

Pennsylvania Department of Transportation District 10-0
Pesticide Application
Statement of Work for Armstrong, Butler, Clarion, Indiana, and Jefferson Counties
(Including Parts I, II, and III)

I. General Information

- a. The Pennsylvania Department of Transportation, hereafter referred to as the Department, requires roadside pesticide spraying services within the guidelines of Chapter 13.4 of the Departments Maintenance Manual (Pub 23) and this Statement of Work. Work is to be performed within Armstrong, Butler, Clarion, Indiana and Jefferson Counties. The services provided shall be consistent with standard operating procedures and applicable Federal, State, and Local laws, rules and regulations for the protection of public health and the environment and includes following OSHA safety requirements and other agencies involved in the application and regulation of pesticides.
- b. Work shall also be in accordance with PennDOT's National Pollutant Discharge Elimination System Permit PA0270792 (NPDES Permit) as well as any renewals or replacements of the above-mentioned Permit. The permit can be viewed at the following link:
[https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/Environment/Documents/PennDOT's%20NPDES%20Final%20Pesticides%20Permit%20\(PA0270792\)%20Document.pdf](https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/Environment/Documents/PennDOT's%20NPDES%20Final%20Pesticides%20Permit%20(PA0270792)%20Document.pdf)
- c. This service will be for a period of one (1) year. Under the service period of this work, there will be two (2) options to renew, upon mutual consent, each for an additional two (2) year period. Each such renewal will receive a four percent (4%) increase over the previous terms unit prices. The Department reserves the right, upon notice to the contractor, to extend the term of any purchase order for up to three (3) months upon the same terms and conditions. This will be utilized to prevent a lapse in service coverage and only for the time necessary, up to three (3) months, to enter a new Purchase Order.
- d. The Department reserves the right to award any or all the line items of this bid proposal.
- e. The contractor shall furnish all equipment, personnel, and materials for roadside pesticide spraying service work as described in this statement of work at the above specified locations.
- f. The Department anticipates forty hours of production work per crew each week. The contractor shall be permitted to work extended work days if it is in the best interest of the Department and permission is granted in writing by the District Roadside Specialist (DRS) or designee. In the event of programming needs, weather conditions, or major equipment failure that affects the application timing of the herbicide programs, the contractor, at the Departments discretion, shall be required to work more than the normal forty-hour work week. This shall require an extended work day and up to a six-

day work week. This additional work shall be paid at the normal unit prices. No overtime rates will be paid by the Department.

- g. No work shall be permitted on holidays or in areas of maintenance or other scheduled activities. In some cases, work will not be permitted on the days prior to and after the holiday. These will be determined each year at the pre-season meeting.
- h. Along the highways scheduled for pesticide spraying, crews will be confronted with sections of roadside that pass through well maintained residential and commercial properties. Do not apply pesticides to shade trees or ornamental trees or to bushes and plants where the property owners are providing maintenance.
- i. The contractor will be responsible for any off-target damages to Department, Commercial, or Private Property. No additional payments will be made for the cost of repairs to these properties. The contractor will be expected to contact all complainants within 48 hours of notification from the Department and rectify any property damage as soon as possible. Failure to do so may result in reduction or termination of work.
- j. The number of hours worked are dependent on satisfactory work performance, program demands and funding. All quantities of services, materials, and equipment are estimated and may be increased or decreased as required to complete the roadside pesticide spraying program as described in this statement of work. The Department reserves the right to terminate this work if it is determined to be in the best interest of The Department.
- k. Prior to the award, the contractor will be required, at their expense, to assemble their proposed equipment and personnel. The DRS will review the equipment and personnel about these specification requirements. A list of equipment modifications and additional personnel training, if needed, shall be developed. This demonstration shall take place within the state boundaries or via an approved department video conference application at a time and place determined by the department and be within ten (10) working days of the bid opening date. The DRS per their schedule will make the site selection. Follow-up reviews shall be conducted at the discretion of the Department. The contractor shall be notified five (5) days prior to a follow-up review.
- l. All certified applicators working within PennDOT District 10-0 will be required to attend a preseason meeting with the DRS at a location within the District boundaries. All contractor costs associated with this meeting shall be incidental to the Service and no payments will be made for time spent traveling to the meeting while at the meeting or after the meeting until directed by the DRS. This meeting may last up to 8 hours to ensure required training and set up are completed. Parts of the meeting will include the setup, calibration, and final inspection of equipment prior to it working within the District and understanding of the PennDOT Roadway Management System (RMS), and the Mobile M-609 application. No payment will be made during this portion of the meeting as well as those previously mentioned. It is recommended, but not required,

that the Contractor have potential replacement applicators attend this meeting as well. Otherwise substitutions may not be permitted.

- m. Subcontracting of this work will not be permitted.
- n. The following information shall be supplied to the DRS prior to April 1 of each pesticide application season
 - 1. A revised contractor applicator licensing form for the new season
 - 2. Complete cell phone list including the numbers for the Project Manager and all foreman.
 - 3. Listing of spray trucks including their identification number as assigned by the contractor
 - 4. A copy of the current Pennsylvania Department of Agriculture "Pesticide Application Business License."

II. Qualifications of the Contractor

- a. Within 5 days of the bid opening date, the Contractor shall submit a copy of their Commercial Pesticide Business License and complete and return the attached Applicator & Licensing Record Form. The Commercial Pesticide Business License must include Category E (Right-of-Way Pest Control), and Category F (Industrial, Institutional, Structural, and Health Related) and/or any other category necessary to perform services in accordance with this statement of work. All Pesticide Applicators must have current certifications for Category 10 (Right-of-Way) and Category 23 (Park / School Pest Control) when applicable and/or any other category necessary to perform services in accordance with this statement of work.

III. Personnel Requirements

- a. The Contractor shall name one person as the Project Manager. The Project Manager shall be the Departments sole point of contact for all service related activity including but not limited to; scheduling, programing, and other program related activities. This person shall have the authority to make all service related decisions and other contractor personnel shall not change these decisions. The Project Manager shall be accessible by Cellular Phone and e-mail. Phone numbers and e-mail address shall be provided to the DRS prior to the start of any work.
- b. The Contractor shall supply two professionally and physically competent operators with each spray truck unless otherwise stated within this statement of work. One of these operators shall have a current Pennsylvania Pesticide License issued by the Pennsylvania Department of Agriculture in the required categories and can communicate clearly using the English language. The Certified applicator shall be considered the Foreman for the crew.

- c. Training of all contractor applicator personnel in computer flow control programming, adjustment, troubleshooting, operation, spray head-setup, nozzle adjustment, proper calibration, and material mixing is mandatory. This is to be done by the contractor prior to the pre-season meeting. The applicators must demonstrate the ability to, without assistance, operate, calibrate, and perform field maintenance on all equipment associated with the spraying complement. This may include passing a written or oral exam given during the preseason meeting. An applicators failure to pass any exams and, properly set up and calibrate their equipment shall result in their removal from all application work on a spray unit until they can demonstrate to the DRS their ability has increased to an adequate level.

- d. Unless authorized by the DRS through email or letter, Certified Commercial pesticide applicators assigned to this Service shall not be replaced during the duration of any Purchase Order so long as the contractor employs them in an applicator position. If an applicator needs to be replaced, the replacement will not be paid by the department for any training that is needed for them to take over the spraying operation.

- e. The Department reserves the right to have any crew member removed from the project at any time at its discretion.

- f. The Certified Pesticide Applicator for each crew shall be supplied with a cellular phone and the number given to the DRS prior to the start of any work. The Certified Pesticide Applicator will be responsible for the following items:
 - 1. Varying rates of application based upon all site conditions such as spray material, vegetation to be controlled, weather, speed of equipment, wind velocity, traffic conditions, and other factors listed on product labels.
 - 2. Daily recording on county maps, supplied by the DRS, of the routes completed and the scheduling of pesticide spraying within the County as coordinated with the DRS and County Management.
 - 3. Familiarization with the areas to be treated within each County. It is imperative that each crew foreman be familiar with the geographical area to maintain smooth and efficient operations.
 - 4. Scheduling of meetings with the DRS and County Representative prior to working in the county and the resolving of the sequence of pesticide applications, the routes to be treated, and the respective traffic controls and protection equipment and devices required in accordance with PENNDOT Publication 213.
 - 5. Complete understanding of the procedure for reporting of work progress using Form M-609 in the mobile application format.
 - 6. Ability to read PennDOT supplied maps and understand the PennDOT Location Referencing System (LRS) and the State Route (SR) system.

7. Maintain a current copy of pesticide hypersensitivity Registry and follow all guidelines related to contacting individuals listed in this publication.
8. Contact the DRS and county representative by 8:00AM of each day to list the roads that are planned to be treated with a pesticide application during that day.
9. Possess knowledge and ability to maintain and field adjust the equipment to sustain a continuous and productive operation
10. Possess the professional and technical ability to distinguish between desirable and undesirable vegetation.
11. Complete understanding of bill able vs. non-billable hours as shown in section VI paragraphs e and f.
12. Review weather prior to start of each workday and continuously monitoring the weather conditions throughout the work day to ensure effectiveness of the application and adherence to the label.
13. The certified applicator is required to do the Pesticide application. Intermittent application by a Non-certified individual will be permitted under this procurement by PennDOT for training purposes only. When this occurs, it shall be documented as required by Recordkeeping requirements in PDA title 7 Chapter 128.35.
14. A complete understanding of the pesticide products used in the Districts herbicide program.

IV. General Equipment and Material Requirements

- a. All equipment shall be in sound mechanical condition, good working order, with a uniformly painted, neat, and clean appearance. At the request of the DRS all equipment will be washed / cleaned within forty-eight (48) hours of email notice.
- b. Overnight storage of equipment will be the responsibility of the contractor. The Department may allow overnight parking in designated areas on commonwealth property but **only** with the permission of the County Manager and such approval may be revoked at any time when it is in the departments best interest.
- c. All vehicles shall display the Contractor's business name, City, state, U.S. DOT numbers and Pesticide Business License Numbers as required by the Pesticide Control Act of 1973.

- d. Shadow Vehicles, and all advanced warning devices associated with them, including but not limited to flashing lights and arrow panels, shall be supplied and be in accordance with the most current addition of PennDOT Publication 213.
- e. All shadow vehicles shall be equipped with a lockable watertight pesticide storage box. The minimum size of the storage box shall be forty-eight inches long by thirty inches wide by thirty inches high (48"X30"X30"). The storage boxes shall be mounted on the truck bed so that the top of the box is not higher than thirty-six inches (36") above the bed. No pesticides or Department materials will be permitted to be stored in areas that are open to rain or snow.
- f. All vehicles delivering pesticides used with Part I shall be equipped with, at the contactors expense, a real-time GPS (Global Positioning System) Location Verifying Unit Receiver Signal System to record the location of the spray vehicles using GPS satellites. The spray vehicle computer and GPS Location Verifying Units shall be supplied, maintained, and installed by the contractor, at their expense, for the duration of the Purchase Order. The GPS Location Verifying Units system shall be capable of real-time and historic tracking of all spray trucks at the same time collectively or individually. In addition, the GPS location system website shall include a real time Doppler radar layer. The Department reserves the rights to download any stored or recorded information within the vehicles spray monitoring or location monitoring units at any time during the term of any Purchase Order. The contractor is responsible for providing The Department with a website access location to view the GPS location, of any spray truck, at any time, in real-time. The website shall be compatible with Google Chrome and Internet Explorer 11 and newer versions and be compatible with Smartphone's using the iPhone, Android, Windows, and Blackberry Operating Systems.
- g. The GPS Units should be capable of accuracies of ten to fifteen meters uncorrected and five meters when differentially corrected. The mobile units must contain a data dictionary capable of collecting and delivering a summary of each day's activities in the form of an attached report which will be correlated with the form M-609 and used as a basis of payment for work performed. This summary must be attached to the daily electronic M-609 report each day work is completed. The GPS unit reports submitted must show the following information:
 - 1. State Routes traveled
 - 2. Locations along the traveled state routes
 - 3. Direction of travel along the state routes
 - 4. Location and time correlated
 - 5. Contract name, date, and applicators name.

This information must be formatted into a file format compatible with The Department's existing software. The contractor will be required at their expense to provide all necessary software to provide the above-mentioned data. This material will be supplied by the contractor and shall include the following:

1. Tracking Units
 2. GPS antennas
 3. Power cords
 4. Download cables
 5. Mapping software
- h. All spray equipment shall be calibrated a minimum of one time each week and at the beginning of a new spray program. All spray equipment shall also be calibrated upon starting work in a different County. Calibrations shall be documented on Form M-609.
- i. The Department will utilize returnable/refillable pesticide material containers under this contract. The contractor shall, as an integral part of this contract, provide per complement the following equipment for handling of these containers as approved by the DRS:
1. A minimum of three (3) truck mounted container-holding brackets designed so the returnable/refillable container fits inside and remains stable.
 2. A permanently mounted twelve-volt (12V) electric material handling pump, minimum four (4) gallons per minute with pressure switch, necessary suction and discharge hose and all special connections as required. In addition, to the pump, a hardwired twelve-volt (12V) connection to operate this pump shall be constructed on the truck in the container holding bracket area.
 3. Up to two (2) hand pumps for low usage product mounted on the necessary drum coupler with discharge hose.
 4. The preferred location of the above-mentioned equipment is on the spray truck.
 5. The contractor shall provide a means of safely loading these fifteen (15) gallon containers onto their equipment.
 6. The contractor shall be held responsible for the care of these containers while they are in their possession.
- j. Each Pesticide Complement shall always have the following equipment on the spray truck:
1. Two (2) translucent 5 gallon buckets with 0.25 gallon graduations.
 2. One (1) 128 fluid ounce liquid measure measuring pitcher with graduations of 2 ounces marked on the pitcher
 3. One (1) 64 fluid ounce liquid measure measuring pitcher with graduations of 2 ounces marked on the pitcher
 4. All personal protective equipment as required by the pesticides being applied.
 5. Two (2) spare OC nozzles of each type used including the nut for the guiderail and shoulder spraying system including:
 - A. OC20
 - B. OC30
 - C. OC40
 - D. OC60
 - E. OC80
 6. One $\frac{3}{4}$ inch nozzle body with cap nut

7. Two (2) spare nozzles of each design type used for the Nutating spray head system and three spare 90-degree elbows of each design used in the application head.
 8. A small assortment of commonly used pipe fittings, hose bibs, and quick couplers
 9. One (1) set of large channel lock type pliers
 10. One (1) 14" pipe wrench
 11. One (1) 12" pipe wrench
 12. Two (2) Philips screw drivers
 13. Two (2) standard screw drivers
 14. Four (4) worm gear type hose clamps to fit each type of hose size
 15. One (1) large funnel
 16. A spill kit of sufficient size to effectively contain a spill based on the size of the tanks
 17. Fire extinguisher/ first aid kit/ eye wash
 18. Nut drivers of various sizes to adjust or remove nozzles and hose clamps
 19. Two (2) extra check valves of the same design used on the truck
 20. A spill response and adverse incident response plan developed by the contractor in accordance the most current PennDOT NPDES permit to include:
 - A. Background and applicable regulations
 - B. Incident reporting chain of command
 - C. Spill preparedness checklist
 - D. Spill response/control methods
 - E. Spill response procedures.
- k. During the pre-award and subsequent pre-season equipment checks, the DRS may state specific corrections needed to equipment based on the equipment specifications. Corrections shall be made within five (5) calendar days after written notification. Written notification will include e-mail, fax, or mailed delivery.
- l. Spray vehicles assigned to this service shall not perform other work outside of the specified areas unless released by the DRS and only once tanks and storage are emptied to the satisfaction of the DRS. The emptying of tanks and storage shall be done at the contractors cost. Upon return, all tanks shall be empty and cleaned. Any equipment that leaves the District shall be subject to re-inspection, at the contractor's expense, by the DRS.
- m. All spray trucks and shadow vehicles shall be equipped with a working 2-way radio system for truck to truck communication. A CB radio is preferred. If a different means of truck to truck communication is utilized other than CB radio, provide the DRS with a unit of the same to be used for communication with the crew when in the field and in close proximity. This unit shall not need to be hard wired to a vehicle. If the unit is battery operated, provide all charging equipment.
- n. The material contingency item of the purchase order will be utilized for pesticides and fertilizers which are not available to the Department through the Department of General Services contract or other types of material or specialized equipment needed to complete special projects. Equipment will be paid hourly at a negotiated rate. All

material will be paid for at the invoice price plus 10% for handling and will be documented on the roadside daily activity report (M-609).

V. Work Zone Traffic Control and Safety Equipment

- a. Maintain traffic in accordance with the current PUB 213. The most current edition of PennDOT Pub 213 can be found on the web at www.dot.state.pa.us.
- b. Publication 213 outlines the minimum requirements for maintenance and protection of traffic. The contractor may be permitted to go above and beyond these requirements should they feel it necessary however the Department will only pay the contractor for the minimum requirement to be satisfied.
- c. All vehicles and equipment must be in accordance with Title 67, Pennsylvania Code and the Pennsylvania Department of Transportation Publication 212.
- d. Work Vehicles shall pull over periodically to allow traffic queues to clear.
- e. All personnel shall wear all personnel protective equipment (PPE) as required by Publication 213 and each specific pesticide label.

VI. Special Billing Requirements

NOTICE—IMPORTANT CHANGE IN CONTRACT ADMINISTRATION

- a. While the Department reserves the right to request submission of the M-609 in other formats in the future as detailed below, the Department **intends to replace paper Form M-609s with a mobile application** (hereinafter the “application”), **effective immediately for this procurement**. Any reference throughout this document to the M-609 shall mean the PennDOT Form M-609, which shall be completed by the Contractor via the Department’s application unless directed otherwise by the DRS. To that end, the following requirements apply:
 1. The Contractor shall become a PennDOT Business Partner obtain credentials to utilize the application and follow Attachment B, titled “Accessing PennDOT iPad Applications for Business Partners.” Attachment B provides guidance on registering to become a Business Partner and using the application.
 2. The Contractor shall be responsible for the purchase, maintenance and operation of all hardware, including devices such as but not limited to compatible cellular telephones or tablets, necessary to utilize the application.
 3. The Contractor shall submit all Form M-609s to Department via the application.
 4. Once registered as a Business Partner, the Contractor shall have the ability to use the application statewide for roadside maintenance work and, as directed by the Department and its authorized personnel, including without limitation the DRS,

complete Form M-609 electronically, with the same binding legal effect as though certified in writing.

A completed Confirmation of Services Form (Form OS-501), as well as all related M-609's shall be submitted by the Contractor to the DRS, for review and verification, on a mutually agreed upon basis. The DRS will notify the Contractor if corrections are needed. Each Form OS-501, prepared by the contractor shall be itemized, include sufficient detail, and coordinate with the line items on the Purchase Order. Untimely or incomplete submissions of Form OS-501 and required supporting documentation (including M-609s) may delay processing of a "proper invoice" as required by the Payment section of the Terms and Conditions.

Invoices shall be submitted by the Contractor on a mutually agreed upon basis. For further instructions regarding invoicing, see the Billing Requirements section of the Terms and Conditions.

The Department reserves the right, throughout the life of the contract, to make changes to Forms M-609 and/or OS-501, including their instructions, content, and all other requirements.

- b. The contractor is responsible for daily documentation of services completed using the M-609 form mobile application for iPad. Failure to provide complete information on the M-609 form will result in DELAYED OR NON-PAYMENT of services provided for that day.
- c. Instructions for registering for and downloading the mobile application are included in Attachment "B".
- d. The Contractor and DRS will review the hours worked as stated on the M-609 forms in regular intervals such as each week or each month. Once the contractor and DRS agree, the Contractor shall submit an OS-501 form to the DRS for all items worked and submit an official invoice to the address shown on the Purchase Order in the "Bill TO" section.
- e. "Billable" hours to the Department will include:
 - 1. Time spent applying pesticides as directed
 - 2. Filling tanks with water at Department facilities, from bodies of water within the boundaries of the PennDOT District 10-0 region, and/or at other approved sites within the PennDOT District 10-0 region.
 - 3. Acquiring, loading, and mixing pesticide concentrates within the PennDOT region 10-0 boundaries.
 - 4. Routine calibration of equipment which is required in Attachment "A" section IV paragraph h.
 - 5. Meeting with Department representatives in the field other than the pre-season meeting as described in Attachment "A" section I paragraph m.
 - 6. Minor equipment repairs not to exceed 15 minutes per occurrence and not to exceed a total time of 30 minutes per day.
 - 7. Time spent traveling from one work location to another work location or "deadheading" (driving on various state routes to get from one spray area to another

and not spraying for periods of time) during the work day. Deadheading shall be minimized and if, in the DRS's opinion, this is being abused by a spray crew, billable hours may be reduced and the crew may be suspended from further work.

8. Reasonable time spent for crew bathroom breaks.
 9. When directed by the DRS, up to 1 hour to flush the spray system when switching between spraying programs.
 10. When directed by the DRS, up to 1 hour to complete the set-up equipment for a different spray program other than in the pre-season meeting as described in Attachment "A" section I paragraph m.
 11. Reasonable time spent completing required M-609 documentation while in the field.
 12. Reasonable time spent completing required maps while in the field.
 13. Reasonable time spent contacting individuals on the hypersensitivity list while in the field.
- f. "Non-billable" hours will include but not be limited to:
1. Travel from the crew's home or home base to the work site or PennDOT county maintenance office before the start of work
 2. Travel from the work site to the crew's home base after a day's work.
 - i. For 1 and 2 above, approximately 15 minutes' leeway will be given prior to the start of work and the conclusion of work for the set up to begin work and ending work including necessary paperwork.
 3. Equipment failure lasting more than 15 minutes or more than two occurrences of 15 minutes.
 4. Lunch breaks
 5. Waiting for roads or vegetation to dry in the morning after arriving to the work area and finding it to be too wet to work after rainfall during the work day. The crew foreman is responsible for monitoring weather conditions.
 6. Filling tanks and mixing/loading at locations not approved by the DRS or outside of the PennDOT 10-0 boundaries.
 7. Filling out and completing any paper work for the contractor's organization that is not required by the Department
 8. Equipment inspections or crew audits performed in the field by the contractor's personnel.
 9. Waiting for spray application equipment (tanks, piping, hoses, nozzles etc..) to thaw out.
 10. Waiting for fog to lift.
 11. Waiting for daylight in the morning

VII. Pesticide Spray Program Maps

- a. Maps outlining the District Pesticide Spraying program will be available for review in the District Roadside Office. The DRS can be reached at 724-357-2833 to set up an appointment.

I. Pesticide Spraying Complement

- a. The Department requires the use of computerized tank mixed Pesticide Delivery equipment with a minimum of a 1000-gallon total capacity and personnel as described below and in Attachment "A". Three (3) complements will be required with this item with the option to require an additional complement within 20 days written notice given by the DRS.
- b. If an additional complement is requested, in the interest of time, some equipment requirements may be waived by the DRS to get the equipment utilized when needed.

II. Materials

- a. Materials under this work will be purchased by PennDOT and dispensed to the contractor from each respective PennDOT County Maintenance Facility.
- b. The DRS may require the contractor to supply materials that are unavailable for purchase from the Department of General Services statewide contract. Contractor furnished materials will be reimbursable using the Material Contingency Item. Proof of purchase, showing the unit price of the materials shall be furnished to the DRS prior to any reimbursement. A 10% markup will be added on to the unit price for handling.

III. Personnel

- a. Personnel shall be supplied as stated in Attachment "A" sections II and III.

IV. Equipment Requirements

- a. Equipment shall be in accordance with Attachment "A" Section IV and as stated in this section.
- b. Spray Trucks will be required to be of sufficient size to legally haul all required equipment and supplies.
- c. Spray Trucks shall be equipped with a 1000 gallon or larger total capacity with independently separate, dual tank capability. For this work, independently separate shall mean that the tanks shall not share any walls and be standalone. The smaller tank will have a minimum capacity of 200 gallons and a maximum capacity of 300 gallons. The Large tank shall be designated as Tank #1 and the smaller Tank shall be designated Tank #2. Both tanks will be equipped with mechanical or hydraulic agitation, a bottom sump from which the pump influent line (the line that connects the tank to the suction side of the pump) shall connect.

- d. The fill system for the tanks shall be constructed with metal pipe and be of the same size as the refill pump effluent housing as stated in paragraph V below and be permanently mounted on the truck. The fill system shall be constructed to have a visual air gap (minimum air gap of six (6) inches) between the end of the pipe and the tank opening. Backflow preventers will not be accepted. Each complement will be required to have any needed pipe fittings, adapters, reducers, etc. that may be needed to properly connect to water sources.
- e. All valves used to shut off system flow at tanks, solenoid valves, and other areas of the system shall be quarter turn one-way ball valves.
- f. Valves used to divert system flow downstream of the solenoid valves may be two or three-way valves.
- g. All valves, hoses, and tanks shall be permanently labeled to indicate their operational function. Labels on hoses shall be marked with arrows indicating the direction of flow. Any equipment that is unlabeled or not in use as needed by these specifications shall be removed so as not to be confused with the operational spray system.
- h. The pumping system shall be outfitted with a high volume-low pressure pump powered by a minimum twelve (12) horsepower engine with an electric starting system and be in sound mechanical condition with working factory muffler system and a pump to engine pulley ratio producing a system capable of discharging the required quantity of spray mixture at the specified pressure.
- i. The pump return line to the tank shall be of the same size as the pump effluent housing. A metal ball valve and liquid filled system pressure gauge shall be installed using metal pipe in the return line as close to the pump effluent housing as possible for regulating and reading pressure.
- j. An inline filter with interchangeable manufacturers recommended mesh size screens shall be installed between the tank and pump. Mesh screens of 30, 50, 80 and 100 mesh shall be on each truck.
- k. The spray unit is to be equipped with a sprayer control system capable of automatically maintaining the application rate and shall include a vehicle speed sensor which is either connected to the vehicle speedometer or has a radar type sensor. The computer shall be capable of operating a minimum of eight (8) separate boom widths and have two different application ratios.
- l. The sprayer shall be equipped with manufacturer recommended solenoid valves, regulators, and a manual shut off valve preceding the solenoid to individually control each of the required eight (8) spray boom sections.
- m. This system shall also be integrated with a positive displacement, pressure side single injection unit to be utilized at the request of the DRS. The injection tank shall be a minimum of twelve (12) gallon and maximum of twenty-five (25) gallon capacity. The injection unit shall be engaged and fully operational with the use of a single switch to

engage or disengage the injection system to be able to inject chemical under normal spray operational conditions and speeds.

- n. The Spray unit shall be equipped with a nozzle system for applying non-selective herbicides to guiderail and roadside shoulders as directed by the DRS. This system shall contain a check valve on each individual nozzle assembly immediately preceding that nozzle assembly. The system shall be capable of simultaneously spraying both the guiderail and the roadway shoulder. The system shall be permanently mounted on both sides of the application unit with both sides able to be operated simultaneously.
- o. All guiderail and shoulder nozzle assemblies shall be constructed so that they can be adjusted up and down along both the vertical and horizontal axis's utilizing square tubing of appropriate sizes so that one square tube tightly fits inside of another while still retaining the ability to be moved freely. Tubing shall have lockable adjustments and must be able to remain in a steady and stable position while driving. Each nozzle assembly must be designed to overlap each adjacent nozzle. Any nozzle breakaway system proposed by the contractor shall be approved by the DRS prior to final equipment inspection.
- p. The guiderail application system shall be constructed of solid metal pipe and pipe fittings and be permanently attached to square tubing. The system is to utilize two nozzles pointed toward the guiderail using $\frac{3}{4}$ inch nozzle body assembly's that can be set up to seventy degrees from a point that is perpendicular to the direction of travel (allowing up to one hundred forty degrees between nozzles) to provide coverage inside and behind guiderail post. Each nozzle assembly shall be capable of spraying an eighteen to thirty-six-inch pattern. These nozzles shall be fixed mounted so that no movement will affect the spray pattern from bounce or distortion. All guiderail nozzle assemblies shall be capable of extending out from the side of the truck a minimum of eighteen inches (18") and so that the target can be reached with the truck maintaining its travel lane safely.
- q. The shoulder application system shall be constructed of solid metal pipe and pipe fittings permanently attached to the square tubing to utilize four (4) three-quarter inch ($\frac{3}{4}$ ") nozzle body assemblies. Each nozzle assembly shall spray an eighteen to thirty-six-inch pattern behind the truck to completely cover the area between the left and right guiderail application nozzles.
- r. Each truck shall have at least one spare set of adjustable bars for the outside guiderail nozzle assemblies to facilitate field repairs if needed during the work day. If the spare set is utilized, it shall be replaced within forty-eight (48) hours.
- s. All trucks used for this application shall be equipped with a boomless nutating Spray Delivery System. This system shall be capable of operating eight (8) separate spray sections independently or simultaneously. Independent spray sections shall be as follows: 2ft, 2ft, 4 ft, 4ft, 4ft, 6ft, 6ft, 6ft totaling a streak free pattern of thirty-four (34) feet. Sections one (1) through four (4) shall have an oscillating motion electrically driven by a 12-volt system. The spray system head shall be capable of mounting on either side of the truck per the manufacturer's instructions. The Spray System shall be capable of

raising and lowering a minimum of 30 degrees for embankment applications and swing in and out (when in the "in" position, spray head will be facing towards the back of the truck) 90 degrees. The operation of independent spray sections and movement of the Spray System shall be done from inside the cabin of the spray truck with an independent switch for each boom section.

- t. The mounting point of the spray head shall be at a point half the length of the total truck bed. Hoses providing material to the spray head shall be no larger than one-half inch (1/2") in diameter.
- u. Each truck shall have at least one hose connection point that is independent of the computer flow control. Each truck shall have a minimum of two hundred (200) feet of PVC / Polyurethane blended core double nylon braid 1/2" electric reel mounted hose with a 600-pound pressure rating and include wands and hand guns for special projects.
- v. Each truck shall be equipped with an auxiliary refill system with adequate check valves. The suction line (pump influent) shall be a minimum of 20' in length and the same size of the pump influent housing. The effluent hose shall be at a minimum 25 feet in length and the same size as the effluent housing. The pump shall be capable of refilling tanks(s) from roadside streams in 30 minutes or less. The fill time includes set-up and tear down of pump and hoses.

V. Basis of Payment – Hours

- a. The crew foreman will be responsible for preparing PennDOT Form M-609 "Roadside Activity Report" daily. Form M-609 documentation will serve as the basis for payment.
- b. Time will not be paid for travel from home to the beginning work location and from the ending location to home.

I. Shadow Vehicles – Freeways and Expressways

- a. Definition of a Shadow Vehicle – a vehicle positioned within the activity in advance of the work space and work vehicles. The primary purpose of the shadow vehicle is to provide information to approaching drivers while protecting workers and work vehicles. Any vehicle can be used as a shadow vehicle if it is equipped with a flashing, oscillating, or revolving yellow light which is visible from any direction (360° visibility) and is not being used as a work vehicle. The yellow light must be activated within an active work zone.
- b. The following conditions apply to shadow vehicles used on freeways and expressways:
 1. Shadow vehicles 1 and 2, as identified in PATA 601, 602 and 603 shall be equipped with a Truck Mounted Attenuator (TMA) rated for the work zone.
 2. Shadow vehicles equipped with a TMA as stated in Publication 213; General Notes page 2 of 2 – Truck Mounted Attenuators (TMA) shall be mandatory for placement on shadow vehicles utilized on freeways and expressways, including exit and entrance ramps. The TMA is optional on all other highways. When a TMA is used, the weight of the shadow vehicle must be greater than the minimum weight specified by the TMA manufacturer.
 3. While doing work on the freeway and expressway entrance and exit ramps, one TMA shall be required. Since driving between interchanges at normal highway speeds is routine in this operation, the Department is specifying that a towable style attenuator that can travel at normal highway speeds be required. The Shadow Vehicle equipped with a towable attenuator shall meet the requirements for TMA as stated in Publication 213.
- c. In most cases, two Shadow Vehicles will be required to meet the minimum requirements of Publication 213.
- d. The hourly rate will be based on one vehicle and when two vehicles are needed each vehicle will be invoiced at the hourly rate.

II. Personnel

- a. One person will be required for each shadow vehicle.
- b. Personnel shall possess a current driver license with all required endorsements as required by the current laws and be familiar with Publication 213 and operating this type of equipment

III. Equipment Requirements

- a. Equipment shall be in accordance with Section IV of Attachment "A" with the exceptions of items f, g and h.
- b. The shadow vehicle shall be loaded to a weight recommended by the manufacturer of the Truck Mounted Attenuator or Trailer Mounted Attenuator.

IV. Basis of Payment – Hours

- a. The crew foreman will be responsible for preparing PennDOT Form M-609 "Roadside Activity Report" daily. Form M-609 documentation will serve as the basis for payment. Payment will be made for each truck supplied
- b. Time will not be paid for travel from home to the beginning work location and from the ending location to home.

I. Shadow Vehicles – Conventional Highways

- a. Definition of a Shadow Vehicle – a vehicle positioned within the activity in advance of the work space and work vehicles. The primary purpose of the shadow vehicle is to provide information to approaching drivers while protecting workers and work vehicles. Any vehicle can be used as a shadow vehicle if it is equipped with a flashing, oscillating, or revolving yellow light which is visible from any direction (360° visibility) and is not being used as a work vehicle. The yellow light must be activated within an active work zone.
- b. This vehicle shall be equipped as stated in "Work Zone Traffic Control Guidelines" Publication 213 PATA 300 series; Conventional Highways- Mobile Operations.
- c. All shadow vehicles shall be equipped with flashing arrow panel in appropriate mode with required W series sign.
- d. The hourly rate will be based on one vehicle. In the event, additional vehicles are needed, they will be invoiced at the individual hourly rate.

II. Personnel

- a. One person will be required for each shadow vehicle.
- b. Personnel shall possess a current driver license with all required endorsements as required by the current laws and be familiar with Publication 213 and operating this type of equipment

III. Equipment Requirements

- a. Equipment shall be in accordance with Section IV of Attachment "A" with the exceptions of items f, g and h.

IV. Basis of Payment – Hours

- a. The crew foreman will be responsible for preparing PennDOT Form M-609 "Roadside Activity Report" daily. Form M-609 documentation will serve as the basis for payment. Payment will be made for each truck supplied
- b. Time will not be paid for travel from home to the beginning work location and from the ending location to home.