FHWA REGION NO	STATE	FED. AID PROJ. NO	SHEET NO.	TOTAL SHEETS
3	MD.	STPG-218-1(7)E	43	66

PHASING DIAGRAM

	1	2	3	4	5	6	7	8	9	10
PHASE 1	R	R	G	G	R	R	DW	DW	DW	DW
1 CHANGE	R	R	Y	Y	R	R	DW	DW	DW	DW
PHASE 2	G	G	R	R	R	R	W	W	DW	DW
2 PED. CLEAR	G	G	R	R	R	R	FL DW	FL DW	DW	DW
2 CHANGE	Y	Y	R	R	R	R	DW	DW	DW	DW
PHASE 4	R	R	R	R	G	G	DW	DW	W	W
4 PED. CLEAR	R	R	R	R	G	G	DW	DW	FL DW	FL DW
4 CHANGE	R	R	R	R	Y	Y	DW	DW	DW	DW
PRE-EMPTION A	R	R	G	G	R	R	DW	DW	DW	DW
CHANGE A	R	R	Y	Y	R	R	DW	DW	DW	DW
PRE-EMPTION B	G	G	R	R	R	R	DW	DW	DW	DW
CHANGE B	Y	Y	R	R	R	R	DW	DW	DW	DW
PRE-EMPTION C	R	R	R	R	G	G	DW	DW	DW	DW
CHANGE C	R	R	R	R	Y	Y	DW	DW	DW	DW
FLASHING OPERATION	FL R	FL R	FL R	FL R	FL Y	FL Y	OFF	OFF	OFF	OFF

EAST ANTIETAM STREET IS ASSUMED TO RUN IN AN EAST-WEST DIRECTION.

SIGNALS

1 — R, Y, G, G (12")

2,3,4,5,6,7 — R, Y, G (12")

7,8,9,10 — (12")

→ – OPTICAL PRE-EMPTION DETECTOR EYE

SIGNS

11 — ONLY — R3-5L 30" x 36"

12,15 — S. Locust St — D3-2 Var. x 16"

13 — ONE WAY — R6-1L 36" x 12"

14,16 — ONE WAY — R6-1R 36" x 12"

17 — E. Antietam St — D3-2 Var. x 16"

CONSTRUCTION DETAILS

(A) INSTALL 10' STEEL PEDESTAL POLE, SIGNAL HEADS AND SIGNS (NOTE: 1-2", 90-DEGREE P.V.C. BEND).

(B) INSTALL 23' STEEL POLE (CITY STANDARD), 24' AND 30' MAST ARMS, SIGNAL HEADS, SIGNS, OPTICOM DETECTORS, PEDESTRIAN SIGNAL AND SIGN (NOTE: 1-2", 90-DEGREE P.V.C. BEND).

(BB) INSTALL 23' STEEL POLE (CITY STANDARD), 22' MAST ARM, SIGNAL HEADS, AND, SIGNS, OPTICOM DETECTOR, PEDESTRAIN SIGNAL AND SIGN (NOTE: 1-2" 90-DEGREE P.V.C. BEND).

(C) INSTALL BASE MOUNTED CABINET, SIZE #5, AND CONTROLLER WITH ALL NECESSARY EQUIPMENT AS SHOWN (NOTE: 2-4" 90-DEGREE P.V.C. BENDS AND 2-2" 90-DEGREE BENDS).

(D) INSTALL HANDHOLE (CITY STANDARD).

(E) USE EXISTING HANDHOLE.

(F) INSTALL 2" P.V.C. (SCHEDULE 80) ELECTRICAL CONDUIT (SLOTTED).

(G) INSTALL 2" P.V.C. (SCHEDULE 40) ELECTRICAL CONDUIT (TRENCHED).

(H) INSTALL 4" P.V.C. (SCHEDULE 40) ELECTRICAL CONDUIT (TRENCHED).

(J) USE EXISTING CONDUIT.

(K) INSTALL 24" SOLID WHITE LINE FOR STOP BAR.

(L) REMOVE EXISTING PEDESTAL POLE, SIGNAL HEAD, SIGN, AND FOUNDATION.

(M) REMOVE EXISTING PEDESTAL POLE, SIGNAL HEAD, AND FOUNDATION.

(N) REMOVE EXISTING SIGNAL HEAD AND RISER.

(P) REMOVE EXISTING CABINET, CONTROLLER, AND FOUNDATION.

(Q) REMOVE EXISTING OPTICOM DETECTOR.

(R) REMOVE AND REPLACE EXISTING SIDEWALK.

(S) INSTALL 3" P.V.C. (SCHEDULE 80) ELECTRICAL CONDUIT – RISER WITH 3" WEATHERHEAD.

(T) CONSTRUCT SIDEWALK RAMP.

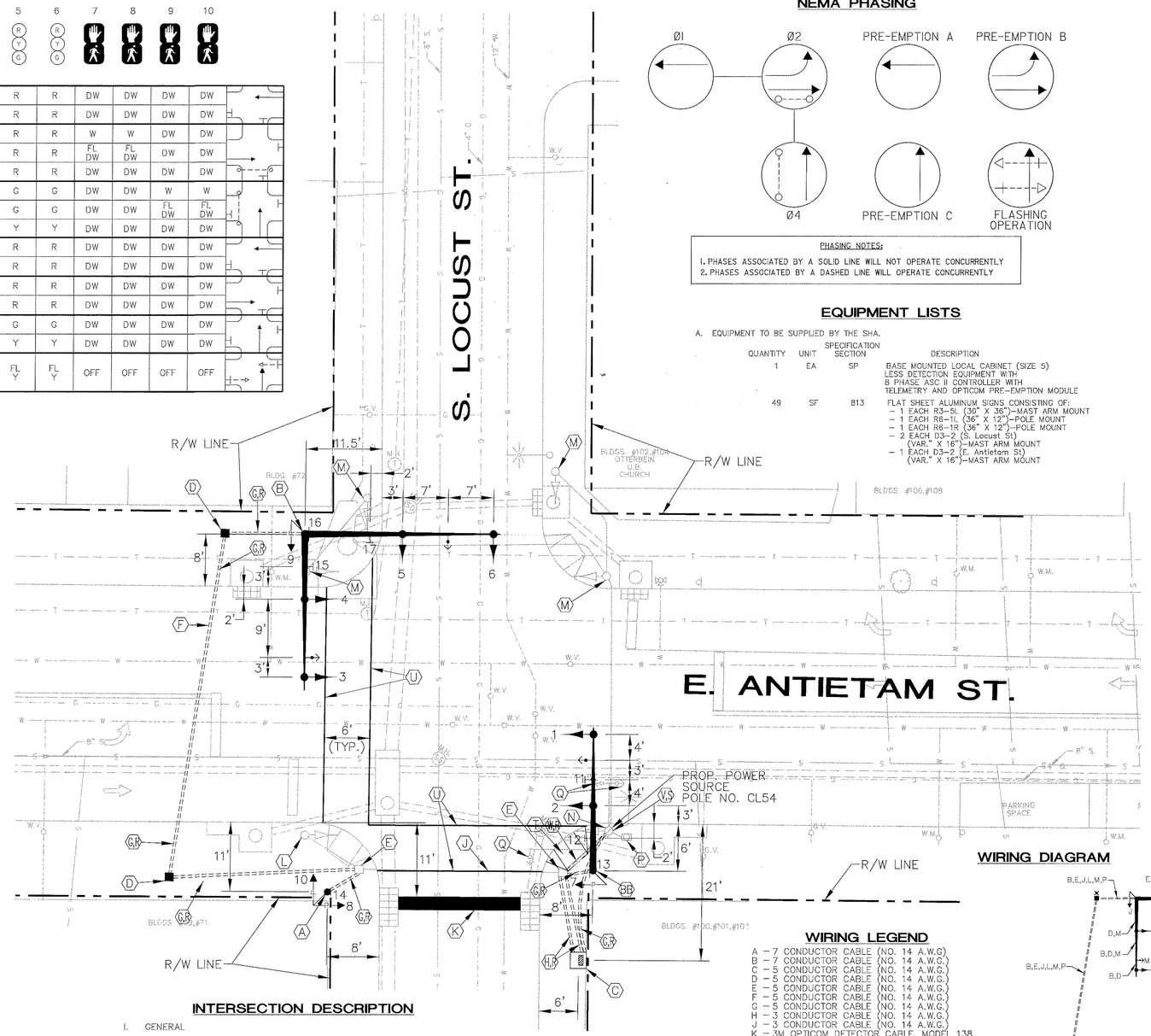
(U) INSTALL 12" SOLID WHITE LINE FOR CROSSWALK.

(V) INSTALL 10' OF 2" P.V.C. (SCHEDULE 80) ELECTRICAL CONDUIT – RISER AND COIL 25' OF ADDITIONAL CABLE.

(W) INSTALL 3" P.V.C. (SCHEDULE 40) ELECTRICAL CONDUIT (TRENCHED).

UTILITY LEGEND

—— G —— G ——	GAS MAIN
—— W —— W ——	WATER MAIN
—— S —— S ——	SEWER MAIN
==========	STORM DRAIN
—— TV —— TV ——	CABLE TELEVISION
—— E —— E ——	ELECTRIC CABLES
—— T —— T ——	TELEPHONE CABLES
—— A —— A ——	AERIAL CABLES



NEMA PHASING

PHASING NOTES:

1. PHASES ASSOCIATED BY A SOLID LINE WILL NOT OPERATE CONCURRENTLY
2. PHASES ASSOCIATED BY A DASHED LINE WILL OPERATE CONCURRENTLY

EQUIPMENT LISTS

A. EQUIPMENT TO BE SUPPLIED BY THE SHA.

QUANTITY	UNIT	SPECIFICATION SECTION	DESCRIPTION
1	EA	SP	BASE MOUNTED LOCAL CABINET (SIZE 5) LESS DETECTION EQUIPMENT WITH 8 PHASE ASC II CONTROLLER WITH TELEMETRY AND OPTICOM PRE-EMPTION MODULE
49	SF	813	FLAT SHEET ALUMINUM SIGNS CONSISTING OF: – 1 EACH R3-5L (30" X 36")–MAST ARM MOUNT – 1 EACH R6-1L (36" X 12")–POLE MOUNT – 1 EACH R6-1R (36" X 12")–POLE MOUNT – 2 EACH D3-2 (S. Locust St) (VAR." X 16")–MAST ARM MOUNT – 1 EACH D3-2 (E. Antietam St) (VAR." X 16")–MAST ARM MOUNT

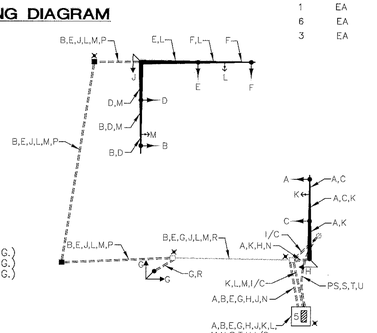
B. EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR.

QUANTITY	UNIT	SPECIFICATION SECTION	DESCRIPTION
5	CY	205	TEST PIT EXCAVATION
10	CY	206	REMOVAL OF EXISTING SIDEWALK
150	LF	SP 555	12 INCH WHITE PERMANENT PREFORMED PAVEMENT MARKING TAPE
25	LF	SP 555	24 INCH WHITE PERMANENT PREFORMED PAVEMENT MARKING TAPE
750	SF	610	4 INCH CONCRETE SIDEWALK
1	EA	816	INSTALL CONTROLLER AND CABINET–BASE MOUNT
49	SF	813	INSTALL OVERHEAD SIGN
6	EA	SP	FURNISH AND INSTALL 12 INCH 1 WAY 3 SECTION (R, Y, G) SIGNAL HEAD HAVING PROPER ADJUSTABLE MAST ARM BRACKET, AND TUNNEL VISORS–PAINTED BLACK
1	EA	SP	FURNISH AND INSTALL 12 INCH 2 WAY 2 SECTION PEDESTRIAN SIGNAL HEAD–PEDESTAL TOP MOUNT–PAINTED BLACK
2	EA	SP	FURNISH AND INSTALL 12 INCH 1 WAY 2 SECTION PEDESTRIAN SIGNAL HEAD–SIDE POLE MOUNT–PAINTED BLACK
3	EA	SP	FURNISH AND INSTALL OPTICOM DETECTOR EYE–MODEL 521
2	EA	SP	FURNISH AND INSTALL ELECTRICAL HANDHOLE (CITY STANDARD)
9	CY	801	FURNISH AND INSTALL CONCRETE FOR SIGNAL FOUNDATION
10	LF	805	FURNISH AND INSTALL 2" SCHEDULE 80 RIGID PVC CONDUIT–RISER
30	LF	805	FURNISH AND INSTALL 3" SCHEDULE 80 RIGID PVC CONDUIT–RISER
125	LF	805	FURNISH AND INSTALL 2" SCHEDULE 40 RIGID PVC CONDUIT–TRENCHED
35	LF	805	FURNISH AND INSTALL 4" SCHEDULE 40 RIGID PVC CONDUIT–TRENCHED
15	LF	805	FURNISH AND INSTALL 3" SCHEDULE 40 RIGID PVC CONDUIT–TRENCHED
90	LF	805	FURNISH AND INSTALL 2" SCHEDULE 80 RIGID PVC CONDUIT–SLOTTED
1	EA	807	FURNISH AND INSTALL CONTROL AND DISTRIBUTION EQUIPMENT
1	EA	SP	FURNISH AND INSTALL 23–FOOT STEEL POLE WITH TWIN 36–FOOT MAST ARMS (CITY STANDARD)–PAINTED GREEN
1	EA	SP	FURNISH AND INSTALL 23–FOOT STEEL POLE WITH A SINGLE 36–FOOT MAST ARM (CITY STANDARD)–PAINTED GREEEN
3	EA	SP	CUT, CLEAN AND CAP TRAFFIC SIGNAL STRUCTURE
1	EA	SP	AS–BUILT FOR TRAFFIC SIGNAL
4	EA	804	FURNISH AND INSTALL GROUND ROD–3/4 INCH DIAMETER X 10–FOOT LENGTH
200	LF	810	FURNISH AND INSTALL NO. 6 AWG STRANDED BARE COPPER GROUND WIRE
225	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE–1 CONDUCTOR (NO. 4 AWG – THHN/THWN)
225	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE–3 CONDUCTOR (NO 14 AWG)
350	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE–5 CONDUCTOR (NO 14 AWG)
300	LF	810	FURNISH AND INSTALL ELECTRICAL CABLE–7 CONDUCTOR (NO 14 AWG)
1	EA	SP	FURNISH AND INSTALL 10–FOOT BREAKAWAY PEDESTAL POLE–PAINTED GREEN
500	LF	810	FURNISH AND INSTALL OPTICOM M–138 DETECTOR CABLE
6	EA	SP	REMOVE AND DISPOSE OF EXISTING FOUNDATION 12" BELOW GRADE
1	LS	SP	DELIVERY OF SALVAGED EQUIPMENT
1	LS	SP	REMOVE AND DISPOSE OF EXISTING EQUIPMENT
1	LS	SP	REMOVAL OF EXISTING SIGNAL EQUIPMENT TO BE SALVAGED

NOTE: ALL EQUIPMENT AND/OR MATERIALS TO BE REMOVED BY THE CONTRACTOR, BUT NOT LISTED BELOW, SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

QUANTITY	UNIT	DESCRIPTION
1	EA	CONTROLLER AND CABINET
6	EA	PEDESTAL POLE AND BASE
3	EA	OPTICOM DETECTOR EYE

WIRING DIAGRAM



WIRING LEGEND

A – 7 CONDUCTOR CABLE (NO. 14 A.W.G)
B – 7 CONDUCTOR CABLE (NO. 14 A.W.G.)
C – 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
D – 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
E – 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
F – 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
G – 5 CONDUCTOR CABLE (NO. 14 A.W.G.)
H – 3 CONDUCTOR CABLE (NO. 14 A.W.G.)
J – 3 CONDUCTOR CABLE (NO. 14 A.W.G.)
K – 3M OPTICOM DETECTOR CABLE, MODEL 138
L – 3M OPTICOM DETECTOR CABLE, MODEL 138
M – 3M OPTICOM DETECTOR CABLE, MODEL 138
N – STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
P – STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
R – STRANDED BARE COPPER GROUND WIRE (NO. 6 A.W.G.)
S – 1 CONDUCTOR CABLE (NO. 4 A.W.G.)
T – 1 CONDUCTOR CABLE (NO. 4 A.W.G.)
U – 1 CONDUCTOR CABLE (NO. 14 A.W.G.)
× – 3/4"x10' GROUND ROD
PS – PROPOSED ELECTRICAL SERVICE
I/C – INTERCONNECT CABLE

INTERSECTION DESCRIPTION

I. GENERAL

THIS INTERSECTION IS SOUTH LOCUST STREET AND EAST ANTIETAM STREET. CONSTRUCTION AT THIS INTERSECTION INVOLVES THE RECONSTRUCTION OF THE EXISTING TRAFFIC SIGNAL AND INTERCONNECTION WITH THE OTHER SIGNALIZED INTERSECTIONS IN THE NEW CITY-WIDE SYSTEM. IT IS ASSUMED THAT EAST ANTIETAM STREET RUNS IN AN EAST-WEST DIRECTION.

II. INTERSECTION OPERATION

THE INTERSECTION WILL OPERATE IN A NEMA THREE (3) PHASE PRE-TIMED MODE. EASTBOUND AND WESTBOUND EAST ANTIETAM STREET WILL OPERATE CONCURRENTLY. NORTHBOUND SOUTH LOCUST STREET WILL OPERATE SEPARATELY. PEDESTRIANS WILL OPERATE CONCURRENTLY WITH NORTHBOUND SOUTH LOCUST STREET AND EASTBOUND EAST ANTIETAM STREET.

PRE-EMPTION ON WESTBOUND EAST ANTIETAM STREET WILL CALL PRE-EMPTION A.
PRE-EMPTION ON EASTBOUND EAST ANTIETAM STREET WILL CALL PRE-EMPTION B.
PRE-EMPTION ON NORTHBOUND SOUTH LOCUST STREET WILL CALL PRE-EMPTION C.

A NEW EIGHT PHASE FULLY ACTUATED CONTROLLER WITH TELEMETRY MODULE AND PRE-EMPTION HOUSED IN A GROUND MOUNTED CABINET WILL BE INSTALLED.

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-317

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

CITY OF HAGERSTOWN, MARYLAND
ENGINEERING DEPARTMENT

LOCATION: East Antietam St. at South Locust St.

TITLE: TRAFFIC SIGNAL UPGRADE

DRAWN BY	A.W. (BASE PLAN)	DATE	8-96
SURVEY BY	A.J.B.	DATE	7-96
SCALES	HORIZONTAL: 1" = 10'	VERTICAL: –	
APPROVED		FILE NUMBER	
DATE / BY / CITY ENGINEER		67-054-08	

MDOT – STATE HIGHWAY ADMINISTRATION
Office of Traffic & Safety
TRAFFIC ENGINEERING DESIGN DIVISION LOC MI. 21MANT00.52

DRAWN BY: T. COURVILLE
DES. BY: J. LAWRENCE
CHK. BY:

DATE: 05/30/97
SCALE: 1" = 10'

F.A.P. NO. STPG-218-1(7)E
S.H.A. NO. WA9535185
CITY NO. 07-293-332

South Locust St. at East Antietam St.

COUNTY: WASHINGTON

TS: . . NO. 3702

SHEET NO. 43 OF 66