## PROJECT DESCRIPTION

I. GENERAL

This project involves the reconstruction of an existing Traffic Control Signal with street lighting and interconnect at the intersection of MD 124 (Montgomery Village Avenue) and Lost Knife Road / Christopher Avenue in Montgomery County. Video camera detection shall be used in all directions and the existing traffic surveillance camera shall be relocated to the new signal pole. MD 124 (Montgomery Village Avenue) is assumed to run an north-south direction.

II. INTERSECTION OPERATION

1. The intersection is to operate in a NEMA eight-phase, fully-actuated mode, with the Montgomery Village Avenue approaches continuing to run concurrently. An Exclusive/Permissive left turn phase shall be maintained for northbound approach of MD 124 (Montgomery Village Avenue). The southbound approach shall maintain an exclusive left turn phase. A pedestrian phase with pushbutton actuation shall be maintained across the north leg and installed across the south leg of MD 124 (Montgomery Village Avenue) The pedestrian phases across Lost Knife Road and Christopher Avenue shall remain on recall. Farside sampling stations, using video camera detection, shall be provided on both legs of MD 124 (Montgomery Avenue) at this intersection. The Lost Knife Road / Christopher Avenue approaches shall change from a split phase to run concurrently. Exclusive left turn phases for both approaches shall be provided.

2. A full-traffic-actuated, eight-phase controller with L.A.U. and L.A.U. Panel with asociated harnesses 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 Mr. Bob Gonzales at (240) 777-8761 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.

### EQUIPMENT LIST

A. EQUIPMENT TO BE SUPPLIED BY MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION AND INSTALLED BY THE CONTRACTOR.

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 8088 | R3-5L "LEFT TURN ONLY" sign, (30" x 36") mast arm mounted. | 5 Each |
| 8088 | R10-12 "LEFT TURN YIELD ON GREEN BALL" sign, (36"x42") mast arm mounted. | 1 Each |
| 8103 | 27' steel pole with a 60' mast arm. (Note: Anchor bolts will be 2" x 90".) | 1 Each |
| 8103 | 27' steel pole with a 60' mast arm. (Note: Anchor bolts will be 2" x 90".) | 2 Each |
| 8103 | 27' steel pole with a 70' mast arm. (Note: Anchor bolts will be 2" x 90".) | 1 Each |
| 8122 | 12", one-way, three-section (R,Y,G) traffic signal head with adjustable bracket for mast arm mounting and tunnel visors. | 7 Each |
| 8122 | 12", one-way, three-section (RA,YA,GA) traffic signal head with adjustable bracket for mast arm mounting and tunnel visors. | 8 Each |
| 8122 | 12", one-way, five-section (R,YA,Y,GA,G) traffic signal head with adjustable bracket for mast arm mounting and tunnel visors. | 2 Each |
| 8124 | 12", one-way, two-section (DW,W) symbolic pedestrian signal head with adjustable bracket for pole mounting and cutaway visors. | 8 Each |
| 8126 | Pedestrian pushbutton and pedestrian education R10-4(1) sign. (Note: Sign to read "PUSH BUTTON TO CROSS MONTGOMERY VILLAGE AV") | 4 Each |
| 8129 | Eight-phase, full-traffic-actuated, solid state digital controller with L.A.U., L.A.U. Panel and associated harnesses housed in a NEMA size "6" base-mounted cabinet. | 1 Each |
| - | Video detector camera w/ coaxial cable (to be installed by County Forces) | 4 Each |
| NEG. | GUIDE SHIELD ASSEMBLY (48"x75") pole mounted. M3-3 "SOUTH"(30"X15") M1-5 "MD 124"(48"X36") M6-1 "left arrow "(30"X24") | 1 Each |
| NEG. | GUIDE SHIELD ASSEMBLY (30"x51") pole mounted. M3-1 "NORTH"(24"X12") M1-5 "MD 124"(30"X24") M6-1 "right arrow "(21"X15") | 1 Each |
| NEG. | GUIDE SHIELD ASSEMBLY (48"x75") pole mounted. M3-1 "NORTH"(30"X15") M1-5 "MD 124"(48"X36") M6-1 "left arrow "(30"X24") | 1 Each |
| NEG. | GUIDE SHIELD ASSEMBLY (30"x51") pole mounted. M3-3 "SOUTH"(24"X12") M1-5 "MD 124"(30"X24") M6-1 "right arrow "(21"X15") | 1 Each |
| Neg. | Relocate pole-mounted cabinet, "G" size, and surveillence camera (By Montgomery County Forces). | 1 Each |

### EQUIPMENT LIST

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

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 2002 | Test pit excavation. | 5 C.Y. |
| 8001 | Concrete foundation. | 22 C.Y. |
| 8023 | 3" polyvinyl chloride electrical conduit (Schedule 80) (trenched). | 105 L.F. |
| 8027 | 4" polyvinyl chloride electrical conduit (Schedule 80) (trenched). | 160 L.F. |
| 8028 | 4" polyvinyl chloride electrical conduit (Schedule 80) (pushed). (To be bored). | 670 L.F. |
| 8041 | Control and distribution equipment. | 1 Each |
| 8043 | Ground rod, $\frac{3}{4}$" diameter x 10' length with clamp. | 5 Each |
| 8051 | 6-pair telemetry cable - jelly-filled (underground). | 95 L.F. |
| 8063 | Canoga 4-conductor electrical cable (No. 14 A.W.G.) (shielded). | 1160 L.F. |
| 8064 | 2-conductor electrical cable (No. 14 A.W.G.). | 890 L.F. |
| 8066 | 5-conductor electrical cable (No. 14 A.W.G.). | 3750 L.F. |
| 8067 | 7-conductor electrical cable (No. 14 A.W.G.). | 660 L.F. |
| 8070 | 2-conductor electrical cable (No. 12 A.W.G.) copper type TC. | 975 L.F. |
| 8075 | 1-conductor electrical cable (No. 6 A.W.G.) stranded bare copper ground wire. | 875 L.F. |
| 8095 | 20' lighting arm. | 4 Each |
| 8097 | 250W-HPS luminaire. | 4 Each |
| 8131 | Traffic signal handbox (pullbox). | 10 Each |
| 8143 | Relocate (street name) sign. | 4 Each |
| 8148 | Removal and salvage of signs less than 50 S.F. | 5 Each |
| 8151 | Removal and salvage of lighting arm on mast arm pole. | 4 Each |
| 8152 | Removal of electrical service. | 1 Each |
| 8157 | Removal and salvage of steel pole with mast arm including foundation. | 4 Each |
| 8159 | Removal and salvage of cabinet, base-mounted. | 1 Each |
| 8161 | Removal of handbox. | 5 Each |
| 8162 | Removal and salvage of traffic signal head. | 8 Each |
| 8162 | Removal and salvage of pedestrian signal | 8 Each |
| 9001 | Signal technician labor to reroute existing underground interconnect cable. | 4 HRS |

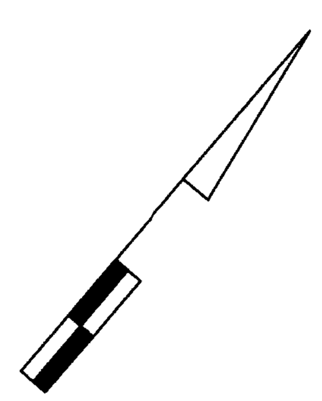
The contact persons for District #3 (Montgomery County) are as follows:

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

Mr. Raleigh Medley
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



## SEQUENCE OF OPERATION SHEET

MONTOMERY VILLAGE AV RUNS IN AN NORTH-SOUTH DIRECTION

TRAFFIC OPERATIONS SECTION
DIVISION OF TRAFFIC ENGINEERING
MONTGOMERY COUNTY, MARYLAND

INTERSECTION: MONTGOMERY VILLAGE AV AND CHRISTOPHER AV / LOST KNIFE RD NO. ________

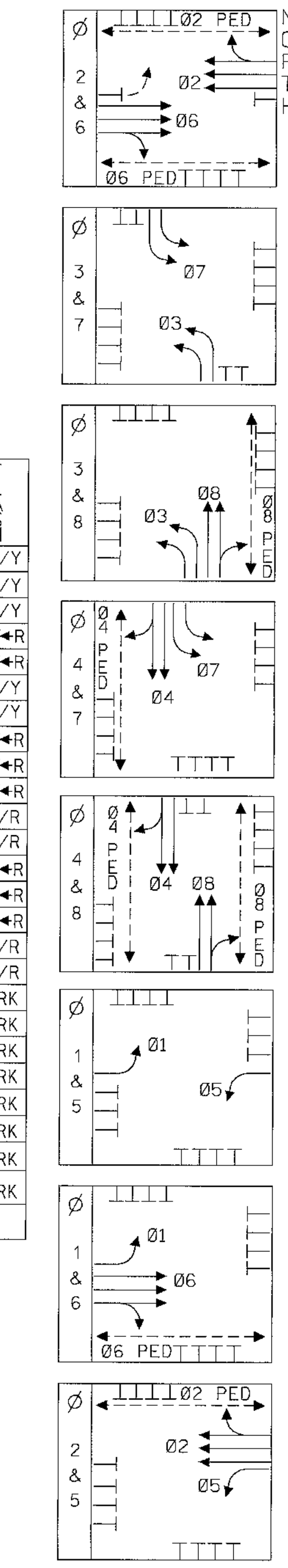
| SIGNAL HEAD INDICATIONS | | | | | |
|---|---|---|---|---|---|
| SIGNAL NO. | 3,6,7,10, 11,12,16,17 | 1,2 | | 4,5,8,9, 13,14,15 | 18-25 |
| TOTAL: | 8 | 2 | | 7 | 8 |
| LEGEND: OPTICALLY LIMITED; R RED; Y YELLOW; G GREEN; ◄— ARROW; F FLASHING | R, Y, G 12" | R, ◄Y Y, ◄G G 12" | R, Y, G, ◄G 12" | ◄R, ◄Y, ◄G 12" | 9"or12" X |

| SIGNAL NO. | 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 | FLASH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | G | G | Y | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | ◄G/R | ◄Y/R | R | ◄G/G | ◄Y/G | G | R | R | R | FL/Y |
| 2 | G | G | Y | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | ◄G/R | ◄Y/R | R | ◄G/G | ◄Y/G | G | R | R | R | FL/Y |
| 3 | G | G | Y | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | G | G | G | R | R | R | FL/Y |
| 4 | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | FL/◄R |
| 5 | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | FL/◄R |
| 6 | G | G | Y | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | G | G | G | FL/Y |
| 7 | G | G | Y | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | R | G | G | G | FL/Y |
| 8 | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | FL/◄R |
| 9 | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | FL/◄R |
| 10 | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | FL/◄R |
| 11 | R | R | R | R | R | R | R | R | R | R | G | G | G | G | G | G | Y | R | R | R | R | R | R | R | R | R | R | FL/R |
| 12 | R | R | R | R | R | R | R | R | R | R | G | G | G | G | G | G | Y | R | R | R | R | R | R | R | R | R | R | FL/R |
| 13 | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | FL/◄R |
| 14 | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | FL/◄R |
| 15 | ◄R- | ◄R- | ◄R- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄G- | ◄Y- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | ◄R- | FL/◄R |
| 16 | R | R | R | R | R | R | R | G | G | G | R | R | R | G | G | G | Y | R | R | R | R | R | R | R | R | R | R | FL/R |
| 17 | R | R | R | R | R | R | R | G | G | G | R | R | R | G | G | G | Y | R | R | R | R | R | R | R | R | R | R | FL/R |
| 18 | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | DARK |
| 19 | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | DW | DW | DW | DARK |
| 20 | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | DW | DW | DW | DARK |
| 21 | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | DARK |
| 22 | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | DW | DW | DW | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DARK |
| 23 | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DARK |
| 24 | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DARK |
| 25 | DW | DW | DW | DW | DW | DW | DW | WK | WK | WK | DW | DW | DW | WK | FL/DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DARK |
| PHASE | 2 & 6 | | | ALL RED | 3 & 7 | | ALL RED | 3 & 8 | | ALL RED | 4 & 7 | | ALL RED | 4 & 8 | | | | ALL RED | 1 & 5 | | ALL RED | 1 & 6 | | ALL RED | 2 & 5 | | ALL RED | |

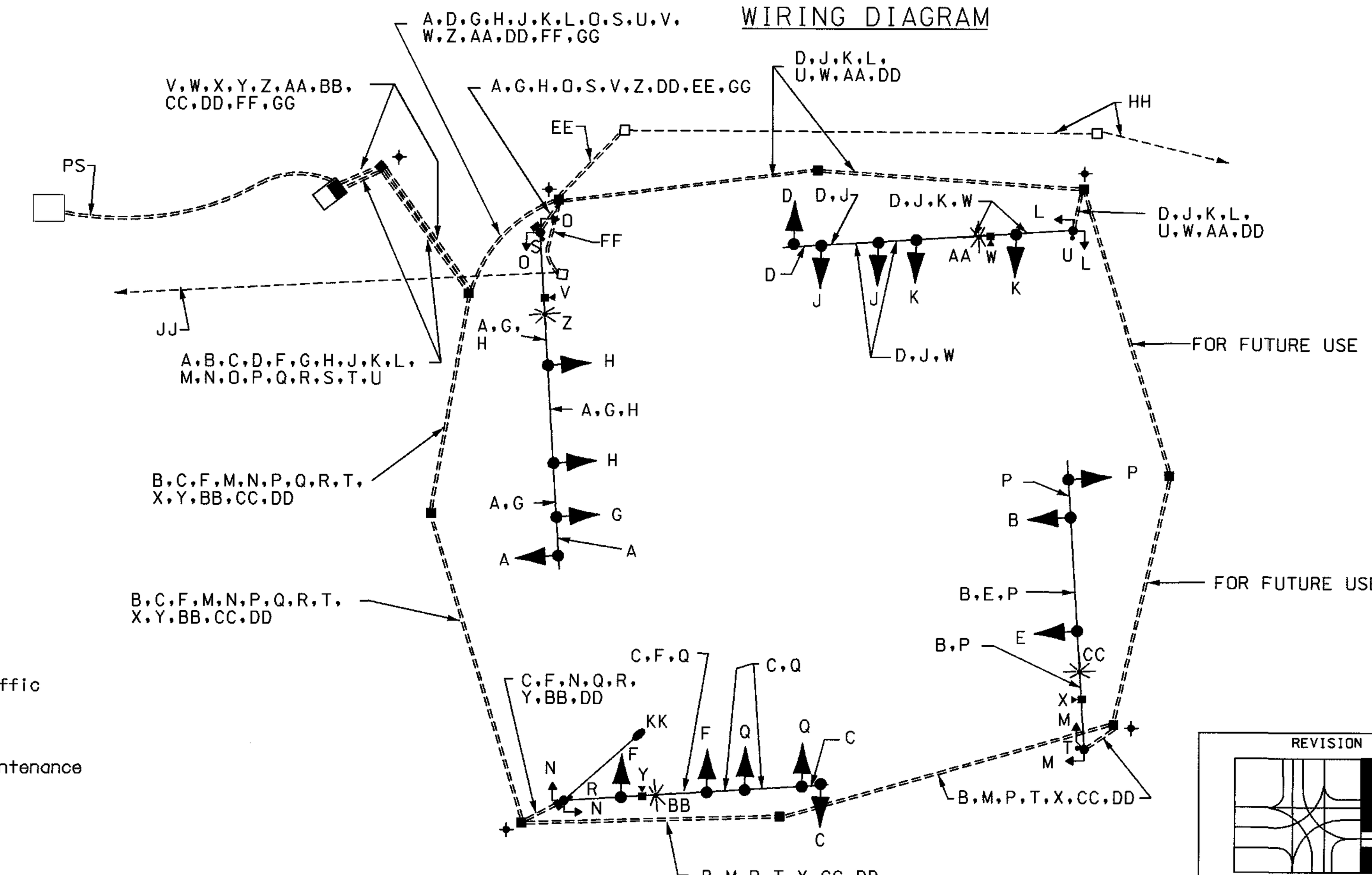
NOTES:

SUBMITTED: ________ CHECKED: ________ APPROVED: ________
IN SERVICE BY: ________ DATE: ________ TIME: ________

PHASING




## WIRING DIAGRAM




### WIRING KEY

A, B, C, D } 7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )

E, F, G, H, J, K, L, M, N, O, P, Q } 5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )

R, S, T, U } 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )

V, W, X, Y } CANOGA 4-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.) SHIELDED COAXIAL CABLE (INCIDENTAL WITH PURCHASE OF CAMERA)

Z, AA, BB, CC } 2-CONDUCTOR TRAY CABLE (NO. 12 A.W.G )

DD - STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)

EE - REROUTED 12-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED) FROM MIDCOUNTY HWY

FF - REROUTED 12-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED) FROM LAKEFOREST MALL D/W

GG - 6-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED)

HH - EXISTING 12-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED) FROM MIDCOUNTY HWY

JJ - EXISTING 12-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED) FROM LAKEFOREST MALL D/W

KK - COMPOSITE CABLE (TO BE WIRED BY MONTGOMERY COUNTY FORCES)

PS - PROPOSED UNDERGROUND SERVICE TO BE INSTALLED BY PEPCO

✦ - GROUND ROD

REVISION "A"

STREET TRAFFIC STUDIES, LTD.
400 Crain Hwy.,N.W.
Glen Burnie,MD 21061
Ph (410) 590-5500
Fax (410) 590-6637

4020B.dgn

**MARYLAND DOT - STATE HIGHWAY ADMINISTRATION**
***Office of Traffic & Safety***
TRAFFIC ENGINEERING DESIGN DIVISION
MD 124 (MONTGOMERY VILLAGE AVENUE) AND CHRISTOPHER AVENUE / LOST KNIFE ROAD
GENERAL INFORMATION SHEET

| | | | | | |
|---|---|---|---|---|---|
| DRAWN BY: | | F.A.P. NO. | | TS NO. 4203A | SHEET NO. |
| CHECKED BY: | | S.H.A. NO. | | | |
| SCALE: | NONE | COUNTY: | MONTGOMERY | T.I.M.S. NO. F345 | 2 OF 2 |
| DATE: | 8/21/02 | LOG MILE: | 15012404.16 | | |

...\4020\4020b\4020bgi.dgn Aug. 23, 2002 14:59:31