F.H.W.A. REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3	MD		192	258

PROJECT DESCRIPTION

I. GENERAL

THIS PROJECT INVOLVES THE INSTALLATION OF A FULLY ACTUATED TRAFFIC SIGNAL AT THE INTERSECTION OF BUSINESS US 1 (CONOWINGO ROAD) AND US 1 (HICKORY BYPASS) IN HARFORD COUNTY, MARYLAND. US 1 (HICKORY BYPASS) RUNS IN A NORTH-SOUTH DIRECTION.

II. INTERSECTION OPERATIONS

THE PROPOSED TRAFFIC SIGNALS WILL OPERATE IN A NEMA EIGHT (8) PHASE, FULLY TRAFFIC ACTIVATED MODE. THE BUSINESS US 1 APPROACHES WILL OPERATE CONCURRENTLY. THE BUSINESS US 1 NORTHBOUND AND SOUTHBOUND LEFT TURNS ARE EXCLUSIVE/PERMISSIVE. THE US 1 APPROACHES WILL OPERATE CONCURRENTLY. THE US 1 NORTHBOUND LEFT TURNS ARE EXCLUSIVE/PERMISSIVE. THE US 1 SOUTHBOUND LEFT TURNS ARE EXCLUSIVE.

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 BUSINESS US 1 AND US 1. ALL CABLE SHALL BE IDENTIFIED AND BROUGHT INTO THE CONTROLLER BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY MR. EDWARD RODENHEIZER, S.H.A. SIGNAL SHOP AT (301) 787-7650 SEVENTY-TWO (72) HOURS IN ADVANCE.

CONSTRUCTION DETAILS

A. INSTALL ONE 27 FOOT GALVANIZED STEEL POLE CUT AND CAPPED TO 20 FEET WITH SINGLE MAST ARM, 60 FEET IN LENGTH, TRAFFIC SIGNAL HEADS, SIGNS, AND FOUR ANCHOR BOLTS IN SIZES OF 2"X90". INCLUDE ONE 3-INCH SCHEDULE 80 90 DEGREE BEND.

B. INSTALL ONE 27 FOOT GALVANIZED STEEL POLE WITH SINGLE MAST ARM, 60 FEET IN LENGTH, TRAFFIC SIGNAL HEADS, SIGNS, AND FOUR ANCHOR BOLTS IN SIZES OF 2"x90". INSTALL ONE 20 FOOT LIGHTING ARM WITH LUMINAIRE ON SIGNAL POLE. INCLUDE TWO 3-INCH SCHEDULE 80 90 DEGREE CONDUIT BENDS.

C. INSTALL BASE MOUNTED CABINETS AND CONTROLLERS WITH ALL NECESSARY EQUIPMENT AND CONTROL AND DISTRIBUTION EQUIPMENT.

D. INSTALL MICRO-LOOP PROBE DETECTORS.

E. INSTALL 6' x 30' LOOP DETECTOR IN 1/4-INCH FLEXIBLE PVC TUBING (3-6-3 TURNS).

F. INSTALL 1-INCH LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT AND FITTING (DETECTOR WIRE SLEEVE).

G. INSTALL 1-INCH GALVANIZED CONDUIT FOR DETECTOR SLEEVE.

H. INSTALL HANDHOLE.

I. INSTALL 2-INCH POLYVINYL CHLORIDE ELECTRICAL CONDUIT SCHEDULE 80-TRENCHED.

J. INSTALL 3-INCH POLYVINYL CHLORIDE ELECTRICAL CONDUIT SCHEDULE 80-TRENCHED.

K. INSTALL 4-INCH POLYVINYL CHLORIDE ELECTRICAL CONDUIT SCHEDULE 80-TRENCHED.

L. INSTALL 4-INCH POLYVINYL CHLORIDE ELECTRICAL CONDUIT SCHEDULE 80-SLOTTED.

M. INSTALL 24-INCH PERMANENT PREFORMED HEAT APPLIED THERMAL PLASTIC STOP LINE.

N. INSTALL OVERHEAD ELECTRICAL POWER FEED.

P. INSTALL W3-3 SIGN AS SHOWN.

Q. INSTALL ROUTE MARKER ASSEMBLY AS SHOWN.

EQUIPMENT LIST

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

ITEM NO.	CAT. CODE NO.	QUANTITY	DESCRIPTION
	900001	5 EA	12" 1-WAY, 3-SECTION (R,Y,G) TRAFFIC SIGNAL HEAD - MAST ARM MOUNT
	900001	2 EA	12" 1-WAY, 3-SECTION (RA,YA,GA) TRAFFIC SIGNAL HEAD - MAST ARM MOUNT
	900001	6 EA	12" 1-WAY, 5-SECTION (R,Y,YA,G,GA) TRAFFIC SIGNAL HEAD - MAST ARM MOUNT
	900001	1 EA	FURNISH NEMA SIZE 6 BASE MOUNTED CABINET & CONTROLLER WITH TELEMETRY
	900001	1 EA	FURNISH NEMA SIZE 5 BASE MOUNTED CABINET & MASTER CONTROLLER
	900001	327 SF	SHEET ALUMINUM SIGNS
		4 EA	D3-2 SIGN (16"x96") - MAST ARM MOUNT
		2 EA	R3-5L SIGN (30"x36") - MAST ARM MOUNT
		2 EA	R3-5R SIGN (30"x36") - MAST ARM MOUNT
		3 EA	R10-12 SIGN (24"x30") "LEFT TURN YIELD ON GREEN" - MAST ARM MOUNT
		1 EA	SHIELD ASSEMBLY "NORTH, US 1, RIGHT ARROW" (30"X51") - POLE MOUNT
		1 EA	SHIELD ASSEMBLY "NORTH, US 1, LEFT ARROW" (48"X75") - POLE MOUNT
		1 EA	SHIELD ASSEMBLY "SOUTH, US 1, RIGHT ARROW" (30"X51") - POLE MOUNT
		1 EA	SHIELD ASSEMBLY "SOUTH, US 1, LEFT ARROW" (48"X75") - POLE MOUNT
		1 EA	SHIELD ASSEMBLY "NORTH, BUSINESS US 1, RIGHT ARROW" (30"X51") - GROUND MOUNT
		1 EA	SHIELD ASSEMBLY "NORTH, BUSINESS US 1, LEFT ARROW" (48"X75") - GROUND MOUNT
		1 EA	SHIELD ASSEMBLY "SOUTH, BUSINESS US 1, RIGHT ARROW" (30"X51") - GROUND MOUNT
		1 EA	SHIELD ASSEMBLY "SOUTH, BUSINESS US 1, LEFT ARROW" (48"X75") - GROUND MOUNT
		6 EA	W3-3 SIGN (48"X48") "NEW SIGNAL AHEAD" - GROUND MOUNT

B. EQUIPMENT TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR

ITEM NO.	CAT. CODE NO.	QUANTITY	DESCRIPTION
	120500	1 LS	MAINTENANCE OF TRAFFIC
	585445	160 LF	FURNISH AND INSTALL 24-IN. WHITE PERMANENT PREFORMED HEAT APPLIED THERMAL PLASTIC (STOP BAR)
	800001	1300 LF	FURNISH AND INSTALL 2-IN. SCHEDULE 80 PVC CONDUIT-TRENCHED
	800002	310 LF	FURNISH AND INSTALL 3-IN. SCHEDULE 80 PVC CONDUIT-TRENCHED
	800003	30 LF	FURNISH AND INSTALL 4-IN. SCHEDULE 80 PVC CONDUIT-TRENCHED
	800004	2 EA	FURNISH AND INSTALL STEEL POLE WITH SINGLE 60' MAST ARM
	800005	2 EA	FURNISH AND INSTALL MICROLOOP PROBE SET 500 FT. LEAD-IN
	800006	6 EA	FURNISH AND INSTALL MICROLOOP PROBE SET 1000 FT. LEAD-IN
2	~~800007~~	~~1 EA~~	~~INSTALL NEMA SIZE 5 BASE MOUNTED CABINET~~
	800008	140 LF	FURNISH AND INSTALL OVERHEAD POWER FEED
	801004	10 CY	FURNISH AND INSTALL CONCRETE SIGNAL FOUNDATION
	801106	475 LF	FURNISH AND INSTALL WOOD SIGN SUPPORTS 4" x 6"
	805011	105 LF	FURNISH AND INSTALL 1-IN. GALVANIZED CONDUIT FOR DETECTOR SLEEVE
	805155	145 LF	FURNISH AND INSTALL 4-IN. SCHEDULE 80 PVC CONDUIT-SLOTTED
	805160	7 LF	FURNISH AND INSTALL 1-IN. LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT SLEEVE
	811001	16 EA	FURNISH AND INSTALL HANDHOLE
	813014	239 SF	INSTALL SIGN GROUND MOUNT
	813015	88 SF	INSTALL OVERHEAD SIGN
	831010	1 EA	FURNISH AND INSTALL 250 WATT HIGH PRESSURE SODIUM LAMP AND LUMINAIRE
	832020	380 LF	FURNISH AND INSTALL NO. 6 STRANDED BARE COPPER GROUND WIRE (NO. 6 AWG)
	837001	2 EA	FURNISH AND INSTALL GROUND ROD- 3/4IN. DIAMETER X 10 FT. LENGTH
	838003	2 EA	FURNISH AND INSTALL CONTROL AND DISTRIBUTION EQUIPMENT (120/240V, 1 PH, 3 W)
	860220	13 EA	INSTALL SIGNAL HEAD ANY TYPE - MAST ARM MOUNT
	861104	825 LF	FURNISH AND INSTALL ELECTRICAL CABLE 2-CONDUCTOR ALUMINUM SHIELDED
	861107	1770 LF	FURNISH AND INSTALL ELECTRICAL CABLE 5-CONDUCTOR NO. 14 AWG
	861108	1675 LF	FURNISH AND INSTALL ELECTRICAL CABLE 7-CONDUCTOR NO. 14 AWG
	861116	110 LF	FURNISH AND INSTALL ELECTRICAL CABLE 2-CONDUCTOR NO. 12 - TYPE TC
	862101	3975 LF	FURNISH AND INSTALL LOOP WIRE
	862102	1125 LF	FURNISH AND INSTALL SAWCUT FOR SIGNAL (LOOP DETECTOR)
	866104	1 EA	FURNISH AND INSTALL 20 FT. LIGHTING ARM ON SIGNAL STRUCTURE
2	871202	~~1~~ 2 EA	INSTALL NEMA SIZE 6 BASE MOUNTED CABINET

PROJECT CONTACTS

THE FOLLOWING CONTACT PERSONS FOR DISTRICT #4 ARE AS FOLLOWS:

MR. DAVID L. MALKOWSKI
DISTRICT ENGINEER
PHONE: (410) 321-3461

MR. RANDALL SCOTT
ASSISTANT DISTRICT ENGINEER - TRAFFIC
PHONE: (410) 321-3514

MR. DAVID RAMSEY
ASSISTANT DISTRICT ENGINEER - MAINTENANCE
PHONE: (410) 363-1315

MR. JOE MCMAHON
ASSISTANT DISTRICT ENGINEER - UTILITY
PHONE: (410) 321-3456

MR. RICHARD DAFF
CHIEF TRAFFIC OPERATIONS DIVISION
PHONE: (410) 787-7360

TYPICAL FOR US BUSINESS 1 SIGNS

LEGEND	BCKGRD	SHIELD
W	G	
W	W	G
B	W	

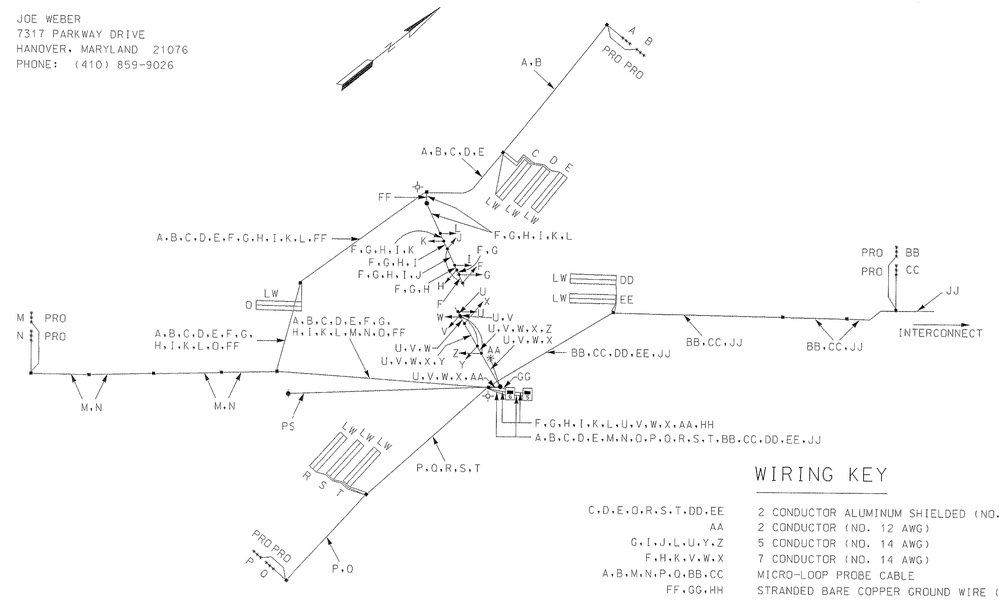
B=BLACK
G=GREEN
W=WHITE

PROJECT CONTACTS

THE POWER COMPANY REPRESENTATIVE IS:
BALTIMORE GAS AND ELECTRIC COMPANY

JOE WEBER
7317 PARKWAY DRIVE
HANOVER, MARYLAND 21076
PHONE: (410) 859-9026

WIRING AND INTERCONNECT DIAGRAM



WIRING KEY

C,D,E,O,R,S,T,DD,EE	2 CONDUCTOR ALUMINUM SHIELDED (NO. 14 AWG)
AA	2 CONDUCTOR (NO. 12 AWG)
G,I,J,L,U,Y,Z	5 CONDUCTOR (NO. 14 AWG)
F,H,K,V,W,X	7 CONDUCTOR (NO. 14 AWG)
A,B,M,N,P,Q,BB,CC	MICRO-LOOP PROBE CABLE
FF,GG,HH	STRANDED BARE COPPER GROUND WIRE (NO. 6 AWG)
JJ	INTERCONNECT
PRO	MICRO-LOOP PROBES
PS	POWER SOURCE
LW	LOOP WIRE
⊕	GROUND ROD

PHASING CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13
PHASE 1 & 5	R G Y	R G Y	R	G	G	R	R	R	R	R	R	R	R
PHASE 1 & 5 CHANGE	R G Y	R G Y	R	Y	Y	R	R	R	R	R	R	R	R
PHASE 1 & 6	G	G	G	R	R	R	R	R	R	R	R	R	R
PHASE 1 & 6 CHANGE	G Y	G Y	G	R	R	R	R	R	R	R	R	R	R
PHASE 2 & 5	R	R	R	G	G	G	G	R	R	R	R	R	R
PHASE 2 & 5 CHANGE	R	R	R	Y	Y	G	G	R	R	R	R	R	R
PHASE 2 & 6	G	G	G	R	R	G	G	R	R	R	R	R	R
PHASE 2 & 6 CHANGE	Y	Y	Y	R	R	Y	Y	R	R	R	R	R	R
PHASE 3 & 7	R	R	R	R	R	R	R	R G Y	R G Y	R	R G Y	R G Y	R
PHASE 3 & 7 CHANGE	R	R	R	R	R	R	R	R G Y	R G Y	R	R G Y	R G Y	R
PHASE 3 & 8	R	R	R	R	R	R	R	G	G	G	R	R	R
PHASE 3 & 8 CHANGE	R	R	R	R	R	R	R	G Y	G Y	G	R	R	R
PHASE 4 & 7	R	R	R	R	R	R	R	R	R	R	G	G	G
PHASE 4 & 7 CHANGE	R	R	R	R	R	R	R	R	R	R	G Y	G Y	G
PHASE 4 & 8	R	R	R	R	R	R	R	G	G	G	G	G	G
PHASE 4 & 8 CHANGE	R	R	R	R	R	R	R	Y	Y	Y	Y	Y	Y
FLASHING OPERATION	FL/Y	FL/Y	FL/Y	FL/R	FL/R	FL/Y	FL/Y	FL/R	FL/R	FL/R	FL/R	FL/R	FL/R

NOTE: 1. PHASE 1 & 5 MAY CHANGE TO PHASE 1 & 6 OR PHASE 2 & 5 OR PHASE 2 & 6.
2. PHASE 3 & 7 MAY CHANGE TO PHASE 3 & 8 OR PHASE 4 & 7 OR PHASE 4 & 8.

REVISIONS	APPROVALS
2 REDLINE NO. 2 10/08/99	CHIEF, DESIGN SECTION
	ASST. DISTRICT ENGINEER, TRAFFIC
	CHIEF, TRAFFIC ENGINEERING DESIGN DIVISION
	DIRECTOR, TRAFFIC & SAFETY

AMT
A. MORTON THOMAS AND ASSOCIATES, INC.
CONSULTING ENGINEERS

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

US 1 (HICKORY BYPASS) AND
BUSINESS US 1 (CONOWINGO ROAD)

DRAWN BY: JAG	F.A.P. NO. AC-NH-G-123-1(301)E	TS NO.	SHEET NO.
CHK. BY: JRL	S.H.A. NO. HA-8735170	3856-GI	194 OF 259
SCALE: N.T.S.	COUNTY HARFORD		
DATE: MARCH, 1999			