

PHASE AND SEQUENCE DIAGRAM	TRAFFIC SIGNAL HEADS										Min. Green	Passage Yellow	Red Clear	Max. I. seconds for Activation	Time to Reduce	Time Before Reduction	Minimum Gap	Recall	Memory
	1	2	3	4	5	6	7	8	9	10									
Phase A Clear	G	R	G1	R	R						10	5	16	10	5	10	35	OFF	ON
Phase B Clear	Y,R	R	G1	R	R							4	1						
Phase D Clear	R	G	G1	G2	R						10	1	10					OFF	OFF
Phase C Clear	R	Y,R	Y,R	G2	R							4	1						
Phase C Clear	R	R	R	G	G	B	I											OFF	OFF
FLASH	Y	R	Y	R	R														

1. ϕ (A+B) Overlap
2. Green Arrow Only - ϕ (D+C) Overlap

EQUIPMENT LIST

CONTROLLER AND ACCESSORIES

1. MESA three phase modular sequential programmable controller with solid state circuitry and digital timing, equivalent to the Crossroads 80-400 Series Digital Controller unit, equivalent manufactured by Single Signal Corporation or Ecocolor, or approved equal. The controller shall be capable of expansion to four phase operation.
 - a. Equipped with two (2) vehicular actuated modules.
 - b. Equipped with one (1) vehicular actuated module with volume density controls.
 - c. Vehicular actuated phase modules shall be capable of the following functions: Minimum Green, Passage Time, Yellow, All Red Clearance, Dual Maximum, Pedestrian Timing, Recall and Memory.
 - d. Vehicular actuated phase module with volume density controls shall be capable of the following functions: Minimum Green, Passage Time, Yellow, All Red Clearance, Dual Maximum, Pedestrian Timing, Seconds Per Actuation, Time to Reduce, Time Before Reduction, Minimum Gap, Recall, and Memory.
 - e. Four phase signal overlap capability.
2. Conflict Monitor and Solid State load switches.
3. Solid State flasher and switch accessible through police door panel.
4. Manual operating control and manual switch accessible through police door panel.
5. Ground mounted traffic controller cabinet large enough to accommodate the above control equipment, detectors, and any future coordination equipment. A 2" spare conduit elbow for future interconnection shall be provided in the controller cabinet foundation and plugged 2' beyond the foundation. The cabinet shall be furnished with a thermostatically controlled cabinet vent fan.
6. Finish of the cabinet shall be all-weather bronze paint.
7. Install 3'x4'x3" concrete slab in front of the controller cabinet.
8. The existing controller and equipment shall be removed and delivered to a location designated by the Traffic Engineer. The existing concrete base shall be removed, and the area backfilled and sodded.
9. Meter Box shall be installed in a vandal proof enclosure supplied by the contractor.

LOOPS AND DETECTORS

1. The existing loops, as indicated on the Contract Drawings, shall be removed. The following new loops shall be installed:

Number	Dimensions	Phase
1,3	6' x 18'	A
2	6' x 6'	A
4	6' x 40' *	B
5,6,7	6' x 40' **	C
8,9	5' x 25' **	C

- * Loops to be installed with 6'x3' powerhead for detection of small vehicles.
- ** Loops to be installed with 5'x3' powerhead.

2. Loops 1 and 2 shall be wired in parallel to a standard detector. Loop 3 shall be wired to the same standard detector.
3. Loop 4 shall be wired to a standard detector.
4. Loops 5 and 9 shall be wired to a delayed timer vehicle loop detector. Delayed timer shall be set at 10 seconds.
5. Loops 6,7 and 8 shall be wired to a standard detector.

6. All wiring shall be in accordance with manufacturer's recommendations for correct operation.
7. Loops 1, 2 and 3 shall operate in pulse mode. All other loops shall operate in presence mode.
8. Delayed timer vehicle loop detectors shall be Sarasota 2357/MS or approved equal. Standard detectors shall be Sarasota 2158/MS or approved equal.

SIGNAL HEADS

1. The existing signal heads shall be removed and shall be delivered to a location designated by the Traffic Engineer. The Contractor shall provide the following new signal heads:

Signal Number	Description
1, 2, 4, 5, 7, 8, 9	12" diameter red indication; 8" diameter amber and green indication.
3	12" diameter red indication; 8" diameter amber; 12" diameter green left turn arrow.
6	12" diameter red indication; 8" diameter amber and green; 12" diameter green right turn arrow.

2. All signals shall have bronze beaded enamel finish and shall be furnished with tunnel visors. All signals shall be vertically mounted on the mast arm with rigid adjustable brackets equivalent to the "Vulco Traffic Controls, Inc. Astro-Brac (Model No. 6-45-100)" or approved equal.

POLES

Proposed Poles

1. Two (2) twin arm support poles with 90° angle of separation.
2. Style and appearance shall be equivalent to Union Metal Design No. 50700. Finish shall be bronze paint.
3. Pole Number
 1. 34' and 40' arm spread, each supporting two signal heads
 2. 36' arm spread supporting two signal heads. 40' arm spread supporting three signal heads

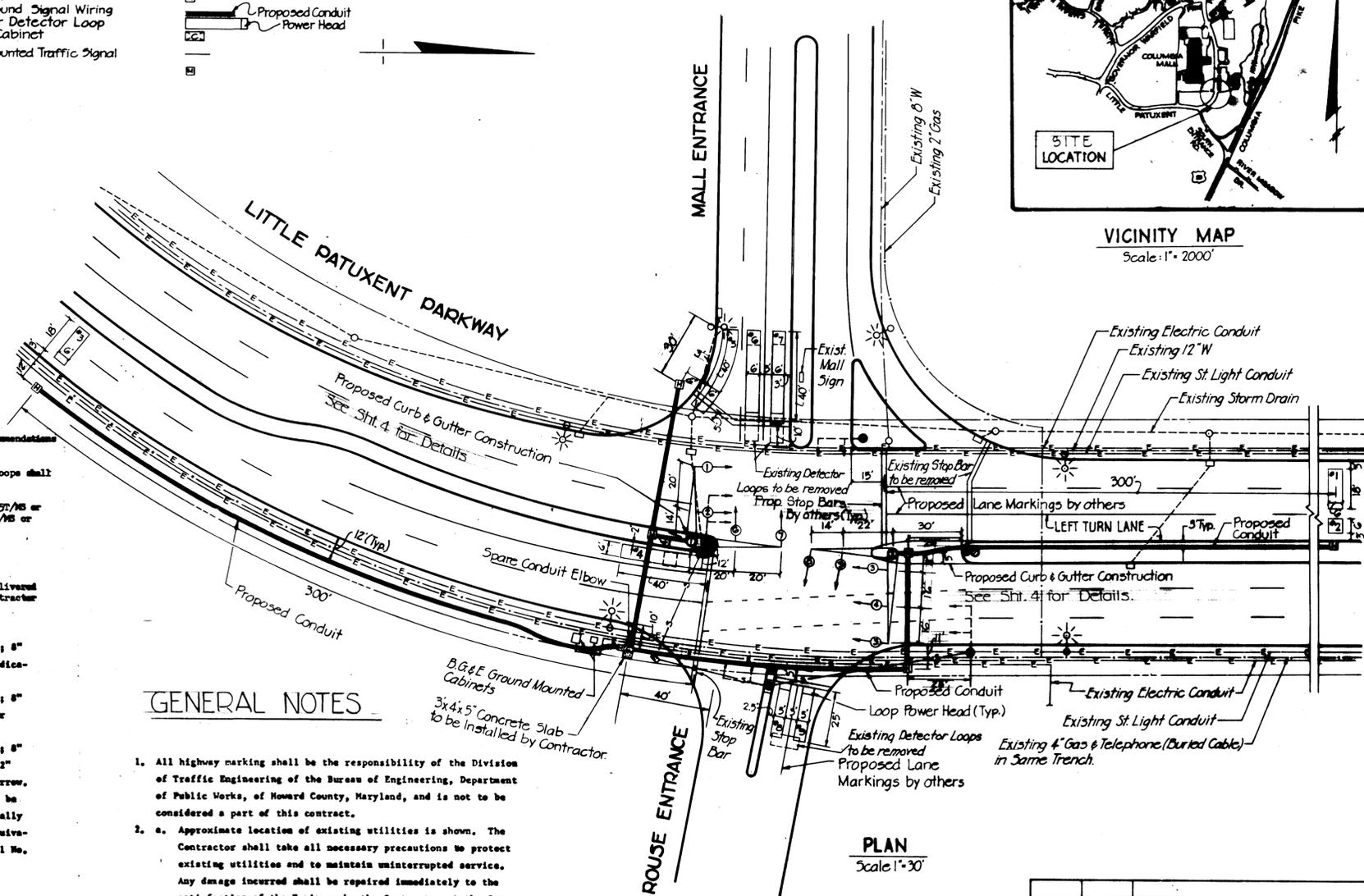
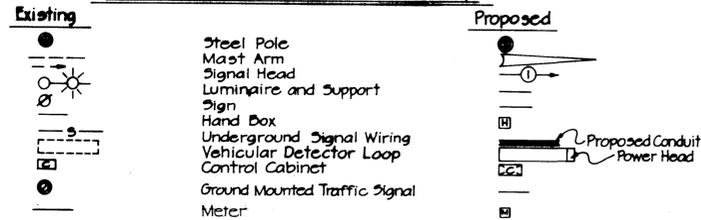
Existing Poles

1. The existing traffic signal support poles shall be removed and delivered to a location designated by the Traffic Engineer. The existing foundations are to be removed to a depth of 1' below grade and backfilled and sodded.

UNDERGROUND WIRING

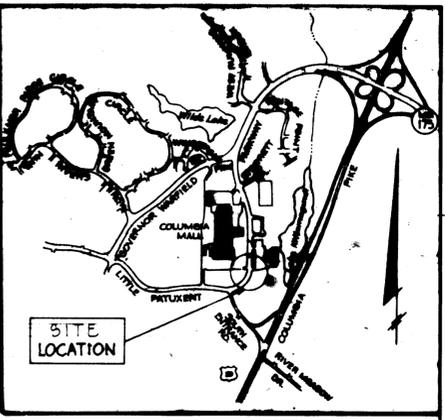
1. Underground wiring shall be placed in new PVC Conduits under the road surface and in grass areas, as shown on the Contract Drawings.
2. The conduit shall be sized to accommodate future wiring for pedestrian (WALK/DON'T WALK) signal heads.
3. All existing direct buried cable shall be abandoned.
4. The Contractor shall furnish an "as-built" drawing as per "General Specifications - 4.02b".

SYMBOLS



GENERAL NOTES

1. All highway marking shall be the responsibility of the Division of Traffic Engineering of the Bureau of Engineering, Department of Public Works, of Howard County, Maryland, and is not to be considered a part of this contract.
2. a. Approximate location of existing utilities is shown. The Contractor shall take all necessary precautions to protect existing utilities and to maintain uninterrupted service. Any damage incurred shall be repaired immediately to the satisfaction of the Engineer by the Contractor at the Contractor's expense.
 - a. The Contractor shall locate existing utilities a minimum of two weeks in advance of construction operations in vicinity of utilities. Cost shall be included in the unit prices bid for excavation and backfill for traffic signal appurtenances.
 - b. Contractor shall notify the following utilities or agencies at least five (5) days before starting work shown on these plans:
 - Miss. Utility (Collect) 1-559-0100
 - Baltimore Gas & Electric Company - Underground Electric Distribution Engineering "Damage Control" - 234-5691
 - Baltimore Gas & Electric Company - Underground Gas Distribution Engineering "Damage Control" - 234-5533
 - Chesapeake and Potomac Telephone Co. - 725-9976
 - State Highway Administration - 531-5533
 - c. Clear all utilities by a minimum of 6". Clear all poles 2'-0" minimum or tunnel as required. Cost for tunneling or bracing at poles shall be included in the unit prices bid for excavation and backfill for traffic signal appurtenances.



VICINITY MAP
Scale: 1"=2000'

Rev. No.	Rev. Date	Revision Description
		Owner and Developer
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		
Project Area		
LITTLE PATUXENT PARKWAY AT INTERSECTION OF ROUSE & MALL ENTRANCE		
Project Title		
PLAN RECONSTRUCTION OF TRAFFIC SIGNAL AND EQUIPMENT LIST CAPITAL PROJECT NO. T-G-7003		
Designed: D.Cheng	Scale: As Noted	
Drawn: T. Staller	Date: Dec. 1980	
Checked: K. Evans	Sheet: 13 of 10	
Prepared By		
THE WILSON T. BALLARD CO. CONSULTING ENGINEERS OWINGS MILLS, MARYLAND		

Approved: <i>Elizabeth Anderson Calia</i> Chief, Division of Pools, Bridges & Storm Drainage Date: 12/15/80	Approved: DEPARTMENT OF PUBLIC WORKS <i>Henry F. Newmyer</i> DIRECTOR OF PUBLIC WORKS Date: 12-16-80	Approved: <i>William C. Riley</i> Chief - Bureau of Engineering Date: 12-16-80
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