

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and DeIDOT Standard Specifications apply to this Section.

1.2 REFERENCES

1. U. S. Government:
 - Code of Federal Regulations (CFR)
 - a. 29 CFR 1910, Department of Labor
 - b. 29 CFR 1926, Department of Labor
 - c. FTA IT-90-5001-02.1, Quality Assurance and Quality Control
 - d. FTA Best Practices, FTA Report No. 0105
 - e. FTA Circular 4220.1E
 - f. FTA Circular 4220.1F

1.3 DEFINITIONS

1. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
2. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
3. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
4. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
5. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
6. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

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1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

7. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 ACTION SUBMITTALS

1. Shop Drawings: Provide plans, sections, and elevations, indicating materials and size for construction.
 1. Indicate manufacturer and model number of individual components.
 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.5 INFORMATIONAL SUBMITTALS

1. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
2. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.
 4. Identification of applicable standards.
 5. Identification of test and inspection methods.
 6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

1. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
2. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
3. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

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1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
4. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
5. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

1. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and re-inspecting.
2. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 1. Name, address, and telephone number of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.

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3. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

1. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
2. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
3. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
4. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.9 QUALITY CONTROL

1. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections.
2. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
3. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
4. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
 1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

1. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
2. Maintain log at Project site. Post changes and revisions as they occur. Provide copies of test and inspection log for Owner and Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

1. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Protect construction exposed by or for quality-control service activities.
3. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 115500 - VEHICLE WASH EQUIPMENT

PART 1 - GENERAL

- 1.1 The Appendix A – Technical Specifications and DeDOT Standard Specifications, apply to the Work in this Section.
- 1.2 WORK INCLUDED
 - A. Equipment items as listed below by Equipment Mark Number:
 1. WASHER, GANTRY, 3 BRUSH WITH RECLAMATION SYSTEM (Ref. Part 2.1)
 - B. Roughing-in, installation of equipment, and final connection of utilities, with labor, services, and incidentals necessary for complete and operational equipment installation.
 - C. Piping, wiring, and switching between equipment and utilities.
- 1.3 QUALITY ASSURANCE
 - A. Experience: Equipment shall be produced by a manufacturer of established reputation with a minimum of five years experience supplying specified equipment in similar transit applications.
 - B. Manufacturer's Representative:
 1. Installation: Provide a qualified manufacturer's representative at site to supervise work related to equipment installation, check out and start up.
 2. Training: Provide qualified manufacturer's technical representative to provide training to Owner's maintenance personnel in operation and maintenance of specified equipment.
 - C. Performance:
 1. The Manufacturer or Supplier of the Vehicle Washer, Mark Number VW014 shall be responsible for the design of a washer that satisfactorily washes the Owner's paratransit fleet.
 - a. The washer shall remove all visible, heavy dirt accumulation and most of the road film from all surfaces including the rear of the Owner's vehicles.

- b. The amount of cleaning agent required to perform the cleaning, as specified, shall not exceed 0.2 gallons per vehicle.
 - c. The washer shall be capable of washing up to 10 vehicles per hour.
2. The Manufacturer or Supplier of the Vehicle Washer, Mark Number VW014 shall be solely responsible for the performance of the washer, as specified, and shall modify, add to, or alter the equipment, as necessary, without any additional cost to the Owner, to provide a satisfactory performance. If the system cannot be altered, modified, or adjusted to provide satisfactory performance according to Section 3.3 of this specification, the Manufacturer or Supplier shall remove the washer equipment at no additional cost to the Owner and shall refund all purchase monies received from the Owner, either directly or indirectly through the Contractor.
- D. The Water Reclamation System shall be guaranteed by the Manufacturer or Supplier to control odors for a period of three years after final acceptance. Manufacturer or Supplier shall take whatever action is necessary to correct any odor causes during the guarantee period without the use of chemicals. Corrective action shall be at no additional cost to Owner.
 - E. The Manufacturer or Supplier shall be responsible for integrating the Vehicle Washer(s) and the Water Reclamation System to operate as a single system.
 - F. Refer to Appendix A-Technical Specifications for additional Contractor requirements.

1.4 STANDARD AND REGULATORY REQUIREMENTS

- A. National Bureau of Standards: Handbook H28 - Screw-Thread Standards for Federal Services. (Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)
- B. United States of America Standard Institute, Inc.:
 - 1. B36.10: Standard Weights and Dimensions of Welded and Seamless Wrought Steel Pipe.
 - 2. C1: National Electric Code (Copies of the National Electrical Code may be obtained from the National Board of Fire Underwriters, 85 John Street, New York, New York 10038.
 - 3. National Electrical Manufacturers Association:

- a. ICI - Circuit Breakers, Low - Voltage Power.
- b. MGI - Motors and Generators.

1.5 SUBMITTALS

A. Product Data:

- 1. Submit Product Data in accordance with Appendix A – Technical Specifications and DeIDOT Standard Specifications.
- 2. Restrict submitted material to pertinent data. For instance, do not include manufacturer's complete catalog when pertinent information is contained on a single page.

B. Operation and Maintenance Manual:

- 1. Provide complete parts, operating, and maintenance manual covering equipment at time of installation including, but not limited to:
 - a. Description of system and components.
 - b. Schematic diagrams of electrical, plumbing, and compressed air systems.
 - c. Manufacturer's printed operating instructions.
 - d. Printed listing of periodic preventive maintenance items and recommended frequency required to validate warranties. Failure to provide maintenance information will indicate that preventive maintenance is not a condition for validation of warranties.
 - e. List of original manufacturer's parts, including suppliers' part numbers and cuts, recommended spare parts stockage quantity, and local parts and service source.
- 2. Assemble and provide three copies of manual in 8-1/2 by 11 inch format. Foldout diagrams and illustrations are acceptable. Manual to be reproducible by dry copy method.

C. Shop Drawings: Submit Shop Drawings in accordance with Appendix A – Technical Specifications and DeIDOT Standard Specifications.

D. Written Verification: Manufacturer shall verify in writing with the submittal, that the washer will satisfactorily wash all paratransit vehicles currently operated by Owner or on order by Owner at time of bid.

- E. Evidence of Experience: Submit written evidence (references with name of contact, telephone number, and year of installation) that manufacturer has required experience.

1.6 PRODUCT SUBSTITUTIONS

- A. Follow requirements specified in Appendix A – Technical Specifications and DeIDOT Standard Specifications.
- B. Additional costs resulting from substitution of products other than those specified, including drawing changes and construction, will be at the expense of the Contractor.
- C. Substitution Approval: Manufacturers listed for each equipment item may bid without submittal for that item. Manufacturers not listed shall submit for approval in accordance with "Instructions to Bidders". Prior to installation, submittals for each equipment item by Mark Number shall be provided in accordance with Appendix A – Technical Specifications and DeIDOT Standard Specifications.

1.7 WARRANTY

- A. Warrant work specified herein for five years from substantial completion or 200,000 vehicle washes, whichever comes first, against defects in materials and workmanship.
- B. Warranty shall include materials and labor necessary to correct defects.
- C. Defects shall include, but not be limited to noisy, rough, or substandard operation; loose, damaged, and missing parts; and abnormal deterioration of finish. Defects shall not include damage due to neglect, misuse, or situations resulting from non-performance of manufacturers recommended preventive maintenance schedule.
- D. Submit warranties in accordance with Appendix A – Technical Specifications and DeIDOT Standard Specifications.
- E. All parts shall be readily available locally in the United States.

1.8 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment in manufacturer's containers, appropriately packaged and/or crated for protection during domestic shipment and storage in humid, dusty conditions.
- B. Indelibly label all containers, including those contained in others, on outside with item description(s) per title of this specification.

- C. Provide equipment and materials specified complete in one shipment for each equipment item. Split or partial shipments are not permissible.

1.10 LABELING

- A. Manufacturer shall securely attach in a prominent location on each major item of equipment a noncorrosive nameplate showing manufacturer's name, address, model number, serial number, and pertinent utility or operating data.
- B. All piping in vehicle wash and water reclaim systems shall be labeled with its function and flow direction.
- C. All electrical equipment and materials shall be new and shall be listed by Underwriter's Laboratories, Inc. (UL) in categories for which standards have been set by that agency and labeled as such in the manufacturer's plant.

PART 2 - PRODUCTS

2.1 WASHER, GANTRY, 3 BRUSH WITH RECLAMATION SYSTEM
Equipment Mark Number: VW014

- A. General Description:
 - 1. The washer system shall thoroughly wash the top, sides, fronts and rears of all vehicles currently owned or on order by the Owner up to and including the following: sedans, minivans, vans, large SUV's up to thirty two foot buses. The system shall be a completely automatic gantry type roll-over washer with two side brushes and one top brush. Vehicles to be washed shall park in the wash bay and the gantry washer, traveling on floor-mounted tracks, shall pass over the vehicle two (2) to four (4) times depending on the selected wash program. An undercarriage wash shall be included as part of the system. The machine shall fully control the degree of brush delivered to the vehicle and automatically adjust as required. The system shall be delivered complete with all control systems, metering, devices, drive motors, and brush assemblies.
 - 2. The system shall consist of the following major components: gantry unit complete with horizontal and side brushes, tire guides (partial, two pair), gantry rail, integral wash water reclamation system, undercarriage wash; automatic air system; electrical control panel, screening and festoon system, and all other necessary hardware to provide an operable system.
- B. Sequence of Operations:
 - 1. Driver shall pull the vehicle to the entry of the wash bay and enter the appropriate wash selection into the selector control panel.

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2. Driver shall enter the wash bay when the traffic signal is green. If the driver has selected the undercarriage wash the vehicle will be washed as it exits. Driver shall stop the vehicle when the traffic signal turns red. The STOP position will be just prior to reaching the parked gantry.
3. The brushes shall move into the front of the vehicle. The front area shall be cleaned by a side- to- side and overlapping motion.
4. Once the front cleaning function is complete the brushes shall withdraw and move automatically around the mirrors. The machine is now washing the sides and the roof of the vehicle.
5. The side brushes shall then move into the back of the vehicle, cleaning with a side- to- side and overlapping motion. Alternate program choices shall be available to accommodate differing styles of vehicles within the fleet.
6. Once the rear has been cleaned, the machine shall start to rinse the vehicle and then return to home position. The driver shall be signaled to EXIT the wash by a green light.
7. The exit door shall be activated to open via a signal from the electronic eyes or other activation means through the washer controls. The controls shall be set to open the exit door midway through the final pass. An auxiliary output or similar means shall be installed by others within the overhead door logic controller. Wiring to the device shall be provided and connected by the wash supplier.

C. Physical Data:

1. The maximum dimensions of vehicles to be washed shall be 32 feet long, 120 inches wide, and 144 inches high.
2. The overall dimensions of the installed system shall not exceed 60 feet long, 15 feet five inches wide and 14 feet 5 inches high.

D. Features and Construction:

1. Structural Framework:
 - a. Steel gantry shall be fabricated of welded tube 2" x 2" x 1/8" and 2" x 1-1/2" x 1/8". All frame tube construction shall have reinforced stress points and shall be double welded.
 - b. Side brush frames shall be fabricated of 2" x 4" x 1/8" steel and shall be completely housed within the Gantry.

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- c. Gantry shall be covered with baked white aluminum sheet (all sides and roof). Aluminum sheets shall be attached to the gantry frame with double sided closed cell foam tape, all aluminum 3/16" rivets with anodized aluminum angle trims on corners, and 30-year life silicone sealer on all seams in splash shield area.
- d. All frame and auxiliary structures that are not stainless steel shall be hot dipped galvanized.

2. Brushes General:

- a. Brushes shall be fabricated of polyethylene filaments tied into a rubber base. Top brush diameter shall be minimum 55 inches and side brush diameters shall be minimum 42 inches. All brushes shall be constructed in segments to afford partial replacement. Brush segments shall have the following specifications.
 - 1) Top Brush: 1400 mm diameter, full density at middle brushes, half density at ends.
 - 2) Side Brushes: 1100 mm diameter, full density on bottom three sections and half density at top.
- b. All brush shafts shall be flange bearing mounted, direct worm gear drive. Side brushes shall be steel frame supported at top and bottom.
- c. Brush rotation shall not exceed 125 RPM.
- d. The machine shall automatically retract the side brushes and counter rotate (reverse rotation) the side brushes when the machine is half-way through the forward pass wash cycle, and then re-extend the side brushes without missing any portions of the vehicle sides. The machine shall also automatically counter rotate the top brush at the rear of the vehicle for the reverse pass rinse cycle.

3. Top Brushes:

- a. The top brush shall be driven by a 2 horsepower, 1800 RPM TEFC electric motor.
- b. The top brush shall include an electrical pressure sensing device. The sensing device shall automatically compensate for vehicle contact. (i.e. vertical or horizontal surfaces).

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- c. The top brush lifting mechanism shall consist of plates which carry the top brush and are attached to chains to raise and lower the brush. The chains shall attach at the top and bottom of each plate. An automatic tensioner sensor on the chain shall sense any increased tension and perform as follows:
 - 1) If the chain becomes too tense as top brush is raising during cycle, the top brush will descend and the machine will reverse travel until the tension is released. The top brush will then return onto the vehicle and proceed with the cycle from that point.
 - 2) If the chain becomes too tense as the top brush is descending, the top brush will raise for two seconds and then all motors and solenoids will de-activate until the machine is reset for safety.
 - 3) Lifting mechanism shall be power by $\frac{3}{4}$ horsepower, 1700 RPM TEFC motor.
4. Side Brushes:
 - a. Two each side brushes shall be drive by 1.5 horsepower, 1800 RPM TEFC electric motors and gear reducers.
 - b. Side brushes shall be mounted in four (4) bolt flange bearings on the arm frames.
 - c. Movement of side brushes toward and away from vehicle shall be performed with a pneumatic system.
5. Gantry Drive Assembly:
 - a. Unit shall include two each drive assemblies, one in each gantry leg. Each drive shall consist of a $\frac{1}{2}$ horsepower TEFC break type electric motor coupled to a 60:1 ratio gear reducer.
6. Plumbing System: The unit plumbing system shall consist of two (2) spray arches mounted on the gantry. All lines shall be fed by a one (1) inch water hose connected to the festoon system. The Chemical Injector pump shall be connected to the plumbing system.
 - a. Fresh Water Tanks: There shall be one (1) 1000-gallon flat bottom, above ground fresh water storage tank. The tanks shall be cross link polyethylene and shall be white translucent. Tanks shall be configured with three levels of float switch control:

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- a) Hi level shut off.
 - b) Fresh water make up.
 - c) Low level cut off.
- b. Wash Pump: Unit shall be provided with a 10 horsepower wash water pump to move water from the fresh water tank to the gantry washer. The unit shall be TEFC 460V, 3 phase with a minimum water supply of 30 gpm at 60 PSI. The water lines shall include a solenoid to switch between the gantry unit rinse mode and the undercarriage wash.
7. Soap Pump: The soap pump shall be diaphragm type and hard wired to the electrical control panel. The pump shall be connected to the control panel to allow OFF/ON selection. Pump shall include the following features.
- a. Double-ball ceramic check valves.
 - b. PVDF valve assemblies
 - c. Viton o-rings.
 - d. High outlet pressure capability of 125 PSIG.
 - e. Ball bearing supported motor drive shaft.
 - f. Permanently lubricated ball bearing motor.
 - g. 20:1 adjustment run down ration
 - h. Corrosion resistant housing.
 - i. Unit shall be minimum NEMA 3R rated.
 - j. Assembly shall include suction tube foot valve and strainer, suction tube weight, suction tubing, discharge tubing and injection fitting with internal back-flow check valve and mounting hardware.
8. Pneumatic System: The unit shall include an air-operated system for positioning side brushes against the vehicle. The system shall include the following components, at a minimum.
- a. Air Compressor: Provide a tank mounted reciprocating compressor to produce air for Pneumatic System. Compressor shall be

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minimum 5 horsepower mounted on an 80 gallon receiver. Compressor shall be 480Vac, 3 phase capable of producing 18 CFM at 175 PSI.

- b. Filter/regulator/lubricator assembly.
 - c. Solenoid valves.
 - d. Air cylinders controlled by the programmable controller. Air cylinders shall be dual-action type.
9. Festoon System:
- a. Unit shall be delivered and installed complete with festoon system for delivery of water and power to gantry as it moves along the travel rail. Components shall include the following at a minimum.
 - 1) Service cable/hose.
 - 2) Trolley support system shall be supported by 4-6 free-standing 4"x4" 6061-T6 structural aluminum posts supporting the overhead track, hangers with trolleys and cord straps and nipples for water and air line connections.
 - 3) Festoon system shall consist of a C- profile with trolley wagons. All steel details shall be hot dipped galvanized including the support 4" x 4" brackets for fastening to the wall.
10. Undercarriage Wash:
- a. Unit shall include a surface mounted undercarriage spray bar controlled by the selector program. Water to the undercarriage spray bar shall be delivered by a high-pressure pump sized to deliver 30 GPM at 60 PSIG. The undercarriage wash shall be connected to the Operator Electrical Control panel to allow ON/OFF selection. Provide HS-20 rated ramp system. System shall be secured to the floor slab with stainless steel bolts and plates.
11. Tire Guide Rails:
- a. Tire guide rails shall be flared at the entrance to facilitate entrance into the wash. The guide rails shall be constructed of 4 inch tubular galvanized steel pipe. Rail height shall not exceed 6 inches.

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- b. All sections shall be smoothly finished to avoid damage to tires. Ends shall be capped.
 - c. Rails shall be anchored to the floor with ½ inch galvanized or non-corrosive concrete lag bolts. (20 feet on both sides).
 - d. Rails shall rotate freely within their fittings.
12. Gantry Track: The gantry shall travel on #12 Light Crane Rail. Track shall run full length of the wash bay and shall have stops on both ends.
13. Water Reclamation System with Ozone Generator:
- a. Wash system shall be supplied with an integrated water reclamation system capable of reclaiming the water from the wash system and cleaning it through a settling pit and centrifugal filter system. The clean water shall be stored in an above ground storage tank and shall be reused in the system for the wash cycles.
 - b. The reclamation system shall include the following components, at a minimum.
 - 1) Sump Pump: A self-priming pump shall transfer water from the recovery pit to the cyclonic filter separators. Filtered water shall be directed to the reclaim storage tank, reject water/solids shall drain to a sludge cart for disposal. System shall include continuous flow recirculation which keeps water constantly circulating from the reclaim tanks to the recovery pits. Pump shall be 15 horsepower minimum with a minimum flow rate of 300 GPM at 50 PSI.
 - 2) Barrel Screen Assembly: A stainless steel mesh basket screen/filter positioned at the drain inlet of the Recovery Pit sump shall capture particles larger than 650 microns. A filtration cage constructed of a galvanized steel mesh shall protect the suction line from the sump pump. The screens and pump cages shall be supplied with a handle and guide system to allow easy removal from the sumps for cleaning.
 - 3) Centrifugal Filter Unit: The centrifugal filter unit shall consist of two (2) appropriately sized centrifugal filters with a combined 220 GPM filtration rate mounted on an aluminum structure to support the filter and its piping. The connections to the filter shall be by an inlet and outlet manifold of galvanized pipe. The connection to the filters shall be made

by a 125 PSI minimum rated hose. The reject water from the filter units shall drain into a 0.5 cu. yd. fiberglass sludge cart. Cart shall be equipped with wheels for movement from beneath the filter assembly.

- 4) Reclaim Tank: There shall be one (1) 1500-gallon flat bottom, above ground reclaim storage tank. The tank shall be cross link polyethylene and shall be white translucent. Tank shall be configured with three levels of float switch control:
 - a) Hi level shut off.
 - b) Fresh water make up.
 - c) Low level cut off.
- c. Wash Pump: Unit shall be provided with a 10 horsepower wash water pump to move water from the reclaim system to the gantry washer. The unit shall be TEFC 460V, 3 phase with a minimum pressure production of 60 PSI.
- d. Reclaim Control Panel: The motor control and monitoring panel shall be housed in an adequately sized non-metallic corrosion resistant housing with a hinged door for access. The panel shall contain the following:
 - 1) Proper NEMA sized starter for the horsepower of the motor.
 - 2) Heater thermal protection across all three legs and a disconnect.
 - 3) 24-volt monitoring and activation system, which is made up of a 24-Volt transformer, NEMA IV oil tight indicator lights for "system on" green, pump on "green" and a "low pressure" red. The activator system shall start the pump motor from any supplied incoming 24-Volt signal. This signal shall light the system requested "on" green light. If the pressure goes below 40 psi the "low pressure" red light must light and shut off the pump to prevent damage from cavitation.
 - 4) The panel shall include a light tester button, shall be designed to meet N.E.M.A. standards and shall be have a U.L. label.
- e. Ozone Odor Control: Provide an ozone type odor control system as part of the reclamation system to control odors from the pit. The odor control system shall be the "Bubbler" manufactured by Sobrite

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Technologies, Inc or equal. Power requirements shall be 120V, 5 amps. Power switch shall be MAN-OFF-AUTO, controlled by a manually adjusted 24 hour timer.

- E. Controls: The unit shall include the following control panels.
1. Main Electrical Panel: The main electrical panel shall include the following:
 - a. Main Power ON/OFF switch: Switch in ON position shall power all motors and the control circuit transformer.
 - b. Power ON/OFF selector switch: Switch in ON position shall supply power to control circuits and programmable controller.
 - c. Power ON light: Green light indicating main power disconnect and power selector switches are both on.
 - d. Safety Cutout Push Button: Guarded white lighted push button indicating unit requires reset.
 - e. Stop Push Button: Red mushroom button for emergency stop.
 - f. Cycle counter.
 2. Remote located Operator Electrical Panel/Program Selector. Unit shall include the following, at a minimum.
 - a. Power ON light: Green light indicating main power disconnect and power selector switches are both on.
 - b. Stop Push Button: Red mushroom button for emergency stop.
 - c. Joystick for manual movement of brushes and gantry.
 - d. Pushbuttons/switches for manual operation and reset:
 - 1) Start Wash.
 - 2) Start Rinse.
 - 3) Side brushes retract.
 - 4) Rear wash assist.
 - 5) Movement stop.

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- 6) Top brush OFF/ON selector switch.
 - 7) Side brushes OFF/ON selector switch.
 - 8) Top brush return level/normal/return up selector switch.
 - 9) Auto start ON/OFF selector switch.
 - 10) Chemical Injector Pump ON/OFF selector switch.
 - 11) Undercarriage Wash ON/OFF selector switch.
- e. Program Selection Switches: Provide the following program selection switches in addition to the above. Unit shall default to the small bus selection.
- 1) Car/Light Truck.
 - 2) Mini-van.
 - 3) Van
 - 4) Large SUV.
 - 5) Small Bus.

F. Accessories:

1. Communication Light System:

- a. Driver shall be notified to proceed and exit the wash system by two communication signal lights, installed at each opening of the building.
- b. Driver shall be directed throughout the wash process with a LED-traffic light (Red/ Green).
- c. Lights shall interact and be a function of the control system. Traffic lights shall be contained in a watertight, enclosure.

2. Splash Guard:

- a. The structural components of the fiberglass splash wall shall be a framework of 6061-T6 structural aluminum. The aluminum used in the manufacture shall have a yield of strength of 40,547 psi, an elongation of 6.5% and a tensile strength of 43,245 psi.

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- b. All main vertical support members shall be a minimum of 1/4" x 3" x 3" angle spaced 48" on center maximum with a supplemental 1/8" x 3" minimum flat bar in the center.
 - c. Vertical support members will be welded together with horizontal support of a minimum of 1/8" x 3" x 47" long flat bars and 1/8" x 1-1/2" x 1-1/2" 47-3/16" long angles in the middle. The top and bottom horizontal supports shall be a minimum 1/4" x 3" x 3" x 47" long spaced vertically as required by the wall height.
 - d. The support structure shall sit on two pieces of flat bar at a minimum of 1/4" x 8" x 11" long. Anchored by a minimum of (4) 1/2" x 3-3/4" stainless steel wedge anchors.
 - e. All hardware shall be stainless steel/corrosive resistant.
 - f. The fiberglass panel shall have a corrugation size of 2.67" x 9/16" wave and shall have a tensile strength of 11,000 psi, a flexural strength of 22,000 psi, and a punch shear strength of 10,000 psi.
 - g. Splash wall shall be 12 foot tall and self supported with no additional bracing or framing connected directly to building walls or roof framing.
- G. Finish: All fabricated steel sections of the washer frame, brush pipes, and miscellaneous structures shall be hot-dipped galvanized after fabrication. Metallic surfaces not suitable for galvanizing shall be coated with 95 percent Zinc primer and covered with durable machine enamel.
- H. Utilities Available:
- 1. Electrical:
 - a. Washer: 460/ 480 VAC, 3 phase, 20 Amp.
 - b. Washer Control Panel: 460 VAC, 3 phase, 70 Amp.
 - c. Ozone Generator: 120 VAC, 1 phase, 5 Amp FLA, plug in receptacle with 15 Amp circuit breaker.
 - 2. Water: 1-1/2 inch at 40 PSI, 30 GPM maximum.
 - 3. Air: 1/2 inch at 100 PSI maximum.
 - 4. Drain: Existing 4 feet trench

I. Manufacturers Reference:

1. Prime manufacturer: This specification is based on the equipment identified in Section I.1.a and b below to establish an acceptable standard of quality, performance and features.
 - a. N/S Wash Systems
235 W Florence Ave
Inglewood, California 90301
Telephone: (877) 679- 2741
 - b. Model: Nautica 4M-12 with WWS-220 Reclaim System
2. Other manufacturers, including the following, may be considered equal upon certification of compliance with this specification and the requirements established in SUBMITTALS.
 - a. Westmatic Corporation
485 Cayuga Road
Cheektowaga, New York 14225
Telephone: (866) 747- 4567
 - b. Ross & White Company
1090 Alexander Court
Cary, Illinois 60013
Telephone: (847) 516-3900

PART 3 - EXECUTION

3.1 INSPECTION

- A. Coordinate location of rough-in work and utility stub-outs to assure match with equipment to be installed.
- B. Inspect delivered equipment for damage from shipping and exposure to weather. Compare delivered equipment with packing lists and specifications to assure receipt of all items.
- C. Report in writing to the Architect any damaged, missing or incomplete scheduled equipment and improper rough-in work or utility stub-outs.

3.2 INSTALLATION

- A. Manufacturer shall be responsible for complete operational equipment installation.

- B. Perform work under direct supervision of Foreman or Construction Superintendent with authority to coordinate installation of scheduled equipment with Architect.
- C. Install equipment in accordance with plans, shop drawings and manufacturer's instructions:
 - 1. Positioning: Place equipment in accordance with any noted special positioning requirements generally level (or slight slope as required by instructions), plumb, and at right angles to adjacent work.
 - 2. Fitting: Where field cutting or trimming is necessary, perform in a neat, accurate, professional manner without damaging equipment or adjacent work.
 - 3. Anchorage: Use fastenings as specified herein. Attach equipment securely to prevent damage resulting from inadequate fastenings. Installation fasteners shall be installed to avoid scratching or damaging adjacent surfaces.
 - 4. Upon completion of work, finish surfaces shall be free of tool marks, scratches, blemishes, and stains.

3.3 TESTING

- A. Specification Compliance: After final connections are made and prior to authorizing payment, specified equipment shall be tested for compliance with all specified features.
- B. Performance Testing: Each washer shall consecutively wash five vehicles of Owner's choosing within 45 minutes.
- C. Equipment shall not damage vehicles, including mirrors, windshield wipers and windows, or equipment itself.
- D. Malfunctions during testing shall be corrected within five days and re-tested. Malfunctions during second testing shall be corrected within five days and re-tested.
- E. Inadequate Performance: If equipment fails third test, Owner may elect to have all specified Vehicle Wash Equipment removed from site at no cost or obligation to Owner.

3.4 CLEANUP

- A. Touch-up damage to painted finishes.
- B. Wipe and clean equipment of any oil, grease, and solvents, and make ready for use.

- C. Clean area around equipment installation and remove packing or installation debris from job site.
- D. Notify Architect for acceptance inspection.

3.5 TRAINING

- A. Direct the technical representative to provide specified hours of training to designated Owner's maintenance personnel in operation and maintenance of the following equipment. Coordinate, with Owner, training schedule and list of personnel to be trained.
 - 1. Bus washer and reclaim system (Mark Nos.): 8 hours.
- B. Obtain, from technical representative, a list of Owner's personnel trained in equipment operations and maintenance.

END OF SECTION 11550