PROJECT DESCRIPTION

I. GENERAL

This project involves the modification of an existing Traffic Control Signal at the intersection of US 40 and Eastern Boulevard in Washington County. The modification is necessary due to the widening of US 40. US 40 is assumed to run in 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 running concurrently. Exclusive left turn phases shall remain for both approaches of US 40. The pedestrian phase across the south leg of Eastern Boulevard shall remain on recall. The Eastern Boulevard approaches shall operate as a split phase.

2. Four (4) four-channel, rack mount loop detector amplifiers and associated harnesses shall be installed into the existing NEMA size "6" base-mounted cabinet at this intersection.

III. SPECIAL NOTE

All field wiring to the existing controller cabinet shall be terminated to the appropriate controller cabinet connectors by the Contractor and labeled. All other controller cabinet wiring will be performed by the S.H.A. Signal Shop. Contact Mr. Ed Rodenhizer at (410) 787-7650 seventy-two hours in advance of intended work.

EQUIPMENT LISTS

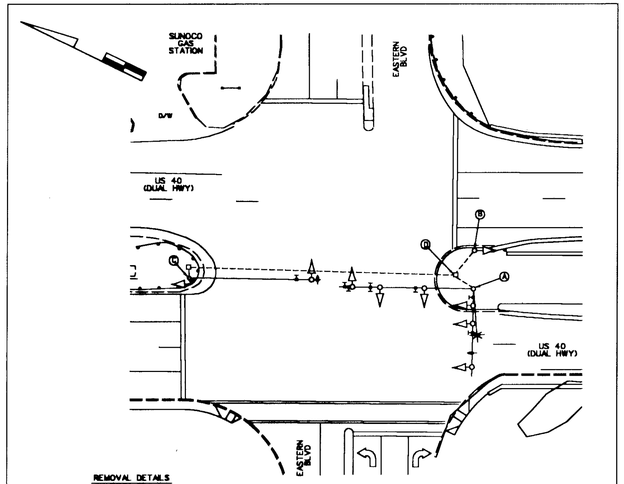
A. EQUIPMENT TO BE SUPPLIED BY S.H.A.

ITEM NO.	QUANTITY	DESCRIPTION
9001	3 Each	12", one-way, three-section (R,Y,G) traffic signal head with adjustable bracket for mast arm mounting and tunnel visors.
9002	4 Each	12", one-way, three-section (RA,YA,GA) traffic signal head with adjustable bracket for mast arm mounting and tunnel visors.
9003	2 Each	12", one-way, four-section (R,Y,G,GA) (left arrow) traffic signal with adjustable bracket for mast arm mounting and tunnel visors.
9004	65 S.F.	Sheet aluminum signs to consist of:
	3 Each	R3-5L "LEFT TURN ONLY" sign, (30" x 36") mast arm mounted.
	2 Each	R3-5R "RIGHT TURN ONLY" sign, (30" x 36") mast arm mounted.
	1 Each	R3-8 "LEFT TURN ONLY, LEFT TURN AND THRU" sign, (60" x 36") mast arm mounted.
	1 Each	R3-3C "NO LEFT OR U TURN" sign, (30" x 30") pole mounted.
	1 Each	R3-3C "NO LEFT OR U TURN" sign, (30" x 30") mast arm mounted.
9005	123 S.F.	Sheet aluminum signs to consist of:
	1 Each	D3-2 "N. Colonial Dr. (arrow)" sign, (96" x 16") ground mounted with hardware.
	1 Each	D3-2 "(arrow) Eastern Blvd S." sign, (96" x 16") ground mounted with hardware.
	1 Each	D-3(3) "Eastern Blvd S., LEFT LANE" (96" x 30") ground mounted with hardware.
	1 Each	D-3(3) "Eastern Blvd N., RIGHT AT SIGNAL" sign, (96" x 30") ground mounted with hardware.
	1 Each	"Eastern Blvd S. (arrow)" sign, (36" x 48") ground mounted with hardware.
	2 Each	R4-7R "KEEP RIGHT" (symbolic) sign, (24" x 30") ground mounted with hardware.
	2 Each	R3-7(1)R "RIGHT LANE MUST TURN RIGHT AT SIGNAL" sign, (30" x 42") ground mounted with hardware.
	1 Each	R6-1R "ONE WAY" sign, (36" x 12") ground mounted with hardware.
	1 Each	R10-6 "STOP HERE (arrow) ON RED" sign, (24" x 30") ground mounted with hardware.
	2 Each	W16-1 Type #1 (Yellow) object marker, (18" x 18") ground mounted with hardware.
	1 Each	"ARROW" (12" X 12") Panel to be applied to an existing ground mounted sign.
	1 Each	OM-3R object marker, (12" x 36") ground mounted with hardware.
	1 Each	OM-3(2) object marker, (24" x 30") ground mounted with hardware.
9006	4 Each	4-channel, rack mount loop detector amplifier. (To be installed by S.H.A. Signal Shop Forces.)
9007	1 Each	Detector Rack Retrofit. (To be installed by S.H.A. Signal Shop Forces.)
9008	1 Each	Detector Rack Power Supply. (To be installed by S.H.A. Signal Shop Forces.)
9009	1265 L.F.	Opticom Detector Cable #138 (3-conductor No. 20 A.W.G.).

EQUIPMENT LISTS (CON'T.)

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

ITEM NO.	QUANTITY	DESCRIPTION
1001	L.S.	Mobilization
1002	L.S.	Maintenance of traffic.
1003	150 S.F.	Temporary traffic sign.
1004	15 U.D.	Flashing arrow panels.
2001	1 C.Y.	Test pit excavation.
5001	4800 L.F.	Furnish and install thermoplastic pavement marking tape, white (5" width for lanelines).
5002	2725 L.F.	Furnish and install thermoplastic pavement marking tape, yellow (5" width for edgelines and centerlines).
5003	450 L.F.	Furnish and install thermoplastic pavement marking tape, white (10" width for edgelines).
5004	220 L.F.	Furnish and install thermoplastic pavement marking tape, white (12" width for crosswalks).
5005	220 L.F.	Furnish and install thermoplastic pavement marking tape, white (24"width for stoplines).
5006	2 Each	Furnish and install combination, left turn arrow and thru arrow (symbol) thermoplastic pavement marking.
5007	7 Each	Furnish and install curved arrow (symbol) thermoplastic pavement marking (right).
5008	7 Each	Furnish and install curved arrow (symbol) thermoplastic pavement marking (left).
5009	6 Each	Furnish and install "ONLY" (word) thermoplastic pavement marking.
8001	5.5 C.Y.	Furnish and install concrete foundation.
8002	2 Each	Furnish and install ground rod, ¾" diameter x 10' length.
8003	1 Each	Furnish and install 10' mast arm.
8004	1 Each	Furnish and install 27' steel pole with 50'-60' mast arms. (Note: 4 anchor bolts will be 2" x 90".)
8005	7 Each	Install 12", one-way, three-section traffic signal head, mast arm mount.
8006	2 Each	Install 12", one-way, four-section traffic signal head, mast arm mount.
8007	65 S.F.	Install overhead mounted sheet aluminum signs.
8008	123 S.F.	Install ground mounted sheet aluminum signs.
8009	1 Each	Relocate opticom detector eye.
8010	815 L.F.	Furnish and install sawcut.
8011	60 L.F.	Furnish and install 1" galvanized steel electrical conduit (detector wire sleeve).
8012	10 L.F.	Furnish and install 1" liquid tight flexible non-metallic electrical conduit (detector wire sleeve).
8013	30 L.F.	Furnish and install 2" polyvinyl chloride electrical conduit (Schedule 80) (bored).
8014	155 L.F.	Furnish and install 3" polyvinyl chloride electrical conduit (Schedule 80) (bored).
8015	160 L.F.	Furnish and install 2" polyvinyl chloride electrical conduit (Schedule 80) (trenched).
8016	20 L.F.	Furish and install 3" polyvinyl chloride electrical conduit (Schedule 80) (trenched).
8017	2 Each	Furnish and install handhole (frame and cover).
8018	375 L.F.	Furnish and install stranded bare copper ground wire (No. 6 A.W.G.).
8019	3120 L.F.	Furnish and install loop wire (No. 14 A.W.G.) encased in ½" flexible tubing.
8020	3685 L.F.	Furnish and install 2-conductor electrical cable (No. 14 A.W.G.) (aluminum shielded).
8021	40 L.F.	Furnish and install 3-conductor electrical cable (No. 14 A.W.G.).
8022	1825 L.F.	Furnish and install 5-conductor electrical cable (No. 14 A.W.G.).
8023	385 L.F.	Furnish and install 7-conductor electrical cable (No. 14 A.W.G.).
8024	530 L.F.	Furnish and install 2-conductor electrical cable (No. 12 A.W.G.) type THHN tray cable.
8025	414 L.F.	Furnish and install wood sign supports (4" x 4").
8026	3 Each	Furnish and install galvanized steel post, 10' U-Channel.
8027	2 Each	Furnish and install 36" flexible post (for W16-1 sign).
8028	1 Each	Furnish and install 10' lighting arm.
8029	1 Each	Furnish and install 250W HPS luminaire.
8030	1 Each	Furnish and install 3M Opticom #521 Detector Eye.
8031	1 Each	Reset lid on existing handhole.
8032	10 Each	Relocate existing ground mounted signs.
8033	6 Each	Remove existing ground mounted signs.
8034	600 L.F.	Remove existing pavement marking lines utilizing grinder method.
8035	6 Each	Remove existing pavement marking symbols utilizing grinder method.
8036	1 Each	Relocate existing pedestal pole and all existing equipment.
8037	L.S.	Removal and salvage of existing signal equipment.



REMOVAL DETAILS

A. Remove existing steel pole with twin mast arms and all attached equipment. Existing opticom detector eye shall be relocated onto the proposed mast arm as shown on the signal plan. (See Detail 'U'.) (Note: Cap and abandon attached conduit.)

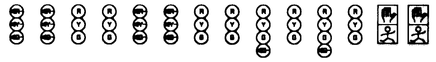
B. Remove existing pedestal pole and all attached equipment. (Note: Cap and abandon attached conduit.)

C. Remove existing pole-mounted traffic signal head.

D. Remove handhole. (Note: Cap and abandon all attached conduits.)

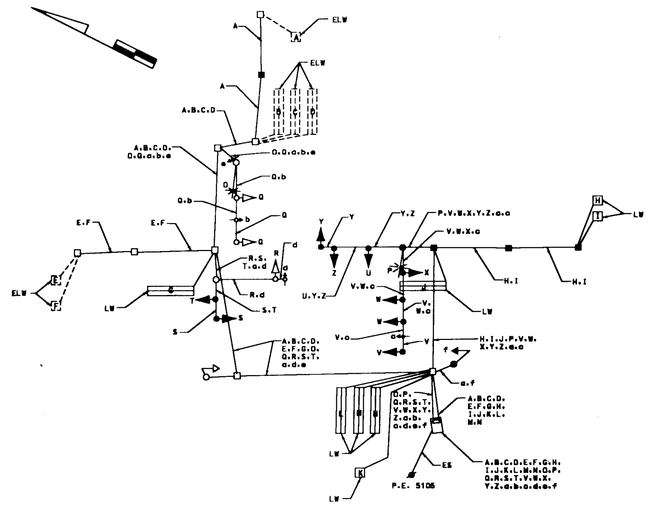
ADDITIONAL SIGNAL EQUIPMENT
REMOVAL TYPICAL
US 40 AND EASTERN BLVD.

PHASE CHART



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
PHASE 1 & 5	G	G	R	R	G	G	R	R	R	R	R	R	DW	DW
1 & 5 CHANGE	TO PHASE 1 & 6 OR PHASE 2 & 5												DW	DW
PHASE 1 & 6	G	G	G	G	R	R	R	R	R	R	R	R	DW	DW
1 CHANGE	Y	Y	G	G	R	R	R	R	R	R	R	R	DW	DW
PHASE 2 & 5	R	R	R	R	G	G	G	G	R	R	R	R	DW	DW
5 CHANGE	R	R	R	R	Y	Y	G	G	R	R	R	R	DW	DW
PHASE 2 & 6	R	R	G	G	R	R	G	G	R	R	R	R	WK	WK
PED CLEARANCE	R	R	G	G	R	R	G	G	R	R	R	R	FL/DW	FL/DW
2 & 6 CHANGE	R	R	Y	Y	R	R	Y	Y	R	R	R	R	DW	DW
PHASE 3	R	R	R	R	R	R	R	R	R	R	G G	G	DW	DW
3 CHANGE	R	R	R	R	R	R	R	R	R	R	Y	Y	DW	DW
PHASE 4	R	R	R	R	R	R	R	R	G G	G	R	R	DW	DW
4 CHANGE	R	R	R	R	R	R	R	R	Y	Y	R	R	DW	DW
PRE-EMPTION (EASTBOUND)	G	G	G	G	R	R	R	R	R	R	R	R	DW	DW
PRE-EMPTION CHANGE	Y	Y	G	G	R	R	R	R	R	R	R	R	DW	DW
PRE-EMPTION (WESTBOUND)	R	R	R	R	R	R	G	G	R	R	R	R	DW	DW
PRE-EMPTION CHANGE	R	R	R	R	R	R	G	G	R	R	R	R	DW	DW
PRE-EMPTION (SOUTHBOUND)	R	R	R	R	R	R	R	R	R	R	G G	G	DW	DW
PRE-EMPTION CHANGE	R	R	R	R	R	R	R	R	R	R	Y	Y	DW	DW
FLASHING OPERATION	FL/RA	FL/RA	FL/Y	FL/Y	FL/RA	FL/RA	FL/Y	FL/Y	FL/R	FL/R	FL/R	FL/R	DARK	DARK

WIRING DIAGRAM



WIRING KEY

A B C D E F G H I J K L M N	2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.) (ALUMINUM SHIELDED)
O P	2-CONDUCTOR ELECTRICAL CABLE (NO. 12 A.W.G.) TYPE THHN TRAY CABLE
Q R S T U V W X	5-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
Y Z	7-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
a	STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
b c d e	OPTICOM DETECTOR CABLE #138 (3-CONDUCTOR NO. 20 A.W.G.)
f	3-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.)
LW	LOOP WIRE (NO. 14 A.W.G.)
ELW	EXISTING LOOP WIRE (NO. 14 A.W.G.) TO BE SPLICED INTO NEW 2-CONDUCTOR ELECTRICAL CABLE (NO. 14 A.W.G.) (ALUMINUM SHIELDED)
ES	EXISTING OVERHEAD SERVICE TO BE MAINTAINED BY P.E. CO.

TRAFFIC SIGNALIZATION PLAN

(GENERAL INFORMATION)

STREET TRAFFIC STUDIES, LTD.
Gateway International
1302 Concourse Drive, Suite 104
Linthicum, Maryland 21090
(410) 859-3553

TASK661

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

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

US 40 AND EASTERN BOULEVARD

DRAWN BY: THACKER	COUNTY: WASHINGTON	TS NO. 2438C-GI	SHEET NO. 63 OF 71
CHECK BY:	LOG MILE: 21004037.77		
DATE: 9-8-98	F.A.P. NO. STP-G218-1(8)E	T.I.M.S. NO.	
SCALE: N/A	S.H.A. NO. MA9455176		