## PROJECT DESCRIPTION

### I. GENERAL

This project involves the reconstruction of an existing Traffic Control Signal with street lighting and interconnect at the intersection of US 40 and Frederick Road/ Pine Orchard Lane in Howard County. The existing span wire signal shall be replaced with a mast arm traffic signal. US 40 is assumed to run an east-west direction.

### II. INTERSECTION OPERATION

1. The intersection is to operate in a NEMA six-phase, fully-actuated mode, with the US 40 approaches continuing to run concurrently. Exclusive left turn phases shall continue to be provided for both approaches of US 40. Forside sampling stations shall remain in use on west leg of US 40 at this intersection. The Frederick Road and Pine Orchard Lane approaches shall now operate as a split phase.

2. A full-traffic-actuated, eight-phase controller with (4) - four channel, rack mount loop detector amplifiers 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. All controller cabinet wiring will be performed by the S.H.A. Signal Shop Contact Mr. Ed Rodenhizer(Dave Swartz) at (410) 787-7650 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 S.H.A..

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 9081 | Eight-phase, full-traffic actuated, solid state digital controller with (four) 4-channel, rack mount loop detector amplifiers, housed in a NEMA size "6" base-mounted. cabinet. | 1 EA |
| 9089 | Sheet aluminum signs to consist of: | 113 SF |
| | R3-5L "LEFT TURN ONLY" sign, (30" x 36") mast arm mounted. | 2 EA |
| | R3-6R "THRU AND RIGHT TURN" sign, (30" x 36") mast arm mounted. | 1 EA |
| | R3-6 MOD "LEFT, THRU AND RIGHT TURN" sign, (30" x 36") mast arm mounted. | 1 EA |
| | R7-1 (1) "NO PARKING (SYMBOL)" sign (12"x18") ground mounted. | 1 EA |
| | R7-1 (L) "NO PARKING (SYMBOL)" sign (12"x18") ground mounted. | 1 EA |
| | R3-8 MOD "LEFT / LEFT THRU AND RIGHT TURN" sign (42"x30") ground mounted | 3 EA |
| | GUIDE SHIELD ASSEMBLY (36"X75") pole mounted. M3-4 "WEST"(30"X15") M1-4 "US 40"(36"X36") M6-1 "left arrow "(36"X24") | 1 EA |
| | GUIDE SIGN ground mounted. M3-4 "WEST"(24"X12") M1-4 "US 40"(24"X24") M6-1 "right arrow "(21"X15") | 1 EA |
| | GUIDE SIGN ground mounted. M3-2 "EAST"(30"X15") M1-4 "US 40"(36"X36") M6-1 "left arrow "(36"X24") | 1 EA |
| | GUIDE SIGN ground mounted. M3-2 "EAST"(24"X12") M1-4 "US 40"(24"X24") M6-1 "right arrow "(21"X15") | 1 EA |
| 9090 | Sheet aluminum signs to consist of: (Blue or Green) | 61 SF |
| | D3-2 "(arrow) Frederick RD / Pine Orchard LA (arrow)", sign (variable x 32") mast arm mounted. | 1 EA |
| | D3-2 "(arrow) Pine Orchard LA / Frederick RD (arrow)", sign (variable x 32") mast arm mounted. | 1 EA |
| | D3-2 "Balto. Nat'l PK", sign (variable x 16") mast arm mounted. | 2 EA |

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

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 1001 | Maintenance of traffic per assignment. | 3 EA |
| 2001 | Class 2 Excavation. | 1 C.Y. |
| 2002 | Test Pit Excavation | 5 C.Y. |
| 5001 | Heat applied permanent preformed thermoplastic pavement marking arrow. (left, thru, right). | 4 EA |

## EQUIPMENT LIST (CONT.)

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

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 5001 | Heat applied permanent preformed thermoplastic pavement marking arrow. (left). | 4 EA |
| 5002 | Heat applied permanent preformed thermoplastic pavement marking letter. (O-N-L-Y) | 8 EA |
| 5006 | 5" white heat applied permanent preformed thermoplastic pavement marking. | 630 L.F. |
| 5007 | 5" yellow heat applied permanent preformed thermoplastic pavement marking. | 70 L.F. |
| 5008 | Remove existing pavement markings - any width. | 420 L.F. |
| 6004 | 4" concrete sidewalk. | 40 S.F. |
| 8011 | Furnish and install 12" vehicular traffic signal head section | 39 EA |
| 8013 | Furnish and install 15' bracket arm for traffic signal structure. | 1 EA |
| 8014 | Furnish and install 250 watt HPS Luminaire with photocell. | 2 EA |
| 8019 | Furnish and install 8" vehicular traffic signal head section. | 3 EA |
| 8020 | Furnish and install control and distribution equipment (120/240 V, 1 phase 3 wire system). | 1 EA |
| 8024 | Furnish and install 27' mast arm pole and 70' mast arm. | 1 EA |
| 8029 | Furnish and install microloop probe set with 500' lead-in | 4 EA |
| 8030 | Furnish and install breakaway pedestal pole (14'). | 1 EA |
| 8035 | 27' steel pole and twin 50'/70' mast arms. | 1 EA |
| 8043 | Furnish and install non-invasive probe set with 1000' lead-in cable. | 4 EA |
| 8047 | Remove and dispose of existing foundation 12" below grade. | 5 EA |
| 8048 | Remove and dispose of existing material and equipment per assignment. | 1 EA |
| 8051 | Furnish and install 3" schedule 80 rigid polyvinyl chloride conduit - trenched | 430 L.F. |
| 8052 | Furnish and install 4" schedule 80 rigid polyvinyl chloride conduit - bored. | 265 L.F. |
| 8053 | Furnish and install 4" schedule 80 rigid polyvinyl chloride conduit - trenched. | 30 L.F. |
| 8057 | Furnish and install concrete for signal foundation. | 14 C.Y. |
| 8058 | Furnish and install wood sign supports 4" x 4". | 125 L.F. |
| 8059 | Furnish and install wood sign supports 4" x 6". | 60 L.F. |
| 8060 | Furnish and install No. 6 AWG stranded bare copper ground wire. | 700 L.F. |
| 8062 | Furnish and install 1" electrical conduit galvanized sleeve. | 25 L.F. |
| 8064 | Furnish and install 3" schedule 80 rigid polyvinyl chloride conduit - bored. | 210 L.F. |
| 8068 | Furnish and install 1" liquid tight flexible non-metallic conduit for detector sleeve. | 25 L.F. |
| 8072 | Furnish and install electrical handhole. | 11 EA |
| 8074 | Install ground mounted sign. | 64 S.F. |
| 8075 | Install overhead sign. | 110 S.F. |
| 8078 | Furnish and install connector kit - Type 1. | 1 EA |
| 8079 | Furnish and install connector kit - Type 2. | 1 EA |
| 8080 | Furnish and install ground rod -¾" x 10'. | 5 EA |
| 8081 | Furnish and install electrical cable - 2 conductor (aluminum shielded). | 900 L.F. |
| 8084 | Furnish and install electrical cable - 5 conductor (No. 14 AWG). | 1255 L.F. |
| 8085 | Furnish and install electrical cable - 7 conductor (No. 14 AWG). | 720 L.F. |
| 8086 | Furnish and install tray cable - 2 conductor (No. 12 AWG). | 390 L.F. |

## EQUIPMENT LIST (CONT.)

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

| ITEM NO. | DESCRIPTION | QUANTITY |
|---|---|---|
| 8087 | Furnish and install loop wire encased in flexible tubing (No. 14 AWG). | 2735 L.F. |
| 8088 | Furnish and install saw cut for signal (loop detector). | 685 L.F. |
| 8093 | Install controller and cabinet base mount. | 1 EA |
| Neg. | Replace and install frame and cover for handhole. | 1 EA |
| Neg. | Pull back and reroute 12-pair interconnect cable | 265 L.F. |
| Neg. | Pull back and reroute 2 conductor (aluminum shielded) cable. | 170 L.F. |
| Neg. | Furnish and install 40' lighting structure with 15' bracket arm | 1 EA |
| Neg. | Furnish and install breakaway base support system for lighting structure. | 1 EA |

C. EQUIPMENT TO BE REMOVED AND RETURNED TO SHA

All removed signal materials are to become property of the contractor.

The contact persons for District #7 are as follows:

Mr. John Concannon
Assistant District Engineer - Traffic
Phone: (310) 624-8141

Mr. Dave Coyne
Assistant District Engineer - Maintenance
Phone: (310) 624-8106

Mr. Jim Buckalew
District Engineer - Utility
Phone: (301) 624-8110

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

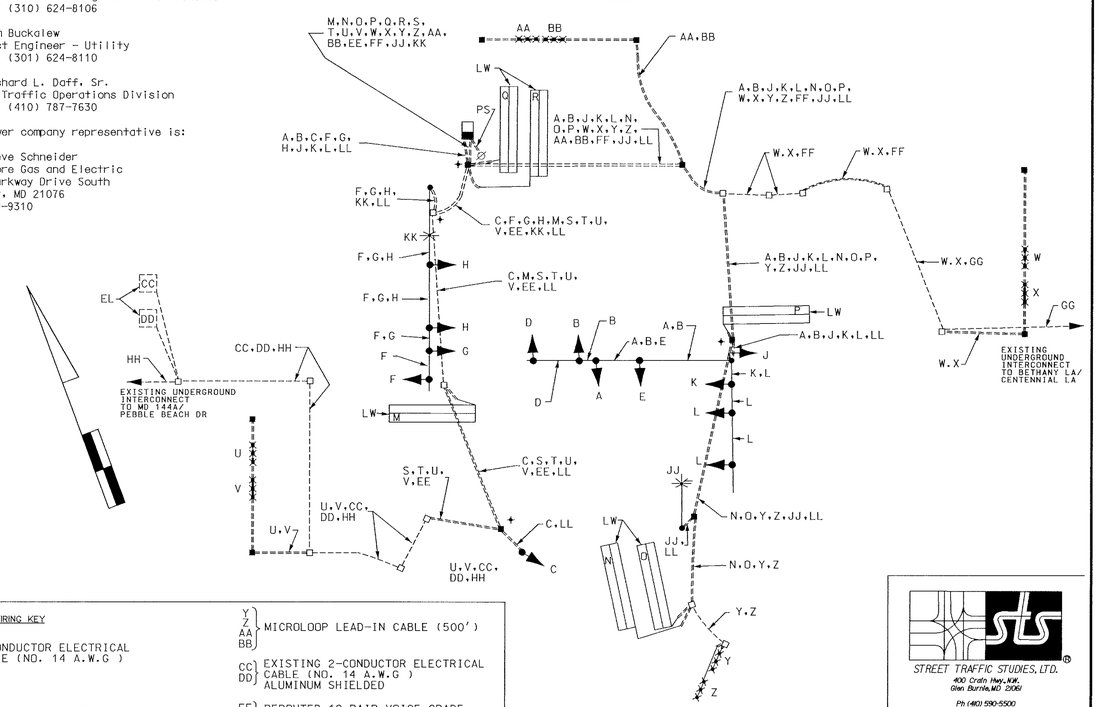
The power company representative is:

Mr. Steve Schneider
Baltimore Gas and Electric
7317 Parkway Drive South
Hanover, MD 21076
410-859-9310
WMS#

## PHASE CHART

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PHASE 1 & 5 | ◄G- | ◄G- | R | R | ◄G- | ◄G- | R | R | R | R | R | R | R |
| CHANGES TO PHASES 1 & 6, 2 & 5 OR 2 & 6 | | | | | | | | | | | | | |
| PHASE 1 & 6 | ◄G- | ◄G- | G | G | ◄R- | ◄R- | R | R | R | R | R | R | R |
| 1 & 6 CHANGE | ◄Y- | ◄Y- | G | G | ◄R- | ◄R- | R | R | R | R | R | R | R |
| PHASE 2 & 5 | ◄R- | ◄R- | R | R | ◄G- | ◄G- | G | G | R | R | R | R | R |
| 2 & 5 CHANGE | ◄R- | ◄R- | R | R | ◄Y- | ◄Y- | G | G | R | R | R | R | R |
| PHASE 2 & 6 | ◄R- | ◄R- | G | G | ◄R- | ◄R- | G | G | R | R | R | R | R |
| 2 & 6 CHANGE | ◄R- | ◄R- | Y | Y | ◄R- | ◄R- | Y | Y | R | R | R | R | R |
| PHASE 3 | ◄R- | ◄R- | R | R | ◄R- | ◄R- | R | R | G / ◄G- | G / ◄G- | G | R | R |
| 3 CHANGE | ◄R- | ◄R- | R | R | ◄R- | ◄R- | R | R | Y | Y | Y | R | R |
| PHASE 4 | ◄R- | ◄R- | R | R | ◄R- | ◄R- | R | R | R | R | R | G / ◄G- | G |
| 4 CHANGE | ◄R- | ◄R- | R | R | ◄R- | ◄R- | R | R | R | R | R | Y | Y |
| FLASHING OPERATION | FL/◄R- | FL/◄R- | FL/Y | FL/Y | FL/◄R- | FL/◄R- | FL/Y | FL/Y | FL/R | FL/R | FL/R | FL/R | FL/R |

## WIRING DIAGRAM




### WIRING KEY

- A, B, C — 7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )
- D, E, F, G, H, J, K, L — 5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G )
- M, N, O, P, Q, R — 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G ) ALUMINUM SHIELDED
- S, T — REROUTED 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G ) ALUMINUM SHIELDED
- U, V, W, X — MICROLOOP LEAD-IN CABLE (1000')
- Y, Z, AA, BB — MICROLOOP LEAD-IN CABLE (500')
- CC, DD — EXISTING 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G ) ALUMINUM SHIELDED
- EE, FF — REROUTED 12-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED)
- GG, HH — EXISTING 12-PAIR VOICE GRADE INTERCONNECT CABLE (JELLY FILLED)
- JJ, KK — 2-CONDUCTOR TRAY CABLE (NO. 14 A.W.G )
- LL — STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
- PS — PROPOSED UNDERGROUND POWER SERVICE BY BGE
- EL — LOOP WIRE (NO. 14 A.W.G.) EXISTING
- LW — LOOP WIRE (NO. 14 A.W.G.)
- ✦ — GROUND ROD

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**MARYLAND DOT - STATE HIGHWAY ADMINISTRATION**
***Office of Traffic & Safety***
TRAFFIC ENGINEERING DESIGN DIVISION

US 40 @ FREDERICK RD/ PINE ORCHARD LN

| | | | | | |
|---|---|---|---|---|---|
| DRAWN BY: ROB CICCHINI | F.A.P. NO. | | TS NO. 2196-A | SHEET NO. 2 OF 3 |
| CHECKED BY: R ZACHERL | S.H.A. NO. | N/A | | |
| SCALE: N/A | COUNTY: HOWARD | | T.I.M.S. NO. | |
| DATE: 2-26-02 | LOG MILE: 13004015.93 | | | |

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