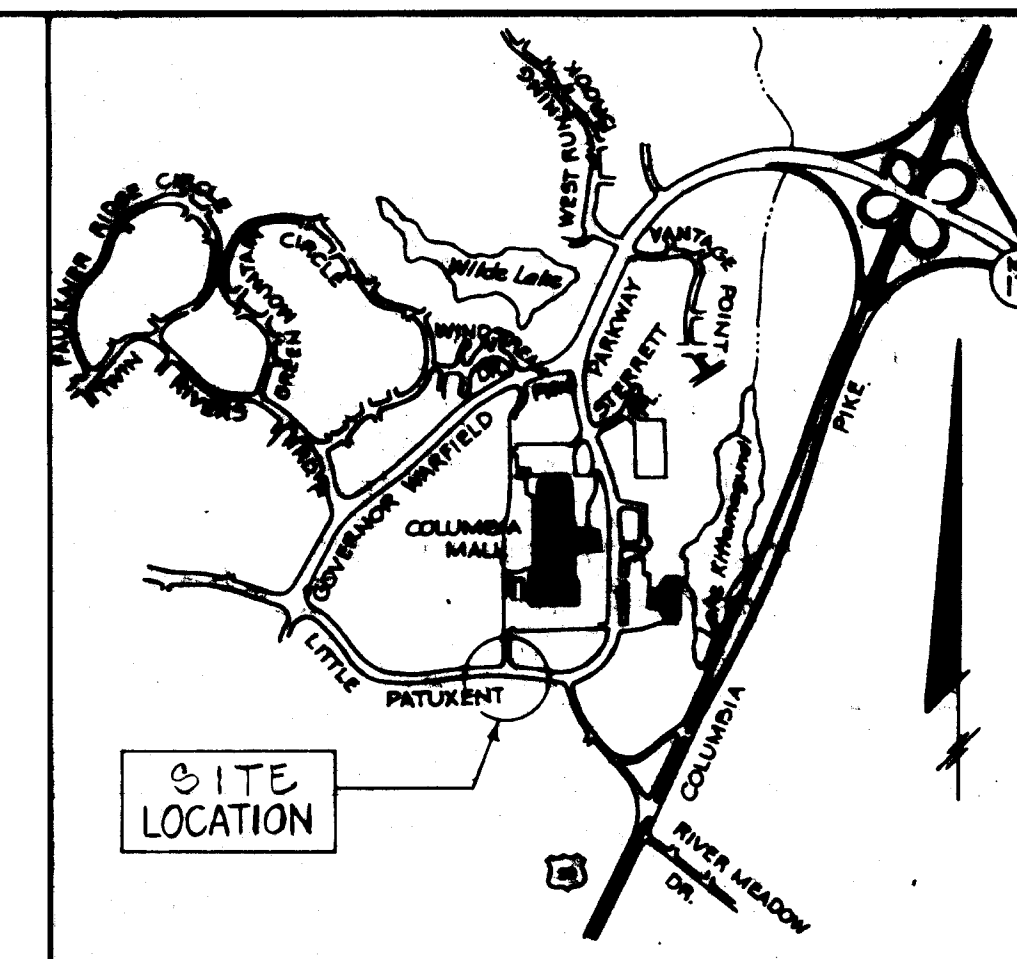
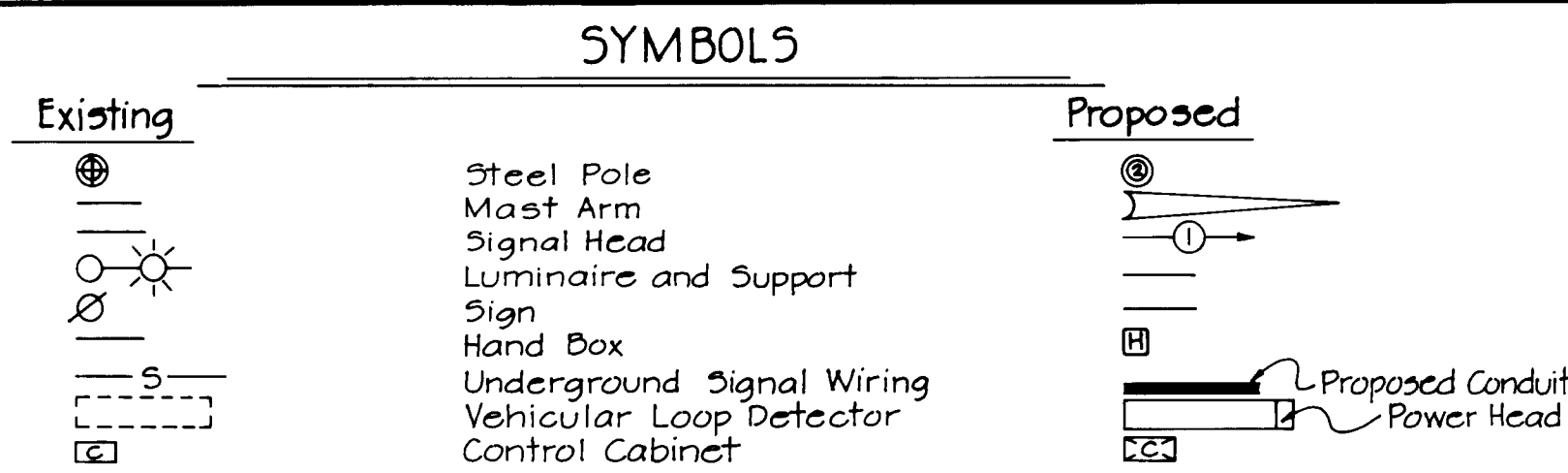


PHASE AND SEQUENCE DIAGRAM		TRAFFIC SIGNAL HEADS							Min. Green	Passage	Yellow	Red/Clear	Max. I	Seconds Per Actuation	Time to Reduce	Time Before Reduction	Minimum Gap	Recall	Memory
		1	2-3	4	5	6	7												
Phase A Clear	G	G ₁	R	R	R	R	R	8	1			21						OFF	OFF
	Y,R	G ₁	R	R	R	R	R			4	2								
Phase B Clear	R	G ₁	G	G	R	R	R	9	5			21	1.2	5	10	35	OFF	ON	
	R	Y,R	Y,R	Y,R	R	R	R			4	1								
Phase C Clear	R	R	R	R	G	G	R	11	1			23					OFF	OFF	
	R	R	R	R	Y,R	Y,R	R			4	2								
FLASH	R	Y	Y	Y	R	R													

GENERAL NOTES

- 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.
- 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.
 - 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.
 - 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
 - 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.
- All materials and workmanship employed under this contract shall conform with the "GENERAL SPECIFICATIONS FOR INSTALLATION OF AND EQUIPMENT FOR TRAFFIC SIGNALS FOR HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS" dated October 7, 1974; revised February 18, 1976, and included in the contract specifications.
- All disturbed areas shall be properly reseeded in accordance with the Contract Specifications.
- The existing traffic signal system shall be maintained and remain operational during the entire construction period of the new signal system. The contractor shall schedule the work such that the time between the total shut down of the existing signal heads and the turn on of the new signal system shall not be more than 1 calendar day. All new signal heads shall be securely wrapped and/or bagged in burlap, when not in use.
- The reconstruction of the center median islands shall be coordinated with the removal of the existing traffic signal system and installation of the new traffic signal system.



VICINITY MAP
Scale 1" = 2000'

EQUIPMENT LIST

CONTROLLER AND ACCESSORIES

- NEMA three phase modular thumbwheel programmable controller with solid state circuitry and digital timing, equivalent to the Crouse Hinds DM-400 Series Digital Controller unit, equivalent manufactured by Eagle Signal Corporation or Econolite, or approved equal. The controller shall be capable of expansion to four phase operation.
 - Equipped with two (2) vehicular actuated modules.
 - Equipped with one (1) vehicular actuated module with volume density controls.
 - 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.
 - 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, Sections Per Actuation, Time to Reduce, Time Before Reduction, Minimum Gap, Recall, and Memory.
 - Four phase signal overlap capability.
- Conflict Monitor and Solid State load switches.
- Solid State flasher and switch accessible through police door panel.
- Manual operating control and manual switch accessible through police door panel.
- 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.
- Finish of the cabinet shall be all-weather bronze paint.
- 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.
- Install 3'x4'x5" concrete slab in front of the controller cabinet.
- Meter box shall be installed in a vandal proof enclosure supplied by the contractor.

LOOPS AND DETECTORS

- The existing loops, as indicated on the Contract Drawings, shall be removed or abandoned as noted. The following loops shall be installed:

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

* Loops to be installed with 6' x 3' powerhead for detection of small vehicles.
- Loops 1 and 2 shall be wired to a common standard detector.
- Loop 3 shall be wired to a standard detector.
- Loop 4 shall be wired to a delayed timer vehicle loop detector.
- Loop 5 shall be wired to a standard detector.
- All wiring shall be in accordance with manufacturer's recommendations for correct operation.
- Loops 1 and 2 shall operate in pulse mode. Loops 3, 4, and 5 shall operate in presence mode.
- Delayed Timer shall be set at 10 seconds for Loop 4.
- 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

- 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	12" diameter indications
2, 3, 4, 5, 6, 7	12" diameter red indication; 8" diameter amber and green indications
- All signals shall have brown baked enamel finish and shall be furnished with tunnel visors. All signals shall be vertically mounted on the mast arms with rigid adjustable brackets equivalent to the "VehPed Traffic Controls, Inc. Astro-Brac (Model No. 0-AB-101)" or approved equal.

POLES

Proposed Poles:

- One (1) single arm support pole, and one (1) twin arm support pole with a 90° angle of separation.
- Style and appearance shall be equivalent to Union Metal Design No. 50700. Finish shall be bronze paint.

Existing Poles:

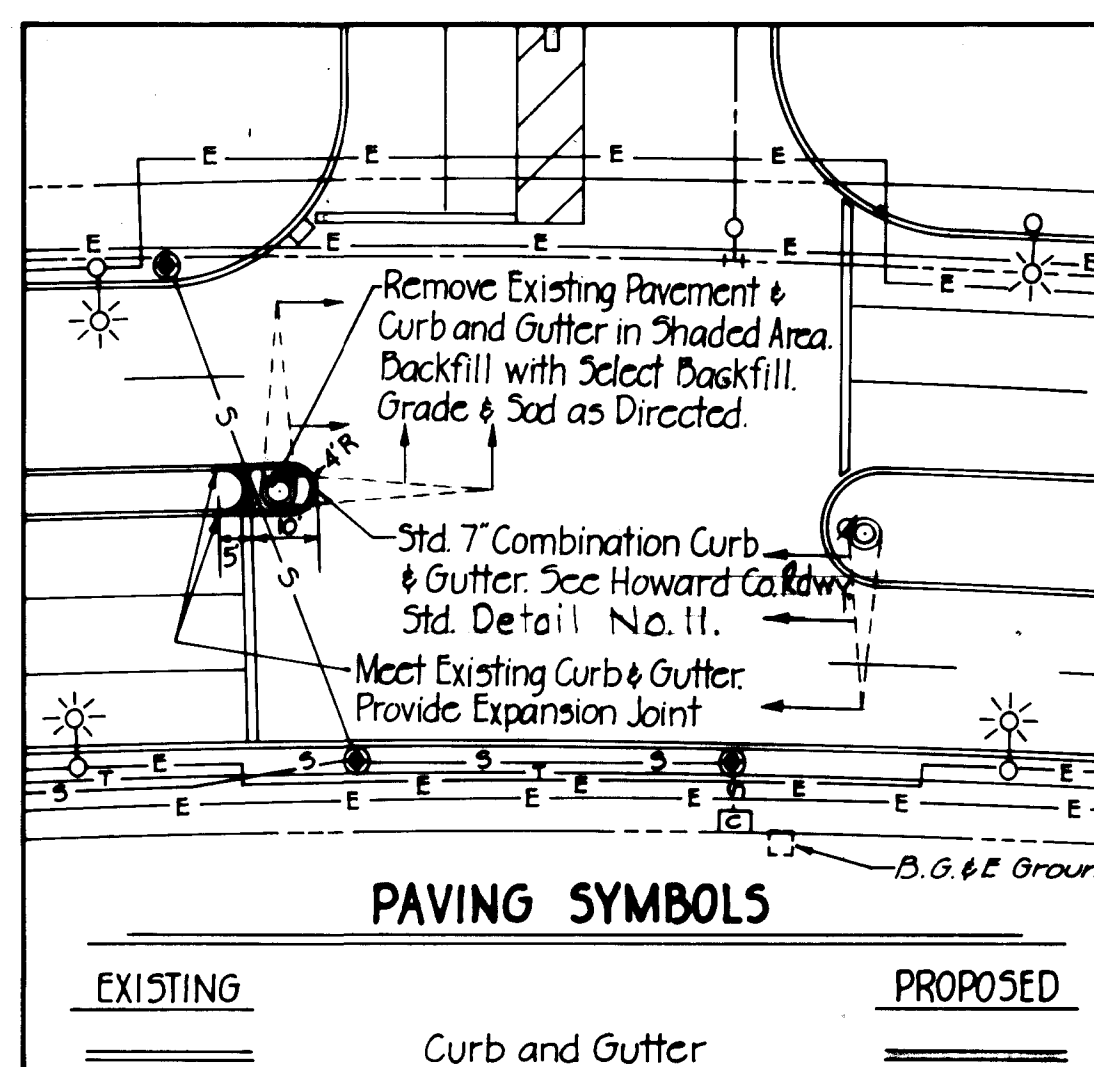
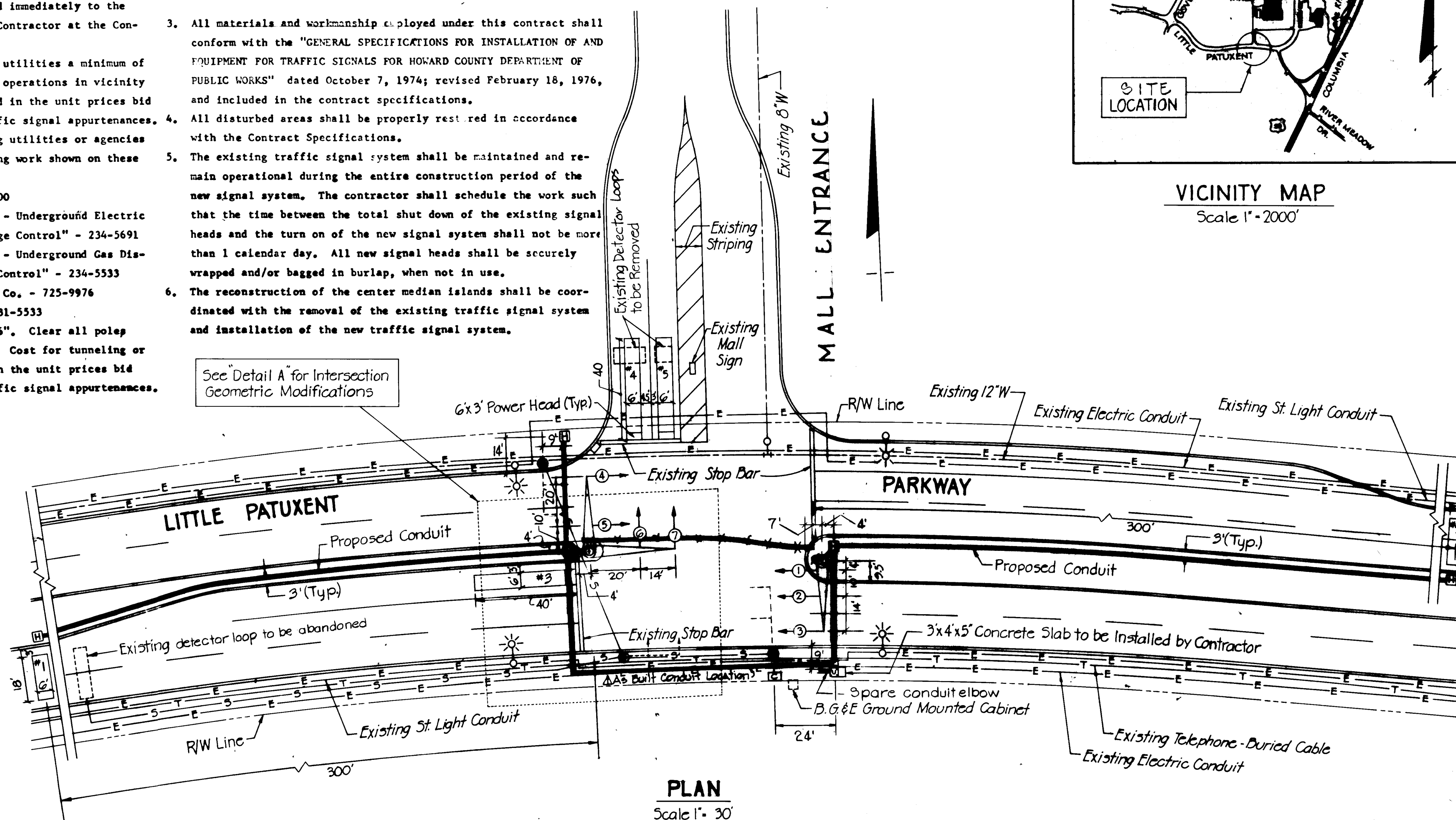
- 30' and 34' arm spread, each supporting two signal heads.
- 28' arm spread, supporting three signal heads.

Existing Poles:

- 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

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



INTERSECTION GEOMETRIC MODIFICATIONS

- Notes:
- The reconstruction of the median island shall be coordinated with the construction of the new traffic signals.
 - All work performed in connection with the median island reconstruction shall be in accordance with the Contract Specifications.
 - See Contract Specifications for Standard Details.

QUANTITY SCHEDULE	
Remove Existing Curb and Gutter	15 LF.
Removal of Existing Pavement	15 SY.
Bituminous Concrete Surface	25 Tons
Bituminous Concrete Base	2 Tons
8" Crusher Run Sub-Base	4 C.Y.
Standard 7" Combination Curb and Gutter	55 LF.
Select Backfill	4 C.Y.
Topsoil	1 C.Y.
Sod	0 SY.

Approved: *Elizabeth Anderson-Palmer* 12/15/80
 Chief, Division of Roads, Bridges & Storm Drainage

Approved: *James E. Kasper* 12-16-80
 Chief, Division of Traffic Engineering

Approved: DEPARTMENT OF PUBLIC WORKS

Henry F. W... 12-16-80
 DIRECTOR OF PUBLIC WORKS

Approved: *...* 12-16-80
 Chief, Bureau of Engineering

1	6-20-82	AS BUILT LOCATION
Rev. No.	Rev. Date	Revision Description
Owner and Developer		
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		
Project Area		
LITTLE PATUXENT PARKWAY AT INTERSECTION OF PAVILION MALL ENTRANCE		
Project Title		
PLAN RECONSTRUCTION OF TRAFFIC SIGNAL AND EQUIPMENT LIST CAPITAL PROJECT NO. T-G-7005		
Designed: D.Cheng	Scale: As Noted	
Drawn: D.Griffin	Date: Dec. 10 80	
Checked: K.Evans	Sheet: G of 10	
Prepared By		
THE WILSON T. BALLARD CO. CONSULTING ENGINEERS OWINGS MILLS, MARYLAND		

#746