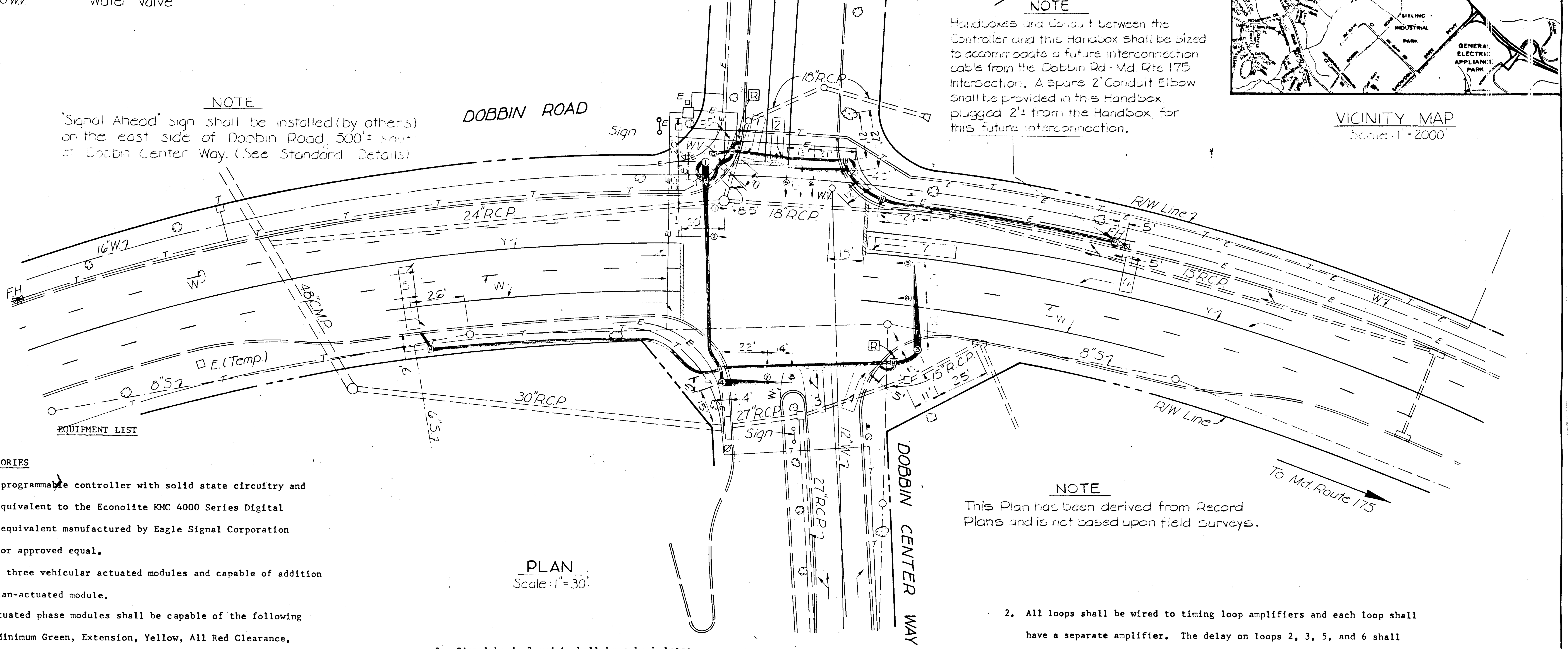
PHASE AND SEQUENCE DIAGRAM		TRAFFIC SIGNAL HEADS 1: R ○12" Y ○8" G ○8"	2: R ○12" Y ⊖○12" G ⊖○12"	3,4: R ○12" Y ○8" G ○8"	5,7,8: R ○12" Y ○8" G ○8"	6: R ○12" Y ○⊖12" G ○⊖12"	Min. Green	Yellow	Red Clearance	Veh. Ext.	Maximum Green	Recall.
	Phase 1	G	G ←G	R	R	R →G	6	—	—	1.8	25	OFF
	Phase 1 Clear (To Phase 2 Only)	G	G ←Y	R	R	R →Y	—	4	1	—	—	—
	Phase 2	G	G	G	R	R	11	—	—	3	20	ON
	Phase 2 Clear (To Phase 3 Only)	Y	Y	Y	R	R	—	4	1	—	—	—
	Phase 3	R	R	R	G	G	10	—	—	2	20	OFF
	Phase 3 Clear (To Phase 1 or 2)	R	R	R	Y	Y	—	4	1	—	—	—
	FLASH	Y	Y	Y	R	R						

NOTES:
1. The above times are in seconds.

LEGEND

EXISTING		PROPOSED
Curb & Gutter		Controller w/Electric Meter
Electric Transformer		Detector Loop
Fire Hydrant		Hand Box
Sign (R Indicates removal by others)		Mast Arm
Storm Drain		Signal Head
Street Light		Steel Pole
Telephone Transformer		Stop Bar (By Others)
Tree		Underground Signal Wiring
Underground Electric Line		White Lane Arrow (By Others)
Underground Telephone Line		Single White Stripe (By Others)
Water Line		Double Yellow Stripe (By Others)
Water Valve		

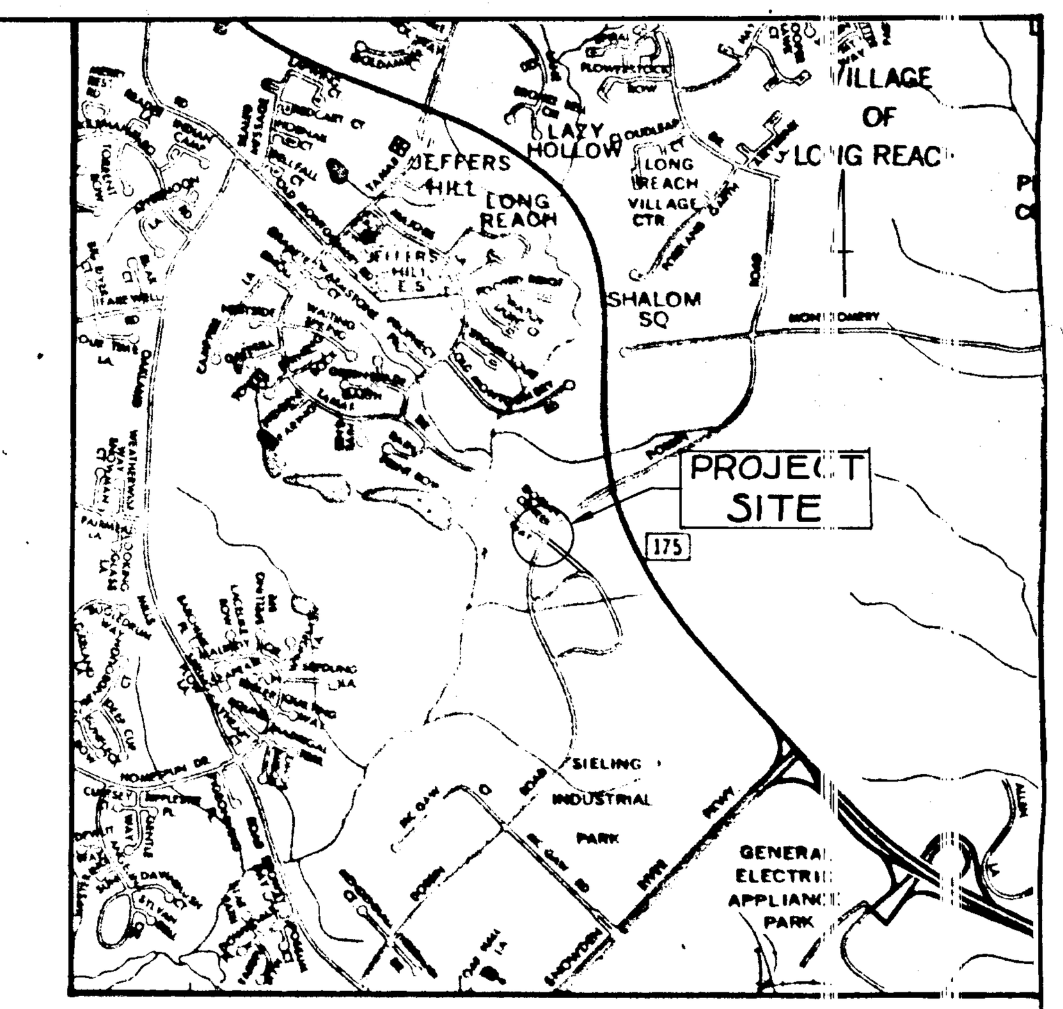


NOTE
"Signal Ahead" sign shall be installed (by others) on the east side of Dobbin Road 500'± south of Dobbin Center Way. (See Standard Details)

NOTE
Handboxes and Conduit between the Controller and this Handbox shall be sized to accommodate a future interconnection cable from the Dobbin Rd - Md Rte 175 Intersection. A Spare 2" Conduit Elbow shall be provided in this Handbox plugged 2'± from the Handbox, for this future interconnection.

NOTE
This Plan has been derived from Record Plans and is not based upon field surveys.

PLAN
Scale: 1"=30'



VICINITY MAP
Scale: 1"=2000'

GENERAL NOTES

1. All highway marking and sign removal 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.
   b. The Contractor shall locate existing utilities a minimum of two weeks in advance of construction operations in vicinity of utilities. Cost shall be incidental to the items in the Proposal Itemization.
   c. 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 Company - 725-9976
   d. 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 incidental to the items in the Proposal Itemization. The locations of poles, handboxes, conduit and controller shall be adjusted, if necessary, to avoid existing utilities.
3. 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 as the General Provisions.
4. All disturbed areas shall be properly restored in accordance with the Contract Specifications.
5. All signal heads shall be securely wrapped and/or bagged in burlap, when not in use.

EQUIPMENT LIST

CONTROLLER AND ACCESSORIES

1. NEMA three phase programmable controller with solid state circuitry and digital timing, equivalent to the Econolite KMC 4000 Series Digital Controller unit, equivalent manufactured by Eagle Signal Corporation or Crouse Hinds, or approved equal.
   a. Equipped with three vehicular actuated modules and capable of addition of a pedestrian-actuated module.
   b. Vehicular actuated phase modules shall be capable of the following functions: Minimum Green, Extension, Yellow, All Red Clearance, Dual Maximum, Recall and Memory.
   c. Three 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. Meter Box shall be installed in a vandal proof enclosure supplied by the Contractor.
7. Install 3' x 4' x 5" concrete slab in front of the controller cabinet.

SIGNAL HEADS & OVERHEAD SIGN

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

Signal Number	Description
1, 3, 4, 5, 7, 8	12" diameter red indication and 8" amber and green indications
2,6	12" red indication; 12" amber and green indications, including turn arrows

2. 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. Signal arrangement shall be as shown in the Phase and Sequence Diagram.
3. Signal heads 3 and 4 shall have backplates.
4. A "Yield When Turning on Green" sign shall be installed adjacent to signal head Number 2. See Standard Details.

POLES

Proposed Poles:

1. Four support poles with individual support arms.
2. Style and appearance shall be equivalent to Union Metal Design No. 50700. Finish shall be bronze paint.
3.

Pole Number	Description
1,2	34' arm spread supporting two signal heads.
3	40' arm spread supporting two signal heads.
4	36' arm spread supporting two signal heads.

LOOPS AND DETECTORS

1. The following new loops shall be installed:

Number	Dimensions	Phase	Mode
1, 4	6' x 20'	3	Presence, non-lock
2, 3	6' x 20'	3	Presence, non-lock
5	6' x 30'	2	Pulse, non-lock
6	6' x 17'	2	Pulse, non-lock
7	6' x 40'*	1	Presence, non-lock

*Loop to be installed with 6' x 3' power head for detection of small vehicles.

2. All loops shall be wired to timing loop amplifiers and each loop shall have a separate amplifier. The delay on loops 2, 3, 5, and 6 shall be zero and the delay for loops 1 and 4 shall be 8 seconds. This delay is to be in effect only during Phases 1 and 2. The delay for detector 7 shall be zero during phases 1 and 3 and 15 seconds during phase 2.
3. Loop amplifiers shall be Sarasota 235T/MS or approved equal.
4. All wiring shall be in accordance with manufacturer's recommendations for correct operation.
5. All loop corners shall be cut at a 45° angle, at least 6" long.

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. The Contractor shall furnish an "as-Built" drawing as per "General Specifications - 4.02 b."
4. The use of direct lay cable or a combination of conduit and direct lay shall not be acceptable.
5. Conduit under existing pavement shall be installed by pushing or boring.
6. Centerline of handbox shall be 3' behind face of curb unless otherwise indicated.
7. Cable is to be placed in saw cut between detector and curbline and in conduit between curbline and handbox.

C1317A01

NO.	DATE	DESCRIPTION OF REVISION	SIGNATURE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS — DATE — CHIEF-BUREAU OF ENGINEERING — DATE 5/7/84
CHIEF ROADS, BRIDGES, STORM DRAINAGE DIVISION — DATE 5/7/84

PREPARED BY:
THE WILSON T. BALLARD COMPANY
CONSULTING ENGINEERS
OWINGS MILLS, MARYLAND

STATE OF MARYLAND — REGISTERED PROFESSIONAL ENGINEER — No. 11446

TRAFFIC SIGNAL SYSTEM TF-250
AT
DOBBIN ROAD AND DOBBIN CENTER WAY
PLAN AND EQUIPMENT LIST

DRAWING NO. 1 OF 1
SCALE: 1"=30'
R.W.R — DESIGNED BY
J.S.L. — DRAFTED BY
R.W.R — CHECKED BY