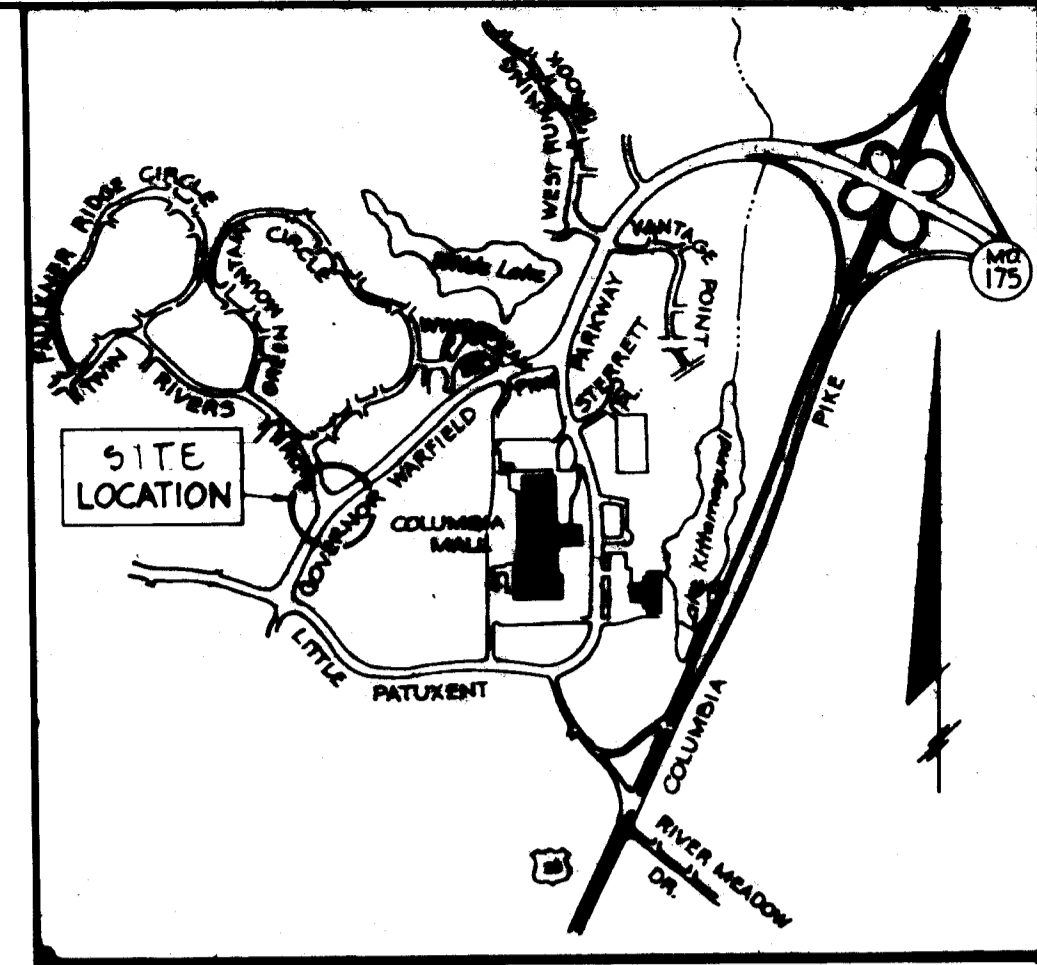
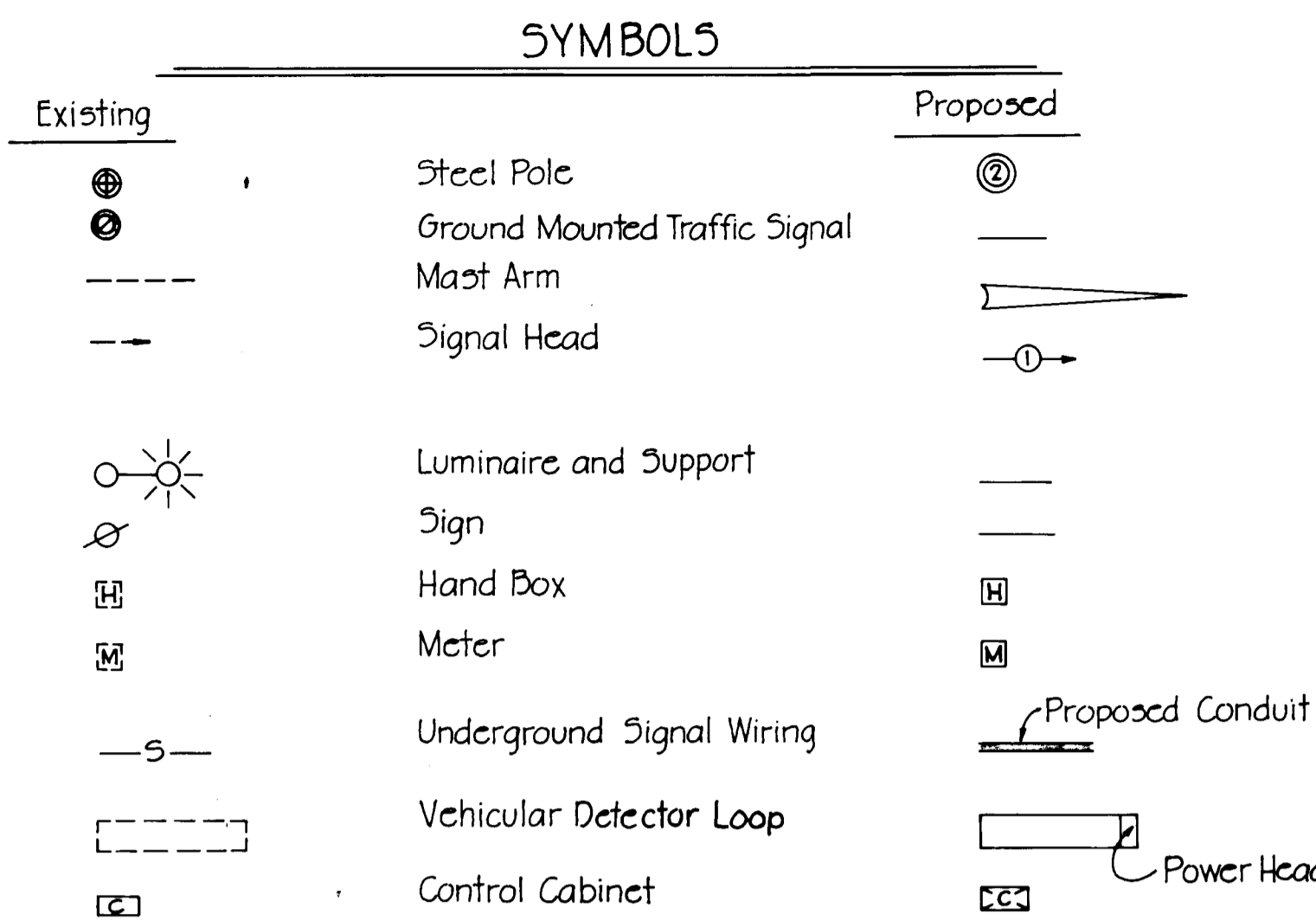


PHASE AND SEQUENCE DIAGRAM	TRAFFIC SIGNAL HEADS				Min. Green	Passage	Yellow	Red Clear	Max. I	Seconds Per Actuation	Time to Reduce	Time Before Reduction	Minimum Gap	Recall	Memory
	1-2	3-4	5	6-7											
	G	R	G	R	5	1		12					OFF	OFF	
	G	R	Y,R	R			4	2							
	G	G	R	R	5	5		15	35	5	5	35	OFF	ON	
	Y,R	Y,R	R	R			4	2							
	R	R	R	G	8	1		15					OFF	OFF	
	R	R	R	Y,R			4	2							
	Y	Y	R	R											



VICINITY MAP
Scale 1" = 2000'

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
- 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 restored 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.

EQUIPMENT LIST

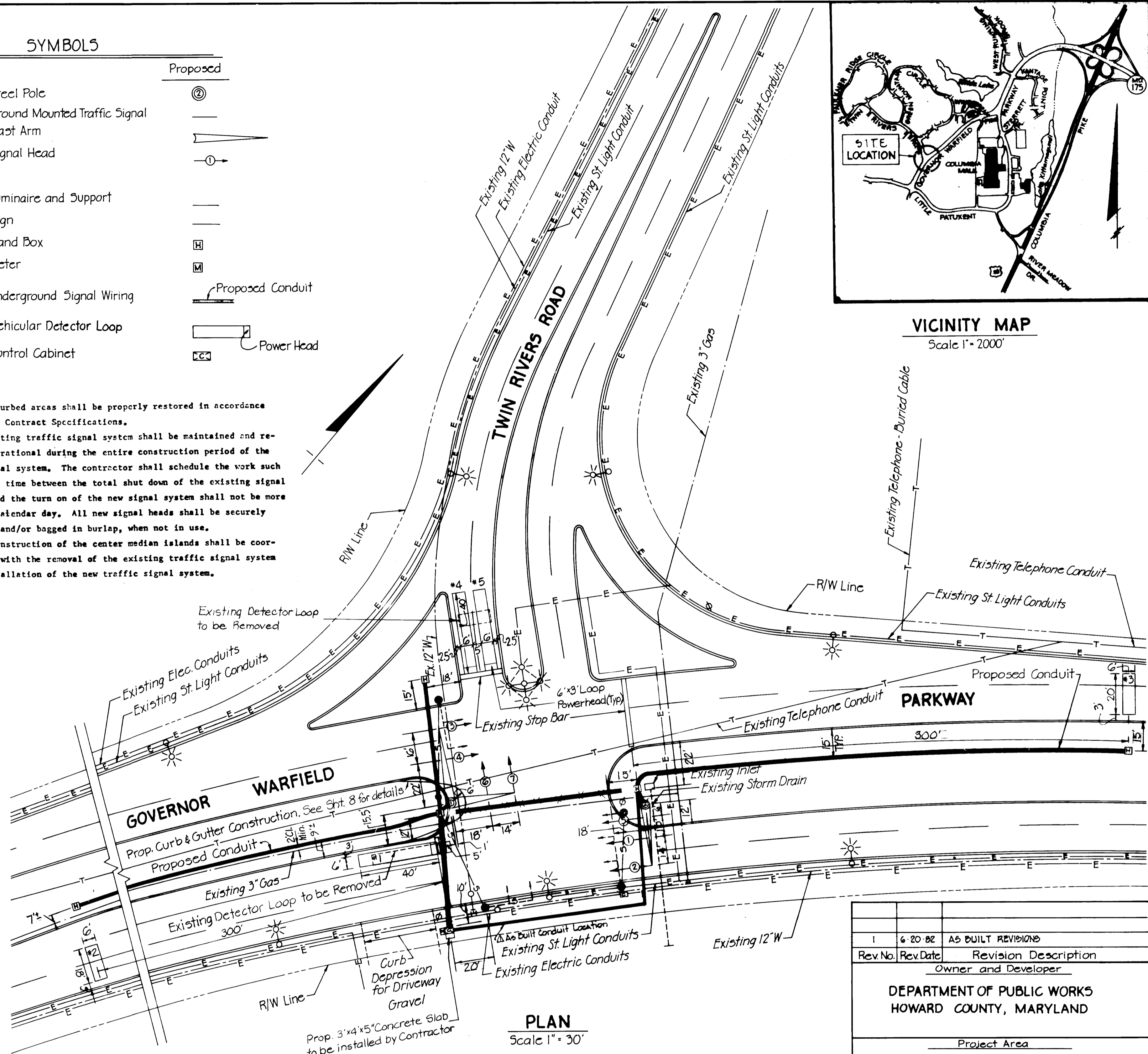
- CONTROLLER AND ACCESSORIES**
- NEMA three phase modular thumbwheel programmable controller with solid state circuitry and digital timing, equivalent to the Crouse Hinds DM-400 Series Digital Controller unit, equivalent manufactured by Eagle Signal Corporation or Econolite, or approved equal. The controller 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, Seconds 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.
 - Ground mounted traffic controller cabinet large enough to accommodate the above control equipment and detectors. The cabinet shall be furnished with a thermostatically controlled cabinet vent fan.
 - Finish of the cabinet shall be all-weather bronze paint.
 - Meter Box shall be installed in a vandal proof enclosure supplied by the contractor.
 - Install 3' x 4' x 5" concrete slab in front of the controller cabinet.
- LOOPS AND DETECTORS**
- The existing loops, as indicated on the Contract Drawings, shall be abandoned. The following new loops shall be installed:

Number	Dimensions	Phase
1	6' x 40'	A
2	6' x 18'	B
3	6' x 20'	B
4, 5	6' x 40'	C

 *Loops to be installed with 6' x 3' power head for detection of small vehicles.
 - Loop 1 shall be wired to a standard detector.
 - Loops 2 and 3 shall be wired separately to a common standard detector.
 - Loops 4 and 5 shall be wired to a standard detector.
 - Standard detectors shall be Sarasota 215 B/MS or approved equal.
 - All wiring shall be in accordance with manufacturer's recommendations for correct operation.
- 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, 2, 3, 4, 6, 7	12" diameter red indication; 8" amber and green
5	12" diameter red indication, 8" amber, and 12" green left turn arrow.
 - 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 "VePed 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.
 - | Pole Number | Description |
|-------------|---|
| 1 | 32' and 38' arm spread, each supporting two signal heads. |
| 2* | 30' arm spread, supporting three signal heads. |

 *Signal Pole No. 2 shall be designed to handle an additional 40' arm at 90° separation without modification to the support pole. This provision is made for a future Columbia Mall Entrance.
- 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 - 4.02 b".
 - The use of direct lay cable or a combination of conduit and direct lay shall not be acceptable.



PLAN
Scale 1" = 30'

Rev. No.	Rev. Date	Revision Description
1	6-20-82	AS BUILT REVISIONS
Owner and Developer		
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND		
Project Area		
GOVERNOR WARFIELD PARKWAY AT INTERSECTION OF TWIN RIVERS ROAD		
Project Title		
PLAN "RECONSTRUCTION OF TRAFFIC SIGNAL" AND EQUIPMENT LIST CAPITAL PROJECT NO. T-6-7003		

Designed: D. Cheng Scale: As Noted
 Drawn: D. Griffin Date: Dec. 1980
 Checked: K. Evans Sheet: 7 of 10

Prepared By
 THE WILSON T. BALLARD CO.
 CONSULTING ENGINEERS
 OWINGS MILLS, MARYLAND



Approved: <u>Elizabeth Anderson-Cole</u> 12/15/80 Chief, Division of Roads, Bridges & Storm Drainage Date	Approved: DEPARTMENT OF PUBLIC WORKS <u>Geoff F. Neumann</u> 12-16-80 DIRECTOR OF PUBLIC WORKS Date	Approved: <u>William E. Ray</u> 12-16-80 Chief, Bureau of Engineering Date
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#746

AS BUILT 6-20-82

GovW TWI 1