F H W A REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	MD		35	47

PROJECT DESCRIPTION

I. GENERAL

This project is located at the intersection of Forest Drive @ Spa Road in Anne Arundel County Maryland and involves the reconstruction of the existing signal and the geometric improvements of an additional left turn lane along Forest Drive eastbound and westbound and an additional left turn lane along Spa Road northbound and southbound.

II. INTERSECTION OPERATION

The proposed traffic signal will operate in a NEMA four (4) phase, fully traffic actuated mode. The Forest Drive approaches will operate concurently. Each of the Spa Road approaches will operate separately.

A new eight phase fully traffic actuated 'Eagle' controller with six (6) two channel time delay output loop detector amplifiers, telemery module, intersection monitor with battery back up and pre-emption call isolation relay package housed in a base mounted cabinet shall be located at its' new location.

III. SPECIAL NOTES

1. It is the responsibility of the contractor to confirm geometrics prior to placing signal equipment.
2. The signal shop will be notified to perform internal wiring of the cabinet at MD 665 @ Hilltop Lane. All cable shall be identified and brought into the controller by the contractor. The contractor shall notify Mr. Douglas Beall, A. A. County Signal shop at (410) 222-1940 seventy-two (72) hours in advance of this work.
3. Anne Arundel County will be given at least three (3) days notice to perform striping through the intersection area. Contact Mr. Robert Sword at (410) 222-7331 to initiate this operation.
4. MOT Plates for this project will be as follows: 104.107, 105.00, 01, 02, 105.101, 105.103, 105.105, and 107.007.

CONSTRUCTION DETAILS

(A) Install 12' x 32 foot galvanized steel pole. (Note: one two inch 90 degree PVC schedule 80 bend.)

(B) Install 12' x 32 foot galvanized steel pole with pedestrian signal heads, pedestrian pushbuttons and pushbutton sign, 20 foot street lighting arm with 250 watt luminaire (Note: one-two inch 90 degree PVC schedule 80 bend.)

(C) Install controller and cabinet. (Note: two, 4" 90 degree PVC schedule 40 bend and one, 2" 90 degree PVC schedule 80 bend.)

(D) Install handhole.

(E) Install 6' x 6' loop detector in 1/4 inch flexible tubing (4 turns).

(F) Install 6' x 30' loop detector in 1/4 inch flexible tubing (3-6-3 turns).

(G) Install 1 inch liquid tight flexible non-metallic conduit and fitting (Detector Wire Sleeve).

(H) Install 2 inch polyvinyl chloride electrical conduit schedule 40 - trenched.

(I) Install 2 inch polyvinyl chloride electrical conduit schedule 80 - bored.

(J) Install 3 inch polyvinyl chloride electrical conduit schedule 40 - trenched

(K) Install 3 inch polyvinyl chloride electrical conduit schedule 80 - bored

(L) Install 4 inch polyvinyl chloride electrical conduit schedule 40 - trenched

(M) Install 24 inch preformed pavement marking tape for stop line.

(N) Remove and salvage existing strain pole and all attached equipment.

(O) Not used.

(P) Remove existing handhole and abandon existing conduit.

(Q) Install proposed pavement marking.

(R) Remove existing controller and attached equipment.

(S) Install 2 inch polyvinyl chloride electrical conduit schedule 80- trenched.

(T) Install 12 inch preformed pavement marking tape for crosswalks.

(U) Install 12' x 10 foot galvanized steel pedestal pole with pedestrian signal heads, pedestrian pushbuttons and pushbutton sign. (Note: one two inch 90 degree PVC schedule 40 bend.)

(V) Install 12' x 32 foot galvanized steel pole with pedestrian signal heads, pedestrian pushbuttons and pushbutton sign.

EQUIPMENT LIST

A. EQUIPMENT TO BE SUPPLIED BY SHA AND INSTALLED BY THE CONTRACTOR:

QUANTITY	SPEC. SECTION	DESCRIPTION
2 EA	814	FURNISH 12" 1 WAY, 3 SECTON (R,Y,G, 12" GA) SIGNAL HEAD - SPAN WIRE MOUNT
8 EA	814	FURNISH 12" 1 WAY, 3 SECTION (R,Y,G) SIGNAL HEAD-SPAN WIRE MOUNT
2 EA	814	FURNISH 12" 1-WAY, 4-SECTION (R, Y, G, GA) SIGNAL HEAD - SPAN MOUNT
6 EA	814	FURNISH 12" ONE-WAY, TWO SECTION PEDESTRIAN SIGNAL HEAD- POLE MOUNT
5 EA	817	FURNISH PUSHBUTTON AND SIGN
1 EA	816	EIGHT-PHASE (FULLY-ACTUATED) "EAGLE" CONTROLLER, TELEMENTRY MODULE, INTERSECTION MONITOR WITH BATTERY BACKUP AND PRE-EMPTION CALL ISOLATION RELAY PACKAGE HOUSED IN BASE MOUNTED CABINET (TO BE FURNISHED BY A. A. COUNTY)
4 S.F.	813	D3-2 STREET NAME SIGN (DUEL FACE) WITH SPAN WIRE MOUNTED HARDWARE (SPA ROAD), 16' x VARIABLE
15 S.F.	813	TWO (2) R3-5L (30"x36") SIGN WITH SPAN WIRE MOUNTED HARDWARE
3.75 S.F.	813	FIVE (5) R10-3C (9" x 12") SIGN WITH POLE BANDING MOUNTED HARDWARE
6 EA.	—	FURNISH TWO CHANNEL TIME DELAY OUTPUT LOOP DETECTOR AMPLIFIERS

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

QUANTITY	SPEC. SECTION	DESCRIPTION
L.S.	104	FURNISH AND INSTALL MAINTENANCE OF TRAFFIC
125 L.F.	—	FURNISH AND INSTALL 24" WHITE PAV'T MARKING TAPE FOR STOP LINES
450 L.F.	—	FURNISH AND INSTALL 12" WHITE PAVEMENT MARKING TAPE FOR CROSSWALKS
4 EA.	—	FURNISH AND INSTALL PAV'T ARROWS
15 C.Y.	801	FURNISH AND INSTALL CONCRETE FOR SIGNAL FOUNDATION
170 L.F.	804	FURNISH AND INSTALL #6 AWG STRANDED BARE COPPER GROUND WIRE
50 L.F.	805	FURNISH AND INSTALL 1" LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT
1 EA.	—	FURNISH AND INSTALL 6' x 6' x 24" STAINLESS STEEL WEATHER TIGHT TROUGH
14 EA.	811	FURNISH AND INSTALL ELECTRIC HANDHOLE
4 EA.	—	FURNISH AND INSTALL 12" x 32' STRAIN POLE (2-PLY)
940 L.F.	810	FURNISH AND INSTALL ELECTRIC CABLE, 2-CONDUCTOR (NO. 14 A.W.G.)
2 EA.	806	FURNISH AND INSTALL 250 WATT HIGH PRESSURE SODIUM LAMP AND LUMINAIRE
6 EA.	804	FURNISH AND INSTALL GROUND ROD - 3/4" DIAMETER x 10' LENGTH
1 EA.	—	FURNISH AND INSTALL CONTROL AND DISTRIBUTION EQUIPMENT (120/240V, 1 PHASE 3 WIRE SYSTEM)
12 EA.	814	INSTALL SIGNAL HEAD - SPAN MOUNT
3500 L.F.	810	FURNISH AND INSTALL ELECTRICAL CABLE 2-CONDUCTOR (ALUMINUM SHIELDED)
90 L.F.	810	FURNISH AND INSTALL CABLE, 5-CONDUCTOR (NO. 14 A.W.G.)
1430 L.F.	810	FURNISH AND INSTALL ELECTRICAL CABLE, 7-CONDUCTOR (NO. 14 A.W.G.)
400 L.F.	810	FURNISH AND INSTALL ELECTRICAL CABLE-2 CONDUCTOR (NO. 12 A.W.G.) TRAY CABLE
2600 L.F.	810	FURNISH AND INSTALL LOOP WIRE ENCASED IN FLEXIBLE TUBING (NO. 14 A.W.G.)
850 L.F.	815	FURNISH AND INSTALL SAWCUT FOR SIGNAL (LOOP DETECTOR)
2 EA.	808	FURNISH AND INSTALL 20' LIGHTING ARM ON SIGNAL STRUCTURE
515 L.F.	819	FURNISH AND INSTALL STEEL SPAN WIRE - 3/8" DIAMETER
775 L.F.	805	FURNISH AND INSTALL P.V.C. CONDUIT 2" - TRENCHED SCHEDULE 40
40 L.F.	805	FURNISH AND INSTALL P.V.C. CONDUIT 2" - BORED SCHEDULE 80
75 L.F.	805	FURNISH AND INSTALL P.V.C. CONDUIT 3" - TRENCHED SCHEDULE 40
240 L.F.	805	FURNISH AND INSTALL P.V.C. CONDUIT 3" - BORED SCHEDULE 80
20 L.F.	805	FURNISH AND INSTALL P.V.C. CONDUIT 4" - TRENCHED SCHEDULE 40
1 EA.	816	INSTALL CONTROLLER AND CABINET - BASE MOUNT
1 L.S.	—	REMOVE AND RETURN EXISTING EQUIPMENT
60 L.F.	810	3 CONDUCTOR (NO. 4 A.W.G.)
110 L.F.	805	FURNISH AND INSTALL P.V.C. CONDUIT 2" -TRENCHED SCHEDULE 80

MR. WILLIAM ECKARDT
BALTIMORE GAS AND ELECTRIC COMPANY
SOUTHERN DISTRIBUTION
7317 PARKWAY DRIVE
HANOVER, MARYLAND 21076

EQUIPMENT LIST (CONT'D)

QUANTITY	SPEC. SECTION	DESCRIPTION
6 EA	814	INSTALL 12" ONE-WAY, TWO SECTION PEDESTRIAN SIGNAL HEAD-POLE MOUNT
5 EA	817	INSTALL PUSHBUTTON AND SIGN
825 L.F.	810	FURNISH AND INSTALL ELECTRICAL CABLE 3 -CONDUCTOR (NO. 14 A.W.G.)
2 EA	800	FURNISH AND INSTALL 12"X 10 FOOT PEDESTAL POLE
19 S.F.	813	INSTALL OVERHEAD SIGNS - SPAN MOUNT

C. EQIUPMENT TO BE REMOVED BY THE CONTRACTOR AND DELIVERED TO ANNE ARUNDEL COUNTY TRAFFIC SIGNAL SHOP. CONTACT MR. DOUGLAS BEALL (410) 222-1940 72 HOURS IN ADVANCE PRIOR TO DELIVERY.

QUANTITY	DESCRIPTION
10 EA	REMOVE AND SALVAGE SIGNAL HEAD (ANY TYPE)
1 EA	REMOVAL AND SALVAGE OF CABINET (ANY TYPE)
2 EA	REMOVE AND SALVAGE SIGNAL STRAIN POLES

NOTE: ALL EQUIPMENT AND MATERIAL NOT LISTED ABOVE WILL BECOME THE PROPERTY OF THE CONTRACTOR

THE FOLLOWING CONTACT PERSONS FOR DISTRICT # 5 ARE AS FOLLOWS:

Mr. Paul Armstrong
District Engineer
Phone: (410) 841-5450

Mr. Lawrence E. Elliott
Assistant District Engineer-Traffic
Phone: (410) 841-5450

Mr. Charles George
Assistant District Engineer-Maintenance
Phone: (410) 841-5450

Mr. John Mayes
Assistant District Engineer-Utility
Phone: (410) 841-5450

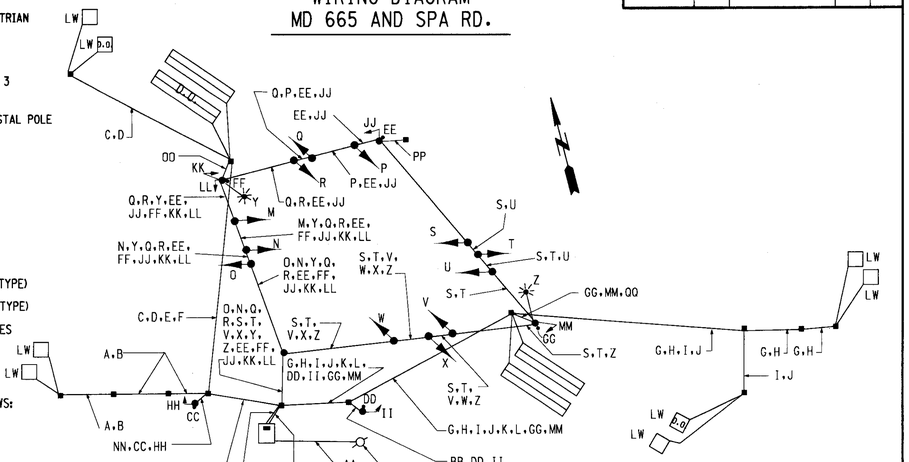
Mr. Richard L. Daff
Chief Traffic Operations Division
Phone: (410) 787-7630

THE FOLLOWING CONTACT PERSONS FOR ANNE ARUNDEL COUNTY ARE AS FOLLOWS:

Mr. Robert Sword
Assistant Division Chief
Phone: (410) 222-7331

Mr. Douglas Beall
Signal Supervisor
Phone: (410) 222-1940

WIRING DIAGRAM
MD 665 AND SPA RD.



WIRING KEY

A,B,C,D,C,D, E,F,G,H,I,J,K,L	2 CONDUCTOR ELECTRICAL CABLE ALUMINUM SHIELDED (NO. 14) AWG
Y,Z	2 CONDUCTOR (NO. 12 A.W.G.) TRAY FOR ALL LUMINAIRES.
CC,DD,EE,FF,GG	2 CONDUCTOR ELECTRIC CABLE NO. 14 A.W.G. FOR PEDS PUSH BUTTON
AA	3 CONDUCTOR (NO. 4 A.W.G.)
HH,II,JJ,KK,LL,MM	3 CONDUCTOR ELECTRICAL CABLE NO 14 A.W.G. ONE WAY 2 SECTION PED SIGNAL HEAD
M,P,U,W	5 CONDUCTOR ELECTRICAL CABLE (NO. 14) AWG
N,O,Q,R,S,T,V,X	7 CONDUCTOR ELECTRICAL CABLE (NO. 14 AWG
BB,NN,OO,PP,QQ	STRANDED BARE COPPER WIRE (NO. 6 A.W.G.)
P.S.	POWER SOURCE
L.W.	LOOP WIRE

PHASE CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
PHASE 2 & 6	G	G	G	G	G	G	R	R	R	R	R	R	W	W	W	W	DW	DW
PED CLEAR	G	G	G	G	G	G	R	R	R	R	R	R	FL/DW	FL/DW	FL/DW	FL/DW	DW	DW
PHASE 2 & 6 CHANGE	Y	Y	Y	Y	Y	Y	R	R	R	R	R	R	DW	DW	DW	DW	DW	DW
PHASE 3	R	R	R	R	R	R	G	G	G	R	R	R	DW	DW	DW	DW	DW	DW
PHASE 3 CHANGE	R	R	R	R	R	R	Y	Y	Y	R	R	R	DW	DW	DW	DW	DW	DW
PHASE 4	R	R	R	R	R	R	R	R	R	G	G	G	DW	DW	DW	DW	W	W
PED CLEAR	R	R	R	R	R	R	R	R	R	G	G	G	DW	DW	DW	DW	FL/DW	FL/DW
PHASE 4 CHANGE	R	R	R	R	R	R	R	R	R	Y	Y	Y	DW	DW	DW	DW	DW	DW
FLASHING OPERATION	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/R	FL/R	FL/R	FL/R	FL/R	DARK	DARK	DARK	DARK	DARK	DARK

PHASING NOTES :
- PHASE 2 WILL ALWAYS BE WITH PHASE 6 NEVER ALONE
- PHASE 3 WILL ALWAYS BE ALONE
- PHASE 4 WILL ALWAYS BE ALONE

JOHNSON, MIRMIRAN, & THOMPSON, P.A.
72 LOVETON CIRCLE
SPARKS, MARYLAND 21152
(410) 329-3100

REVISIONS

D. 10/95 S.H.A. AA 317-202-571 RECONSTRUCT TRAFFIC SIGNAL DUE TO GEOMETRIC CHANGES
C. 4/89 ADD E/P LT. FOR S.B. MD 387 (SPA ROAD)
D.C.D.
B. 10/83 S.H.A. AA 374-501-595 RECONSTRUCTION OF A TWO PHASE INTERSECTION
E.W.M.
A. 11/3/82 REDRAW
K.W.

APPROVALS

CHIEF, DESIGN SECTION
ASST. DISTRICT ENGINEER, TRAFFIC
CHIEF, TRAFFIC ENGINEERING DESIGN DIVISION
DIRECTOR, TRAFFIC & SAFETY

REVISIONS

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

FOREST DRIVE AND SPA ROAD

GENERAL INFORMATION — LOG MILE: 02038700.66

DRAWN BY:	S.R.BARANOWSKI	F.A.P. NO.		TS NO.	SHEET NO.
CHK. BY:	R.R.ZACHERL	S.H.A. NO.	AA3175376	121(D)	35 OF 47
SCALE:	1" = 20'	COUNTY	ANNE ARUNDEL		
DATE:	3/16/88				

FILE: m:\md_sigs\spa_gen.dgn
DATE: 12-Sep-96 17:20