

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the vehicle wheelwashing system and equipment and accessories, including:
 - 1. Wheel Washing platform elements with spray nozzles and piping.
 - 2. Side spray piping nozzle assemblies
 - 3. Wheelwashing pumps (1 required).
 - 4. Controls for wheelwashing system, including vehicle entrance sensor.
 - 5. Water Recycling with Automatic Scraper Conveyor Solids Removal Tank System
 - 6. Automatic Flocculent dosing system.

1.2 WHEELWASHING SYSTEM DESCRIPTION

- A. Furnish a completely automatic, modular, touchless drive-through wheelwashing and water reclamation (dirt sediment settlement and water recirculation) system for mobile and/or permanent applications, suitable for vehicles having weights and dimensions allowed on public roads.

1.4 PERFORMANCE REQUIREMENTS

- A. Operation: As the vehicle approaches the wheelwashing unit the wash cycle and related water recycling operations shall be automatically activated by the vehicle passing through the entrance sensor. Length of the continuous wash platform must allow for 10 ft 10 inches drive through length. A technically coordinated spray system creates an effective washing result for the complete length of the vehicle as the vehicle is driven in a fixed path between tire guides at a slow speed (30-40 feet per minute) through the wash platform. The angled profile construction portion of the continuous wash platform base areas flexes open the tire profiles and therefore supplements the cleaning effect.
 - 1. A specially developed nozzle characteristic including side and bottom nozzles ensures for an efficient water spray profile for targeted cleaning of the tire profiles and outer and inner wheel surfaces. The bottom nozzle angles are no more than 20 degrees so arranged that the vehicle driver's sight is not impaired during the wash cycle and that only a minimum of over spray is transferred into the surrounding area.
 - 2. The length of the wash cycle is dependent on operating conditions and is progressively adjustable via a timer located on the front of the control cabinet.

3. The Wheel Washing System shall also be equipped with an adjustable timed shut off which stops the system after the set time has elapsed after the vehicle enters the system, to allow drivers of stopped or stalled vehicles to exit the vehicle after the wash system stops.
4. As the vehicle is driven through the wheelwash at 30-40 feet per minute, the Wheel Washing System shall satisfactorily remove visible, light soil accumulation from the vehicle's tires and tire-grooves and wheel wells, to prevent track-out of dirt by a truck's tires out of the owner's premises.
 - A. Minimum design capacity in vehicle wash cycles per hour shall be up to 60 at a 1-minute wash cycle.
 - B. The supplier is solely responsible for the equipment performance. Should the equipment not perform, as per these specification requirements, the supplier shall modify, add and/or alter the equipment supplied at his own expense until the performance is satisfactory.
 - C. The water reclamation system shall be capable of reclaiming water from the wheelwashing system and process the removal of suspended dirt by means of a settling tank. The submersible slurry pump then reuses the water in the wheelwashing system.
 1. The continuous wash platform shall be of 3 modular sections, 2 of which are constructed of hot dipped galvanized plate with integrated water carrying channels and nozzles with graded slopes inclined 2% to the center module. The centered washing module shall be constructed of water recycling tank with integrated water carrying channels and nozzles and a fitted removable triangular tube module constructed of angle iron at right angles to the tire travel. with angle aligned upward to flex the tires as the vehicle traverses this module The dirt/sand/ wash water slurry is diverted into the approximately 35 inch opening transversely installed under tank.
 2. The Wheel Washing System is also equipped with a 2,115 gallons recycling tank of self-supporting steel construction consisting of a steel 4 mm thickness, ST 37 profile frame and plate. The tank in an empty condition is also capable of withstanding the ground pressures and forces resulting from a passing by, fully loaded truck. External dimensions: 197 inches l x 43 1/3 inches w x 43 1/3/inches h, Useful volume: 1,950 gallons.
 3. The recycling tank shall be equipped with a continually operating single scraper-conveyor to evacuate and dewater solids, the scraper conveyor chain/plate assy shall be mounted on dual rails and guide ways with 6 specialty designed sprockets and 3 shaft assemblies and 6 auto lubricating 30 mm diameter bearing. The linked chain length shall be of 39'7 3/4" with 18 collection plates 8.5 cm high attached 3 points with a dirt removal scraper conveyor discharge 33 " height. The conveyor assemblies are driven by a .33 hp Nord motor and gear reducer.

4. The scraper-conveyor automatically transports the settled out dirt/sand through the evacuation channel to the side of the Wheelwashing unit into, e.g. a container. The dirt/sand solids are being de-watered during the conveying process. The wash water is then further directed into a separate recycling compartment for re-use. The wash-water pump is fitted inside the recycling compartment.
5. The wheelwash system's slurry quality pump is to be placed in the pump chamber of the in- ground 2,115 gallon water recycling and sedimentation collection tank. The pump will be capable to pump abrasive slurries without compressors or filters, other than the integrated pump screens, to filter the reclaimed water. The pump and integrated screen system are to be designed to not allow the passing of larger than ¼ inch solids to the wheelwash platform.
6. The wash pumps are to be designed for maximum cleaning effectiveness flow and pressure at 49 ft to 72 ft of head.
7. The pump is to be designed for a complete mechanical rebuild cost of components under \$790 USD.
8. Water delivery from the pump chamber to the wheelwash platform shall be via one pump and one direct 4 inch id supply line to provide for an efficient pressurized water spray profile at the wheelwash platform. The water delivery system will be capable to pump wash water without headers.
9. The settled-out sediment in the recycling chambers shall be removed at regular intervals, the time period for which being dependent on how often the system is used.
10. The system shall have an Automatic Flocculent dosing system to increase and optimize the sedimentation process. The flocculent is fed via automatic dosing unit volume delivery at 50 liters per hour.
11. The system must be able to continuously supply adequate amount of water for the wheelwash pumps regardless of traffic volume (subject to 1.4 B).
12. Prior to final acceptance of the system by the owner, the supplier shall demonstrate the continuous operating capacity of the reclamation system in relation to the wheelwashing

1.5 SUBMITTALS

A. Product Data:

1. Submit Product Data in strict accordance with requirements of these specifications and the General Requirements.

2. Submit the below listed technical information, concept design drawings and layouts for the Engineer. The quality of these drawings shall be such that the Engineer shall be able to determine and make changes required to related civil construction, electrical and mechanical work and installation work shown in the Contract Documents to accommodate the system supplier's proposed system.

The set of drawings submitted shall consist of, but not be limited to, the following:

- a. CAD Equipment general layout longitudinal section.
 - b. CAD Equipment general layout side view.
 - c. CAD Equipment general layout cross-section.
 - d. CAD Wheelwashing and Water discharge drawings.
 - e. Detailed listing of pumps, valves and other components used within the system and operation and maintenance data and instructions.
- B. Operation and Maintenance Data: For Wheelwashing System to include emergency, operation, and maintenance manuals.
 - C. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. The wheel wash system, pumping equipment and all electrical controls shall be designed and supplied by one supplier.
- B. Supplier shall have been regularly engaged in the engineering, manufacturing and supply of the wheelwash systems for a period of not less than Twenty five years and a minimum of 2000 wheelwash systems installed and operating. All similar items shall be the products of one manufacturer. The equipment offered shall be the latest standard product, modified as necessary to meet conditions of the project.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of the named supplier listed in the Products section of this specification and are based on the specific systems indicated.
- D. The equipment specified herein shall be MobyDick Wheelwashing Systems ConLine Series manufactured by Frutiger Company AG.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store received materials at project site or other contractor-controlled location and handle delivered materials in accordance with system supplier's instructions.

1.8 COORDINATION

- A. Coordinate layout and installation of wheelwashing system and components and with other construction shown on the drawings.
- B. Coordinate size and location of concrete with the project Structural Engineering firm qualified to provide concrete specifications. Concrete, reinforcement, and formwork requirements are specified in Division 3 by the project-engineering firm.

1.9 WARRANTY

- A. Special Warranty: Warranty on the Wheelwashing system components and accessories supplied by the system supplier, in which system supplier agrees to repair or replace components that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Operation: noisy, rough or substandard operation of system or individual system components.
 - 2. Parts: loose, damaged or missing parts.
 - 3. Finish: Abnormal deterioration.
 - 4. System effectiveness: dirt removal from vehicle's tires.

- B. Warranty Period: Two years from date of Substantial Completion for Items A. 1. through 4 above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. The equipment specified herein shall be MobyDick Dragon Wheelwashing Systems manufactured by Frutiger Company AG.

2.2 WHEELWASHING SYSTEM

- A. Description
 - 1. Furnish and supervise the installation of an integrated wheelwashing system consisting of continuous wash platform of 3 modular sections, with integrated water carrying channels with nozzles , quick coupler removal 1 tier side spray bar assemblies with integrated nozzles; with pump, check valves and piping; controls and accessories, one recycling tank 2,115 gallons of self-supporting steel construction with continually operating single scraper-conveyor module to evacuate and dewater solids as shown on the drawings. The wheelwash system shall operate automatically through the entry controls. Overall dimensions, with a drive-through track width of 108 inches are (130 inches l x 221 inches w x 92 inches h) and weight of ca 6,000 lbs.

 - 2. The wheelwash water spray pattern shall not extend above a 20 inch height.

B. Wheel Washing System

1. The Wheel Washing System shall have a continuous wash platform of 3 modular sections, 2 of which are constructed of hot dipped galvanized plate with integrated water carrying channels and nozzles with graded slopes inclined 2% to the center module. Each of these is 47 ¼ inches L x 123 2/3 inches W x 2 inch H. The centered washing module shall be constructed of water recycling tank with integrated water carrying channels and nozzles and a fitted removable triangular tube module constructed of angle iron at right angles to the tire travel with angle aligned upward to flex the tires as the vehicle traverses this module. The dirt/sand/ wash water slurry is diverted into the approximately 35 inch opening transversely installed under tank. The surface angled profile module 112 ¼ inches L x 34 ¾ inches W x 5 1/3 inches H is designed to take a maximum axle load of 33,069 lbs.
2. Overall dimensions, with a drive-through track width of 108 inches are (130 inches l x 221 inches w x 92 inches h).
3. The Wheelwash element system for washing of the tire profiles, outer and inner wheel surfaces is constructed such that the static spray nozzle manifolds consisting of 28 of 4.5 mm diameter with 10degree spray angle are integral with the hot dipped galvanized plates and 28 of 7 mm diameter with 15 degree spray angle integral to the centered tank washing module such that the truck tires drive over the spray manifold assemblies and ensures for an efficient pressurized water spray profile for targeted cleaning of the tire profiles, outer and inner wheel surfaces in order to maximize the discharge of dirt from between the tire grooves while being sprayed by the wheelwash system. The truck tires must roll on and contact the spray nozzle manifolds with all nozzles being protected.
4. The hot dipped galvanized wheelwash galvanized plates shall each have two of 2 ¾ inch diameter locating holes for each 1.5 inch diameter lifting eyes.
5. The wheelwash elements load carrying capability of the triangular tubes shall be a minimum of 33,069 lbs.
6. The Wheel Washing System shall have a minimum of 1 submersible sludge quality pump with integrated screen assembly, check valve and clean water well piping, the pump being a minimum of 7.4 hp (480 V,60 Hz) and able to deliver individually a maximum of 237.5 gallons per 30 second wash cycle . At 49 ft to 72 ft of head, the pump is capable of operating with a flow of 475 GPM and approximately 22-psi lower wash element nozzle pressure with a completely filled water system.
7. The pump is to be designed for a complete mechanical rebuild cost of components under \$790 USD.

8. Water delivery from the pump chamber to the wheelwash platform shall be via one pump and one direct 4 inch id supply line, fixed with hose and clamps to provide for an efficient pressurized water spray profile at the wheelwash platform modules. The water delivery system will be capable to pump wash water without headers.
9. The Wheel Washing System shall have two sets of one tier boxed steel side spray bar assemblies. Each spray assembly shall be 131.5 inches L x 12.5 inches H x 15 3/4 inch W with nozzle systems consisting of a total 42 integrated 6mm side spray 3 piece brass nozzles, adjustable to a variety of angles and fixing nuts. The spray bar assemblies are removal and attached to the wash element platforms with cam and lock fittings. Each spray bar assembly is designed to protect the recessed 6 mm nozzles, has entrance and exit angle to guide vehicle tires, a drain lug and 2 vertical 4 inch H x 3/4 inch diameter holders for sight guide poles. The spray bar assemblies shall run the full length of the wheelwash platform. All construction parts are chemically pre-treated, prepared with a special primer and finished in RAL-Color 6029 Green.
10. The Wheel Washing System shall have 3 sets of splash guard assemblies to fit with the steel side spray bar assemblies. Each shall be 43 1/3 inches long x 12.5 inches H x 63/64 thick.
11. The Wheel Washing System must be capable of emptying the continuous wash platform elements and side compartments of wash water effluent back into the recycling tank within 60 minutes of its last use to prevent water freezing in the wheelwash system during the winter periods.
12. The system shall include a total of 2,115 gallons serving as water recycling; solids collection chambers and a pump compartment. The one tank; fabricated of self-supporting steel construction consisting of a steel 4 mm thickness, ST 37 profile frame and plate. The tank in an empty condition is also capable of withstanding the ground pressures and forces resulting from a passing by, fully loaded truck. All construction parts are chemically pre-treated, prepared with a special primer and finished in RAL-Color 6029 Green. The water level in the tank will be controlled by automatic level control. The tank shall have a 1 piece weir assembly. The tank's external dimensions: 197 in l x 43 1/3 in w x 43 1/3 in h, Useful volume: 2,115 gallons, weight: ca. 4,200 lbs
13. The recycling tank shall be equipped with a continually operating single scraper-conveyor module to evacuate and dewater solids, the scraper conveyor chain/plate assy shall be mounted on dual rails and guide ways with 6 specialty designed sprockets and 3 shaft assemblies and 6 auto lubricating 30 mm diameter bearing. The linked chain length shall be of 39' 7 3/4" with 18 collection plates 8.5 cm high attached 3 points with a dirt removal scraper conveyor discharge 33 " height. The conveyor assemblies are driven by a .33 hp Nord motor and gear reducer.

14. The Wheel Washing System tank is also equipped with water carrying channels with specially developed 15 degree spray angle nozzle system 28 of 7 mm diameter with 15 degree spray angle nozzles and 4 lifting eyes 6 2/3 inch high x 1 5/8 inch diameter . All construction parts are chemically pre-treated, prepared with a special primer and finished in RAL-Color 6029 Green.
15. The Wheel Washing System is also equipped with an electro-mechanical flocculent dosing pump with oil-lubrication and diaphragm dosing head. The flocculent dosage sized at 50liters per hour is regulated via a hand-wheel and time relay for infinite variation of the feed-amount. The flocculent is pumped directly from the original container and evenly fed into the water-system where it is optimally mixed, thus ensuring good sludge-settlement. The dosing unit can be mounted onto the wheel-washing unit and is complete with a protective hood, Connected load:1/4 hp. 3 phase , 60 Hz ,480 v

D. Electric Control Panels and Components:

1. Stainless Steel Control enclosure panel with complete electrical system with Allen Bradley components with Standard UL 508A and ULC certification. Control panels shall be designed for operation on a 440/480/ Volt, 3 phases, 60-Hertz system, and shall be of a central open loop design. Control panels that are not UL/ULC certified are not acceptable.
2. System power is 8.15 hp, 480v, 3PH, 60 HZ and approximately 12.4 Amps operating.
3. System activation and stoppage switches shall consist of one IP 67 data sensor.
4. The sensor will be placed in a self-supporting hot dipped galvanized stand .The sensor stand head housing shall have an integrated rotation plate to provide for sensor focus directional changes in the field.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine site and project conditions for compliance with requirements for, installation tolerances and other conditions affecting performance.
- B. Examine roughing-in for process water and potable piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Electric Control Panels and Components:
 1. Control panels shall be designed for operation on a 440/480 Volt, 3 phase, 60 Hertz system, with a short circuit capacity of 25,000 amperes RMS symmetrical available at the incoming line terminals of the control panel.

2. System activation sensor shall be designed to be activated by all fleet vehicles used by the owner.

3.2 WHEELWASHING SYSTEM INSTALLATION

- A. Install equipment in accordance with manufacturers' supplied assembly drawings.
- B. Equipment supplier shall undertake the commissioning of the system and make all required adjustments to ensure proper operation.
- C. The equipment manufacturer's representative shall start-up the system. The owner will have operating personnel present during the start-up and equipment training.
- D. The owner's personnel shall be trained for a minimum of 5 hours in the system assembly, operation and maintenance.
- E. The supplier shall provide the owner the names and the addresses of all factory-authorized regional service and maintenance personnel to assist in future service.

3.3 CLEANING

- A. Clean the wheelwashing system and components after startup and testing and before final acceptance by Owner.
- B. After completing system installation, including outlet fitting and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finishes.

PART 4 OPTIONAL ITEMS

- **SPECIALTY CLEANING SYSTEMS**

1. Hand Wash for manual periodical cleaning down of the Wheelwashing unit and/or cleaning of other vehicles and equipment within the wash area. The wheelwashing system is also equipped with a manual hand wash system that will contain a manual cleaning facility consisting of a Sliding, 2-way valve with ca. 50 feet of hose and fire type end control nozzle, separate pump control on control cabinet.

- **RUMBLE STRIP , DRIP PAD, RAMPS**

1. Rumble Strip Pads for vehicle speed reduction and passive cleaning of the sediment from the tires: The wheelwashing system is also equipped with Rumble strip assemblies for entrance and an exit areas, each assembly will be 12 ft long x 118 inches wide, hot dipped galvanized, 2x angle iron tire installed as a chevron design with centered water flow collection channel optimally mounted on a ½ inch steel plate with 4 lifting eyelets for locating chains or straps for placement.

- **WATER RECYCLING /SOLID SEPARATION TANK SYSTEMS & ACCESSORIES**
 1. Recycling Tank 5000 gallons to collect recycled water, sediment and sludge from the washing platform: The wheelwashing system is also equipped with recycling tank 5000 gallons of self-supporting steel construction consisting of a steel 4 mm thickness, ST 37 profile frame and plate. The tank in an empty condition is also capable of withstanding the ground pressures and forces resulting from a passing by, fully loaded truck. The tank design is of channel-section frame for statically strengthening the pump area and for location of the overflow weir; includes a removable overflow weir with screen, a removable surge plate, a 2 ½" drain plug for easy emptying of the tank. The inner and outer surfaces primed and finished with a top coat. External dimensions: 228 in l x 87 in w x 57in h, Useful volume: 5000 gallons, weight: ca. 4,200 lbs

- **WEATHER AND HOUSING ACCESSORIES**
 1. All Weather Storage Container for security of the control panel and flocculent delivery system : The wheelwashing system is also equipped with a MobyDos Container, made of a steel profile frame and galvanized corrugated plate, with solid wood flooring and roof insulation, 4 lifting eyelets for locating chains or straps for placement, 2 lockable folding doors, locations and brackets for the system control panel , the Electro-mechanical flocculent dosing pump, with insulation, heating with ventilator, externally located emergency stop button, all necessary cables and conduit within the container, dimensions:89"x 87"x87" (L x W x H), Weight: ca. 990lbs and a connected Load:1/6 hp
 2. Cold Weather kit for MobyDick Recycling Tanks. The wheelwashing system is also equipped with a Cold Weather kit with 2x heat trace circuits and cables for flocculent delivery piping, control panel with transformer , circuits , each 1500 watts, 1 phase for 4x 1500watt immersion heaters

END OF SECTION