# LIST OF APPENDICES

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# Appendix A-1

## QUALITY REVIEW

As an integral part of the design process, every designer should perform quality reviews, or checks, to review their work. Designers should review the content of both their plans and their PS&E packages. In addition, for in-house projects it is good practice to let another designer review your work prior to submission to the Team Leader.

A thorough review of your design involves checking messages, verifying destinations and their spelling, checking consistency and application, calculating quantities and ensuring all items are accounted for in the estimate and specifications. Before a plan is submitted to the TEDD Project Manager and ultimately the Team Leader, this information should be checked by both the designer, and another designer/manager to ensure quality control and quality assurance.

There are some items that the designer should always keep in mind on a project. Each of these items is discussed in the following sections.

### STRUCTURE LOCATIONS

After locations are chosen for all sign structures, signal structures and lighting structures it is important to cross reference these locations with the highway plans. Make sure that there are no conflicts with drainage structures, drainage ditches, overhead utilities, and underground utilities. Designers should also check the Right of Way line to ensure that all proposed equipment is placed within proposed Right of Way.

### UPDATE CROSS REFERENCES

Whenever changes are made to the plan sheets, verify that all appropriate sheets are updated. For instance, changing a sign size may affect the plan sheet, the sign detail sheet, the wood or steel support tables, and the index of quantities.

### TRAFFIC BARRIER END TREATMENTS

Check the use of end treatments and make sure that they are appropriate. Also check the use of surface adjustment/grading quantities where slopes are greater than 10:1.

### QUANTITIES

Make sure that quantities are consistent from the plan sheets to the quantity sheets to the estimate. Verify that related quantities are included, such as breakaway couplings for steel supports and ground rods for each structure.

### SPECIFICATIONS

The designer should verify that the latest specifications have been included in the IFB and any special notes have been added as necessary.

# Appendix A-2

## CHECKLISTS

### REVIEWING YOUR WORK

The following pages include a copy of the TEDD Design Checklists which include four Sections: Signing and Pavement Marking, Lighting, Traffic Signals and Document Preparation. These checklists can be used as design aids as well as for quality control reviews. They outline all the major areas of a plan which should be verified by both the designer and the reviewer. TEDD requires that the appropriate checklists are completed for all projects by the designer and are submitted with the PS&E package along with the signed Cover Letter.

### CHECKING YOUR PS&E PACKAGE

In addition to checking the design, it is important to verify that the PS&E package is complete and contains all the information and approvals necessary to construct the project. Three checklists have been developed to assist TEDD Project Manager's with this: the "TEDD Areawide Checklist," "TEDD Developer Checklist" and the "TEDD Insert Checklist." As projects progress, TEDD Project Managers should keep these checklists updated to help ensure that the final submission package will be complete.

# TEDD Design Checklist

| Project Identification | | | |
|---|---|---|---|
| **TIMS Number:** | | **District:** | |
| **Designer:** | | **Review Date:** | |
| **Project Name:** | | | |
| **Type of Project:** | ☐ **Areawide** | ☐ **Insert/Advertised** | |

Complete all applicable sections of the TEDD Design Checklist as outlined below. Note required revisions, errors and omissions. Submit checklist with PS&E package to Team Leader for approval.

| Section | Pages | Complete | N/A |
|---|---|---|---|
| **Section 1 – Signing and Pavement Marking** | **1 - 10** | ☐ | ☐ |
| **Section 2 – Lighting** | **11 - 18** | ☐ | ☐ |
| **Section 3 – Traffic Signals** | **19 - 25** | ☐ | ☐ |
| **Section 4 – Document Preparation** | **26 - 30** | ☐ | ☐ |

**Reviewer Notes:**

**Consultant Design Engineer:**

***Signature:*** _____ ***Name:*** _____

***Date:*** _____

**TEDD Project Manager:**

***Signature:*** _____ ***Name:*** _____

***Date:*** _____

**TEDD Team Leader:**

***Signature:*** _____ ***Name:*** _____

***Date:*** _____

**SECTION 1 – SIGNING AND PAVEMENT MARKING** – Complete Section 1 for projects that include signing and pavement marking design.

| **SECTION 1 – SIGNING AND PAVEMENT MARKING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| **GENERAL NOTES AND PROPOSALS SHEET (SN-1)** | | | | |
| ***The following are correctly noted on the General Notes and Proposal Sheet:*** | | | | |
| • Appropriate standards | ☐ | ☐ | ☐ | |
| • Sign orientation | ☐ | ☐ | ☐ | |
| • Overhead sign alignment | ☐ | ☐ | ☐ | |
| • Project requirements | ☐ | ☐ | ☐ | |
| • Project-specific exceptions to standard criteria | ☐ | ☐ | ☐ | |
| • Project approvals | ☐ | ☐ | ☐ | |
| • Project title | ☐ | ☐ | ☐ | |
| • TIMS number | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **PLAN SHEETS (SN-2)** | | | | |
| ***The following items are included and shown correctly on the Plan Sheets:*** | | | | |
| • Existing and proposed conditions (Only pertinent information should be shown on plans. All other levels should be turned off.) | ☐ | ☐ | ☐ | |
| • Limits of work | ☐ | ☐ | ☐ | |
| • Base mapping | ☐ | ☐ | ☐ | |
| • North arrow | ☐ | ☐ | ☐ | |
| • Directional arrows with destinations | ☐ | ☐ | ☐ | |
| • Match lines with sheet numbers or letters | ☐ | ☐ | ☐ | |
| • Baseline / Stationing with labels | ☐ | ☐ | ☐ | |
| • Correct scale | ☐ | ☐ | ☐ | |
| • Key / Legend | ☐ | ☐ | ☐ | |
| • Signing | ☐ | ☐ | ☐ | |
| • Pavement Marking | ☐ | ☐ | ☐ | |
| • Project notes | ☐ | ☐ | ☐ | |
| • Street names shown on cross streets | ☐ | ☐ | ☐ | |
| • Route numbers with cardinal direction (e.g. I-70 (WBL)) and road name | ☐ | ☐ | ☐ | |
| • Right-of-way lines and labels (existing and proposed) | ☐ | ☐ | ☐ | |
| • Current Borders / Signature / Revision block | ☐ | ☐ | ☐ | |
| • Consultant logo | ☐ | ☐ | ☐ | |
| • TIMS Number and Construction Contract Number | ☐ | ☐ | ☐ | |
| | | | | |
| **Existing Sign Information** | | | | |
| ***The following existing sign information is included and shown correctly on the Plan Sheets:*** | | | | |
| • Existing sign structure and message at correct location | ☐ | ☐ | ☐ | |
| • Type of sign structure | ☐ | ☐ | ☐ | |
| • Sign size | ☐ | ☐ | ☐ | |
| • Overhead sign structure number | ☐ | ☐ | ☐ | |

| SECTION 1 – SIGNING AND PAVEMENT MARKING | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Sign messages on plan sheet oriented to read in direction of travel | ☐ | ☐ | ☐ | |
| • Designations for existing signs to remain, to be relocated, or to be removed | ☐ | ☐ | ☐ | |
| • Information is provided for sign disposal or salvage | ☐ | ☐ | ☐ | |
| • The following signs to be reused are correctly placed and have appropriate messages to fit proposed conditions: | | | | |
| o Guide signs | ☐ | ☐ | ☐ | |
| o Lane Use signs | ☐ | ☐ | ☐ | |
| o Turn restriction signs | ☐ | ☐ | ☐ | |
| o Parking restriction signs | ☐ | ☐ | ☐ | |
| o Other signs | ☐ | ☐ | ☐ | |
| | | | | |
| **Proposed Sign Information** | | | | |
| ***The following proposed sign information is included and shown correctly on the Plan Sheets:*** | | | | |
| • Proposed sign structure and message at correct location | ☐ | ☐ | ☐ | |
| • Stations or measurements from a fixed object | ☐ | ☐ | ☐ | |
| • Sign numbers | ☐ | ☐ | ☐ | |
| o Cantilever signs: C-1, C-2, etc. | ☐ | ☐ | ☐ | |
| o Overhead signs: OH-1, OH-2, etc. | ☐ | ☐ | ☐ | |
| o Bridge mount signs: BM-1, BM-2, etc. | ☐ | ☐ | ☐ | |
| o Ground mount signs: GM-1, GM-2, etc. | ☐ | ☐ | ☐ | |
| o Regulatory and warning signs: 1,2,3, etc. | ☐ | ☐ | ☐ | |
| o Multiple signs on a single structure are numbered independently using letters (e.g. OH-1A, OH-1B, etc.) | ☐ | ☐ | ☐ | |
| o All signs are numbered | ☐ | ☐ | ☐ | |
| o Each sign is assigned only one number | ☐ | ☐ | ☐ | |
| • Sign size and designation | ☐ | ☐ | ☐ | |
| • Proper sign orientation (noted as required) | ☐ | ☐ | ☐ | |
| • Sign messages on plan sheet oriented to read in direction of travel | ☐ | ☐ | ☐ | |
| • Sign sizes match functional classification of roadway | ☐ | ☐ | ☐ | |
| • Sign locations comply with minimum lateral offset requirements | ☐ | ☐ | ☐ | |
| • Signs are located as far from the traveled roadway as possible to provide adequate recovery area | ☐ | ☐ | ☐ | |
| • Cantilever signs are situated above the shoulder or over lane drop | ☐ | ☐ | ☐ | |
| • Maintenance activities can take place off the traveled roadway | ☐ | ☐ | ☐ | |

| SECTION 1 – SIGNING AND PAVEMENT MARKING | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Sign locations provide adequate sight distance from downstream and upstream signalized intersections | ☐ | ☐ | ☐ | |
| • All non-breakaway sign structures are located outside of clear zone or protected with traffic barrier | ☐ | ☐ | ☐ | |
| • Adequate clearance from overhead and underground utilities is provided (overhead utility line heights are shown on plan) | ☐ | ☐ | ☐ | |
| • Plan sheet items match legend and legend only includes symbols used in project | ☐ | ☐ | ☐ | |
| | | | | |
| ***Regulatory signs are included and comply with the following design requirements:*** | | | | |
| • Size, shape and color of regulatory signs are in accordance with the MdMUTCD | ☐ | ☐ | ☐ | |
| | | | | |
| ***Warning signs are included and comply with the following design requirements:*** | | | | |
| • Size, shape and color of warning signs are in accordance with the MdMUTCD | ☐ | ☐ | ☐ | |
| o Fluorescent Yellow-Green for school signs | ☐ | ☐ | ☐ | |
| o Fluorescent Yellow for warning signs | ☐ | ☐ | ☐ | |
| • Warning sign placement provides adequate PIEV time in accordance with the MdMUTCD | ☐ | ☐ | ☐ | |
| | | | | |
| ***Guide signs for conventional roads are included and comply with the following design requirements:*** | | | | |
| • Shape and color of guide signs are in accordance with the MdMUTCD | ☐ | ☐ | ☐ | |
| • Correct control cities are identified with consistent spelling and abbreviations | ☐ | ☐ | ☐ | |
| ***The following guide sign types have been correctly shown on the Plan Sheets:*** | | | | |
| • Route signs / assemblies (advance and confirmatory) | ☐ | ☐ | ☐ | |
| • Destination and distance signs | ☐ | ☐ | ☐ | |
| • Street name signs (advance and intersection) | ☐ | ☐ | ☐ | |
| • General service signs | ☐ | ☐ | ☐ | |
| • Reference location signs | ☐ | ☐ | ☐ | |
| • General information signs | ☐ | ☐ | ☐ | |
| • Parking Area / Park and Ride signs | ☐ | ☐ | ☐ | |
| • Rest Area / Scenic Area signs | ☐ | ☐ | ☐ | |
| • Weigh Station signs | ☐ | ☐ | ☐ | |

| SECTION 1 – SIGNING AND PAVEMENT MARKING | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| ***Guide signs for freeways and expressways are included and comply with the following design requirements:*** | | | | |
| • Shape and color of guide signs are in accordance with the MdMUTCD | ☐ | ☐ | ☐ | |
| • Sign spreading / spacing is used correctly | ☐ | ☐ | ☐ | |
| • 800' minimum spacing is provided between guide signs | ☐ | ☐ | ☐ | |
| • Special requirements for diagrammatic signs are addressed | ☐ | ☐ | ☐ | |
| • Correct control cities are identified with consistent spelling and abbreviations | ☐ | ☐ | ☐ | |
| • Arrow sizes, types and orientations are correct | ☐ | ☐ | ☐ | |
| • Left exits are properly signed | ☐ | ☐ | ☐ | |
| • Exit numbers and letters are correct | ☐ | ☐ | ☐ | |
| • CHART | | | | |
| o Special requirements for changeable message signs are addressed | ☐ | ☐ | ☐ | |
| o Senior Staff Engineer contacted to confirm need | ☐ | ☐ | ☐ | |
| o DMS structures are located outside of clear zone or protected with traffic barrier | ☐ | ☐ | ☐ | |
| o 800' minimum spacing is provided between DMS structures and adjacent guide signs | ☐ | ☐ | ☐ | |
| ***The following guide sign types have been correctly shown on the Plan Sheets:*** | | | | |
| • Route signs / assemblies | ☐ | ☐ | ☐ | |
| • Distance signs | ☐ | ☐ | ☐ | |
| • Interchange guide signs | ☐ | ☐ | ☐ | |
| o Advance Guide signs (1 mi., ½ mi.) | ☐ | ☐ | ☐ | |
| o Exit Direction signs | ☐ | ☐ | ☐ | |
| o Next Exit supplemental signs | ☐ | ☐ | ☐ | |
| o Exit Gore signs | ☐ | ☐ | ☐ | |
| o Interchange Sequence signs | ☐ | ☐ | ☐ | |
| • General Service signs | ☐ | ☐ | ☐ | |
| • Rest and Scenic Area signs | ☐ | ☐ | ☐ | |
| • Tourist Information and Welcome Center signs | ☐ | ☐ | ☐ | |
| • Mile markers | ☐ | ☐ | ☐ | |
| • Weigh Station signs | ☐ | ☐ | ☐ | |
| • Preferential Only lane signs | ☐ | ☐ | ☐ | |

| **SECTION 1 – SIGNING AND PAVEMENT MARKING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| ***Specific service signs are included and comply with the following design requirements:*** | | | | |
| • Businesses / services are eligible | ☐ | ☐ | ☐ | |
| • Sign placement follows correct order (Gas-Food-Lodging-Camping-Attractions, moving back from gore) | ☐ | ☐ | ☐ | |
| • Distances (if needed) are included | ☐ | ☐ | ☐ | |
| • Exit numbers (if required) are correct | ☐ | ☐ | ☐ | |
| | | | | |
| ***Recreational and cultural interest area signs are included and comply with the following design requirements:*** | | | | |
| • Byways, community gateways, dedication signing, TAC, MD history, rivers, attractions are included as appropriate | ☐ | ☐ | ☐ | |
| | | | | |
| ***Bicycle lane signing is included and complies with the following design requirements:*** | | | | |
| • Size, shape and color of bicycle lane signs are in accordance with the MdMUTCD and the Maryland SHA Bicycle and Pedestrian Design Guidelines | ☐ | ☐ | ☐ | |
| • BIKE LANE (R3-17) sign is used only in conjunction with marked bicycle lanes | ☐ | ☐ | ☐ | |
| | | | | |
| ***Signs with signals are included and comply with the following design requirements:*** | | | | |
| • Hazard Identification Beacons (HIBs) are included as appropriate | ☐ | ☐ | ☐ | |
| • Highway Advisory Radios (HARs) are included as appropriate | ☐ | ☐ | ☐ | |
| | | | | |
| **General Signing Information** | | | | |
| ***All signing complies with the following design requirements:*** | | | | |
| • Appropriate design criteria are used | ☐ | ☐ | ☐ | |
| • Opportunities to reduce sign clutter are identified | ☐ | ☐ | ☐ | |
| • Proposed and/or existing grades are suitable for installation of foundations and trenching of conduit | ☐ | ☐ | ☐ | |
| • Impacts to existing signing on mainline and cross streets are addressed | ☐ | ☐ | ☐ | |
| • Signing design corresponds with pavement markings and traffic signal operations and design | ☐ | ☐ | ☐ | |
| • Level of signing is appropriate for roadway type | ☐ | ☐ | ☐ | |
| • Route numbers, names, destinations and exit numbers are accurate and consistent | ☐ | ☐ | ☐ | |
| • Supplemental destinations are addressed and trailblazed, as necessary | ☐ | ☐ | ☐ | |
| • Service signs are applicable and consistent | ☐ | ☐ | ☐ | |

| SECTION 1 – SIGNING AND PAVEMENT MARKING | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Unexpected or unusual circumstances that require signing have been identified | ☐ | ☐ | ☐ | |
| • Tree trimming noted where required | ☐ | ☐ | ☐ | |
| • Signs are located outside of clear zone (if possible) | ☐ | ☐ | ☐ | |
| • Sign visibility is not impeded by physical obstructions | ☐ | ☐ | ☐ | |
| | | | | |
| **Pavement Marking Information** | | | | |
| ***The following pavement marking information is included and shown correctly on the Plan Sheets:*** | | | | |
| • Existing pavement markings to be removed (shown and labeled) | ☐ | ☐ | ☐ | |
| • Existing markings to be replaced | ☐ | ☐ | ☐ | |
| o Crosswalk revisions required | ☐ | ☐ | ☐ | |
| o Stop lines revisions required | ☐ | ☐ | ☐ | |
| o Lane marking revisions required | ☐ | ☐ | ☐ | |
| o Turning path revisions required | ☐ | ☐ | ☐ | |
| • Pavement and Curb Markings | ☐ | ☐ | ☐ | |
| o Centerlines | ☐ | ☐ | ☐ | |
| o Edge Lines | ☐ | ☐ | ☐ | |
| o Lane Lines | ☐ | ☐ | ☐ | |
| o Channelizing Lines | ☐ | ☐ | ☐ | |
| o Auxiliary Lines | ☐ | ☐ | ☐ | |
| o Obstruction Markings | ☐ | ☐ | ☐ | |
| o Stop Lines and Yield Lines | ☐ | ☐ | ☐ | |
| o Crosswalks | ☐ | ☐ | ☐ | |
| • Hatched (school zones, ramps, free right turns and midblock) | ☐ | ☐ | ☐ | |
| • Pavement Word and Symbol Markings | ☐ | ☐ | ☐ | |
| o Symbols (to be crossed referenced with R3-7 (1) R & L signs) | ☐ | ☐ | ☐ | |
| o Arrows | ☐ | ☐ | ☐ | |
| o Legend (ONLY) | ☐ | ☐ | ☐ | |
| o Bicycle Markings | ☐ | ☐ | ☐ | |
| o Railroad Crossing Markings | ☐ | ☐ | ☐ | |
| o Dimensions for placement of arrow, symbol and legend markings | ☐ | ☐ | ☐ | |
| • Raised Pavement Markers (RPM's) | ☐ | ☐ | ☐ | |
| o Recessed (District 6 only) | ☐ | ☐ | ☐ | |
| • Object Markers | ☐ | ☐ | ☐ | |
| • Concrete Barrier Delineators (wall markers) | ☐ | ☐ | ☐ | |
| • Delineators (post mounted) | ☐ | ☐ | ☐ | |
| o Delineators on at least one side of interchange ramps | ☐ | ☐ | ☐ | |
| • Contrast markings | ☐ | ☐ | ☐ | |
| • Rumble strips | ☐ | ☐ | ☐ | |
| • W-beam barrier markers | ☐ | ☐ | ☐ | |
| • Pavement Marking Legend | ☐ | ☐ | ☐ | |
| • Dimensions for lane widths | ☐ | ☐ | ☐ | |
| • Dimensions for taper lengths | ☐ | ☐ | ☐ | |

| **SECTION 1 – SIGNING AND PAVEMENT MARKING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Locations for tie-ins to existing markings | ☐ | ☐ | ☐ | |
| • Passing zones on two way undivided highways (determined by District office) | ☐ | ☐ | ☐ | |
| | | | | |
| ***All pavement markings comply with the following design requirements:*** | | | | |
| • Pavement marking widths, colors, patterns and materials are in accordance with MdMUTCD and MDSHA Pavement Marking Policy | ☐ | ☐ | ☐ | |
| • Pavement marking call-outs specify size, type and color | ☐ | ☐ | ☐ | |
| • Lane drops and transitions are marked | ☐ | ☐ | ☐ | |
| • Pavement markings correspond with sign placement and traffic signal operations and design | ☐ | ☐ | ☐ | |
| • Pavement markings correspond with current roadway design / typical sections | ☐ | ☐ | ☐ | |
| | | | | |
| **Traffic Barrier Details and Design** | | | | |
| ***The traffic barrier details and design comply with the following design requirements:*** | | | | |
| • Traffic barrier is warranted | ☐ | ☐ | ☐ | |
| • Appropriate type of traffic barrier is indicated on plans (per MDSHA guidelines) | ☐ | ☐ | ☐ | |
| • Lateral location and elevation of traffic barrier are correct | ☐ | ☐ | ☐ | |
| • Length of need calculations are submitted and correct | ☐ | ☐ | ☐ | |
| • Appropriate end treatment is indicated on plans (per MDSHA guidelines) | ☐ | ☐ | ☐ | |
| • Non-breakaway supports within the clear zone are protected by traffic barrier | ☐ | ☐ | ☐ | |
| • Existing barrier can be extended to meet project need | ☐ | ☐ | ☐ | |
| • Barrier protects traffic in both directions | ☐ | ☐ | ☐ | |
| • Existing traffic barrier end treatments meet current standards | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **FABRICATION DETAIL SHEETS (SN-3)** | | | | |
| ***The following information is included and shown correctly on the Fabrication Detail Sheets:*** | | | | |
| • Appropriate text sizes and series | ☐ | ☐ | ☐ | |
| • FHWA Highway Gothic font | ☐ | ☐ | ☐ | |
| • Appropriate text spacing | ☐ | ☐ | ☐ | |
| • Correct spelling and abbreviations | ☐ | ☐ | ☐ | |
| • Correct exit numbers and letters | ☐ | ☐ | ☐ | |
| • Appropriate message combinations (e.g. Supplemental signs are not combined with standard guide signs) | ☐ | ☐ | ☐ | |
| • Appropriate symbol sizes | ☐ | ☐ | ☐ | |
| • Standard FHWA / SHA arrows and shields | ☐ | ☐ | ☐ | |

| **SECTION 1 – SIGNING AND PAVEMENT MARKING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Correct MD shield for guide sign use vs. independent use | ☐ | ☐ | ☐ | |
| • Correct arrow types, dimensions, directions | ☐ | ☐ | ☐ | |
| • Angle of diagonal arrows | ☐ | ☐ | ☐ | |
| • Details for any non-standard arrows | ☐ | ☐ | ☐ | |
| • Correct border | ☐ | ☐ | ☐ | |
| • Double borders used between different background colors (i.e. EXIT ONLY panels) | ☐ | ☐ | ☐ | |
| • Extruded or sheet aluminum | ☐ | ☐ | ☐ | |
| • Cardinal directions aligned with top of shield | ☐ | ☐ | ☐ | |
| • TO aligned with center of shield | ☐ | ☐ | ☐ | |
| • Mounting details | ☐ | ☐ | ☐ | |
| • Appropriate Dimensions | ☐ | ☐ | ☐ | |
| o Width | ☐ | ☐ | ☐ | |
| o Height (extruded signs have even foot increments) | ☐ | ☐ | ☐ | |
| o Square foot area matches height/width dimensions | ☐ | ☐ | ☐ | |
| o Line spacing | ☐ | ☐ | ☐ | |
| • Correct sign colors / color codes | ☐ | ☐ | ☐ | |
| • Correct sign sheeting type | ☐ | ☐ | ☐ | |
| • All sign messages match what is shown on plan sheets | ☐ | ☐ | ☐ | |
| • All sheet aluminum signs are 4'x8' or smaller | ☐ | ☐ | ☐ | |
| • Overlays are clearly defined | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **GROUND MOUNTED SIGN SUPPORTS SHEET (SN-4)** | | | | |
| ***The following information is included and shown correctly on the Ground Mounted Sign Supports Sheet:*** | | | | |
| • Steel Beam Chart for guide signs is complete and correct and includes the following information: | ☐ | ☐ | ☐ | |
| o Post size, length and distance from edge of sign and between posts | ☐ | ☐ | ☐ | |
| o Breakaway/non-breakaway | ☐ | ☐ | ☐ | |
| o Object offset codes specific to conditions | ☐ | ☐ | ☐ | |
| o Steel post sizes in accordance with TRANSPO breakaway design software | ☐ | ☐ | ☐ | |
| o Square tube used in narrow concrete median (for signs 30"x30" or smaller) | ☐ | ☐ | ☐ | |
| • Wood Support Chart for guide signs is complete and correct and includes the following information: | ☐ | ☐ | ☐ | |
| o Post size, length and distance from edge of sign and between posts | ☐ | ☐ | ☐ | |
| o Breakaway / non-breakaway | ☐ | ☐ | ☐ | |
| o Object offset codes specific to conditions | ☐ | ☐ | ☐ | |

| **SECTION 1 – SIGNING AND PAVEMENT MARKING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • All ground mounted signs meet vertical clearance requirements | ☐ | ☐ | ☐ | |
| • All sheet aluminum signs are placed on wood supports | ☐ | ☐ | ☐ | |
| • All wood post sizes are in accordance with Support Selection Charts (Traffic Control Devices Design Manual) and MDSHA Book of Standards | ☐ | ☐ | ☐ | |
| • No more than (2) 4x4 or (2) drilled 4x6 wood posts are used within a 7-foot distance | ☐ | ☐ | ☐ | |
| • 7' minimum spacing between supports provided for all 6x6 or 6x8 breakaway wood posts (inside edge of support to inside edge of support) | ☐ | ☐ | ☐ | |
| • 7' minimum spacing between supports provided for all breakaway steel supports (inside edge of support to inside edge of support) | ☐ | ☐ | ☐ | |
| • All gore signs are installed on breakaway steel supports | ☐ | ☐ | ☐ | |
| • All information on SN-4 sheet matches plan sheets and sign detail sheet | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **OVERHEAD SIGN SUPPORTS SHEETS (SN-8 and SN-9)** | | | | |
| ***The following information is included and shown correctly on the Overhead Sign Supports Sheets:*** | | | | |
| • Structure and foundation details | ☐ | ☐ | ☐ | |
| o Overhead structures | ☐ | ☐ | ☐ | |
| o Cantilever structures (no more than 2 signs; 46' maximum offset) | ☐ | ☐ | ☐ | |
| o Bridge-mount structures (Special permission obtained from SHA Bridge Design Unit) | ☐ | ☐ | ☐ | |
| o Butterfly structures | ☐ | ☐ | ☐ | |
| o Post-top structures | ☐ | ☐ | ☐ | |
| • All overhead sign structures meet vertical clearance requirements | ☐ | ☐ | ☐ | |
| • Proposed signs are within design sign dimensions | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **SUMMARY OF QUANTITIES SHEETS (SN-11)** | | | | |
| ***The following information is included and shown correctly on the Summary of Quantities Sheets:*** | | | | |
| • Item descriptions and units of measure match corresponding category code items and estimate | ☐ | ☐ | ☐ | |
| • All columns are completed | ☐ | ☐ | ☐ | |
| • All project items are included | ☐ | ☐ | ☐ | |
| • Only items being used are listed | ☐ | ☐ | ☐ | |
| • Pavement marking items are listed last on each sheet | ☐ | ☐ | ☐ | |

| SECTION 1 – SIGNING AND PAVEMENT MARKING | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Item totals are listed at bottom of sheet and are correct | ☐ | ☐ | ☐ | |

| SECTION 1B – SIGN LIGHTING |
|---|
| **Refer to "Section 2 – Lighting" for Sign Lighting Checklist.** |

**SECTION 2 – LIGHTING** – Complete Section 2 for projects that include lighting and/or sign lighting design.

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| **GENERAL** | | | | |
| ***The following items are included and shown correctly on the Plan Sheets:*** | | | | |
| • Existing and proposed conditions (Only pertinent information should be shown on plans. All other levels should be turned off.) | ☐ | ☐ | ☐ | |
| • Limits of work | ☐ | ☐ | ☐ | |
| • Base mapping | ☐ | ☐ | ☐ | |
| • North arrow | ☐ | ☐ | ☐ | |
| • Directional arrows with destinations | ☐ | ☐ | ☐ | |
| • Match lines with sheet numbers or letters | ☐ | ☐ | ☐ | |
| • Baseline / Stationing with labels | ☐ | ☐ | ☐ | |
| • Correct scale | ☐ | ☐ | ☐ | |
| • Key / Legend (as defined in MD Book of Standards) | ☐ | ☐ | ☐ | |
| • Equipment list | ☐ | ☐ | ☐ | |
| • Project notes | ☐ | ☐ | ☐ | |
| • Street names shown on cross streets | ☐ | ☐ | ☐ | |
| • Route Numbers with cardinal direction (e.g. I-70 (WBL)) and road names | ☐ | ☐ | ☐ | |
| • Right-of-way lines and labels (existing and proposed) | ☐ | ☐ | ☐ | |
| • TIMS number and Construction Contract number | ☐ | ☐ | ☐ | |
| • Consultant logo | ☐ | ☐ | ☐ | |
| • Current Borders / Signature / Revision block | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **EXISTING LIGHTING INFORMATION** | | | | |
| ***The following existing lighting and electrical information is included and shown correctly on the Plan Sheets:*** | | | | |
| • Existing light poles at correct locations and oriented properly | ☐ | ☐ | ☐ | |
| • Existing electric / utilities | ☐ | ☐ | ☐ | |
| • Designations for existing light poles and electrical equipment to remain, to be relocated, or to be removed | ☐ | ☐ | ☐ | |
| • List of lighting to be removed with power company number (where applicable) | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **PROPOSED LIGHTING INFORMATION** | | | | |
| ***The following proposed lighting and electrical information is included and shown correctly on the Plan Sheets:*** | | | | |
| • Proposed light poles at correct locations and oriented properly | ☐ | ☐ | ☐ | |

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Light pole call-outs—including pole number, mounting height, arm length, circuit number, station, offset, quantity and type of connector kits | ☐ | ☐ | ☐ | |
| • Circuit call-outs—including wire type and size and conduit type and size | ☐ | ☐ | ☐ | |
| • Overhead sign structures to be lighted at correct locations | ☐ | ☐ | ☐ | |
| • Sign lighting call-outs—including structure number, circuit numbers, station, offset, quantity and type of connector kits | ☐ | ☐ | ☐ | |
| • Proposed utility information | ☐ | ☐ | ☐ | |
| • Proposed electrical equipment (e.g. lighting cabinets, service pedestals, junction boxes, manholes / handholes, transformers, ground rods, etc.) | ☐ | ☐ | ☐ | |
| • Manhole call-outs—including manhole number, station, offset, quantity and type of connector kits | ☐ | ☐ | ☐ | |
| ***The proposed lighting and electrical design complies with the following design requirements:*** | | | | |
| • Lighting design is in agreement with functional classification of roadway | ☐ | ☐ | ☐ | |
| • Appropriate lighting design criteria are used | ☐ | ☐ | ☐ | |
| • Photometric calculations have been submitted and approved | ☐ | ☐ | ☐ | |
| • Call-outs use letters defined in legend | ☐ | ☐ | ☐ | |
| • Proposed and existing grades are suitable for installation and maintenance of lighting equipment | ☐ | ☐ | ☐ | |
| • Plan sheet items match legend and legend only includes items used in project | ☐ | ☐ | ☐ | |
| • Non-breakaway structures are protected by traffic barrier when in the clear zone | ☐ | ☐ | ☐ | |
| • Input has been received from District Traffic Office and TEDD Team Leader | ☐ | ☐ | ☐ | |
| • Lighting design meets requirements of the Design Request | ☐ | ☐ | ☐ | |
| • Special design considerations are addressed (e.g. underpasses, roundabouts, signing, pedestrians, tunnels, etc.) | ☐ | ☐ | ☐ | |
| • Design meets photometric criteria | ☐ | ☐ | ☐ | |
| • Photometric design is in accordance with IES and SHA standards | ☐ | ☐ | ☐ | |
| | | | | |
| **Interchange Lighting** | ☐ | ☐ | ☐ | If Yes, explain why justified below.<br>If No, skip this section. |
| • Verify interchange lighting is warranted | ☐ | ☐ | ☐ | |
| • Indicate which of the following are used for this project: | | | | |
| o Partial interchange lighting | ☐ | ☐ | ☐ | |

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| o Full interchange lighting | ☐ | ☐ | ☐ | |
| o High mast lighting | ☐ | ☐ | ☐ | |
| o Low level lighting | ☐ | ☐ | ☐ | |
| o Continuous lighting (along the mainline roadway) | ☐ | ☐ | ☐ | |
| • Decision points are illuminated | ☐ | ☐ | ☐ | |
| • Conflict points are illuminated | ☐ | ☐ | ☐ | |
| • Critical roadway features (e.g. sharp curves, reverse curves, etc.) are illuminated | ☐ | ☐ | ☐ | |
| • Underpasses and tunnels are illuminated (as required) | ☐ | ☐ | ☐ | |
| • Crosswalks are illuminated | ☐ | ☐ | ☐ | |
| • Verify illumination levels meet recommended criteria | ☐ | ☐ | ☐ | |
| | | | | |
| Description/Justification: | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Continuous Mainline Lighting** | ☐ | ☐ | ☐ | If Yes, explain why justified below.<br>If No, skip this section. |
| • Verify continuous mainline lighting is warranted | ☐ | ☐ | ☐ | |
| • Verify illumination levels meet recommended criteria | ☐ | ☐ | ☐ | |
| • Underpasses are illuminated (as required) | ☐ | ☐ | ☐ | |
| | | | | |
| Description/Justification: | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Intersection Lighting** | ☐ | ☐ | ☐ | If Yes, check for each intersection.<br>If No, skip this section. |
| • Verify intersection lighting is warranted | ☐ | ☐ | ☐ | |
| • All signalized intersections are illuminated | ☐ | ☐ | ☐ | |
| o Conflict points are illuminated | ☐ | ☐ | ☐ | |
| o Crosswalks are illuminated | ☐ | ☐ | ☐ | |
| • All roundabouts are illuminated | ☐ | ☐ | ☐ | |
| o Conflict points are illuminated | ☐ | ☐ | ☐ | |
| o Crosswalks are illuminated | ☐ | ☐ | ☐ | |
| • Unsignalized intersections are illuminated per Design Request | ☐ | ☐ | ☐ | |
| o Arms and luminaires are oriented correctly | ☐ | ☐ | ☐ | |
| o Illumination is adequate on crosswalks | ☐ | ☐ | ☐ | |
| • Wiring and conduits are boxed at intersections | ☐ | ☐ | ☐ | |

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Verify that illumination levels meet recommended criteria | ☐ | ☐ | ☐ | |
| • Leased lighting has been coordinated with utility company | ☐ | ☐ | ☐ | |
| | | | | |
| Description/Justification: | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Streetscape / Pedestrian Lighting** | ☐ | ☐ | ☐ | If No, skip this section. |
| • MOU has been signed and approved | ☐ | ☐ | ☐ | |
| • Illumination of pedestrian facilities meets IES requirements | ☐ | ☐ | ☐ | |
| • Veiling luminance on adjacent roads falls within acceptable values | ☐ | ☐ | ☐ | |
| • Pole details are provided | ☐ | ☐ | ☐ | |
| | | | | |
| **Sign Lighting** | ☐ | ☐ | ☐ | If No, skip this section. |
| ***Verify the following design requirements for existing sign lighting and sign structures:*** | | | | |
| • Existing overhead signs retain existing sign lighting and/or new lighting is provided | ☐ | ☐ | ☐ | |
| • Maintenance activities for existing sign lighting can take place off the traveled roadway | ☐ | ☐ | ☐ | |
| • Item for luminaire supports is provided for new signs on existing structures | ☐ | ☐ | ☐ | |
| | | | | |
| ***Verify the following design requirements for new sign lighting and sign structures:*** | | | | |
| • New overhead and cantilever signs are illuminated | ☐ | ☐ | ☐ | |
| • Standard Luminaires and Supports | ☐ | ☐ | ☐ | |
| o Overhead | ☐ | ☐ | ☐ | |
| o Cantilever | ☐ | ☐ | ☐ | |
| • Luminaire spacing is correct in accordance with TEDD Design Manual charts | ☐ | ☐ | ☐ | |
| • Number and wattage of luminaires are consistent with standard Sign Lighting Schedule | ☐ | ☐ | ☐ | |
| • Sign lighting corresponds with signing design | ☐ | ☐ | ☐ | |
| • Sign lighting details are included on lighting plans (for insert projects) | ☐ | ☐ | ☐ | |
| • Proper LED type is being specified | ☐ | ☐ | ☐ | |
| • Locations are noted where LED luminaires are used on 480V systems | ☐ | ☐ | ☐ | |
| | | | | |
| Description/Justification: | | | | |
| | | | | |

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| | | | | |
| | | | | |
| | Yes | No | N/A | Comments |
| **ELECTRICAL AND CONTROL SYSTEMS** | | | | |
| ***The following lighting and electrical information is included and shown correctly on the Plan Sheets:*** | | | | |
| • Cabinet type (pole or base mounted) and location | ☐ | ☐ | ☐ | |
| • Electric meter socket | ☐ | ☐ | ☐ | |
| • Disconnect | ☐ | ☐ | ☐ | |
| • Photoelectric control specified for individual luminaires (as required) | ☐ | ☐ | ☐ | |
| • Junction boxes, manholes, handholes and conduit location, size and type | ☐ | ☐ | ☐ | |
| • Conduit and circuitry at proposed locations | ☐ | ☐ | ☐ | |
| • Connector Kits | ☐ | ☐ | ☐ | |
| o Electrical tags filled in | ☐ | ☐ | ☐ | |
| o Correct types used | ☐ | ☐ | ☐ | |
| • Circuits | ☐ | ☐ | ☐ | |
| o Existing amperage adequate for additional loads | ☐ | ☐ | ☐ | |
| o New circuits numbered correctly | ☐ | ☐ | ☐ | |
| o Current does not exceed breaker capacity (80% of breaker size) | ☐ | ☐ | ☐ | |
| • Manholes (Electrical tag filled in) | ☐ | ☐ | ☐ | |
| • Structure Conduit | ☐ | ☐ | ☐ | |
| o Size meets fill requirements | ☐ | ☐ | ☐ | |
| o Type of conduit is noted (flexible or rigid) | ☐ | ☐ | ☐ | |
| o #6 AWG or larger cable used in bridges and walls | ☐ | ☐ | ☐ | |
| o Conduit attachment / support details are included | ☐ | ☐ | ☐ | |
| • Availability of electrical power determined | ☐ | ☐ | ☐ | |
| o Power location and feed coordination with utility company complete | ☐ | ☐ | ☐ | |
| o Confirm cabinet / service pedestal / electrical service equipment locations are constructable as shown | ☐ | ☐ | ☐ | |
| o Confirm service load is available (SHA prefers 120/240 voltage service with 100 amp cabinet; 480V operating voltage is not to be used for new construction) | ☐ | ☐ | ☐ | |
| • Verify all luminaires and illuminated signs are connected to a power supply | ☐ | ☐ | ☐ | |
| • Voltage Drop Calculations submitted and correct | ☐ | ☐ | ☐ | |
| o Minimum of two (2) separate circuits used, alternating circuits between adjacent lights | ☐ | ☐ | ☐ | |

| SECTION 2 – LIGHTING | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| o Cable size correct | ☐ | ☐ | ☐ | |
| o Cable ampacity sufficient | ☐ | ☐ | ☐ | |
| • Underground conduit: the following type of installation is required: | | | | |
| o Trenched | ☐ | ☐ | ☐ | |
| o Slotted | ☐ | ☐ | ☐ | |
| o Bored | ☐ | ☐ | ☐ | |
| • Conduit used beneath roadway; duct cable used elsewhere | ☐ | ☐ | ☐ | |
| • Conduit sizes accommodate fill requirements (25% maximum fill for new construction, 40% for modifications) | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **GROUNDING** | | | | |
| • Ground rods are provided for all light poles, illuminated signs and manholes | ☐ | ☐ | ☐ | |
| • Electrical service drop is grounded | ☐ | ☐ | ☐ | |
| • Continuous ground wire is provided from each luminaire, pole, illuminated sign, and manhole to power supply | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **UTILITIES** | | | | |
| • Utility relocations coordinated | ☐ | ☐ | ☐ | |
| • Utility company has approved service location | ☐ | ☐ | ☐ | |
| • Pole number is shown on plans for service drop location | ☐ | ☐ | ☐ | |
| • Utility poles for leased lighting are clearly shown with pole numbers | ☐ | ☐ | ☐ | |

| | | | | |
|---|---|---|---|---|
| **POLE SCHEDULE** | | | | |
| ***The following are clearly and correctly shown in the pole schedule:*** | | | | |
| • Lateral location (offset) | ☐ | ☐ | ☐ | |
| • Pole height and type | ☐ | ☐ | ☐ | |
| • Bracket arm length (matches sizes provided in MDSHA Book of Standards) | ☐ | ☐ | ☐ | |
| • Luminaire wattage | ☐ | ☐ | ☐ | |
| • Poles with breakaway bases indicated | ☐ | ☐ | ☐ | |
| | | | | |
| **PANEL SCHEDULE** | | | | |
| ***The following are clearly and correctly shown in the panel schedule:*** | | | | |
| • All luminaires and signs on panel | ☐ | ☐ | ☐ | |
| • Amperage loads | ☐ | ☐ | ☐ | |
| • Main breaker and contactor ratings | ☐ | ☐ | ☐ | |

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Luminaire operating voltage | ☐ | ☐ | ☐ | |
| • Number, type and wattage of luminaires | ☐ | ☐ | ☐ | |
| | | | | |
| **SIGN LIGHTING SCHEDULE** | | | | |
| ***The following are clearly and correctly shown in the sign lighting schedule:*** | | | | |
| • All illuminated overhead and cantilever sign structures are included (as appropriate) | ☐ | ☐ | ☐ | |
| • Luminaire quantity, type, wattage, and operating voltage | ☐ | ☐ | ☐ | |
| • Correct luminaire spacing | ☐ | ☐ | ☐ | |
| • Sign lighting system (where required) | ☐ | ☐ | ☐ | |
| • Circuit numbers | ☐ | ☐ | ☐ | |
| • Sign panel sizes agree with signing plans | ☐ | ☐ | ☐ | |
| • 2 circuits are used per structure, alternated between adjacent luminaires | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **SAFETY CONSIDERATIONS** | | | | |
| ***The following safety considerations have been addressed:*** | | | | |
| • Poles are located outside roadside clear zone or suitable protection or breakaway bases are provided | ☐ | ☐ | ☐ | |
| • High mast structures are located outside of clear zone or protected by traffic barrier | ☐ | ☐ | ☐ | |
| • Pole locations and luminaire placement allow for maintenance activities to take place off the traveled roadway | ☐ | ☐ | ☐ | |
| • Pole locations provide adequate safety clearance (100’ minimum) in gore areas of exit / entrance ramps | ☐ | ☐ | ☐ | |
| • Pole locations minimize interference with driver’s sight distance | ☐ | ☐ | ☐ | |
| • Poles are not placed within 50’ of a sign structure | ☐ | ☐ | ☐ | |
| • Poles are not placed on traffic side of traffic barrier | ☐ | ☐ | ☐ | |
| • Poles behind traffic barrier provide necessary clear distance for barrier deflection | ☐ | ☐ | ☐ | |
| • Required clearance is provided to existing and proposed underground and overhead utilities | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **OTHER DESIGN CONSIDERATIONS** | | | | |
| ***The following design considerations have been addressed:*** | | | | |
| • Pole locations conform to ADA requirements | ☐ | ☐ | ☐ | |
| • Design reflects consideration of light pollution (i.e. glare, light trespass, sky glow) | ☐ | ☐ | ☐ | |
| • Design reflects aesthetic considerations | ☐ | ☐ | ☐ | |

| **SECTION 2 – LIGHTING** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Design considers annual cost of energy and maintenance, maintenance capability, and responsibility for maintenance of the lighting system | ☐ | ☐ | ☐ | |

**SECTION 3 – TRAFFIC SIGNALS** – Complete Section 3 for projects that include signal design.

| **SECTION 3 – TRAFFIC SIGNALS** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| **PLAN SHEETS** | | | | |
| ***The following items are included and shown correctly on the Plan Sheets:*** | | | | |
| • Existing and proposed conditions (Only pertinent information should be shown on plans. All other levels should be turned off.) | ☐ | ☐ | ☐ | |
| • Limits of work | ☐ | ☐ | ☐ | |
| • Base mapping | ☐ | ☐ | ☐ | |
| • North arrow / North arrow note | ☐ | ☐ | ☐ | |
| • Correct scale | ☐ | ☐ | ☐ | |
| • Utility legend | ☐ | ☐ | ☐ | |
| • Consultant logo | ☐ | ☐ | ☐ | |
| • Revision letter matches TS number | ☐ | ☐ | ☐ | |
| • Right-of-way lines and labels (existing and proposed) | ☐ | ☐ | ☐ | |
| • Equipment within Right-of-Way | ☐ | ☐ | ☐ | |
| • Overhead utilities (heights indicated) | ☐ | ☐ | ☐ | |
| • Log mile | ☐ | ☐ | ☐ | |
| • General Notes | ☐ | ☐ | ☐ | |
| • Street names | ☐ | ☐ | ☐ | |
| • Directional arrows with destinations | ☐ | ☐ | ☐ | |
| • Route numbers with cardinal direction (e.g. I-70 (WBL)) and road names | ☐ | ☐ | ☐ | |
| • TIMS number and Construction Contract number | ☐ | ☐ | ☐ | |
| • Current borders / signature / revision block | ☐ | ☐ | ☐ | |
| • Construction details | ☐ | ☐ | ☐ | |
| | | | | |
| **Existing Signal Information** | | | | |
| • Existing signal plans have been verified | ☐ | ☐ | ☐ | |
| • Site characteristics have been inventoried and examined | ☐ | ☐ | ☐ | |
| • Existing signals are to be replaced with LED modules | ☐ | ☐ | ☐ | |
| • Existing signals to be removed are noted | ☐ | ☐ | ☐ | |
| | | | | |
| **Proposed Signal Information** | | | | |
| ***The following signal items are included and shown correctly on the Plan Sheets:*** | | | | |
| • Appropriate signal structures | ☐ | ☐ | ☐ | |
| • Appropriate signal structure configuration / placement | ☐ | ☐ | ☐ | |
| o Lateral clearance requirements are met | ☐ | ☐ | ☐ | |
| o Alternative pole configurations are used where applicable | ☐ | ☐ | ☐ | |
| o Breakaway bases or couplings are used for pedestal poles and median pedestal poles | ☐ | ☐ | ☐ | |

| SECTION 3 – TRAFFIC SIGNALS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Signal controller cabinet location and type | ☐ | ☐ | ☐ | |
| o Cabinet location permits safe access by maintenance | ☐ | ☐ | ☐ | |
| o Cabinet is located near a power source (if possible) | ☐ | ☐ | ☐ | |
| o Cabinet is protected (if needed) | ☐ | ☐ | ☐ | |
| o Cabinet does not restrict driver visibility | ☐ | ☐ | ☐ | |
| • Signal heads are numbered and placement is correct | ☐ | ☐ | ☐ | |
| o Distances from stop line are acceptable (40’ to 120’; up to 180’ with near side) | ☐ | ☐ | ☐ | |
| o Minimum of two signal heads are provided for each movement | ☐ | ☐ | ☐ | |
| o Near side signals are provided (if required) | ☐ | ☐ | ☐ | |
| o Vertical signal head clearance requirements are met | ☐ | ☐ | ☐ | |
| o Adequate signal visibility is provided | ☐ | ☐ | ☐ | |
| o Appropriate signal head size | ☐ | ☐ | ☐ | |
| o Appropriate signal head sections | ☐ | ☐ | ☐ | |
| • Countdown pedestrian signals and APS pushbuttons follow Design and Installation Guidelines | ☐ | ☐ | ☐ | |
| o Countdown signal located near and visible within crosswalk | ☐ | ☐ | ☐ | |
| o Pushbuttons located correctly and readily accessible from 60”x60” level landing area on the sidewalk (maximum 10 feet from curb) | ☐ | ☐ | ☐ | |
| • Availability of electrical power determined | ☐ | ☐ | ☐ | |
| o Power location and feed coordination with utility company complete | ☐ | ☐ | ☐ | |
| o Confirm cabinet / service pedestal / electrical service equipment locations are constructable as shown | ☐ | ☐ | ☐ | |
| • Metered service pedestal (preferred) | ☐ | ☐ | ☐ | |
| • Overhead service | ☐ | ☐ | ☐ | |
| • Underground service | ☐ | ☐ | ☐ | |
| • Utility pole or transformer number labeled | ☐ | ☐ | ☐ | |
| o Confirm service load is available (SHA prefers 120/240 voltage service with 100 amp cabinet) | ☐ | ☐ | ☐ | |
| • Photoelectric control specified for individual luminaires (as required) | ☐ | ☐ | ☐ | |
| • Signal equipment meets clear zone requirements (SHA & AASHTO criteria) | ☐ | ☐ | ☐ | |
| • Handholes and manholes are appropriately located | ☐ | ☐ | ☐ | |

| **SECTION 3 – TRAFFIC SIGNALS** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Handholes, conduit and wire are correct size and type | ☐ | ☐ | ☐ | |
| • Conduit sizes accommodate fill requirements (25% maximum fill for new construction, 40% for modifications) | ☐ | ☐ | ☐ | |
| • Signal preemption provided (if required) | ☐ | ☐ | ☐ | |
| • Numbering (including signs) is correct | ☐ | ☐ | ☐ | |
| • Signal legend matches plan | ☐ | ☐ | ☐ | |
| | | | | |
| **Signs** | | | | |
| ***The following signing items are included and shown correctly on the Plan Sheets:*** | | | | |
| • Street name signs | ☐ | ☐ | ☐ | |
| o 20” max on span wire | ☐ | ☐ | ☐ | |
| o Back to back on mast arm if over 32” | ☐ | ☐ | ☐ | |
| o Dual-faced if 16” or 20” | ☐ | ☐ | ☐ | |
| o Advance street name signs (NEXT SIGNAL) | ☐ | ☐ | ☐ | |
| • Route marker / shield assemblies | ☐ | ☐ | ☐ | |
| • Signal warning signs | ☐ | ☐ | ☐ | |
| • Turn prohibitions | ☐ | ☐ | ☐ | |
| o LTOR / RTOR | ☐ | ☐ | ☐ | |
| • Lane use control signs | ☐ | ☐ | ☐ | |
| • Remove Stop / Stop Ahead signs | ☐ | ☐ | ☐ | |
| • Pedestrian pushbutton and sign (oriented correctly) | ☐ | ☐ | ☐ | |
| • Special sign layouts | ☐ | ☐ | ☐ | |
| • Sign legend matches plan | ☐ | ☐ | ☐ | |
| • New signal warning signs with NEW plaque and flags | ☐ | ☐ | ☐ | |
| • Signs on signal plans match signing plans | ☐ | ☐ | ☐ | |
| | | | | |
| **Pavement Markings** | | | | |
| ***The following pavement marking items are included and shown correctly on the Plan Sheets:*** | | | | |
| • Arrow / Only for lane drops | ☐ | ☐ | ☐ | |
| • Stop lines (perpendicular to curb) | ☐ | ☐ | ☐ | |
| • Edgelines, centerlines, lane lines | ☐ | ☐ | ☐ | |
| • Turn bays (arrows for double movements only) | ☐ | ☐ | ☐ | |
| • Crosswalks | ☐ | ☐ | ☐ | |
| o Hatched (school zones, ramps, free right turns and midblock) | ☐ | ☐ | ☐ | |
| • Other markings per MdMUTCD | ☐ | ☐ | ☐ | |
| | | | | |
| **NEMA Phasing** | | | | |
| • Correct orientation | ☐ | ☐ | ☐ | |
| • Flashing operation | ☐ | ☐ | ☐ | |
| • Matches phase chart | ☐ | ☐ | ☐ | |
| • Solid / Dash lines shown correctly | ☐ | ☐ | ☐ | |
| • Notes | ☐ | ☐ | ☐ | |
| • Preemption | ☐ | ☐ | ☐ | |

| SECTION 3 – TRAFFIC SIGNALS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Pedestrian phases | ☐ | ☐ | ☐ | |
| • Split phasing | ☐ | ☐ | ☐ | |
| **Dimensions / Stationing** | | | | |
| ***Dimensions or Station/Offset are provided for the following items:*** | | | | |
| • Pavement Markings | ☐ | ☐ | ☐ | |
| • Signals and Signs | ☐ | ☐ | ☐ | |
| • Detectors (presence and advanced) | ☐ | ☐ | ☐ | |
| • Poles | ☐ | ☐ | ☐ | |
| • Controller cabinet | ☐ | ☐ | ☐ | |
| • Breaklines | ☐ | ☐ | ☐ | |
| | | | | |
| **Detectors** | | | | |
| • Detection included and applied properly | ☐ | ☐ | ☐ | |
| • Location of presence detection (1' behind stop line) is correct | ☐ | ☐ | ☐ | |
| • Location of system detection is correct | ☐ | ☐ | ☐ | |
| • Sizes and locations are correct | ☐ | ☐ | ☐ | |
| • Side road advance detection is warranted (if used) | ☐ | ☐ | ☐ | |
| • Inductive loops | ☐ | ☐ | ☐ | |
| • Micro-loop probes | ☐ | ☐ | ☐ | |
| • Non-invasive micro-loop probes | ☐ | ☐ | ☐ | |
| • Detector sleeves conduit for loops | ☐ | ☐ | ☐ | |
| • Video detection equipment locations are correct | ☐ | ☐ | ☐ | |
| • Dilemma zone at correct distance | ☐ | ☐ | ☐ | |
| | | | | |
| **Geometrics** | | | | |
| • Stop line set back adequate distance for turning vehicles | ☐ | ☐ | ☐ | |
| • Crosswalk curb ramps are correctly located and ADA compliant | ☐ | ☐ | ☐ | |
| • Pad or sidewalk provides access to pedestrian push button | ☐ | ☐ | ☐ | |
| • Detectable Warning Surfaces (DWS) are applied correctly | ☐ | ☐ | ☐ | |
| | | | | |
| **Traffic Barrier Details and Design** | | | | |
| ***The traffic barrier details and design comply with the following design requirements:*** | | | | |
| • Traffic barrier is warranted | ☐ | ☐ | ☐ | |
| • Appropriate type of traffic barrier is indicated on plans (per MDSHA guidelines) | ☐ | ☐ | ☐ | |
| • Lateral location and elevation of traffic barrier are correct | ☐ | ☐ | ☐ | |
| • Length of need calculations are submitted and correct | ☐ | ☐ | ☐ | |
| • Appropriate end treatment is indicated on plans (per MDSHA guidelines) | ☐ | ☐ | ☐ | |
| • Non-breakaway supports within the clear zone are protected by traffic barrier (if | ☐ | ☐ | ☐ | |

| SECTION 3 – TRAFFIC SIGNALS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| warranted) | | | | |
| • Existing barrier can be extended to meet project need | ☐ | ☐ | ☐ | |
| • Barrier protects traffic in both directions | ☐ | ☐ | ☐ | |
| • Existing traffic barrier end treatments meet current standards | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **GENERAL INFORMATION SHEET** | | | | |
| **Project Description** | | | | |
| • Reconstruction / Modification / New installation | ☐ | ☐ | ☐ | |
| • Road direction – North / South or East / West | ☐ | ☐ | ☐ | |
| • Street lighting | ☐ | ☐ | ☐ | |
| • Controller requirements | ☐ | ☐ | ☐ | |
| • Interconnect (fiberoptic / copper) | ☐ | ☐ | ☐ | |
| • Check phasing with plan | ☐ | ☐ | ☐ | |
| • Special notes | ☐ | ☐ | ☐ | |
| • APS button message special note | ☐ | ☐ | ☐ | |
| | | | | |
| **Equipment List "A"** | | | | |
| • Cabinet (Base / Pole Mount) | ☐ | ☐ | ☐ | |
| • Controller Equipment – Specifics | ☐ | ☐ | ☐ | |
| • Mast-arm / pole / span wire mounted signs | ☐ | ☐ | ☐ | |
| • Special Signs | ☐ | ☐ | ☐ | |
| • Video Detection Interface Equipment | ☐ | ☐ | ☐ | |
| • Amplifiers | ☐ | ☐ | ☐ | |
| | | | | |
| **Equipment List "B"** | | | | |
| • Items match construction details | ☐ | ☐ | ☐ | |
| • Items match wiring diagram | ☐ | ☐ | ☐ | |
| • Test pit (for conduit bore) | ☐ | ☐ | ☐ | |
| • Install equipment from Equipment List "A" | ☐ | ☐ | ☐ | |
| • Equipment removal for disposal | ☐ | ☐ | ☐ | |
| • Correct item numbers as per areawide contract or category codes | ☐ | ☐ | ☐ | |
| • Verify all items applied and used | ☐ | ☐ | ☐ | |
| | | | | |
| **Equipment List "C"** | | | | |
| • Equipment to be Removed and Salvaged (e.g. Controller) | ☐ | ☐ | ☐ | |
| | | | | |
| **Wiring Diagram** | | | | |
| • Signals | ☐ | ☐ | ☐ | |
| • Detectors | ☐ | ☐ | ☐ | |
| • Existing cables to be reused | ☐ | ☐ | ☐ | |
| • Ground wire and rods | ☐ | ☐ | ☐ | |
| • Legend | ☐ | ☐ | ☐ | |

| SECTION 3 – TRAFFIC SIGNALS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • North arrow | ☐ | ☐ | ☐ | |
| • Power service with pole number / transformer number | ☐ | ☐ | ☐ | |
| • Interconnect | ☐ | ☐ | ☐ | |
| | | | | |
| **Phase Chart** | | | | |
| • Check signals with plans | ☐ | ☐ | ☐ | |
| • Check movements versus indications | ☐ | ☐ | ☐ | |
| • Preemption | ☐ | ☐ | ☐ | |
| • Pedestrian phase | ☐ | ☐ | ☐ | |
| • North arrow | ☐ | ☐ | ☐ | |
| • Flashing operation | ☐ | ☐ | ☐ | |
| | | | | |
| **Maintenance of Traffic** | | | | |
| • Standards specified as needed | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **OTHER DESIGN CONSIDERATIONS** | | | | |
| ***The following design considerations have been addressed:*** | | | | |
| • ADA requirements are met | ☐ | ☐ | ☐ | |
| • Median disturbance is minimized | ☐ | ☐ | ☐ | |
| • Design addresses environmental concerns (if present) | ☐ | ☐ | ☐ | |
| • Design addressed unique construction problems (if present) | ☐ | ☐ | ☐ | |
| • Design adheres to driver expectancy for the corridor | ☐ | ☐ | ☐ | |
| • Equipment locations do not hinder maintenance activities | ☐ | ☐ | ☐ | |
| • Other facilities within the project limits that require traffic signal devices (i.e. schools) are noted | ☐ | ☐ | ☐ | |
| • Railroad signal interconnect is provided (if required) | ☐ | ☐ | ☐ | |
| • Signal design meets the requirements of the Design Request | ☐ | ☐ | ☐ | |
| • Signal is not in conflict with any utilities | ☐ | ☐ | ☐ | |
| • Special design considerations such as HIBs, pedestrians, preemption or interconnection are addressed | ☐ | ☐ | ☐ | |
| • Signal will work as a system with the roadway, signing and marking design | ☐ | ☐ | ☐ | |
| • Design is in accordance with Federal and SHA standards | ☐ | ☐ | ☐ | |
| | | | | |
| **UTILITIES** | | | | |
| • Overhead utility conflicts avoided | ☐ | ☐ | ☐ | |
| • Underground utility conflicts avoided | ☐ | ☐ | ☐ | |
| • Special signal poles detailed (if needed) | ☐ | ☐ | ☐ | |

| **SECTION 3 – TRAFFIC SIGNALS** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Special pole foundations detailed (if needed) | ☐ | ☐ | ☐ | |
| • Utility relocations coordinated | | | | |
| o Utility relocation details provided (if required) | ☐ | ☐ | ☐ | |
| • Overhead clearance callouts at cable crossing with signal structure are provided | ☐ | ☐ | ☐ | |
| | | | | |
| **RIGHT-OF-WAY** | | | | |
| • Adequate right-of-way is available for proposed pole locations | ☐ | ☐ | ☐ | |
| • Required right-of-way acquisitions are noted (if needed) | ☐ | ☐ | ☐ | |
| • Easement for special purpose is noted (if needed) | ☐ | ☐ | ☐ | |

## SECTION 4 – DOCUMENT PREPARATION – Complete the following sections for all projects.

| FORMS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| **SIGNING** | | | | |
| • Structure design request (input sheets and x-sections for new overhead and cantilever sign structures) | | | | |
| o Complete | ☐ | ☐ | ☐ | |
| o Submitted to Structural Design Section | ☐ | ☐ | ☐ | |
| • Structure verification sheet (for modifications to an existing sign structure) | | | | |
| o Complete | ☐ | ☐ | ☐ | |
| o Submitted and approved by Structural Design Section | ☐ | ☐ | ☐ | |

| PROJECT COORDINATION | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| **HIGHWAY DESIGN** | | | | |
| ***Verify that the following coordination with Highway Design has been completed:*** | | | | |
| • Traffic barrier is provided where required | ☐ | ☐ | ☐ | |
| • Signing/lighting/signal design corresponds with current roadway design | ☐ | ☐ | ☐ | |
| • Locations of curb ramps correspond to crosswalks, pedestrian signals, pushbuttons, etc. | ☐ | ☐ | ☐ | |
| • Proposed and/or existing grades allow for correct installation of foundations and equipment | ☐ | ☐ | ☐ | |
| • Cross sections show that TCDs are not installed in ditches | ☐ | ☐ | ☐ | |
| • No conflicts exist with landscaping, drainage structures and adjacent construction projects | ☐ | ☐ | ☐ | |
| • Check project limits against pavement marking plans | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **STRUCTURE DESIGN** | | | | |
| ***Verify that the following coordination with Structure Design has been completed:*** | | | | |
| • Conflicts with noisewalls / retaining walls have been resolved | ☐ | ☐ | ☐ | |
| • All signing / lighting / signal equipment located on bridges has been coordinated with structure and bridge designer | ☐ | ☐ | ☐ | |
| • All conduits / junction boxes located in parapets or barrier / retaining walls have been coordinated with structure and bridge designer | ☐ | ☐ | ☐ | |

| PROJECT COORDINATION | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| **UTILITIES** | | | | |
| • Utility conflicts or impacts have been resolved (overhead and underground, drainage ditches, etc.) | ☐ | ☐ | ☐ | |
| • Power source location and available service have been confirmed with utility company | ☐ | ☐ | ☐ | |
| • Telephone line and power source have been confirmed with the power/phone company | ☐ | ☐ | ☐ | |
| • Service application completed and submitted to power company | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **RIGHT-OF-WAY** | | | | |
| • Verify that all work will be completed within SHA Right of Way (ROW) | ☐ | ☐ | ☐ | |
| • ROW needs submitted to Plats and Surveys | ☐ | ☐ | ☐ | |
| • Existing and proposed ROW clearly indicated on plans | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **TRAFFIC** | | | | |
| • Sign numbers and messages match on plan sheets and detail sheets | ☐ | ☐ | ☐ | |
| • Quantities items match on Sign Supports Sheets (SN-4, SN-8 and SN-9), Summary of Quantities sheets (SN-11), and Engineer's Estimate | ☐ | ☐ | ☐ | |
| • All bid items and quantities are included on Summary of Quantities Sheet (SN-11) | ☐ | ☐ | ☐ | |
| • Pavement markings correspond to signing and signal operation | ☐ | ☐ | ☐ | |
| • All bid items and quantities are included on Engineer's Estimate | ☐ | ☐ | ☐ | |
| • Lighting details match on plan sheets, detail sheets, and schedules | ☐ | ☐ | ☐ | |
| • Sign lighting information is included on appropriate plans (Signing or Lighting) | ☐ | ☐ | ☐ | |
| • Wording and quantities match in Special Provisions and Category Codes | ☐ | ☐ | ☐ | |

| SPECIAL PROVISIONS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| Verify that the following items are included in the Special Provisions: | | | | |
| • State Highway Administration (SHA) Contract Number | ☐ | ☐ | ☐ | |
| • 950 Material Specs | ☐ | ☐ | ☐ | |
| • Project Description | ☐ | ☐ | ☐ | |

| SPECIAL PROVISIONS | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Clearinghouse and Shelf Specs | ☐ | ☐ | ☐ | |
| o Correlate to items on Estimate | ☐ | ☐ | ☐ | |
| • Shelf typicals | ☐ | ☐ | ☐ | |
| • 900 Specs | ☐ | ☐ | ☐ | |
| • Verify that Special Provisions correlate to items on SN-11 Sheet | ☐ | ☐ | ☐ | |

| ENGINEER'S ESTIMATE | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Estimate includes category code number, item description, unit of measure, quantity, unit cost and total cost for each item | ☐ | ☐ | ☐ | |
| • Current category codes / item codes are used | ☐ | ☐ | ☐ | |
| • All necessary bid items are included | ☐ | ☐ | ☐ | |
| • Unit of measurement matches category code / specification for each item | ☐ | ☐ | ☐ | |
| • Cost estimate consistent with SHA Price Index, areawide contract and/or industry trends | ☐ | ☐ | ☐ | |
| • Cost share breakdown (county/state/federal) included | ☐ | ☐ | ☐ | |
| • Appropriate contingency added (no contingency for PS&E submittal) | ☐ | ☐ | ☐ | |
| • Breakout is provided for federally funded and SHA supplied items | ☐ | ☐ | ☐ | |
| o Cabinets 900000 | ☐ | ☐ | ☐ | |
| o Signing (mast-arm/pole/span wire mounted) | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **SIGNING** | | | | |
| • One breakaway base support system is supplied for each sign post | ☐ | ☐ | ☐ | |
| • Aluminum angles quantity is included for mounting signs on existing steel supports | ☐ | ☐ | ☐ | |
| • Concrete quantity is included for foundations for steel supports and overhead / cantilever sign structures | ☐ | ☐ | ☐ | |
| • Item for removal of signs, sign supports and sign structures is included in quantities / estimate | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **PAVEMENT MARKING** | | | | |
| • Pavement marking words and symbols are measured in SF (not EA) | ☐ | ☐ | ☐ | |
| • Item for removal of pavement markings is included in quantities / estimate | ☐ | ☐ | ☐ | |

| **ENGINEER'S ESTIMATE** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Quantities are separated by line width, color, and material | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **LIGHTING** | | | | |
| • Pole height is included in measurements when a pole is used to transport electrical cable from overhead to underground | ☐ | ☐ | ☐ | |
| • Connector kits are quantified | ☐ | ☐ | ☐ | |
| • Cable estimate accounts for total measured quantity plus 10-20% for excess in handholes, cable slack, connections, splices, and drip loops | ☐ | ☐ | ☐ | |
| • Ground rod quantity is included | ☐ | ☐ | ☐ | |
| | | | | |
| | Yes | No | N/A | Comments |
| **SIGNALS** | | | | |
| • Span wire quantity accounts for sag and extra wire at each end | ☐ | ☐ | ☐ | |
| • Pole height is included in measurements when a pole is used to transport electrical cable from overhead to underground | ☐ | ☐ | ☐ | |
| • Loop wire estimate accounts for the number of turns per sawcut, plus two times the distance from the detector to the handhole, plus 5% to account for twisted cable | ☐ | ☐ | ☐ | |
| • Cable estimate accounts for total measured quantity plus 10-20% for excess in handholes, cable slack, connections, splices, and drip loops | ☐ | ☐ | ☐ | |
| • Loop detector lead-in cable quantity is included | ☐ | ☐ | ☐ | |
| • Detector Cable quantity for signal preemption accounts for extra 20% in the length for slack, coil, connections, etc. | ☐ | ☐ | ☐ | |
| • Test pits quantity is included | ☐ | ☐ | ☐ | |

| **FIELD REVIEW** | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Existing signing, pavement markings, lane configurations, traffic barrier, etc. are as shown on the plans | ☐ | ☐ | ☐ | |
| • Existing signing equipment to be reused is in good condition and accommodates intended use as shown on plans | ☐ | ☐ | ☐ | |
| • Existing traffic patterns, including lane drops, reductions, transitions, etc. are as shown on the plans | ☐ | ☐ | ☐ | |

| FIELD REVIEW | | | | |
|---|---|---|---|---|
| | Yes | No | N/A | Comments |
| • Existing lighting, electrical systems, drainage elements, overhead and underground utilities, existing power service, etc. are as shown on the plans | ☐ | ☐ | ☐ | |
| • Existing lighting and electrical equipment to be reused is in good condition and accommodates intended use as shown on plans | ☐ | ☐ | ☐ | |
| • Existing signals and associated equipment (e.g. cabinet, conduit runs, detection, signal structures, signal heads, etc.) are as shown on the plans | ☐ | ☐ | ☐ | |
| • Existing signal equipment to be reused is in good condition and accommodates intended use as shown on plans | ☐ | ☐ | ☐ | |
| • Existing roadway geometrics, drainage elements, sidewalks / ramps, traffic barrier, etc. are as shown on the plans | ☐ | ☐ | ☐ | |
| • Posted speed corresponds with design speed used for the project | ☐ | ☐ | ☐ | |
| • Project limits are correct | ☐ | ☐ | ☐ | |
| • Adequate right of way and/or easements have been provided for signing, lighting, and signal installations | ☐ | ☐ | ☐ | |
| • Existing bicycle facilities have been retained in the proposed design | ☐ | ☐ | ☐ | |
| • Proposed power feeds and telephone lines are available for service | ☐ | ☐ | ☐ | |
| • Heights of overhead utilities will not conflict with proposed signing, lighting and signal installations | ☐ | ☐ | ☐ | |
| • Proposed structures / foundations are not located in drainage facilities | ☐ | ☐ | ☐ | |
| • Locations exist where existing guardrail may be extended rather than new guardrail installed, as proposed in the plans | ☐ | ☐ | ☐ | |
| • All physical constraints that may prevent traffic control device installation are shown on the plans (e.g. trees, shrubbery) | ☐ | ☐ | ☐ | |
| • There are no obvious special conditions that have been omitted from the plans (e.g. on-street parking, bus lanes / stops) | ☐ | ☐ | ☐ | |
| • Digital photographs of the project site have been submitted | ☐ | ☐ | ☐ | |

# Maryland Department of Transportation State Highway Administration
# Traffic Engineering Design Division Areawide Checklist

Contract No.: _____ TIMS No.: _____ Designer: _____
Scheduled PSE: _____ Location: _____
Description: _____
Project Type: _____

| Tasks | Dates<br>Requested/ Began | Received/ Completed | Comments |
|---|---|---|---|
| Contact DR Preparer | | | |
| Obtain Existing Plans – Construction/ROW | | | |
| Environmental Review Request w/ Site Map | | | |
| Field Review | | | |
| Power Location Requested | | | |
| Request Structure Design | | | |
| Utility Conflicts Cleared? | ☐ Yes ☐ No ☐ N/A | | |
| Final Review | | | |
| FR Minutes (to Team Leader from Designer for concurrence) | | | |
| Modified 25C to CFD w/ map<br>Note: Cost Sharing | | | |
| PSE Package for Signature | | | |
| PSE Submittal | | | |
| If APS, approved APS Message Worksheet emailed to Edward Rodenhizer? | ☐ Yes ☐ No ☐ N/A | | |

**PSE Package Contains the Following**

| | Yes | N/A |
|---|---|---|
| Transmittal Letter | ☐ | ☐ |
| Work Description | ☐ | ☐ |
| Independent Review | ☐ | ☐ |
| Power Confirmation | ☐ | ☐ |
| Traffic Barrier Include | ☐ | ☐ |
| Structure Details | ☐ | ☐ |
| Signing & Lighting Details | ☐ | ☐ |
| Engineer's Estimate | ☐ | ☐ |

**Final Cost:** _____

| | Yes | N/A |
|---|---|---|
| Environmental Review Request | ☐ | ☐ |
| Final Review Letter | ☐ | ☐ |
| Modified 25C- CPD | ☐ | ☐ |
| CD | ☐ | ☐ |
| Partial Reimbursements - Logo projects | ☐ | ☐ |
| Consultant Report Card | ☐ | ☐ |
| LED Tracker | ☐ | ☐ |
| UPS Tracker | ☐ | ☐ |

Checked by Team Leader (signature)

# Maryland Department of Transportation
# State Highway Administration
# Traffic Engineering Design Division Insert Checklist

Contract No.: _____ TIMS No.: _____ Designer: _____
Scheduled PSE: _____ Location: _____
Description: _____
Project Type: _____

| Tasks | Dates<br>Requested/ Began | Received/ Completed | Comments |
|---|---|---|---|
| Field Review | | | |
| Request Structure Design | | | |
| Power Location Requested | | | |
| Utility Conflicts Cleared? | ☐ Yes ☐ No ☐ N/A | | |
| Final Review | | | |
| FR Minutes (to Cedric Ward from Chief for concurrence) | | | |
| PSE Package for Signature | | | |
| PSE Submittal | | | |
| If APS, approved APS Message Worksheet emailed to Edward Rodenhizer? | ☐ Yes ☐ No ☐ N/A | | |

**PSE Package Contains the Following**

| | Yes | N/A |
|---|---|---|
| Transmittal Letter | ☐ | ☐ |
| Work Description | ☐ | ☐ |
| Signal Plan & SP Info – GI | ☐ | ☐ |
| Power Confirmation | ☐ | ☐ |
| Traffic Barrier Include | ☐ | ☐ |
| Structure Details | ☐ | ☐ |
| Signing & Lighting Details | ☐ | ☐ |
| Engineer's Estimate | ☐ | ☐ |

**Final Cost:** _____

| | Yes | N/A |
|---|---|---|
| Final Review Letter | ☐ | ☐ |
| CD | ☐ | ☐ |
| Consultant Report Card | ☐ | ☐ |
| Design Checklist | ☐ | ☐ |
| LED Tracker | ☐ | ☐ |
| UPS Tracker | ☐ | ☐ |

Checked by Team Leader (signature)

# Maryland Department of Transportation
# State Highway Administration
# Traffic Engineering Design Division Developer Checklist

Contract No.: _____ TIMS No.: _____ Designer: _____
Scheduled PSE: _____ Location: _____
Description: _____
Project Type: _____

| Tasks | Dates<br>Requested/ Began | Received/ Completed | Comments |
|---|---|---|---|
| Field Review | | | |
| Utility Conflicts Cleared? | ☐ Yes ☐ No ☐ N/A | | |
| Final Review | | | |
| FR Minutes (to Team Leader from Designer for concurrence) | | | |
| PSE Package for Signature | | | |
| PSE Submittal | | | |
| If APS, approved APS Message Worksheet emailed to Edward Rodenhizer? | ☐ Yes ☐ No ☐ N/A | | |

**PSE Package Contains the Following:**

**Final Cost:** _____

| | Yes | N/A |
|---|---|---|
| Transmittal Letter: | ☐ | ☐ |
| Work Description: | ☐ | ☐ |
| Traffic Barrier Include: | ☐ | ☐ |
| Structure Details: | ☐ | ☐ |
| Signing & Lighting Details: | ☐ | ☐ |
| Engineer's Estimate: | ☐ | ☐ |

| | Yes | N/A |
|---|---|---|
| Final Review Letter: | ☐ | ☐ |
| CD: | ☐ | ☐ |
| Consultant Report Card: | ☐ | ☐ |

Checked by Team Leader (signature)

# Appendix A-3

## POST ADVERTISEMENT PROCESS

After a PS&E package has been submitted, there are several post advertisement processes which may be used on a project. These include Addenda, Redlines, Greenlines and Shop Drawings.

### ADDENDA

An addendum is issued to make design changes between the advertised date and the date bids are received. Generally, an addendum can be issued if there is sufficient time for bidders to be notified and revise their submissions prior to turning in their bid. An addendum is used to make any changes which may impact the quantities and bid prices. OOTS must review and approve all addenda prior to submission.

### FIELD REVISIONS

Field revisions are broken down into two categories based on the size of the change, in terms of contract price and/or quantities. Major revisions or changes, which are issued by the lead division and authorized by the Chief Engineer, are referred to as Redline Revisions. Minor or discretionary changes, which do not have a significant impact, are called Greenline Revisions. Designers working on a field revision should work closely with the construction Project Engineer.

### REDLINES

Redline Revisions are design changes which cause a significant impact to the contract price and/or quantities, require changes to a standard, or involve a significant change in the design. They are issued by the lead division after the contractor has been given Notice to Proceed, and must be approved by OOTS and the Chief Engineer prior to submission. Redline revisions can be used to show changes to the plans such as adding or deleting signs, changing sign sizes, or changing sign supports. These changes are drawn on the plans in red, with each revision designated by a red box with the appropriate revision number. These changes also require a revised estimate showing original and revised quantities.

### GREENLINES

Greenline Revisions are used to make minor or discretionary design changes which do not cause a change in the contract price or quantities. They can be done at the request of the lead division or can be issued by the construction Project Engineer in conjunction with the appropriate SHA Design Unit. Greenlines are also used to track As-Built changes for a particular project. These types of changes are typically marked on the plans in green, and are not numbered.

### SHOP DRAWINGS

During construction, the Inspection Section (part of TOD) will coordinate the review and approval of shop drawings. Before the TCD's can be fabricated for Insert or Advertised projects, the contractor must submit shop drawings of the equipment and devices, such as lighting structures and sign faces, for review by TEDD.

It is also important to check that the TCD's are the same as what is specified on the plans in terms of size and layout. The shop drawings are the last opportunity to revise layouts, however keep in mind that major changes require a formal Redline Revision.

# Appendix A-4

## SAMPLE PROJECTS

### SIGNING AND MARKING PLANS

*Signing and Marking*

US 15 at Monocacy Blvd Signing & Marking Plans*…… SN-1
SN-2.5
SN-2.6
SN-2.7
SN-2.8
SN-3.1
SN-3.2
SN-4.1
SN-9
SN-11.1

*Sign Structure Replacement*

MD 32 at US 1 Signing…… SN-2.1
SN-2.2
SN-8.1

*Specific Service Signing*

Specific Service Signing for I-95 at MD 272 (Exit 100)*……General Notes & Quantities
Signing Plan
Sign Details
Sign Support Details

### SIGNAL PLANS

*Signal Modification*

MD 174 at Thelma Avenue…… Signalization Plan Sheet
General Information Sheet

*Signal Reconstruct*

MD 182 at Longmead Crossing Dr/Norvale Rd*…… Signalization Plan Sheet
Interconnect Plan Sheet
Geometric Detail Sheet
General Information Sheet

*New Construction*

MD 28 at Wintergate Drive…… Signalization Plan Sheet
Interconnect Plan Sheet
General Information Sheet

## LIGHTING PLANS

*Interchange Lighting*

| | |
|---|---|
| I-70 at Marriottsville Rd Interchange Lighting…… | Project Information and Quantities |
| | Sheet Layout |
| | Lighting Plan |
| | Lighting Plan |
| | Lighting Plan |
| | Lighting Plan |
| | Panel and Pole Schedule |

*Intersection Lighting*

| | |
|---|---|
| MD 41 at Satyr Hill Rd and Waltham Woods Rd…… | Title Sheet |
| | Lighting Plan |
| | Lighting Plan |

*Underpass Lighting*

| | |
|---|---|
| MD 26 at I-695 Interchange…… | Project Information and Quantities |
| | Lighting Plan |
| | Lighting Plan |
| | Underpass Lighting Layout |
| | Underpass Lighting Details |
| | Underpass Lighting Details |

*Complete plan set is not included

## CRITERIA

THE CONTRACTOR SHALL BE GOVERNED BY THE STANDARDS AND REQUIREMENTS OF THE FOLLOWING PUBLICATIONS, EXCEPT AS MODIFIED BY THE SPECIAL PROVISIONS OF THIS CONTRACT:

DESIGN

MDSHA - "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", 2011 EDITION AND SUBSEQUENT REVISIONS. (MdMUTCD)

A A S H T O - "HIGHWAY SAFETY DESIGN AND OPERATIONS GUIDE" -1997

A A S H T O - "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS LUMINAIRES AND TRAFFIC SIGNALS", 2001 EDITION (CATEGORY II FOR ALL OVERHEAD AND CANTILEVER SIGN STRUCTURES).

MATERIALS AND CONSTRUCTION

MDSHA - "STANDARD SPECIFICATIONS FOR CONSTRUCTION & MATERIALS", 2008 EDITION AND SUBSEQUENT SUPPLEMENTS.

## DESIGN WIND

100 MPH - WOOD SUPPORTS
10 YEAR RECURRENCE INTERVAL

100 MPH - GROUND MOUNT SIGN STEEL SUPPORTS
10 YEAR RECURRENCE INTERVAL

100 MPH - OVERHEAD AND CANTILEVER STRUCTURES
50 YEAR RECURRENCE INTERVAL

} ALL DISTRICTS

## DESIGN STRESS

SOIL BEARING PRESSURE - S = 3,000 P.S.F. (ASSUMED)
SEE MATERIAL & CONSTRUCTION ABOVE AND SPECIAL PROVISIONS FOR DESIGN STRESSES FOR STRUCTURAL STEEL, ALUMINUM, REINFORCING STEEL AND CONCRETE.

## CHAMFER

ALL EXPOSED EDGES OF CONCRETE SHALL HAVE A 3/4" X 3/4" CHAMFER.

## CLASSIFICATION OF SIGNS

SIGNS ARE DIVIDED INTO TWO (2) GENERAL CATEGORIES.

1. GUIDE SIGNS
   - A) STRUCTURAL TYPES
     - OH - OVERHEAD
     - C - CANTILEVER
     - GM - GROUND MOUNT, BREAKAWAY OR NON-BREAKWAY
     - BM - BRIDGE MOUNTED
   - B) PANELS
     - MATERIAL - EXTRUDED ALUMINUM
     - COPY - DIRECT APPLIED
       - 1) HIGH INTENSITY (NEW SIGNS AND REVISIONS TO EXISTING SIGNS)
2. STANDARD SIGNS (REGULATORY, WARNING, ETC.)
   - A) STRUCTURAL TYPES
     - WOOD SUPPORTS
     - SQUARE TUBE
   - B) PANELS
     - MATERIAL - SHEET ALUMINUM
     - COPY - DIRECT APPLIED

## IDENTIFICATION OF SIGNS AND PANELS

GUIDE SIGNS

EACH GUIDE SIGN IS IDENTIFIED BY A SIGN NUMBER ON THE PLANS AND IN THE TABULATIONS. (GM-1, GM-2, GM-3, etc)
SIGNS ON STRUCTURES ARE IDENTIFIED WITH A NUMBER AND WHERE VARIATIONS OCCUR, A LOWER CASE LETTER. (OH-1a, OH-1b, OH-1c)

STANDARD SIGNS

STANDARD SIGNS ARE IDENTIFIED BY PANEL NUMBERS AND ARE CLASSIFIED AS FOLLOWS
- R - REGULATORY
- W - WARNING
- M - ROUTE MARKERS AND ACCESSORIES
- D - DESTINATION AND MILEAGE PANELS
- S - SCHOOL

PANELS SHALL BE DESIGNATED TO AGREE WITH MARYLAND STANDARD SIGN BOOK.
EACH STANDARD SIGN IS IDENTIFIED FIRST BY THE SHEET NUMBER, THEN BY THE NUMERICAL ORDER OF THE SIGN AS IT APPEARS ON THE PLAN.
FOR EXAMPLE SHEET SN 2.1-101,102,103, ETC. SHEET SN 2.2-201,202,203,ETC.

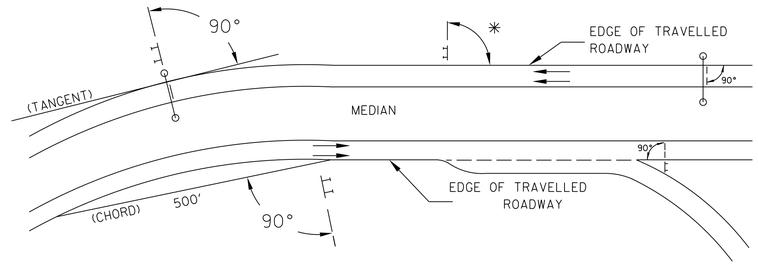
## PANEL LAYOUT AND ALPHABETS

1. GUIDE SIGN PANEL LAYOUTS ARE BASED ON THE A.A.S.H.T.O. MANUALS NOTED ABOVE.
2. STANDARD SIGN PANEL LAYOUTS ARE BASED ON THE MdMUTCD WITH SPECIFICATIONS DETAILED IN THE MARYLAND STATE HIGHWAY ADMINISTRATION PUBLICATION, "STANDARD SIGN BOOK", AVAILABLE ONLINE @ https:/www.marylandroads.com/businesswithsha/bizStdsSpecs/desManualStdPub/publicationsonline/oots/internet_signbook.asp

## REFLECTORIZATION

BACKGROUNDS, BORDERS, TEXTS AND ALL OTHER ELEMENTS OF SIGN PANELS SHALL BE REFLECTORIZED EXCEPT WHERE NOTED. REFER TO PROJECT REQUIREMENTS FOR MORE DETAIL.

## ORIENTATION OF SIGN FACES




✳ UNDER 30 FEET FROM TRAVELLED ROADWAY TO NEAR EDGE OF SIGN - 93° AWAY FROM THE ROAD TO AVOID SPECULAR REFLECTION AS INDICATED IN 813.03 OF THE MARYLAND STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS.

OVER 30 FEET FROM TRAVELLED ROADWAY TO NEAR EDGE OF SIGN - 90°

## SIGN LOCATIONS

1. GUIDE SIGNS ARE LOCATED ON THE PLANS BY DIMENSION TO SURVEY STATIONS, OR WHEN NECESSARY, TO IDENTIFIABLE PHYSICAL FEATURES.
2. ALL CHANGES IN THE LOCATIONS OF SIGNS AS SHOWN ON THE PLAN SHALL HAVE THE PRIOR APPROVAL OF THE ENGINEER.

## EXISTING UTILITIES

THE ENGINEER DOES NOT WARRANT OR GUARANTEE THE ACCURACY OR COMPLETENESS OF UTILITY INFORMATION SHOWN ON THE PLAN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND PROTECT ALL EXISTING FACILITIES WHICH MIGHT BE AFFECTED BY THIS WORK OR HIS OPERATION.

## ROADSIDE SIGNS

1. VERTICAL ALIGNMENT
   POSITION PANEL SO FACE IS PLUMB.
2. HORIZONTAL ALIGNMENT (SEE DIAGRAM ABOVE)
   - A) ON STRAIGHT ROADWAY SECTIONS, ANGLE OF SIGN FACE TO ROADWAY VARIES WITH DISTANCE FROM TRAVELLED ROADWAY TO NEAR EDGE OF SIGN - SEE DIAGRAM.
   - B) ON THE INSIDE OF HORIZONTAL CURVES, POSITION SIGN SO FACE OF PANEL MAKES AN ANGLE OF 90° WITH A CHORD BETWEEN A POINT ON NEAR EDGE OF PAVEMENT AT SIGN LOCATION AND A POINT ON EDGE OF PAVEMENT 500' IN ADVANCE OF SIGN.
   - C) ON THE OUTSIDE OF HORIZONTAL CURVES, POSITION SIGN SO FACE OF PANEL IS AT RIGHT ANGLES TO THE TANGENT OF THE CURVE AT THE SIGN LOCATION.
   - D) POSITIONING OF SIGNS AT GORES AND RAMP SEPARATIONS IS REFERRED TO THE NORMAL EDGE OF THE MAINLINE ROADWAY.

## OVERHEAD SIGNS

1. VERTICAL ALIGNMENT
   POSITION PANELS FOR ALL OVERHEAD STRUCTURES SO THAT PANEL FACE IS PLUMB.
2. OVERHEAD SIGN STRUCTURES SHALL NOT BE ERECTED WITHOUT ATTACHING LUMINAIRES, SUPPORTS, AND/OR SIGNS.
3. HORIZONTAL ALIGNMENT
   - A) POSITION ALL OVERHEAD SIGNS SO THAT THE FACE OF THE PANEL IS AT RIGHT ANGLES TO THE NORMAL EDGE OF ROADWAY, IF ON A STRAIGHT ROADWAY SECTION.
   - B) POSITION ALL OVERHEAD SIGNS SO THAT THE FACE OF THE PANEL IS AT RIGHT ANGLES TO THE TANGENT OF THE CURVE AT SIGN LOCATION, IF ON A HORIZONTAL CURVE.
   - C) POSITIONING OF SIGNS AT GORES AND RAMP SEPARATIONS IS REFERRED TO THE NORMAL EDGE OF THE MAINLINE ROADWAY.
4. VERTICAL CLEARANCE
   - A) OVERHEAD SIGNS SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 17'-9" FROM ROADWAY TO THE BOTTOM OF LIGHT FIXTURES. ALL LIGHT FIXTURES ARE TO BE AT THE SAME ELEVATION.
   - B) IF THE CONTRACTOR CANNOT OBTAIN 17'-9" (SEE 3A) CLEARANCE, HE IS TO CEASE WORK AND CONTACT THE PROJECT ENGINEER FOR FURTHER INSTRUCTIONS. THE PROJECT ENGINEER MAY CONTACT THE TRAFFIC ENGINEERING DESIGN DIVISION FOR ASSISTANCE.
   - C) ON ALL OVERHEAD SIGNS, THE MINIMUM CLEARANCE TO BOTTOM OF SIGN: 20'-9".

## PROJECT REQUIREMENTS

ALL NEW SIGNS ON THIS PROJECT SHALL BE FABRICATED FROM SHEETING WHICH MEETS ALL OF THE FOLLOWING REQUIREMENTS, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS DIRECTED BY THE ENGINEER:

1. SHEETING SHALL MEET THE REQUIREMENTS OF SECTIONS 813 AND 950.03 OF MDSHA'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS (JULY 2008) AND SUBSEQUENT REVISIONS
2. LISTED ON MDSHA OFFICE OF TRAFFIC AND SAFETY'S QUALIFIED PRODUCTS LIST (QPL)

## PROJECT REQUIREMENTS CONT'D

3. THE FOLLOWING TYPES OF SHEETING SHALL BE USED FOR THE SPECIFIED SIGN CLASSIFICATIONS
   - A) **GUIDE, EXIT GORE, AND GENERAL INFORMATION SIGNS-** RETROREFLECTIVE SHEETING FOR GUIDE SIGNS, EXIT GORE, AND GENERAL INFORMATION (INCLUDES WHITE ON GREEN, WHITE ON BLUE, WHITE ON BROWN AND THE REVERSE OF THESE COLORS) SHALL MEET OR EXCEED THE REQUIREMENTS FOR ASTM TYPE IX LEGEND ON ASTM TYPE IX BACKGROUND. REGULATORY AND WARNING MESSAGES WITHIN GUIDE SIGNS SHALL BE NON-REFLECTIVE BLACK LEGEND ON BACKGROUND SHEETING WHICH MEETS OR EXCEEDS THE REQUIREMENTS FOR ASTM TYPE IX SHEETING.
   - B) **WARNING SIGNS** - RETROREFLECTIVE SHEETING FOR BLACK ON FLUORESCENT YELLOW WARNING SIGNS SHALL BE NON-REFLECTIVE BLACK LEGEND ON BACKGROUND SHEETING WHICH MEETS OR EXCEEDS THE REQUIREMENTS FOR ASTM TYPE IX SHEETING. REGULATORY MESSAGES WITHIN WARNING SIGNS SHALL FOLLOW THE GUIDELINES FOR REGULATORY SIGNS.
   - C) **SCHOOL SIGNS** - RETROREFLECTIVE SHEETING FOR SCHOOL SIGNS (BLACK ON FLUORESCENT YELLOW AND BLACK ON FLUORESCENT YELLOW GREEN) SHALL BE NON-REFLECTIVE BLACK LEGEND ON BACKGROUND SHEETING WHICH MEETS OR EXCEEDS THE REQUIREMENTS FOR ASTM TYPE IX SHEETING. REGULATORY MESSAGES WITHIN SCHOOL SIGNS SHALL FOLLOW THE REQUIREMENTS FOR REGULATORY SIGNS.
   - D) **REGULATORY SIGNS** - FALL INTO THREE SUBCATEGORIES:
     - i. "RED" REGULATORY SIGNS (STOP, YIELD, DO NOT ENTER AND WRONG WAY) RETROREFLECTIVE SHEETING FOR THESE SIGNS AND THEIR SUPPLEMENTAL PANELS (INCLUDES WHITE ON RED AND RED ON WHITE) SHALL MEET OR EXCEED THE REQUIREMENTS FOR ASTM TYPE IX SHEETING.
     - ii. ALL R7 AND R8 SERIES PARKING RELATED SIGNS AND THEIR SUPPLEMENTAL PANELS, NO TRESPASSING SIGNS, AND SIGNS DIRECTED AT PEDESTRIANS AND BICYCLISTS ONLY (INCLUDES RED ON WHITE, GREEN ON WHITE, BLUE ON WHITE, BLACK ON WHITE AND THE REVERSE OF THESE COLORS) SHALL BE ASTM TYPE I LEGEND ON ASTM TYPE I BACKGROUND.
     - iii. ALL OTHER REGULATORY SIGNS - RETROREFLECTIVE SHEETING FOR THESE SIGNS AND THEIR SUPPLEMENTAL PANELS (INCLUDES BLACK ON WHITE) SHALL BE NON-REFLECTIVE BLACK LEGEND ON ASTM TYPE IV BACKGROUND. WHERE RED IS SPECIFIED, OR WHERE THE COLOR OF THE SIGN IS WHITE ON BLACK, THE LEGEND SHALL BE ASTM TYPE IV RETROREFLECTIVE SHEETING ON NON-REFLECTIVE BLACK BACKGROUND. WARNING MESSAGES WITHIN REGULATORY SIGNS SHALL FOLLOW THE GUIDELINES FOR WARNING SIGNS.
   - E) **ROUTE MARKERS** - RETROREFLECTIVE SHEETING FOR ROUTE MARKERS (INCLUDES BLACK ON WHITE , GREEN ON WHITE, WHITE ON GREEN, WHITE ON RED/BLUE) SHALL MEET THE REQUIREMENTS OF GUIDE SIGNS ABOVE WHEN SPECIFIED AS THE LEGEND OF A GUIDE SIGN. RETROREFLECTIVE SHEETING FOR ALL INDEPENDENT ROUTE MARKERS AND THEIR AUXILIARY PANELS SHALL BE ASTM TYPE IV AND/OR NON-REFLECTIVE BLACK LEGEND ON ASTM TYPE IV BACKGROUND.
   - F) **LOGOS AND/OR GRAPHICS** - WITHIN SIGNS SHALL FOLLOW THE GUIDELINES FOR THE RESPECTIVE SIGN CLASSIFICATION UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, OR AS DIRECTED BY THE ENGINEER.
   - G) **CIVIL DEFENSE SIGNS AND OTHER SIGNS** - NOT SPECIFICALLY FALLING INTO ONE OF THE CATEGORIES ABOVE, SHALL FOLLOW THE GUIDELINES FOR THE SIGN CLASSIFICATION THAT MOST CLOSELY MATCHES THE COLOR(S) OF THE PROPOSED SIGN.
   - H) **SIGN LIGHTING** - ALL OVERHEAD EXIT DIRECTIONS SIGNS SHALL BE LIT. SEE THE LIGHTING PLANS FOR DETAILS.
4. THE FOLLOWING MINIMUM THICKNESS SHALL BE USED FOR THE APPROPRIATE WIDTH OF SHEET ALUMINUM BLANKS.

| LONGEST DIMENSION | MINIMUM THICKNESS |
|---|---|
| UP TO 12" | 0.040" |
| GREATER THAN 12" TO 24" | 0.063" |
| GREATER THAN 24" TO 36" | 0.080" |
| GREATER THAN 36" TO 48" | 0.100" |
| OVER 48" | 0.125" |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Baltimore, MD 21201
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(Fax) 410-727-4608
http:/www.pbworld.com


| APPROVALS | REVISIONS |
|---|---|
| TEAM LEADER | |
| ASST. DIV. CHIEF | |
| DIVISION CHIEF | |
| OFFICE DIRECTOR | |

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)
MONOCACY BOULEVARD INTERCHANGE

# GENERAL NOTES AND PROPOSALS

SCALE N.T.S. DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

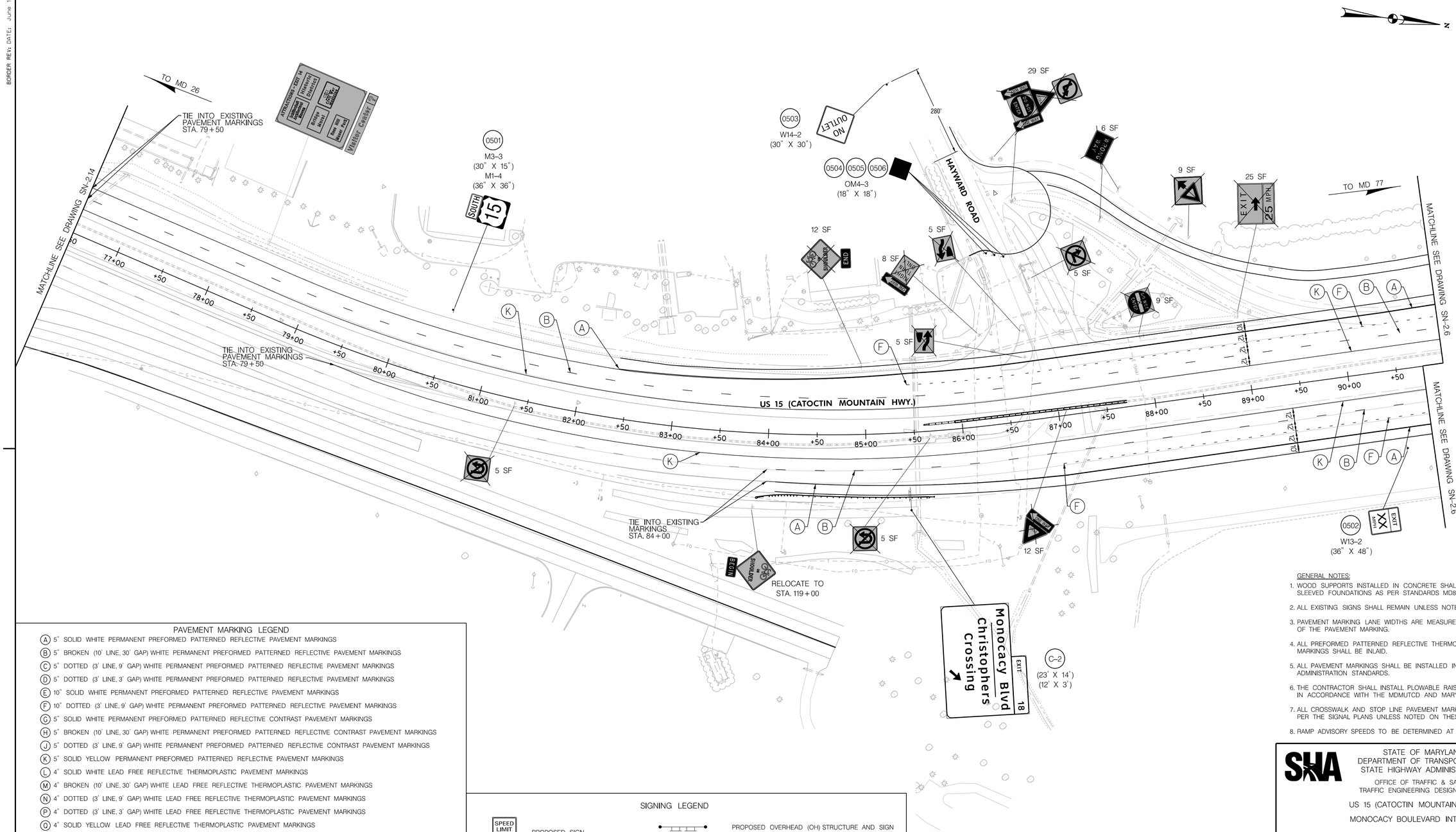
DESIGNED BY JEK
DRAWN BY JEK
CHECKED BY KMP
F.A.P. NO. SEE TITLE SHEET
COUNTY FREDERICK
LOGMILE 15.8-18
TIMS NO. K420
TOD NO.

DRAWING SN-1 OF 1 SHEET NO. 456 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:39 AM
FILE: T:\173124A-TrafficDesignServices\TRF\100\Plans\pSN-1_US15.dgn

SN-1 REV. DATE: April 02, 2012

BY: Kurgansky




GENERAL NOTES:

1. WOOD SUPPORTS INSTALLED IN CONCRETE SHALL BE INSTALLED WITH SLEEVED FOUNDATIONS AS PER STANDARDS MD812.05-01 AND MD812.05-02.
2. ALL EXISTING SIGNS SHALL REMAIN UNLESS NOTED ON THE PLAN.
3. PAVEMENT MARKING LANE WIDTHS ARE MEASURED FROM THE CENTER OF THE PAVEMENT MARKING.
4. ALL PREFORMED PATTERNED REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS SHALL BE INLAID.
5. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH ADMINISTRATION STANDARDS.
6. THE CONTRACTOR SHALL INSTALL PLOWABLE RAISED PAVEMENT MARKINGS IN ACCORDANCE WITH THE MDMUTCD AND MARYLAND BOOK OF STANDARDS.
7. ALL CROSSWALK AND STOP LINE PAVEMENT MARKINGS SHALL BE INSTALLED PER THE SIGNAL PLANS UNLESS NOTED ON THESE PLANS.
8. RAMP ADVISORY SPEEDS TO BE DETERMINED AT A LATER DATE IN TIME.

## PAVEMENT MARKING LEGEND

- (A) 5" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (B) 5" BROKEN (10' LINE, 30' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (C) 5" DOTTED (3' LINE, 9' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (D) 5" DOTTED (3' LINE, 3' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (E) 10" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (F) 10" DOTTED (3' LINE, 9' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (G) 5" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKINGS
- (H) 5" BROKEN (10' LINE, 30' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKINGS
- (J) 5" DOTTED (3' LINE, 9' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKINGS
- (K) 5" SOLID YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (L) 4" SOLID WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (M) 4" BROKEN (10' LINE, 30' GAP) WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (N) 4" DOTTED (3' LINE, 9' GAP) WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (P) 4" DOTTED (3' LINE, 3' GAP) WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Q) 4" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (R) 8" SOLID WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (S) 10" DOTTED (3' LINE, 3' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (T) HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKINGS LEGENDS/SYMBOLS
- (U) 12" SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING (FOR CROSSWALK)
- (V) 24" SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING (FOR STOP LINE)
- (W) 15" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (X) 5" SOLID WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Y) 5" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Z) 10" SOLID YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS

## SIGNING LEGEND

- SPEED LIMIT 50 — PROPOSED SIGN
- SPEED LIMIT 50 — EXISTING SIGN AND SUPPORT TO REMAIN
- SPEED LIMIT 50 — EXISTING SIGN TO BE REMOVED
- PROPOSED OVERHEAD (OH) STRUCTURE AND SIGN
- PROPOSED CANTILEVER (C) STRUCTURE AND SIGN
- PROPOSED GROUND MOUNTED (GM) SIGN
- EXISTING GROUND MOUNTED SIGN
- ### — SIGN NUMBER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http://www.pbworld.com


STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)

MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# SIGNING AND MARKING PLAN

SCALE 1" = 50' DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

| | | | |
|---|---|---|---|
| DESIGNED BY | JEK | COUNTY | FREDERICK |
| DRAWN BY | JEK | LOGMILE | 15.8–18 |
| CHECKED BY | KMP | TIMS NO. | K420 |
| F.A.P. NO. | SEE TITLE SHEET | TOD NO. | |

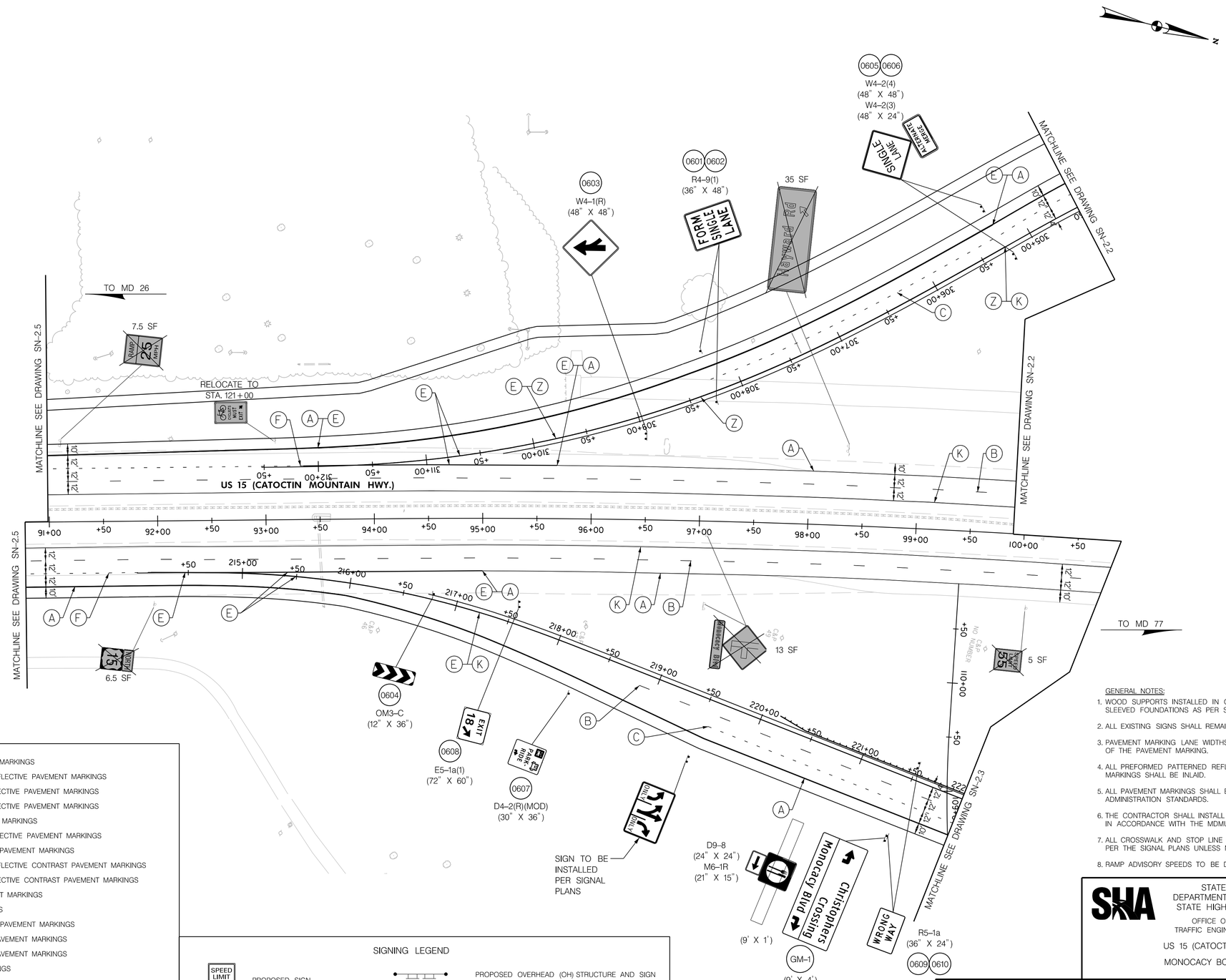
DRAWING SN-2.5 OF 2.19 SHEET NO. 463 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:42 AM
FILE: T:\173124A-Traffic\DesignServices\TRF\100\Plans\pSN-P005_US15.dgn

BY: Kurgansky –

BORDER REV: DATE: June 1, 2004

DRILL HOLES




GENERAL NOTES:

1. WOOD SUPPORTS INSTALLED IN CONCRETE SHALL BE INSTALLED WITH SLEEVED FOUNDATIONS AS PER STANDARDS MD812.05–01 AND MD812.05–02.
2. ALL EXISTING SIGNS SHALL REMAIN UNLESS NOTED ON THE PLAN.
3. PAVEMENT MARKING LANE WIDTHS ARE MEASURED FROM THE CENTER OF THE PAVEMENT MARKING.
4. ALL PREFORMED PATTERNED REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS SHALL BE INLAID.
5. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH ADMINISTRATION STANDARDS.
6. THE CONTRACTOR SHALL INSTALL PLOWABLE RAISED PAVEMENT MARKINGS IN ACCORDANCE WITH THE MDMUTCD AND MARYLAND BOOK OF STANDARDS.
7. ALL CROSSWALK AND STOP LINE PAVEMENT MARKINGS SHALL BE INSTALLED PER THE SIGNAL PLANS UNLESS NOTED ON THESE PLANS.
8. RAMP ADVISORY SPEEDS TO BE DETERMINED AT A LATER DATE IN TIME.

PAVEMENT MARKING LEGEND

- (A) 5" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (B) 5" BROKEN (10' LINE, 30' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (C) 5" DOTTED (3' LINE, 9' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (D) 5" DOTTED (3' LINE, 3' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (E) 10" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (F) 10" DOTTED (3' LINE, 9' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (G) 5" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKINGS
- (H) 5" BROKEN (10' LINE, 30' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKINGS
- (J) 5" DOTTED (3' LINE, 9' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKINGS
- (K) 5" SOLID YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (L) 4" SOLID WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (M) 4" BROKEN (10' LINE, 30' GAP) WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (N) 4" DOTTED (3' LINE, 9' GAP) WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (P) 4" DOTTED (3' LINE, 3' GAP) WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Q) 4" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (R) 8" SOLID WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (S) 10" DOTTED (3' LINE, 3' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (T) HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKINGS LEGENDS/SYMBOLS
- (U) 12" SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING (FOR CROSSWALK)
- (V) 24" SOLID WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING (FOR STOP LINE)
- (W) 15" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (X) 5" SOLID WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Y) 5" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Z) 10" SOLID YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS

SIGNING LEGEND

| | | | |
|---|---|---|---|
| SPEED LIMIT 50 | PROPOSED SIGN | | PROPOSED OVERHEAD (OH) STRUCTURE AND SIGN |
| SPEED LIMIT 50 | EXISTING SIGN AND SUPPORT TO REMAIN | | PROPOSED CANTILEVER (C) STRUCTURE AND SIGN |
| | EXISTING SIGN TO BE REMOVED | | PROPOSED GROUND MOUNTED (GM) SIGN |
| | | | EXISTING GROUND MOUNTED SIGN |
| | | ### | SIGN NUMBER |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STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)
MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# SIGNING AND MARKING PLAN

SCALE 1" = 50' DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

| | | | |
|---|---|---|---|
| DESIGNED BY | JEK | COUNTY | FREDERICK |
| DRAWN BY | JEK | LOGMILE | 15.8–18 |
| CHECKED BY | KMP | TIMS NO. | K420 |
| F.A.P. NO. | SEE TITLE SHEET | TOD NO. | |

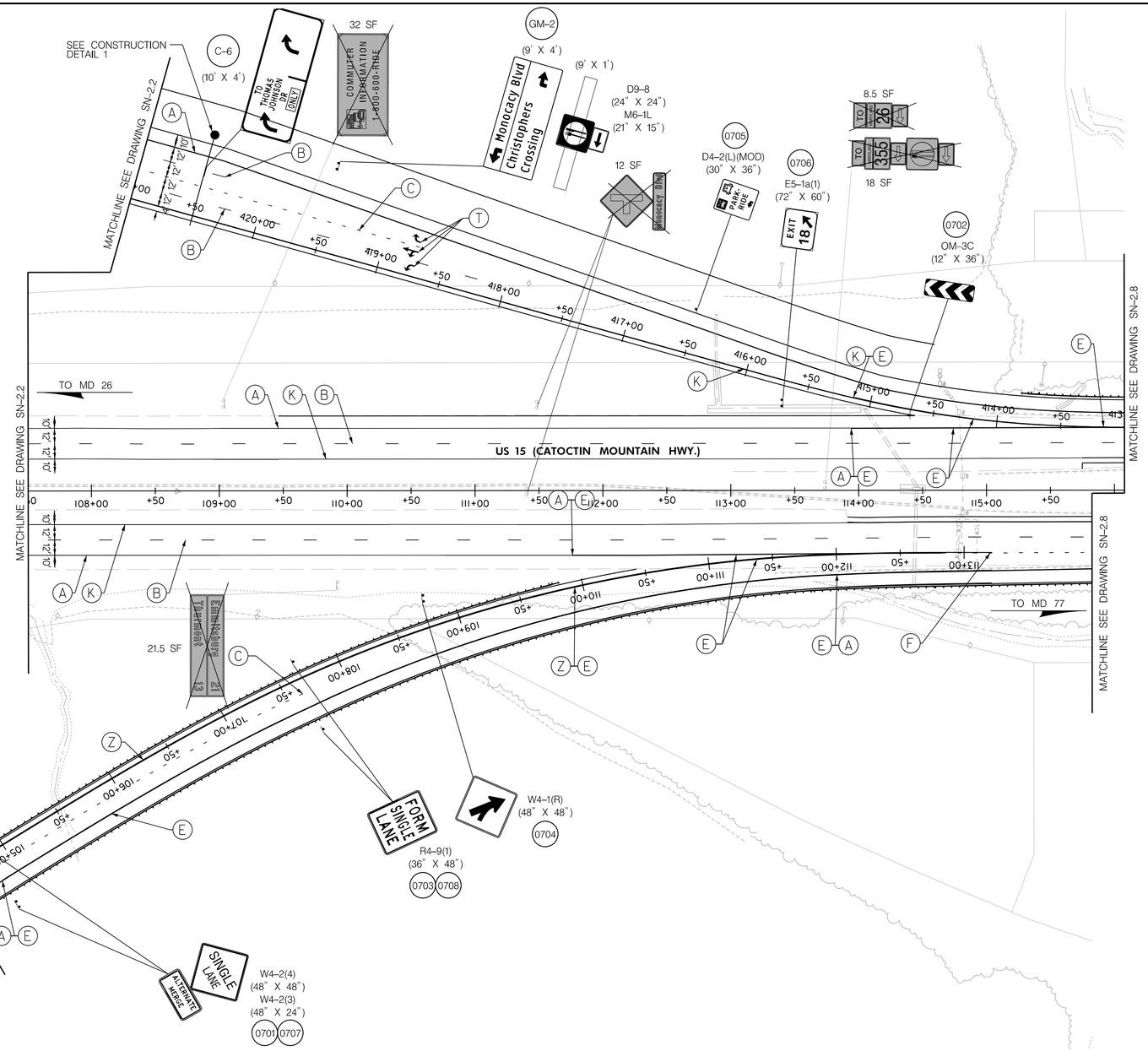
DRAWING SN – 2.6 OF 2.19 SHEET NO. 464 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:42 AM
FILE: T:\173124A–Traffic\DesignServices\TRF\100\Plans\pSN–P006_US15.dgn

BORDER REV: DATE: June 1, 2004

DRILL HOLES

BY: Kurgansky –




GENERAL NOTES:

1. WOOD SUPPORTS INSTALLED IN CONCRETE SHALL BE INSTALLED WITH SLEEVED FOUNDATIONS AS PER STANDARDS MD812.05-01 AND MD812.05-02.
2. ALL EXISTING SIGNS SHALL REMAIN UNLESS NOTED ON THE PLAN.
3. PAVEMENT MARKING LANE WIDTHS ARE MEASURED FROM THE CENTER OF THE PAVEMENT MARKING.
4. ALL PREFORMED PATTERNED REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS SHALL BE INLAID.
5. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH ADMINISTRATION STANDARDS.
6. THE CONTRACTOR SHALL INSTALL PLOWABLE RAISED PAVEMENT MARKINGS IN ACCORDANCE WITH THE MDMUTCD AND MARYLAND BOOK OF STANDARDS.
7. ALL CROSSWALK AND STOP LINE PAVEMENT MARKINGS SHALL BE INSTALLED PER THE SIGNAL PLANS UNLESS NOTED ON THESE PLANS.
8. RAMP ADVISORY SPEEDS TO BE DETERMINED AT A LATER DATE IN TIME.

PAVEMENT MARKING LEGEND

- (A) 5" SOLID WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
- (B) 5" BROKEN (10' LINE, 30' GAP) WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS
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- (Y) 5" SOLID YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS
- (Z) 10" SOLID YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKINGS

CONSTRUCTION DETAILS:

1. INSTALL CONCRETE FOUNDATION WITH A 27 FT. STEEL POLE WITH A 60 FT. MAST ARM WITH SHEET ALUMINUM SIGN. CENTER THE SIGN OVER THE 2 RIGHT TURN LANES. CUT THE MAST ARM FROM 60 FT. TO 38 FT. CLEAN, GALVANIZE AND CAP THE MAST ARM.

SIGNING LEGEND

- SPEED LIMIT 50 — PROPOSED SIGN
- SPEED LIMIT 50 — EXISTING SIGN AND SUPPORT TO REMAIN
- SPEED LIMIT 50 — EXISTING SIGN TO BE REMOVED
- PROPOSED OVERHEAD (OH) STRUCTURE AND SIGN
- PROPOSED CANTILEVER (C) STRUCTURE AND SIGN
- PROPOSED GROUND MOUNTED (GM) SIGN
- EXISTING GROUND MOUNTED SIGN
- ### — SIGN NUMBER


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TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)

MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# SIGNING AND MARKING PLAN

SCALE 1" = 50' DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

DESIGNED BY JEK COUNTY FREDERICK
DRAWN BY JEK LOGMILE 15.8-18
CHECKED BY KMP TIMS NO. K420
F.A.P. NO. SEE TITLE SHEET TOD NO.

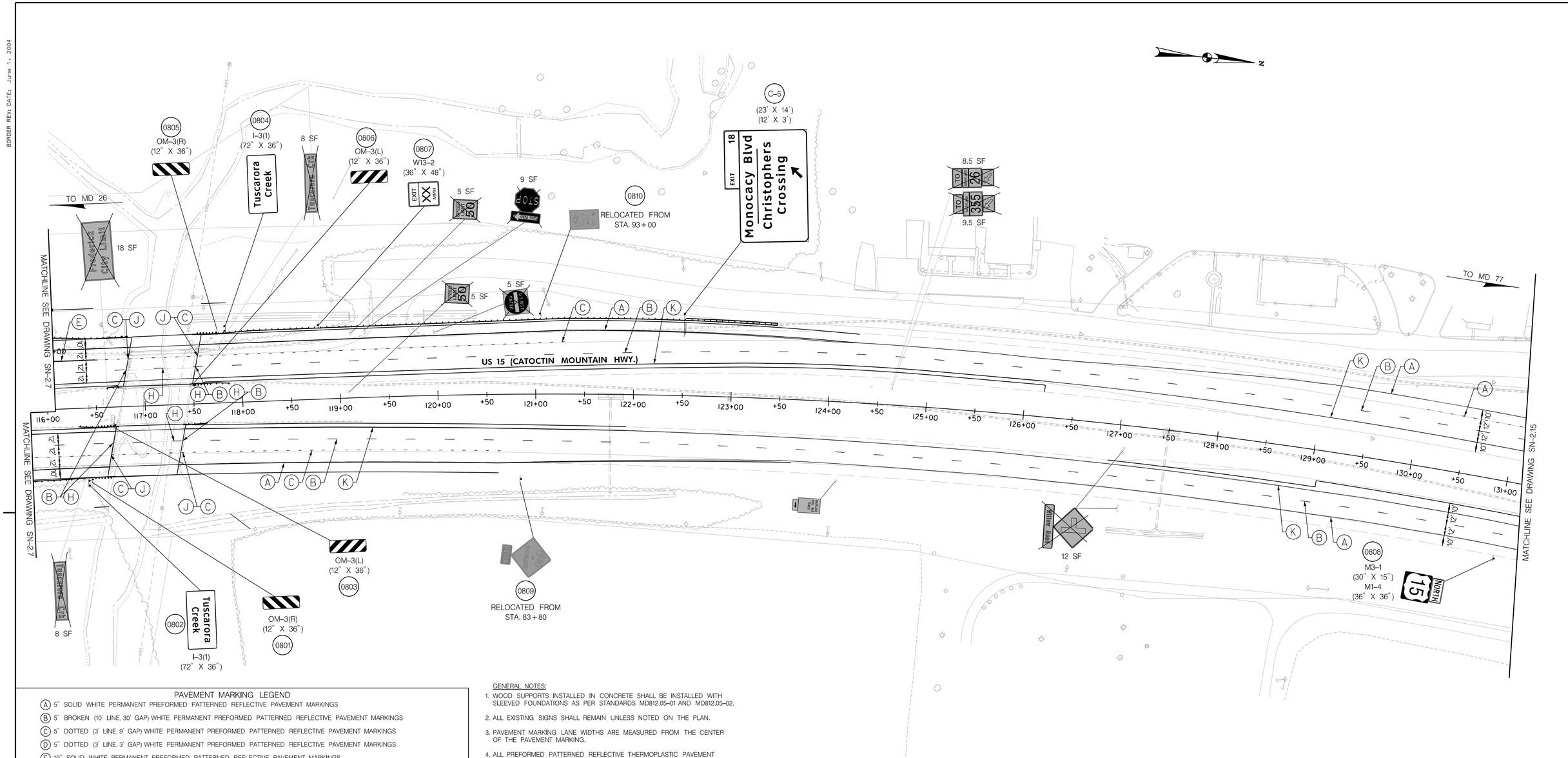
DRAWING SN-2.7 OF 2.19 SHEET NO. 465 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:43 AM
FILE: T:\173124A-Traffic\DesignServices\TRF\100\Plans\pSN-P007_US15.dgn

BY: Kurgansky

BORDER REV: DATE: June 1, 2004

DRILL HOLES

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## SIGNING LEGEND

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- SPEED LIMIT 50 — EXISTING SIGN AND SUPPORT TO REMAIN
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- PROPOSED OVERHEAD (OH) STRUCTURE AND SIGN
- PROPOSED CANTILEVER (C) STRUCTURE AND SIGN
- PROPOSED GROUND MOUNTED (GM) SIGN
- EXISTING GROUND MOUNTED SIGN
- ### — SIGN NUMBER


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TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)
MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# SIGNING AND MARKING PLAN

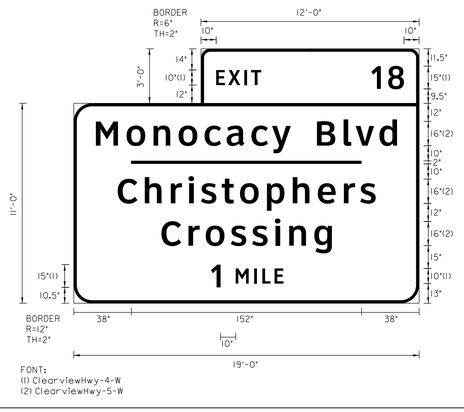
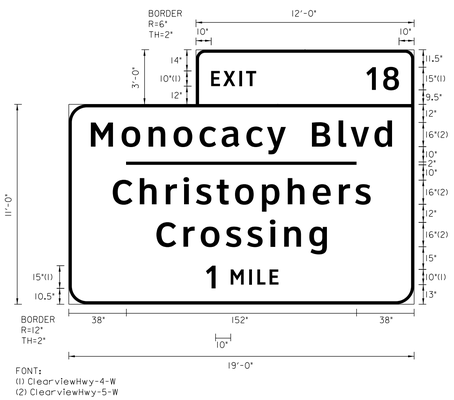
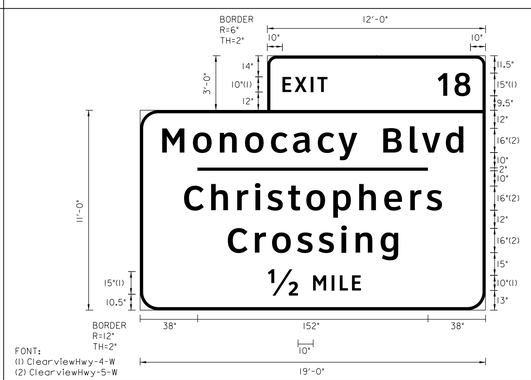
SCALE 1" = 50' DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

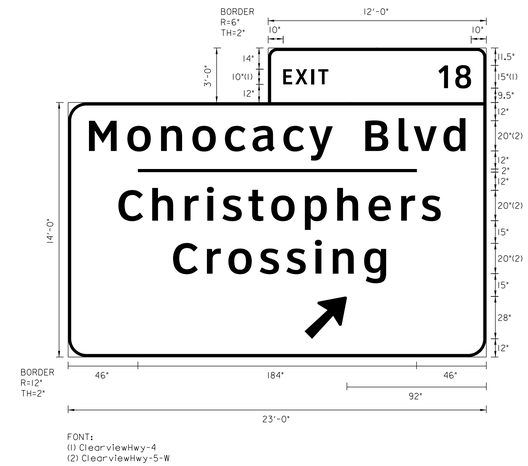
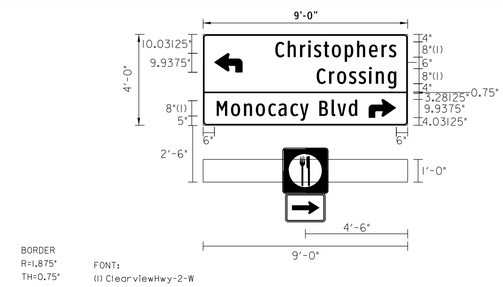
| | | | |
|---|---|---|---|
| DESIGNED BY | JEK | COUNTY | FREDERICK |
| DRAWN BY | JEK | LOGMILE | 15.8-18 |
| CHECKED BY | KMP | TIMS NO. | K420 |
| F.A.P. NO. | SEE TITLE SHEET | TOD NO. | |

DRAWING SN-2.8 OF 2.19 SHEET NO. 466 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:43 AM
FILE: T:\173124A-Traffic\DesignServices\TRF\100\Plans\pSN-P008_US15.dgn

BORDER REV: DATE: June 1, 2004
BY: Kurgansky
DRILL HOLES

| PANEL DESIGNATION | SHEET NO. | QUANTITY | LEGEND | SIZE AREA | SIZE WIDTH | SIZE HEIGHT | COLOR LEGEND | COLOR BCKGRND | BORDER WIDTH | BORDER RADIUS | ARROW | SHIELD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-3 | SN-2.17 | 1 |  | 36 SF | 12′ | 3′ | W | G | 2" | 6" | - | - | EXTRUDED ALUMINUM |
| | | | | 209 SF | 19′ | 11′ | W | G | 2" | 12" | - | - | EXTRUDED ALUMINUM |
| TS-1 | SN-2.12 | 1 |  | 36 SF | 12′ | 3′ | W | G | 2" | 6" | - | - | EXTRUDED ALUMINUM |
| | | | | 209 SF | 19′ | 11′ | W | G | 2" | 12" | - | - | EXTRUDED ALUMINUM<br>THIS DETAIL IS FOR THE TEMPORARY GROUND MOUNTED SIGN IN THE CASE THAT FR5715170 IS COMPLETED BEFORE FR5785178 |
| C-1<br>C-4 | SN-2.14<br>SN-2.15 | 2 |  | 36 SF | 12′ | 3′ | W | G | 2" | 6" | - | - | EXTRUDED ALUMINUM |
| | | | | 209 SF | 19′ | 11′ | W | G | 2" | 12" | - | - | EXTRUDED ALUMINUM |

| PANEL DESIGNATION | SHEET NO. | QUANTITY | LEGEND | SIZE AREA | SIZE WIDTH | SIZE HEIGHT | COLOR LEGEND | COLOR BCKGRND | BORDER WIDTH | BORDER RADIUS | ARROW | SHIELD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-2<br>C-5 | SN-2.5<br>SN-2.8 | 2 |  | 36 SF | 12′ | 3′ | W | G | 2" | 6" | - | - | EXTRUDED ALUMINUM |
| | | | | 322 SF | 23′ | 14′ | W | G | 2" | 12" | A-3 @ 45° | - | EXTRUDED ALUMINUM |
| GM-1 | SN-2.6 | 1 |  | 36 SF | 9′ | 4′ | W | G | ¾" | 1-⅞" | ARROWDET-2 @ 0°, 180° | - | EXTRUDED ALUMINUM |
| | | | | 9 SF | 9′ | 1′ | - | BLU | - | - | - | D9-8 24" X 24"<br>M6-1R 21" X 15" | EXTRUDED ALUMINUM |

LEGEND & BACKGROUND COLORS: BLK=BLACK, BLU=BLUE, BRO=BROWN, G=GREEN, R=RED, W=WHITE/SILVER, FLY=FLUORESCENT YELLOW

DRILL HOLES

DRILL HOLES

DRILL HOLES

BORDER REV: DATE: June 1, 2004

BY: Kurgansky –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REVISIONS

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OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)
MONOCACY BOULEVARD INTERCHANGE

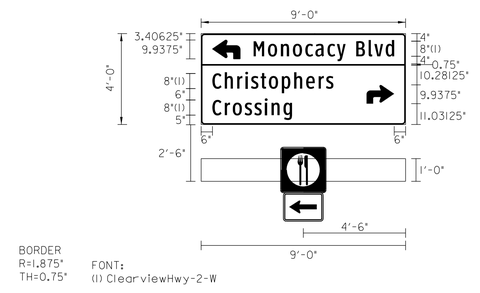
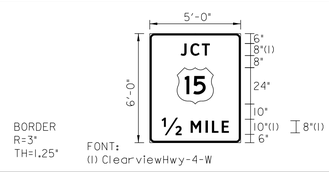
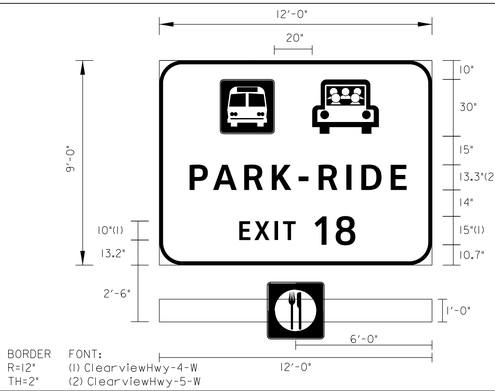
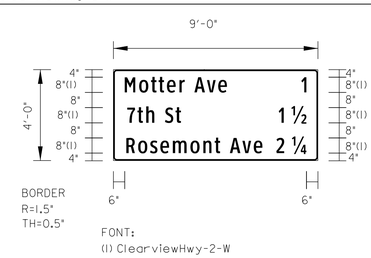
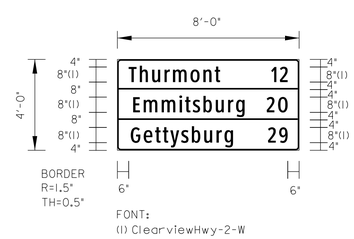
# SIGNING DETAIL SHEET

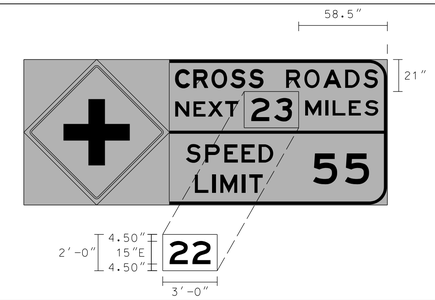
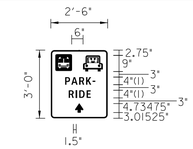
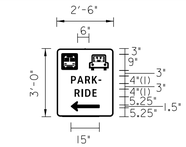
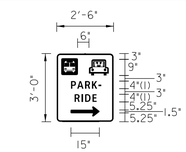
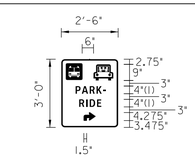
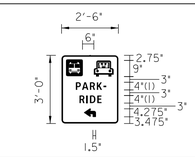
SCALE N.T.S. DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

DESIGNED BY JEK COUNTY FREDERICK
DRAWN BY JEK LOGMILE 15.8–18
CHECKED BY KMP TIMS NO. K420
F.A.P. NO. SEE TITLE SHEET TOD NO.

DRAWING SN – 3.1 OF 3.3 SHEET NO. 478 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:47 AM
FILE: T:\173124A–TrafficDesignServices\TRF\100\Plans\pSN–D001_US15.dgn

| PANEL DESIGNATION | SHEET NO. | QUANTITY | LEGEND | SIZE AREA | SIZE WIDTH | SIZE HEIGHT | COLOR LEGEND | COLOR BCKGRND | BORDER WIDTH | BORDER RADIUS | ARROW | SHIELD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-2 | SN-2.7 | 1 |   | 36 SF | 9' | 4' | W | G | ¾" | 1-⅞" | ARROWDET-2 @ 0°, 180° | - | EXTRUDED ALUMINUM |
| | | | | 9 SF | 9' | 1' | - | BLU | - | - | - | D9-8 24" X 24" M6-1L 21" X 15" | EXTRUDED ALUMINUM |
| GM-3 GM-4 | SN-2.10 SN-2.11 | 2 |   | 30 SF | 5' | 6' | W | G | 1.25" | 3" | - | MI-4 24"x24" | EXTRUDED ALUMINUM |
| GM-5 GM-8 | SN-2.13 SN-2.16 | 2 |   | 108 SF | 12' | 9' | W | G | 2" | 12" | - | I-6 30"X30" PARK-RIDE 30"X30" | EXTRUDED ALUMINUM (FOR PARK-RIDE LOGO REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION) |
| | | | | 12 SF | 12' | 1' | - | BLU | - | - | - | D9-8 30" X 30" | EXTRUDED ALUMINUM |
| GM-6 | SN-2.14 | 1 |   | 36 SF | 9' | 4' | W | G | 0.5" | 1.5" | - | - | EXTRUDED ALUMINUM |
| GM-7 | SN-2.16 | 1 |   | 32 SF | 8' | 4' | W | G | 0.5" | 1.5" | - | - | SHEET ALUMINUM |

| PANEL DESIGNATION | SHEET NO. | QUANTITY | LEGEND | SIZE AREA | SIZE WIDTH | SIZE HEIGHT | COLOR LEGEND | COLOR BCKGRND | BORDER WIDTH | BORDER RADIUS | ARROW | SHIELD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-9 | SN-2.15 | 1 |   | 6 SF | 3' | 2' | BLK | FLY | - | - | - | - | RELOCATED EXISTING SIGN SHEET ALUMINUM OVERLAY |
| 0216 | SN-2.2 | 2 | BORDER R=1.875" TH=0.75" FONT: (I) ClearviewHwy-3-W   | 7.5 SF | 2.5' | 3' | W | G | 0.75" | 1.875" | ARROWDET-1 | I-6 9"X9" PARK-RIDE 9"X9" | SHEET ALUMINUM (FOR PARK-RIDE LOGO REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION) |
| 0317 0318 | SN-2.3 SN-2.3 | 2 | BORDER R=1.875" TH=0.75" FONT: (I) ClearviewHwy-3-W   | 7.5 SF | 2.5' | 3' | W | G | 0.75" | 1.875" | TYPE D | I-6 9"X9" PARK-RIDE 9"X9" | SHEET ALUMINUM (FOR PARK-RIDE LOGO REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION) |
| 0401 | SN-2.4 | 1 | BORDER R=1.875" TH=0.75" FONT: (I) ClearviewHwy-3-W   | 7.5 SF | 2.5' | 3' | W | G | 0.75" | 1.875" | TYPE D | I-6 9"X9" PARK-RIDE 9"X9" | SHEET ALUMINUM (FOR PARK-RIDE LOGO REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION) |
| 0607 | SN-2.6 | 1 | BORDER R=1.875" TH=0.75" FONT: (I) ClearviewHwy-3-W   | 7.5 SF | 2.5' | 3' | W | G | 0.75" | 1.875" | ARROWDET-2(R) | I-6 9"X9" PARK-RIDE 9"X9" | SHEET ALUMINUM (FOR PARK-RIDE LOGO REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION) |
| 0705 | SN-2.7 | | BORDER R=1.875" TH=0.75" FONT: (I) ClearviewHwy-3-W   | 7.5 SF | 2.5' | 3' | W | G | 0.75" | 1.875" | ARROWDET-2(L) | I-6 9"X9" PARK-RIDE 9"X9" | SHEET ALUMINUM (FOR PARK-RIDE LOGO REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION) |

LEGEND & BACKGROUND COLORS: BLK=BLACK, BLU=BLUE, BRO=BROWN, G=GREEN, R=RED, W=WHITE/SILVER, FLY=FLUORESCENT YELLOW

DRILL HOLES

DRILL HOLES

DRILL HOLES

BORDER REV: DATE: June 1, 2004

BY: Kurgansky

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)

MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# SIGNING DETAIL SHEET

SCALE N.T.S. DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

DESIGNED BY JEK COUNTY FREDERICK
DRAWN BY JEK LOGMILE 15.8–18
CHECKED BY KMP TIMS NO. K420
F.A.P. NO. SEE TITLE SHEET TOD NO.

DRAWING SN – 3.2 OF 3.3 SHEET NO. 479 OF 532

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PLOTTED: Sunday, February 09, 2014 AT 10:47 AM
FILE: T:\173124A-TrafficDesignServices\TRF\100\Plans\pSN-D002_US15.dgn

DRILL HOLES

DRILL HOLES

DRILL HOLES

SN-4 REV. DATE: July 21, 2009 BORDER REV: DATE: June 1, 2004

BY: Kurgansky –

## GUIDE SIGN STEEL SUPPORT CHART

| SIGN NO. | SIGN SIZE (WXH) | EXIT/AUX. PANELS | SHEET NO. | POST SIZE | *BW OR NBW | SUPPORT L - 1 | SUPPORT L - 2 | SUPPORT L - 3 | LATERAL CLEARANCE OFFSET | LATERAL CLEARANCE OBJECT ** | SUPPORT SPACING FROM LEFT EDGE OF SIGN | C TO C OF SUPPORTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-1 | 9'x4' | 9'x1' | SN-2.6 | W6x16 | NBW | 15'-9" | 17'-4" | - | 6' | W | 1',8' | 7' |
| GM-2 | 9'x4' | 9'x1' | SN-2.7 | W6x16 | BW | 15'-10" | 17'-5" | - | 6' | ES | 1',8' | 7' |
| GM-3 | 5'x6' | - | SN-2.10 | W6x9 | BW | 12'-10" | 12'-10" | - | 3'-6" | CM | 0'-6",4'-6" | 4' |
| GM-4 | 5'x6' | - | SN-2.11 | W6x9 | BW | 12'-8" | 12'-8" | - | 4'-6" | CM | 0'-6",4'-6" | 4' |
| GM-5 | 12'x9' | 12'x1' | SN-2.13 | W10x22 | BW | 21'-0" | 19'-7" | - | 15' | ES | 2'-5",9'-7" | 7'-2" |
| GM-6 | 9'x4' | - | SN-2.14 | W6x9 | NBW | 11'-6" | 11'-0" | - | 15' | ES | 1',8' | 7' |
| GM-8 | 12'x9' | 12'x1' | SN-2.16 | W10x22 | BW | 21'-10" | 21'-10" | - | 10' | ES | 2'-5",9'-7" | 7'-2" |
| GM-9 | 20'x8' | - | SN-2.15 | W8x18 | BW | 16'-4" | 13'-7" | - | 15' | ES | 4',16' | 12' |
| 0608 | 6'x5' | - | SN-2.6 | W6x9 | BW | 14'-8" | 15'-6" | - | 13'-0" | CG | 0'-6",5'-6" | 5' |
| 0706 | 6'x5' | - | SN-2.7 | W6x9 | BW | 12'-11" | 12'-6" | - | 6' | ES | 0'-6",5'-6" | 5' |

* BW = BREAKAWAY NBW = NON-BREAKAWAY

NOTES:

1. THE CONTRACTOR SHALL VERIFY THE FINAL FOUNDATION TYPE TO BE USED SO THAT THE FOUNDATION DOES NOT EXCEED A 4" PROJECTION ABOVE THE GROUND.
2. ALL NON-BREAKAWAY FOUNDATIONS SHALL BE TYPE A

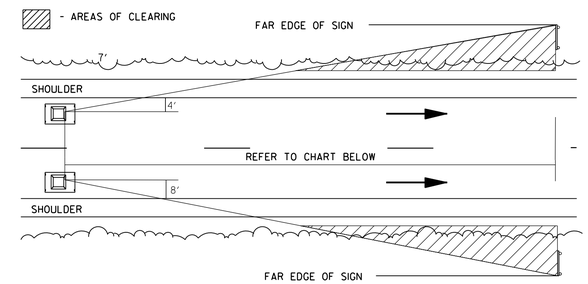
## GUIDE SIGN WOOD SUPPORT CHART

| SIGN NO. | SIGN SIZE (WXH) | SHEET NO. | POST SIZE | *BW OR NBW | SUPPORT L - 1 | SUPPORT L - 2 | SUPPORT L - 3 | LATERAL CLEARANCE OFFSET | LATERAL CLEARANCE OBJECT ** | SUPPORT SPACING FROM LEFT EDGE OF SIGN |
|---|---|---|---|---|---|---|---|---|---|---|
| 0802 | 6'x3' | SN-2.8 | 4"x6" | NBW | 17'-5" | 18'-2" | - | 6' | W | 0'-6",5'-6" |
| 0804 | 6'x3' | SN-2.8 | 4"x6" | NBW | 17'-2" | 17'-11" | - | 6' | W | 0'-6",5'-6" |
| GM-7 | 8'x4' | SN-2.16 | 6"x6" | BW | 19'-3" | 20'-6" | - | 10' | ES | 0'-6",7'-6" |

* BW = BREAKAWAY NBW = NON-BREAKAWAY

NOTE: SEE MARYLAND STANDARDS 812.01, 812.04, AND 813.02 FOR WARNING AND REGULATORY SIGN INSTALLATION

## FOLIAGE CLEARING FOR SIGN INSTALLATIONS




| Acceptable Viewing Distance for Sign | |
|---|---|
| Copy Size | Distance |
| 20" u.c. | 1000 ft |
| 16" u.c. | 800 ft |
| 13.3" u.c. | 675 ft |
| 10.67" u.c. | 550 ft |

## STEEL BREAKAWAY SUPPORT FOUNDATION SELECTION MATRIX

| POST SIZE | FOUNDATION DIAMETER | ROADWAY CUT / FILL SLOPE ≥2:1 | 3:1 | 4:1 | 5:1 | 6:1 | 7:1 | 8:1 | 9:1 | 10:1 | 12:1 | ≤13:1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W6x9 | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W6x12 or TS 5"X5"X1/4" | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W6x15 or TS 6"X6"X1/4" | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W8x18 | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W8x21 or TS 7"X7"X1/4" | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W10x22 or TS 8"X8"X5/16" | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W10x26 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W12x26 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W14x30 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W16x31 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W18x35 or W18x40 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W21x44 | 42" | • | • | C | C | C | C | C | B | B | B | A |

• IF A FOUNDATION EXCEEDS THE 4" AASHTO CRITERIA, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR APPROPRIATE GUIDANCE.

SEE MARYLAND STANDARD DRAWINGS FOR FOUNDATION DETAILS:

TYPE A = STANDARD MD 801.04
TYPE B = STANDARD MD 801.04-01
TYPE C = STANDARD MD 801.04-02

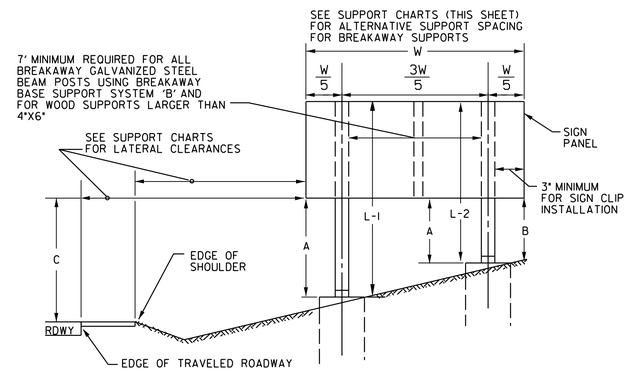
## STEEL POST BREAKAWAY SYSTEM SELECTION CHART

| SYSTEM TYPE | ASSOCIATED POST SIZE |
|---|---|
| A16 | W6X9 |
| B525 | TS 5"X5"X1/4", TS 6"X6"X1/4", W6X12, W6X15, W8X18, W8X21 |
| B650 | 7"X7" & 8"X8" SQUARE AND ALL I-BEAMS LARGER THAN W8X21 |

**OBJECT CODES

W = FACE OF W-BEAM TRAFFIC BARRIER
FOC = FACE OF CURB
ES = EDGE OF SHOULDER
ETR = EDGE OF TRAVELED ROADWAY
CM = CENTERED IN MEDIAN
CG = CENTERED IN GORE (6' MINIMUM FROM EDGE OF PAVEMENT)

## SIGN CLEARANCE




VERTICAL CLEARANCE OF SIGNS

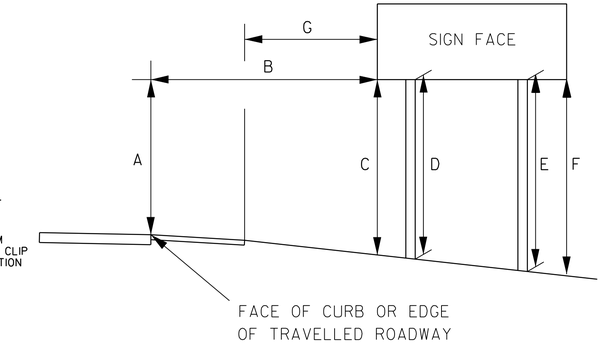
A. 7'6" MINIMUM FOR BREAKAWAY SUPPORTS OR 5'-0" FOR NON-BREAKAWAY SUPPORTS.
B. 2.0' MINIMUM
C. 7'6" MINIMUM & PREFERABLE. THIS DIMENSION IS TO BE INCREASED ONLY WHEN REQUIRED TO MEET A = 7'-6" FOR BREAKAWAY OR A (MIN.) = 5'-0" FOR NON-BREAKAWAY AND B (MIN) = 2'-0"
ALL DIMENSIONS ARE TO BOTTOM OF SIGN

•TOTAL WEIGHT BELOW THE HINGES SHOULD BE LESS THAN 600 POUNDS

LATERAL CLEARANCE

SEE SUPPORT CHARTS

## SIGN STAKEOUT DIMENSIONS




NOTE: SEE SECTION 802 IN THE CONTRACT DOCUMENTS FOR SIGN STAKEOUT LOCATIONS.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STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)
MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# GUIDE SIGN SUPPORT DETAILS

SCALE N.T.S. DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

DESIGNED BY JEK COUNTY FREDERICK
DRAWN BY JEK LOGMILE 15.8–18
CHECKED BY KMP TIMS NO. K420
F.A.P. NO. SEE TITLE SHEET TOD NO.

DRAWING SN – 4.1 OF 4.1 SHEET NO. 481 OF 532

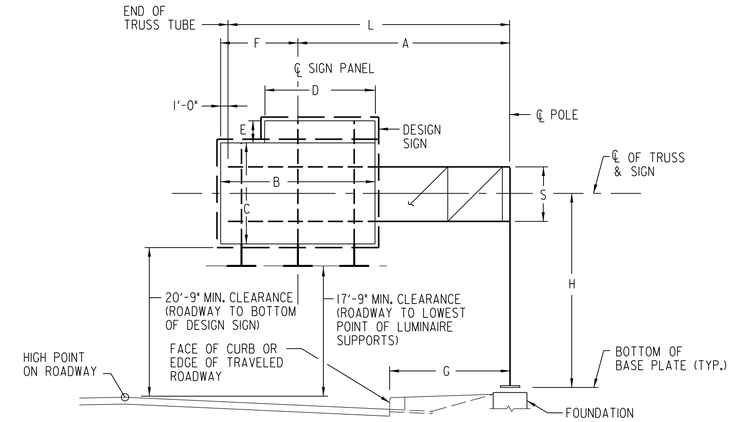

PLOTTED: Sunday, February 09, 2014 AT 10:48 AM
FILE: T:\173124A–TrafficDesignServices\(TRF)\100\Plans\pSN–4001_US15.dgn

DRILL HOLES

BORDER REV: DATE: June 1, 2004

## CANTILEVER SIGN SUPPORT – SINGLE PANEL

| SIGN STRUCTURE NO. | STRUCTURE MARK | STRUCTURE DIMENSIONS H | S | L | SIGN PANEL A | B | C | D | E | F | G | DESIGN SIGN SIZE W x H | FOUNDATION MARK | TYPE | C.Y. CONC. | LOCATION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C-1 | C-35-32-C | 31'-6" | 4'-0" | 35'-0" | 26'-6" | 19'-0" | 11'-0" | 12'-0" | 3'-0" | 9'-6" | 17'-0" | 22' (W) X 16' (H) + • | CF-20 | A | 14.4 | NB US 15 APPROX. STA. 65+40 | |
| C-2 | C-35-32-E | 30'-10" | 6'-0" | 32'-10" | 22'-4" | 23'-0" | 14'-0" | 12'-0" | 3'-0" | 11'-6" | 17'-0" | 26' (W) X 16' (H) + • | CF-22 | A | 15.0 | NB US 15 APPROX. STA. 85+45 | |
| C-3 | C-35-32-C | 30'-11" | 4'-0" | 35'-0" | 26'-6" | 19'-0" | 11'-0" | 12'-0" | 3'-0" | 9'-6" | 17'-0" | 22' (W) X 16' (H) + • | CF-20 | A | 14.4 | SB US 15 APPROX. STA. 164+60 | |
| C-4 | C-35-32-C | 30'-10" | 4'-0" | 35'-0" | 26'-6" | 19'-0" | 11'-0" | 12'-0" | 3'-0" | 9'-6" | 17'-0" | 22' (W) X 161' (H) + • | CF-20 | A | 14.4 | SB US 15 APPROX. STA. 141+95 | |
| C-5 | C-40-32-E | 29'-5" | 6'-0" | 39'-0" | 28'-5" | 23'-0" | 14'-0" | 12'-0" | 3'-0" | 11'-6" | 17'-0" | 26' (W) X 16' (H) + • | CF-22 | A | 15.0 | SB US 15 APPROX. STA. 407+45 | |

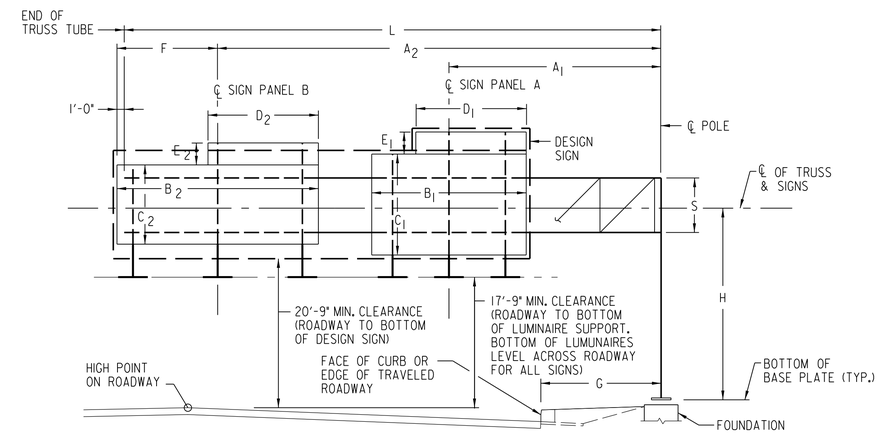



ELEVATION OF CANTILEVER SIGN SUPPORT – SINGLE PANEL
DIRECTION OF TRAFFIC

DRILL HOLES

## CANTILEVER SIGN SUPPORT – DOUBLE PANEL

| SIGN STRUCTURE NO. | STRUCTURE MARK | STRUCTURE DIMENSIONS H | S | L | SIGN PANEL PANEL A $A_1$ | $B_1$ | $C_1$ | $D_1$ | $E_1$ | PANEL B $A_2$ | $B_2$ | $C_2$ | $D_2$ | $E_2$ | F | G | DESIGN SIGN SIZE W x H | FOUNDATION MARK | TYPE | C.Y. CONC. | LOCATION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|




ELEVATION OF CANTILEVER SIGN SUPPORT – DOUBLE PANEL
DIRECTION OF TRAFFIC

DRILL HOLES

## GENERAL NOTES:

1. REFER TO CONTRACT PROPOSAL AND MD. STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS FOR MATERIAL, CONSTRUCTION SPECIFICATIONS AND DETAILS.
2. REFER TO ROADWAY LIGHTING PLANS FOR LIGHTING CHARTS.
3. ANY ALTERNATE DESIGN SHALL BE STRUCTURALLY EQUIVALENT AND SUBJECT TO APPROVAL BY THE ENGINEER.
4. ALL ALTERNATE DESIGNS MUST BE SIMILAR TO THE DESIGN SHOWN ON THE PLANS.
5. ALTERNATE DESIGNS MAY BE REJECTED BY THE ENGINEER FOR ANY REASON, INCLUDING REASONS NOT RELATED TO STRUCTURAL EQUIVALENCY.
6. ACTUAL STRUCTURE HEIGHT "H" SHALL NOT BE LESS THAN 20'-9" + 1/2 x DESIGN SIGN HEIGHT + ELEVATION DIFFERENCE BETWEEN HIGH POINT OF ROADWAY AND TOP OF FOUNDATION.
7. ALL SIGN STRUCTURE SUPPORTS SHALL BE LOCATED BEHIND PHYSICAL TRAFFIC BARRIERS.
8. ALL ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF F1554, GRADE 55 SI.
9. STEEL TEMPLATES SHALL BE USED TO SET ANCHOR BOLTS PLUMB WHEN POURING THE FOUNDATION.
10. ALL ANCHOR BOLTS SHALL BE PLUMB AFTER FOUNDATION INSTALLATION.
11. ALL CONNECTION BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325 (BOLTS OVER 1 1/2 " DIA. ASTM A449), WASHERS F436 AND NUTS A194 GRADE 2 OR 2H. THE BOLTS SHALL HAVE A FLAT WASHER UNDER THE ELEMENT TO BE TURNED.
12. USE LOCK NUTS AND FLAT WASHERS FOR ALL "U" BOLTS (A307 OR EQUIVALENT).
13. BASE PLATE SHALL BE IN FULL CONTACT WITH ALL FLAT WASHERS.
14. GROUT SHALL NOT BE PLACED BETWEEN THE BASE PLATE AND CONCRETE TOP.
15. FOR ALL STRUCTURAL DETAILS, SEE STANDARDS NO. MD-803.04 THRU. MD-803.08-23.

BY: Kurgansky –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US 15 (CATOCTIN MOUNTAIN HIGHWAY)

MONOCACY BOULEVARD INTERCHANGE

REVISIONS

**CANTILEVER SIGN STRUCUTRE – ERECTION DETAILS**

SCALE N.T.S. DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

DESIGNED BY JEK COUNTY FREDERICK
DRAWN BY JEK LOGMILE 15.8–18
CHECKED BY KMP TIMS NO. K420
F.A.P. NO. SEE TITLE SHEET TOD NO.

DRAWING **SN – 9** OF 1 SHEET NO. 482 OF 532

PLOTTED: Sunday, February 09, 2014 AT 10:48 AM
FILE: T:\173124A-TrafficDesignServices\TRF\100\Plans\pSN-9_US15.dgn

| SHEET NO. | REMARKS | | CODE NUMBERS • 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN-2.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0101 | R4-7 (24" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0102 | OMI-3 (18" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 2.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0103 | OMI-3 (18" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 2.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0104 | OMI-3 (18" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 2.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0105 | W11-2 (30" x 30"); W16-7pL (24" x 12") | 2 - 3 LB/FT U-CHANNEL SUPPORTS | 8.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 0106 | R4-7 (24" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0107 | R3-17 (24" x 18"); R3-17b MOD. (24" x 8") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 4.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0108 | R2-1 (24" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0109 | R2-1 (24" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0110 | OMI-3 (18" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 2.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0111 | R3-17 (24" x 18"); R3-17b MOD. (24" x 8") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 4.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0112 | R3-17 (24" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0113 | R3-7R (30" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 6.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0114 | R3-7R (30" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 6.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0115 | R3-17 (24" x 18"); R3-17bP (24" x 8") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 4.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0116 | R3-17 (24" x 18"); R3-17bP (24" x 8") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 4.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0117 | R3-7R (30" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 6.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | PAVEMENT MARKINGS | | | | | | | | | | | | | | | | | | | | | | | 294 | | | | | | | | 2625 | 2665 | 975 | 115 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SN-2.2 | | | | | | | 190 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0201 | R5-1a (36" x 24") | 2 - 4" x 4" WOOD SUPPORTS | 6 | | | | | | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0202 | R6-1(L) (36" x 12"); R6-1(R) (36" x 12"); R5-1 (30" x 30") | 1 - 4" x 6" WOOD SUPPORT | 12.25 | | | | | | | 16.5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0203 | OMI-3 (18" x 18") | 1 - 4" x 4" WOOD SUPPORT | 2.25 | | | | | | 11.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0204 | R6-1(L) (36" x 12"); R6-1(R) (36" x 12"); R5-1 (30" x 30") | 1 - 4" x 6" WOOD SUPPORT | 12.25 | | | | | | | 16.5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0205 | M4-5 (24" x 12"); M1-5 (24" x 24"); M5-1(I)(L) (21" x 15"); R5-1a (36" x 24") | 1 - 4" x 6" WOOD SUPPORT | 14.1875 | | | | | | | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0206 | W4-2(4) (48" x 48"); W16-2P (30" x 24") | 2 - 6" x 6" WOOD SUPPORTS (NBW) | 21 | | | | | | | | 40 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0207 | OMI-3 (18" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 2.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0208 | R4-7 (24" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0209 | OM-3(R) (12" x 36") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0210 | W4-2(4) (48" x 48"); W16-2P (30" x 24") | 2 - 6" x 6" WOOD SUPPORTS (NBW) | 21 | | | | | | | | 40 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0211 | R1-2 (36" x 36" x 36")) | 1 - 4" x 4" WOOD SUPPORT | 4.5 | | | | | | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0212 | OMI-3 (18" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 2.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0213 | W11-2 (30" x 30"); W16-7pL (24" x 12") | 2 - 3 LB/FT U-CHANNEL SUPPORTS | 8.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 0214 | M3-3 (24" x 12"); M1-4 (24" x 24"); M6-2(R) (21" x 15") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 8.1875 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0215 | R5-10b (30" x 18") | 1 - 4" x 4" WOOD SUPPORT | 3.125 | | | | | | 14.5 | | | | | | | | | | | | | | | | | | | | | 2.2 | 2 | | | | | |
| 0216 | D4-2(MOD) (30" x 36") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0217 | R3-17 (24" x 18") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0218 | M3-3 (24" x 12"); M1-4 (24" x 24"); M6-2(R) (21" x15") | 2 - 3 LB/FT U-CHANNEL SUPPORTS | 8.1875 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 0219 | R3-7(I)(R) (30" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 6.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0220 | M3-1 (24" x 12"); M1-4 (24" x 24"); M5-1(L) (21" x15") | 2 - 3 LB/FT U-CHANNEL SUPPORTS | 8.1875 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| 0221 | R4-4 (36" x 30") | 1 - 3 LB/FT U-CHANNEL SUPPORT | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| 0222 | D3-2(I) (86" x 24") | 2 - 4" x 6" WOOD SUPPORT | 14.33 | | | | | | | 31 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PAVEMENT MARKINGS | | | | | | | | | | | | | | | 4125 | 2305 | 475 | 75 | | | | | 352 | | | 25 | | | | | 3665 | 2100 | 395 | | |
| | SUBTOTAL THIS SHEET | | 256.775 | 0 | 0 | 0 | 190 | 0 | 72 | 81 | 80 | 0 | 0 | 0 | 0 | 4125 | 2305 | 475 | 75 | 0 | 0 | 0 | 0 | 646 | 0 | 0 | 25 | 0 | 0 | 2.2 | 2 | 6290 | 4765 | 1370 | 115 | 33 |

• CODE NUMBER DESCRIPTION & UNIT

| CODE NUMBERS | DESCRIPTION | UNIT | CODE NUMBERS | DESCRIPTION | UNIT |
|---|---|---|---|---|---|
| 1 | FURNISH & INSTALL SHEET ALUMINUM GROUND MOUNTED SIGN | S.F. | 19 | 5 INCH YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. |
| 2 | FURNISH & INSTALL EXTRUDED ALUMINUM GROUND MOUNTED SIGN | S.F. | 20 | 10 INCH WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. |
| 3 | FURNISH & INSTALL EXTRUDED ALUMINUM OVERHEAD SIGN | S.F. | 21 | 10 INCH YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. |
| 4 | RELOCATE EXISTING GROUND MOUNTED SIGN | S.F. | 22 | WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKINGS LEGENDS/SYMBOLS | S.F. |
| 5 | REMOVE EXISTING GROUND MOUNTED SIGN AND SUPPORTS | S.F. | 23 | 12 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING | L.F. |
| 6 | REMOVE EXISTING OVERHEAD SIGN STRUCTURE AND SIGNS AND SUPPORTS | S.F. | 24 | 24 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING | L.F. |
| 7 | FURNISH & INSTALL WOOD SIGN SUPPORTS 4"x4" | L.F. | 25 | SNOWPLOWABLE RAISED PAVEMENT MARKINGS | E.A. |
| 8 | FURNISH & INSTALL WOOD SIGN SUPPORTS 4"x6" | L.F. | 26 | OVERHEAD SIGN STRUCTURE | E.A. |
| 9 | FURNISH & INSTALL WOOD SIGN SUPPORTS 6"x6" | L.F. | 27 | CANTILEVER SIGN STRUCTURE | E.A. |
| 10 | FURNISH & INSTALL STEEL SIGN SUPPORTS W6x9 | L.F. | 28 | CONCRETE FOR SIGN FOUNDATION | C.Y. |
| 11 | FURNISH & INSTALL STEEL SIGN SUPPORTS W6x16 | L.F. | 29 | BREAKAWAY BASE SUPPORT FOR STEEL BEAMS | E.A. |
| 12 | FURNISH & INSTALL STEEL SIGN SUPPORTS W8x18 | L.F. | 30 | 4 INCH WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. |
| 13 | FURNISH & INSTALL STEEL SIGN SUPPORTS W10x22 | L.F. | 31 | 4 INCH YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F |
| 14 | 5 INCH WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKING | L.F. | 32 | 8 INCH WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. |
| 15 | 5 INCH YELLOW PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKING | L.F. | 33 | 15 IN YELLOW LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. |
| 16 | 10 INCH WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE PAVEMENT MARKING | L.F. | 34 | 3 LB/FT U-CHANNEL SIGN SUPPORT | E.A. |
| 17 | 5 INCH WHITE PERMANENT PREFORMED PATTERNED REFLECTIVE CONTRAST PAVEMENT MARKING | L.F. | | | |
| 18 | 5 INCH WHITE LEAD FREE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS | L.F. | | | |


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http://www.pbworld.com


STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

US 15 (CATOCTIN MOUNTAIN HIGHWAY)

MONOCACY BOULEVARD INTERCHANGE

REVISIONS

# INDEX OF QUANTITES

SCALE N.T.S. DATE FEBRUARY 10, 2014 CONTRACT NO. FR5715170

DESIGNED BY JEK COUNTY FREDERICK
DRAWN BY JEK LOGMILE 15.8–18
CHECKED BY KMP TIMS NO. K420
F.A.P. NO. SEE TITLE SHEET TOD NO.

DRAWING SN–11.1 OF 11.4 SHEET NO. 483 OF 532

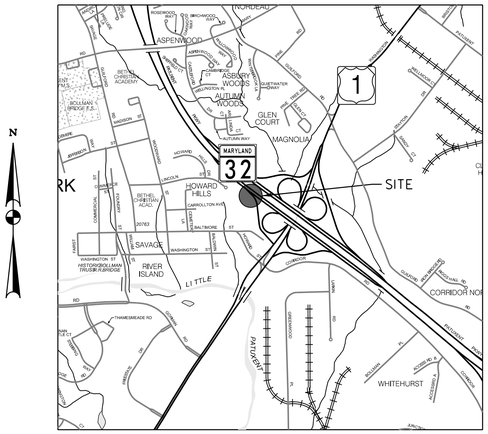

PLOTTED: Sunday, February 09, 2014 AT 10:49 AM
FILE: T:\173124A-Traffic\DesignServices\TRF\100\Plans\pSN-1101_US15.dgn



DRILL HOLES
DRILL HOLES
DRILL HOLES
BORDER REV: DATE: June 1, 2004
BY: Kurgansky –

## PROJECT DESCRIPTION

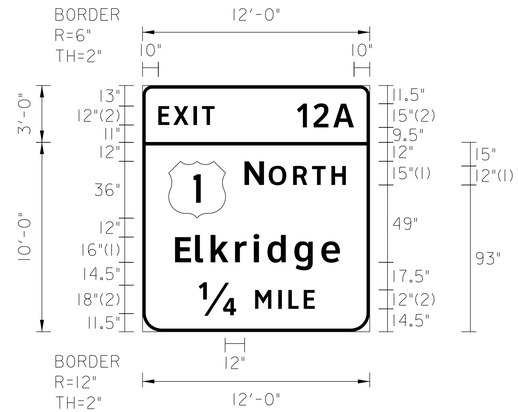
THIS PROJECT WILL REPLACE THE EXISTING OVERHEAD SIGN STRUCTURE #13067 ALONG MD 32 (PATUXENT FWY) EASTBOUND AT THE CD RAMP TO US 1 (WASHINGTON BLVD) AND WILL UPGRADE THE EXISTING EXIT DIRECTION SIGNING. MD 32 AT US 1 IS LOCATED IN HOWARD COUNTY.




PROJECT LOCATION

## B. EQUIPMENT TO BE FURNISHED BY CONTRACTOR

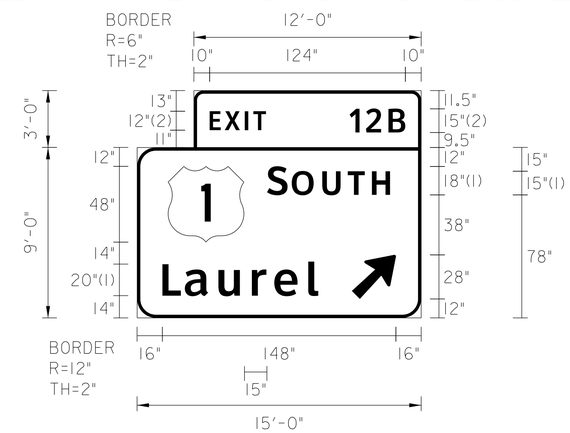
| ITEM NO. | QUANTITY | DESCRIPTION |
|---|---|---|
| 1001 | 1 EA | MAINTENANCE OF TRAFFIC PER ASSIGNMENT |
| 6001 | 2 EA | REMOVE EXISTING END TREATMENT |
| 6006 | 440 LF | TRAFFIC BARRIER W BEAM USING 6 FOOT POST |
| 6007 | 20 EA | TRAFFIC BARRIER W BEAM 6 FOOT POST |
| 6010 | 2 EA | TYPE C TRAFFIC BARRIER END TREATMENT |
| 6011 | 1 EA | TYPE K TRAFFIC BARRIER END TREATMENT, ANY OPTION |
| 8001 | 69.6 CY | CONCRETE FOUNDATION - OVERHEAD SIGN STRUCTURES |
| 8006 | 1 EA | BOX TRUSS OVERHEAD SIGN STRUCTURE, 60' TO 80' |
| 8009 | 2 EA | CONCRETE TESTING |
| 8014 | 110 LF | 1 INCH RIGID STEEL CONDUIT, SCHEDULE 80 |
| 8016 | 500 LF | CABLE-1 CONDUCTOR, NO 4 AWG, TYPE THHN/THWN, 600V |
| 8018 | 185 LF | SCHEDULE 80 RIGID PVC CONDUIT UP TO 4 INCH-BORED |
| 8019 | 115 LF | SCHEDULE 80 RIGID PVC CONDUIT UP TO 4 INCH-TRENCHED |
| 8020 | 327 SF | EXTRUDED ALUMINUM SIGN & ALL HARDWARE, TYPE IX ON TYPE IX OR GREATER |
| 8022 | 15 UD | PROTECTION VEHICLE - TRUCK MOUNTED ATTENUATOR |
| 8023 | 130 LF | NO. 4 AWG STRANDED BARE COPPER GROUND WIRE |
| 8025 | 1 EA | REMOVE EXISTING OVERHEAD STRUCTURE AND SIGNS AND SUPPORTS |
| 8029 | 1 EA | FURNISH AND INSTALL ELECTRICAL MANHOLE |
| 8030 | 750 LF | CABLE - 1 CONDUCTOR NO. 10 AWG, TYPE THWN/THHN, 600V |
| 8031 | 25 LF | 1 INCH LIQUID DIAMETER FLEXIBLE STEEL CONDUIT LIQUID TIGHT |
| 8032 | 8 EA | CONNECTOR KIT - TYPE I |
| 8033 | 4 EA | CONNECTOR KIT - TYPE II |
| 8036 | 2 EA | GROUND ROD - 3/4 INCH DIAMETER X 10 FOOT LENGTH |
| NEG | 5 EA | LED LUMINAIRE |
| NEG | 4 EA | W BEAM BARRIER REFLECTIVE DELINEATORS |
| NEG | 970 LF | DISCONNECT, PULL-BACK & REROUTE CABLES |




FONT:
(1) ClearviewHwy-5-W
(2) ClearviewHwy-4-W

| OH-1a SIGN DETAILS CHART | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PANEL NO. | QUANTITY | AREA (SF) | WIDTH | HEIGHT | COLOR | | BORDER | | ARROW | SHIELD | REMARKS |
| | | | | | LEG. | BKGD | WIDTH | RADIUS | | | |
| OH-5a | 1 | 120 | 12'-0" | 10'-0" | W | G | 2" | 12" | --- | M1-4 (36"x36") | EXTRUDED PANEL |
| | 1 | 36 | 12'-0" | 3'-0" | W | G | 2" | 6" | --- | --- | EXTRUDED PANEL |

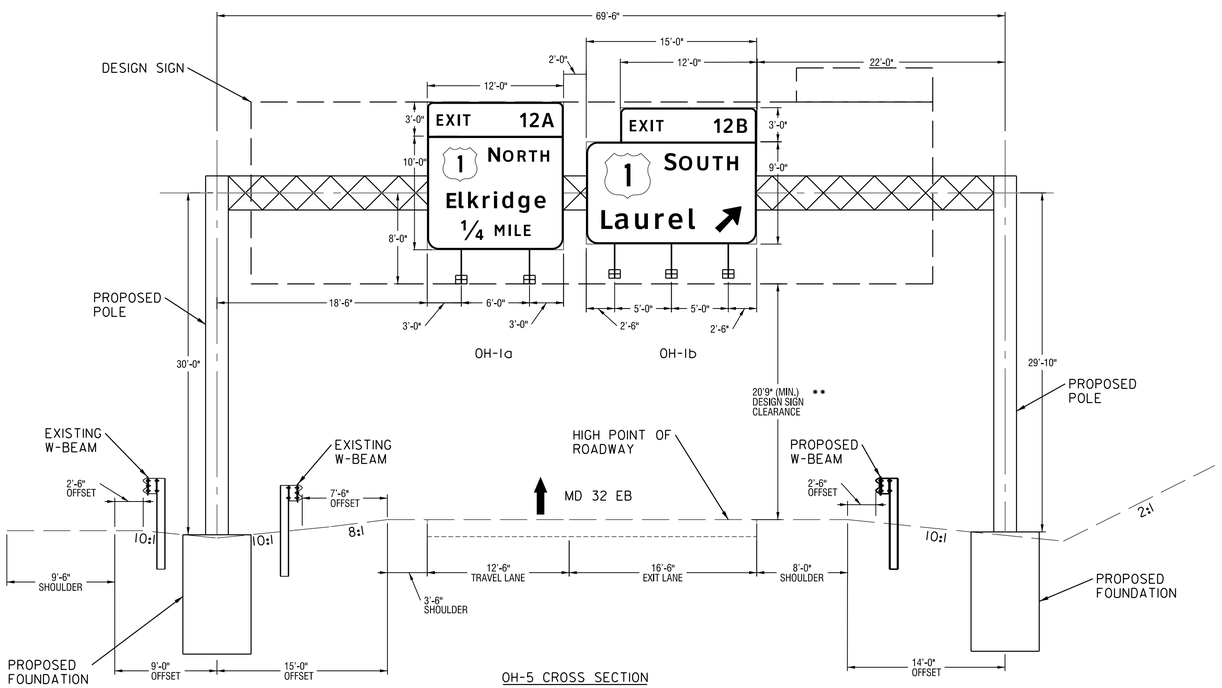
COLORS: BLK=BLACK; BLU=BLUE; BRO=BROWN; G=GREEN; OR=ORANGE; R=RED; W=WHITE; FY=FLUORESCENT YELLOW




FONT:
(1) ClearviewHwy-5-W
(2) ClearviewHwy-4-W

| OH-1b SIGN DETAILS CHART | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PANEL NO. | QUANTITY | AREA (SF) | WIDTH | HEIGHT | COLOR | | BORDER | | ARROW | SHIELD | REMARKS |
| | | | | | LEG. | BKGD | WIDTH | RADIUS | | | |
| OH-5b | 1 | 135 | 15'-0" | 9'-0" | W | G | 2" | 12" | A-3 @ 45° | M1-4 (48"x48") | EXTRUDED PANEL |
| | 1 | 36 | 12'-0" | 3'-0" | W | G | 2" | 6" | --- | --- | EXTRUDED PANEL |

COLORS: BLK=BLACK; BLU=BLUE; BRO=BROWN; G=GREEN; OR=ORANGE; R=RED; W=WHITE; FY=FLUORESCENT YELLOW




OH-5 CROSS SECTION
MD 32 EB - 95' WEST OF EXISTING STRUCTURE NO. 13067
(N.T.S.)

REPLACES EXISTING SIGN STRUCTURE #13067
DESIGN SIGN: 60'(W) X 16'(H) + 12'(W) X 3'(H) EP
SPAN LENGTH: 69'-6"
STRUCTURE MARK: OH-80-32B
FOOTING MARK: OF-625
(•DIMENSION ASSUMED)
(••THIS DIMENSION ACCOUNTS FOR THE 17'-9" MIN. CLEARANCE REQUIRED TO BOTTOM OF LUMINAIRE)


PARSONS BRINCKERHOFF
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http://www.pbworld.com


STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 32 (PATUXENT FWY) AT US 1 (WASHINGTON BLVD) SIGNING
OVERHEAD SIGN STRUCTURE NO. 03067 REPLACEMENT
JESSUP, MD

APPROVALS
TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF
OFFICE DIRECTOR

REVISIONS

## PROJECT INFORMATION AND QUANTITIES

SCALE N.T.S. DATE JANUARY 2014 CONTRACT NO. XY1445185

DESIGNED BY EML
DRAWN BY EML
CHECKED BY LFW
F.A.P. NO.
COUNTY HOWARD
LOGMILE 13003201.50
TIMS NO. M383
TOD NO.

DRAWING SN-2.1 OF 2 SHEET NO. 1 OF 3

PLOTTED: Monday, February 17, 2014 AT 05:16 PM
FILE: T:\173124A-TrafficDesignServices\TRF\168\Plans\pSN-2.1.dgn

BORDER REV: DATE: June 1, 2004
BY: littleton –
DRILL HOLES
DRILL HOLES
DRILL HOLES

## CONSTRUCTION DETAILS

A. INSTALL OVERHEAD SIGN STRUCTURE OH-5 WITH PROPOSED SIGNS, LUMINAIRES AND SUPPORTS.
B. REMOVE EXISTING OVERHEAD SIGN STRUCTURE, SIGNS, LUMINAIRES, AND SUPPORTS. REMOVE BOTH FOUNDATIONS 12 IN. BELOW GRADE AND BACKFILL.
C. INSTALL 4 IN. SCHEDULE 80 RIGID PVC CONDUIT - BORED WITH 4-1 CONDUCTOR #4 AWG AND 1-NO. 4 AWG STRANDED BARE COPPER GROUND WIRE REROUTED FROM EXISTING MANHOLE TO PROPOSED MANHOLE.
D. USE EXISTING ELECTRICAL MANHOLE. PULL BACK EXISTING CABLES FROM STRUCTURE NO. 13067 AND REROUTE TO PROPOSED MANHOLE. EXISTING CONNECTOR KITS AND CABLE TO EXISTING LIGHT POLES TO REMAIN.
E. ABANDON EXISTING CONDUIT FOR EXISTING STRUCTURE NO. 13067.
F. INSTALL (4) TYPE II CONNECTOR KITS IN PROPOSED OVERHEAD SIGN STRUCTURE POLE WITH 4-1 CONDUCTOR NO. 10 AWG TYPE THWN/THHN.
G. INSTALL SINGLE FACED TRAFFIC BARRIER W-BEAM PER STD. NOS. MD 605.21, 605.22, AND 605.23. INSTALL TRAFFIC BARRIER W-BEAM DELINEATORS AS PER STD. NOS. MD 656.03 AND MD 656.04.
H. TIE PROPOSED TRAFFIC BARRIER INTO EXISTING TRAFFIC BARRIER.
J. INSTALL TYPE K TRAFFIC BARRIER END TREATMENT AS PER STD NOS. MD 605.10, MD 605.10-01, AND MD 605.10-02.
K. INSTALL TYPE C TRAFFIC BARRIER END TREATMENT AS PER STD NOS. MD 605.02-01 AND 605.03.
L. REMOVE EXISTING END TREATMENT.
M. INSTALL 4 IN. SCHEDULE 80 RIGID PVC CONDUIT - TRENCHED WITH 4-1 CONDUCTOR #4 AWG AND 1-NO. 4 AWG STRANDED BARE COPPER GROUND WIRE FROM PROPOSED MANHOLE TO PROPOSED OVERHEAD SIGN STRUCTURE.
N. INSTALL ELECTRICAL MANHOLE WITH FOUR (4) TYPE I CONNECTOR KITS.
P. DOUBLE POST EXISTING W-BEAM BEGINNING 25' IN ADVANCE OF PROPOSED SIGN STRUCTURE FOUNDATION AND CONTINUING TO THE END OF THE FOUNDATION.

## GENERAL NOTES

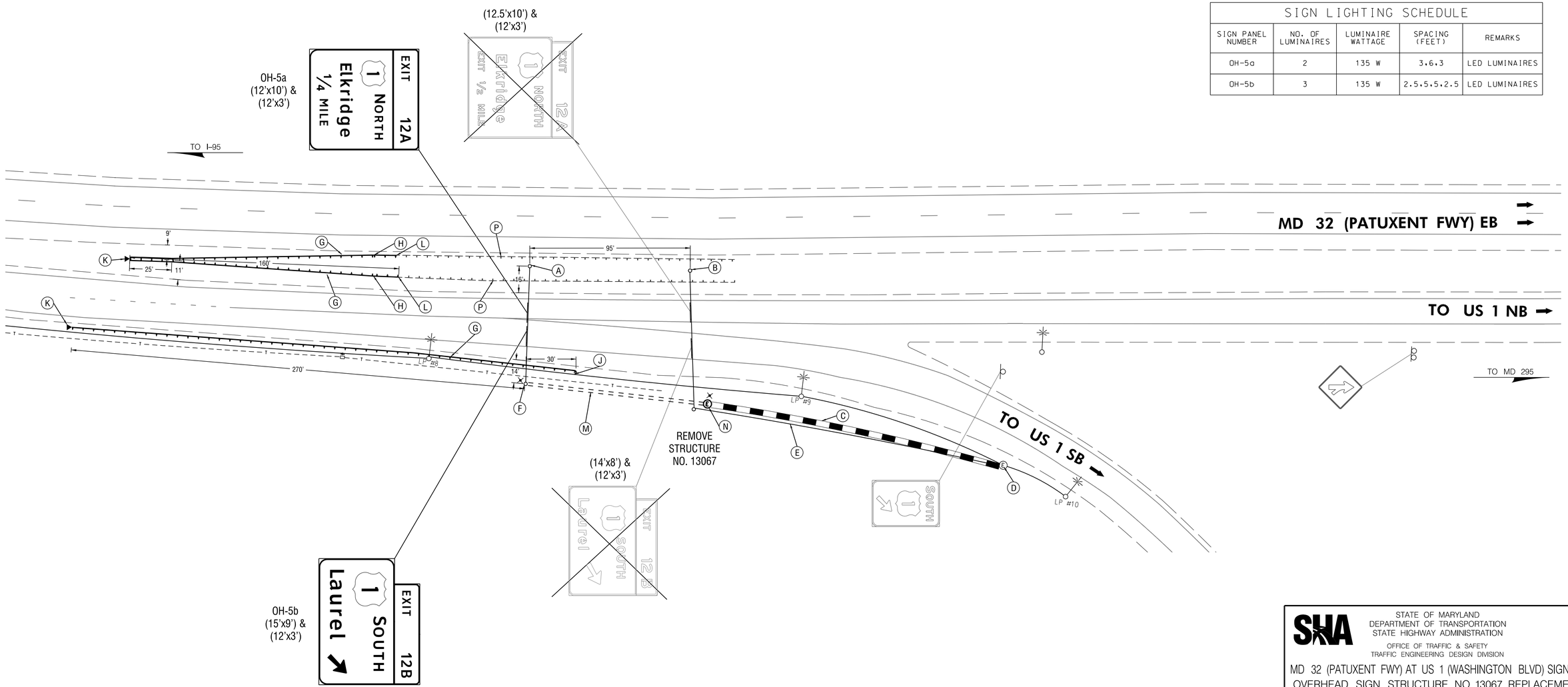
1. AT A MINIMUM, THE FOLLOWING MOSHA TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATIONS ARE RECOMMENDED FOR THE WORK SHOWN ON THIS PLAN: MD 104.05-18 AND MD 104.05-19.
2. SINGLE LANE CLOSURES AND SHOULDER WORK ALONG MD 32 AND RAMP GORE WORK ALONG THE CD ROAD SHALL BE PERMITTED MONDAY THROUGH FRIDAY BETWEEN 10:00 AM AND 3:00 PM.
3. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE SIGN STRUCTURE WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.
4. PROPOSED LUMINAIRES SHALL BE WIRED IN ALTERNATING CIRCUITS SO THAT NO TWO ADJACENT LUMINAIRES ARE ON THE SAME CIRCUIT.
5. THE CONTRACTOR SHALL INVENTORY THE OPERATING CONDITION OF EXISTING LIGHTS AND CIRCUITS PRIOR TO BEGINNING ANY WORK.

## SIGNING LEGEND

| SYMBOL | DESCRIPTION | SYMBOL | |
|---|---|---|---|
| | EXISTING OVERHEAD SIGN AND SUPPORTS | | EXISTING LIGHTING STRUCTURE |
| | PROPOSED CANTILEVER SIGN AND SUPPORT | E | EXISTING ELECTRICAL MANHOLE |
| | EXISTING GROUND MOUNTED SIGN AND SUPPORT(S) | E | PROPOSED ELECTRICAL MANHOLE |
| | PROPOSED GROUND MOUNTED SIGN AND SUPPORT(S) | | EXISTING CABLE RUN |
| | EXISTING SIGN TO REMAIN | | EXISTING TRAFFIC BARRIER W-BEAM |
| | EXISTING SIGN TO BE REMOVED | | PROPOSED TRAFFIC BARRIER W-BEAM |
| | PROPOSED SIGN TO BE INSTALLED | | PROPOSED GROUND ROD |
| | TRAFFIC FLOW ARROW | | |

## SIGN LIGHTING SCHEDULE

| SIGN PANEL NUMBER | NO. OF LUMINAIRES | LUMINAIRE WATTAGE | SPACING (FEET) | REMARKS |
|---|---|---|---|---|
| OH-5a | 2 | 135 W | 3.6.3 | LED LUMINAIRES |
| OH-5b | 3 | 135 W | 2.5.5.5.2.5 | LED LUMINAIRES |




STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 32 (PATUXENT FWY) AT US 1 (WASHINGTON BLVD) SIGNING
OVERHEAD SIGN STRUCTURE NO. 13067 REPLACEMENT
JESSUP, MD

REVISIONS

# SIGNING ELECTRICAL AND STRUCTURE PLAN

SCALE 1" = 30' DATE JANUARY 2014 CONTRACT NO. XY1445185

DESIGNED BY EML COUNTY HOWARD
DRAWN BY EML LOGMILE 13003201.50
CHECKED BY LFW TIMS NO. M383
F.A.P. NO. TOD NO.

DRAWING SN-2.2 OF 2 SHEET NO. 2 OF 3

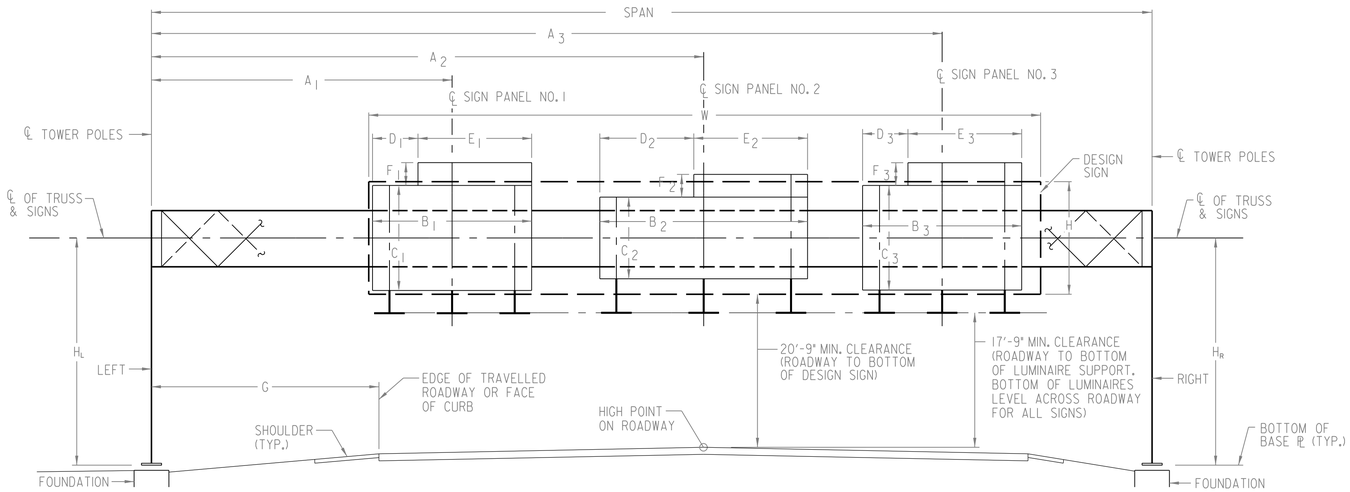

PARSONS BRINCKERHOFF
100 S. Charles Street
Tower 1, 10th Floor
Baltimore, MD 21201
(Ph) 410-787-5050
(Fax) 410-727-4608
http://www.pbworld.com



PLOTTED: Monday, February 17, 2014 AT 04:33 PM
FILE: T:\173124A-TrafficDesignServices\TRF\168\Plans\pSN-2.2.dgn



DRILL HOLES
DRILL HOLES
DRILL HOLES
BORDER REV: DATE: June 1, 2004
BY: littleton -




ELEVATION OF OVERHEAD SIGN STRUCTURE
DIRECTION OF TRAFFIC

## GENERAL NOTES:

1. REFER TO CONTRACT PROPOSAL AND MD. STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS FOR MATERIAL, CONSTRUCTION SPECIFICATIONS AND DETAILS.
2. REFER TO SIGNING PLANS FOR LIGHTING CHARTS.
3. ANY ALTERNATE DESIGN SHALL BE STRUCTURALLY EQUIVALENT AND SUBJECT TO APPROVAL BY THE ENGINEER.
4. ALL ALTERNATE DESIGNS MUST BE SIMILAR TO THE DESIGN SHOWN ON THE PLANS.
5. ALTERNATE DESIGNS MAY BE REJECTED BY THE ENGINEER FOR ANY REASON, INCLUDING REASONS NOT RELATED TO STRUCTURAL EQUIVALENCY.
6. ACTUAL STRUCTURE HEIGHT "H" SHALL NOT BE LESS THAN 20'-9" + ½ × DESIGN SIGN HEIGHT + ELEVATION DIFFERENCE BETWEEN HIGH POINT OF ROADWAY AND TOP OF FOUNDATION.
7. ALL SIGN SUPPORTS SHALL BE LOCATED BEHIND PHYSICAL TRAFFIC BARRIERS.
8. ALL ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF F1554, GRADE 55 SI.
9. STEEL TEMPLATES SHALL BE USED TO SET ANCHOR BOLTS PLUMB WHEN POURING THE FOUNDATION.
10. ALL ANCHOR BOLTS SHALL BE PLUMB AFTER FOUNDATION INSTALLATION.
11. ALL CONNECTION BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325 (BOLTS OVER 1½" DIA. ASTM A449), WASHERS F436 AND NUTS A194 GRADE 2 OR 2H. THE BOLTS SHALL HAVE A FLAT WASHER UNDER THE ELEMENT TO BE TURNED.
12. USE LOCK NUTS AND FLAT WASHERS FOR ALL "U" BOLTS (A307 OR EQUIVALENT).
13. BASE PLATE SHALL BE IN FULL CONTACT WITH ALL FLAT WASHERS.
14. GROUT SHALL NOT BE PLACED BETWEEN THE BASE PLATE AND CONCRETE TOP.
15. FOR ALL STRUCTURAL DETAILS, SINGLE SPAN LENGTHS UP TO 140 FEET, SEE STANDARDS NO. MD-803.04 THRU. MD-803.08-23.

## OVERHEAD SIGN STRUCTURE

| SIGN STRUCTURE NO. | STRUCTURE MARK | SPAN | SIGN PANEL LOCATIONS | | | | | | | | | | | | | | | | | | TOWER DIMENSION | | | DESIGN SIGN SIZE W x H | FOUNDATION | | | C.Y. CONC. | LOCATION | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | PANEL NO. 1 | | | | | | PANEL NO. 2 | | | | | | PANEL NO. 3 | | | | | | | | | | MARK | FOOTING TYPE | | | | |
| | | | $A_1$ | $B_1$ | $C_1$ | $D_1$ | $E_1$ | $F_1$ | $A_2$ | $B_2$ | $C_2$ | $D_2$ | $E_2$ | $F_2$ | $A_3$ | $B_3$ | $C_3$ | $D_3$ | $E_3$ | $F_3$ | $H_L$ | $H_R$ | G | | | LEFT TOWER | RIGHT TOWER | | | |
| 0H-5 | 0H-80-32B | 69'-6" | 24'6" | 12' | 10' | 0' | 12' | 3' | 40' | 15' | 9' | 3' | 12' | 3' | - | - | - | - | - | - | 30'-0" TO EB | 29'10" | 18'-6" | 60'x16' + 12'x3' EP | 0F-625 | A | A | 69.6 | MD 32 EB AT US 1 | REPLACES STR. #13067 |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STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 32 (PATUXENT FWY) AT US 1 (WASHINGTON BLVD) SIGNING
OVERHEAD SIGN STRUCTURE NO. 13067 REPLACEMENT
JESSUP, MD

REVISIONS

**OVERHEAD SIGN STRUCTURE – DETAILS**

SCALE N.T.S. DATE JANUARY 2014 CONTRACT NO. XY1445185

DESIGNED BY EML COUNTY HOWARD
DRAWN BY EML LOGMILE 13003201.50
CHECKED BY LFW TIMS NO. M383
F.A.P. NO. TOD NO.

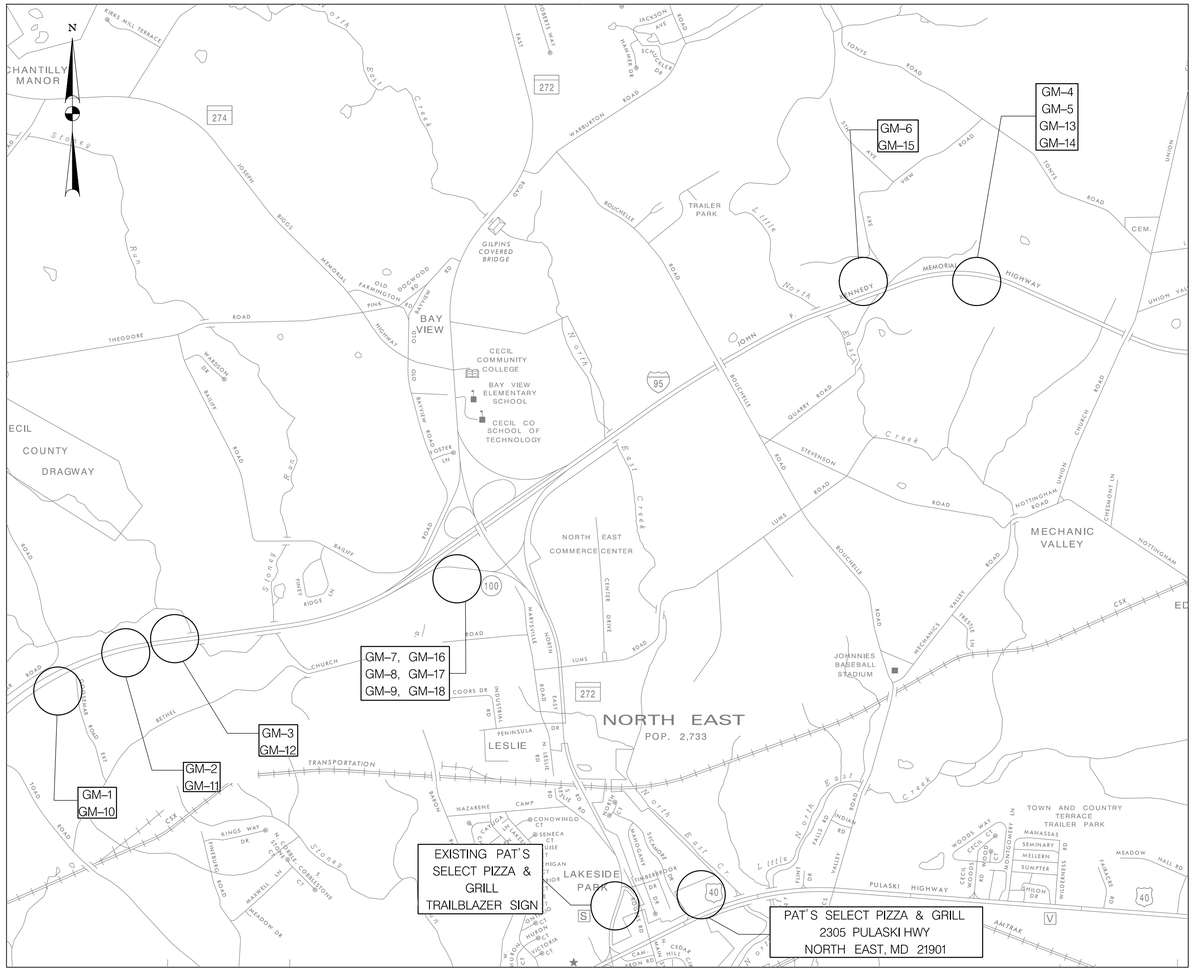
DRAWING **SN-08.1** OF 1 SHEET NO. 3 OF 3

PLOTTED: Monday, February 17, 2014 AT 03:26 PM
FILE: T:\173124A-TrafficDesignServices\TRF\168\Plans\pSN-08.dgn


DRILL HOLES
DRILL HOLES
DRILL HOLES
BORDER REV: DATE: June 1, 2004
BY: littleton

## PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE INSTALLATION OF SPECIFIC SERVICE SIGNING FOR PAT'S SELECT PIZZA & GRILL AT I–95 AND MD 272 (EXIT 100) IN CECIL COUNTY, MARYLAND.




PROJECT LOCATION:
I–95 at MD 272 (EXIT 100)
NOT TO SCALE

GENERAL NOTES:

1. PAT'S SELECT PIZZA & GRILL VENDOR LOGO SIGN PANELS TO BE FABRICATED BY VENDOR. THE LOGO PANELS WILL BE DELIVERED TO MARYLAND STATE HIGHWAY SIGN OPERATIONS. THE LOGO SIGN PANELS ARE TO BE INSTALLED ON PROPOSED SIGN PANELS BY CONTRACTOR AS SHOWN. CONTACT MR. SONNY BAILEY AT (410)787–7676 TO ARRANGE PICKUP.
2. EXISTING HOLIDAY INN EXPRESS, COMFORT INN, BEST WESTERN INN & SUITES, WOODY'S CRAB HOUSE, BURGER KING, MCDONALD'S, DUNKIN DONUTS, DENNY'S, WAFFLE HOUSE, WENDY'S, PAT'S SELECT PIZZA & GRILL, SUNOCO, FLYING J, AND HIGH'S LOGO SIGN PANELS ARE TO BE REUSED AND RELOCATED BY CONTRACTOR TO NEW SIGN AND SUPPORTS AT NEW LOCATION AS SHOWN.
3. IN THE EVENT THAT EXISTING SIGN PANELS CANNOT BE REUSED AND RELOCATED; VENDOR LOGOS TO BE PROVIDED BY VENDORS. THESE LOGO SIGN PANEL DESIGNS WILL BE DELIVERED TO MARYLAND STATE HIGHWAY SIGN OPERATIONS. THE LOGO SIGN PANELS ARE TO BE INSTALLED ON PROPOSED SIGN PANELS BY CONTRACTOR AS SHOWN. CONTACT MR. SONNY BAILEY AT (410)787–7676 AT ARRANGE PICKUP.
4. THE SIGN SHOP SHALL CONTACT MR. DAVID MAY AT (410)787–7607 AT THE TRAFFIC DEVELOPMENT AND SUPPORT DIVISION (TDSD) AT THE OFFICE OF TRAFFIC AND SAFETY (OOTS) UPON COMPLETION OF THE PROJECT SO THE LOGO DATABASE CAN BE UPDATED.
5. SIGN MESSAGE DETAILS ARE ON SHEET AW–5, AW–6. AW–7. AW–8, AND AW–9 OF THIS PLAN SET.
6. SIGN SUPPORT DETAILS ARE ON SHEET AW–10 OF THIS PLAN SET.
7. THE CONTACTOR SHALL ATTEMPT TO BUILD SIGN SUPPORTS PER PLAN. SHOULD THE CONTRACTOR EXPERIENCE ROCK CONDITIONS IN THE FIELD, THEY SHALL CONTACT THE PROJECT ENGINEER FOR TOD TO DISCUSS THE USE OF SPREAD FOOTER SIGN FOUNDATIONS.
8. THE CONTRACTOR IS RESPONSIBLE TO VERIFYING ALL EXISTING CONDITIONS IN THE FIELD, INCLUDING UTILITY CONFLICTS, PRIOR TO CONSTRUCTION.
9. UNDERGROUND UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING "MISS UTILITY" PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE SIGNS WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.
10. THE CONTRACTOR SHALL BE AWARE OF WORKING WITHIN MDTA RIGHT OF WAY IN AND AROUND THE I–95 CORRIDOR. WORK PERMITS AS WELL AS TRAFFIC CONTROL PERMITS MAY NEED TO BE OBTAINED FROM MDTA. CONTACT MDTA TRAFFIC MANAGER AT 410–537–7848 AND THE FACILITY ADMINISTRATOR AT 410–537–1101 3 WEEKS PRIOR TO THE START OF CONSTRUCTION. ACCEPTABLE LANE CLOSURE HOURS WILL BE DETERMINED BY MDTA.
11. ALL OVERLAY BORDERS, WORDS AND ARROWS SHALL BE ASSEMBLED AT THE FABRICATOR AND DELIVERED TO THE FIELD LOCATION FULLY ASSEMBLED AND FABRICATED. ONLY THE LOGOS SHALL BE FIELD INSTALLED. OVERLAY ARROWS, BORDERS AND WORDS WILL BE MEASURED AND PAID FOR USING THE SHEET ALUMINUM SIGN ITEMS PER SQUARE FOOT.


T3 design

T3 DESIGN CORP
10340 DEMOCRACY LN
SUITE 305
FAIRFAX, VA 22030
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www.t3design.us


BY: atimm –

## EQUIPMENT LIST

A. EQUIPMENT TO BE FURNISHED BY ADMINISTRATION (SHA)

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT |
|---|---|---|---|
| 9000 | SHEET ALUMINUM SIGNS<br>1 EA PAT'S SELECT PIZZA & GRILL" LOGO (60" X 36") | 15 | SF |

B. EQUIPMENT TO BE FURNISHED BY CONTRACTOR

| ITEM NO. | DESCRIPTION | QUANTITY | UNIT |
|---|---|---|---|
| 1006 | PROTECTION VEHICLE | 24 | UD |
| 6007 | TRAFFIC BARRIER W BEAM USING 6 FOOT POST | 488 | LF |
| 6016 | TYPE C TRAFFIC BARRIER END TREATMENT | 2 | EA |
| 6020 | TYPE K TRAFFIC BARRIER END TREATMENT, ANY OPTION | 1 | EA |
| 6021 | SHOULDER GRADING ADJUSTMENT FOR TRAFFIC BARRIER END TREATMENT | 10 | CY |
| 6022 | REMOVAL AND DISPOSAL OF EXISTING TRAFFIC BARRIER W BEAM | 125 | LF |
| 6023 | REMOVE EXISTING END TREATMENT | 1 | EA |
| 6024 | W BEAM BARRIER REFLECTIVE DELINEATORS | 5 | EA |
| 8013 | EXTRUDED ALUMINUM SIGN AND ALL HARDWARE, TYPE IX OR GREATER | 1,573 | SF |
| 8015 | SHEET ALUMINUM SIGN AND ALL HARDWARE, TYPE IX OR GREATER | 154 | SF |
| 8016 | CONCRETE FOUNDATION FOR GROUND MOUNTED SIGNS | 36 | CY |
| 8021 | INSTALL SHEET ALUMINUM SIGN | 15 | SF |
| 8024 | REMOVE EXISTING GROUND MOUNTED SIGNS AND SUPPORTS | 1,389 | SF |
| 8044 | RELOCATE EXISTING GROUND MOUNTED SIGNS | 458 | SF |
| 8046 | BREAKAWAY BASE SUPPORT SYSTEM 'B' FOR STEEL BEAMS AND STEEL TUBING SUPPORTS | 6 | EA |
| 8067 | GALVANIZED STEEL BEAMS (W10X26) | 93 | LF |
| 8068 | GALVANIZED STEEL BEAMS (W14X30) | 100 | LF |
| 8069 | GALVANIZED STEEL BEAMS (W18X40) | 106 | LF |

C. EQUIPMENT TO BE RETURNED TO THE ADMINISTRATION (SHA)
NONE

| SIGN NUMBER | SIGN DESIGNATION | POST | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM–1 | INSTALL GROUND MOUNTED SIGN | USE EXISTING | 1 | 195 | 24.7 | | | | 75 | | | | |
| GM–2 | INSTALL GROUND MOUNTED SIGN | 2 – W14x30 | 2 | 182 | 10.5 | 5.8 | | | 90 | | | 47.5 | |
| GM–3 | INSTALL GROUND MOUNTED SIGN | 2 – W14x30 | 2 | 195 | 12.2 | 5.8 | | | 45 | | | 52.3 | |
| GM–4 | INSTALL GROUND MOUNTED SIGN | 2 – W18X40 | 2 | 234 | 39.4 | 7 | 15 | | 60 | 2 | | | 53.5 |
| GM–5 | INSTALL GROUND MOUNTED SIGN | 2 – W10X26 | 2 | 182 | 11 | 4.8 | | | 90 | 2 | 45.3 | | |
| GM–6 | INSTALL GROUND MOUNTED SIGN | 2 – W18X40 | 2 | 234 | 24.2 | 7 | | | 45 | | | | 52.5 |
| GM–7 | INSTALL GROUND MOUNTED SIGN | USE EXISTING | 1 | 117 | 13.7 | | | | 18.8 | | | | |
| GM–8 | INSTALL GROUND MOUNTED SIGN | 2 – W10X26 | 2 | 117 | 11 | 4.8 | | | 22.5 | 2 | 47.1 | | |
| GM–9 | INSTALL GROUND MOUNTED SIGN | USE EXISTING | 1 | 117 | 6.5 | | | | 11.3 | | | | |
| GM–10 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 182 | | | | | |
| GM–11 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 182 | | | | | |
| GM–12 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 150 | | | | | |
| GM–13 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 182 | | | | | |
| GM–14 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 182 | | | | | |
| GM–15 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 169 | | | | | |
| GM–16 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 117 | | | | | |
| GM–17 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 117 | | | | | |
| GM–18 | REMOVE GROUND MOUNTED SIGN | | 1 | | | | | 108 | | | | | |
| | TOTALS | | 24 | 1,573 | 154 | 36 | 15 | 1,389 | 458 | 6 | 93 | 100 | 106 |

| ITEM NO. | DESCRIPTION | UNIT |
|---|---|---|
| 1 | PROTECTION VEHICLE | UD |
| 2 | EXTRUDED ALUMINUM SIGN AND ALL HARDWARE, TYPE IX OR GREATER | SF |
| 3 | SHEET ALUMINUM SIGN AND ALL HARDWARE, TYPE IX OR GREATER | SF |
| 4 | CONCRETE FOUNDATION FOR GROUND MOUNTED SIGNS | CY |
| 5 | INSTALL SHEET ALUMINUM SIGN | SF |
| 6 | REMOVE EXISTING GROUND MOUNTED SIGNS AND SUPPORTS | SF |
| 7 | RELOCATE EXISTING GROUND MOUNTED SIGNS | SF |
| 8 | BREAKAWAY BASE SUPPORT SYSTEM 'B' FOR STEEL BEAMS AND STEEL TUBING SUPPORTS | EA |
| 9 | GALVANIZED STEEL BEAMS (W10X26) | LF |
| 10 | GALVANIZED STEEL BEAMS (W14X30) | LF |
| 11 | GALVANIZED STEEL BEAMS (W18X40) | LF |
| | | LF |

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

**SPECIFIC SERVICE SIGNING FOR I–95 AT MD 272 (EXIT 100)**

NORTH EAST, MD

APPROVALS
TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF
OFFICE DIRECTOR

REVISIONS

**GENERAL NOTES AND QUANTITIES**

SCALE NONE DATE SEPTEMBER, 2016 CONTRACT NO. XY1705185

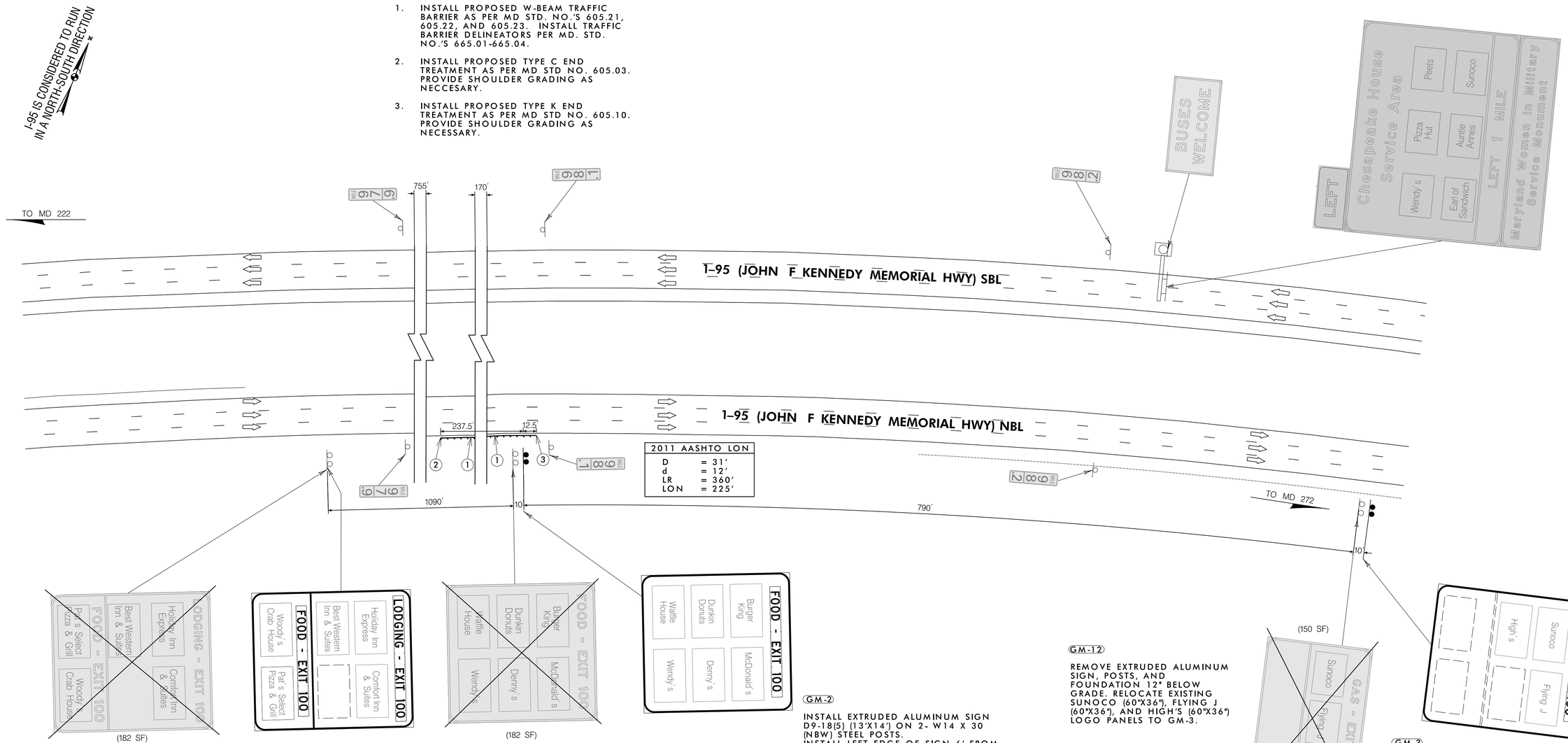
DESIGNED BY MG COUNTY CECIL
DRAWN BY MG LOGMILE MULTIPLE
CHECKED BY SJW T.I.M.S. NO. N509
F.A.P. NO. TOD NO.

DRAWING NO. AW– 1 OF 10 SHEET NO. 1 OF 10

PLOTTED: Friday, September 09, 2016 AT 10:33 AM
FILE: Y:\0732–299–16 I–95 at MD 272 logo signing\CADD\pSN–P001_I–95 AT MD272.dgn

## CONSTRUCTION NOTES

1. INSTALL PROPOSED W-BEAM TRAFFIC BARRIER AS PER MD STD. NO.'S 605.21, 605.22, AND 605.23. INSTALL TRAFFIC BARRIER DELINEATORS PER MD. STD. NO.'S 665.01-665.04.
2. INSTALL PROPOSED TYPE C END TREATMENT AS PER MD STD NO. 605.03. PROVIDE SHOULDER GRADING AS NECCESARY.
3. INSTALL PROPOSED TYPE K END TREATMENT AS PER MD STD NO. 605.10. PROVIDE SHOULDER GRADING AS NECESSARY.




GM-10

REMOVE EXTRUDED ALUMINUM SIGN. POSTS TO REMAIN.
RELOCATE EXISTING HOLIDAY INN EXPRESS (60"X36"), COMFORT INN & SUITES (60"X36"), AND BEST WESTERN INN & SUITES (60"X36"), WOODY'S CRAB HOUSE (60"X36"), AND PAT'S SELECT PIZZA & GRILL (60"X36")LOGO PANELS TO GM-1.

GM-1

INSTALL EXTRUDED ALUMINUM SIGN D9-18(6) (13'X15'). USE EXISTING W14X30 SUPPORTS, INSTALL NEW SIGN 6" ABOVE BREAKAWAY HINGE VERTICALLY CENTERED ON EXISTING SUPPORTS (SEE NOTE 1). INSTALL RELOCATED EXISTING HOLIDAY INN EXPRESS (60"X36"), COMFORT INN & SUITES (60"X36"), BEST WESTERN INN & SUITES (60"X36"), WOODY'S CRAB HOUSE (60"X36"), AND PAT'S SELECT PIZZA & GRILL (60"X36") LOGO PANEL FROM GM-10.

GM-11

REMOVE EXTRUDED ALUMINUM SIGN, POSTS, AND FOUNDATION 12" BELOW GRADE. RELOCATE EXISTING BURGER KING (60"X36"), MCDONALD'S (60"X36"), DUNKIN DONUTS (60"X36"), DENNY'S (60"X36"), WAFFLE HOUSE (60"X36"), AND WENDY'S (60"X36") LOGO PANELS TO GM-2.

GM-2

INSTALL EXTRUDED ALUMINUM SIGN D9-18(5) (13'X14') ON 2- W14 X 30 (NBW) STEEL POSTS.
INSTALL LEFT EDGE OF SIGN 6' FROM THE FACE OF PROPOSED W-BEAM BARRIER.
INSTALL RELOCATED EXISTING BURGER KING (60"X36"), MCDONALD'S (60"X36"), DUNKIN DONUTS (60"X36"), DENNY'S (60"X36"), WAFFLE HOUSE (60"X36"), AND WENDY'S (60"X36") LOGO PANELS FROM GM-11.

GM-12

REMOVE EXTRUDED ALUMINUM SIGN, POSTS, AND FOUNDATION 12" BELOW GRADE. RELOCATE EXISTING SUNOCO (60"X36"), FLYING J (60"X36"), AND HIGH'S (60"X36") LOGO PANELS TO GM-3.

GM-3

INSTALL EXTRUDED ALUMINUM SIGN D9-18(6) (13'X15') ON 2- W14 X 30 (NBW) STEEL POSTS.
INSTALL LEFT EDGE OF SIGN 6.5' FROM THE FACE OF W-BEAM.
INSTALL RELOCATED EXISTING SUNOCO (60"X36"), FLYING J (60"X36"), AND HIGH'S (60"X36") LOGO PANELS FROM GM-12.

### SIGN LEGEND

- PROPOSED GROUND MOUNTED SIGN
- EXISTING GROUND MOUNTED SIGN
- EXISTING SIGN TO REMAIN
- EXISTING SIGN TO BE REMOVED
- SIGN PROPOSED UNDER SEPERATE CONTRACT
- PROPOSED SIGN
- EXISTING CANTILEVER STRUCTURE
- TRAFFIC FLOW ARROW

NOTE 1: PROPOSED LOGO SIGN SHALL BE MOUNTED ON THE EXISTING W-BEAM SUPPORTS PER STD. MD 813.05. ALL SIGN MOUNTING ITEMS AND ALUMINUM ANGLES REQUIRED ARE INCIDENTAL TO THE COST OF THE EXTRUDED ALUMINUM SIGN PANEL.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STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

# SPECIFIC SERVICE SIGNING FOR I-95 AT MD 272 (EXIT 100)

NORTH EAST, MD

REVISIONS

## SPECIFIC SERVICE SIGNING PLAN

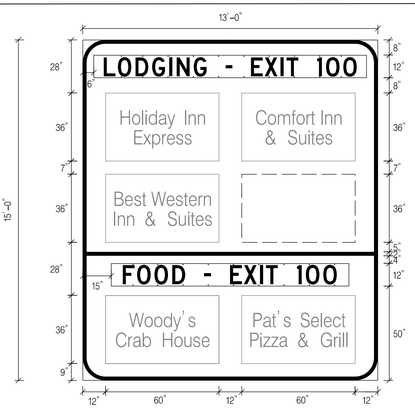
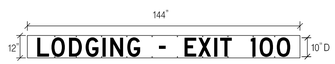
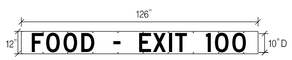
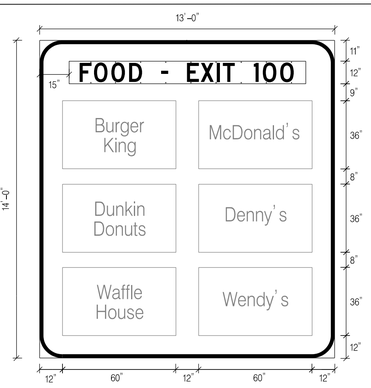
SCALE 1" = 50' DATE SEPTEMBER, 2016 CONTRACT NO. XY1705185

DESIGNED BY MG COUNTY CECIL
DRAWN BY MG LOGMILE 07009507.28
CHECKED BY SJW T.I.M.S. NO. N509
F.A.P. NO. TOD NO.

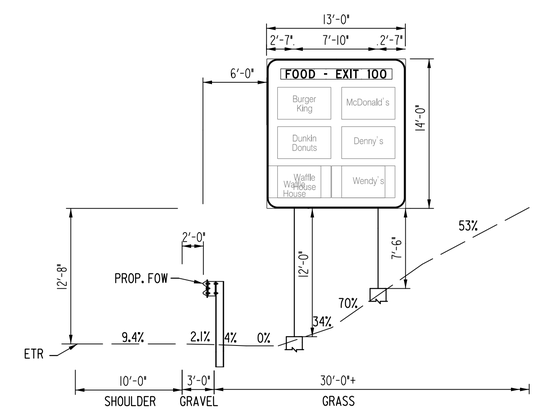
DRAWING NO. AW- 2 OF 10 SHEET NO. 2 OF 10

PLOTTED: Friday, September 09, 2016 AT 10:33 AM
FILE: Y:\0732-299-16 I-95 at MD 272 logo signing\CADD\pSN-P002_I-95 AT MD272.dgn

BY: atimm

| PANEL DESIGNATION | SHEET NO. | QUANTITY | LEGEND | SIZE AREA | SIZE WIDTH | SIZE HEIGHT | COLOR LEGEND | COLOR BCKGRND | BORDER WIDTH | BORDER RADIUS | ARROW | SHIELD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-1 | AW-2 | 1 |   | 195 | 13'-0" | 15'-0" | W | BLU | 2" | 12" | - | HOLIDAY INN EXPRESS (60"X36") (RELOCATED)<br>COMFORT INN & SUITES (60"X36") (RELOCATED)<br>BEST WESTERN INN & SUITES (60"X36") (RELOCATED)<br>WOODY'S CRAB HOUSE (60"X36") (RELOCATED)<br>PATS SELECT PIZZA & GRILL (60"X36") (RELOCATED)<br>LODGING - EXIT 100, FOOD - EXIT 100, & DIVIDER BAR TO BE OVERLAY PANELS | EXTRUDED ALUMINUM D9-18(6)<br>OL-1, OL-2, AND OL-3 TO BE INSTALLED BY FABRICATOR. |
| OL-1 | AW-2 | 1 |   | 12 | 12'-0" | 1'-0" | W | BLU | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-1 WITH 1/8" ALUM. POP RIVETS |
| OL-2 | AW-2 | 2 |   | 10.5 | 10'-6" | 1'-0" | W | BLU | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-1 AND GM-2 WITH 1/8" ALUM. POP RIVETS |
| OL-3 | AW-2, AW-3, AW-4 | 5 | | 2.17 | 13'-0" | 0'-2" | W | - | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-1, GM-3, (2) GM-4, & GM-6 WITH 1/8" ALUM. POP RIVETS |
| GM-2 | AW-2 | 1 |   | 182 | 13'-0" | 14'-0" | W | BLU | 2" | 12" | - | BURGER KING (60"X36") (RELOCATED)<br>MCDONALD'S (60"X36") (RELOCATED)<br>DUNKIN' DONUTS (60"X36") (RELOCATED)<br>DENNY'S (60"X36") (RELOCATED)<br>WAFFLE HOUSE (60"X36") (RELOCATED)<br>WENDY'S (60"X36") (RELOCATED)<br>FOOD - EXIT 100 TO BE OVERLAY PANEL | EXTRUDED ALUMINUM D9-18(5)<br>OL-2 TO BE INSTALLED BY FABRICATOR. |

LEGEND & BACKGROUND COLORS: BLK=BLACK, BLU=BLUE, BRO=BROWN, G=GREEN, R=RED, W=WHITE/SILVER, Y=YELLOW




SIGN NO. GM-2
SHEET NO. AW-2
2-W14X30 (NBW)
N.T.S.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

**SPECIFIC SERVICE SIGNING FOR I-95 AT MD 272 (EXIT 100)**

NORTH EAST, MD

REVISIONS

**SPECIFIC SERVICE SIGN DETAILS**

SCALE NONE DATE SEPTEMBER, 2016 CONTRACT NO. XY1705185

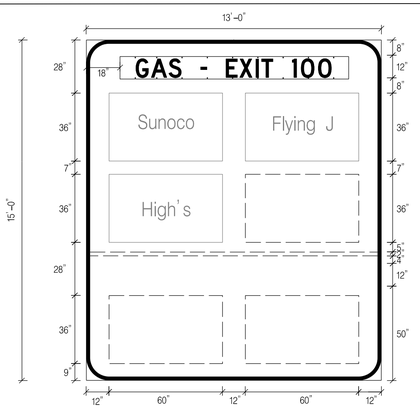
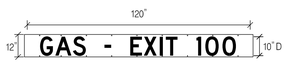
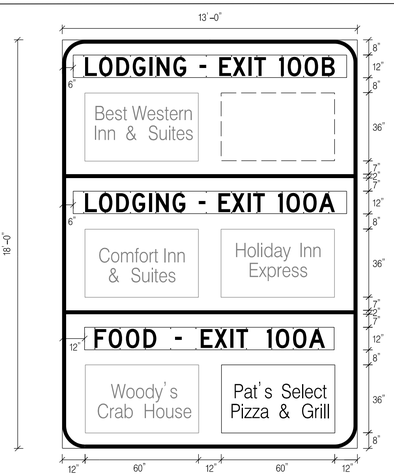
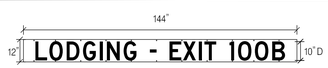
DESIGNED BY MG COUNTY CECIL
DRAWN BY MG LOGMILE MULTIPLE
CHECKED BY SJW T.I.M.S. NO. N509
F.A.P. NO. TOD NO.

DRAWING NO. AW- 5 OF 10 SHEET NO. 5 OF 10

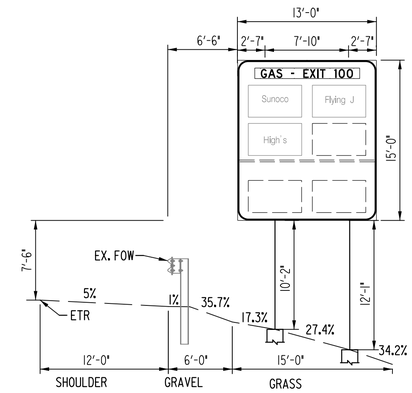
T3 DESIGN CORP
10340 DEMOCRACY LN
SUITE 305
FAIRFAX, VA 22030
PHONE: 703-359-5861
www.t3design.us

BY: atimm -

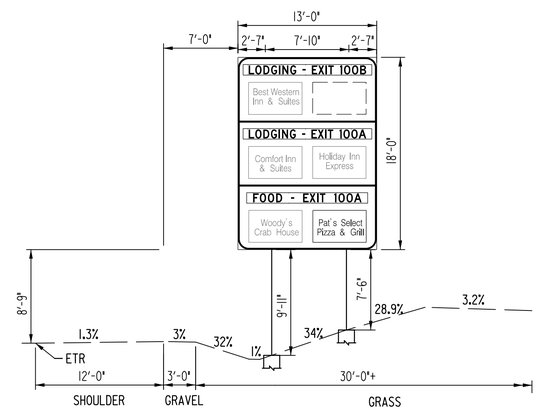
PLOTTED: Friday, September 09, 2016 AT 10:10 AM
FILE: Y:\0732-299-16 I-95 at MD 272 logo sligning\CADD\pSN-P005_I-95 AT MD272.dgn

| PANEL DESIGNATION | SHEET NO. | QUANTITY | LEGEND | SIZE AREA | SIZE WIDTH | SIZE HEIGHT | COLOR LEGEND | COLOR BCKGRND | BORDER WIDTH | BORDER RADIUS | ARROW | SHIELD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-3 | AW-2 | 1 |   | 195 | 13'-0" | 15'-0" | W | BLU | 2" | 12" | - | SUNOCO (60"X36") (RELOCATED)<br>FLYING J (60"X36") (RELOCATED)<br>HIGH'S (60"X36") (RELOCATED)<br>GAS - EXIT 100 TO BE OVERLAY PANEL | EXTRUDED ALUMINUM D9-18(6) OL-3 AND OL-4 TO BE INSTALLED BY FABRICATOR. |
| OL-4 | AW-2 | 1 |   | 10 | 10'-0" | 1'-0" | W | BLU | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-3 WITH 1/8" ALUM. POP RIVETS |
| GM-4 | AW-3 | 1 |   | 234 | 13'-0" | 18'-0" | W | BLU | 2" | 12" | - | BEST WESTERN INN & SUITES (60"X36") (RELOCATED)<br>COMFORT INN & SUITES (60"X36") (RELOCATED)<br>HOLIDAY INN EXPRESS (60"X36") (RELOCATED)<br>WOODY'S CRAB HOUSE (60"X36") (RELOCATED)<br>PAT'S SELECT PIZZA & GRILL (60"X36") (PROPOSED)<br>LODGING - EXIT 100B, LODGING - EXIT 100A, FOOD - EXIT 100A, & DIVIDER BARS TO BE OVERLAY PANELS | EXTRUDED ALUMINUM D9-18(6) MOD OL-3, OL-5, OL-6, AND OL-7 TO BE INSTALLED BY FABRICATOR. |
| OL-5 | AW-3 | 1 |   | 12 | 12'-0" | 1'-0" | W | BLU | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-4 WITH 1/8" ALUM. POP RIVETS |
| OL-6 | AW-3 | 1 | | 12 | 12'-0" | 1'-0" | W | BLU | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-4 WITH 1/8" ALUM. POP RIVETS |
| OL-7 | AW-3 | 2 | | 11 | 11'-0" | 1'-0" | W | BLU | - | - | - | - | 0.050" OVERLAY TYPE IX SHEETING FABRICATOR TO INSTALL ON GM-4 AND GM-5 WITH 1/8" ALUM. POP RIVETS |

LEGEND & BACKGROUND COLORS: BLK=BLACK, BLU=BLUE, BRO=BROWN, G=GREEN, R=RED, W=WHITE/SILVER, Y=YELLOW




SIGN NO. GM-3
SHEET NO. AW-2
2-W14X30 (NBW)
N.T.S.




SIGN NO. GM-4
SHEET NO. AW-3
2-W18X40 (BW)
N.T.S.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STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

**SPECIFIC SERVICE SIGNING FOR I-95 AT MD 272 (EXIT 100)**

NORTH EAST, MD

REVISIONS

**SPECIFIC SERVICE SIGN DETAILS**

SCALE NONE DATE SEPTEMBER, 2016 CONTRACT NO. XY1705185

DESIGNED BY MG COUNTY CECIL
DRAWN BY MG LOGMILE MULTIPLE
CHECKED BY SJW T.I.M.S. NO. N509
F.A.P. NO. TOD NO.

DRAWING NO. AW- 6 OF 10 SHEET NO. 6 OF 10

PLOTTED: Friday, September 09, 2016 AT 10:12 AM
FILE: Y:\0732-299-16 I-95 at MD 272 logo signing\CADD\pSN-P006_I-95 AT MD272.dgn

BY: atimm

## GUIDE SIGN STEEL SUPPORT CHART

| SIGN NO. | SIGN SIZE (WXH) | SHEET NO. | POST SIZE | *BW OR NBW | SUPPORT L - 1 | SUPPORT L - 2 | SUPPORT L - 3 | LATERAL CLEARANCE OFFSET | LATERAL CLEARANCE OBJECT ** | SUPPORT SPACING FROM LEFT EDGE OF SIGN | C TO C OF SUPPORTS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GM-2 | 13'x14' | AW-2 | W14X30 | NBW | 26'-0" | 21'-6" | - | 6'-0" | FOW | 2'-7"; 10'-5" | 7'-10" |
| GM-3 | 13'x15' | AW-2 | W14X30 | NBW | 25'-2" | 27'-1" | - | 6'-6" | FOW | 2'-7"; 10'-5" | 7'-10" |
| GM-4 | 13'x18' | AW-3 | W18X40 | BW | 27'-11" | 25'-6" | - | 7'-0" | ES | 2'-7"; 10'-5" | 7'-10" |
| GM-5 | 13'x14' | AW-3 | W10X26 | BW | 23'-10" | 21'-6" | - | 10'-6" | FOW | 2'-7"; 10'-5" | 7'-10" |
| GM-6 | 13'x18' | AW-3 | W18X40 | NBW | 28'-11" | 23'-6" | - | 6'-6" | FOW | 2'-7"; 10'-5" | 7'-10" |
| GM-8 | 9'x13' | AW-4 | W10X26 | BW | 20'-6" | 26'-7" | - | 14'-0" | ES | 0'-9"; 8'-3" | 7'-6" |

* BW = BREAKAWAY NBW = NON-BREAKAWAY

NOTES:

1. THE CONTRACTOR SHALL VERIFY THE FINAL FOUNDATION TYPE TO BE USED SO THAT THE FOUNDATION DOES NOT EXCEED A 4" PROJECTION ABOVE THE GROUND.
2. ALL NON-BREAKAWAY FOUNDATIONS SHALL BE TYPE A

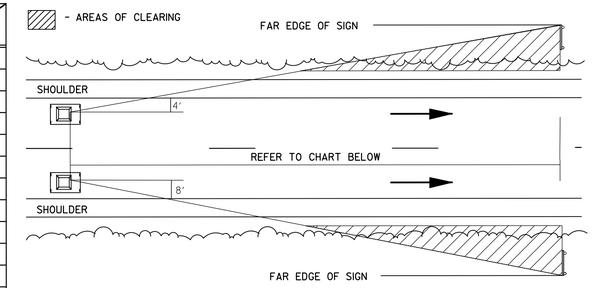
## GUIDE SIGN WOOD SUPPORT CHART

| SIGN NO. | SIGN SIZE (WXH) | SHEET NO. | POST SIZE | *BW OR NBW | SUPPORT L - 1 | SUPPORT L - 2 | SUPPORT L - 3 | LATERAL CLEARANCE OFFSET | LATERAL CLEARANCE OBJECT ** | SUPPORT SPACING FROM LEFT EDGE OF SIGN |
|---|---|---|---|---|---|---|---|---|---|---|

* BW = BREAKAWAY NBW = NON-BREAKAWAY

NOTE: SEE MARYLAND STANDARDS 812.01, 812.04, AND 813.02 FOR WARNING AND REGULATORY SIGN INSTALLATION

## FOLIAGE CLEARING FOR SIGN INSTALLATIONS




Acceptable Viewing Distance for Sign

| Copy Size | Distance |
|---|---|
| 20" u.c. | 1000 ft |
| 16" u.c. | 800 ft |
| 13.3" u.c. | 675 ft |
| 10.67" u.c. | 550 ft |

## STEEL BREAKAWAY SUPPORT FOUNDATION SELECTION MATRIX

| POST SIZE | FOUNDATION DIAMETER | ROADWAY CUT / FILL SLOPE ≥2:1 | 3:1 | 4:1 | 5:1 | 6:1 | 7:1 | 8:1 | 9:1 | 10:1 | 12:1 | ≤13:1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W6x9 | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W6x12 or TS 5"X5"X1/4" | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W6x15 or TS 6"X6"X1/4" | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W8x18 | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W8x21 or TS 7"X7"X1/4" | 30" | • | C | C | C | C | B | B | B | A | A | A |
| W10x22 or TS 8"X8"X5/16" | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W10x26 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W12x26 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W14x30 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W16x31 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W18x35 or W18x40 | 36" | • | • | C | C | C | C | B | B | B | A | A |
| W21x44 | 42" | • | • | C | C | C | C | C | B | B | B | A |

• IF A FOUNDATION EXCEEDS THE 4" AASHTO CRITERIA, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR APPROPRIATE GUIDANCE.

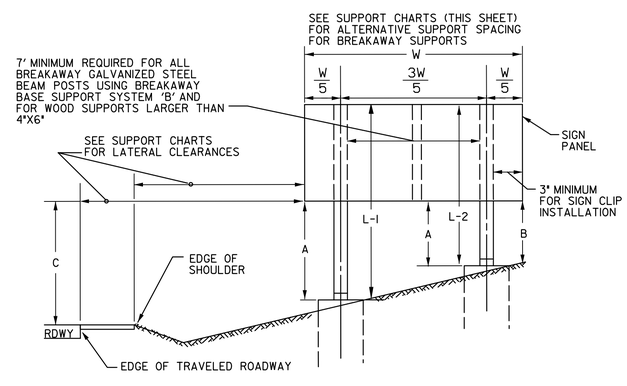
SEE MARYLAND STANDARD DRAWINGS FOR FOUNDATION DETAILS:

TYPE A = STANDARD MD 801.04
TYPE B = STANDARD MD 801.04-01
TYPE C = STANDARD MD 801.04-02

## STEEL POST BREAKAWAY SYSTEM SELECTION CHART

| SYSTEM TYPE | ASSOCIATED POST SIZE |
|---|---|
| A16 | W6X9 |
| B525 | TS 5"X5"X1/4", TS 6"X6"X1/4", W6X12, W6X15, W8X18, W8X21 |
| B650 | 7"X7" & 8"X8" SQUARE AND ALL I-BEAMS LARGER THAN W8X21 |

## SIGN CLEARANCE




VERTICAL CLEARANCE OF SIGNS

A. 7'6" MINIMUM FOR BREAKAWAY SUPPORTS OR 5'-0" FOR NON-BREAKAWAY SUPPORTS.
B. 2.0' MINIMUM
C. 7'6" MINIMUM & PREFERABLE. THIS DIMENSION IS TO BE INCREASED ONLY WHEN REQUIRED TO MEET A = 7'-6" FOR BREAKAWAY OR A (MIN.) = 5'-0" FOR NON-BREAKAWAY AND B (MIN) = 2'-0"

ALL DIMENSIONS ARE TO BOTTOM OF SIGN

•TOTAL WEIGHT BELOW THE HINGES SHOULD BE LESS THAN 600 POUNDS

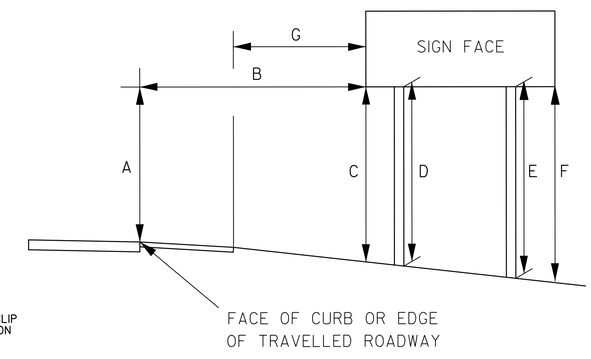
LATERAL CLEARANCE

SEE SUPPORT CHARTS

**OBJECT CODES

FOW = FACE OF W-BEAM TRAFFIC BARRIER
FOC = FACE OF CURB
ES = EDGE OF SHOULDER
ETR = EDGE OF TRAVELED ROADWAY
CM = CENTERED IN MEDIAN
CG = CENTERED IN GORE (6' MINIMUM FROM EDGE OF PAVEMENT)

## SIGN STAKEOUT DIMENSIONS




NOTE: SEE SECTION 802 IN THE CONTRACT DOCUMENTS FOR SIGN STAKEOUT LOCATIONS.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BY: atimm

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

**SPECIFIC SERVICE SIGNING FOR I-95 AT MD 272 (EXIT 100)**

NORTH EAST, MD

REVISIONS

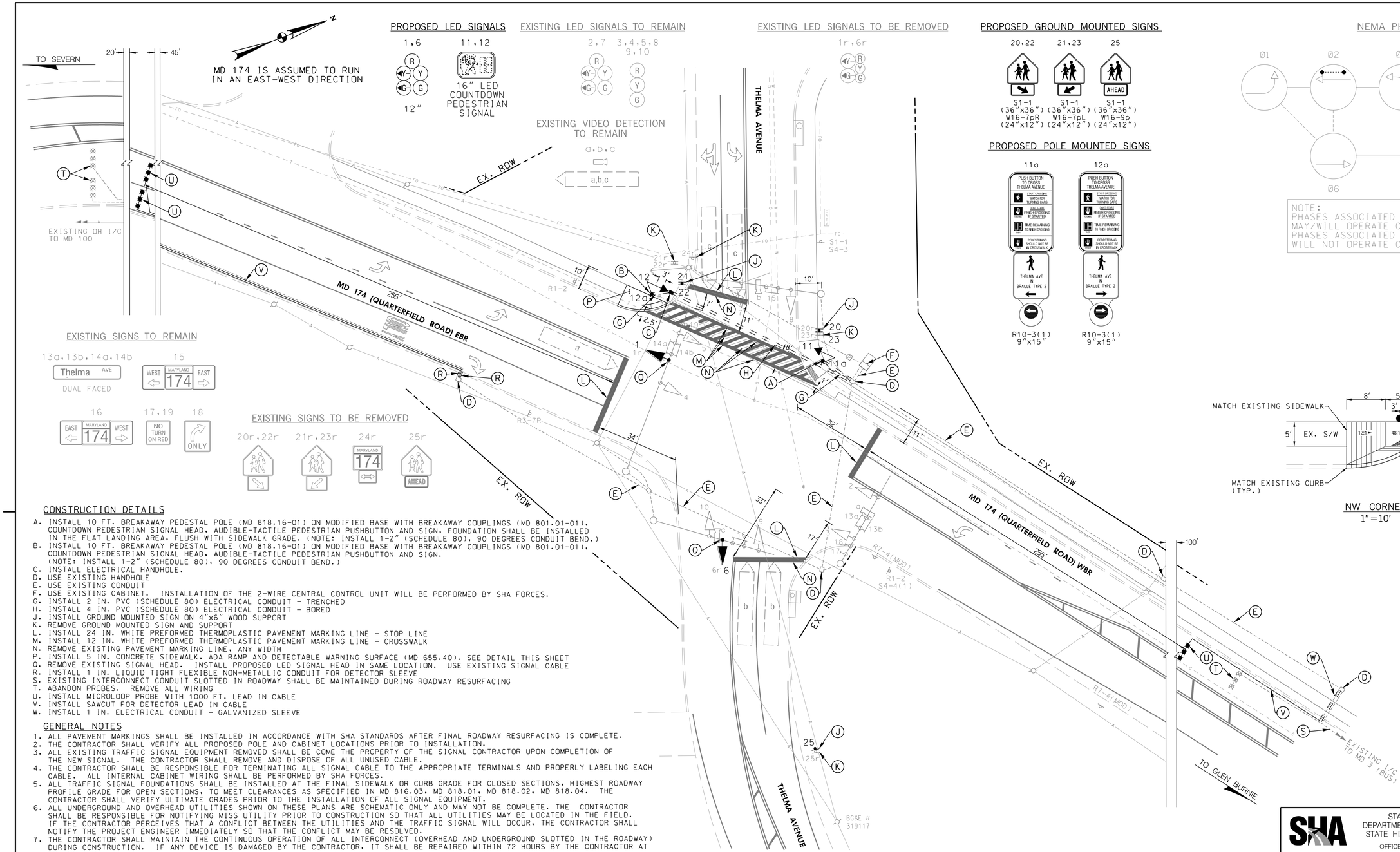
**SIGN SUPPORTS DETAILS**

SCALE NONE DATE SEPTEMBER, 2016 CONTRACT NO. XY1705185

DESIGNED BY MG COUNTY CECIL
DRAWN BY MG LOGMILE MULTIPLE
CHECKED BY SJW T.I.M.S. NO. N509
F.A.P. NO. TOD NO.

DRAWING NO. AW- 10 OF 10 SHEET NO. 10 OF 10


PLOTTED: Friday, September 09, 2016 AT 10:26 AM
FILE: Y:\0732-299-16 I-95 at MD 272 logo signing\CADD\pSN-P010_I-95 AT MD272.dgn




## CONSTRUCTION DETAILS

A. INSTALL 10 FT. BREAKAWAY PEDESTAL POLE (MD 818.16-01) ON MODIFIED BASE WITH BREAKAWAY COUPLINGS (MD 801.01-01), COUNTDOWN PEDESTRIAN SIGNAL HEAD, AUDIBLE-TACTILE PEDESTRIAN PUSHBUTTON AND SIGN. FOUNDATION SHALL BE INSTALLED IN THE FLAT LANDING AREA, FLUSH WITH SIDEWALK GRADE. (NOTE: INSTALL 1-2" (SCHEDULE 80), 90 DEGREES CONDUIT BEND.)
B. INSTALL 10 FT. BREAKAWAY PEDESTAL POLE (MD 818.16-01) ON MODIFIED BASE WITH BREAKAWAY COUPLINGS (MD 801.01-01), COUNTDOWN PEDESTRIAN SIGNAL HEAD, AUDIBLE-TACTILE PEDESTRIAN PUSHBUTTON AND SIGN. (NOTE: INSTALL 1-2" (SCHEDULE 80), 90 DEGREES CONDUIT BEND.)
C. INSTALL ELECTRICAL HANDHOLE.
D. USE EXISTING HANDHOLE
E. USE EXISTING CONDUIT
F. USE EXISTING CABINET. INSTALLATION OF THE 2-WIRE CENTRAL CONTROL UNIT WILL BE PERFORMED BY SHA FORCES.
G. INSTALL 2 IN. PVC (SCHEDULE 80) ELECTRICAL CONDUIT - TRENCHED
H. INSTALL 4 IN. PVC (SCHEDULE 80) ELECTRICAL CONDUIT - BORED
J. INSTALL GROUND MOUNTED SIGN ON 4"x6" WOOD SUPPORT
K. REMOVE GROUND MOUNTED SIGN AND SUPPORT
L. INSTALL 24 IN. WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINE - STOP LINE
M. INSTALL 12 IN. WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINE - CROSSWALK
N. REMOVE EXISTING PAVEMENT MARKING LINE, ANY WIDTH
P. INSTALL 5 IN. CONCRETE SIDEWALK, ADA RAMP AND DETECTABLE WARNING SURFACE (MD 655.40). SEE DETAIL THIS SHEET
Q. REMOVE EXISTING SIGNAL HEAD. INSTALL PROPOSED LED SIGNAL HEAD IN SAME LOCATION. USE EXISTING SIGNAL CABLE
R. INSTALL 1 IN. LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT FOR DETECTOR SLEEVE
S. EXISTING INTERCONNECT CONDUIT SLOTTED IN ROADWAY SHALL BE MAINTAINED DURING ROADWAY RESURFACING
T. ABANDON PROBES. REMOVE ALL WIRING
U. INSTALL MICROLOOP PROBE WITH 1000 FT. LEAD IN CABLE
V. INSTALL SAWCUT FOR DETECTOR LEAD IN CABLE
W. INSTALL 1 IN. ELECTRICAL CONDUIT - GALVANIZED SLEEVE

## GENERAL NOTES

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH SHA STANDARDS AFTER FINAL ROADWAY RESURFACING IS COMPLETE.
2. THE CONTRACTOR SHALL VERIFY ALL PROPOSED POLE AND CABINET LOCATIONS PRIOR TO INSTALLATION.
3. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT REMOVED SHALL BE COME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE NEW SIGNAL. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL UNUSED CABLE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TERMINATING ALL SIGNAL CABLE TO THE APPROPRIATE TERMINALS AND PROPERLY LABELING EACH CABLE. ALL INTERNAL CABINET WIRING SHALL BE PERFORMED BY SHA FORCES.
5. ALL TRAFFIC SIGNAL FOUNDATIONS SHALL BE INSTALLED AT THE FINAL SIDEWALK OR CURB GRADE FOR CLOSED SECTIONS, HIGHEST ROADWAY PROFILE GRADE FOR OPEN SECTIONS, TO MEET CLEARANCES AS SPECIFIED IN MD 816.03, MD 818.01, MD 818.02, MD 818.04. THE CONTRACTOR SHALL VERIFY ULTIMATE GRADES PRIOR TO THE INSTALLATION OF ALL SIGNAL EQUIPMENT.
6. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.
7. THE CONTRACTOR SHALL MAINTAIN THE CONTINUOUS OPERATION OF ALL INTERCONNECT (OVERHEAD AND UNDERGROUND SLOTTED IN THE ROADWAY) DURING CONSTRUCTION. IF ANY DEVICE IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPAIRED WITHIN 72 HOURS BY THE CONTRACTOR AT NO COST TO THE ADMINISTRATION AFTER NOTIFICATION BY THE ENGINEER.
8. ALL EXISTING SIGNS SHALL REMAIN UNLESS NOTED ON THE PLAN.
9. FOR HATCHED CROSSWALK DETAIL, REFER TO MDMUTCD FIGURE 3B-20a.
10. THE CONTRACTOR SHALL DELIVER APS PUSHBUTTONS AND CENTRAL CONTROL UNIT TO THE SHA SIGNAL SHOP AT LEAST 3 WEEKS PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL HAVE THE APS MESSAGE PROGRAMMED FROM THE FACTORY AND DELIVER THE APS WAVE FILES TO MR. ED RODENHIZER.
11. THE CONTRACTOR SHALL UTILIZE SHA STANDARD TYPICALS FOR TRAFFIC CONTROL (SECTION 104) FOR THE INSTALLATION OF PROPOSED TRAFFIC CONTROL DEVICES, UNLESS APPROVED BY THE ENGINEER.

## APS NOTES:

1. PUSHBUTTONS ARE TO BE LOCATED SO THAT THEY CAN BE ACTIVATED BY A PERSON IN WHEELCHAIR REACHING LESS THAN 18 IN. FROM A 60 IN.X60 IN. LEVEL LANDING AREA WITH A CROSS SLOPE OF LESS THAN OR EQUAL TO 2%.
2. THE 10' MINIMUM SEPARATION BETWEEN PUSHBUTTONS IS TO BE MEASURED FROM FACE OF PUSHBUTTON TO FACE OF PUSHBUTTON, NOT CENTER TO CENTER OF POLE.
3. PUSHBUTTON ARROWS ARE TO BE PARALLEL TO THE CROSSING FOR WHICH THEY ARE INTENDED.
4. LOCATION OF ACCESSIBLE PEDESTRIAN SIGNAL PUSHBUTTONS MUST MEET LOCATION REQUIREMENTS OF MUTCD SECTIONS 4E.08 AND 4E.10. FIGURES 4E-3 AND 4E-4 AND THE NCHRP PUBLICATION, ACCESSIBLE PEDESTRIAN SIGNALS: GUIDE TO BEST PRACTICE. IF NOT MET, THE CONTRACTOR IS TO STOP WORK ON PUSHBUTTON LOCATION UNTIL A DESIGN WAIVER IS OBTAINED, APPROVED BY THE DIRECTOR, OFFICE OF TRAFFIC AND SAFETY.

GEOMETRIC LEGEND

EXISTING
PROPOSED

UTILITY LEGEND

SD — STORM DRAIN
G — GAS MAIN
W — WATER MAIN
S — SEWER MAIN
E — ELECTRIC CABLES
A — AERIAL CABLES
T — TELEPHONE CABLES
F — FIBER-OPTIC

BY: WagnerM

WSP
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(Fax) 410-727-4608
http://www.pbworld.com

APPROVALS

TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF
OFFICE DIRECTOR

ORIGINAL ON FILE

REVISIONS

⑥ INSTALL APS/CPS ON THE NORTH LEG
SHA NO. AA8965177 TIMS NO. N793 12/2316
KWP
C ADD E/P PHASE FOR EB APPROACH 06 /2011
SHA NO. XX3475185 TIMS# K714
STV SDY | JT | DJD | DJD RB | MLP | TH
B COMPLETE RECONSTRUCTION; ADDITION OF E/P LEFT TURN PHASE FOR NB THELMA AVENUE
SHA NO. AT6045185 9-7-2004
M.O. | W.M. | M.A.R. | D.A.Z. | B.R.K.

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 174 (QUARTERFIELD ROAD) at THELMA AVENUE

GLEN BURNIE, MD

# SIGNALIZATION PLAN SHEET

SCALE 1" = 20' DATE 11-17-1975 CONTRACT NO.

DESIGNED BY
DRAWN BY D. DODA
CHECKED BY
MDE/PRD

COUNTY ANNE ARUNDEL
LOGMILE 02017405.78
TIMS NO.
TOD NO.

TS NO. 1274D | DRAWING SG-01 OF 02 | SHEET NO. 01 OF 02

PLOTTED: Thursday, December 22, 2016 AT 01:36 PM
FILE: T:\173124A-Traffic\DesignServices\TRF\247\Plans\pSG-P001_MD174.dgn

## PROJECT DESCRIPTION

I. GENERAL

THIS PROJECT INVOLVES THE MODIFICATION OF THE EXISTING TRAFFIC CONTROL SIGNAL WITH INTERCONNECT AT THE INTERSECTION OF MD 174 (QUARTERFIELD RD) AND THELMA AVE. IN ANNE ARUNDEL COUNTY. THIS PROJECT CONSISTS OF INSTALLING APS AND CPS FOR THE NORTH LEG OF THE INTERSECTION. MD 174 IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION.

II. INTERSECTION OPERATION

1. THE INTERSECTION OPERATES IN A NEMA SIX (6) PHASE, FULLY-ACTUATED MODE. EASTBOUND AND NORTHBOUND OPERATE WITH A EXCLUSIVE/PERMISSIVE LEFT TURN PHASE.

2. AN EXISTING NEMA FULL-TRAFFIC-ACTUATED, EIGHT (8) PHASE CONTROLLER IN A NEMA SIZE "S" BASE MOUNTED CABINET SHALL BE CONTINUE TO BE UTILIZED AT THIS LOCATION. A 2-WIRE APS CENTRAL CONTROL UNIT SHALL BE INSTALLED IN THE CABINET BY SHA FORCES.

III. SPECIAL NOTES

APS WILL FUNCTION AS FOLLOWS:
TO CROSS THELMA AVENUE

1. WHEN A PEDESTRIAN LOCATES AND PRESSES THE PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE THE FOLLOWING MESSAGE: "WAIT TO CROSS THELMA AT QUARTERFIELD, WAIT".
2. WHEN THE WALK PHASE BEGINS, THE PUSHBUTTON UNIT WILL PROVIDE A RAPID TICK WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE.

## CONTACTS

DISTRICT (DISTRICT 5)

MR. TIM SMITH
DISTRICT ENGINEER
410-841-1001

MS. KIMBERLY TRAN
ASSISTANT DISTRICT ENGINEER - TRAFFIC
410-841-1019

MR. AARON JONES
DISTRICT UTILITY ENGINEER
410-841-1039

MR. PETER KEKE
ASSISTANT DISTRICT ENGINEER - CONSTRUCTION
410-841-1031

MR. WILLIAM MCFARLAND
ASSISTANT DISTRICT ENGINEER - MAINTENANCE
410-841-1013

OFFICE OF TRAFFIC AND SAFETY

MS. CORREN JOHNSON
CHIEF, TRAFFIC OPERATIONS
410-787-7630

MS. KELLY CALDWELL-HARPER
ASSISTANT DIVISION CHIEF, TRAFFIC OPERATIONS
410-787-7625

MR. EDWARD RODENHIZER
CHIEF, SIGNAL OPERATIONS SECTION
410-787-7650

MR. TODD JONES, ACTING
CHIEF, SIGN OPERATIONS SECTION
410-787-7670

MR. MICHAEL BOYLE
SUPPLY OFFICER IV (SIGNAL SHOP WAREHOUSE)
410-787-7673

## EQUIPMENT LIST

A. EQUIPMENT TO BE FURNISHED BY STATE HIGHWAY ADMINISTRATION

| ITEM NO. | QUANTITY | | DESCRIPTION |
|---|---|---|---|
| 973024 | 55 | SF | SHEET ALUMINUM GROUND MOUNTED SIGN<br>2 EA S1-1 (36"x36"); W16-7pR (24"x12")<br>2 EA S1-1 (36"x36"); W16-7pL (24"x12")<br>1 EA S1-1 (36"x36"); W16-9p (24"x12") |
| 973025 | 2 | SF | SHEET ALUMINUM MAST ARM/POLE MOUNTED SIGN<br>2 EA R10-3(1) (9"x15") |

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY CONTRACTOR

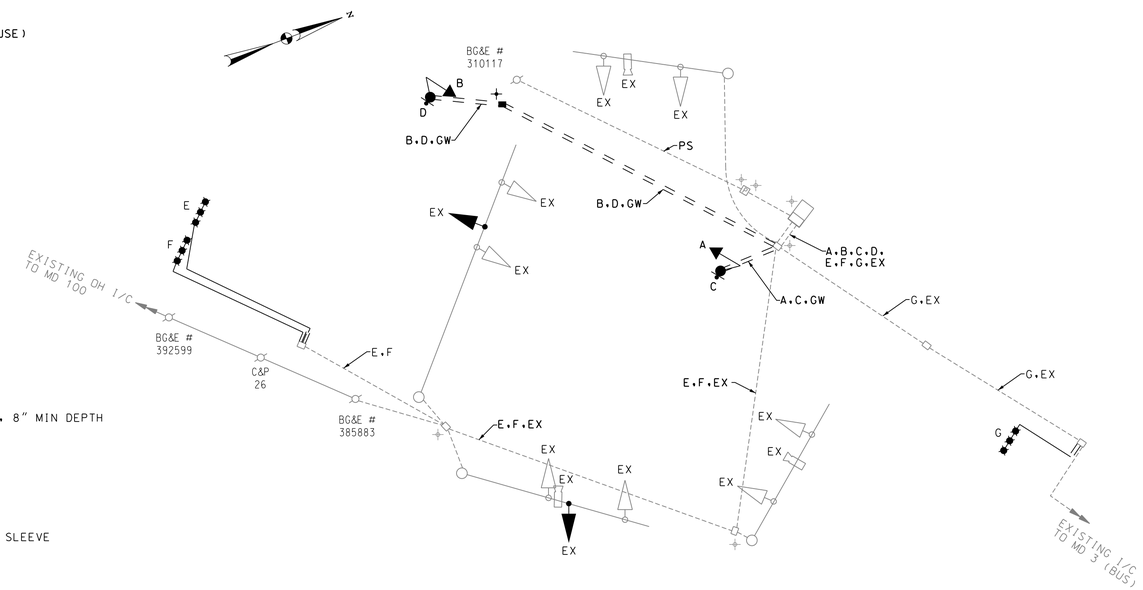
| ITEM NO. | QUANTITY | | DESCRIPTION |
|---|---|---|---|
| 203030 | 1 | CY | TEST PIT EXCAVATION |
| 585621 | 300 | LF | 12" WHITE PREFORMED THERMOPLASTIC MARKING LINES |
| 585625 | 115 | LF | 24" WHITE PREFORMED THERMOPLASTIC MARKING LINES |
| 585700 | 415 | LF | REMOVAL OF EXISTING PAVMENT MARKING LINES, ANY WIDTH |
| 634301 | 25 | LF | STANDARD TYPE A COMBINATION CURB AND GUTTER 12" GUTTER PAN, 8" MIN DEPTH |
| 655105 | 120 | SF | 5" CONCRETE SIDEWALK |
| 655120 | 20 | SF | DETECTABLE WARNING SURFACE FOR CURB RAMPS |
| 801001 | 1 | CY | CONCRETE FOR SIGNAL FOUNDATION |
| 801106 | 50 | LF | WOOD SIGN SUPPORTS 4"x6" |
| 802501 | 100 | LF | NO. 6 AWG STRANDED BARE COPPER GROUND WIRE |
| 805011 | 10 | LF | 1" ELECTRICAL CONDUIT - GALVANIZED SLEEVE |
| 805118 | 90 | LF | 4" SCHEDULE 80 RIGID PVC CONDUIT - BORED |
| 805125 | 30 | LF | 2" SCHEDULE 80 RIGID PVC CONDUIT - TRENCHED |
| 805160 | 20 | LF | 1" LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT FOR DETECTOR SLEEVE |
| 810555 | 3 | EA | MICROLOOP PROBE, 1000 FOOT LEAD IN CABLE |
| 811001 | 1 | EA | FURNISH AND INSTALL ELECTRICAL HANDHOLE |
| 813014 | 55 | SF | INSTALL GROUND MOUNTED SIGN |
| 813015 | 2 | SF | INSTALL OVERHEAD SIGN |
| 813022 | 61 | SF | REMOVE GROUND MOUNTED SIGNS AND SUPPORTS |
| 818004 | 2 | EA | 10 FOOT BREAKAWAY PEDESTAL POLE |
| 837001 | 1 | EA | GROUND ROD - 3/4 INCH DIAMETER x 10 FOOT LENGTH |
| 860284 | 10 | EA | 12 INCH LED VEHICULAR TRAFFIC SIGNAL HEAD SECTION |
| 860285 | 2 | EA | 16 INCH LED COUNTDOWN PEDESTRIAN SIGNAL HEAD |
| 861105 | 200 | LF | ELECTRICAL CABLE - 2 CONDUCTOR (NO. 14 AWG) |
| 861107 | 215 | LF | ELECTRICAL CABLE - 5 CONDUCTOR (NO. 14 AWG) |
| 862102 | 500 | LF | SAW CUT FOR SIGNAL |
| 865210 | 2 | EA | AUDIBLE/TACTILE PEDESTRIAN PUSHBUTTON STATION & SIGN |
| 865300 | 1 | EA | 2-WIRE APS CENTRAL CONTROL UNIT |
| 873002 | 1 | LS | REMOVE AND DISPOSE OF EXISTING SIGNAL EQUIPMENT |

C. ANY MATERIALS TO BE REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE SIGNAL MODIFICATION.

## PHASE CHART

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PHASE 1 AND 6 | G / G | G / G | G | R | R | R | R | R | R | R | DW | DW |
| PHASE 1 CHANGE | Y / G | Y / G | G | R | R | R | R | R | R | R | DW | DW |
| PHASE 2 AND 6 | G | G | G | G | G | R | R | R | R | R | W | W |
| PED CLEARANCE | G | G | G | G | G | R | R | R | R | R | FL/DW | FL/DW |
| PHASE 2 AND 6 CHANGE | Y | Y | Y | Y | Y | R | R | R | R | R | DW | DW |
| PHASE 3 AND 8 | R | R | R | R | R | G / G | G / G | G | R | R | DW | DW |
| PHASE 3 CHANGE | R | R | R | R | R | Y / G | Y / G | G | R | R | DW | DW |
| PHASE 4 AND 8 | R | R | R | R | R | G | G | G | G | G | DW | DW |
| PHASE 4 AND 8 CHANGE | R | R | R | R | R | Y | Y | Y | Y | Y | DW | DW |
| FLASHING OPERATION | FL/Y | FL/Y | FL/Y | FL/Y | FL/Y | FL/R | FL/R | FL/R | FL/R | FL/R | DARK | DARK |

## WIRING DIAGRAM




## WIRING KEY

| | |
|---|---|
| A,B | - 5 CONDUCTOR ELECTRICAL CABLE ( NO. 14 AWG) |
| C,D | - 2 CONDUCTOR ELECTRICAL CABLE (NO. 14 AWG) |
| E,F,G | - MICRLOOP PROBE 1000 FT. LEAD-IN CABLE |
| PS | - EXISTING POWER SERVICE |
| GW | - 1 CONDUCTOR STRANDED COPPER GROUND WIRE (NO. 6 AWG) |
| EX | - EXISTING SIGNAL CABLE |
| + | - PROPOSED GROUND ROD |
| + | - EXISTING GROUND ROD |

SHA
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 174 (QUARTERFIELD ROAD) at THELMA AVENUE

GLEN BURNIE, MD

# GENERAL INFORMATION SHEET

SCALE N.T.S. DATE 12/23/2016 CONTRACT NO. AA8965177

DESIGNED BY MAW COUNTY ANNE ARUNDEL
DRAWN BY MAW LOGMILE 02017405.79
CHECKED BY MF TIMS NO. N793
MDE/PRD SEE TITLE SHEET TOD NO.

TS NO.1274D-GI | DRAWING SG-02 OF 02 | SHEET NO. 02 OF 02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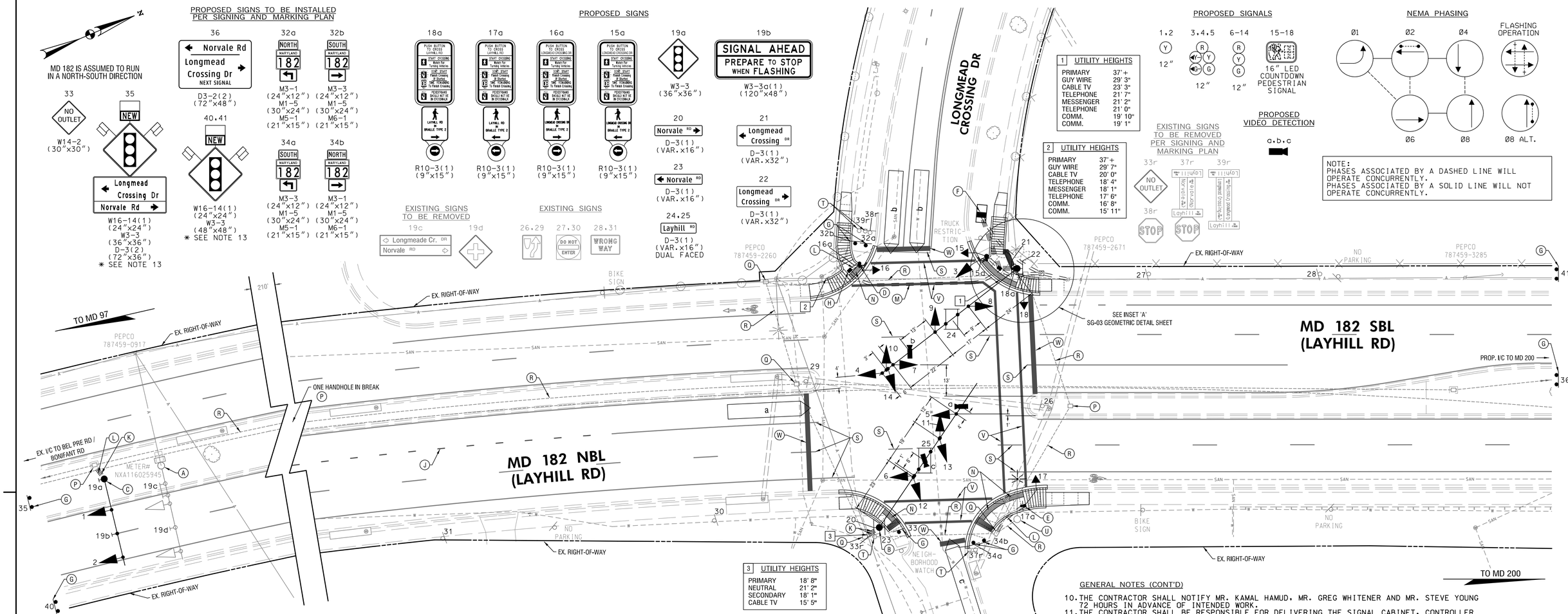
PLOTTED: Thursday, December 22, 2016 AT 01:38 PM
FILE: T:\173124A-TrafficDesignServices\TRF\247\Plans\pSG-N002_MD174.dgn
BY: WagnerM




| 1 | UTILITY HEIGHTS |
|---|---|
| PRIMARY | 37'+ |
| GUY WIRE | 29' 3" |
| CABLE TV | 23' 3" |
| TELEPHONE | 21' 7" |
| MESSENGER | 21' 2" |
| TELEPHONE | 21' 0" |
| COMM. | 19' 10" |
| COMM. | 19' 1" |

| 2 | UTILITY HEIGHTS |
|---|---|
| PRIMARY | 37'+ |
| GUY WIRE | 29' 7" |
| CABLE TV | 20' 0" |
| TELEPHONE | 18' 4" |
| MESSENGER | 18' 1" |
| TELEPHONE | 17' 6" |
| COMM. | 16' 8" |
| COMM. | 15' 11" |

| 3 | UTILITY HEIGHTS |
|---|---|
| PRIMARY | 18' 8" |
| NEUTRAL | 21' 2" |
| SECONDARY | 18' 1" |
| CABLE TV | 15' 5" |

## CONSTRUCTION DETAILS

A. REMOVE EXISTING SIGNAL POLE AND ALL ASSOCIATED EQUIPMENT. EXISTING OVERHEAD SERVICE FEED TO BE REMOVED BY PEPCO FORCES. CAP AND ABANDON EXISTING CONDUIT. REMOVE EXISTING FOUNDATION 12 IN. BELOW GRADE AND BACKFILL.
B. INSTALL 16.5 FT. MAST ARM POLE WITH A 15 FT. 'T' DIMENSION AND A SINGLE 70 FT. MAST ARM ON CONCRETE FOUNDATION WITH SIGNAL HEADS, VIDEO DETECTION CAMERAS AND SIGNS (NOTE: INSTALL 2-3 IN. 90° PVC CONDUIT BEND).
C. INSTALL 27 FT. MAST ARM POLE WITH A SINGLE 60 FT. MAST ARM WITH SIGNAL HEADS AND SIGNS (NOTE: INSTALL 1-3 IN. AND 1-2 IN. 90° PVC CONDUIT BEND). INSTALL ONLY THE BUTT SECTION OF THE MAST ARM AT 35 FT.
D. INSTALL 10 FT. PEDESTAL POLE (MD 818.16-01) ON MODIFIED BASE WITH BREAKAWAY COUPLINGS (MD 801.01-01). COUNTDOWN PEDESTRIAN SIGNAL HEAD, AUDIBLE-TACTILE PEDESTRIAN PUSHBUTTON AND SIGN (NOTE: INSTALL 1-2 IN. 90° PVC CONDUIT BEND). INCORPORATE CONCRETE FOUNDATION INTO PROPOSED CURB.
E. INSTALL 10 FT. PEDESTAL POLE (MD 818.16-01) ON MODIFIED BASE WITH BREAKAWAY COUPLINGS (MD 801.01-01), COUNTDOWN PEDESTRIAN SIGNAL HEAD, AUDIBLE-TACTILE PEDESTRIAN PUSHBUTTON AND SIGN (NOTE: INSTALL 1-2 IN. 90° PVC CONDUIT BEND). FOUNDATION SHALL BE FLUSH WITH SIDEWALK GRADE.
F. INSTALL A NEMA SIZE 'S' BASE MOUNTED CABINET WITH BATTERY BACKUP AND ALL NECESSARY EQUIPMENT (NOTE: INSTALL 2-2 IN. AND 2-4 IN. 90° PVC CONDUIT BEND).
G. PROPOSED SIGN TO BE INSTALLED PER SIGNING AND MARKING PLANS.
H. INSTALL ELECTRICAL HANDHOLE.
J. PROPOSED PAVEMENT MARKING TO BE INSTALLED PER SIGNING AND MARKING PLANS.
K. INSTALL 3 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).
L. INSTALL 2 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).
M. INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT (SLOTTED), UNDER PROPOSED CROSSWALK MARKING.
N. INSTALL RAMP PER DETAIL SHEET SG-03.
P. USE EXISTING HANDHOLE.
Q. USE EXISTING HANDHOLE. ADJUST HANDHOLE TO GRADE WITH NEW FRAME AND COVER.
R. USE EXISTING CONDUIT.
S. REMOVE EXISTING PAVEMENT MARKING.
T. EXISTING SIGN TO BE REMOVED PER SIGNING AND MARKING PLANS.
U. REMOVE EXISTING LUMINAIRE FROM EXISTING LIGHTING POLE AND INSTALL PROPOSED LED LUMINAIRE ON EXISTING LIGHTING ARM. REPLACE LIGHTING CABLE PER WIRING DIAGRAM.
V. INSTALL 12 IN. WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING (FOR CROSSWALK).
W. INSTALL 24 IN. WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING (FOR STOP LINE).

## GENERAL NOTES

1. VIDEO CAMERA LOCATION / ALIGNING SHALL BE COORDINATED WITH THE MONTGOMERY COUNTY ENGINEER.
2. ALL PROPOSED LUMINAIRES SHALL BE SUPPLIED WITH A PHOTOCELL.
3. FOR FINAL PAVEMENT MARKINGS, REFER TO THE PAVEMENT MARKING PLANS, AS APPLICABLE; OTHER THAN THOSE DETAILED ON THE PLAN. ALL PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH SHA STANDARDS.
4. THE CONTRACTOR SHALL VERIFY ALL PROPOSED POLE AND CABINET LOCATIONS PRIOR TO INSTALLATION.
5. ALL TRAFFIC SIGNAL FOUNDATIONS SHALL BE INSTALLED AT THE FINAL SIDEWALK OR CURB GRADE FOR CLOSED SECTIONS, HIGHEST ROADWAY PROFILE GRADE FOR OPEN SECTIONS, TO MEET CLEARANCES AS SPECIFIED IN THE APPROPRIATE 800 SERIES STANDARD PLATES. THE CONTRACTOR SHALL VERIFY ULTIMATE GRADES PRIOR TO THE INSTALLATION OF ALL SIGNAL EQUIPMENT.
6. MONTGOMERY COUNTY FORCES SHALL REMOVE THE CONTROLLER AND ALL AUXILIARY EQUIPMENT FROM THE CONTROLLER CABINET. THE CABINET AND ALL OTHER MATERIALS TO BE REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE NEW SIGNAL. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL UNUSED CABLES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TERMINATING ALL SIGNAL CABLE TO THE APPROPRIATE TERMINALS AND PROPERLY LABELING EACH CABLE. DISCONNECTING AND SPLICING OF INTERCONNECT CABLE SHALL BE PERFORMED BY MONTGOMERY COUNTY FORCES. THE CONTRACTOR SHALL RUN THE INTERCONNECT CABLE INTO THE BASE OF THE CABINET AND PROPERLY LABEL EACH CABLE. ALL INTERNAL CABINET WIRING SHALL BE PERFORMED BY MONTGOMERY COUNTY FORCES.
8. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.
9. THE CONTRACTOR SHALL MAINTAIN THE CONTINUOUS OPERATION OF ALL INTERCONNECT, VEHICULAR, PEDESTRIAN DETECTORS, AND LIGHTING DEVICES. IF ANY DEVICE IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPAIRED WITHIN 72 HOURS BY THE CONTRACTOR AT NO COST TO THE SHA AFTER NOTIFICATION BY THE ENGINEER.

## GENERAL NOTES (CONT'D)

10. THE CONTRACTOR SHALL NOTIFY MR. KAMAL HAMUD, MR. GREG WHITENER AND MR. STEVE YOUNG 72 HOURS IN ADVANCE OF INTENDED WORK.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERING THE SIGNAL CABINET, CONTROLLER AND VIDEO INTERFACE EQUIPMENT TO THE MONTGOMERY COUNTY SIGNAL SHOP. THE CONTRACTOR SHALL INSTALL APS PUSHBUTTONS AND CENTRAL CONTROL UNIT AND MONTGOMERY COUNTY FORCES SHALL PROGRAM THE APS MESSAGES IN THE FIELD.
12. FOR INTERCONNECT CONSTRUCTION AND ROUTING, AS APPLICABLE; OTHER THAN THOSE DETAILED ON THE PLAN, REFER TO THE INTERCONNECT PLANS.
13. FOR THE REMOVAL OF W3-3 NEW ASSEMBLIES AND FLAGS, REFER TO THE SIGNING AND MARKING PLAN.

## APS NOTES

1. PUSHBUTTONS ARE TO BE LOCATED SO THAT THEY CAN BE ACTIVATED BY A PERSON IN A WHEELCHAIR REACHING LESS THAN 18 IN. FROM A 60 IN.X60 IN. LEVEL LANDING AREA WITH A CROSS SLOPE OF LESS THAN OR EQUAL TO 2%.
2. THE 10' MINIMUM SEPARATION BETWEEN PUSHBUTTONS IS TO BE MEASURED FROM FACE OF PUSHBUTTON TO FACE OF PUSHBUTTON, NOT CENTER TO CENTER OF POLE.
3. PUSHBUTTON ARROWS ARE TO BE PARALLEL TO THE CROSSING FOR WHICH THEY ARE INTENDED.
4. LOCATION OF ACCESSIBLE PEDESTRIAN SIGNAL PUSHBUTTONS MUST MEET LOCATION REQUIREMENTS OF MUTCD SECTIONS 4E.08 AND 4E.10, FIGURES 4E-3 AND 4E-4 AND THE NCHRP PUBLICATION, ACCESSIBLE PEDESTRIAN SIGNALS: GUIDE TO BEST PRACTICE. IF NOT MET, THE CONTRACTOR IS TO STOP WORK ON PUSHBUTTON LOCATION UNTIL A DESIGN WAIVER IS OBTAINED, APPROVED BY THE DIRECTOR, OFFICE OF TRAFFIC AND SAFETY.

GEOMETRIC LEGEND
EXISTING
PROPOSED

UTILITY LEGEND
SD — STORM DRAIN
G — GAS MAIN
W — WATER MAIN
S — SEWER MAIN
E — ELECTRIC CABLES
A — AERIAL CABLES
T — TELEPHONE CABLES
F — FIBER-OPTIC

BY: Fukui

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Tower 1, 10th Floor
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http://www.pbworld.com

APPROVALS
TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF
OFFICE DIRECTOR
ORIGINAL ON FILE

REVISIONS
6 INSTALLATION OF TRAFFIC CONTROL SIGNAL WITH NB ADVANCE HB AND REMOVAL OF EX. NB INTERSECTION WARNING HB. SHA NO.XY1283185 TMS NO.L915 06/20/2014 KMP

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 182 AT LONGMEAD CROSSING DR /NORVALE RD
TRAFFIC SIGNAL INSTALLATION
ASPEN HILL, MD

# SIGNALIZATION PLAN SHEET

SCALE 1" = 20' DATE OCTOBER, 1996 CONTRACT NO.
DESIGNED BY COUNTY MONTGOMERY
DRAWN BY LOGMILE 15018202.59
CHECKED BY D. DODA TIMS NO.
F.A.P. NO. TOD NO.

TS NO. 3630A | DRAWING SG-01 OF 04 | SHEET NO. 01 OF 05

PLOTTED: Friday, June 20, 2014 AT 09:52 AM
FILE: T:\173124A-TrafficDesignServices\TRF\172\Plans\pSG_P001-MD 182 @ Longmead Crossing.dgn

MD 182 IS ASSUMED TO RUN
IN A NORTH-SOUTH DIRECTION

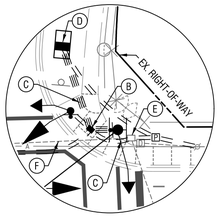
## WIRING DIAGRAM

WIRING KEY

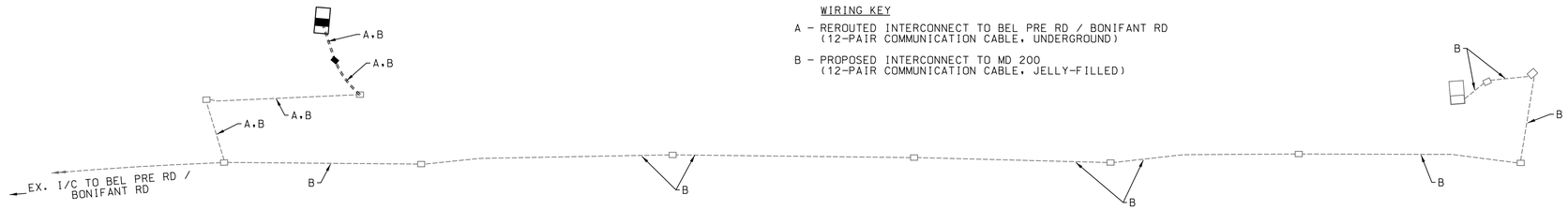
A – REROUTED INTERCONNECT TO BEL PRE RD / BONIFANT RD
(12-PAIR COMMUNICATION CABLE, UNDERGROUND)

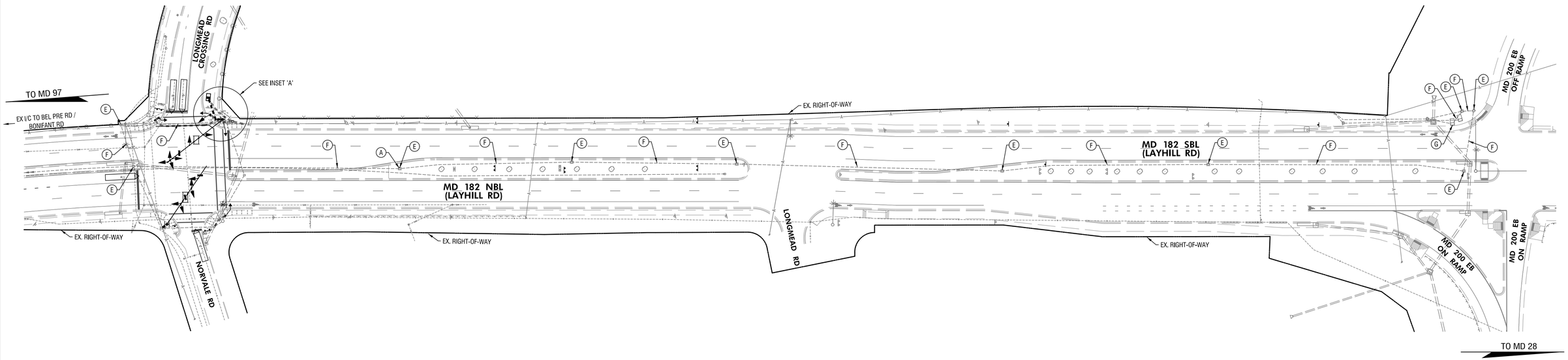
B – PROPOSED INTERCONNECT TO MD 200
(12-PAIR COMMUNICATION CABLE, JELLY-FILLED)

INSET 'A'




SCALE: 1'=20'




CONSTRUCTION DETAILS

A. DISCONNECT EXISTING INTERCONNECT CABLE AT MD 200 RAMPS THAT CONNECTS TO BEL PRE RD / BONIFANT RD. CUT EXISTING INTERCONNECT CABLE AT THE LOCATION SHOWN, PULL BACK AND REROUTE EXISTING INTERCONNECT CABLE TO THE PROPOSED CABINET AT LONGMEAD CROSSING DR / NORVALE RD. REMOVE REMAINING INTERCONNECT CABLE FROM EXISTING CONDUIT.
B. USE PROPOSED HANDHOLE.
C. USE PROPOSED CONDUIT.
D. USE PROPOSED CABINET AND CONTROLLER.
E. USE EXISTING HANDHOLE.
F. USE EXISTING CONDUIT.
G. USE EXISTING CABINET AND CONTROLLER.

GENERAL NOTES

1. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL UNUSED CABLES. ALL MATERIALS TO BE REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE SIGNAL MODIFICATION.
2. ALL UNDERGROUND AND OVERHEAD UTILITIES SHOWN ON THESE PLANS ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING MISS UTILITY PRIOR TO CONSTRUCTION SO THAT ALL UTILITIES MAY BE LOCATED IN THE FIELD. IF THE CONTRACTOR PERCEIVES THAT A CONFLICT BETWEEN THE UTILITIES AND THE TRAFFIC SIGNAL WILL OCCUR, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IMMEDIATELY SO THAT THE CONFLICT MAY BE RESOLVED.
3. THE CONTRACTOR SHALL MAINTAIN THE CONTINUOUS OPERATION OF ALL INTERCONNECT, VEHICULAR, PEDESTRIAN DETECTORS, AND LIGHTING DEVICES. IF ANY DEVICE IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPAIRED WITHIN 72 HOURS BY THE CONTRACTOR AT NO COST TO THE SHA AFTER NOTIFICATION BY THE ENGINEER.
4. DISCONNECTING AND SPLICING OF INTERCONNECT CABLE SHALL BE PERFORMED BY MONTGOMERY COUNTY FORCES. THE CONTRACTOR SHALL RUN THE INTERCONNECT CABLE INTO THE BASE OF EACH CABINET AND PROPERLY TAG THE CABLE. ALL INTERNAL CABINET WIRING SHALL BE PERFORMED BY MONTGOMERY COUNTY FORCES.
5. THE CONTRACTOR SHALL NOTIFY MR. KAMAL HAMUD AND CHIEF, MONTGOMERY COUNTY SIGNAL SHOP 72 HOURS IN ADVANCE OF INTENDED WORK.

GEOMETRIC LEGEND

EXISTING
PROPOSED

UTILITY LEGEND

SD — STORM DRAIN
G — GAS MAIN
W — WATER MAIN
S — SEWER MAIN
E — ELECTRIC CABLES
A — AERIAL CABLES
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BY: Fukui –

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(Fax) 410-727-4608
http://www.pbworld.com

| APPROVALS | REVISIONS |
|---|---|
| TEAM LEADER | |
| ASST. DIV. CHIEF | |
| DIVISION CHIEF | |
| OFFICE DIRECTOR | |

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 182 FROM LONGMEAD CROSSING DR TO MD 200
INTERCONNECT INSTALLATION
ASPEN HILL, MD

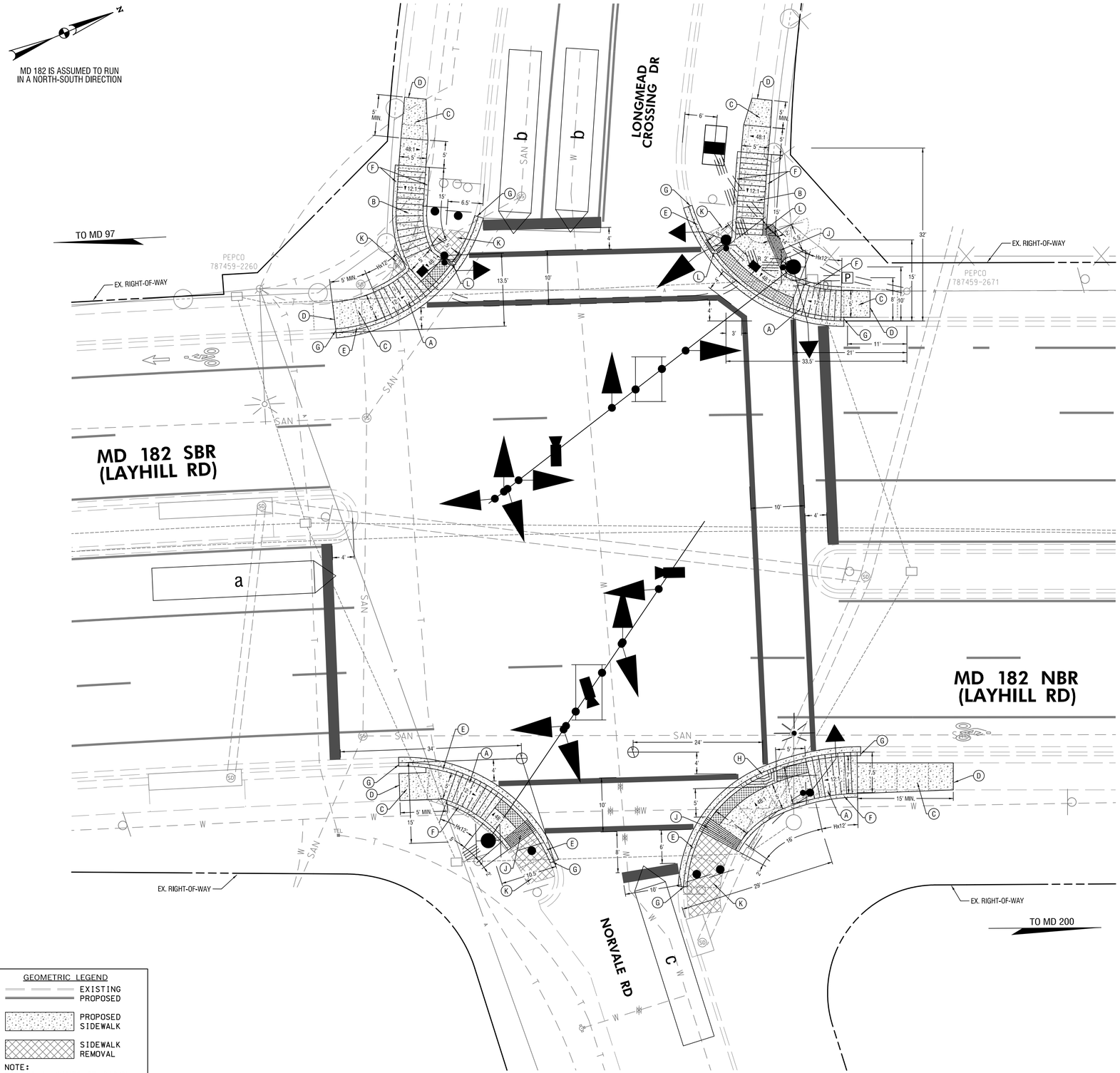
# INTERCONNECT PLAN SHEET

SCALE 1" = 50' DATE JUNE 20, 2014 CONTRACT NO. XY1285185

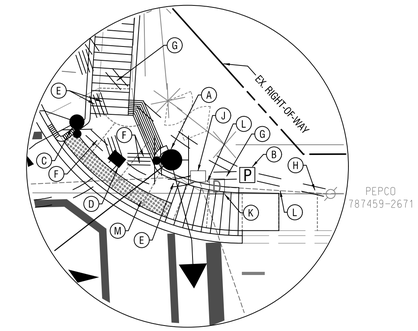
DESIGNED BY MF COUNTY MONTGOMERY
DRAWN BY MF LOGMILE 15018202.59 TO 15018202.84
CHECKED BY KMP TIMS NO. L915
F.A.P. NO. AC-STPG-000A(832)E TOD NO.

TS NO.3630A-IC | DRAWING SG – 02 OF 04 | SHEET NO. 02 OF 05

PLOTTED: Friday, June 20, 2014 AT 09:53 AM
FILE: T:\173124A-Traffic\DesignServices\TRF\172\Plans\pSG_C001-MD 182 @ Longmead Crossing.dgn




INSET 'A'
(FROM SG-01 SIGNALIZATION PLAN SHEET)




SCALE: 1" = 10'

CONSTRUCTION DETAILS (INSET 'A')

A. INSTALL 16.5 FT. MAST ARM POLE WITH A 15 FT. 'T' DIMENSION AND A SINGLE 70 FT. MAST ARM ON CONCRETE FOUNDATION WITH SIGNAL HEADS, VIDEO DETECTION CAMERA, SIGNS, COUNTDOWN PEDESTRIAN SIGNAL AND AUDIBLE-TACTILE PEDESTRIAN PUSHBUTTON AND SIGN (NOTE: INSTALL 2-3 IN. 90° PVC CONDUIT BEND).
B. INSTALL 100 AMP EMBEDDED METERED SERVICE PEDESTAL (NOTE: INSTALL 3-2 IN. AND 1-4 IN. 90° PVC CONDUIT BEND).
C. INSTALL 14 FT. PEDESTAL POLE (MD 818.17) ON TRANSFORMER BASE (MD 821.01) AND STANDARD CONCRETE FOUNDATION WITH SIGNAL HEAD (MOUNTED PER MD 814.01), COUNTDOWN PEDESTRIAN SIGNAL HEAD (MOUNTED PER MD 814.03), AUDIBLE-TACTILE PEDESTRIAN PUSHBUTTON AND SIGN (NOTE: INSTALL 1-3 IN. 90° PVC CONDUIT BEND). INCORPORATE CONCRETE FOUNDATION INTO PROPOSED CURB.
D. INSTALL ELECTRICAL HANDHOLE.
E. INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).
F. INSTALL 3 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).
G. INSTALL 2 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).
H. INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED). WORK WITH PEPCO TO STUB UP AT THE BASE OF PEPCO POLE 787459-2671 IN THE PLACE OF THE EXISTING STUB UP FOR THE EXISTING LIGHTING POWER FEED. COIL 35 FT OF CABLE EACH AT THE BASE OF THE POLE.
J. USE EXISTING HANDHOLE. ADJUST HANDHOLE TO GRADE WITH NEW FRAME AND COVER.
K. REMOVE EXISTING DISCONNECT FOR STREET LIGHTING. EXISTING UNDERGROUND SERVICE FEED TO BE REMOVED BY PEPCO FORCES. CAP AND ABANDON EXISTING CONDUIT.
L. CAP AND ABANDON EXISTING CONDUIT.
M. INSTALL RAMP PER THIS SHEET.

CONSTRUCTION DETAILS (GEOMETRIC DETAIL SHEET)

A. INSTALL PARALLEL SIDEWALK RAMP (MD 655.12) WITH DETECTABLE WARNING SURFACE (MD 655.40).
B. INSTALL PERPENDICULAR SIDEWALK RAMP (MD 655.11) EXTENDING FROM THE BACK OF THE PROPOSED PARALLEL SIDEWALK RAMP AS SHOWN.
C. INSTALL 5 IN. SIDEWALK.
D. MATCH EXISTING SIDEWALK.
E. INSTALL TYPE 'A' COMBINATION CURB AND GUTTER.
F. INSTALL TYPE 'A' CURB.
G. MATCH EXISTING CURB.
H. INSTALL 3 IN. TYPE 'A' CURB AND GUTTER WITH SIDEWALK SLOPED TOWARDS LANDING AREA.
J. INSTALL SIDEWALK FLARE.
K. REMOVE EXISTING SIDEWALK. BACKFILL WITH SUITABLE MATERIAL AND INSTALL TURFGRASS SOD.
L. CURB TO BE NOSED DOWN.

GENERAL NOTES

1. ALL CURB FILLETS ARE 1' RADII UNLESS OTHERWISE DIMENSIONED.
2. ALL DETECTABLE WARNING SURFACES SHALL BE BRICK RED.

GEOMETRIC LEGEND

EXISTING
PROPOSED
PROPOSED SIDEWALK
SIDEWALK REMOVAL

NOTE:
SIDEWALK JOINTS IF SHOWN ARE APPROXIMATE.

BY: Fukui

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STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 182 AT LONGMEAD CROSSING DR /NORVALE RD
TRAFFIC SIGNAL INSTALLATION
ASPEN HILL, MD

# GEOMETRIC DETAIL SHEET

| | | | |
|---|---|---|---|
| SCALE 1" = 10' | DATE JUNE 20, 2014 | CONTRACT NO. XY1285185 | |
| DESIGNED BY MF | | COUNTY MONTGOMERY | |
| DRAWN BY MF | | LOGMILE 15018202.59 | |
| CHECKED BY KMP | | TIMS NO. L915 | |
| F.A.P. NO. AC-STPG-000A(832)E | | TOD NO. | |
| TS NO.3630A-DE | DRAWING SG-03 OF 04 | SHEET NO. 03 OF 05 | |

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## PROJECT DESCRIPTION

I. GENERAL

THIS PROJECT INVOLVES THE INSTALLATION OF A PROPOSED PART TIME TRAFFIC CONTROL SIGNAL WITH INTERCONNECT AT THE INTERSECTION OF MD 182 (LAYHILL RD) AND LONGMEAD CROSSING DR / NORVALE RD IN MONTGOMERY COUNTY. SIGNALIZED PEDESTRIAN CROSSINGS WITH APS/CPS WILL BE INSTALLED ACROSS THE NORTH AND WEST LEGS. THE NORTHBOUND INTERSECTION WARNING HAZARD IDENTIFICATION BEACON (HIB) WILL BE CONVERTED TO AN ACTIVE SIGNAL AHEAD HIB CONNECTED TO THE SIGNAL. THE EXISTING INTERSECTION LIGHTING ON NORTHBOUND MD 182 WILL BE UPGRADED TO LED. MD 182 IS ASSUMED TO RUN IN A NORTH-SOUTH DIRECTION.

II. INTERSECTION OPERATION

1. THE INTERSECTION SHALL OPERATE IN A NEMA FIVE (5) PHASE, SEMI-ACTUATED MODE. AN EXCLUSIVE-PERMISSIVE LEFT TURN PHASE WILL BE PROVIDED FOR THE NORTHBOUND MD 182 APPROACH. NORTHBOUND AND SOUTHBOUND MD 182 APPROACHES OPERATE CONCURRENTLY. AN ACTUATED AUDIBLE PEDESTRIAN PHASE IS PROVIDED ACROSS THE WEST LEG TO CROSS LONGMEAD CROSSING DR. EASTBOUND LONGMEAD CROSSING DR AND WESTBOUND NORVALE RD APPROACHES OPERATE CONCURRENTLY. AN ALTERNATE PEDESTRIAN PHASE WITH AUDIBLE/TACTILE PEDESTRIAN SIGNALS WILL BE PROVIDED ACROSS THE NORTH LEG TO CROSS LAYHILL RD. THE SIGNAL SHALL OPERATE FROM 7:00 AM TO 9:00 AM AND 4:00 PM TO 7:00 PM AND OPERATE ON FLASH THE REST OF THE TIME. THE NORTHBOUND ACTIVE SIGNAL AHEAD HIB WILL OPERATE WITH THE NORTHBOUND RED SIGNAL.

2. A PROPOSED NEMA FULL-TRAFFIC-ACTUATED, EIGHT (8) PHASE CONTROLLER WITH VIDEO DETECTION INTERFACE, 2 WIRE CENTRAL CONTROL UNIT, BATTERY BACKUP AND ALL NECESSARY EQUIPMENT IN A NEMA SIZE "S" BASE MOUNTED CABINET SHALL BE INSTALLED AT THIS LOCATION.

III. SPECIAL NOTES

APS WILL FUNCTION AS FOLLOWS:
TO CROSS MD 182 (LAYHILL RD)

1. WHEN A PEDESTRIAN LOCATES AND PRESSES THE PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE THE FOLLOWING MESSAGE: "WAIT TO CROSS LAYHILL AT LONGMEAD CROSSING AND NORVALE, WAIT."
2. WHEN THE WALK PHASE BEGINS, THE PUSHBUTTON UNIT WILL PROVIDE A RAPID TICK WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE.

TO CROSS LONGMEAD CROSSING DR

1. WHEN A PEDESTRIAN LOCATES AND PRESSES THE PUSHBUTTON FOR AN EXTENDED TIME, THE PUSHBUTTON UNIT WILL ANNOUNCE THE FOLLOWING MESSAGE: "WAIT TO CROSS LONGMEAD CROSSING AT LAYHILL, WAIT."
2. WHEN THE WALK PHASE BEGINS, THE PUSHBUTTON UNIT WILL PROVIDE A RAPID TICK WHICH WILL LAST FOR THE DURATION OF THE WALK PHASE.

## EQUIPMENT LIST

A. EQUIPMENT TO BE FURNISHED BY STATE HIGHWAY ADMINISTRATION

| ITEM NO. | QUANTITY | DESCRIPTION |
|---|---|---|
| 9104 | 1 EA | CONTROLLER CABINET, SIZE "S" W/CTRL, VIDEO INT. 1-8 CAM |
| 9110 | 1 EA | UPS EQUIPMENT FOR "S" CABINET |
| 9570 | 186 SF | SHEET ALUMINUM GROUND MOUNTED SIGN |
| | 2 EA | R2-1 - SPEED LIMIT 40 (24"x30") |
| | 1 EA | R8-7 (24"x24") |
| | 1 EA | W3-3 (36"x36") |
| | 2 EA | W3-3 (48"x48") |
| | 1 EA | W14-2 (30"x30") |
| | 3 EA | W16-14(1) (24"x24") |
| | 1 EA | D-3(2) - Longmead Rd -> (84"x12") |
| | 1 EA | D-3(2)MOD - <- Argyle Club Ln (60"x24") |
| | 1 EA | D-3(2)MOD - Argyle Club Ln -> (60"x24") |
| | 1 EA | D-3(2)MOD - <- Longmead Crossing Dr / Norvale Rd -> (72"x36") |
| | 1 EA | D3-2(2)MOD - <- Norvale Rd / Longmead Crossing Dr -> (72"x48") |
| | 5 EA | M1-5 (30"x24") |
| | 2 EA | M3-1 (24"x12") |
| | 3 EA | M3-3 (24"x12") |
| | 2 EA | M5-1 (21"x15") |
| | 2 EA | M6-1 (21"x15") |
| 9571 | 128 SF | SHEET ALUMINUM MAST ARM / POLE MOUNTED SIGN |
| | 2 EA | R10-3(1) - LAYHILL RD (9"x15") |
| | 2 EA | R10-3(1) - LONGMEAD CROSSING DR (9"x15") |
| | 1 EA | W3-3 (36"x36") |
| | 1 EA | W3-3a(1) (120"x48") |
| | 1 EA | D-3(1) - Layhill Rd (DUAL FACED) (VAR.x16") |
| | 1 EA | D-3(1) - <- Longmead Crossing Dr (VAR.x32") |
| | 1 EA | D-3(1) - Longmead Crossing Dr -> (VAR.x32") |
| | 1 EA | D-3(1) - <- Norvale Rd (VAR.x16") |
| | 1 EA | D-3(1) - Norvale Rd -> (VAR.x16") |

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY CONTRACTOR

| ITEM NO. | QUANTITY | DESCRIPTION |
|---|---|---|
| 1001 | 2 EA | MAINTENANCE OF TRAFFIC |
| 2001 | 7 CY | CLASS 2 EXCAVATION |
| 2002 | 4 CY | TEST PIT EXCAVATION |
| 5002 | 40 LF | 5" HEAT APPLIED WHITE OR YELLOW PERMANENT PAVEMENT MARKINGS |
| 5003 | 105 LF | REMOVAL OF EXISTING PERMANENT PAVEMENT LINE MARKINGS |
| 5004 | 370 LF | 12 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES |
| 5005 | 125 LF | 24 INCH WHITE PREFORMED THERMOPLASTIC PAVEMENT MARKING LINES |
| 6001 | 320 LF | STANDARD TYPE A COMBINATION CURB AND GUTTER 12 INCH GUTTER PAN 8 INCH DEPTH |
| 6002 | 970 SF | 5 INCH CONCRETE SIDEWALK |
| 6003 | 95 SF | DETECTABLE WARNING SURFACE FOR CURB RAMPS |
| 8001 | 44 EA | 12 INCH LED SIGNAL HEAD SECTION |
| 8002 | 1 EA | 2-WIRE CENTRAL CONTROL UNIT |
| 8005 | 5 EA | ADJUST HANDHOLE TO GRADE WITH NEW FRAME AND COVER |
| 8008 | 4 EA | AUDIBLE/TACTILE PEDESTRIAN PUSHBUTTON STATION AND SIGNS |
| 8009 | 3 EA | BREAKAWAY PEDESTAL POLE (ANY SIZE) |
| 8012 | 1 EA | EMBEDDED METERED SERVICE PEDESTAL WITH BYPASS SWITCH |
| 8014 | 1 EA | INSTALL CONTROLLER AND CABINET BASE MOUNT (ANY SIZE) |
| 8016 | 4 EA | LED 16 INCH COUNTDOWN PEDESTRIAN SIGNAL HEAD |
| 8020 | 1 EA | MAST ARM POLE & 60' MAST ARM ANY 'T' DIMENSION |
| 8021 | 2 EA | MAST ARM POLE & 70' MAST ARM ANY 'T' DIMENSION |
| 8024 | 1 EA | REMOVE & DISPOSE OF EQUIPMENT (PER ASSIGNMENT) |
| 8029 | 3 EA | VIDEO DETECTION CAMERA AND CABLE ANY LENGTH |
| 8031 | 205 LF | 1-CONDUCTOR ELECTRICAL CABLE, NO. 2/0 AWG/THHN |
| 8032 | 1900 LF | 12-PAIR COMMUNICATION CABLE, SELF- SUPPORTING, JELLY-FILLED/UNDERGROUND |
| 8034 | 255 LF | DISCONNECT, PULL-BACK & REROUTE CABLES |

## CONTACTS

DISTRICT (DISTRICT 3 - MONTGOMERY)

MR. BRIAN YOUNG
DISTRICT ENGINEER
301-513-7311

MS. ANYESHA MOOKHERJEE
ASSISTANT DISTRICT ENGINEER - TRAFFIC
301-513-7409

MR. VICTOR GRAFTON
DISTRICT UTILITY ENGINEER
301-513-7350

MR. KEVIN NOWAK & MR. DUANE BERNARD
ASSISTANT DISTRICT ENGINEER - CONSTRUCTION
301-513-7336

MR. TOM FOUNTAIN
ASSISTANT DISTRICT ENGINEER - MAINTENANCE
301-513-7304

MONTGOMERY COUNTY DOT

MR. KAMAL HAMUD
TRAFFIC ENGINEER
240-777-8761

MR. GREG WHITENER & MR. STEVE YOUNG
SUPERVISOR, SIGNAL SHOP
301-279-1291

OFFICE OF TRAFFIC AND SAFETY

MS. CORREN JOHNSON
CHIEF, TRAFFIC OPERATIONS
410-787-7630

MS. SHANEKA OWENS
ASSISTANT DIVISION CHIEF, TRAFFIC OPERATIONS
410-787-7630

MR. EDWARD RODENHIZER
CHIEF, SIGNAL OPERATIONS SECTION
410-787-7650

MR. EUGENE BAILEY
CHIEF, SIGN OPERATIONS SECTION
410-787-7670

MR. MICHAEL STOCKER
SUPPLY OFFICER IV (SIGNAL SHOP WAREHOUSE)
410-787-7696

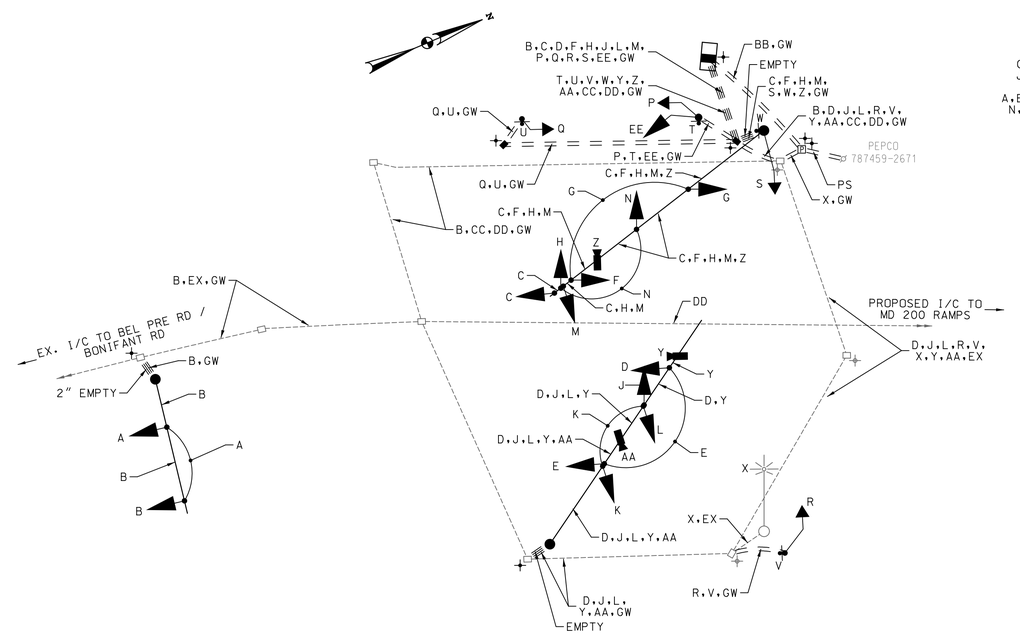
UTILITY CONTACT

PEPCO
PAUL WILSON
(301)548-4332
201 W GUDE DRIVE
ROCKVILLE, MD 20850-0850

## PHASE CHART

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Y | Y | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | R, Y, G | | | | |
| PHASE 1 AND 6 | DARK | DARK | ◄G→G | ◄G→G | ◄G→G | G | R | R | R | R | R | R | R | R | DW | DW | DW | DW |
| 1 CHANGE | DARK | DARK | ◄Y→G | ◄Y→G | ◄Y→G | G | R | R | R | R | R | R | R | R | DW | DW | DW | DW |
| PHASE 2 AND 6 | DARK | DARK | G | G | G | G | G | G | R | R | R | R | R | R | WK | WK | DW | DW |
| PED CLEAR /COUNTDOWN | DARK | DARK | G | G | G | G | G | G | R | R | R | R | R | R | FL/DW | FL/DW | DW | DW |
| 2 AND 6 CHANGE | DARK | DARK | Y | Y | Y | Y | Y | Y | R | R | R | R | R | R | DW | DW | DW | DW |
| PHASE 4 AND 8 | FL/Y | FL/Y | R | R | R | R | R | R | G | G | G | G | G | G | DW | DW | DW | DW |
| 4 AND 8 CHANGE | FL/Y | FL/Y | R | R | R | R | R | R | Y | Y | Y | Y | Y | Y | DW | DW | DW | DW |
| PHASE 4 AND 8 ALT. | FL/Y | FL/Y | R | R | R | R | R | R | G | G | G | G | G | G | DW | DW | WK | WK |
| PED CLEAR /COUNTDOWN | FL/Y | FL/Y | R | R | R | R | R | R | G | G | G | G | G | G | DW | DW | FL/DW | FL/DW |
| 4 AND 8 CHANGE | FL/Y | FL/Y | R | R | R | R | R | R | Y | Y | Y | Y | Y | Y | DW | DW | DW | DW |
| FLASHING OPERATION | DARK | DARK | FL/Y | FL/Y | FL/Y | FL/Y | FL/Y | FL/Y | FL/R | FL/R | FL/R | FL/R | FL/R | FL/R | DARK | DARK | DARK | DARK |

## WIRING DIAGRAM




WIRING KEY

C,D,F,H, J,L,M,EE - 7 CONDUCTOR ELECTRICAL CABLE (NO.14 AWG)

A,B,E,G,K, N,P,Q,R,S - 5 CONDUCTOR ELECTRICAL CABLE (NO.14 AWG)

T,U,V,W - 2 CONDUCTOR ELECTRICAL CABLE (NO.14 AWG)

X - 3 CONDUCTOR ELECTRICAL CABLE (NO.12 AWG TRAY)

Y,Z,AA - VIDEO DETECTION CABLE (3 CONDUCTOR NO. 18 AWG)

BB - 3-1 CONDUCTOR ELECTRICAL CABLE (NO. 8 AWG THHN/THWN)

CC - REROUTED EXISTING INTERCONNECT TO BEL PRE RD / BONIFANT RD (12-PAIR COMMUNICATION CABLE)

DD - PROPOSED INTERCONNECT TO MD 200 (12-PAIR COMMUNICATION CABLE)

GW - 1 CONDUCTOR STRANDED BARE COPPER GROUND WIRE (NO. 6 AWG)

PS - 3-1 CONDUCTOR ELECTRICAL CABLE (NO. 2/0 AWG THHN)

EX - EXISTING CABLE

+ - PROPOSED GROUND ROD

+ - EXISTING GROUND ROD

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY CONTRACTOR (CONT'D)

| ITEM NO. | QUANTITY | DESCRIPTION |
|---|---|---|
| 8035 | 250 LF | ELECTRICAL CABLE - 3-CONDUCTOR (NO. 12 AWG) TYPE T/C |
| 8039 | 75 LF | UP TO 4 INCH SCHEDULE 80 RIGID PVC CONDUIT-SLOTTED |
| 8040 | 240 LF | UP TO 4 INCH SCHEDULE 80 RIGID PVC CONDUIT-TRENCHED |
| 8041 | 340 LF | WOOD SIGN SUPPORTS UP TO 4' X 6' |
| 8042 | 314 SF | INSTALL OVERHEAD OR GROUND MOUNTED SIGN (INCLUDING ALL HARDWARE) |
| 8044 | 1105 LF | NO. 6 AWG STRANDED BARE COPPER GROUND WIRE |
| 8047 | 205 LF | ELECTRICAL CABLE 1-CONDUCTOR NO. 8 AWG-THHN/THWN |
| 8048 | 2 EA | FURNISH AND INSTALL ELECTRICAL HANDHOLE |
| 8055 | 530 LF | ELECTRICAL CABLE - 2 CONDUCTOR (NO. 14 AWG) |
| 8057 | 1600 LF | ELECTRICAL CABLE - 5 CONDUCTOR (NO. 14 AWG) |
| 8058 | 1800 LF | ELECTRICAL CABLE - 7 CONDUCTOR (NO. 14 AWG) |
| 8066 | 1 EA | CONCRETE TESTING |
| 8067 | 1 EA | NEG - APPROVED - FURNISH & INSTALL LED LUMINAIRES & LAMPS |
| NEG | 7 SY | TURFGRASS SOD ESTABLISHMENT |
| NEG | 45 LF | WOOD SIGN SUPPORTS 6' X 6' |

C. MONTGOMERY COUNTY FORCES SHALL REMOVE THE CONTROLLER AND ALL AUXILIARY EQUIPMENT FROM THE CONTROLLER CABINET. THE CABINET AND ALL OTHER MATERIALS TO BE REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE SIGNAL CONTRACTOR UPON COMPLETION OF THE NEW SIGNAL.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STATE OF MARYLAND
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MD 182 AT LONGMEAD CROSSING DR /NORVALE RD
TRAFFIC SIGNAL INSTALLATION
ASPEN HILL, MD

# GENERAL INFORMATION SHEET

SCALE N.T.S. DATE JUNE 20, 2014 CONTRACT NO. XY1285185

DESIGNED BY MF
DRAWN BY MF
CHECKED BY KMP
F.A.P. NO. AC-STPG-000A(832)E
COUNTY MONTGOMERY
LOGMILE 15018202.59
TIMS NO. L915
TOD NO.

TS NO.3630A-GI | DRAWING SG-04 OF 04 | SHEET NO. 04 OF 05


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BY: Fukui -

DRILL HOLES

BORDER REV: DATE: June 1, 2004

## EXISTING SIGNS

22

19 — W1-2L 36" x 36"

15 — W1-2R 36" x 36"

18 — NEW — R Y G — TEMPORARY SIGN W3-3 NEW 48"x 48"

EXISTING RELOCATED SIGN — Wintergate Drive

## PROPOSED SIGNS

11A,17B — Wintergate DR (2800) — D3-2 VARIABLE X 16"

11B,17A — Wintergate DR (2800) — D3-2 VARIABLE X 16"

23 — Norbeck RD — D3-2 VARIABLE X 16"

16 — 4PM-7PM MONDAY - FRIDAY EXCEPT BUSES — R3-3(5) MOD. 36"x 24"

12 — ONLY — R3-5R 30" x 36"

14 — W3-3 36"x 36" — Wintergate Drive — EXISTING RELOCATED SIGN

20 — EAST — MARYLAND 28 — M3-2 24"x 12" — M1-5 24"x 24" — M6-1 21"x 15" — ASSOCIATED SHIELD ASSEMBLY 24" x 51"

21 — WEST — MARYLAND 28 — M3-4 30"x 15" — M1-5 36"x 36" — M6-1 30"x 24" — ASSOCIATED SHIELD ASSEMBLY 36" x 75"

13 — SIGNAL AHEAD — PREPARE TO STOP WHEN FLASHING — W3-3(2) 120"x60"

## PROPOSED SIGNALS

1-3,8-10: R, Y, G — 12"

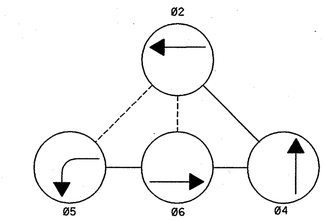
4,5: Y — 12"

6,7: R, Y-Y, G-G, Y — 12"

## PROPOSED CAMERAS

- VIDEO DETECTION CAMERA (a-c)

## NEMA PHASING



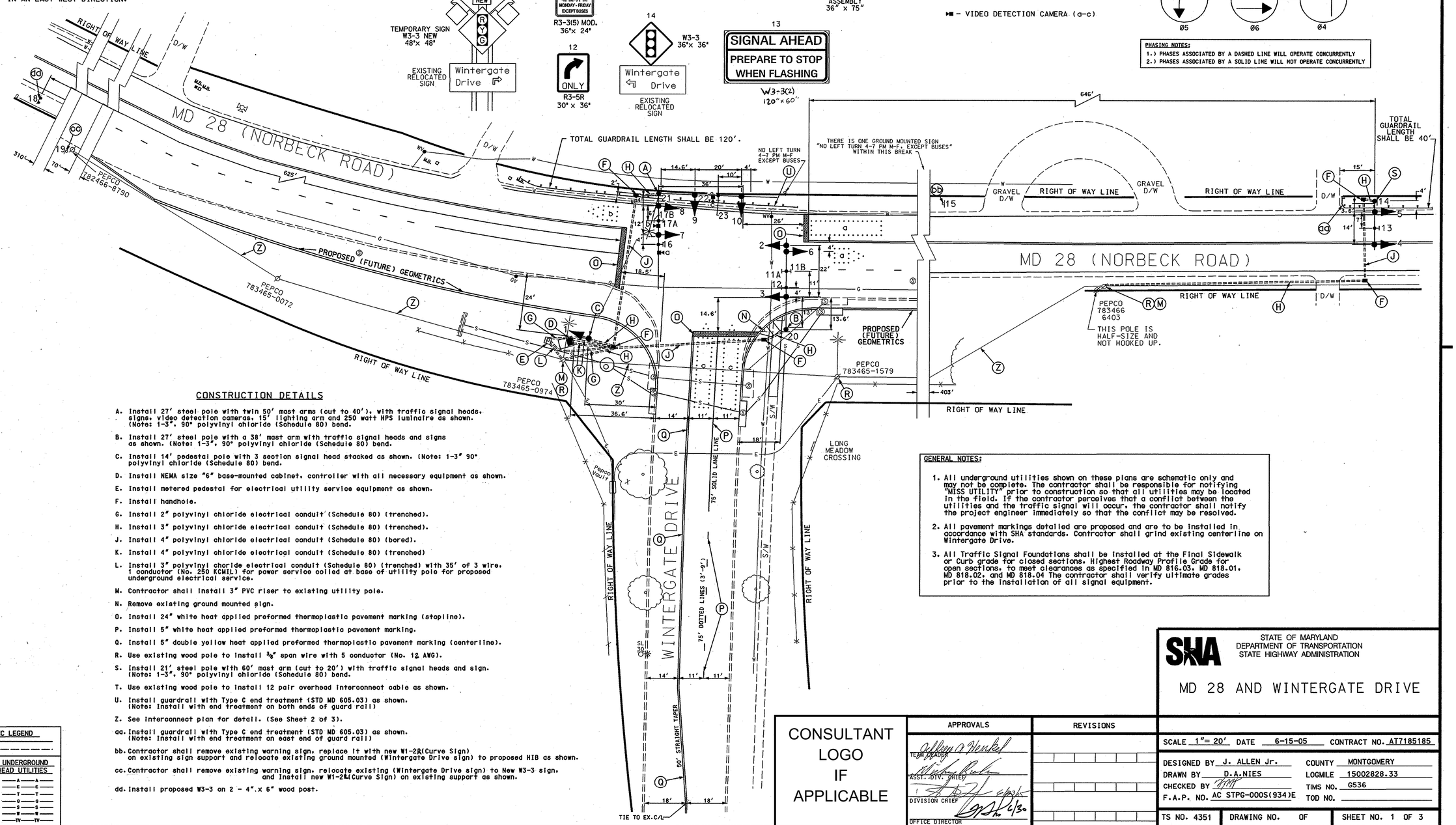

FLASHING OPERATION

**PHASING NOTES:**

1.) PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY

2.) PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY

NOTE: MD 28 IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION.




## CONSTRUCTION DETAILS

A. Install 27' steel pole with twin 50' mast arms (cut to 40'), with traffic signal heads, signs, video detection cameras, 15' lighting arm and 250 watt HPS luminaire as shown. (Note: 1-3", 90° polyvinyl chloride (Schedule 80) bend.

B. Install 27' steel pole with a 38' mast arm with traffic signal heads and signs as shown. (Note: 1-3", 90° polyvinyl chloride (Schedule 80) bend.

C. Install 14' pedestal pole with 3 section signal head stacked as shown. (Note: 1-3" 90° polyvinyl chloride (Schedule 80) bend.

D. Install NEMA size "6" base-mounted cabinet, controller with all necessary equipment as shown.

E. Install metered pedestal for electrical utility service equipment as shown.

F. Install handhole.

G. Install 2" polyvinyl chloride electrical conduit (Schedule 80) (trenched).

H. Install 3" polyvinyl chloride electrical conduit (Schedule 80) (trenched).

J. Install 4" polyvinyl chloride electrical conduit (Schedule 80) (bored).

K. Install 4" polyvinyl chloride electrical conduit (Schedule 80) (trenched)

L. Install 3" polyvinyl chloride electrical conduit (Schedule 80) (trenched) with 35' of 3 wire, 1 conductor (No. 250 KCMIL) for power service coiled at base of utility pole for proposed underground electrical service.

M. Contractor shall install 3" PVC riser to existing utility pole.

N. Remove existing ground mounted sign.

O. Install 24" white heat applied preformed thermoplastic pavement marking (stopline).

P. Install 5" white heat applied preformed thermoplastic pavement marking.

Q. Install 5" double yellow heat applied preformed thermoplastic pavement marking (centerline).

R. Use existing wood pole to install 3/8" span wire with 5 conductor (No. 12 AWG).

S. Install 21' steel pole with 60' mast arm (cut to 20') with traffic signal heads and sign. (Note: 1-3", 90° polyvinyl chloride (Schedule 80) bend.

T. Use existing wood pole to install 12 pair overhead interconnect cable as shown.

U. Install guardrail with Type C end treatment (STD MD 605.03) as shown. (Note: Install with end treatment on both ends of guard rail)

Z. See interconnect plan for detail. (See Sheet 2 of 3).

aa. Install guardrail with Type C end treatment (STD MD 605.03) as shown. (Note: Install with end treatment on east end of guard rail)

bb. Contractor shall remove existing warning sign, replace it with new W1-2R(Curve Sign) on existing sign support and relocate existing ground mounted (Wintergate Drive sign) to proposed HIB as shown.

cc. Contractor shall remove existing warning sign, relocate existing (Wintergate Drive sign) to New W3-3 sign, and install new W1-2L(Curve Sign) on existing support as shown.

dd. Install proposed W3-3 on 2 - 4".x 6" wood post.

**GENERAL NOTES:**

1. All underground utilities shown on these plans are schematic only and may not be complete. The contractor shall be responsible for notifying "MISS UTILITY" prior to construction so that all utilities may be located in the field. If the contractor perceives that a conflict between the utilities and the traffic signal will occur, the contractor shall notify the project engineer immediately so that the conflict may be resolved.
2. All pavement markings detailed are proposed and are to be installed in accordance with SHA standards. Contractor shall grind existing centerline on Wintergate Drive.
3. All Traffic Signal Foundations shall be installed at the Final Sidewalk or Curb grade for closed sections. Highest Roadway Profile Grade for open sections, to meet clearances as specified in MD 816.03, MD 818.01, MD 818.02, and MD 818.04 The contractor shall verify ultimate grades prior to the installation of all signal equipment.

**GEOMETRIC LEGEND**

PROPOSED
EXISTING

**LEGEND OF UNDERGROUND AND OVERHEAD UTILITIES**

AERIAL CABLE — A —
ELECTRIC — E —
TELEPHONE — T —
GAS — G —
SEWER — S —
WATER — W —
CABLE TV — TV —

CONSULTANT LOGO IF APPLICABLE

APPROVALS

TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF 6/30
OFFICE DIRECTOR

REVISIONS

PLOTTED: \$DATETIME\$
FILE: \$FILE\$

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

# MD 28 AND WINTERGATE DRIVE

SCALE 1"= 20' DATE 6-15-05 CONTRACT NO. AT7185185

DESIGNED BY J. ALLEN Jr. COUNTY MONTGOMERY
DRAWN BY D.A.NIES LOGMILE 15002828.33
CHECKED BY TIMS NO. G536
F.A.P. NO. AC STPG-000S(934)E TOD NO.

TS NO. 4351 | DRAWING NO. OF | SHEET NO. 1 OF 3

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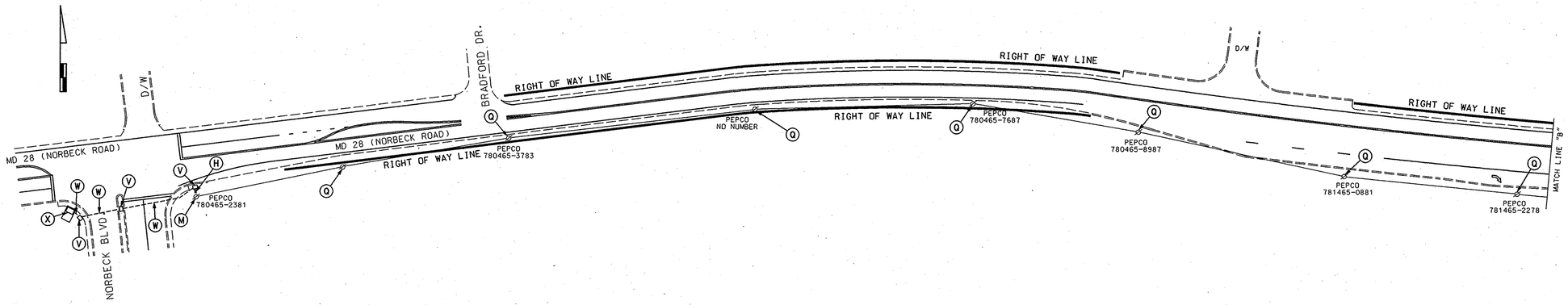
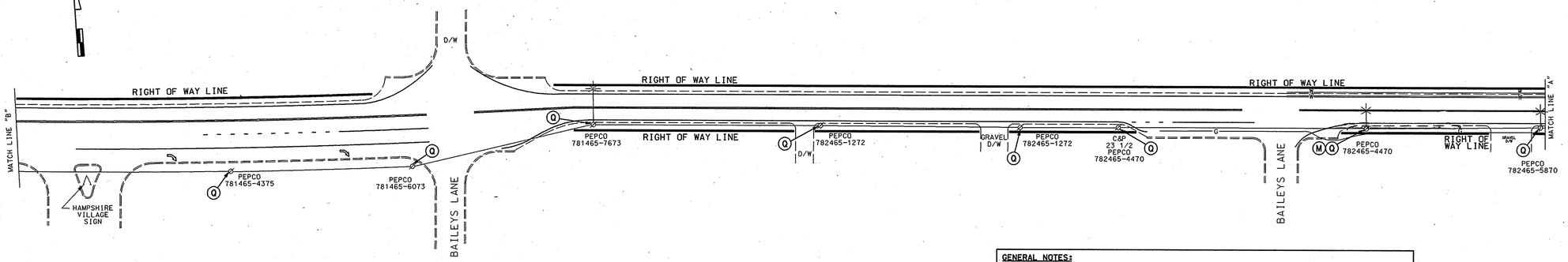
DRILL HOLES

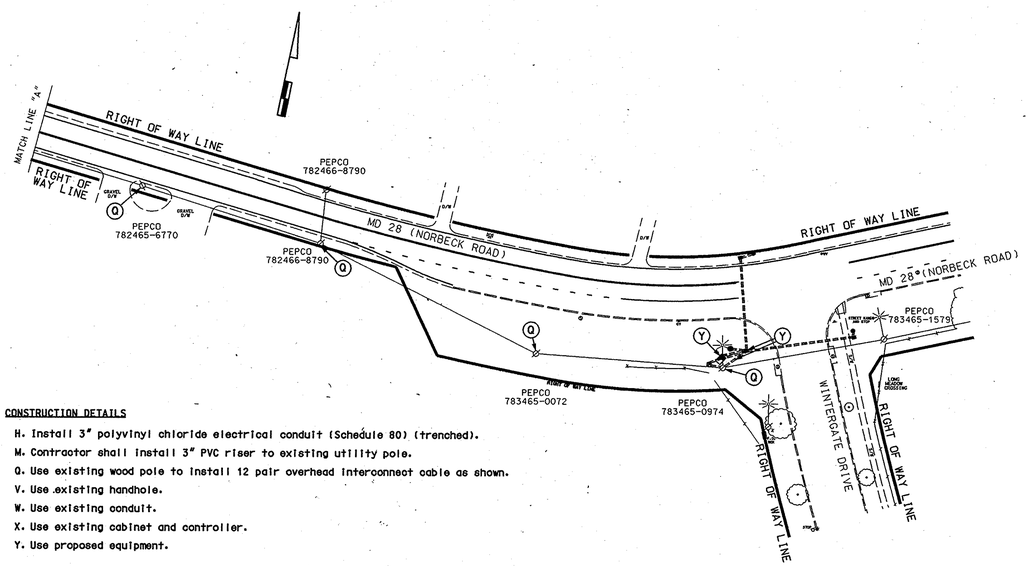
BORDER REV: DATE: June 1, 2004




DRILL HOLES




DRILL HOLES




**GENERAL NOTES:**

1. All underground utilities shown on these plans are schematic only and may not be complete. The contractor shall be responsible for notifying "MISS UTILITY" prior to construction so that all utilities may be located in the field. If the contractor perceives that a conflict between the utilities and the traffic signal will occur, the contractor shall notify the project engineer immediately so that the conflict may be resolved.
2. All pavement markings detailed are proposed and are to be installed in accordance with SHA standards.
3. The contractor shall ground and bond all PEPCO poles that are affected.
4. The contractor shall contract Mr. Bob Thorne at (301) 651-6025 at least 72 hour prior to attaching to PEPCO poles.

**CONSTRUCTION DETAILS**

H. Install 3" polyvinyl chloride electrical conduit (Schedule 80) (trenched).
M. Contractor shall install 3" PVC riser to existing utility pole.
Q. Use existing wood pole to install 12 pair overhead interconnect cable as shown.
V. Use existing handhole.
W. Use existing conduit.
X. Use existing cabinet and controller.
Y. Use proposed equipment.

**GEOMETRIC LEGEND**

PROPOSED
EXISTING

**LEGEND OF UNDERGROUND AND OVERHEAD UTILITIES**

| | |
|---|---|
| AERIAL CABLE | A |
| ELECTRIC | E |
| TELEPHONE | T |
| GAS | G |
| SEWER | S |
| WATER | W |
| CABLE TV | TV |

CONSULTANT LOGO IF APPLICABLE

| APPROVALS | REVISIONS |
|---|---|
| TEAM LEADER | |
| ASST. DIV. CHIEF | |
| DIVISION CHIEF | |
| OFFICE DIRECTOR | |

PLOTTED: $DATETIME$
FILE: $FILE$

# INTERCONNECT PLAN

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

## MD 28 AND WINTERGATE DRIVE

SCALE 1"= 50' DATE 6-15-05 CONTRACT NO. AT7185185

DESIGNED BY J. ALLEN Jr.
DRAWN BY D.A.NIES
CHECKED BY
F.A.P. NO.

COUNTY MONTGOMERY
LOGMILE 15002828.33
TIMS NO. G536
TOD NO.

TS NO. 4351 I/C | DRAWING NO. | OF | SHEET NO. 2 OF 3

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DRILL HOLES

BORDER REV DATE: June 1, 2004

DRILL HOLES

DRILL HOLES

## PROJECT DESCRIPTION

I. GENERAL

This project involves the installation of a new Traffic Control Signal with street lighting and interconnect at the intersection of MD 28 (Norbeck Rd) and Wintergate Drive in Montgomery County. Hazard Identification Beacons shall be installed on the Westbound approache of Norbeck Road in advance of this intersection. Video detection shall be used at this intersection. MD 28 (Norbeck Rd) is assumed to run an east-west direction.

II. INTERSECTION OPERATION

1. The intersection is to operate in a NEMA four-phase, semi-actuated mode, with the MD 28 (Norbeck Rd) approaches running concurrently. An Exclusive/Permissive left turn phase shall be provided for the westbound approach of MD 28 (Norbeck Rd). Farside sampling stations shall be provided on both legs of MD 28 (Norbeck Rd) at this intersection. The Wintergate Drive approach shall run in its own phase.

2. A full-traffic-actuated, eight-phase controller with video interface and all necessary equipment housed in a NEMA size "6" base-mounted cabinet shall be installed at this intersection.

III. SPECIAL NOTES

1. The Contractor shall be responsible for terminating all signal cables, excluding interconnect, to the appropriate terminals and shall properly label each cable.

2. Disconnecting and splicing of interconnect cable shall be performed by Montgomery County Forces. The contractor shall run the interconnect cable into the base of each cabinet and properly tag the cable. Contact Dr. Wilhelm Derminassian (240) 777-8795 seventy-two hours in advance of intended work.

3. All underground and overhead utilities shown on these plans are schematic only and may not be complete. The Contractor shall be responsible for notifying Miss Utility prior to construction so that all utilities may be located in the field. If the Contractor perceives that a conflict between the utilities and the traffic signal will occur, the Contractor shall notify the Project Engineer immediately so that the conflict may be resolved.

The contact persons for District #3 (Montgomery County) are as follows:

Mr. Lee Starkloff
Assistant District Engineer - Traffic
Phone: (301) 513-7318

Mr. Wayne Mowdy
Assistant District Engineer - Maintenance
Phone: (301) 513-7304

Mr. Augie Rebish
District Engineer - Utility
Phone: (301) 513-7350

Mr. Richard L. Daff, Sr.
Chief, Traffic Operations Division
Phone: (410) 787-7630

Mr. Ed Rodenhizer
Signal Shop
410-787-7652

Mr. Sonny Bailey
Sign Shop
410-787-7670

Dr. Wilhelm Derminassian
Montgomery County
240-777-8795

The power company representative is:
Mr. Steve Custer
PEPCO Customer Design
201 W Guide Dr.,
Rockville, MD 20850
Phone: 301 548-4333

## EQUIPMENT LIST

A. EQUIPMENT TO BE SUPPLIED BY S.H.A. AND INSTALLED BY THE CONTRACTOR.

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 9042 | Controller ASC II with telemetry | 1 EA |
| 9044 | Controller cabinet, size "6" | 1 EA |
| 9086 | Video detection interface equipment: 1-4 cameras (To be installed by signal shop). | 1 EA |
| 9570 | Sheet aluminum signs to consist of: (ground mount) | 34 SF |
| | W1-2R "CURVE AHEAD (Symbolic)" sign, (36" x 36") with hardware. | 1 EA |
| | W1-2L "CURVE AHEAD (Symbolic)" sign, (36" x 36") with hardware. | 1 EA |
| | W3-3 NEW "SIGNAL AHEAD" sign, (48" x 48") with hardware. | 1 EA |
| 9571 | Sheet aluminum signs to consist of: (mast arm or pole mount) | 132 SF |
| | D3-2 "Wintergate Dr 2800>" sign, (variable x 16") mast arm. | 1 EA |
| | D3-2 "Wintergate Dr <2800" sign, (variable x 16") mast arm. | 1 EA |
| | D3-2 "Norbeck RD sign, (Variable x 16") mast arm | 1 EA |
| | R3-3(5) mod"NO LEFT TURN (Symbolic) / 4PM-7PM MONDAY-FRIDAY EXCEPT BUSES" sign (36"x24") mast arm. | 1 EA |
| | R3-5R "RIGHT TURN ONLY" sign, (30" x 36") mast arm. | 1 EA |
| | W3-3 "SIGNAL AHEAD" sign, (36" x 36") pole mount. | 1 EA |
| | W3-3(2) "SIGNAL AHEAD/PREPARE TO STOP WHEN FLASHING" sign, (120" X 60") mast arm. | 1 EA |
| | GUIDE SHIELD ASSEMBLY (36"x75") pole mounted. M3-4 "WEST"(30"X15") M1-5 "MD 28"(36"X36") M6-1 "left arrow "(30"X24") | 1 EA |
| | GUIDE SHIELD ASSEMBLY (24"x51") pole mounted. M3-2 "EAST"(24"X12") M1-5 "MD 28"(24"X24") M6-1 "right arrow "(21"X15") | 1 EA |

## EQUIPMENT LIST (CONT.)

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 1001 | Maintenance of traffic per assignment. | 3 EA |
| 2002 | Test Pit Excavation | 6 C.Y. |
| 5001 | 5" white heat applied permanent preformed thermoplastic pavement marking. | 105 L.F. |
| 5002 | 5" yellow heat applied permanent preformed thermoplastic pavement marking. | 410 L.F. |
| 5003 | Removal of existing permanent pavement line markings | 400 L.F. |
| 5006 | 24" white heat applied permanent preformed thermoplastic pavement marking. | 65 L.F. |
| 6006 | Traffic barrier w Beam using 6' Post | 160 L.F. |
| 6008 | Type C traffic barrier end treatment. | 3 EA |
| 8001 | Furnish and install concrete for signal foundation. | 21 C.Y. |
| 8014 | Pre-manufactured camera to controller (200' length) cable | 3 EA |
| 8027 | Furnish and install breakaway pedestal pole (14'). | 1 EA |
| 8028 | Relocate sign. | 36 SF |
| 8034 | 3" electrical conduit riser (PVC). | 15 LF |
| 8035 | Furnish and install electrical cable - 5 conductor (No. 12 AWG) | 1150 LF |
| 8037 | Furnish and install electrical cable - 1 conductor (No. 250 KCMIL) | 140 L.F. |
| 8043 | Wood sign supports 4"x6". | 40 L.F. |
| 8044 | Furnish and install No. 6 AWG stranded bare copper ground wire. | 285 L.F. |
| 8047 | Weatherhead, 3 inch | 1 EA |
| 8050 | Furnish and install 4" schedule 80 rigid polyvinyl chloride - bored. | 170 L.F. |
| 8051 | Furnish and install 2" schedule 80 rigid polyvinyl chloride - trenched. | 45 L.F. |
| 8052 | Furnish and install 3" schedule 80 rigid polyvinyl chloride - trenched. | 185 L.F. |
| 8053 | Furnish and install 4" schedule 80 rigid polyvinyl chloride - trenched. | 60 L.F. |
| 8058 | Metered pedestal service. | 1 EA |
| 8061 | Furnish and install electrical cable 1-conductor No. 4 AWG THHN/THWN. | 35 L.F. |
| 8067 | Furnish and install electrical handhole. | 5 EA |
| 8069 | Install ground mounted sign. | 34 SF |
| 8070 | Install overhead sign. | 132 SF |
| 8071 | Video detector camera. | 3 EA |
| 8075 | 27' steel pole and twin 50' (cut to 40')/50' mast arms. | 1 EA |
| 8076 | Furnish and install 27' mast arm pole and 38' mast arm. | 1 EA |
| 8078 | Furnish and install 27' mast arm pole and 60' (cut to 20') mast arm. | 1 EA |
| 8082 | Furnish and install 12-pair communication cable, self-supporting (overhead). | 3660 L.F. |
| 8084 | Furnish and install 250 watt HPS Luminaire with photocell. | 1 EA |
| 8091 | Furnish and install ground rod -3/4" x 10'. | 8 EA |
| 8093 | Furnish and install 12" vehicular traffic signal head section | 30 EA |
| 8096 | Cut, clean, galvanize and cap traffic signal structure. | 2 EA |
| 8101 | Furnish and install electrical cable -5 conductor (No. 14 AWG). | 80 L.F. |
| 8102 | Furnish and install electrical cable -7 conductor (No. 14 AWG). | 515 L.F. |
| 8103 | Furnish and install tray cable - 2 conductor (No. 12 AWG). | 130 L.F. |
| 8107 | Furnish and install 15' lighting arm for traffic signal structure. | 1 EA |

## EQUIPMENT LIST (CONT.)

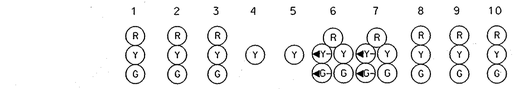
B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 8110 | Furnish and install steel span wire, 3/8" diameter. | 750 L.F. |
| 8112 | Install controller and cabinet base mount. | 1 EA |

C. EQUIPMENT TO BE REMOVED

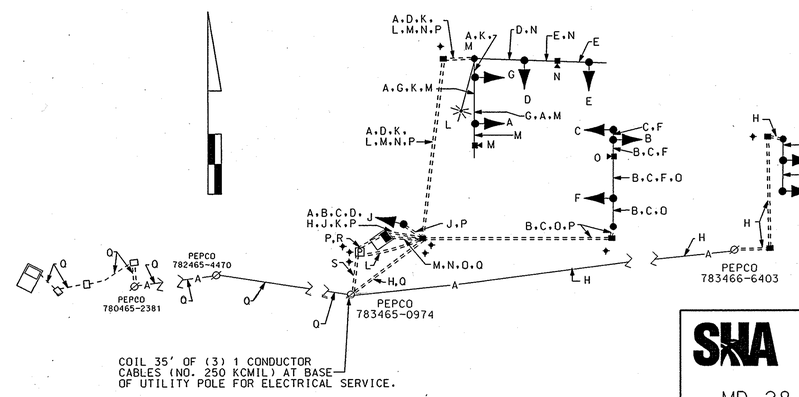
There is no signal equipment to be removed.

## PHASE CHART




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| PHASE 2 & 6 | G | G | G | DARK | DARK | G | G | G | R | R |
| 2 & 6 CHANGE | Y | Y | Y | DARK | DARK | G | G | G | R | R |
| PHASE 2 & 5 | R | R | R | DARK | DARK | ◄G-/G | ◄G-/G | G | R | R |
| WB RED WARNING | R | R | R | FL/Y | FL/Y | ◄G-/G | ◄G-/G | G | R | R |
| 2 & 5 CHANGE | R | R | R | FL/Y | FL/Y | ◄Y-/Y | ◄Y-/Y | Y | R | R |
| PHASE 4 | R | R | R | FL/Y | FL/Y | R | R | R | G | G |
| 4 CHANGE | R | R | R | FL/Y | FL/Y | R | R | R | Y | Y |
| FLASHING OPERATION | FL/Y | FL/Y | FL/Y | DARK | DARK | FL/Y | FL/Y | FL/Y | FL/R | FL/R |

## WIRING DIAGRAM




WIRING KEY

- A, B, C, D — 7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )
- E, F, G, J — 5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )
- H - 5-CONDUCTOR ELECTRICAL CABLE (NO. 12 A.W.G )
- K - 3-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )
- L - 2-CONDUCTOR TRAY CABLE (NO. 12 A.W.G )
- M, N, O — PRE MANUFACTURED CAMERA TO CONTROLLER CABLE (200')
- P - STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
- Q - 12-PAIR VOICE GRADE INTERCONNECT CABLE (SELF SUPPORTING)
- R - 2-1 CONDUCTOR ELECTRICAL CABLE (NO. 4 A.W.G.)
- S - 3 - 1 CONDUCTOR ELECTRICAL CABLE (NO. 250 KCMIL)
- ✦ - GROUND ROD

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

MD 28 AND WINTERGATE DR.

CONSULTANT LOGO IF APPLICABLE

SCALE NONE DATE 6/15/05 CONTRACT NO. AT7185185

DESIGNED BY J.A. COUNTY MONTGOMERY
DRAWN BY R.C. LOGMILE 15002828.33
CHECKED BY TIMS NO. G536
F.A.P. NO. AC STPG-000S(934)E TOD NO.

TS NO. 4351GI | DRAWING NO. OF | SHEET NO. 3 OF 3

PLOTTED: $DATETIME$
FILE: $FILE$

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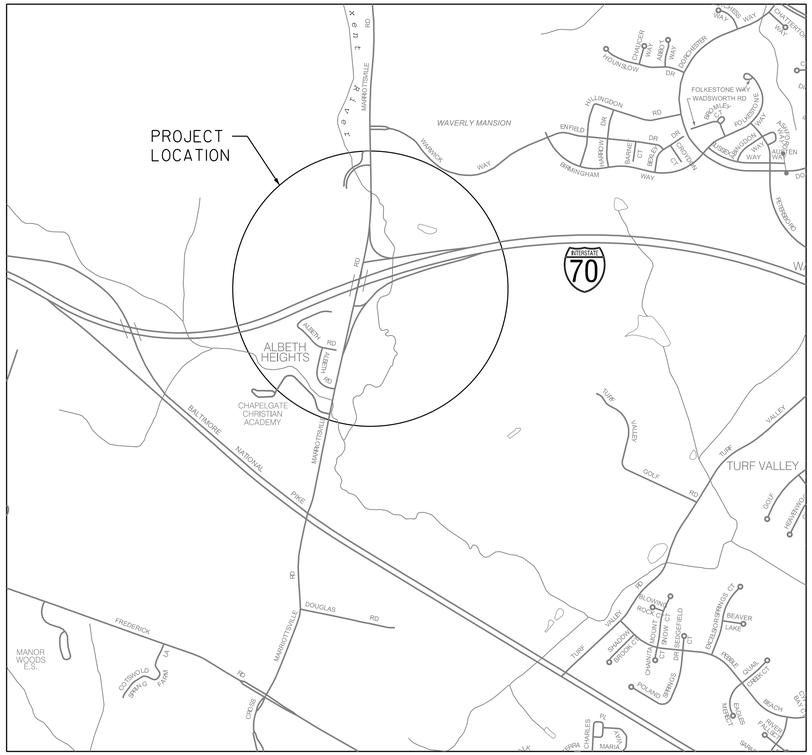
## PROJECT DESCRIPTION

THIS PROJECT INVOLVES INSTALLING INTERCHANGE LIGHTING AT THE I-70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE ROAD INTERCHANGE. THIS PROJECT IS IN HOWARD COUNTY.




PROJECT LOCATION
N.T.S.

GENERAL NOTES:

1. ALL UTILITY LINES ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND ELECTRICAL LINES AND UTILITIES PRIOR TO CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT THERE IS A CONFLICT BETWEEN THE PROPOSED LIGHTING EQUIPMENT AND THE EXISTING UNDERGROUND ELECTRICAL LINES OR UTILITIES THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

2. THE HORIZONTAL OFFSET OF THE PROPOSED LIGHT POLE TO THE NOTED OBJECT MAY BE ADJUSTED SO THAT THE LUMINAIRE IS MOUNTED BETWEEN 1 FOOT WITHIN AND 2 FEET OUTSIDE OF THE EDGE OF TRAVEL LANE. THE MINIMUM POLE OFFSET FROM THE CENTERLINE OF THE LIGHT POLE TO THE EDGE OF SHOULDER, FACE OF W-BEAM OR FACE OF CURB SHALL NOT BE LESS THAN 6 FEET, UNLESS OTHERWISE SHOWN ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

3. THE CENTER OF THE CABLE TRENCH SHALL BE 3 FEET BEHIND THE CENTER OF THE LIGHTING STRUCTURES UNLESS OTHERWISE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

4. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN CASE OF DAMAGE TO AN EXISTING FACILITY.

5. THE CONTRACTOR SHALL REPLACE ALL CONCRETE GUTTERS, FLUMES, UNDERDRAINS AND OTHER CONCRETE STRUCTURES DAMAGED OR REMOVED DURING THE INSTALLATION OF FOUNDATIONS AND CABLE. REPLACEMENT OF CONCRETE STRUCTURES WILL NOT BE MEASURED, BUT THEIR REPLACEMENT WILL BE INCIDENTAL TO OTHER PERTINENT ITEMS IN THE CONTRACT.

6. LIGHTING STRUCTURES SHALL NOT BE PLACED ON THE ROADWAY SIDE OF EXISTING OR PROPOSED TRAFFIC BARRIER W-BEAM OR CONCRETE TRAFFIC BARRIER WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER.

7. ALL CONNECTIONS BETWEEN GROUND RODS AND GROUND CABLE SHALL BE BY EXOTHERMIC WELD.

8. CONDUCTORS SHALL NOT BE SPLICED EXCEPT IN STRUCTURES, MANHOLES AND PULL OR JUNCTION BOXES. ALL MANHOLES, CONDUITS UNDER PAVEMENT, LIGHTING STRUCTURES, ETC. SHALL BE STAKED OUT AND EVERY LOCATION APPROVED BY THE ENGINEER BEFORE ANY WORK IS DONE.

9. ALL DRIVEN CONDUIT SHALL BE PLACED UNDER PAVEMENT BY DIRECTIONAL BORING OR JACKING.

10. ALL LIGHTING STRUCTURES NOT PROTECTED BY TRAFFIC BARRIER SHALL BE ON BREAKAWAY BASES.

11. ALL TRENCHING MUST BE BACKFILLED AND STABILIZED ON THE SAME WORKING DAY ON WHICH IT WAS OPENED. AREAS WHICH ARE NOT RESEEDED, MULCHED OR SODDED MUST BE COVERED TO PREVENT EROSION.

12. ALL SOIL REMOVED FOR HANDBOXES, FOUNDATIONS, ETC. MUST BE COVERED TO PREVENT EROSION. SOIL NOT USED FOR BACKFILL MUST BE DISPOSED OF THE ENGINEER'S SATISFACTION ON THE SAME WORKING DAY THE BACKFILL IS COMPLETED.

## EQUIPMENT LISTS "A, B & C"

A. EQUIPMENT TO BE FURNISHED BY ADMINISTRATION AND INSTALLED BY THE CONTRACTOR

NONE

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR

| ITEM NO. | DESCRIPTION | UNIT | QUANTITY |
|---|---|---|---|
| 1002 | MAINTENANCE OF TRAFFIC | LUMP | 1 |
| 1003 | PROTECTION VEHICLE | UD | 45 |
| 2001 | TEST PIT EXCAVATION | CY | 21 |
| 8004 | LIGHTING CONTROL CABINET, BASE MOUNT (12 0/240V,1 PHASE, 3 WIRE) | EA | 2 |
| 8007 | UP TO 200 AMP BASE MOUNTED METERED SERVICE PEDESTAL | EA | 2 |
| 8012 | CONCRETE FOUNDATION FOR TRAFFIC CONTROL DEVICES | CY | 64 |
| 8013 | THIRD PARTY CONCRETE TESTING | EA | 2 |
| 8017 | NO. 4 AWG STRANDED BARE COPPER GROUND WIRE | LF | 6800 |
| 8019 | ELECTRICAL CABLE 1-CONDUCTOR 250 KCMIL, CU, TYPE USE, 600V | LF | 200 |
| 8022 | UP TO 4 INCH SCHEDULE 80 RIGID PVC CONDUIT-BORED | LF | 620 |
| 8023 | UP TO 4 INCH SCHEDULE 80 RIGID PVC CONDUIT-TRENCHED | LF | 220 |
| 8026 | LED ROADWAY LUMINAIRE | EA | 29 |
| 8031 | 40 FOOT LIGHTING STRUCTURE WITH UP TO A 20 FOOT BRACKET ARM | EA | 29 |
| 8036 | FURNISH AND INSTALL ELECTRICAL MANHOLE | EA | 14 |
| 8039 | BREAKAWAY BASE SUPPORT SYSTEM FOR LIGHTING STRUCTURE | EA | 15 |
| 8044 | DUCT CABLE - 2 CONDUCTOR, NO 4 AWG, 600 V | LF | 10,300 |
| 8047 | CABLE - 1 CONDUCTOR, NO 4 AWG, TYPE USE, 600V | LF | 2,600 |
| 8049 | CABLE - 1 CONDUCTOR, NO 10 AWG, TYPE THWN/THHN, 600V | LF | 5,800 |
| 8052 | CONNECTOR KIT - TYPE I | EA | 36 |
| 8053 | CONNECTOR KIT - TYPE II | EA | 28 |
| 8054 | CONNECTOR KIT - TYPE III | EA | 30 |
| 8055 | CONNECTOR KIT - TYPE IV | EA | 20 |
| 8056 | GROUND ROD - 3/4 INCH DIAMETER X 10 FOOT LENGTH | EA | 51 |
| 8061 | REMOVE AND DISPOSE OF EXISTING MATERIAL AND EQUIPMENT (PER ASSIGNMENT) | EA | 1 |

## INDEX OF SHEETS


| | | |
|---|---|---|
| 1 | AT-01 | PROJECT INFORMATION AND QUANTITIES |
| 2 | LT-01 | SHEET LAYOUT |
| 3 | LT-02 | LIGHTING PLAN |
| 4 | LT-03 | LIGHTING PLAN |
| 5 | LT-04 | LIGHTING PLAN |
| 6 | LT-05 | LIGHTING PLAN |
| 7 | LT-06 | PANEL AND POLE SCHEDULE |


GENERAL NOTES (CONTINUED):

13. ALL DIMENSIONS SHOWN ARE MEASURED ALONG EDGE OF ROAD OR FACE OF CURB. OFFSETS ARE MEASURED FROM OBJECT TO CENTERLINE OF PROPOSED LIGHT POLE AS NOTED IN THE LIGHTING TAG AND POLE SCHEDULE.

14. FOR LOCATION OF CONTROL CABINETS WITH PANEL SEE SHEETS LT-02 AND LT-05.

15. CONTRACTOR SHALL NOTIFY MR. DAVE CLUTTER OF DISTRICT 7 MAINTENANCE (301-624-8113) 2 WEEKS PRIOR TO REMOVAL OF ANY EQUIPMENT. MR. CLUTTER WILL MARK EXISTING LIGHT POLES TO BE SALVAGED BY DISTRICT 7 FORCES.

16. AS-BUILT LIGHTING INVENTORY DATA SHALL BE PROVIDED TO THE ADMINISTRATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AT THE COMPLETION OF THE BURN TEST. LIGHTING SYSTEMS WILL NOT BE ACCEPTED FOR MAINTENANCE UNTIL AS-BUILT LIGHTING INVENTORY DATA HAS BEEN RECEIVED BY THE ADMINISTRATION.

17. FOUNDATIONS WITH BREAKAWAY BASES SHALL NOT PROTRUDE MORE THAN 4" ABOVE GRADE.

18. THE THIRD WIRE IN THE LIGHT POLES SHALL BE GREEN IN COLOR FOR THE GROUND WIRE.

19. EXISTING LEASE LIGHTS SHOWN ARE FOR REFERENCE PURPOSES ONLY. ALL PROPOSED LEASE LIGHTS AND REVISIONS TO EXISTING LEASE LIGHT WILL BE PERFORMED BY BG&E FORCES ONLY.

20. ALL TRENCHED CONDUIT SHALL BE 4 INCH CONDUIT UNLESS OTHERWISE NOTED ON THE PLANS.

21. INSTALL LIGHTING TAGS PER MD 808.03.

22. ALL MANHOLES SHALL BE INSTALLED WITH A 6 INCH UNDERDRAIN TO THE NEAREST OUTLET AS PER MD 811.04.


PARSONS BRINCKERHOFF
100 S. Charles Street
Tower 1, 10th Floor
Baltimore, MD 21201
(Ph) 410-787-5050
(Fax) 410-727-4608
http://www.pbworld.com


| APPROVALS | REVISIONS |
|---|---|
| TEAM LEADER | |
| ASST. DIV. CHIEF | |
| DIVISION CHIEF | |
| OFFICE DIRECTOR | |

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

I-70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD

INTERCHANGE LIGHTING

MARRIOTTSVILLE, MD

# PROJECT INFORMATION AND QUANTITIES

SCALE NONE DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

DESIGNED BY JEK COUNTY HOWARD
DRAWN BY JEK LOGMILE 13007013.59
CHECKED BY LFW TIMS NO. M585
F.A.P. NO. TOD NO.

DRAWING NO. AT-01 OF 01 SHEET NO. 01 OF 07

PLOTTED: Monday, March 09, 2015 AT 04:12 PM
FILE: T:\173124A-TrafficDesignServices\TRP\198\Plans\pLT-AW_I-70 @ Marriottsville.dgn

BORDER REV: DATE: Mar mh 12/2/08 007

DRILL HOLES

BY: Kurgansky –

BORDER REV: DATE: Monen12/2/08007

DRILL HOLES

DRILL HOLES

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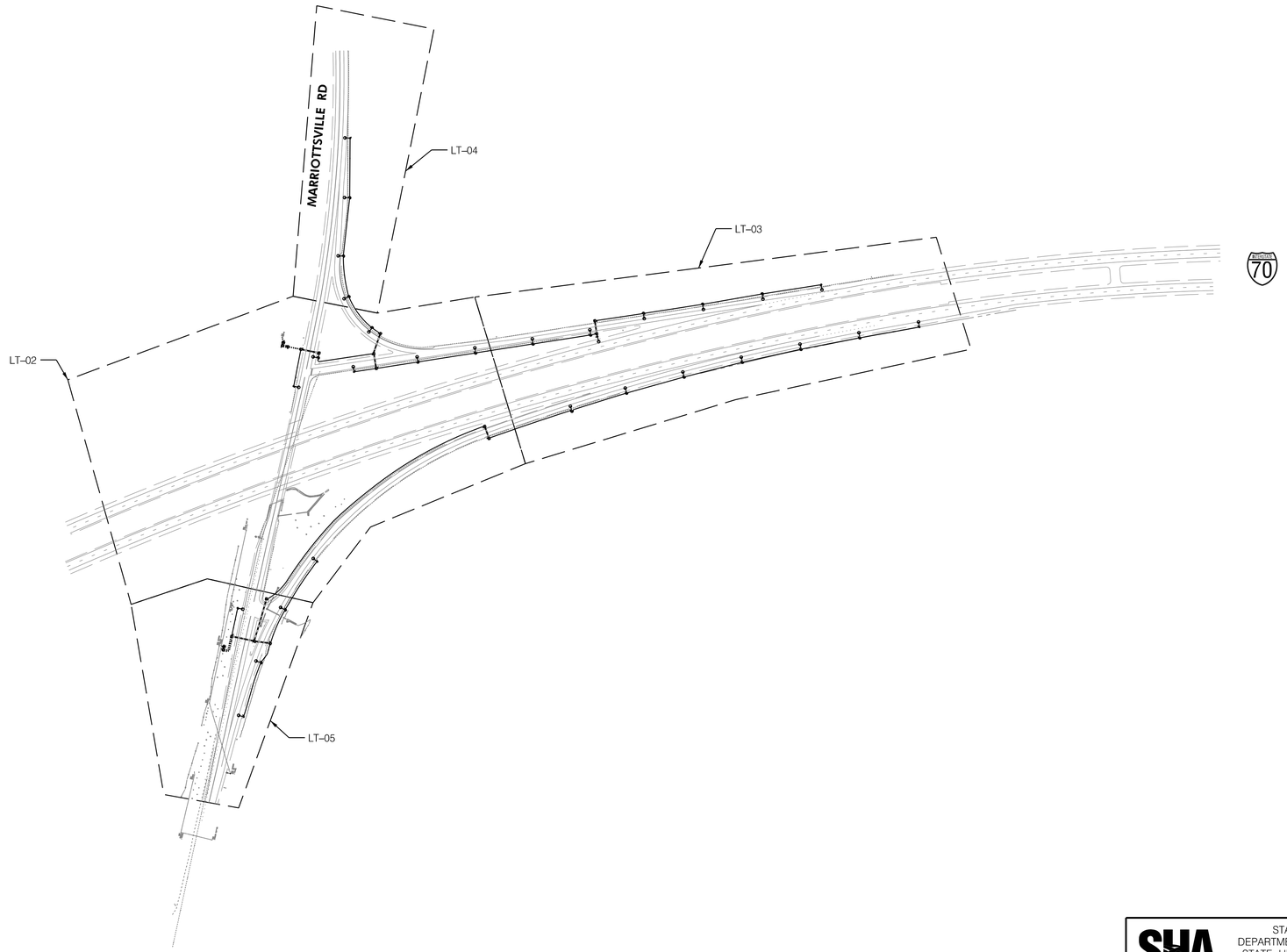
BY: Kurgansky –




STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

I–70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD

INTERCHANGE LIGHTING

MARRIOTTSVILLE, MD

REVISIONS

# SHEET LAYOUT

SCALE 1" = 200' DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

DESIGNED BY JEK
DRAWN BY JEK
CHECKED BY LFW
F.A.P. NO.

COUNTY HOWARD
LOGMILE 13007013.59
TIMS NO. M585
TOD NO.

DRAWING NO. **LT – 01** OF 06

SHEET NO. 02 OF 07


PARSONS BRINCKERHOFF

100 S. Charles Street
Tower 1, 10th Floor
Baltimore, MD 21201
(Ph) 410-787-5050
(Fax) 410-727-4608
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PLOTTED: Tuesday, February 03, 2015 AT 02:03 PM
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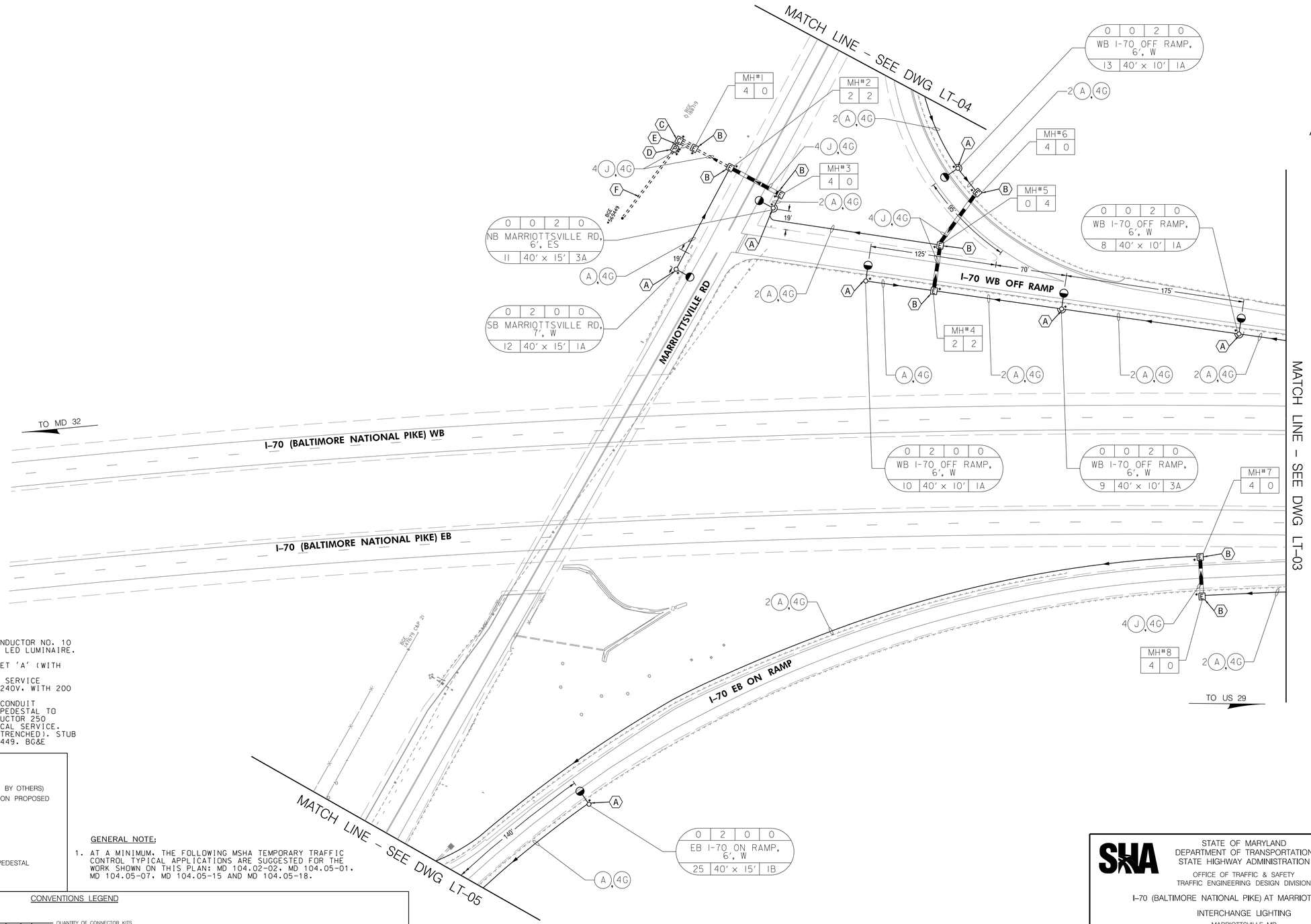


CONSTRUCTION DETAILS

A. INSTALL PROPOSED LIGHT POLE WITH 3-1 CONDUCTOR NO. 10 AWG. TYPE THWN/THHN. 600V CABLES TO THE LED LUMINAIRE.
B. INSTALL PROPOSED ELECTRICAL MANHOLE.
C. INSTALL PROPOSED LIGHTING CONTROL CABINET 'A' (WITH PHOTOCELL) PER MD 801.03 AND 807.03.
D. FURNISH AND INSTALL BASE MOUNTED METER SERVICE PEDESTAL WITH SOCKET, SINGLE PHASE 120/240V, WITH 200 AMP MAIN DISCONNECT SWITCH.
E. INSTALL PROPOSED 4 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED) FROM PROPOSED METER SERVICE PEDESTAL TO PROPOSED LIGHTING CABINET WITH 3-1 CONDUCTOR 250 KCMIL, 600V CABLES FOR PROPOSED ELECTRICAL SERVICE.
F. INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED). STUB UP AT THE BASE OF PROPOSED POLE BGE#569449. BG&E FORCES TO MAKE FINAL CONNECTION.

LIGHTING SYMBOL LEGEND

- EXISTING UTILITY POLE
- PROPOSED 280W LED LEASED LIGHT (INSTALLED BY OTHERS)
- PROPOSED 280W LED COBRA HEAD LUMINAIRE ON PROPOSED GROUND MOUNT LIGHTING STRUCTURE
- 4" SCHEDULE 80 PVC CONDUIT, BORED
- 4" SCHEDULE 80 PVC CONDUIT, TRENCHED
- DIRECT BURIAL DUCT CABLE
- (C) PROPOSED LIGHTING CABINET
- (P) PROPOSED BASE MOUNTED METERED SERVICE PEDESTAL
- (E) PROPOSED ELECTRICAL MANHOLE
- PROPOSED GROUND ROD

GENERAL NOTE:

1. AT A MINIMUM, THE FOLLOWING MSHA TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATIONS ARE SUGGESTED FOR THE WORK SHOWN ON THIS PLAN: MD 104.02-02, MD 104.05-01, MD 104.05-07, MD 104.05-15 AND MD 104.05-18.

GEOMETRIC LEGEND

- EXISTING
- PROPOSED

UTILITY LEGEND

- SD — STORM DRAIN
- G — GAS MAIN
- W — WATER MAIN
- S — SEWER MAIN
- E — ELECTRIC CABLES
- A — AERIAL CABLES
- T — TELEPHONE CABLES
- F — FIBER-OPTIC

CONVENTIONS LEGEND

- QUANTITY OF CONNECTOR KITS
- OFFSET AND OFFSET CODE
- CIRCUIT NUMBER
- MOUNTING HEIGHT X MAST ARM LENGTH
- POLE NUMBER
- MANHOLE NUMBER
- # OF TYPE IV CONNECTOR KITS
- # OF TYPE I CONNECTOR KITS

*OFFSET CODES:
W=FACE OF W-BEAM, FOC=FACE OF CURB, ES=EDGE OF SHOULDER
CM=CENTERED IN MEDIAN, B=FACE OF CONCRETE BARRIER

- (A) 2 /C #4 AWG DUCT CABLE
- (J) 1 /C #4 AWG TYPE XHHW USE, 600V
- (4G) #4 AWG STRANDED BARE COPPER GROUND WIRE
- # (X) (G) — TYPE AND SIZE OF CABLES IN TRENCH /CONDUIT; TOTAL NUMBER OF CABLE(S) IN TRENCH /CONDUIT


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I-70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD

INTERCHANGE LIGHTING

MARRIOTTSVILLE, MD

REVISIONS

# LIGHTING PLAN

SCALE 1" = 50' DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

DESIGNED BY JEK COUNTY HOWARD
DRAWN BY JEK LOGMILE 13007013.59
CHECKED BY LFW TIMS NO. M585
F.A.P. NO. TOD NO.

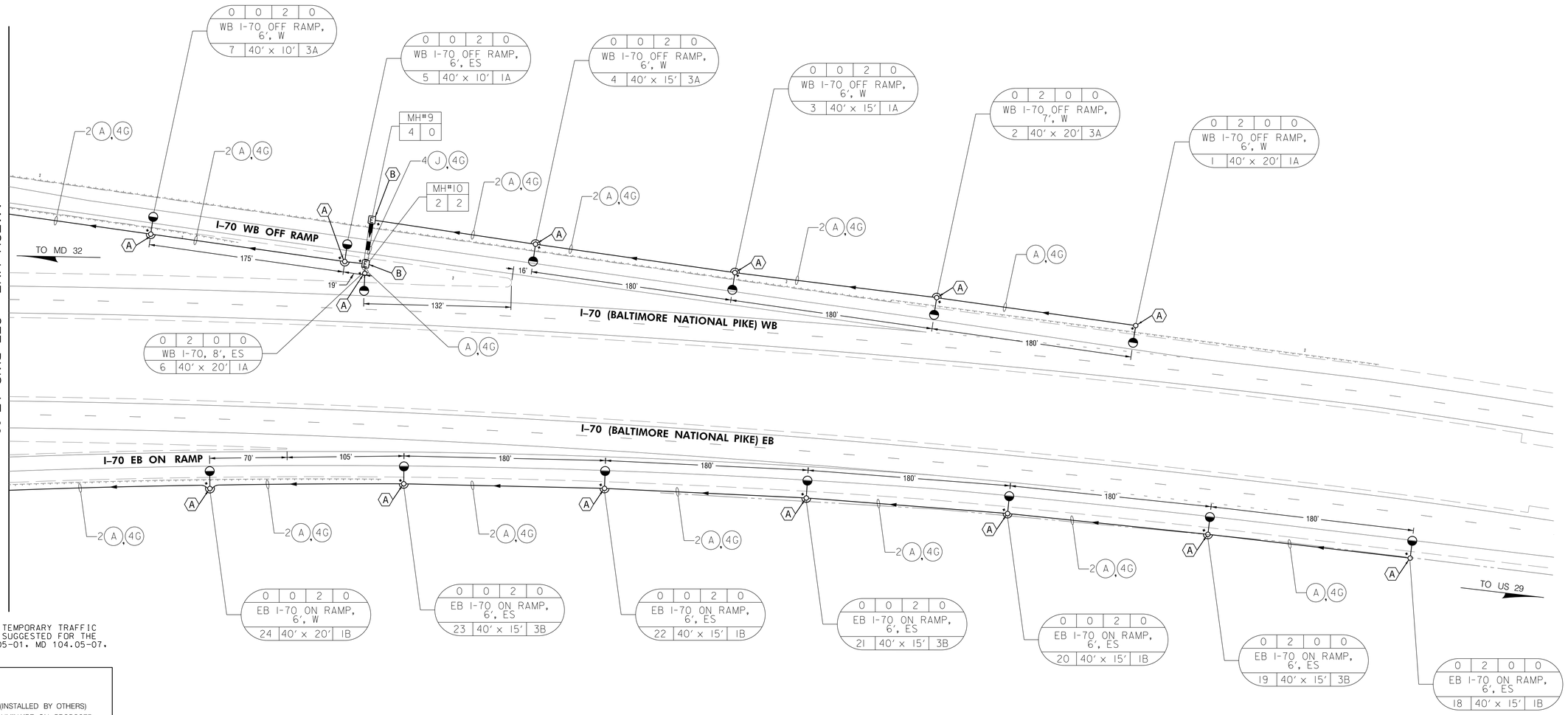
DRAWING NO. LT-02 OF 06 SHEET NO. 03 OF 07

PLOTTED: Monday, March 09, 2015 AT 04:12 PM
FILE: T:\173124A-Traffic\Design\Services\TRF\198\Plans\pLT-P002_I-70 @ Marriottsville.dgn

BY: Kurgansky –

BORDER REV: DATE: Mar09\12\20007

DRILL HOLES




GENERAL NOTE:

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- EXISTING UTILITY POLE
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- PROPOSED 280W LED COBRA HEAD LUMINAIRE ON PROPOSED GROUND MOUNT LIGHTING STRUCTURE
- 4" SCHEDULE 80 PVC CONDUIT, BORED
- 4" SCHEDULE 80 PVC CONDUIT, TRENCHED
- DIRECT BURIAL DUCT CABLE
- C PROPOSED LIGHTING CABINET
- P PROPOSED BASE MOUNTED METERED SERVICE PEDESTAL
- E PROPOSED ELECTRICAL MANHOLE
- PROPOSED GROUND ROD

CONSTRUCTION DETAILS

A. INSTALL PROPOSED LIGHT POLE WITH 3-1 CONDUCTOR NO. 10 AWG, TYPE THWN/THHN, 600V CABLES TO THE LED LUMINAIRE.
B. INSTALL PROPOSED ELECTRICAL MANHOLE.

GEOMETRIC LEGEND

- EXISTING
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UTILITY LEGEND

- SD — STORM DRAIN
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CONVENTIONS LEGEND

- QUANTITY OF CONNECTOR KITS
- OFFSET AND OFFSET CODE
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I-70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD
INTERCHANGE LIGHTING
MARRIOTTSVILLE, MD

REVISIONS

# LIGHTING PLAN

SCALE 1" = 50' DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

DESIGNED BY JEK
DRAWN BY JEK
CHECKED BY LFW
F.A.P. NO.
COUNTY HOWARD
LOGMILE 13007013.59
TIMS NO. M585
TOD NO.

DRAWING NO. LT-03 OF 06 SHEET NO. 04 OF 07

PLOTTED: Tuesday, February 03, 2015 AT 02:03 PM
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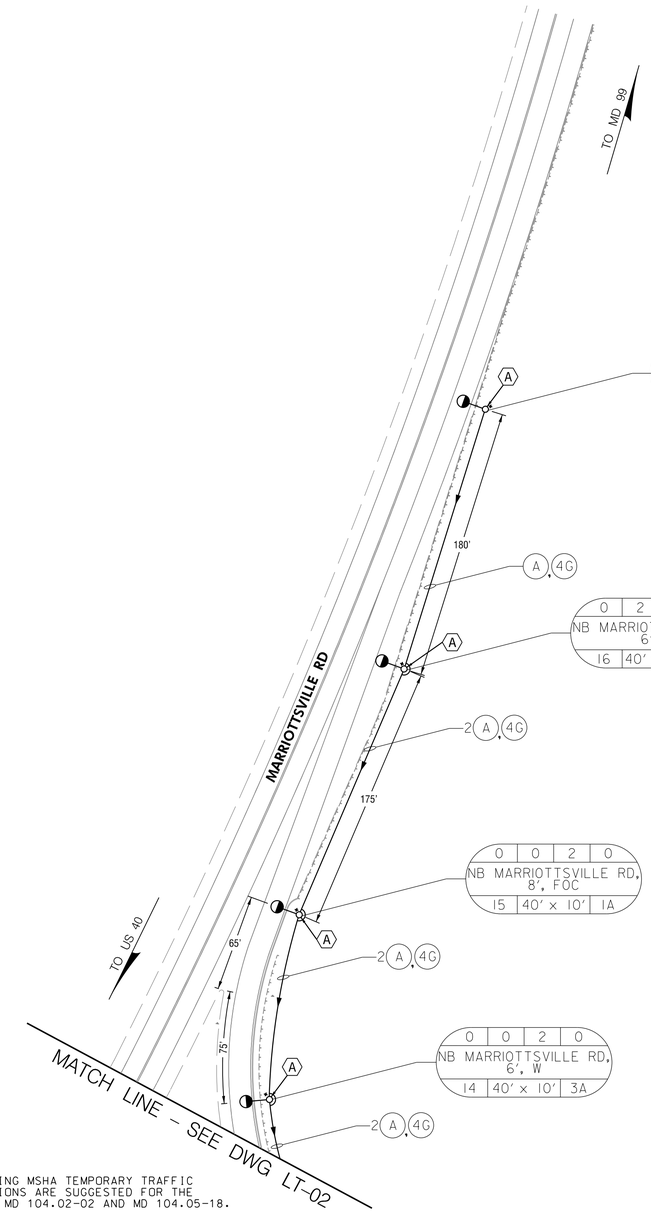
BY: Kurgansky –

BORDER REV: DATE: Monen\27\08007

DRILL HOLES
DRILL HOLES
DRILL HOLES

BORDER REV: DATE: Monen12/2/08007




## CONSTRUCTION DETAILS

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## LIGHTING SYMBOL LEGEND

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- PROPOSED GROUND ROD

## GENERAL NOTE:

1. AT A MINIMUM, THE FOLLOWING MSHA TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATIONS ARE SUGGESTED FOR THE WORK SHOWN ON THIS PLAN: MD 104.02-02 AND MD 104.05-18.

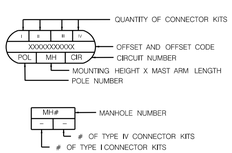
## GEOMETRIC LEGEND

- EXISTING
- PROPOSED

## UTILITY LEGEND

| | | |
|---|---|---|
| SD | SD | STORM DRAIN |
| G | G | GAS MAIN |
| W | W | WATER MAIN |
| S | S | SEWER MAIN |
| E | E | ELECTRIC CABLES |
| A | A | AERIAL CABLES |
| T | T | TELEPHONE CABLES |
| F | F | FIBER-OPTIC |

## CONVENTIONS LEGEND

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I-70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD
INTERCHANGE LIGHTING
MARRIOTTSVILLE, MD

REVISIONS

# LIGHTING PLAN

SCALE 1" = 50' DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

| | | | |
|---|---|---|---|
| DESIGNED BY | JEK | COUNTY | HOWARD |
| DRAWN BY | JEK | LOGMILE | 13007013.59 |
| CHECKED BY | LFW | TIMS NO. | M585 |
| F.A.P. NO. | | TOD NO. | |

DRAWING NO. LT-04 OF 06 SHEET NO. 05 OF 07

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BY: Kurgansky -
DRILL HOLES
DRILL HOLES
DRILL HOLES

BORDER REV: DATE: Monen12/2/08007

DRILL HOLES

DRILL HOLES

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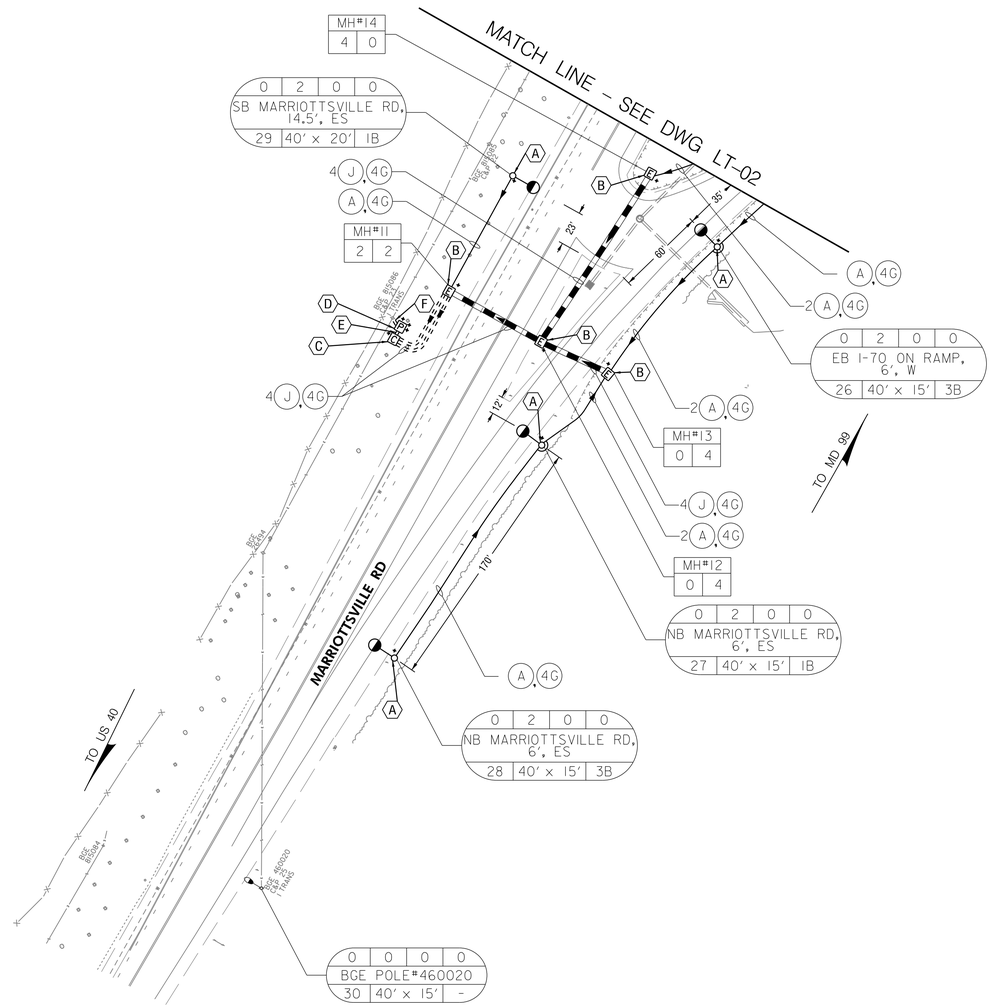


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GEOMETRIC LEGEND

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- E — E — ELECTRIC CABLES
- A — A — AERIAL CABLES
- T — T — TELEPHONE CABLES
- F — F — FIBER-OPTIC

CONVENTIONS LEGEND

- QUANTITY OF CONNECTOR KITS
- OFFSET AND OFFSET CODE (XXXXXXXXXXX)
- CIRCUIT NUMBER (CIR)
- MOUNTING HEIGHT X MAST ARM LENGTH
- POLE NUMBER (POL)
- MANHOLE NUMBER (MH#)
- # OF TYPE IV CONNECTOR KITS
- # OF TYPE I CONNECTOR KITS

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- # X G — TYPE AND SIZE OF CABLES IN TRENCH /CONDUIT; TOTAL NUMBER OF CABLE(S) IN TRENCH /CONDUIT

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I-70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD
INTERCHANGE LIGHTING
MARRIOTTSVILLE, MD

REVISIONS

# LIGHTING PLAN

SCALE 1" = 50' DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

DESIGNED BY JEK COUNTY HOWARD
DRAWN BY JEK LOGMILE 13007013.59
CHECKED BY LFW TIMS NO. M585
F.A.P. NO. TOD NO.

DRAWING NO. LT – 05 OF 06 SHEET NO. 06 OF 07

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BORDER REV: DATE: Monen12/12/08/07

DRILL HOLES

DRILL HOLES

DRILL HOLES

BY: Kurgansky –

**SCHEDULE OF PROPOSED PANEL "A"- LT-02 (MARRIOTTSVILLE RD SB)**

| SERVICE 200 AMP 120/240 VOLTS, 1 PHASE, 3 WIRE | | LUMINAIRE VOLTAGE, 240 VOLTS | | | BREAKERS 200 AMP MAIN BREAKER | | | |
|---|---|---|---|---|---|---|---|---|
| CIRCUIT NUMBER | EQUIPMENT SERVED | CONNECTED LOAD | | PHASE AND VOLTS | BRANCH CIRCUIT BREAKERS | | | REMARKS |
| | | KW | AMPS | | NUMBER OF POLES | FRAME SIZE | TRIP SIZE | |
| 1A | LIGHT POLES 1, 3,5,6,8,10,12,13,15,17 | 2.80 | 11.67 | 1/240 | 2 | 100 | 20 | (10) -280 WATT LED ROADWAY LUMINAIRES |
| 2A | SPACE | - | - | - | - | - | - | |
| 3A | LIGHT POLES 2,4,7,9,11,14,16 | 1.96 | 8.17 | 1/240 | 2 | 100 | 20 | (7) -280 WATT LED ROADWAY LUMINAIRES |
| 4A | SPACE | - | - | - | - | - | - | |
| 5A | SPACE | - | - | - | - | - | - | |
| 6A | SPACE | - | - | - | - | - | - | |
| 7A | SPACE | - | - | - | - | - | - | |
| 8A | SPACE | - | - | - | - | - | - | |
| | TOTAL | 4.76 | 19.8 | | | | | |

**SCHEDULE OF PROPOSED PANEL "B"- LT-05 (MARRIOTTSVILLE RD SB)**

| SERVICE 200 AMP 120/240 VOLTS, 1 PHASE, 3 WIRE | | LUMINAIRE VOLTAGE, 240 VOLTS | | | BREAKERS 200 AMP MAIN BREAKER | | | |
|---|---|---|---|---|---|---|---|---|
| CIRCUIT NUMBER | EQUIPMENT SERVED | CONNECTED LOAD | | PHASE AND VOLTS | BRANCH CIRCUIT BREAKERS | | | REMARKS |
| | | KW | AMPS | | NUMBER OF POLES | FRAME SIZE | TRIP SIZE | |
| 1B | LIGHT POLES 18,20,22,24,25,27,29 | 1.96 | 8.17 | 1/240 | 2 | 100 | 20 | (7) -280 WATT LED ROADWAY LUMINAIRES |
| 2B | SPACE | - | - | - | - | - | - | |
| 3B | LIGHT POLES 19,21,23,26,28 | 1.40 | 5.83 | 1/240 | 2 | 100 | 20 | (5) -280 WATT LED ROADWAY LUMINAIRES |
| 4B | SPACE | - | - | - | - | - | - | |
| 5B | SPACE | - | - | - | - | - | - | |
| 6B | SPACE | - | - | - | - | - | - | |
| 7B | SPACE | - | - | - | - | - | - | |
| 8B | SPACE | - | - | - | - | - | - | |
| | TOTAL | 3.36 | 14.0 | | | | | |

**SCHEDULE OF MANHOLES - I-70 @ MARRIOTTSVILLE**

| MANHOLE NUMBER | NUMBER OF TYPE I CONNECTOR KITS | NUMBER OF TYPE IV CONNECTOR KITS | EXISTING OR PROPOSED |
|---|---|---|---|
| 01 | 4 | 0 | PROPOSED |
| 02 | 2 | 2 | PROPOSED |
| 03 | 4 | 0 | PROPOSED |
| 04 | 2 | 2 | PROPOSED |
| 05 | 0 | 4 | PROPOSED |
| 06 | 4 | 0 | PROPOSED |
| 07 | 4 | 0 | PROPOSED |
| 08 | 4 | 0 | PROPOSED |
| 09 | 4 | 0 | PROPOSED |
| 10 | 2 | 2 | PROPOSED |
| 11 | 2 | 2 | PROPOSED |
| 12 | 0 | 4 | PROPOSED |
| 13 | 0 | 4 | PROPOSED |
| 14 | 4 | 0 | PROPOSED |

**SCHEDULE OF POLES - I-70 @ MARRIOTTSVILLE**

| POLE NUMBER | BRACKET ARM LENGTH | POLE HEIGHT | LUMINAIRE WATTAGE | TYPE OF BASE | POLE STANDARD | POLE LOCATION | DRAWING NUMBER |
|---|---|---|---|---|---|---|---|
| 1 | 20' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-03 |
| 2 | 20' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 7' TO FACE OF W-BEAM | LT-03 |
| 3 | 15' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-03 |
| 4 | 15' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-03 |
| 5 | 10' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 6 | 20' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 8' TO EDGE OF SHOULDER | LT-03 |
| 7 | 10' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-03 |
| 8 | 10' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-02 |
| 9 | 10' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-02 |
| 10 | 10' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-02 |
| 11 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-02 |
| 12 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 7' TO FACE OF W-BEAM | LT-02 |
| 13 | 10' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-02 |
| 14 | 10' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-04 |
| 15 | 10' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 8' TO FACE OF CURB | LT-04 |
| 16 | 20' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-04 |
| 17 | 10' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 7' TO FACE OF W-BEAM | LT-04 |
| 18 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 19 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 20 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 21 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 22 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 23 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-03 |
| 24 | 20' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-03 |
| 25 | 15' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-02 |
| 26 | 15' | 40' | UP TO 280 WATT LED | NON-BREAKAWAY | PROPOSED | 6' TO FACE OF W-BEAM | LT-05 |
| 27 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-05 |
| 28 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO EDGE OF SHOULDER | LT-05 |
| 29 | 20' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 14.5' TO EDGE OF SHOULDER | LT-05 |
| 30 | 15' | N/A | UP TO 280 WATT LED | EXISTING UTILITY POLE | - | BG&E POLE # 460020 | LT-05 |


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SHA

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STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

I–70 (BALTIMORE NATIONAL PIKE) AT MARRIOTTSVILLE RD

INTERCHANGE LIGHTING

MARRIOTTSVILLE, MD

REVISIONS

# PANEL AND POLE SCHEDULE

SCALE N.T.S. DATE FEBRUARY 3, 2015 CONTRACT NO. XY2395185

DESIGNED BY JEK
DRAWN BY JEK
CHECKED BY LFW
F.A.P. NO.

COUNTY HOWARD
LOGMILE 13007013.59
TIMS NO. M585
TOD NO.

DRAWING NO. LT – 06 OF 06

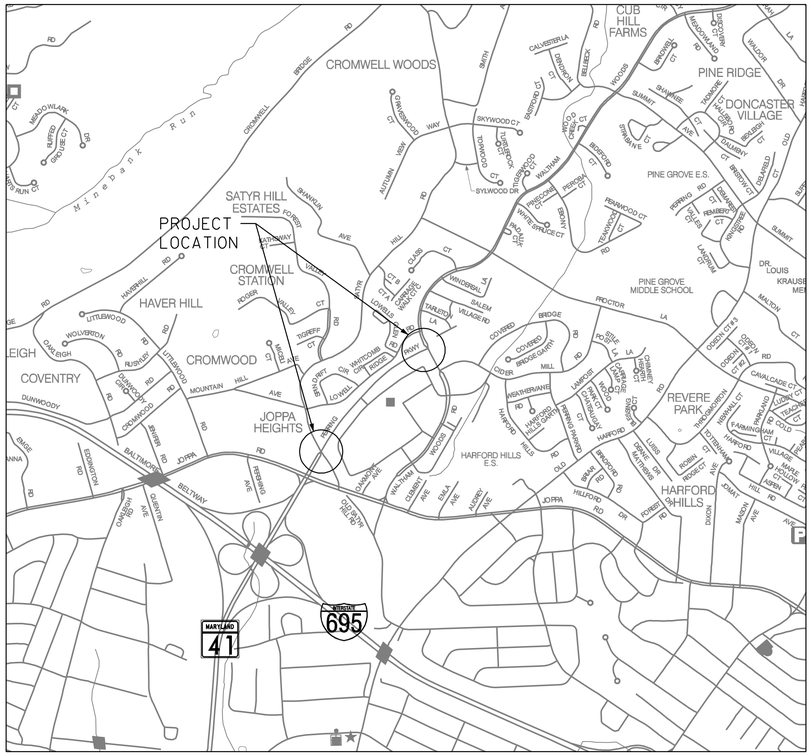
SHEET NO. 07 OF 07

PLOTTED: Tuesday, February 03, 2015 AT 02:04 PM
FILE: T:\173124A–TrafficDesignServices\TRF\198\Plans\pLT–S006_I–70@Marriottsville.dgn

## PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE INSTALLATION OF STREET LIGHTING AT THE INTERSECTION OF MD 41 (PERRING PKWY) AND SATYR HILL ROAD AND THE INTERSECTION OF MD 41 AND WALTHAM WOODS RD.

THIS PROJECT IS IN BALTIMORE COUNTY.




PROJECT LOCATION
N.T.S.

## EQUIPMENT LISTS "A, B & C"

A. EQUIPMENT TO BE FURNISHED BY ADMINISTRATION AND INSTALLED BY THE CONTRACTOR

NONE

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR

| ITEM NO. | DESCRIPTION | UNIT | QUANTITY |
|---|---|---|---|
| 1001 | MAINTENANCE OF TRAFFIC | EA | 2 |
| 2001 | TEST PIT EXCAVATION | CY | 4 |
| 8001 | CONCRETE FOR TRAFFIC CONTROL DEVICES | CY | 11 |
| 8002 | 40 FOOT LIGHT STRUCTURE WITH UP TO A 20 FOOT BRACKET ARM | EA | 5 |
| 8004 | EMBEDDED METERED SERVICE PEDESTAL (100 OR 200 AMP) | EA | 2 |
| 8010 | REMOVE AND DISPOSE EXISTING MATERIAL AND EQUIPMENT (PER ASSIGNMENT) | EA | 1 |
| 8016 | UP TO 4 INCH SCHEDULE 80 RIGID PVC CONDUIT - BORED | LF | 365 |
| 8017 | UP TO 4 INCH SCHEDULE 80 RIGID PVC CONDUIT - TRENCHED | LF | 170 |
| 8020 | NO. 4 AWG STRANDED BARE COPPER GROUND WIRE | LF | 635 |
| 8024 | FURNISH AND INSTALL ELECTRICAL MANHOLE | EA | 5 |
| 8025 | BREAKAWAY BASE SUPPORT SYSTEM FOR LIGHTING STRUCTURE | EA | 5 |
| 8027 | DUCT CABLE - 2 CONDUCTOR, NO 4 AWG, 600 V | LF | 350 |
| 8029 | CABLE - 1 CONDUCTOR, NO 6 AWG, TYPE USE, 600V | LF | 850 |
| 8030 | CABLE - 1 CONDUCTOR, NO 10 AWG, TYPE THWN/THHN, 600V | LF | 750 |
| 8031 | CONNECTOR KIT - TYPE I | EA | 14 |
| 8032 | CONNECTOR KIT - TYPE II | EA | 10 |
| 8034 | CONNECTOR KIT - TYPE IV | EA | 2 |
| 8035 | GROUND ROD - 3/4 INCH DIAMETER X 10 FOOT LENGTH | EA | 10 |
| 8043 | FURNISH & INSTALL LED LUMINAIRE & LAMPS | EA | 5 |

C. ALL MATERIALS TO BE REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

## INDEX OF SHEETS


| | | |
|---|---|---|
| 1 | AT-1 | TITLE SHEET |
| 2 | LT-01 | LIGHTING PLAN |
| 3 | LT-02 | LIGHTING PLAN |



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DIVISION CHIEF
OFFICE DIRECTOR

REVISIONS

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 41 (PERRING PKWY) AT SATYR HILL RD AND WALTHAM WOODS RD
INTERSECTION LIGHTING UPGRADE

**TITLE SHEET**

SCALE NONE DATE APRIL 26, 2013 CONTRACT NO. XX6445185

DESIGNED BY JEK COUNTY BALTIMORE
DRAWN BY JEK LOGMILE
CHECKED BY KMP TIMS NO. L865
F.A.P. NO. TOD NO.

TS NO. DRAWING **AT – 01** OF 01 SHEET NO. 01 OF 03

PLOTTED: Friday, April 26, 2013 AT 01:18 PM
FILE: T:\173124A-TrafficDesignServices\TRF\130\Plans\pLT-AW_MD 41 @ Satyr Hill & Waltham Woods.dgn


DRILL HOLES
DRILL HOLES
DRILL HOLES
BORDER REV: DATE: June 1, 2004
BY: kurgansky –

BORDER REV: DATE: June 1, 2004

DRILL HOLES

DRILL HOLES

DRILL HOLES

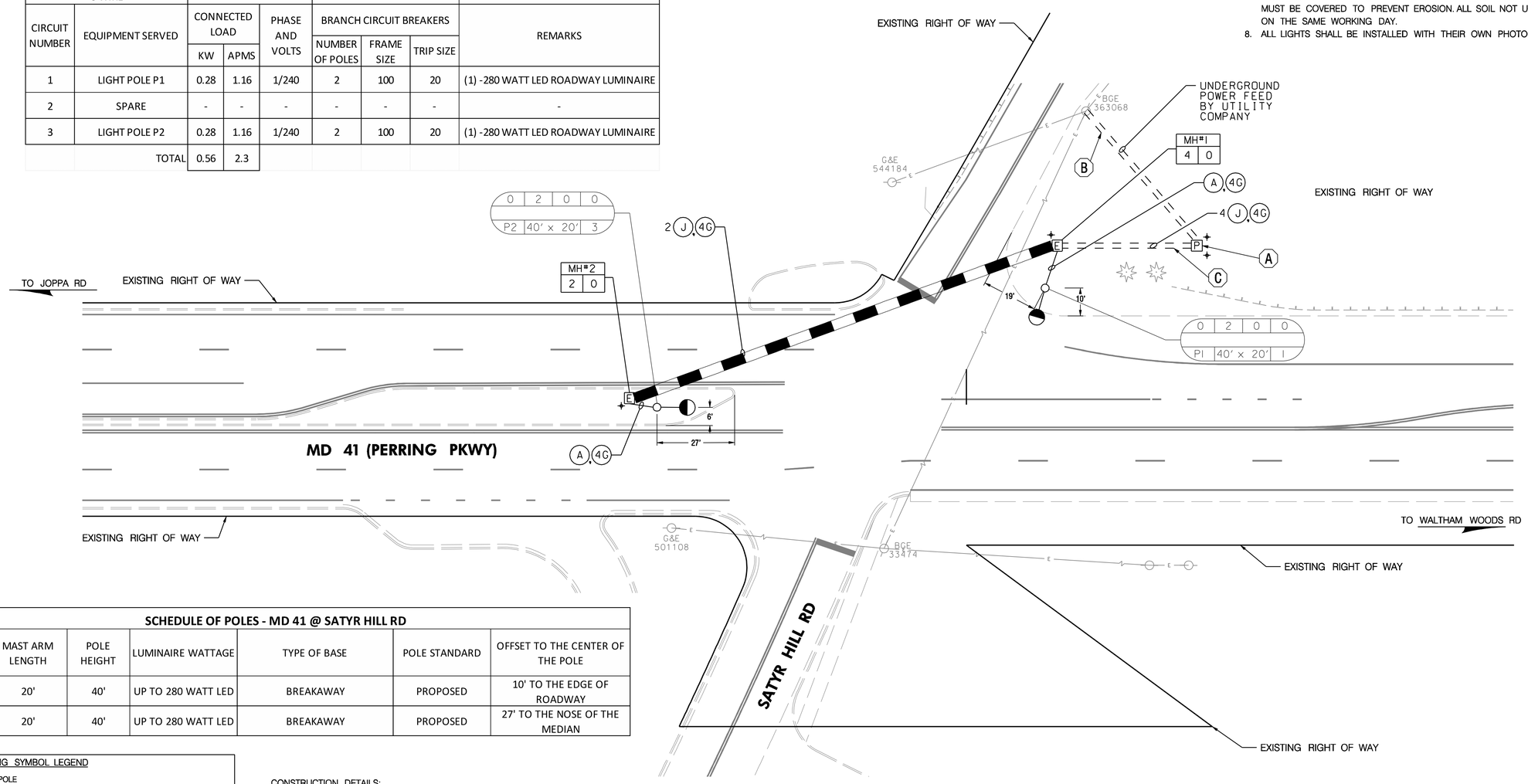
BY: kurgansky –

GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION.
2. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN CASE OF DAMAGE TO AN EXISTING FACILITY.
3. LIGHTING STRUCTURE FOUNDATIONS SHALL BE INSTALLED PER STANDARD NO. MD 801.02.
4. ALL CONNECTIONS BETWEEN GROUND RODS AND GROUND CABLE SHALL BE BY EXOTHERMIC WELD.
5. ALL LIGHTING STRUCTURES NOT PROTECTED BY TRAFFIC BARRIER SHALL BE ON BREAKAWAY BASES.
6. FOUNDATIONS WITH BREAKAWAY BASES SHALL NOT PROTRUDE MORE THAN 4" ABOVE GRADE.
7. ALL TRENCHING MUST BE BACK FILLED AND RESTORED TO ITS ORIGINAL CONDITION ON THE SAME WORKING DAY ON WHICH IT WAS OPENED. AREAS WHICH ARE NOT RE-SEEDED, MULCHED OR SODDED MUST BE COVERED TO PREVENT EROSION. ALL SOIL NOT USED FOR BACKFILL MUST BE REMOVED ON THE SAME WORKING DAY.
8. ALL LIGHTS SHALL BE INSTALLED WITH THEIR OWN PHOTOCELL.

SCHEDULE OF PROPOSED PANEL "A"- LT-01

| SERVICE 100 AMP 120/240 VOLTS, 1 PHASE, 3 WIRE | | LUMINAIRE VOLTAGE, 240 VOLTS | | | BREAKERS 100 AMP MAIN BREAKER | | | EMBEDDED METERED SERVICE PEDESTAL |
|---|---|---|---|---|---|---|---|---|
| CIRCUIT NUMBER | EQUIPMENT SERVED | CONNECTED LOAD | | PHASE AND VOLTS | BRANCH CIRCUIT BREAKERS | | | REMARKS |
| | | KW | APMS | | NUMBER OF POLES | FRAME SIZE | TRIP SIZE | |
| 1 | LIGHT POLE P1 | 0.28 | 1.16 | 1/240 | 2 | 100 | 20 | (1) -280 WATT LED ROADWAY LUMINAIRE |
| 2 | SPARE | - | - | - | - | - | - | - |
| 3 | LIGHT POLE P2 | 0.28 | 1.16 | 1/240 | 2 | 100 | 20 | (1) -280 WATT LED ROADWAY LUMINAIRE |
| | TOTAL | 0.56 | 2.3 | | | | | |




SCHEDULE OF POLES - MD 41 @ SATYR HILL RD

| POLE NUMBER | MAST ARM LENGTH | POLE HEIGHT | LUMINAIRE WATTAGE | TYPE OF BASE | POLE STANDARD | OFFSET TO THE CENTER OF THE POLE |
|---|---|---|---|---|---|---|
| P1 | 20' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 10' TO THE EDGE OF ROADWAY |
| P2 | 20' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 27' TO THE NOSE OF THE MEDIAN |

LIGHTING SYMBOL LEGEND

- UTILITY POLE
- PROPOSED 280W LED COBRA HEAD LUMINAIRE ON PROPOSED GROUND MOUNT LIGHTING STRUCTURE
- 4" SCHEDULE 80 PVC CONDUIT, BORED
- SCHEDULE 80 PVC CONDUIT, TRENCHED (SIZE AS NOTED)
- DIRECT BURIAL DUCT CABLE
- E PROPOSED LIGHTING MANHOLE
- P PROPOSED METERED SERVICE PEDESTAL
- PROPOSED GROUND ROD

CONSTRUCTION DETAILS:

(A) FURNISH AND INSTALL EMBEDDED METER SERVICE PEDESTAL WITH SOCKET, SINGLE PHASE 120/240V, WITH A 100 AMP MAIN DISCONNECT SWITCH (PANEL A).

(B) INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED). STUB UP AT THE BASE OF BGE POLE 363068. BGE FORCES SHALL MAKE THE FINAL CONNECTION.

(C) INSTALL 2 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).

SCHEDULE OF MANHOLES - MD 41 @ SATYR HILL RD

| MANHOLE NUMBER | NUMBER OF TYPE I CONNECTOR KITS | NUMBER OF TYPE IV CONNECTOR KITS | EXISTING OR PROPOSED |
|---|---|---|---|
| 01 | 4 | 0 | PROPOSED |
| 02 | 2 | 0 | PROPOSED |

GEOMETRIC LEGEND

- EXISTING
- PROPOSED

UTILITY LEGEND

- SD — SD — STORM DRAIN
- G — G — GAS MAIN
- W — W — WATER MAIN
- S — S — SEWER MAIN
- E — E — ELECTRIC CABLES
- A — A — AERIAL CABLES
- T — T — TELEPHONE CABLES
- F — F — FIBER-OPTIC

CONVENTIONS LEGEND

- QUANTITY OF CONNECTOR KITS (I II III IV)
- STATION NUMBER & OFFSET (STA. #& OFF)
- CIRCUIT NUMBER (POL MH CIR)
- MOUNTING HEIGHT X MAST ARM LENGTH
- POLE NUMBER
- MANHOLE NUMBER (MH #)
- # OF TYPE IV CONNECTOR KITS
- # OF TYPE I CONNECTOR KITS
- (A) 2C #4 AWG DUCT CABLE
- (J) #6 AWG TYPE USE, 600V
- (4G) #4 AWG STRANDED BARE COPPER GROUND WIRE
- # (X) (G) — TYPE AND SIZE OF CABLES IN TRENCH CONDUIT; TOTAL NUMBER OF CABLE(S) IN TRENCH CONDUIT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STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 41 (PERRING PKWY) AT SATYR HILL RD

INTERSECTION LIGHTING UPGRADE

REVISIONS

# LIGHTING PLAN

SCALE 1" = 20' DATE APRIL 26, 2013 CONTRACT NO. XX6445185

DESIGNED BY JEK COUNTY BALTIMORE
DRAWN BY JEK LOGMILE 03041002.59
CHECKED BY KMP TIMS NO. L865
F.A.P. NO. TOD NO.

TS NO. DRAWING LT – 01 OF 02 SHEET NO. 02 OF 03

PLOTTED: Friday, April 26, 2013 AT 01:24 PM
FILE: T:\173124A-TrafficDesignServices\TRF\130\Plans\pLT-P001_MD 41 @ Satyr Hill.dgn

BORDER REV: DATE: June 1, 2004

DRILL HOLES

DRILL HOLES

DRILL HOLES

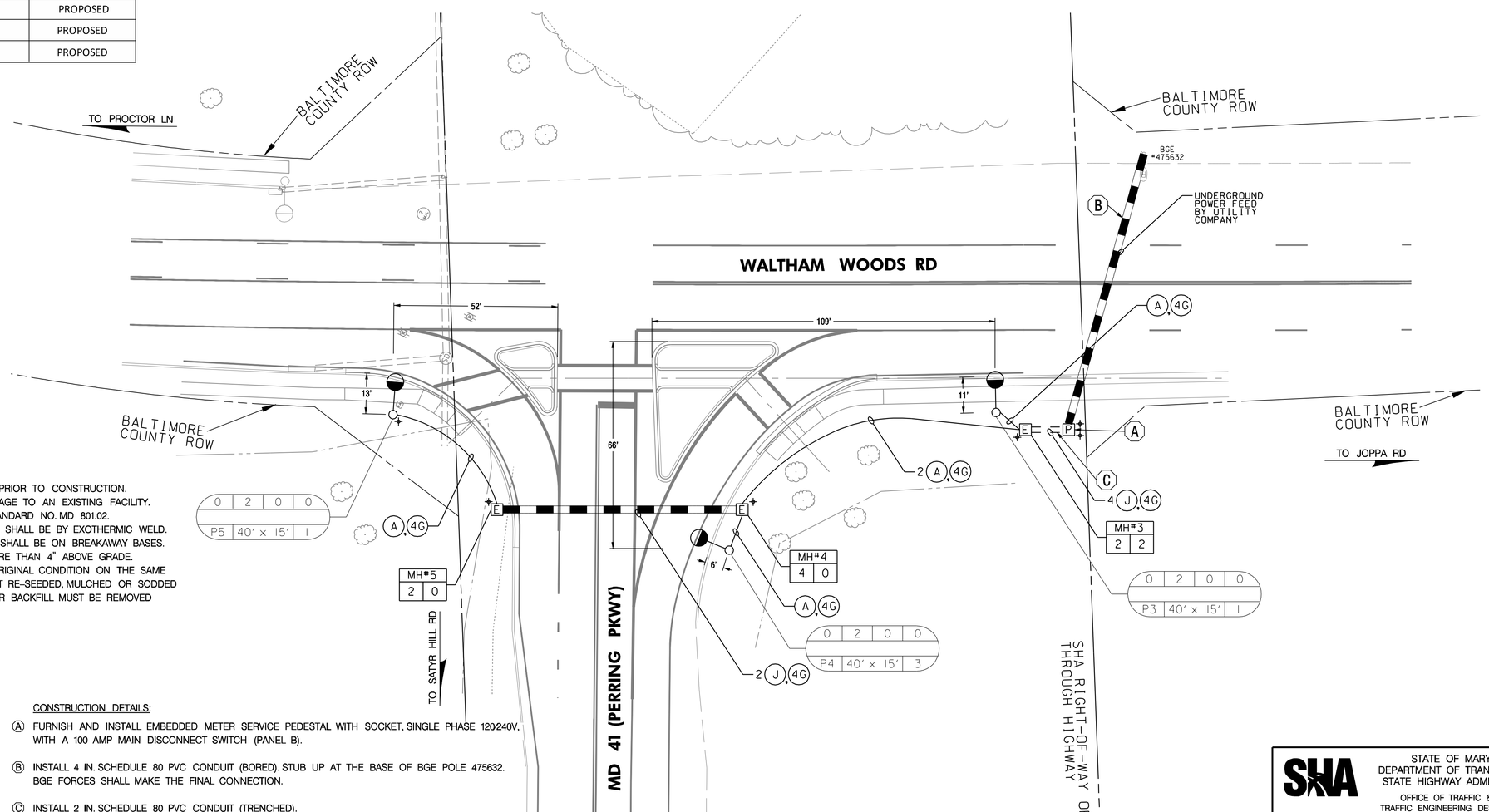
BY: kurgansky

| SCHEDULE OF POLES - MD 41 @ WALTHAM WOODS RD | | | | | | |
|---|---|---|---|---|---|---|
| POLE NUMBER | MAST ARM LENGTH | POLE HEIGHT | LUMINAIRE WATTAGE | TYPE OF BASE | POLE STANDARD | OFFSET TO THE CENTER OF THE POLE |
| P3 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 11' TO THE FACE OF CURB |
| P4 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 6' TO THE FACE OF CURB |
| P5 | 15' | 40' | UP TO 280 WATT LED | BREAKAWAY | PROPOSED | 13' TO THE FACE OF CURB |

| SCHEDULE OF MANHOLES - MD 41 @ WALTHAM WOODS RD | | | |
|---|---|---|---|
| MANHOLE NUMBER | NUMBER OF TYPE I CONNECTOR KITS | NUMBER OF TYPE IV CONNECTOR KITS | EXISTING OR PROPOSED |
| 03 | 2 | 2 | PROPOSED |
| 04 | 4 | 0 | PROPOSED |
| 05 | 2 | 0 | PROPOSED |

SCHEDULE OF PROPOSED PANEL "B"- LT-02

| SERVICE 100 AMP 120/240 VOLTS, 1 PHASE, 3 WIRE | | LUMINAIRE VOLTAGE, 240 VOLTS | | | BREAKERS 100 AMP MAIN BREAKER | | | EMBEDDED METERED SERVICE PEDESTAL |
|---|---|---|---|---|---|---|---|---|
| CIRCUIT NUMBER | EQUIPMENT SERVED | CONNECTED LOAD | | PHASE AND VOLTS | BRANCH CIRCUIT BREAKERS | | | REMARKS |
| | | KW | APMS | | NUMBER OF POLES | FRAME SIZE | TRIP SIZE | |
| 1 | LIGHT POLES P3 & P5 | 0.56 | 2.32 | 1/240 | 2 | 100 | 20 | (2) -280 WATT LED ROADWAY LUMINAIRES |
| 2 | SPARE | - | - | - | - | - | - | - |
| 3 | LIGHT POLE P4 | 0.28 | 1.16 | 1/240 | 2 | 100 | 20 | (1) -280 WATT LED ROADWAY LUMINAIRE |
| | TOTAL | 0.84 | 3.5 | | | | | |




GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION.
2. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN CASE OF DAMAGE TO AN EXISTING FACILITY.
3. LIGHTING STRUCTURE FOUNDATIONS SHALL BE INSTALLED PER STANDARD NO. MD 801.02.
4. ALL CONNECTIONS BETWEEN GROUND RODS AND GROUND CABLE SHALL BE BY EXOTHERMIC WELD.
5. ALL LIGHTING STRUCTURES NOT PROTECTED BY TRAFFIC BARRIER SHALL BE ON BREAKAWAY BASES.
6. FOUNDATIONS WITH BREAKAWAY BASES SHALL NOT PROTRUDE MORE THAN 4" ABOVE GRADE.
7. ALL TRENCHING MUST BE BACK FILLED AND RESTORED TO ITS ORIGINAL CONDITION ON THE SAME WORKING DAY ON WHICH IT WAS OPENED. AREAS WHICH ARE NOT RE-SEEDED, MULCHED OR SODDED MUST BE COVERED TO PREVENT EROSION. ALL SOIL NOT USED FOR BACKFILL MUST BE REMOVED ON THE SAME WORKING DAY.
8. ALL LIGHTS SHALL BE INSTALLED WITH THEIR OWN PHOTOCELL.

LIGHTING SYMBOL LEGEND

- EXISTING LEASED LIGHTING TO REMAIN
- EXISTING LIGHT POLE TO REMAIN
- UTILITY POLE
- PROPOSED 280W LED COBRA HEAD LUMINAIRE ON PROPOSED GROUND MOUNT LIGHTING STRUCTURE
- 4" SCHEDULE 80 PVC CONDUIT, BORED
- SCHEDULE 80 PVC CONDUIT, TRENCHED (SIZE AS NOTED)
- DIRECT BURIAL DUCT CABLE
- E PROPOSED LIGHTING MANHOLE
- P PROPOSED METERED SERVICE PEDESTAL
- PROPOSED GROUND ROD

CONSTRUCTION DETAILS:

(A) FURNISH AND INSTALL EMBEDDED METER SERVICE PEDESTAL WITH SOCKET, SINGLE PHASE 120/240V, WITH A 100 AMP MAIN DISCONNECT SWITCH (PANEL B).

(B) INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT (BORED). STUB UP AT THE BASE OF BGE POLE 475632. BGE FORCES SHALL MAKE THE FINAL CONNECTION.

(C) INSTALL 2 IN. SCHEDULE 80 PVC CONDUIT (TRENCHED).

GEOMETRIC LEGEND

- EXISTING
- PROPOSED

UTILITY LEGEND

- SD — SD — STORM DRAIN
- G — G — GAS MAIN
- W — W — WATER MAIN
- S — S — SEWER MAIN
- E — E — ELECTRIC CABLES
- A — A — AERIAL CABLES
- T — T — TELEPHONE CABLES
- F — F — FIBER-OPTIC

CONVENTIONS LEGEND

QUANTITY OF CONNECTOR KITS

| I | II | III | IV |
|---|---|---|---|
| STA. #& OFF | | | |
| POL | MH | CIR | |

STATION NUMBER & OFFSET

CIRCUIT NUMBER

MOUNTING HEIGHT X MAST ARM LENGTH

POLE NUMBER

| MH # | |
|---|---|
| – | – |

MANHOLE NUMBER

# OF TYPE IV CONNECTOR KITS

# OF TYPE I CONNECTOR KITS

(A) 2C #4 AWG DUCT CABLE

(J) #6 AWG TYPE USE, 600V

(4G) #4 AWG STRANDED BARE COPPER GROUND WIRE

# (X) (G)

TYPE AND SIZE OF CABLES IN TRENCH CONDUIT

TOTAL NUMBER OF CABLE(S) IN TRENCH CONDUIT

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STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 41 (PERRING PKWY) AT WALTHAM WOODS RD

INTERSECTION LIGHTING UPGRADE

REVISIONS

# LIGHTING PLAN

SCALE 1" = 20' DATE APRIL 26, 2013 CONTRACT NO. XX6445185

DESIGNED BY JEK
DRAWN BY JEK
CHECKED BY TE
F.A.P. NO.

COUNTY BALTIMORE
LOGMILE 03041002.97
TIMS NO. L865
TOD NO.

TS NO. | DRAWING LT-02 OF 02 | SHEET NO. 03 OF 03

PLOTTED: Friday, April 26, 2013 AT 01:25 PM
FILE: T:\1/3124/A-TrafficDesignServices\TRF\130\Plans\pLT-P001_MD 41 @ Waltham Woods.dgn

## PROJECT DESCRIPTION

THIS PROJECT INVOLVES INSTALLING UNDERPASS LIGHTING AT THE I-695 AT MD 26 (LIBERTY ROAD) INTERCHANGE. THIS PROJECT IS IN BALTIMORE COUNTY.

PROJECT LOCATION
N.T.S.

GENERAL NOTES:

1. ALL UTILITY LINES ARE SCHEMATIC ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND ELECTRICAL LINES AND UTILITIES PRIOR TO CONSTRUCTION. IF THE CONTRACTOR PERCEIVES THAT THERE IS A CONFLICT BETWEEN THE PROPOSED LIGHTING EQUIPMENT AND THE EXISTING UNDERGROUND ELECTRICAL LINES OR UTILITIES THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
2. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN CASE OF DAMAGE TO AN EXISTING FACILITY.
3. ALL CONNECTIONS BETWEEN GROUND RODS AND GROUND CABLE SHALL BE BY EXOTHERMIC WELD.
4. CONDUCTORS SHALL NOT BE SPLICED EXCEPT IN STRUCTURES, MANHOLES AND PULL OR JUNCTION BOXES. ALL MANHOLES, CONDUITS UNDER PAVEMENT, LIGHTING STRUCTURES, ETC. SHALL BE STAKED OUT AND EVERY LOCATION APPROVED BY THE ENGINEER BEFORE ANY WORK IS DONE.
5. FOR EXISTING ELECTRICAL INFORMATION FOR LIGHTING CONTACT JIM FLUTKA AT DISTRICT 4 MAINTENANCE AT (410) 229-2375.
6. ALL ANCHOR BOLTS USED FOR MOUNTING JUNCTION BOXES AND CONDUIT CLAMPS TO BRIDGE WINGWALLS, ABUTMENTS AND PARAPETS SHALL BE STAINLESS STEEL. ALL ANCHOR BOLTS SHALL BE 1/4 INCH DIAMETER AND EMBEDDED A MINIMUM OF 2 INCHES WITH A TENSILE PULLOUT STRENGTH OF 500 LBS. ANCHOR BOLTS MUST BE AN EPOXY BASED MOUNTING SYSTEM. MECHANICAL OR EXPANDING ANCHOR BOLTS SHALL NOT BE USED. CONTRACTOR SHALL SUBMIT A DETAIL TO THE ENGINEER FOR APPROVAL ON METHOD OF ATTACHING JUNCTION BOXES.

## EQUIPMENT LIST

A. EQUIPMENT TO BE FURNISHED BY STATE HIGHWAY ADMINISTRATION

| ITEM NO. | QUANTITY | UNIT | DESCRIPTION |
|---|---|---|---|

B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY CONTRACTOR

| ITEM NO. | QUANTITY | UNIT | DESCRIPTION |
|---|---|---|---|
| 1001 | 1 | LS | MAINTENANCE OF TRAFFIC |
| 8003 | 16 | EA | GALVANIZED STEEL JUNCTION BOX, ANY SIZE UP TO 12 INCH x 12 INCH |
| 8016 | 600 | LF | NO. 4 AWG STANDARD BARE COPPER GROUND WIRE |
| 8027 | 14 | EA | LED UNDERPASS LUMINAIRE |
| 8045 | 2275 | LF | CABLE - 1 CONDUCTOR, NO 4 AWG, TYPE USE, 600V |
| 8047 | 2300 | LF | CABLE - 1 CONDUCTOR, NO 10 AWG, TYPE THWN/THHN, 600V |
| 8049 | 190 | LF | 1 INCH DIAMETER FLEXIBLE STEEL CONDUIT |
| 8050 | 26 | EA | CONNECTOR KIT - TYPE I |
| 8051 | 20 | EA | CONNECTOR KIT - TYPE II |
| 8052 | 16 | EA | CONNECTOR KIT - TYPE III |
| 8053 | 16 | EA | CONNECTOR KIT - TYPE IV |
| 8059 | 1 | EA | REMOVE AND DISPOSE OF EXISTING MATERIAL AND EQUIPMENT (PER ASSIGNMENT) |
| 8062 | 1200 | LF | 1 1/2 INCH DIAMETER RIGID STEEL CONDUIT |
| 8063 | 720 | LF | L 5"x5"x3/8" ANGLE IRON SUPPORT FOR CONDUIT SUPPORT (COATED DARK BROWN) |
| 8064 | 14 | EA | LED UNDERPASS LUMINAIRE MOUNTING ASSEMBLY (COATED DARK BROWN) |
| 8065 | 14 | EA | DRILLING OF BRIDGE GIRDER OR DIAPHRAGM FOR UNDERPASS LUMINAIRE |

## INDEX OF SHEETS


| | | |
|---|---|---|
| 1 | AT-01 | PROJECT INFORMATION AND QUANTITIES |
| 2 | LT-01 | LIGHTING PLAN |
| 3 | LT-02 | LIGHTING PLAN |
| 4 | LT-03 | UNDERPASS LIGHTING LAYOUT |
| 5 | LT-04 | UNDERPASS LIGHTING DETAILS |
| 6 | LT-05 | UNDERPASS LIGHTING DETAILS |


### SCHEDULE OF JUNCTION BOXES

| JUNCTION BOX NUMBER | NUMBER OF TYPE I CONNECTOR KITS | NUMBER OF TYPE II CONNECTOR KITS | NUMBER OF TYPE III CONNECTOR KITS | NUMBER OF TYPE IV CONNECTOR KITS | EXISTING OR PROPOSED | DRAWING NUMBER |
|---|---|---|---|---|---|---|
| 01 | 0 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 02 | 0 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 03 | 2 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 04 | 2 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 05 | 0 | 0 | 0 | 4 | PROPOSED | LT-02 |
| 06 | 2 | 0 | 2 | 0 | EXISTING | LT-02 |
| 07 | 2 | 0 | 2 | 0 | EXISTING | LT-02 |
| 08 | 0 | 0 | 0 | 8 | EXISTING | LT-02 |
| 09 | 2 | 0 | 2 | 0 | PROPOSED | LT-02 |
| 10 | 2 | 0 | 2 | 0 | PROPOSED | LT-02 |
| 11 | 2 | 0 | 2 | 0 | PROPOSED | LT-02 |
| 12 | 2 | 0 | 2 | 0 | PROPOSED | LT-02 |
| 13 | 2 | 0 | 2 | 0 | PROPOSED | LT-02 |
| 14 | 2 | 0 | 2 | 0 | PROPOSED | LT-02 |
| 15 | 0 | 2 | 0 | 0 | EXISTING | LT-02 |
| 16 | 2 | 2 | 0 | 0 | EXISTING | LT-02 |
| 17 | 0 | 0 | 0 | 4 | EXISTING | LT-02 |
| 18 | 2 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 19 | 2 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 20 | 0 | 2 | 0 | 0 | PROPOSED | LT-02 |
| 21 | 0 | 2 | 0 | 0 | PROPOSED | LT-02 |

### SCHEDULE OF PROPOSED CHANGES TO PANEL P2 "MD-26 UNDERPASS"

| | SERVICE 100 AMP, 120/240 VOLTS, SINGLE PHASE, 3-WIRE | | LUMINAIRE VOLTAGE, 240 VOLTS | | | BREAKERS 100 AMP MAIN BREAKER | | | NEMA 4X ENCLOSURE |
|---|---|---|---|---|---|---|---|---|---|
| | CIRCUIT NUMBER | EQUIPMENT SERVED | CONNECTED LOAD | | PHASE AND VOLTS | BRANCH CIRCUIT BREAKERS | | | REMARKS |
| | | | KW | APMS | | NUMBER OF POLES | FRAME SIZE | TRIP SIZE | |
| * | 1 | SIGN # C-5 | 0.30 | 1.40 | 1/240 | 2 | 100 | 20 | (2) -135 WATT LED |
| * | 2 | POLE # 13, 14, 21, 40, 42 | 1.50 | 6.30 | 1/240 | 2 | 100 | 20 | (5) -250 WATT HPS |
| * | 3 | SIGN # C-5 | 0.20 | 0.70 | 1/240 | 2 | 100 | 20 | (1) -135 WATT LED |
| * | 4 | POLE # 17, 20, 41 | 0.90 | 3.80 | 1/240 | 2 | 100 | 20 | (3) - 250 WATT HPS |
| | 5 | UNDERPASS LUMINAIRE # 1, 4, 5, 8, 9, 12, 13, 16, 17 | 0.86 | 3.6 | 1/240 | 2 | 100 | 20 | (9) -97 WATT LED |
| * | 6 | SPARE | - | - | - | - | - | - | |
| | 7 | UNDERPASS LUMINAIRE # 2, 3, 6, 7, 10, 11, 14, 15, 18 | 0.86 | 3.6 | 1/240 | 2 | 100 | 20 | (9) -97 WATT LED |
| * | 8 | SPARE | - | - | - | - | - | - | |
| * | 9 | SPARE | - | - | - | - | - | - | |
| * | 10 | SPARE | - | - | - | - | - | - | |
| * | 11 | SPARE | - | - | - | - | - | - | |
| * | 12 | SPARE | - | - | - | - | - | - | |
| * | 13 | SPARE | - | - | - | - | - | - | |
| * | 14 | SPARE | - | - | - | - | - | - | |
| * | 15 | SPARE | - | - | - | - | - | - | |
| * | 16 | SPARE | - | - | - | - | - | - | |
| * | 17 | SPARE | - | - | - | - | - | - | |
| * | 18 | SPARE | - | - | - | - | - | - | |
| * | 19 | SPARE | - | - | - | - | - | - | |
| * | 20 | SPARE | - | - | - | - | - | - | |
| | | TOTAL | 4.62 | 19.4 | | | | | |

*EXISTING CIRCUITS TO REMAIN UNCHANGED. NOT SHOWN ON PLANS

## CONTACTS

DISTRICT (DISTRICT 4)

MS. WENDY WOLCOTT
DISTRICT ENGINEER
410-229-2310/2311

MS. ERIN KUHN
ASSISTANT DISTRICT ENGINEER - TRAFFIC
410-229-2381

MR. MICHAEL PASQUARIELLO
DISTRICT UTILITY ENGINEER
410-229-2341

MR. JESSE FREE
ASSISTANT DISTRICT ENGINEER - CONSTRUCTION
410-229-2421

MR. ANDRE FUTRELL
ASSISTANT DISTRICT ENGINEER - MAINTENANCE
410-229-2361

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MS. KELLY CALDWELL-HARPER
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APPROVALS

TEAM LEADER
ASST. DIV. CHIEF
DIVISION CHIEF
OFFICE DIRECTOR

REVISIONS

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 26 (LIBERTY RD) AT I-695 INTERCHANGE

BALTIMORE, MD

# PROJECT INFORMATION AND QUANTITIES

SCALE NONE DATE MAY 15, 2017 CONTRACT NO. XY1615185

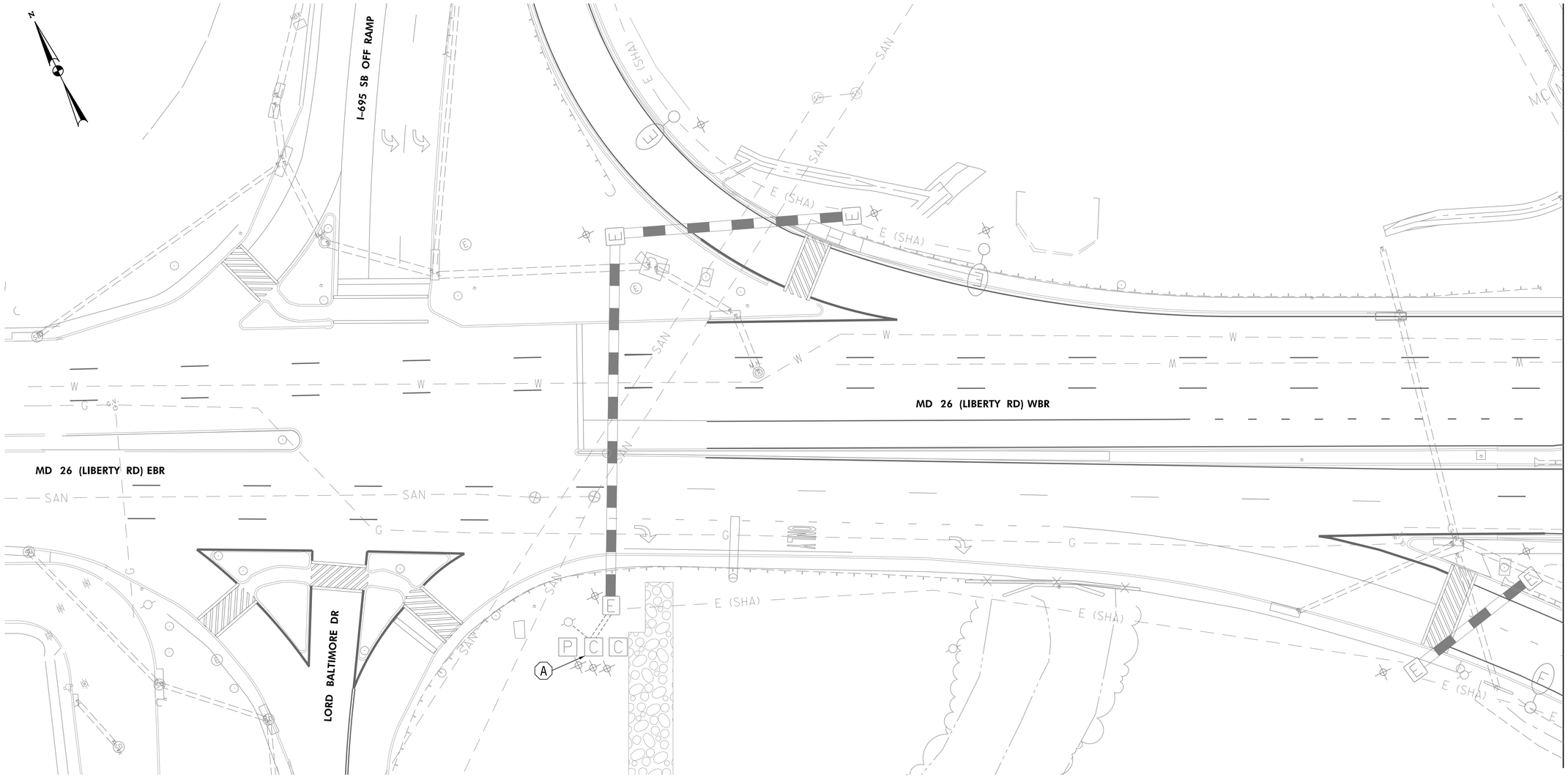
DESIGNED BY NEK
DRAWN BY MAW
CHECKED BY TJS
MDE/PRD SEE TITLE SHEET

COUNTY BALTIMORE
LOGMILE 03002608.31 - 8.40
TIMS NO. M486
TOD NO.

DRAWING NO. AT - 01 OF 01 SHEET NO. 01 OF 06

PLOTTED: Monday, May 15, 2017 AT 03:17 PM
FILE: T:\173124A-TrafficDesignServices\TRF\251\Plans\pLT-P000_MD26&695.dgn

BORDER REV: DATE: March 27, 2007
BY: WagnerM
DRILL HOLES




NOTES:

1. EXISTING DUCT CABLE AND MANHOLES SERVING EXISTING LIGHTING TO REMAIN.
2. THERE IS NO WORK PROPOSED ON THIS DRAWING. DRAWING SHOWN FOR INFORMATION PURPOSES ONLY.

CONSTRUCTION DETAILS:

(A) EXISTING LIGHTING CABINET

## LIGHTING SYMBOL LEGEND

- PROPOSED 97W LED UNDERPASS LIGHT & ORIENTATION (TYPE II DISTRIBUTION)
- EXISTING UNDERPASS LIGHT, TO REMAIN
- EXISTING LIGHT STRUCTURE, TO REMAIN
- EXISTING CANTILEVER STRUCTURE, TO REMAIN
- EXISTING 4" SCHEDULE 80 PVC CONDUIT, BORED
- EXISTING SCHEDULE 80 PVC CONDUIT, TRENCHED
- EXISTING 2" STEEL CONDUIT
- PROPOSED 1 1/2" RIGID GALVANIZED STEEL CONDUIT
- PROPOSED 12"X 12"X 6" JUNCTION BOX
- EXISTING LIGHTING CABINET
- EXISTING LIGHTING MANHOLE
- EXISTING LIGHTING JUNCTION BOX
- EXISTING DUCT CABLE TO REMAIN
- EXISTING METERED SERVICE PEDESTAL, TO REMAIN
- EXISTING GROUND ROD

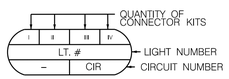
## GEOMETRIC LEGEND

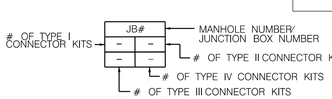
- EXISTING
- PROPOSED

## UTILITY LEGEND

- SD — STORM DRAIN
- G — GAS MAIN
- W — WATER MAIN
- S — SEWER MAIN
- E — ELECTRIC CABLES
- A — AERIAL CABLES
- T — TELEPHONE CABLES
- F — FIBER-OPTIC

## CONVENTIONS LEGEND




- (J) 1 CONDUCTOR #4 AWG TYPE USE, 600V
- (4G) #4 AWG STRANDED BARE COPPER GROUND WIRE
- # (X) (G) — TYPE AND SIZE OF CABLES IN CONDUIT; TOTAL NUMBER OF CABLE(S) IN CONDUIT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STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 26 (LIBERTY RD) AT I-695 INTERCHANGE

BALTIMORE, MD

REVISIONS

# LIGHTING PLAN

SCALE 1" = 20' DATE MAY 15, 2017 CONTRACT NO. XY1615185

DESIGNED BY NEK
DRAWN BY MAW
CHECKED BY TJS
MDE/PRD SEE TITLE SHEET

COUNTY BALTIMORE
LOGMILE 03002608.31 – 8.40
TIMS NO. M486
TOD NO.

DRAWING NO. LT – 01 OF 05 SHEET NO. 02 OF 06

PLOTTED: Monday, May 15, 2017 AT 03:17 PM
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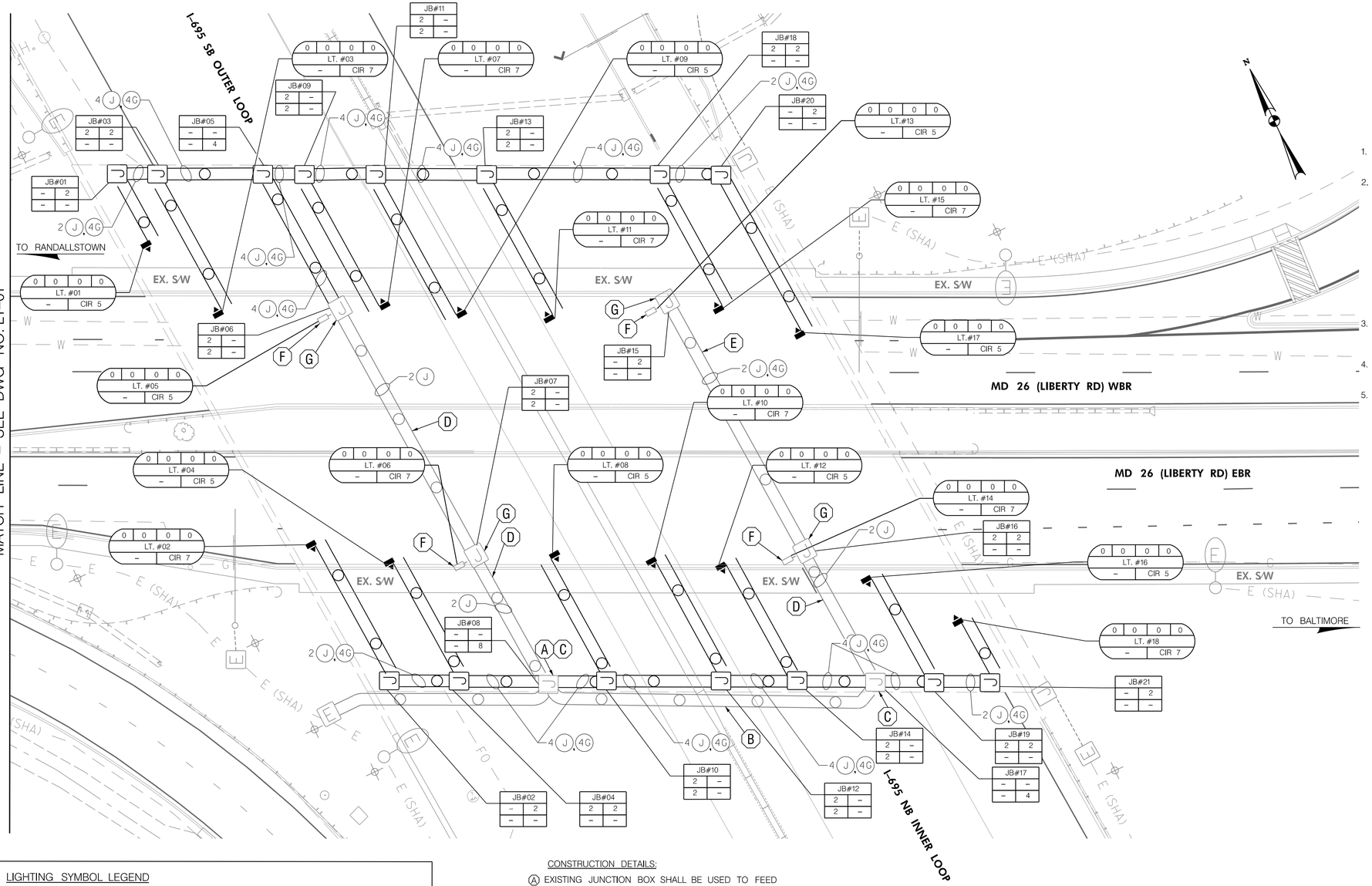
BORDER REV: DATE: March 27, 2007

DRILL HOLES

BY: WagnerM –




NOTES:

1. EXISTING DUCT CABLE AND MANHOLES SERVING EXISTING LIGHTING TO REMAIN.
2. CONDUIT FROM CLOSEST JUNCTION BOX TO UNDERPASS LUMINAIRE SHALL BE $1\frac{1}{2}$ INCH RIGID STEEL CONDUIT. CONNECTIONS FROM JUNCTION BOX TO RIGID CONDUIT AND FROM LUMINAIRE TO RIGID CONDUIT WILL INCLUDE A SECTION OF FLEXIBLE CONDUIT. $1\frac{1}{2}$ INCH RIGID STEEL CONDUIT SHALL CONTAIN THREE (3) NO. 10 AWG TYPE THWN/THHN, 600V WIRES. TWO (2) NO. 10 AWG CABLES SHALL CONNECT THE UNDERPASS LUMINAIRE TO THE CONNECTOR KITS IN THE JUNCTION BOX NEAREST THE UNDERPASS LUMINAIRE. ONE (1) NO. 10 AWG SHALL UTILIZE GREEN INSULATION AND CONNECT BETWEEN THE GROUND TERMINAL IN THE LUMINAIRE AND THE NO. 4 AWG GROUND WIRE IN THE JUNCTION BOX.
3. ALL MOUNTING HARDWARE REQUIRED FOR THE INSTALLATION OF JUNCTION BOXES SHALL BE INCIDENTAL TO THE COST OF FURNISHING EACH ITEM.
4. REFER TO DRAWINGS LT-04 & LT-05 FOR UNDERPASS LUMINAIRE AND CONDUIT MOUNTING DETAILS.
5. REFER TO THE UNDERPASS LIGHTING LAYOUT ON LT-03 FOR LUMINAIRE PLACEMENT DIMENSIONS.

LIGHTING SYMBOL LEGEND

- PROPOSED 97W LED UNDERPASS LIGHT & ORIENTATION (TYPE II DISTRIBUTION)
- EXISTING UNDERPASS LIGHT, TO REMAIN
- EXISTING LIGHT STRUCTURE, TO REMAIN
- EXISTING CANTILEVER STRUCTURE, TO REMAIN
- EXISTING 4" SCHEDULE 80 PVC CONDUIT, BORED
- EXISTING SCHEDULE 80 PVC CONDUIT, TRENCHED
- EXISTING 2" STEEL CONDUIT
- PROPOSED $1\frac{1}{2}$" RIGID GALVANIZED STEEL CONDUIT
- PROPOSED 12"X 12"X 6" JUNCTION BOX
- EXISTING LIGHTING CABINET
- EXISTING LIGHTING MANHOLE
- EXISTING LIGHTING JUNCTION BOX
- EXISTING DUCT CABLE TO REMAIN
- EXISTING METERED SERVICE PEDESTAL, TO REMAIN
- EXISTING GROUND ROD

GEOMETRIC LEGEND

- EXISTING
- PROPOSED

UTILITY LEGEND

- SD — STORM DRAIN
- G — GAS MAIN
- W — WATER MAIN
- S — SEWER MAIN
- E — ELECTRIC CABLES
- A — AERIAL CABLES
- T — TELEPHONE CABLES
- F — FIBER-OPTIC

CONVENTIONS LEGEND

- QUANTITY OF CONNECTOR KITS
- LIGHT NUMBER
- CIRCUIT NUMBER
- J — 1 CONDUCTOR #4 AWG TYPE USE, 600V
- 4G — #4 AWG STRANDED BARE COPPER GROUND WIRE
- # X G — TYPE AND SIZE OF CABLES IN CONDUIT; TOTAL NUMBER OF CABLE(S) IN CONDUIT
- # OF TYPE I CONNECTOR KITS
- MANHOLE NUMBER/ JUNCTION BOX NUMBER
- # OF TYPE II CONNECTOR KITS
- # OF TYPE IV CONNECTOR KITS
- # OF TYPE III CONNECTOR KITS

CONSTRUCTION DETAILS:

(A) EXISTING JUNCTION BOX SHALL BE USED TO FEED PROPOSED $1\frac{1}{2}$" GALVANIZED STEEL CONDUITS.

(B) EMBEDDED CONDUIT BETWEEN EXISTING JUNCTION BOXES SHALL BE ABANDONED IN PLACE. WIRE WITHIN EMBEDDED CONDUIT SHALL BE REMOVED AND CAPPED.

(C) EXISTING JUNCTION BOX SHALL BE USED TO HOUSE CONNECTOR KITS AND FEEDERS ASSOCIATED WITH PROPOSED LUMINAIRE INSTALLATION.

(D) USE EXISTING CONDUIT. EXISTING CABLES TO REMAIN. INSTALL PROPOSED CABLES AS SHOWN.

(E) USE EXISTING CONDUIT. REMOVE EXISTING CABLES AND INSTALL PROPOSED CABLES AS SHOWN

(F) EXISTING UNDERPASS LUMINAIRE AND ASSOCIATED HARDWARE TO REMAIN.

(G) USE EXISTING JUNCTION BOX AND REMOVE EXISTING CONNECTOR KITS. INSTALL PROPOSED CONNECTOR KITS AS SHOWN.

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STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 26 (LIBERTY RD) AT I-695 INTERCHANGE

BALTIMORE, MD

REVISIONS

# LIGHTING PLAN

SCALE 1" = 20' DATE MAY 15, 2017 CONTRACT NO. XY1615185

DESIGNED BY NEK COUNTY BALTIMORE
DRAWN BY MAW LOGMILE 03002608.31 – 8.40
CHECKED BY TJS TIMS NO. M486
MDE/PRD SEE TITLE SHEET TOD NO.

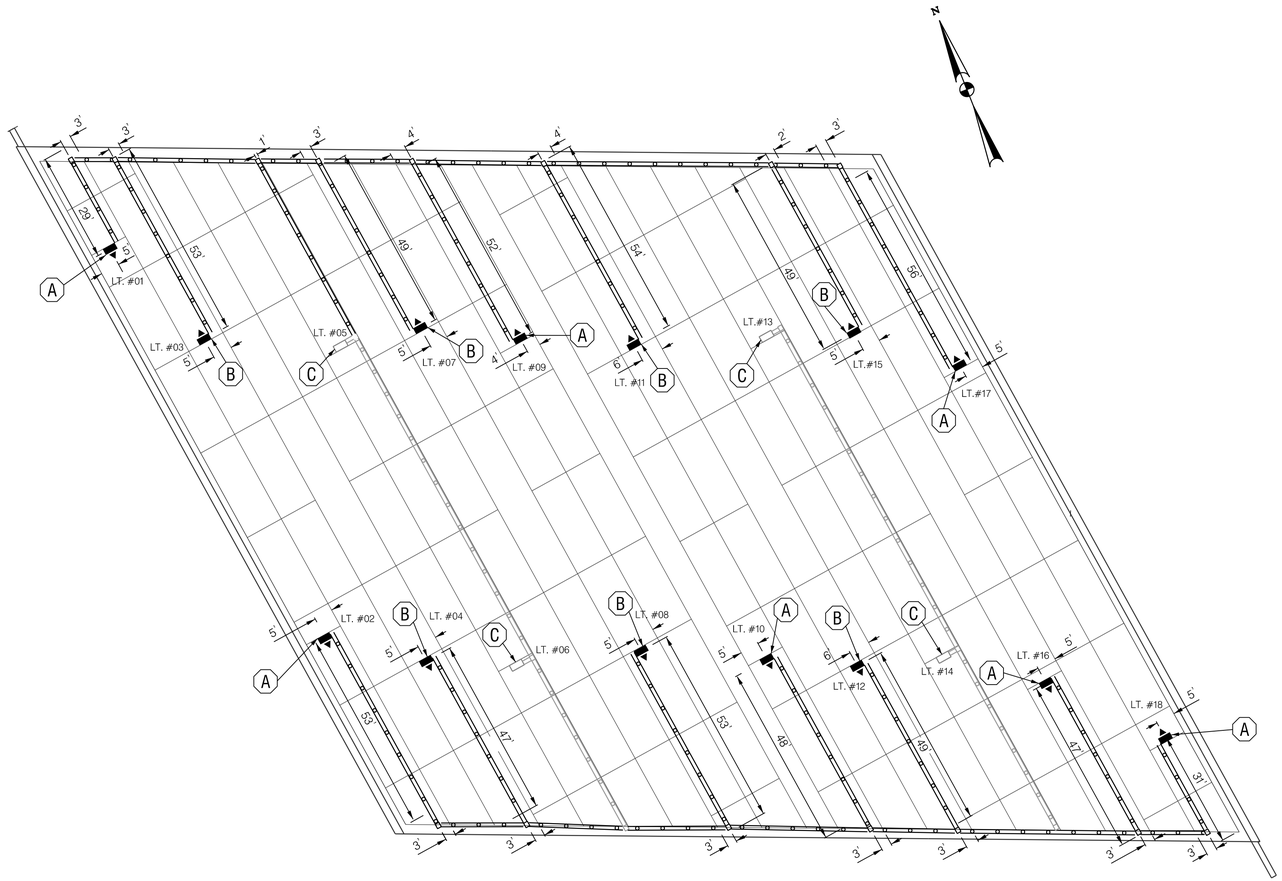
DRAWING NO. LT – 02 OF 05 SHEET NO. 03 OF 06

PLOTTED: Monday, May 15, 2017 AT 03:17 PM
FILE: T:\173124A–TrafficDesignServices\TRF\251\Plans\pLT–P002_MD26&695.dgn

BORDER REV: DATE: March 27, 2007

BY: WagnerM –

DRILL HOLES




LED UNDERPASS LIGHT AND JUNCTION BOX LAYOUT

NOTES:

1. LIGHT FIXTURES NOT SHOWN TO SCALE

CONSTRUCTION DETAILS:

Ⓐ INSTALL LED UNDERPASS LIGHT, LIGHTING CONDUIT, ANGLE SUPPORT (8 INCH x 6 INCH X 1/2 INCH) AS DETAILED ON LT-04

Ⓑ INSTALL LED UNDERPASS LIGHT, LIGHTING CONDUIT ON EXISTING DIAPHRAGM AS DETAILED ON LT-04

Ⓒ EXISTING UNDERPASS LUMINAIRE ON ANGLE SUPPORT TO REMAIN

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BALTIMORE, MD

REVISIONS

# UNDERPASS LIGHTING LAYOUT

SCALE 1" = 20' DATE MAY 15, 2017 CONTRACT NO. XY1615185

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CHECKED BY TJS
MDE/PRD SEE TITLE SHEET

COUNTY BALTIMORE
LOGMILE 03002608.31 – 8.40
TIMS NO. M486
TOD NO.

DRAWING NO. LT – 03 OF 05

SHEET NO. 04 OF 06

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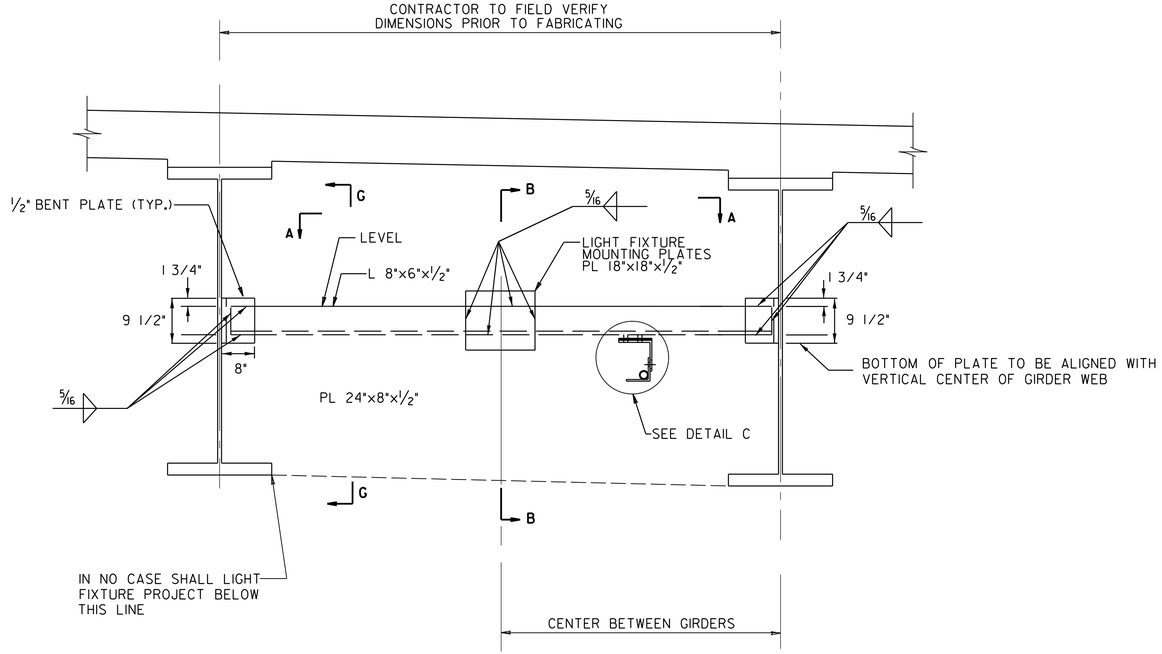
DRILL HOLES

DRILL HOLES

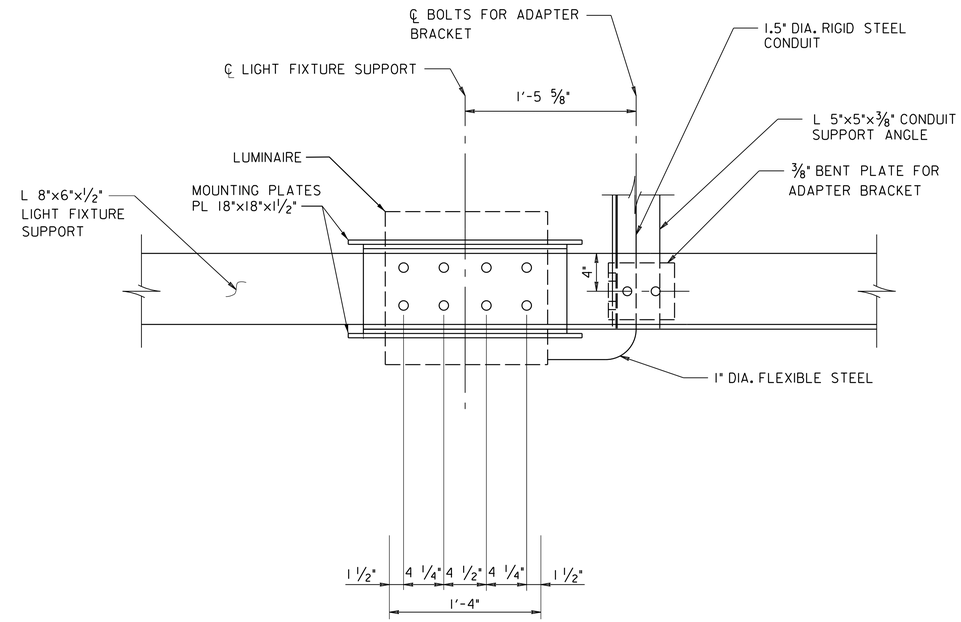
DRILL HOLES

BY: WagnerM –




LIGHT FIXTURE SUPPORT (LT.# 01,02,09,10,16,17,18)

SCALE: ¾" = 1'-0"

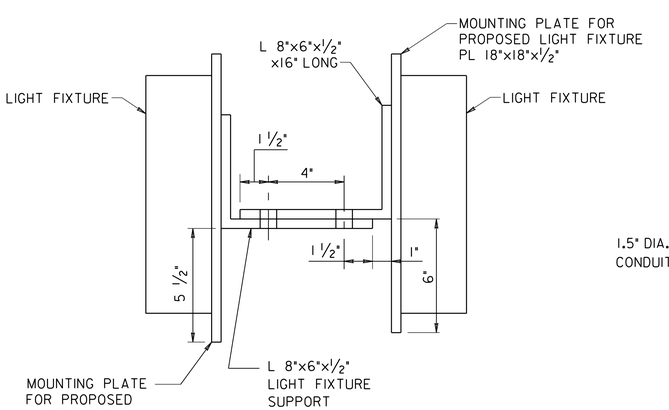



VIEW A–A

SCALE: 1 ½" = 1'-0"

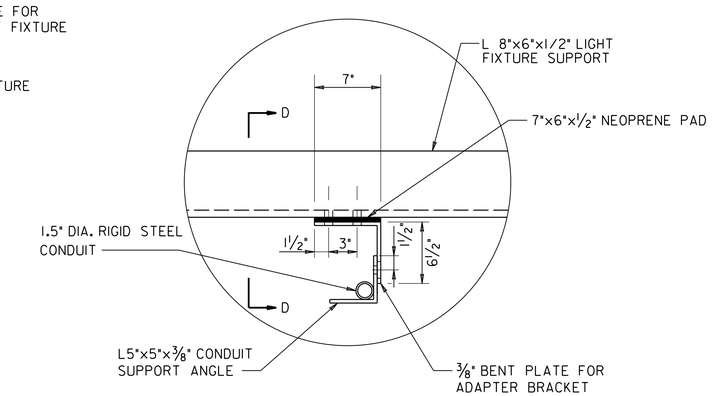
NOTES:

1. THE STEEL SUPPLIER SHALL COORDINATE WITH THE LIGHTING SUPPLIER FOR THE LOCATION OF HOLES FOR MOUNTING LIGHT FIXTURE.
2. THE BOTTOM OF THE LIGHT FIXTURE SHALL NOT EXTEND BELOW THE BOTTOM OF THE BEAM
3. ALL BOLTS TO BE ⅞" Ø A 325 IN 15/16 " Ø HOLES BOLTS FOR ATTACHING LUMINAIRE TO BRACKET AND BRACKET TO LUMINAIRE SUPPORT SHALL BE AS SPECIFIED OR PROVIDED BY THE MANUFACTURER.
4. WELDING, FABRICATION, ALL MOUNTING HARDWARE, AND INSTALLATION SHALL BE INCIDENTAL TO THE ANGLE IRON AND LUMINAIRE ASSEMBLY BID ITEMS.
5. LUMINAIRE MOUNTING PLATE SHALL BE SIZED AS SHOWN OR SIZED TO PROVIDE A MINIMUM OF 2" CLEAR AROUND THE OUTER EDGE OF ANY ATTACHMENT BOLT HOLE FOR THE BRACKET



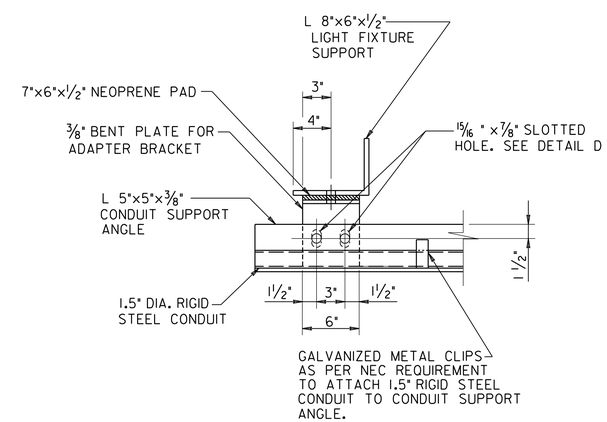

SECTION B–B

SCALE: 3" = 1'-0"



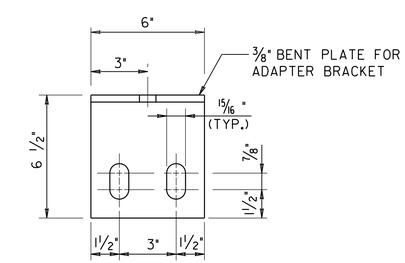

DETAIL C

SCALE: 1 ½" = 1'-0"




VIEW D–D – ADAPTER BRACKET

SCALE: 1 ½" = 1'-0"




DETAIL D

SCALE: 3" = 1'-0"

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DEPARTMENT OF TRANSPORTATION
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TRAFFIC ENGINEERING DESIGN DIVISION

MD 26 (LIBERTY RD) AT I–695 INTERCHANGE

BALTIMORE, MD

REVISIONS

# UNDERPASS LIGHTING DETAILS

| | | | |
|---|---|---|---|
| SCALE NONE | DATE MAY 15, 2017 | CONTRACT NO. XY1615185 | |
| DESIGNED BY NEK | | COUNTY BALTIMORE | |
| DRAWN BY MAW | | LOGMILE 03002608.31 – 8.40 | |
| CHECKED BY TJS | | TIMS NO. M486 | |
| MDE/PRD SEE TITLE SHEET | | TOD NO. | |
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DRILL HOLES
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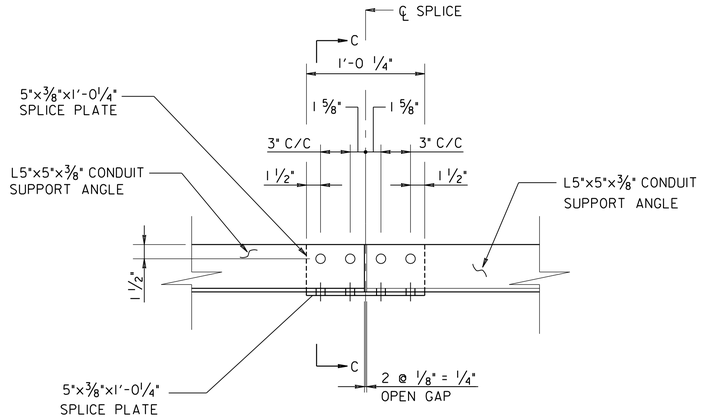
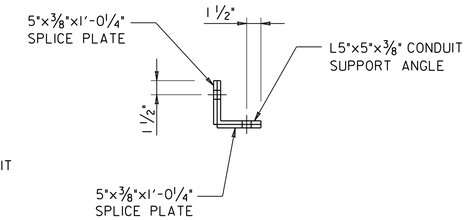



SPLICE FOR CONDUIT SUPPORT ANGLE – ELEVATION

SCALE: 1 1/2" = 1'-0"



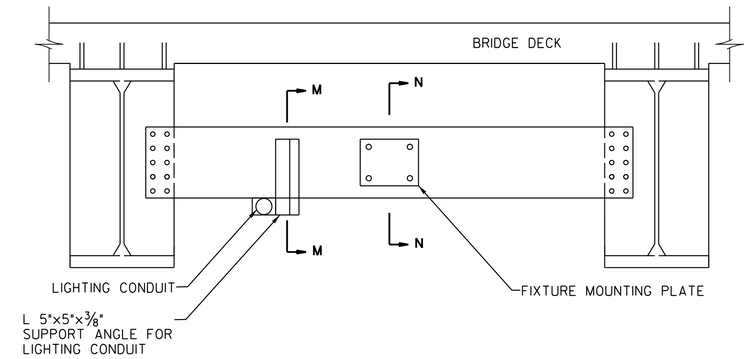

SECTION C–C

SCALE: 1 1/2" = 1'-0"

UL LISTED GALVANIZED CONDUIT CLAMP, THROUGH BOLTED THROUGH SUPPORT ANGLE. BOLTS SIZED TO FACTORY CLAMP HOLE AND AS SPECIFIED IN SECTION 909.06

DETAIL F

SCALE: 1 1/2" = 1'-0"

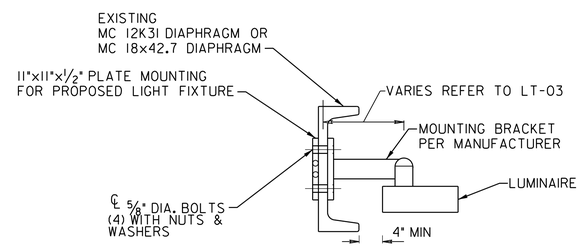



LIGHT FIXTURE SUPPORT AT DIAPHRAGM DETAIL (LT.#03,04,07,08,11,12,15)

SCALE: N.T.S.

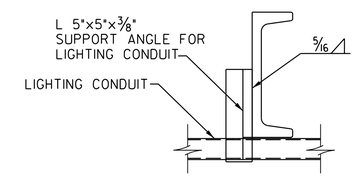
NOTES:

1. THE CONTRACTOR SHALL PROVIDE 1/2" NEOPRENE PADS BETWEEN THE DIAPHRAGMS AND THE CONDUIT SUPPORT ANGLE AND BETWEEN ADAPTER AND BRACKET LIGHT FIXTURE SUPPORT TO ATTENUATE VIBRATION FROM THE BRIDGE.
2. ALL CONDUIT ATTACHED TO CONDUIT SUPPORT ANGLE SHALL BE AS SPECIFIED ON THE LIGHTING PLANS.
3. APPROPRIATE GROUNDING SHALL BE PROVIDED IN THE CONDUIT.
4. ALL STRUCTURAL STEEL AND HARDWARE ATTACHED TO THE BRIDGE SHALL BE PAINTED DARK BROWN. (FEDERAL STD. NO. 595-20045)
5. BOLT HOLES IN DIAPHRAGMS AND GIRDERS SHALL BE DRILLED. THE BURNING OF HOLES WILL NOT BE PERMITTED. THE AFFECTED AREA SHALL BE CLEANED WITH A METAL WIRE BRUSH AND PAINTED TO MATCH THE BRIDGE PAINT SYSTEM BEFORE INSTALLATION OF CONDUIT SUPPORT ANGLE.
6. ALL BOLTS USED TO ATTACH GALVANIZED METAL CONDUIT CLIPS TO THE CONDUIT SUPPORT ANGLE OR BACKWALL SHALL USE LOCK WASHERS OR LOCK NUTS.
7. FIELD SPLICE TO BE LOCATED AS REQUIRED. NO MORE THAN 10 FIELD SPLICES PER CONDUIT SUPPORT WILL BE ALLOWED. FIELD SPLICES SHALL NOT BE LOCATED OVER SUPPORTS.
8. ALL BOLTS TO BE 7/8" Ø A 325 IN 15/16 " Ø HOLES UNLESS OTHERWISE INDICATED.
9. FOR CONDUIT SUPPORT ANGLE SPLICES, ALL BOLTS SHALL BE PLACED SO THAT THE BOLT HEAD IS ON THE INSIDE OF THE ANGLE.
10. CONDUIT SHALL BE ATTACHED TO CONDUIT SUPPORT ANGLE WITH GALVANIZED METAL CLIPS PER NEC REQUIREMENTS.
11. REINFORCING STEEL IN CONCRETE ABUTMENTS SHALL BE LOCATED WITH PACHOMETER SO MOUNTING HARDWARE DOES NOT INTERFERE WITH IT.
12. HOLES IN THE DIAPHRAGM AND GIRDER SHALL BE DRILLED ONLY AFTER FINAL CONDUIT AND LUMINAIRE POSITIONING HAS BEEN DETERMINED.



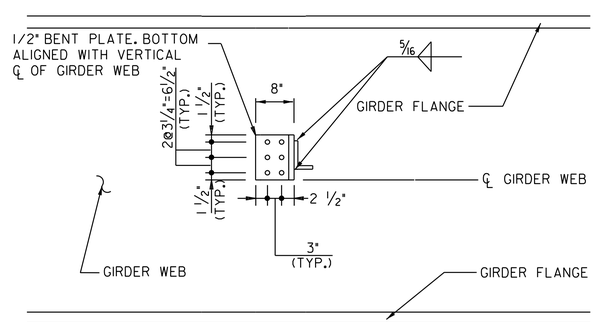

SECTION N–N

SCALE: N.T.S.




SECTION M–M

SCALE: N.T.S.




SECTION G–G

SCALE: N.T.S.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STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

OFFICE OF TRAFFIC & SAFETY
TRAFFIC ENGINEERING DESIGN DIVISION

MD 26 (LIBERTY RD) AT I-695 INTERCHANGE

BALTIMORE, MD

REVISIONS

# UNDERPASS LIGHTING DETAILS

| | | | |
|---|---|---|---|
| SCALE NONE | DATE MAY 15, 2017 | CONTRACT NO. XY1615185 | |
| DESIGNED BY NEK | | COUNTY BALTIMORE | |
| DRAWN BY MAW | | LOGMILE 03002608.31 – 8.40 | |
| CHECKED BY TJS | | TIMS NO. M486 | |
| MDE/PRD SEE TITLE SHEET | | TOD NO. | |
| DRAWING NO. LT – 05 | OF 05 | SHEET NO. 06 | OF 06 |

PLOTTED: Monday, May 15, 2017 AT 03:17 PM
FILE: T:\173124A-TrafficDesignServices\TRF\251\Plans\pLT-P005_MD26&695.dgn

BORDER REV: DATE: March 27, 2007
BY: WagnerM
DRILL HOLES

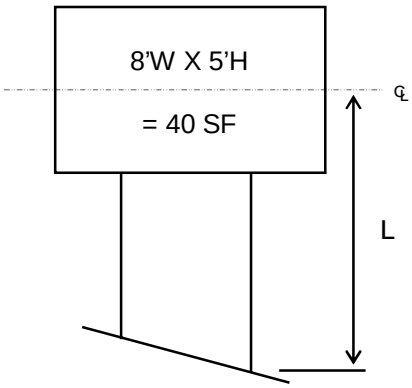
# Appendix A-5

## GROUND MOUNTED SUPPORT CHARTS

## WOOD SUPPORTS

Wood supports are selected using the tables included in this section of the Appendix. For standard signs, the Book of Standards gives the required number and size of wood supports. The tables given here list the maximum sign area for each combination of longest support, post size, and number of supports. To read these tables, find your longest support length (L) in the left most column, read across that row to find the sign area (Square Feet) equal to or next larger than your sign, and read up to find the size and number of supports.

As an example, consider the support size necessary for the following sign:




Using the wood support chart for Districts 1,2, and 5 with L= 9.5 Feet and an area of 40 SF, we can use 2-6"x8" supports (62 SF). This presents the designer with some choices, because two 6"x8" supports must be 7'-0" apart to meet breakaway requirements. These are:

1. The first choice in this situation would be to use the 6"x8" supports and clearly mark on the plans that a minimum of 7'-0" spacing must be used. This deviates from SHA spacing standards. This allows the preferred support size to be used.

2. The second choice in this situation would be to mount the sign on two 6"x8" supports or three 6"x6" supports (nonbreakaway) and to install w-beam to protect the sign.

3. The third, will be to use breakaway steel supports. This would be extremely overdesigned.

These types of situations are frequently encountered when designing sign supports. The designer should use engineering judgement to ensure that the type of support is matched with the intended function of the sign.

## NON-BREAKAWAY STEEL SUPPORTS

Non-Breakaway steel supports are selected based on the sign width (W), the sign height (H), and $L_{MAX}$, the maximum distance between the top of footing and the bottom of sign. Use the following steps to determine the appropriate support size. Note that $L_{MAX}$ is calculated based on your support spacing and roadside elevations (see the chapters on Field Review and Sign Supports).

- The information in these tables is grouped by sign width, so in the left most column of the table, find the appropriate sign width. Since the table is incremented every two feet, use the next higher grouping for odd values of W.

- Within width group W, find the appropriate value of $L_{MAX}$ in column 2.

- From $L_{MAX}$, read horizontally until you reach the column representing the height of your sign (H).

- You now have the required steel support size.

The sizes listed in the table take the form W6x9, and represent the structural shape, followed by the beam depth, followed by the weight of the beam in pounds per foot. All of the sizes used in this table have a Category Code Number, however, if you are working with an existing contract you should try to work with the sizes used in the contract. Areawide contracts typically use W6x9, W6x15, W8x21, W10x26, W14x30, W16x31, W18x35, W18x40, and W21x44 supports. For non-breakaway foundation details refer to Standard MD 801.04.

## BREAKAWAY STEEL SUPPORTS

Breakaway steel supports are selected based on the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" requirements. These requirements include the wind speed, structure design life, yield stress, width and height of sign panel, number of sign posts, distance between posts and the maximum under sign clearance. SHA requires designers to use the Transpo Industries "Break-Safe" sign post selection program for selecting the appropriate steel supports in their design. This software incorporates the AASHTO requirements listed above and allows users to input data for each parameter.

Square Tube and I-Beam are the two types of breakaway steel supports to be used in Maryland. Based on AASHTO guidelines, the clear distance between the inside edge of the two breakaway steel supports using the Transpo 'B' system must be greater than 7 feet. Therefore, for signs that cannot accommodate two supports while maintaining 7' of clear distance, one breakaway steel square tube post must be used. For all other applications with clear distances exceeding 7' between supports, I-Beams must be used. The 'Break-Safe' sign post selection software has programs for both I-Beam and Square Tube supports.

The designer must select either the I-Beam or the Square Tube Program from the list of programs in the 'Break-Safe' menu. Both programs require the following parameters to be input the designer:

- Basic Wind Speed for Location (mph): Input **100 mph** for all applications.

- Structure Design Life / Recurrence Interval (10, 25, 50, or 100 years): Input **10 years** for all applications in accordance with the AASHTO recommendation for typical roadside sign structures.

- Yield Stress for Steel I-Beam Post (psi): Use **36,000 psi** (ASTM A36) for standard steel I-beam shapes.

  Use **46,000 psi** (ASTM A500), Grade B for structural square steel tube post.

- Width of Sign Panel (ft): Measured horizontally from left edge to right edge of sign panel.

- Height of Sign Panel (ft): Measured vertically from top edge to bottom edge of sign panel.

- Maximum Under Sign Clearance (ft): Measured vertically from the bottom edge of the sign panel to the ground at the location of the longest post. May include fractions of a foot, for example 12.75 ft. Note that multiple-post breakaway signs must have an under sign clearance of at least 7.0 ft, in accordance with Section 12.5.3 of the AASHTO Specifications.

- Number of Posts (1, 2, 3, 4, or 5): Must be an integer. The program assumes that all posts in the sign structure are the same size, type and material.

- Clear Distance Between Adjacent Posts (ft): Measured horizontally from inside edge of one post to inside edge of the adjacent post. May include fractions of a foot, for example 7.25 ft. This distance is zero (0) for single-post signs. For multiple-post signs, the program assumes that all posts are evenly spaced i.e. *both* distances between adjacent posts in a 3-post sign are equal.

When all the parameters have been input by the designer, the program outputs the correct minimum steel support size required to satisfy loading conditions that correspond to the input parameters.

The steel I-Beam size calculated by the I-Beam program is in the form W6x12, and represents the structural shape, followed by the beam depth, followed by the weight of the beam in pounds per foot.

The steel square tube calculated by the Square Tube Post Program is in the form 4 x 4 x 3/16, and represents the width of each side followed by the thickness of the steel.

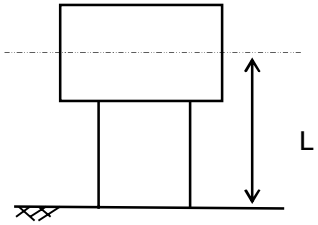
The designer now has the correct steel support size to be used in the design.

For breakaway foundation details refer to Standards MD 801.04, MD 801.04-01 and MD 801.04-02.

NOTE: W6X9 I-Beam supports shall not be placed on Breakaway System 'B' as per SHA requirements. W6X9 I-Beam supports shall only be installed on Breakaway System 'A'.

# Breakaway Wood Support Selection Chart
## Districts 1, 2 and 5

| L (FEET) | Allowable Sign Area (SF) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | One Post | | | | Two Post | | | | Three Post | | | |
| | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” |
| **7** | 7 | 16 | 25 | 45 | 14 | 33 | 50 | 90 | 21 | 49 | 75 | 134 |
| **8** | 6 | 14 | 22 | 39 | 12 | 29 | 43 | 78 | 18 | 43 | 65 | 117 |
| **9** | 5 | 13 | 19 | 35 | 11 | 25 | 38 | 69 | 16 | 38 | 58 | 104 |
| **10** | 5 | 11 | 17 | 31 | 10 | 22 | 34 | 62 | 14 | 33 | 52 | 93 |
| **11** | 4 | 10 | 16 | 28 | 8 | 20 | 31 | 56 | 13 | 30 | 47 | 84 |
| **12** | 4 | 9 | 14 | 26 | 8 | 18 | 28 | 51 | 11 | 27 | 43 | 77 |
| **13** | 3 | 8 | 13 | 24 | 7 | 16 | 26 | 47 | 10 | 24 | 39 | 71 |
| **14** | 3 | 7 | 12 | 22 | 6 | 16 | 24 | 44 | 9 | 22 | 36 | 65 |
| **15** | 3 | 7 | 11 | 20 | 6 | 13 | 22 | 40 | 8 | 20 | 33 | 61 |



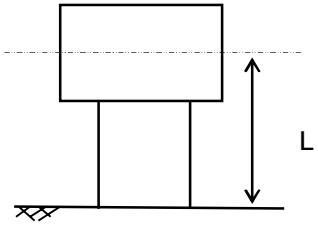

Based on 65 MPH Wind Speed.

# Breakaway Wood Support Selection Chart

## Districts 3, 4, 6 and 7

| L (FEET) | Allowable Sign Area (SF) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | One Post | | | | Two Post | | | | Three Post | | | |
| | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” |
| **7** | 8 | 19 | 29 | 53 | 17 | 39 | 58 | 105 | 25 | 58 | 87 | 158 |
| **8** | 7 | 17 | 25 | 46 | 14 | 33 | 51 | 92 | 22 | 50 | 76 | 138 |
| **9** | 6 | 15 | 23 | 41 | 13 | 29 | 45 | 81 | 19 | 44 | 68 | 122 |
| **10** | 6 | 13 | 20 | 36 | 11 | 26 | 40 | 73 | 17 | 39 | 61 | 109 |
| **11** | 5 | 12 | 18 | 33 | 10 | 23 | 37 | 66 | 15 | 35 | 55 | 99 |
| **12** | 4 | 10 | 17 | 30 | 9 | 21 | 33 | 60 | 13 | 31 | 50 | 90 |
| **13** | 4 | 9 | 15 | 28 | 8 | 19 | 31 | 55 | 12 | 28 | 46 | 83 |
| **14** | 4 | 9 | 14 | 26 | 7 | 17 | 28 | 51 | 11 | 26 | 42 | 77 |
| **15** | 3 | 8 | 13 | 24 | 7 | 16 | 26 | 47 | 10 | 24 | 39 | 71 |

Based on 60 MPH Wind Speed.

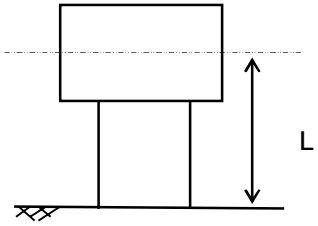


# Non-Breakaway Wood Support Selection Chart

## Districts 1, 2 and 5

| L (FEET) | Allowable Sign Area (SF) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | One Post | | | | Two Post | | | | Three Post | | | |
| | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” |
| **7** | 7 | 18 | 29 | 53 | 14 | 36 | 57 | 107 | 21 | 53 | 86 | 160 |
| **8** | 6 | 15 | 25 | 47 | 12 | 31 | 50 | 93 | 18 | 45 | 75 | 140 |
| **9** | 5 | 14 | 22 | 41 | 11 | 27 | 44 | 82 | 16 | 42 | 66 | 124 |
| **10** | 5 | 12 | 20 | 37 | 9 | 24 | 40 | 74 | 14 | 36 | 59 | 111 |
| **11** | 4 | 11 | 18 | 33 | 8 | 22 | 36 | 67 | 13 | 33 | 54 | 100 |
| **12** | 4 | 10 | 16 | 30 | 8 | 19 | 33 | 61 | 11 | 30 | 49 | 92 |
| **13** | 3 | 9 | 15 | 28 | 7 | 18 | 30 | 56 | 10 | 27 | 45 | 84 |
| **14** | 3 | 8 | 14 | 26 | 6 | 16 | 27 | 52 | 9 | 24 | 42 | 78 |
| **15** | 3 | 7 | 13 | 24 | 6 | 15 | 26 | 48 | 8 | 21 | 39 | 72 |

Based on 65 MPH Wind Speed.

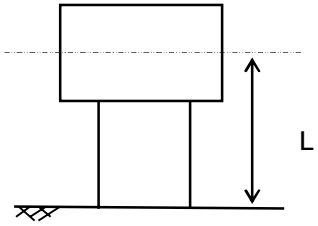


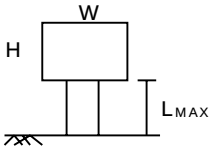
# Non-Breakaway Wood Support Selection Chart

## Districts 3, 4, 6 and 7

| L (FEET) | Allowable Sign Area (SF) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | One Post | | | | Two Post | | | | Three Post | | | |
| | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” | 4”x4” | 4”x6” | 6”x6” | 6”x8” |
| **7** | 8 | 21 | 34 | 63 | 17 | 42 | 67 | 125 | 25 | 63 | 101 | 188 |
| **8** | 7 | 18 | 29 | 55 | 14 | 36 | 59 | 109 | 22 | 54 | 88 | 164 |
| **9** | 6 | 16 | 26 | 48 | 13 | 32 | 52 | 97 | 19 | 48 | 78 | 145 |
| **10** | 5 | 14 | 23 | 43 | 11 | 28 | 47 | 87 | 17 | 42 | 70 | 130 |
| **11** | 5 | 13 | 21 | 39 | 10 | 25 | 42 | 79 | 15 | 38 | 63 | 118 |
| **12** | 4 | 11 | 19 | 36 | 9 | 23 | 38 | 72 | 13 | 34 | 58 | 108 |
| **13** | 4 | 10 | 18 | 33 | 8 | 21 | 35 | 66 | 12 | 31 | 53 | 99 |
| **14** | 4 | 9 | 16 | 30 | 7 | 19 | 32 | 61 | 11 | 28 | 49 | 91 |
| **15** | 3 | 9 | 15 | 28 | 7 | 17 | 30 | 56 | 10 | 26 | 45 | 85 |

Based on 60 MPH Wind Speed.



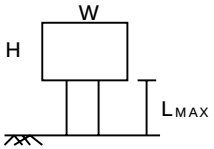



Office of Traffic and Safety
Traffic Engineering Design Division
Traffic Control Devices Design Manual

## Non-Breakaway Steel Supports
## Two Post Selection Chart (A36 Steel)

## 100 MPH
## 10 Year Recurrence

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 6 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x12 | - | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | - | - | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - |
| | 12 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - |
| | 14 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - |
| | 16 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - |
| | 18 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - |
| | 20 | W6x12 | W6x15 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - |
| 8 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W10x22 |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W10x22 |
| | 12 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W10x22 |
| | 14 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | - | - | - | - | - |
| | 16 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | - | - | - | - | - | - | - |
| | 18 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - |
| 10 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 12 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 14 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | - | - | - | - | - | - |
| | 16 | W6x12 | W6x15 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | - | - | - | - | - | - | - | - |
| | 18 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 12 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W14x30 | W14x30 |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W14x30 |
| | 10 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W14x30 |
| | 12 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W14x30 |
| | 14 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W10x26 | W12x26 | W14x30 | W18x35 |
| | 16 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W10x26 | W10x26 | W14x30 | W14x30 | W18x35 | - |
| | 18 | W6x15 | W6x15 | W8x18 | W8x18 | W18x21 | W8x21 | W10x22 | W10x26 | W10x26 | W14x30 | W14x30 | - | - | - | - |
| | 20 | W6x15 | W8x18 | W8x18 | W8x21 | W18x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - |

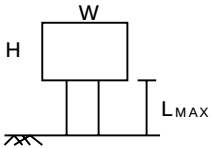



Office of Traffic and Safety
Traffic Engineering Design Division
Traffic Control Devices Design Manual

## Non-Breakaway Steel Supports
## Two Post Selection Chart (A36 Steel)

## 100 MPH
## 10 Year Recurrence

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 14 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W10x22 | W16x31 | W18x35 |
| | 8 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 |
| | 10 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 |
| | 12 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 |
| | 14 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W10x26 | W14x30 | W18x35 | W18x35 | - |
| | 16 | W6x15 | W6x15 | W8x18 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W10x26 | W10x26 | W14x30 | W18x35 | - | - | - |
| | 18 | W6x15 | W8x18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | W14x30 | - | - | - | - | - |
| | 20 | W6x15 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - |
| 16 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W18x35 | W21x44 |
| | 8 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W12x26 | W12x26 | W14x30 | W18x35 | W21x44 |
| | 10 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W12x26 | W12x26 | W14x30 | W18x35 | W21x44 |
| | 12 | W6x9 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 |
| | 14 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | - | - |
| | 16 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W10x26 | W14x30 | W18x35 | - | - | - | - |
| | 18 | W6x15 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | W14x30 | - | - | - | - | - | - | - |
| 18 | 6 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W18x35 | W21x44 |
| | 8 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 |
| | 10 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 |
| | 12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - |
| | 14 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | W18x35 | - | - | - |
| | 16 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - |
| | 18 | W8x18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W14x30 | W14x30 | - | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - |
| 20 | 6 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W12x26 | W12x26 | W14x30 | W21x44 | - |
| | 8 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - |
| | 10 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | - W16x31 | W18x35 | W21x44 | - |
| | 12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - | - |
| | 14 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | W18x35 | - | - | - | - |
| | 16 | W8x18 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - | - |
| | 18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - |

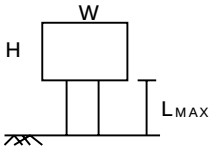



Office of Traffic and Safety
Traffic Engineering Design Division
Traffic Control Devices Design Manual

## Non-Breakaway Steel Supports
## Two Post Selection Chart (A36 Steel)

## 100 MPH
## 10 Year Recurrence

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 22 | 6 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | - | - |
| | 8 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W14x30 | W16x31 | W18x35 | W21x44 | - | - |
| | 10 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - | - |
| | 12 | W6x12 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - | - | - |
| | 14 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W14x30 | W16x31 | W18x35 | - | - | - | - | - |
| | 16 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W14x30 | W18x35 | - | - | - | - | - | - | - |
| | 18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - |
| | 20 | W8x21 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - |
| 24 | 6 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | - | - |
| | 8 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W14x30 | W16x31 | W21x44 | W21x44 | - | - |
| | 10 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x26 | W12x26 | W16x31 | W18x35 | W21x44 | - | - | - |
| | 12 | W6x12 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W16x31 | W18x35 | W21x44 | - | - | - | - |
| | 14 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W16x31 | W18x35 | - | - | - | - | - | - |
| | 16 | W8x18 | W8x18 | W8x21 | W10x26 | W10x26 | W12x26 | W18x35 | W18x35 | - | - | - | - | - | - | - |
| | 18 | W8x18 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - |
| | 20 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - | - |
| 26 | 6 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x40 | - | - |
| | 8 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W16x31 | W18x35 | W21x44 | - | - | - |
| | 10 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | W21x44 | - | - | - | - |
| | 12 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | W21x44 | - | - | - | - | - |
| | 14 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - | - | - |
| | 16 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - | - | - | - |
| | 18 | W8x21 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - |
| | 20 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - | - |
| 28 | 6 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - | - |
| | 8 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W18x35 | W21x44 | - | - | - | - |
| | 10 | W6x12 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W14x30 | W16x31 | W18x40 | W21x44 | - | - | - | - |
| | 12 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W14x30 | W16x31 | W21x44 | - | - | - | - | - | - |
| | 14 | W8x18 | W8x18 | W10x22 | W10x22 | W10x26 | W14x30 | W16x31 | - | - | - | - | - | - | - | - |
| | 16 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W18x35 | - | - | - | - | - | - | - | - | - |
| | 18 | W8x21 | W10x22 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W8x21 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - | - | - |

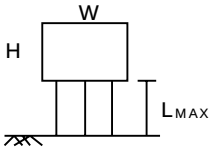



Office of Traffic and Safety
Traffic Engineering Design Division
Traffic Control Devices Design Manual

## Non-Breakaway Steel Supports
## Two Post Selection Chart (A36 Steel)

## 100 MPH
## 10 Year Recurrence

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 30 | 6 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W21x44 | W21x44 | - | - |
| | 8 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W18x35 | W21x44 | - | - | - | - |
| | 10 | W6x15 | W6x15 | W8x18 | W8x18 | W8x21 | W10x26 | W12x26 | W16x31 | W18x35 | W21x44 | - | - | - | - | - |
| | 12 | W6x15 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W16x31 | W18x35 | W21x44 | - | - | - | - | - | - |
| | 14 | W8x18 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - | - | - | - |
| | 16 | W8x18 | W8x21 | W10x26 | W10x26 | W14x30 | W18x35 | - | - | - | - | - | - | - | - | - |
| | 18 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W10x22 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - | - | - |





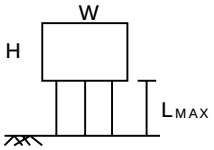

# Non-Breakaway Steel Supports

## Three Post Selection Chart (A36 Steel)

**100 MPH**

**10 Year Recurrence**

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 6 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 14 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 16 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 18 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x12 | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | - | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - |
| | 12 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - |
| | 14 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - |
| | 16 | W6x9 | W6x12 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - |
| | 18 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - |
| | 20 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - |
| 10 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | - | - | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | - | - | - | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - |
| | 12 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - |
| | 14 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - |
| | 16 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - |
| | 18 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - |
| | 20 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - |
| 12 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | - | - | - | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | - | - | - | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - |
| | 12 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - |
| | 14 | W6x9 | W6x12 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - |
| | 16 | W6x12 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - |
| | 18 | W6x12 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - |





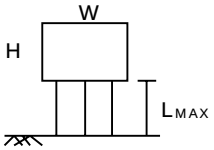

# Non-Breakaway Steel Supports

## Three Post Selection Chart (A36 Steel)

**100 MPH**

**10 Year Recurrence**

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 14 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x12 | - | - | - | - | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | - | - | - | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - |
| | 12 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - |
| | 14 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - |
| | 16 | W6x12 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - |
| | 18 | W6x12 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 12 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 14 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W8x21 | - | - | - | - | - | - |
| | 16 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | - | - | - | - | - | - | - | - | - |
| | 18 | W6x15 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 18 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - | - |
| | 12 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - | - |
| | 14 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x18 | W8x21 | - | - | - | - | - | - | - |
| | 16 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | - | - | - | - | - | - | - | - | - | - |
| | 18 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 20 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | - | - |
| | 8 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | - | - | - |
| | 10 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W10x22 | - | - | - |
| | 12 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | - | - | - | - |
| | 14 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | - | - | - | - | - | - | - | - |
| | 16 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | - | - | - | - | - | - | - | - | - | - |
| | 18 | W6x15 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 20 | W6x15 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




Office of Traffic and Safety
Traffic Engineering Design Division
Traffic Control Devices Design Manual

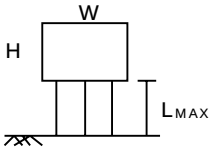
# Non-Breakaway Steel Supports

## Three Post Selection Chart (A36 Steel)

**100 MPH**

**10 Year Recurrence**

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 22 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W10x22 | W16x31 | W16x31 |
| | 8 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W16x31 |
| | 10 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W16x31 |
| | 12 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 |
| | 14 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W10x26 | W12x26 | W14x30 | W18x35 | W18x35 | - |
| | 16 | W6x15 | W6x15 | W8x18 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - |
| | 18 | W6x15 | W8x18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - |
| | 20 | W6x15 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - |
| 24 | 6 | W6x9 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W16x31 | W18x35 |
| | 8 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W12x26 | W12x26 | W14x30 | W16x31 | W18x35 |
| | 10 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W12x26 | W12x26 | W14x30 | W16x31 | W18x35 |
| | 12 | W6x9 | W6x15 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 |
| | 14 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | - | - |
| | 16 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - |
| | 18 | W6x15 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W10x26 | W14x30 | W14x30 | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - |
| 26 | 6 | W6x9 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W12x26 | W18x35 | W21x44 |
| | 8 | W6x9 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 |
| | 10 | W6x9 | W6x12 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 |
| | 12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W10x26 | W12x26 | W16x31 | W18x35 | W21x44 | W21x44 |
| | 14 | W6x15 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W10x26 | W12x26 | W16x31 | W18x35 | - | - | - |
| | 16 | W6x15 | W8x18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | W18x35 | W18x35 | - | - | - | - |
| | 18 | W8x18 | W8x18 | W8x21 | W18x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - |
| 28 | 6 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W21x44 | W21x44 |
| | 8 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x18 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | W21x44 |
| | 10 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | W21x44 |
| | 12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x40 | W21x44 | - |
| | 14 | W6x15 | W8x18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - |
| | 16 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - |
| | 18 | W8x18 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W10x22 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - |






# Non-Breakaway Steel Supports

## Three Post Selection Chart (A36 Steel)

**100 MPH**

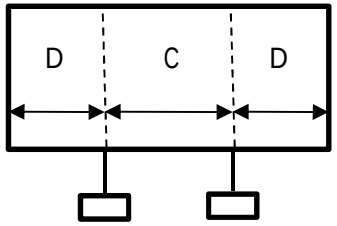
**10 Year Recurrence**

| W (FEET) | L MAX (FEET) | HEIGHT 'H' IN FEET | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 30 | 6 | W6x9 | W6x9 | W6x9 | W6x12 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W10x22 | W12x26 | W12x26 | W14x30 | W21x44 | - |
| | 8 | W6x9 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W8x21 | W10x22 | W10x22 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - |
| | 10 | W6x9 | W6x12 | W6x15 | W6x15 | W8x18 | W10x22 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - |
| | 12 | W6x12 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W16x31 | W18x35 | W21x44 | - | - |
| | 14 | W6x15 | W8x18 | W8x18 | W8x21 | W10x22 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | W18x35 | - | - | - | - |
| | 16 | W8x18 | W8x18 | W8x21 | W8x21 | W10x22 | W10x26 | W12x26 | W14x30 | W18x35 | - | - | - | - | - | - |
| | 18 | W8x18 | W8x21 | W8x21 | W10x26 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - |
| | 20 | W8x18 | W8x21 | W10x26 | W10x26 | W14x30 | - | - | - | - | - | - | - | - | - | - |

## Appendix A-6

## SIGN LIGHTING TABLES

The attached sign lighting tables have been developed by TEDD to represent current practice in Sign Lighting. These tables are updated on a periodic basis to reflect changes in design, application, maintenance, and technology. Always check that you are using the most recent revision of these tables before proceeding with your design.




# SIGN LIGHTING SCHEDULE

| PANEL WIDTH (FEET) | SPACING | | NUMBER LIGHTS NEEDED |
|---|---|---|---|
| | D (FEET) | C (FEET) | |
| 8 | 2 | 4 | 2 |
| 9 | 2 | 5 | 2 |
| 10 | 3 | 4 | 2 |
| 11 | 3 | 5 | 2 |
| 12 | 3 | 6 | 2 |
| 13 | 2.5 | 4 | 3 |
| 14 | 2 | 5 | 3 |
| 15 | 2.5 | 5 | 3 |
| 16 | 3 | 5 | 3 |
| 17 | 3 | 5.5 | 3 |
| 18 | 3 | 6 | 3 |
| 19 | 2 | 5 | 4 |
| 20 | 2.5 | 5 | 4 |
| 21 | 3 | 5 | 4 |
| 22 | 2 | 6 | 4 |
| 23 | 2.5 | 6 | 4 |
| 24 | 3 | 6 | 4 |

| PANEL WIDTH (FEET) | SPACING | | NUMBER LIGHTS NEEDED |
|---|---|---|---|
| | D (FEET) | C (FEET) | |
| 25 | 2.5 | 5 | 5 |
| 26 | 3 | 5 | 5 |
| 27 | 2.5 | 5.5 | 5 |
| 28 | 2 | 6 | 5 |
| 29 | 2.5 | 6 | 5 |
| 30 | 3 | 6 | 6 |
| 31 | 3 | 5 | 6 |
| 32 | 3.5 | 5 | 6 |
| 33 | 1.5 | 6 | 6 |
| 34 | 2 | 6 | 6 |
| 35 | 2.5 | 6 | 6 |
| 36 | 3 | 6 | 6 |
| 37 | 2 | 5.5 | 7 |
| 38 | 2.5 | 5.5 | 7 |
| 39 | 3 | 5.5 | 7 |
| 40 | 2 | 6 | 7 |
| 41 | 2.5 | 6 | 7 |

| PANEL WIDTH (FEET) | SPACING | | NUMBER LIGHTS NEEDED |
|---|---|---|---|
| | D (FEET) | C (FEET) | |
| 42 | 3 | 6 | 7 |
| 43 | 3.5 | 6 | 7 |
| 44 | 2.75 | 5.5 | 8 |
| 45 | 1.5 | 6 | 8 |
| 46 | 2 | 6 | 8 |
| 47 | 2.5 | 6 | 8 |
| 48 | 3 | 6 | 8 |
| | | | |
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| | | | |

## Appendix A-7

## UTILITY COORDINATION PROCEDURE

When a Designer encounters a potential utility conflict, most often in the preliminary design stages, all design options should be reviewed and double-checked. A second opinion should also be gathered from the Team Leader or Senior Designer. In certain situations the utility can be avoided simply by altering design. In such cases the designer shall proceed with the design and PS&E package.

### WHEN UTILITY CONFLICTS CANNOT BE AVOIDED

If there are utility conflicts that cannot be avoided by altering design or for other reasons, the appropriate District Utility Engineer should be contacted immediately. A request for a field meeting with the Utility Engineer and Utility Representative should be arranged.

#### Field Meeting

If the Utility Engineer was receptive to the request for a field meeting, the designer should follow up with written correspondence. At this point the Utility Engineer sets up a field meeting at the site with the affected utility companies. This field meeting should occur within 7-10 working days. If the Utility Engineer was not receptive to the request, notify the Team Leader and he will call the Utility Companies and set up the field meeting at the site.

Prior to the field meeting the Designer will prepare plan sheets noting where potential points of conflict will be. At the field meeting the Utility Companies determine what they will need to do and when work can be completed. This process usually takes 2 months.

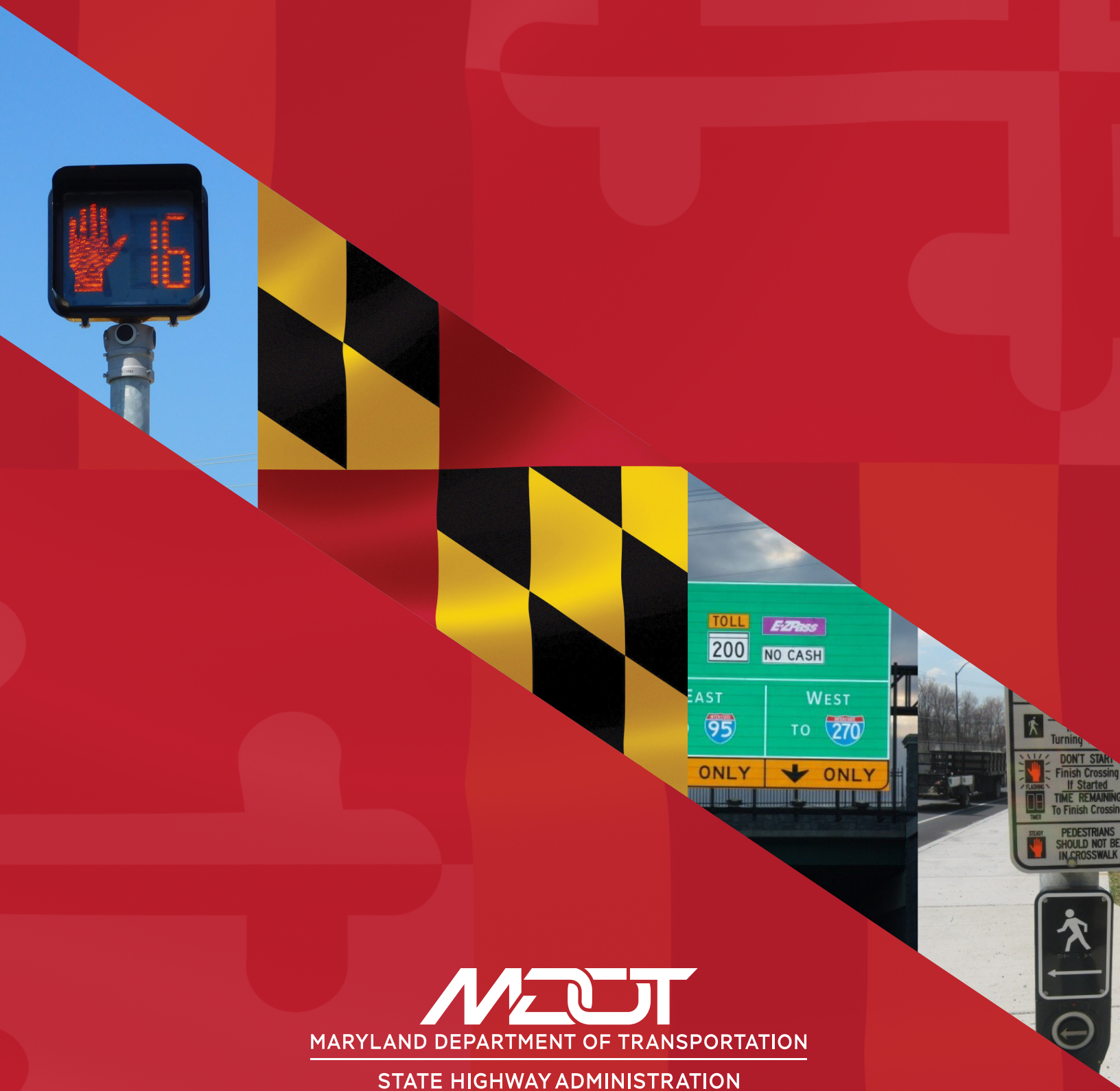
#### PS&E

After the field meeting, the Utility Companies will have an idea how long the relocations, if any, will take to complete (as noted above this usually takes 2 months). If the utility relocations conflict with the PS&E date, the Designer must prepare an AD schedule change form to delay the PS&E date until relocations are complete.

If the utility relocation schedule does not conflict with the PS&E date, a request for written confirmation from the utility company shall be submitted asking when the relocation will be completed. Note: Do not PS&E the project until this confirmation is received from the utility company. When confirmation is received, proceed with the design and PS&E package to CFD.

SHA will not pay for utility work until it is complete. A Purchase Order (P.O.) number shall be provided to the utility company before work is performed. NOTE: This is based on approval of the invoice submitted by the utility company.

Prepared by: wsp




MDOT

MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION