

# Special Specification 6103

## Performance Based High Occupancy Vehicle Lane Operations and Maintenance with Automated Solar Powered Barricade Gates



### 1. DESCRIPTION

This item will govern for complete daily operation of the high occupancy vehicle (HOV) lanes in the Dallas Area. This includes, but is not limited to, daily opening and closing of the lanes, emergency event opening and closing of the lanes, special event opening and closing of the lanes, ensuring the lane is clear prior to opening the lanes, driving the lanes during operating hours to monitor for debris and stranded vehicles; and maintenance of the HOV lanes including all traffic control channelizing devices, Type III barricades, barrier gates, furnishing and installing of automated solar powered barricade gates at designated field locations and all debris removal. The HOV lane corridors will include the following:

- I-30 (ERLT) from near Ervay Street to near Northwest Drive (Approx. 11.1 miles)

An HOV lane corridor refers to the limits of the HOV lane (listed above) and includes all access related to the HOV lanes and all approaches/departures to the accesses of the HOV lanes.

### 2. DEFINITIONS

The following definitions will be referenced throughout this document.

- TxDOT or Department – Texas Department of Transportation
- Engineer – TxDOT Engineer
- HOV – high occupancy vehicle
- Contractor – Contractor to which this specification is awarded
- NCTCOG – North Central Texas Council of Government
- SOP – Standard Operating Procedures
- DalTrans – Dallas Traffic Management Center (TMC)
- CCTV – closed circuit television
- DBE – Disadvantaged Business Enterprise
- Incident – a non-recurring event that either interrupts or overwhelms transportation operations
- BTM – Barrier Transfer Machine
- CBD – Central Business District
- ABG – Automated Barricade Gates

### 3. GENERAL

It is the intent of this specification that it will be the responsibility of the Contractor to ensure that they are completely aware of the traditional functions of the operations of the HOV lanes and the maintenance performed for the HOV lanes.

- 3.1. **Limits.** During the morning operating period, traffic flows in the westbound direction on the HOV lane (from Northwest Drive towards the CBD) and in the afternoon, traffic flows eastbound on the HOV lane (from CBD towards Northwest Drive). The HOV lane is set up and taken down by the deployment of movable barriers using the BTMs. Intermediate access to and/or egress from the HOV lane is in the vicinity of Northwest Drive, Jim Miller Road, Dolphin Road, and CBD during the morning and afternoon operating periods.

- 3.2. **Operation Hours.** Hours of operation are 6 a.m. to 10 a.m. in the westbound direction and 3:30 p.m. to 7 p.m. in the eastbound direction between the limits of Northwest Drive and CBD Monday through Friday.

#### 4. DEPARTMENT STANDARDS

Unless otherwise approved by the Engineer, work performed and materials used under this contract will conform to the latest version of all applicable Department manuals, standards, specifications, statewide special specifications and special provisions, policies and procedures and their addenda. These include, but are not limited to, the following, which are available online:

- Maintenance Management Manual
- Standard Operating Procedures (SOP) Manuals for each HOV lane facility
- Departmental Traffic Control Standard Sheets
- Texas Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges; 2014 and applicable Special Provisions and Special Specifications
- Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD)
- Material Producer List
- Departmental Material Specifications
- Maintenance Operations Manual
- TxDOT – Dallas District Standard Operating Procedure No. 81 – 05

#### 5. COORDINATION

Ensure that proper coordination exists with other Contractors, cities, counties, state and local law enforcement, utilities, fire departments, medical facilities and other state and federal agencies, etc. This includes, but is not limited to, Contractor ensuring communication systems, procedures and technology meet TxDOT and DalTrans specifications.

#### 6. HIGHWAY MAIN LANE CLOSURES

Main lane closures will not be allowed without approval of the Engineer. Work requiring main lane closures will be coordinated with the Engineer. All main lane closures must have an engineer sealed traffic control plan and must be provided to the Engineer 24 hrs in advance. The contractor will follow TxDOT Dallas District Standard Operating Procedure No. 81-05 titled "Planned Construction/Maintenance/3rd Party Freeway Lane Closures."

#### 7. MAINTENANCE WORK SCHEDULES AND PLANS

Contractor must submit a weekly maintenance work plan for approval by the Engineer no later than the Friday at 12:00 p.m. prior to the scheduled week the work is to be performed. This work plan and schedule must include all scheduled work in the time period stated and must be on a form as approved by the Engineer. No maintenance will be performed during any HOV lane daily operational hours, emergency operational hours, special event operational hours or any other time that the HOV lane is operational to traffic.

#### 8. COMPLAINTS/SERVICE REQUESTS

Report monthly, on a format approved by the Engineer, information on any complaints or service requests received from the public, cities, counties, etc., from the previous month. Any legislative contact will be immediately directed to the Director of Operations for response. This information will include, as a minimum, the following:

- The date and time of the complaint;
- The location of the problem;
- The nature of the complaint;

- Name of the complainant;
- Available contact information of complainant; and
- Date, time and action taken to address the complaint.

## 9. MATERIALS AND STORAGE

Furnish all materials necessary to complete the work unless otherwise noted. Furnish the Engineer with documentation indicating material compliance with Department specifications.

### 9.1. General Requirements for Automated Solar Powered Barricade Gates.

All materials furnished, assembled, fabricated, or installed under this Item must be new, corrosion resistant, weatherproof, and in strict accordance with the details shown on the plans and in the specifications.

Contractor must submit shop drawings for approval to the Engineer. Shop drawings must provide documentation stating the proposed location and spacing of gates at each location. The materials and construction will be governed by the following specification or approved equal

**Manufacturer:** VERSILIS, Inc.  
4295 St. Elzear Blvd. West  
Laval, QC Canada, H7P 4J3  
Tel. 1-450-978-1818  
[masequin@versilis.com](mailto:masequin@versilis.com)

**Model:** Solar Powered SwiftGate™ (various lengths) model # V490-000018-000,  
or approved equal

#### 9.1.1. The automated barricade gate includes, but is not limited to the following:

- Gate support frame with built-in anchoring base
- Gate swing arm
- Horizontal FHWA approved NCHRP 350 crash tested swing gate
- Electrical linear actuator equipped with:
  - end of travel limit switches;
  - mechanical overload protection;
  - hand crank manual override
- Electrical components and associated equipment:
  - power control circuit for actuator operation;
  - 12 VDC battery charger;
  - full gate light power management and flashing logic
- Pushbutton Control Panel (remote)
  - Gate arm assembly
  - Gate mechanical assembly
  - Gate control box with electrical control components
  - Antenna assembly
  - Solar panel assembly

### 9.2. Functional Requirements.

The barricade gate is horizontal swing type, operated by an electrical linear actuator. The length of the gate must be sufficient to span the roadway as indicated on the plans, in the range of about 4 to 18 ft.

The barricade gate must withstand a wind speed of 80 MPH.

The design of the entire gate assembly and the driving mechanism must be in accordance with ASTM F900-11.

Gate cannot deploy outside of the designated range and limit switches indicate at which end of travel the gate is positioned.

The gate must have a travel range of 90 degrees as indicated on the plans. The entire 90 degree travel of the gate is accomplished in less than 30 seconds.

Mechanical and electrical burn-out protections are provided to protect the actuator when the gate meets an obstruction or power is not shut-off at the end of travel.

Operations Mode select switches are provided for field personnel to override the satellite control function and to operate the gate with pushbuttons.

Manual operation of the gates must be possible at any time. The operator that performs a manual override must be able to do so without changing the mechanical or electronic configuration of the modules.

Signage and gate modules must be activated by a remote control. This remote control must be capable of activating the system from a distance of at least 1000 feet to the closest signage or gate module. It must be possible to perform monitoring of the modules parameters from a distance using the remote control.

Panels must be protected by an enclosure that is intended for outdoor use. It must be constructed to provide access to limited personnel only. Enclosure of choice must also be resistant to corrosion and protect the electrical equipment against windblown dust and hazardous weather conditions.

### 9.3 Electrical Requirements

9.3.1 **Linear Actuator.** The actuator must be weatherproof, include end of stroke limit switches and be mechanically protected against overload. It operates from 12 VDC and is sized by the gate manufacturer for the swing gate length and the operating conditions.

9.3.2 **Actuator Control Circuits and Accessories.** A local (gate mount) electrical compartment is provided to contain the following electrical components:

- Power control electronic circuit for actuator operation
- 12VDC 30Ah AGM battery
- Battery charger (ready for constant source and solar power)
- Gate light power management and flashing logic electronics
- RF control system for communication with the remote control

9.3.3 **Control Panels.** The Contractor must provide a Gate Control Panel which is used to control a specified number of gates. The Gate Control Panel interconnects wirelessly.

The gate manufacturer must provide a Gate HOV Lane Control Panel that controls a specified number of gates. The Gate HOV Lane Control Panel is mounted on the Gate Control Panel.

9.3.3.1 **Gate Control Panel.** The Gate Control Panel controls the specified number of gates at each specified location. The gate control panel is not to be microprocessor based.

The gate control panel provides the gates with any one of the three (3) selectable modes of operation.

9.3.3.1.1 **Remote Control Mode.** The gate is controlled remotely via a wireless remote control unit. Remote control is locked out when in Local Mode or HOV Lane Mode.

9.3.3.1.2. **HOV Lane Mode.** The gate is controlled locally by the use of switches on the Gate HOV Lane Control Panel located on the gate housing.

9.3.3.1.3. **Local Mode** - The gates are controlled locally by the use of switches on the gate control panel located in the Gate Control Box.

The gate control panel has the following clearly labeled waterproof switches and indicators.

9.3.3.1.3.1. **Operations Mode Select Switch.** This switch, in conjunction with the Gate Control Panel mode switch, controls the mode of operation of the gates. The positions of this switch are Local and Remote. Only one position can be selected at one time.

9.3.3.1.3.2. **Gate Position Indicators.** Light emitting diodes (LED) mounted on the Gate Control Panel and clearly labeled are provided to show the gate positions, either open or closed. The LED's reflect the status of the signal confirms described below:

COMMANDS	CONFIRMS
1. Open	1. Open
2. Close	2. Closed
3. Local Control	

A true "local control confirm" indicates that the operations mode select switch is in the local position. A true "open confirm" indicates that the gate is fully open. A true "closed confirm" indicates that the gate is fully closed. Both "open confirm" and "closed confirm" are false when the gate is not fully open or fully closed.

A true "open command" (0 VDC) from the local control unit to the local control panel for greater than .5 to 5 seconds adjustable in .5 second intervals simultaneous with a false "close command" causes the local control panel to send an "open" signal to the gate.

A true "close command" (0 VDC) from the local control unit to the local control panel for greater than .5 to 5 seconds adjustable in .5 second intervals simultaneous with a false "open command" causes the local control panel to send a "close" signal to the gate.

Invalid conditions are not acted upon by the local control panel, including:

- Valid command of less than .5 seconds in duration.
- Simultaneous true "open command" and "close command."
- Simultaneous false "open command" and "close command."

The gate while in motion, responds to a valid command requesting a change of direction, without harm to the gate or its drive mechanism.

9.3.3.2 **Gate HOV Lane Control Panel.** A Gate HOV Lane Control Panel is provided and installed in the gate operator housing. The Gate HOV Lane Control Panel cabinet is equipped with a number 2 Corbin lock and is accessible without accessing the gate operating mechanisms. The front panel of the Gate HOV Lane Control Panel has the following clearly labeled waterproof switches:

Gate Open - Push button switch to control opening of the gate.

Gate Close - Push button switch to control closing of the gate.

Operation Mode Select - Two position switch used in conjunction with the Gate Control Panel as described in Section 9.3.3.1.3.1. to determine mode of operation. The positions of this switch are HOV Lane and Remote. The way in which they interact is shown below:

<u>Gate HOV Lane Control Panel Mode Switch</u>	<u>Gate Control Panel Mode Switch</u>	<u>Mode of Operation</u>
HOV Lane	Local	HOV Lane
HOV Lane	Remote	HOV Lane
Remote	Local	Local
Remote	Remote	Remote

9.3.4 **Limit Switches.** Limit switches are integrated into the linear actuator and are preset for the system. Wiring method to the electronic circuit for actuator operation must be provided by manufacturer to the Contractor.

9.3.5 **Wiring.** Wires exiting and entering the gate housing is via terminal blocks in the housing and through openings in the concrete foundation or pedestal. Gate housing must be properly grounded.

All wiring must meet the requirements of the National Electric Code. All wires are cut to proper length before assembled. No wire is to be doubled back to take up slack. Wires are neatly laced into cables with nylon lacing or plastic straps. Cables are secured with clamps.

Service loops are provided to facilitate the removal and replacement of assemblies, panels, and modules for maintenance.

9.3.6 **Power Requirements.** The automated barricade gate and the associated equipment must operate from a solar panel power source, which includes a solar panel, controller and battery charger. The gate local power requirement is 24 VDC at 30 watts. The battery for the solar power system must be capable of operating the gates for 1 full week at 2 activations per day, if the solar panel power system fails.

The equipment operation is not affected by transient voltages, surges, and sags normally experienced on commercial power lines. The Contractor must check the local power service to determine if any special design is needed for the equipment. The extra cost, if required, is included in the bid price of the automatic gate.

9.3.7 **Transient Suppression.** All DC relays, solenoids and holding coils have diodes across the coils for transient suppression. All AC contactors have snubbers.

9.3.8 **Protection.** The equipment contains readily accessible, manually resettable, or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection.

Circuit breakers or fuses are provided and sized such that no wire, component, connector, PC board or assembly is subject to sustained current in excess of their respective design limits upon the failure of any single circuit element or wiring.

9.3.9 **Fail Safe.** The equipment is designed such that the failure of the equipment does not cause the failure of any other unit of equipment.

#### 9.4 **Mechanical Requirements**

9.4.1 **Gate Construction.** Gate is driven by an electrical linear actuator. The actuator is connected to the arm via eyes and clevis. The electrical linear actuator is a removable single unit. Each linear actuator is interchangeable with all other units.

The linear actuator is self-locking to provide integrated brake.

Each linear actuator must have a hand crank manual override to operate the gate during emergencies.

Lubrication is not required at any point more often than once every 12 months. All gears, actuator pinions, and similar mechanical parts are enclosed and running in grease.

- 9.4.2 **Gate Support Frames and Swing Arms.** Every part of the gate support frame and swing arm are fabricated from carbon steel and are hot dipped galvanized after fabrication. The housing base provides four 9/16 in. holes for mounting to the foundation. Anchor bolts and template are supplied by the gate manufacturer. Standard anchor bolt size is 1/2-13 x 4 1/2 in. hot dip galvanized. All external fasteners are of stainless steel.

The support frame and swing arm must be designed to withstand gate impacted force.

A safety latch must be part of the frame / arm assembly. This latch must lock the gate arm in the retracted position when activated. The latch must not interfere with arm movement in any operating condition.

- 9.4.3 **Swing Gates.** The swing gates are fabricated from high-density polyethylene. All bolts, nuts, washers, braces, rivets, and brackets are stainless steel or aluminum. Nails are not permitted. The length of the swing gate is as shown on the plans. The manufacturer must present an approval letter from the Federal Highway Administration (FHWA) stating that the gates have successfully completed the crash tests according to the NCHRP-350 requirements.

Gate arms are covered on both sides with 22 in. alternating red and white engineering grade reflectorized sheeting.

To prevent projectile on impact of the gate, a rope must travel the lower and upper gate tubes and knotted to the frame.

A reflective chevron panel must be installed on the gate extremity. Chevron panel must be fabricated from polycarbonate sheeting. A red flashing Gate LED arrow must be fitted on the chevron panel for additional road user's visibility and safety. Gate, chevron and Gate LED assembly must be easily replaceable in case of permanent damage. Gate and chevron must be able to withstand multiple nuisance impacts and only suffer visual damage.

- 9.5 **Environmental Design Requirements.**

The barricade gate and its associated equipment must meet all of its specified requirements during and after subjecting to any combination of the following conditions:

- Ambient temperature range of 0°F to 140°F.
- Temperature shock not to exceed 30°F per hour, during which the relative humidity must not exceed 95%.
- Relative humidity range not to exceed 95% over the temperature range of 40°F to 110°F.
- Moisture condensation on all surfaces caused by temperature changes.

---

## 10. CONSTRUCTION

### 10.1 General

The Automated Barricade Gate design and construction must utilize the latest available techniques with a minimum number of parts, subassemblies, circuits, cards, and modules to maximize standardization and commonality.

The equipment is designed for ease of maintenance. All component parts are readily accessible for inspection and maintenance. Test points are provided for checking essential voltages and waveforms.

### 10.2 Mechanical Components.

All external screws, nuts, and locking washers are stainless steel; no self-tapping screws are used unless specifically approved by the Engineer.

All parts are made of corrosion resistant material, such as plastic, stainless steel, anodized aluminum or brass.

All materials used in construction are protected from fungus growth and moisture deterioration.

## 11. LICENSE AND EXPERIENCE REQUIREMENTS

Possess the appropriate qualifications and/or licenses. Provide the Department with documentation of licenses prior to the beginning of work. All Contractor or subcontractor personnel will be appropriately licensed for specialized work. At a minimum, personnel must be licensed as a Traffic Control Technician (TCT), have completed Flagger Training and have completed the NCTCOG Freeway Incident Management: First Responder and Manager's Course.

## 12. EQUIPMENT

Furnish all equipment, tools and machinery necessary for the proper execution of the work. All equipment must be in good operating condition. Periodic checks must be made to ensure that the equipment is operating as intended. Properly equipped Contractor vehicles to be used in the performance of all work must consist of the proper number of full sized pickup truck vehicles equipped with safety devices and markings including roof mounted vehicle light bar with arrow capability, safety chevrons on tailgate and other equipment as described in the HOV Lane SOP manuals. Vehicles must be marked to identify the Contractor. Sponsorships for vehicles are acceptable, as approved by the Department. Vehicle appearance including color, decals and any/all markings to be submitted and approved by the Engineer.

## 13. SCOPE OF WORK

Perform all work required to operate and maintain the HOV lanes on the highway and appurtenances excluding only those items of work listed in Section 13.1, "Items Excluded from the Contract."

This includes all maintenance required to ensure the highway system is kept in its designed and constructed or updated condition. Repair any damage caused by the Contractor at no additional cost to the Department.

The Contractor has the option to automate some of the entrances or continue performing normal manual operations. If the contractor chooses the automated option, they will install ABGs at the locations and spacing as shown in the plans and the SOP for the facility. Compensation for supplying and installation of ABGs if this option is chosen will be paid for under the item number for Automated Barricade Gates included in this contract.

All operations and maintenance of ABGs are the responsibility of the contractor and will be subsidiary to the items in this contract. Upon the end of the contract, all ABGs must be in good operating condition prior to final payment, and will become the property of TxDOT.

- 13.1. **Items Excluded from the Contract.** Maintenance of any of the following HOV lane items: small and large signing, illumination, fixed pylons, thermoplastic pavement markings and reflective pavement markers, Intelligent Transportation Systems including changeable Dynamic Message Signs, static signs with flasher operation, unless otherwise noted in the plans, are excluded from the contract.
- 13.2. **Traffic Control Plans.** Perform work in conformance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD) and the Traffic Control Standard Sheets.
- 13.3. **Performance Standards.** Listed below are performance standards, which will be utilized to schedule work. The safety of the traveling public is of the utmost importance and will take priority over any other work. Work



will be scheduled as soon as possible. Time based performance standards will be defined by the clock time at DALTRANS unless directed otherwise by the Engineer. Performance standards and pay levels will be based on the HOV lane corridor as being active or in "operational status" (meaning the corridor has Routine Operations (Daily Operations) of an HOV lane, as described in section 13.4). The Department will inspect, verify and/or evaluate the work performed by the Contractor.

13.3.1. **Operations.**

13.3.1.1. **Routine Operations (Daily Operations).** This includes daily open and close procedures on all active and operating HOV lanes as required unless otherwise noted by the Engineer

13.3.1.1.1. **Daily Opening of the HOV Lanes.** Contractor must perform the daily opening of each HOV lane based on the sequence of procedures provided in the HOV lane SOP manual for each respective facility.

The HOV lane daily opening procedures includes at a minimum:

- removal of any debris from the HOV lane right-of-way (ROW)
- proper placement of vertical panels and/or cones
- proper automated and/or manual gate positioning
- proper vehicle arresting barrier activation/de-activation, where applicable
- proper Type III barricade positioning, where applicable
- proper placement of barrier wall

Daily opening times for each HOV lane must occur at the following scheduled times, unless otherwise noted by the Engineer:

- I-30 (ERLT) - Westbound 6:00 a.m. / Eastbound 3:30 p.m.

13.3.1.1.2. **Daily Closing of the HOV Lanes.** Contractor must perform the daily closing of each HOV lane based on the sequence of procedures provided in the HOV lane SOP manual for each respective facility.

The HOV lane daily closing procedures includes at a minimum:

- removal of any debris from the HOV lane right-of-way (ROW)
- proper placement of vertical panels and/or cones
- proper automated and/or manual gate positioning
- proper vehicle arresting barrier activation/de-activation, where applicable
- proper Type III barricade positioning, where applicable

Daily closing times for each HOV lane must occur at the following scheduled times, unless otherwise noted by the Engineer:

- I-30 (ERLT) - Westbound 10:00 a.m. / Eastbound 7:00 p.m.

13.3.1.2. **Non-routine Operations.** Non-routine operations include Emergency and Special Event Operations on IH-30 (ERLT) HOV lanes as required that are not performed as Routine Operations of daily open and close procedures, unless otherwise directed by the Engineer or Department. These non-routine operations are considered a full closure or opening of a major section of the HOV lane. Contractor notification of Non-routine Operations will be provided by the Engineer. Non-routine Operations will not be paid for directly but will be considered subsidiary to the overall items in this contract.

13.3.1.2.1. **Emergency Event Opening of the HOV Lanes.** Upon notification by the Engineer, Contractor must perform emergency opening of HOV lane based on the sequence used for daily opening procedures provided in the HOV lane SOP manual for the facility unless directed otherwise by the Engineer. The Emergency Event Opening must be restored to the proper operating period as directed by the Engineer. Emergency Event opening will be included as part of this specification. The contractor should estimate six (6) emergency events per year.

The HOV lane emergency opening procedures includes at a minimum:

- removal of any debris from the HOV lane right-of-way (ROW)
- proper placement of vertical panels and/or cones
- proper automated and/or manual gate positioning
- proper vehicle arresting barrier activation/de-activation, where applicable
- proper Type III barricade positioning, where applicable

#### 13.3.1.2.2.

**Emergency Event Closing of the HOV Lanes.** Upon notification by the Engineer, Contractor must perform emergency closing of HOV lane based on the sequence used for daily closing procedures provided in the HOV lane SOP manual for the facility unless directed otherwise by the Engineer. The Emergency Event Closing must be restored to the proper operating period as directed by the Engineer. Emergency Event Closing will be included as part of this specification. The contractor should estimate six (6) emergency events per year.

The HOV lane emergency closing procedures includes at a minimum:

- removal of any debris from the HOV lane right-of-way (ROW)
- proper placement of vertical panels and/or cones
- proper automated and/or manual gate positioning
- proper vehicle arresting barrier activation/de-activation, where applicable
- proper Type III barricade positioning, where applicable

#### 13.3.2.3.

**Special Event Opening of the HOV Lanes.** Upon notification by the Engineer, Contractor must perform special event opening of HOV lane based on the sequence used for daily opening procedures provided in the HOV lane SOP manual for the facility unless directed otherwise by the Engineer. Special Event Opening of the HOV lane must be included as part of this specification. The contractor should estimate two (2) special events per year.

The HOV lane special event opening procedures includes at a minimum:

- removal of any debris from the HOV lane right-of-way (ROW)
- proper placement of vertical panels and/or cones
- proper automated and/or manual gate positioning
- proper vehicle arresting barrier activation/de-activation, where applicable
- proper Type III barricade positioning, where applicable

#### 13.3.2.4.

**Special Event Closing of the HOV Lanes.** Upon notification by the Engineer, Contractor must perform special event closing of HOV lane based on the sequence used for daily closing procedures provided in the HOV lane SOP manual for each respective facility unless directed otherwise by the Engineer. Special Event Closing of the HOV lane must be included as part of this specification. The contractor should estimate two (2) special events per year.

The HOV lane special event closing procedures includes at a minimum:

- removal of any debris from the HOV lane right-of-way (ROW)
- proper placement of vertical panels and/or cones
- automated and/or manual gate positioning
- proper vehicle arresting barrier activation/de-activation, where applicable
- proper Type III barricade positioning, where applicable

### 13.3.2.

#### **Maintenance.**

#### 13.3.2.1.

**Routine Maintenance.** includes routine maintenance of all HOV lane related Safety Devices, Channelizing Devices, Automated Barricade Gates and repairs as required. Routine Maintenance will not be paid for directly but will be considered subsidiary to the overall items in the contract.

- 13.3.2.1.1. **Safety Devices.** Safety devices include all related manual gates, automated gates, automated gates with flashing lights and vehicle arresting barriers (dragnets) that are used to operate an HOV lane.

While performing any HOV lane SOP sequence for opening and closing procedures, Contractor must visually inspect all manual gates, automated gates, automated gates with flashing lights and vehicle arresting barriers (dragnets) for proper operation and repair immediately upon the finding of any malfunction, damage, or missing safety device.

Contractor must perform any repairs needed, outside of any HOV lane operating hours.

Contractor must clean and grease manual gates, automated gates and automated gates with flashing lights including pins and/or motors (if applicable) every October and April of each calendar year per work plan submitted to the Engineer.

Contractor must perform all other routine maintenance according to each device specifications.

- 13.3.2.1.2. **Channelizing Devices.** Channelizing devices are any vertical panel, cone, Type III barricade, or other channelizing device used on the HOV lane.

While performing any HOV lane SOP sequence for opening and closing procedures, Contractor must visually inspect all vertical panels, cones and Type III barricades related to the HOV lane for proper operation and repair immediately upon the finding of any malfunction, damage, or missing channelizing device.

Contractor must perform any repair as needed outside of any HOV lane operating hours.

Contractor must clean vertical panels, cones and Type III barricades every three (3) months or as needed to maintain retro-reflectivity. All vertical panels and Type III barricades must be retro-reflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs. The web address for DMS specifications is shown on BC(1).

Contractor must perform all other routine maintenance according to each device specifications.

Contractor must repair/replace any malfunctioning, damaged or missing Channelizing Device needed for proper operation of an HOV lane as required, as authorized by the Engineer or immediately upon notification by the Engineer.

- 13.3.2.2. **Emergency Debris Removal.** Includes the removal of any debris that is obstructing the proper operation of the HOV lane or is in the ROW of the HOV lane.

Contractor must perform Emergency Debris Removal as required, outside of any HOV lane SOP sequence as authorized by the Engineer or immediately upon notification by the Engineer.

---

## 13. SUBCONTRACTORS

Prior to any Subcontractors performing any work on the project, a request for approval of Subcontractor must be submitted and approved. A copy of the executed subcontract agreement with all the provisions required under the Contractor's Assurance must be provided for all DBE Subcontractors and at least one (1) Non-DBE Subcontractor.

---

## 14. CONTRACTORS PERFORMANCE FOR OPERATIONS

The pay level to the Contractor will be based on the performance levels attained for the key Performance Measures as described in Section 14.1.

Table 1.  
Daily Operations Pay Level

PERFORMANCE MEASURE	PERFORMANCE LEVEL	NUMBER OF DEFICIENCIES ALLOWED	PERFORMANCE PAY LEVEL
<b>MAJOR DEFICIENCIES</b>	ACCEPTABLE	0	100%
	UNACCEPTABLE 1	1	90%
	UNACCEPTABLE 2	2	80%
	UNACCEPTABLE 3	3	70%
	UNACCEPTABLE 4	4 or more	0%
<b>MINOR DEFICIENCIES</b>	ACCEPTABLE	0	100%
	UNACCEPTABLE 1	1	95%
	UNACCEPTABLE 2	2	90%
	UNACCEPTABLE 3	3	85%
	UNACCEPTABLE 4	4 or more	75%

14.1. **Deficiencies**

14.1.1. **Major Deficiencies**

- Not opening gates
- Not properly securing gates
- Unsafe operation (i.e. traveling the wrong direction in the HOV Lane)
- Not opening facility on time (within 5 minutes of allotted window)
- Not placing proper safety / channelizing devices where needed

14.1.2. **Minor Deficiencies**

- Not calling in on time as specified in SOP
- Not calling at all
- Not calling to verify signs have been changed
- Not replacing safety / channelizing devices within 48 hours of being notified

The Daily Operations pay level will be calculated on a monthly basis. DalTrans operators will use CCTV and communications with the Contractor to verify Performance Measure open/close times and record on the Daily Operations Monthly Verification form.

<b>Daily Operations Pay Level Calculation</b>				
<b>Daily Operations Pay Level</b>	=	<b>Major Deficiency</b>	X	<b>Minor Deficiency</b>

---

**15. CONTRACTORS PERFORMANCE FOR MAINTENANCE**

15.1. **Routine Maintenance of Channelizing Devices.** Routine Maintenance of Channelizing Devices involves the maintaining of all HOV lane related channelizing devices as described in section 12.6. Table 2 provides a historical perspective of the number of channelizing devices for the HOV lane corridor as inventoried in

January 2014. It is the Contractor's responsibility to know the exact number and type of safety devices that will need to be maintained for the corridor and confirmed with the Engineer.

**Table 2.**  
**Channelizing Device Inventory by HOW Lane Corridor**

<b>CORRIDOR</b>	<b>EQUIPMENT DEVICE</b>	<b>QUANTITY</b>
<b>I-30 (ERLT)</b>	VERTICAL PANELS	280

\* Inventory Performed in January 2014

The pay level will be based on the Performance Measure and the corresponding Performance Level which is based on the number of deficient occurrences (defects) allowed for each submitted work plan. A defect is defined as an occurrence where a Routine Maintenance of Channelizing Devices is not performed as stated in the submitted work plan as described in section 12.6.

- 15.2. **Non-routine Maintenance of Devices.** Non-routine Maintenance of Devices involves any other maintenance (not including Routine Maintenance of Safety Devices or Routine Maintenance of Longitudinal Gates or Routine Maintenance of Channelizing Devices) needed to repair/replace any malfunctioning, damaged or missing Safety Device, Longitudinal Gate or Channelizing Device as needed for proper operation of the HOV lane and immediately upon notification by the Engineer (e.g. notification of damaged Gate on the I-30 (ERLT) HOV lane at 7:00 p.m. on a Sunday).

---

## 16. MEASUREMENT

This Item will be measured by the "Lump Sum" for the four year contract period, as referenced in Table 3, Four Year Bid Information, found in the Appendix and as used in the bidding procedure.

---

## 17. CONTRACTOR PAYMENT FOR ROUTINE OPERATIONS (DAILY OPERATIONS) PERFORMED.

- 17.1. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for in partial payments in accordance with the Four Year Payment Schedule, in Table 3.

This price will be performance based compensation for this work and for furnishing all labor, equipment, materials, fuel, tools, disposal of removed materials and incidentals necessary to complete the work for the contract period and based on the following payment schedule.

**Table 3.**  
**Four Year Payment Schedule**

MONTH	PAYMENT SCHEDULE PERCENT	CUMULATIVE PAYMENT PERCENT	CUMULATIVE TIME PERCENT	MONTH	PAYMENT SCHEDULE PERCENT	CUMULATIVE PAYMENT PERCENT	CUMULATIVE TIME PERCENT
1	2.08	2.08	2.08	25	2.08	52.08	52.08
2	2.08	4.17	4.17	26	2.08	54.17	54.17
3	2.08	6.25	6.25	27	2.08	56.25	56.25
4	2.08	8.33	8.33	28	2.08	58.33	58.33
5	2.08	10.42	10.42	29	2.08	60.42	60.42
6	2.08	12.50	12.50	30	2.08	62.50	62.50
7	2.08	14.58	14.58	31	2.08	64.58	64.58

8	2.08	16.67	16.67	32	2.08	66.67	66.67
9	2.08	18.75	18.75	33	2.08	68.75	68.75
10	2.08	20.83	20.83	34	2.08	70.83	70.83
11	2.08	22.92	22.92	35	2.08	72.92	72.92
12	2.08	25.00	25.00	36	2.08	75.00	75.00
13	2.08	27.08	27.08	37	2.08	77.08	77.08
14	2.08	29.17	29.17	38	2.08	79.17	79.17
15	2.08	31.25	31.25	39	2.08	81.25	81.25
16	2.08	33.33	33.33	40	2.08	83.33	83.33
17	2.08	35.42	35.42	41	2.08	85.42	85.42
18	2.08	37.50	37.50	42	2.08	87.50	87.50
19	2.08	39.58	39.58	43	2.08	89.58	89.58
20	2.08	41.67	41.67	44	2.08	91.67	91.67
21	2.08	43.75	43.75	45	2.08	93.75	93.75
22	2.08	45.83	45.83	46	2.08	95.83	95.83
23	2.08	47.92	47.92	47	2.08	97.92	97.92
24	2.08	50.00	50.00	48	2.08	100.00	100.00

- 17.2. **Payment Schedule for Routine Operations (Daily Operations).** A monthly payment will be made by multiplying the "Lump Sum" bid for Routine Operations (Daily Operations) of the HOV lane corridor for each month, times the Pay Level attained from Table 1 as indicated above under "Contractor Performance" in the month, times the Payment Schedule Percent from Table 3 for the month.

## 18. CONTRACT EXTENSION

If agreed upon in writing by both parties to the contract, the contract may be extended at two year increments for a total of four additional years. The State may permit a price increase or decrease when correlated with the price index specified herein. Unless otherwise indicated, the price index will be the specified index as published by the Bureau of Labor Statistics, Washington, D.C. 20212. The baseline index will be the index announced for the month in which the bids opened. Prices may be adjusted for each renewal period in accordance with changes in index.

The allowable percent change will be calculated by subtracting the baseline index from the index announced for the month in which the renewal option is exercised and dividing the result by the baseline index. The allowable percent change will be rounded to the nearest one-hundredth of one percent and will be the maximum price adjustment permitted, except that the Contractor may offer price decreases in excess of the allowable percent change. Price increases for the first and second extension periods will be based on the CPI-W.

Either party to this contract may request a revised pay schedule for the contract extension, and if executed by change order, will replace the following:

### 18.1. 1st Two-year Renewal.

**Payment Schedule.** The Payment Schedule will follow the same procedures as outlined and described in Sections 16 through 17 except for replacing Table 3. **Payment Schedule** with Table 4. **1st Renewal Payment Schedule** and utilizing Table 4.

**Table 4.**  
**1st Renewal Payment Schedule**

MONTH	PAYMENT SCHEDULE PERCENT	CUMULATIVE PAYMENT PERCENT	CUMULATIVE TIME PERCENT
49	4.17	4.17	4.17
50	4.17	8.33	8.33
51	4.17	12.50	12.50
52	4.17	16.67	16.67
53	4.17	20.83	20.83
54	4.17	25.00	25.00
55	4.17	29.17	29.17
56	4.17	33.33	33.33
57	4.17	37.50	37.50
58	4.17	41.67	41.67
59	4.17	45.83	45.83
60	4.17	50.00	50.00

MONTH	PAYMENT SCHEDULE PERCENT	CUMULATIVE PAYMENT PERCENT	CUMULATIVE TIME PERCENT
61	4.17	54.17	54.17
62	4.17	58.33	58.33
63	4.17	62.50	62.50
64	4.17	66.67	66.67
65	4.17	70.83	70.83
66	4.17	75.00	75.00
67	4.17	79.17	79.17
68	4.17	83.33	83.33
69	4.17	87.50	87.50
70	4.17	91.67	91.67
71	4.17	95.83	95.83
72	4.17	100.00	100.00

**18.2 2nd Two-year Renewal.**

**18.2.1 Payment Schedule.** The Payment Schedule will follow the same procedures as outlined and described in Sections 16 through 17 except for replacing Table 4. Payment Schedule with **Table 5. 2nd Renewal Payment Schedule** and utilizing **Table 5.**

**Table 5.**  
**2nd Renewal Payment Schedule**

MONTH	PAYMENT SCHEDULE PERCENT	CUMULATIVE PAYMENT PERCENT	CUMULATIVE TIME PERCENT
73	4.17	4.17	4.17
74	4.17	8.33	8.33
75	4.17	12.50	12.50
76	4.17	16.67	16.67
77	4.17	20.83	20.83
78	4.17	25.00	25.00
79	4.17	29.17	29.17
80	4.17	33.33	33.33
81	4.17	37.50	37.50
82	4.17	41.67	41.67
83	4.17	45.83	45.83
84	4.17	50.00	50.00

MONTH	PAYMENT SCHEDULE PERCENT	CUMULATIVE PAYMENT PERCENT	CUMULATIVE TIME PERCENT
85	4.17	54.17	54.17
86	4.17	58.33	58.33
87	4.17	62.50	62.50
88	4.17	66.67	66.67
89	4.17	70.83	70.83
90	4.17	75.00	75.00
91	4.17	79.17	79.17
92	4.17	83.33	83.33
93	4.17	87.50	87.50
94	4.17	91.67	91.67
95	4.17	95.83	95.83
96	4.17	100.00	100.00

---

**19. CONTRACT TERMINATION**

The Department may issue a 10 day warning letter at any time contractor has 3 defects, major or minor, during any given month, to assist the contractor in returning to proper performance levels.

If the performance levels do not return to an acceptable level, the Engineer may terminate this contract if at such a time the contractor has 3 major defects following the issuance of the 10 day warning letter, as this demonstrates a failure of the Contractor to comply with the performance standards described herein.