow meets all specifications in the bid.

12’ Front Mounted Snowplow (Item ID: 1000114263)

Acceptable brands/models: VCM Model MW30R12-TN EXT CURL,
Craig Mfg. Model TT-0600-10 or Equal

General

Full trip rolled formed moldboard with power reverse by use of hydraulic cylinders 35 degrees left and right. Plow bid shall be a standard proven model of manufacturer’s latest current production with additional features outlined in the following specifications. Unit shall be fully assembled and ready for installation.

Moldboard

Shall be 12’ long and 30” high. Top edge shall have a full length integral snow shield. The front face of the moldboard is to be formed from a single sheet using 12 Ga. Strenx 100XF. The top edge of the moldboard is to extend a minimum of 17.5” forward of the cutting edge mounting angle. The radius from the cutting edge mounting angle to the top edge of the moldboard is to be a minimum of 24” overall. Top corners of the moldboard shall be tapered at a 45 degree angle. The outer vertical ribs shall be the cap for the moldboard cut out.

The rubber snow deflector shall be constructed of heavy duty reinforced rubber 10’ long and 12” high and 3/8” thick. The deflector is to be bolted to the top moldboard reinforcing angle.

The moldboard front sheet shall be no less than 12 Ga. Strenx 100XF material and must be roll formed. Brake formed front sheet is not acceptable.

Moldboard shall have a 2” X 3” X 3/8” full length, one piece top angle.

Welding must be continuous to eliminate corrosion pockets.

Reinforcement shall be six (6) ribs of 5/16” Strenx 100XF plate with 3” X 4” X 3/8” horizontal reinforcing angle full width of the moldboard. The horizontal brace angle shall be one piece design.

Segmented angles welded between the vertical ribs are not acceptable. The four center ribs shall include 1-5/16” ID X 3/8” wall X 1-1/4” length tubular bushings to accept 1-1/4” diameter push frame mounting pins.

The plow moldboard shall have a double base angle. Lower moldboard reinforcing angle is to be welded to the blade rib braces and moldboard skin. Cutting edge mounting angle constructed from 4” X 4” X ¾” structural angle shall be bolted to the lower moldboard angle. This design will allow the cutting edge angle to be replaced if damaged and does not require replacement of the entire moldboard.

The moldboard shall be designed to allow the cutting edge (described below) to be perpendicular to the road surface when the moldboard adjustment is set in the center pitch position (15 degrees).

Plow markers shall be included with the package. Markers shall be 48” tall 3/4” diameter and must include galvanized aircraft wire rope reinforcements crimped to the lower portion of the marker and inserted into the steel mounting bracket.

Cutting Edge System

Plow shall include one of the following cutting edge systems designed to fit a 12' moldboard with AASHO punching:
Kuper GK-5 low noise and abrasion – resistant rubber – corundum plow cutting edge or
a winter equipment Joma 6000 articulating blade system.
12" AASHO punch for blade sections.
Three (3) four foot long sections are required.

Cutting Edge Reinforcement

The cutting edge mounting angle shall be reinforced using ½" thick gusset plates welded to the cutting edge angle the full length of the angle at 12" intervals.

Drive-Frame

Truss member shall be made from 3-1/2" X 3-1/2" X 3/8" rolled angle.
The main drive-frame member shall be made from 4" X 4" X 3/8" structural tube.
Two (2) additional pieces of 3-1/2" X 3-1/2" X 3/8" angle shall be welded perpendicular to the main drive angle connecting with the truss member tube to form a rigid structure.
Four (4) hinge points shall be provided for pinning the moldboard to the drive-frame, spanning 86-3/8" (on center).
Hinge points shall be double lugs constructed from ½" plate.
Four (4) 1-1/4" pins shall pin the moldboard to the drive-frame.
A removable screw adjustable jack stand shall be included on the inside of the rolled angle in the center of the truss member. A storage bracket shall be included in order to pin the jack leg to the main drive member tube when the plow is attached to the vehicle and is in the plowing mode.

Reversible A-Frame

Pivot frame shall be fabricated from two (2) pieces of extra heavy duty 4" ship and car channel welded to form a "V".
The base or truck side of the A-frame shall have a 1" pivot plate welded continuously to the end of the A frame.
The center of the swivel plates shall be drilled to accept a 1-1/4" swivel bolt.
The A-frame shall be attached to the 4" X 4" X 3/8" tubular pivot beam with a 1-1/4" X 6-1/2" grade 8 bolt.
The front pivot point shall have a bushing and shall be drilled and tapped for a grease fitting. Pivot bolt to be 1-1/4" grade 8.
Power reverse cylinders shall be a minimum of two (2) 3" X 10" heavy duty cylinders with induction hardened Nitrated rods.
Packing for these cylinders shall have minimum 3000 PSI operating pressure.
Ports for these cylinders shall have #8 S.A.E. male boss ratings.

Hoses shall be 3/8” diameter conforming to SAE 100R17 ratings and shall include 3/8” pioneer series 4050-39 or compatible quick disconnect fittings. One reversing hose shall have a female quick disconnect the second hose shall have the male side of the fitting so that the hoses can be coupled together when the plow is removed from the vehicle.

Plow manufacturer shall inspect our new truck hitch frame and locate hydraulic fittings so that they will not be damage during operation.
Special note: The power reverse hoses must include a two port, slim body Multifaster connection with 3/8” body and 3/8” male O-ring face seal threads.

Trip Mechanism

Moldboard trip shall be designed with three compression spring trip assemblies.
Compression springs shall be a minimum of 9/16” diameter spring size with a minimum free length of 14-1/2”.
Trip mechanism shall provide for three (3) spring tension adjustments providing a soft, medium and hard trip. Trip mechanism shall be set at medium trip upon delivery.
Push frame shall have three (3) compression trip arm mounting locations to provide the trip tension adjustments.
There shall be three (3) moldboard attachment positions to adjust the pitch of the moldboard to approximately 8 degrees, 15 degrees, or 22 degrees. Shall be set at 15 degrees upon delivery.
Tripping action of the plow shall allow for full rotation of the moldboard to the road surface (approximately 105 degrees) but be limited to 60 degrees rotation by the rubber bumpers and moldboard stops.

Lifting / Leveling Device

The plow is to be lifted by means of a single lift chain. The lift chain shall be constructed from a minimum of 3/8” proof coiled system 70 material and is to be attached to the plow push frame with a mid-link on each side of the plow frame. The mid-links shall be of proper capacity to carry the weight of the plow and must exceed the pull test weight of the chain. The lift chain shall be attached to the hitch lift arm to lift and allow the plow to lower into plowing position. Both the chain and the mid-link tensile strength shall withstand the weight of the plow under bouncing conditions during travel on rough roads.
Plow lifting chain shall be capable of adjustment that permits the plow to be transported either fully angled to the left or right side of the vehicle and remain level with the road surface. Plow leveling shall be accomplished by means of chains only; the addition of plates, slides, or rollers in order to level the plow is not acceptable.
NOTE: Cold shuts on any portion of the plow chain system shall not be acceptable.

Hitches / Swivel

Pin swivel shall be constructed from 4" ship and car channel with drive bars for 1-1/4" pin and shall accept plows with pin centers from 30" to 30.5".

Paint

All material shall be blasted to remove all mill scale, rust and contaminants.
Push frame parts shall be top coated black with polysiloxane direct to metal paint.
Moldboards shall be sand blasted and top coated with orange polysiloxane paint

Finished Weight

Plow shall be a minimum of 1,300 lbs. and a maximum of 1800 lbs.

Installation

The snowplow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snowplows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows and spreaders must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within eight (8) hours of F.O.B. delivery location. The supplier of the front mounted snowplow is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snowplow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snowplows and spreader system currently being bid. Franchised dealer address information must be attached. This must be a full service franchised dealership which includes field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snowplows and spreaders.

Literature

Vendor shall provide engineer drawings and sketches to substantiate the plow meets all specifications in the bid.

14’ Front Mounted Snow Plow (Item ID: 1000114259)

Acceptable brands/models: VCM Model MW30R14-TN EXT CURL,
Craig Mfg. Model TT-0600-10 or Equal

General

Full trip rolled formed moldboard with power reverse by use of hydraulic cylinders 35 degrees left and right. Plow bid shall be a standard proven model of manufacturer’s latest current production with additional features outlined in the following specifications. Unit shall be fully assembled and ready for installation.

Moldboard

Shall be 14’ long and 30” high. Top edge shall have a full length integral snow shield. The front face of the moldboard is to be formed from a single sheet using 12 Ga. Strenx 100XF the top edge of the moldboard is to extend a minimum of 17.5” forward of the cutting edge mounting angle. The radius from the cutting edge mounting angle to the top edge of the moldboard is to be a minimum of 24” overall. Top corners of the moldboard shall be tapered at a 45 degree angle. The outer vertical ribs shall be the cap for the moldboard cut out.

The rubber snow deflector shall be constructed of heavy duty reinforced rubber 12’ long and 12” high and 3/8” thick. The deflector is to be bolted to the top moldboard reinforcing angle.

The moldboard front sheet shall be no less than 12 Ga Strenx 100XF material and must be roll formed. Brake formed front sheet is not acceptable.

Moldboard shall have a 2” X 3” X 3/8” full length, one piece top angle.

Welding must be continuous to eliminate corrosion pockets.

Reinforcement shall be eight (8) ribs of 5/16” Strenx 100XF plate with 3” X 4” X 3/8” horizontal reinforcing angle full width of the moldboard. The horizontal brace angle shall be one piece design. Segmented angles welded between the vertical ribs are not acceptable. The six (6) center ribs shall include 1-5/16” ID X 3/8” wall X 1-1/4” length tubular bushings to accept 1-1/4” diameter push frame mounting pins.

The plow moldboard shall have a double base angle. Lower moldboard reinforcing angle is to be welded to the blade rib braces and moldboard skin. Cutting edge mounting angle constructed from 4” X 4” X ¾” structural angle shall be bolted to the lower moldboard angle. This design will allow the cutting edge angle to be replaced if damaged and does not require replacement of the entire moldboard.

The moldboard shall be designed to allow the cutting edge (described below) to be perpendicular to the road surface when the moldboard adjustment is set in the center pitch position (15 degrees).

Plow markers shall be included with the package. Markers shall be 48” tall 3/4" diameter and must include galvanized aircraft wire rope reinforcements crimped to the lower portion of the marker and inserted into the steel mounting bracket.

Cutting Edge System

Plow shall include one of the following cutting edge systems designed to fit a 14' moldboard with AASHO punching:
Kuper GK-5 low noise and abrasion – resistant rubber – corundum plow cutting edge or
a winter equipment Joma 6000 articulating blade system.
12" AASHO punch for blade sections.
Two (2) three foot sections and two (2) four foot long sections are required.

Cutting Edge Reinforcement

The cutting edge mounting angle shall be reinforced using ½" thick gusset plates welded to the cutting edge angle the full length of the angle at 12" intervals.

Drive-Frame

Truss member shall be made from 3-1/2" X 3-1/2" X 3/8" rolled angle.
~~A~~ The main drive-frame member shall be made from 4" X 4" X 3/8" structural tube.
Two (2) additional pieces of 3-1/2" X 3-1/2" X 3/8" angle shall be welded perpendicular to the main drive angle connecting with the truss member tube to form a rigid structure. Six (6) hinge points shall be provided for pinning the moldboard to the drive-frame, spanning 137" (on center).
Hinge points shall be double lugs constructed from ½" plate. Six (6) 1-1/4" pins shall pin the moldboard to the drive-frame. A removable screw adjustable jack stand shall be included on the inside of the rolled angle in the center of this truss member. A storage bracket shall be included in order to pin the jack leg to the main drive member tube when the plow is attached to the vehicle and is in the plowing mode.

Reversible A-Frame

Pivot frame shall be fabricated from two (2) pieces of extra heavy duty 4" ship and car channel welded to form a "V"
The base or truck side of the A-frame shall have a 1" pivot plate welded continuously to the end of the A frame.
The center of the swivel plates shall be drilled to accept a 1-1/4" swivel bolt.
The A-frame shall be attached to a 4" X 4" X 3/8" tubular pivot beam with a 1-1/4" X 6-1/2" grade 8 bolt.
The front pivot point shall have a bushing and shall be drilled and tapped for grease fitting. Pivot bolt to be 1-1/4" grade 8.
Power reverse cylinders shall be a minimum of two (2) 3" X 10" heavy duty cylinders with induction hardened Nitrated rods.
Packing for these cylinders shall have minimum 3000 PSI operating pressure.
Ports for these cylinders shall have #8 S.A.E. male boss threads.
Hoses shall be 3/8" diameter conforming to SAE 100R17 ratings and shall include 3/8" pioneer series 4050-39 or compatible quick disconnect fittings. One reversing hose shall have a female quick

disconnect the second hose shall have the male side of the fitting so that the hoses can be coupled together when the plow is removed from the vehicle.
Plow manufacturer shall inspect our new truck hitch frame and locate hydraulic fittings so that they will not be damage during operation.
Special note: The power reverse hoses must include a two port, slim body Multifaster connection with 3/8" body and 3/8" male O-ring face seal threads.

Trip Mechanism

Moldboard trip shall be designed with three compression spring trip assemblies.
Compression springs shall be a minimum of 9/16" diameter spring size with a minimum free length of 14-1/2".
Trip mechanism shall provide for three (3) spring tension adjustments providing a soft, medium and hard trip. Trip mechanism shall be set at medium trip upon delivery.
Push frame shall have three (3) compression trip arm mounting locations to provide the trip tension adjustments.
There shall be three (3) moldboard attachment positions to adjust the pitch of the moldboard to approximately 8 degrees, 15 degrees, or 22 degrees. Shall be set at 15 degrees upon delivery.
Tripping action of the plow shall allow for full rotation of the moldboard to the road surface (approximately 105 degrees) but be limited to 60 degrees rotation by the rubber bumpers and moldboard stops.

Lifting / Leveling Device

The plow is to be lifted by means of a single lift chain. The lift chain shall be constructed from a minimum of 3/8" proof coiled system 70 material and is to be attached to the plow push frame with a mid-link on each side of the plow frame. The mid-links shall be of proper capacity to carry the weight of the plow and must exceed the pull test weight of the chain. The lift chain shall be attached to the hitch lift arm to lift and allow the plow to lower into plowing position. Both the chain and the mid-link tensile strength shall withstand the weight of the plow under bouncing conditions during travel on rough roads.
Plow lifting chain shall be capable of adjustment that permits the plow to be transported either full angled to the left or right side of the vehicle and remain level with the road surface. Plow leveling shall be accomplished by means of chains only; the addition of plates, slides, or rollers in order to level the plow is not acceptable.
NOTE: Cold shuts on any portion of the plow chain system shall not be acceptable.

Hitches / Swivel

Pin swivel shall be constructed from 4" ship and car channel with drive bars for 1-1/4" pin and shall accept plows with pin centers from 30" to 30.5".

Paint

All material shall be blasted to remove all mill scale, rust and contaminants.

Push frame parts shall be top coated black with polysiloxane direct to metal paint.

Moldboards shall be sand blasted and top coated with orange polysiloxane paint.

Finished Weight

Plow shall be a minimum of 1,500 lbs. and a maximum of 2,100 lbs.

Installation

The snowplow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snowplows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows and spreaders must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within eight (8) hours of F.O.B. delivery location. The supplier of the front mounted snowplow is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snowplow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snowplows and spreader system currently being bid. Franchised dealer address information must be attached. This must be a full service franchised dealership which includes field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snowplows and spreaders.

Literature

Vendor shall provide engineer drawings and sketches to substantiate the plow meets all specifications in the bid.

PLOW SPECIFICATIONS

Rev.12/21

8’ Front Mounted Snow Plow (Item ID 1000176369)

Acceptable Brands/Models: Boss Super Duty Straight Blade, Western Pro Plus or Equal

Moldboard

The blade shall be 8’ wide and is a full moldboard trip blade design.
Blade moldboard shall be constructed from a minimum 11 gauge steel and includes standard cast iron wear shoes.
Cutting edge shall be Kuper GK-5 rubber edge with ceramic inserts or Joma 6000
Blade shall be 29” high with 7 vertical and 2 diagonal ribs. Blade measures 83” wide when angled at 30° and 96” when in the straight position.
Blade shall have a heavy duty push frame and quadrant which 1½” X 10” hydraulic angle rams attach directly to.
The quadrant shall have built in angle ram stops. Blade shall include 4 fully adjustable trip springs and a shock absorber.
The blade and all attached parts shall have a baked-on powder coat finish with a zinc primer undercoating.
Note: Stainless steel or poly moldboard is not acceptable

Plow Attaching System

The plow shall have a hydraulically assisted attaching mechanism with an electrical toggle switch mounted on the headgear.
The connecting pin spring levers can be properly positioned and shall engage automatically when toggle switch is energized, and headgear is raised by use of the hydraulic lift cylinder and hydraulic power unit.
The system shall also have a direct mounted 2” x 1⅛” x 10” lift ram with no lift chain or linkage or a two chain lift system.
The truck mounted push assembly shall be height adjustable to be properly adjusted to various vehicle ride heights.

Headlamp System

The plow headlamps shall have high and low beam capability. Halogen or L.E.D. bulbs are acceptable. Front lenses with a built-in defrosting system to eliminate snow and ice build-up are required if bidding an L.E.D. bulb. System shall include cab mounted toggle switch to energize plow lights when plow is attached. Headlamp mounting mechanism shall include wraparound type hold down mount and tab style adjustment locking mechanism.
Lights meet SAE and FMVSS 108 specifications.

Electrical / Control System

PLOW SPECIFICATIONS

Rev.12/21

Electrical system shall have two connectors at the vehicle grille.
Control harness shall have complete compatibility to operate either straight plows or Vee plows with no modifications to harness.
Electrical power for plow shall come directly from vehicle battery and shall have no effect on other vehicle systems.
Plow control options shall include a push button type handheld control or a joystick type control.
Handheld control shall have options that include the control being mounted to dash or the handle being removed for operators' preference.

Hydraulic System

The complete hydraulic system shall be contained inside an enclosure protecting it from corrosive elements and hydraulic freeze-up.
The two part system shall consist of an electric hydraulic power unit operating at 2500PSI and a separate electrically activated hydraulic valve block.
The atmospheric breather for the system shall be enclosed from the elements to avoid water ingression each time the system is activated.
All plow angling hydraulic cylinders shall have nitride coated rods to resist corrosion. Fluid level can be checked without tools.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within eight (8) hours of F.O.B. delivery location. The supplier of the front mounted snow plows is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows currently being bid. Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians.

Manuals

PLOW SPECIFICATIONS

Rev.12/21

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

9’ Front Mounted Snow Plow (Item ID 1000176370)

Acceptable Brands/Models: Boss Super Duty Straight Blade, Western Pro Plus or Equal

Moldboard

The blade shall be 9’ wide and is a full moldboard trip blade design.
Blade moldboard shall be constructed from 11 gauge steel and includes standard cast iron wear shoes.
Cutting edge shall be Kuper GK-5 rubber edge with ceramic inserts or Joma 6000
Blade shall be 29” high with 7 vertical and 2 diagonal ribs. Blade measures 93 1/2” wide when angled at 30° and 96” when in the straight position.
Blade shall have a heavy duty push frame and quadrant which 1½” X 10” hydraulic angle rams attach directly to.
The quadrant shall have built in angle ram stops. Blade shall include 4 fully adjustable trip springs and a shock absorber.
The blade and all attached parts shall have a baked-on powder coat finish with a zinc primer undercoating.
Note: Stainless steel or poly moldboard is not acceptable

Plow Attaching System

The plow shall have a hydraulically assisted attaching mechanism with an electrical toggle switch mounted on the headgear.
The connecting pin spring levers can be properly positioned and shall engage automatically when toggle switch is energized, and headgear is raised by use of the hydraulic lift cylinder and hydraulic power unit.
The system shall also have a direct mounted 2” x 1⅛” x 10” lift ram with no lift chain or linkage or a two chain lift system.
The truck mounted push assembly shall be height adjustable to be properly adjusted to various vehicle ride heights.

Headlamp System

PLOW SPECIFICATIONS

Rev.12/21

The plow headlamps shall have high and low beam capability. Halogen of L.E.D bulbs are acceptable. Front lenses with a built-in defrosting system to eliminate snow and ice build-up are required if bidding and L.E.D. bulb. System shall include cab mounted toggle switch to energize plow lights when plow is attached. Headlamp mounting mechanism shall include wraparound type hold down mount and tab style adjustment locking mechanism.
Lights meet SAE and FMVSS 108 specifications.

Electrical / Control System

Electrical system shall have two connectors at the vehicle grille.
Control harness shall have complete compatibility to operate either straight plows or Vee plows with no modifications to harness.
Electrical power for plow shall come directly from vehicle battery and shall have no effect on other vehicle systems.
Plow control options shall include a push button type handheld control or a joystick type control.
Handheld control shall have options that include the control being mounted to dash or the handle being removed for operators' preference.

Hydraulic System

The complete hydraulic system shall be contained inside an enclosure protecting it from corrosive elements and hydraulic freeze-up.
The two part system shall consist of an electric hydraulic power unit operating at 2500PSI and a separate electrically activated hydraulic valve block.
The atmospheric breather for the system shall be enclosed from the elements to avoid water ingression each time the system is activated.
All plow angling hydraulic cylinders shall have nitride coated rods to resist corrosion. Fluid level can be checked without tools.

Installation

The snow plow manufacturer is required to supply with each piece of equipment, a full set installation instruction detailing torque specifications for the mounting fasteners, hydraulic oil specifications for the plow hydraulic system and wiring schematics covering the plow headlights. The awarded vendor shall install snow plows per the manufacturer's instructions as supplied with bid. Bid price shall include all cost for installation and all vehicle modifications. The electronic controls for the plows must be wired thru a "key on hot" ignition source provided by the truck manufacturer. An electronic connection added to the truck's electrical system by the vendor is not acceptable.

Parts & Service

Manufacturer's franchised authorized dealer must have parts and service facility within eight (8) hours of F.O.B. delivery location. The supplier of the front mounted snow plows is required to have a minimum of two (2) associates, who have completed certification training of the systems being provided, residing in

the state of Tennessee. Each associate must have a minimum of four (4) years working experience in the snow plow equipment industry. They must also have completed certification training of the systems being provided to the state of Tennessee. The two associates will provide statewide training, and they shall also provide troubleshooting and warranty repairs for the snow plows currently being bid. Franchised dealer address information must be attached to ITB and is a requirement for award. This must be a full service franchised dealership which includes; field representatives, manufacturer's required specialized tools, fully equipped service trucks, factory trained technicians.

Manuals

Manuals (printed or electronic) shall be provided with each unit and shall consist of complete electrical and hydraulic schematic drawings, replaceable parts list including brand names and part numbers of the snow plows and spreaders.

Acceptable Brands/Models: Boss Super Duty Straight Blade, Western Pro Plus or Equal

SNOWPLOW BLADE SPECIFICATIONS

Front Snowplow Blades, Carbide Inserts 3 Ft. (Item Id: 1000200495) And 4 Ft. (Item ID: 1000200496) Lengths, 7/8" X 6"

Acceptable Brands: Chemung, Valk, or equal

1. Blade:
   - 1.1 The Blade shall be Flat, Hot Rolled Finished Steel SAE 1020
   - 1.2 Holes shall be 11/16" Square Counter-Sunk to Receive 5/8" Diameter No. 3 Head Plow Bolt, to be standard highway punch
   - 1.3 The groove for the carbide inserts shall be milled in the center of the blade edge
   - 1.4 Center of Holes shall be in line within 1/32" of Established Centerline

2. Tungsten Carbide Inserts:
   - 2.1 The Inserts shall be Virgin Tungsten Carbide with 10 1/2 to 12 Percent Cobalt Content
     - Density: 14.1 Minimum to 14.6 Maximum
     - Hardness: 87.8 Minimum to 88.6 Maximum Rockwell Ra. "A"
     - Scales: Transverse Rupture Strength (P.S.I.) 350,000 Min. (Certification Required)
   - 2.2 The Inserts shall be of the following dimensions:
     - Height: .635" +/- .005 (Long Side)
     - Width: .365" +/- .010
     - Length: 1" Nominal
     - Bottom Angle: 25 Degrees with a Nose Radius of 1/16" Minimum

3. Brazing
   - 3.1 The Braze shall have a shear strength no less than 30,000 P.S.I.
   - 3.2 The tungsten carbide inserts shall be positioned in the milled grove at .010 inch between the inserts for the entire length of each cutting section.
   - 3.3 The Inserts shall be induction brazed on all sides consistent with sound particles with no evidence of voids or use of shims.
   - 3.4 Each blade section to contain one insert one inch nominal length for each inch of blade section length. (reference 2.2)

4. Specific Requirements:
   - 4.1 The Difference Between the Highest and Lowest Tip Point not to exceed 1/32" on any given Blade Assembly
   - 4.2 The Finished Blade Section shall be free of Warpage and Longitudinal Deviation not to exceed 1/8" in a Four-Foot Blade Section

Front Snowplow Blades, Rubber 3' Section (Item ID:1000200497)

Low –noise and abrasion-resistant rubber blade.
Dimensions: 3 foot long, minimum .75" thick, minimum 7" high
Acceptable Brands/Models: Kuper GK5, Joma 6000, or equal

1. Wear resistant rubber body with ceramic inlays or tungsten carbide inserts
2. Standard Highway punching pattern with holes for 5/8" plow bolts.
3. Mounting hardware for cutting edge system must include cover blade, backer blade, individual carbide or ceramic sections and all necessary mounting bolts and hardware if required.

Front Snowplow Blades, Rubber 4' Section (Item ID:1000200498)

Low –noise and abrasion-resistant rubber blade.
Dimensions: 4 foot long, minimum .75" thick, minimum 7" high
Acceptable Brands/Models: Kuper GK5, Joma 6000, or equal

1. Wear resistant rubber body with ceramic inlays or tungsten carbide inserts.
2. Standard Highway punching pattern with holes for 5/8" plow bolts
3. Mounting hardware for cutting edge system must include cover blade, backer blade, individual carbide or ceramic sections and all necessary mounting bolts and hardware, if required.

Grader Blades, Type "B", Thru Hardened, 6 Ft. (Item Id: 1000114250) and 7 Ft. (Item Id: 1000176361) X 8 Inch X 5/8 Inch

This type "B" cutting edge shall be manufactured to standards and quality to withstand severe impact loads imposed in normal highway construction and ditching on motor grades through 175 H.P. range without undue breakage or chipping. The cutting edge shall be thru-hardened and shall have a Brinell Hardness Range of 400 - 512.

Acceptable Brands: Chemung, Valk, or equal

1. Fabrication:
   1.1 Blades shall be fabricated to comply with dimensions; hole punching to be standard highway punched.
   1.2 Holes shall be squared and countersunk to accept a #3 head plow bolt. The minimum average weight of a 6 ft. X 8-inch x 5/8-inch blade shall be 91 lbs. And in no case shall any individual blade be more than two (2) pounds below this average.
   1.3 Bids shall be accompanied by a certified Mill Test Report showing numerical values for chemical and physical analysis and meeting the requirements of the specifications.

Grader Blades, Carbide Tipped, Beveled Top Edge, 3 Foot (Item Id:1000200491) and 4 Foot X 7/8" X 5" (Item Id: 1000200492)

Acceptable Brands: Chemung, Valk, or equal

1. Blade:
   1.1 The Blade shall be Flat, Hot Rolled Finished Steel SAE 1020
   1.2 The Blade shall be beveled on top to allow for mounting to grader.
   1.3 Holes Shall be 11/16" Square Counter-Sunk to Receive 5/8" Diameter No. 3 Head Plow Bolt. Standard Highway punch
   1.4 The groove for the carbide inserts shall be milled in the center of the blade edge.
   1.5 Center of holes shall be in line within 1/32" of established centerline.

2. Tungsten Carbide Inserts:
   2.1 The inserts shall be virgin tungsten carbide with 10 1/2 to 12 percent cobalt content.
   Density: 14.1 Minimum To 14.6 Maximum
   Hardness: 87.8 Minimum To 88.6 Maximum Rockwell Ra. "A" Scales: Transverse Rupture Strength (P.S.I.) 350,000 Min. (Certification Required)
   2.2 The inserts shall be of the following dimensions:
   Height:. 635" +/- .005 (Long Side)
   Width: .365" +/- .010
   Length: 1" Nominal
   Bottom Angle: 25 Degrees with a nose radius Of 1/16" minimum
   2.3 Brazing the Braze shall have a Shear Strength no less than 30,000 P.S.I.
   2.4 The Tungsten Carbide Inserts shall be positioned in the milled grove at .010 inch between the inserts for the entire length of each cutting section.
   2.5 The Inserts shall be induction brazed on all sides consistent with sound particles with no evidence of voids or use of shims.
   2.6 Each blade section to contain one insert one inch nominal length for each inch of blade section length. (Reference 2.2)
3. Specific requirements:
   3.1 The difference between the highest and lowest tip point not to exceed 1/32" on any given blade assembly.
   3.2 The finished blade section shall be free of warpage and longitudinal deviation not to exceed 1/8" in a four-foot blade section.

Underbody Scraper Blades, Carbide Inserts, 3 Ft. (Item Id: 1000200493) and 4 Ft. (Item Id: 1000200494) Lengths, 7/8" X 5"

Acceptable Brands: Chemung, Valk, or equal

1. Blade:
   - 1.1 The blade shall be fabricated from flat hot-rolled finished steel meeting or exceeding 1040 type steel specifications.
   - 1.2 Holes shall be 11/16" square counter-sunk to receive 5/8" Diameter No. 3 head plow bolt. Hole punching to be standard highway punched
   - 1.3 The groove for the carbide inserts shall be milled in the center of the blade edge.
   - 1.4 Center of holes shall be in line within 1/32" of established centerline and 1/16" of established vertical center line.

2. Tungsten Carbide Inserts:
   - 2.1 The Inserts Shall be High Shock Tungsten Carbide With 11 To 12 .5 Percent Cobalt Content.
     Density: 14.1 Minimum To 14.6 Maximum
     Hardness: 87.0 Minimum To 89.0 Maximum Rockwell "A" Scales
     Transverse Rupture Strength (P.S.I.) 350,000 Min. (Certification Required)

   - 2.2 The Inserts shall be of the following dimensions:
     Height: .635" +/- .005 (Long Side)
     Width: .365" +/- .010
     Length: 1" Nominal
     Bottom Angle: 25 Degrees with A Nose Radius Of 1/16" Minimum

3. Brazing
   - 3.1 The Inserts shall be brazed reverse angled securely in place along the entire length of the blade using an alloy type braze material and an induction brazing process.
   - 3.2 The Tungsten Carbide Inserts shall be positioned in the milled grove at .010 inch between the inserts for the entire length of each cutting section.
   - 3.3 The Inserts shall be brazed on all sides consistent with sound particles with no evidence of voids or use of shims.
   - 3.4 Each Blade Section to contain one insert, one inch nominal length for each inch of blade section length (Reference 2.2)

4. Specific Requirements:
   - 4.1 The difference between the highest and lowest tip point not to exceed 1/32" on any given blade assembly.
   - 4.2 The finished blade section shall be free of warpage and longitudinal deviation not to exceed 1/8" in a four-foot blade section.
   - 4.3 The finished blade sections shall have marking showing the front edge of the blade to avoid improper mounting.

Underbody Scraper Blades with Ceramic Insert, 3' (Item ID 1000176374) and 4' (Item ID 1000176375)

Acceptable brands: Kuper Kombi, Joma, or equal.

1. Description: This specification covers snowplow blades for underbody plows with ceramic inserts free floating in vulcanized rubber with the configuration of STEEL-RUBBER-CERAMIC-RUBBER-STEEL.

2. Materials

2.1 Front Steel Plate:

Wear-resistant steel with an average hardness of 400HB
Plate thickness of 8mm
Hardness: 400HB (43 Rockwell C, 114 Rockwell B) Tensile Strength: U.T.S. = 1300 MPa
Yield Point: Y.P. = 1000 MPa
Tolerances according to specification of DILLIDUR 400V

2.2 Back Steel Plate:

Wear resistant steel with an average hardness of 400HB Plate thickness of 6mm
Hardness: 400HB (43 Rockwell C, 114 Rockwell B)
Tensile Strength: U.T.S. = 1300 MPa
Yield Point: Y.P. = 1000 MPa
Tolerances according to specification of DILLIDUR 400V

2.3 Rubber:

The blade shall have a wear resistant rubber body, vulcanized between two steel plates with ceramic inserts embedded within the rubber.

2.4 Ceramic inlays:

The inlay must according to DIN ISO
Hardness of the inlay must be >15000 HV10
Bending strength must be over 300 MPa
The average grain size must be between 2 - 8 µm Density 3.65 g/cm²

3. Finished Blades Dimensions

3.1 Overall blade height 125mm (tolerance ± 2mm)
3.2 Overall blade thickness 36mm (tolerance ± 2mm)
3.3 Overall blade length according to customer and plow requirements
3.4 The hole position and design must be according to customer and plow requirements.

4. Physical Requirements

4.1 All blades shall be straight and free from flaws and injurious defects and shall have workmanlike finish.
4.2 The mounting area must have a physical protection again over tightening of bolts. The percentage of ceramic in the rubber must be more than 38% per foot.
4.3 The percentage of ceramic with contact to the road should not be under 35% per foot.
4.4 Each blade section should provide the name of the manufacturer and a serial number for quality control.

TAILGATE SPREADER, AUGER TYPE,304 STAINLESS-STEEL SPECIFICATIONS
(Item ID: 1000120019)

Acceptable Brands: SaltDogg, Swenson, or Equal

1. Type - Single auger
2. Width: 96”
3. 3. Hopper – 7 gauge 304 stainless-steel, continuous weld
4. Cover plate – Manufactured from 7 gauge 304 stainless-steel, designed for easy clean out from both top and bottom. Rear plate also to serve a as spill plate over auger for dumping over and across the spreader hopper. Clean-out and dumping features shall be accomplished without the use of tools, pins, latches, etc. Shall be secured to spreader by manufacturer design.
5. Anti-spill cover plate – Must prevent material free flow when auger is idle, Removable without tools.
6. Tailgate spill plate – Manufactured from 7-gauge minimum steel. Plate designed for attaching to inside tailgate at ends to prevent material spillage at end of spreader when tailgate is at its maximum opening for material spreading.
7. Auger – Full width- 7’, Manufactured from minimum 2-3/8” O.D. schedule 80 pipe. 6” single, one-way directional step flite or continuous with 3/8” flites, designed to send material to extreme left.
   *Note: Auger must move salt to the extreme left, an offset to brace will not be acceptable. Spinner must be visible from driver’s mirror. Reverse flite will not be acceptable.
8. Auger drive – Hydraulic motor, Char-lynn or equal , mounted to a 5:1 reduction worm gear type, gear box speed reducer developing 4,224-inch pounds of torque.
9. Bearings – Self-aligning sealed, dust-proof grease fittings. Minimum 1-1/4” I.D.
10. Spinner (Single) – 18” minimum, 304 stainless-steel formed for low trajectory with six stainless-steel 3/16” replaceable fins. Adjustable spread left to center to right. Spinner to be located extreme left side of spreader.
11. Spinner shield – Shield to be provided to prevent salt from striking truck.
12. Stabilizer of parallel bar -To keep spinner parallel to rad at all bump angles.
13. Hydraulic hose – Wire braid pressure and return sufficient length to hook up spreader to rear of trucks central hydraulic system. Hose end to be furnished less quick disconnect coupler.
14. Hose sizes - Spinner: ½”; Auger: ½”; Return: ¾”
15. Spreader to be delivered with all necessary components, brackets hydraulic hoses and accessories to form a complete unit for installation and proper operation.

16. Through Mounting- Quick attach or removal with no parts to detach. Heavy duty steel rod latches.
17. Color - Black (Note: Any components manufactured from stainless-steel do not require painting.)
18. Spreader designed so spreaders top cover can open when truck dump bed tailgate is closed. *Note: 4” Spacer is required between truck tailgate and spreader.
19. Manuals, parts list, and mounting instructions.

V-BOX MATERIAL SPREADER SPECIFICATIONS, 10 FT (Item ID: 1000120006)

1. **General Description:**
   - **a.** This specification shall describe a v-box material spreader capable of hauling and spreading free flowing granular materials from a width of four (4) to forty (40) feet.
   - **b.** This unit will consist of a hopper, Dual Auger discharge/feed, spinner disc, power drive, and all components necessary to make a complete operating unit.
   - **c.** All bidders shall provide a complete proposal drawing accurately showing the exact model to be provided including all options, and units, loaded and unloaded weights and centers of gravity. These drawings shall be provided as part of the bid package. Failure to attach these drawings with the completed bid form will be grounds for disqualification of the entire bid package.
   - **d.** This unit shall be factory ready to accept or retrofit servo controls.
   - **e.** All stainless steel used in the production of this unit shall be corrosion resistant, non-magnetic stainless steel.
   - **f.** The manufacturing and production of this unit shall be of the best commercial practices and only materials of the finest quality are to be used.
   - **g.** Bidders must submit with their bid complete specifications on the unit they propose to furnish.
   - **h.** Hopper body sides shall be constructed of 201 Grade, 10 GA. minimum non-magnetic stainless steel. Hopper sides shall be formed of one solid piece. **NO WELDED SEAMS OR SPLICES ON THE SIDE SHEET ARE PERMITTED.**

2. **Body:**
   - a. Construction – 10 Ga. 201 minimum non-magnetic stainless steel with a double crimped top edge forming a 2" section for greater rigidity.
   - b. Hopper body Length – 10’ with 2’ of longitudinal overhang for unloading material to the spinner assembly.
   - c. Outside Width – 82” maximum
   - d. Side Height – 54” maximum
   - e. Capacity – Approximately 5.4 cubic yards water level full
   - **f.** Body sides – 10 ga. 201 Stainless-steel with no less than 45-degree pitch to ensure free flow of material to the auger trough. Sides are to be constructed using a single sheet of 304 stainless steel NO SPLICES
   - g. Body ends – 10 ga. 201 stainless-steel. Front sheet shall be sloped so as not to interfere with an internally mounted telescopic hoist incorporating a cylinder doghouse, if required.
   - h. Body longitudinal – Shall be manufactured of 10 ga. Non-magnetic stainless steel.
   - i. Inside weld – Spreader body shall be 100% welded on the inside.
   - j. Channel cross sills – Shall be 7 ga. Non-magnetic stainless steel that tie the lower edge of the longitudinal to each side support.
   - k. Cross supports – Shall be wide enough to allow the hopper box to be mounted on various width truck frames or slide into a dump box.
   - l. Top – A 4” X 6” formed non-magnetic stainless-steel bolt in box beam shall be elevated 3” above the top edge of the hopper, thus providing a longitudinal brace and hinge point for the top screens.
   - m. Channel – There shall be a 3” formed non-magnetic stainless channel welded under the H-beam to each hopper side for additional side support.
   - n. Body welding – body and auger channel shall be electrically welded into a rugged solid unit
   - o. Side supports – There shall be 12 ga minimum formed non-magnetic stainless-steel side supports that extend the full angle height spaced on 2’ centers.

p. Lift Hook – A heavy duty non-magnetic stainless steel lift hook shall be provided at each corner.
q. Mounting kit – Mounting kit is to include:
    i. 4 ea. 4" nylon load straps which will attach to the pockets welded to the spreader hopper. These straps will be secured to the truck body with 4" capacity, cargo winches (which are to be welded to the dump body).
    ii. 1 ea. 3" X 3" X 3/8" structural steel angle to run between the left and right-side tailgate latch. The latch bar is to have a 1-1/4" round pin stock welded to the latch bar angle and positioned to allow the dump body tailgate locks to latch over the pins in order to hold the spreader securely into the dump body.
    iii. All stainless-steel joints shall be welded with stainless steel welding wire.
    iv. All sub-assemblies shall be secured with stainless steel hardware
    v. A mounting kit shall be provided to safely secure the hopper to the truck.

3. Auger System:

a. The dual auger system shall be twin augers 7" in diameter running longitudinally with the body, feeding material the full length of the hopper.

b. The augers shall consist of a 4" O.D. steel pipe with a 2" steel end shaft and 3/8"x11/2" AR400 flighting continuously welded the full length. Augers shall be manufactured for a right- and left-hand side. The augers shall not be interchangeable from side to side.

c. The fliting shall be 3/8" thick steel. The fliting shall have (3) different pitches so the hopper will unload evenly from the front, middle and rear. Outer edge of fliting shall include welded steel hardened matrix.

d. The augers shall be driven by dual 14 H.P. hydraulic motors. The motors will drive dual gear boxes providing a 3.6 – 1.0 ratio and shall be directly coupled by a spline shaft coupling to the augers or shall be dual hydraulic motors direct coupled to the auger shaft. The hydraulic motors shall have sufficient power to maintain constant spread rate of dry or wet materials.

e. The coupling shall be equipped with a grease fitting so that the motor spline and coupling can be lubricated.

f. The idler end of the auger shall be supported by a 4 bolt flange, heavy duty, dust sealed, self- aligning ball bearing.

g. This bearing shall be able to be lubricated from the rear of the body.

h. Both the auger drive and idler end plate shall be manufactured from 3/16" Stainless steel.

i. A height adjustable stainless steel inverted vee shall be provided to keep material load off the auger for easier auger start-up.

j. A protective stainless-steel grate shall be placed over the exposed auger outside the hopper.

k. A closed loop auger sensor is to be installed on the passenger side auger shaft at the front of the spreader. Wiring for the sensor is to be run to the rear of the spreader. This pulse sensing line must be capable of being connected to the chassis mounted pulse sense wiring in order to provide closed loop operation.

l. The spreader shall be equipped with a safety interlock device to positively prevent power from reaching the auger motor when the auger cover and top screens are opened beyond the normal operation position.

m. The auger floor shall be manufactured of ¾" UHMW polyurethane. It shall be of a curved designed and shall be replaceable. The floor shall be supported on 7 gauge stainless steel formed c-channel spaced approximately 24" apart.

4. Spinner Assembly:

a. Distributer disc – 22" diameter, made of polyurethane
b. Mounting – Disc shall be mounted on a steel replaceable hub connected directly to the hydraulic drive motor.
c. Material shall be guided from the Auger trough to the distribution disc by means of a 10 Ga. polyurethane tapered chute which is attached to the discharge opening of the spreader by means of a single stainless-steel pin. The chute must be adjustable to direct salt flow to front, center and rear of the spinner in order to direct salt to the salt to the left or right of spinner center without using any tools
d. Spinner frame shall be manufactured of 12 ga stainless steel and shall include a one piece tapered deflector system.
e. Spinner shall be mounted independently from the V box. The spinner will be installed into the 4" receiver tube hitch assembly supplied with the dump truck, to allow for cleaning, storage and unloading from the conveyor without the interference from the spinner assembly.
f. Spinner shall be capable of being stored on material spreader when not in use and shall not interfere with the loading or unloading of spreader.

5. Top Screens:

a. Top screens shall be constructed of 3/8" steel rods welded to form a 3" square mesh, which is framed by a combination of 3/16" X 1-1/2" flat steel with the edge supports reinforced by 1/4" X 1" flat bars at the pivot point of the screen opening.
b. Top screens shall be removable and use drop-n-loc type hinge.
c. Screens utilizing hardware that may vibrate loose are not acceptable.
d. Screens are to be hot dipped galvanized. PAINTED SCREENS ARE NOT ACCEPTABLE.

6. Painting – All stainless steel shall be left unpainted. Carbon steel components shall be chemically cleaned or sand/media blasted and coated with a lead free rust inhibitive primer and painted with lead free black enamel.

7. Liquid Chemical Storage:

a. Two side mounted 225gallon polyethylene reservoir tanks, one per side shall be provided to allow a total of 450 gallons of liquid capacity.
b. A 3" top fill port with splash proof vent and a 2" suction port are to be provided in each tank.
c. A plumbing/quick fill kit is to be included consisting of:
    i. Shut-off valves at each tank end
    ii. Banjo coupler and all necessary fittings to plumb the tanks together
    iii. Provisions to fill one tank only or both tanks at the same time.
    iv. Quick drain valve is to be plumbed into the system on the passenger side of the vehicle.

8. **Conspicuity** – Spreader shall be outfitted with DOT-C2 11”red/7”white or 6”red/6”white parabolic retro-reflective conspicuity tape (Reflexite, 3M or equal) as per TDOT guidelines. Layout pattern shall be provided to the successful bidder.

9. Ladder

Stainless steel folding ladder is to be provided and installed on the curb side rear of the spreader hopper. The ladder is to be constructed using 100% non-magnetic stainless steel material including stainless steel grip punched ladder rungs, vertical bracing and grab handle tubes on each side of the ladder treads and all hardware. The ladder shall provide a ”three” point access to the top screens for cleaning

10. Leg Stand Frame:

Leg stand frame and legs shall be hot dipped galvanized **OR** stainless steel. Leg stand shall be constructed using 3” X 3” X 3/16” tubing which form four long-members running the length of the stand that support the V box. The front of the stand assembly includes two folding and self-storing 3” X 3” tubular legs which will support the empty weight of the spreader when it has been removed from the dump body. Front legs are to have a minimum of three grease zerks to lubricate the inner tube on which the leg assembly rotates.

The stand shall be equipped with holes spaced on 24” centers for mounting to v-box spreader.

Entire leg-stand frame shall be welded solid where possible.

Legs:

Rear spreader legs are constructed using 3 ½” X 3 1/2” X ¼” tubing. **The legs must be capable of lifting above the height of at least 35” above the ground level so as not to interfere with trailer connections and operation.**

Front legs shall be designed to lock at an angle of 90 degrees down in relation to the frame rails for storage, and shall also be designed to swing up, nest between frame rails, and lock for installation into the dump body.

Left and right front upper legs shall be connected by a cross tube constructed from formed 7 gauge steel. Front legs to be bolted to the cross tube.

Left and Right front legs shall be equipped with ½” diameter spring loaded pins to lock the legs in the standing and folded positions.

Front upper legs shall be equipped with 5/8” diameter spring-loaded pins to lock lower leg into the desired height.

The spreader stand shall include a guide plate system to assist in loading the spreader into the truck body.

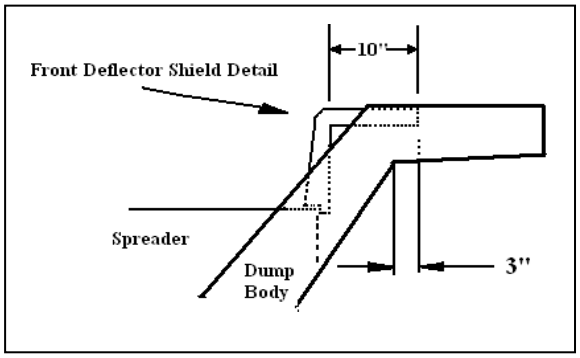
Guide plates are to be constructed using ½" thick stainless-steel plates which are tapered to guide the spreader into the correct position inside the body and must be designed to position the spreader in the center of the body and thus protect the liquid tanks from damage if the spreader is not properly positioned when loading the unit has begun.

11.TDOT Salt Spreader Material Deflector System

All V-Box slide-in material spreaders are to be delivered, equipped with the following material deflector system installed on the spreader.

- **a.** System shall include rubber belting bolted to the upper vertical top rail of the spreader and must be long enough to extend down over the outside of the dump body top rails, to the lower vertical edge of the rail.
- **b.** Belting must not interfere with the ability to strap the spreader down to the body with load strap, and tensioning winches that are provided under the body top rails.
- **c.** Belting is to be a minimum of two ply, with a tension rating of 220 LBS.
- d. Weight per square foot is to be a minimum of 0.80 LBS. per square foot.
- e. Belting is to be 0.125" thick including the top and bottom smooth rubber cover material.
- f. Belting is to be bolted to the spreader using 5/16" Stainless steel lock nuts, bolts and flat washers.
- g. Bolts are to be located on 12" centers running the entire length of the spreader hopper.
- h. Spreader is to be equipped with a front deflector shield and be constructed from 10 Ga., 201 non-magnetic stainless steel.
- i. Front deflector is to be welded to the front wall of the spreader body on an angle so as to be self-cleaning, and properly braced to carry the weight of salt that may not fall into the top of the spreader while loading.
- j. Front deflector shield is to extend forward a minimum of 10" in front on the spreader head sheet and must also be long enough to extend over the dump body cab shield a minimum of three inches.

Acceptable V-box brands: Viking, Flink or equal.



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V-BOX MATERIAL SPREADER SPECIFICATIONS, 15FT. (Item ID: 100200499)

1. **General Description:**

   a. This specification shall describe a v-box material spreader capable of hauling and spreading free flowing granular materials from a width of four (4) to forty (40) feet.
   b. This unit will consist of a hopper, dual auger discharge/feed, spinner disc, power drive, and all components necessary to make a complete operating unit.
   c. All bidders shall provide a complete proposal drawing accurately showing the exact model to be provided including all options, and units, loaded andunloaded weights and centers of gravity. These drawings shall be provided as part of the bid package. Failure to attach these drawings with the completed bid form will be grounds for disqualification of the entire bid package.
   d. This unit shall be factory ready to accept or retrofit servo controls.
   e. All stainless steel used in the production of this unit shall be corrosion resistant, non-magnetic stainless steel.
   f. The manufacturing and production of this unit shall be of the best commercial practices and only materials of the finest quality are to be used.
   g. Bidders must submit with their bid complete specifications on the unit they propose to furnish.
   h. Hopper body sides shall be constructed of 201 10-gauge minimum non- magnetic stainless steel. Hopper sides shall be formed of one solid piece. **NO WELDED SEASMS OR SPLICES ON THE SIDE SHEET ARE PERMITTED.**

2. **Body:**

   a. Construction: 10 gauge, 201 grade stainless steel with a double crimpedtop edge forming a 2-inch section for greater rigidity.
   b. Hopper body length: 15-feet with 24-inches of longitudinal overhung for unloading material to the spinner assembly.
   c. Outside width: 82-inch maximum
   d. Side height: 50-inch maximum
   e. Capacity: Approximately 8.3 cubic yards water level full.
   f. Body sides: 10-gauge, stainless steel with no less than 45-degree pitch to ensure free flow of material to the auger trough. Body side sheets are tobe one piece with no welded splices.
   g. Body ends: 10-gauge, 304 stainless-steel.
   h. Body longitudinal: One piece formed hat channel design.
   i. Inside weld: Spreader body shall be 100% welded on the inside.
   j. Channel cross sills: Shall be 7-gauge, 201 stainless-steel. The cross sills are built into the leg stand. The hopper is then integrally welded to the legstand frame.
   k. Cross supports: Shall be wide enough to allow the hopper box to be mounted on various width truck frames or slide into a dump box.
   l. Top: A 4-inch X 6-inch formed non-magnetic stainless-steel bolt in box beam shall be elevated 3-inches above the top edge of the hopper, thus providing a longitudinal brace and hinge point for the top screens.
   m. Channel: There shall be a 4 1/2-inch-tall X 1 3/4-inch wide, formed non- magnetic stainless channel welded under the H-beam to each hopper sidefor additional side support.
   n. Body welding: Body and auger channel shall be electrically welded into a solid unit.

o. Side supports: There shall be 12-gauge minimum formed non-magnetic stainless-steel side supports that extend the full angle height spaced on 2- foot centers.
p. Lift hook: A heavy duty non-magnetic stainless steel lift hook shall be provided at each corner.
q. Endplate: The rear endplate shall be sloped inward 22 degrees.
r. Mounting kit: Mounting kit is to include.
   i. Two (2) ea. 4-inch nylon load straps which will attach to the pocketswelded to the spreader hopper. These straps will be secured to the truck body with 4-inch capacity, cargo winches (which are to be welded to the dump body).
   ii. One (1) ea. 3"X3"X3/8" structural steel angle to run between the leftand right-side tailgate latch. The latch bar is to have a 1-1/4-inch round pinstock welded to the latch bar angle and positioned to allow the dumpbody tailgate locks to latch over the pins to hold the spreader securely into the dump body.
   iii. All stainless-steel joints shall be welded with stainless steel weldingwire.
   iv. All sub-assemblies shall be secured with stainless steel hardware.
   v. A mounting kit shall be provided to safely secure the hopper to the truck.
   vi. Two (2) 3/8 GR70 zinc plated chains provided for additional tie-downs from the top rear of the spreader to the chain latches in the post. Chains approximately 6' long each.
s. License plate mounting bracket shall be attached to the rear of the end plate. Bracket to have two (2) pre-punched holes.

3. Auger System:

a. The dual auger system shall be twin augers 7-inches in diameter running longitudinally with the body, feeding material the full length of the hopper.
b. The augers shall consist of a 4-inch O.D. steel pipe. The auger shaft shall have nylon bushings inserted in each end. The front bushing shall have an inner diameter to accept a 2-inch O.D. round bar shaft that is to be used to attach the auger to the front bearings. The rear nylon bushing shall have an inner diameter to accept a 2 1/2-inch shaft attached to the rear reducer. Both ends of the augers shall be attached with a 7/8" X 5 1/2" stainless steel bolt and lock nut.
c. The flitting shall be 3/8" X 2 1/2" wide AR400 Hardox material. The flitting shall have (5) five different pitches so the hopper will unload evenly from the front, middle and rear.
d. The augers shall be driven by dual 14 H.P. hydraulic motors coupled to the augers thru speed reducing gear boxes having a 3.6:1 gear reduction ratio that will deliver 27,576 in. lbs. of torque to the augers. The motors shall be connected hydraulically in series with return oil out of the motor first in line directed to power the downstream motor.
e. The coupling shall be equipped with a grease fighting so that the motor splineand coupling can be lubricated.
f. The idler end of the auger shall be supported by a 4-bolt flange, heavy duty, sealed, self- aligning ball bearing.
g. This bearing shall be able to be lubricated from the rear of the body.
h. The idler bearing end plate shall be manufactured from 1/4-inch stainless steel. The auger drive end plates shall be manufactured from 3/8-inch stainless steel.
i. A height adjustable stainless steel inverted "V" shall be provided to keep material load off the auger for easier auger start-up.

j. A protective stainless-steel grate shall be placed over the exposed auger outside the hopper.
k. A closed loop motor sensor is to be installed on the passenger side auger motor. Wiring for the sensor is to be run to the rear of the spreader. This pulse sensing line must be capable of being connected to the chassis mounted pulse sense wiring in order to provide closed loop operation.
l. The spreader shall be equipped with a safety interlock device to positively prevent power from reaching the auger motor when the auger cover and top screens are opened beyond the normal operation position.
m. The auger floor shall be manufactured of 3/8-inch UHMW polyurethane. It shall be of a break-formed designed and shall be replaceable. The floor shall be supported by a 10-gauge, stainless steel break-formed through, running the entire length of the spreader hopper and extending 24-inches past the rear of the spreader hopper.

4. Spinner Assembly:

a. Distributer disc: 18-inch diameter, made of polyurethane.
b. Mounting: Disc shall be mounted on a steel replaceable hub connected directly to the hydraulic drive motor.
c. Material shall be guided from the auger trough to the distribution disc by means of a 12-gauge tapered chute. The chute is to be lined on the inside surface with 3/16-inch-thick poly sheet, which is attached to the discharge opening of the spreader by means of a single stainless-steel pin. The chute must be adjustable to direct salt flow to front, center and rear of the spinner to direct salt to the salt to the left or right of spinner center without using any tools.
d. Spinner frame shall be manufactured of 12-gauge stainless steel and shall include a one piece tapered, 12-gauge stainless steel deflector above the spinner disc. The spinner frame shall include right and left adjustable deflector panels in order to direct salt projected off the spinner to left, center, and right-side discharge patterns.
e. Spinner shall be mounted independently from the V box. The spinner will be installed into the existing 4-inch receiver tube on the pintle plate of the truck. The insert weldment on the spinner frame is to be 4" round pipe with a ¼" wallthickness. The insert tube shall include a weld on stop to allow the pipe to line up with the insert hole in the 4" pintle hitch receiver tube as well as two tabs that center the tube into the hitch assembly to easily line up the mounting pin.
f. Spinner shall be capable of being stored on material spreader when not inuse and shall not interfere with the loading or unloading of spreader.

5. Top Screens:

a. Top screens shall be constructed of 3/8-inch steel rods welded to form a 3- inch square mesh woven pattern, which is framed by a combination of 3/16" X1-1/2" flat steel and 3/16" X 1 1/2" cross-locking bars in the center. Spreader top screens are to be hot dipped galvanized to prevent rust and corrosion. Painted top screens are not acceptable.
b. Top screens shall be removable and use drop-n-loc type hinge. Screens utilizing hardware that may vibrate loose are not acceptable.

6. Painting:

All stainless steel shall be left unpainted. Carbon steel components shall be chemically cleaned, or sand/media blasted and coated with a lead-free rust inhibitive primer and painted with lead free black enamel.

7. Liquid Chemical Storage:

a. Two (2) side-mounted 225-gallon polyethylene reservoir tanks, one per sideshall be provided to allow a total of 450 gallons of liquid capacity.
b. A 3-inch top fill port with splash proof vent and a 2-inch suction port are to be provided in each tank.
c. A plumbing/quick fill kit is to be included consisting of:
   i. Shut-off valves at each tank end.
   ii. Cam lever coupler and all necessary fittings to plumb the tanks together.
   iii. Provisions to fill one tank only or both tanks at the same time.
   iv. Quick drain valve is to be plumbed into the system on the passenger side.of the vehicle

8. Conspicuity:

Spreader shall be outfitted with DOT-C2 11" red/7" white or 6"red/6"white parabolic retro-reflective conspicuity tape (Reflexite, 3M or equal) as perTDOT guidelines. Layout pattern shall be provided to the successful bidder.

9. Tailgate Standoff:

There shall be tailgate standoff brackets attached to the spreader to hold the raised tailgate off the spreader and spinner chute during spreader operations. Standoffs shall be of a fixed design and shall be made of non-magnetic stainless steel. Standoffs shall not interfere with the operation or the loading or unloading of the spreader assembly. Design must be approved by the state.

10. Ladder:

Stainless steel folding ladder is to be provided and installed on the curb side rear of the spreader hopper. The ladder is to be constructed using 100% non-magnetic stainless-steel material including stainless steel grip punched ladder rungs, vertical bracing and grab handle tubes on each side of the ladder treads and all hardware. The ladder shall provide a three-point contactaccess to the top screens for cleaning.

11. Leg Stand Frame:

Leg stand frame and legs shall be hot dipped galvanized **OR** stainless steel. Leg stand shall be constructed using 3" X 3" X 3/16" tubing which form four long- members running the length of the stand that support the V box. The front of the stand assembly includes two folding and self-storing 3" X 3" tubular legs whichwill support the empty weight of the spreader when it has been removed from thedump body. Front legs are to have a minimum of three grease zerks to lubricate the inner tube on which the leg assembly rotates.

The stand shall be equipped with holes spaced on 24" centers for mounting to v- box spreader.

Entire leg-stand frame shall be welded solid where possible.

Legs:

Rear spreader legs are constructed using 3 ½" X 3 1/2" X ¼" tubing. The legs must be capable of lifting above the height of at least 35" above the ground level so as not to interfere with trailer connections and operation.

Front legs shall be designed to lock at an angle of 90 degrees down in relation to the frame rails for storage, and shall also be designed to swing up, nest between frame rails, and lock for installation into the dump body.

Left and right front upper legs shall be connected by a cross tube constructed from formed 7-gauge steel. Front legs to be bolted to the cross tube.

Left and Right front legs shall be equipped with ½" diameter spring loaded pins tolock the legs in the standing and folded positions.

Front upper legs shall be equipped with 5/8" diameter spring-loaded pins to lock lower leg into the desired height.

The spreader stand shall include a guide plate system to assist in loading the spreader into the truck body.

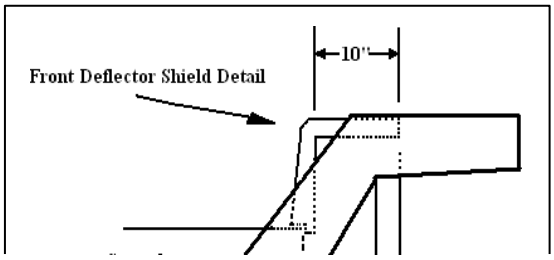
Guide plates are to be constructed using ½" thick stainless-steel plates which aretapered to guide the spreader into the correct position inside the body and must be designed to position the spreader in the center of the body and thus protect the liquid tanks from damage if the spreader is not properly positioned when loading the unit has begun.

12. Salt Spreader Material Deflector System

All V-Box slide-in material spreaders are to be delivered, equipped with thefollowing material deflector system installed on the spreader.

a. Spreader is to be equipped with a front deflector shield and be constructedfrom 10 Ga., 201 non-magnetic stainless steel.
b. Front deflector is to be welded to the front wall of the spreader body on anangle to be self-cleaning, and properly braced to carry the weight of salt that may not fall into the top of the spreader while loading.
c. Front deflector shield is to extend forward a minimum of 10" in front on the spreader head sheet and must also be long enough to extend over the dump body cab shield a minimum of three inches.

Acceptable V-box brands: Viking, Flink, or equal.



V-BOX MATERIAL SPREADER SPECIFICATIONS, 19 FT (Item ID: 1000200500)

1. General Description:

a. This specification shall describe a v-box material spreader capable of hauling and spreading free flowing granular materials from a width of four (4) to forty (40) feet.

b. This unit will consist of a hopper, dual auger discharge/feed, spinner disc, power drive, and all components necessary to make a complete operating unit.

c. All bidders shall provide a complete proposal drawing accurately showing the exact model to be provided including all options, and units, loaded andunloaded weights and centers of gravity. These drawings shall be provided as part of the bid package. Failure to attach these drawings with the completed bid form will be grounds for disqualification of the entire bid package.

d. This unit shall be factory ready to accept or retrofit servo controls.

e. All stainless steel used in the production of this unit shall be corrosion resistant, non-magnetic stainless steel.

f. The manufacturing and production of this unit shall be of the best commercial practices and only materials of the finest quality are to be used.

g. Bidders must submit with their bid complete specifications on the unit they propose to furnish.

h. Hopper body sides shall be constructed of 201 10-gauge minimum non- magnetic stainless steel. Hopper sides shall be formed of one solid piece.
NO WELDED SEAMS OR SPLICES ON THE SIDE SHEET ARE PERMITTED.

2. Body:

a. Construction: 10 gauge, 201 grade stainless steel with a double crimpedtop edge forming a 2-inch section for greater rigidity.

b. Hopper body length: 19-feet with 24-inches of longitudinal overhung for unloading material to the spinner assembly.

c. Outside width: 82-inch maximum

d. Side height: 50-inch maximum

e. Capacity: Approximately 14.10 cubic yards water level full.

f. Body sides: 10-gauge, stainless steel with no less than 45-degree pitch to ensure free flow of material to the auger trough. Body side sheets are to be one piece with no welded splices.

g. Body ends: 10-gauge, 201 stainless-steel.

h. Body longitudinal: One piece formed hat channel design

i. Inside weld: Spreader body shall be 100% welded on the inside.

j. Channel cross sills: Shall be 7-gauge, 201 stainless-steel. The cross sills are built into the leg stand. The hopper is then integrally welded to the legstand frame

k. Cross supports: Shall be wide enough to allow the hopper box to be mounted on various width truck frames or slide into a dump box

l. Top: A 4-inch X 6-inch formed non-magnetic stainless-steel bolt in box beam shall be elevated 3-inches above the top edge of the hopper, thus providing a longitudinal brace and hinge point for the top screens.

m. Channel: There shall be a 4 1/2-inch-tall X 1 3/4-inch wide, formed non- magnetic stainless channel welded under the H-beam to each hopper sidefor additional side support.

n. Body welding: Body and auger channel shall be electrically welded into a rugged solid unit.

o. Side supports: There shall be 12-gauge minimum formed non-magnetic stainless-steel side supports that extend the full angle height spaced on 2- feet centers.

p. Lift hook: A heavy duty non-magnetic stainless steel lift hook shall be provided at each corner.
q. Endplate: The rear endplate shall be sloped inward 22 degrees.
r. Mounting kit: Mounting kit is to include.
   i. Four (4) ea. 4-inch nylon load straps which will attach to the pockets welded to the spreader hopper. These straps will be secured to the truck body with 4-inch capacity, cargo winches (which are to be welded to the dump body).
   ii. One (1) ea. 3"X3"X3/8" structural steel angle to run between the leftand right-side tailgate latch. The latch bar is to have a 1-1/4-inch round pinstock welded to the latch bar angle and positioned to allow the dumpbody tailgate locks to latch over the pins in order to hold the spreader securely into the dump body.
   iii. All stainless-steel joints shall be welded with stainless steel welding wire.
   iv. All sub-assemblies shall be secured with stainless steel hardware
   v. A mounting kit shall be provided to safely secure the hopper to the truck.
s. License plate mounting bracket shall be attached to the rear of the end plate. Bracket to have two (2) pre-punched holes.

3. Auger System:

a. The dual auger system shall be twin augers 7-inches in diameter running longitudinally with the body, feeding material the full length of the hopper.
b. The augers shall consist of a 4-inch O.D. steel pipe. The auger shaft shall have nylon bushings inserted in each end. The front bushing shall have an inner diameter to accept a 2-inch O.D. round bar shaft that is to be used to attach the auger to the front bearings. The rear nylon bushing shall have an inner diameter to accept a 2 1/2-inch shaft attached to the rear reducer. Both ends of the augers shall be attached with a 7/8" X 5 1/2" stainless steel bolt and lock nut.

c. The flitting shall be 3/8" X 2 1/2" wide AR400 Hardox material. The flitting shall have (5) five different pitches so the hopper will unload evenly from the front, middle and rear.
d. The augers shall be driven by dual 14 H.P. hydraulic motors coupled to the augers thru speed reducing gear boxes having a 3.6:1 gear reduction ratio that will deliver 27,576 in. lbs. of torque to the augers. The motors shall be connected hydraulically in series with return oil out of the motor first in line directed to power the downstream motor.
e. The coupling shall be equipped with a grease fitting so that the motor spline and coupling can be lubricated.
f. The idler end of the auger shall be supported by a 4-bolt flange, heavy duty, dust sealed, self- aligning ball bearing.
g. This bearing shall be able to be lubricated from the rear of the body.
h. The idler bearing end plate shall be manufactured from 1/4-inch stainless steel. The auger drive end plates shall be manufactured from 3/8-inch stainless steel.
i. A height adjustable stainless steel inverted "V" shall be provided to keep material load off the auger for easier auger start-up.
j. A protective stainless-steel grate shall be placed over the exposed auger outside the hopper.
k. A closed loop motor sensor is to be installed on the passenger side auger motor. Wiring for the sensor is to be run to the rear of the spreader. This pulse sensing line must be capable of being connected to the chassis mounted pulse sense wiring in order to provide closed loop operation.
l. The spreader shall be equipped with a safety interlock device to positively prevent power from reaching the auger motor when the auger cover and top screens are opened beyond the normal operation position.

m. The auger floor shall be manufactured of 3/8-inch UHMW polyurethane. It shall be of a break-formed designed and shall be replaceable. The floor shall be supported by a 10-gauge, stainless steel break-formed through, running the entire length of the spreader hopper and extending 24-inches past the rear of the spreader hopper.

4. Spinner Assembly:

a. Distributer disc: 18-inch diameter, made of polyurethane.
b. Mounting: Disc shall be mounted on a steel replaceable hub connected directly to the hydraulic drive motor.
c. Material shall be guided from the auger trough to the distribution disc by means of a 12-gauge tapered chute. The chute is to be lined on the inside surface with 3/16-inch-thick poly sheet, which is attached to the discharge opening of the spreader by means of a single stainless-steel pin. The chute must be adjustable to direct salt flow to front, center and rear of the spinner in order to direct salt to the salt to the left or right of spinner center without using any tools
d. Spinner frame shall be manufactured of 12-gauge stainless steel and shall include a one piece tapered, 12-gauge stainless steel deflector above the spinner disc. The spinner frame shall include right and left adjustable deflector panels in order to direct salt projected off the spinner to left, center, and right-side discharge patterns.
e. Spinner shall be mounted independently from the V box. The spinner will be installed into the existing 4-inch receiver tube on the pintle plate of the truck. The insert weldment on the spinner frame is to be 4" round pip with a ¼" wall thickness. The insert tube shall include a weld on stop to allow the pipe to line up with the insert hole in the 4" pintle hitch receiver tube as well as two tabs that center the tube into the hitch assembly in order to easily line up the mounting pin.
f. Spinner shall be capable of being stored on material spreader when not inuse and shall not interfere with the loading or unloading of spreader.

5. Top Screens:

a. Top screens shall be constructed of 3/8-inch steel rods welded to form a 3- inch square mesh woven pattern, which is framed by a combination of 3/16" X1-1/2" flat steel and 3/16" X 1 1/2" cross-locking bars in the center. Spreader top screens are to be hot dipped galvanized to prevent rust and corrosion. Painted top screens are not acceptable.
b. Top screens shall be removable and use drop-n-loc type hinge. Screens utilizing hardware that may vibrate loose are not acceptable.

6. Painting:

All stainless steel shall be left unpainted. Carbon steel components shall be chemically cleaned, or sand/media blasted and coated with a lead-free rust inhibitive primer and painted with lead free black enamel.

7. Liquid Chemical Storage:

a. Two (2) side-mounted 225-gallon polyethylene reservoir tanks, one per sideshall be provided to allow a total of 450 gallons of liquid capacity.
b. A 3-inch top fill port with splash proof vent and a 2-inch suction port are to be provided in each tank.
c. A plumbing/quick fill kit is to be included consisting of:
   i. Shut-off valves at each tank end
   ii. Banjo coupler and all necessary fittings to plumb the tanks together

iii. Provisions to fill one tank only or both tanks at the same time.
iv. Quick drain valve is to be plumbed into the system on the passenger sideof the vehicle.

8. Conspicuity:

Spreader shall be outfitted with DOT-C2 11" red/7"white or 6"red/6"white parabolic retro-reflective conspicuity tape (Reflexite, 3M or equal) as perTDOT guidelines. Layout pattern shall be provided to the successful bidder.

9. Tailgate Standoff:

There shall be tailgate standoff brackets attached to the spreader to hold the raised tailgate off the spreader and spinner chute during spreader operations.Standoffs shall be of a fixed design and shall be made of non-magnetic stainless steel. Standoffs shall not interfere with the operation or the loading or unloading of the spreader assembly. Design must be approved by TDOT.

10. Ladder:

Stainless steel folding ladder is to be provided and installed on the curb side rear of the spreader hopper. The ladder is to be constructed using 100% non-magnetic stainless-steel material including stainless steel grip punched ladder rungs, vertical bracing and grab handle tubes on each side of the ladder treads and all hardware. The ladder shall provide a" three" point access to the top screens for cleaning

11. Leg Stand Frame:

Leg stand frame and legs shall be hot dipped galvanized **or** stainless steel. Leg stand shall be constructed using 3" X 3" X 3/16" tubing which form four long- members running the length of the stand that support the V box. The front of the stand assembly includes two folding and self-storing 3" X 3" tubular legs which will support the empty weight of the spreader when it has been removed from thedump body. Front legs are to have a minimum of three grease zerks to lubricate the inner tube on which the leg assembly rotates.

The stand shall be equipped with holes spaced on 24" centers for mounting to v- box spreader.

Entire leg-stand frame shall be welded solid where possible.

Legs:

Rear spreader legs are constructed using 3 ½" X 3 1/2" X ¼" tubing. **The legs must be capable of lifting above the height of at least 35" above the groundlevel so as not to interfere with trailer connections and operation.**

Front legs shall be designed to lock at an angle of 90 degrees down in relation to the frame rails for storage, and shall also be designed to swing up, nest between frame rails, and lock for installation into the dump body.

Left and right front upper legs shall be connected by a cross tube constructed from formed 7-gauge steel. Front legs to be bolted to the cross tube.

Left and Right front legs shall be equipped with ½" diameter spring loaded pins tolock the legs in the standing and folded positions.

Front upper legs shall be equipped with 5/8" diameter spring-loaded pins to lock lower leg into the desired height.

The spreader stand shall include a guide plate system to assist in loading the spreader into the truck body.

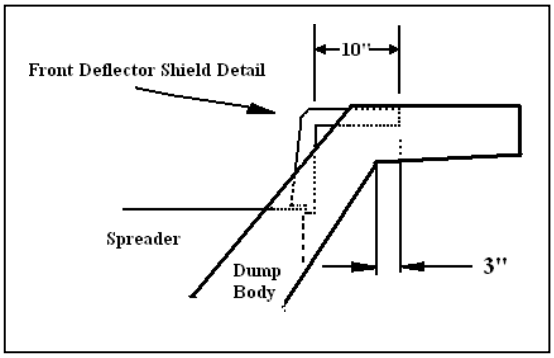
Guide plates are to be constructed using ½" thick stainless-steel plates which aretapered to guide the spreader into the correct position inside the body and must be designed to position the spreader in the center of the body and thus protect the liquid tanks from damage if the spreader is not properly positioned when loading the unit has begun.

12. TDOT Salt Spreader Material Deflector System

All V-Box slide-in material spreaders are to be delivered, equipped with thefollowing material deflector system installed on the spreader.

a. Spreader is to be equipped with a front deflector shield and be constructedfrom 10 Ga., 201 nonmagnetic stainless steel.
b. Front deflector is to be welded to the front wall of the spreader body on anangle so as to be self-cleaning, and properly braced to carry the weight of salt that may not fall into the top of the spreader while loading.
c. Front deflector shield is to extend forward a minimum of 10" in front on the spreader head sheet and must also be long enough to extend over the dump body cab shield a minimum of three inches.

Acceptable V-box brands: Viking, Flink or equal.



PUMP SPECIFICATIONS

REV.12/21

ELECTRIC MOTOR DRIVEN CENTRIFUGAL PUMP (7.5 HP) SPECIFICATIONS
(ITEM Id.1000200490) AMT or Equal

A) SHALL HAVE A 2" INLET AND 1.5" OUTLET CAPABLE OF PUMPING VARIOUS ANTI-ICING MATERIALS AT 200GPM WITH A MINIMUM PSI OF 25 AFTER 10 FEET.
B) SHALL HAVE STAINLESS STEEL SHAFT IMPELLER, SEVERE SERVICE SEAL, BRASS OR STAINLESS STEEL HOUSING AND STAINLESS STEEL SHAFT.
C) IMPELLER SHALL HAVE THE CAPABILITY OF PUMPING ANTI-ICING AGENTS WITH A MINIMUM SPECIFIC GRAVITY OF 1.5.
D) PUMP SHALL BE TOTALLY ENCLOSED AND FAN COOLED.
E) MOTOR AND PUMP SHALL BE MOUNTED WITH STAINLESS STEEL BOLTS (WELDED MOUNTINGS WILL NOT BE ACCEPTABLE).
F) PUMP SHALL BE CONNECTED BY A 2" CAMLOCK COUPLER TO THE TANK AND MANIFOLD.
G) PUMP SHALL BE A MINIMUM 7.5 HP, 220 VOLT, SINGLE OR THREE PHASE (AGENCY WILL NOTE ON PURCHASE ORDER WHICH ONE IS NEEDED).
H) PUMP SHALL BE EQUIPPED WITH A MOTOR STARTER AND ALL ELECTRICAL COMPONENTS READY FOR IMMEDIATE ELECTRICAL HOOK UP.

BRINE PRODUCTION SYSTEM SPECIFICATIONS

REV.05/25

STAINLESS STEEL SALT BRINE PRODUCTION SYSTEM SPECIFICATIONS (ITEM #. 1000119825)

Acceptable Brands/Models: Varitech HCSB700-SS, Henderson Xtreme or Equal

MODEL BID SHALL BE OF CURRENT PRODUCTION FOR WHICH PARTS AND ACCESSORIES ARE READILY AVAILABLE FROM THE SUCCESSFUL BIDER.

A. GENERAL REQUIREMENTS:

1) BRINE PRODUCTION SYSTEM SHALL BE DESIGNED TO CONVERT ROCK SALT TO SALT BRINE.
2) SYSTEM SHALL PRODUCE 5,000 GAL PER HOUR OF 23% SALT BRINE
3) TOTAL BRINE PRODUCTION SYSTEM SHALL FIT WITHIN A SPACE OF 12 FEET WIDE BY 8 ½ FEET DEEP BY 8 FEET HIGH.
4) SYSTEM SHALL BE CAPABLE OF PUMPING THE BRINE INTO APPLICATION AND STORAGE TANKS.
5) UNIT SHALL BE PORTABLE AND DESIGNED TO BE MOVED WITH A FORKLIFT.
6) FRAME SHALL BE OF STAINLESS STEEL CONSTRUCTION.

B. TANKS:

BRINE PRODUCTION SYSTEM SHALL CONSIST OF A MIXING TANK AND BRINE HOLDING TANK.

1) MIXING TANK SHALL HAVE A MINIMUM ROCK SALT CAPACITY OF 5 CUBICYARDS.
2) OPENING FOR LOADING SALT SHALL BE A MINIMUM OF 9.5’ X 4’.
3) BRINE HOLDING TANK CAPACITY SHALL BE A MINIMUM OF 700 GALLONS.
4) ALL TANKS AND MOUNTING HARDWARE SHALL BE MADE UP OF NON-CORROSIVE MATERIAL SUCH AS STAINLESS STEEL. INTERNAL SEAMS SHALL BE TREATED WITH. POLYURETHANE ADHESIVE FOR LEAK PROTECTION
5) TANKS SHALL BE DESIGNED TO SUPPORT THE DESIGNED CAPACITY OF ALL LOADS THAT MAY BE PLACED UPON THEM.
6) TANK SHALL BE CAPABLE OF EASY REMOVAL AND DUMP BY A LOADER FOR COMPLETE CLEAN OUT OF SLUDGE. SHOVELING OR FLUSHING SLUDGE THRU DRAIN CLEAN OUT METHODS IS NOT ACCEPTABLE. TANK SHALL BE DESIGNED TO WITHSTAND ALL STRESSES ASSOCIATED WITH REMOVAL AND DUMPING OF SLUDGE.
7) HOLDING TANK SHALL HAVE A 3” BOTTOM FLUSH MOUNT CLEAN OUT/DRAIN. IF HOLDING TANK IS EQUIPPED WITH A LID, THE BOTTOM DRAIN SHALL BE LOCATED ON THE OPPOSITE END OF THE LID ACCESS HOLE.
8) TANK SHALL HAVE A FRESH WATER LINE AT THE OVERFLOWS PLUMBED TO THE AUTOMATIC FILL SYSTEM.
9) BRINE SHALL FLOW BY GRAVITY FROM THE MIXING TANK TO THE HOLDING TANK THRU A MINIMUM OF TWO OVERFLOW. OVERFLOW SHALL BE DESIGNED TO PREVENT SALT AND FLOATING SLUDGE FROM PLUGGING THE SCREEN AND SHALL BE VENTED TO PREVENT HYDRO LOCKING.

C. PLUMBING AND PUMPING SYSTEM:

BRINE PRODUCTION SYSTEM SPECIFICATIONS

REV.05/25

THERE SHALL BE TWO PLUMBING SYSTEMS: THE FULL SYSTEM AND THE DISCHARGE SYSTEM. PIPING SHALL BE SCHEDULE 80 PVC AND/OR BRAIDED EPDM HOSE. ALL THREADED FITTINGS SHALL BE MADE OF GLASS FILLED POLYPROPYLENE. ALL VALVES SHALL BE BALL TYPE MAD OF GLASS FILLED POLYPROPYLENE. RV STYLE GATE VALVES ARE NOT ACCEPTABLE.

1) FILL SYSTEM SHALL BE 2 INCH PIPING TO THE MIXING TANK MANIFOLD AND 1 INCH TO THE HOLDING TANK SWEETENER. MAIN WATER INLET LINE FOR SYSTEM WILL COME IN THROUGH A MECHANICAL WATER LEVEL (FLOAT) ON-OFF VALVE, THEN THROUGH A MANUEL ON-OFF BALL VALVE AND THEN SPLIT BETWEEN THE MIXING AND HOLDING TANK.

A) MAIN WATER INLET SHALL BE A 2 INCH CAM LOCK NIPPLE FOR ATTACHING A HOSE TO THE REQUESTING LOCATION'S MAIN WATER LINE**.**

B) BRINE LEVEL ON-OFF VALVE SHALL BE ACTIVATED BY A FLOAT MOUNTED IN THE SALT BRINE HOLDING TANK. FULL LEVEL IS TO BE 6" BELOW THE TOP OF THE BRINE TANK. LEVEL SENSOR SHALL AUTOMATICALLY TURN ON AND OFF THE WATER SUPPLY OF THE MIXING TANK MANIFOLD AND HOLDING TANK SWEETNER AS THE BRINE LEVEL CHANGES IN THE HOLDING TANK.

C) MIXING TANK MANIFOLD SHALL BE DESIGNED TO FLOW A MINIMUM OF 5,000 GAL.PER HOUR AND ACHIEVE A 23% BRINE SOLUTION. MANIFOLD SHALL BE MOUNTED 2-4 INCHES OFF THE BOTTOM OF THE TANK, BE SECURED AT BOTH ENDS AND BE EASILY REMOVED FOR TANK CLEANING.

D) HOLDING TANK LINE (SWEETNER) SHALL HAVE AN ON-OFF BALL VALVE TO REGULATE FLOW.

2.) DISCHARGE SYSTEM SHALL HAVE AN AMT 315A STAINLESS STEEL WATER PUMP, OR EQUAL, WITH 2" INLET AND 1.5" OUTLET. PUMP SHALL BE CLOSE COUPLED TO THE MOTOR.

A) PUMP'S SUCTION SIDE SHALL FEED INTO 2 LINES; ONE (1) LINE TO BE PLUMBED INTO THE BRINE HOLDING TANK WITH AN ON/OFF BALL CONNECTOR FOR CONNECTING LINE TO MIXING TANK.

B) PUMP'S DISCHARGE SIDE SHALL HAVE A THREE-POSITION BALL VALVE (BANJO OR EQUAL) WITH TWO (2) LINES; ONE (1) LINE SHALL INCLUDE A ONE-WAY CHECK LINE VALVE AND CONNECT THE MAIN WATER FEED LINE TO THE MIXING TANK AND THE OTHER LINE SHALL HAVE A CAM LOCK CONNECTOR. THREE-POSITION BALL VALVE SHALL DIRECT PUMP FLOW TO EITHER SIDE OF THE VALVE AND HAVE AN "OFF" POSITION TO STOP FLOW COMPLETELY.

C) PLUMBING SYSTEMS SHALL BE INSTALLED IN A PROTECTED AREA SO THAT THE SYSTEMS SHALL BE EASILY SERVICED AND OPERATED. PUMP, FLOAT VALVE AND BALL VALVES SHALL BE REMOVABLE (UNIONS NOT CEMENTED).

D. ELECTRICAL:

1) ELECTRICAL SYSTEM SHALL BE A 230 VOLT, SINGLE PHASE SYSTEM.

BRINE PRODUCTION SYSTEM SPECIFICATIONS

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2) ELECTRICAL SYSTEM SHALL BE MOUNTED IN A WATERPROOF ELECTRICAL BOX ATTACHED TO THE FRAME ASSEMBLY.

3) ELECTRICAL BOX SHALL CONTAIN THE REMOTE ON-OFF SWITCH CONNECTION CONTROL.

4) WATERPROOF ON-OFF SWITCH SHALL BE SUPPLIED AND REMOTE MOUNTED ON A 10 FOOT CABLE.

5) ALL ELECTRICAL WIRING SHALL BE RUN THROUGH WATERTIGHT CONDUIT.

6) PUMP MOTOR SHALL BE A 3-HP TFC. MOTOR SHALL BE DIRECT MOUNTED TO PUMP AND INSTALLED WHERE PROTECTED FROM SALT, SALT BRINE OR DAMAGE.

E. COMPLETENESS:

ALL NECESSARY COMPONENTS, HOSES, WIRING, MOUNTING BRACKETS AND CLAMPS SHALL BE FURNISHED TO FACILITATE THE COMPLETE INSTALLATION AND TO PROVIDE A COMPLETE WORKING SYSTEM.

Specifications for Automation Controls for Brine Maker (Item ID: New/TBD)

1.Automatic Salinity control cabinet capable of automatically producing 23.3% salinity brine
2. Automated Control cabinet controlled by a 5" communication display
3. Control cabinet weatherproofing to be NEMA 4 rated

4. Power 230V Single phase
Brine Controller must be compatible with brine maker bid.

Acceptable Brands: Varitech Brine Boss ECO, Henderson Brine Extreme Controller or equal.

TANK SPECIFICATIONS

REV. 12/21

ELLIPTICAL LEG TANK, 995 GALLON, SPECIFICATIONS (ITEM ID 1000119823)

Acceptable Brands: Norwesco or Equal

A) SHALL HAVE A FULL CAPACITY MAXIMUM OF 990 GALLONS.
B) TANK SHALL BE CONSTRUCTED WITH POLYETHYLENE RESIN AND BE TREATED WITH AN ULTRAVIOLET RADIATION STABILIZER.
C) CAPABLE OF STORING ANTI-ICING MATERIALS WITH A SPECIFIC GRAVITY OF 1.5.
D) SHALL BE EQUIPPED WITH A MINIMUM 12" MANWAY AND COVER, STAINLESS STEEL COMPRESSION FITTINGS AND 2" COMLOCK BOTTOM DISCHARGE.
E) SHALL HAVE A MINIMUM OF THREE TIE-DOWN STRAPS CONFORMING TO THE ELLIPTICAL SHAPE OF THE TANK. TIE-DOWN STRAPS SHALL COMPLY WITH MANUFACTURER SPECIFICATIONS AND SHALL BE SUPPLIED BY THE TANK MANUFACTURER.

F) DIMENSIONS:	MINIMUM	MAXIMUM
HEIGHT:	48"	49"
WIDTH:	75"	78.5"
LENGTH:	84"	89"

ELLIPTICAL LEG TANK, 1600 GALLONS, SPECIFICATIONS (ITEM ID. 1000119824)

Acceptable Brands: Norwesco, Protank, or Equal

A) SHALL HAVE A FULL CAPACITY OF 1600-1650 GALLONS
B) SHALL BE CONSTRUCTED WITH POLYETHYLENE RESIN AND BE TREATED WITH AN ULTRAVIOLET RADIATION STABILIZER.
C) SHALL BE CABABLE OF STORING ANTI-ICING MATERIAL WITH A SPECIFIC GRAVITY OF 1.5.
D) SHALL BE EQUIPPED WITH A MINIMUM OF 12" MANWAY AND COVER, STAINLESS STEEL COMPRESSION FITTINGS AND A 2" CAMLOCK BOTTOM DISCHARGE.
E) SHALL HAVE A MINIMUM OF FOUR TIE-DOWN STRAPS CONFORMING TO THE ELLIPITICAL SHAPE OF THE TANK. TIE-DOWN STRAPS SHALL COMPLY WITH MANUFACTURER SPECIFICATIONS AND SHALL BE SUPPLIED BY THE TANK MANUFACTURER

F) DIMENSIONS:	MINIMUM	MAXIMUM
HEIGHT	52"	59"
WIDTH:	67"	71"
LENGTH:	138"	142"

TANK SPECIFICATIONS

REV. 12/21

ELLIPTICAL LOW PROFILE TANK, 2000 GALLON, SPECIFICATIONS (ITEM ID 1000119827)

Acceptable Brands: Norwesco, Protank or Equal

A) SHALL HAVE A FILL CAPACITY OF 2000-2600 GALLONS.

B) SHALL BE CONSTRUCTED WITH POLYETHYLENE RESIN AND BE TREATED WITH AN ULTRA VIOLET RADIATION STABILIZER.

C) SHALL BE CAPABLE OF STORING ANTI-ICING MATERIAL WITH A SPECIFIC GRAVITY OF 1.5

D) SHALL BE EQUIPPED WITH A MINIMUM 12" MANWAY AND COVER, STAINLESS STEEL COMPRESSION FITTINGS AND A 2" CAMLOCK BOTTOM DISCHARGE.

E) SHALL HAVE MINIMUM OF FOUR TIE-DOWN STRAPS CONFORMING TO THE ELLIPITICAL SHAPE OF THE ANK. TIE-DOWN STRAPS SHALL COMPLY WITH MANUFACTURER SPECIFICATIONS AND SHALL BE SUPPLIED BY THE TANK MANUFACTURER.

F) DIMENSIONS:	MINIMUM	MAXIMUM
HEIGHT:	53"	72"
WIDTH:	67"	84"
LENGTH:	140''	156"

5000 GALLON TANK SPECIFICATIONS (ITEM ID 1000119828)

Acceptable Brands: Norwesco, Protank or Equal

A) TANK SHALL BE A MINIMUM 5,000 GALLON CAPACITY.

B) CONSTRUCTION: POLYETHYLENE RESIN TREATED WITH AN ULTRAVIOLET RADIATION STABILIZER.

C) SHALL BE CAPABLE OF STORING ANTI-ICING MATERIALS WITH A SPECIFIC GRAVITY OF 1.5.

D) TANK SHALL BE EQUIPPED WITH A 16" MANWAY AND VENTED COVER WITH MOLDED FLAT ACCESS AREA AND LADDER TIE DOWNS, STAINLESS STEEL COMPRESSION FITTINGS, MINIMUM 2" CAMLOCK CAPPED BOTTOM FILL/DISCHARGE FITTING, WITH A FULL-PORT VALVE(POLY) THAT REACHES WITHIN TWO INCHES OF THE BOTTOM OF THE TANK.

E) TANK SHALL BE EQUIPPED WITH A RECIRCULATION MANIFOLD WITH A 2" FULL-PORT CAM LOCK VALVE (POLY) FOR AGITATION OF LIQUID. TANK MUST HAVE A MINIMUM OF 6" FLAT AREA FOR FITTING MOUNTING ON SIDEWALL OF TANK.

F) TANK SHALL HAVE A MINIMUM 50 FOOT LONG 2" RUBBER REINFORCED SUCTION HOSE FOR CONNECTING TO THE PUMP AND RECIRCULATION MANIFOLD.

TANK SPECIFICATIONS

REV. 12/21

G) TANK MUST HAVE MOLDED-IN LIFT LUGS.

H) LEVEL GRADUATIONS MUST BE MOLDED IN TANK WALL PER 1,000 GALLON INCREMENTS.

SPECIFICATIONS FOR SPRAYER (Item ID: 1000176364)

1) 25 GALLON CAPACITY POLY TANK
2) 12-VOLT DIAPHRAGM PUMP HIGH-FLO PUMP, 2.1 GPM AND 60 psi
3) 5 INCH FILL LID
4) MOLDED DRAIN PORT WITH FULL DRAIN CAPABILITY
5) PISTOL GRIP HANDGUN WITH ADJUSTABLE NOZZLE
6) 15 FOOT HANDGUN HOSE

Acceptable Brands: Any brand which meets specs above.

RUST PREVENTATIVE/RUST ENCAPSULANT/SALT NEUTRALIZER SPECIFICATIONS

REV. 12/21

SPECIFICATIONS FOR RUST PREVENTATIVE (ITEM 1000120026 AND 1000120027):

ACCEPTABLE BRANDS: RHOMAR LUBRA SEAL OR EQUAL

1) ENCAPSULANT - HIGH-STRENGTH POLYMER WITH APPROPRIATE CHARGE TO ENCAPSULATE SALTS AND CHLORIDES
2) DRIED FLEXIBLE FILM THICKNESS - 2-3 MILS, NON-TACKY
3) ADDITIVE PACKAGE - E.P. AGENT, ANTI-RUST, ANTI-OXIDATION, CORROSION INHIBITOR
4) MOISTURE AND WATER RESISTANCE - INSOLUBLE, TOTALLY RESISTANT
5) ELEMEMT RESISTANCE - HEAT, RAIN, WATER PRESSURE AND ACID
6) DRYING TIME - 60-120 MINUTES
7) API SPECIFIC GRAVITY - 7.5
8) VISCOSITY - SPRAYABLE LIQUID
9) FLASH POINT AND METHOD - >110 DEGREES F TCC
10) PACKAGING – 4/SIX GALLON PAILS AND 55 GALLON DRUMS

SPECIFICATIONS FOR RUST PREVENTATIVE SPRAYER (ITEM 1000120028):

ACCEPTABLE BRANDS/MODELS: RHOMAR, CHAPIN OR EQUAL

1) 3 GALLON CAPACITY
2) VITON SEALS AND GASKETS
3) BRASS NOZZLE AND ASSEMBLY WITH T-JET .5 GPM NOZZLE
4) BRASS SHUT OFF
5) HOSE IS TO BE ATTACHED AT THE FACTORY TO PREVENT HAZARDS OF ASSEMBLY
6) TANK - STEEL INTERIOR AND EXTERIOR COATED WITH TRI-POXY COATING

SPECIFICATIONS FOR SALT NEUTRALIZER AND CHLORIDE REMOVER (ITEM 1000176362 AND ITEM 1000176363)

ACCEPTABLE BRANDS: RHOMAR NEUTRO - WASH OR EQUAL

1) CHLORIDE REMOVAL – CALCIUM, MAGNESIUM AND SODIUM CHLORIDE LEAVING A SURFACE PH OF 6.5-7.5
2) ACTIVE INGREDIENT – ORGANIC SULFAMIC ACID
3) VAPOR PHASE INHIBITOR
4) WILL NOT HARM OIL WATER SEPERATORS
5) SPECIFIC GRAVITY – 1.02
6) WATER SOLUABLE

7) NON-FLAMMABLE
8) PACKAGING – 6 GALLON PAILS AND 55 GALLON DRUMS

SPECIFICATIONS FOR RUST ARRESTOR (ITEM 1000176365)

ACCEPTABLE BRANDS: RHOMAR "BLACK MAX", KBS COATNGS MAXX OR EQUAL

1) ENCAPSULATES RUSTY SURFACE AND TRANSFORMS OXIDEZED RUST INTO PANTINA SURFACE.
2) SPECIFIC GRAVITY – 1.01
3) NON-FLAMMABLE
4) DRYING TIME – 3 TO 4 HOURS
5) CONVERTIVE BLEND – INVERSION POLYMERS
6) WATER SOLUBALE
7) VISCOSITY – SPRAYABLE OR BRUSH
8) PACKAGING – 4/ 1 GALLON CONTAINERS

LIQUID APPLICATOR SPECIFICATIONS

REV. 7/22

LIQUID APPLICATOR SPECIFICATIONS, 1000 GALLON (ITEM Id. 1000120014)

VariTech Industries Inc., Swenson or Equal

DESCRIPTION

DIRECT APPLICATION SYSTEM DESIGNED TO APPLY LIQUID ANTI-ICERS AND DEICERS DIRECTLY TO THE ROAD SURFACE FROM THE MINIMUM 1000 GALLON FRAME MOUNT TANK IN A 37,000 GVWR DUMP TRUCK. SPRAY NOZZLES ARE STRAIGHT STREAM AND WILL COVER 8' TO 12' WIDE. SYSTEM IS A SLIDE IN TYPE FOR EASY LOAD AND UNLOAD WITH A FORKLIFT. THE PUMP SHALL BE HYDRAULICALLY DRIVEN.

TANK

THE HORIZONAL LEG TANK HAS A CAPACITY OF 1000 GALLONS (MINIMUM) AND IS RATED FOR MATERIALS UP TO 12.5 LBS. PER GALLON. IT IS ROTATIONALLY MOLDED OF HIGH IMPACT LINEAR POLYETHYLENE WITH UV STABILIZERS. IT HAS A 16" VENTED MAN WAY AND A 2" NPT OUTLET. THREE (3) GALVANIZED STEEL BANDS ATTACH THE TANK TO THE FRAME.

TANK FRAME

THE TANK FRAME IS FABRICATED STEEL, HOT DIP GALVANIZED OR STAINLESS STEEL FOR CORRISSION PROTECTION. IT HOLDS THE TANK, PUMP UNIT AND PLUMBING. IT IS FORMED TO ALLOW FOR ACCESS BY FORKLIFT FOR EASY LOADING & UNLOADING. TANK FRAME MUST HAVE A 10 GUAGE DECK FOR MOUNTING PLUMBING APPROX. 24" X 82". FRAME ASSEMBLY SHALL BE EQUIPPED WITH A CROSSBAR THAT WILL UTILIZE THE DUMP BODY TAILGATE LATCH AS THE REAR HOLD DOWN. FRAME ASSEMBLY SHALL INCLUDE A SELF LOADING/STORAGE LEG KIT. SELF LOADING WHEELS TO BE 4” DIAMETER. FRONT LEGS SHALL MOUNT ON THE FRONT EDGE OF THE SKID, REAR LEGS SHALL BE FOLDING TYPE AND SHALL INCLUDE HERBICIDE SPRAY BAR MOUNT.

PUMP UNIT

HYDRAULIC MOTOR DRIVE. MAXIMUM MOTOR PSI 2000 CONTINOUS DUTY PUMP HOUSING SHALL BE CAST IRON AND THE PUMP IMPELLER SHALL BE NYLON. PORT SIZES: 2" FULL PORT FLANGED INLET AND 2.0 “ STANDARD FLANGED OUTLET. MAXIMUM UNRESTRICTED FLOW RATE SHALL BE 147 GPM

SPRAY BAR

THREE (3) LANE COVERAGE, ALL SPRAY BAR TO BE 1.5" STAINLESS STEEL. ALL SPRAY NOZZLES TO BE BRASS, STRAIGHT STREAM, QUICK-CHANGE, MOUNTED IN

16 DEGREE SWIVEL MOUNT, WHICH CLIPS TO THE SPRAY BOOM. EACH SPRAY BOOM TO HAVE A 5 PSI INLINE DIAPHRAGM CHCEK VALVE. CENTER SPRAY BOOM TO HAVE (10) NOZZLE ASSEMBLIES AND SHALL BE ADJUSTABLE FROM 12" TO 18" IN HEIGHT FROM THE PAVEMENT. SIDE LANE BOOMS SHALL HAVE (4) TO (6) NOZZLE ASSEMBLIES TO COVER THE LEFT AND RIGHT LANES. ALL SPRAY BOOMS TO BE INDEPENDENTLY CONTROLLED BY ELECTRIC ON/OFF BALL VALVES MANIFOLD TOGETHER.

PLUMBING

TANK VALVE - 2" POLYPROPYLENE
3 BANK ELECTRIC VALVES - 1" OUTLET TO SPRAY BAR, 12 V DC POWER, BALL VALVE, POLY HOUSING
BY-PASS CONTROL - 2 EACH, 1 1/2" POLY BALL VALVES FOR MANUAL CONTROL
RECIRCULATION/BYPASS LINE - 1" RUBBER RETURN TO TANK WITH POLY BULKHEAD
LINE STRAINER - 2" POLYPROPYLENE WITH 80 MESH STAINLESS STEEL SCREEN
FITTINGS - POLYPROPYLENE OR PVC SHC 80
HOSE CLAMPS - STAINLESS STEEL

HOSE REEL

MANUAL HOSE REEL WITH 50' OF 1/2" ID HIGH PRESSURE HOSE WITH 17" ADJUSTABLE SPRAY WAND WITH MANUALLY CONTROLLED ADJUSTABLE BALL VALVE. (HYPRO MODEL 3381 OR EQUAL)

GROUND SPEED CONTROL SYSTEM

APPLICATION SYSTEM MUST BE COMPATABLE AND WORK IN CONJUNCTION WITH EXISTING 5100EX CLOSED LOOP CONTROLLER AND HARNESSING ALREADY IN USE IN TDOT TRUCK. UNIT MUST INCLUDE ALL HARNESSING REQUIRED FOR COMPLETE FUNCTIONALITY AND INSTALLATION BY TDOT PERSONNEL. ANY ADDITIONAL NEED FOR SEPARATE CONTROLLER WILL NOT BE ACCEPTABLE.

TANK BAFFLE SYSTEM

THE TANK SHALL CONTAIN A TOTAL BAFFLE SYSTEM. THE BAFFLE SYSTEM SHALL FILL THE 1000 GALLON POLYETHYLENE TANK AND COMPLETELY ELIMINATE UNSAFE CONDITIONS RESULTING FROM THE LIQUID SLOSH ASSOCIATED WITH MOBILE PLY TANKS WHICH ARE NOT BAFFLED.

REQUIRED HERBICIDE CONVERSION

UNIT TO HAVE 3 NOZZLE STREAM TO SPRAY THREE (3) APPLICATIONS:
(1) WIDTH BESIDE ROADWAY; (2) GUARDRAIL; (3) DITCH BANK.

NOTE: THREE (3) MANUAL CHANGE OVER QUICK COUPLERS RQUIRED TO SWITCH FROM SUMMER TO WINTER APPLICATIONS. ASSEMBLY TO BE REMOVABLE AND ABLE TO SWITCH FROM RIGHT OR LEFT SIDE OF TRUCK WITH NO TOOLS. ASSEMBLY MUST BE ATTAHCED TO SPRAYER STEEL FRAME. MUST BE ABLE TO BE STOWED ON UNIT WHEN NOT IN USE.

LIQUID APPLICATOR SPECIFICATIONS,1800 GALLON (ITEM Id. 1000120016)

VariTech Industries Inc., Swenson or Equal

DESCRIPTION

DIRECT APPLICATION SYSTEM IS DESIGNED TO APPLY LIQUID ANTI-ICERS AND DEICERS DIRECTLY TO THE ROAD SURFACE FROM A 1800 GALLON FRAME MOUNT TANK ON A 46,000 GVWR TANDEM DUMP TRUCK. SPRAY NOZZLES ARE STRAIGHT STREAM AND WILL COVER 8' TO 12' WIDE. THE SYSTEM IS A SLIDE IN TYPE FOR EASY LOAD AND UNLOAD WITH A FORKLIFT. THE PRODUCT PUMP SHALL BE HYDRAULIC POWERED.

TANK

THE HORIZONTAL LEG TANK HAS A CAPACITY OF 1800 GALLONS AND IS RATED FOR MATERIALS UP TO 12.5 LBS. PER GALLON. IT IS ROTATIONALLY MOLDED OF HIGH IMPACT LINEAR POLYETHYLENE WITH UV STABILIZERS. IT HAS A 16" VENTED MAN WAY AND A 2" NPT OUTLET. FOUR (4) GALVANIZED STEEL BANDS ATTACH THE TANK TO THE FRAME.

TANK FRAME

THE TANK FRAME IS FABRICATED STEEL, HOT DIP GALVANIZED OR STAINLESS STEEL FOR CORRISSION PROTECTION. IT HOLDS THE TANK, PUMP UNIT, AND PLUMBING. IT IS FORMED TO ALLOW FOR ACCESS BY FORKLIFT FOR EASY LOADING & UNLOADING. PLUMBING SHALL BE MOUNTED ON A 10 GUAGE DECK THAT IS APPROX. 24" X 82". FRAME ASSEMBLY SHALL BE EQUIPPED WITH A CROSSBAR THAT WILL UTILIZE THE DUMP BODY TAILGATE LATCH AS THE REAR HOLD DOWN. FRAME ASSEMBLY SHALL INCLUDE A SELF LOADING/STORAGE LEG KIT. SELF LOADING WHEELS TO BE 4” DIAMETER. FRONT LEGS SHALL MOUNT ON THE FRONT EDGE OF THE SKID, REAR LEGS SHALL BE FOLDING TYPE AND SHALL INCLUDE HERBICIDE SPRAY BAR MOUNT.

PUMP UNIT

HYDRAULIC MOTOR DRIVE. MAXIMUM MOTOR PSI 2000 CONTINOUS DUTY PUMP HOUSING SHALL BE CAST IRON AND THE PUMP IMPELLER SHALL BE NYLON. PORT SIZES: 2" FULL PORT FLANGED INLET AND 2” STANDARD FLANGED OUTLET. MAXIMUM UNRESTRICTED FLOW RATE SHALL BE 147 GPM.

LIQUID APPLICATOR SPECIFICATIONS

REV. 7/22

SPRAY BAR

THREE (3) LANE COVERAGE, ALL SPRAY BARS TO BE 1.5" STAINLESS STEEL. ALL APRAY NOZZLES TO BE BRASS, STRAIGHT STREAM, QUICK-CHANGE, MOUNTED IN 16 DEGREE SWIVEL MOUNT, WHICH CLIP TO THE SPRAY BOOM. EACH SPRAY BOOM TO HAVE A 5 PSI INLINE DIAPHRAGM CHECK VALVE. CENTER SPRAY BOOM TO HAVE (10) NOZZLE ASSEMBLIES AND SHALL BE ADJUSTABLE FROM 12" TO 18" IN HEIGHT FROM PAVEMENT. SIDE LANE BOOMS SHALL HAVE (4) TO (6) NOZZLE ASSEMBLIES TO COVER THE LEFT AND RIGHT LANES. ALL SPRAY BOOMS TO BE INDEPENDENTLY CONTROLLED BY ELECTRIC ON/OFF BALL VALVES MANIFOLD TOGETHER.

PLUMBING

TANK VALVE - 2" POLYPROPYLENE
3 BANK ELECTRIC VALVES - 1" OUTLET TO SPRAY BAR, 12 V DC POWER, BALL VALVE, POLY HOUSING
BY-PASS CONTROL - 2 EACH 1" POLY BALL VALVES FOR MANUAL CONTROL
RECIRCULATION/BYPASS LINE - 1 1/2" RUBBER RETURN TO TANK WITH POLY BULKHEAD

LINE STRAINER - 2" POLYPROPYLENE WITH 80 MESH STAINLESS STEEL SCREEN
FITTINGS - POLYPROPYLENE OR PVC SCH 80
HOSE CLAMPS - STAINLESS STEEL

HOSE REEL

MANUAL HOSE REEL WITH 50' OF 1/2" ID HIGH PRESSURE HOSE WITH 17" ADJUSTABLE SPRAY WAND WITH MANUALLY CONTROLLED ADJUSTABLE BALL VALVE. (HYRPO MODEL 3381 OR EQUAL)

GROUND SPEED CONTROL SYSTEM

APPLICATION SYSTEM MUST BE COMPATABLE AND WORK IN CONJUNCTION WITH EXISTING 5100EX CLOSED LOOP CONTROLLER AND HARNESSING ALREADY IN USE IN TDOT TRUCK. UNIT MUST INCLUDE ALL HARNESSING REQUIRED FOR COMPLETE FUNCTIONALITY AND INSTALLATION BY TDOT PERSONNEL. ANY ADDITIONAL NEED FOR SEPARATE CONTROLLER WILL NOT BE ACCEPTABLE.

TANK BAFFLE SYSTEM

THE TANK SHALL CONTAIN A TOTAL BAFFLE SYSTEM. THE BAFFLE SYSTEM SHALL FILL THE 1800 GALLON POLYETHYLENE TANK AND COMPLETELY ELIMINATE UNSAFE CONDITIONS RESULTING FROM THE LIQUID SLOSH ASSOCIATED WITH MOBILE POLY TANKS WHICH ARE NOT BAFFLED.

REQUIRED HERBICIDE CONVERSION

UNIT TO HAVE 3 NOZZLE STREAM TO SPRAY 3 APPLICATIONS:
(1) WIDTH BESIDE ROADWAY; (2) GUARDRAIL; (3) DITCH BANK
NOTE: THREE (3) MANUAL CHANGE OVER QUICK COUPLERS REQUIRED TO SWITCH FROM SUMMER TO WINTER APPLICATIONS. ASSEMBLY MSUT BE REMOVEABLE AND ABLE TO SWITCH FROM RIGHT OR LEFT SIDE OF TRUCK WITH NO TOOLS. ASSEMBLY MUST BE ATTACHED TO SPRAYER STEEL FRAME. MUST BE ABLE TO BE STOWED WHEN NOT IN USE.