

PHASE CHART

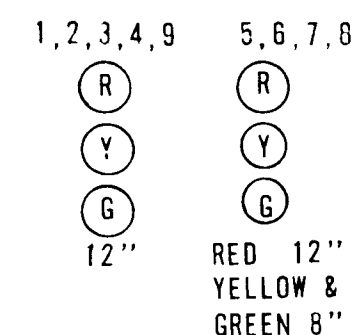
DISPLAY	1 (R)	2 (R)	3 (R)	4 (R)	5 (R)	6 (R)	7 (R)	8 (R)	9 (R)	MOVEMENT
PHASE 1	G	G	G	G	R	R	R	R	G	← T
PHASE 1 CHANGE	Y	Y	Y	Y	R	R	R	R	Y	← T
PHASE 2	R	R	R	R	G	G	R	R	R	← T
PHASE 2 CHANGE	R	R	R	R	Y	Y	R	R	R	← T
PHASE 3	R	R	R	R	R	R	G	G	R	← T
PHASE 3 CHANGE	R	R	R	R	R	R	Y	Y	R	← T
FLASHING OPERATION	FL Y	FL Y	FL Y	FL Y	FL R	FL R	FL R	FL R	FL Y	← T

NOTE: PROVIDE CAPABILITIES FOR ALL RED CLEARANCE PHASE AND PEDESTRIAN ACTUATION.

CONSTRUCTION DETAILS

1. Install 20' signal pole, 39' mast arm, 34' mast arm and signals as shown (Note: One 2" 90° Elbow). Contractor shall verify location of sanitary sewer and notify the Engineer of clearance to foundation prior to excavation for foundation.
2. Install 20' signal pole, 23' mast arm, 48' mast arm and signals as shown (Note: One 2" 90° Elbow).
3. Install base mounted cabinet and controller with all necessary equipment (Note: One 2" 90° Elbow and One 4" 90° Elbow). Mount Electric Meter on Cabinet with vandal proof meter box. Mount meter on side of cabinet away from roadway.
4. Install Handbox.
5. Install 1" galvanized electrical conduit sleeve for detector wire.
6. Install 2" galvanized electrical conduit.
7. Install 2" polyvinyl chloride electrical conduit.
8. Install 4" polyvinyl chloride electrical conduit.
9. Install loop detector wire and connect to handbox.

SIGNALS



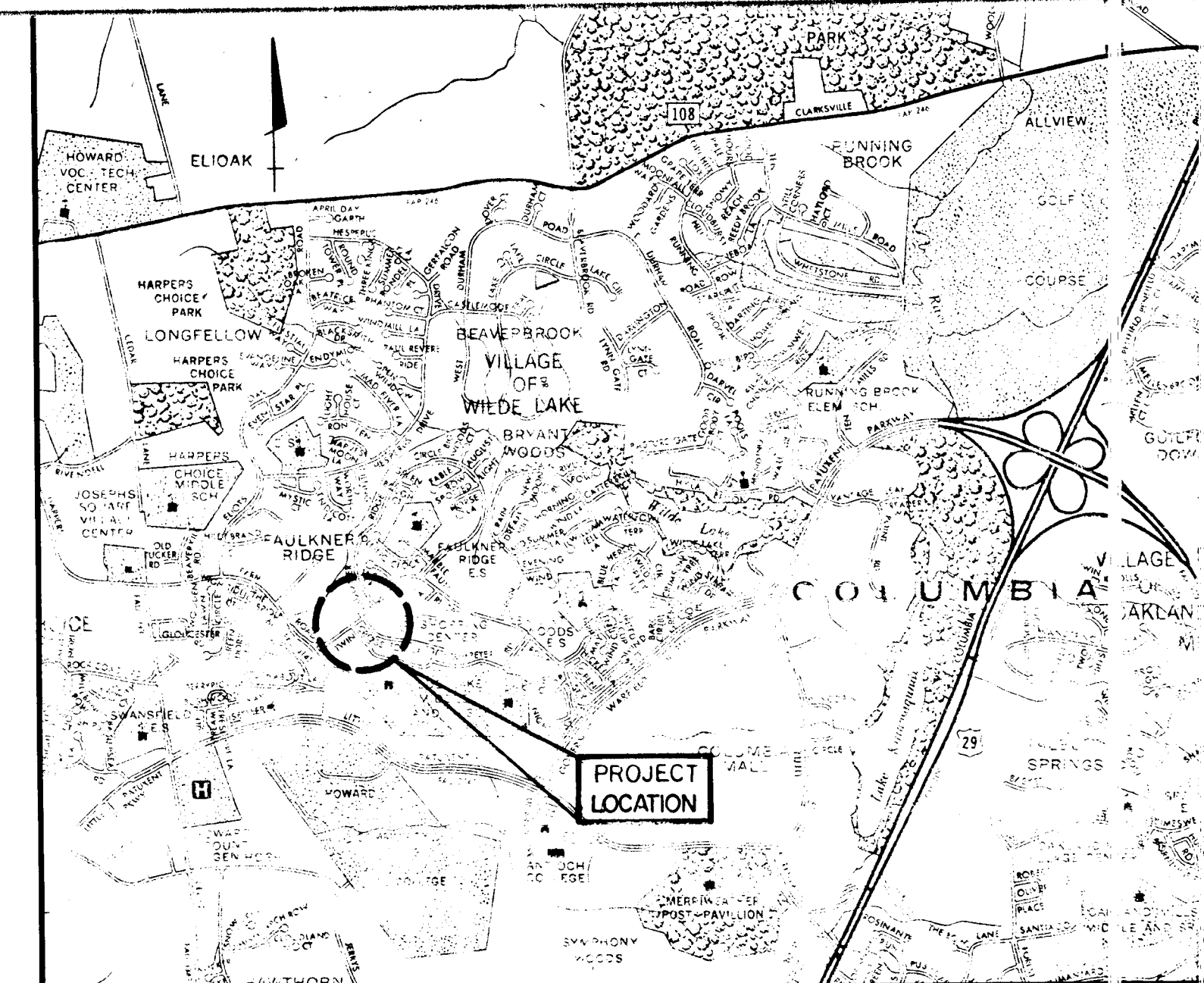
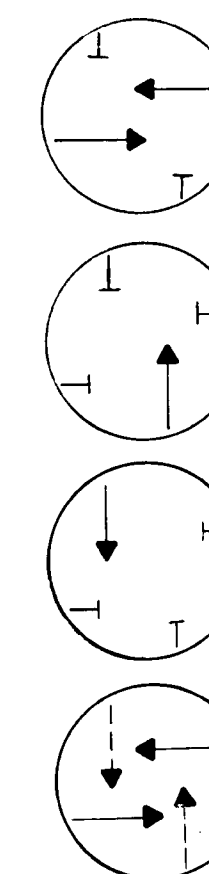
PHASING SEQUENCE

PHASE 1

PHASE 2

PHASE 3

FLASHING OPERATION

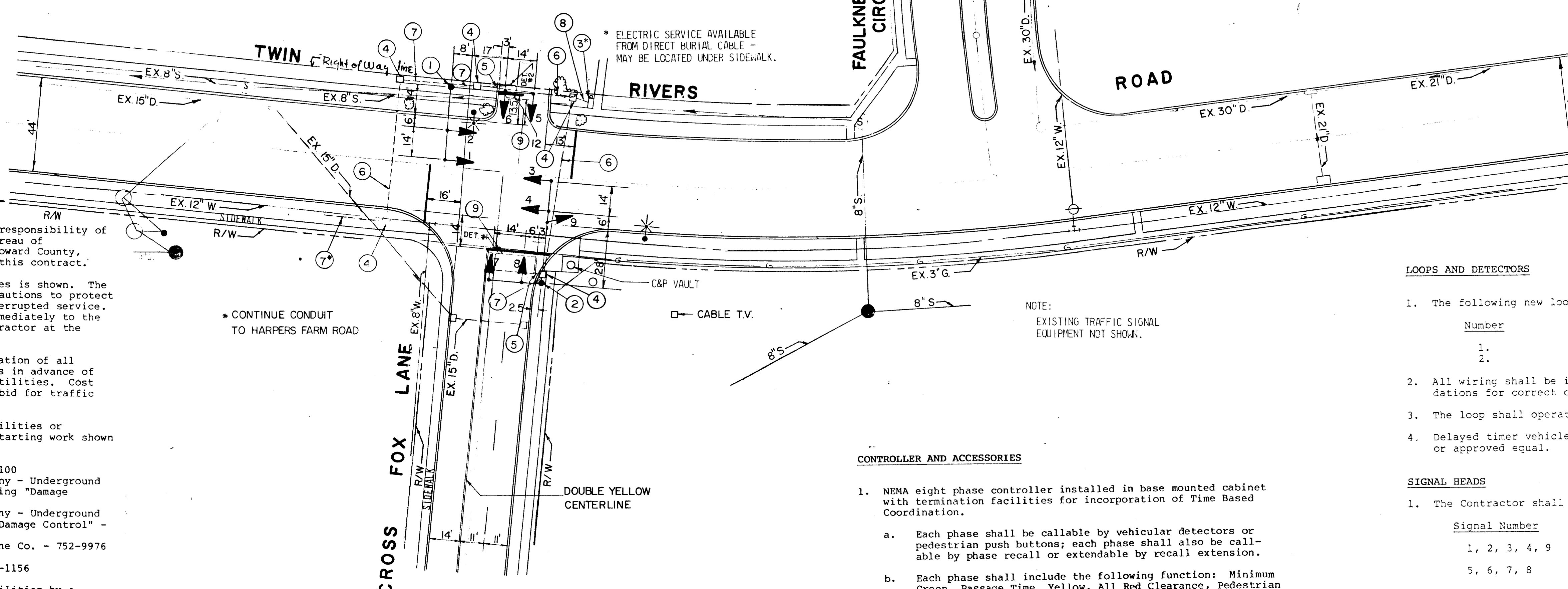


VICINITY MAP
SCALE 1"=2000'

TOPO BASED UPON EXISTING PLANS AND OTHER DATA SUPPLIED BY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS AND NOT BASED UPON FIELD SURVEY

GENERAL NOTES

1. All highway marking and signing shall be the responsibility of the Division of Traffic Engineering of the Bureau of Engineering, Department of Public Works, of Howard County, Maryland and shall not be considered 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. Contractor shall locate and mark the location of all existing utilities a minimum of two weeks in advance of construction operations in vicinity of utilities. Cost shall be included in the lump sum price bid for traffic signal systems.
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 Co. - 752-9976
 - Traffic Division - 992-2072
 - Howard County Cable T.V. - 461-1156
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.
4. All disturbed areas shall be properly restored in accordance with the Contract Specifications.
5. All new signal heads shall be securely wrapped and/or bagged in burlap, prior to signal being placed in service.
6. Traffic signal systems at Twin Rivers Road and Faulkner Ridge Circle shall remain in service until the proposed system at Lynx Lane and Cross Fox Lane are accepted by Howard County.



EQUIPMENT LIST

UNDERGROUND WIRING

1. Underground wiring shall be placed in new Conduits under the sidewalk or road surface as shown on the Contract Drawings.
2. The conduit shall be sized to accommodate the addition of future wiring for detectors, vehicular signals, and pedestrian (WALK/DON'T WALK) signal heads.
3. The use of direct lay cable or a combination of conduit and direct lay cable shall not be acceptable.
4. The Contractor shall furnish an "as-built" drawing as per "General Specifications - 4.02b".

CONTROLLER AND ACCESSORIES

1. NEMA eight phase controller installed in base mounted cabinet with termination facilities for incorporation of Time Based Coordination.
 - a. Each phase shall be callable by vehicular detectors or pedestrian push buttons; each phase shall also be callable by phase recall or extendable by recall extension.
 - b. Each phase shall include the following function: Minimum Green, Passage Time, Yellow, All Red Clearance, Pedestrian Timing, Recall and Memory.
2. Conflict Monitor and solid state load switches.
3. Solid State flasher 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 on the side of 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 (See Pole Finish).
7. Electric service shall be installed by the Contractor in a manner satisfactory to the Baltimore Gas and Electric Company.

LOOPS AND DETECTORS

1. The following new loops shall be installed:

Number	Dimensions	Phase
1.	8' x 20' (2 turns)	2
2.	6' x 6' (3 turns)	3
2. All wiring shall be in accordance with manufacturer's recommendations for correct operation.
3. The loop shall operate in presence mode.
4. Delayed timer vehicle loop detector shall be Sarasota 235T/MS or approved equal.

SIGNAL HEADS

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

Signal Number	Dimensions
1, 2, 3, 4, 9	12" diameter red, amber and green
5, 6, 7, 8	12" diameter red, 8" diameter amber and green
2. All signals shall have bronze baked enamel finish and shall be furnished with tunnel visors. All signals shall be mounted on the mast arm with rigid adjustable brackets.

POLES

1. Two (2) 20' poles with two mast arms with mounting assembly for two (2) or three (3) signal heads (12" indications) on each mast arm.
2. Finish shall be all-weather bronze paint designated Sea Shore Gloss Trim #27721, Durantic Bronze, Code 7557581 available from M.A. Bruder & Sons, Inc.
3. Style and appearance of poles shall be equivalent to Union Metal Design No. 50700.

Bids Rec'd 3-1-84

RECORD SET.

DEPARTMENT OF PUBLIC WORKS

KIDDE CONSULTANTS, INC.
ENGINEERS • ARCHITECTS • PLANNERS
BALTIMORE, MARYLAND

TRAFFIC SIGNAL PLAN

TWIN RIVERS ROAD AND CROSS FOX LANE
CAPITAL PROJECT NO. T-7003
ELECTION DISTRICT NO. 5
HOWARD COUNTY MARYLAND

DRAWING NO. OF	1 2	SCALE: 1"=30'	J.W.E. DESIGNED BY V.Y. CHECKED BY DATE: 1-25-84 J.W.E. CHECKED BY
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HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS DATE
CHIEF-BUREAU OF ENGINEERING DATE

John W. Erdman
2/16/84

C 753A 201

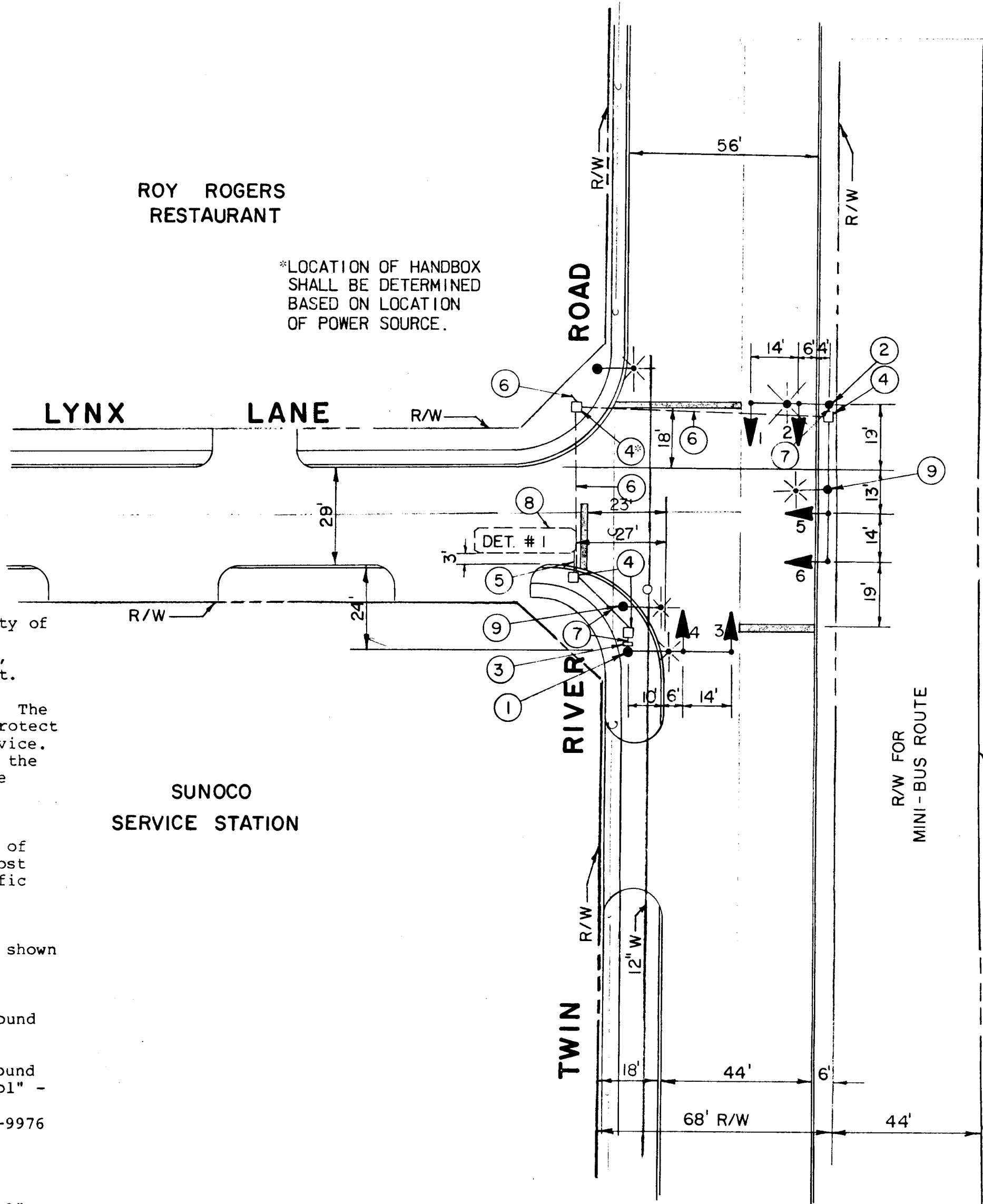
PHASE CHART							
DISPLAY	1 (R)	2 (R)	3 (R)	4 (R)	5 (R)	6 (R)	MOVEMENT
	Y	Y	Y	Y	Y	Y	
	G	G	G	G	G	G	
PHASE 1	G	G	G	G	R	R	↓ ↑
PHASE 1 CHANGE	Y	Y	Y	Y	R	R	
PHASE 2	R	R	R	R	G	G	← →
PHASE 2 CHANGE	R	R	R	R	Y	Y	
FLASHING OPERATION	FL. Y	FL. Y	FL. Y	FL. Y	FL. R	FL. R	↓ ↑

NOTE: PROVIDE CAPABILITIES FOR ALL RED CLEARANCE PHASE AND PEDESTRIAN ACTUATION.

TOPO BASED UPON EXISTING PLANS AND OTHER DATA SUPPLIED BY HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS AND NOT BASED UPON FIELD SURVEY.

ROY ROGERS RESTAURANT

*LOCATION OF HANDBOX SHALL BE DETERMINED BASED ON LOCATION OF POWER SOURCE.

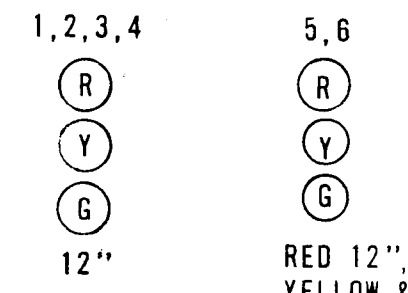


GENERAL NOTES

- All highway marking and signing shall be the responsibility of the Division of Traffic Engineering of the Bureau of Engineering, Department of Public Works, of Howard County, Maryland and shall not be considered 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.
 - Contractor shall locate and mark the location of all existing utilities a minimum of two weeks in advance of construction operations in vicinity of utilities. Cost shall be included in the lump sum price bid for traffic signal systems.
 - 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. - 752-9976
 - Traffic Division - 992-2072
 - Howard County Cable T.V. - 461-1156
 - The Contractor's work shall clear all utilities by a minimum of 6" and clear all poles by a minimum of 2'-0" or the Contractor shall tunnel, as required. Cost for tunneling or bracing at poles shall be included in the lump sum price bid for traffic signal systems.
 - Where the existing traffic signal or light standards are to be removed by the Contractor, the remaining foundation shall be removed to a point 1'-0" below finished grade and the surface restored to match the adjacent area. Cost for this work shall be included in the lump sum price bid for the project.
- 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.
- All new signal heads shall be securely wrapped and/or bagged in burlap, prior to signal being placed in service.
- Traffic signal systems at Twin Rivers Road and Faulkner Ridge Circle shall remain in service until the proposed system at Lynx Lane and Cross Fox Lane are accepted by Howard County.

NOTES:
CONTRACTOR SHALL VERIFY LOCATION OF STREET LIGHTING ELECTRIC FEED LINE BEFORE EXCAVATION.
PROPOSED PAVEMENT MARKINGS BY OTHERS.

SIGNALS

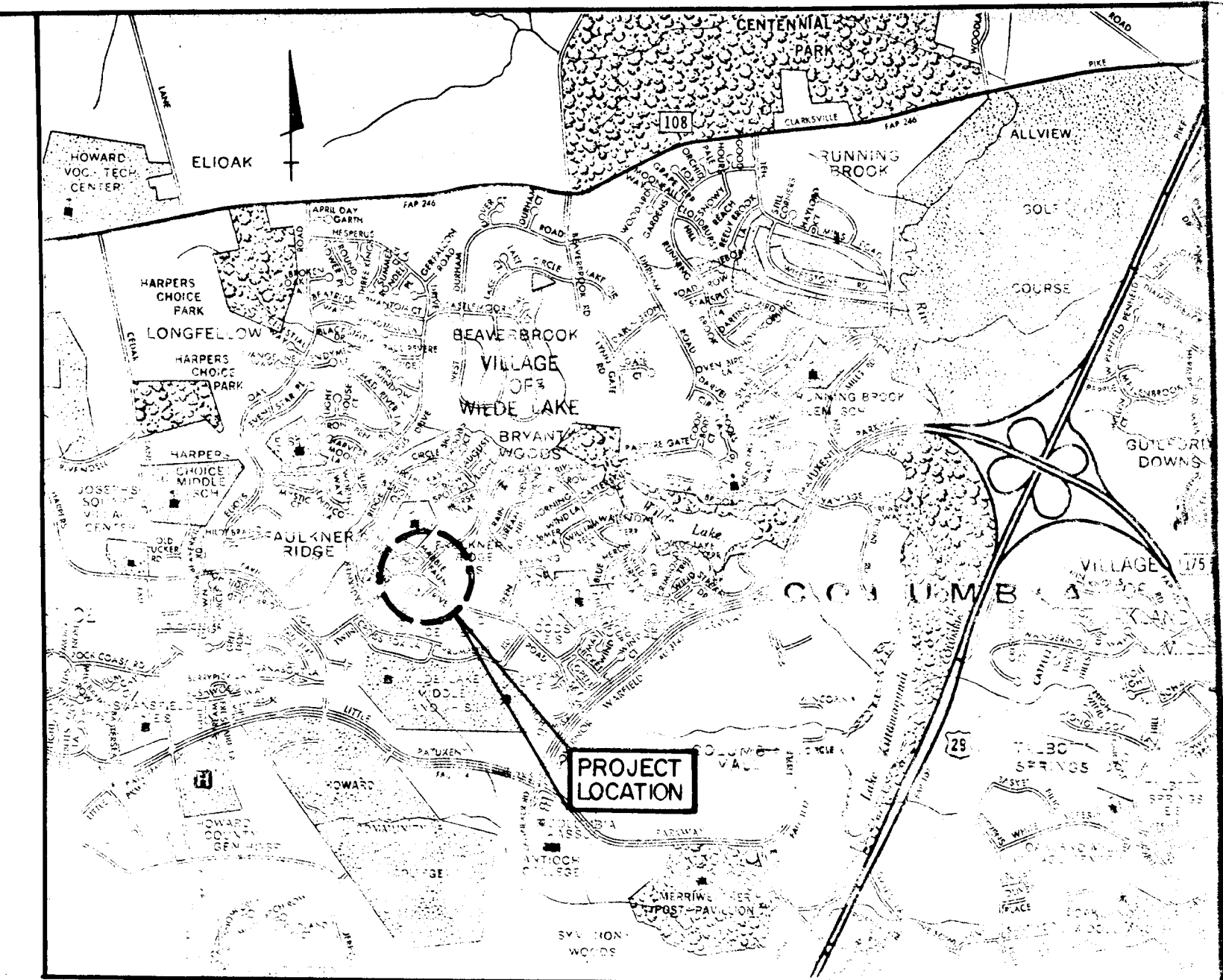


PHASING SEQUENCE

PHASE 1

PHASE 2

FLASHING OPERATION



VICINITY MAP
SCALE 1"=2000'

EQUIPMENT LIST

LOOPS AND DETECTORS

1. The following new loops shall be installed:

Number	Dimensions	Phase
1	6' x 30' (2 turns)	2

- All wiring shall be in accordance with manufacturer's recommendations for correct operation.
- The loop shall operate in presence mode.
- Delayed timer vehicle loop detector shall be Sarasota 235T/MS or approved equal.

SIGNAL HEADS

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

Signal Number	Dimensions
1, 2, 3, 4,	12" diameter red, amber and green
5, 6	12" diameter red, 8" diameter amber and green

2. All signals shall have bronze baked enamel finish and shall be furnished with tunnel visors. All signals shall be mounted on the mast arm with rigid adjustable brackets.

POLES

- One (1) 28' pole with two mast arms with mounting assembly for two (2) signal heads (12" indications) on each mast arm and one (1) Luminaire arm with mounting assembly for one (1) mercury vapor Luminaire.
- One (1) 23' pole with one mast arm with mounting assembly for two (2) signal heads (12" indications) and one (1) Luminaire arm with mounting assembly for one mercury vapor Luminaire.
- Finish shall be all-weather bronze paint designated Sea Shore Gloss Trim #27721, Durantic Bronze, Code 7557581 available from M.A. Bruder & Sons, Inc.
- Style and appearance of poles shall be equivalent to Union Metal Design No. 50700.

UNDERGROUND WIRING

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

CONTROLLER AND ACCESSORIES

- NEMA eight phase controller installed in Pole mounted cabinet with termination facilities for incorporation of Time Based Coordination.
 - Each phase shall be callable by vehicular detectors or pedestrian push buttons; each phase shall also be callable by phase recall or extendable by recall extension.
 - Each phase shall include the following function: Minimum Green, Passage Time, Yellow, All Red Clearance, Pedestrian Timing, Recall and Memory.
- Conflict Monitor and solid state load switches.
- Solid State flasher switch accessible through police door panel.
- Manual operating control and manual switch accessible through police door panel.
- Pole mounted traffic controller cabinet large enough to accommodate the above control equipment, detectors, and any future coordination equipment. The cabinet shall be furnished with a thermostatically controlled cabinet vent fan.
- Finish of the cabinet shall be all-weather bronze paint (See Pole Finish).
- Electric service shall be installed by the Contractor in a manner satisfactory to the Baltimore Gas and Electric Company.

CONSTRUCTION DETAILS

- Install 28' signal pole, 30' mast arm and signals as shown and 12' Luminaire arm and 250 W mercury vapor Luminaire. (Note: Two 2" 90° Elbows). Luminaire shall be erected to a height equal to adjacent luminaires.
- Install 28' signal pole, 24' mast arm, 46' mast arm and signals as shown and 12' Luminaire arm with 250 W mercury vapor Luminaire. (Note: Two 2" 90° Elbows). Luminaire shall be erected to a height equal to adjacent luminaires.
- Install pole mounted cabinet and controller with all necessary equipment Normal to Roadway. Mount Electric Meter on Cabinet with vandal proof meter box.
- Install Handbox.
- Install 1" galvanized electrical conduit sleeve for detector wire.
- Install 2" galvanized electrical conduit.
- Install 2" polyvinyl chloride electrical conduit.
- Install loop detector wire and connect to handbox.
- Remove and salvage street light pole and Luminaire. Deliver to Scaggsville Facility, Public Works Annex, 11226 Route 216, Laurel, MD 20707.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

KILDE CONSULTANTS, INC.
ENGINEERS • ARCHITECTS • PLANNERS
BALTIMORE, MARYLAND

TRAFFIC SIGNAL PLAN

TWIN RIVERS ROAD AND LYNX LANE
CAPITAL PROJECT NO. T-7003
ELECTION DISTRICT NO. 5
HOWARD COUNTY MARYLAND

DRAWING
NO. 2
OF 2

SCALE:
1" = 30'
DATE:
1-25-84
J.W.E. DESIGNED BY
V.V. DRAFTED BY
J.W.E. CHECKED