

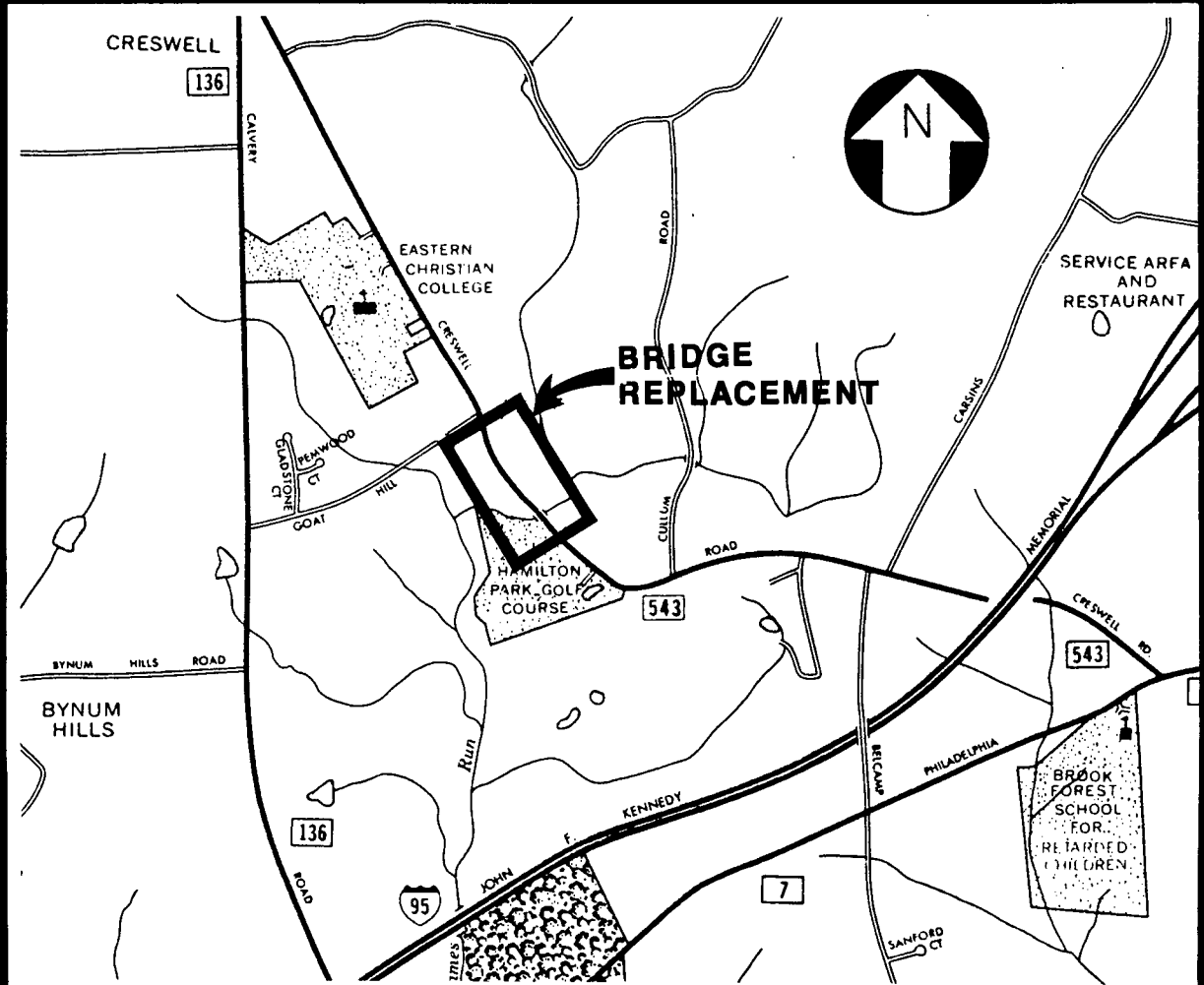
# SECTION 4 (f)

## STATEMENT

CONTRACT NO. H 836-501-471  
FAP NO. BR-505-1(222)

Md. Route 543

Replacement of Bridge No. 12051 over  
James Run and Roadway Improvements



prepared by  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

and  
MARYLAND DEPARTMENT OF TRANSPORTATION  
STATE HIGHWAY ADMINISTRATION

REPORT NUMBER: FHWA-MD-85-01-F

FEDERAL HIGHWAY ADMINISTRATION

REGION III

MARYLAND ROUTE 543

REPLACEMENT OF BRIDGE NO. 12051 OVER

JAMES RUN AND ROADWAY IMPROVEMENTS

HARFORD COUNTY, MARYLAND

ADMINISTRATIVE ACTION

4(f) STATEMENT

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

STATE OF MARYLAND

DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

SUBMITTED PURSUANT TO: 49 U.S.C. 303 (C) and 16 U.S.C. 470

HAL KASSOFF  
ADMINISTRATOR

6/13/85  
DATE

Neil J. Pedersen  
Neil J. Pedersen, Director  
Office of Planning and  
Preliminary Engineering

7/18/85  
DATE

Paul H. Kengel  
for Federal Highway Administration  
Division Administrator

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Section 4(f) Statement  
Maryland Route 543 Replacement of  
Bridge No. 12051 over James Run  
Harford County

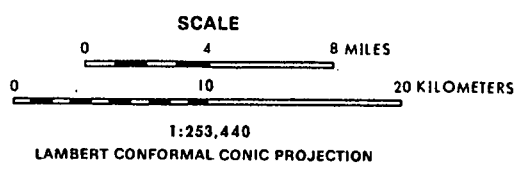
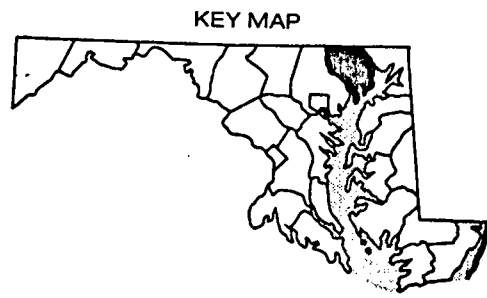
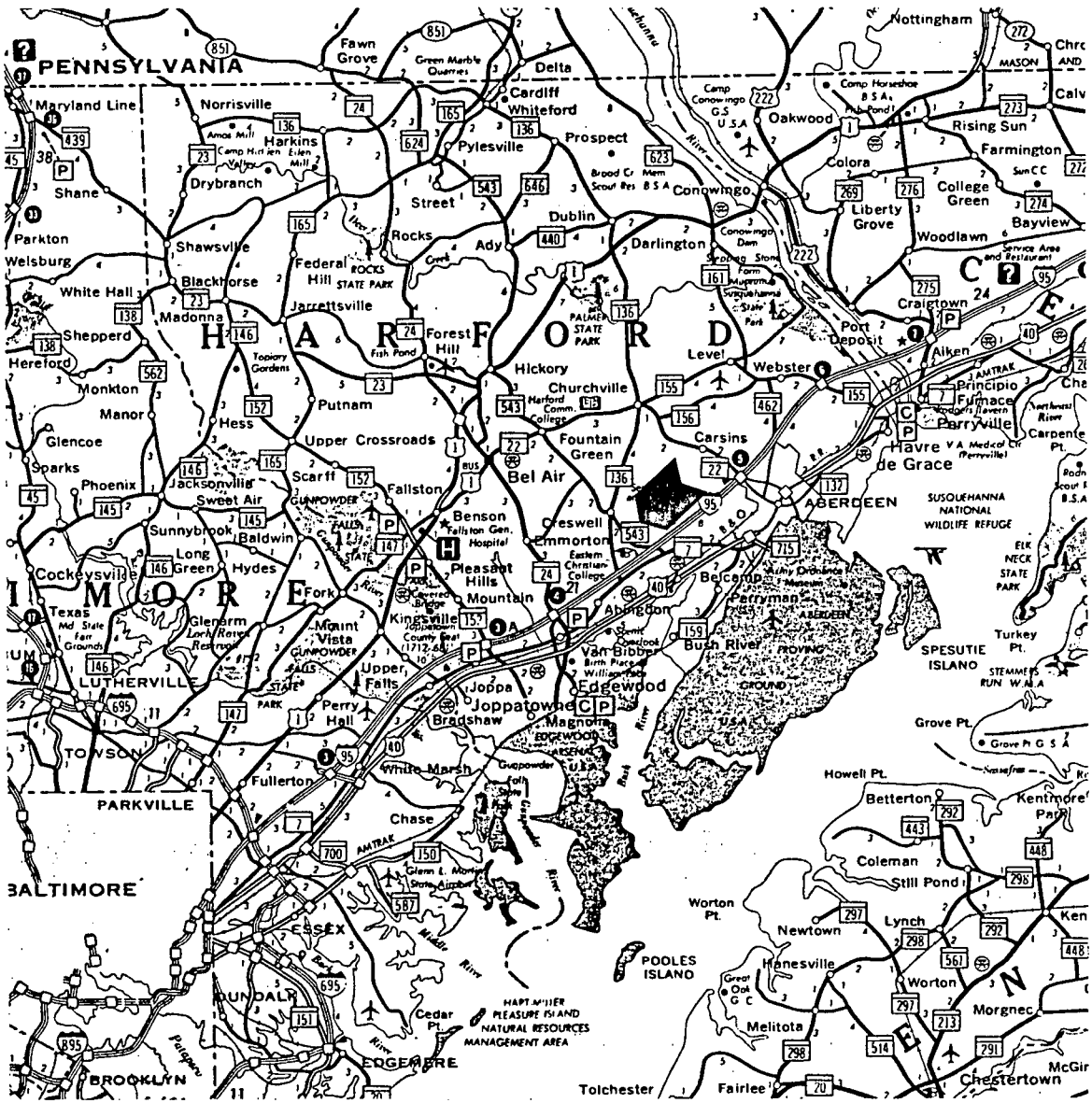
INTRODUCTION

Section 4(f) of the Department of Transportation Act, as amended by Section 18 of the Federal Aid Highway Act of 1968, states that utilizing land from a significant publicly-owned park, recreation area, wildlife refuge, or any significant historic site for a federally funded transportation project is permissible only if there is no feasible and prudent alternative and if all possible planning to minimize harm is included as part of the project.

1. Proposed Action

Maryland Route 543 is a two-lane secondary highway that connects Maryland Route 7 with Bel Air in Harford County, Maryland. The proposed project would replace the Maryland Route 543 bridge #12051 over James Run (See Figure 1) and improve the deficient horizontal curves of the approach roadway. The project begins at Goat Hill Road north of the bridge and ends approximately 700 feet south of James Run (Figure 2).

There are two other separate projects in the immediate vicinity of this project. One is a special project consisting of safety improvements and resurfacing of Maryland Route 543 from Goat Hill Road north to Maryland Route 136 scheduled for construction in late 1985 (See figure 2). The other is the relocation of Maryland Route 543 from south of James Run to a new interchange with Interstate 95 (See figure 2). The Finding of No Significant Impact, FHWA-MD-EA-82-02-F, for the relocation of Maryland Route 543 was approved on February 3, 1984. This project is scheduled for construction in



HARFORD COUNTY

Location Map

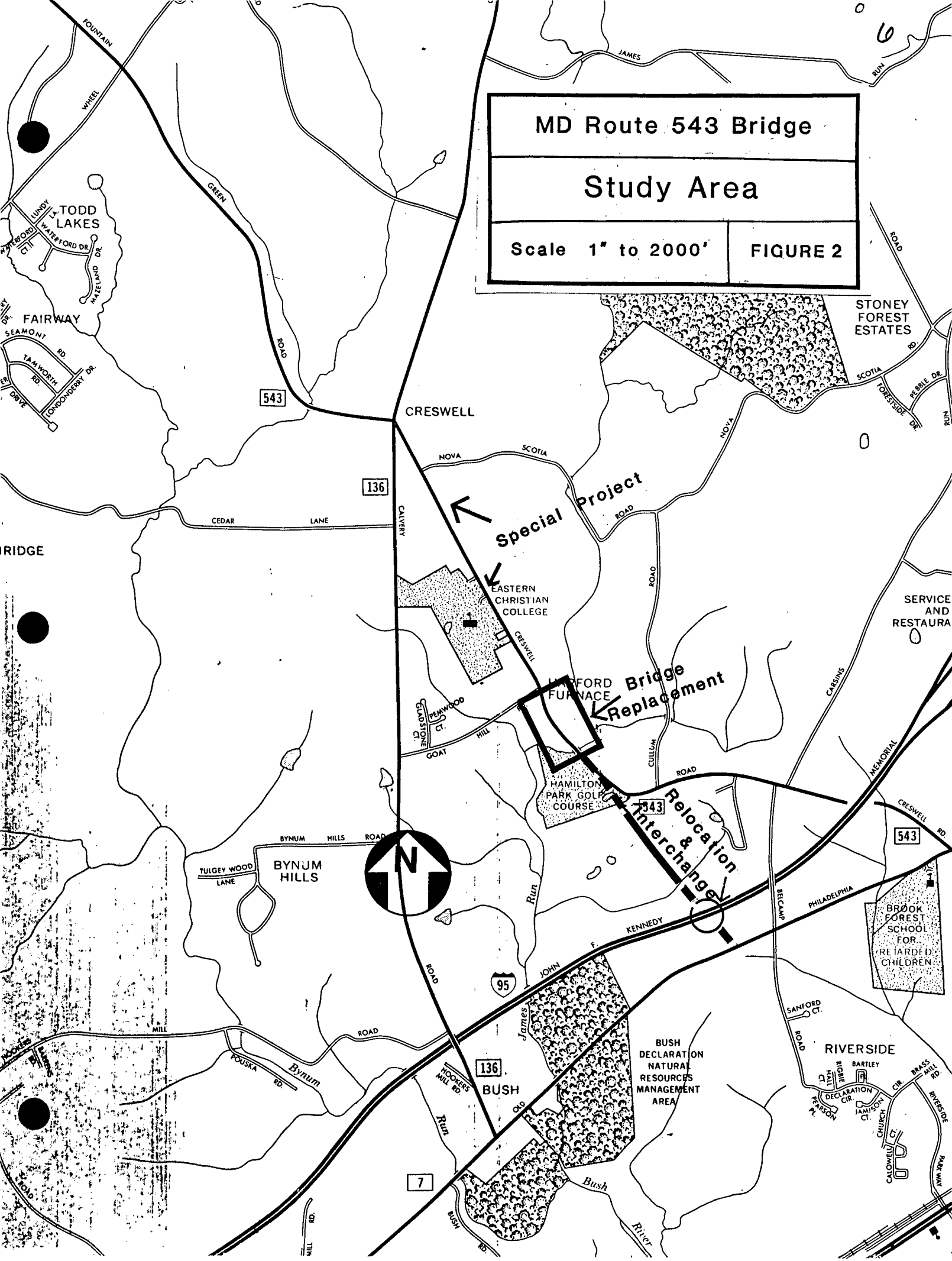
FIGURE 1

# MD Route 543 Bridge

## Study Area

Scale 1" to 2000'

FIGURE 2



1989. The project discussed in this document, replacement of the Maryland Route 543 bridge over James Run and approaches, is scheduled for construction in August of 1985.

The existing bridge, constructed before 1900, has structural deficiencies and inadequate roadway width. It consists of two spans with a total length of 40 feet  $\pm$  and a curb to curb width of 22 feet  $\pm$  with 11' wide lanes and no shoulders. The existing bridge is assumed to be designed for an H-20 loading or 40,000 pounds. Because the concrete abutments and steel frame pier are in a state of major deterioration, a load increase is not considered feasible.

The condition of the bridge deck was evaluated in 1977 and it was found to be in an advanced state of deterioration. A complete removal and replacement of the bridge deck was recommended. The substructure concrete exhibits cracks, the reinforcing is exposed, the stone wingwalls are deteriorating and the mortar is falling into James Run. The 1977 evaluation concluded that the deteriorated condition of the bridge warranted full removal and replacement. However, funds were not available at that time to complete the work. Funds are now available.

The estimated remaining life of the bridge is 9 years and the sufficiency rating is 19.16%. The sufficiency rating is a criteria used to determine whether or not a bridge should be replaced. Any structure with a rating of less than 50% is eligible for replacement. Between 1981 and 1984 repairs to the deck were completed. These repairs were associated with the age of the structure and are considered temporary and do not remove the need for a new bridge.

Existing Maryland Route 543 is designed and posted for 40 mph, except in the vicinity of James Run. The existing approach roadway

criteria on either side of James Run does not meet American Association of State Highway Transportation Officials (AASHTO) standards for 40 mph and is posted for 30 mph. This factor in addition to the roadway's narrow shoulders (2'-4'), the location of trees and shrubbery relatively close to the road and a pavement width of 18'-21' within a right-of-way width of 40' contribute to unsafe conditions for motorists and inadequate capacity for the projected traffic increases as shown below:

<u>Traffic</u>	<u>1983</u>	<u>2005</u>
Average Daily Traffic	2,500	13,000
Percent Trucks - ADT	6%	6%
Directional Distribution	75%	65%

The small shoulder area provides no safe refuge for disabled vehicles and no area for drivers to regain control of vehicles. In addition, the closeness of the trees to the travel roadway presents a hazardous condition.

The projected traffic increases will result from the construction of Maryland Route 543/I-95 interchange to be located south of this project area. As part of this interchange, Maryland Route 543 would be relocated from just south of the James Run Bridge across I-95 to an at-grade intersection with Maryland Route 7 (See Figure 2). Diamond type interchange ramps would be constructed on the north and south sides of I-95. This section of Maryland Route 543 is being designed for 50 mph. Maryland Routes 7 and 543 would be dualized in the vicinity of the interchange. Interchange construction is slated to begin in 1989. Even if this interchange is not constructed, the bridge must be replaced due to its structural deficiencies.

Replacing the bridge and providing a 50 mph design speed for both horizontal and vertical alignments would result in a level of



service C. The bridge project would make this section of Maryland Route 543 consistent with the special project to the north and the proposed interchange and relocation to the south. This project was determined to be a categorical exclusion on October 31, 1984.

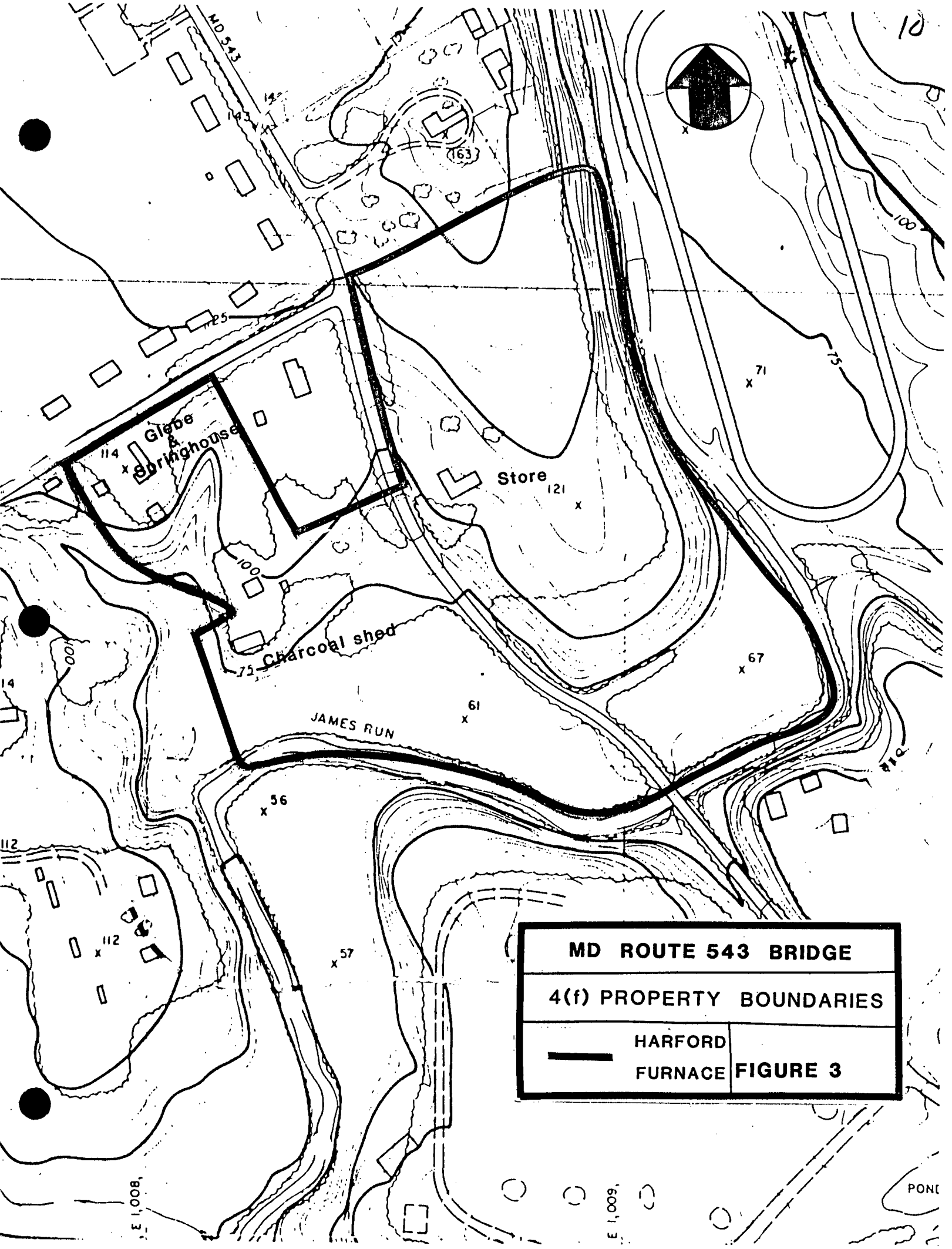
2. Description of 4(f) Property

This selected alternate requires the acquisition of property from the Harford Furnace complex, a National Register eligible historic site located south of the Goat Hill Road/Maryland Route 543 (Creswell Road) intersection. The site boundaries are shown on figure 3.

In its heyday, the Harford Furnace comprised 5873 acres. It included a charcoal iron furnace, a four-building chemical works, a "flouring mill", a "steam sawmill", at least 45 dwelling houses, wheelwright, blacksmith, coppersmith, copper and harness shops, a store, a warehouse and offices.

Only fragments remain of the community built around what was known as the Harford Furnace (1830-1867) and later the Harford Furnace and Chemical Works (1867-1876). Property associated with two remaining standing structures (charcoal shed and the store) of the Harford furnace would be required. The charcoal shed (now part of 17.7 acres parcel owned by Mr. and Mrs. David J. Smith) is located on the west side of Maryland Route 543 south of the Creswell Road/Goat Hill Road intersection. The store (now part of 8.5 acres parcel owned by Mr. and Mrs. John W. Gayley) is located on the east side of Maryland Route 543. Both the charcoal shed and the store have been remodeled and are used as residences.

The Glebe and its associated springhouse, also a part of the



10



114  
Glebe  
&  
Springhouse

Store  
121

75  
Charcoal shed

JAMES RUN

**MD ROUTE 543 BRIDGE**

**4(f) PROPERTY BOUNDARIES**

 HARFORD  
FURNACE

**FIGURE 3**

E 1,008

E 1,008

POND

11

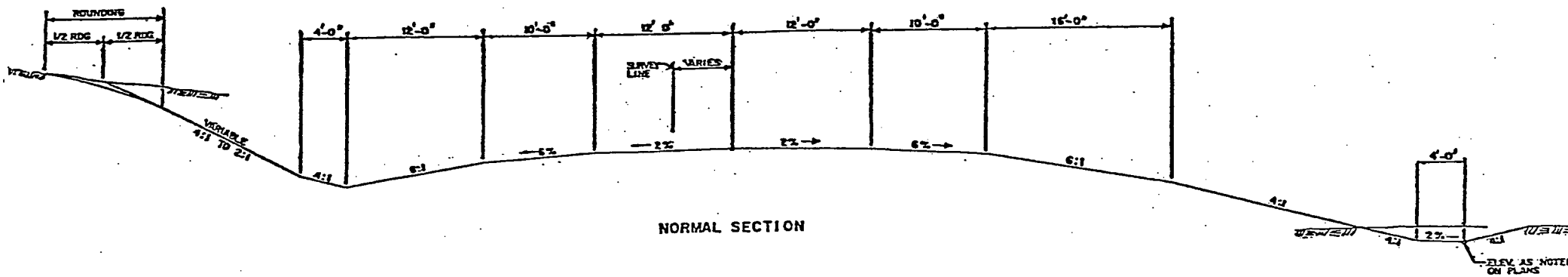
Furnace, probably housed workers and is located on the south side of Goat Hill Road, just west of Maryland Route 543 (See Figure 3). It is the oldest extant building associated with the Furnace and would not be affected by the proposed project. All of these properties are privately owned and are included within the National Register Eligible boundaries for the Harford Furnace. There is no public use of either of the properties.

The State Historic Preservation Officer has determined that the bridge itself does not meet the criteria for inclusion in the National Register of Historic Places.

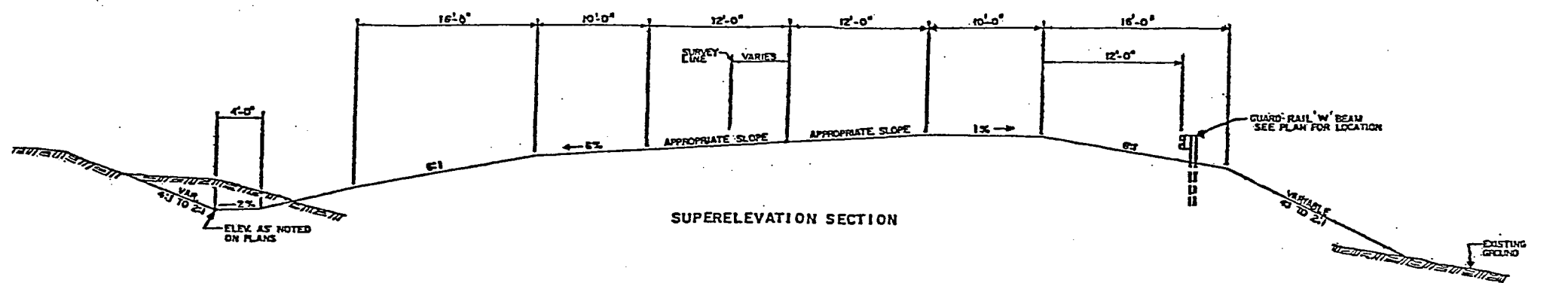
### 3. Description of Selected Alternate

The Selected Alternate consists of replacing the existing Maryland Route 543 bridge with a triple 15 foot - 10 inch x 9 foot - 10 inch structural pipe arch carrying James Run under Maryland Route 543 and improving the approach roadway horizontal geometry for a design speed of 50 mph. The project total length would be approximately 2300 feet. The new structure would be located adjacent to and approximately 50 feet downstream from the existing structure and would accommodate an HS-20 or 72,000 pounds loading. The pipe would be countersunk approximately 18" below the streambed to allow for the development of a natural stream bottom. The typical section consists of two 12 foot lanes with 10 foot shoulders and safety grading on each side (See figure 4). The existing bridge would be required to maintain traffic during construction of the new structure, but would be removed upon completion of the project.

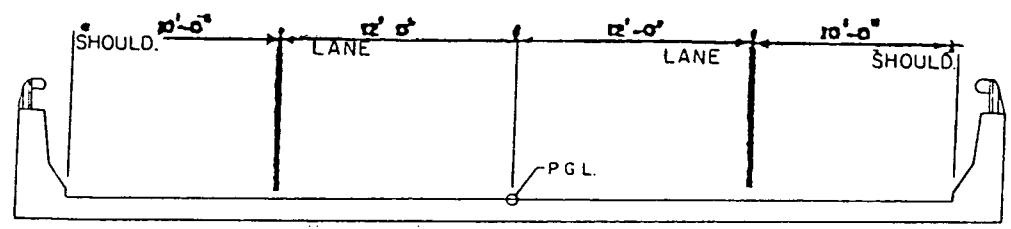
Construction of the approach roadway improvements would require an approximate 40 foot strip of right-of-way and approximately one acre of revertible easement from the Harford Furnace on the east



NORMAL SECTION



SUPERELEVATION SECTION



BRIDGE SECTION

MD Route 543 Bridge	
Typical Sections	
NOT TO SCALE	FIGURE 4

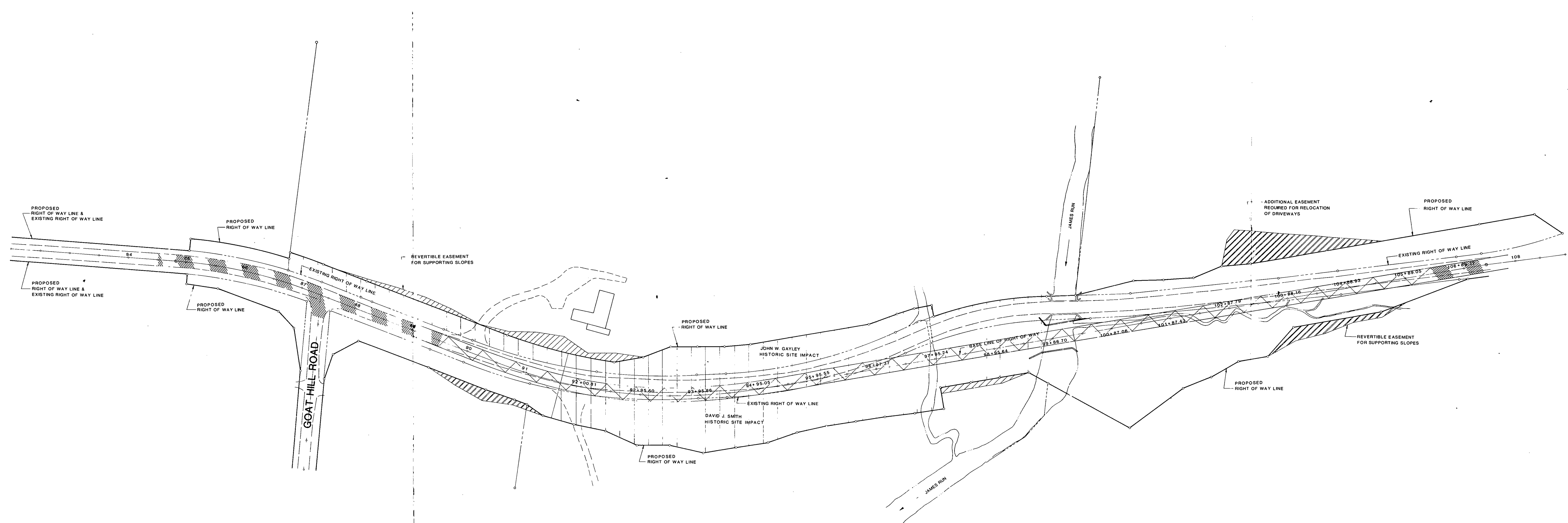
side of Maryland Route 543 (See Figure 5). The proposed roadway travel lanes would be located approximately 80' from the Gayley residence. The existing road is located approximately 70' from the house. The top of the cut will be approximately 35 feet from the house and the removal of a stone retaining wall between the dwelling and roadway along with 10-40 feet of shrubbery and trees in front of the house would be required. Approximately 30 feet of the driveway to this property would also be required. The use of the property for residential purposes would not be affected.






An additional strip of right-of-way approximately 65 feet in width or 1.8 acres would be required from the Harford Furnace property on the west side of Maryland Route 543. The Smith house, located approximately 280 feet from the road is buffered by a dense grove of pine trees. There would be no effect to the present use of the property. The proposed improvements would not be seen from the house.

In accordance with the Section 106 procedures the State Historic Preservation Officer has determined the project will have a no adverse effect on the historic Harford Furnace complex. See the letter in the Correspondence Section dated June 3, 1985.

A Phase I archeological survey has been performed and coordinated with the Maryland Geological Survey (MGS) and the Maryland Historical Trust (MHT). Some archeological potential regarding the Harford Furnace was indicated in the area north of the bridge and on the east and west sides of Maryland Route 543. For example a head race was noted on the east side of Maryland Route 543.

A Phase II reconnaissance has been completed. The site has been



<b>MARYLAND ROUTE 543 BRIDGE REPLACEMENT</b>			
<b>4(f) INVOLVEMENT</b>			
	HISTORIC SITE IMPACTS		REVERTIBLE EASEMENT
	EXISTING MD 543		RECONSTRUCTION OF EXISTING MD 543
	PROPOSED MD 543		
SCALE 1" = 100'		FIGURE 5	

determined significant for the artifacts found. The Maryland Geological Survey and Maryland Historical Trust have determined that Phase III archeological work (artifact recovery) is appropriate mitigation. Phase III work will be completed before construction activities begin in the area of the archeological remains.

The State Historic Preservation Officer has determined that the project will have a no adverse effect on the archeological resources associated with the Harford Furnace. See the letter in the Correspondence Section dated June 3, 1985.

4. Avoidance Alternates and their Impacts

The No-Build Alternate is the only means of avoiding use of property from this historic site. The No-Build Alternate consists of no major improvements to the existing bridge or the approach roadway. The bridge substructure would continue to deteriorate and to experience deck punctures resulting in unsafe conditions for motorists and eventually closing the bridge which has a life expectancy of 9 years.

If the bridge was closed, the 13,000 vehicles projected to use the bridge and roadway in the design year would have to use an approximate 9 mile detour through residential areas in order to access I-95. This would create an unsafe situation by putting high volumes of through traffic on local access residential streets. These streets are currently used by motorists, children and pedestrians not accustomed to high volume traffic. The detour would also introduce unnecessary noise impacts, visual impacts and essentially unsafe traffic operations in residential areas. The detour could also jeopardize the ability of the fire and police departments to provide effective service to Maryland Route 543 residents since response times would be increased. Thus, the No-Build Alternate is

not considered prudent or feasible.

It is necessary to correct the horizontal geometric deficiencies of the approach roads with the replacement of the bridge. The approach to the west contains a horizontal curve which does not meet the American Association of State Highway Transportation Officials (AASHTO) criteria for a 50 mph design speed. The existing curve results in poor sight distance for vehicles entering the curve from both directions. This is particularly unsafe because of the number of large dump trucks that utilize the road. These trucks drift over to the middle of the road into the opposing lane when negotiating the curve which increases the chance of head-on and sideswipe type of accidents. The road curvature will become even more critical and dangerous when the roadway improvements to the north and south are complete. If the approach roadways were not improved this section would be the only portion of Maryland Route 543 between Maryland Route 136 and I-95 that was not designed to the 50 mph criteria. Motorists not completely familiar with the road would not expect or be prepared for the change in the design criteria of the road.

Improvements are also required to make the roadway and shoulder width consistent with current safety criteria and the other planned improvements. The existing roadway is only 18' to 22' wide with narrow shoulders ranging from 2' to 4'. In order to satisfy current safety criteria the roadway will be widened to 24' with 10' shoulders. The existing shoulders provide little area for disabled vehicles or room for drivers to regain control of errant vehicles. Consideration was given to reducing the shoulder width through the historic area. However, because of the large dump trucks using the



road it was decided that the 10' shoulders were necessary to provide sufficient room for the trucks for use in emergencies. The 10' shoulders will also allow cars to pull well off the roadway, reducing the potential for accidents. The additional area will also allow pedestrians and bicyclists to use the shoulder area and remain a safer distance from the travel way.

In addition there are large trees located immediately adjacent to the narrow shoulder which present obvious safety conditions. It is imperative that the approach roads be relocated and improved to correct these deficiencies and to provide a safe facility for the motorist.

As can be seen from figure 3, the study area is bordered on both sides by property associated with the historic site. Therefore, whether the bridge is replaced in the same location or on new alignment, the necessary roadway improvements would require property from the Harford Furnace. Shifting the roadway immediately to the east or west requires additional property from the Harford Furnace historic site, and could impact the associated historic structures.

Avoidance alternates were also looked at that moved the entire alignment to the east or west of the existing roadway to completely avoid the historic site (See Figure 6). In the immediate area of the historic site, it would be necessary to move the alignment approximately 1000 feet east or west to stay out of the historic property. In order to achieve acceptable design criteria both the east and west alignment would be approximately 8000 feet in length. The selected alternate is about 2300 feet long. The construction cost of the 8000 feet would be approximately \$2.5 million. This cost does not include right-of-way or any improvements that may be affected. The total cost of the selected alternate is approximately

\$500,000.

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A western shift would require right-of-way from the Eastern Christian College as well as a golf course. The alignment would require two new crossings of James Run and any associated wetlands. It would also require the acquisition of several improvements. The shift would also traverse through land used for agricultural purposes.

A eastern shift to avoid the historic site would also require two new crossings of James Run. It would traverse through a horse farm and require the acquisition of an exercise and race track. As with the eastern shift it would require the acquisition of several improvements and land being used for agricultural purposes.

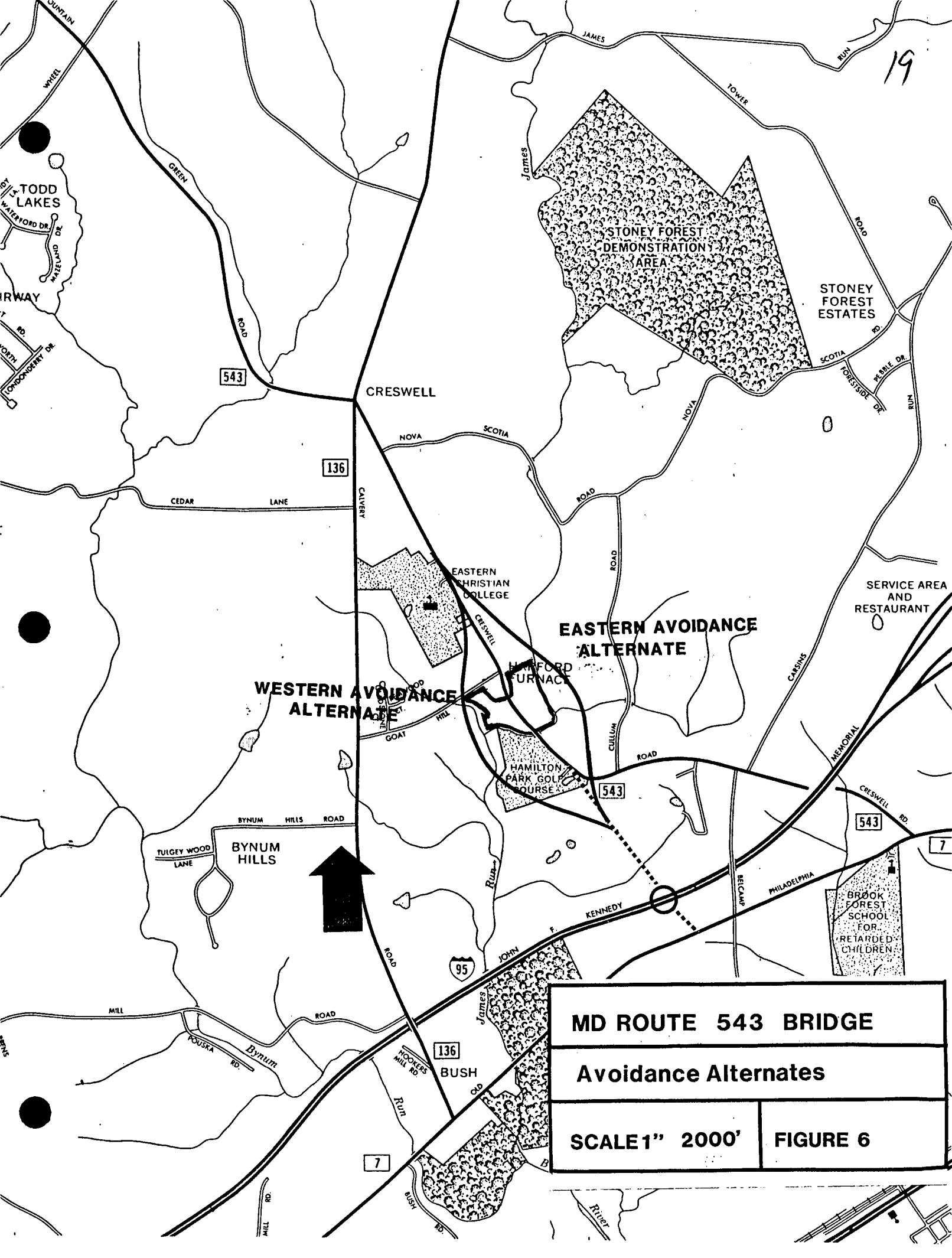
A significant relocation of Maryland Route 543 in this specific area would not be consistent with the County Transportation Plans or planned land use for the area.

Both an eastern and western shift have substantial added costs and additional impacts that can be avoided by using the existing transportation corridor. Thus neither alternate is considered prudent or feasible.

##### 5. Mitigation

The amount of right-of-way required through the historic site has been minimized as much as possible. The fill slopes for the selected alternate were reduced from 4:1 to 3:1 resulting in the reduction of right-of-way requirements of approximately twenty feet. As previously discussed, reduction of the shoulder width through the historic area was studied but was not considered feasible due to safety concerns.

The easement area will be graded to blend into the existing environment. Any landscape plans developed will be provided to the State Historic Preservation Officer. All work will be completed to the satisfaction of the property owner.



<b>MD ROUTE 543 BRIDGE</b>	
<b>Avoidance Alternates</b>	
<b>SCALE 1" 2000'</b>	<b>FIGURE 6</b>

Access to the properties affected will be maintained at all times during construction. 20

During a field visit to the site on May 20, 1985 both the Maryland Historical Trust and the Maryland Geological Survey agreed that photographing the stone wall that will be removed was acceptable mitigation. Photographs of the wall and stairs will be taken to the satisfaction of the Maryland Historical Trust.

As was discussed previously a Phase II archeological survey has been completed. Both the Maryland Historical Trust and the Maryland Geological Survey concur that Phase III archeology, artifact recovery, is appropriate mitigation for the archeological site. See letter in Correspondence Section dated June 3, 1985. All artifacts recovered will be given to the Maryland Historical Trust or the Maryland Geological Survey. All archeological work completed has been and will be in accordance with appropriate State and Federal regulations.

#### 6. Coordination

Copies of the 4(f) Evaluation were provided to the U.S. Department of the Interior and the Maryland Historical Trust.

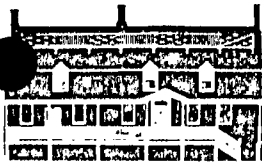
A field review was held with the Maryland Historical Trust and the Maryland Geological Survey to discuss the results of Phase II archeology and the methodology to be used for the Phase III archeology. Effect determinations have been received from the Maryland Historical Trust and are included in the Correspondence Section.

Coordination will be maintained with both agencies during Phase III archeological activities.

#### 7. Concluding Statement

Based upon the above considerations, it is determined that

there is no prudent or feasible alternative to the use of land from the Harford Furnace historic site and that the proposed action includes all possible planning to minimize harm to the site resulting from such use.



Maryland Historical Trust

June 3, 1985

Mr. Louis H. Ege, Jr., Acting Chief  
Bureau of Project Planning  
State Highway Administration  
P. O. Box 717  
707 North Calvert Street  
Baltimore, Maryland 21203-0717

RE: Contract No. H 836-201-480  
P. D. M. S. No. 123042  
Bridge No. 12051  
MD Route 543 over James Run  
Harford Furnace  
Harford County, Maryland

65 JF

Dear Mr. Ege:

Thank you for your letter of 23 May 1985 and for the Management Summary of the Phase II investigations of the Harford Furnace archeological site (18 HA 148).

We concur that the investigations identified significant archeological resources associated with the Harford Furnace Complex in Areas 1, 2, 3 and 4. Since area 4 is located outside and adjacent to the proposed project's right-of-way, no additional investigations are warranted for this area. However, it should be carefully avoided during all construction activities. Areas 1, 2 and 3 will be impacted by the project; therefore, archeological data recovery and recordation will be necessary to mitigate the project's effects. Area 5 does not contain significant resources and no further work is required for this area.

Based upon the results of the Phase II investigations, we are now able to make a determination of effect for this project. It is our opinion that the above-referenced project will have no adverse effect upon the Harford Furnace Complex district, including the archeological resources, provided that the following conditions are fulfilled:

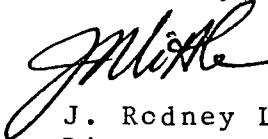
- 1) An archeological data recovery and recordation program will be developed in consultation with the State Historic Preservation Officer (SHPO), and will be implemented in Areas 1, 2 and 3 prior to project commencement in these areas. Following completion and SHPO review of the archeological program, the project may proceed in these areas. The archeological program will include the following components;

Mr. Louis H. Ege, Jr., Acting Chief  
Page Two  
June 3, 1985

- a) Data recovery of a sample of the archeological resources in Area 1, and additional historical research and analysis necessary for interpretation of those resources.
  - b) Archeological recording of the raceway in Area 2.
  - c) Measured archeological drawings and photographs of the retaining wall and stairs in Area 3.
- 2) If significant, unexpected, and currently unidentified archeological resources are identified during implementation of the data recovery plan, and it is determined that the project will adversely affect these resources, a plan to mitigate the adverse effects will be developed and implemented in consultation with the SHPO, prior to construction in the area.
- 3) The edge of the project right of way in the vicinity of Area 4 will be temporarily fenced and clearly flagged during construction. Area 4 will be avoided by all project related construction activities, machinery, and equipment.
- 4) A landscaping plan is developed and implemented to replace the existing vegetation that will be removed from in front of the Gayley property. The landscaping plan will be sent to the SHPO for review and, if the SHPO does not object, the project may proceed. If the SHPO objects to the plan, the matter will be referred to the FHWA and the Advisory Council.

Because this is a conditional determination of no adverse effect, you must request the comments of the federal Advisory Council.

Sincerely,



J. Rodney Little .  
Director  
State Historic  
Preservation Officer

JRL/BCB/KEK/hec

- cc: Ms. Rita Suffness  
Mr. Ron Anzalone  
Mr. Charles L. Robbins  
Mr. Charles Keenan

Note: All conditions cited by the MHT will be followed by the State Highway Administration.



# United States Department of the Interior

OFFICE OF THE SECRETARY  
WASHINGTON, D.C. 20240

MAY 20 1985

ER 85/524

Mr. Emil Elinsky  
Division Administrator  
Federal Highway Administration  
711 West 40th Street  
Suite 220, The Rotunda  
Baltimore, Maryland 21211

Dear Mr. Elinsky:

This is in response to the request for the Department of the Interior's comments on the draft Section 4(f) statement for SR-543 Bridge over James Run, Harford County, Maryland.

SECTION 4(f) STATEMENT COMMENTS

We concur that there is no feasible and prudent alternative to the use of land from the Historic Harford Furnace for the purpose of this project. We also concur with the proposed measures to minimize harm.

All work undertaken within the Harford Furnace boundary should be in accord with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 Fed. Reg. 44716, September 29, 1983), and the final statement should include documentation of the State Historic Preservation Officer's concurrence with the plans and the mitigation measures.

FISH AND WILDLIFE COORDINATION ACT COMMENTS

The U.S. Fish and Wildlife Service advises that its probable position on any U.S. Corps of Engineers permit application would be to:

1. Recommend replacement of the existing structure with one of the following structures (listed in order of preference)
  - a. a bridge spanning the entire waterway
  - b. a bottomless box culvert or pipe arch, if the stream substrate will accommodate one



2.

c. a box or pipe culvert countersunk at least 6" below the streambed to allow for development of a natural stream bottom and passage of aquatic organisms

2. Recommend avoidance of, or significant reduction of encroachment on, all wetlands associated with the bridge replacement and Route 543 relocation

3. Recommend replacement of all unavoidable wetland losses on a value basis

4. Recommend elimination of any proposed channel changes or significant channel clean-outs

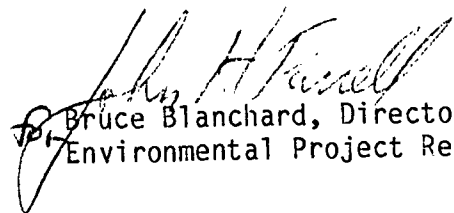
Further coordination with the Fish and Wildlife Service should be undertaken before applying for a Corps permit. Please contact the Field Supervisor, 1825-B Virginia Street, Annapolis, Maryland 21401 (301/269-5448 or FTS 922-2007).

SUMMARY COMMENTS

The Department of the Interior has no objection to Section 4(f) approval of this project, provided the above mentioned measures to minimize harm are documented in the final statement.

We appreciate the opportunity to provide these comments.

Sincerely,

  
Bruce Blanchard, Director  
Environmental Project Review

✓ cc:  
Mr. Louis H. Ege, Jr.  
Acting Chief  
Bureau of Project Planning  
State Highway Administration  
707 North Calvert Street  
Baltimore, Maryland 21202

J. Rodney Little  
Maryland Historical Trust  
John Shaw House  
21 State Circle  
Annapolis, Maryland 21401

Response to DOI letter - May 20, 1985

1. All archeological work undertaken will be in accordance with the appropriate State and Federal regulations. Close coordination has been and will continue to be maintained with the Maryland Historical Trust and the Maryland Geological Survey.

2. As discussed on page 5 a pipe culvert will be countersunk 18" below the streambed to allow for the development of a natural bottom.

3. There will be no wetlands impacted as a result of this project.

4. No channel changes are required. No significant clean channel cuts are required.