

**PROJECT DESCRIPTION**

**GENERAL**

THIS PROJECT INVOLVES THE INSTALLATION OF A NEW FULL-TRAFFIC-ACTUATED CONTROL SIGNAL AT THE INTERSECTION OF MD 80 AND CAMPUS DRIVE IN FREDERICK COUNTY. MD 80 IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION.

**INTERSECTION OPERATION**

THE INTERSECTION WILL OPERATE IN A NEMA FOUR-PHASE, FULL-TRAFFIC-ACTUATED MODE DURING SCHOOL DAYS BETWEEN 6:00 AM AND 7:00 PM WITH THE MD 80 APPROACHES OPERATING CONCURRENTLY AND THE CAMPUS DRIVE APPROACHES OPERATING CONCURRENTLY.

THE INTERSECTION WILL OPERATE IN A FLASHING-MODE AT ALL OTHER TIMES OF THE DAY, EXCEPT WHEN THE QUEUE DETECTOR IS ACTIVATED, WHICH WILL ACTUATE THE SIGNAL TO FULL OPERATION.

AN ALTERNATE PEDESTRIAN PHASE IS PROVIDED ACROSS THE WEST LEG OF MD 80.

**CONTROLLER REQUIREMENTS**

INSTALL A FULL-TRAFFIC-ACTUATED, EIGHT-PHASE CONTROLLER WITH TWO (2) FOUR-CHANNEL, TIME-DELAY-OUTPUT LOOP DETECTOR AMPLIFIERS, INTERSECTION MONITOR WITH BATTERY BACKUP FOR PHONE DROP AND ASSOCIATED HARNESSES HOUSED IN A NEMA SIZE "6" BASE MOUNTED CABINET.

**PHONE DROP**

UPON COMPLETION OF THIS PROJECT, THE CONTRACTOR SHALL NOTIFY MR. ROBERT SNYDER OF SHA AT (410) 787-7635 TO ARRANGE FOR THE PHONE LINE INSTALLATION. THE CONTRACTOR IS TO PROVIDE MR. SNYDER THE NEAREST STREET ADDRESS, ZIP CODE, AND PHONE NUMBER.

**MAINTENANCE OF TRAFFIC**

THE FOLLOWING TRAFFIC CONTROL STANDARDS SHALL BE REFERENCED FOR THE PROJECT.

STANDARD NO. MD-104.00 - 104.00-12

STANDARD NO. MD-104.31-01 (FLAGGING OPERATION)

STANDARD NO. MD-104.33-01 (SHOULDER WORK)

STANDARD NO. MD-104.35-01 (LANE SHIFT)

STANDARD NO. MD-104.32-01 (INTERSECTION FLAGGING OPERATION)

**PROJECT CONTACTS**

THE CONTACT PERSONS FOR SHA ARE AS FOLLOWS:

MR. JOHN CONCANNON  
ASSISTANT DISTRICT ENGINEER - TRAFFIC  
PHONE: (301) 624-8140

MR. JAMES BUCKALEW  
DISTRICT UTILITIES ENGINEER  
PHONE: (301) 624-8115

MR. DAVE COYNE  
ASSISTANT DISTRICT ENGINEER - MAINTENANCE  
PHONE: (301) 624-8105

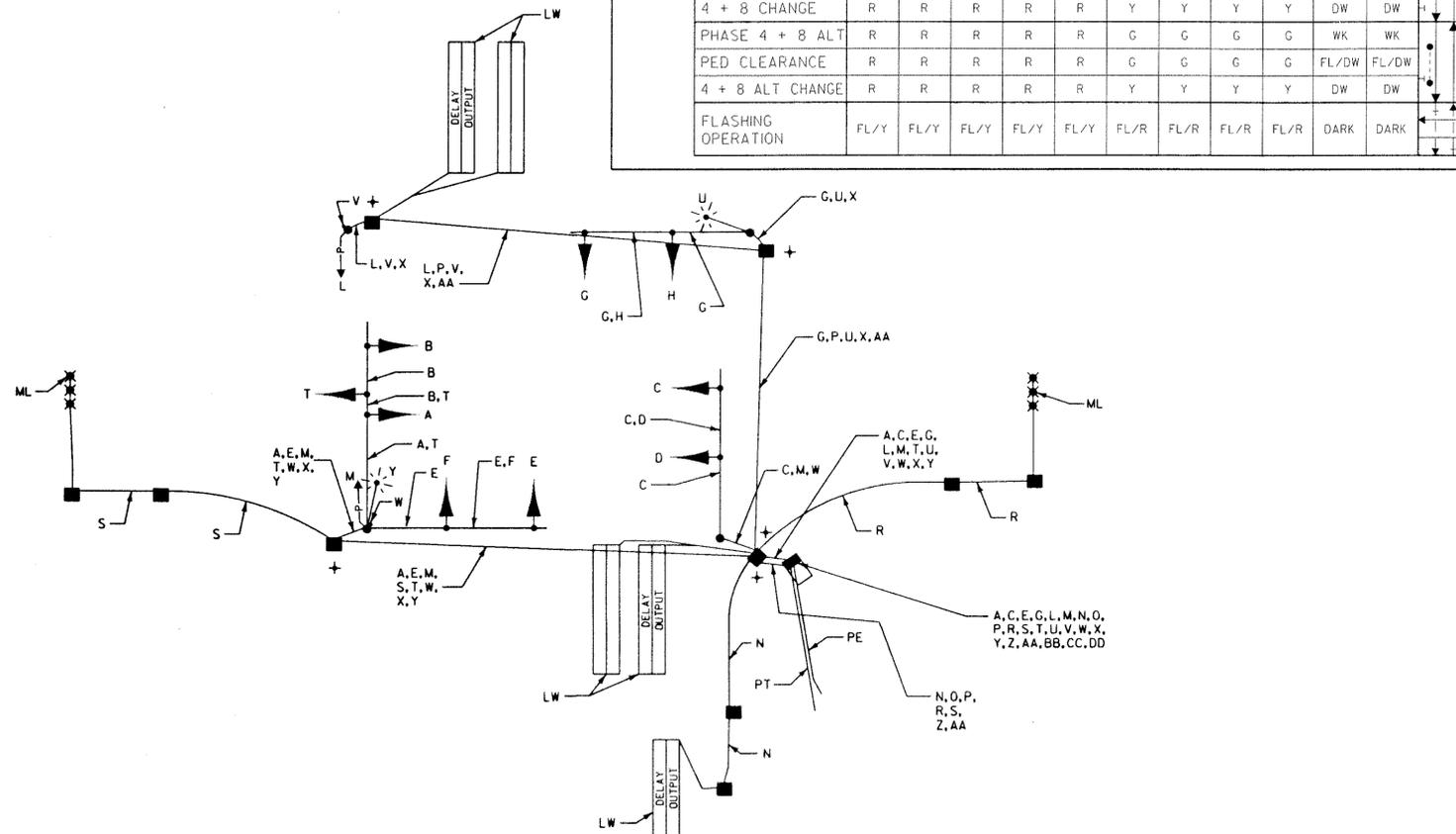
MR. RICHARD L. DAFF, SR.  
CHIEF, TRAFFIC OPERATIONS DIVISION  
PHONE: (410) 787-7630

**WIRING DIAGRAM**

**WIRING KEY**

- A C C E T } 7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- B D F H } 5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- L M } 3-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- V W } 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
- N D P Z A A } 2-CONDUCTOR ELECTRICAL CABLE ALUMINUM SHIELDED (NO. 14 A.W.G.)
- R S } MICROLOOP PROBE LEAD-IN
- U Y } 2-CONDUCTOR ELECTRICAL CABLE (NO. 12 A.W.G.) TC
- X } STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
- BB CC DD } 1-CONDUCTOR ELECTRICAL CABLE (NO. 4 A.W.G.)

- LW - LOOP WIRE (NO. 14 A.W.G.)
- ML - MICROLOOP PROBE SET
- PT - PROPOSED UNDERGROUND TELEPHONE SERVICE
- PE - PROPOSED UNDERGROUND ELECTRICAL SERVICE
- + - 3/4 IN. X 10 FT. GROUND ROD



**EQUIPMENT LIST "A"**

A. EQUIPMENT TO BE SUPPLIED BY THE SHA

| ITEM NO. | QUANTITY | DESCRIPTION  |
|----------|----------|--|
| 9002     | 2 EACH   | FOUR-CHANNEL, TIME-DELAY-OUTPUT, LOOP DETECTOR AMPLIFIER   |
| 9087     | 1 EACH   | EIGHT-PHASE, FULL-TRAFFIC-ACTUATED CONTROLLER WITH INTERSECTION MONITOR HOUSED IN A NEMA SIZE "6" BASE MOUNTED CABINET   |
| 9089     | 168 S.F. | SHEET ALUMINUM SIGNS TO CONSIST OF :<br>- 2 EACH W3-3 SIGN (36 IN. X 36 IN.) WITH "NEW" PANEL (30 IN. X 30 IN.) AND FLAG - GROUND MOUNT<br>- 2 EACH D-3(1) SIGN "CAMPUS DR" (VARIABLE X 16 IN.) DUAL FACED - MAST ARM MOUNT<br>- 2 EACH M95-1 SIGN (72 IN. X 24 IN.) - MAST ARM MOUNT<br>- 2 EACH R3-5R SIGN (30 IN. X 36 IN.) - MAST ARM MOUNT<br>- 1 EACH R4-7 SIGN (24 IN. X 30 IN.) - GROUND MOUNT<br>- 2 EACH S1-1 SIGN (36 IN. X 36 IN.) F.Y.G. AND S4-3 (30 IN. X 12 IN.) F.Y.G. - GROUND MOUNT<br>- 1 EACH S1-1 SIGN (36 IN. X 36 IN.) F.Y.G. AND M6-2R (30 IN. X 12 IN.) F.Y.G. - GROUND MOUNT<br>- 1 EACH S1-1 SIGN (36 IN. X 36 IN.) F.Y.G. AND M6-2L (30 IN. X 12 IN.) F.Y.G. - GROUND MOUNT<br>- 1 EACH D-3(3) SIGN (72 IN. X 18 IN.) - GROUND MOUNT<br>- 1 EACH D-3(3) SIGN (72 IN. X 24 IN.) - GROUND MOUNT |

**EQUIPMENT LIST "C"**

C. EQUIPMENT TO BE REMOVED AND RETURNED TO SHA  
 1 EACH - LIGHTING POLE AND LUMINAIRE

**PHASE CHART**

|                    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10    | 11    |
|--------------------|------|------|------|------|------|------|------|------|------|-------|-------|
| PHASE 2 + 6        | G    | G    | G    | G    | G    | R    | R    | R    | R    | DW    | DW    |
| 2 + 6 CHANGE       | Y    | Y    | Y    | Y    | Y    | R    | R    | R    | R    | DW    | DW    |
| PHASE 4 + 8        | R    | R    | R    | R    | R    | G    | G    | G    | G    | DW    | DW    |
| 4 + 8 CHANGE       | R    | R    | R    | R    | R    | Y    | Y    | Y    | Y    | DW    | DW    |
| PHASE 4 + 8 ALT    | R    | R    | R    | R    | R    | G    | G    | G    | G    | WK    | WK    |
| PED CLEARANCE      | R    | R    | R    | R    | R    | G    | G    | G    | G    | FL/DW | FL/DW |
| 4 + 8 ALT CHANGE   | R    | R    | R    | R    | R    | 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 | DARK  | DARK  |

**EQUIPMENT LIST "B"**

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

| ITEM NO. | QUANTITY | DESCRIPTION  |
|----------|----------|--|
| 1001     | 1 EA     | MAINTENANCE OF TRAFFIC   |
| 2001     | 4 CY     | CLASS 2 EXCAVATION   |
| 2002     | 6 CY     | TEST PIT EXCAVATION  |
| 5001     | 4 EA     | HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING (ARROW)                        |
| 5003     | 2 EA     | REMOVE EXISTING PAVEMENT MARKING LETTER OR ARROW   |
| 5004     | 350 LF   | 12 INCH WHITE HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING                  |
| 5005     | 120 LF   | 24 INCH WHITE HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING                  |
| 5006     | 250 LF   | 5 INCH WHITE HEAT APPLIED PERMANENT PREFORMED THERMOPLASTIC PAVEMENT MARKING                   |
| 5008     | 370 LF   | REMOVAL OF EXISTING PAVEMENT LINE MARKINGS - ANY WIDTH   |
| 6001     | 70 LF    | FURNISH AND INSTALL DEPRESS CURB AND GUTTER  |
| 6004     | 380 SF   | 4 INCH CONCRETE SIDEWALK   |
| 8006     | 2 EA     | CUT, CLEAN, GALVANIZE AND CAP TRAFFIC SIGNAL STRUCTURE   |
| 8010     | 4 EA     | FURNISH AND INSTALL 12 IN. PEDESTIAN TRAFFIC SIGNAL HEAD SECTION                               |
| 8011     | 24 EA    | FURNISH AND INSTALL 12 IN. VEHICULAR TRAFFIC SIGNAL HEAD SECTION                               |
| 8013     | 2 EA     | FURNISH AND INSTALL 15 FT. BRACKET ARM FOR SIGNAL STRUCTURE                                    |
| 8014     | 2 EA     | FURNISH AND INSTALL 250W HPS LUMINAIRE WITH PHOTOCCELL   |
| 8019     | 3 EA     | FURNISH AND INSTALL 8 IN. VEHICULAR TRAFFIC SIGNAL HEAD SECTION                                |
| 8020     | 1 EA     | FURNISH AND INSTALL CONTROL AND DISTRIBUTION EQUIPMENT FOR SIGNAL                              |
| 8022     | 1 EA     | FURNISH AND INSTALL MAST ARM POLE AND 50 FT. MAST ARM  |
| 8023     | 1 EA     | FURNISH AND INSTALL MAST ARM POLE AND 60 FT. MAST ARM  |
| 8028     | 1 EA     | FURNISH AND INSTALL MICROLOOP PROBE SET WITH 1000 FOOT LEAD-IN CABLE                           |
| 8029     | 1 EA     | FURNISH AND INSTALL MICROLOOP PROBE SET WITH 500 FOOT LEAD-IN CABLE                            |
| 8030     | 1 EA     | FURNISH AND INSTALL PEDESTAL POLE  |
| 8032     | 2 EA     | FURNISH AND INSTALL PUSHBUTTON AND SIGN  |
| 8034     | 1 EA     | FURNISH AND INSTALL TWIN MAST ARM POLE AND 50 FT./60 FT. MAST ARM                              |
| 8047     | 1 EA     | REMOVE AND DISPOSE FOUNDATION 12 IN. BELOW GRADE   |
| 8048     | 1 EA     | REMOVE AND DISPOSE MATERIAL & EQUIPMENT PER ASSIGNMENT   |
| 8052     | 300 LF   | FURNISH AND INSTALL 4 IN. SCHEDULE 80 RIGID PVC CONDUIT - BORED                                |
| 8053     | 65 LF    | FURNISH AND INSTALL 4 IN. SCHEDULE 80 RIGID PVC CONDUIT - TRENCHED                             |
| 8057     | 14 CY    | FURNISH AND INSTALL CONCRETE FOR SIGNAL FOUNDATION   |
| 8059     | 140 LF   | FURNISH AND INSTALL WOOD SIGN SUPPORTS 4 IN. X 6 IN.   |
| 8060     | 520 LF   | FURNISH AND INSTALL NO. 6 A.W.G. STRANDED BARE COPPER GROUND WIRE                              |
| 8062     | 30 LF    | FURNISH AND INSTALL 1 IN. ELECTRICAL CONDUIT - GALVANIZED SLEEVE                               |
| 8063     | 40 LF    | FURNISH AND INSTALL 2 IN. SCHEDULE 80 RIGID PVC CONDUIT - BORED                                |
| 8068     | 20 LF    | FURNISH AND INSTALL 1 INCH LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT FOR DETECTOR WIRE SLEEVE |
| 8070     | 45 LF    | FURNISH AND INSTALL ELECTRICAL CABLE - 1 CONDUCTOR NO. 4 A.W.G. - THHN/THWN                    |
| 8072     | 10 EA    | FURNISH AND INSTALL ELECTRICAL HANDHOLE  |
| 8074     | 106 SF   | INSTALL GROUND MOUNTED SIGN  |
| 8075     | 62 SF    | INSTALL OVERHEAD SIGN  |
| 8080     | 5 EA     | FURNISH AND INSTALL GROUND ROD - 3/4 INCH DIAMETER X 10 FOOT LENGTH                            |
| 8081     | 710 LF   | FURNISH AND INSTALL ELECTRICAL CABLE - 2 CONDUCTOR (ALUMINUM SHIELDED)                         |
| 8082     | 450 LF   | FURNISH AND INSTALL ELECTRICAL CABLE - 2 CONDUCTOR (NO. 14 A.W.G.)                             |
| 8083     | 750 LF   | FURNISH AND INSTALL ELECTRICAL CABLE - 3 CONDUCTOR (NO. 14 A.W.G.)                             |
| 8084     | 80 LF    | FURNISH AND INSTALL ELECTRICAL CABLE - 5 CONDUCTOR (NO. 14 A.W.G.)                             |
| 8085     | 900 LF   | FURNISH AND INSTALL ELECTRICAL CABLE - 7 CONDUCTOR (NO. 14 A.W.G.)                             |
| 8086     | 310 LF   | FURNISH AND INSTALL ELECTRICAL CABLE - 2 CONDUCTOR (NO. 12 A.W.G.) TC                          |
| 8087     | 2100 LF  | FURNISH AND INSTALL LOOP WIRE ENCASED IN 1/2 INCH FLEXIBLE TUBING (NO. 14 A.W.G.)              |
| 8088     | 570 LF   | FURNISH AND INSTALL SAW CUT FOR SIGNAL (LOOP DETECTOR)   |
| 8091     | 1000 LF  | FURNISH AND INSTALL 2 IN. SCHEDULE 80 RIGID PVC CONDUIT - TRENCHED                             |
| 8093     | 1 EA     | INSTALL CONTROLLER AND CABINET - BASE MOUNT  |

**MARYLAND DOT - STATE HIGHWAY ADMINISTRATION**  
 Office of Traffic & Safety  
**TRAFFIC ENGINEERING DESIGN DIVISION**  
 GENERAL INFORMATION SHEET  
 MD 80 (FINGERBOARD ROAD) and CAMPUS DRIVE

**WR&A**  
 Whitman, Reardon  
 and Associates, LLP  
 801 South Caroline Street  
 Baltimore, Maryland 21231  
 (410) 235-3450

|                      |                      |              |           |
|----------------------|----------------------|--------------|-----------|
| DRAWN BY: B. MARTINE | F.A.P. NO.           | TS NO.       |           |
| CHECKED BY: N. LEARY | S.H.A. NO. XX1065585 | TS-4166      | SHEET NO. |
| SCALE: NONE          | COUNTY: FREDERICK    | T.I.M.S. NO. |           |
| DATE: 4/1/02         | LOG MILE:            | E703         | 2 OF 2    |