PDF

A DESIGN-BUILD PROJECT

Interstate 66

Active Traffic Management

TECHNICAL PROPOSAL: VOLUME I

From: District of Columbia/Virginia Border in Arlington County
To: U.S. 29 (Lee Highway) in Gainesville, Prince William County
– Arlington, Fairfax and Prince William Counties

July 27, 2012

Technical Proposal submitted to the Virginia Department of Transportation

VDOT

Prepared by

LANE

State Project No.: 0066-96A-917, P101, N501
Federal Project Nos.: IM-5A01(253) & IM-5A01(274)
Contract ID Number: C00098017DB46

4.1 Letter of Submittal

THE LANE CONSTRUCTION CORPORATION
A Commitment to Excellence

MID-ATLANTIC REGIONAL OFFICE
14500 Avion Parkway
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July 27, 2012

Joseph A. Clarke, P.E.
Virginia Department of Transportation
1221 E. Broad Street
Main Building, 4th Floor
Richmond, Virginia 23219

RE: **I-66 Active Traffic Management**
State Project No. 0066-96A-917, P101, N501
Federal Project No.: IM-5A01 (274)
Contract ID Number: C00098017DB46

Dear Mr. Clarke:

The LANE Construction Corporation (LANE) is pleased to submit our Proposal for the above referenced design-build project with the Virginia Department of Transportation (VDOT). Our response contains all information requested in the RFP dated April 6, 2012 and Addenda No. 1 dated June 22, 2012 and No. 2 dated July 6, 2012. LANE has teamed with Rinker Design Associates, P.C. (RDA), Lead Design Consultant, to provide VDOT a team with a solid reputation for completing complex projects innovatively, on time, and often ahead of schedule. Our Team's experience enables us to deliver the kind of high quality and technically-sound projects that VDOT requires.

4.1.1 Identification of Offeror's Official Representative and Point of Contact

Mr. Richard A. McDonough is an authorized representative of the Offeror, The LANE Construction Corporation, and has executed this Letter of Submittal by original signature. He is the official representative, point of contact, for the Offeror. His contact information is as follows:

Mr. Richard A. McDonough
District Manager
The LANE Construction Corporation
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (703) 222-5670 (office)
Tel: (703) 898-3811 (cell)
Fax: (703) 222-5960
Email: RAMcdonough@laneconstruct.com

4.1.2 Offeror's Intent

It is the Offeror's intent, if selected, to enter into a contract with VDOT for the Project, in accordance with the terms of this respective RFP.

4.1.3 120 Day Declaration

Pursuant to Part 1, Section 8.2, we declare that the offer represented by this Proposal will remain in full force and effect for one hundred twenty days after the date the Proposal is formally submitted to VDOT.

4.1.4 Principal Officer Information

Mr. Joseph P. Lark is a Principal Officer of The LANE Construction Corporation and the legal entity with whom a design-build contract with VDOT will be coordinated and written. His contact information is as follows:

Mr. Joseph P. Lark
Regional Vice President, Mid-Atlantic Region
The LANE Construction Corporation
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (703) 222-5670
Fax: (703) 222-5960
Email: JPLark@laneconstruct.com

4.1.5 Executed Proposal Payment Agreement

An executed Proposal Payment Agreement (Attachment 9.3.1) may be found in the Appendix of Volume 1.

The LANE Team appreciates the opportunity to propose on this critically-important project. We look forward to partnering with the Department to make the I-66 Active Traffic Management project a landmark success for the citizens of Virginia.

Respectfully submitted,

Richard A. McDonough
District Manager
The LANE Construction Corporation

4.2 Offeror's Qualifications

4.2 OFFEROR'S QUALIFICATIONS

The LANE Team always strives to maintain a consistent team—from the procurement phase through the final construction of any design-build project. Occasionally, however, circumstances arise that result in changes to the project team. As required, notification was sent to Mr. Joseph Clarke, the VDOT point of contact, informing him of a change to the key personnel. Mr. Jeff Minnix, who was the designated Lead Designer in the SOQ for the project team, resigned from URS Corporation and, therefore, will not be able to participate in the role of Lead Designer, as previously identified in the SOQ submitted on December 22, 2012. The LANE Team proposed to replace Mr. Minnix with Mr. Ziad Sabra, PhD, PE, PTOE in email correspondence to VDOT, as specified by Mr. Clarke, VDOT APD. Dr. Sabra's resume and updated VA PE license were submitted to Mr. Clarke for review. In addition, an updated SCC-DPOR Table (verifying a responsible PE in charge to replace Mr. Minnix) and a revised Organizational Chart were also submitted. These changes were confirmed as acceptable and compliant, as per correspondence from VDOT POC, Mr. Joseph Clarke, PE, on July 10, 2012.

4.2.1 Confirmation of SOQ Information

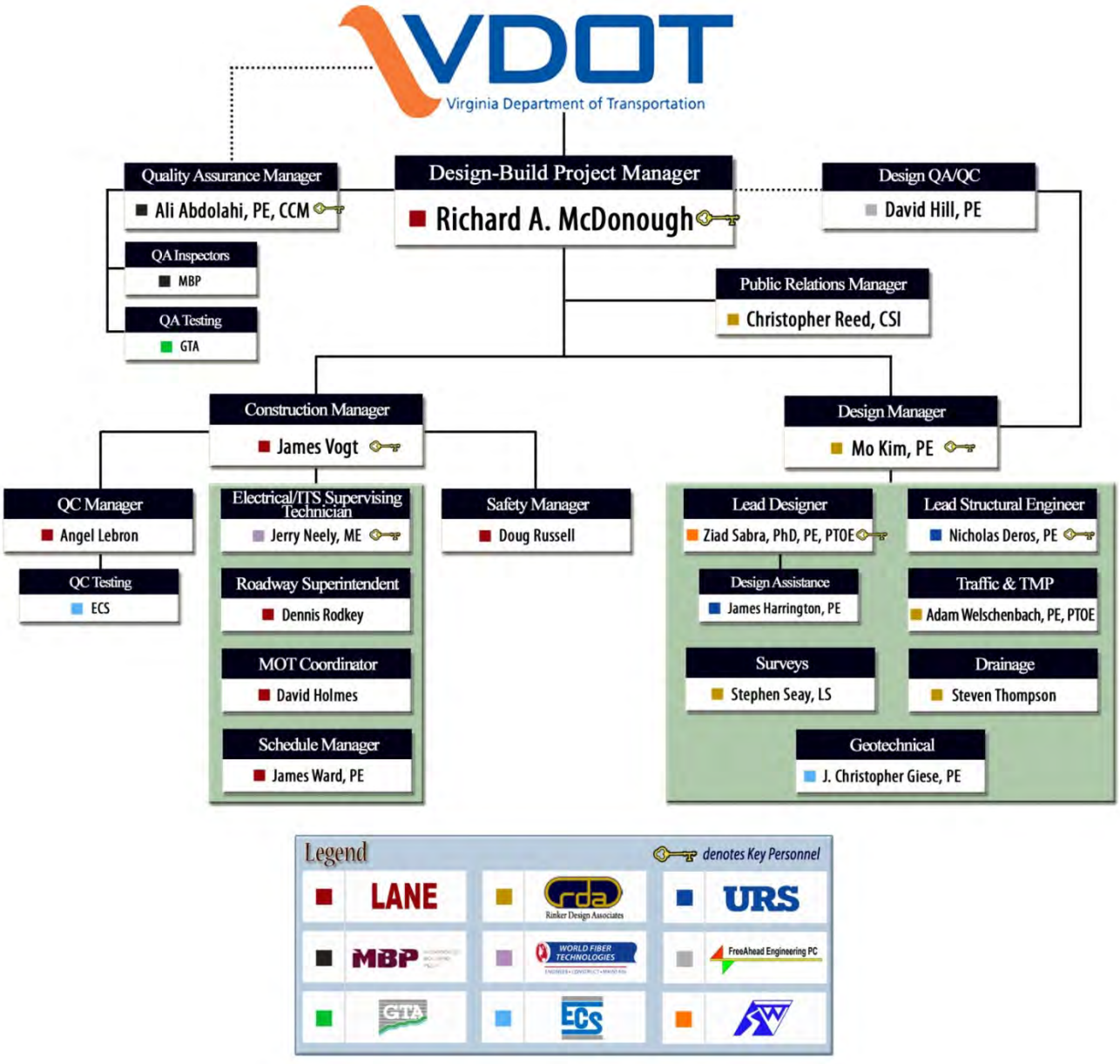
Other than the change noted above, The LANE Construction Corporation confirms that the information presented in the Statement of Qualifications dated December 9, 2011 is true and accurate, and in accordance with RFP Section 11.4. As reflected in the Organizational Chart in the following subsection, the organizational structure and team proposed by the Offeror, (including the Offeror's lead contractor, lead designer, "Key Personnel", and other individuals identified pursuant to Part 1, Section 4.2), shall remain on the Offeror's team for the duration of the procurement process; and, if the Offeror is awarded the design-build contract, for the duration of the design-build contract.

4.2.2 Organizational Chart

The LANE Team is organized to provide VDOT with a single source point of contact, the D-B Project Manager, Mr. Rich McDonough, who is responsible for all design and construction activities. The LANE Team organization has a straightforward chain of command, with individual tasks and functional responsibilities clearly identified. The following Organizational Chart identifies the Key Personnel and the major functions to be performed for the successful management, design, and construction of the I-66 Active Traffic Management project. Though reporting relationships are rigid, the lines of communication within the Team are fluid and flexible enough to meet the requirements of each individual project task. In order to prevent unnecessary project delays, it may sometimes be prudent for other members within the LANE Team to communicate directly with their counterparts at VDOT, as directed and authorized in advance by both the D-B Project Manager and the VDOT Project Manager. The following paragraph furnishes a revised narrative describing the functional relationships in which Dr. Sabra will participate as [replacement] Lead Designer.

3.3.1 Qualifications and Functional Relationships of Key Personnel: ***Lead Designer, Mr. Ziad Sabra, Ph.D., PE, PTOE (Sabra-Wang & Associates),*** will coordinate and lead all ITS design activities and staff to meet the needs of the Contract. He will report directly to the Design Manager, Mr. Mo Kim, PE. He will work with the Design-Build Manager, Mr. Richard McDonough; the Design QA/QC Manager, Mr. Dave Hill, PE; and the ultimate responsible authority, Mr. Ali Abdolahi, PE, who will be serving as the Quality Assurance Manager. In addition, he will coordinate with other key designers in order to comply with the requirements of the QA/QC Plan. Dr. Sabra has more than 27 years of experience in traffic engineering, ITS design, traffic operations and safety analysis, and transportation engineering. His experience includes several ITS deployments for MDSHA's CHART, City of Baltimore, North Carolina DOT, and other clients. His ITS planning and design work encompass strategic planning, feasibility studies, developing Concept of Operations

(ConOps), configuration management plans, communications master planning, design, deployment, integration and testing, CEI, and O&M of components and systems for TOC and TMS programs nationwide. This includes variable message signs, CCTV surveillance and monitoring, vehicle detection, communications and IT systems, video walls, and other traffic control equipment. For nearly 20 years, on a continuous basis, Dr. Sabra has led SWA in projects providing planning, design, CE&I, and O&M services to numerous public clients for implementation, development, and operations. Over the past 10 years, he has been extensively involved in performing feasibility studies and preparing engineering design plans for ITS and signal systems contracts. Projects have included design of RTMS detectors in Maryland; fiber optic backbone systems in Baltimore, Arizona, and Ohio; DMS systems in Maryland and North Carolina; RWIS, HARs, and CCTV Systems in Maryland along I-70, I-95, I-83, I-495, and US 50; XDSL CCTV Systems in the City of Baltimore; and TMC space planning and construction management of the TMC for the City of Baltimore. He also directed the design and construction inspection of 17 communication hubs for the entire signal system in the City of Baltimore. Dr. Sabra has had a professional relationship of long-standing with Mr. Hill in the ITS arena, and like Mr. Hill, he brings a regional and national reputation for ITS design capabilities.



4.3 Design Concept

4.3 DESIGN CONCEPT

The I-66 Active Traffic Management (ATM) project is the first project of its kind to be delivered for the Department. The LANE Team has developed our design concept by integrating our ITS discipline leaders with our design-build experts for this very unique project. Our Team has composed each design element with consideration to all facets of the project, while taking advantage of Design-Build means and methods. This project encompasses numerous jurisdictions along the I-66 corridor. Stretching from the District of Columbia to Route 29 in Gainesville, Virginia, there exists an array of stakeholders along the way. ***The purpose of our design concept is to improve this heavily-congested commuter corridor through the integration and deployment of Active Traffic Management efficiently and cost-effectively.*** Our experienced and qualified team members understand the importance and complexities of this project. Together, we offer VDOT the best solution to delivering this multi-disciplined Design-Build project, by providing professional services that cater to each of our strengths.

Improving communications in real-time and enhancement of traffic safety to the traveling public is the ultimate goal of this project.

Being able to present variable speed limits dynamically prompts motorists of varying traffic conditions ahead of them, and alerts them to be prepared to take actions, if necessary.

The LANE Team's approach to designing the I-66 ATM project includes comprehensive reviews of:

1) Systems Engineering documents: to fully understand the intended function of the various ITS devices and function of the I-66 ATM system as a whole
2) Specifications: to select durable and proven products and materials that facilitate inspection and maintenance, minimize life cycle costs, and meet/exceed the minimum requirements
3) 30% design plans and details: to review the specific device locations to ensure that the design conforms to the Concept of Operations, Technical Requirements, Project Technical Specifications, and other relevant standards (e.g., MUTCD). Means and methods for construction have been developed at each device location and on the corridor as a whole. Careful consideration has been made to mitigate impacts to traffic operations and safety. We have developed work-around solutions to potential field conflicts in order to ensure continuity of existing ITS and TCD operations, as well as techniques to expedite installation and minimize lane closure impacts. These concepts and designs will produce a project that is both aesthetically pleasing and accepted by the public.

The benefits of the I-66 ATM project include operational, safety, and environmental improvements.

The LANE Team's design fully accomplishes VDOT's goals of improving safety, mobility, and the environment. This project entails the installation of various types of ITS and traffic devices for active traffic management; namely Lane Control Signs (LCS), Dynamic Message Signs (DMS), Closed Circuits Television (CCTV) surveillance, Shoulder Lane Monitoring System (SLMS), Ramp Metering, and Microwave Vehicle Detectors (MVD). Additionally, this project includes removal and relocation of existing static and DMS signs, installation of new static signs and sign structures, sign gantries, auxiliary power instrumentation, and roadway work for staging and enhanced emergency pull-off areas. These various ITS and traffic devices will work in concert to

This active/advanced traffic management technology will increase roadway efficiency and help drivers travel safer and smarter.

provide several advanced traffic management systems to the VDOT TOC, including Continuous CCTV Camera Coverage (CCTV and SLMS devices), Back-of-Queue Warning System (DMS, MVDs), Auxiliary Lane Control System (LCS and SLMS), Dynamic Merge System (DMS, LCS, SLMS), and System-Wide Adaptive Dynamic Ramp Metering System (MVDs, signs, signals). ***This completed project will provide a state-of-the-art Active Traffic Management System that will manage traffic in the I-66 corridor safely and efficiently.***

- **Operational Benefits.** A primary benefit of active traffic management is the reduction of delays, stops, and travel time and the management of queues more efficiently. To fully attain these operational benefits, the total system will be designed to meet the objectives of each component of the project, (e.g. advance warnings, lane control signals, shoulder lane monitoring system, closed circuit surveillance, side fire detection, and ramp metering). We will also continue to seek opportunities to further maximize the benefits of our design. Such improvements could entail relocation, co-location, additional devices, customization of sign structures, and/or other measures that would enhance overall operations. All design features will be fully compliant with the functional requirements of the project.

High-tech overhead signs will display variable speed limits, lane status and real-time traffic information so drivers know what's happening ahead.

- **Safety Benefits.** Once completed, ***this active traffic management design approach will ultimately reduce traffic congestion and crashes, reduce lane closures due to crashes, and manage queues more efficiently in the I-66 corridor***. Our planning, design, deployment, and integration of a *seamless* system will uphold these benefits and their realization by VDOT and the motoring public. Drivers' expectations will be met through ***communicative means,*** meaning that careful consideration will be given to types of signs selected, sign location, sign positioning, types of mounting, and continuous surveillance. Each of these considerations contributes favorably to driver awareness, recognition and reaction.
- **Environmental Benefits.** A direct result of reducing congestion, both in the peak and off-peak times is reduced emissions. Emissions are lower at constant speeds, and strategies such as adaptive dynamic ramp metering, back-of-queue warning and speed harmonization will reduce stop-and-go traffic congestion and thus lower emissions. Reducing congestion also means reducing delays and, as such, reducing the amount of wasted fuel. A third category of environmental benefits is not as easily quantified, but may have the most impact -- that being "quality of life." ***Increased freedom of mobility and reduced frustration from traffic congestion can only improve one's quality of life.***

The LANE Team's design concept also focuses on details to ensure public acceptance. At the same time, though, a final product must be produced that is engineered to accommodate maintenance and inspection; considers construction methods and impacts; and, meets traffic control needs.

- **Public Acceptance.** The design should be aesthetically pleasing to the eye and should meet drivers' expectations. This entails that clear messages are displayed; that drivers don't see multiple conflicting messages at once; that signs and messages are within their line of sight; that messages are not confusing; that sign structures are of a modern design; and, that drivers feel that the system is serving their needs. These objectives will be addressed in the layout, location, and mounting of the various ITS devices supporting equipment. Particular attention will also be made such that confusion will be minimized in the transition from the existing equipment to the new devices and equipment.
- **Accommodation for Maintenance, Inspection and Life Cycle Costs.** The design and construction of this project will ensure that all equipment can be inspected and tested successfully, can be maintained easily and safely in the field and office, and has a service life that will be commensurate with life cycle costs (i.e., a cost-effective solution). These attributes will be addressed in the selection

of equipment, equipment warrantees, equipment maintainability, proper installation methods, vigorous testing and acceptance methods, integration, and overall compliance with the project functional requirements.

- **Construction Methods and Impacts.** Construction methods, primarily for installing lane control signs/signals, DMSs, detectors, sign structures, and cameras are extremely critical. This is especially true when trying to minimize lane closures, while also maximizing construction efficiency and adherence to the project schedule. As one of the leaders in this industry, the selection of optimum construction methods while assessing impacts and mitigation measures is not new to the LANE Team. We have vast experience applying innovative and expedient methods that minimize disruption to the traveling public. Maintenance of traffic measures employed during the performance of the I-495 [HOT] Express Lanes project have met with favorable and timely results. Structure/signage construction and placement on one of the busiest and most congested highways in the country has impacted traffic only moderately. VDOT has continued to select LANE's Virginia Sign and Lighting Company to perform analogous projects on I-95, I-395 and I-66. The LANE Team is very familiar with the roadways, their traffic patterns, and the optimum daily cycles within which to work. Lessons learned from these and other projects will be implemented on this project to ensure success both during and through completion of the I-66 ATMS undertaking.

VDOT I-495 [HOT] Express Lanes

- **Traffic Control.** Lane closures, lane shifts, and other type of traffic controls that would deviate from the normal traffic control operation during peak and non-peak hours on I-66 will be considered in accordance with VDOT's standards and the MUTCD. Constructability and safety risk assessment will be evaluated for each lane closure condition to determine the safest hours of lane closure, the type of lane closure, the day of the week, and the traffic control devices to be used. We will give higher priority to lane closures during non-peak periods and non-peak days of the week. These conditions will be continually examined and addressed in the overall schedule and the sequence of installations throughout the corridor.

4.3.1. Conceptual Project Layout for ITS Devices

The LANE Team's design concepts are included in Volume II, including 1) a conceptual plan layout, 2) a tabular summary of proposed ITS devices, 3) typical mounting details for each type of ITS device, and 4) a power distribution plan.

Conceptual Plan Layout. The conceptual plan layout in Volume II illustrates ITS devices only; static signing is not shown, for increased clarity. Our design is consistent with the 30% RFP design plans, unless specifically noted therein. Signing is not shown on our concept layout plans, for increased clarity, and due to constraint on the number of sheets allowed in the RFP. Also, note that the MVD device symbols shown are symbols only; coverage is compliant with the 30% RFP plans. **Table 1** summarizes the design standards and/or goals applied for the design of this project.

Final ITS Design. Our final ITS design will be dependent upon final survey and utility designation and field studies. Modifications to the 30% plans are expected as new information (that was not available to VDOT for 30% design) is collected and conflicts identified. In addition, bucket truck surveys will be performed to ensure that the proposed SLMS and CCTV cameras will provide the correct field of view. Table 1 summarizes the objectives and design standards, along with expected final design activities for each ITS device.

Table 1. Standards for ITS Device Spacing

ITS Device	Segment	Objective	Required Spacing	Source(s)	VDOT RFP Design	* Final Design Activities
CCTV	All	Full & Continuous; overlapping in critical areas	1 mile ± (each CCTV FOV approx. ½ mile)	Vendors	Average spacing 0.5 miles, max. spacing 1.2 miles	1, 2
Vehicle Detection (MVDs)	All	Provide information to accurately drive the incident and congestion algorithm, provide queue warning and for adaptive ramp metering	Varies from ½ to $^{1}/_{3}$ mile.	I-66 ATM SE Bridge Document & VDOT Q&A	Spacing varies; average is ½ mile ±	1
DMS	All	Place in advance of decision points and for travel time dissemination		I-66 ATM SE Bridge Document		1
Lane Control Signals	Segments 2 and 3	Motorists shall be able to see at least 1 LCS at all times	Full span at ½ mile ±, shoulder-specific at ¼ mile ±	I-66 ATM SE Bridge Document	Average spacing of 2,200 feet.	1, 3
SLMS—Fixed CCTV	Segments 2 and 3	100% Coverage	Varies; dependent upon bucket truck surveys and final design development	Special Provisions		1, 2

*Definition of Final Design Activities:

1. Confirm placement of devices in 30% is achievable for survey, utilities and final design features.
2. Perform bucket truck surveys to ensure objectives are met.
3. Perform visual surveys from roadway to ensure at least one LCS is visible, with particular attention to over/underpasses, roadway curvature and driver field of view with respect to the horizon.

Design Changes. Our design is consistent with the preliminary design prepared by VDOT, with a few exceptions that are noted on the design concepts. Our design changes consist of co-locating ITS devices such as MVDs and SLMS CCTVs with gantries and CCTVs, and modifying static sign locations; a tabular summary of proposed design deviations is included in **Table 2**. We will consider additional deviations from these conceptual plans as we move from 30% to 100% design. Deviations will be considered as long as they serve the objectives and goals of this project and are in the best interest of both VDOT and the constructability

of such. These deviations may be driven by underground utilities and other physical constraints, drivers' expectations, co-locations to optimize construction methods and minimize traffic impacts, field serviceability of equipment, WMATA's aerial and lateral restrictions, power source constraints, and/or aesthetics. No deviations will be finalized unless they are reasonably justified and approved by VDOT.

Table 2. Design Changes

ITS/TCD Device	Design Change	Advantages
Lane Control Regulatory Sign on US 29 (Lee Hwy) On-Ramp to I-66 EB	Move the sign 500' back onto the Ramp. Add a new sign on On-Ramp from US 29 North to I-66 EB. [*See Exhibit 3, Volume II]*	The proposed location per RFP is located behind a barrier wall on a slope to SWM Pond; the sign is too wide to fit in this space. Therefore the sign will be installed at the shown location and the new sign will be added on the On-Ramp from US 29 North.
Lane Control Regulatory Sign on Route 28 (Sully Road) On-Ramp to I-66 EB	Move the sign 500' back onto the Ramp. *[See Exhibit 3, Volume II]*	The proposed location per RFP is located in front of a retaining wall; the sign is too wide to fit in this space. Therefore the sign will be installed at the shown location.
MVD-005 (See plan sheet 3)	Move MVD-005 from MM 53.58 to the proposed Gantry G-005 at MM 53.7. *[See Exhibit 4, Volume II]*	Combine equipment cabinets for ease of maintenance and reduced construction cost. Relocated device within design spacing tolerances.
Gantry G-0021	Move the proposed WB Gantry Structure from MM 58.72 to MM 58.8. *[See Exhibit 9, Volume II]*	Moving the Gantry would provide the required 800' minimum MUTCD spacing as well as the 0.5 mile spacing from WB Gantry G-018. The spacing to the Gantry G-025 will be maintained with the design spacing tolerances.
Proposed Sign "Route 123 1 ½ Mile" & Structure at MM 61.85 and SLMS FCCTV cameras 61-62, LCS C-009 & Lane Control Regulatory Sign at MM 61.9	Move the proposed sign & structure to 520' west at MM 61.72. Move the LCS C-009 structure to MM 61.85 and Co-locate the SLMS FCCTV cameras 61-62 onto LCS C-009 at MM 61.85 *[See Exhibit 12, Volume II]*	• The proposed sign & structure, LCS C-009 structure and the Lane Control Regulatory are located within a distance of 250'. This results in LCS C-009 structure blocking the visibility of the new Sign that is recommended 250' from the LCS C-009 structure. In addition, due to the close spacing drivers may not be able to pay attention to either sign. Moving the sign to 520' west would not only provide a better visibility but also eliminates any driver confusion. • The LCS C-009 and Lane Control Regulatory Sign (LCRS) are within a distance of 40'. Due to the very close spacing, drivers will miss one sign trying to read the information on the other. Moving the LCS C-009 structure to MM 61.85 would provide a distance of at least 250' and enable the information from both signs to be read in turn. • In addition, co-locating the proposed SLMS FCCTV cameras 61-62 with the proposed LCS C-009 at MM 61.85, would provide for a shared cabinet and reduced construction cost.

ITS/TCD Device	Design Change	Advantages
Proposed Ground Mount Sign at MM 61.1	Move the sign to MM 61.2. *[See Exhibit 11, Volume II]*	The proposed sign is located next to Gantry Structure G-031 (within 20'), due to which drivers may miss the Lane Control Signals displayed trying to read the information on the proposed ground mount sign. Moving the sign to 500' from the Gantry G-031 would enable drivers to observe the lane control displays followed by the information provided on the sign.
Proposed Ground Mount Sign at MM 67.57	Move the sign to MM 67. 65. *[See Exhibit 18, Volume II]*	The proposed sign is located next to an existing ground mount sign per RFP. Again this would create an information overload to the drivers and confusion. Moving the sign to 500' from the existing ground mount sign would eliminate the confusion created by too many signs in a close distance.

Tabular Summary of Proposed ITS Devices. Tables listing each type of ITS device by mile marker location and direction of travel, along with spacing between devices, are included in Exhibit 25 and Exhibit 26 in Volume II. Location changes from the VDOT's RFP Conceptual plans are identified; a discussion of the rationale for the changes is presented in **Table 2** above.

Typical Mounting Details for Each ITS Device. Detail sheets illustrating typical mounting details for each type of ITS device are included in Exhibits 27 through 30 in Volume II. The details provided depict mounting of signs on tubular structures; however, angle beam type structures may also be used. Typical details are illustrated for the following:

- MVD on 25' pole
- MVD on existing structure with mounting arm
- MVD on CCTV Pole or DMS structure with 10' arm
- DMS (Walk-In) on Round/Angle Chord Sign Structure
- DMS (Small) on Lane Control Gantry
- DMS (One-Line) on Gantry Structure
- Lane Control System on Gantry Structure
- SLMS Fixed CCTVs on 50' pole (high and low mounting options)
- SLMS Fixed CCTV on existing sign or gantry structure with Vertical Extension Arm
- CCTV (PTZ) on 80' pole with Lowering Device
- CCTV (PTZ) on 50' pole.

Mounting devices, methods and hardware for all ITS equipment will vary depending on the manufacturer's recommendation, the weight and wind loading parameters of the equipment, and the type of structure on which it will be mounted. Final mounting details will be prepared in coordination with the ITS equipment suppliers, structure designers, and the Design-Build contractor. The finished product will meet the applicable standards and project specifications before any equipment or structure is released for production. CCTV camera poles and MVD poles and mounts shall be designed to Section 700 of the VDOT 2007 *Road and Bridge Specifications*, Section 1300 of the VDOT 2008 *Road and Bridge Standards*, and the 1994, 3rd Edition of *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires (AASHTO LTS-5), and Traffic Signals*.

Microwave Vehicle Detectors and Ramp Metering Detectors. MVDs and RMDs are essentially the same device when discussing mounting details. MVDs will be mounted to new and existing structures utilizing mounting brackets and hardware manufactured or recommended by Wavetronics, the manufacturer of the MVD and RMD that we anticipate using. The mounting brackets will be:

- Adjustable in both the horizontal and vertical positions
- Engineered to support the load of the detector
- Banded to existing structures as indicated on the Plans
- Fabricated to provide a minimum of two contact points with the pole.

MVDs and RMDs mounted on structures may include a horizontal arm attachment that will position the MVD away from any interference or occlusions the structure may present to the MVD field of view. Horizontal support arms shall be attached using "U" bolts or adjustable clamps to the pole or structure. The MVD will be attached to the support or MVD pole with the required ¾ inch stainless steel banding selected from the VDOT Pre-Approved materials list. Installing the MVD's utilizing bands provides for easy maintenance, quick adjustment in the event a height change is necessary, and is recommended by the manufacturer.

Dynamic Message, Lane Control Signs and One Line DMS. DMS and LCS mounting methods will vary depending on the type of sign and the structure to which it will be attached. Typically, the DMS manufacturer will incorporate framing and structural shapes or "Z" bars or on smaller Lane Control Signs integrated aluminum mounting brackets on the rear of the sign to distribute the load. The number and size of these supports and fasteners, "U" bolts and the accompanying vertical I-Beam supports on the new or re-used structure must be designed in accordance with the appropriate AASHTO standard and the special provisions. Close coordination and exchange of information between the DMS manufacturer, the new structure designer and the professional engineer certifying and designing mounting for the existing structure is critical to providing the correct mounting. DMS mounting frames on the sign shall be constructed of aluminum, alloy 6061-T6. Non-corrosive materials shall be used and corrosion protection shall be provided between dissimilar metals. A level walkway shall be installed in the bottom of any Type 1 walk-in DMS on which maintenance personnel can walk; this will be designed in accordance with the associated special provision. Mounting members, walkways and supports shall be designed to conform to the requirements of AASHTO's 2001 4th Edition *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*.

Closed Circuit Television Cameras (CCTV). CCTV camera mounting will vary depending on the type of camera, height and type of the support structure.

- Fixed cameras for SLMS will be mounted at a height recommended by the manufacturer in order to attain the required field of vision and overlap between zones required by the special provisions. This mounting height will at no time be less than the 30', unless the camera is aimed to monitor traffic under a bridge or other structure. Fixed cameras will be mounted using the camera manufacturer's recommended mounting brackets and banded to the pole or existing structure with a minimum of two attachment points per camera.
- CCTV with Pan, Tilt & Zoom (PTZ) on 50' poles shall be mounted on static arms specifically designed to attach to the pole using hot dipped galvanized hardware. The pole is specifically machined to allow all wiring to enter the camera from within the pole and raceway inside the static arm.
- CCTV with PTZ installed on 80' poles shall be equipped with lowering devices that attach to the pole with hot dipped galvanized hardware. The pole is specifically machined to match the lowering arm's bolt spacing. All wiring will enter the camera thru the pole and lowering arm over internal pulleys and to the self-aligning connector box.

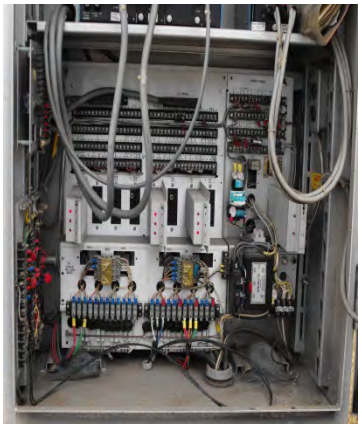
Electrical Service Panels. With over 100 existing electrical service panels dispersed throughout the project corridor, we anticipate that there will be ample service connections available to supply the electrical loads of the existing and proposed equipment. The critical question to be addressed is whether the existing supplied power and/or service panels can support the total combined loads of the ultimate equipment layout. Once the preliminary equipment locations are agreed upon, the LANE Team will analyze the power requirements at each service location. This is discussed in more detail in Section 4.4.3 Utilities.

Our conceptual plan for power distribution is shown in Exhibits 31 and 32 in Volume II. These exhibits show the location of the existing and proposed equipment locations requiring power, along with the existing service panel locations. VDOT standard SE-9s are the majority of the power supplies that exist currently to power the

existing ITS devices. From our knowledge of the corridor, it is likely that the proposed devices inside the Beltway that will be located near existing service panels will be able to utilize the current power distribution infrastructure. Between the Beltway and Route 28, where the vast amount of new equipment is being installed, it will be very challenging to use many of the existing service panels to feed the proposed equipment. Our detailed design will determine where new SE-9 or isolated SE-5's will need to be installed to carry the ultimate electrical needs of the proposed and existing ITS devices to ensure no more than an overall 5% drop in voltage. These preliminary locations are shown in Exhibits 31 and 32 in Volume II. We will attempt to locate new SE-9 service panels at, or adjacent to, existing service panels to eliminate the need for new connection points to the Dominion Power and NOVEC power grid. The LANE Team will work and coordinate with both power companies regarding the necessary service that must be provided for the project.

Auxiliary Power Systems for Field Hubs: As part of the project-wide ATM system, the three existing electrical services at field hubs 16, 42 and 59 will be evaluated and upgraded, if necessary, to include any additional loads we intend to add at these locations. The existing, as well as any new ITS circuits, will be isolated from other loads. Furthermore, automatic transfer switches, UPS back-up generators and foundations, and propane fuel tanks will be installed. Our master electricians will ensure that all electrical upgrades will be seamless so that none of the existing DMS and LCS operations are affected during the upgrading process. This upgrade work can occur independently of other work items on the project, but will be completed concurrently with the installation of new ATM devices so that it can be tested properly. All three APS Genset stations will include modification to the existing guardrails so that adequate protection of the new installation is maintained per VDOT standards.

Communications Design. The LANE Team has conducted a preliminary field review in order to verify the concept plans and develop our communications design approach. Our communications designers have a complete understanding of the design requirements for this project. We are aware that the current VDOT Ethernet network consists of field hubs located throughout the region, connected via a fiber optic trunk. Field devices at approximately 30 ITS cabinets are connected to hub sites via a distribution fiber in a ring tropology. ***Our design will be consistent with VDOT's current communication architecture.*** Our Team will meet with VDOT and their ITS maintenance contractor to identify, test, document, accept, and maintain assigned fibers that will be used exclusively for this I-66 ATM project. We are aware that splicing will be required at several segments between existing cabinets in order to obtain a continuous fiber trunk line backbone. Fiber optic drop cables to new or existing cabinets will have a minimum of 12 strands of fiber and will be installed in new or existing conduits. At the cabinet level, our Team will furnish, install and configure ITS devices such as encoders, UPS, controllers and their associated TVSS protection devices. Cable routing and management within the cabinets will be second to none. Our Team will install environmentally-hardened managed field Ethernet switches capable of providing transmission rates of 100 Mbps or higher and will meet all the technical requirements of the RFP. The LANE Team will furnish and install MOXA Model EDS 510A 3SFP-T or similar MOXA units that are capable of using MOXA Turbo Ring and Turbo Chain self-healing Ethernet technology in order to maintain continuity and match existing communication network equipment currently in use in the NRO MPSTOC. ***This will reduce potential conflicts and reduce overall maintenance costs.***



LANE communications designers will work closely with the VDOT PM and operations and maintenance personnel to coordinate network configurations during meetings held prior to configuring any networking devices. Our network engineers will develop a Requirements Definition Document (RDD) that will clearly detail all the requirements of the physical and logical network architecture design. We will obtain a network

IP schema from VDOT and configure field switches, their SNMP settings and VLANs assignments, and Rendezvous Points according to an agreed-upon implementation plan established between the LANE Team and VDOT.

Integration. Seamless integration will be achieved through early coordination with Open Roads Consulting by providing OpenTMS™ administrators with an MIB database of all new I-66 ATM devices. This database will include IP addresses, port assignments and communications protocols. This complete communications and control database will facilitate a quick and smooth integration of newly-installed ITS devices into OpenTMS™ modules such as OpenVDS, OpenDMS, OpenSLC, and the like. Additionally, and in order to allow early use, our Team will furnish and install a new workstation at the MPSTOC as ITS devices come online and are fully tested. This workstation will be fully loaded with all required vendor-master software applications necessary to operate the newly installed ITS devices. The workstation will also provide ITS device operational status and can be used to monitor ITS equipment availability. This will provide an invaluable service, delivering immediate notification and aiding in the deployment of our maintenance personnel.

Seamless integration will be achieved through early coordination with Open Roads Consulting by providing OpenTMS™ administrators with an MIB database of all new I-66 ATM devices.

4.3.2. Structural Design Concept for Gantries, OH and GM Structures

General. The LANE Team will design, furnish and install poles and overhead structures with foundations in accordance with the RFP Conceptual Plans. The poles will support cameras, signals, and detection devices. The overhead structures will include gantries to support Lane Control Signals (LCS), span or butterfly structures to support Dynamic Message Signs (DMS), and span or cantilever structures to support static signs.

- *Clearances:* For new structures, a minimum vertical clearance of 19’ will be maintained over all roadways and shoulders at all times during and after construction. For structures being re-used, the existing minimum vertical clearances will be maintained.
- *Materials/Coatings:* In general, the structures will be hot-dipped galvanized steel, except for structures located in Arlington County, which will be powder coated brown steel structures in accordance with the VDOT Project Special Provisions.
- *Base Plates:* All base plates will have a minimum of six (6) 1 ½-inch diameter anchor bolts.

Foundations. Typically, the foundations for overhead sign structures, gantries, and poles will consist of reinforced concrete caissons or spread footings, in accordance with the VDOT *Road and Bridge Standards*. In some cases, existing concrete roadway barriers may be modified to accommodate the mounting of vertical supports on the barriers or to accommodate the installation of foundations within the barriers. Where necessary and feasible, concrete roadway barriers may be modified to accommodate the mounting of vertical supports of certain structures on the barriers and/or to accommodate the installation of foundations within the barriers.

Proposed Protection of Structures. When possible, the foundations for these structures will be placed outside of the clear zone or behind guardrail and/or concrete barriers, in accordance with VDOT and other applicable guidelines. When mounted in the ground, they will be a located a minimum of 1’ behind the deflection zone of the guardrail or concrete barrier. Guardrail is generally placed 2’ offset from the edge of pavement and concrete barriers will generally abut the paved shoulder. The selection of guardrail vs. concrete barrier protection will be made to meet VDOT criteria for protection of obstructions within the clear zone. Typically, the offset from the edge of pavement will be approximately 9’.

Poles. There will be three standard pole types designed, furnished, and installed for this project, each made of a round, tapered galvanized steel section. Two will be either 25' or 50' with mounting brackets to support one or more of the following ITS components: Closed Circuit Television (CCTV) cameras, battery cabinets, Microwave Vehicle Detectors (MVD), antennas, and/or ITS controller cabinets. These poles will also support ramp metering equipment. There will also be an 80' pole with a CCTV camera-lowering device that maintains an uninterrupted electrical or communication connection between the control cabinet and the equipment without reducing the function or effectiveness of the equipment or degrading the overall system in any way. The pole and the lowering devices will be two interdependent units of a single unit and function together such that the pole and the lowering device are fully compatible and interoperable. Any reused structures will be inspected, analyzed for conformance to the requirements of the 3rd Edition (1994) of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, repaired as needed, and certified by a Virginia-registered Professional Engineer. (Please refer to Exhibit 35 in Volume II.) In addition, signal poles will be designed according to VDOT specifications and standards.

Spans, Cantilevers, and Overhead Gantries. Consistent with most other structures on I-66, the structures provided for this project will consist of standard cantilever and overhead VDOT box truss structures and foundations, as specified in the 2007 *VDOT Road and Bridge Standards* Section 13 for Traffic Control Devices (Please refer to Exhibits 33 and 34 in Volume II). These structures will be designed to conform to the requirements of the 4th Edition (2001) of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

The half-span overhead structures will span across all travel lanes and shoulders of a single direction of travel. The full-span overhead structures will span across all travel lanes and shoulders of both directions of travel. Sign structures for walk-in Dynamic Message Sign (DMS) structures will include catwalks with toe stops, handrails, harness clip-ons, and other design features to provide OSHA-compliant access to the entry of the walk-in sign cabinet from the edge of pavement.

When feasible, the very long full-span overhead structures such as those over the WMATA tracks will be broken up into two structures or a middle support will be included to shorten the spans. This will almost certainly be required for Lane Signal Gantry G-035, which is shown on the RFP plans to well exceed 300'; a span that would be extremely challenging to achieve. Other longer span structures may also prove to be more appropriate to construct with the addition of a middle support.

Structures to Be Re-used. In general, we anticipate that the structures will be new with the following exceptions, as identified in the RFP: G-002, G-007, G-012, G-014, G-016, G-019, G-022, G-024, G-032, G-038, G-039, and C-006. There are also several un-numbered overhead sign structures that will be re-used after existing signs are removed or new signs installed. Prior to their re-use, these structures will be inspected, repaired as needed, certified by a Virginia-registered Professional Engineer, and notification provided to VDOT. Our inspections will place particular emphasis on the connections, especially fatigue sensitive components, such as welds, that could influence the structure's susceptibility to wind or vibration-induced cracking. The inspections will include Non-Destructive Testing of welds, D-meter measurements of material thicknesses, etc., to accurately assess the condition of the existing structure. Rehabilitation options may include strengthening or replacement of members or components. Any reused structures will meet the requirements of VDOT *Road and Bridge Specifications* Section 700. These structures, which support only static signs, will be analyzed to ensure conformance to the requirements of the 3rd Edition (1994) of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

Ground-Mounted Sign Structures. Ground-mounted sign structures will be constructed in accordance with VDOT Standard SSP-VIA or SSP-VA structures, as applicable. (Please refer to Exhibit 36 in Volume II).

Erection Sequence. The foundations will be installed first, followed by the vertical supports mounted on the foundations. When lane closures are required to erect portions of the structure over the roadway, LANE will comply with all restrictions pertinent to this project and will accomplish the work quickly and efficiently to minimize disruption to the traveling public. These may include short-duration (15 minutes) full closures with Virginia State Police coordination. All construction activities that could impact WMATA's property will be coordinated and carried out in accordance with the requirements outlined in the current edition of WMATA's *Adjacent Construction Project Manual*, similar to what the LANE Team performed on the recently completed I-66 3rd Lane Widening Improvements Project—Spot Improvement 1 Project.

As much work as possible will be completed in the shoulders and outside of the traveled portion of the roadway before any lane closures are utilized.

Features to Decrease Lane Closure/Exposure of Maintenance Staff to Live Traffic. Type 1 DMS structures are anticipated to be walk-in type and may have a catwalk to allow personnel to walk into the sign for maintenance purposes. The catwalk will extend to the outside edge of the paved shoulder to allow access without the need for lane closures. All sign structures will utilize lighting with a Luminaire Retrieval System equal to "LUMI-TRAK". The system will be designed in accordance with VDOT Standard OSS-1 to allow for safe replacement of the luminaires outside of the traveled roadway. In general, structure foundations will be located behind existing or new guardrail or barrier, providing additional protection to inspectors and maintenance workers.

The LANE Team has extensive experience working with WMATA. We are well-versed in local code, condition, and review agency requirements, having worked directly for, or been integrally involved with, WMATA on projects that (among others) include the following:

- ***WMATA/Blue Line Extension to Largo***
- ***WMATA Green Line/College Park Station***
- ***WMATA/Red Line***
  - ***New York Avenue Station at Glenmont***
  - ***Storage Yard at Glenmont***
- ***Dulles Transit Partners/Falls Church Storage Yard***
- ***Dulles Transit Partners/Dulles Metrorail Utilities Relocation***
- ***And, most recently …***

DMS Sign at I-66 Third Lane Widening Job.

VDOT/I-66 3rd Lane Widening (Spot 1)

VDOT/I-495 [HOT] Express Lanes

4.4 Project Approach

4.4 PROJECT APPROACH

The LANE Team's approach to project management through design and construction minimizes deployment risks associated with the project through:

- Assignment of work tasks to qualified personnel
- Recording and retention of all project documents to ensure that design and construction work is performed according to sound engineering practices, contractual agreements, and client directions
- Periodic review of work in progress to identify and resolve any deficiencies affecting the quality of work
- Monitoring and control of all work activities
- Scheduling and identification of long lead time/critical path items
- Sequencing of work to reduce the number of lane closures
- Coordination of multiple crews
- Backup/contingency plans
- Managing material and equipment procurement
- Clear and continuous communication.

Our project approach manages all aspects of the project … from design through construction … minimizing the risks for all stakeholders.

Risk management will address many facets of the design and construction elements of this project. Risk in design will be assessed in the selection of equipment; the selection and design of sign structures; assessment of existing sign structures; equipment integration and testing; design constructability; equipment maintainability and serviceability; design of lane closures; and overall cost-cutting measures. For construction, risk will be assessed in the selection of construction methods, deployment schedule, and cost.

An example of our design scheduling is illustrated through our proposed sequencing of design elements and submittals, as shown in **Table 3**. The Design Elements are grouped to mirror the construction sequence we foresee. Refer to Section 4.6 for the construction project schedule, from which our Submittal Packages sequence will be developed.

Table 3. Design Elements*

	Name	Description/Notes
1	ITS Device Locations	Plans for locations only. Approval of submittal will allow for test bores and foundation design to begin.
	Catalog cut for all ITS hardware	Catalog cuts and shop drawings for DMS, LCS, SLMS, MPSTOC Work station, MVD, RMD
	Staging Areas and Emergency Pull-Offs	This design package requires survey as a predecessor to the start. The initial survey will only include these specific areas in order to provide the designers an advance start on this package.
	ITS Device (Non-Critical) Removals and Relocations	Remove existing ITS devices that do not impact operations, i.e., the RESTRICTED Lane static portion of the VMS.
	Temporary DMS	Temporary and Portable DMS locations, power and communication design. This must take place in advance of the design package for ITS removals that are critical to maintaining existing operations.

	Name	Description/Notes
2	DMS Removals & Make Operational Temporary DMS	Follows Temporary DMS submittal.
	Power and Communication Design	This package includes work for conduit, junction boxes, and cabinet foundations
	Gantry and Sign Structure Design	This package includes all calculations, PE certifications and shop drawings for all new structures and extension arms for SLMS cameras.
3	UPS and Generator Design	Design drawings and catalog cuts for generator/UPS back-up power stations.
	Re-used Structure Design	This package includes calculations and repair and strengthening proposals for existing structures to be re-used.
	Equipment Test Plans	ITS equipment test plans
	Signing Design	This package requires full survey in order to develop sign cross sections, and requires final approval for all ITS device locations (because of MUTCD spacing requirements to LCS and DMS).
	ITS Equipment Removals	These are devices that cannot be removed until new systems are operational, i.e., existing cantilever LCS and related signing.

** Design elements may be separated by Segment or grouped by relevance in order to expedite approvals.*

4.4.1 ITS Deployment Management

Our deployment sequence will be vetted. Risks and contingencies will be addressed in order to maintain continuous operation and surveillance of the current shoulder lane/lane control system. An equally-important objective is to establish that the proposed deployment sequence will have minimum interruption to traffic during off-peak periods (e.g., minimum lane closures and minimum exposure to workers and vehicular traffic). Finally, the deployment sequence will be designed so that all project installations are designed to meet scheduled milestones. For example, our approach will be to assess when and how devices should be removed so that multiple lane closures at the same location can be minimized; thus avoiding interruption and reducing exposure to traffic.

The primary objectives of the deployment sequence are to mandate that:

1) ***there is no interruption to the existing traffic management operations on I-66***
2) ***material and equipment are ordered in adequate time to be on-site when needed***
3) ***back-up plans are established for contingencies.***

Expediting Construction. Timely construction completion is dependent upon the prioritization and thoroughness we attribute to the following key activities:

- Submittal of design packages that meet VDOT specifications without requiring multiple submissions. This requires comprehensive peer reviews, and contractor input and coordination.
- Material submissions and shop drawings that are clear and provide all information demonstrating compliance with the specifications and special provisions. Our intent is to provide thorough submissions, allowing for minimal comments and resulting in expeditious approvals.
- As mentioned previously, one of the first items to address will be to provide plans to WMATA for review and to open a dialog. This will assure we are adhering to their requirements for air space and

work in proximity to property owned by the Authority. Advancing this planning is paramount to getting our overall plan approved.

- Inspect, test, and evaluate existing structures and prepare analyses for new loadings. This activity must be completed early in the process to prevent delays in material ordering or purchasing new structures.
- Effective planning and execution are critical to the success of this project. Proper planning of work locations and sequencing the work to reduce the number of times a lane closure is needed is both safer and more efficient. We plan to work on both the eastbound and westbound sides of I-66 simultaneously, first working where we can do so without lane closures. Traffic impacts will inevitably occur but will be minimized and night operations implemented as necessary for avoidance. Plans and materials will have been reviewed, accepted and materials delivered to the site to mitigate impacts.

LANE has the necessary resources and equipment at hand to fully support the needs of this project.

- Bench Test ITS Equipment. We intend to establish our own testing area to be able to check all equipment before it goes into the field for installation. Getting equipment up and operating on the fiber system from a warm and dry warehouse is much easier than trying to do it in the field, and ultimately saves time. Knowing that the equipment worked in the shop, enables us to more effectively troubleshoot a new installation in the field.

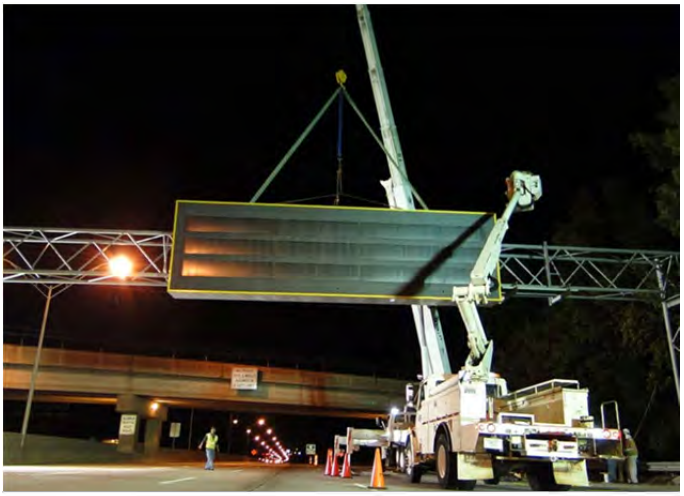
Managing Equipment Procurement. Designated and approved material will be on site, ready for installation before it needs to be installed, according to the project schedule. The LANE Team is experienced in material procurement. The nature of this project, with discrete, non-contiguous work sites, provides the flexibility of shifting work locations and tasks to align with procurement of approved material. Additional considerations include securing material from theft, protection from the weather, and scheduling time for testing prior to field inspection and testing. Spare parts and materials for emergency repairs will also be in place, and available when the associated equipment is ready to be installed. The purchasing manager will be kept apprised of day-to-day operations, as well as long-term needs.

Material Warehousing. Protection and proper storage of material is crucial to preventing damage of material while stored before installation. Our warehouse will be located adjacent to the project site and will also serve as our testing center. There, we will have ample power, a climate-controlled environment, and a safe place for our highly-skilled technicians to test and store equipment in a secure environment.

Tests for Compatibility and Functionality. The project specifications provide a robust and detailed list of the requirements for the ITS equipment functional requirements and interoperability with the overall system. We will provide test procedures for approval for each type of equipment, and will pre-test the equipment in accordance with the approved document before ultimately inviting VDOT to witness a test and to operate the equipment from the MPSTOC. The MPSTOC work center will be one of the first items submitted for approval and installed as the initial planning and designs are in the process of being submitted. Approved factory firmware and Application Programming Interface (API) and/or Software Development Kit (SDK) will be delivered and installed as they are approved by VDOT. Proper coordination of acceptance testing followed by prompt installation of the tested equipment will aid in completing this project quickly.

Coordination of Current Activities. Planning, with clear and continuous communication among all interested parties, is the key to providing a quality product in the shortest possible time. Regularly-scheduled progress and teaming meetings with VDOT will be incorporated into the schedule, fostering an atmosphere of partnership. This partnership will aid in issue resolution as well as future planning and work staging based on the continually-changing dynamics of a project of this size. These meetings will also include a daily “tool-box” talk with crew and quality control personnel, with the intent of establishing work for the short term.

Unique Resources Employed. The LANE Team's unique resource is the experience and qualifications of our team members. Our Team consists of design consultants with actual field experience, designing and installing ITS equipment, who understand contracting and the Design-Build process, while also understanding the need to keep the project moving. We have engineers and PhD's who not only know ITS equipment, but they also "wrote the book" on ITS equipment. We have electrical engineers who were once employed by the local utility company that know the "ins and outs" of the electrical application process, and who know the best place to obtain electrical service; and we have people experienced with planning, designing, and building similar projects for VDOT, WMATA, MDSHA, and MWAA, among others. Additionally, LANE team member, World Fiber, has completed ATMS and ITS deployments throughout the southeast (GDOT, FDOT, TDOT) and telecommunications projects throughout the country.



FDOT 10/I-110 Design-Build Freeway Management System

The FMS portion includes 40 miles of conduit for the fiber optic backbone, 43 miles of 96 count single mode fiber optic cable and the electrical services for all devices. ITS devices include 88 microwave vehicle detectors (MVDS), 40 CCTV cameras and poles, 12 dynamic message signs (DMS) and one roadway weather information station (RWIS). Underground fiber optic cable backbone infrastructure was installed by various methods of construction. ~World Fiber project completed in 2010

Contingencies and In-Service Maintenance Plans for ITS Deployment. Successful contracting demands multiple plans to be in place. This extends to emergencies as well as day-to-day maintenance operations. The ITS equipment we will be installing is a mix of existing "tried and true" technology, as well as the use of some new cutting edge computer algorithms for simple fixed CCTV cameras for the shoulder monitoring system that we have worked with for years. Spare parts and proper test equipment for each type of equipment will be on hand in the event of an equipment failure or damage due to unforeseen accidents. This will be ensured by our purchasing manager in conjunction with our ITS lead consultant and electrical / fiber optic system specialists. Trained technicians will be available 24/7 to respond to issues that may arise for the new and existing equipment that may be impacted as part of the construction process; and they will direct or accomplish repairs as necessary. Having one phone number to call a repair technician is important for VDOT in the event of a problem, but is not enough from our viewpoint. Our policy of having multiple plans ready for action in the event they are needed mandates that we provide our repair and testing technicians with other resources in the event that additional manpower, equipment or the technical assistance of a manufacturer's representative is needed.

Proper testing in compliance with the project's specifications, along with the approved testing procedures, is one way to make sure all equipment is ready and operates properly, prior to installation. This initial testing procedure is critical to reducing initial out-of-box failures and also the start of in-the-field testing once a device is on an extended time load test prior to installation. This method, established between World Fiber Technologies and LANE, is proven to reduce initial failures and catch problems before the equipment is placed into long-term service for public use.

Spare parts on hand are not limited to the new equipment we will be installing, but also to the existing equipment we will take over for maintenance. Our plan is to inventory each cabinet as part of the inspection with a VDOT representative before we accept a device for maintenance. Spare parts will be discussed and sources identified in advance to ensure everything we might need is on hand at short notice.

Testing. Our overall system testing process will begin after approval of the Test Plans based on the project requirements. We intend to witness and document DMS Factory Acceptance Tests (FAT) where we will also invite VDOT representatives. We will expedite the procurement of non-plan dependent, long lead time items, such as DMS by submitting cut sheets early in the design/submittal phase. Once equipment is received at our secure storage facility, we will conduct a pre-installation test and provide test results to VDOT. We will conduct stand-alone functionality tests of all ITS devices after they have been implemented in the field. At the subsystem level, tests will be conducted and recorded, along with VDOT representatives, and will be based on our VDOT-approved subsystem test plans for CCTV, DMS, LCS, MVD, Ramp Meters, SLMS, and their associated ancillary equipment. Subsystems will be tested from the MPSTOC using our furnished and installed workstation running vendor-supplied software that has been integrated to communicate with all installed devices. The subsystem tests will be followed by the overall systems operational test that will also be conducted from the MPSTOC. Once our Team is convinced that all newly-installed ITS devices and communication systems are operating and fully functional per requirements, VDOT will be requested to schedule the acceptance test. The acceptance test will be performed over a sixty (60) consecutive day period under real-world operation conditions. During acceptance testing, our Team will have maintenance resources available to respond to any issues noted by VDOT operations within four hours of notification, and all repairs will be completed within 48 hours for all newly-installed systems and devices, except for communications failures that could affect multiple devices. Such communication failures will be repaired within 24 hours.

4.4.2 ITS Operation Continuity

The success of this project will be measured by our ability to maintain the existing ITS systems that the traveling public relies on every day to provide traffic safety and information in advance of a problem ahead, and keep the road open for traffic to the fullest extent possible. Our approach is anchored by the years of experience we and our subcontractors and consultants bring to this project. Simply put, the existing equipment must continue to operate until the new system is installed, tested and made completely operational before the existing system is removed or disabled. Our approach is to maintain ITS operation continuity.

Design Phasing and Construction Sequencing. Our approach to sequencing this project takes into consideration the fact that there are many places and numerous tasks that can be done early on in the project without impacting traffic. Our experience with the time it takes to design, approve, manufacture, test and install ITS equipment and related structures has molded our approach into a smooth and seamless plan of continuous work. Contingencies and back-up plans are also provided by some of the most experienced consultants and contractors in the business. Our plan is presented in **Table 4**.

Table 4. Design Phasing and Construction Sequencing

Preliminary Work	• Identify needs for air space, insurance and approvals for work near or over WMATA property and submit plans for comment in concert with the initial designs for structures spanning Metro Rail. • Identify, document, test, accept, and develop splicing diagrams based on assigned VDOT fibers and communications topology. • Design equipment locations and conduit runs, and submit for approval. • Identify needs for new electrical service and ROW for same, start application process. • Submit all catalog cuts and shop drawings for ITS equipment, cabinets and related infrastructure as well as certifications for material that is on the VDOT pre-approved material list. • Inspect, test, and evaluate candidate structures for re-use.

	• Submit signs and sign structures for approval. • At approved structure locations commence test bores to have them available to submit with structure designs, concentrating on 25' and 50' CCTV, FCCTV and MVD/RMD poles and foundations that have shorter manufacturing lead times than larger structures. • Identify conflicts with the existing ITS system and infrastructure in order to design work around solutions that are to be in place and installed before the work that impacts the legacy system is started. • Design and submit for approval structure and foundation calculations and shop drawings. • Identify all work that can be accomplished outside the clear zone and with shoulder closures only. • Submit designs for staging areas.
Initial construction	• Construct emergency pull-off/staging areas, using approved designs. • Commence work on both the east and westbound directions of I-66 with multiple crews concentrating on conduit, junction boxes, and incidental concrete foundations as well as approved foundations for 25' and 50' poles. • Remove any ITS equipment and signs that do not impact current operations. • Test and verify proper operation of approved ITS equipment for installation in the field. • Test, splice to make whole, and final test of existing fiber optic cable. • Install new fiber and submit test results. • Begin ground mount sign installation.
Heavy construction and night work	• Begin construction of approved foundations for all overhead structures and work that involves lane closures and night work. • Install gantry and overhead structures. • Install tested DMS and LCS on new structures and cover. • Test new ITS equipment systems and have it certified for operation. • Commission new ITS equipment and remove existing ITS equipment system by system until completed.

Approach to Identifying and Mitigation of Existing ITS Operation Disruption. Part of our initial work plan is to identify places where we have conflicts with conduit systems or equipment locations, and to design and develop implementation plans for work around solutions ahead of time. This contingency planning will allow both the LANE Team and VDOT a chance to thoroughly investigate and approve the modification well before they are actually needed.

We consider the entire ITS system on I-66 critical to maintaining traffic flow. The critical component of both the new and existing system is the underground fiber optic cable and power conductors that traverse the entire project. We know from experience, that even with excellent as-built drawings and expert utility locators, at some point one of these critical components will be impacted. For example, an excavator for guard rail operation may be 5' from a marked utility but find that the utility is not where it was marked or identified. Our policy will be to identify the location of conduits by test pitting prior to any guard rail installation, foundation excavation or trenching, in order to reduce the possibility of damage to as close to "zero" as possible. The best plans always have a reliable back-up plan, and in this case we will have a certified fiber cable splicer and a certified electrician available 24/7 to make both temporary and permanent repairs as necessary, until final acceptance.

Another disruption potential that will gradually become our responsibility is the repair and maintenance of specific cabinets and systems we have modified or taken over for maintenance, as the job progresses. Our plan

to minimize disruption risk is to provide an ample and readily-available supply of correct spare parts/related materials; and to have properly trained and certified technicians always available, before work is started or before a specific system becomes our responsibility for maintenance.

Maximizing New ATM Equipment during Construction. The ATM workstation will be installed early in the project to load vendor software and hardware for the purpose of testing the interface between the field and the MPSTOC. The testing will include verifying equipment operation and communications prior to installation on, or over, the road. DMS and CCTV systems will be made available, as they are commissioned, to MPSTOC personnel when the operation of these new systems does not conflict with existing systems.

Avoid/Reducing Conflicts with Legacy Equipment. Our goal in designing equipment locations and conduit routing will take into consideration the location of existing equipment and infrastructure. Part of our initial work plan is to identify places where we have conflicts with conduit systems or equipment locations. We will then use that information to design and implement work-around solutions that are necessary for construction. This will give both the designers and VDOT a chance to thoroughly investigate and approve the modification well before they are needed.

Our concept for maintaining the previous ITS system in operation until the new system is completed will effectively eliminate the possibility of conflicting displays between the new and legacy equipment installed on I-66. Situations might present themselves, however, as the job progresses, when both the new and legacy systems, (particularly the shoulder lane control system) must be operated together. We expect one or more possible solutions to be acceptable to VDOT.

1. In the event the new and legacy lane control systems are operating simultaneously during field verification, a standard operating procedure will be put in place to confirm that the two systems are not in conflict.
2. Depending on the availability of status output from the legacy system at the MPSTOC from the affected portion of the highway, we will provide an algorithm at the new MPSTOC work station that monitors both the new and the existing system for conflicts. Should a conflict be detected, the new system will be shut down.

Methods for Maintaining the Existing ITS Equipment during Construction. The most challenging part of keeping the existing ITS equipment intact and operating during construction occurs when new LCS and small DMS are added to an existing structure. We have identified 6 gantries that have existing DMS signs that must remain in operation until the new systems are operational. In some cases we will relocate the existing DMS to the side of the structure on the upright while the new installation is in progress. Another scenario will require us to install temporary DMS on the shoulder or in the median while new construction is underway. Communication to the portable sign will be established with the MPSTOC prior to the removal of the conflicting DMS. The third scenario requires us to find a suitable location to place temporary DMS where the existing DMS conflicts with the new installation and no space is available on either side of the roadway to support the placement of portable DMS signs. We have identified some alternate locations for VDOT approval and intend to connect to the VDOT fiber at an existing cabinet or provide cellular communications to the portable DMS.

Staging Areas. The LANE Team will design and construct the staging area improvements at all locations and lengths required by the RFP. The locations are shown on Exhibits 1, 2 and 6 in Volume II, and these locations are consistent with VDOT's RFP Conceptual plans. The staging areas will be designed to meet the requested typical section outlined in the RFP conceptual plans and the improvements will accommodate any drainage reconfigurations that are required to accommodate the staging areas. The LANE Team will ensure the pavement widening to the existing shoulder to create the staging area will meet its expected use and will be no

less than required by the RFP. The staging areas will be signed and pavement markings will be provided as required by the MUTCD and VDOT's Supplement to the MUTCD.

4.4.3 Utilities

Overview. The LANE Team's approach to utility coordination, adjustments, relocations and expansion to secure new service needed for ATM devices and systems will be well integrated into the project sequencing. This will maximize ATM beneficial use and will avoid disrupting existing operational systems, while minimizing the possibility of schedule delays. Our utility coordination team has extensive experience working directly with the types of utilities involved with this project, particularly electric utilities. During the RFP Phase, our Utility Manager initiated coordination with each utility owner along the project corridor, and obtained facilities maps from the critical power companies, NOVEC and Dominion Power. After reviewing the available plans and record information, we do not anticipate the electric utilities or any other utilities to be in conflict with this project. Should an unexpected case arise where a utility relocation is required, our Team has the expertise to expedite this relocation process and minimize the possibility of schedule delays while following the procedures set forth in the VDOT *Utility Manual*.

Utility Coordination. In accordance with the RFP requirements, the LANE Team will carry out the necessary utility coordination in compliance with the VDOT *Utility Manual*. Following the notice-to-proceed, we will continue communications with all utility owners. Utility designations will be performed that verify the location of existing utilities; plans will be distributed; and a Utility Field Inspection (UFI) meeting will take place. Letters of no-conflict from all owners within the project area who do not require relocation will be obtained. Conflict evaluations and cost responsibility determinations will be performed for utilities that require relocation. Utility plans and estimates will be reviewed and approved per VDOT form UT-9. The overall project schedule will accommodate these activities to mitigate any unexpected utility conflicts.

Mapping the Electric Facilities. The most critical utilities are the electric utilities governed by NOVEC and Dominion Virginia Power. Facilities must be designated and analyzed in order to minimize schedule delays, coordinate properly, and maximize opportunities to use readily-available tie-in points. The LANE Team has already begun the preparations necessary and has the experience required for understanding the scope of the existing electric facilities. As shown in Exhibit 31 and 32 of Volume II, the data from the maps obtained from NOVEC and Dominion, along with the existing VDOT service panels, was transferred to our project file in order to reflect where the overhead and underground electric facilities exist along the entire length of the project. This comprehensive map allows us to assess the possible expansion of these facilities to accommodate the proposed ATM devices**.** In any locations that require service upgrades, we recognize that the utilities will already have access to the VDOT right of way. Our coordination with NOVEC and Dominion Virginia Power will ultimately determine if new access points are required, and if new easements must be obtained.

Expansion of Electric Utility Systems. The key to mitigating unexpected delays due to utilities on this project will be to engage the electric utility owners early in the design process. Based on the existing and proposed equipment locations we will determine the power requirements for each of the associated existing service panels. The panels and their distribution cables will be analyzed to see if they can support the new power requirements. Voltage drop calculations will be performed for each run to determine if the existing distribution cables can be retained/extended, or need to be replaced/supplemented with additional runs. This design effort will determine what changes to the utility may be required and what coordination with Dominion Virginia Power and NOVEC will be necessary to upgrade the service. We will coordinate closely with the power companies during this design effort so that we can determine early on if there may be obstacles to upgrading service at any of the locations. This feedback will then be used to refine our design of the power

distribution system. During construction, we will schedule in advance where and when changes in electrical services will be required. Our approach to the power system design and proactive coordination with Dominion Virginia Power and NOVEC will allow our Team to minimize the possibility of schedule delays and will allow us to avoid disrupting any existing operational systems.

Unexpected Conflict Resolution. In the case there may be unknown utilities that are in conflict with the proposed equipment locations, our Team will be able to minimize or eliminate the impacts by shifting equipment and/or poles and maintaining the integrity of the ATM system and requirements set forth in the RFP. There are many utility crossings along the length of the project, mostly running perpendicular with I-66, which have the possibility of being in conflict with the project. These utilities include, but are not limited to: electric (NOVEC and Dominion Virginia Power), communications (Verizon, Cox, Comcast, and others), sewer and water, and gas. If an unexpected case should arise where a utility will be required to relocate, our Team has the experience required to expedite the relocation process in order to minimize the possibility of schedule delays. The utility will be identified and located and the affected utility will be contacted. All pertinent information will then be shared in order to relocate in a timely manner.

4.4.4 Quality Assurance/Quality Control (QA/QC)

Design Process Quality Assurance. The Quality Assurance for the design aspects of the I-66 ATM project will be structured to ensure that all of the project deliverables have been prepared and checked according to the project requirements. This entails compliance with VDOT's *Minimum Requirements for QA/QC on Design Build and PPTA Projects*, January 2012 (VDOT January 2012 *QA/QC Guide*). Our goal is to minimize the amount of review that may be required by VDOT or its consultant support team, by such adherence. The key ingredient to any successful QA/QC process is having independent review and checking of each aspect of the work product; from initial design and production to the final Quality Assurance reviews.

QA/QC Roles & Responsibilities. Our Team is structured such that it maintains a clear and independent separation between Design QA/QC, Construction QC, and Construction QA. QA and QC for the Project will be managed by several key team members.

There is a clear separation of our Team's QA and QC components.

***Design QC and QA*:** The unique nature of this project mandates special treatment. Mr. Mo Kim with RDA will be responsible for the overall design Quality Assurance of all disciplines involved. Mr. Kim will be applying his full knowledge of managing multi-disciplinary projects delivered as Design-Build projects. Mr. Kim will also adhere to RDA's proven internal QA/QC manual which has been successfully implemented on several recent VDOT Design-Build projects. Mr. Kim will be additionally responsible for the QC of all non-ITS design related elements as part of the project, such as the TMP/SOC design and the drainage design for the emergency pull-off/staging areas. The LANE Team also includes Mr. David Hill, PE of FreeAhead, an ITS designer himself, serving as the team's Design QC Manager. He will be responsible for managing and implementing the QC process for the ITS system design. This project warrants the most qualified experts performing the tasks at hand, but also that the Quality reviews for each element of work are carefully and knowledgably conducted. The LANE Team organizational structure ensures this. Mr. Hill brings more than 30 years of experience leading and managing some of the most complex ITS designs undertaken in Northern Virginia and around the country. His previous experience with the design of the existing ITS system along I-66 provides him great familiarity with the project corridor, the local conditions, and the unique requirements of this project. This firsthand knowledge and familiarity greatly enhances the insight that can be brought to the QA/QC process by Mr. Hill.

***Construction QC*:** The LANE Team's production philosophy emphasizes putting work in place correctly, the first time. As such, construction QC will be the responsibility of the entire Construction Team. Construction QC will be led by Construction Manager (CM) James Vogt, who will assign a LANE Construction internal QC Project Engineer to be responsible for planning quality into daily operations by assembling work packets, inspecting work daily, and discussing quality requirements with field personnel. LANE Construction believes that proactive QC planning and self-monitoring will prevent the rework and schedule delay that occurs if QC inspections uncover any deficiencies.

The LANE Team's QC Manager (QCM), Angel Lebron, will provide appropriate oversight of inspection and testing technicians to verify that construction is being completed in accordance with the Project plans and specifications. ECS will provide testing laboratories for construction QC; they are accredited by the AASHTO Acceptance Program.

Construction QA*:** The QA Program for Construction will be led by Quality Assurance Manager (QAM) Mr. Ali Abdolahi, PE, CCM, of McDonough Bolyard Peck, Inc. (MBP). He will be responsible for independent QA oversight of construction and will provide documentation and reporting to VDOT, thus minimizing VDOT's QA activities. In accordance with VDOT January 2012 *QA/QC Guide*, ***the QA organization will be distinct and separate from design and production staff, and will not perform conflicting duties or production work.

The QAM has both the authority and responsibility to suspend project activities in the event of quality deficiencies and/or irregularities.

The QAM will be supported by Geo-Technology Associates, Inc. (GTA) for QA Materials Testing (a VDOT certified laboratory). Inspection technicians will have the certifications required by VDOT January 2012 *QA/QC Guide.*

Design QA/QC Plan. The Project's Design QA/QC Plan will establish criteria to verify the following:

- Conformity of design documents
- Technical accuracies
- Reviewing procedures
- Stamping, signing and dating requirements
- Coordination between design disciplines
- Constructability reviews

Design QC reviews will occur at a detailed level to verify accuracy and completeness of calculations and plans, and conformance to VDOT standards and contract requirements. This process makes extensive use of standardized checklists, including VDOT LD-436, and document controls developed in-house. Design QA reviews will look at the "big picture" to verify completeness and reasonableness of the design solution. The plan will also include conformance with contract requirements, and will include the following efforts, at a minimum:

- All calculations will be reviewed by the discipline Design Engineer, and deficiencies will be corrected as appropriate.
- The general ITS design shown on the drawings will be reviewed by the Design Engineer to ensure established design criteria are met.
- Once all calculations are checked, the QC Engineer will confirm that design information has been correctly transferred to the plans.
- Checks by the QC Engineer and reviews by the QA Engineer will be provided on all plan components

- To confirm quantity calculations, the original calculations compiled by the Design Engineer will be checked by the QC Engineer and compared to information in the final drawings
- Special Provisions and Special Provisions Copied Notes will be reviewed by the Design Engineer, QC Engineer, and QA Engineer to confirm applicability and design conformance.

The Design Manager will also consider constructability, traffic maintenance issues, and interdisciplinary co-ordination. RDA and all design team members will work directly with LANE's construction personnel and the QAM to complete constructability reviews of the plans to ensure that all portions of the project can be physically constructed in a safe manner. The Design Manager will carry out his responsibilities by ensuring all QC and QA reviews are performed appropriately and by conducting monthly design meetings for specific issues and concerns. The Design Manager will manage and review designs by all subconsultants. The Design Manager will appoint an Engineer in Responsible Charge to assist in the direct oversight and QA reviews of all subconsultants.

Construction Quality Control Plan. The LANE Team will implement Construction Quality Control through the development of a Construction Quality Control Plan (CQCP) for the ATM devices, which will be submitted to VDOT for approval prior to construction. The CQCP will outline quality control procedures for implementation of the CQCP. The construction QA/QC Management Team is composed of the CM, QAM, and the QCM. We will provide the final detailed CQCP to VDOT's CEI for review prior to construction commencement.

Our quality control program provides standard guidelines for performing and documenting construction activities. These methods will ensure construction specifications are met or exceeded, while ensuring quality for all construction tasks, including submittals, materials procurement, installation, integration and schedule adherence. The paragraphs below outline these processes.

- *Submittals:* The LANE Team will submit the material cut sheets in compliance with VDOT specifications and project special provisions. Each submittal will be carefully reviewed for conformation with the plans, specifications and RFP prior to delivery to the Department.
- *Procurement:* The LANE Team has an excellent relationship with our vendors, all of whom have a keen understanding of the VDOT specifications. Once the material submittals are approved, we will work with our vendors to expedite delivery to our construction yard. Materials requiring factory acceptance testing, such as fiber optic cable, DMS, etc., will be tested and documented with the materials shipment.
- *Installation:* The LANE Team crews will follow strict QC procedures for all installation work, including checklists and as-built documentation. Each crew chief will be responsible for properly documenting all installation work and submitting the QC documentation with his daily report. The Construction Manager will review the daily reports as part of the Team's Quality Assurance monitoring.
- *Inspection* will be carried out in three stages: preparatory, intermediate, and completion. Project-specific checklists will be developed for all construction operations and processes, to be used by the QA and QC inspection and testing personnel during each inspection. These checklists will include construction requirements stated in the specifications or Contract, will comply with VDOT *QA/QC Requirements*, and will be approved by VDOT as part of the QA/QC Plan approval. Hold and Witness points will be defined to ensure that all critical testing and inspections are performed. A brief outline of each inspection stage follows:
- *Testing & Verification:* The QA and QC laboratory and field sampling and testing program requirements will be based on *VDOT Road and Bridge Specifications*, the *VDOT Construction Manual*, the *VDOT Inspection Manual*, the *VDOT Materials Manual of Instructions*, *VDOT January*

2012 QA/QC Guide, and other documents outlined in the contract. Testing will be performed by separate and independent QA and QC laboratories using VDOT-certified inspectors and laboratory personnel. The Construction QA/QC Plan will include inspections and testing for all materials manufactured offsite, except for the items specified in the RFP, which will be inspected and tested by VDOT. Notification to Proceed of work and materials not meeting the plans and specifications will be made in a timely manner using the Non-Conformance Reporting Plan.

- *Documentation:* Project work activities and progress documentation will be prepared in a standardized manner based on materials invoicing, daily diaries, sketches for as-builts, and photographs as a matter of record. Documentation procedures will include verifying, logging, and filing all material tickets and invoices received. Sketches will be drawn with calculations for all identified elements that have changed and require a dimensional visualization, and photos of key items will be taken for archive purposes and viewing by others. A detailed Materials Notebook will be maintained during construction, cataloguing the specific materials used on the Project, their test results, and all required certifications.

The LANE Team will use an Internal Quality Planning Process, above and beyond the *VDOT January 2012 QA/QC Guide*, to manage Project quality. All members of the Construction Team will be included in the planning process. Subcontractors and materials suppliers will also be included as work activities and materials are required on the Project.

- *Monthly progress meetings* provide an opportunity to discuss design and construction progress and upcoming activities. Based on the latest Schedule update, the LANE Team will develop a 3-week look-ahead schedule for the project team, which will include:
  - Descriptions of upcoming activities
  - Activity start and finish dates
  - QC inspections and/or testing required
  - Dates of upcoming Witness or Hold Points
- *Weekly meetings* provide an opportunity to review the current 3-week look-ahead schedule and develop a detailed QC and QA schedule for the upcoming week. This schedule includes activities to be performed each day by each crew and the QC and QA testing and inspection requirements for each activity. The schedule shows the anticipated Witness Points, Hold Points, Independent Assurance (IA) and Independent Verification (IV) testing, and preparatory meetings for the upcoming week. Upcoming QC and QA testing and inspection requirements will be planned using this schedule.
- *Daily meetings* provide an opportunity for the CM and/or project superintendent to meet with the construction crew staff to review the work that occurred that day and the work planned for the next day. “After Action Review” discussions are held to identify what went well and what could be improved. Activities planned for the following day are reviewed in “Before Action Reviews” including scope of work, sequence, necessary materials and equipment, safety plan, environmental controls, and MOT. Crew members will be assigned tasks based on the pertinent QA/QC checklist. Witness Points and QC, QA, IA, and/or IV testing and inspections will be identified and communicated to the QAM.

The QCM will ensure that the QC Plan is adhered to regarding all construction activities. On a daily basis, the QCM will ensure, at a minimum:

- Inspection of work activities and site conditions.
- Verification that all construction is in accordance with the Contract Documents.
- Testing of materials for conformance with specifications.

- Equipment tests are performed offsite to ensure the material meets specifications. Each component is entered into the QC log.
- Equipment and materials are delivered to the construction yard. The construction manager performs a self-inspection to ensure the equipment and materials meet Department standards. If any deficiencies are noted, the material is returned and replacement equipment is ordered.
- The devices are installed by the field crews. Installation check lists are used to ensure all procedures are followed correctly. Each device installation is entered into the QC log.
- The CEI inspector back-checks the field crew to ensure the materials and equipment have been installed correctly. Any discrepancies are discussed with the crew chief and construction manager. If corrective action is required, the equipment will be reinstalled to the satisfaction of the CEI inspector. The results are then entered into the QC log.

The QCM will communicate any issues identified as a result of this continuous monitoring to the CM and the QAM. The CM will take appropriate actions to correct the issues or deficiencies, and will update the Design Build Project Manager on their status.

Construction QA. The purpose of the QA Plan is to verify the QC sampling and testing program, and to ensure the conformance of the work to design standards and specifications. The Construction QA Program will be administered by the QAM independent of LANE construction staff.

The QAM, assisted by a QA Lead Inspector and other QA inspectors and/or testing technicians as needed, will represent VDOT on the site, minimizing the likelihood of additional QA/QC effort needed by VDOT.

The Construction portion of the Plan will address the five levels of testing and inspection activities and responsibilities required by VDOT January 2012 *QA/QC Guide*. Detailed checklists will be employed to document the performance of inspection activities, clearly describing the procedures applicable to both QA and QC.

- ***Preparatory Meetings.*** Prior to the start of a work activity, the QAM will lead a Preparatory Inspection Meeting (PIM). Attendees will include production personnel, subcontractors, QA and QC personnel, and VDOT's Owner Independent Assurance (OIA) and Owner Verification Sampling and Testing (OVST) personnel. The PIM is an excellent forum to review and discuss topics including, but not limited to: relevant specifications, special provisions, drawings, safety, means and methods, and QC requirements. During the PIM, the completion of required permits, safety procedures, approved drawings and shop drawings, material approvals, and scheduled inspections will be verified. The QAM will also review the location, type, and frequency of tests and inspections as outlined in *QA/QC Requirements.* The Team will identify and discuss Hold and/or Witness Points associated with the work.
- ***Construction Inspections and Testing***. The QAM will establish and monitor testing frequencies throughout the life of the Project to ensure that QC, QAM Independent Assurance (QAM IA), QAM Independent Verification Sampling and Testing (QAM IVST), OIA, and OVST satisfy VDOT January 2012 *QA/QC Guide*. QA inspectors will submit a Daily Work Report (DWR), including these nine items identified in VDOT January 2012 *QA/QC Guide:*
  - Work performed, identified by Work Package notation, including QA/QC checklists.
  - Weather Conditions.
  - Inspections performed and their results.
  - Communications.
  - Type, location, and results of tests performed.

- Delays encountered.
- Safety related problems and corrective action(s).
- Non-conforming work and corrective action(s).
- Signature of inspector.

The QA organization will also keep the VDOT Project Manager informed of scheduled OIA and OVST testing, Witness Points, and Hold Points during construction.

The QMP will establish a Quality Assurance Auditing and Non-Conformance Recovery Plan in accordance with *VDOT January 2012 QA/QC Guide*. This plan will establish a uniform process for reporting, controlling, and correction of non-conformance issues. This process will include the issuance of a Non-Conformance Report, documenting an approved recovery plan and concurrence between the Design Builder and VDOT.

- ***Documentation.*** The QAM will monitor the efforts of the QC team to ensure that appropriate records are prepared and submitted daily, including Daily Work Reports (DWRs) and test reports. A master set of all QA documents will be assembled, including meeting minutes, daily diaries, QA test reports, OIA/OVST test reports, photographs, and materials documentation such as the Project's Materials Notebook and Design Build Materials Tracking information. Hard copy and parallel electronic filing systems with appropriate backup will be used for project documents. ***Project documentation will be available for the Department's review at all times.***

Design and Construction QA/QC Plan Challenges and Risks. Based on our Team's significant ITS design and construction experience, in general, we have found the greatest challenges from a QA/QC perspective are with interdisciplinary coordination. Individual designers are often focused on a single aspect of the project design and the problems develop where different disciplines intersect. Most Quality Control procedures are geared to ensure that designs are performed according to established standards and criteria and all calculations have been reviewed and back checked per the established procedures.

An example of this for the I-66 ATM project involves both the design and construction of the conduit, power and fiber optic cable routing. In this example, the designer will be addressing the following major elements:

- Conduit routing
- Placement of junction boxes and communication vaults
- Conduit crossings of roadway, ramps, and/or structures
- Number of bends in the conduit routing
- Number and size of conduit
- Fiber optic cable design
- Splicing details of the fiber
- Equipment connection details
- Electrical power cable design
- Voltage loss calculations
- Size of electrical cables
- Design of electrical service panels and conductor connections
- Fill ratio of both communications and electrical conduits

The Quality Control procedures need to address each of these design elements to ensure that the design meets all NEC and VDOT design standards regarding items such as fill ratio, maximum number of turns, bend radii, etc. Through the LANE Team's extensive experience with similar ITS designs, we have developed rigid Quality Control procedures for each step of the design process. While each of these example design elements may have been done flawlessly and passed each Quality Control review, this alone is not sufficient. The

Quality Control procedures must also address the interdisciplinary aspects of the project and must ensure that there are no conflicts with utilities, drainage and other structures. A key function of the Design QA/QC Manager is to monitor the system design and ensure that the established Quality Control procedures are adhered to and sufficiently documented so as to provide the Quality Assurance and traceability through the design, construction and integration process. The Quality Assurance, which will be provided by the most senior members of the LANE Team, will also ensure that the sequence of construction is feasible, the most efficient and provides the least disruption to existing systems and equipment.

For the I-66 ATM project, we see the most critical element from a design and construction QA/QC perspective as integrating the ATM communications and electrical power design into the existing VDOT infrastructure.

While VDOT has indicated that it will set aside existing fiber optic cable for use by the project, it has acknowledged that the fibers to be provided are not continuous throughout the length of the project. Recognizing that there may need to be splices made at approximately 30 cabinets just to provide a continuous backbone, accurate documentation of the existing fibers to be used, and each of the splices to be made is paramount. The fiber documentation is critical not only to the system design and construction, but to protect VDOT's existing operations so that fibers currently being utilized are not impacted by the project, unless there are no other alternatives. In those instances, the Quality Assurance process will be focused to ensure the disruptions are kept to an absolute minimum and that VDOT is fully aware and agreeable to any interruptions in service that may be required.

From the construction standpoint, identifying the correct existing fibers and power cables and then executing the splices, extensions, equipment connections, conduit and cable routing called out in the plans is essential to delivering a successful project. Providing detailed fiber routing and splicing plans is critical not only to the successful implementation and integration of the I-66 ATM, they also provide a vital resource to VDOT for ongoing maintenance and support of its ITS infrastructure, following project completion.

4.5 Construction of the Project

4.5 CONSTRUCTION OF THE PROJECT

4.5.1 Sequence of Construction

Project safety is of utmost importance to the LANE Team, not only out of concern for our Team and other personnel directly involved with the project, but for the traveling public as well.

The LANE Team has developed a general sequence of construction for the proposed I-66 Active Traffic Management Design-Build project, bearing in mind we are working along one of the most heavily-traveled interstate systems in the region. It is our intent to simultaneously perform the majority of construction activities in both the EB and WB directions of I-66, including foundation installation, structure erection and ITS installations. This sequence provides a safe separation of the construction work zone operations, minimizing potential traffic disruption, while enhancing our productivity. It is recognized that coordinating and scheduling the timely submission, approval, and procurement of structures and equipment is critical to the concurrent flow of all installations.

Recognizing the importance of initiating construction activities as soon as possible, our Team's intent is to start in areas or segments of the project that offer the least time-consuming design requirements. This will engage the construction and ITS installations while designs are prepared for the next segment. This process will provide for a more fluid operation for all parties involved.

The impacts to the traveling public will generally be in the form of temporary shoulder closures, temporary ramp closures, temporary lane closures, and temporary rolling road closures in either the eastbound or westbound direction. The LANE Team's sequence of construction proposes to keep these to a minimum and plans to construct proposed structures in close proximity simultaneously by utilizing multiple construction teams and a single closure.

During the preliminary investigation phase, the first step will be to inspect, test, and evaluate existing structures to determine candidates for re-use. At this time, initial geotechnical investigations and soil borings for the proposed structures will begin, concentrating on the 25' and 50' CCTV, FCCTV, and MVD/RMD poles and foundations, which have shorter manufacturing lead times than larger structures. Using the worst-case soil borings as a conservative approach, the LANE Team will complete and submit designs for approval as soon as possible. Another major purpose of this phase is to identify conflicts with the existing ITS system and infrastructure in order to design work-around solutions that are to be in place and installed before beginning work that impacts the legacy system.

During the initial construction phase, the first step will be to complete the geotechnical investigation and soil borings, in order to complete foundation designs for submittal and approval, as soon as possible. Our foundation design team will analyze the soil conditions and develop a minimum number of designs to eliminate an abundant amount of foundation sizes and depths. Using the worst-case soil borings as a conservative design approach, the LANE Team will submit the designs for the 80' poles and foundations and for the sign structures and gantry foundations for approval. This process should provide for better quality control, consistency, and efficiency.

Simultaneously, designs and shop drawings for the other materials, including ITS equipment, UPS, auxiliary power system, MVD poles, ramp meter signal poles, cabinets, and signage will be submitted. Once these drawings have been approved, materials will be ordered and stored or warehoused as necessary. Items requiring initial testing can be tested at the warehouse at this time. The LANE Team will provide adequate space for storage and warehousing within a suitable distance from the project site. We will coordinate with other project teams in this corridor as storage sites are selected.

At this time, the LANE Team will also begin preparing the staging areas necessary for temporary operations. Multiple work zone construction staging areas, with adequate separation between roadway users and construction works, will be utilized along the length of the project to optimize quick and efficient deployment of temporary traffic control devices and materials as needed. Additionally, and in order to allow early use of ITS devices as they come online and are fully tested, our Team will furnish and install a new workstation at the MPSTOC that will be fully loaded with all required vendor-master software applications necessary to operate the newly installed ITS devices.

Erosion and Sediment Control Plans (E&S)
The LANE Team will provide detailed plans for the E&S components as required as part of the I-66 ATM design plan set. The LANE Team will ensure that all areas impacted by the installation of any ITS devices or new signage and pull-off staging areas are included within the E&S plan. This will provide complete coverage and appropriate controls to guarantee proper protection measures throughout each phase of our sequence of construction.

The staging areas as shown in VDOT's RFP Conceptual Plan and Exhibits 1,2 and 6 of Volume II, will be graded and paved while the shop drawings are out for approval, in order to keep construction activities ongoing. During these and all other construction activities, measures will be taken to ensure compliance with all environmental requirements. Also at this time, any ITS equipment and signs that do not impact current operations will be removed.

Once designs and shop drawings have been approved, the LANE Team will begin with the trenching work. Conduit, cabinet foundations, cabinets, junction boxes, and incidental concrete foundations for the poles will be installed. Then splicing and testing of the existing fiber can occur, followed by installation of new fiber. Ground-mount sign installation will follow.

During the heavy construction phase, the overhead sign structures and other ITS device structures will be installed. The ground-mount sign supports and signs can be constructed at this point if they are already on-site. For the construction of the overhead sign structures, the foundations and side supports will be installed first. All work that can be completed outside of the roadway will be completed. This will allow for the shortest possible closures while the overhead structures are installed. It is the LANE Team's goal to provide quick installation of all equipment, but any construction activities requiring full road closures are of particular focus. The LANE Team will comply with all restrictions listed in the RFP pertaining to construction times and closure allowances. The LANE Team feels strongly that raising the overhead structures can be accomplished quickly and efficiently.

Once all overhead structures and gantries are constructed, the DMS and LCS will be installed. The next step in the construction process will be testing all systems as described in the RFP and making any modifications deemed necessary to enable the systems to be certified for operations and accepted by VDOT. Temporary ITS measures will be installed as necessary to allow removal of legacy ITS still needed for operations in locations where the proposed equipment is not yet fully operational. The last step of construction will be to remove any remaining, existing ITS equipment, system-by-system, until complete. These items will be removed and disposed of as required by the RFP.

During construction, it will be very important to communicate with the general public and other stakeholders. The LANE Team will notify and educate the public about any planned closures or changes to traffic patterns. Managers of any nearby projects along I-66 (including but not limited to the I-66 Widening from Gainesville to Haymarket, the I-66 Spot Improvement 2, and the I-66 Spot Improvement 3) or along adjacent roadways that are ongoing or may come online during construction of the I-66 ATM project will also be alerted and coordination will occur to prevent any conflicts that would negatively affect construction operations or the traveling public. Please see the Public Communications Plan in Section 4.5.2 for additional information.

Maintenance of Traffic will be thoroughly planned and coordinated to ensure that all necessary precautions are taken to comply with the RFP and to keep motorists and workers safe. In general, construction operations will proceed in both eastbound and westbound directions, utilizing off-peak hours. Proper signage will be installed to alert the traveling public to any changes in traffic patterns. The LANE Team will use the same, few Temporary Traffic Control (TTC) operations for the length of the project to enable ease of understanding for the traveling public. The differing Virginia Work Area Protection Manual (VWAPM) Temporary Traffic Control (TTC) operations are described further in Section 4.5.2.

The LANE Team will comply with all requirements pertaining to right-of-way as outlined in the RFP document. The LANE Team will maximize construction capabilities while staying within the constraints of the existing right-of-way.

The LANE Team, including QA/QC staff and production crews, is committed to providing a high quality, successful project—a project where VDOT is assured that they will not need to provide additional QA/QC.

In addition, the LANE Team's QA/QC process will fully comply with the RFP as outlined by VDOT to ensure a quality design and a quality project that will have as little impact as possible on the traveling public, while maintaining an aggressive construction schedule to meet all project milestones. The LANE Team's members have had proven success implementing QA/QC procedures with other Design-Build projects such as the Sudley Manor Drive and Linton Hall Road PPTA. As previously indicated in the LANE Team's detailed QC/QA plan for the I-66 ATM project, shown in Section 4.4.4, ***the LANE Team is committed to providing a high quality, successful project—a project where VDOT is assured that they will not need to provide additional QA/QC.*** The LANE Team will ensure from design to construction to final VDOT acceptance that all members of the QC/QA process (Design QC/QA Manager and Construction QAM), will follow and implement LANE's "task-force" approach to complete the necessary, but independent reviews in order to maintain the highest quality of construction and ensure traveler safety.

The final goal for this project will be to minimize any disruptions or downtime for the ITS as new equipment is tested and deployed and any existing equipment is turned off and removed. The LANE Team will ensure that all information needed by the traveling public will be displayed as necessary during this transition. After the new ATM systems are installed and tested, the LANE Team will work closely with VDOT and the Open Roads software team to integrate the newly installed ATM devices for operation. This will enable VDOT and the traveling public to take advantage of the active traffic management information along the corridor.

The major risks with a construction project of this type are conflicts between motorists and construction activities and driver confusion over varying traffic patterns and temporary closures. As stated earlier, safety of our Team and the general public is of greatest concern to the LANE Team. Ample temporary signage explaining traffic patterns, prior notification of temporary closures, and appropriate separation between staging areas and the traveling public will be utilized to minimize construction risks. Coordination between the LANE Team, project stakeholders, other projects in the corridor, and the general public will also be vital to minimizing risks. The LANE Team endeavors to provide all information that would be beneficial to VDOT, the general public, and other stakeholders through a transparent design and construction process, while adhering to our construction schedule as outlined in Section 4.6. Please see the Public Communications Plan in Section 4.5.2 for additional information about coordination.

4.5.2 Transportation Management Plan

The LANE Team will design and implement the Transportation Management Plan (TMP) in accordance with VDOT's Requirements in IIM-241 and incorporate all the strategies outlined for a Type B, Category IV

project. The LANE Team recognizes that the Interstate 66 corridor is one of the most heavily-traveled interstate systems in the region. We additionally recognize the importance and necessity of maintaining traffic with the least amount of disruption for the corridor. LANE, through its experience as part of the I-66 3rd Lane Widening Improvements Project – Spot Improvement 1 Project and having recently been selected for other ITS and Signage Installation projects (the DMS New Installation on Primaries on I-66 project and the Bridge Mounted Sign Structure Replacement project) understands the dynamics of maintaining traffic along a heavily-traveled corridor, particularly for our region and Interstate 66. The LANE Team's TMP encompasses three critical parts: Traffic Control, Public Communication, and Transportation Operations.

Traffic Control

Temporary Traffic Control: The I-66 ATM Project, which is comprised of four segments over 30 miles, will entail a number of different traffic control applications over the course of the project. As part of the LANE Team's TMP, the following is noted:

- Flagging Operations will only be permitted as allowed by the VWAPM, and all flaggers will have the required certifications.
- The LANE Team, after reviewing the proposed design, does not anticipate the need for Work Zone Speed Reductions.
- For all roadway, lane, and ramp closures, the LANE Team will follow the time-of-day restrictions outlined in Section 2.16 of the RFP.
- All lanes on I-66 as part of the TMP plan will not be less than 12' in width, and all temporary traffic control devices (TCD) will be a minimum of 2' from the travelway.
- For all other roadways, the roadway width will be no less than permitted by the VDOT Road and Bridge Standards, and all temporary TCD will be a minimum of 1' away from the travelway.

In general, the types of Temporary Traffic Control applications fall within several categories: Single/Dual or Triple Lane Closures, Shoulder Closure (including Shoulder Lane), Ramp Closures, Temporary Detours, and Total Roadway Closures.

Single/Dual or Triple Lane Closures: These closures will generally be implemented for the following proposed elements: removing/installing HOV signs, removing/installing shoulder lane LCS, installing side pieces for overhead sign and gantry structure components that will span the roadway, and when any other proposed elements require the LANE Team's work zone to be roadside due to physical constraints.

- The LANE Team's design will require closure of the HOV Lane during the permitted times outlined by the RFP utilizing VWAPM TTC 17.0.
- When the inside left lane is required to be closed, VWAPM TTC 18.0 will be implemented. This will also be implemented if the shoulder lane and inside right lane are to be closed to install ATM Devices along the right side of the roadway.
- Inside the beltway, where I-66 is generally a four-lane divided highway, VWAPM TTC 16.0 and/or TTC 17.0 will be implemented to install ATM devices as needed.

Shoulder Closure (including Shoulder Lane): These closures will generally consist of closing the shoulder and/or the shoulder lane (For segments 2 and 3). The closures will be for the following proposed elements: Installing CCTV poles, FCCTV/CCTV cameras, installing or working on O/H gantry structure poles (prior to installing span), installing/removing LCS for shoulder lane, installing/removing roadside static signs, and any other proposed elements that require the LANE Team to utilize the shoulder space and/or the space adjacent to the shoulder.

- The LANE Team will implement VWAPM TTC-4.0 and/or TTC-16.0 as applicable for all shoulder and shoulder lane closures.

Additionally the LANE Team is committed to maintaining traffic to the maximum extent as possible. When the inside lanes are closed due to median work or work over the inside travel lanes, the LANE Team will work with VDOT to open (show green arrow) the normally closed shoulder lane through VDOT's Segments 2 and 3 of the project to provide for more through-way travel lanes.

Temporary Ramp Closures: As part of the LANE Team's TMP design, these closures will be limited in nature due to the disruption it would cause. These closures are for a multitude of proposed elements such as removing existing O/H signs on bridges and installing signs onto cantilevers and cantilevers for LCS that span over the CD roadways for the ramps. Therefore, as permitted by the RFP, these closures will be proposed for approval to VDOT with complete detours for each instance. The LANE Team's TMP Design approach will be so that, the ramp closures do not extend more than one over-night shift, the ramps will be re-opened to traffic the following morning, and may be re-implemented the next available over-night shift to avoid major disruption to traffic. The LANE Team, when coordinating the TMP and reviewing the proposed design, has determined that Ramp Closures are limited to the following interchanges:

- I-66 at Route 123 (Chain Bridge Road)
- I-66 at Route 50 (Lee Jackson Memorial Highway)
- I-66 at Route 243 (Nutley Street)
- I-66 at Route 120 (Glebe Road)—[WB Exit Ramp, for Removal of Ex. O/H on N. Utah St. Bridge]

The LANE Team will design temporary/short term detours, compliant with VWAPM TTC 46.0 for each occurrence in which there is a need to close an interchange's ramp access, noting that the LANE Team will use the optional PCMS to further advise the public as appropriate. For exit ramps that are closed, the LANE Team will direct travelers to the preceding or acceding interchanges, to guide travelers to desired destinations from the opposite direction of travel along I-66.

As a mitigation measure in all other instances that interchange ramps are impacted and the proposed design for the project does not require a ramp closure, the LANE Team will implement VWAPM TTC 37.0, 38.0 and/or 39.0 as appropriate.

Rolling Roadway Closures: This project will require rolling roadway closures. The LANE Team will follow the RFP time-limit requirements (15-minute maximum) and will follow the TTC applications outlined in the VWAPM. The rolling roadway closures (one directional or two directional) will be implemented to best serve multiple needs (e.g., multiple proposed gantry crossings for a stretch of roadway) in order to save time for all stakeholders. In all instances of rolling roadway closures (one directional or two directional), the LANE Team will provide the required advance notification outlined by the RFP and communicate the TMP implementation plans to all stakeholders, including the traveling public.

Temporary Detours: This project, outside of the temporary detours mentioned for the temporary ramp closures, does not anticipate the need for temporary detours for any side streets and/or I-66. If such circumstances arise, the LANE Team is more than able to adapt and will provide for a temporary detour. The LANE Team also does not anticipate any long term detours required for any pedestrian/bicyclist movements as these detours will be on-site deviations of the normal path to ensure continuity of the pedestrian/bicyclist movement for the duration of the project.

Public Communication Plan. A Public Communication Plan developed with the project's TMP will be incorporated into the LANE Team's overall Public Involvement Plan. Through this plan, the LANE Team will maintain multiple channels of communication with the traveling public, mass transit systems, local jurisdiction fire and rescue, utilities, Parks and Recreation, local residents and businesses, and other stakeholders. The major stakeholders include, but are not limited to, all of the local jurisdictions (Arlington County, City of Falls Church, Fairfax County, City of Fairfax, Prince William County, and Town of Vienna)

along I-66, WMATA, VDOT's MPSTOC, project managers of adjacent VDOT projects (including but not limited to the I-66 Widening from Gainesville to Haymarket, the I-66 Spot Improvement 2, and the I-66 Spot Improvement 3), and the traveling public. As required by the RFP, the LANE Team has designated Christopher Reed, the Team's Public Relations Manager, to be the project's liaison/Point of Contact between VDOT and the project's stakeholders to help provide notification to the affected property owners and traveling public. These open channels of communication will be used throughout the life of the project to disseminate project information, including TMP information such as lane closures, traffic pattern changes, and the implementation of ramp closures and, if necessary, temporary detours. The LANE Team will provide the required weekly updates to VDOT's Northern Virginia District Office of Public Affairs to enable information to be posted on VDOT's website for access by the traveling public and any others who may be seeking project updates. In addition to ongoing communication, the LANE Team will hold coordination meetings with VDOT and any other stakeholders to provide critical information for continuity of operations along I-66.

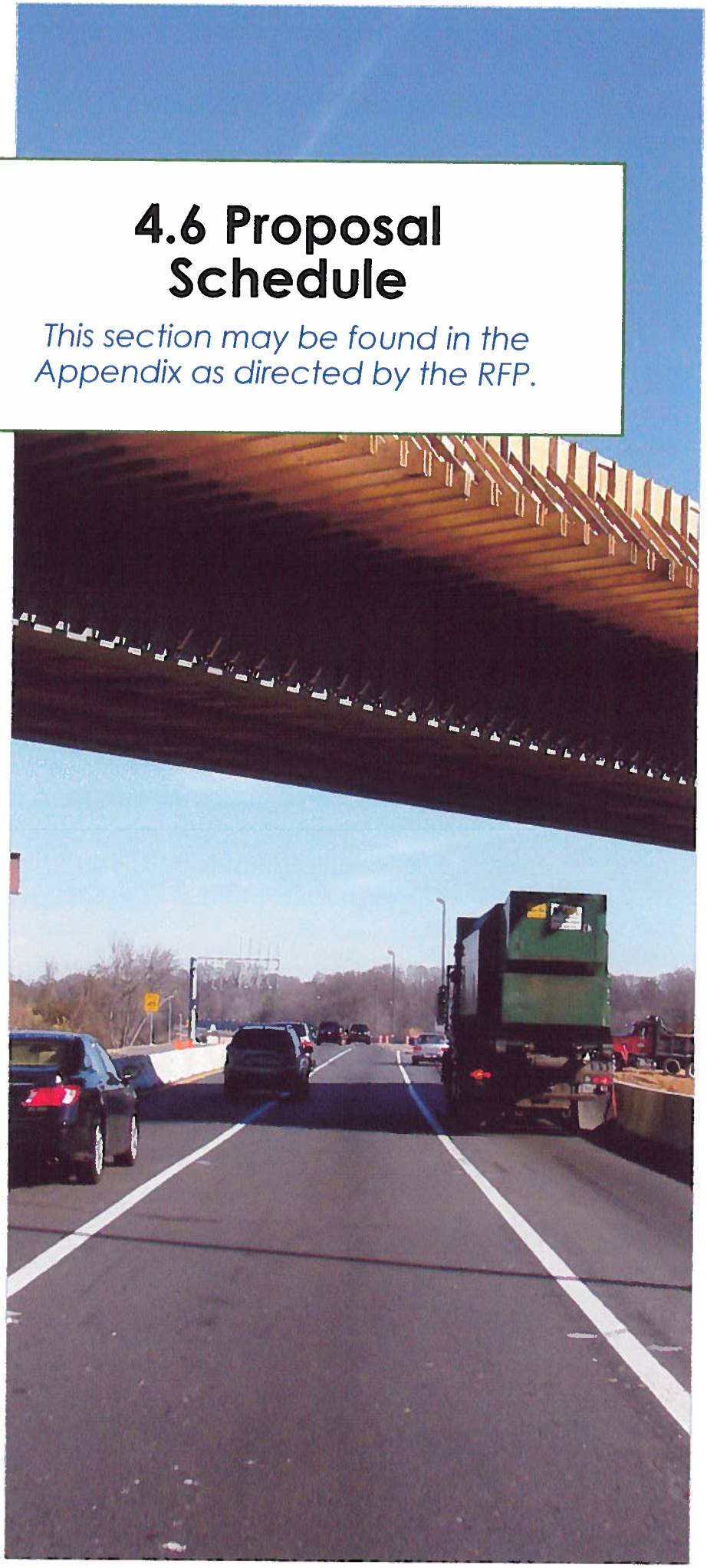
An emergency contact list of project personnel and the response plan to respond to any on-site emergency including in any work zone incidents will be available to EMS personnel, schools, hospitals, parks and recreation and other necessary service providers. (per IIM-241)

The LANE Team will provide advance notification of construction activities to VDOT and the public to minimize and mitigate the disruption to travelers through the project area. We do not anticipate that the construction phases will introduce driver unfamiliarity, as current and on-going construction along the corridor has engaged with the public and increased the awareness of construction activity. The LANE Team will seek to continue and, where necessary, improve this awareness through coordination with VDOT. We will address this with proper signage and notification, as stated above, but it will require some exposure to the traffic pattern to complete the education and to normalize traffic movement. As required, all steps to schedule significant construction events will be taken to use off-peak times for construction activities. Likewise, strict attention will be paid to construction activities being normalized in the appropriate eastbound/westbound flow during peak hours.

Transportation Operations Plan. The LANE Team will coordinate with VDOT to develop protocols for the implementation of incident management. We will develop the necessary list of contacts for any emergency action required and will develop plans to address incident scenarios. Such plans will include the utilization of strategically-placed variable message signs to assist motorists in dealing with the incident. These plans may include recommended alternative routes and procedures for emergency lane closures or hazard protection. Plans may include recommended signal timing changes at affected intersections, as well as possible turn movement restrictions, by the installation of cones or drums to be placed in addition to what may be reflected in the plan. In addition to planning for incidents occurring within the immediate project limits, it is also appropriate to consider the effect of an incident outside the project boundary. The LANE Team will develop protocols and procedures for various incidents that could affect travel patterns in, and around, the project area. The Contractor will have on hand: variable message sign boards, signs, and channelizing devices to immediately deploy for incident management. The LANE Team will follow VDOT's recently-updated VWAPM 2011, which now includes Temporary Traffic Control applications for emergency/ incident situations. The LANE Team will keep this onsite along with a list of emergency contacts. This approach will allow our project team to be prepared for, and react quickly and appropriately to, any incident affecting travel through and around the project. LANE is currently maintaining the traffic on one of the area's most congested commuter routes, the I-495 [HOT] Express Lanes construction. The lessons learned on this project in moving high volumes of traffic through extremely tight construction limits will be integrated as part of our overall TMP approach.

4.6 Proposal Schedule

This section may be found in the Appendix as directed by the RFP.



4.7 Disadvantaged Business Enterprises (DBEs)

4.7 DISADVANTAGED BUSINESS ENTERPRISES

The LANE Team supports the Disadvantaged Business Enterprise program and is ***committed to meeting or exceeding the 15% goal for the design and construction of this project utilizing the services of firms certified in Virginia as DBE's***. It is also LANE's intention to take all necessary and reasonable steps to confirm that SWaM firms have the maximum opportunity to compete for and perform services in this design-build contract.

Design Subconsultants. The LANE Team includes highly qualified DBE/SWaM subconsultants who bring specialized design services necessary for the successful completion of this design-build project, as presented in the table below.

Subconsultant	Services	Certification
Rinker Design Associates, P.C.	Civil Design, Traffic & TMP, Surveys, Drainage, Public Relations	SWaM No. 652784
World Fiber Technologies	Electrical/ITS	SWaM No. 696558
Sabra, Wang & Associates, Inc.	ITS Design/Civil Design	SWaM/ DBE/MBE No. 000982
FreeAhead Engineering, P.C.	QA/QC	SWaM No. 664467

Construction Subcontractors. LANE implements a subcontracting plan on all of our projects to allow the maximum opportunity for DBE and SWaM subcontractors to qualify for and provide services on this project. The selection of subcontractors for procurement is a two-step process.

During source selection, we research the capabilities of the subcontractor to perform the work under consideration. This includes consideration of past performance, socioeconomic status, financial condition, current availability, and past safety performance indicators. Based on this research, a list of potential subcontractors is developed.

Once a solicitation for pricing has been set, potential subcontractors have the opportunity to respond with their site-specific worker protection program and best price proposals. A management evaluation team then evaluates the proposals against the requirements of the contract. We review the price proposal to determine price reasonableness. The final selection of the subcontractor is made by combining the results of the safety and price evaluations to determine the proposal that provides the best value to the Owner and LANE. Any subcontractor who does not meet our stringent technical, quality, and safety requirements is excluded from further consideration during the proposal evaluation.

LANE conducts a technical evaluation of the qualifications presented in the subcontractor's proposal as well as an independent review of their past performance. The qualifications of the prospective subcontractors are evaluated against the criteria and requirements stated in the contract specifications. References, provided with their price proposal, are contacted and questioned about the subcontractor's past performance. The topics covered include safety, schedule and cost compliance, and quality of work.

If the potential subcontractor has worked for LANE before, their past performance and safety record for LANE is also evaluated. If the potential subcontractor is required to submit a Quality Control Program or Worker Protection Program with their proposal, these documents are evaluated by LANE's Safety Health Officer. If the subcontractor has not worked for LANE previously, a project interview may be required.

DBE participation is represented across disciplines for both design and construction activities.

Appendix

Attachment 4.0.1.1: Technical Proposal Checklist

ATTACHMENT 4.0.1.1

I-66 Active Traffic Management

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Offerors shall furnish a copy of this Technical Proposal Checklist, including page references, with the Technical Proposal.

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Technical Proposal Checklist and Contents	Attachment 4.0.1.1	Section 4.0.1.1	no	**i. (Appendix)**
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.6 (Form C-78-RFP)	Sections 3.6, 4.0.1.1	no	**iv. (Appendix)**
Letter of Submittal	NA	Sections 4.1		
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	**1**
Offeror's official representative information	NA	Section 4.1.1	yes	**1**
Authorized representative's original signature	NA	Section 4.1.1	yes	**2**
Declaration of intent	NA	Section 4.1.2	yes	**2**
120 day declaration	NA	Section 4.1.3	yes	**2**
Principal Officer information	NA	Section 4.1.4	yes	**2**
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.5	no	**v. (Appendix)**
Offeror's Qualifications	NA	Section 4.2		
Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT	NA	Section 4.2.1	yes	**3**
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	**4**

ATTACHMENT 4.0.1.1

I-66 Active Traffic Management

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	**3**
Design Concept	NA	Section 4.3		**5**
Conceptual Project Layout for ITS devices - table and plans	NA	Section 4.3.1	yes	**7**
Structural Design Concept – description and renderings	NA	Section 4.3.2	yes	**13**
Project Approach	NA	Section 4.4		**16**
ITS Deployment Management	NA	Section 4.4.1	yes	**17**
ITS Operation Continuity	NA	Section 4.4.2	yes	**20**
Utilities	NA	Section 4.4.3	yes	**23**
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	**24**
Construction of Project	NA	Section 4.5		
Sequence of Construction	NA	Section 4.5.1	yes	**31**
Transportation Management Plan	NA	Section 4.5.2	yes	**33**
Proposal Schedule	NA	Section 4.6		
Detailed Work Plan	NA	Section 4.6.1	no	**vi. (Appendix)**
Proposal Schedule Narrative	NA	Section 4.6.2	no	**vii. (Appendix)**

ATTACHMENT 4.0.1.1

I-66 Active Traffic Management

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.6	no	viii. (Appendix)
Disadvantaged Business Enterprises (DBE)	NA	Section 4.7		
Written statement of percent DBE participation	NA	Section 4.7	yes	37
DBE subcontracting narrative	NA	Section 4.7	yes	37

Attachment 3.6: Form C-78-RFP
Acknowledgement of Receipt of RFP, Revisions, and/or Addenda

ATTACHMENT 3.6

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

RFP NO. C00098017DB46

PROJECT NO.: 0066-96A-917, P101, N501

ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA

Acknowledgement shall be made of receipt of the Request for Proposals (RFP) and/or any and all revisions and/or addenda pertaining to the above designated project which are issued by the Department prior to the Letter of Submittal submission date shown herein. Failure to include this acknowledgement in the Letter of Submittal may result in the rejection of your proposal.

By signing this Attachment 3.6, the Offeror acknowledges receipt of the RFP and/or following revisions and/or addenda to the RFP for the above designated project which were issued under cover letter(s) of the date(s) shown hereon:

1. Cover letter of April 6, 2012 - RFP
   (Date)
2. Cover letter of June 22, 2012 - Addendum No. 1
   (Date)
3. Cover letter of July 6, 2012 - Addendum No. 2
   (Date)

SIGNATURE

7/24/12
DATE

Attachment 9.3.1: Proposal Payment Agreement

ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this "Agreement") is made and entered into as of this **27th** day of **July**, 20**12** by and between the Virginia Department of Transportation ("VDOT"), and **The Lane Construction Corporation ("Offeror").**

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications ("SOQs") pursuant to VDOT's **October 25, 2011** Request for Qualifications ("RFQ") and was invited to submit proposals in response to a Request for Proposals ("RFP") for the **I-66 Active Traffic Management, Project No. 0066-96A-917, P101, N501** ("Project"), under a design-build contract with VDOT ("Design-Build Contract"); and

WHEREAS, as part of the procurement process for the Project, Offeror has already provided and/or furnished to VDOT, and may continue to provide and/or furnish to VDOT, certain intellectual property, materials, information and ideas, including, but not limited to, such matters that are: (a) conveyed verbally and in writing during proprietary meetings or interviews; and (b) contained in, related to or associated with Offeror's proposal, including, but not limited to, written correspondence, designs, drawings, plans, exhibits, photographs, reports, printed material, tapes, electronic disks, or other graphic and visual aids (collectively "Offeror's Intellectual Property"); and

WHEREAS, VDOT is willing to provide a payment to Offeror, subject to the express conditions stated in this Agreement, to obtain certain rights in Offeror's Intellectual Property, provided that Offeror submits a proposal that VDOT determines to be responsive to the RFP ("Offeror's Proposal"), and either (a) Offeror is not awarded the Design-Build Contract; or (b) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror; and

WHEREAS, Offeror wishes to receive the payment offered by VDOT, in exchange for granting VDOT the rights set forth in this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements set forth in this Agreement and other good and valuable consideration, the receipt and adequacy of which are acknowledged by the parties, the parties agree as follows:

1. **VDOT's Rights in Offeror's Intellectual Property**. Offeror hereby conveys to VDOT all rights, title and interest, free and clear of all liens, claims and encumbrances, in Offeror's Intellectual Property, which includes, without restriction or limitation, the right of VDOT, and anyone contracting with VDOT, to incorporate any ideas or information from Offeror's Intellectual Property into: (a) the Design-Build Contract and the Project; (b) any other contract awarded in reference to the Project; or (c) any subsequent procurement by VDOT. In receiving all rights, title and interest in Offeror's Intellectual Property, VDOT is deemed to own all intellectual property rights, copyrights, patents, trade secrets, trademarks, and service marks in Offeror's Intellectual Property, and Offeror agrees that it shall, at the request of VDOT, execute all papers and perform all other acts that may be necessary to ensure that VDOT's rights, title and interest in Offeror's Intellectual Property are protected. The rights conferred herein to VDOT include, without limitation, VDOT's ability to use Offeror's Intellectual Property without the obligation to notify or seek permission from Offeror.

2. **Exclusions from Offeror's Intellectual Property**. Notwithstanding Section 1 above, it is understood and agreed that Offeror's Intellectual Property is not intended to include, and Offeror does not convey any rights to, the Escrow Proposal Documents submitted by Offeror in accordance with the RFP.

3. **Proposal Payment**. VDOT agrees to pay Offeror the lump sum amount of **Fifty Thousand and 00/100 Dollars ($50,000.00)** ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

4. **Payment Due Date**. Subject to the conditions set forth in this Agreement, VDOT will make payment of the Proposal Payment to the Offeror within forty-five (45) days after the later of: (a) notice from VDOT that it has awarded the Design-Build Contract to another Offeror; or (b) notice from VDOT that the procurement for the Project has been cancelled and that there will be no Contract Award.

5. **Effective Date of this Agreement**. The rights and obligations of VDOT and Offeror under this Agreement, including VDOT's ownership rights in Offeror's Intellectual Property, vests upon the date that Offeror's Proposal is submitted to VDOT. Notwithstanding the above, if Offeror's Proposal is determined by VDOT, in its sole discretion, to be nonresponsive to the RFP, then Offeror is deemed to have waived its right to obtain the Proposal Payment, and VDOT shall have no obligations under this Agreement.

6. **Indemnity**. Subject to the limitation contained below, Offeror shall, at its own expense, indemnify, protect and hold harmless VDOT and its agents, directors, officers, employees, representatives and contractors from all claims, costs, expenses, liabilities, demands, or suits at law or equity ("Claims") of, by or in favor of or awarded to any third party arising in whole or in part from: (a) the negligence or wilful misconduct of Offeror or any of its agents, officers, employees, representatives or subcontractors; or (b) breach of any of Offeror's obligations under this Agreement, including its representation and warranty under Section 8 hereof. This indemnity shall not apply with respect to any Claims caused by or resulting from the sole negligence or wilful misconduct of VDOT, or its agents, directors, officers, employees, representatives or contractors.

7. **Assignment**. Offeror shall not assign this Agreement, without VDOT's prior written consent, which consent may be given or withheld in VDOT's sole discretion. Any assignment of this Agreement without such consent shall be null and void.

8. **Authority to Enter into this Agreement**. By executing this Agreement, Offeror specifically represents and warrants that it has the authority to convey to VDOT all rights, title, and interest in Offeror's Intellectual Property, including, but not limited to, those any rights that might have been vested in team members, subcontractors, consultants or anyone else who may have contributed to the development of Offeror's Intellectual Property, free and clear of all liens, claims and encumbrances.

9. **Miscellaneous**.

a. Offeror and VDOT agree that Offeror, its team members, and their respective employees are not agents of VDOT as a result of this Agreement.

b. Any capitalized term used herein but not otherwise defined shall have the meanings set forth in the RFP.

c. This Agreement, together with the RFP, embodies the entire agreement of the parties with respect to the subject matter hereof. There are no promises, terms, conditions, or obligations other than those contained herein or in the RFP, and this Agreement shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties hereto.

d. It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement is by the courts held to be illegal or in conflict with any law of the Commonwealth of Virginia, validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.

e. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia.

IN WITNESS WHEREOF, this Agreement has been executed and delivered as of the day and year first above written.

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

The Lane Construction Corporation

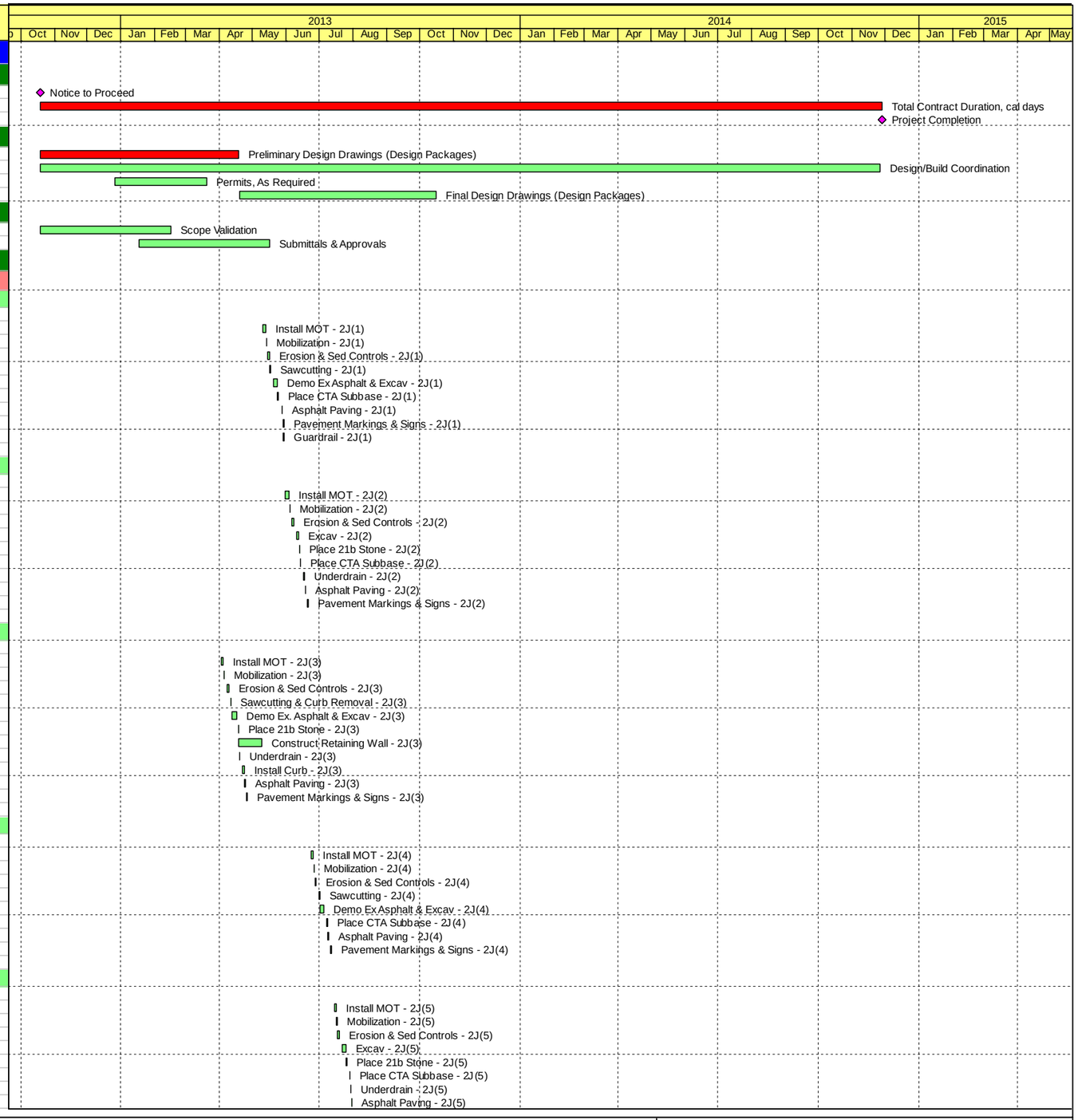
By: _____

Name: Richard A. McDonough

Title: District Manager

4.6.1: Proposal Schedule

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
I-66 Active Traffic Management (ATM)			534	19-Oct-12	28-Nov-14
Milestones		I-66: 7 day/wk	771	19-Oct-12	28-Nov-14
1000	Notice to Proceed	I-66: 7 day/wk	0	19-Oct-12	
9000	Total Contract Duration, cal days	I-66: 7 day/wk	771	19-Oct-12	28-Nov-14
9900	Project Completion	I-66: 7 day/wk	0		28-Nov-14
Design & Permitting		I-66: 5 day/wk	533	19-Oct-12	26-Nov-14
1320	Preliminary Design Drawings (Design Packages)	I-66: 5 day/wk	125	19-Oct-12	18-Apr-13
1340	Design/Build Coordination	I-66: 5 day/wk	533	19-Oct-12	26-Nov-14
1350	Permits, As Required	I-66: 5 day/wk	60	26-Dec-12	20-Mar-13
1330	Final Design Drawings (Design Packages)	I-66: 5 day/wk	126	19-Apr-13	16-Oct-13
Scope Validation/Submittals		I-66: 7 day/wk	210	19-Oct-12	16-May-13
2000	Scope Validation	I-66: 7 day/wk	120	19-Oct-12	15-Feb-13
2100	Submittals & Approvals	I-66: 7 day/wk	120	17-Jan-13	16-May-13
Construction Activities			422	02-Apr-13	28-Nov-14
Staging Areas		I-66: 5 d/wk w/ rain	92	02-Apr-13	26-Aug-13
Staging Area 2J(1)		I-66: 5 d/wk w/ rain	13	10-May-13	30-May-13
2J(1)1000	Start Work @ Staging Area 2J(1)	I-66: 5 d/wk w/ rain	0	10-May-13	
2J(1)1010	Install MOT - 2J(1)	I-66: 5 d/wk w/ rain	2	10-May-13	13-May-13
2J(1)1020	Mobilization - 2J(1)	I-66: 5 d/wk w/ rain	1	14-May-13	14-May-13
2J(1)1030	Erosion & Sed Controls - 2J(1)	I-66: 5 d/wk w/ rain	2	15-May-13	16-May-13
2J(1)1040	Sawcutting - 2J(1)	I-66: 5 d/wk w/ rain	1	17-May-13	17-May-13
2J(1)1050	Demo Ex Asphalt & Excav - 2J(1)	I-66: 5 d/wk w/ rain	3	20-May-13	23-May-13
2J(1)1060	Place CTA Subbase - 2J(1)	I-66: 5 d/wk w/ rain	1	24-May-13	24-May-13
2J(1)1070	Asphalt Paving - 2J(1)	I-66: 5 d/wk w/ rain	1	28-May-13	28-May-13
2J(1)1080	Pavement Markings & Signs - 2J(1)	I-66: 5 d/wk w/ rain	2	29-May-13	30-May-13
2J(1)1090	Guardrail - 2J(1)	I-66: 5 d/wk w/ rain	2	29-May-13	30-May-13
2J(1)1100	Complete Work @ Staging Area 2J(1)	I-66: 5 d/wk w/ rain	0		30-May-13
Staging Area 2J(2)		I-66: 5 d/wk w/ rain	14	31-May-13	21-Jun-13
2J(2)1000	Start Work @ Staging Area 2J(2)	I-66: 5 d/wk w/ rain	0	31-May-13	
2J(2)1010	Install MOT - 2J(2)	I-66: 5 d/wk w/ rain	2	31-May-13	03-Jun-13
2J(2)1020	Mobilization - 2J(2)	I-66: 5 d/wk w/ rain	1	04-Jun-13	04-Jun-13
2J(2)1030	Erosion & Sed Controls - 2J(2)	I-66: 5 d/wk w/ rain	2	06-Jun-13	07-Jun-13
2J(2)1040	Excav - 2J(2)	I-66: 5 d/wk w/ rain	3	10-Jun-13	12-Jun-13
2J(2)1050	Place 21b Stone - 2J(2)	I-66: 5 d/wk w/ rain	1	13-Jun-13	13-Jun-13
2J(2)1060	Place CTA Subbase - 2J(2)	I-66: 5 d/wk w/ rain	1	14-Jun-13	14-Jun-13
2J(2)1070	Underdrain - 2J(2)	I-66: 5 d/wk w/ rain	1	17-Jun-13	17-Jun-13
2J(2)1080	Asphalt Paving - 2J(2)	I-66: 5 d/wk w/ rain	1	18-Jun-13	18-Jun-13
2J(2)1090	Pavement Markings & Signs - 2J(2)	I-66: 5 d/wk w/ rain	2	20-Jun-13	21-Jun-13
2J(2)1100	Complete Work @ Staging Area 2J(2)	I-66: 5 d/wk w/ rain	0		21-Jun-13
Staging Area 2J(3)		I-66: 5 d/wk w/ rain	24	02-Apr-13	09-May-13
2J(3)1000	Start Work @ Staging Area 2J(3)	I-66: 5 d/wk w/ rain	0	02-Apr-13	
2J(3)1010	Install MOT - 2J(3)	I-66: 5 d/wk w/ rain	2	02-Apr-13	04-Apr-13
2J(3)1020	Mobilization - 2J(3)	I-66: 5 d/wk w/ rain	1	05-Apr-13	05-Apr-13
2J(3)1030	Erosion & Sed Controls - 2J(3)	I-66: 5 d/wk w/ rain	2	08-Apr-13	09-Apr-13
2J(3)1040	Sawcutting & Curb Removal - 2J(3)	I-66: 5 d/wk w/ rain	1	11-Apr-13	11-Apr-13
2J(3)1050	Demo Ex. Asphalt & Excav - 2J(3)	I-66: 5 d/wk w/ rain	3	12-Apr-13	16-Apr-13
2J(3)1060	Place 21b Stone - 2J(3)	I-66: 5 d/wk w/ rain	1	18-Apr-13	18-Apr-13
2J(3)1070	Construct Retaining Wall - 2J(3)	I-66: 5 d/wk w/ rain	15	18-Apr-13	09-May-13
2J(3)1080	Underdrain - 2J(3)	I-66: 5 d/wk w/ rain	1	19-Apr-13	19-Apr-13
2J(3)1090	Install Curb - 2J(3)	I-66: 5 d/wk w/ rain	2	22-Apr-13	23-Apr-13
2J(3)1100	Asphalt Paving - 2J(3)	I-66: 5 d/wk w/ rain	1	24-Apr-13	24-Apr-13
2J(3)1110	Pavement Markings & Signs - 2J(3)	I-66: 5 d/wk w/ rain	2	25-Apr-13	26-Apr-13
2J(3)1120	Complete Work @ Staging Area 2J(3)	I-66: 5 d/wk w/ rain	0		09-May-13
Staging Area 2J(4)		I-66: 5 d/wk w/ rain	13	24-Jun-13	12-Jul-13
2J(4)1000	Start Work @ Staging Area 2J(4)	I-66: 5 d/wk w/ rain	0	24-Jun-13	
2J(4)1010	Install MOT - 2J(4)	I-66: 5 d/wk w/ rain	2	24-Jun-13	25-Jun-13
2J(4)1020	Mobilization - 2J(4)	I-66: 5 d/wk w/ rain	1	26-Jun-13	26-Jun-13
2J(4)1030	Erosion & Sed Controls - 2J(4)	I-66: 5 d/wk w/ rain	2	27-Jun-13	28-Jun-13
2J(4)1040	Sawcutting - 2J(4)	I-66: 5 d/wk w/ rain	1	01-Jul-13	01-Jul-13
2J(4)1050	Demo Ex Asphalt & Excav - 2J(4)	I-66: 5 d/wk w/ rain	3	02-Jul-13	05-Jul-13
2J(4)1060	Place CTA Subbase - 2J(4)	I-66: 5 d/wk w/ rain	1	08-Jul-13	08-Jul-13
2J(4)1070	Asphalt Paving - 2J(4)	I-66: 5 d/wk w/ rain	1	09-Jul-13	09-Jul-13
2J(4)1080	Pavement Markings & Signs - 2J(4)	I-66: 5 d/wk w/ rain	2	11-Jul-13	12-Jul-13
2J(4)1090	Complete Work @ Staging Area 2J(4)	I-66: 5 d/wk w/ rain	0		12-Jul-13
Staging Area 2J(5)		I-66: 5 d/wk w/ rain	14	15-Jul-13	02-Aug-13
2J(5)1000	Start Work @ Staging Area 2J(5)	I-66: 5 d/wk w/ rain	0	15-Jul-13	
2J(5)1010	Install MOT - 2J(5)	I-66: 5 d/wk w/ rain	2	15-Jul-13	16-Jul-13
2J(5)1020	Mobilization - 2J(5)	I-66: 5 d/wk w/ rain	1	17-Jul-13	17-Jul-13
2J(5)1030	Erosion & Sed Controls - 2J(5)	I-66: 5 d/wk w/ rain	2	18-Jul-13	19-Jul-13
2J(5)1040	Excav - 2J(5)	I-66: 5 d/wk w/ rain	3	22-Jul-13	25-Jul-13
2J(5)1050	Place 21b Stone - 2J(5)	I-66: 5 d/wk w/ rain	1	26-Jul-13	26-Jul-13
2J(5)1060	Place CTA Subbase - 2J(5)	I-66: 5 d/wk w/ rain	1	29-Jul-13	29-Jul-13
2J(5)1070	Underdrain - 2J(5)	I-66: 5 d/wk w/ rain	1	30-Jul-13	30-Jul-13
2J(5)1080	Asphalt Paving - 2J(5)	I-66: 5 d/wk w/ rain	1	31-Jul-13	31-Jul-13



Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
2J(5)1090	Pavement Markings & Signs - 2J(5)	I-66: 5 d/wk w/ rain	2	01-Aug-13	02-Aug-13
2J(5)1100	Complete Work @ Staging Area 2J(5)	I-66: 5 d/wk w/ rain	0		02-Aug-13
Staging Area 2J(6)		I-66: 5 d/wk w/ rain	14	05-Aug-13	26-Aug-13
2J(6)1000	Start Work @ Staging Area 2J(6)	I-66: 5 d/wk w/ rain	0	05-Aug-13	
2J(6)1010	Install MOT - 2J(6)	I-66: 5 d/wk w/ rain	2	05-Aug-13	06-Aug-13
2J(6)1020	Mobilization - 2J(6)	I-66: 5 d/wk w/ rain	1	08-Aug-13	08-Aug-13
2J(6)1030	Erosion & Sed Controls - 2J(6)	I-66: 5 d/wk w/ rain	2	09-Aug-13	12-Aug-13
2J(6)1040	Sawcutting - 2J(6)	I-66: 5 d/wk w/ rain	1	13-Aug-13	13-Aug-13
2J(6)1050	Demo Ex Asphalt & Excav - 2J(6)	I-66: 5 d/wk w/ rain	3	14-Aug-13	16-Aug-13
2J(6)1060	Place 21b Stone - 2J(6)	I-66: 5 d/wk w/ rain	1	19-Aug-13	19-Aug-13
2J(6)1070	Underdrain - 2J(6)	I-66: 5 d/wk w/ rain	1	20-Aug-13	20-Aug-13
2J(6)1080	Asphalt Paving - 2J(6)	I-66: 5 d/wk w/ rain	1	22-Aug-13	22-Aug-13
2J(6)1090	Pavement Markings & Signs - 2J(6)	I-66: 5 d/wk w/ rain	2	23-Aug-13	26-Aug-13
2J(6)1100	Complete Work @ Staging Area 2J(6)	I-66: 5 d/wk w/ rain	0		26-Aug-13
Active Traffic Management (ATM) Work along I-66			409	19-Apr-13	28-Nov-14
Gantry Foundations		I-66: 5 d/wk w/ rain	87	19-Apr-13	03-Sep-13
Eastbound		I-66: 5 d/wk w/ rain	87	19-Apr-13	03-Sep-13
ATM1000	Modify Barrier & Install Gantry Fdn G-001, MM 52.4-52.5 EB	I-66: 5 d/wk w/ rain	7	19-Apr-13	29-Apr-13
ATM1010	Install Gantry Fdn G-003, MM 52.9-53 EB	I-66: 5 d/wk w/ rain	4	30-Apr-13	03-May-13
ATM1030	Install Gantry Fdn G-005, MM 53.7-53.8 EB	I-66: 5 d/wk w/ rain	2	06-May-13	07-May-13
ATM1050	Install Gantry Fdn G-008, MM 54.8-54.9 EB	I-66: 5 d/wk w/ rain	2	09-May-13	10-May-13
ATM1060	Install Gantry Fdn G-009, MM 55.4-55.5 EB	I-66: 5 d/wk w/ rain	2	13-May-13	14-May-13
ATM1070	Install Gantry Fdn G-010, MM 55.9-56 EB	I-66: 5 d/wk w/ rain	2	15-May-13	16-May-13
ATM1080	Install Gantry Fdn G-011, MM 56.4-56.5 EB	I-66: 5 d/wk w/ rain	2	17-May-13	20-May-13
ATM1100	Install Gantry Fdn G-014, MM 57-57.1 EB	I-66: 5 d/wk w/ rain	4	21-May-13	28-May-13
ATM1110	Modify Barrier & Install Gantry Fdn G-015, MM 57.5-57.6 EB	I-66: 5 d/wk w/ rain	7	29-May-13	07-Jun-13
ATM1130	Install Gantry Fdn G-018, MM 58.3-58.4 EB	I-66: 5 d/wk w/ rain	2	10-Jun-13	11-Jun-13
ATM1140	Modify Barrier & Install Gantry Fdn G-020, MM 58.6-58.7 EB	I-66: 5 d/wk w/ rain	7	12-Jun-13	21-Jun-13
ATM1160	Install Gantry Fdn G-023, MM 59.2-59.3 EB	I-66: 5 d/wk w/ rain	4	24-Jun-13	27-Jun-13
ATM1180	Modify Barrier & Install Gantry Fdn G-026, MM 59.9-60 EB	I-66: 5 d/wk w/ rain	7	28-Jun-13	09-Jul-13
ATM1200	Modify Barrier & Install Gantry Fdn G-028, MM 60.6-60.7 EB	I-66: 5 d/wk w/ rain	7	11-Jul-13	19-Jul-13
ATM1220	Install Gantry Fdn G-031, MM 61.1-61.2 EB	I-66: 5 d/wk w/ rain	4	22-Jul-13	26-Jul-13
ATM1240	Install Gantry Fdn G-033, MM 61.5-61.6 EB	I-66: 5 d/wk w/ rain	4	29-Jul-13	01-Aug-13
ATM1260	Install Gantry Fdn G-035, MM 62.1-62.2 EB	I-66: 5 d/wk w/ rain	2	02-Aug-13	05-Aug-13
ATM1270	Install Gantry Fdn G-036, MM 62.6-62.7 EB	I-66: 5 d/wk w/ rain	2	06-Aug-13	08-Aug-13
ATM1280	Install Gantry Fdn G-037, MM 63.1-63.2 EB	I-66: 5 d/wk w/ rain	2	09-Aug-13	12-Aug-13
ATM1290	Install Gantry Fdn G-040, MM 64.5-64.6 EB	I-66: 5 d/wk w/ rain	2	13-Aug-13	14-Aug-13
ATM1350	Install Gantry Fdn, MM 66.5-66.6 EB	I-66: 5 d/wk w/ rain	4	15-Aug-13	20-Aug-13
ATM1330	Install Gantry Fdn for Static Signs, MM 67.7-67.8 EB	I-66: 5 d/wk w/ rain	4	22-Aug-13	27-Aug-13
ATM1310	Install Gantry Fdn G-042, MM 67.9-68 EB	I-66: 5 d/wk w/ rain	4	28-Aug-13	03-Sep-13
Westbound		I-66: 5 d/wk w/ rain	83	19-Apr-13	27-Aug-13
ATM1300	Install Gantry Fdn G-041, MM 66.1-66.2 WB	I-66: 5 d/wk w/ rain	4	19-Apr-13	24-Apr-13
ATM1295	Install Gantry Fdn G-040, MM 64.5-64.6 WB	I-66: 5 d/wk w/ rain	2	25-Apr-13	26-Apr-13
ATM1285	Install Gantry Fdn G-037, MM 63.1-63.2 WB	I-66: 5 d/wk w/ rain	2	29-Apr-13	30-Apr-13
ATM1275	Install Gantry Fdn G-036, MM 62.6-62.7 WB	I-66: 5 d/wk w/ rain	2	01-May-13	02-May-13
ATM1265	Install Gantry Fdn G-035, MM 62.1-62.2 WB	I-66: 5 d/wk w/ rain	4	03-May-13	09-May-13
ATM1250	Install Gantry Fdn G-034, MM 61.5-61.6 WB	I-66: 5 d/wk w/ rain	4	10-May-13	15-May-13
ATM1230	Install Gantry Fdn G-032, MM 61.2-61.3 WB	I-66: 5 d/wk w/ rain	4	16-May-13	21-May-13
ATM1210	Install Gantry Fdn G-029, MM 60.8-60.9 WB	I-66: 5 d/wk w/ rain	4	23-May-13	29-May-13
ATM1190	Modify Barrier & Install Gantry Fdn G-027, MM 60-60.1 WB	I-66: 5 d/wk w/ rain	7	30-May-13	10-Jun-13
ATM1170	Install Gantry Fdn G-025, MM 59.4-59.5 WB	I-66: 5 d/wk w/ rain	4	11-Jun-13	14-Jun-13
ATM1150	Modify Barrier & Install Gantry Fdn G-021, MM 58.7-58.8 WB	I-66: 5 d/wk w/ rain	7	17-Jun-13	26-Jun-13
ATM1340	Install Gantry Fdn for Static Signs, MM 58.6-58.7 WB	I-66: 5 d/wk w/ rain	4	27-Jun-13	02-Jul-13
ATM1135	Install Gantry Fdn G-018, MM 58.3-58.4 WB	I-66: 5 d/wk w/ rain	2	03-Jul-13	05-Jul-13
ATM1120	Modify Barrier & Install Gantry Fdn G-017, MM 57.7-57.8 WB	I-66: 5 d/wk w/ rain	7	08-Jul-13	17-Jul-13
ATM1090	Install Gantry Fdn G-013, MM 56.9-57 WB	I-66: 5 d/wk w/ rain	4	18-Jul-13	23-Jul-13
ATM1085	Install Gantry Fdn G-011, MM 56.4-56.5 WB	I-66: 5 d/wk w/ rain	2	25-Jul-13	26-Jul-13
ATM1075	Install Gantry Fdn G-010, MM 55.9-56 WB	I-66: 5 d/wk w/ rain	2	29-Jul-13	30-Jul-13
ATM1065	Install Gantry Fdn G-009, MM 55.4-55.5 WB	I-66: 5 d/wk w/ rain	2	31-Jul-13	01-Aug-13
ATM1055	Install Gantry Fdn G-008, MM 54.8-54.9 WB	I-66: 5 d/wk w/ rain	2	02-Aug-13	05-Aug-13
ATM1040	Install Gantry Fdn G-006, MM 54.1-54.2 WB	I-66: 5 d/wk w/ rain	4	06-Aug-13	12-Aug-13
ATM1035	Install Gantry Fdn G-005, MM 53.7-53.8 WB	I-66: 5 d/wk w/ rain	2	13-Aug-13	14-Aug-13
ATM1320	Install Gantry Fdn for Static Signs, MM 53.2-53.3 WB	I-66: 5 d/wk w/ rain	4	15-Aug-13	20-Aug-13
ATM1020	Install Gantry Fdn G-004, MM 53-53.1 WB	I-66: 5 d/wk w/ rain	4	22-Aug-13	27-Aug-13
Assemble, Mount LCS/DMS/Elec, & Set Gantries		I-66: 5 d/wk w/ rain	136	02-May-13	06-Dec-13
Eastbound		I-66: 5 d/wk w/ rain	83	07-May-13	16-Sep-13
ATM1500	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-001, MM 52.4-52.5 EB	I-66: 5 d/wk w/ rain	3	07-May-13	10-May-13
ATM1510	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-003, MM 52.9-53 EB	I-66: 5 d/wk w/ rain	3	14-May-13	16-May-13
ATM1600	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-014, MM 57-57.1 EB	I-66: 5 d/wk w/ rain	3	06-Jun-13	10-Jun-13
ATM1610	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-015, MM 57.5-57.6 EB	I-66: 5 d/wk w/ rain	3	17-Jun-13	20-Jun-13
ATM1640	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-020, MM 58.6-58.7 EB	I-66: 5 d/wk w/ rain	3	01-Jul-13	03-Jul-13
ATM1660	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-023, MM 59.2-59.3 EB	I-66: 5 d/wk w/ rain	3	08-Jul-13	11-Jul-13
ATM1680	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-026, MM 59.9-60 EB	I-66: 5 d/wk w/ rain	3	18-Jul-13	22-Jul-13
ATM1700	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-028, MM 60.6-60.7 EB	I-66: 5 d/wk w/ rain	3	30-Jul-13	01-Aug-13
ATM1720	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-031, MM 61.1-61.2 EB	I-66: 5 d/wk w/ rain	3	05-Aug-13	08-Aug-13
ATM1740	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-033, MM 61.5-61.6 EB	I-66: 5 d/wk w/ rain	3	12-Aug-13	14-Aug-13
ATM1850	Assemble, Mount LCS/DMS/Elec, & Set Gantry, MM 66.5-66.6 EB	I-66: 5 d/wk w/ rain	3	29-Aug-13	03-Sep-13

Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
ATM1830	Assemble, Mount LCS/DMS/Elec, & Set Gantry, MM 67.7-67.8 EB	I-66: 5 d/wk w/ rain	3	05-Sep-13	09-Sep-13
ATM1810	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-042, MM 67.9-68 EB	I-66: 5 d/wk w/ rain	3	12-Sep-13	16-Sep-13
Westbound		I-66: 5 d/wk w/ rain	82	02-May-13	09-Sep-13
ATM1800	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-041, MM 66.1-66.2 WB	I-66: 5 d/wk w/ rain	3	02-May-13	06-May-13
ATM1750	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-034, MM 61.5-61.6 WB	I-66: 5 d/wk w/ rain	3	24-May-13	29-May-13
ATM1730	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-032, MM 61.2-61.3 WB	I-66: 5 d/wk w/ rain	3	31-May-13	04-Jun-13
ATM1710	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-029, MM 60.8-60.9 WB	I-66: 5 d/wk w/ rain	3	07-Jun-13	11-Jun-13
ATM1690	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-027, MM 60-60.1 WB	I-66: 5 d/wk w/ rain	3	18-Jun-13	21-Jun-13
ATM1670	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-025, MM 59.4-59.5 WB	I-66: 5 d/wk w/ rain	3	25-Jun-13	27-Jun-13
ATM1650	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-021, MM 58.7-58.8 WB	I-66: 5 d/wk w/ rain	3	05-Jul-13	09-Jul-13
ATM1840	Assemble, Mount LCS/DMS/Elec, & Set Gantry, MM 58.6-58.7 WB	I-66: 5 d/wk w/ rain	3	12-Jul-13	16-Jul-13
ATM1620	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-017, MM 57.7-57.8 WB	I-66: 5 d/wk w/ rain	3	26-Jul-13	30-Jul-13
ATM1590	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-013, MM 56.9-57 WB	I-66: 5 d/wk w/ rain	3	01-Aug-13	05-Aug-13
ATM1540	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-006, MM 54.1-54.2 WB	I-66: 5 d/wk w/ rain	3	20-Aug-13	23-Aug-13
ATM1820	Assemble, Mount LCS/DMS/Elec, & Set Gantry, MM 53.2-53.3 WB	I-66: 5 d/wk w/ rain	3	29-Aug-13	03-Sep-13
ATM1520	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-004, MM 53-53.1 WB	I-66: 5 d/wk w/ rain	3	05-Sep-13	09-Sep-13
Spanning EB & WB		I-66: 5 d/wk w/ rain	50	17-Sep-13	06-Dec-13
ATM1630	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-018, MM 58.3-58.4 EB&WB	I-66: 5 d/wk w/ rain	5	17-Sep-13	23-Sep-13
ATM1580	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-011, MM 56.4-56.5 EB&WB	I-66: 5 d/wk w/ rain	5	24-Sep-13	01-Oct-13
ATM1570	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-010, MM 55.9-56 EB&WB	I-66: 5 d/wk w/ rain	5	02-Oct-13	08-Oct-13
ATM1760	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-035, MM 62.1-62.2 EB&WB	I-66: 5 d/wk w/ rain	5	10-Oct-13	16-Oct-13
ATM1560	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-009, MM 55.4-55.5 EB&WB	I-66: 5 d/wk w/ rain	5	17-Oct-13	24-Oct-13
ATM1770	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-036, MM 62.6-62.7 EB&WB	I-66: 5 d/wk w/ rain	5	25-Oct-13	31-Oct-13
ATM1550	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-008, MM 54.8-54.9 EB&WB	I-66: 5 d/wk w/ rain	5	01-Nov-13	08-Nov-13
ATM1780	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-037, MM 63.1-63.2 EB&WB	I-66: 5 d/wk w/ rain	5	11-Nov-13	18-Nov-13
ATM1790	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-040, MM 64.5-64.6 EB&WB	I-66: 5 d/wk w/ rain	5	19-Nov-13	26-Nov-13
ATM1530	Assemble, Mount LCS/DMS/Elec, & Set Gantry G-005, MM 53.7-53.8 EB&WB	I-66: 5 d/wk w/ rain	5	27-Nov-13	06-Dec-13
Cantilever Structure Foundations		I-66: 5 d/wk w/ rain	78	19-Apr-13	19-Aug-13
Eastbound		I-66: 5 d/wk w/ rain	42	19-Apr-13	24-Jun-13
ATM2810	Install Cantilever Str Fdn, MM 53.1-53.2 EB	I-66: 5 d/wk w/ rain	3	19-Apr-13	23-Apr-13
ATM2820	Install Cantilever Str Fdn, MM 53.8-53.9 EB	I-66: 5 d/wk w/ rain	3	24-Apr-13	26-Apr-13
ATM2030	Install Cantilever Str Fdn, MM 57.9-58 EB	I-66: 5 d/wk w/ rain	3	29-Apr-13	01-May-13
ATM2040	Install Cantilever Str Fdn, MM 58.8-58.9 EB	I-66: 5 d/wk w/ rain	3	02-May-13	06-May-13
ATM2840	Install Cantilever Str Fdn, MM 60-60.1 EB	I-66: 5 d/wk w/ rain	3	07-May-13	10-May-13
ATM2060	Install Cantilever Str Fdn, MM 60.2-60.3 EB	I-66: 5 d/wk w/ rain	3	13-May-13	15-May-13
ATM2100	Install Cantilever Str Fdn, MM 61.3-61.4 EB	I-66: 5 d/wk w/ rain	3	16-May-13	20-May-13
ATM2110	Install Cantilever Str Fdn, MM 61.8-61.9 EB	I-66: 5 d/wk w/ rain	3	21-May-13	24-May-13
ATM2140	Install Cantilever Str Fdn, MM 62.2-62.3 EB	I-66: 5 d/wk w/ rain	3	28-May-13	30-May-13
ATM2150	Install Cantilever Str Fdn, MM 62.8-62.9 EB	I-66: 5 d/wk w/ rain	3	31-May-13	04-Jun-13
ATM2160	Install Cantilever Str Fdn, MM 63.6-63.7 EB	I-66: 5 d/wk w/ rain	3	06-Jun-13	10-Jun-13
ATM2890	Install Cantilever Str Fdn, MM 65.7-65.8 EB	I-66: 5 d/wk w/ rain	3	11-Jun-13	13-Jun-13
ATM2910	Install Cantilever Str Fdn, MM 68.6-68.7 EB	I-66: 5 d/wk w/ rain	3	14-Jun-13	18-Jun-13
ATM2950	Install Cantilever Str Fdn, MM 73.5-73.6 EB	I-66: 5 d/wk w/ rain	3	20-Jun-13	24-Jun-13
Westbound		I-66: 5 d/wk w/ rain	36	25-Jun-13	19-Aug-13
ATM2940	Install Cantilever Str Fdn, MM 72.5-72.6 WB	I-66: 5 d/wk w/ rain	3	25-Jun-13	27-Jun-13
ATM2930	Install Cantilever Str Fdn, MM 71.9-72 WB	I-66: 5 d/wk w/ rain	3	28-Jun-13	02-Jul-13
ATM2880	Install Cantilever Str Fdn, MM 63.6-63.7 WB	I-66: 5 d/wk w/ rain	3	03-Jul-13	08-Jul-13
ATM2875	Install Cantilever Str Fdn, MM 62.4-62.5 WB	I-66: 5 d/wk w/ rain	3	09-Jul-13	12-Jul-13
ATM2870	Install Cantilever Str Fdn, MM 62.3-62.4 WB	I-66: 5 d/wk w/ rain	3	15-Jul-13	17-Jul-13
ATM2860	Install Cantilever Str Fdn, MM 62.0-62.1 WB	I-66: 5 d/wk w/ rain	3	18-Jul-13	22-Jul-13
ATM2130	Install Cantilever Str Fdn, MM 61.8-61.9 WB (2)	I-66: 5 d/wk w/ rain	3	23-Jul-13	26-Jul-13
ATM2120	Install Cantilever Str Fdn, MM 61.8-61.9 WB (1)	I-66: 5 d/wk w/ rain	3	29-Jul-13	31-Jul-13
ATM2080	Install Cantilever Str Fdn, MM 60.4-60.5 WB	I-66: 5 d/wk w/ rain	3	01-Aug-13	05-Aug-13
ATM2050	Install Cantilever Str Fdn, MM 59.6-59.7 WB	I-66: 5 d/wk w/ rain	3	06-Aug-13	09-Aug-13
ATM2830	Install Cantilever Str Fdn, MM 56.7-56.8 WB	I-66: 5 d/wk w/ rain	3	12-Aug-13	14-Aug-13
ATM2800	Install Cantilever Str Fdn, MM 52.3-52.4 WB	I-66: 5 d/wk w/ rain	3	15-Aug-13	19-Aug-13
Cantilever Structure Installation		I-66: 5 d/wk w/ rain	76	01-May-13	28-Aug-13
Eastbound		I-66: 5 d/wk w/ rain	40	01-May-13	02-Jul-13
ATM2970	Install Cantilever Str's for Signs, MM 53.1-53.2 EB	I-66: 5 d/wk w/ rain	1	01-May-13	01-May-13
ATM2980	Install Cantilever Str's for Signs, MM 53.8-53.9 EB	I-66: 5 d/wk w/ rain	1	06-May-13	06-May-13
ATM2280	Install Cantilever Str's for Signs, MM 57.9-58 EB	I-66: 5 d/wk w/ rain	1	10-May-13	10-May-13
ATM2290	Install Cantilever Str's for Signs, MM 58.8-58.9 EB	I-66: 5 d/wk w/ rain	1	15-May-13	15-May-13
ATM3000	Install Cantilever Str's for Signs, MM 60-60.1 EB	I-66: 5 d/wk w/ rain	1	20-May-13	20-May-13
ATM2310	Install Cantilever Str's for Signs, MM 60.2-60.3 EB	I-66: 5 d/wk w/ rain	1	24-May-13	24-May-13
ATM2350	Install Cantilever Str's for Signs, MM 61.3-61.4 EB	I-66: 5 d/wk w/ rain	1	30-May-13	30-May-13
ATM2360	Install Cantilever Str's for Signs, MM 61.8-61.9 EB	I-66: 5 d/wk w/ rain	1	04-Jun-13	04-Jun-13
ATM2390	Install Cantilever Str's for Signs, MM 62.2-62.3 EB	I-66: 5 d/wk w/ rain	1	10-Jun-13	10-Jun-13
ATM2400	Install Cantilever Str's for Signs, MM 62.8-62.9 EB	I-66: 5 d/wk w/ rain	1	13-Jun-13	13-Jun-13
ATM2410	Install Cantilever Str's for Signs, MM 63.6-63.7 EB	I-66: 5 d/wk w/ rain	1	18-Jun-13	18-Jun-13
ATM3050	Install Cantilever Str's for Signs, MM 65.7-65.8 EB	I-66: 5 d/wk w/ rain	1	27-Jun-13	27-Jun-13
ATM3070	Install Cantilever Str's for Signs, MM 68.6-68.7 EB	I-66: 5 d/wk w/ rain	1	28-Jun-13	28-Jun-13
ATM3110	Install Cantilever Str's for Signs, MM 73.5-73.6 EB	I-66: 5 d/wk w/ rain	1	02-Jul-13	02-Jul-13
Westbound		I-66: 5 d/wk w/ rain	34	08-Jul-13	28-Aug-13
ATM3100	Install Cantilever Str's for Signs, MM 72.5-72.6 WB	I-66: 5 d/wk w/ rain	1	08-Jul-13	08-Jul-13
ATM3090	Install Cantilever Str's for Signs, MM 71.9-72 WB	I-66: 5 d/wk w/ rain	1	12-Jul-13	12-Jul-13
ATM3040	Install Cantilever Str's for Signs, MM 63.6-63.7 WB	I-66: 5 d/wk w/ rain	1	17-Jul-13	17-Jul-13
ATM3035	Install Cantilever Str's for Signs, MM 62.4-62.5 WB	I-66: 5 d/wk w/ rain	1	22-Jul-13	22-Jul-13

Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

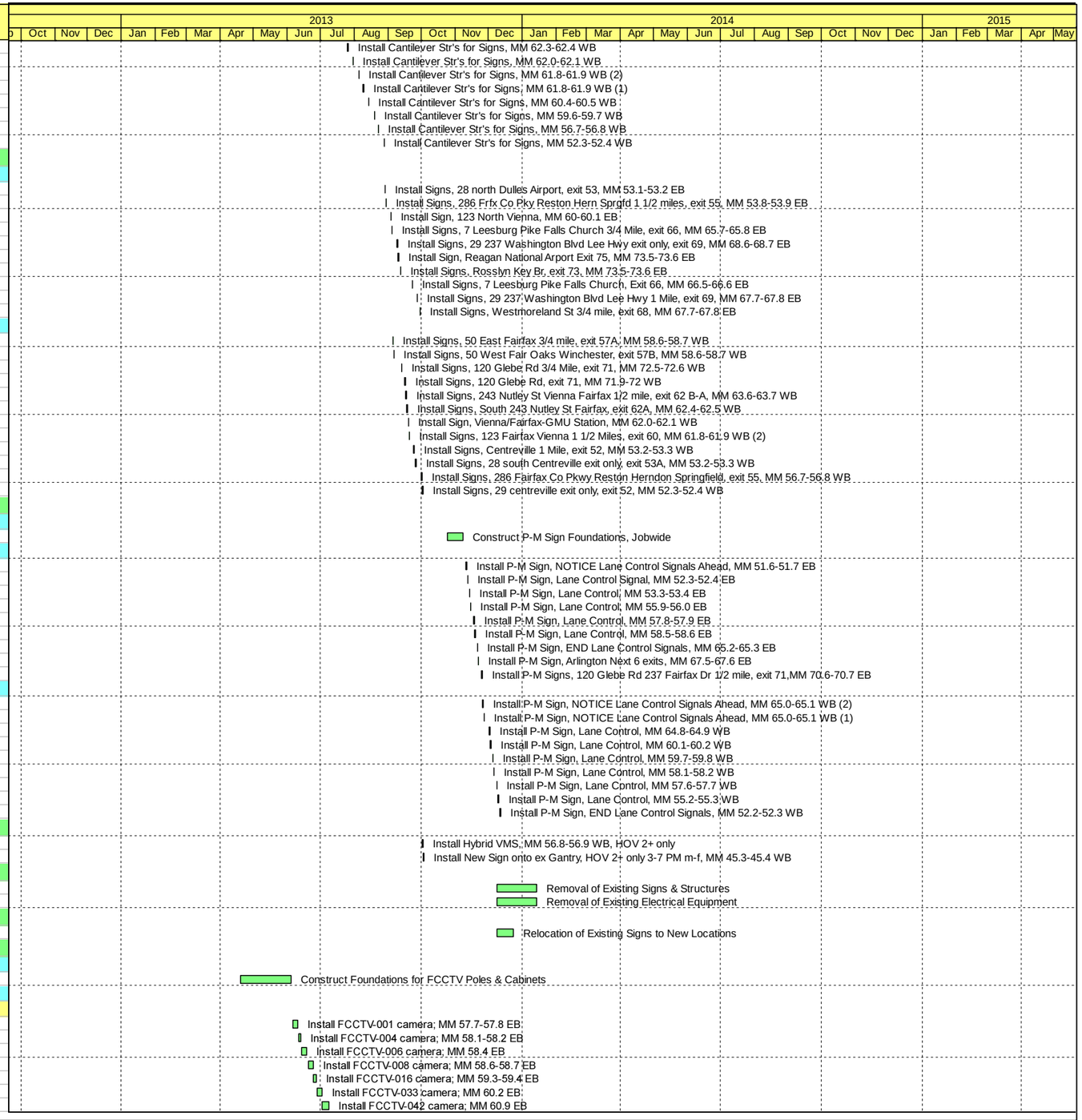
THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
ATM3030	Install Cantilever Str's for Signs, MM 62.3-62.4 WB	I-66: 5 d/wk w/ rain	1	26-Jul-13	26-Jul-13
ATM3020	Install Cantilever Str's for Signs, MM 62.0-62.1 WB	I-66: 5 d/wk w/ rain	1	31-Jul-13	31-Jul-13
ATM2380	Install Cantilever Str's for Signs, MM 61.8-61.9 WB (2)	I-66: 5 d/wk w/ rain	1	05-Aug-13	05-Aug-13
ATM2370	Install Cantilever Str's for Signs, MM 61.8-61.9 WB (1)	I-66: 5 d/wk w/ rain	1	09-Aug-13	09-Aug-13
ATM2330	Install Cantilever Str's for Signs, MM 60.4-60.5 WB	I-66: 5 d/wk w/ rain	1	14-Aug-13	14-Aug-13
ATM2300	Install Cantilever Str's for Signs, MM 59.6-59.7 WB	I-66: 5 d/wk w/ rain	1	19-Aug-13	19-Aug-13
ATM2990	Install Cantilever Str's for Signs, MM 56.7-56.8 WB	I-66: 5 d/wk w/ rain	1	23-Aug-13	23-Aug-13
ATM2960	Install Cantilever Str's for Signs, MM 52.3-52.4 WB	I-66: 5 d/wk w/ rain	1	28-Aug-13	28-Aug-13
Sign Installation		I-66: 5 d/wk w/ rain	22	29-Aug-13	02-Oct-13
Eastbound		I-66: 5 d/wk w/ rain	20	29-Aug-13	30-Sep-13
ATM3370	Install Signs, 28 north Dulles Airport, exit 53, MM 53.1-53.2 EB	I-66: 5 d/wk w/ rain	1	29-Aug-13	29-Aug-13
ATM3380	Install Signs, 286 Frfx Co Pky Reston Hern Sprgfd 1 1/2 miles, exit 55, MM 53.8-53.9 EB	I-66: 5 d/wk w/ rain	1	30-Aug-13	30-Aug-13
ATM3460	Install Sign, 123 North Vienna, MM 60-60.1 EB	I-66: 5 d/wk w/ rain	1	03-Sep-13	03-Sep-13
ATM3540	Install Signs, 7 Leesburg Pike Falls Church 3/4 Mile, exit 66, MM 65.7-65.8 EB	I-66: 5 d/wk w/ rain	1	04-Sep-13	04-Sep-13
ATM3620	Install Signs, 29 237 Washington Blvd Lee Hwy exit only, exit 69, MM 68.6-68.7 EB	I-66: 5 d/wk w/ rain	1	09-Sep-13	09-Sep-13
ATM3710	Install Sign, Reagan National Arport Exit 75, MM 73.5-73.6 EB	I-66: 5 d/wk w/ rain	1	10-Sep-13	10-Sep-13
ATM3720	Install Signs, Rosslyn Key Br, exit 73, MM 73.5-73.6 EB	I-66: 5 d/wk w/ rain	1	12-Sep-13	12-Sep-13
ATM3560	Install Signs, 7 Leesburg Pike Falls Church, Exit 66, MM 66.5-66.6 EB	I-66: 5 d/wk w/ rain	1	23-Sep-13	23-Sep-13
ATM3590	Install Signs, 29 237 Washington Blvd Lee Hwy 1 Mile, exit 69, MM 67.7-67.8 EB	I-66: 5 d/wk w/ rain	1	27-Sep-13	27-Sep-13
ATM3610	Install Signs, Westmoreland St 3/4 mile, exit 68, MM 67.7-67.8 EB	I-66: 5 d/wk w/ rain	1	30-Sep-13	30-Sep-13
Westbound		I-66: 5 d/wk w/ rain	18	05-Sep-13	02-Oct-13
ATM3420	Install Signs, 50 East Fairfax 3/4 mile, exit 57A, MM 58.6-58.7 WB	I-66: 5 d/wk w/ rain	1	05-Sep-13	05-Sep-13
ATM3440	Install Signs, 50 West Fair Oaks Winchester, exit 57B, MM 58.6-58.7 WB	I-66: 5 d/wk w/ rain	1	06-Sep-13	06-Sep-13
ATM3690	Install Signs, 120 Glebe Rd 3/4 Mile, exit 71, MM 72.5-72.6 WB	I-66: 5 d/wk w/ rain	1	13-Sep-13	13-Sep-13
ATM3680	Install Signs, 120 Glebe Rd, exit 71, MM 71.9-72 WB	I-66: 5 d/wk w/ rain	1	16-Sep-13	16-Sep-13
ATM3520	Install Signs, 243 Nutley St Vienna Fairfax 1/2 mile, exit 62 B-A, MM 63.6-63.7 WB	I-66: 5 d/wk w/ rain	1	17-Sep-13	17-Sep-13
ATM3510	Install Signs, South 243 Nutley St Fairfax, exit 62A, MM 62.4-62.5 WB	I-66: 5 d/wk w/ rain	1	18-Sep-13	18-Sep-13
ATM3490	Install Sign, Vienna/Fairfax-GMU Station, MM 62.0-62.1 WB	I-66: 5 d/wk w/ rain	1	19-Sep-13	19-Sep-13
ATM3470	Install Signs, 123 Fairfax Vienna 1 1/2 Miles, exit 60, MM 61.8-61.9 WB (2)	I-66: 5 d/wk w/ rain	1	20-Sep-13	20-Sep-13
ATM3330	Install Signs, Centreville 1 Mile, exit 52, MM 53.2-53.3 WB	I-66: 5 d/wk w/ rain	1	24-Sep-13	24-Sep-13
ATM3340	Install Signs, 28 south Centreville exit only, exit 53A, MM 53.2-53.3 WB	I-66: 5 d/wk w/ rain	1	26-Sep-13	26-Sep-13
ATM3400	Install Signs, 286 Fairfax Co Pkwy Reston Herndon Springfield, exit 55, MM 56.7-56.8 W	I-66: 5 d/wk w/ rain	1	01-Oct-13	01-Oct-13
ATM3310	Install Signs, 29 centreville exit only, exit 52, MM 52.3-52.4 WB	I-66: 5 d/wk w/ rain	1	02-Oct-13	02-Oct-13
Post-Mounted Sign Installation		I-66: 5 d/wk w/ rain	28	25-Oct-13	12-Dec-13
Foundations		I-66: 5 d/wk w/ rain	10	25-Oct-13	08-Nov-13
ATM4410	Construct P-M Sign Foundations, Jobwide	I-66: 5 d/wk w/ rain	10	25-Oct-13	08-Nov-13
Eastbound		I-66: 5 d/wk w/ rain	9	11-Nov-13	25-Nov-13
ATM4420	Install P-M Sign, NOTICE Lane Control Signals Ahead, MM 51.6-51.7 EB	I-66: 5 d/wk w/ rain	1	11-Nov-13	11-Nov-13
ATM4430	Install P-M Sign, Lane Control Signal, MM 52.3-52.4 EB	I-66: 5 d/wk w/ rain	1	12-Nov-13	12-Nov-13
ATM4450	Install P-M Sign, Lane Control, MM 53.3-53.4 EB	I-66: 5 d/wk w/ rain	1	14-Nov-13	14-Nov-13
ATM4470	Install P-M Sign, Lane Control, MM 55.9-56.0 EB	I-66: 5 d/wk w/ rain	1	15-Nov-13	15-Nov-13
ATM4490	Install P-M Sign, Lane Control, MM 57.8-57.9 EB	I-66: 5 d/wk w/ rain	1	18-Nov-13	18-Nov-13
ATM4510	Install P-M Sign, Lane Control, MM 58.5-58.6 EB	I-66: 5 d/wk w/ rain	1	19-Nov-13	19-Nov-13
ATM4600	Install P-M Sign, END Lane Control Signals, MM 65.2-65.3 EB	I-66: 5 d/wk w/ rain	1	21-Nov-13	21-Nov-13
ATM4610	Install P-M Sign, Arlington Next 6 exits, MM 67.5-67.6 EB	I-66: 5 d/wk w/ rain	1	22-Nov-13	22-Nov-13
ATM4620	Install P-M Signs, 120 Glebe Rd 237 Fairfax Dr 1/2 mile, exit 71,MM 70.6-70.7 EB	I-66: 5 d/wk w/ rain	1	25-Nov-13	25-Nov-13
Westbound		I-66: 5 d/wk w/ rain	9	26-Nov-13	12-Dec-13
ATM4590	Install P-M Sign, NOTICE Lane Control Signals Ahead, MM 65.0-65.1 WB (2)	I-66: 5 d/wk w/ rain	1	26-Nov-13	26-Nov-13
ATM4580	Install P-M Sign, NOTICE Lane Control Signals Ahead, MM 65.0-65.1 WB (1)	I-66: 5 d/wk w/ rain	1	27-Nov-13	27-Nov-13
ATM4570	Install P-M Sign, Lane Control, MM 64.8-64.9 WB	I-66: 5 d/wk w/ rain	1	02-Dec-13	02-Dec-13
ATM4530	Install P-M Sign, Lane Control, MM 60.1-60.2 WB	I-66: 5 d/wk w/ rain	1	03-Dec-13	03-Dec-13
ATM4520	Install P-M Sign, Lane Control, MM 59.7-59.8 WB	I-66: 5 d/wk w/ rain	1	05-Dec-13	05-Dec-13
ATM4500	Install P-M Sign, Lane Control, MM 58.1-58.2 WB	I-66: 5 d/wk w/ rain	1	06-Dec-13	06-Dec-13
ATM4480	Install P-M Sign, Lane Control, MM 57.6-57.7 WB	I-66: 5 d/wk w/ rain	1	09-Dec-13	09-Dec-13
ATM4460	Install P-M Sign, Lane Control, MM 55.2-55.3 WB	I-66: 5 d/wk w/ rain	1	10-Dec-13	10-Dec-13
ATM4440	Install P-M Sign, END Lane Control Signals, MM 52.2-52.3 WB	I-66: 5 d/wk w/ rain	1	12-Dec-13	12-Dec-13
New Signs Installed onto Existing Structures		I-66: 5 d/wk w/ rain	2	02-Oct-13	03-Oct-13
ATM4810	Install Hybrid VMS, MM 56.8-56.9 WB, HOV 2+ only	I-66: 5 d/wk w/ rain	1	02-Oct-13	02-Oct-13
ATM4800	Install New Sign onto ex Gantry, HOV 2+ only 3-7 PM m-f, MM 45.3-45.4 WB	I-66: 5 d/wk w/ rain	1	03-Oct-13	03-Oct-13
Removal of Existing Structures, Signs, & Equipment		I-66: 5 d/wk w/ rain	20	09-Dec-13	14-Jan-14
ATM7000	Removal of Existing Signs & Structures	I-66: 5 d/wk w/ rain	20	09-Dec-13	14-Jan-14
ATM7010	Removal of Existing Electrical Equipment	I-66: 5 d/wk w/ rain	20	09-Dec-13	14-Jan-14
Relocation of Existing Signs		I-66: 5 d/wk w/ rain	10	09-Dec-13	24-Dec-13
A7100	Relocation of Existing Signs to New Locations	I-66: 5 d/wk w/ rain	10	09-Dec-13	24-Dec-13
FCCTV Poles & Cameras		I-66: 5 d/wk w/ rain	265	19-Apr-13	02-Jul-14
Foundations for Poles & Cabinets		I-66: 5 d/wk w/ rain	30	19-Apr-13	04-Jun-13
ATM5078	Construct Foundations for FCCTV Poles & Cabinets	I-66: 5 d/wk w/ rain	30	19-Apr-13	04-Jun-13
Eastbound		I-66: 5 d/wk w/ rain	235	06-Jun-13	02-Jul-14
Pole-Mounted FCCTV Camera's		I-66: 5 d/wk w/ rain	45	06-Jun-13	14-Aug-13
ATM5080	Install FCCTV-001 camera; MM 57.7-57.8 EB	I-66: 5 d/wk w/ rain	3	06-Jun-13	10-Jun-13
ATM5120	Install FCCTV-004 camera; MM 58.1-58.2 EB	I-66: 5 d/wk w/ rain	3	11-Jun-13	13-Jun-13
ATM5140	Install FCCTV-006 camera; MM 58.4 EB	I-66: 5 d/wk w/ rain	3	14-Jun-13	18-Jun-13
ATM5160	Install FCCTV-008 camera; MM 58.6-58.7 EB	I-66: 5 d/wk w/ rain	3	20-Jun-13	24-Jun-13
ATM5240	Install FCCTV-016 camera; MM 59.3-59.4 EB	I-66: 5 d/wk w/ rain	3	25-Jun-13	27-Jun-13
ATM6020	Install FCCTV-033 camera; MM 60.2 EB	I-66: 5 d/wk w/ rain	3	28-Jun-13	02-Jul-13
ATM6110	Install FCCTV-042 camera; MM 60.9 EB	I-66: 5 d/wk w/ rain	3	03-Jul-13	08-Jul-13



Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

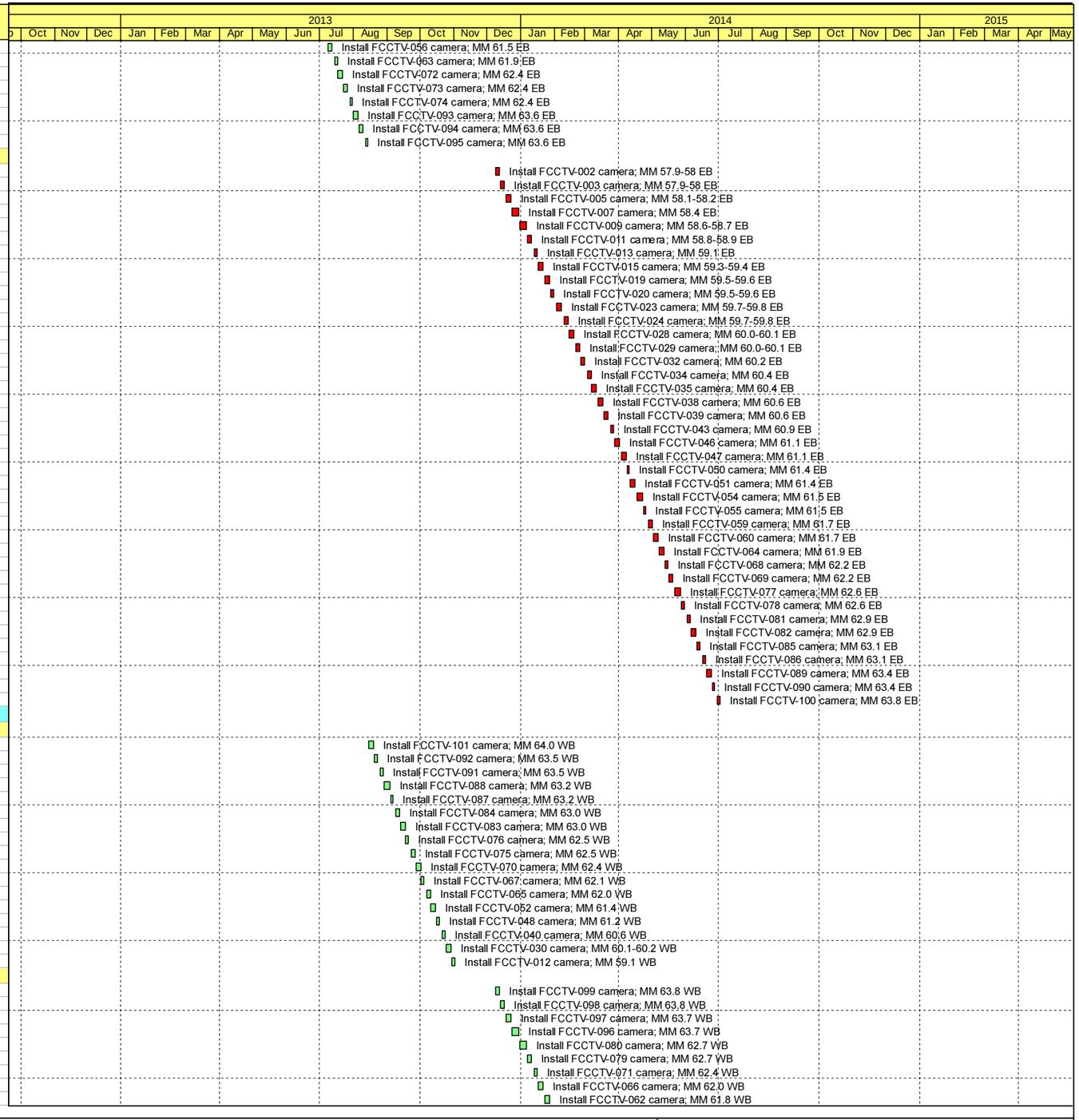
THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
ATM6250	Install FCCTV-056 camera; MM 61.5 EB	I-66: 5 d/wk w/ rain	3	09-Jul-13	12-Jul-13
ATM6320	Install FCCTV-063 camera; MM 61.9 EB	I-66: 5 d/wk w/ rain	3	15-Jul-13	17-Jul-13
ATM6410	Install FCCTV-072 camera; MM 62.4 EB	I-66: 5 d/wk w/ rain	3	18-Jul-13	22-Jul-13
ATM6420	Install FCCTV-073 camera; MM 62.4 EB	I-66: 5 d/wk w/ rain	3	23-Jul-13	26-Jul-13
ATM6430	Install FCCTV-074 camera; MM 62.4 EB	I-66: 5 d/wk w/ rain	3	29-Jul-13	31-Jul-13
ATM6620	Install FCCTV-093 camera; MM 63.6 EB	I-66: 5 d/wk w/ rain	3	01-Aug-13	05-Aug-13
ATM6630	Install FCCTV-094 camera; MM 63.6 EB	I-66: 5 d/wk w/ rain	3	06-Aug-13	09-Aug-13
ATM6640	Install FCCTV-095 camera; MM 63.6 EB	I-66: 5 d/wk w/ rain	3	12-Aug-13	14-Aug-13
FCCTV Camera's Mounted on other Structures		I-66: 5 d/wk w/ rain	120	09-Dec-13	02-Jul-14
ATM5100	Install FCCTV-002 camera; MM 57.9-58 EB	I-66: 5 d/wk w/ rain	3	09-Dec-13	12-Dec-13
ATM5110	Install FCCTV-003 camera; MM 57.9-58 EB	I-66: 5 d/wk w/ rain	3	13-Dec-13	17-Dec-13
ATM5130	Install FCCTV-005 camera; MM 58.1-58.2 EB	I-66: 5 d/wk w/ rain	3	19-Dec-13	23-Dec-13
ATM5150	Install FCCTV-007 camera; MM 58.4 EB	I-66: 5 d/wk w/ rain	3	24-Dec-13	30-Dec-13
ATM5170	Install FCCTV-009 camera; MM 58.6-58.7 EB	I-66: 5 d/wk w/ rain	3	31-Dec-13	06-Jan-14
ATM5190	Install FCCTV-011 camera; MM 58.8-58.9 EB	I-66: 5 d/wk w/ rain	3	07-Jan-14	10-Jan-14
ATM5210	Install FCCTV-013 camera; MM 59.1 EB	I-66: 5 d/wk w/ rain	3	13-Jan-14	16-Jan-14
ATM5230	Install FCCTV-015 camera; MM 59.3-59.4 EB	I-66: 5 d/wk w/ rain	3	17-Jan-14	21-Jan-14
ATM5270	Install FCCTV-019 camera; MM 59.5-59.6 EB	I-66: 5 d/wk w/ rain	3	23-Jan-14	27-Jan-14
ATM5280	Install FCCTV-020 camera; MM 59.5-59.6 EB	I-66: 5 d/wk w/ rain	3	28-Jan-14	31-Jan-14
ATM5310	Install FCCTV-023 camera; MM 59.7-59.8 EB	I-66: 5 d/wk w/ rain	3	03-Feb-14	07-Feb-14
ATM5320	Install FCCTV-024 camera; MM 59.7-59.8 EB	I-66: 5 d/wk w/ rain	3	10-Feb-14	13-Feb-14
ATM5360	Install FCCTV-028 camera; MM 60.0-60.1 EB	I-66: 5 d/wk w/ rain	3	14-Feb-14	18-Feb-14
ATM5370	Install FCCTV-029 camera; MM 60.0-60.1 EB	I-66: 5 d/wk w/ rain	3	20-Feb-14	24-Feb-14
ATM6010	Install FCCTV-032 camera; MM 60.2 EB	I-66: 5 d/wk w/ rain	3	25-Feb-14	28-Feb-14
ATM6030	Install FCCTV-034 camera; MM 60.4 EB	I-66: 5 d/wk w/ rain	3	03-Mar-14	06-Mar-14
ATM6040	Install FCCTV-035 camera; MM 60.4 EB	I-66: 5 d/wk w/ rain	3	07-Mar-14	11-Mar-14
ATM6070	Install FCCTV-038 camera; MM 60.6 EB	I-66: 5 d/wk w/ rain	3	13-Mar-14	17-Mar-14
ATM6080	Install FCCTV-039 camera; MM 60.6 EB	I-66: 5 d/wk w/ rain	3	18-Mar-14	21-Mar-14
ATM6120	Install FCCTV-043 camera; MM 60.9 EB	I-66: 5 d/wk w/ rain	3	24-Mar-14	27-Mar-14
ATM6150	Install FCCTV-046 camera; MM 61.1 EB	I-66: 5 d/wk w/ rain	3	28-Mar-14	01-Apr-14
ATM6160	Install FCCTV-047 camera; MM 61.1 EB	I-66: 5 d/wk w/ rain	3	03-Apr-14	07-Apr-14
ATM6190	Install FCCTV-050 camera; MM 61.4 EB	I-66: 5 d/wk w/ rain	3	08-Apr-14	10-Apr-14
ATM6200	Install FCCTV-051 camera; MM 61.4 EB	I-66: 5 d/wk w/ rain	3	11-Apr-14	15-Apr-14
ATM6230	Install FCCTV-054 camera; MM 61.5 EB	I-66: 5 d/wk w/ rain	3	17-Apr-14	22-Apr-14
ATM6240	Install FCCTV-055 camera; MM 61.5 EB	I-66: 5 d/wk w/ rain	3	23-Apr-14	25-Apr-14
ATM6280	Install FCCTV-059 camera; MM 61.7 EB	I-66: 5 d/wk w/ rain	3	28-Apr-14	01-May-14
ATM6290	Install FCCTV-060 camera; MM 61.7 EB	I-66: 5 d/wk w/ rain	3	02-May-14	06-May-14
ATM6330	Install FCCTV-064 camera; MM 61.9 EB	I-66: 5 d/wk w/ rain	3	08-May-14	12-May-14
ATM6370	Install FCCTV-068 camera; MM 62.2 EB	I-66: 5 d/wk w/ rain	3	13-May-14	15-May-14
ATM6380	Install FCCTV-069 camera; MM 62.2 EB	I-66: 5 d/wk w/ rain	3	16-May-14	20-May-14
ATM6460	Install FCCTV-077 camera; MM 62.6 EB	I-66: 5 d/wk w/ rain	3	22-May-14	27-May-14
ATM6470	Install FCCTV-078 camera; MM 62.6 EB	I-66: 5 d/wk w/ rain	3	28-May-14	30-May-14
ATM6500	Install FCCTV-081 camera; MM 62.9 EB	I-66: 5 d/wk w/ rain	3	02-Jun-14	05-Jun-14
ATM6510	Install FCCTV-082 camera; MM 62.9 EB	I-66: 5 d/wk w/ rain	3	06-Jun-14	10-Jun-14
ATM6540	Install FCCTV-085 camera; MM 63.1 EB	I-66: 5 d/wk w/ rain	3	11-Jun-14	13-Jun-14
ATM6550	Install FCCTV-086 camera; MM 63.1 EB	I-66: 5 d/wk w/ rain	3	16-Jun-14	19-Jun-14
ATM6580	Install FCCTV-089 camera; MM 63.4 EB	I-66: 5 d/wk w/ rain	3	20-Jun-14	24-Jun-14
ATM6590	Install FCCTV-090 camera; MM 63.4 EB	I-66: 5 d/wk w/ rain	3	25-Jun-14	27-Jun-14
ATM6690	Install FCCTV-100 camera; MM 63.8 EB	I-66: 5 d/wk w/ rain	3	30-Jun-14	02-Jul-14
Westbound		I-66: 5 d/wk w/ rain	157	15-Aug-13	12-May-14
Pole-Mounted FCCTV Camera's		I-66: 5 d/wk w/ rain	51	15-Aug-13	01-Nov-13
ATM6700	Install FCCTV-101 camera; MM 64.0 WB	I-66: 5 d/wk w/ rain	3	15-Aug-13	19-Aug-13
ATM6610	Install FCCTV-092 camera; MM 63.5 WB	I-66: 5 d/wk w/ rain	3	20-Aug-13	23-Aug-13
ATM6600	Install FCCTV-091 camera; MM 63.5 WB	I-66: 5 d/wk w/ rain	3	26-Aug-13	28-Aug-13
ATM6570	Install FCCTV-088 camera; MM 63.2 WB	I-66: 5 d/wk w/ rain	3	29-Aug-13	03-Sep-13
ATM6560	Install FCCTV-087 camera; MM 63.2 WB	I-66: 5 d/wk w/ rain	3	04-Sep-13	06-Sep-13
ATM6530	Install FCCTV-084 camera; MM 63.0 WB	I-66: 5 d/wk w/ rain	3	09-Sep-13	12-Sep-13
ATM6520	Install FCCTV-083 camera; MM 63.0 WB	I-66: 5 d/wk w/ rain	3	13-Sep-13	17-Sep-13
ATM6450	Install FCCTV-076 camera; MM 62.5 WB	I-66: 5 d/wk w/ rain	3	18-Sep-13	20-Sep-13
ATM6440	Install FCCTV-075 camera; MM 62.5 WB	I-66: 5 d/wk w/ rain	3	23-Sep-13	26-Sep-13
ATM6390	Install FCCTV-070 camera; MM 62.4 WB	I-66: 5 d/wk w/ rain	3	27-Sep-13	01-Oct-13
ATM6360	Install FCCTV-067 camera; MM 62.1 WB	I-66: 5 d/wk w/ rain	3	02-Oct-13	04-Oct-13
ATM6340	Install FCCTV-065 camera; MM 62.0 WB	I-66: 5 d/wk w/ rain	3	07-Oct-13	10-Oct-13
ATM6210	Install FCCTV-052 camera; MM 61.4 WB	I-66: 5 d/wk w/ rain	3	11-Oct-13	15-Oct-13
ATM6170	Install FCCTV-048 camera; MM 61.2 WB	I-66: 5 d/wk w/ rain	3	16-Oct-13	18-Oct-13
ATM6090	Install FCCTV-040 camera; MM 60.6 WB	I-66: 5 d/wk w/ rain	3	21-Oct-13	24-Oct-13
ATM5380	Install FCCTV-030 camera; MM 60.1-60.2 WB	I-66: 5 d/wk w/ rain	3	25-Oct-13	29-Oct-13
ATM5200	Install FCCTV-012 camera; MM 59.1 WB	I-66: 5 d/wk w/ rain	3	30-Oct-13	01-Nov-13
FCCTV Camera's Mounted on other Structures		I-66: 5 d/wk w/ rain	87	09-Dec-13	12-May-14
ATM6680	Install FCCTV-099 camera; MM 63.8 WB	I-66: 5 d/wk w/ rain	3	09-Dec-13	12-Dec-13
ATM6670	Install FCCTV-098 camera; MM 63.8 WB	I-66: 5 d/wk w/ rain	3	13-Dec-13	17-Dec-13
ATM6660	Install FCCTV-097 camera; MM 63.7 WB	I-66: 5 d/wk w/ rain	3	19-Dec-13	23-Dec-13
ATM6650	Install FCCTV-096 camera; MM 63.7 WB	I-66: 5 d/wk w/ rain	3	24-Dec-13	30-Dec-13
ATM6490	Install FCCTV-080 camera; MM 62.7 WB	I-66: 5 d/wk w/ rain	3	31-Dec-13	06-Jan-14
ATM6480	Install FCCTV-079 camera; MM 62.7 WB	I-66: 5 d/wk w/ rain	3	07-Jan-14	10-Jan-14
ATM6400	Install FCCTV-071 camera; MM 62.4 WB	I-66: 5 d/wk w/ rain	3	13-Jan-14	16-Jan-14
ATM6350	Install FCCTV-066 camera; MM 62.0 WB	I-66: 5 d/wk w/ rain	3	17-Jan-14	21-Jan-14
ATM6310	Install FCCTV-062 camera; MM 61.8 WB	I-66: 5 d/wk w/ rain	3	23-Jan-14	27-Jan-14



Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

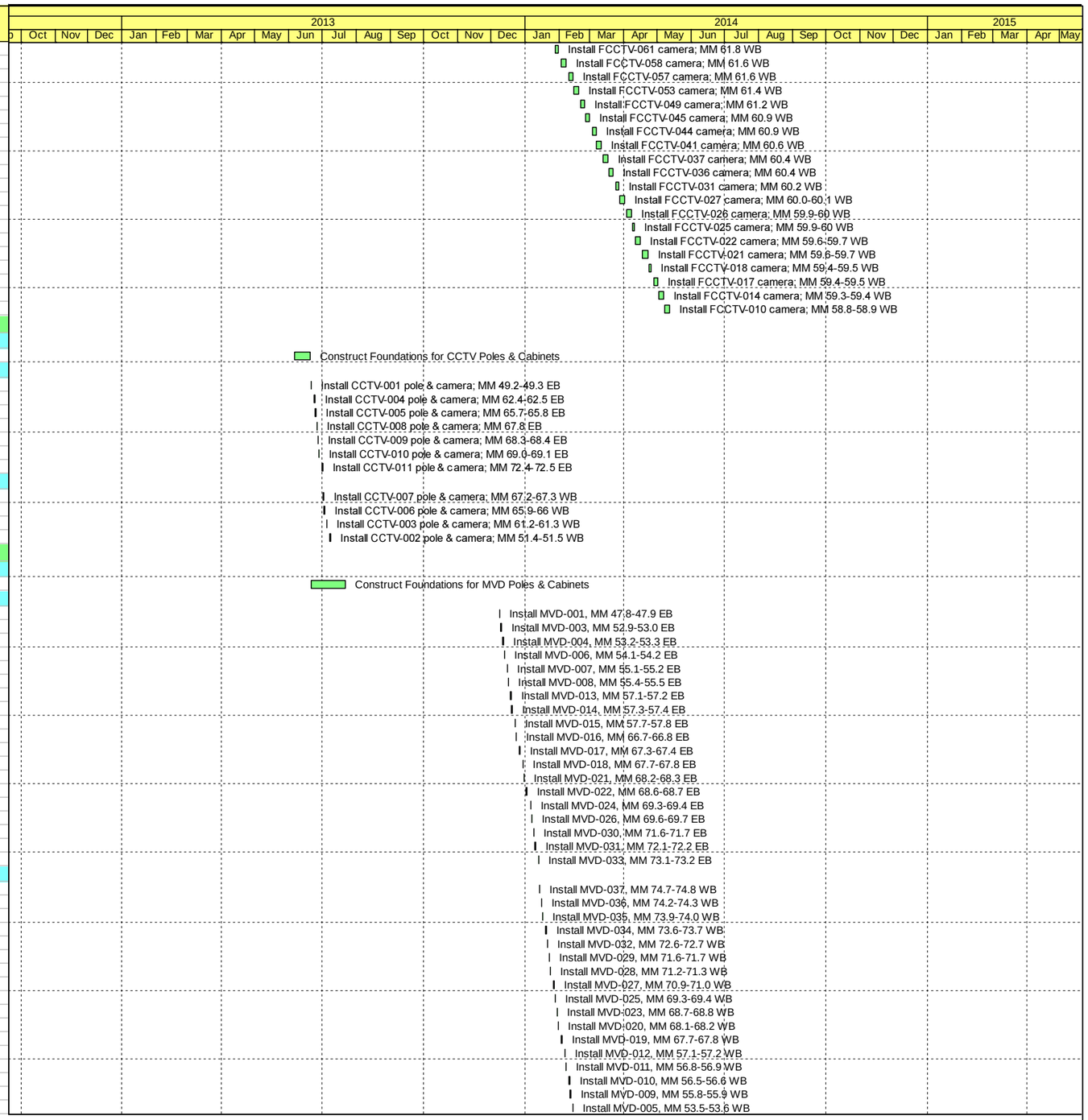
THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
ATM6300	Install FCCTV-061 camera; MM 61.8 WB	I-66: 5 d/wk w/ rain	3	28-Jan-14	31-Jan-14
ATM6270	Install FCCTV-058 camera; MM 61.6 WB	I-66: 5 d/wk w/ rain	3	03-Feb-14	07-Feb-14
ATM6260	Install FCCTV-057 camera; MM 61.6 WB	I-66: 5 d/wk w/ rain	3	10-Feb-14	13-Feb-14
ATM6220	Install FCCTV-053 camera; MM 61.4 WB	I-66: 5 d/wk w/ rain	3	14-Feb-14	18-Feb-14
ATM6180	Install FCCTV-049 camera; MM 61.2 WB	I-66: 5 d/wk w/ rain	3	20-Feb-14	24-Feb-14
ATM6140	Install FCCTV-045 camera; MM 60.9 WB	I-66: 5 d/wk w/ rain	3	25-Feb-14	28-Feb-14
ATM6130	Install FCCTV-044 camera; MM 60.9 WB	I-66: 5 d/wk w/ rain	3	03-Mar-14	06-Mar-14
ATM6100	Install FCCTV-041 camera; MM 60.6 WB	I-66: 5 d/wk w/ rain	3	07-Mar-14	11-Mar-14
ATM6060	Install FCCTV-037 camera; MM 60.4 WB	I-66: 5 d/wk w/ rain	3	13-Mar-14	17-Mar-14
ATM6050	Install FCCTV-036 camera; MM 60.4 WB	I-66: 5 d/wk w/ rain	3	18-Mar-14	21-Mar-14
ATM6000	Install FCCTV-031 camera; MM 60.2 WB	I-66: 5 d/wk w/ rain	3	24-Mar-14	27-Mar-14
ATM5350	Install FCCTV-027 camera; MM 60.0-60.1 WB	I-66: 5 d/wk w/ rain	3	28-Mar-14	01-Apr-14
ATM5340	Install FCCTV-026 camera; MM 59.9-60 WB	I-66: 5 d/wk w/ rain	3	03-Apr-14	07-Apr-14
ATM5330	Install FCCTV-025 camera; MM 59.9-60 WB	I-66: 5 d/wk w/ rain	3	08-Apr-14	10-Apr-14
ATM5300	Install FCCTV-022 camera; MM 59.6-59.7 WB	I-66: 5 d/wk w/ rain	3	11-Apr-14	15-Apr-14
ATM5290	Install FCCTV-021 camera; MM 59.6-59.7 WB	I-66: 5 d/wk w/ rain	3	17-Apr-14	22-Apr-14
ATM5260	Install FCCTV-018 camera; MM 59.4-59.5 WB	I-66: 5 d/wk w/ rain	3	23-Apr-14	25-Apr-14
ATM5250	Install FCCTV-017 camera; MM 59.4-59.5 WB	I-66: 5 d/wk w/ rain	3	28-Apr-14	01-May-14
ATM5220	Install FCCTV-014 camera; MM 59.3-59.4 WB	I-66: 5 d/wk w/ rain	3	02-May-14	06-May-14
ATM5180	Install FCCTV-010 camera; MM 58.8-58.9 WB	I-66: 5 d/wk w/ rain	3	08-May-14	12-May-14
CCTV Poles & Cameras		I-66: 5 d/wk w/ rain	21	06-Jun-13	08-Jul-13
Foundations for Poles & Cabinets		I-66: 5 d/wk w/ rain	10	06-Jun-13	20-Jun-13
ATM4995	Construct Foundations for CCTV Poles & Cabinets	I-66: 5 d/wk w/ rain	10	06-Jun-13	20-Jun-13
Eastbound		I-66: 5 d/wk w/ rain	7	21-Jun-13	01-Jul-13
ATM4996	Install CCTV-001 pole & camera; MM 49.2-49.3 EB	I-66: 5 d/wk w/ rain	1	21-Jun-13	21-Jun-13
ATM5005	Install CCTV-004 pole & camera; MM 62.4-62.5 EB	I-66: 5 d/wk w/ rain	1	24-Jun-13	24-Jun-13
ATM5010	Install CCTV-005 pole & camera; MM 65.7-65.8 EB	I-66: 5 d/wk w/ rain	1	25-Jun-13	25-Jun-13
ATM5040	Install CCTV-008 pole & camera; MM 67.8 EB	I-66: 5 d/wk w/ rain	1	26-Jun-13	26-Jun-13
ATM5050	Install CCTV-009 pole & camera; MM 68.3-68.4 EB	I-66: 5 d/wk w/ rain	1	27-Jun-13	27-Jun-13
ATM5070	Install CCTV-010 pole & camera; MM 69.0-69.1 EB	I-66: 5 d/wk w/ rain	1	28-Jun-13	28-Jun-13
ATM5071	Install CCTV-011 pole & camera; MM 72.4-72.5 EB	I-66: 5 d/wk w/ rain	1	01-Jul-13	01-Jul-13
Westbound		I-66: 5 d/wk w/ rain	4	02-Jul-13	08-Jul-13
ATM5030	Install CCTV-007 pole & camera; MM 67.2-67.3 WB	I-66: 5 d/wk w/ rain	1	02-Jul-13	02-Jul-13
ATM5015	Install CCTV-006 pole & camera; MM 65.9-66 WB	I-66: 5 d/wk w/ rain	1	03-Jul-13	03-Jul-13
ATM5000	Install CCTV-003 pole & camera; MM 61.2-61.3 WB	I-66: 5 d/wk w/ rain	1	05-Jul-13	05-Jul-13
ATM4998	Install CCTV-002 pole & camera; MM 51.4-51.5 WB	I-66: 5 d/wk w/ rain	1	08-Jul-13	08-Jul-13
Microwave Vehicle Detectors (MVD)		I-66: 5 d/wk w/ rain	142	21-Jun-13	14-Feb-14
Foundations for Poles & Cabinets		I-66: 5 d/wk w/ rain	20	21-Jun-13	22-Jul-13
ATM5385	Construct Foundations for MVD Poles & Cabinets	I-66: 5 d/wk w/ rain	20	21-Jun-13	22-Jul-13
Eastbound		I-66: 5 d/wk w/ rain	19	09-Dec-13	13-Jan-14
ATM5390	Install MVD-001, MM 47.8-47.9 EB	I-66: 5 d/wk w/ rain	1	09-Dec-13	09-Dec-13
ATM5410	Install MVD-003, MM 52.9-53.0 EB	I-66: 5 d/wk w/ rain	1	10-Dec-13	10-Dec-13
ATM5420	Install MVD-004, MM 53.2-53.3 EB	I-66: 5 d/wk w/ rain	1	12-Dec-13	12-Dec-13
ATM5440	Install MVD-006, MM 54.1-54.2 EB	I-66: 5 d/wk w/ rain	1	13-Dec-13	13-Dec-13
ATM5450	Install MVD-007, MM 55.1-55.2 EB	I-66: 5 d/wk w/ rain	1	16-Dec-13	16-Dec-13
ATM5460	Install MVD-008, MM 55.4-55.5 EB	I-66: 5 d/wk w/ rain	1	17-Dec-13	17-Dec-13
ATM5510	Install MVD-013, MM 57.1-57.2 EB	I-66: 5 d/wk w/ rain	1	19-Dec-13	19-Dec-13
ATM5520	Install MVD-014, MM 57.3-57.4 EB	I-66: 5 d/wk w/ rain	1	20-Dec-13	20-Dec-13
ATM5530	Install MVD-015, MM 57.7-57.8 EB	I-66: 5 d/wk w/ rain	1	23-Dec-13	23-Dec-13
ATM5540	Install MVD-016, MM 66.7-66.8 EB	I-66: 5 d/wk w/ rain	1	24-Dec-13	24-Dec-13
ATM5550	Install MVD-017, MM 67.3-67.4 EB	I-66: 5 d/wk w/ rain	1	27-Dec-13	27-Dec-13
ATM5560	Install MVD-018, MM 67.7-67.8 EB	I-66: 5 d/wk w/ rain	1	30-Dec-13	30-Dec-13
ATM5570	Install MVD-021, MM 68.2-68.3 EB	I-66: 5 d/wk w/ rain	1	31-Dec-13	31-Dec-13
ATM5580	Install MVD-022, MM 68.6-68.7 EB	I-66: 5 d/wk w/ rain	1	02-Jan-14	02-Jan-14
ATM5590	Install MVD-024, MM 69.3-69.4 EB	I-66: 5 d/wk w/ rain	1	06-Jan-14	06-Jan-14
ATM5600	Install MVD-026, MM 69.6-69.7 EB	I-66: 5 d/wk w/ rain	1	07-Jan-14	07-Jan-14
ATM5630	Install MVD-030, MM 71.6-71.7 EB	I-66: 5 d/wk w/ rain	1	09-Jan-14	09-Jan-14
ATM5640	Install MVD-031, MM 72.1-72.2 EB	I-66: 5 d/wk w/ rain	1	10-Jan-14	10-Jan-14
ATM5660	Install MVD-033, MM 73.1-73.2 EB	I-66: 5 d/wk w/ rain	1	13-Jan-14	13-Jan-14
Westbound		I-66: 5 d/wk w/ rain	18	14-Jan-14	14-Feb-14
ATM5700	Install MVD-037, MM 74.7-74.8 WB	I-66: 5 d/wk w/ rain	1	14-Jan-14	14-Jan-14
ATM5690	Install MVD-036, MM 74.2-74.3 WB	I-66: 5 d/wk w/ rain	1	16-Jan-14	16-Jan-14
ATM5680	Install MVD-035, MM 73.9-74.0 WB	I-66: 5 d/wk w/ rain	1	17-Jan-14	17-Jan-14
ATM5670	Install MVD-034, MM 73.6-73.7 WB	I-66: 5 d/wk w/ rain	1	20-Jan-14	20-Jan-14
ATM5650	Install MVD-032, MM 72.6-72.7 WB	I-66: 5 d/wk w/ rain	1	21-Jan-14	21-Jan-14
ATM5645	Install MVD-029, MM 71.6-71.7 WB	I-66: 5 d/wk w/ rain	1	23-Jan-14	23-Jan-14
ATM5620	Install MVD-028, MM 71.2-71.3 WB	I-66: 5 d/wk w/ rain	1	24-Jan-14	24-Jan-14
ATM5610	Install MVD-027, MM 70.9-71.0 WB	I-66: 5 d/wk w/ rain	1	27-Jan-14	27-Jan-14
ATM8020	Install MVD-025, MM 69.3-69.4 WB	I-66: 5 d/wk w/ rain	1	28-Jan-14	28-Jan-14
ATM8030	Install MVD-023, MM 68.7-68.8 WB	I-66: 5 d/wk w/ rain	1	30-Jan-14	30-Jan-14
ATM8040	Install MVD-020, MM 68.1-68.2 WB	I-66: 5 d/wk w/ rain	1	31-Jan-14	31-Jan-14
ATM8050	Install MVD-019, MM 67.7-67.8 WB	I-66: 5 d/wk w/ rain	1	03-Feb-14	03-Feb-14
ATM5500	Install MVD-012, MM 57.1-57.2 WB	I-66: 5 d/wk w/ rain	1	06-Feb-14	06-Feb-14
ATM5490	Install MVD-011, MM 56.8-56.9 WB	I-66: 5 d/wk w/ rain	1	07-Feb-14	07-Feb-14
ATM5480	Install MVD-010, MM 56.5-56.6 WB	I-66: 5 d/wk w/ rain	1	10-Feb-14	10-Feb-14
ATM5470	Install MVD-009, MM 55.8-55.9 WB	I-66: 5 d/wk w/ rain	1	11-Feb-14	11-Feb-14
ATM5430	Install MVD-005, MM 53.5-53.6 WB	I-66: 5 d/wk w/ rain	1	13-Feb-14	13-Feb-14



Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

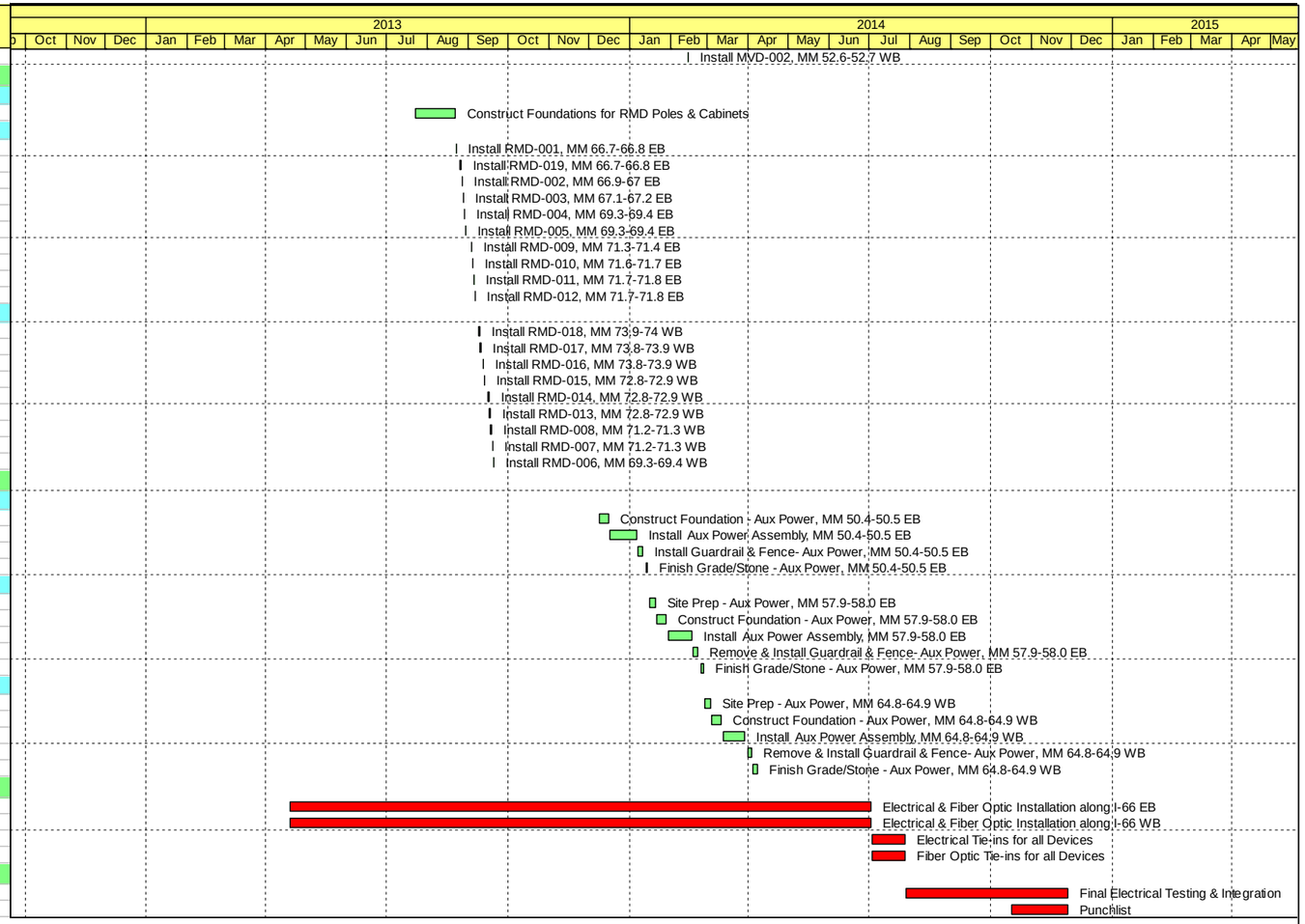
THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

Activity ID	Activity Name	Calendar	Original Duration	Start	Finish
ATM5400	Install MVD-002, MM 52.6-52.7 WB	I-66: 5 d/wk w/ rain	1	14-Feb-14	14-Feb-14
Ramp Meter Detectors (RMD)		I-66: 5 d/wk w/ rain	39	23-Jul-13	20-Sep-13
Foundations for Poles & Cabinets		I-66: 5 d/wk w/ rain	20	23-Jul-13	22-Aug-13
ATM5755	Construct Foundations for RMD Poles & Cabinets	I-66: 5 d/wk w/ rain	20	23-Jul-13	22-Aug-13
Eastbound		I-66: 5 d/wk w/ rain	10	23-Aug-13	06-Sep-13
ATM5760	Install RMD-001, MM 66.7-66.8 EB	I-66: 5 d/wk w/ rain	1	23-Aug-13	23-Aug-13
ATM5940	Install RMD-019, MM 66.7-66.8 EB	I-66: 5 d/wk w/ rain	1	26-Aug-13	26-Aug-13
ATM5770	Install RMD-002, MM 66.9-67 EB	I-66: 5 d/wk w/ rain	1	27-Aug-13	27-Aug-13
ATM5780	Install RMD-003, MM 67.1-67.2 EB	I-66: 5 d/wk w/ rain	1	28-Aug-13	28-Aug-13
ATM5790	Install RMD-004, MM 69.3-69.4 EB	I-66: 5 d/wk w/ rain	1	29-Aug-13	29-Aug-13
ATM5800	Install RMD-005, MM 69.3-69.4 EB	I-66: 5 d/wk w/ rain	1	30-Aug-13	30-Aug-13
ATM5840	Install RMD-009, MM 71.3-71.4 EB	I-66: 5 d/wk w/ rain	1	03-Sep-13	03-Sep-13
ATM5850	Install RMD-010, MM 71.6-71.7 EB	I-66: 5 d/wk w/ rain	1	04-Sep-13	04-Sep-13
ATM5860	Install RMD-011, MM 71.7-71.8 EB	I-66: 5 d/wk w/ rain	1	05-Sep-13	05-Sep-13
ATM5870	Install RMD-012, MM 71.7-71.8 EB	I-66: 5 d/wk w/ rain	1	06-Sep-13	06-Sep-13
Westbound		I-66: 5 d/wk w/ rain	9	09-Sep-13	20-Sep-13
ATM5930	Install RMD-018, MM 73.9-74 WB	I-66: 5 d/wk w/ rain	1	09-Sep-13	09-Sep-13
ATM5920	Install RMD-017, MM 73.8-73.9 WB	I-66: 5 d/wk w/ rain	1	10-Sep-13	10-Sep-13
ATM5910	Install RMD-016, MM 73.8-73.9 WB	I-66: 5 d/wk w/ rain	1	12-Sep-13	12-Sep-13
ATM5900	Install RMD-015, MM 72.8-72.9 WB	I-66: 5 d/wk w/ rain	1	13-Sep-13	13-Sep-13
ATM5890	Install RMD-014, MM 72.8-72.9 WB	I-66: 5 d/wk w/ rain	1	16-Sep-13	16-Sep-13
ATM5880	Install RMD-013, MM 72.8-72.9 WB	I-66: 5 d/wk w/ rain	1	17-Sep-13	17-Sep-13
ATM5830	Install RMD-008, MM 71.2-71.3 WB	I-66: 5 d/wk w/ rain	1	18-Sep-13	18-Sep-13
ATM5820	Install RMD-007, MM 71.2-71.3 WB	I-66: 5 d/wk w/ rain	1	19-Sep-13	19-Sep-13
ATM5810	Install RMD-006, MM 69.3-69.4 WB	I-66: 5 d/wk w/ rain	1	20-Sep-13	20-Sep-13
Auxiliary Power System		I-66: 5 d/wk w/ rain	66	09-Dec-13	07-Apr-14
Auxiliary Power Installation (Cabinet #59) at MM 50.4-50.5 EB		I-66: 5 d/wk w/ rain	20	09-Dec-13	14-Jan-14
ATM6710	Construct Foundation - Aux Power, MM 50.4-50.5 EB	I-66: 5 d/wk w/ rain	5	09-Dec-13	16-Dec-13
ATM6730	Install Aux Power Assembly, MM 50.4-50.5 EB	I-66: 5 d/wk w/ rain	10	17-Dec-13	06-Jan-14
ATM6740	Install Guardrail & Fence- Aux Power, MM 50.4-50.5 EB	I-66: 5 d/wk w/ rain	3	07-Jan-14	10-Jan-14
ATM6750	Finish Grade/Stone - Aux Power, MM 50.4-50.5 EB	I-66: 5 d/wk w/ rain	2	13-Jan-14	14-Jan-14
Auxiliary Power Installation (Cabinet #42) at MM 57.9-58.0 EB		I-66: 5 d/wk w/ rain	23	16-Jan-14	25-Feb-14
ATM6760	Site Prep - Aux Power, MM 57.9-58.0 EB	I-66: 5 d/wk w/ rain	3	16-Jan-14	20-Jan-14
ATM6770	Construct Foundation - Aux Power, MM 57.9-58.0 EB	I-66: 5 d/wk w/ rain	5	21-Jan-14	28-Jan-14
ATM6780	Install Aux Power Assembly, MM 57.9-58.0 EB	I-66: 5 d/wk w/ rain	10	30-Jan-14	17-Feb-14
ATM6790	Remove & Install Guardrail & Fence- Aux Power, MM 57.9-58.0 EB	I-66: 5 d/wk w/ rain	3	18-Feb-14	21-Feb-14
ATM6800	Finish Grade/Stone - Aux Power, MM 57.9-58.0 EB	I-66: 5 d/wk w/ rain	2	24-Feb-14	25-Feb-14
Auxiliary Power Installation (Cabinet #16) at MM 64.8-64.9 WB		I-66: 5 d/wk w/ rain	23	27-Feb-14	07-Apr-14
ATM6810	Site Prep - Aux Power, MM 64.8-64.9 WB	I-66: 5 d/wk w/ rain	3	27-Feb-14	03-Mar-14
ATM6820	Construct Foundation - Aux Power, MM 64.8-64.9 WB	I-66: 5 d/wk w/ rain	5	04-Mar-14	11-Mar-14
ATM6830	Install Aux Power Assembly, MM 64.8-64.9 WB	I-66: 5 d/wk w/ rain	10	13-Mar-14	28-Mar-14
ATM6840	Remove & Install Guardrail & Fence- Aux Power, MM 64.8-64.9 WB	I-66: 5 d/wk w/ rain	3	31-Mar-14	03-Apr-14
ATM6850	Finish Grade/Stone - Aux Power, MM 64.8-64.9 WB	I-66: 5 d/wk w/ rain	2	04-Apr-14	07-Apr-14
Electrical & Fiber Optic Tie-ins		I-66: 5 d/wk w/ rain	280	19-Apr-13	28-Jul-14
ATM7200	Electrical & Fiber Optic Installation along I-66 EB	I-66: 5 d/wk w/ rain	265	19-Apr-13	02-Jul-14
ATM7300	Electrical & Fiber Optic Installation along I-66 WB	I-66: 5 d/wk w/ rain	265	19-Apr-13	02-Jul-14
ATM7400	Electrical Tie-ins for all Devices	I-66: 5 d/wk w/ rain	15	03-Jul-14	28-Jul-14
ATM7450	Fiber Optic Tie-ins for all Devices	I-66: 5 d/wk w/ rain	15	03-Jul-14	28-Jul-14
Final Electrical Testing/Integration & Punchlist		I-66: 5 day/wk	87	29-Jul-14	28-Nov-14
ATM8000	Final Electrical Testing & Integration	I-66: 5 day/wk	87	29-Jul-14	28-Nov-14
ATM8010	Punchlist	I-66: 5 day/wk	30	17-Oct-14	28-Nov-14



Remaining Work
Critical Remaining Work
Milestone

Project ID: I-66 ATM Pre-Bid
Run Date: 24-Jul-12 16:42
Data Date: 19-Oct-12
Project Finish Date: 28-Nov-14

THE LANE CONSTRUCTION CORPORATION
I-66 Active Traffic Management (ATM)

PROPOSAL SCHEDULE
WBS SORT OF ALL ACTIVITIES

CPM SCHEDULE

Date	Revision	Checked	Approved

4.6.2: Proposal Schedule Narrative

4.6 PROPOSAL SCHEDULE

Integral to the design-build processes is the creation of a working CPM schedule using Primavera® software. The schedule integrates subcontracted work requirements, as well as the delivery of permanent materials requiring long lead times. Time for necessary inspections is built into the scheduled activities. Potential conflicts are identified early to formulate alternate plans and allow work to proceed in an organized and timely fashion. Conversely, opportunities to advance items of work will be capitalized upon as "early finish activities" are identified.

4.6.2 Narrative Description of the Proposed Work Schedule

The LANE Team will coordinate the scope of all project-related activities to establish a timely Primavera Critical Path Method (CPM) job schedule that will help ensure on-time completion and identify potential risks. LANE's Project Controls will be centralized in the local project office. The Project Engineer will be responsible for scheduling, cost engineering, and cost forecasting. The project controls system will utilize Primavera software to develop staffing/resource allocation plans and status/progress reports. The Design-Build Project Manager, supported by the Construction Manager, is ultimately responsible for the implementation of the project controls system. Three levels of schedules will be used: Level 1 will be the Master Schedule, a management level schedule; Level 2 will be the Critical Path Schedule, the project level schedule; and Level 3 will be the Control Level Schedule, a compilation of detailed work activity level schedules. Subcontract work and third party work will be tracked at the same detail level as LANE's self-performed work. A Baseline Network Analysis Schedule will be submitted to, and accepted by, VDOT prior to the start of construction. Schedule maintenance is the central focus of the weekly project coordination meetings.

To address the issue of controlling time, LANE will develop a detailed, time-phased CPM project schedule, prepared with timelines outlined within the Scope of Work to indicate the necessary procurement and construction activities for each phase of the project. The CPM will utilize the Precedence Diagram Method (PDM) to satisfy both time and cost applications. Various calendars will be incorporated into the project schedule to reflect holidays, seasonal work, temperature and precipitation restrictions, owner requirements, etc. The activities within the CPM schedule will be organized according to a Work Breakdown Structure (WBS) that has been developed for the project. An Activity Coding Structure will be utilized in the project schedule to facilitate the various organizations of the CPM schedule data output. For example, a typical activity code structure would include areas/zone/section, responsibility, phase, and type of work. The project schedule will be the tool utilized for coordination by both onsite and offsite project team management. The schedule updates are used as a tool by managers to review progress and coordinate the efforts of all entities involved.

The Project Schedule will graphically represent, in its Network Diagram, the logical sequence and duration of each activity necessary to complete the work in accordance with the contract requirements. The Project Schedule will include Design activities, Shop Drawing activities, Procurement activities, Government activities, Construction Quality Management (CQM) activities, and Construction activities.

The information provided in the Project Schedule will include the interdependencies between LANE's activities and all other activities required for the successful completion of the Contract. Milestones, as well as other significant dates provided for in the contract, will be identified.

As work progresses, start dates, finish dates, percent complete, and remaining durations are updated to report the progress of each work activity. The Construction Manager will incorporate updated data into the CPM schedule on a monthly basis, review the results internally and with the owner, and prepare the required reports

for submittal. Monthly updates of the CPM schedule provide the foundation of progress reports utilized by the project team.

CPM SUMMARY DATES	
• Notice To Proceed	October 19, 2012
• Project Completion	November 28, 2014
• Total Contract Duration	771 Calendar Days
• Start of Design	October 19, 2012
• Start of Construction	April 2, 2013
• Start Staging Area Construction	April 2, 2013
• Complete Staging Area Construction	August 26, 2013
• Start Gantry Structure Construction	April 19, 2013
• Complete Gantry Structure Construction	December 6, 2013
• Start Cantilever Structure Construction	April 19, 2013
• Complete Cantilever Structure Construction	August 28, 2013
• Complete Sign Installation	December 24, 2013
• Start FCCTV & CCTV Installation	April 19, 2013
• Complete FCCTV & CCTV Installation	July 2, 2014
• Start MVD & RMD Installation	June 21, 2013
• Complete MVD & RMD Installation	February 14, 2014
• Start Auxiliary Power Installation	December 9, 2013
• Complete Auxiliary Power Installation	April 7, 2014
• Complete Electrical & Fiber Optic Connections	July 28, 2014
• Start Final Electrical Testing & Integration	July 29, 2014
• Complete Final Electrical Testing, Integration & Training	November 28, 2014

The Project Schedule is based on LANE's proposed construction approach and includes milestones identified in the RFP.

LANE

www.laneconstruct.com

CORPORATE

90 Fieldstone Court
Cheshire, CT 06410
p/203.235.3351 f/203.237.4260

LOCAL

14500 Avion Parkway, Suite 200
Chantilly, VA 20151
p/703.222.5670 f/703.222.5960

PDF

A DESIGN-BUILD PROJECT

Interstate 66

Active Traffic Management

TECHNICAL PROPOSAL: VOLUME II

State Project No.: 0066-96A-917, P101, N501
Federal Project Nos.: IM-5A01(253) & IM-5A01(274)
Contract ID Number: C00098017DB46

0 125 250 500 Feet

CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

MVD

Ramp Meter Detector

Ramp Meter Detector Assembly

Lane Control Signals on Existing Structure

Lane Control Signals on Proposed Structure

Existing Structure with DMS

Proposed Structure with DMS

Shoulder Lane Control Signal on Existing Sign Structure

Shoulder Lane Control Signal on Proposed Cantilever Structure

EB & WB Lane Control Signals on Existing Structure

EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT # 1

CCTV Camera
SLMS Fixed CCTV
Lane Control Regulatory Sign
MVD
Ramp Meter Detector
Ramp Meter Detector Assembly
Lane Control Signals on Existing Structure
Lane Control Signals on Proposed Structure
Existing Structure with DMS
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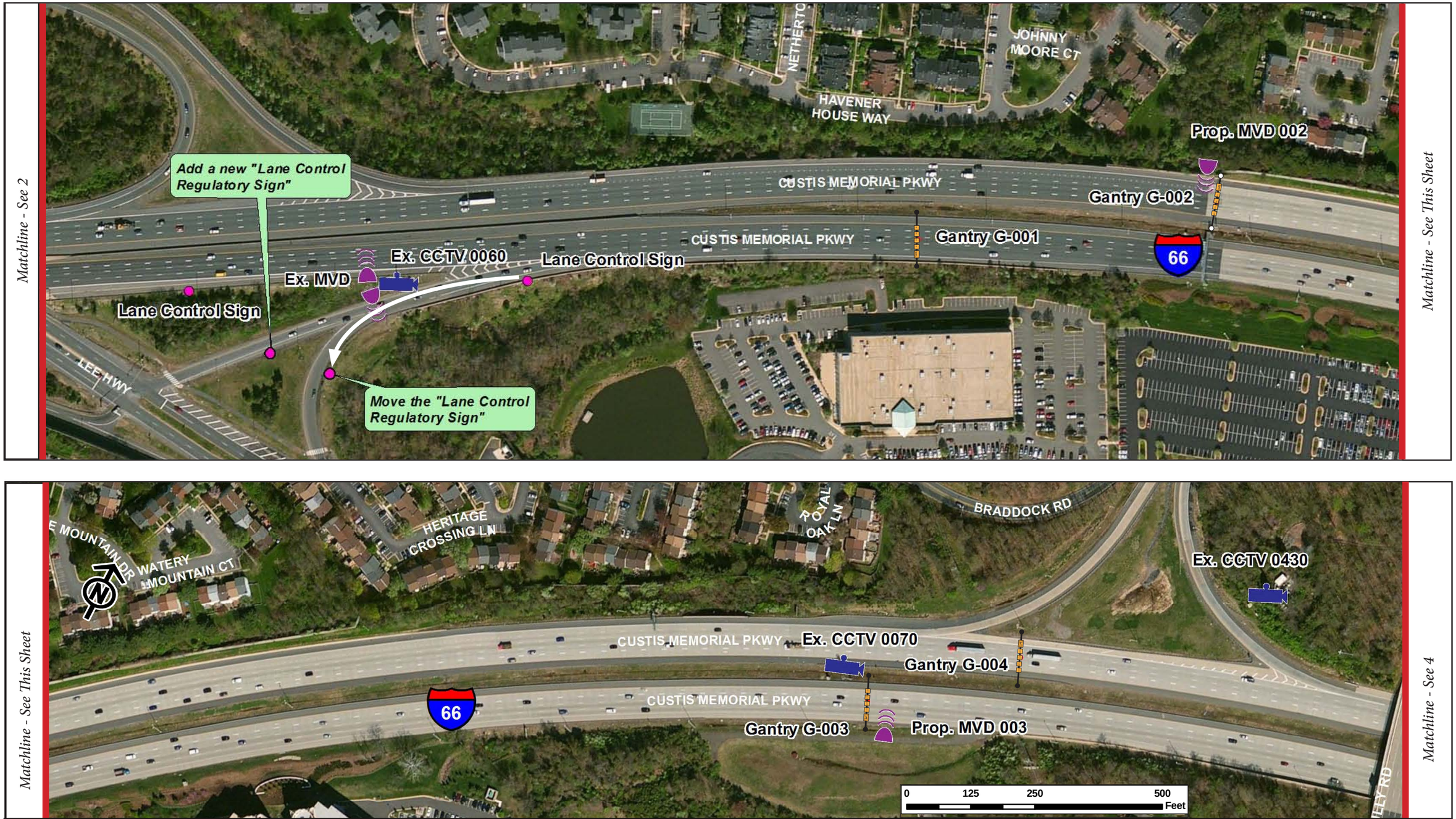
EB & WB Lane Control Signals on Existing Structure
EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	2



LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	3

CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

MVD

Ramp Meter Detector

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EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	4

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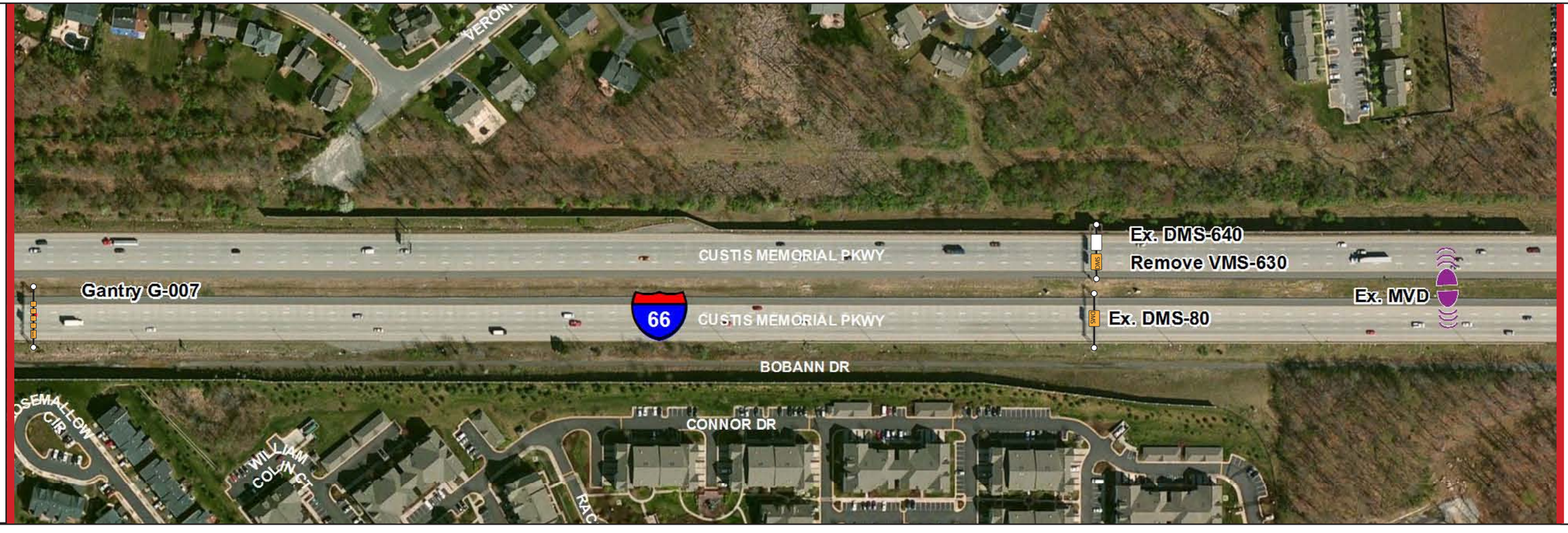

Matchline - See This Sheet

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Matchline - See 6

CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

MVD

Ramp Meter Detector

Ramp Meter Detector Assembly

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LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	5

CCTV Camera
SLMS Fixed CCTV
Lane Control Regulatory Sign
MVD
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Ramp Meter Detector Assembly
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LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	6

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	7

Matchline - See 7

Matchline - See This Sheet

Matchline - See This Sheet

Matchline - See 9

CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

MVD

Ramp Meter Detector

Ramp Meter Detector Assembly

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LANE

THE LANE TEAM

ITS PLANS

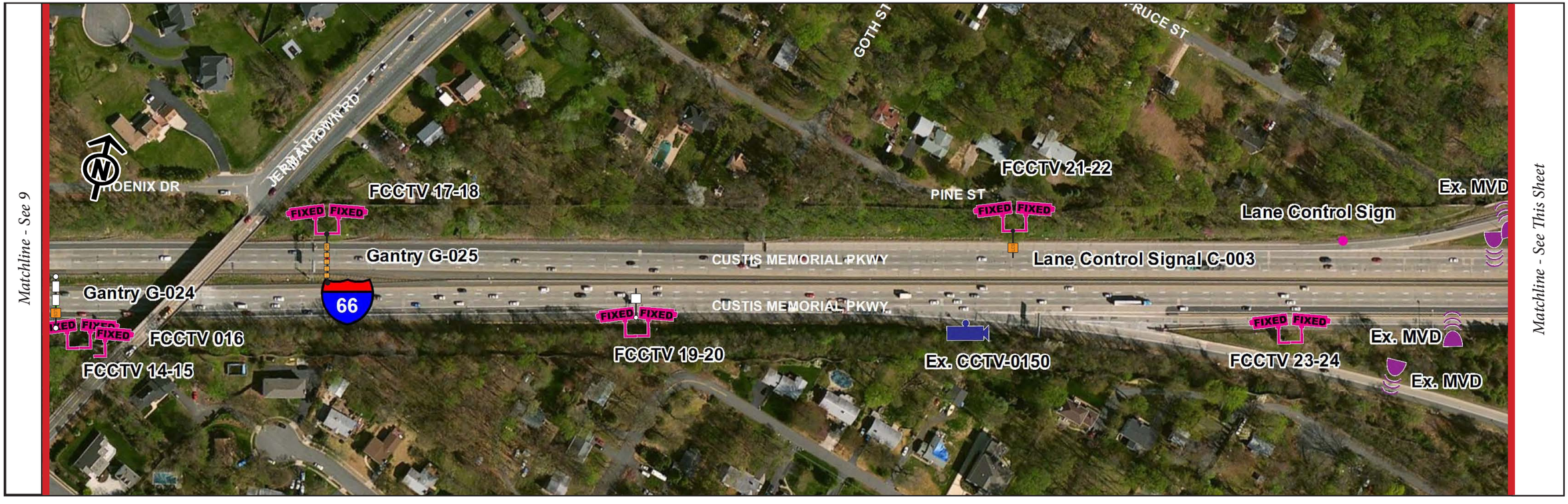
EXHIBIT #	8

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	9



CCTV Camera
SLMS Fixed CCTV
Lane Control Regulatory Sign
MVD
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Lane Control Signals on Existing Structure
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EB & WB Lane Control Signals on Existing Structure
EB & WB Lane Control Signals on Proposed Structure

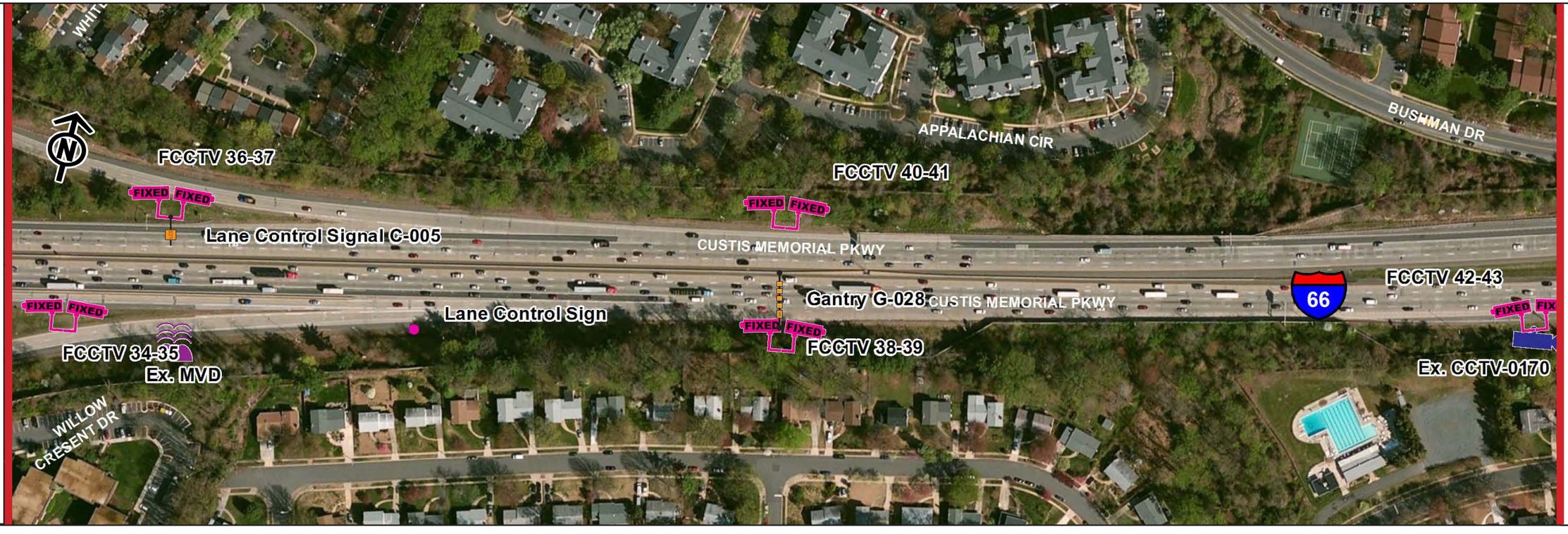
LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	10

Matchline - See 10



Matchline - See This Sheet

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Ramp Meter Detector Assembly
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Lane Control Signals on Proposed Structure
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Proposed Structure with DMS
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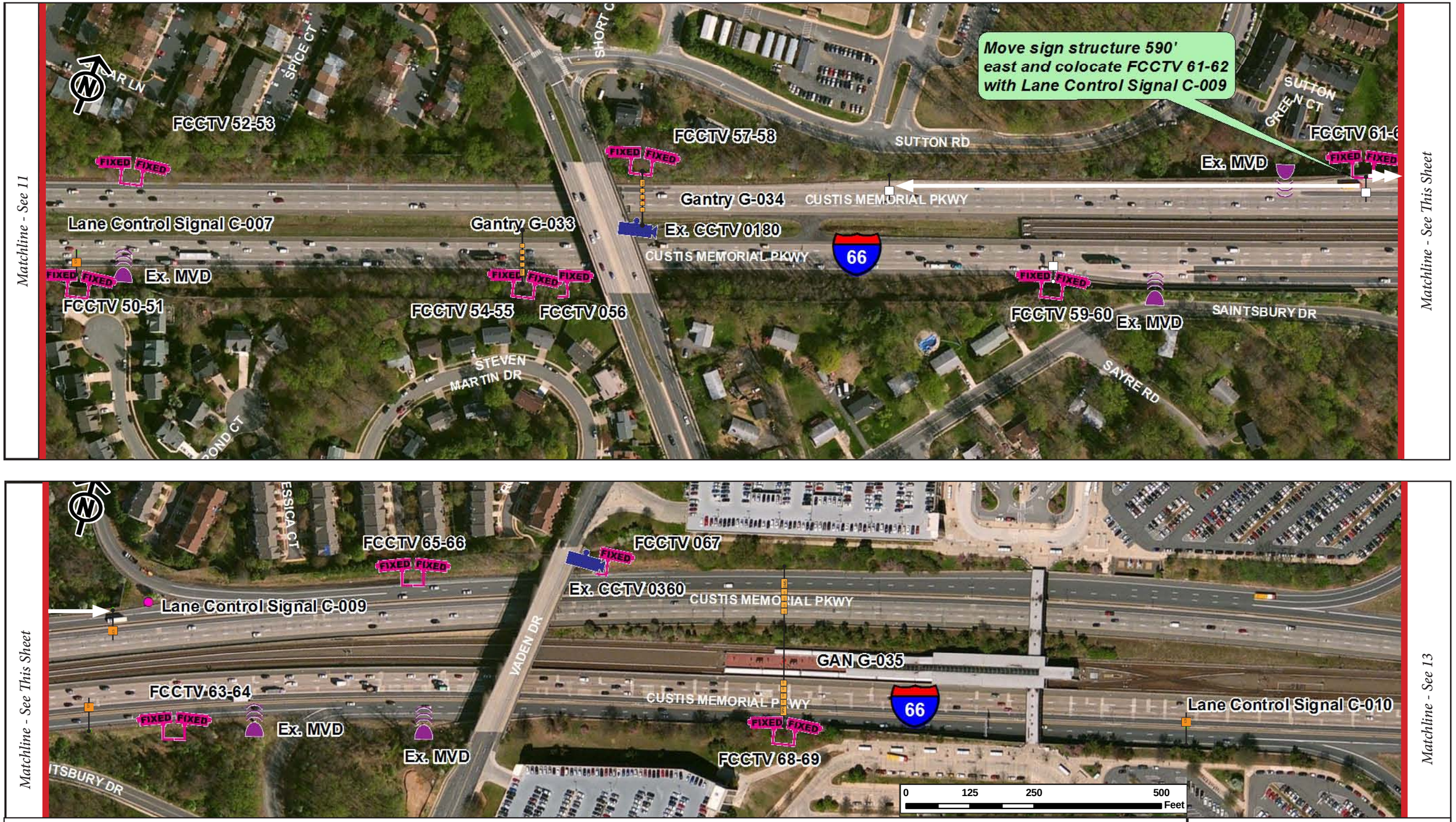
EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	11



LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	12

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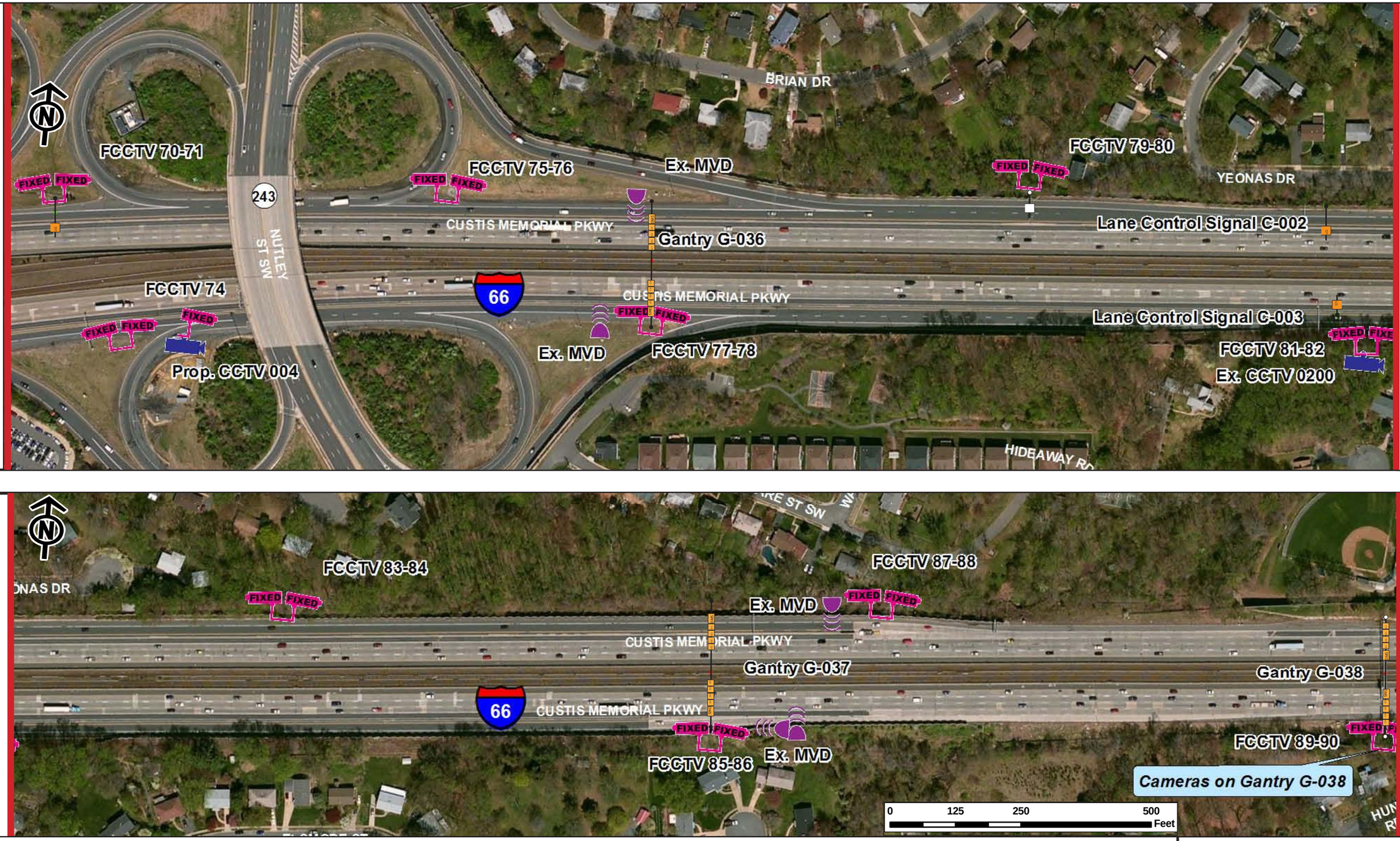

Matchline - See This Sheet

Matchline - See This Sheet

Matchline - See 14

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SLMS Fixed CCTV
Lane Control Regulatory Sign
MVD
Ramp Meter Detector
Ramp Meter Detector Assembly
Lane Control Signals on Existing Structure
Lane Control Signals on Proposed Structure
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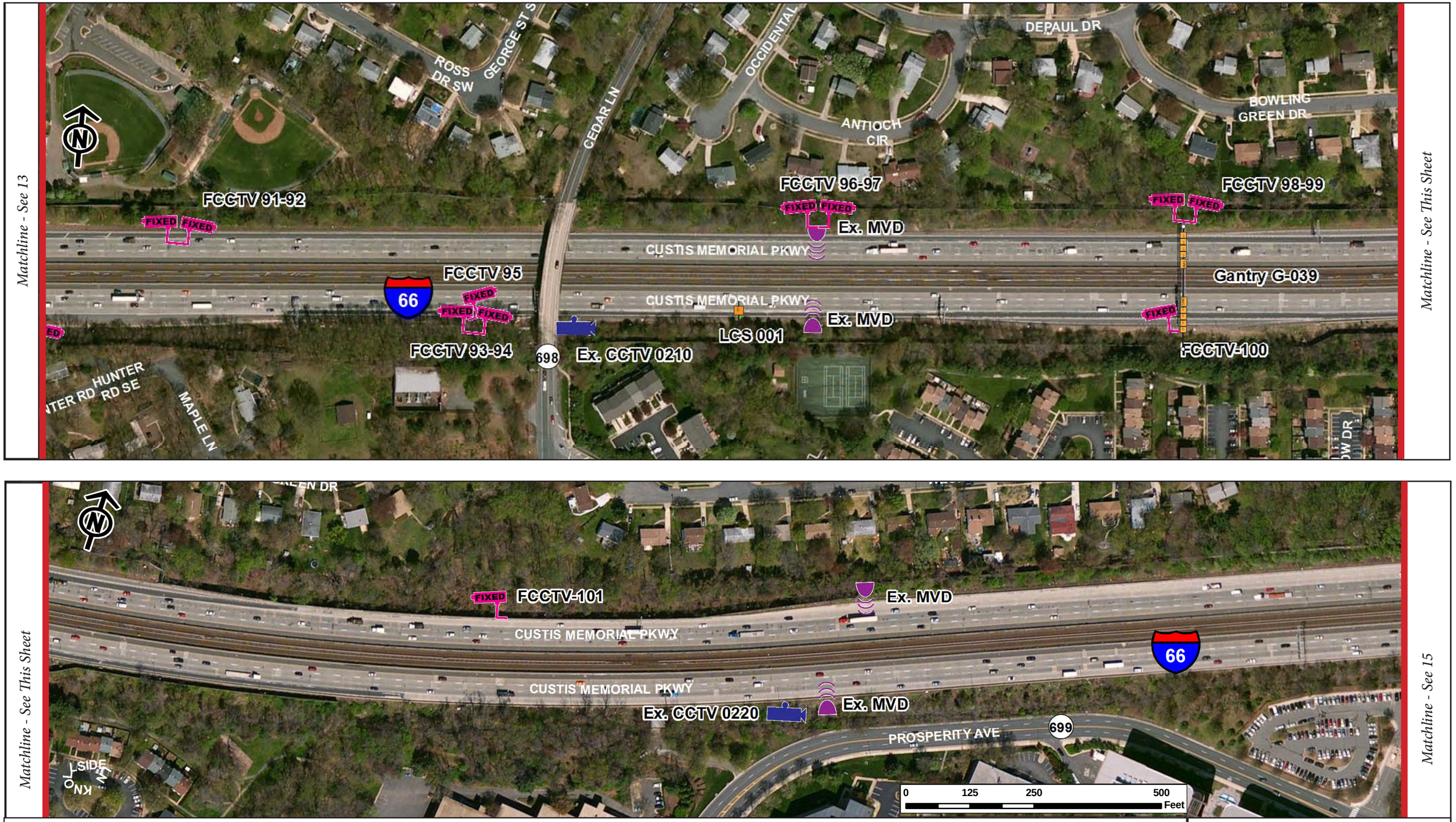
LANE

THE LANE TEAM

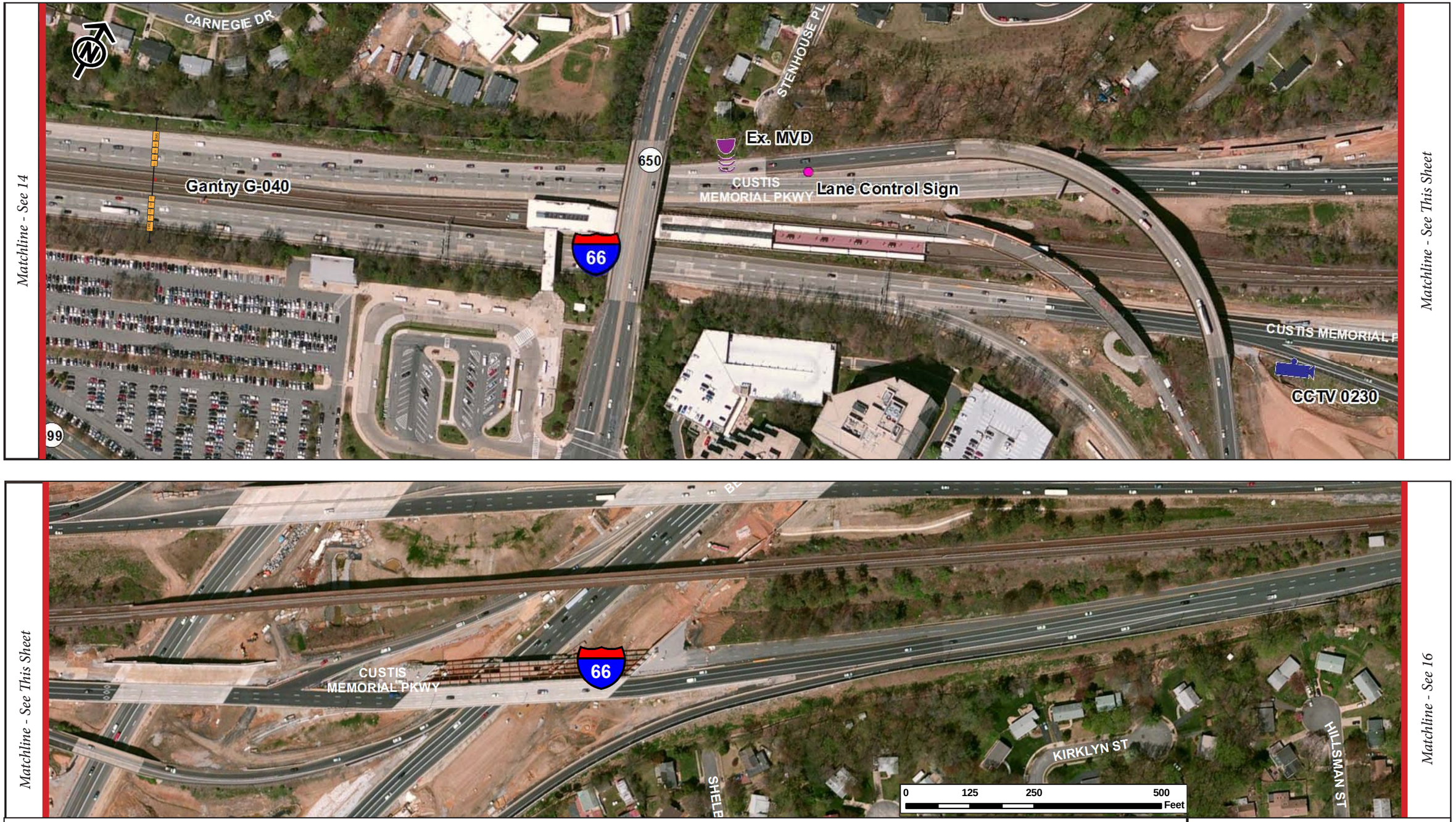
ITS PLANS

EXHIBIT #	13



LANE

THE LANE TEAM	
ITS PLANS	
EXHIBIT #	14



Matchline - See 14

Matchline - See This Sheet

Matchline - See This Sheet

Matchline - See 16

CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

MVD

Ramp Meter Detector

Ramp Meter Detector Assembly

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EB & WB Lane Control Signals on Existing Structure

EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	15


Matchline - See 15
CENTERSIDE CT
VIRGINIA LN
Prop. CCTV 006
CUSTIS MEMORIAL PKWY
66
CUSTIS MEMORIAL PKWY
STAGING AREA
AVON LA
AVON LN
VIRGINIA AVE
CENTER ST
SALEM RD
FALLSMERE CT
Matchline - See This Sheet
Matchline - See This Sheet
LEIGHTON DR W
STAGING AREA
Ex. MVD
Prop. DMS-001 G 041
CUSTIS MEMORIAL PKWY
66
CUSTIS MEMORIAL PKWY
Ex. MVD
BARBOUR RD
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125
250
500
Feet
Matchline - See 17
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SLMS Fixed CCTV
Lane Control Regulatory Sign
MVD
Ramp Meter Detector
Ramp Meter Detector Assembly
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Lane Control Signals on Proposed Structure
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Proposed Structure with DMS
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Shoulder Lane Control Signal on Proposed Cantilever Structure
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EB & WB Lane Control Signals on Proposed Structure
LANE
THE LANE TEAM
ITS PLANS
EXHIBIT #
16

CCTV Camera
SLMS Fixed CCTV
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MVD
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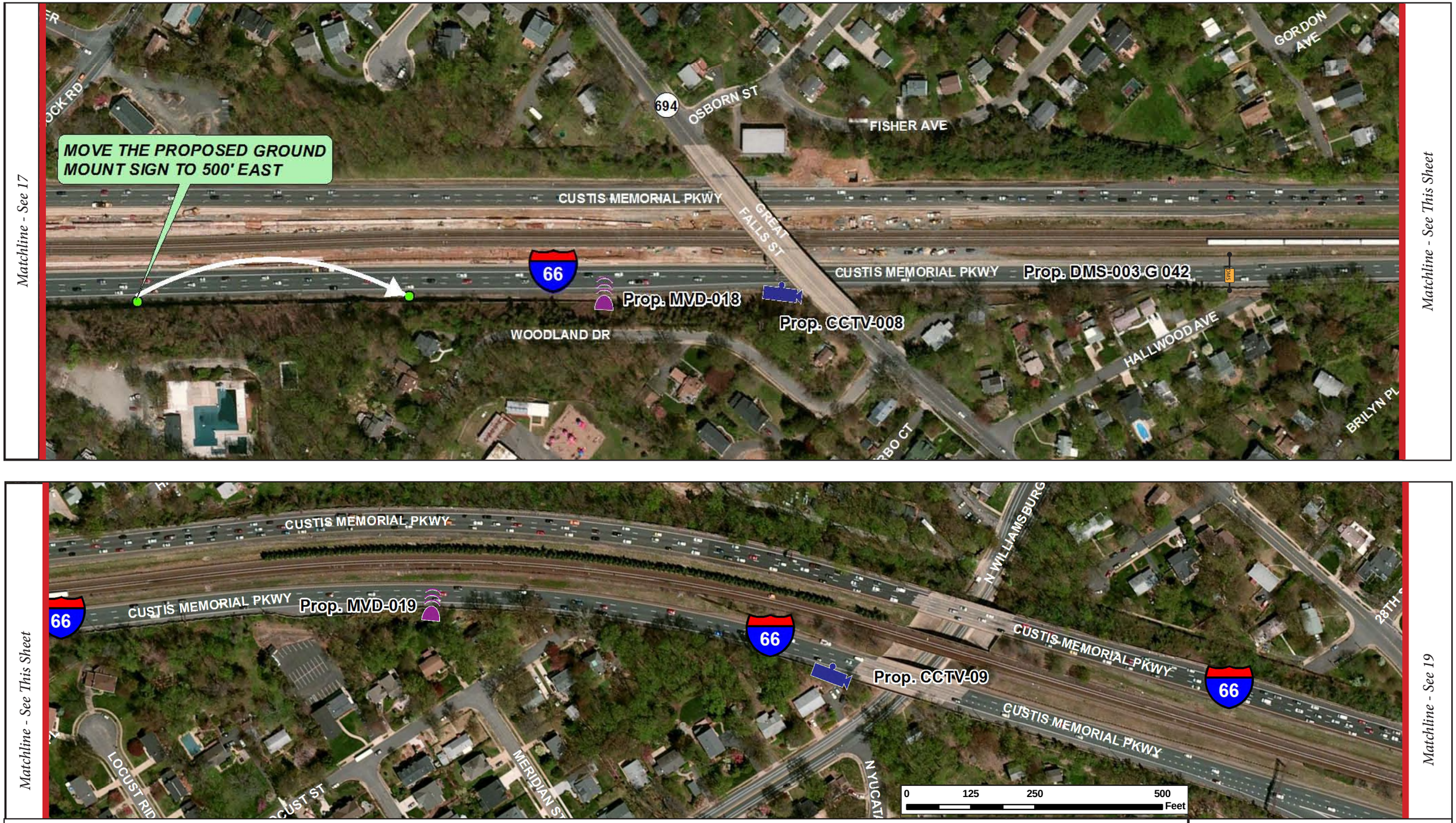
LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	17



CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

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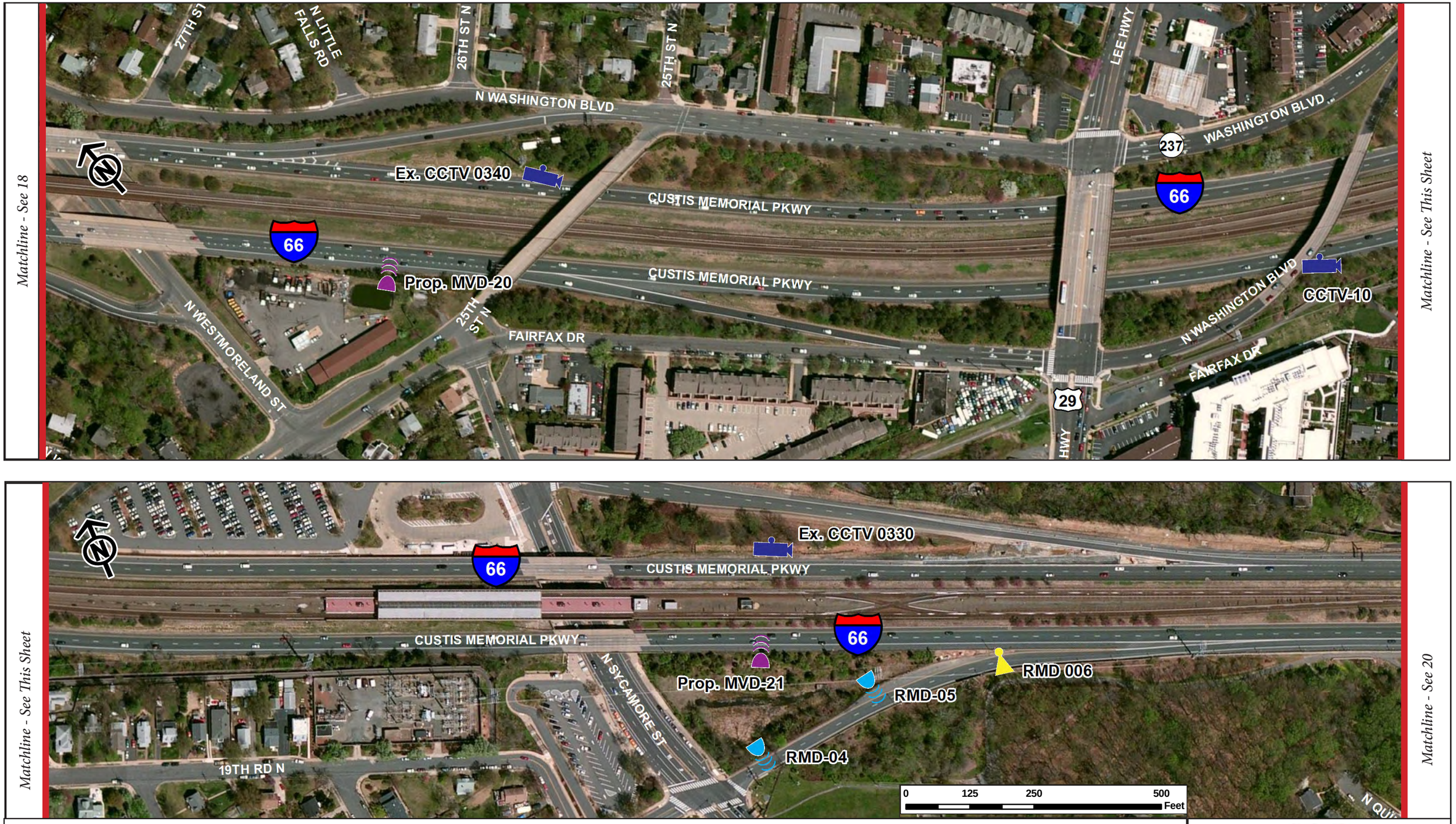
LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	18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27TH ST
N LITTLE FALLS RD
26TH ST N
25TH ST N
LEE HWY
N WASHINGTON BLVD
WASHINGTON BLVD
237
66
Ex. CCTV 0340
CUSTIS MEMORIAL PKWY
66
CUSTIS MEMORIAL PKWY
Prop. MVD-20
N WESTMORELAND ST
25TH ST N
FAIRFAX DR
N WASHINGTON BLVD
CCTV-10
FAIRFAX DR
29
Matchline - See This Sheet
Matchline - See This Sheet
Ex. CCTV 0330
66
CUSTIS MEMORIAL PKWY
CUSTIS MEMORIAL PKWY
66
N SYCAMORE ST
Prop. MVD-21
RMD 006
RMD-05
RMD-04
19TH RD N
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125
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500
Feet
Matchline - See 20
CCTV Camera
SLMS Fixed CCTV
Lane Control Regulatory Sign
MVD
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Ramp Meter Detector Assembly
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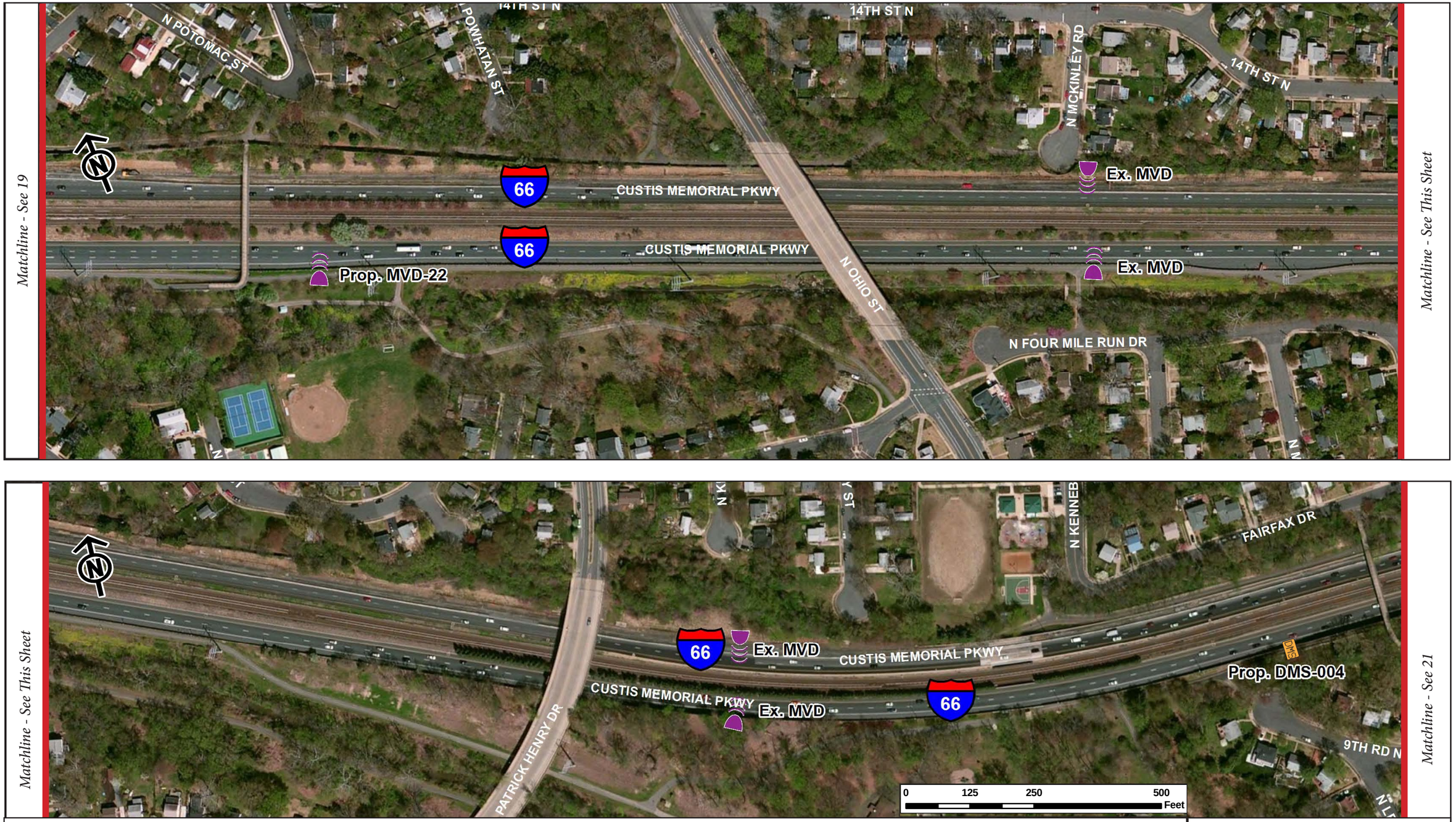
EB & WB Lane Control Signals on Proposed Structure
LANE
THE LANE TEAM
ITS PLANS
EXHIBIT #
19



LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	20

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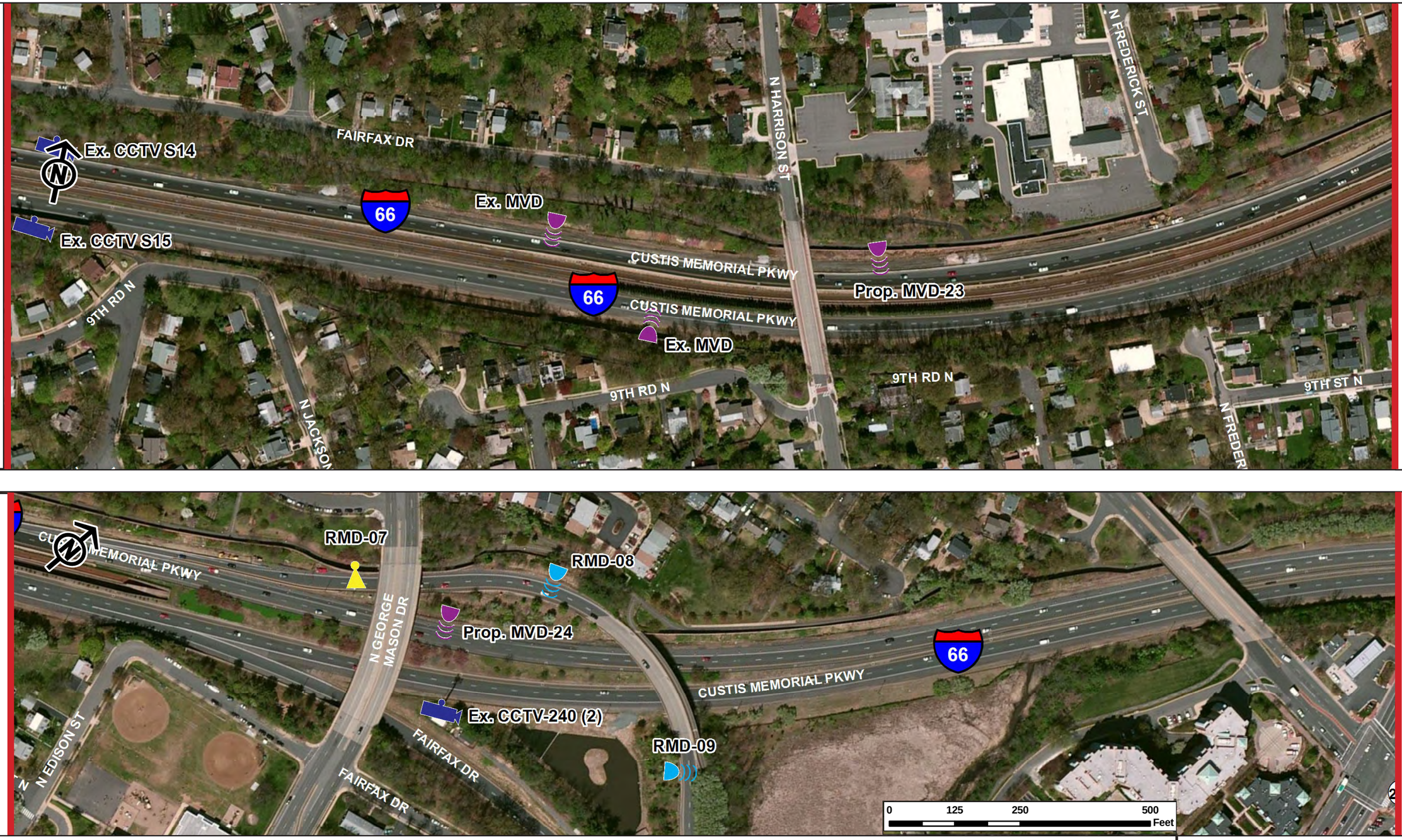

Matchline - See This Sheet

Matchline - See This Sheet

Matchline - See 22

CCTV Camera

SLMS Fixed CCTV

Lane Control Regulatory Sign

MVD

Ramp Meter Detector

Ramp Meter Detector Assembly

Lane Control Signals on Existing Structure

Lane Control Signals on Proposed Structure

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EB & WB Lane Control Signals on Existing Structure

EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	21

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	22

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	23

Matchline - See 23

Matchline - See This Sheet

Matchline - See This Sheet

CCTV Camera
SLMS Fixed CCTV
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MVD
Ramp Meter Detector
Ramp Meter Detector Assembly
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EB & WB Lane Control Signals on Proposed Structure

LANE

THE LANE TEAM

ITS PLANS

EXHIBIT #	24

SLMS FIXED CCTV CAMERAS - WESTBOUND

Sheet #	Exisiting/Proposed	Westbound Location	Westbound Spacing(ft.)	Notes
63	Proposed	57.98		FCCTV002, Collocate on New Structure
63	Proposed	58.19	1108.8	FCCTV004
64	Proposed	58.41	1161.6	FCCTV006
65	Proposed	58.65	1267.2	FCCTV008, Collocate on New Structure
66	Proposed	58.86	1108.8	FCCTV010, Collocate on New Structure
67	Proposed	59.12	1372.8	FCCTV012
68	Proposed	59.35	1214.4	FCCTV014, Collocate on Existing Structure
68	Proposed	59.44	475.2	FCCTV017, FCCTV018 Collocate on New Structure
69	Proposed	59.67	1214.4	FCCTV021, FCCTV022 Collocate on New Structure
70	Proposed	59.91	1267.2	FCCTV025, FCCTV026
71	Proposed	60	475.2	FCCTV027, Collocate on New Structure
71	Proposed	60.18	950.4	FCCTV030, FCCTV031
72	Proposed	60.42	1267.2	FCCTV036, FCCTV037 Collocate on New Structure
73	Proposed	60.62	1056	FCCTV040, FCCTV041
74	Proposed	60.88	1372.8	FCCTV044, FCCTV045 Collocate on New Structure
75	Proposed	61.15	1425.6	FCCTV048, FCCTV049
76	Proposed	61.38	1214.4	FCCTV052, FCCTV053
77	Proposed	61.58	1056	FCCTV057, FCCTV058 Collocate on New Structure
78	Proposed	61.85	1425.6	FCCTV061, FCCTV062 Collocate on New Structure
79	Proposed	62.03	950.4	FCCTV065, FCCTV066
79	Proposed	62.08	264	FCCTV067
80	Proposed	62.39	1636.8	FCCTV070, FCCTV071 Collocate on New Structure
81	Proposed	62.52	686.4	FCCTV075, FCCTV076
81	Proposed	62.73	1108.8	FCCTV079,FCCTV080 Collocate on Existing Structure
82	Proposed	62.97	1267.2	FCCTV083, FCCTV084
83	Proposed	63.21	1267.2	FCCTV087, FCCTV088
84	Proposed	63.46	1320	FCCTV091, FCCTV092
85	Proposed	63.69	1214.4	FCCTV096, FCCTV097 Collocate on Existing Structure
86	Proposed	63.83	739.2	FCCTV098, FCCTV099
86	Proposed	64	897.6	FCCTV101

SLMS FIXED CCTV CAMERAS - EASTBOUND

Sheet #	Exisiting/Proposed	Eastbound Location	Eastbound Spacing(ft.)	Notes
62	Proposed	57.73		FCCTV001, Collocate on New Structure
63	Proposed	57.98	1320	FCCTV003,Collocate on New Structure
63	Proposed	58.19	1108.8	FCCTV005
64	Proposed	58.41	1161.6	FCCTV007
65	Proposed	58.65	1267.2	FCCTV009, Collocate on New Structure
66	Proposed	58.86	1108.8	FCCTV011, Collocate on New Structure
67	Proposed	59.12	1372.8	FCCTV013
68	Proposed	59.35	1214.4	FCCTV015, Collocate on Existing Structure
68	Proposed	59.36	52.8	FCCTV016
69	Proposed	59.54	950.4	FFCTV019, FCCTV020, Collocate on Existing Structure
70	Proposed	59.78	1267.2	FCCTV023, FCCTC024
71	Proposed	60.04	1372.8	FCCTV028, FCCTV029
71	Proposed	60.22	950.4	FCCTV032, FCCTV033 Collocate on New Structure
72	Proposed	60.35	686.4	FCCTV034, FCCTV035
73	Proposed	60.61	1372.8	FCCTV038, FCCTV039 Collocate on New Structure
74	Proposed	60.86	1320	FCCTV042, FCCTV043
75	Proposed	61.11	1320	FCCTV046, FCCTV047 Collocate on New Structure
76	Proposed	61.36	1320	FCCTV050, FCCTV051 Collocate on New Structure
77	Proposed	61.54	950.4	FCCTV054, FCCTV055 Collocate on New Structure
77	Proposed	61.55	52.8	FCCTV056
77	Proposed	61.74	1003.2	FCCTV059, FCCTV060 Collocate on Existing Structure
78	Proposed	61.95	1108.8	FCCTV063, FCCTV064 Collocate on Existing Structure
79	Proposed	62.15	1056	FCCTV068, FCCTV069Collocate on New Structure
80	Proposed	62.41	1372.8	FCCTV072, FCCTV073, FCCTV074
81	Proposed	62.61	1056	FCCTV077, FCCTV078 Collocate on New Structure
82	Proposed	62.88	1425.6	FCCTV081, FCCTV082 Collocate on Existing CCTV Pole
83	Proposed	63.13	1320	FCCTV085, FCCTV086Collocate on New Structure
84	Proposed	63.4	1425.6	FCCTV089, FCCTV090 Collocate on Existing Structure
85	Proposed	63.57	897.6	FCCTV093, FCCTV094, FCCTV095
86	Proposed	63.83	1372.8	FCCTV100

CCTV SURVEILLANCE

Sheet #	Exisiting/Proposed	MM	Segment	Spacing (ft)
5	Existing	43.09	4	
7	Existing	43.55	4	2???
9	Existing	44.17	4	3274
12	Existing	44.85	4	3590
14	Existing	45.45	4	3168
15	Existing	45.71	4	1373
18	Existing	46.31	4	3168
20	Existing	46.78	4	2482
21	Existing	47.25	4	2482
21	Existing	47.26	4	53
24	Existing	47.88	4	3274
27	Existing	48.79	4	4805
29	Proposed	49.22	4	2270
32	Existing	50.13	4	4805
35	Existing	50.81	4	3590
38	Proposed	51.48	3	3538
40	Existing	52.16	3	3590
41	Existing	52.34	3	950
43	Existing	52.96	3	3274
44	Existing	53.12	3	845
47	Existing	53.88	3	4013
48	Existing	54.17	3	1531
50	Existing	54.87	3	3696
53	Existing	55.57	3	3696
55	Existing	55.93	3	1901
57	Existing	56.49	3	2957
59	Existing	56.99	3	2640
61	Existing	57.6	3	3221
64	Existing	58.61	2	5333
69	Existing	59.69	2	5702
74	Existing	60.89	2	6336
76	Proposed	61.28	2	2059
77	Existing	61.59	2	1637
79	Existing	62.08	2	2587
80	Proposed	62.45	2	1954
82	Existing	62.87	2	2218
85	Existing	63.6	2	3854
87	Existing	64.19	2	3115
90	Existing	64.96	2	4066
93	Proposed	65.74	1	4118
94	Proposed	65.98	1	1267
97	Existing	66.8	1	4330
99	Proposed	67.21	1	2165
102	Proposed	67.81	1	3168
104	Proposed	68.33	1	2746
105	Existing	68.75	1	2218
107	Proposed	68.93	1	950
108	Existing	69.36	1	2270
113	Existing	70.6	1	6547
116	Existing	71.3	1	3696
117	Existing	71.68	1	2006
120	Proposed	72.49	1	4277
122	Existing	72.9	1	2165
125	Existing	73.6	1	3696
126	Existing	73.87	1	1426
128	Existing	74.38	1	2693
129	Existing	74.55	1	
129	Existing	74.67	1	
131	Existing	75.03	1	

LANE CONTROL SIGNALS - EASTBOUND

Sheet #	Exisiting/Proposed	Eastbound Location	Eastbound Spacing (ft.)	Notes
41	Proposed	52.47		G-001 TYPE 1
43	Proposed	52.97	2640	G-003 TYPE 1A
46	Proposed	53.73	4012.8	G-005 TYPE 2C
48	Proposed	54.23	2640	G-007 TYPE 1A, On Existing Structure
50	Proposed	54.85	3273.6	G-008 TYPE 2
53	Proposed	55.48	3326.4	G-009 TYPE 2
55	Proposed	55.97	2587.2	G-010 TYPE 2
57	Proposed	56.5	2798.4	G-011 TYPE 2
59	Proposed	57.05	2904	G-014 TYPE 1
61	Proposed	57.54	2587.2	G-015 TYPE 1
63	Proposed	57.97	2270.4	C-001, Collocate On New Structure
64	Proposed	58.31	4065.6	G-018 TYPE 2
67	Proposed	59.21	4752	G-023 TYPE 1
68	Proposed	59.34	686.4	G-024 TYPE 3A, On Existing Structure
70	Proposed	59.9	2956.8	G-026 TYPE 1
71	Proposed	60.23	1742.4	C-004 TYPE 3
73	Proposed	60.6	1953.6	G-028 TYPE 1
74	Proposed	60.96	1900.8	C-006 TYPE 3, On Existing Structure
75	Proposed	61.11	792	G-031 TYPE 1
76	Proposed	61.37	1372.8	C-007 TYPE 3
77	Proposed	61.53	844.8	G-033 TYPE 1
78	Proposed	61.87	1795.2	C-008 TYPE 3
79	Proposed	62.15	1478.4	G-035 TYPE 2
80	Proposed	62.29	739.2	C-010 TYPE 3
81	Proposed	62.62	1742.4	G-036 TYPE 2
82	Proposed	62.86	1267.2	C-013 TYPE 3
83	Proposed	63.13	1425.6	G-037 TYPE 2
84	Proposed	63.41	1478.4	G-038 TYPE 2B, On Existing Structure
85	Proposed	63.65	1267.2	C-014 TYPE 3
86	Proposed	63.83	950.4	G-039 TYPE 2A, On Existing Structure
88	Proposed	64.5	3537.6	G-040 TYPE 2

LANE CONTROL SIGNALS - WESTBOUND

Sheet #	Exisiting/Proposed	Westbound Location	Westbound Spacing (ft.)	Notes
42	Proposed	52.61		G-002 TYPE 1, On Existing Structure
44	Proposed	53.06	2376	G-004 TYPE 1
48	Proposed	54.19	2428.8	G-006 TYPE 1A
50	Proposed	54.85	3484.8	G-008 TYPE 2
53	Proposed	55.48	3326.4	G-009 TYPE 2
55	Proposed	55.97	2587.2	G-010 TYPE 2
57	Proposed	56.5	2798.4	G-011 TYPE 2
59	Proposed	56.66	844.8	G-013 TYPE 1
62	Proposed	57.76	5808	G-017 TYPE 1
64	Proposed	58.31	2904	G-018 TYPE 2
65	Proposed	58.57	1372.8	G-020 TYPE 1
66	Proposed	58.8	121440	G-021 TYPE 1 (Moved from 58.8 from 58.75)
66	Proposed	58.85	264	C-002
68	Proposed	59.44	3115.2	G-025 TYPE 1
69	Proposed	59.68	1267.2	C-003 TYPE 3
71	Proposed	60	1689.6	G-027 TYPE 1
72	Proposed	60.41	2164.8	C-005 TYPE 3
74	Proposed	60.88	2481.6	G-029 TYPE 1
76	Proposed	61.27	2059.2	G-032 TYPE 1, On Existing Structure
77	Proposed	61.71	2323.2	G-034 TYPE 1
78	Proposed	61.85	1161.6	C-009 TYPE 3 (Moved from 61.85 from 61.89)
79	Proposed	62.15	1584	G-035 TYPE 2
80	Proposed	62.39	1267.2	C-011 TYPE 3
81	Proposed	62.62	1214.4	G-036 TYPE 2
82	Proposed	62.86	1267.2	C-012 TYPE 3
83	Proposed	63.13	1425.6	G-037 TYPE 2
84	Proposed	63.41	1478.4	G-038 TYPE 2B, On Existing Structure
86	Proposed	63.83	2217.6	G-039 TYPE 2A, On Existing Structure
88	Proposed	64.5	3537.6	G-040 TYPE 2

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Lane Control Singal, Fixed CCTV Camera, and CCTV Surveillance Camera Tables

EXHIBIT 25

DMS SIGNS - WESTBOUND

Sheet #	Exisiting/Proposed	Westbound Location	Westbound Spacing(ft.)	Notes
25	Existing	48.27		VMS-0690
32	Existing	50	9134.4	VMS-0670
38	Existing	51.5	7920	VMS-660
49	Existing	54.62	16473.6	VMS-0640, Adjacent VMS to be removed
52	Existing	55.3	3590.4	VMS-0620
54	Existing	55.82	2745.6	VMS-610
58	Both	56.82	5280	One-Line DMS G-012, On Existing Structure;VMS-600,Adjacent VMS to be removed
61	Existing	57.51	3643.2	VMS-0580
65	Proposed	58.48	5121.6	One-Line DMS G-019, On Existing Structure
67	Existing	59.06	3062.4	VMS-0550
94	Hot Lanes Project	65.89	36062.4	
95	Proposed	66.16	1425.6	DMS-001, On Assembly Structure
96	Hot Lanes Project	66.43	1425.6	
110	Existing	69.94	18532.8	
120	Proposed	72.33	12619.2	DMS-005, Butterfly Mounted
130	Existing	74.81	13094.4	

MVD'S - EASTBOUND

Sheet #	Exisiting/Proposed	Eastbound Location	Eastbound Spacing (ft.)	Notes
8	Existing	43.89		
24	Proposed	47.82	20750.4	MVD001
29	Existing	49.19	7233.6	
30	Existing	49.63	2323.2	
32	Existing	50.12	2587.2	
34	Existing	50.59	2481.6	
38	Existing	51.49	4752	
41	Existing	52.34	4488	
42	Proposed	52.61	1425.6	MVD002, Collocate on Existing Structure
43	Proposed	52.97	1900.8	MVD003, Collocate on New Structure
45	Proposed	53.29	1689.6	MVD004
46	Proposed	53.58	1531.2	MVD005, Collocate on G-005
47	Existing	53.88	1584	
48	Proposed	54.15	1425.6	MVD006
50	Existing	54.75	3168	
51	Proposed	55.14	2059.2	MVD007
53	Proposed	55.48	1795.2	MVD008, Collocate on New Structure
54	Proposed	55.82	1795.2	MVD009, Collocate on Existing Structure
55	Existing	56.13	1636.8	On-ramp from 286
58	Proposed	56.82	3643.2	MVD011, Collocate on Existing Structure
59	Proposed	57.17	1848	MVD013
60	Proposed	57.4	1214.4	MVD014
62	Proposed	57.73	1742.4	MVD015, Collocate on Existing CCTV Pole
64	Existing	58.21	2534.4	
65	Existing	58.53	1689.6	
66	Existing	58.96	2270.4	
68	Existing	59.36	2112	PR 3
70	Existing	59.81	2376	On Off-ramp to 123
70	Existing	59.84	158.4	PR 4 & 5
71	Existing	60.05	1108.8	PR 8 From Chain Bridge Rd
71	Existing	60.19	739.2	PR 9 & 10 To Chain Bridge Rd
72	Existing	60.34	792	
72	Existing	60.41	369.6	PR 13 & 14 From Chain Bridge Rd
74	Existing	60.99	3062.4	
78	Existing	61.77	4118.4	
78	Existing	61.96	1003.2	
79	Existing	62.02	316.8	
81	Existing	62.59	3009.6	
83	Existing	63.15	2956.8	For Onramp
85	Existing	63.68	2798.4	
87	Existing	64.19	2692.8	
96	Existing	66.37	11510.4	
97	Proposed	66.75	2006.4	MVD016
100	Proposed	67.39	3379.2	MVD017
101	Proposed	67.74	1848	MVD018
103	Proposed	68.22	2534.4	MVD019
105	Proposed	68.7	2534.4	MVD020, Collocate on New Structure
108	Proposed	69.34	3379.2	MVD021
109	Proposed	69.7	1900.8	MVD022
110	Existing	69.97	1425.6	
112	Existing	70.37	2112	
114	Existing	70.83	2428.8	SI7
117	Proposed	71.69	4540.8	MVD025
119	Proposed	72.13	2323.2	MVD026
123	Proposed	73.15	5385.6	MVD028
125	Proposed	73.68	2798.4	MVD029

DMS SIGNS - EASTBOUND

Sheet #	Exisiting/Proposed	Eastbound Location	Eastbound Spacing(ft.)	Notes
25	Existing	48.09		VMS-0020
29	Existing	49.21	5913.6	VMS-0030
33	Existing	50.33	5913.6	VMS 40
36	Existing	51.03	3696	VMS-0050
38	Existing	51.5	2481.6	VMS-660
42	Existing	52.6	5808	VMS-0060
49	Existing	54.62	10665.6	VMS 80
57	Existing	56.63	10612.8	VMS-120, Relocatred from MM 57.06,Adjacent VMS to be removed
62	Existing	57.7	5649.6	VMS-0140,Adjacent VMS to be removed
63	Existing	57.99	1531.2	VMS-0570
67	Existing	59.06	5649.6	VMS-0160,Adjacent VMS to be removed
74	Existing	60.9	9715.2	
83	Hot Lanes Project	63.04	11299.2	
86	Hot Lanes Project	63.96	4857.6	
89	Hot Lanes Project	64.67	3748.8	
96	Proposed	66.57	10032	DMS-002, Off-ramp to Rt. 7, On Assembly Structure
102	Proposed	67.98	7444.8	DMS-003,On Assembly Structure
113	Proposed	70.55	13569.6	DMS-004, Butterfly Mounted
120	Proposed	72.46	10084.8	DMS-006, Butterfly Mounted
130	Existing	74.81	12408	

MVD'S - WESTBOUND

Sheet #	Exisiting/Proposed	Westbound Location	Westbound Spacing (ft.)	Notes
8	Existing	43.89		
24	Proposed	47.82	20750.4	MVD001
25	Existing	48.28	2428.8	
43	Proposed	52.97	24763.2	MVD003, Collocate on New Structure
45	Proposed	53.29	1689.6	MVD004
46	Proposed	53.58	1531.2	MVD005
47	Existing	53.88	1584	
48	Proposed	54.15	1425.6	MVD006
50	Existing	54.75	3168	
53	Proposed	55.48	3854.4	MVD008, Collocate on New Structure
54	Proposed	55.82	1795.2	MVD009, Collocate on Existing Structure
57	Proposed	56.5	3590.4	MVD010, Collocate on Existing CCTV Pole
58	Proposed	56.82	1689.6	MVD011, Collocate on Existing Structure
59	Proposed	57.17	1848	MVD012
62	Proposed	57.73	2956.8	MVD015, Collocate on Existing CCTV Pole
64	Existing	58.21	2534.4	
65	Existing	58.45	1267.2	
65	Existing	58.53	422.4	
66	Existing	58.96	2270.4	
70	Existing	59.85	4699.2	
74	Existing	60.99	6019.2	
78	Existing	61.85	4540.8	
79	Existing	62.09	1267.2	
81	Existing	62.6	2692.8	
83	Existing	63.18	3062.4	
85	Existing	63.68	2640	
87	Existing	64.22	2851.2	
89	Existing	64.75	2798.4	
94	Existing	66.09	7075.2	
97	Existing	66.78	3643.2	
110	Existing	69.97	16843.2	
112	Existing	70.36	2059.2	
114	Existing	70.78	2217.6	SI6
114	Proposed	70.93	792	MVD023
116	Proposed	71.27	1795.2	MVD024
121	Proposed	72.67	7392	MVD027
125	Proposed	73.68	5332.8	MVD029
127	Proposed	73.99	1636.8	MVD030
128	Proposed	74.24	1320	MVD031
130	Proposed	74.73	2587.2	MVD032

LANE

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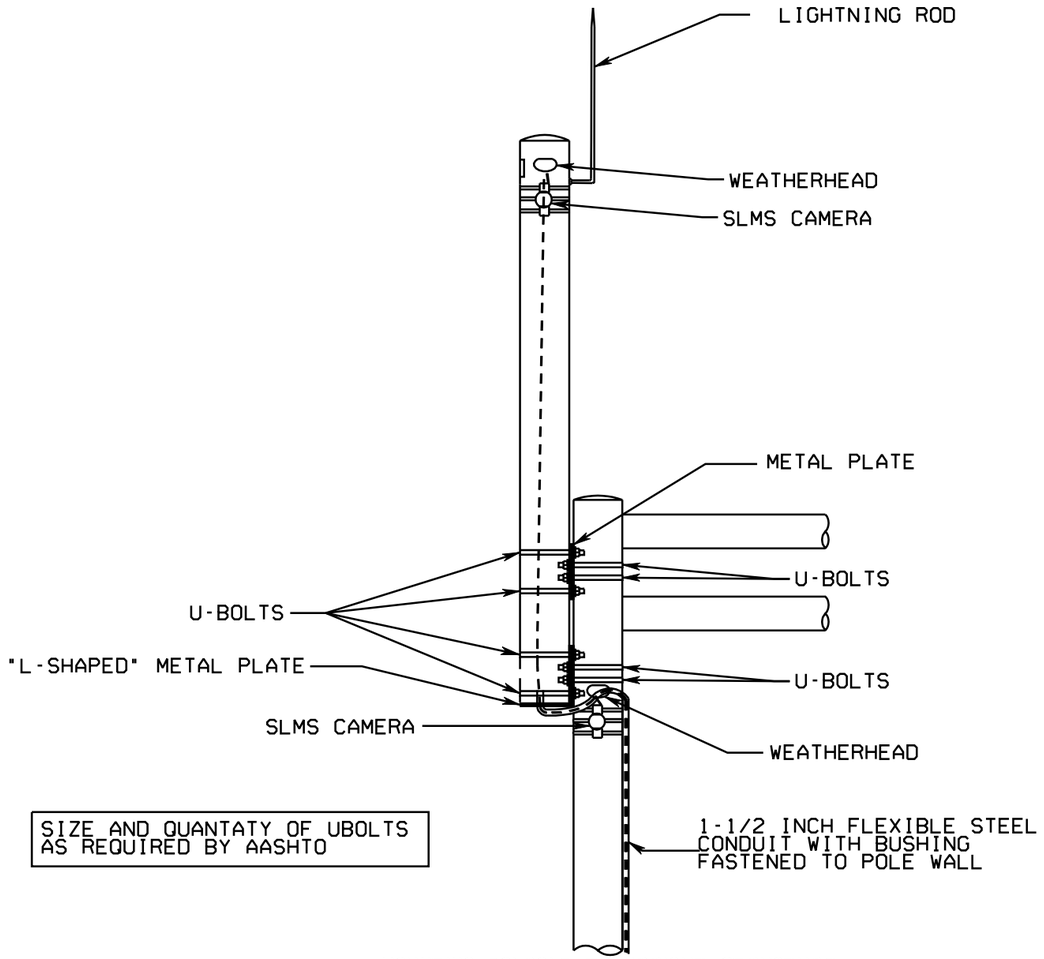
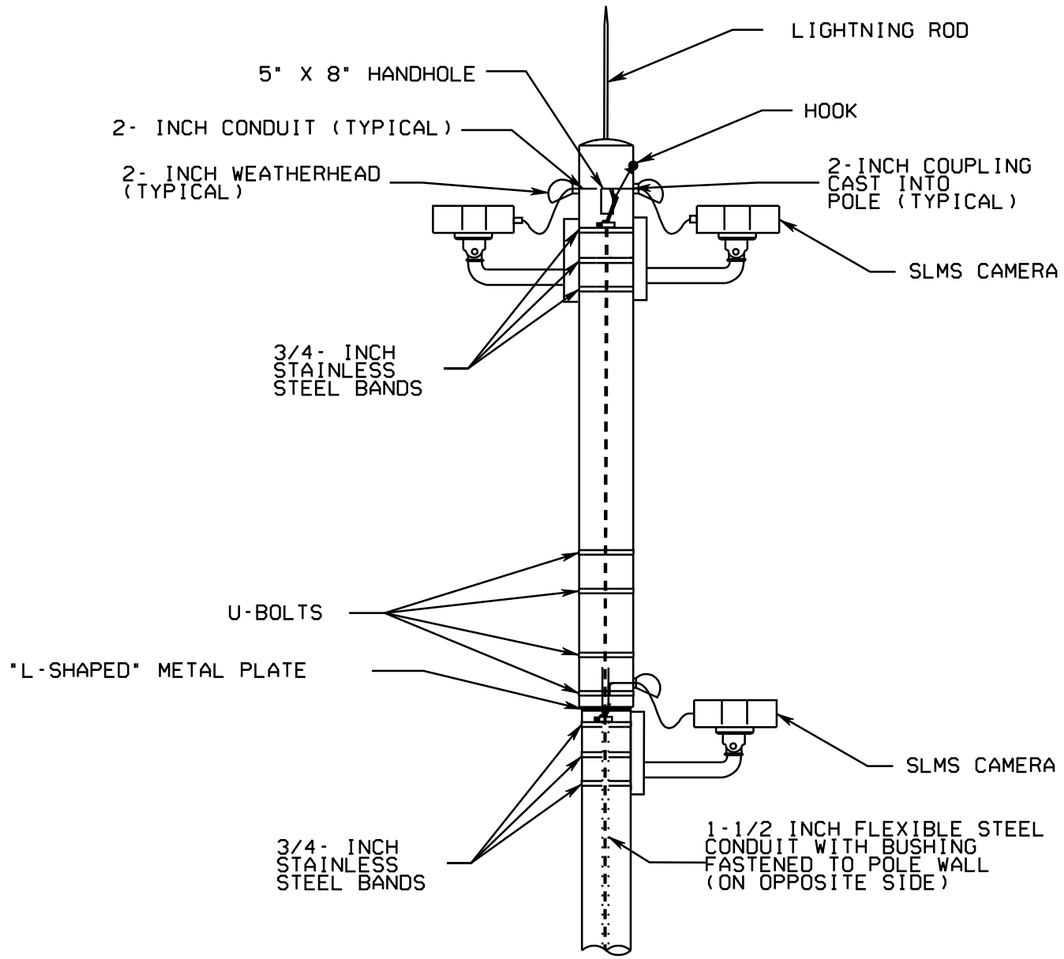
Dynamic Message Sign, and
Microwave Vehicle Detection Tables

EXHIBIT 26



MOUNTING 30' POLE TO UPRIGHT STRUCTURE WITH SLMS CAMERAS SIDE VIEW
NOT TO SCALE



MOUNTING 30' POLE TO UPRIGHT STRUCTURE WITH SLMS CAMERAS
NOT TO SCALE

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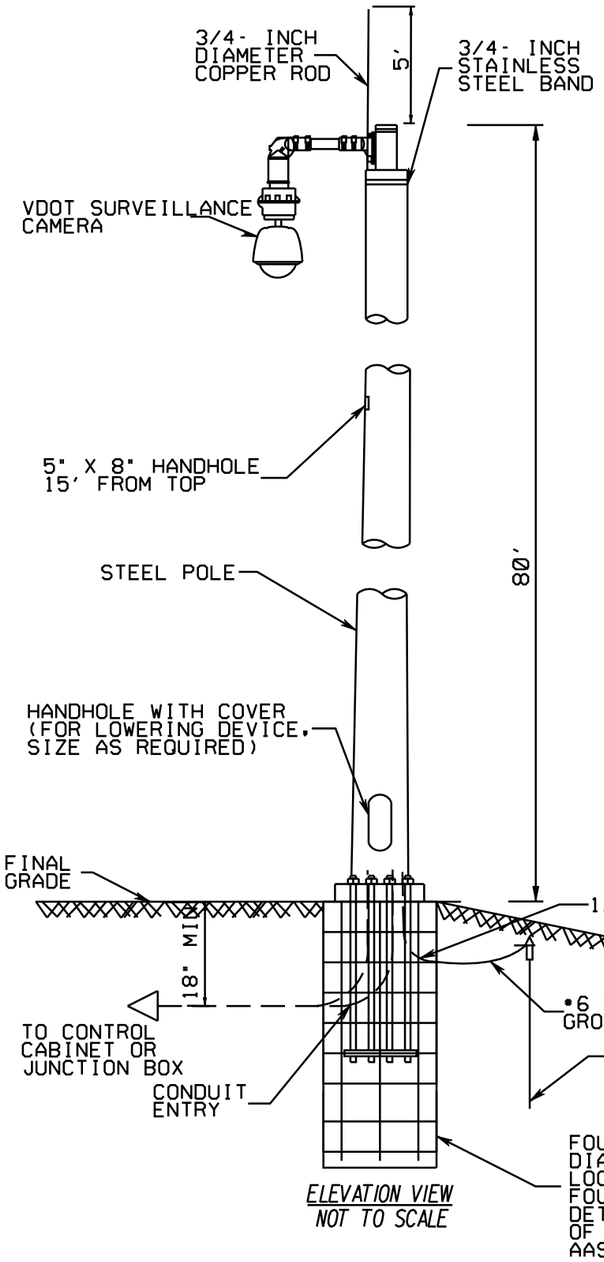
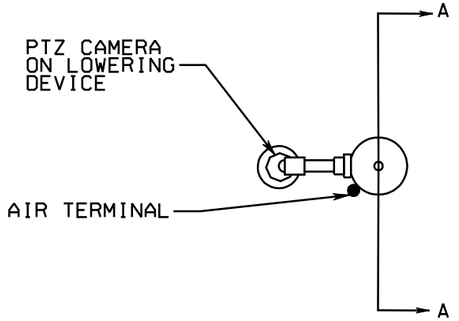
SLMS Fixed CCTV Camera
Upright Mounting Details

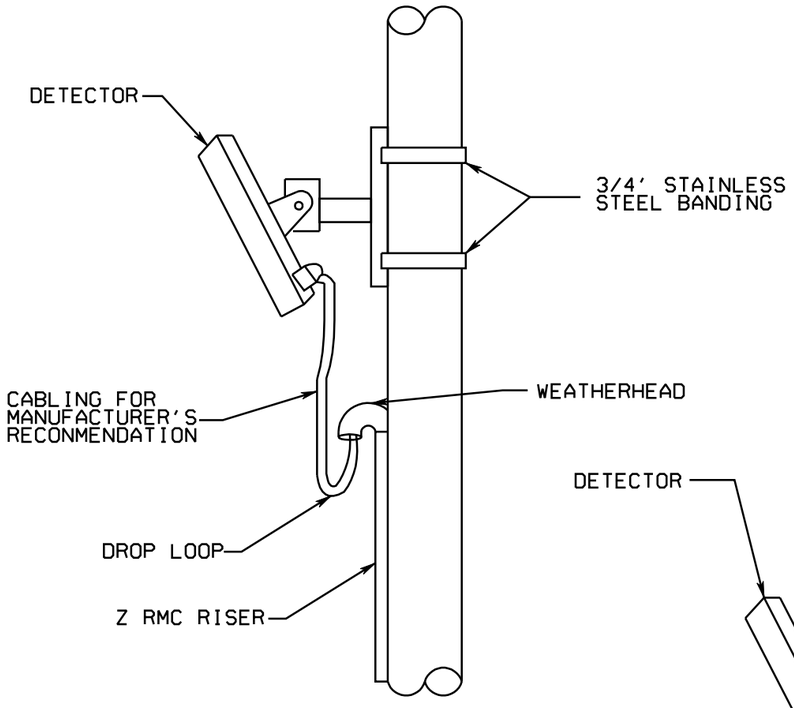
EXHIBIT 27



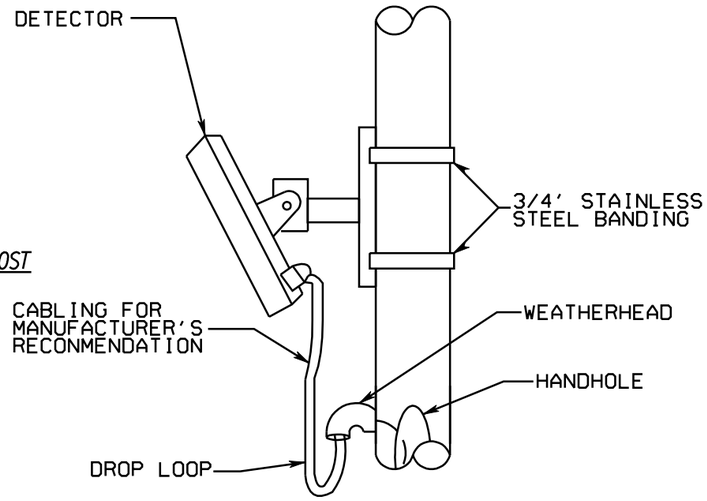
ELEVATION VIEW
NOT TO SCALE



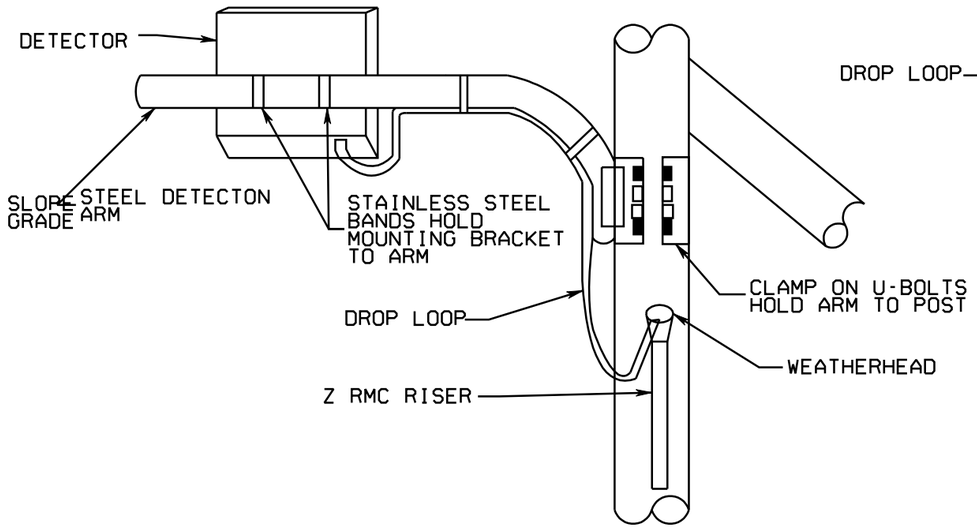
PLAN VIEW
NOT TO SCALE



MOUNTING ON SIGN STRUCTURE POST
NOT TO SCALE



MOUNTING ON DEDICATED POLE
NOT TO SCALE



MOUNTING ON STEEL ARM
NOT TO SCALE

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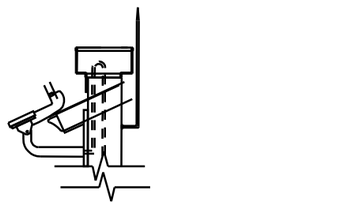
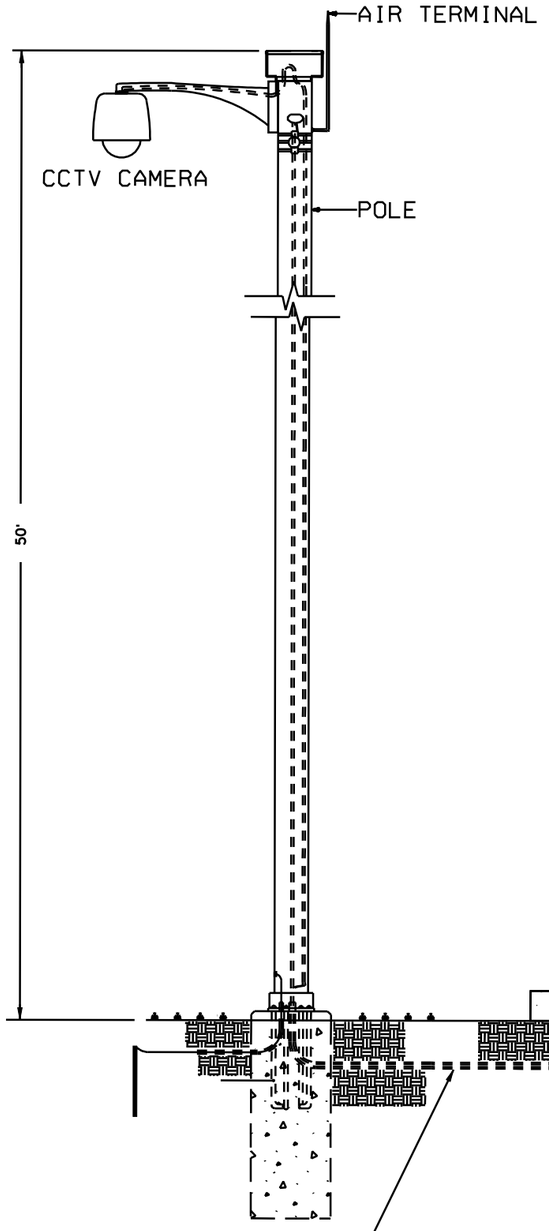
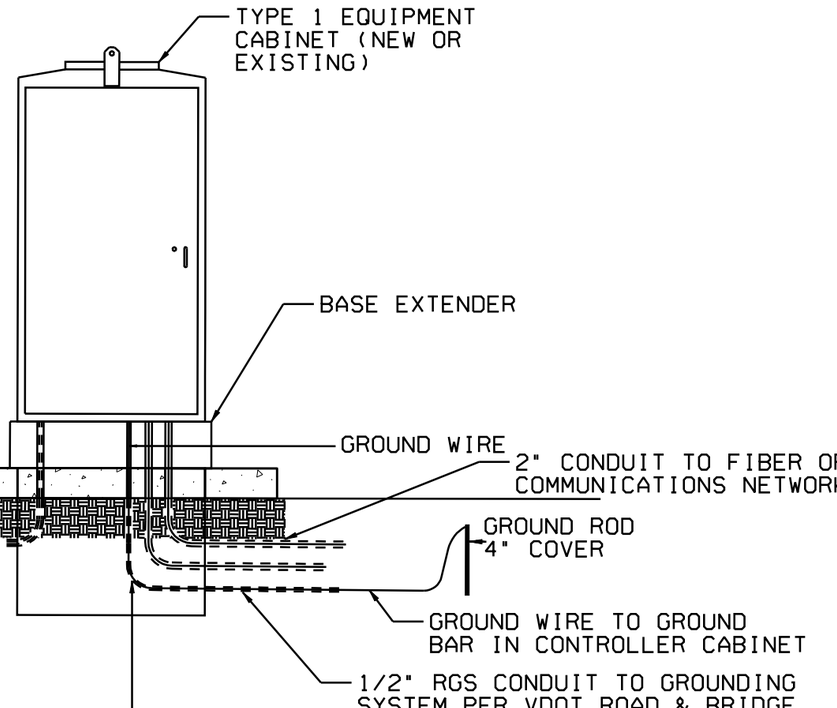
CCTV Camera and Microwave Vehicle Detection Mounting Details

EXHIBIT 28



OPTIONAL FIXED
MOUNT CCTV CAMERA





CCTV CAMERA ELEVATION DETAIL
50' WITHOUT LOWERING DEVICE
NOT TO SCALE

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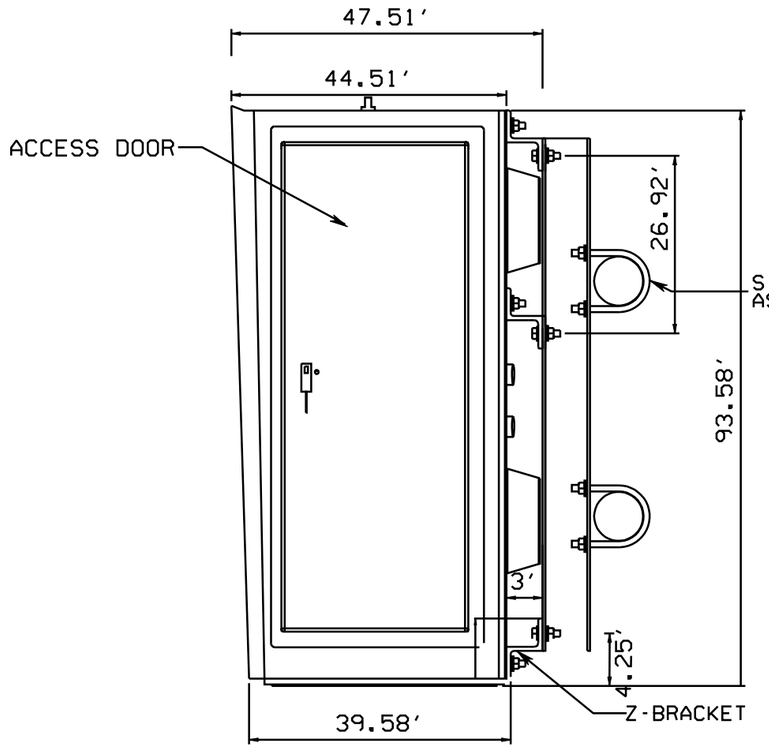
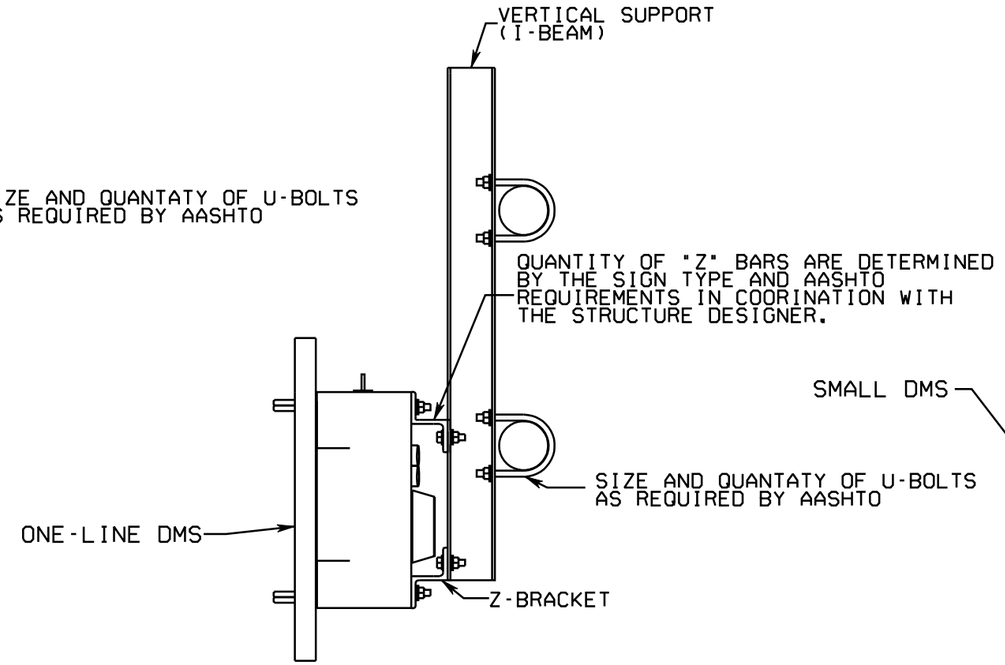
PTZ Camera Mounting Details

EXHIBIT 29



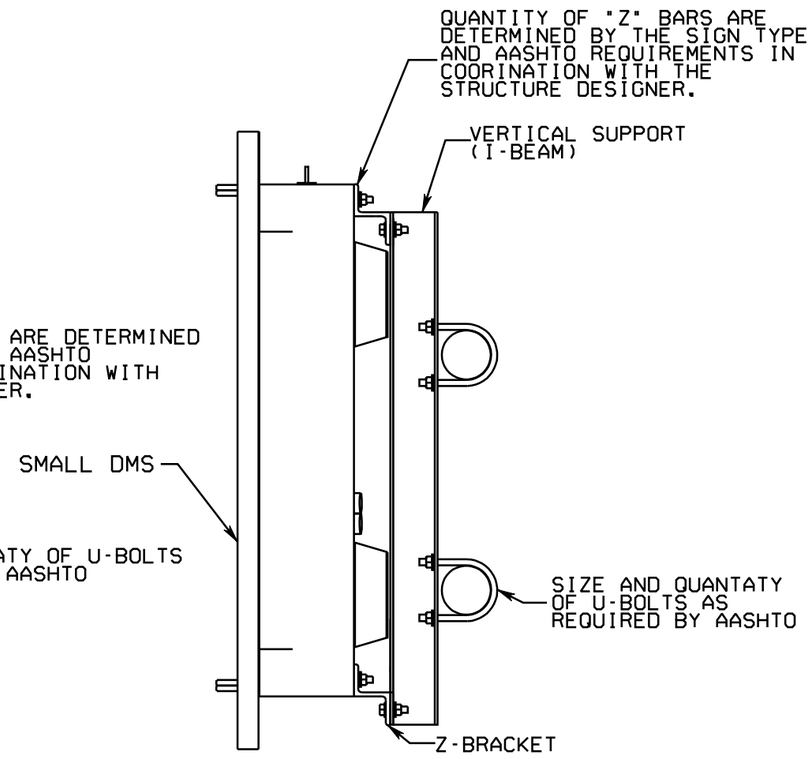
MOUNTING TYPE 1 DMS SIGN TO SIGN STRUCTURE

NOT TO SCALE



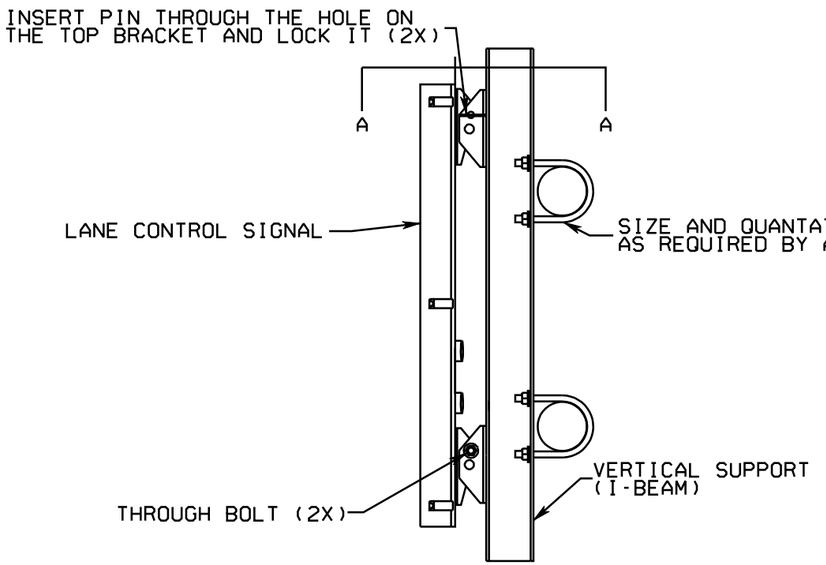
MOUNTING ONE LINE DMS SIGN TO SIGN STRUCTURE

NOT TO SCALE



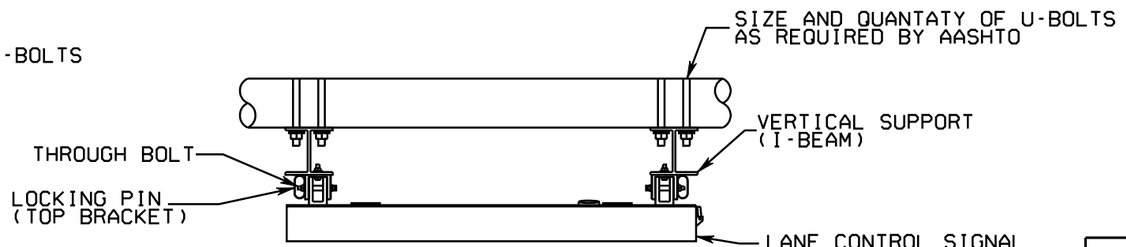
MOUNTING TYPE 2 DMS SIGN TO SIGN STRUCTURE

NOT TO SCALE



MOUNTING LANE CONTROL SIGNAL TO SIGN STRUCTURE

NOT TO SCALE



SECTION A-A

NOT TO SCALE

LANE

The LANE Team

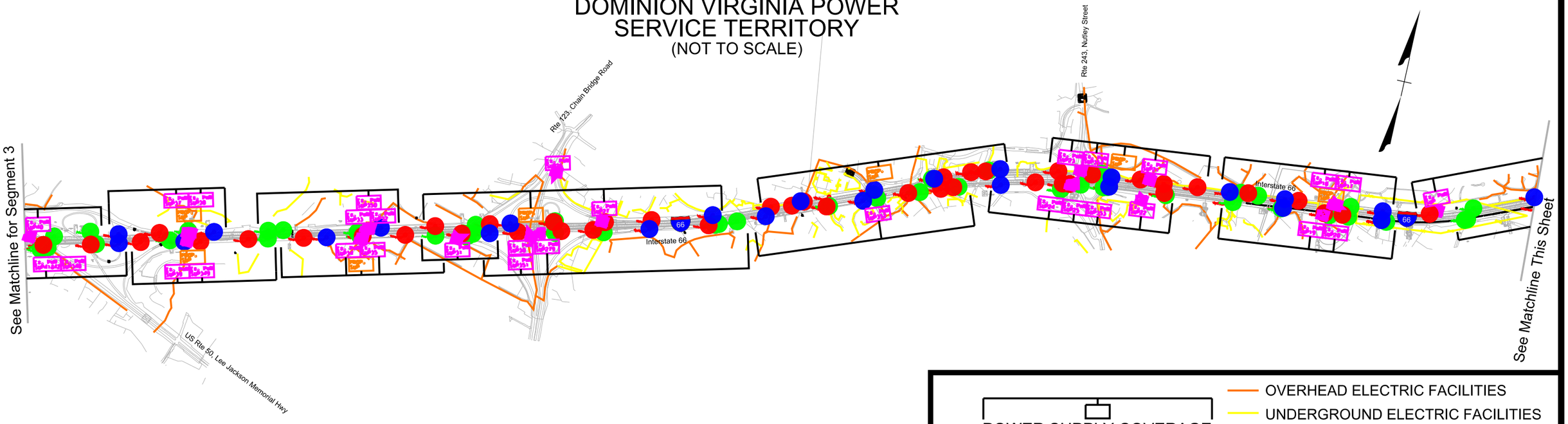
Dynamic Message Sign and Lane Control Sign Mounting Details

EXHIBIT 30

SEGMENT 2

DOMINION VIRGINIA POWER SERVICE TERRITORY

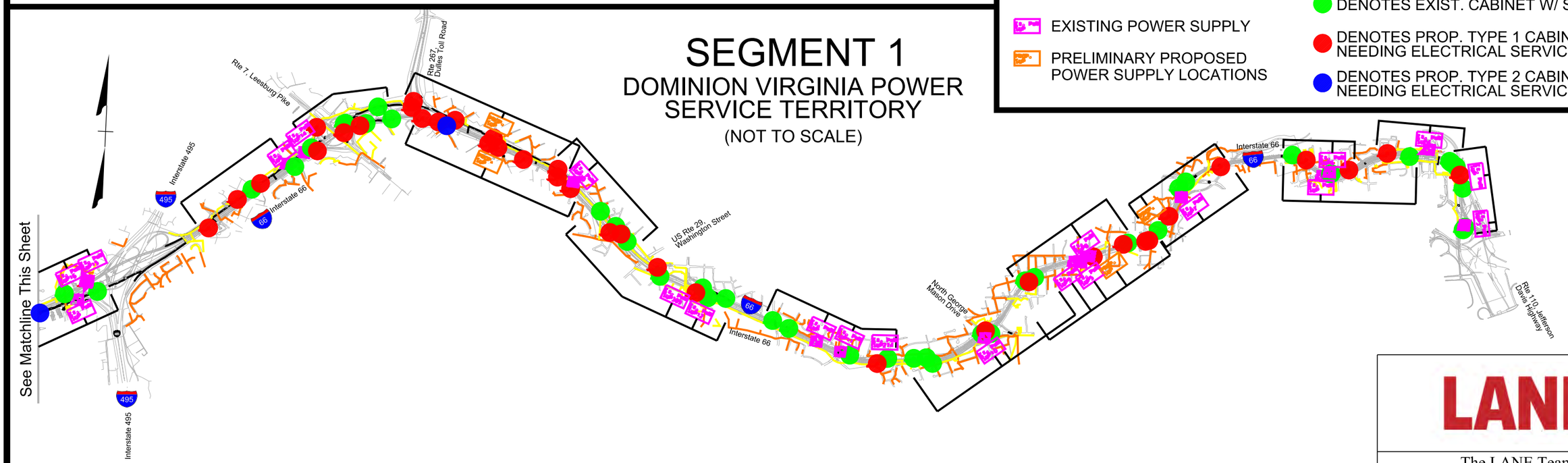
(NOT TO SCALE)



SEGMENT 1

DOMINION VIRGINIA POWER SERVICE TERRITORY

(NOT TO SCALE)



POWER SUPPLY COVERAGE

EXISTING POWER SUPPLY

PRELIMINARY PROPOSED POWER SUPPLY LOCATIONS

OVERHEAD ELECTRIC FACILITIES

UNDERGROUND ELECTRIC FACILITIES

DENOTES EXIST. CABINET W/ SERVICE

DENOTES PROP. TYPE 1 CABINET NEEDING ELECTRICAL SERVICE

DENOTES PROP. TYPE 2 CABINET NEEDING ELECTRICAL SERVICE

LANE

The LANE Team

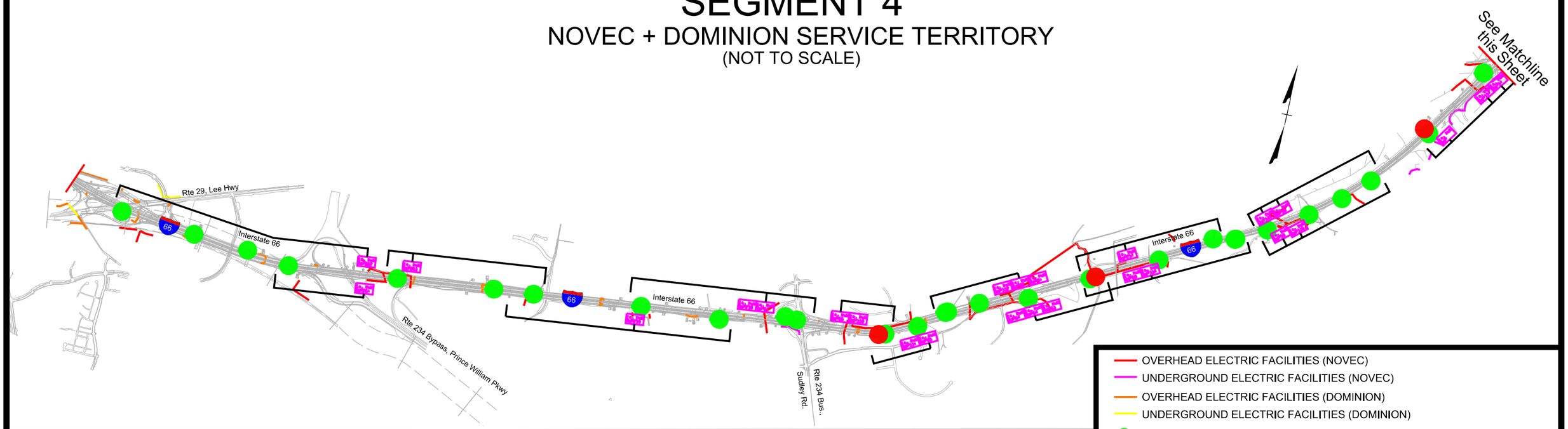
Electric Utility Layout & Power Distrubition Plan (RFP Segments 1 and 2)

EXHIBIT 31

SEGMENT 4

NOVEC + DOMINION SERVICE TERRITORY

(NOT TO SCALE)



OVERHEAD ELECTRIC FACILITIES (NOVEC)

UNDERGROUND ELECTRIC FACILITIES (NOVEC)

OVERHEAD ELECTRIC FACILITIES (DOMINION)

UNDERGROUND ELECTRIC FACILITIES (DOMINION)

DENOTES EXIST. CABINET W/ SERVICE

DENOTES PROP. TYPE 1 CABINET NEEDING ELECTRICAL SERVICE

DENOTES PROP. TYPE 2 CABINET NEEDING ELECTRICAL SERVICE

POWER SUPPLY COVERAGE

EXISTING POWER SUPPLY

PRELIMINARY PROPOSED POWER SUPPLY LOCATIONS

SEGMENT 3

NOVEC + DOMINION SERVICE TERRITORIES

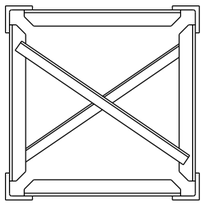
(NOT TO SCALE)

LANE

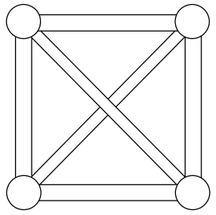
The LANE Team

Electric Utility Layout & Power Distribution Plan (RFP Segments 3 and 4)

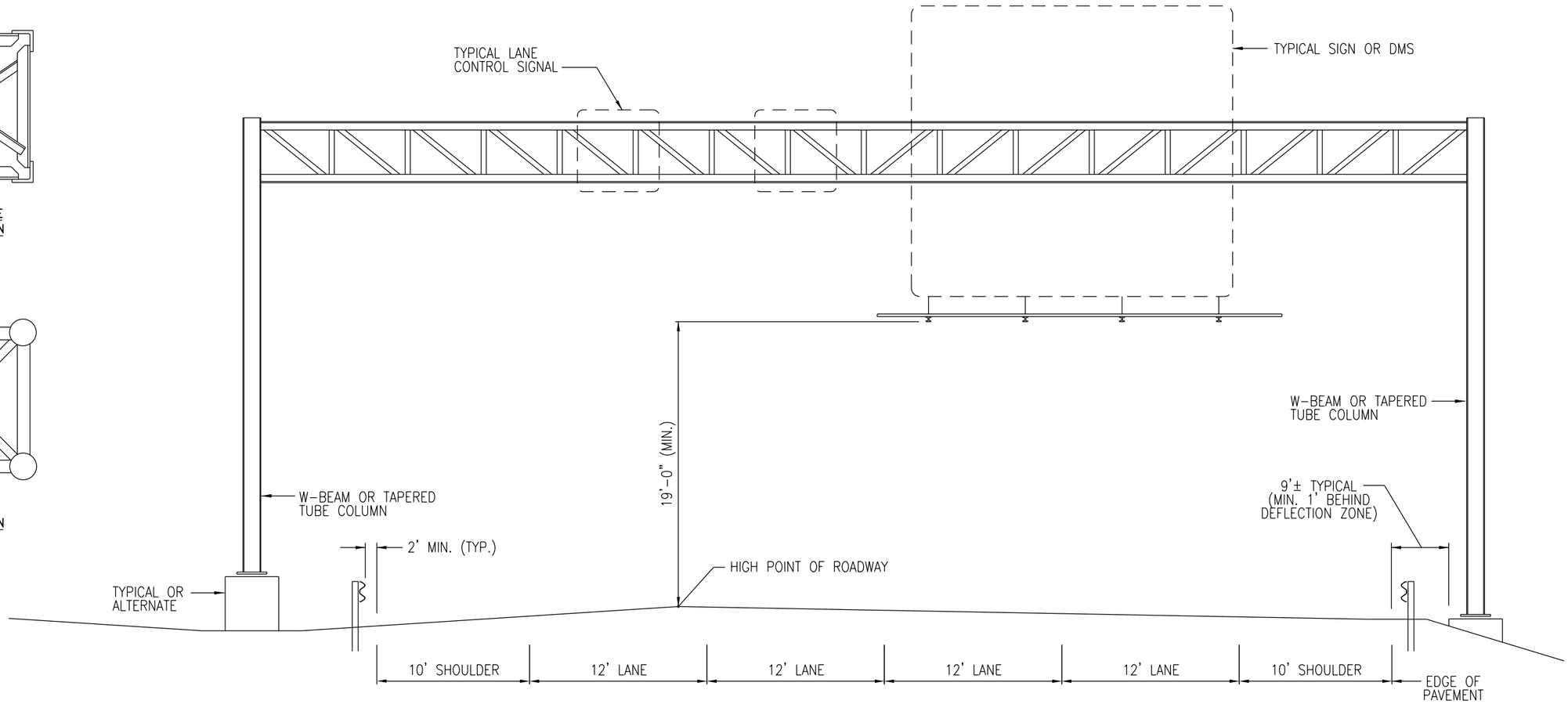
EXHIBIT 32



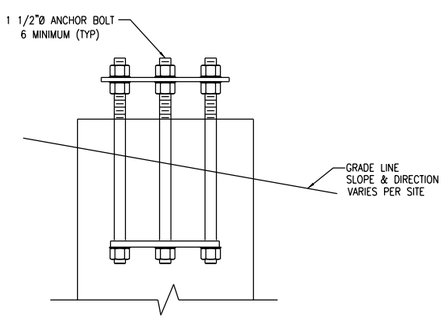
TYPICAL ANGLE
TRUSS SECTION



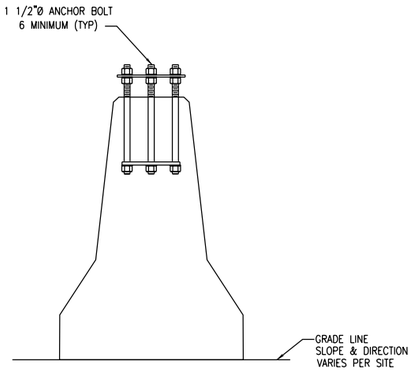
TYPICAL PIPE
TRUSS SECTION



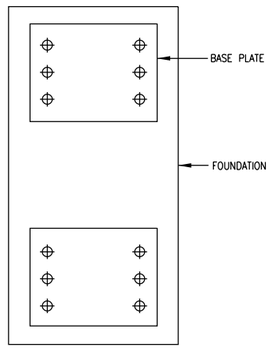
ELEVATION



TYPICAL FOUNDATION
ELEVATION



ALTERNATE FOUNDATION
FOR CONCRETE MEDIAN
ELEVATION



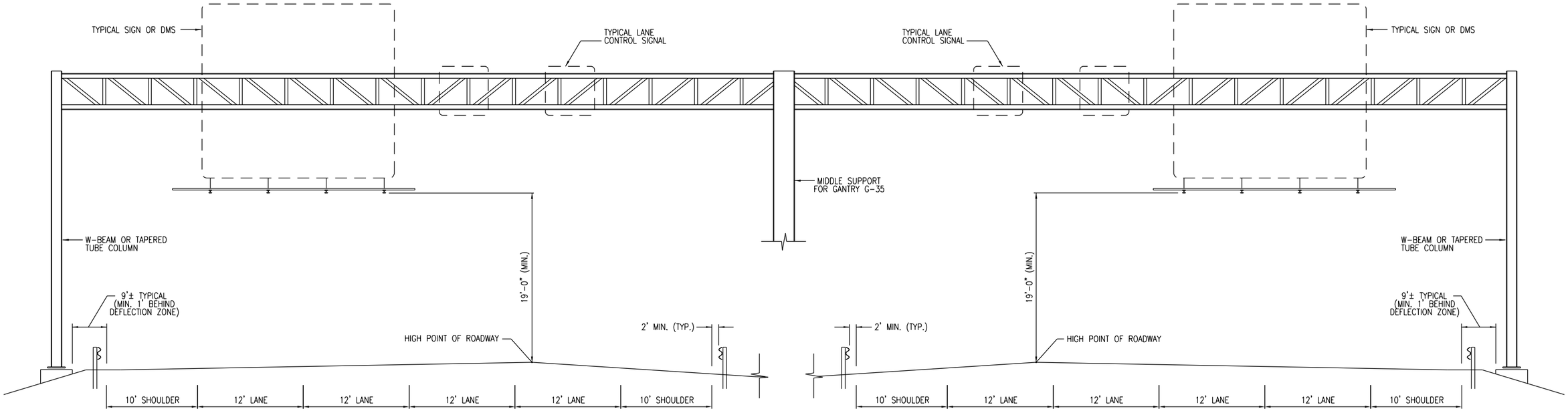
FOUNDATION/BASE PLATE
TYPICAL PLAN

LANE

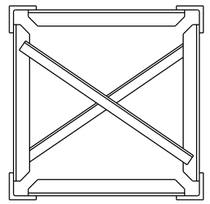
The LANE Team

Typical Overhead Sign Structure or
Lane Signal Gantry (One Direction)

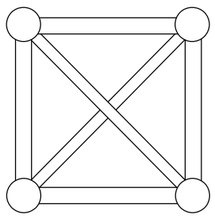
EXHIBIT 33



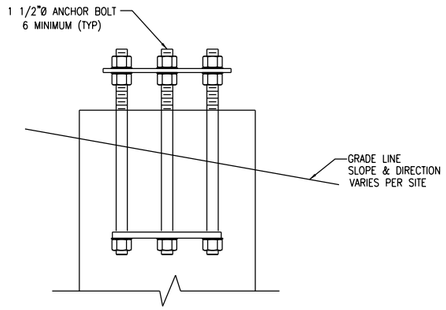
ELEVATION



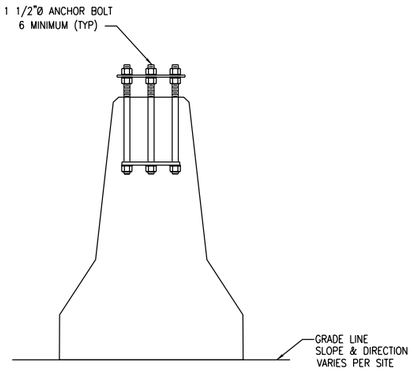
TYPICAL ANGLE TRUSS SECTION



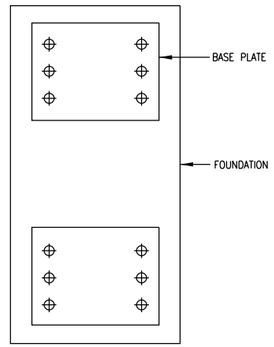
TYPICAL PIPE TRUSS SECTION



TYPICAL FOUNDATION ELEVATION



ALTERNATE FOUNDATION FOR CONCRETE MEDIAN ELEVATION



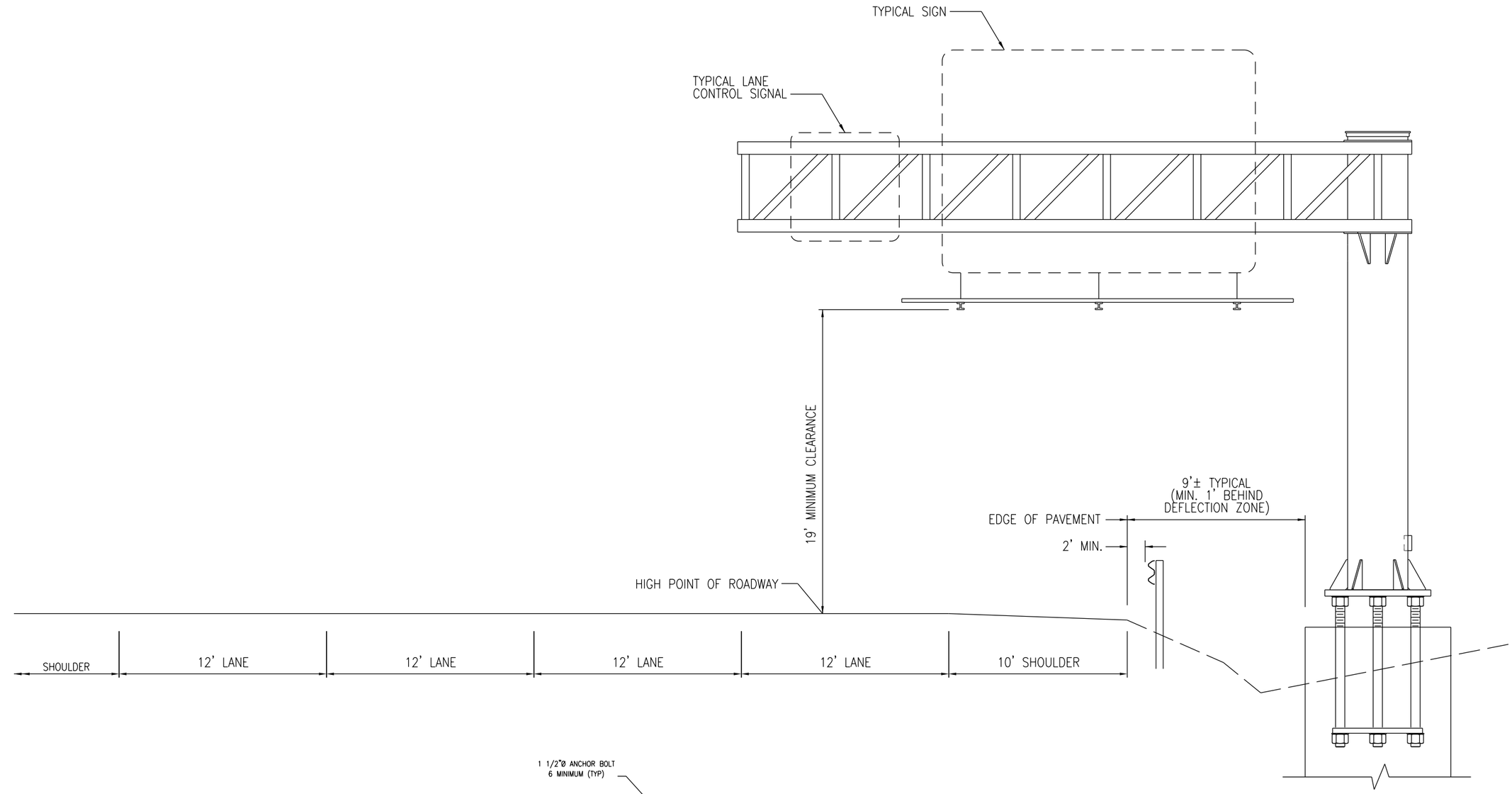
FOUNDATION/BASE PLATE TYPICAL PLAN

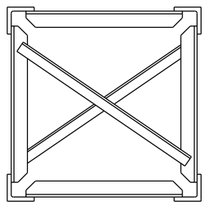
LANE

The LANE Team

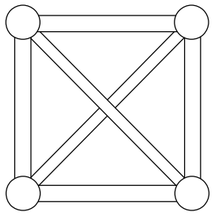
Typical Overhead Sign Structure or Lane Signal Gantry (Two Directions)

EXHIBIT 34

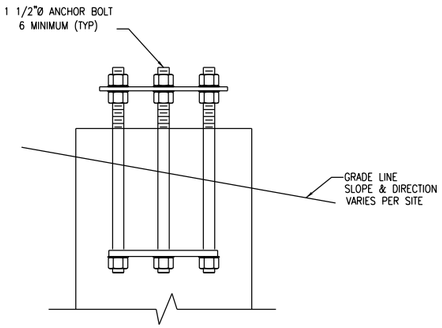




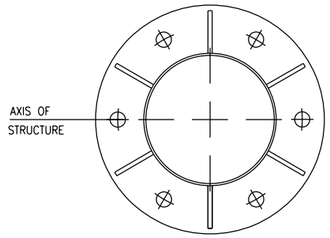
TYPICAL ANGLE
TRUSS SECTION



TYPICAL PIPE
TRUSS SECTION



TYPICAL FOUNDATION
ELEVATION



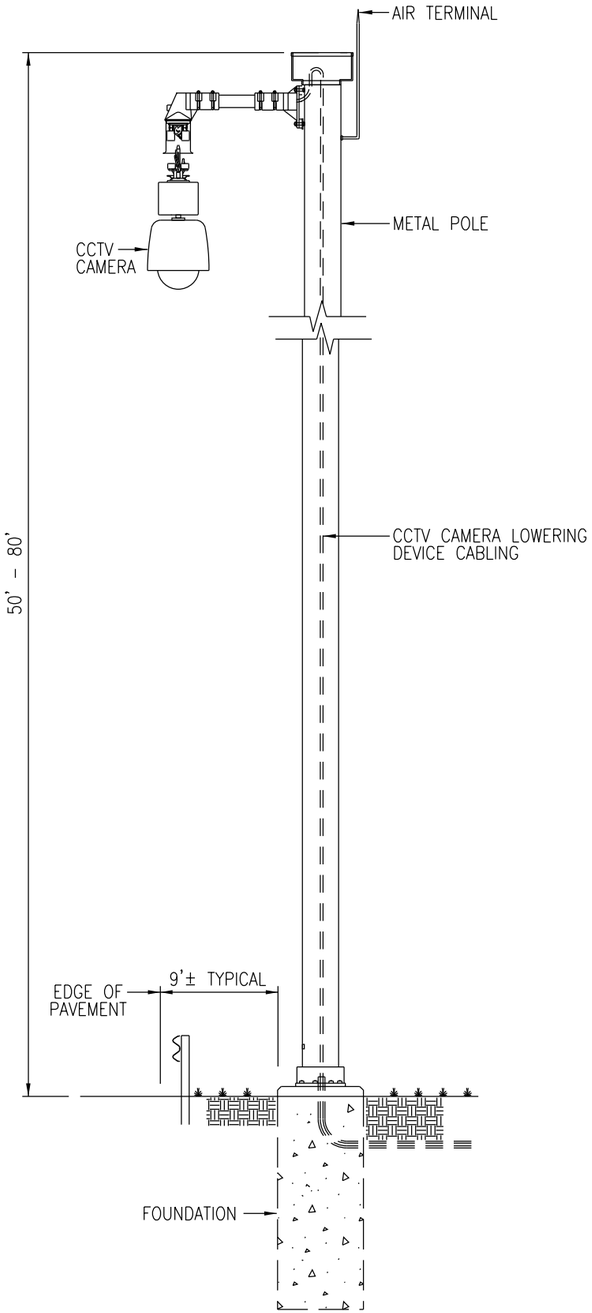
BASE PLATE DETAIL

LANE

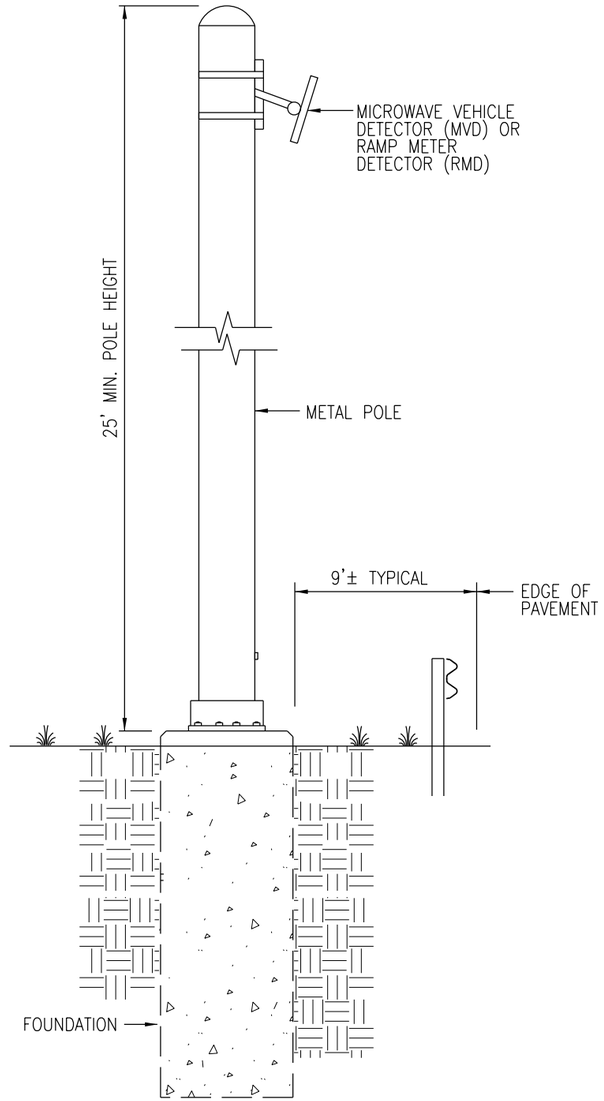
The LANE Team

Typical Cantilever Sign Structure
or Lane Signal Gantry

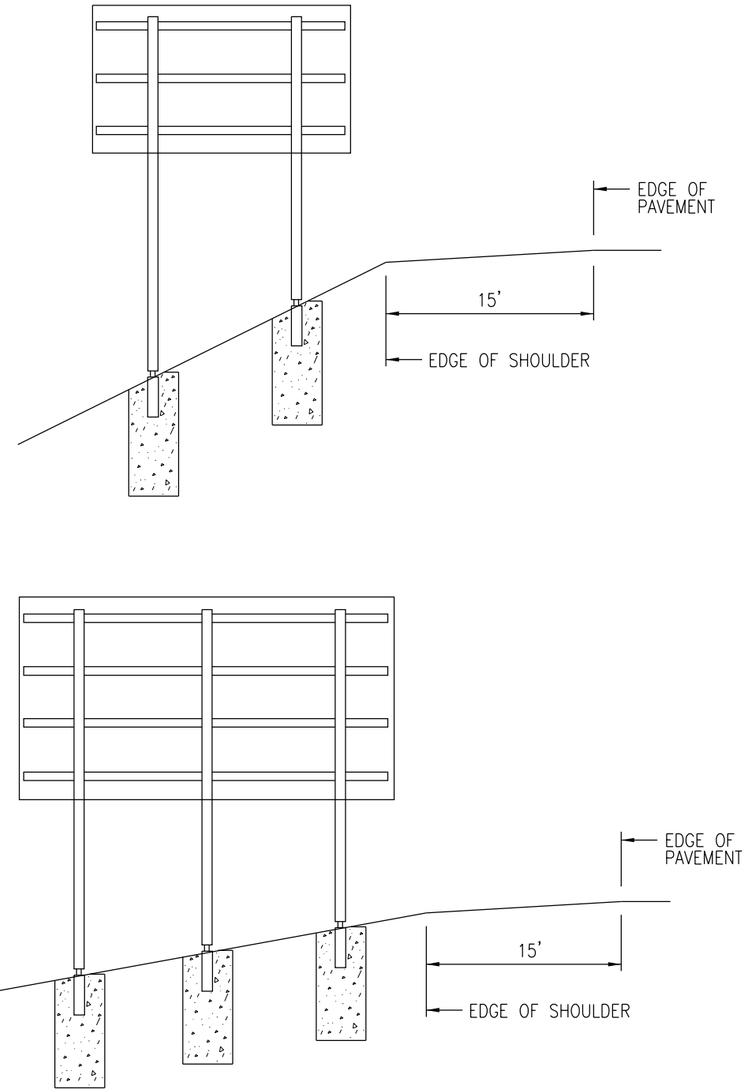
EXHIBIT 35



TYPICAL CCTV
CAMERA POLE



TYPICAL MICROWAVE VEHICLE
DETECTOR (MVD) POLE



TYPICAL DETAILS FOR
INTERSTATE SIGN STRUCTURES

LANE

The LANE Team

Miscellaneous Poles/Details

EXHIBIT 36

LANE

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