

FEASIBILITY STUDY

Burlington
New Route From Greensboro Highway (US 70)
to Ossipee Road (NC 87)
Alamance County

U-3110

Prepared by
Program Development Branch
Division of Highways
N. C. Department of Transportation

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Date

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I. GENERAL DESCRIPTION

This feasibility study describes a proposed roadway connecting Greensboro Highway (US 70) with Ossipee Road (NC 87) and includes construction on new location, widening of Cook Road (SR 1311) and Shallowford Church Road (SR 1501), and construction of a grade separation south of Burlington Street (NC 100). The location of the recommended improvements is shown on Figure 1.

The recommended cross section is a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter section for all of the 4.2 mile (6.7 km) project length except for a 0.4 mile (0.3 km) section in the area of Burlington Street around the proposed grade separation. This 0.4 mile (0.3 km) section will be constructed as a 4-lane, 52-foot (15.8-m) wide (face-to-face), curb-and-gutter section. The required right-of-way width is 100 feet (30.5 m) for the 5-lane section and 200 feet (61.0 m) for the grade separation. The estimated cost for these improvements is \$15,000,000 including right-of-way and construction. The cross sections are shown on Figures 2 and 3.

For the segment of the project from Greensboro Highway to Burlington Street, two alternatives were studied in addition to the recommended improvements. Alternative 2 was developed by the Statewide Planning Branch of NCDOT and Alternative 3 was developed by a private engineering firm for the City of Burlington. Both alternatives utilize identical alignments; however, they propose cross sections that differ from current NCDOT standard practice with regard to total required right-of-way width, median width, berm width, and bicycle accommodation. Alternative 1 is in keeping with NCDOT standards, and is therefore recommended unless the non-standard elements can be justified. The cross sections for Alternatives 2 and 3 are discussed further in Section IV below.

Any of the three alternatives will likely require the relocation of 13 residences and no businesses. The total estimated cost for each alternative is:

Alternative 1	\$ 15,000,000
Alternative 2	\$ 15,200,000
Alternative 3	\$ 15,200,000

The estimated construction cost of bikeways and sidewalks, as requested in Alternatives 2 and 3 is \$ 600,000. The estimated cost for additional right-of-way to accommodate a separate bicycle path is \$ 200,000 for Alternatives 2 and 3. The bike facilities are proposed to be constructed within the right-of-way.

This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of this study is to describe the alternative treatments including costs, and identify potential problem areas that deserve consideration in the planning and design phases.

II. NEED FOR PROJECT

The purpose of this project is to accommodate north/south traffic between Greensboro Highway and Ossipee Road and provide improved access to the newly constructed Alamance Hospital and health facilities south of I-85.

The Alamance County Urban Area Thoroughfare Plan includes the project as a major thoroughfare. That section of the project from Greensboro Highway to Burlington Street is included in the Statewide Functional Classification System as a minor arterial, however; the remaining portion of the project is not presently classified.

The studied corridor can generally be characterized as undeveloped wooded and farmland properties from Greensboro Highway to Westbrook Avenue (SR 1309) and from Burlington Street to Shallowford Church Road. The area around the intersection of this project with Burlington Street is commercially developed. The segments of the project along Cook Road and Shallowford Church Road are generally developed as light density residential.

The existing section of Cook Road which is proposed for widening as part of this project is generally a 2-lane, 2-way, 20-foot (6.1-m) wide, shoulder section with 6-foot (1.8-m) wide soil shoulders. It has a 35 mph (56 kph) speed limit and does not include any passing zones.

The existing section of Shallowford Church Road which is proposed for widening as part of this project is generally a 2-lane, 2-way shoulder section with soil shoulders. The roadway width varies from 20 to 24 feet (6.1 to 7.3 m) with a shoulder width of 4 to 6 feet (1.2 to 1.8 m). It has a speed limit which varies from 35 to 55 mph (56 to 89 kph) and passing zones are limited.

The Average Daily Traffic (ADT) for the proposed road is estimated to be approximately 11,000 vehicles per day (vpd) in the year 2000 and 14,900 vpd in the design year (2015).

The Level Of Service (LOS) on the new road is estimated to be Level A when construction is completed and Level B for the design year (2015).

III. RECOMMENDATIONS

It is recommended to construct a roadway connecting Greensboro Highway (US 70) with Ossipee Road (NC 87). The recommendations include construction on new location, widening of Cook Road (SR 1311) and Shallowford Church Road (SR 1501), and construction of a grade separation south of Burlington Street (NC 100). The location of the recommended improvements is shown on Figure 1.

A segment of roadway will be constructed on new location from Greensboro Highway to Westbrook Avenue. This segment is proposed to be a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter section with 8-foot (2.4-m) wide berms and will require a 100-foot (30.5-m) wide right-of-way. The cross section is shown in Figure 2.

From Westbrook Avenue to approximately 0.2 miles (0.3 km) west of Burlington Street, existing Cook Road will be widened on the east side to a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter section with 8-foot (2.4-m) wide berms. The required right-of-way width is 100 feet (30.5 m). The cross section is shown in Figure 2.

From approximately 0.2 miles (0.3 km) south of Burlington Street to approximately 0.2 miles (0.3 km) north of Burlington Street, the proposed cross section is a 4-lane, 52-foot (15.8-m) wide (face-to-face) curb-and-gutter section on a 200-foot (61.0-m) wide right-of-way. Two new 52-foot (15.8-m) wide bridges are recommended to grade separate the new roadway from both Burlington Street and the Southern Railroad. The grade of Burlington Street will be lowered in the area of the this studied grade separation and a bi-directional ramp will be provided in the northeast quadrant. This segment of the project will be fully access controlled. The cross section is shown in Figure 3.

From approximately 0.2 miles (0.3 km) north of Burlington Street to Shallowford Church Road, the 2-lane roadway to be constructed as part of Project U-2406 will be widened to a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter section with 8-foot (2.4-m) wide berms. No additional right-of-way will be required. This cross section is shown in Figure 2.

From Project U-2406 to NC 87, Shallowford Church Road will be widened to a 5-lane, 68-foot (20.7-m) wide (face-to-face), curb-and-gutter section with 8-foot (2.4-m) wide berms. The required right-of-way width is 100 feet (30.5 m). The cross section is shown in Figure 2.

At all intersections, except Burlington Street, all approaches of this project should include a through/right-turn

lane, a through lane, and a left-turn lane. At Burlington Street, the roadways will be grade separated and will include access ramps.

The intersections with Greensboro Highway and Westbrook Avenue should be signalized.

To accommodate bicycles along the entire project length, the outside travel lanes will be 14 feet (4.2 m) wide.

This project will likely require the relocation of 13 residences and no businesses. The estimated cost for the studied improvements, including right-of-way and construction, is \$15,000,000 as follows:

Right-of-Way.....	\$ 4,675,000
Construction.....	<u>\$10,325,000</u>
Total Cost	\$15,000,000

IV. DETAILS AND COST OF ALTERNATIVES 2 & 3

Alternative 2

From Greensboro Highway to Burlington Street, Alternative 2 includes a 4-lane, median-divided, curb-and-gutter section to be constructed on a 120-foot (36.6-m) wide right-of-way with no control of access. The north and south travel ways are proposed to be 27 feet (8.2 m) wide from face-to-face of curbs with a 30-foot (9.1-m) wide berm on the east side and a 10-foot (3.0-m) wide berm on the west side. The travel ways will be separated by an 18-foot (5.5-m) wide raised median. Each travel way will include two 12-foot (3.6-m) wide travel lanes, a 2-foot (0.6-m) wide outside gutter, and a 1-foot (0.3-m) wide inside gutter. A 2-way, 10-foot (3.0-m) wide bike path will be located approximately 18 feet (5.5 m) from the curb on the east side. For the typical section see Figure 4.

Alternative 3

From Greensboro Highway to Westbrook Avenue, Alternative 3 includes a 4-lane, median-divided, curb-and-gutter section to be constructed on a 120-foot (36.6-m) wide right-of-way with no control of access. The north and south travel ways are proposed to be 25 feet (7.6 m) wide from face-to-face of curbs with a 30-foot (9.1-m) wide berm on the east side and a 10-foot (3.0-m) wide berm on the west side. The travel ways will be separated by an 18-foot (5.5-m) wide raised median. Each travel way will include two 11-foot (3.3-m) wide travel lanes, a 2-foot (0.6-m) wide outside gutter, and a 1-foot (0.3-m) wide inside gutter. A 2-way, 10-foot (3.0-m) wide bike path will be located approximately 18 feet (5.5 m) from the curb on the east side. For the typical section see Figure 5.

From Westbrook Avenue to Burlington Street, Alternative 3 includes the same cross section as described above for Alternative 2. For the typical section see Figure 6.

Alternatives 2 and 3 include a realignment of Cook Road and construction of a railroad underpass just south of Burlington Street.

These cross sections were studied at the request of the City of Burlington to preserve the residential environment of the area.

It is estimated that either alternative would require the relocation of approximately 13 residences and no businesses.

At the Greensboro Road intersection, the Westbrook Avenue intersection, and the Burlington Street intersection, for each alternative, the approaches from this project should include a through/right-turn lane, a through lane, and a left-turn lane. These intersections should also be signalized.

The total cost for right-of-way and construction including requested bikeways and sidewalks is estimated to be \$15,200,000 each for both Alternatives 2 and 3 as follows:

Right-of-Way Cost	\$ 4,900,000
Construction Cost	<u>10,300,000</u>
Total	\$ 15,200,000

The estimated construction cost of bikeways and sidewalks as requested in both alternatives is \$600,000. The estimated cost for additional right-of-way to accommodate a separate bicycle path is \$200,000 for each alternative. These facilities would be constructed within the right-of-way as proposed in the alternatives.

Alternatives 2 and 3 propose cross sections that differ from current NCDOT standard practice, with regard to either total required right-of-way width, lane widths, median width, berm width, or bicycle accommodation. It is recommended that NCDOT standards be used when this project is implemented unless the non-standard elements can be justified. For each alternative the differences are noted below:

Alternative 2

- a. From Greensboro Highway to Westbrook Avenue, the proposed travel lane width is 11 feet (3.3 m). Twelve feet (3.6 m) is the standard lane width.
- b. The proposed bicycle accommodation is a 2-way bicycle path 10 feet (3.0 m) wide. Bicycle accommodation is typically effected with 14-foot (4.2-m) wide outside travel lanes in each direction. This would allow the proposed 120-foot (36.6-m) wide right-of-way to be reduced to 100 feet (30.5 m).

- c. The proposed width for raised medians is 18 feet (5.5 m). This width is typically 16 feet (4.9 m) from face-to-face of curbs.
- d. Berm widths of 9 feet (2.7 m) or more are proposed. The standard berm width is 8.0 feet (2.4 m).

Alternative 3

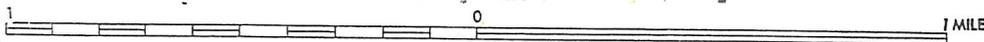
- a. The proposed bicycle accommodation, a 2-way, 10-foot (3.0-m) wide bicycle path, should be accomplished by 14-foot (4.2-m) wide outside travel lanes in each direction. This would allow the proposed 120-foot (36.6-m) wide right-of-way to be reduced to 100 feet (30.5 m).
- b. The proposed width for raised medians is 18 feet (5.5 m). This width is typically 16 feet (4.9 m) from face-to-face of curbs.
- c. Berm widths of 9 feet (2.7 m) or more are proposed. The standard berm width is 8 feet (2.4 m).

V. OTHER COMMENTS

Due to the proximity of Burlington Street and the Southern Railroad, grade separations are recommended. However, other options such as an underpass could be studied in the planning and environmental documentation phases.

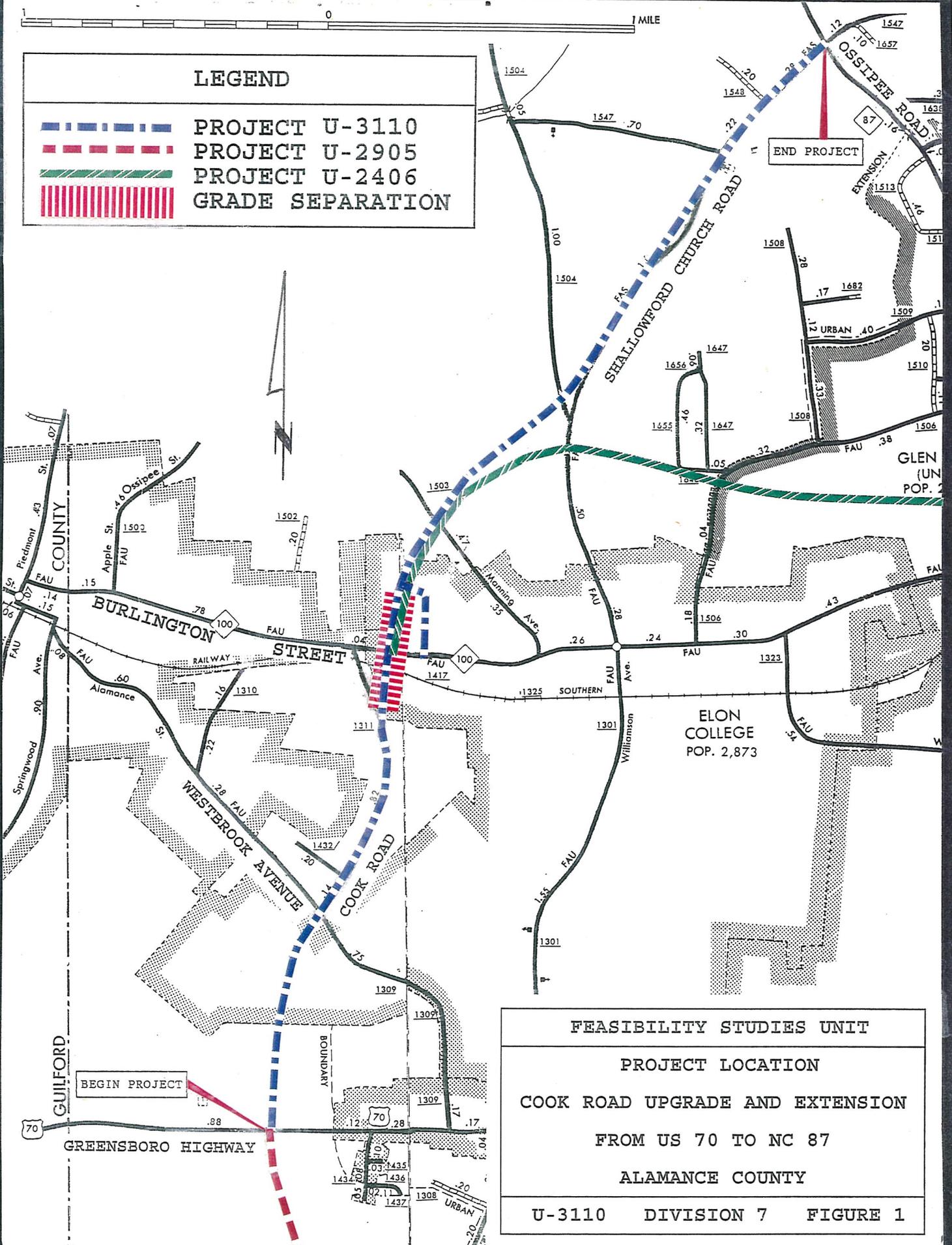
The NCDOT Bicycle Program has identified this roadway segment as one which has need for special accommodations for bicycles. The recommended cross section should adequately address this need.

An environmental screening was not conducted for this study.



LEGEND

-  PROJECT U-3110
-  PROJECT U-2905
-  PROJECT U-2406
-  GRADE SEPARATION



FEASIBILITY STUDIES UNIT

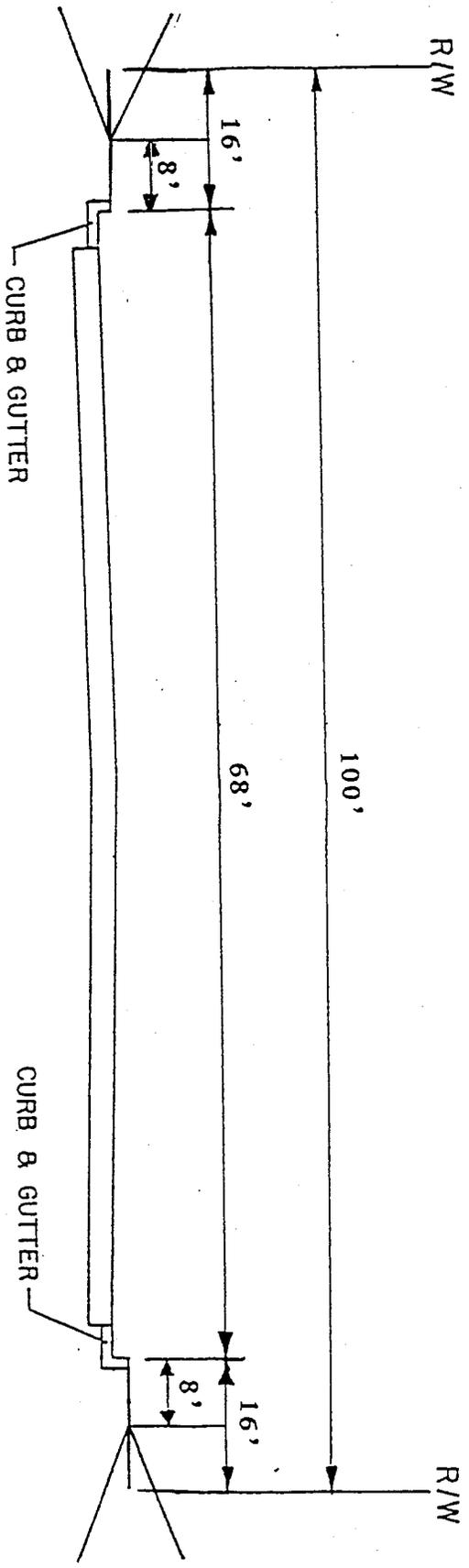
PROJECT LOCATION

COOK ROAD UPGRADE AND EXTENSION

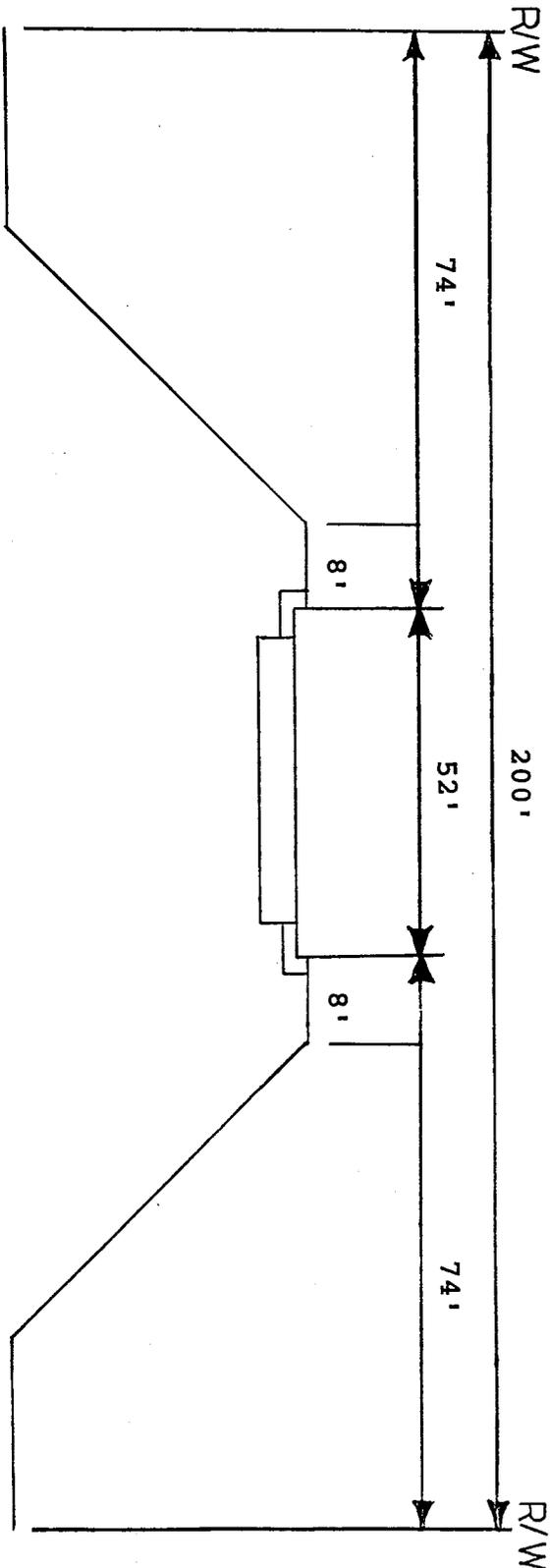
FROM US 70 TO NC 87

ALAMANCE COUNTY

U-3110 DIVISION 7 FIGURE 1



FEASIBILITY STUDIES UNIT
 TYPICAL SECTION
 ALTERNATIVE 1
 FROM US 70 (GREENSBORO HWY) TO
 NC 87 (OSSISPEE RD); NOT INCLUDING
 GRADE SEPARATION AT NC 100
 (BURLINGTON ST) AND SOUTHERN RR
 BURLINGTON ALAMANCE COUNTY
 U-3110 DIVISION 7 FIGURE 2



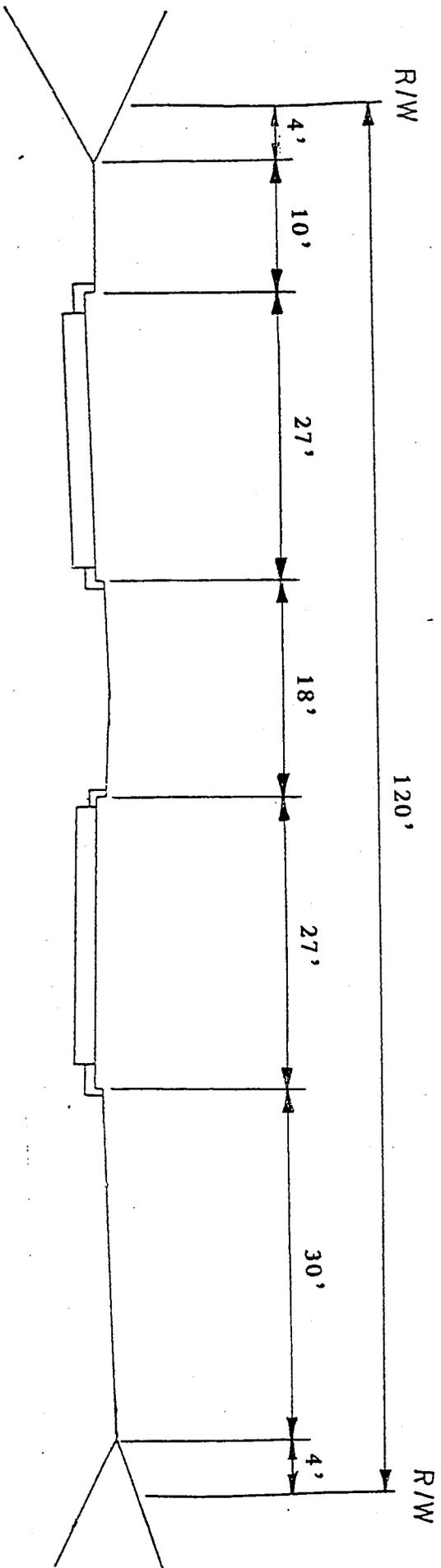
FEASIBILITY STUDIES UNIT

TYPICAL SECTION

ALTERNATIVE 1
 GRADE SEPARATION AT NC 100
 (BURLINGTON ST) AND SOUTHERN RR

BURLINGTON ALAMANCE COUNTY

U-3110 DIVISION 7 FIGURE 3



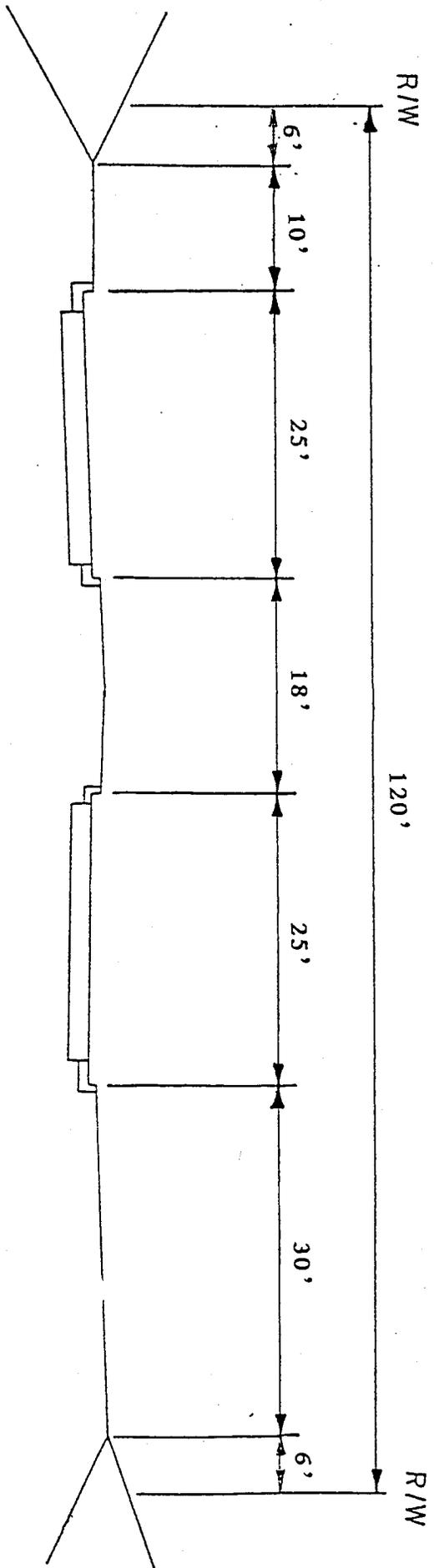
FEASIBILITY STUDIES UNIT

TYPICAL SECTION

ALTERNATIVE 2
 FROM US 70 (GREENSBORO HIGHWAY)
 TO NC 100 (BURLINGTON STREET)

BURLINGTON ALAMANCE COUNTY

U-3110 DIVISION 7 FIGURE 4



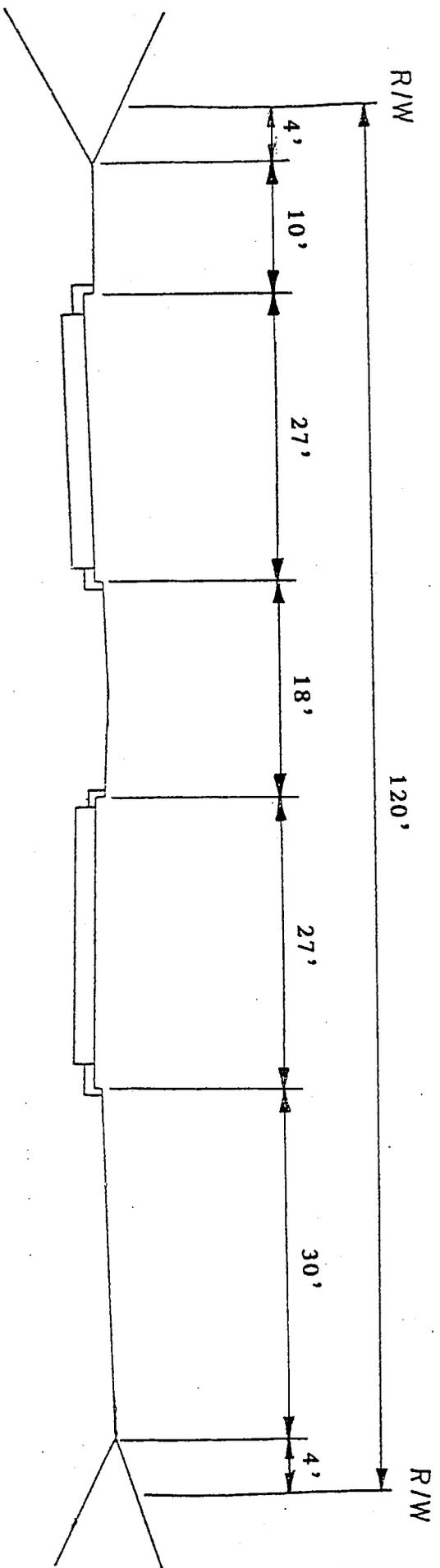
FEASIBILITY STUDIES UNIT

TYPICAL SECTION

ALTERNATIVE 3
 FROM US 70 (GREENSBORO HIGHWAY)
 TO SR 1309 (WESTBROOK AVENUE)

BURLINGTON ALAMANCE COUNTY

U-3110 DIVISION 7 FIGURE 5



FEASIBILITY STUDIES UNIT		
TYPICAL SECTION		
ALTERNATIVE 3		
FROM SR 1309 (WESTBROOK AVENUE)		
TO NC 100 (BURLINGTON STREET)		
BURLINGTON	ALAMANCE COUNTY	
U-3110	DIVISION 7	FIGURE 6