PHASE AND SEQUENCE DIAGRAM		Traffic Signal Head 1,2,3,4	Traffic Signal Head 5,6	Traffic Signal Head 7,8,9,10	Min. Green	Passage	Yellow	Red Clear	Max. I	Recycle Per Actuation	Per Actuation	Time Before Reduction	Min. Gap	Recall	Memory
	Phase A	R	G	R	10	1			10					Off	Off
	Phase A Clear	R	Y,R	R			4	1							
	Phase B	G	R	R	10	5			10	3.0	5.0	10.0	3.5	Off	On
	Phase B Clear	Y,R	R	R			4	1							
	Phase C	R	R	G	10	1			10					Off	Off
	Phase C Clear	R	R	Y,R			4	1							
	Flash	Y	R	R											

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 be considered a part of this contract.
2. The utilities shown on the construction plan are schematic only and are not to be considered complete. The contractor shall be responsible for notifying all utility companies prior to construction so that all utilities can be located in the field. The contractor shall locate existing utilities a minimum of two (2) weeks in advance of the construction operations in the vicinity of the utilities. Any damage incurred by the contractor shall be repaired immediately at the contractor's expense. See Section 4.09 of the General Specifications.
3. All materials and workmanship employed under this contract shall conform with the "GENERAL SPECIFICATIONS FOR INSTALLATION OF EQUIPMENT FOR TRAFFIC SIGNALS FOR HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS" dated October 7, 1974; revised February 18, 1976.
4. All disturbed areas shall be properly restored in accordance with Section 4.20 of the General Specifications.

CONTROLLER AND ACCESSORIES

1. NEMA three phase modular controller with solid state circuitry and digital timing, similar to the Crouse-Hinds DM 400 Series Digital Controller unit, equivalent manufactured by Econolite Control Products, Inc., Eagle Signal Corporation 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. 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.
5. Finish of the cabinet shall be all-weather bronze paint.
6. Install 3' x 4' x 5" concrete slab in front of the controller cabinet.
7. A tamper proof meter box shall be mounted on the outside of the controller cabinet for future electric connection by utility company.

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, and pedestrian push button detectors.
3. The contractor shall furnish an "as-built" drawing as per "General Specifications - 1.02b".

LOOPS AND DETECTORS

1. The following new loops shall be installed:

Number	Dimensions	Phase
1,2	6' x 20'	B
3,4	6' x 40' *	A
5,6,7,8,9,	6' x 40' *	C
10	6' x 10'	C

* Loops to be installed with 6' x 3' powerhead for detection of small vehicles.

2. Loops 1 and 2 shall be wired in parallel to a standard detector.
3. Loops 3 and 4 shall be wired in parallel to a standard detector.
4. Loops 5,6,7 & 10 shall be wired in series to a standard detector.
5. Loops 8 and 9 shall be wired in series to a standard detector.
6. All wiring shall be in accordance with manufacturer's recommendations for correct operation.
7. Loops 1 and 2 shall operate in pulse mode.
8. Loops 3,4,5,6,7,8,9 & 10 shall operate in presence mode.
9. Standard detectors shall be Sarasota 215B/MS, equivalent as manufactured by Crouse-Hinds, Econolite Control Products, Inc. or approved equal.

SIGNAL HEADS

1. The contractor shall provide the following new signal heads:

Signal Number	Description
1,2,3,4,	12" Diameter Indications
5,6	12" Diameter Red and Amber indications with 12" Green Left Turn Arrow.
7,8,9, 10	12" Diameter Red Indication 8" Diameter Amber and Green Indication

2. All signals shall be painted bronze with M.A. Bruder & Sons, Inc. Seashore Gloss Trim 27721 Duranodic Bronze Code 7557581 or equal.
3. All signals except signal Number 5 shall be vertically mounted on the signal pole mast arms with an adjustable signal bracket equivalent to the "ASTRO-BRAC" Model O-AB-101 by VePed Traffic Controls, Inc. or approved equal. Signal Number 5 shall be mounted to the signal pole with vertical bracket mountings and pole plates.

POLES

The contractor shall provide the following new signal poles:

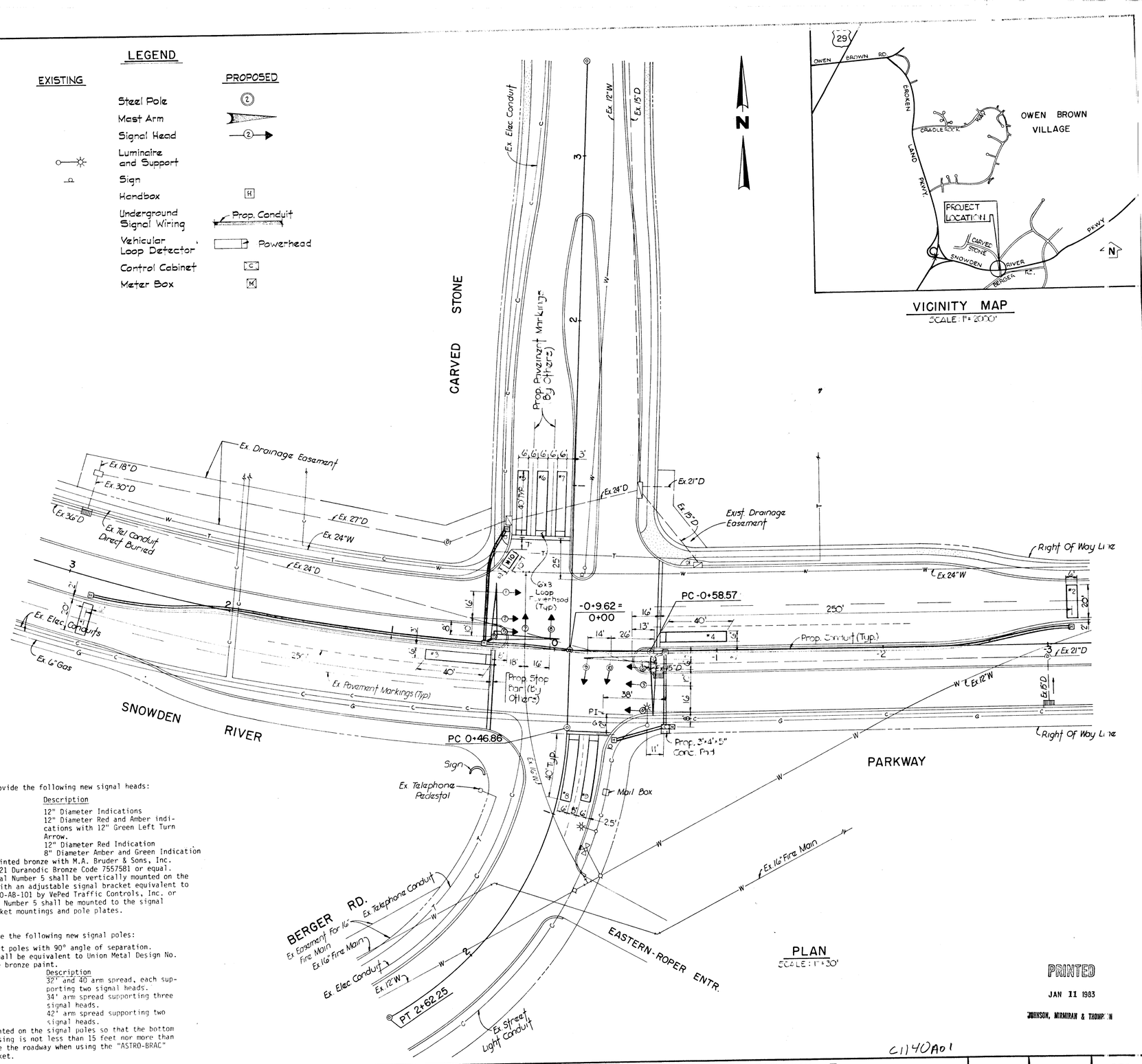
1. Two (2) twin arm support poles with 90° angle of separation.
2. Style and appearance shall be equivalent to Union Metal Design No. 50700. Finish shall be bronze paint.
3.

Pole Number	Description
1	32' and 40 arm spread, each supporting two signal heads.
2	34' arm spread supporting three signal heads. 42' arm spread supporting two signal heads.

4. Mast arms shall be mounted on the signal poles so that the bottom of the signal head housing is not less than 15 feet nor more than 19 feet clearance above the roadway when using the "ASTRO-BRAC" adjustable signal bracket.

LEGEND

EXISTING	PROPOSED
	Steel Pole (2)
	Mast Arm
	Signal Head (2)
Luminaire and Support	
Sign	
	Handbox (H)
Underground Signal Wiring	Prop. Conduit
Vehicular Loop Detector	Powerhead
	Control Cabinet (C)
	Meter Box (M)



PLAN
SCALE: 1"=30'

VICINITY MAP
SCALE: 1"= 2000'

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DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE

CHIEF, BUREAU OF ENGINEERING — DATE 12/30/82

CHIEF, DIVISION OF ROADS, BRIDGES AND STORM DRAINAGE — DATE 12/29/82

Johnson, Mirmiran & Thompson, P. A.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS
80 GLENEAGLES CT. • BALTIMORE, MARYLAND • 21204 • (301) 821-5500

Daniel J. Chang 0/83

PLAN
CONSTRUCTION OF TRAFFIC SIGNAL AND EQUIPMENT LIST

SNOWDEN RIVER PARKWAY AT CARVED STONE & BERGER RD.
CAPITAL PROJECT NO. T-7017
ELECTION DISTRICT NO. 6
HOWARD COUNTY, MARYLAND

DRAWING	SCALE	
NO. 1	1"= 30'	DES. D.T.C.
OF. 1		DRN. D.C.S.
		CHK.