FHWA REGION NO	STATE	FED. AID PROJ. NO	SHEET NO.	TOTAL SHEETS
3	MD.	SEE TITLE SHEET		

Intersection Operation

This intersection is to operate in a NEMA six phase, semi-traffic-actuated mode. There will be exclusive/permissive left turns for both the north and southbound movements of MD 355. The through movements for MD 355 will operate concurrently and have a concurrent pedestrian phase across the east and west legs of the intersection. The Chrisopher Avenue/IBM Entrance movements will operate concurrently and have an actuated pedestrian phase across the north leg of the intersection.

An eight phase, full-traffic-actuated, solid state digital controller with seven two-channel time delay output loop detector amplifiers housed in a base mounted cabinet are to be installed at this location.

Construction Details

A. Install base mounted cabinet/controller with all necessary equipment (Note: two 4 in., 90-degree (Schedule 40) PVC bends, one 3 in. 90-degree (Schedule 40) PVC bend, and one 2 in., 90-degree (Schedule 80) PVC bend).

B. Install 12 in. x 30 ft. steel strain pole with a 15 ft. luminaire arm, 250 watt HPS luminaire, pedestrian signal heads, pedestrian signs, and all necessary equipment for an overhead type B-14 electrical service (Note: two 3 in., 90-degree (Schedule 40) PVC bends, and one 2 in., 90-degree (Schedule 80) PVC bend). [Use four 1-3/4 in. x 90 in. anchor bolts.]

C. Install 12 in. x 30 ft. steel strain pole with pedestrian signal heads, pedestrian push button, pedestrian signs, a 20 ft. luminaire arm, and 250 watt HPS luminaire (Note: one 2 in., 90-degree (Schedule 40) PVC bend). [Use four 1-3/4 in. x 90 in. anchor bolts.]

D. Install 12 in. x 30 ft. steel strain pole with pedestrian signal head, pedestrian sign, a 10 ft. luminaire arm, and 250 watt HPS luminaire (Note: one 2 in., 90-degree (Schedule 40) PVC bend). [Use four 1-3/4 in. x 90 in. anchor bolts.]

E. Install 12 in. x 30 ft. steel strain pole with pedestrian signal heads, pedestrian pushbutton, pedestrian signs, a 15 ft. luminaire arm, and 250 watt HPS luminaire (Note: two 2 in., 90-degree (Schedule 40) PVC bends. [Use four 1-3/4 in. x 90 in. anchor bolts.]

F. Install handhole.

G. Install 1 in. liquid tight, non-metallic conduit for loop detector sleeve.

H. Install 2 in. polyvinyl chloride (Schedule 40) electrical conduit – trenched.

J. Install 2 in. polyvinyl chloride (Schedule 80) electrical conduit – trenched.

K. Install 3 in. polyvinyl chloride (Schedule 40) electrical conduit – trenched.

L. Install 4 in. polyvinyl chloride (Schedule 40) electrical conduit – trenched.

M. Install 1 in. galvanized steel conduit for loop detector sleeve.

N. Install 4 in. polyvinyl chloride (Schedule 80) electrical conduit – pushed.

O. Install 6 ft. x 30 ft. quadrupole type vehicle loop detector (2-4-2 turns).

P. Use existing handhole. Pull back existing interconnect cable and re-run to new controller.

Q. Use existing handhole.

R. Use existing conduit.

S. Install 3/8 in. steel span wire, 1/4 in. tether wire, vehicle signal heads, and sign as shown (Note: Provide approximately 50 ft. of additional electrical cable for each signal head for use during roadway construction phasing).

T. Install 3/8 in. steel span wire, vehicle signal heads, and sign as shown.

U. Install 24 in. preformed white pavement marking for stop line.

V. Install 12 in. preformed white pavement marking for pedestrian crossing.

W. Remove existing steel pole and all attached equipment.

X. Remove existing handhole.

Y. Cap and abandon existing conduit.

Z. Remove existing cabinet/controller and all attached equipment.

a. Remove existing electrical service.

b. Conduit for interconnect. Refer to interconnect plan.

c. Install 4 in. polyvinyl chloride (Schedule 80) electrical conduit – slotted.

Equipment List "A"

Equipment to be supplied by the SHA.

Quantity	Unit	Description
1	EA	Eight phase, full-traffic-actuated, solid state digital controller with LAU panel (to be used in a NEMA six phase semi-traffic-actuated mode) housed in a base mounted cabinet.
7	EA	Two-channel time delay output vehicle loop detector amplifier and harness.
2	EA	8 in./12 in., one-way, five section (8 in. R,Y,G/12 in. YA,GA) adjustable traffic signal head – span wire mount.
8	EA	12 in., one-way, three section (R,Y,G) adjustable traffic signal head – span wire mount.
2	EA	12 in., one-way, five section (R,Y,YA,G,GA) adjustable traffic signal head – span wire mount.
2	EA	12 in., one-way, two section (Symbolic WK,DW) adjustable pedestrain signal head – pole mount.
2	EA	12 in., two-way, two section (Symbolic WK,DW) adjustable pedestrain signal head – pole mount.
2	EA	Pedestrian pushbutton assembly.
40.5	SF	Sheet aluminum signing. [To consist of six 9 in. x 12 in. R10-3C signs for pole mounting, and two 36 in. x 42 in. R10-12 and two 30 in. x 36 in. R3-5(L) signs for span wire mounting.]

Equipment List "B"

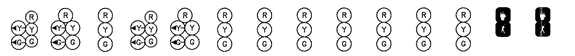
Equipment to be furnished and/or installed by the Contractor.

Quantity	Unit	Description
5	CY	Test pit excavation.
420	LF	12 in. preformed white pavement marking for crosswalk.
100	LF	24 in. preformed white pavement marking for stop line.
4	EA	30 ft. steel strain pole.
6	EA	Handhole.
925	LF	Sawcut for signal loop detector.
2350	LF	Loop detector wire (No. 14 A.W.G.) encased in flexible tubing.
1100	LF	2-conductor (aluminum shielded) electrical cable (No. 14 A.W.G.).
650	LF	2-conductor electrical tray cable (No. 12 A.W.G.).
550	LF	2-conductor electrical cable (No. 14 A.W.G.).
275	LF	3-conductor electrical cable (No. 14 A.W.G.).
750	LF	5-conductor electrical cable (No. 14 A.W.G.).
1675	LF	7-conductor electrical cable (No. 14 A.W.G.).
80	LF	Bare copper ground wire (No. 6 A.W.G.)
60	LF	3-wire electrical cable (No. 4 A.W.G.) for electrical services.
300	LF	1/4 in. tether wire.
550	LF	3/8 in. steel span wire.
20	LF	1 in. galvanized steel conduit for loop detector sleeve.
50	LF	1 in. liquid tight, flexible, non-metallic conduit for loop detector sleeve.
75	LF	2 in. polyvinyl chloride (Schedule 40) electrical conduit – trenched.
15	LF	2 in. polyvinyl chloride (Schedule 80) electrical conduit – trenched.
30	LF	3 in. polyvinyl chloride (Schedule 40) electrical conduit – trenched.
20	LF	4 in. polyvinyl chloride (Schedule 80) electrical conduit – pushed.
80	LF	4 in. polyvinyl chloride (Schedule 40) electrical conduit – trenched.
85	LF	4 in. polyvinyl chloride (Schedule 80) electrical conduit – slotted.
14	CY	Concrete foundation for signal equipment.
6	EA	Ground rod – 3/4 in. diameter x 10 ft. length.
1	EA	Control and distribution equipment (120/240V, one phase, three wire system).
1	EA	10 ft. Luminaire arm with 250 watt HPS luminaire.
2	EA	15 ft. Luminaire arm with 250 watt HPS luminaire.
1	EA	20 ft. Luminaire arm with 250 watt HPS luminaire.
12	EA	Install traffic signal head – span wire mount.
6	EA	Install pedestrian signal head – pole mount.
2	EA	Install pedestrian pushbutton.
4.5	SF	Install sheet aluminum signing – pole mount.
36	SF	Install sheet aluminum signing – overhead mount.
1	EA	Install base mounted cabinet.
LS	LS	Removal of existing traffic signal equipment.

Equipment List "C"

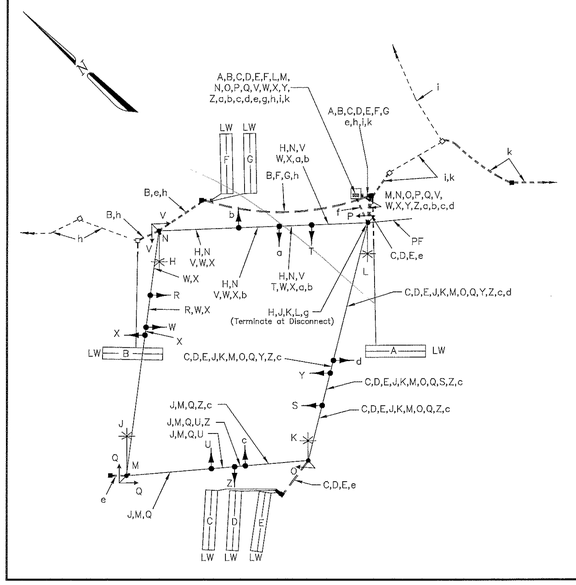
Equipment to be removed by the contractor and delivered to the MCDOT Systems Technical Center, 1283 Seven Locks Road, Building "C", Rockville, MD 20852. A twenty-four (24) hour notice is required prior to delivery. Contact Mr. Emil Wolanin at (301) 217-2208.

Quantity	Unit	Description
4	EA	Mast arm pole with arm.
8	EA	Traffic signal head.
7	EA	Overhead mounted sign.
1	EA	Base mounted cabinet / controller.
6	EA	Pedestrian signal head.



	1	2	3	4	5	6	7	8	9	10	11	12	13–16	17,18	
Phase 1 & 5	R ←G—	R ←G—	R	R ←G—	R ←G—	R	R	R	R	R	R	R	DW	DW	
1 & 5 Change To Phase 1 & 6 or Phase 2 & 5															
Phase 1 & 6	G ←G—	G ←G—	G	R	R	R	R	R	R	R	R	R	DW	DW	
1 Change	G ←Y—	G ←Y—	G	R	R	R	R	R	R	R	R	R	DW	DW	
Phase 2 & 5	R	R	R	G ←G—	G ←G—	G	R	R	R	R	R	R	DW	DW	
5 Change	R	R	R	G ←Y—	G ←Y—	G	R	R	R	R	R	R	DW	DW	
Phase 2 & 6	G	G	G	G	G	G	R	R	R	R	R	R	WK	DW	
Ped Clearance	G	G	G	G	G	G	R	R	R	R	R	R	FL\DW	DW	
2 & 6 Change	Y	Y	Y	Y	Y	Y	R	R	R	R	R	R	DW	DW	
Phase 4 & 8	R	R	R	R	R	R	G	G	G	G	G	G	DW	DW	
4 & 8 Change	R	R	R	R	R	R	Y	Y	Y	Y	Y	Y	DW	DW	
Phase 4 & Alt. 8	R	R	R	R	R	R	G	G	G	G	G	G	DW	WK	
Ped Clearance	R	R	R	R	R	R	G	G	G	G	G	G	DW	FL\DW	
4 & Alt. 8 Change	R	R	R	R	R	R	Y	Y	Y	Y	Y	Y	DW	DW	
Flashing Operation	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/R	FL/R	FL/R	FL/R	FL/R	FL/R	DARK	DARK	

Phase Chart



A,B,C,D,E,F,L,M,N,O,P,Q,V,W,X,Y,Z,a,b,c,d,e,g,h,i,k — 2-Conductor Cable (Aluminum Shielded)

H,J,K,L — 2-Conductor Tray Cable (No.12 A.W.G.)

M,N — 2-Conductor Cable (No.14 A.W.G.)

O,P — 3-Conductor Cable (No.14 A.W.G.)

Q,R,S,T,U,V — 5-Conductor Cable (No.14 A.W.G.)

W,X,Y,Z,a,b,c,d — 7-Conductor Cable (No.14 A.W.G.)

e — Bare Copper Stranded Ground Wire (No. 6 A.W.G.)

f — 3-Wire #4 For Traffic Signal Electrical Service

g — 3-Wire #4 For Intersection Lighting Electrical Service

h — Existing Voice Grade Telemetry Jelly-Filled Cable [Watkins Mill – Christopher Run]

i — Existing Voice Grade Telemetry Jelly-Filled Cable [Christopher – Russell Run]

k — 50-Pair Voice Grade Telemetry Jelly-Filled Cable [Christopher – Loral Run]

LW — LoopWire (No.14 A.W.G.) In Flexible Tubing

PF — Proposed Overhead Electrical Service By PEPCO

Wiring Diagram

Maintenance of Traffic
Phase 1, Stage 1

Sheet 34 of

Revision 'B'

A/E GROUP, INC.
CONSULTING ENGINEERS • PLANNERS
11409 CRONHILL DRIVE
OWINGS MILLS, MD. 21117
(410) 363-1908
A/E JOB NO: 94-264

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

ORIGINATION FILE

(B) November 6, 1995
Rebuild to new geometrics.
S.H.A. No.:M 611-501-371

MDOT – STATE HIGHWAY ADMINISTRATION
Office of Traffic & Safety
TRAFFIC ENGINEERING DESIGN DIVISION SIGNAL # 15035515.86

DRAWN BY: T. Zaydel
DES. BY: T. Zaydel
CHK. BY: D. Doda

MD 355 at Christopher Avenue/ IBM Entrance

COUNTY: MONTGOMERY

DATE: September 26, 1986 F.A.P. NO. N/A
SCALE: N/A S.H.A. NO. BW-890-801-312

TS/STD. NO. 2230-BX-1 GI

SHEET NO. ____ OF ____