TAMPA-HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY
AND
FLORIDA DEPARTMENT OF TRANSPORTATION

NORTHWEST HILLSBOROUGH EXPRESSWAY

Engineering Report

HNTB

FEBRUARY 1987

FLORIDA STATE GOVERNOR
The Honorable
BOB MARTINEZ

TAMPA-HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

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Executive Director	RAY SPEER
Counsel	WILLIAM C. McLEAN, JR., P.A.

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HOWARD NEEDLES TAMMEN & BERGENDOFF

February 20, 1987

Mr. William P. Bissett, Jr.,
Chairman
Tampa-Hillsborough County
Expressway Authority
412 E. Madison Street, Suite 802
Tampa, Florida 33602

Dear Mr. Bissett:

We are pleased to present our Engineering Report for the Northwest Hillsborough Expressway which commences at I-275 on the south and proceeds northward to Dale Mabry Highway. The report summarizes the studies performed and describes in detail the proposed project.

The alignment as presented herein is the Recommended Alignment which proved to be the most feasible and acceptable of the several investigated. This alignment which was known during the study process as the Eisenhower West/Lake LeClare/South Termini Alignment, was evaluated based upon engineering, environmental and community impact factors and public input. The alignment was approved by the Authority as the selected alignment on April 28, 1986.

The project was closely coordinated with local governmental regulatory and planning agencies to insure the provision of a safe, efficient and environmentally sound expressway system to relieve traffic congestion in Northwest Hillsborough County. The need for the project was clearly established by the prior studies of the Hillsborough County - City County Planning Commission and the Expressway Authority. This report was authorized by the Tampa-Hillsborough County Expressway Authority and the Florida Department of Transportation to document the Recommended Alignment and to be used in determining revenue bond financing.

We estimate the total project cost of the Northwest Hillborough Expressway from I-275 to Dale Mabry Highway, exclusive of interest and financing costs, to be $266,400,000. Provided design and acquisition of right-of-way are completed by December 1988, the project can be open to traffic by September 1990. This scheduling was made possible by an advance of funding for engineering design by the Florida Department of Transportation. These advance monies will be reimbursed upon receipt of the proceeds of the bond sale.

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Throughout the preparation of the report we have received the cooperation and support of the Expressway Authority, your Executive Director, Mr. Ray Speer, the Florida Department of Transportation, area leaders, governmental agencies at every level and interested private citizens. All parties were dedicated to the success of the project and their contributions are gratefully acknowledged.

Respectfully submitted,

HOWARD NEEDLES TAMMEN & BERGENDOFF

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INTRODUCTION

As a part of a continuing effort to provide the means for financing and constructing an adequate surface transportation system within Hillsborough County, the Tampa-Hillsborough County Expressway Authority has authorized the preparation of this engineering report.

The Expressway Authority was created by an Act of the 1963 State Legislature when it became evident that public highway funds could not be made available in sufficient amount to finance a major Tampa area expressway network capable of satisfying projected user demands. In 1964 the Tampa Urban Area Transportation Study (TUATS) was initiated in Hillsborough County. An ensuing metropolitan transporation plan which included the Northwest Hillsborough Expressway was adopted in 1971.

The initial project undertaken by the Expressway Authority was the first phase of the Tampa South Crosstown Expressway. The first phase project was intended to alleviate traffic congestion on the Interbay Peninsula by providing a limited access highway between Gandy Boulevard and downtown Tampa with provision for future extension to the east. This project was financed by a $54,000,000 series of 1971 bonds and was opened to traffic in April 1976.

The eastward extension of the Tampa South Crosstown Expressway to the vicinity of the planned location of I-75 was initiated in 1976. This project, which terminated at US 301, was financed by a $117,500,000 series of 1979 bonds and was opened to traffic in July 1981. The eastward extension

from US 301 to I-75 was constructed by the Florida Department of Transportation with the initial section to Faulkenburg Road opened in March 1986 and the remaining section to I-75 opened in August 1986.

The Northwest Hillsborough Expressway was identified as a needed transportation facility in the original 1971 TUATS plan. The Expressway Authority selected the Expressway as a potential project in 1980 and engaged corridor, and traffic and revenue studies to determine preliminary feasibility for the project. As a result of the Phase I - Corridor Report completed in January 1982 and updated in July 1983 and based upon input received from public meetings conducted in July 1981 and August 1983, preliminary feasibility was established and a corridor was selected for potential expressway alignments. These alignments extended from I-275 on the south northward to Dale Mabry Highway north of Van Dyke Road.

In March 1984, the Expressway Authority authorized the preparation of the Draft Environmental Impact Statement (DEIS) for the purpose of identifying and evaluating the engineering and environmental impacts of potential alignments within the previously identified corridor. The preparation of this document included a comprehensive public participation program to inform the public of the study as it progressed and to seek public input. As part of this program two editions of the "Expressway Newsletter" were published in the Tampa Tribune and two public workshops and a corridor location and design public hearing were conducted. The results of these studies were documented in the DEIS which was approved by the Federal Highway Administration on January 21, 1986.

The recommended alignment presented in this report is that chosen by the Authority on April 28, 1986 based upon the engineering, environmental and community impacts assessment information presented in the DEIS and public comment received in the March 4, 1986 corridor location and design public hearing.

In June 1986, the Florida Legislature authorized $5,000,000 from the revolving trust fund for the Expressway Authority to engage design engineering firms for preparation of final design plans, right-of-way plans, and construction specifications. This funding is an advance from the Florida Department of Transportation which will be repaid from the proceeds of the bond issue.

In summary, the Northwest Hillsborough Expressway has been evaluated by all principal highway planning agencies. There is unanimous agreement that relief must be provided for the ever increasing volume of traffic on Dale Mabry Highway and throughout Northwest Hillsborough County. The improvement in traffic flow for the longer distance trips can only be realized through the implementation of a high-type, limited access expressway. The project described herein as the Northwest Hillsborough Expressway will provide this type of improvement and correspondent relief to local arterial roadways.

ROUTE LOCATION

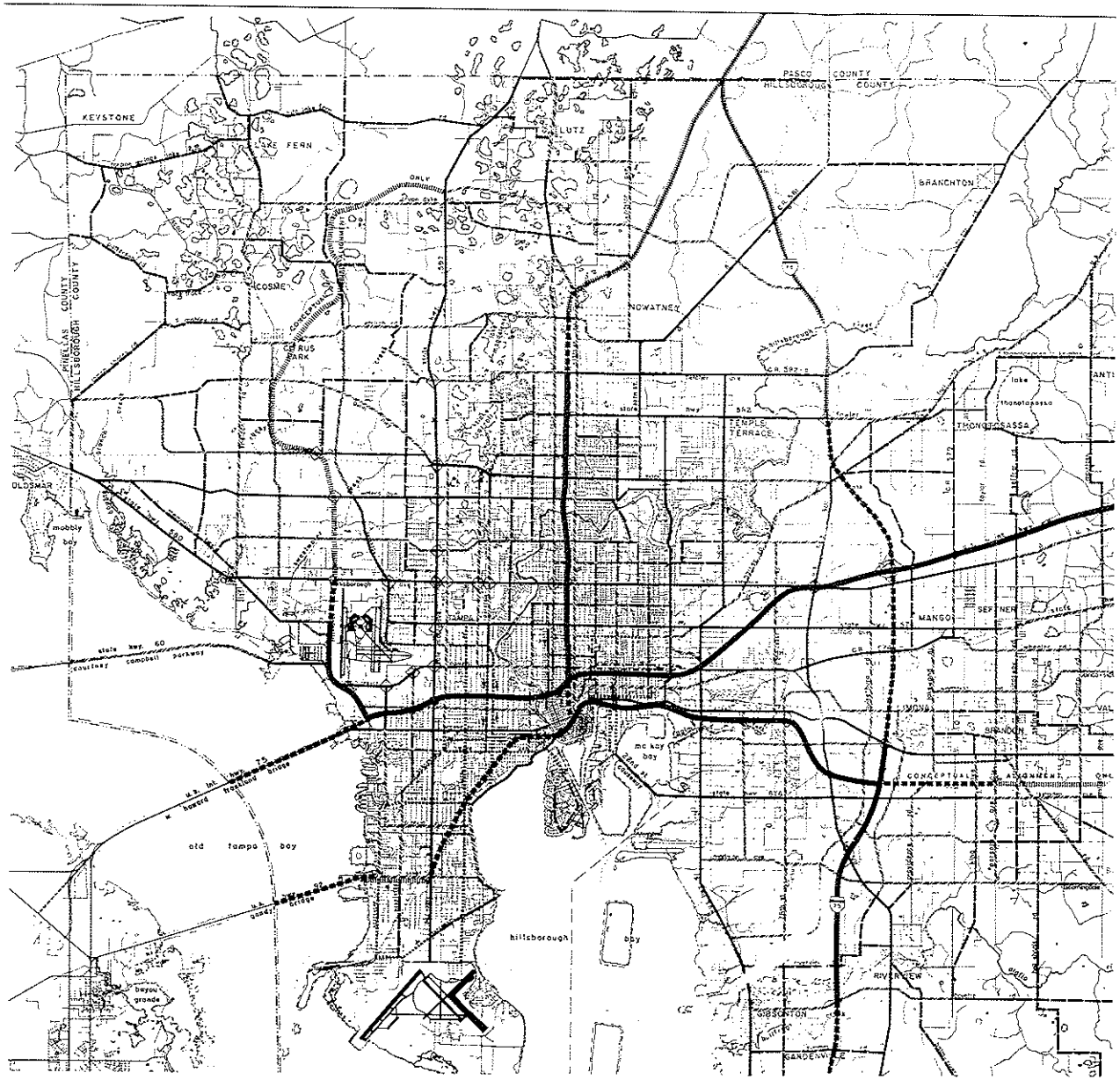
GENERAL

The generalized corridor for the Northwest Hillsborough Expressway was first identified in the TUATS plan in 1971. Since then the expanded and updated long range plans for the area's proposed highway network, including the most recently adopted Year 2010 Long Range Transportation Plan (See Figure 1) have included the Expressway.

Alternate location studies, including the preferred alignment, were evaluated with extensive use of aerial photography. The aerial mapping was supplemented by analysis of environmental impacts, field reconnaissance, preliminary subsurface exploration, utility investigations, and drainage and right-of-way studies, all of which played a significant role in determining the final recommended facility.

ALIGNMENT

The Northwest Hillsborough Expressway, as shown on the Figure 2, Location Map, and in the Appendix on Plan and Profile Plates 1 through 23, originates at I-275 south of Tampa International Airport and terminates 16.9 miles to the north at Dale Mabry Highway north of Van Dyke Road. South of Hillsborough Avenue, the new Expressway will connect to an upgraded Eisenhower Boulevard. This major segment of arterial highway will be improved to a limited access freeway with frontage roads from I-275 northward to Hillsborough Avenue. From Hillsborough Avenue, the proposed Expressway would proceed northward crossing principally residential and industrial properties until



TAMPA URBAN AREA
METROPOLITAN PLANNING ORGANIZATION
YEAR 2010 LONG RANGE TRANSPORTATION PLAN
FOR
HILLSBOROUGH COUNTY

LEGEND

FREEWAYS and EXPRESSWAYS

- 8 LANE OR MORE
- 6 LANE
- 4 LANE

ARTERIALS and COLLECTORS

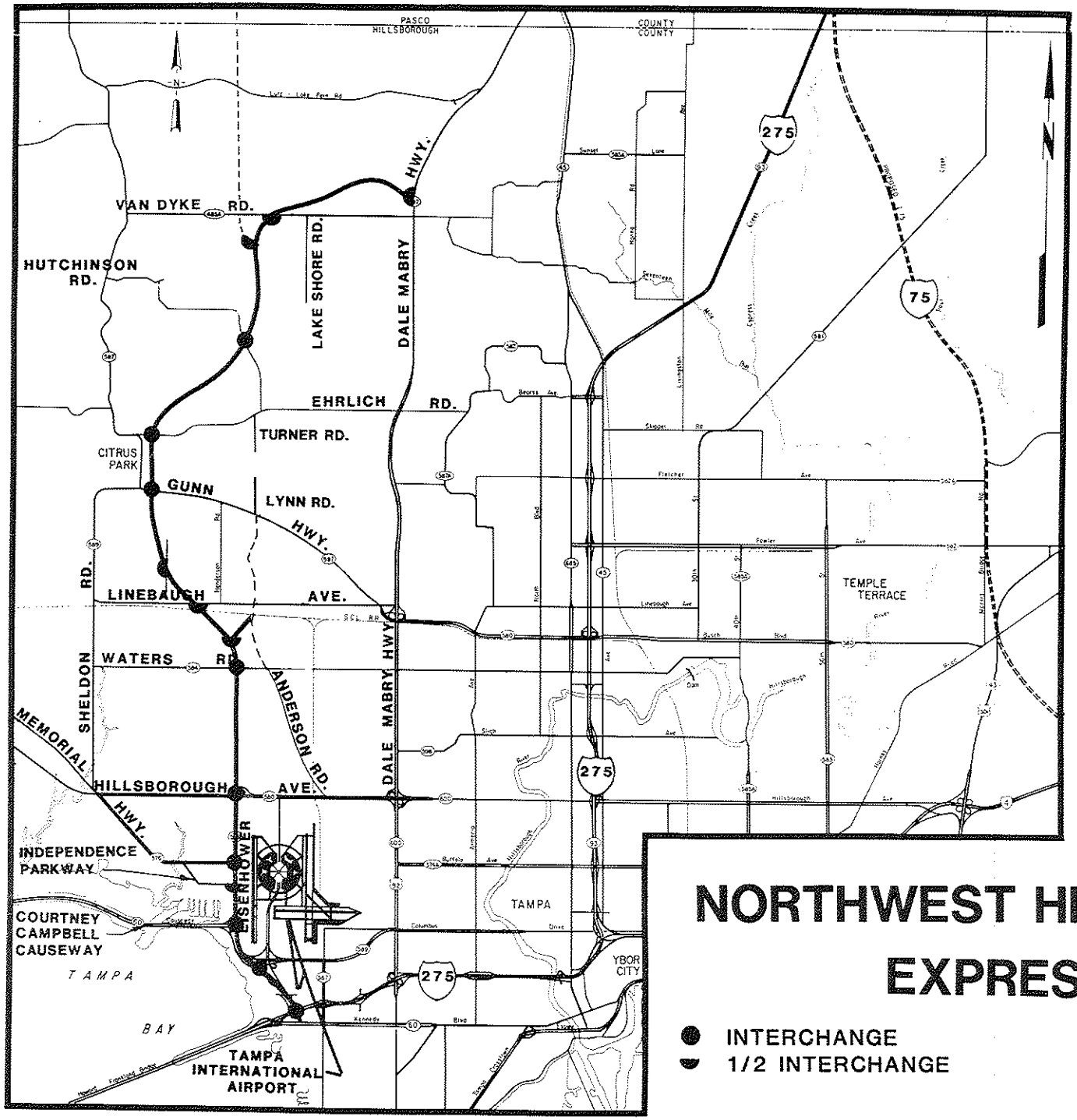
- 6 LANE
- 4 LANE DIVIDED
- 4 LANE UNDIVIDED
- 2 LANE
- 2 LANE ONE WAY
- 3 LANE ONE WAY
- 4 LANE ONE WAY
- ARTERIAL INTERCHANGE

N

SCALE IN MILES

PREPARED BY: THE HCDPC FOR THE TAMPA URBAN AREA METROPOLITAN PLANNING ORGANIZATION

FIGURE 1



NORTHWEST HILLSBOROUGH EXPRESSWAY

● INTERCHANGE
◒ 1/2 INTERCHANGE

LOCATION MAP

FIGURE 2

its crossing of Waters Avenue. The Expressway would then turn in a northwesterly direction toward an abandoned railroad right-of-way which would be followed northward to Gunn Highway. From Gunn Highway, the Expressway would turn in a northeasterly direction skirting the eastern side of Rocky Creek while traversing around several major subdivisions. Upon crossing Rawls Road, the Expressway would again turn northward through principally agricultural and vacant undeveloped land toward Van Dyke Road. South of Van Dyke Road the Expressway would turn sharply eastward crossing Van Dyke Road and skirting the southeastern side of the Turkey Fork Lake watershed. The Expressway would generally parallel Van Dyke Road to its terminus at Dale Mabry Highway.

The selection of this final alignment known during the study phase as the Eisenhower West/Lake LeClare/Southern Termini Alignment was made after an exhaustive evaluation of many potential alignments. The initial evaluation considered an expressway which extended from I-275 in the vicinity of Tampa International Airport northward and eastward to the new I-75 (Bypass) south of the Pasco County line. In selecting the most feasible corridor to develop alignment alternatives, the Expressway Authority, at the recommendation of the FDOT and its engineers, decided to eliminate the section between I-275 and the I-75 bypass from further consideration due to low projected traffic service and significant environmental impacts to the Cypress Creek watershed. As the study and review process continued, the need for an expressway in the East-West corridor between Dale Mabry Highway and I-275 was reconsidered. Upon further study of traffic generation forecasts, social and environmental impacts and related project costs, the Expressway Authority decided to drop this corridor segment from further consideration and instead promote improvements to Dale Mabry Highway and County Road 54 (CR 54) in Pasco County. The latter two roadway projects are currently under

study by the FDOT and are both in the FDOT five year work program. The local arterial system, Dale Mabry Highway and CR 54, will provide a dual function, serving the general land use in this rapidly growing area while providing a bypass route around the I-275 freeway serving downtown Tampa.

The alignment studies considered many different alternatives originating both east and west of Tampa International Airport. Those alignments originating east of Tampa International Airport were later rejected due to severe community impacts, increased project costs and lower traffic generation. The alignment study carried four alignment alternatives into the DEIS for detailed evaluation. The alternatives followed the same alignment to just south of Gunn Highway from where the Railroad alternative continued to follow the abandoned railroad right-of-way to Mobley Road before turning eastward toward Van Dyke Road. The alignment alternatives rejoined south of Van Dyke Road and are common to a point approximately 4000 feet west of Dale Mabry Highway where they split for a northern and southern terminus into Dale Mabry Highway. The Expressway Authority on April 28, 1986 after review of the DEIS and the public hearing transcripts selected the Eisenhower West/Lake LeClare/South Termini Alignment as being the best alternative for serving the northwest region of Hillsborough County.

INTERCHANGES, INTERSECTIONS AND IMPROVEMENTS

The proposed Expressway is planned as a four or more lane limited access facility with fifteen interchanges to provide traffic service to the major intersecting roadways. The interchanges would be nine full interchanges and six partial interchanges. Additionally, an at-grade intersection will be provided at the Dale Mabry Highway terminus.

The Expressway section between I-275 and Hillsborough Avenue will be an extensive upgrading of existing Memorial Highway and Eisenhower Boulevard. The mainline will be widened to ten lanes south of Courtney Campbell Causeway and incrementally decreased from eight lanes with frontage roads to four lanes as the Expressway proceeds northward toward Hillsborough Avenue. Interchanges at I-275, Tampa International Airport and Courtney Campbell Causeway will be upgraded to provide more directional movements and improve overall traffic conditions. New interchange locations will be provided at Independence Parkway and Memorial Highway. These interchanges will be designed to operate as part of the frontage road system.

The four lane Expressway with frontage roads will begin south of Hillsborough Avenue connecting into Hillsborough Avenue using a full urban or tight diamond interchange. The frontage roads will terminate into the ramps developed on the south side of Hillsborough Avenue. North of Hillsborough Avenue normal slip ramps consistent with urban or tight diamond design will be used. The tight diamond design allows all left turn movements to and from the entrance and exit ramps to occur under the overpass bridge using a single signal operation. While such design typically requires more retaining walls and a greater overpass bridge length, it has the benefit of requiring less land area to develop ramps, thereby making such a design cost effective in the more densely developed urban environment.

The next interchange northward will also be a full tight diamond interchange at Waters Avenue. This type design has been selected to minimize right-of-way acquisition on the south side of Waters

Avenue. North of Waters Avenue, the Expressway will have a partial interchange with the new Anderson Road Extension. Ramps will be developed to provide southbound access and northbound egress to the Expressway with an at-grade intersection into the Anderson Road Extension.

Partial interchanges will also be developed at the crossings of Linebaugh Avenue and Wilsky Boulevard. The Linebaugh Avenue interchange will provide southbound access and northbound egress to the Expressway. Due to the skew of the Expressway crossing over Linebaugh Avenue and the anticipated volume from northbound to westbound, the exit ramp will be designed as a loop ramp in the northeast quadrant of the interchange. The entrance ramp to the southbound Expressway will be a standard slip ramp design. The Wilsky Boulevard interchange will provide northbound access and southbound egress through a standard half diamond interchange.

The next three interchanges northward are with Gunn Highway, Ehrlich Road and Hutchinson Road respectively. These interchanges will be designed as full diamond interchanges capable of handling all movements.

Two additional partial interchanges are proposed at the northern end of the Expressway. The first partial interchange will provide northbound egress and southbound access from a proposed new Hillsborough County roadway. This roadway designated as Gunn Highway Relocated would have its southern terminus into the Northwest Hillsborough Expressway and extend northward into Pasco County terminating into the proposed Suncoast Expressway. The interchange will be designed as slip ramps.

The Van Dyke Road interchange is the second partial interchange which will be designed to accommodate southbound access and northbound egress. The Van Dyke Road interchange requires a different approach to the ramp design due to the skew at which the Expressway crosses Van Dyke Road. The northbound exit ramp will be a tight loop which will cross back under the Expressway to intersect Van Dyke Road.

The northern terminus of the Northwest Hillsborough Expressway will be an at-grade intersection with Dale Mabry Highway.

GEOLOGY

Soils explorations were performed along the proposed project corridor beginning at the Hillsborough Avenue and Eisenhower Boulevard interchange and extending northward to the proposed interchange with I-75. These explorations revealed subsurface materials primarily mixed, light and dark colored fine sand of loose to dense compaction. At deeper strata, very stiff sandy clays were found.

The explorations were terminated when the blow count of the standard penetration test was sufficient to support a precast concrete pile with a forty ton capacity. Based upon the borings in the corridor area, the average depth of pile to achieve this capacity will be approximately sixty feet. The borings typically terminated into soft clay limestone.

All explorations revealed soils capable of supporting the roadway embankments required for the construction of the Expressway. While no pockets of peat, muck and other unsuitable materials were

found, such pockets can be expected in this region, especially in the vicinity of wetlands areas. These materials will require removal and replacement with suitable backfill materials or compaction through surcharge loading of the overlying fills. It is not anticipated that unsuitable materials will pose a major problem to the construction of the Expressway.

DESIGN STANDARDS

GENERAL

The design standards for the Northwest Hillsborough Expressway will generally conform to the current high standards in effect for the design and construction of Interstate highways as recommended by the State of Florida Department of Transportation. Safety features as specified in the current publication of the American Association of State Highway and Transportation Officials are included in the design and construction of the facility where applicable. In complying with these design and safety standards, the Expressway will provide high type traffic service compatible with the other major existing and planned limited access highways in the area. Every effort is being made to provide an efficient, safe and aesthetically pleasing facility.

DESIGN CRITERIA AND STANDARDS

The project will be developed in accordance with design criteria and standards summarized in Table I following:

TABLE I

DESIGN CRITERIA

DESIGN SPEED	
Main Roadway	60 miles per hour
Ramps	Varies with curvature, 35 miles per hour desirable minimum 25 miles per hour minimum
PAVEMENT LANE WIDTHS	
Main Roadway	12 feet
Normal Ramps	15 feet
SHOULDER WIDTHS	
Main Roadway	12 feet (outside), 10 feet paved 8 feet (inside), 4 feet paved
Ramps	6 feet (outside), 4 feet paved 6 feet (inside), 2 feet paved
Structures	10 feet (outside) 4 feet (inside)
PAVEMENT GRADES	
Main Roadway	3 percent maximum
Ramps	6 percent desirable maximum 6.5 percent maximum
MINIMUM STOPPING SIGHT DISTANCE	
Main Roadway 3.75 feet height of eye to 6" object	475 feet

TABLE I (Continued)

HORIZONTAL CURVATURE	
Main Roadway	
Curvature	3 degrees maximum for 60 mph
Ramps	
Curvature	310 feet radius desirable minimum 150 feet radius minimum
MINIMUM VERTICAL CLEARANCE	
Main Roadway Over Side Road	16 feet 3 inches
Main Roadway Over Railroad	23 feet
EMBANKMENT SLOPES	
Less than 5 feet	6' horizontal to 1' vertical
5 feet to 10 feet	6' horizontal to 1' vertical to edge of clear zone then 4' horizontal to 1' vertical
10 feet to 20 feet	6' horizontal to 1' vertical to edge of clear zone then 3' horizontal to 1' vertical
Over 20 feet	2' horizontal to 1' vertical
CLEAR ZONE	
Main Roadway	30' from edge of travel lane or shoulder width plus 2' to face of guardrail.

The mainline will be designed for operation at speeds of 60 miles per hour with a posted speed limit of 55 mph. Ramp design speeds will vary as dictated by their horizontal geometry. The ramp entrances and exits will be designed for approximately 70 percent of the adjacent mainline roadway design speed. Lengths of acceleration and deceleration lanes will conform to or exceed the requirements established by the American Association of State Highway and Transportation Officials and the Florida Department of Transportation.

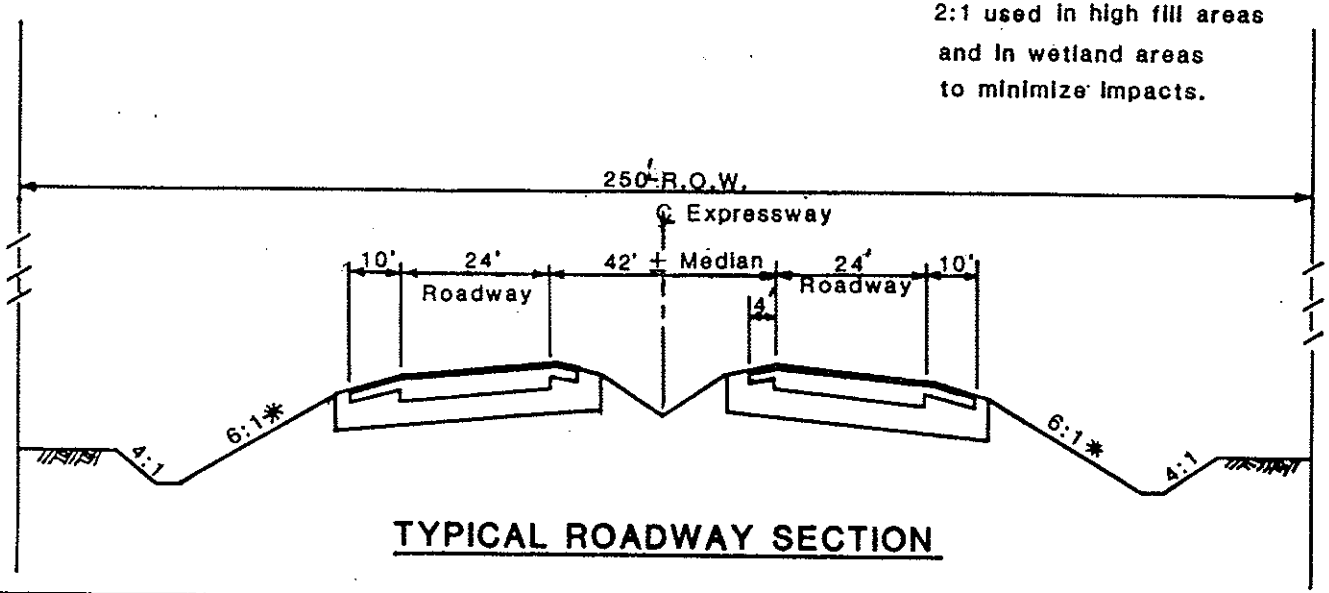
The main roadway lanes are 12 feet wide, and the minimum width of ramp lanes is 15 feet. Ramp lane width, including shoulder paving where required, will in all cases be sufficient to provide for the temporary parking of a disabled vehicle.

Typical roadway and bridge cross sections are illustrated in Figure 3.

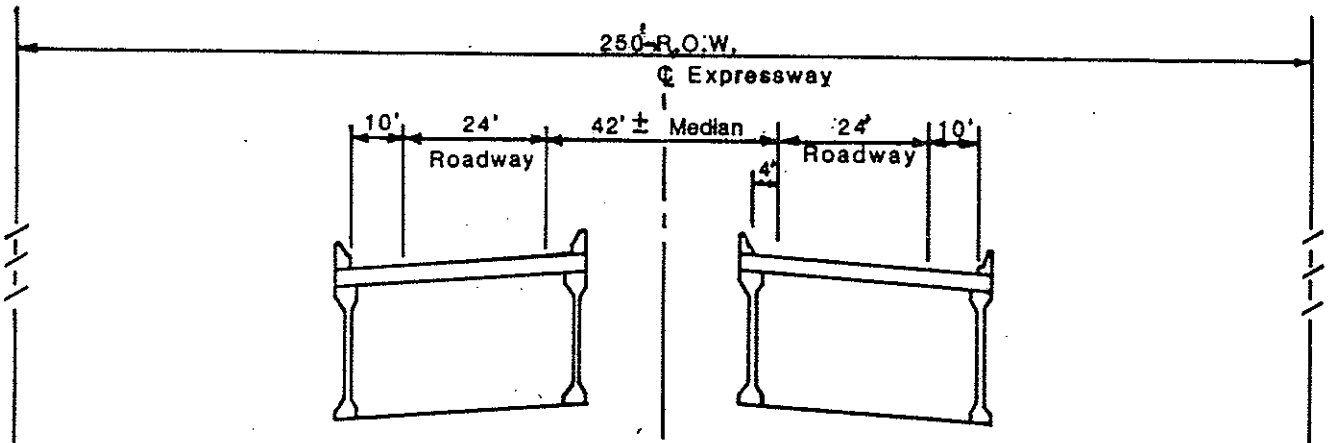
Asphaltic concrete pavement three inches thick, including a one-inch thick friction course, is planned for the Expressway throughout its length, as well as for all ramps leading to or from the Expressway. Paved outside shoulders for the mainline will be asphaltic concrete ten feet in width, with two feet of additional grassed shoulder provided. Inside shoulders will have four feet of asphaltic concrete pavement and four feet of grassed shoulder. Structures will have shoulder widths of ten feet outside and four feet inside. Ramps will have four feet outside paved shoulders with a minimum two feet of additional grassed area and two feet inside paved shoulders, with four feet additional grassed area.

The Expressway will have a median width of 42 feet. The median is designed to accommodate future widening of the Expressway to six lanes, one additional lane each direction and provision for a concrete median barrier and shoulders to separate opposing traffic flows. Guardrails will be used

✱ NOTE:
2:1 used in high fill areas
and in wetland areas
to minimize impacts.



TYPICAL ROADWAY SECTION



TYPICAL BRIDGE SECTION

FIGURE 3

at all hazardous locations such as bridge ends, high fills and appropriate sign structure supports. Chain link right-of-way fence will be utilized throughout the project. In addition to seeding and grassing for erosion control, landscaping will serve as visual backdrop at certain locations along the project.

The maximum grade will be three percent on the mainline and six and one-half percent on the ramps.

Minimum vertical clearances of 16 feet 3 inches will be provided over local streets and roads. Where the Expressway crosses over railroads, 23 feet vertical clearance to the bottom of the Expressway structure will be designed.

CROSS STREETS AND FRONTAGE ROADS

Principal intersecting roadways will remain open by means of grade separation structures. Cross street bridge openings and relocated and improved roads along the project will be designed for widths compatible with future governmental planning requirements. Required street closings will be reviewed with responsible governmental agencies to determine frontage and connector road requirements.

Pavement types and sections to be used on these roadways will be equal or superior to those which currently exist. Sidewalks and bikeways will be provided at all locations where they presently exist or are required for pedestrian and cyclist safety.

DRAINAGE AND WATER QUALITY

The drainage flows in the project corridor have two distinct patterns, one for the flatwoods and another for the sandy hills. The flatwoods lie in the southern portion of the alignment corridor and are drained by a series of creeks and streams eventually flowing into Tampa Bay. Those found within the final alignment are Rocky Creek and Sweetwater Creek. The sandy hills area found in the northern portion of the corridor has numerous lakes; therefore, most of the drainage is retained through the porous sand, and through natural or manmade drainage systems into the lakes.

Drainage improvements are needed in portions of the alignment of poorly defined natural drainage patterns and where there is a lack of sufficient drainage facilities. Most existing roadways in the project corridor utilize open ditch and sheet flow drainage and do not have well defined drainage patterns.

The construction of the Expressway with cross-street drainage improvements at interchange locations will be beneficial for areawide drainage. The highway drainage facilities will be designed to remove storm water runoff from the traveled roadways and to protect the Expressway and adjacent properties from flood damage.

Preservation of water quality is an important consideration in the design of an Expressway. Design techniques which utilize retention/detention areas to hold runoff prior to discharge into open water systems will be employed. The natural wetland areas adjacent to portions of the project will provide natural filtration of runoff prior to entering creeks or lakes.

STRUCTURES

The structures proposed for the Northwest Hillsborough Expressway will primarily be of prestressed concrete beam construction with conventional concrete decks and substructures. At several locations where span lengths are long, alternative economical superstructures will be investigated. The alternatives will include concrete and steel box girders, and steel beams. It is anticipated that all structures will be supported on prestressed concrete friction bearing piling.

The Expressway will have a total of twenty-four structural crossings, four over water and the remainder as roadway overpasses. There will be two long viaduct sections from the I-275 interchange area to the Spruce Street interchange area.

SIGNING

Signing, one of the key elements in an effective Expressway system, will be clearly legible with directional, regulatory and warning signs provided. Signing criteria is in accordance with the latest State of Florida Department of Transportation standards, the practices endorsed by the American Association of State Highway and Transportation Officials and the Federal Highway Administration. Signs will be designed and fabricated to withstand hurricane wind loads and will be reflectorized or illuminated to be clearly visible at night. Special sign structures will be designed and constructed adjacent to the airport as required to minimize encroachment into the airport clear zone and interference with airport operations.

A system of directional signs (trailblazers), that is presently being used in the Tampa area for the Tampa South Crosstown Expressway, will be installed on major highways and local streets in the area to assist drivers in utilizing direct access routes to the Expressway.

ROADWAY LIGHTING

All critical sections of the Expressway, such as interchange areas and toll collection facilities, are to be lighted. The criteria to be used for design of the lighting systems will be based on the standards and recommendations for highway lighting of the Illuminating Engineering Society and on policies of the State of Florida Department of Transportation and the Federal Highway Administration. The light standards will be modified in the Airport area to meet FAA requirements for clear zones and to accommodate airport operations.

RIGHT OF WAY

Varied right-of-way requirements have been established for the recommended alignment. A normal width of 250 feet has been set for the Expressway north of Hillsborough Avenue. At the area from I-275 to Hillsborough Avenue and other interchange locations, additional right-of-way will be required. The additional area will accommodate frontage roads, ramps and crossroads. Between Linebaugh Avenue and Gunn Highway, in the area of the abandoned railroad track, and at several other locations, less width will be needed.

Wherever desirable, total takings of real estate parcels are planned in lieu of leaving unusable property. In some instances, excess land (uneconomical remainders), not required for the expressway facility can be sold to adjacent property owners.

The proposed alignment will require the taking of approximately 163 residential parcels for mainline and interchange construction. In addition, approximately 19 non-residential properties with improvements (buildings and appurtenances) will be required. Many of these are small businesses or rental of real properties. No public schools, parks, or recreational facilities will be taken, wholly or in part. The only publicly owned facility to be taken will be the West Hillsborough Fire Station located on Eisenhower Boulevard.

The right-of-way corridor has been studied in depth and right-of-way estimates developed accordingly.

UTILITY ADJUSTMENTS

The complete range of utility services, including water, electric, sanitary, gas, telephone and telecommunication cables, are encountered throughout the alignment. The local service lines, either overhead or underground, are found principally within existing roadway rights-of-way and generally can easily be relocated nearby. During design, plans of the alignment will be sent to the utility owners with facilities in the area. Existing and proposed major utilities will be identified by the owners with potential conflicts noted. Major transmission lines which will be considered in final design of the Expressway were found as discussed below:

In the Eisenhower Boulevard area there are major water lines and buried electric lines which service the Tampa International Airport. Within the abandoned railroad right-of-way a new West Coast Regional Water Supply Authority water line has been installed which will remain approximately 30 feet west of the edge of pavement. The alignment parallels this water line for approximately 0.8 mile. None of the wells will be encroached upon by the Expressway.

Crossings under high voltage transmission power lines will entail relocation of several towers in the vicinity of Lake LeClare. The number of towers to be relocated depends upon the final design of the Expressway.

TOLL COLLECTION FACILITIES

North of Hillsborough Avenue a combination of five ramp toll collection facilities and two mainline barrier toll plazas will be constructed as recommended by the Traffic and Revenue Engineers for the project. The toll plaza plan presented in this report could change when the financial plan is developed.

The toll plaza locations are indicated on the Plan and Profile Plates 1 through 23. The mainline barrier plazas will intercept all traffic utilizing the Expressway north of the Waters Avenue interchange and south of the Hutchinson Road interchange. The barrier plazas are to be located between Waters Avenue and the Anderson Road Extension and between Bellamy Road and Hutchinson Road.

Toll collection facilities are located on ramps at the Hillsborough Avenue, Waters Avenue, Wilsky Boulevard, Gunn Highway and Hutchinson Road interchanges. The proposed project, north of Hillsborough Avenue, provides no toll-free passage.

The mainline barriers will feature automatic or exact change and attendant operated lanes. The ramp facilities will be of the honor system type with fully automated exact change collection equipment.

DESIGN AND CONSTRUCTION SCHEDULE

It is anticipated that the entire 16.9 miles of the Northwest Hillsborough Expressway will be designed and construction completed in two years and three months, commencing April 1987 and ending September 1990. Design will be initiated in the Spring of 1987 and will be completed in eighteen months. Right-of-way acquisition is scheduled for eighteen months starting with plan work in September 1987. With the initial construction contracts under way before completion of the final design plans, approximately two years additional time is scheduled for completion of all construction and opening to traffic. A one month contingency period is included in the schedule to provide for cleanup, completion of fencing and final operational checks on lighting and toll collection facilities prior to the planned opening in September 1990. Funds have been advanced by the Florida Department of Transportation for proceeding with the final design. Final plans should be well advanced at the time of the bond sale anticipated in June 1988.

Table II shows the relative time schedule for performing the design, acquisition of right-of-way and construction.

The initial step in the design of the project is the development of final design standards which are included in this report. Contracts for design will be separated into sections and awarded to Section Engineers. Photogrammetric mapping, title search of property holdings, detailed design surveys, right-of-way surveys, soils investigation and establishment of final design standards will be started in early 1987.

Soil investigation and structural foundation recommendations are scheduled to be completed in the Winter of 1987-88.

Acquisition of property should start prior to completion of final design plans in those areas where the right-of-way limits are established early in the design phase. Acquisition priorities will be set to emphasize locations where lengthy negotiations or facility relocations may be anticipated.

Completion of design contracts will be scheduled in order to have property acquisition advanced as much as possible prior to award of the construction contracts. Completion of construction within the planned time framework is dependent upon adherence to financing, design, right of way appraisal and acquisition and utility relocation schedules.

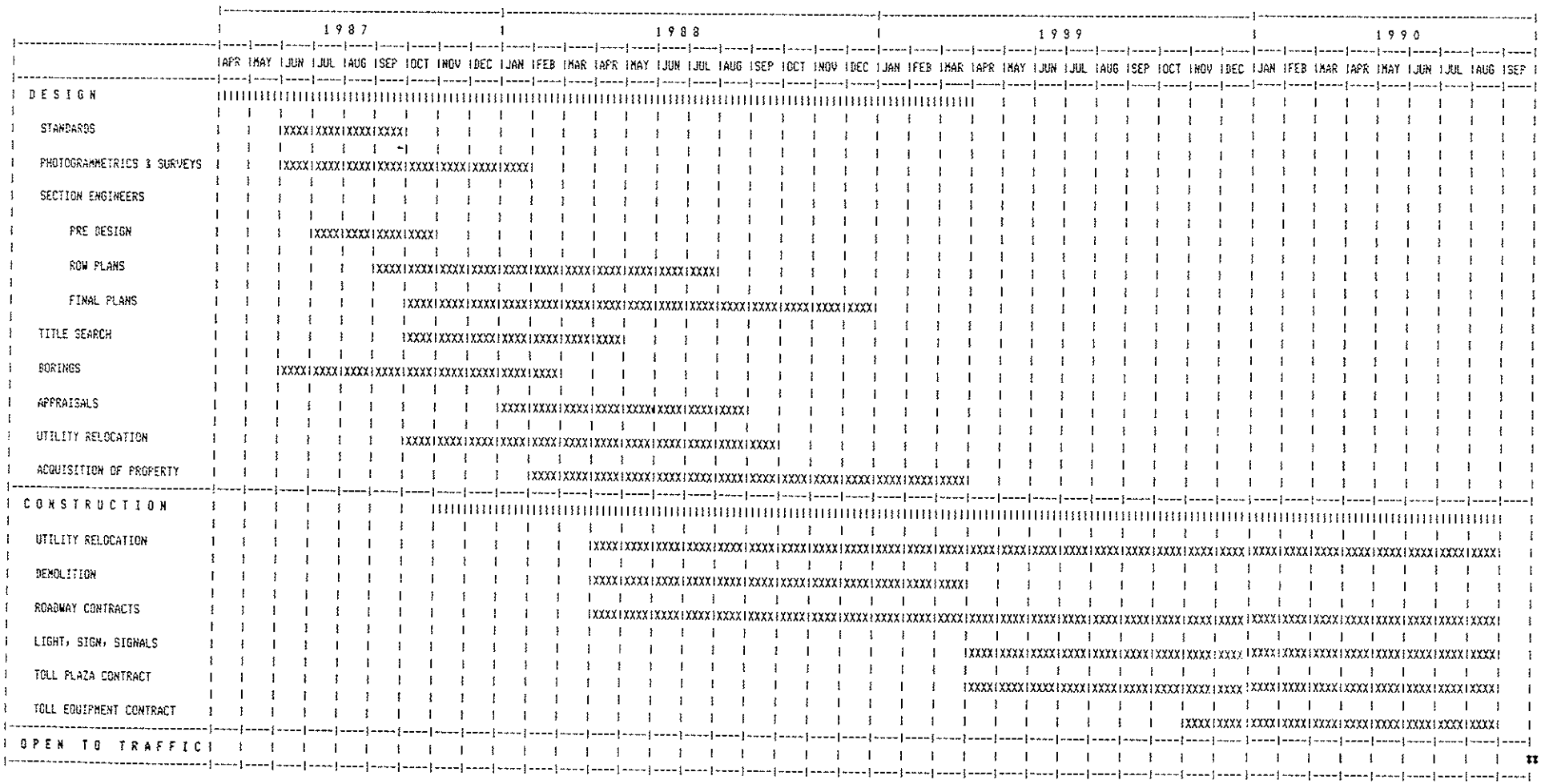
Work on demolition contracts will begin as early as possible when property acquisition is well under way. The roadway and structure contracts will be bid sequentially in order to receive thorough analysis and consideration by the construction industry.

In addition to the one month cleanup period prior to opening, it is anticipated that certain incidental cleanup activities will be scheduled for a period of approximately three months after the opening date.

Analysis of the Table II schedule clearly shows that close coordination of all activities is required from the onset of design activities to the anticipated opening date. Experience on like projects of similar scope and complexity indicates that the schedule is realistic and can be met.

TABLE II

DESIGN & CONSTRUCTION SCHEDULE
NORTHWEST HILLSBOROUGH EXPRESSWAY



OPERATION AND MAINTENANCE COSTS

The operation and maintenance of the Expressway facility described herein will be accomplished by the State of Florida Department of Transportation. The total estimated costs of these services for the first year are $1,400,000 for operation and $430,000 for maintenance. The maintenance costs for the first seven years include $286,000/year for deposit in the sinking fund toward Expressway resurfacing in 1997. These estimates are shown in Table III. The operation and maintenance costs developed are based on actual expenditures for similar facilities now in operation in Florida. For determining financial feasibility, the figures have been escalated at appropriate rates. Should the toll plaza plan change from that shown in this report, the operation and maintenance costs will be revised accordingly.

TABLE III

OPERATION AND MAINTENANCE COSTS (000)

Year	Operation Costs	Maintenance Costs	Resurfacing Costs	Total O&M Costs
1990	$1,400	$ 430	$286	$2,116
1991	1,470	452	286	2,208
1992	1,544	474	286	2,304
1993	1,621	498	286	2,405
1994	1,702	523	286	2,511
1995	1,787	549	286	2,622
1996	1,877	576	286	2,739
1997	1,971	605	-	2,576
1998	2,069	636	-	2,705
1999	2,173	667	-	2,840
2000	2,281	701	-	2,982
2001	2,395	736	-	3,131
2002	2,515	773	-	3,288
2003	2,641	811	-	3,452
2004	2,773	852	-	3,625
2005	2,912	894	-	3,806
2006	3,057	939	-	3,996
2007	3,210	986	-	4,196
2008	3,371	1,035	-	4,406
2009	3,539	1,087	-	4,626
2010	3,716	1,141	-	4,857

PROJECT COSTS

Project cost is a summation of the various expenditures anticipated in administering, planning, engineering, acquiring of right-of-way, construction and related incidental items associated with the realization of the Expressway project described in this engineering report. A tabulation of the estimated Project Cost is shown in Table IV.

The estimate for right-of-way cost was prepared by the Florida Department of Transportation. The current market values have been increased to reflect upward trends in land prices and to provide for acquisition by condemnation proceedings, as well as in consideration of other normal contingencies.

The estimate of construction cost is based upon quantities taken from preliminary plans developed during the preparation of this engineering report. All construction items and details have been included. Current unit prices for items of work for similar type projects were tabulated and increased to reflect anticipated escalation prior to the actual awarding of construction contracts and in accordance with the project schedule.

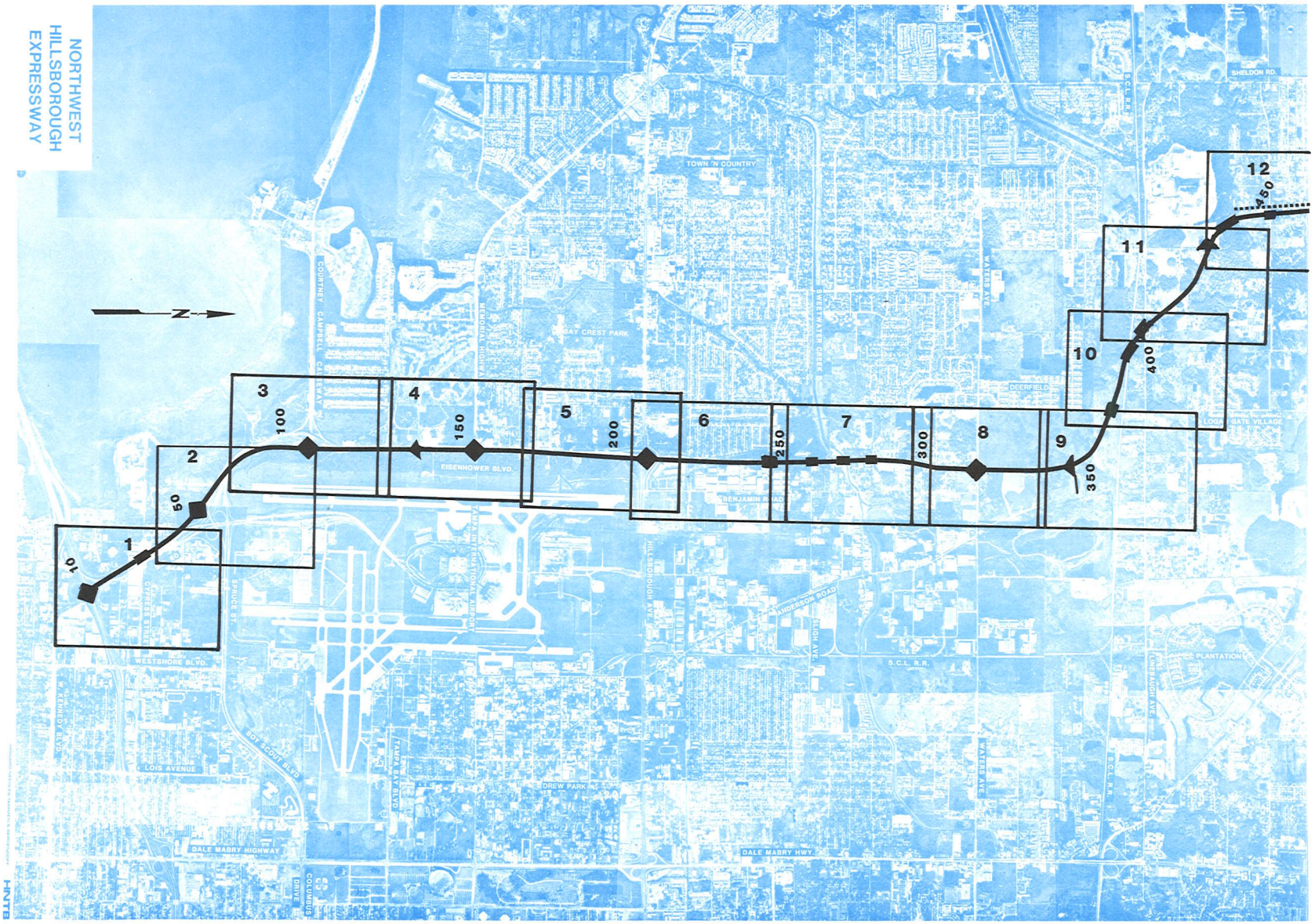
TABLE IV

PROJECT COSTS

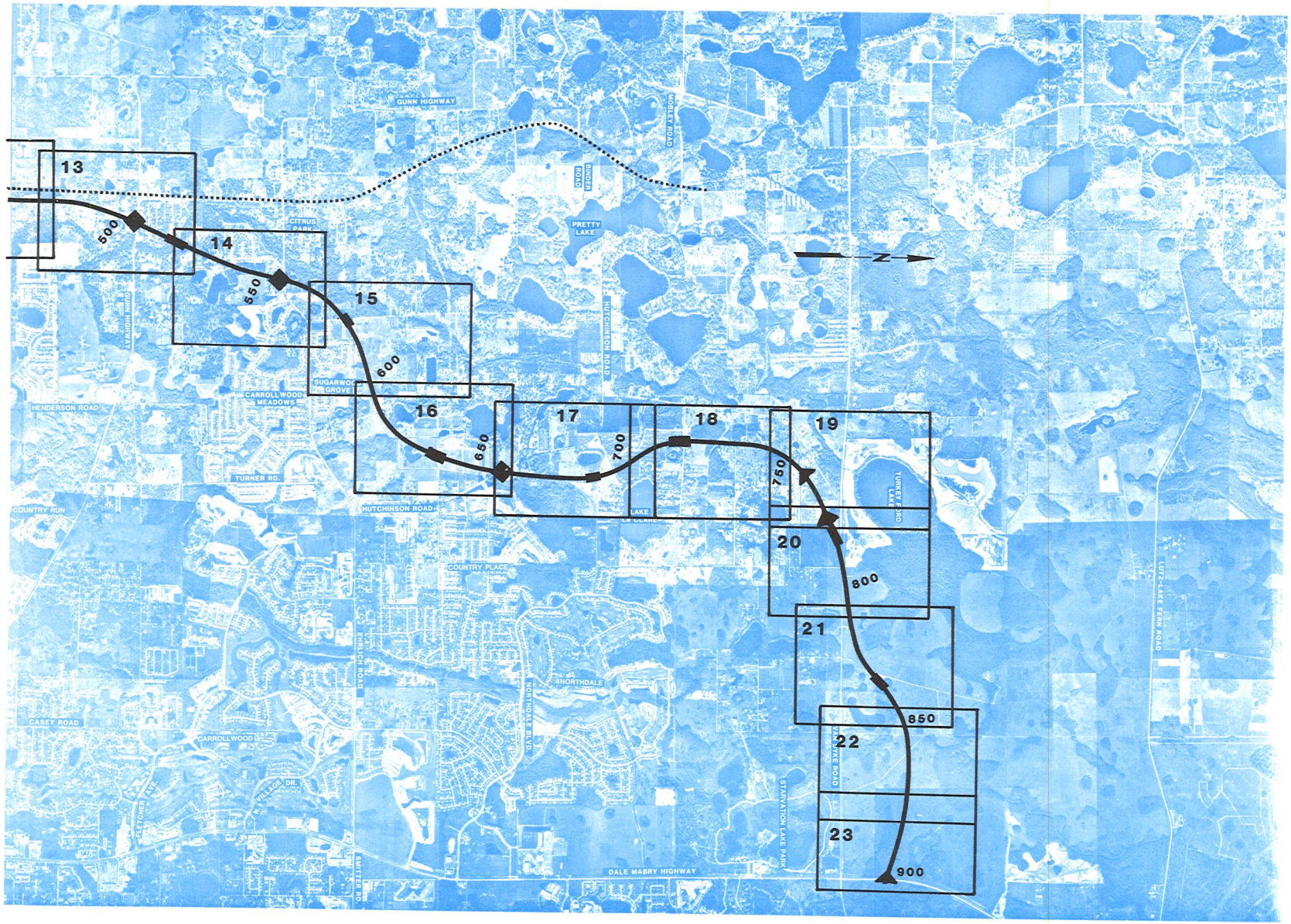
Construction Costs	$134,300,000
Engineering, Surveys, Testing & Supervision	20,300,000
Administration, Legal, Auditing & Financial	400,000
Subtotal	$155,000,000
Contingencies	23,200,000
Right-of-Way, Relocation, Demolition & Contingencies	88,200,000
TOTAL ESTIMATED PROJECT COSTS (Exclusive of Interest & Financing Costs)	$266,400,000

APPENDIX

PLATE INDEX MAP
PLATES 1 THRU 23



PLAN AND PROFILE

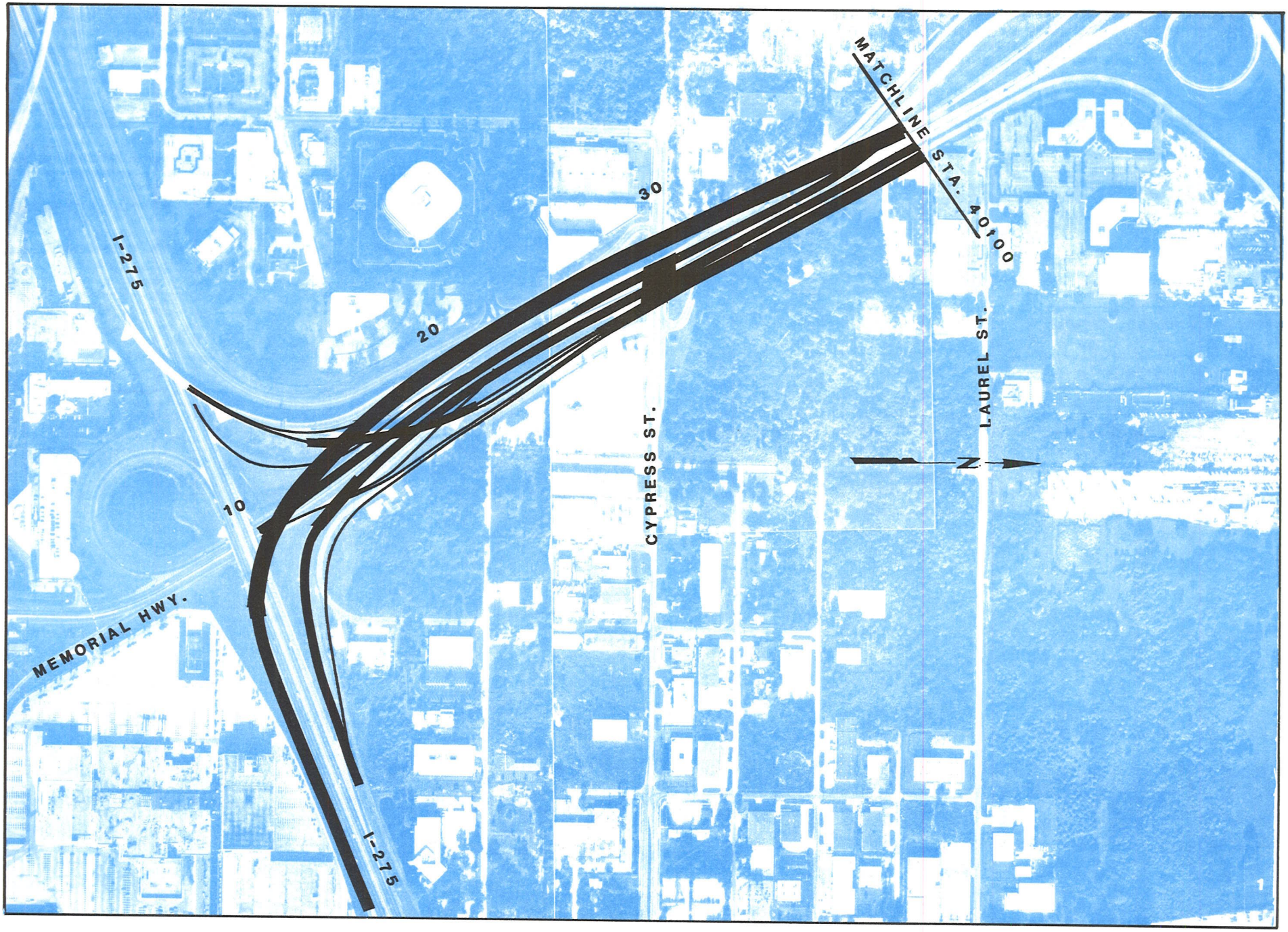


LEGEND

- RECOMMENDED ALIGNMENT
- FULL INTERCHANGE
- HALF INTERCHANGE
- LOCATION OF ABANDONED RAILROAD RIGHT OF WAY

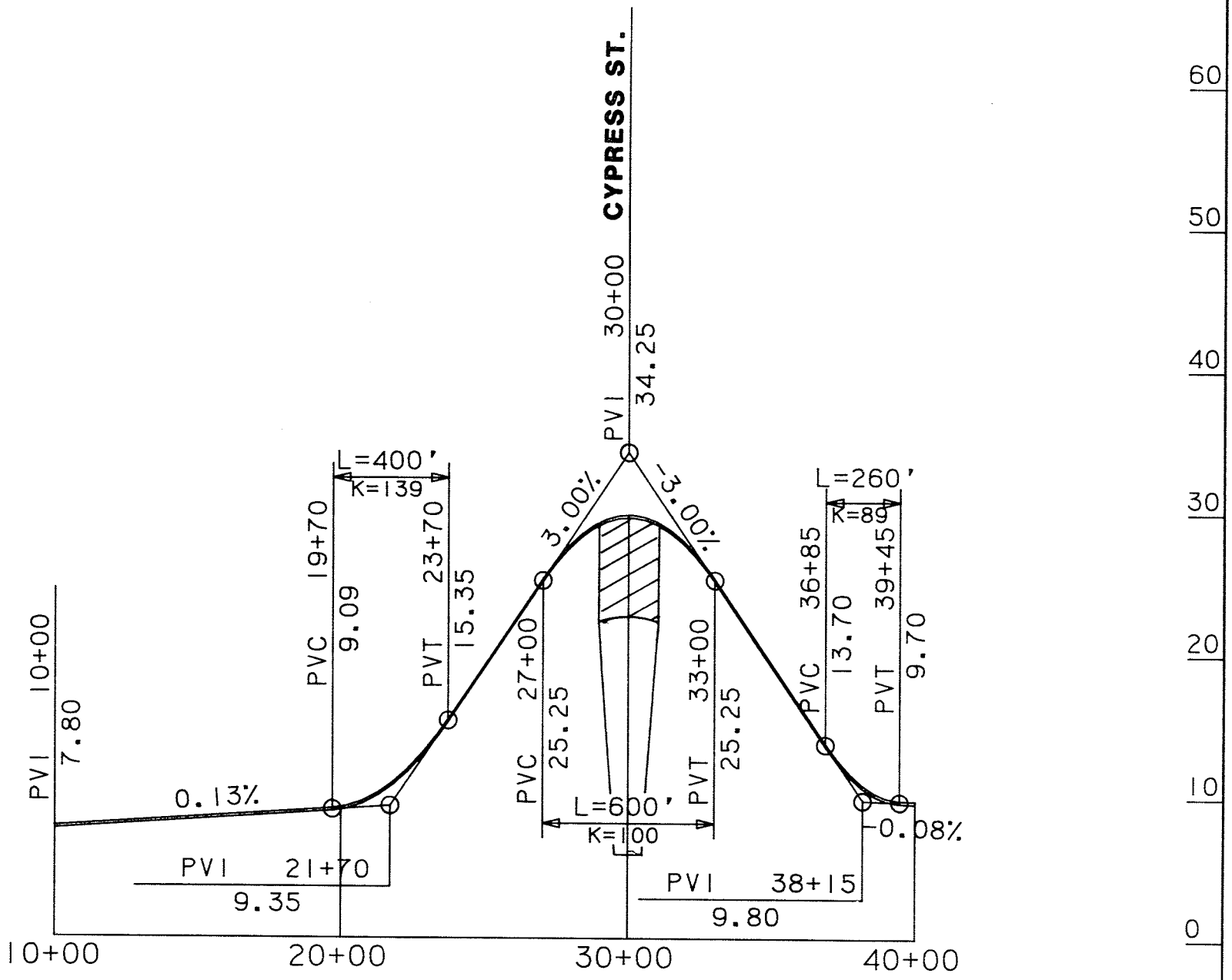
N

PLATE INDEX MAP


MATCHLINE STA. 401+00
30
20
10
I-275
CYPRESS ST.
LAUREL ST.
N
MEMORIAL HWY.
I-275

PLAN

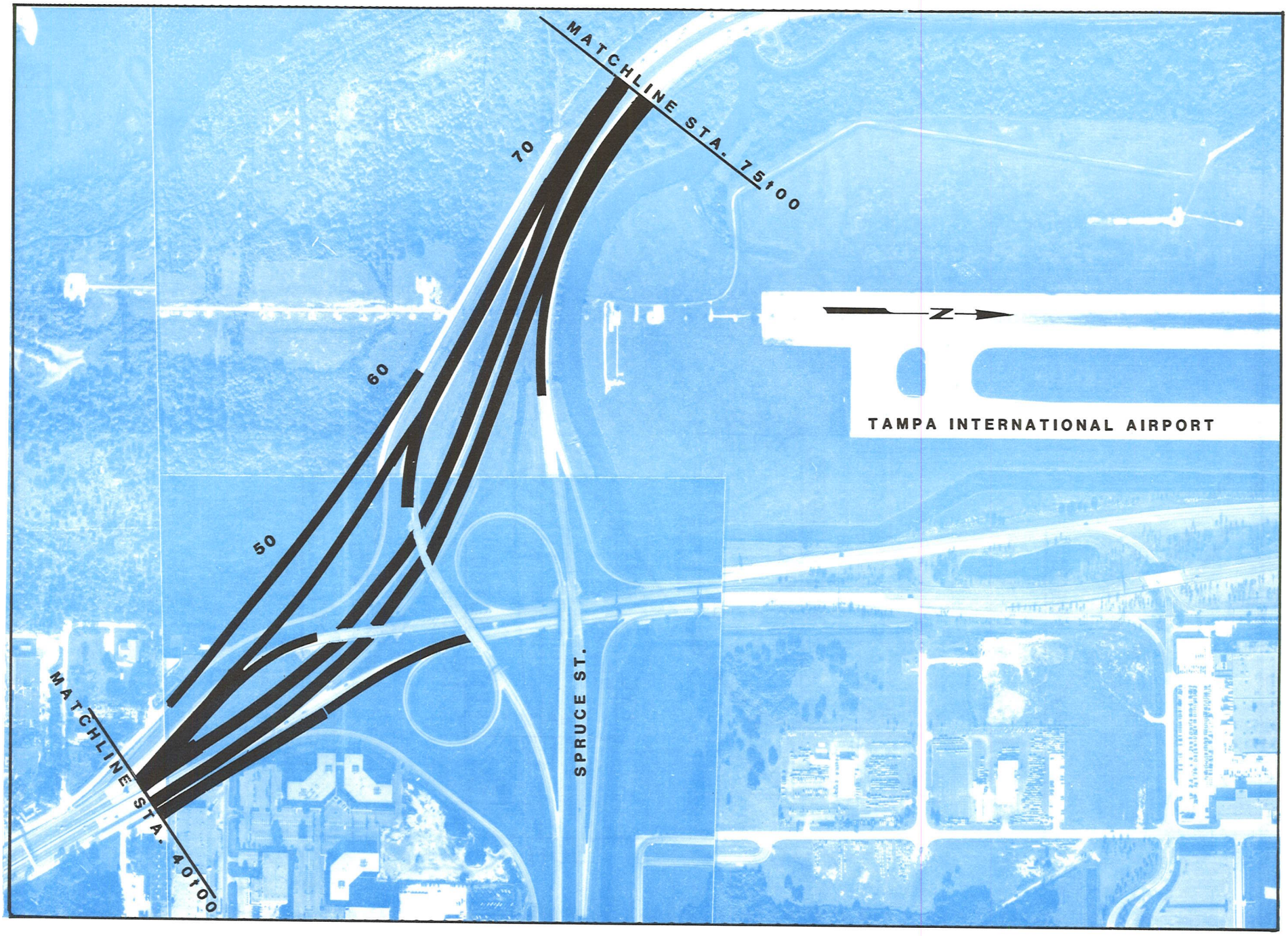
PLATE 1



ORGRAPH.T7857.HI | PROPLOT2.FGB

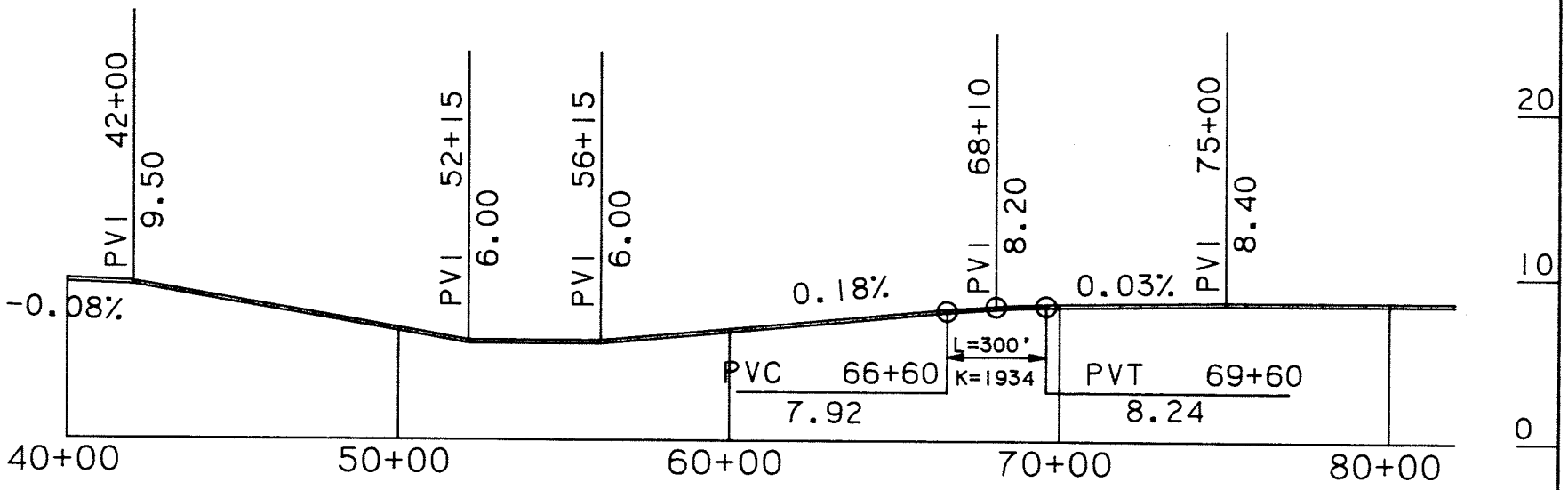
PROFILE

PLATE 1A


MATCHLINE STA. 75+00
70
60
50
N
TAMPA INTERNATIONAL AIRPORT
SPRUCE ST.
MATCHLINE STA. 40+00

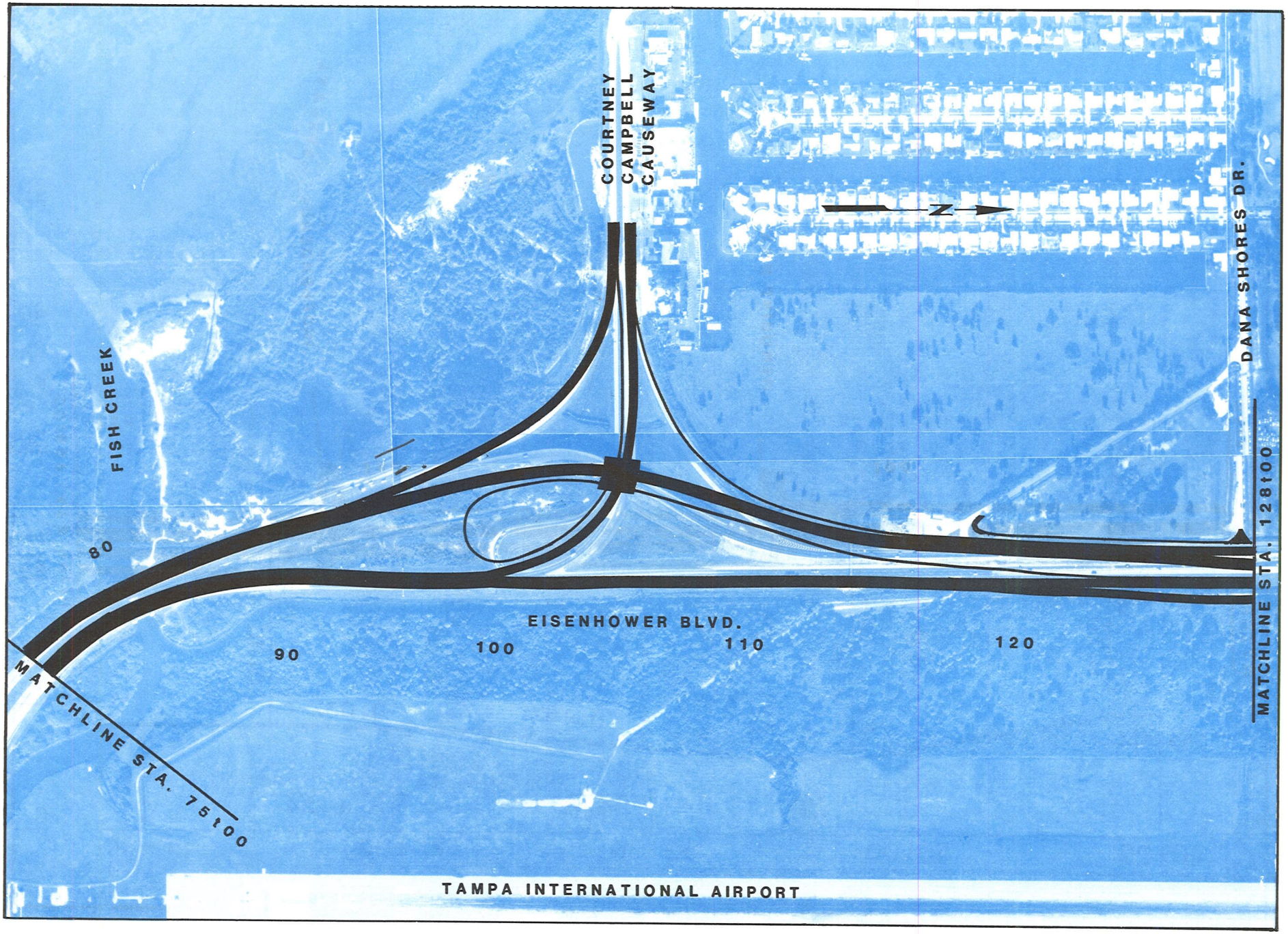
PLAN

PLATE 2



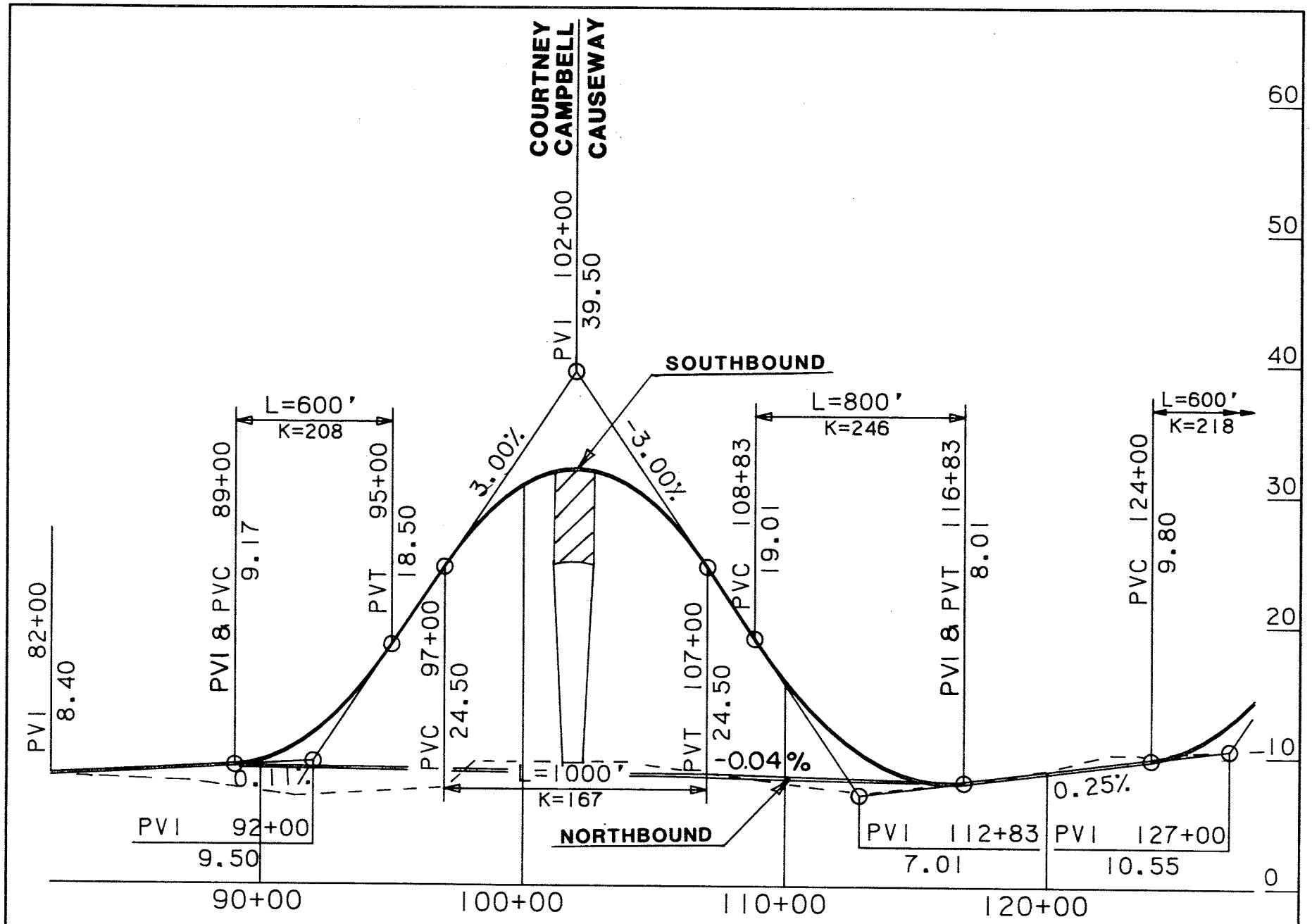
PROFILE

PLATE 2A


COURTNEY CAMPBELL CAUSEWAY
N
DANA SHORES DR.
FISH CREEK
80
EISENHOWER BLVD.
90
100
110
120
MATCHLINE STA. 128+00
MATCHLINE STA. 75+00
TAMPA INTERNATIONAL AIRPORT

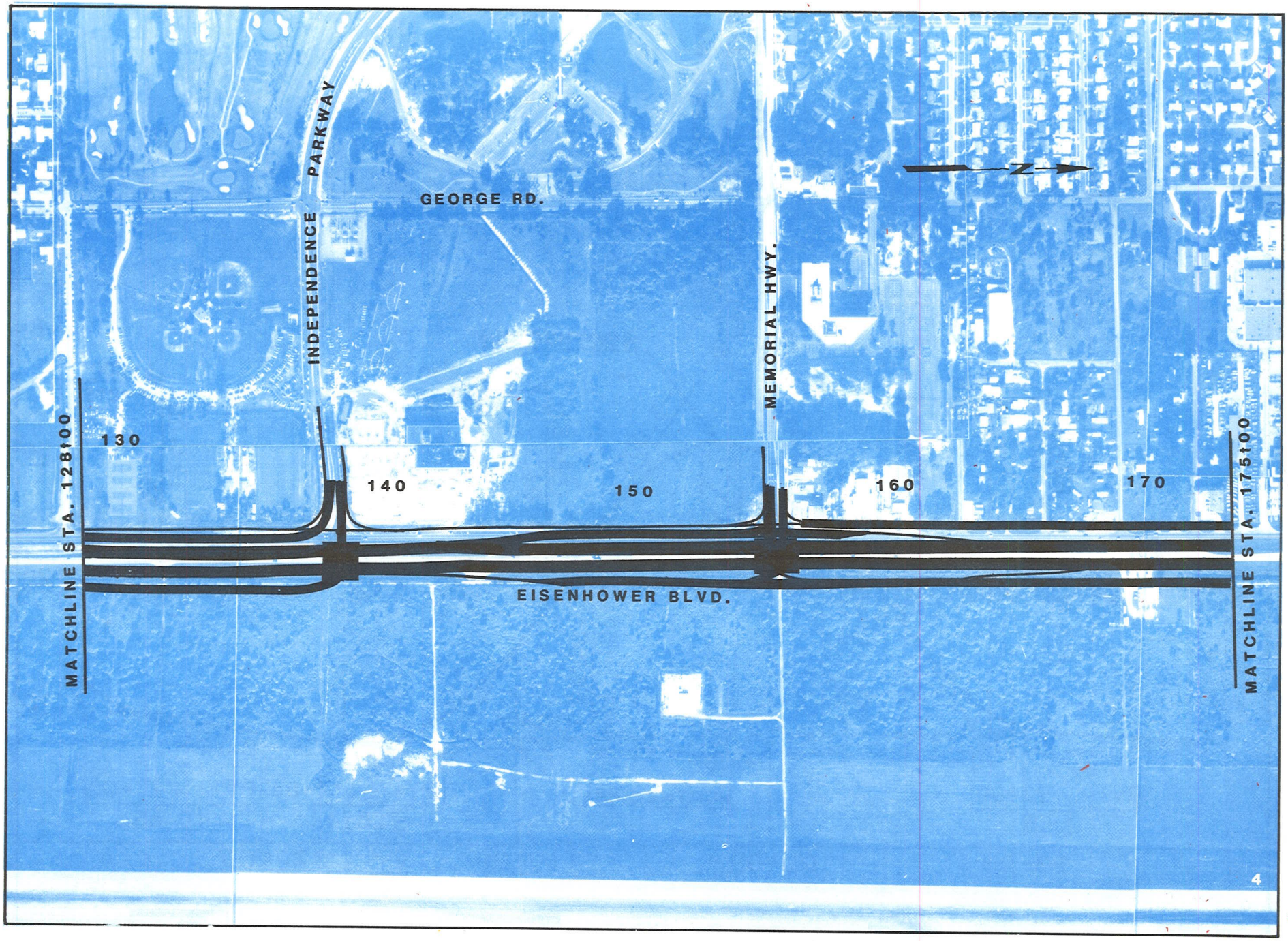
PLAN

PLATE 3



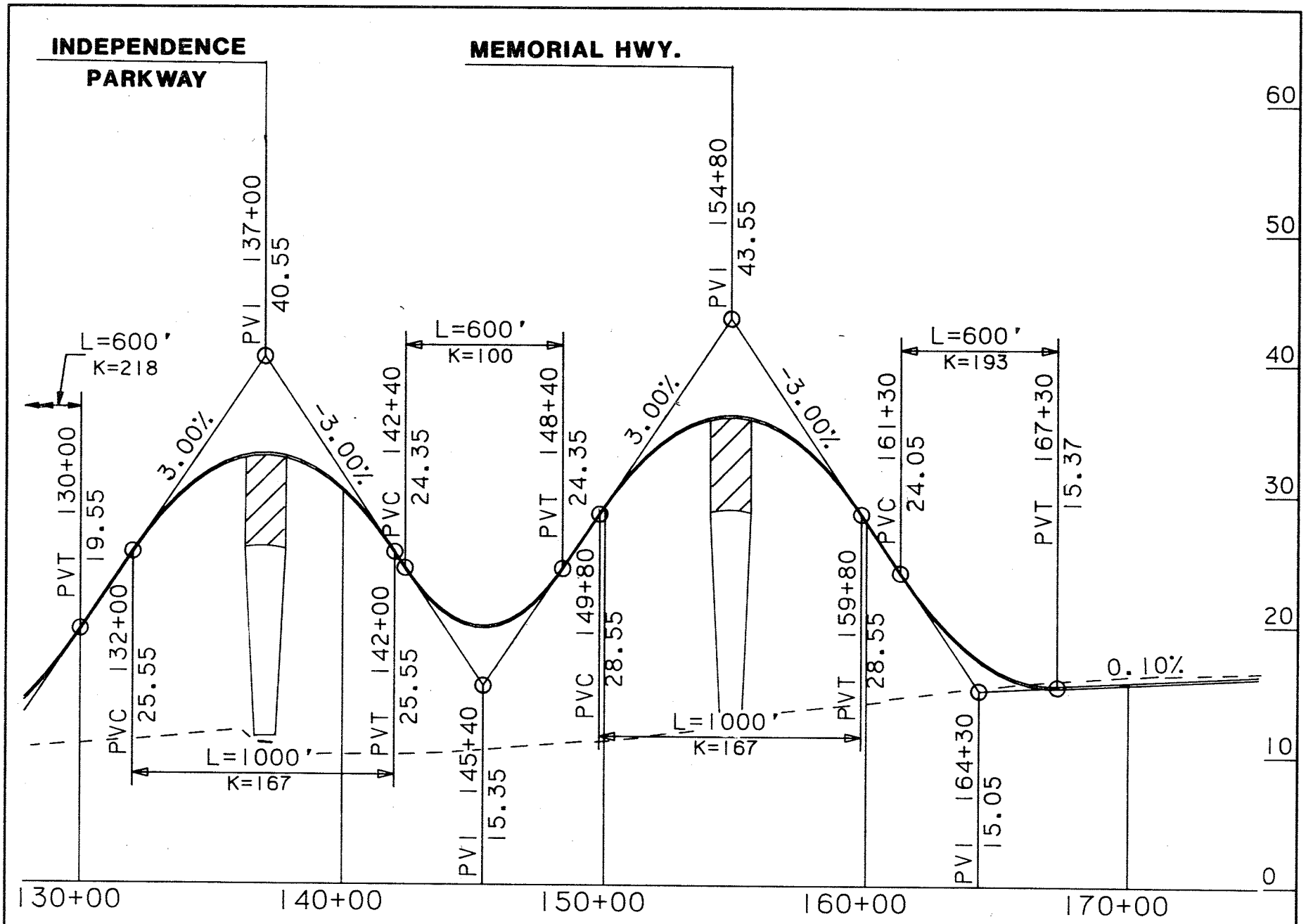
PROFILE

PLATE 3A


INDEPENDENCE PARKWAY
GEORGE RD.
MEMORIAL HWY.
N
MATCHLINE STA. 128+00
130
140
150
160
170
MATCHLINE STA. 175+00
EISENHOWER BLVD.
4

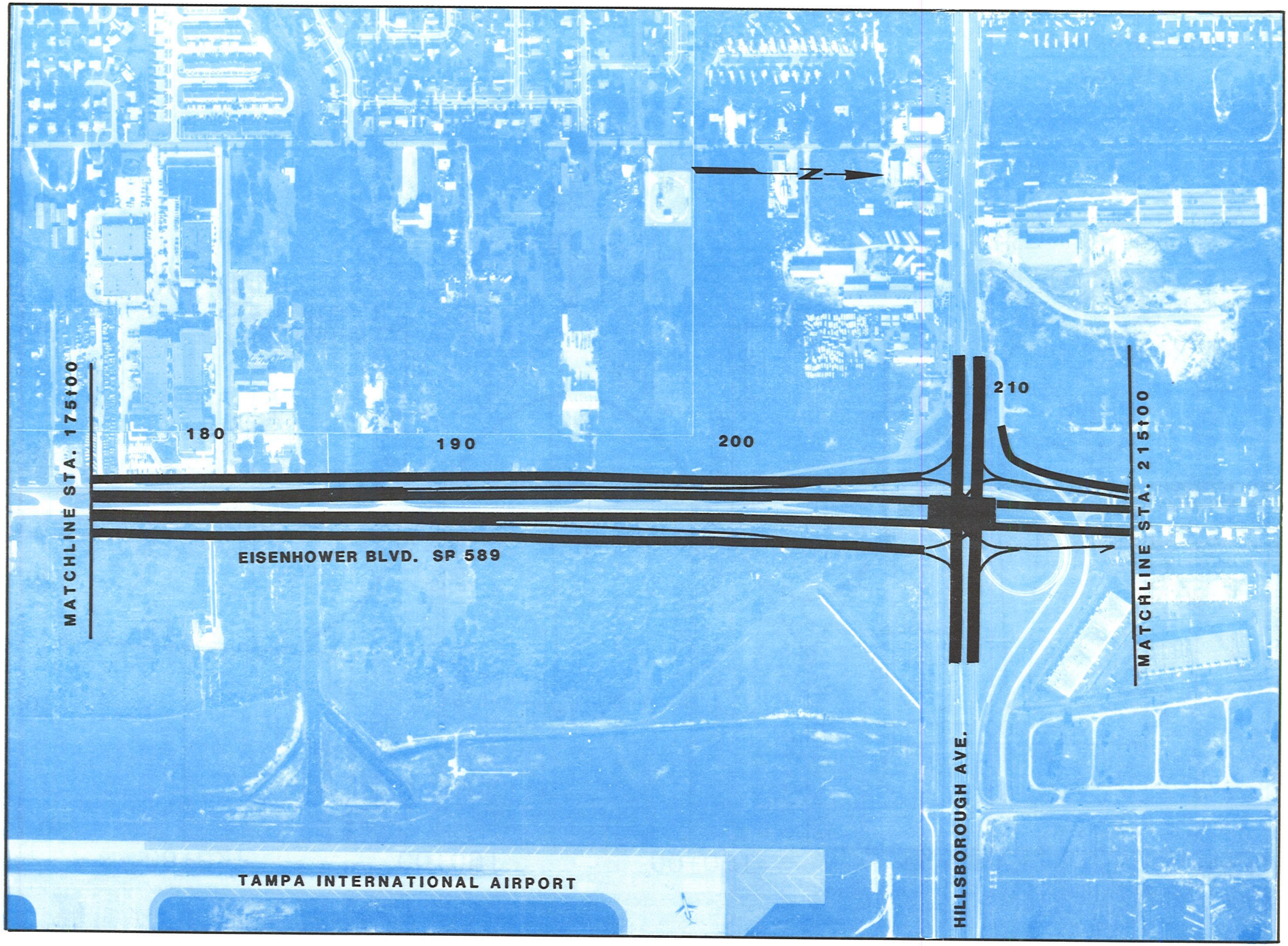
PLAN

PLATE 4



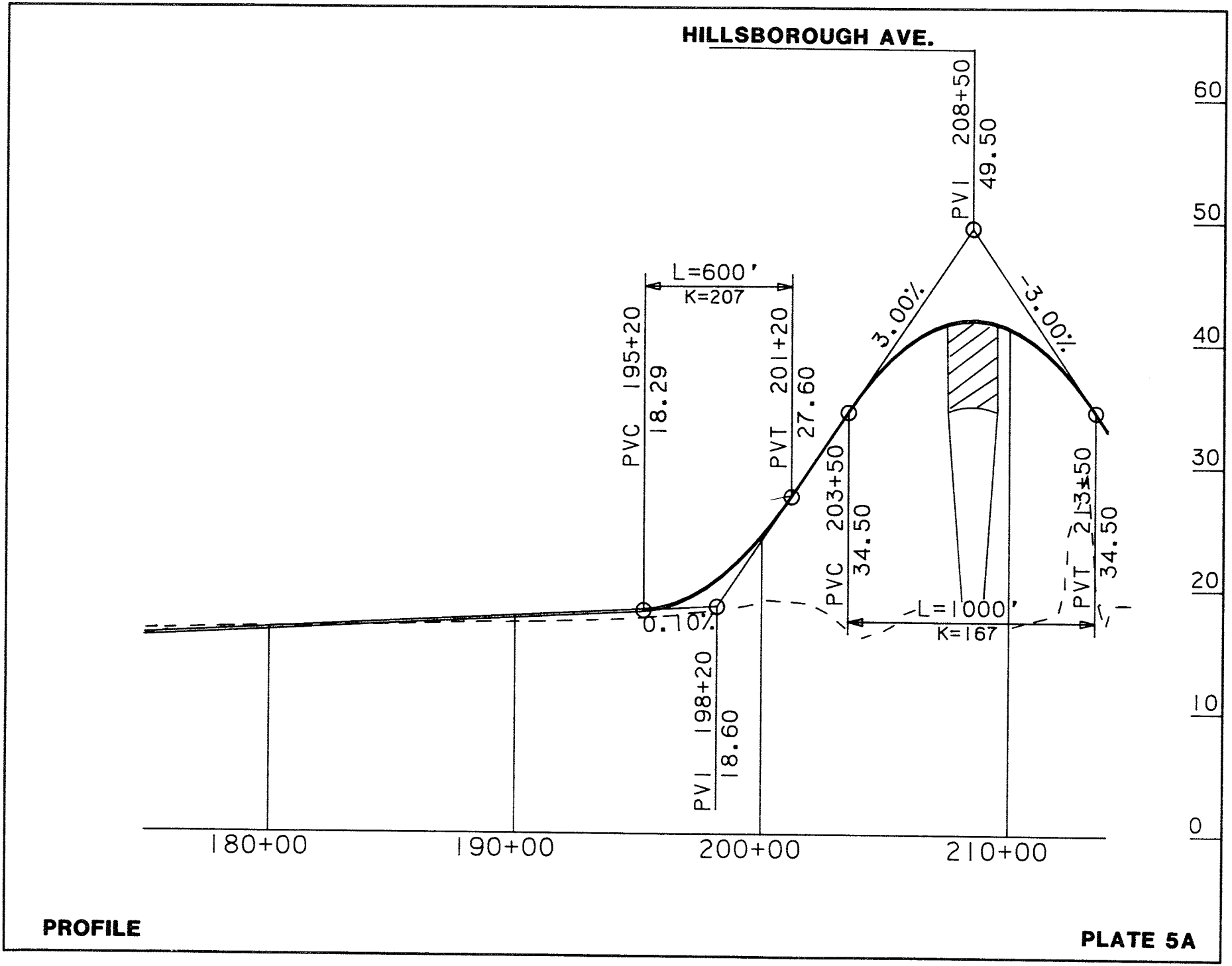
PROFILE

PLATE 4A


N
MATCHLINE STA. 175+00
180
190
200
210
MATCHLINE STA. 215+00
EISENHOWER BLVD. SR 589
HILLSBOROUGH AVE.
TAMPA INTERNATIONAL AIRPORT

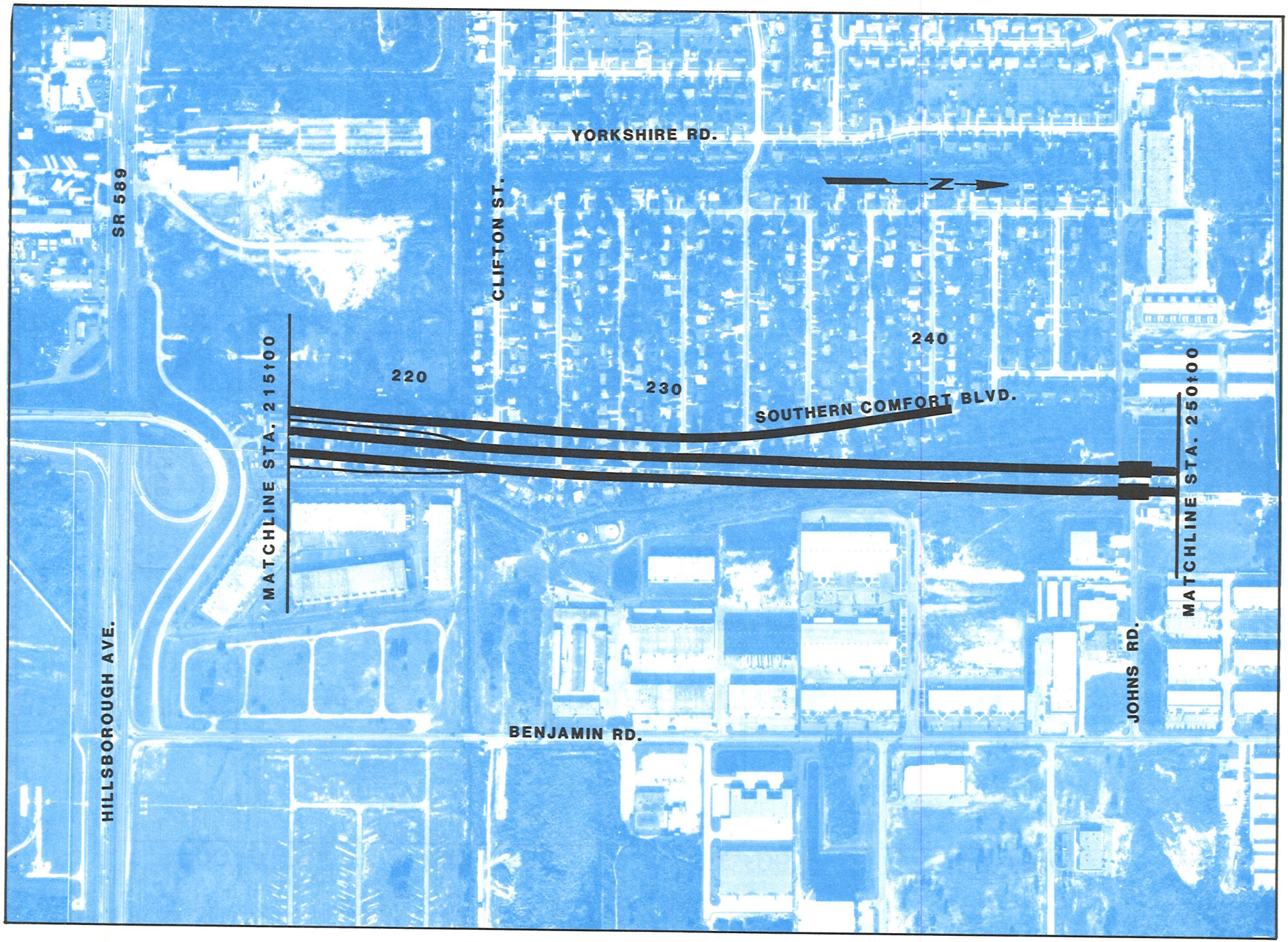
PLAN

PLATE 5



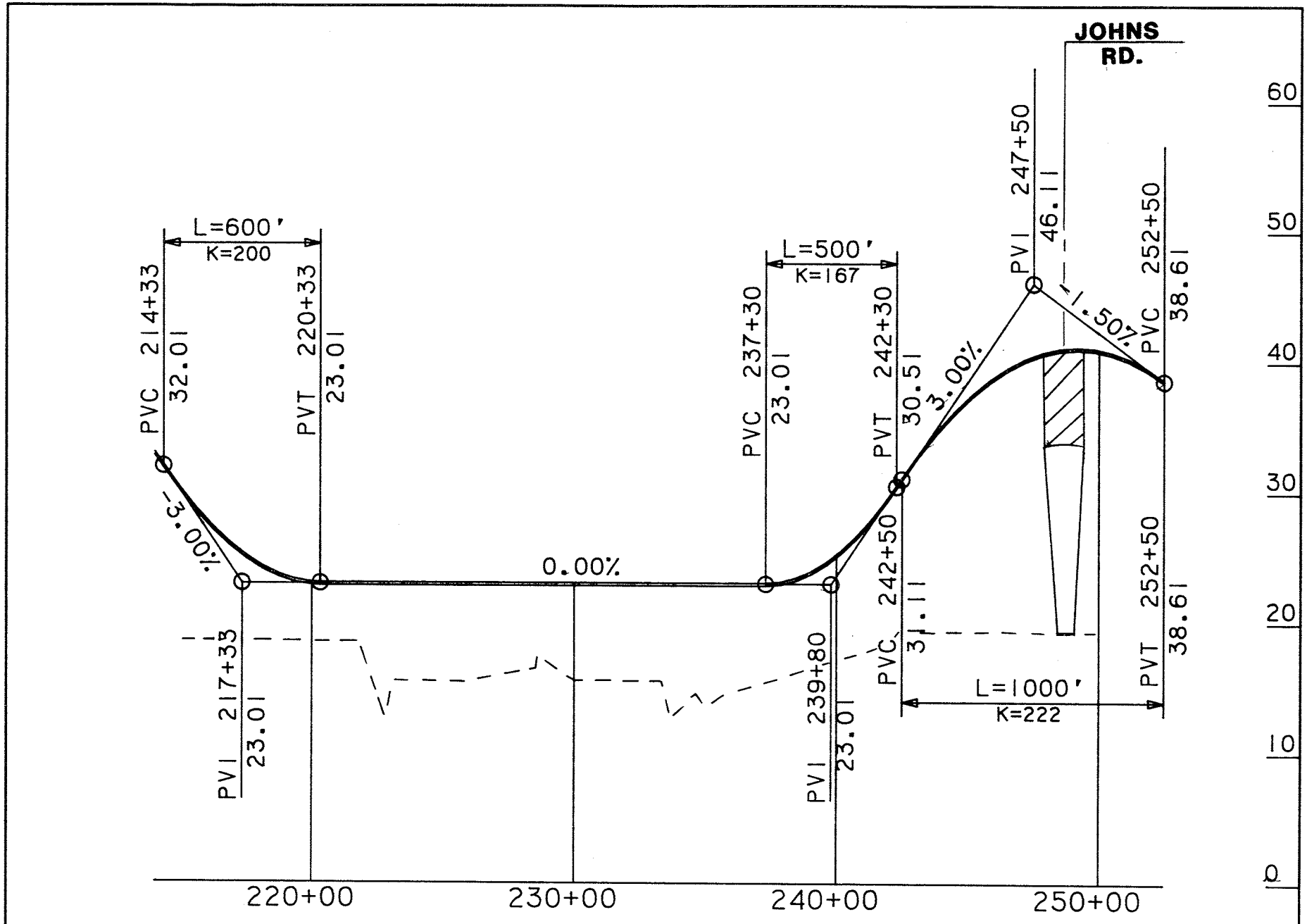
PROFILE

PLATE 5A


YORKSHIRE RD.
SR 589
CLIFTON ST.
N
220
230
240
SOUTHERN COMFORT BLVD.
MATCHLINE STA. 215+00
MATCHLINE STA. 250+00
HILLSBOROUGH AVE.
BENJAMIN RD.
JOHNS RD.

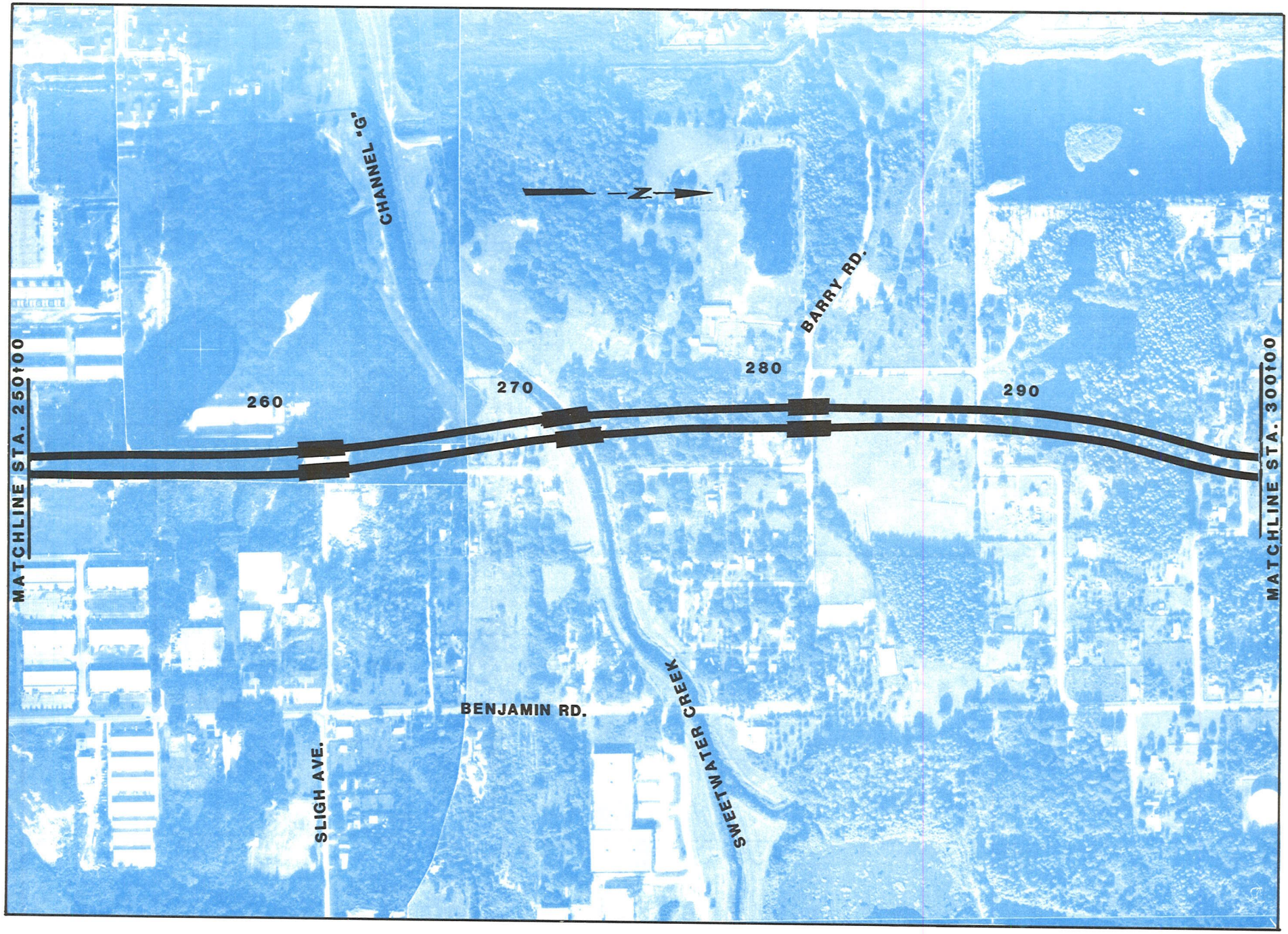
PLAN

PLATE 6



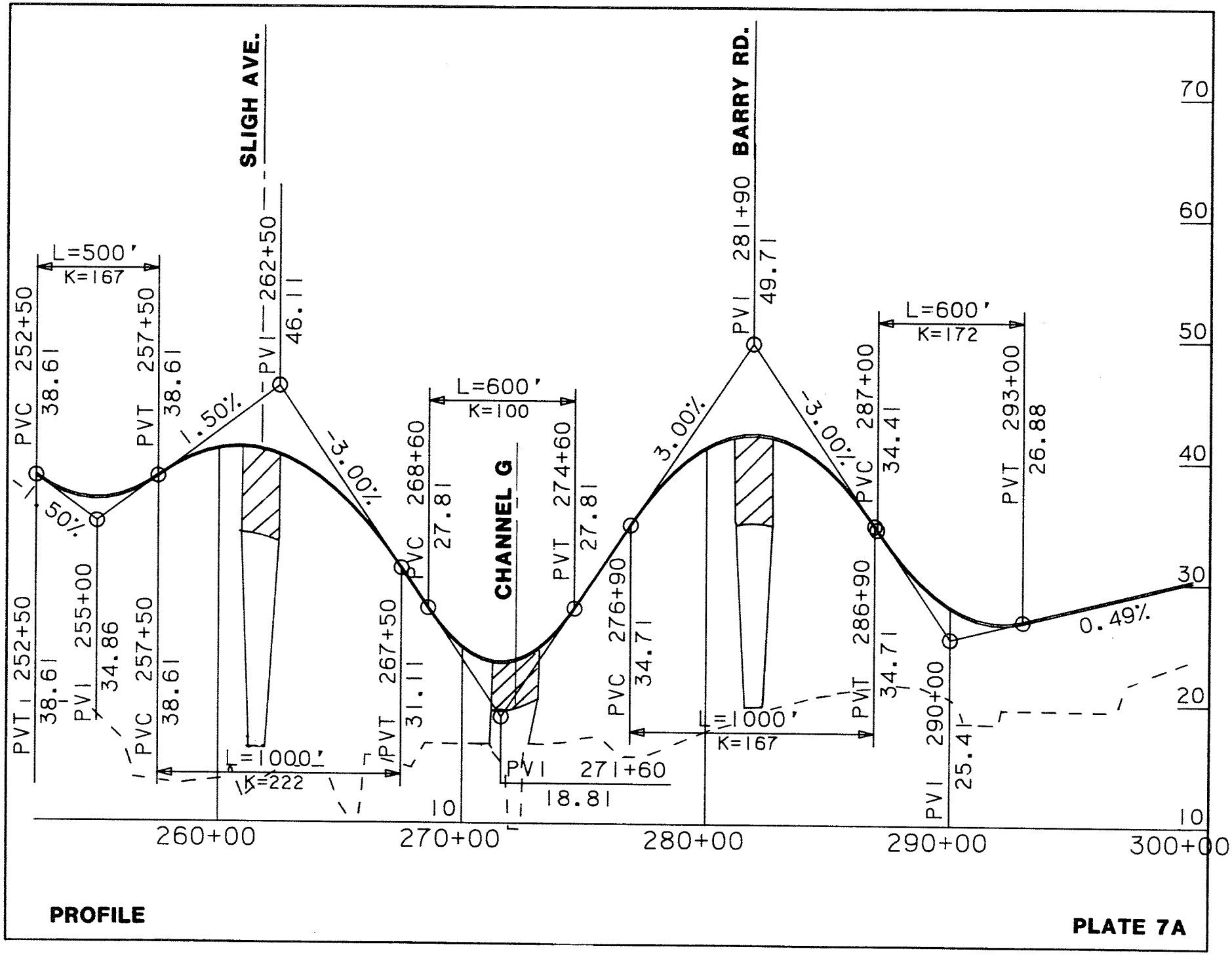
PROFILE

PLATE 6A


CHANNEL 'G'
N
BARRY RD.
MATCHLINE STA. 250+00
260
270
280
290
MATCHLINE STA. 300+00
BENJAMIN RD.
SLIGH AVE.
SWEETWATER CREEK

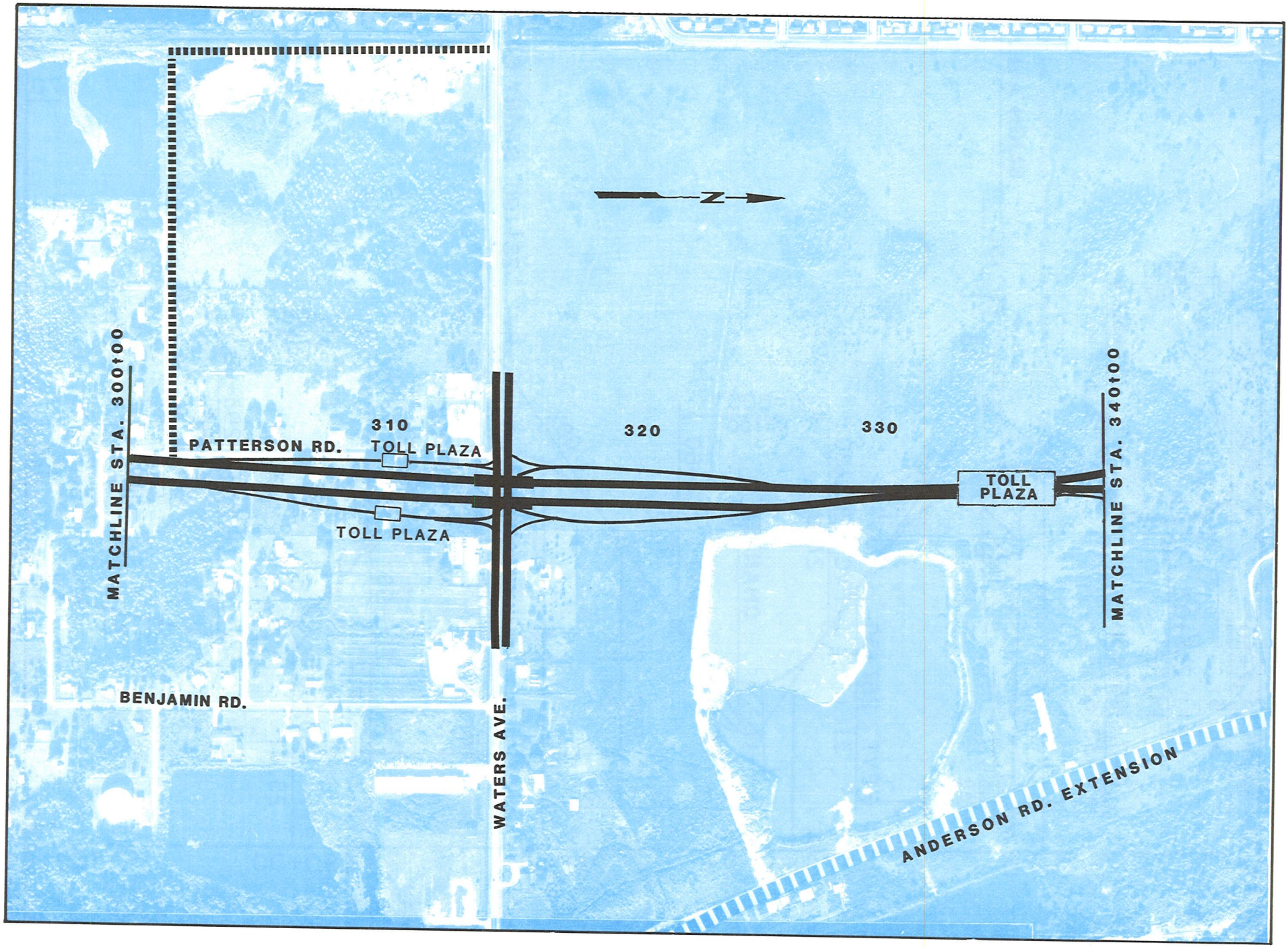
PLAN

PLATE 7



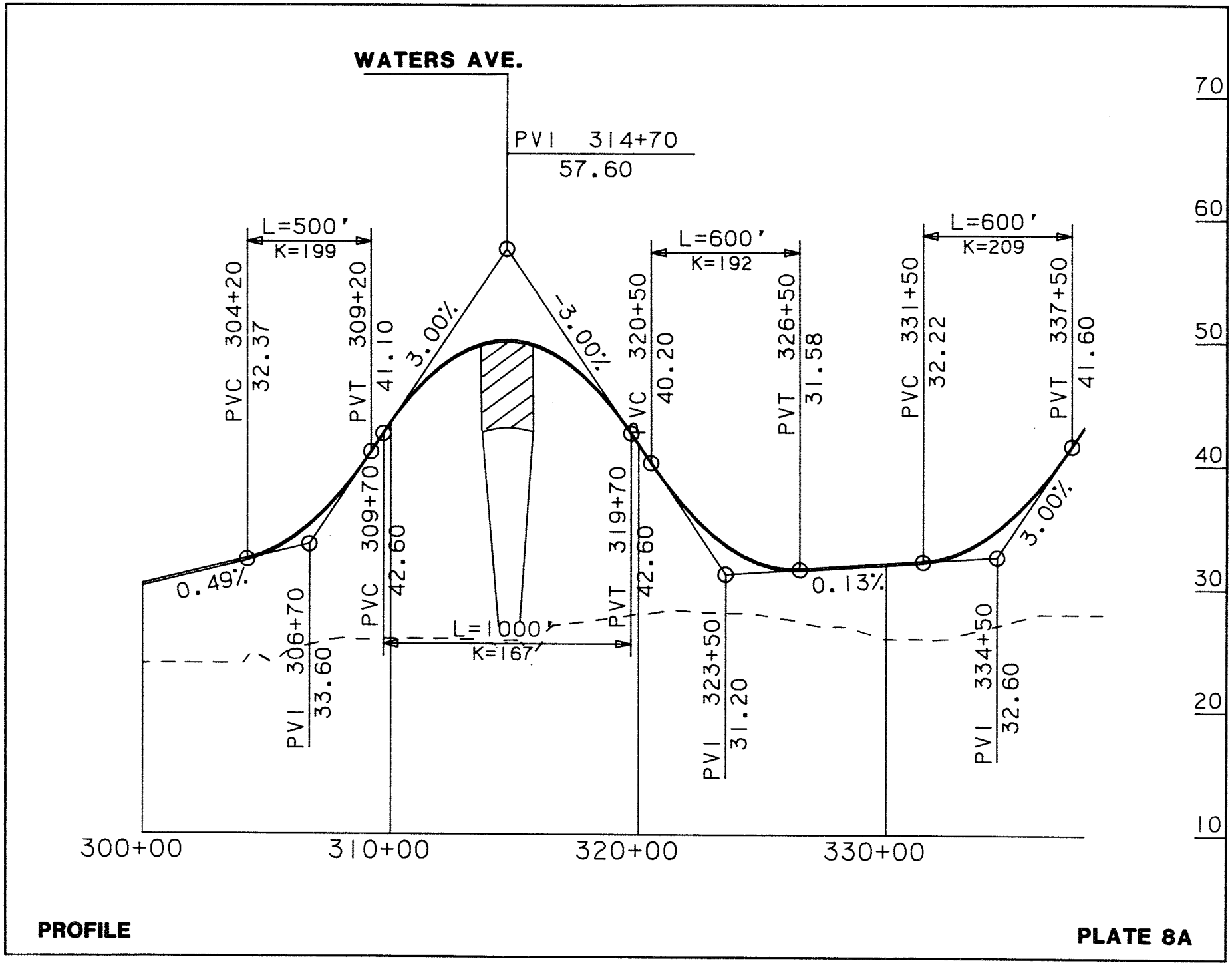
PROFILE

PLATE 7A


N
MATCHLINE STA. 300+00
PATTERSON RD.
310
TOLL PLAZA
320
330
TOLL PLAZA
TOLL PLAZA
MATCHLINE STA. 340+00
BENJAMIN RD.
WATERS AVE.
ANDERSON RD. EXTENSION

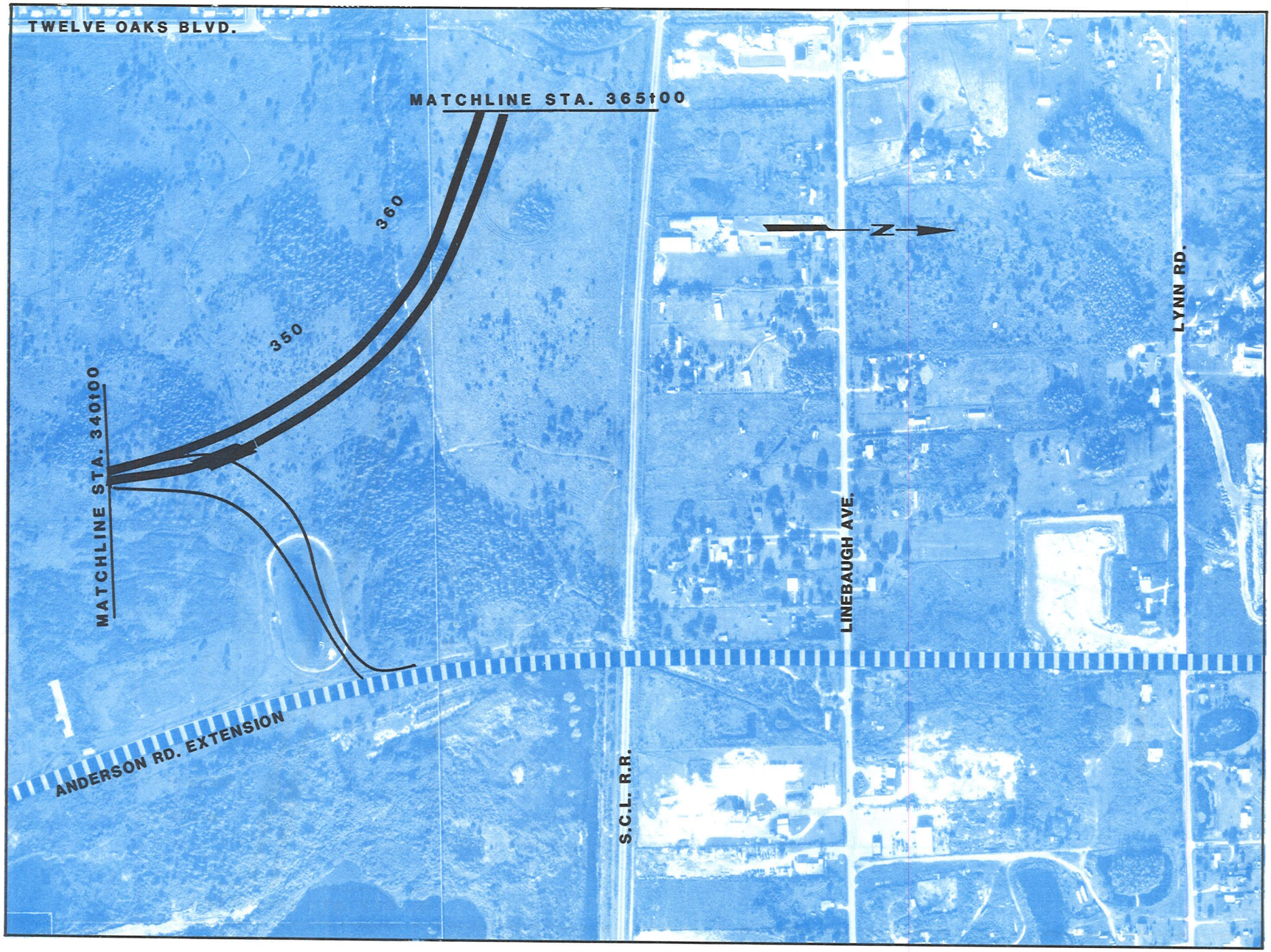
PLAN

PLATE 8



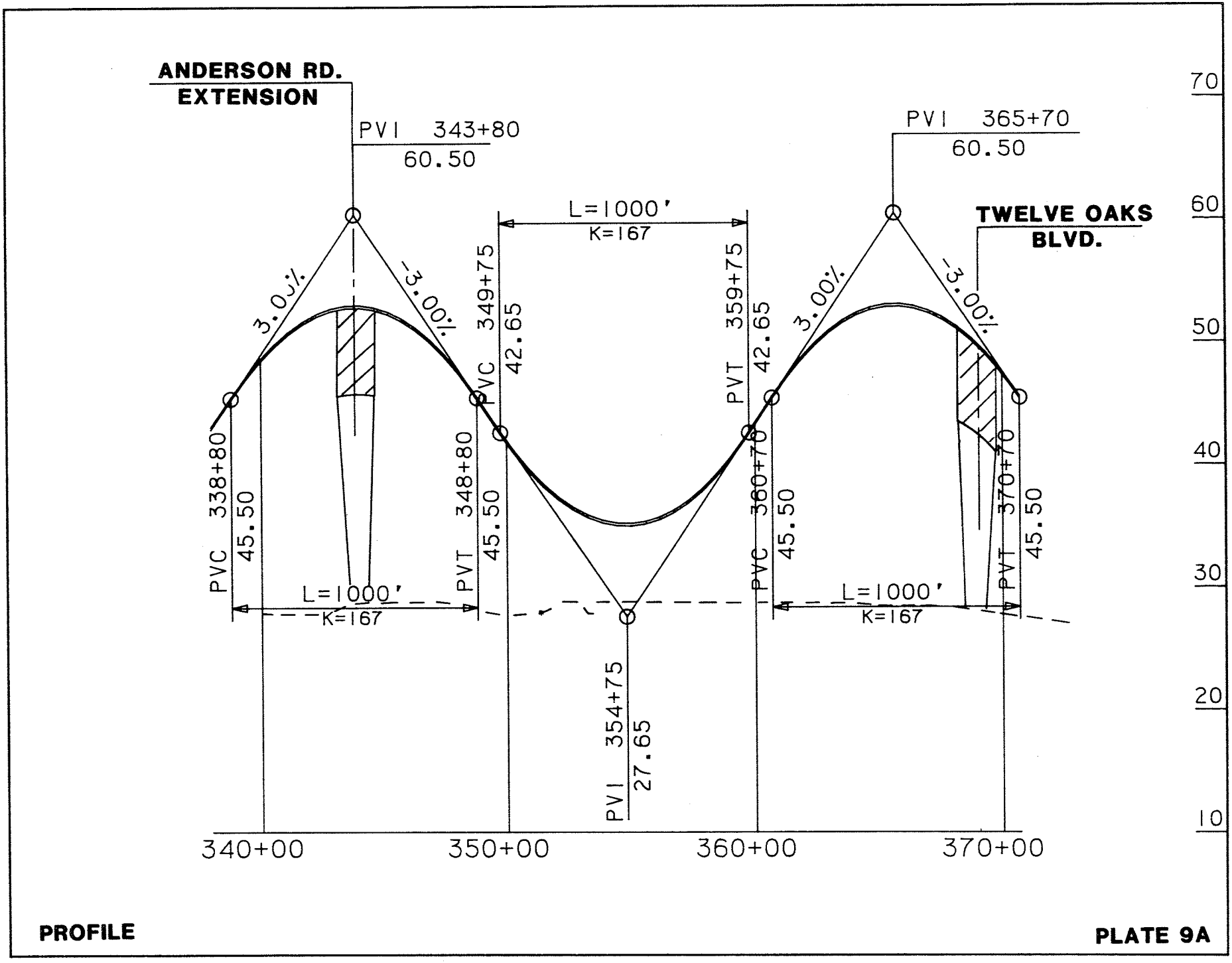
PROFILE

PLATE 8A


TWELVE OAKS BLVD.
MATCHLINE STA. 365+00
360
350
MATCHLINE STA. 340+00
N
LYNN RD.
LINEBAUGH AVE.
ANDERSON RD. EXTENSION
S.C.L. R.R.

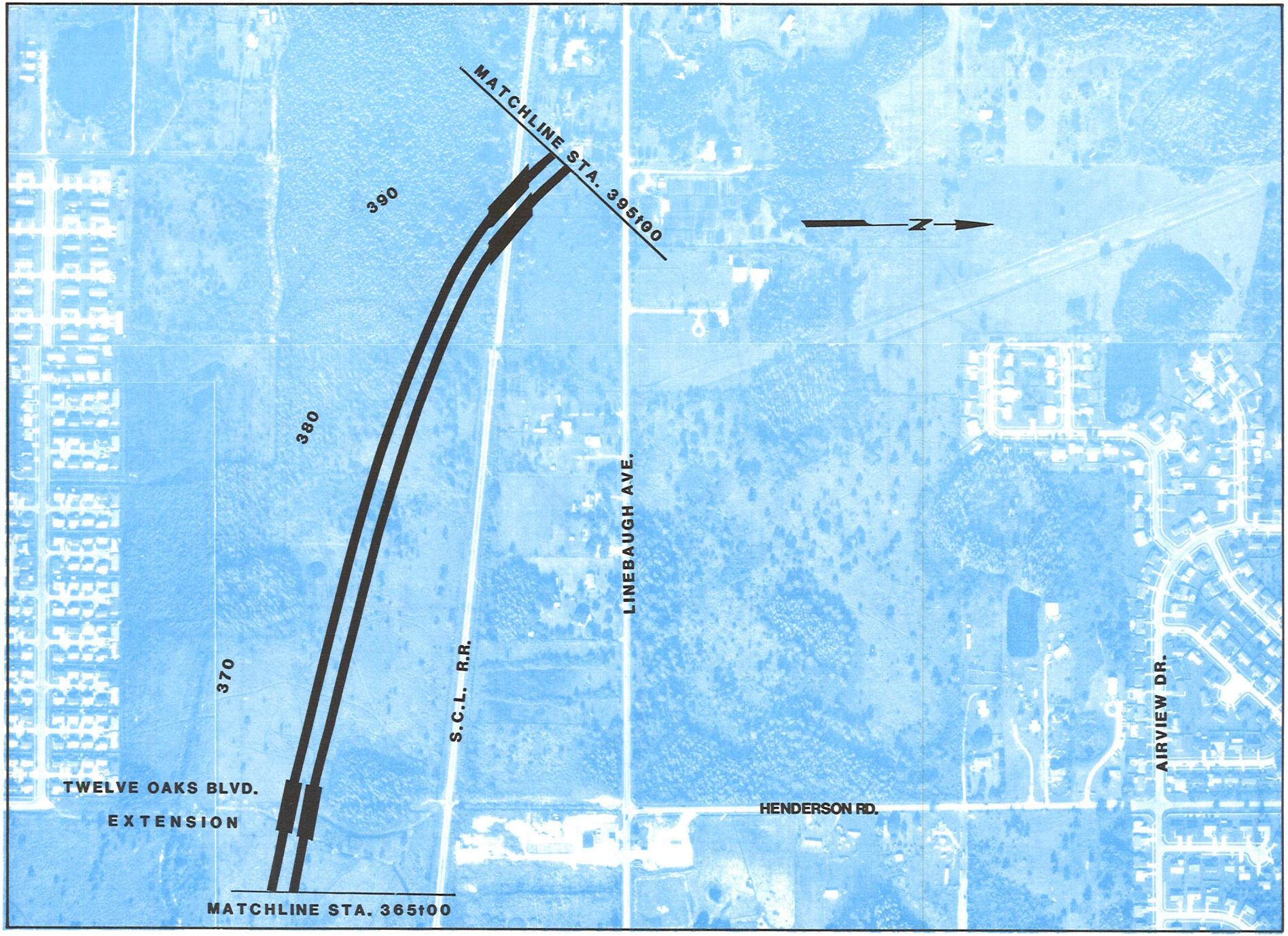
PLAN

PLATE 9



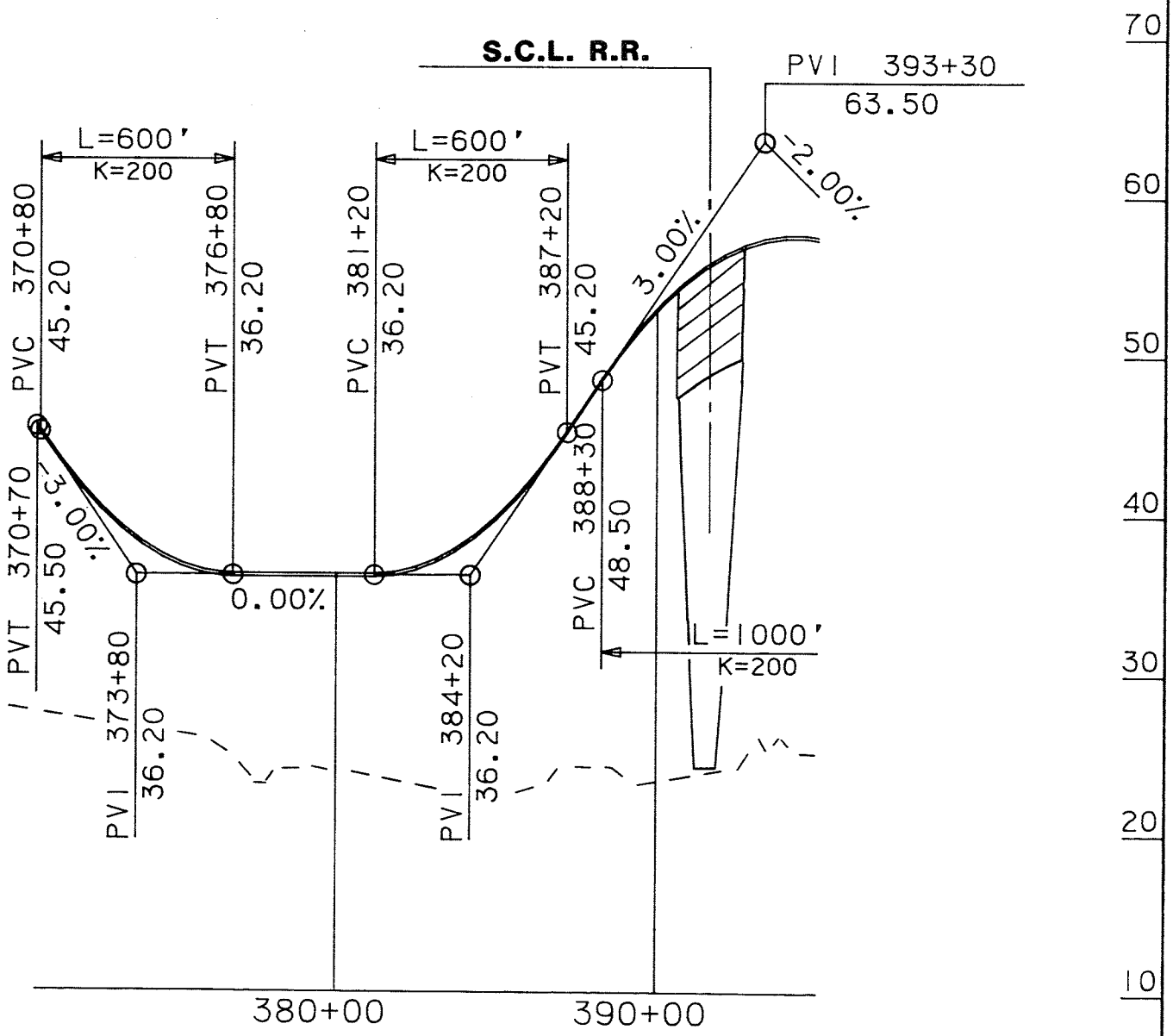
PROFILE

PLATE 9A



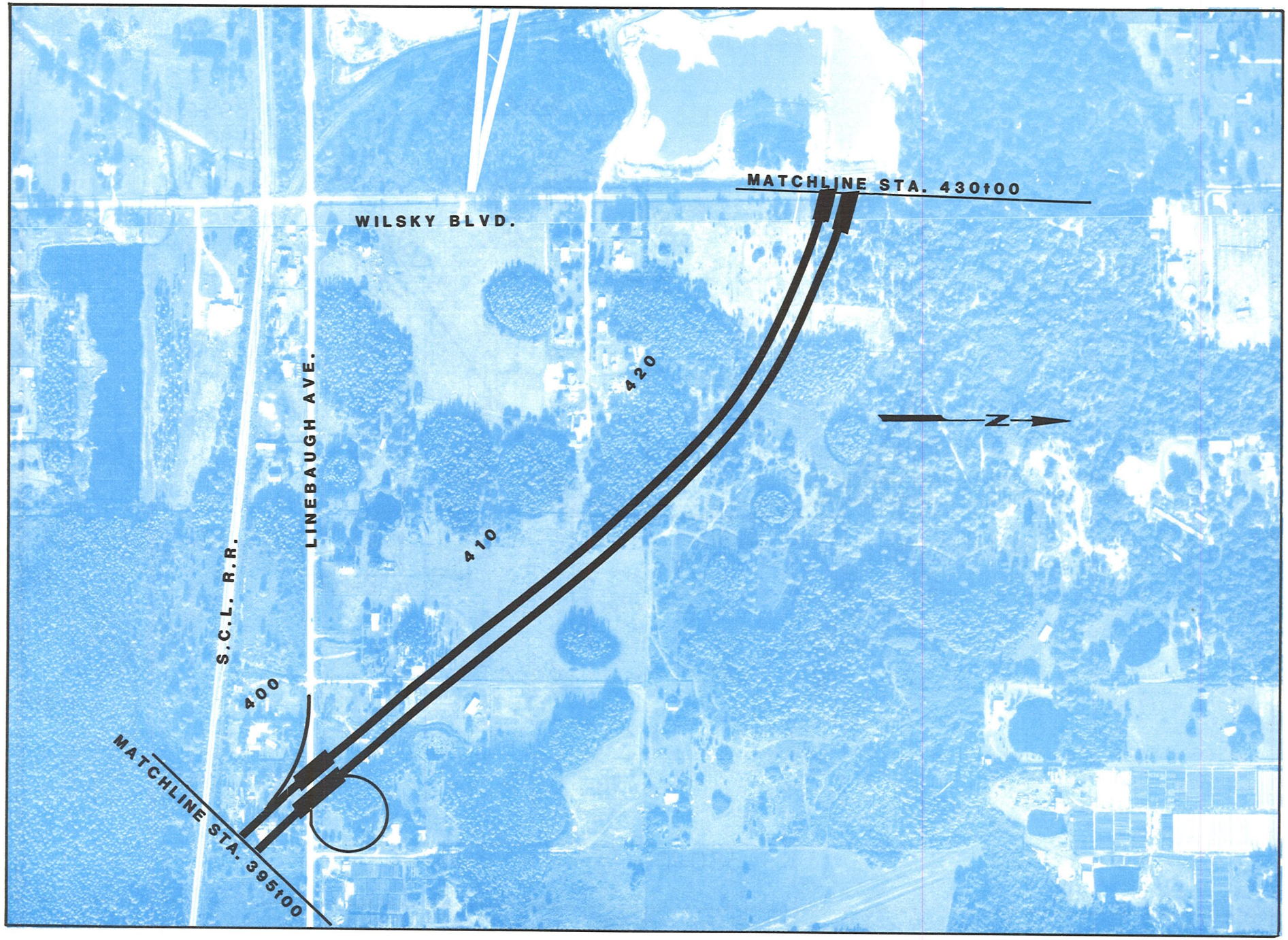
PLAN

PLATE 10



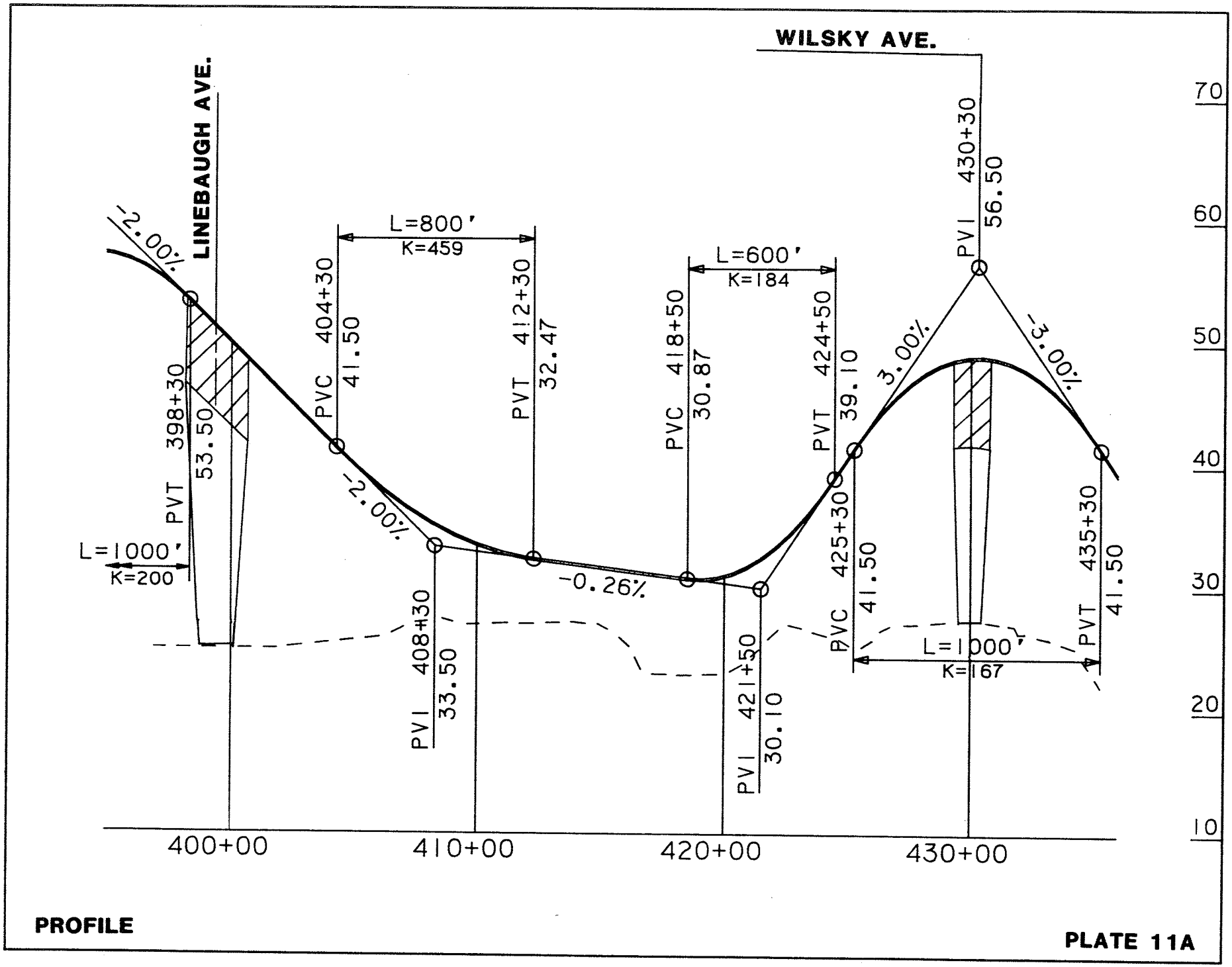
PROFILE

PLATE 10A



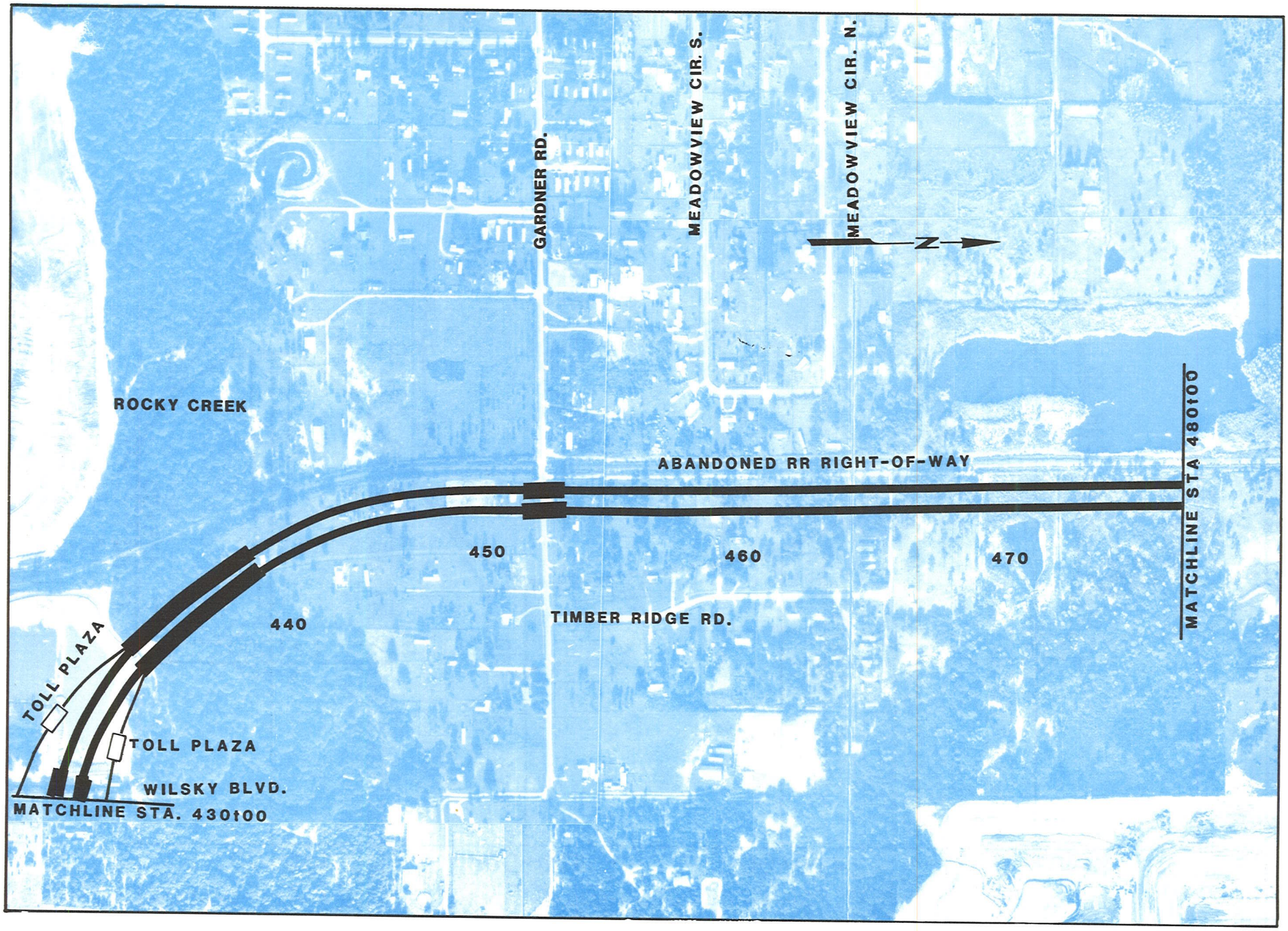
PLAN

PLATE 11



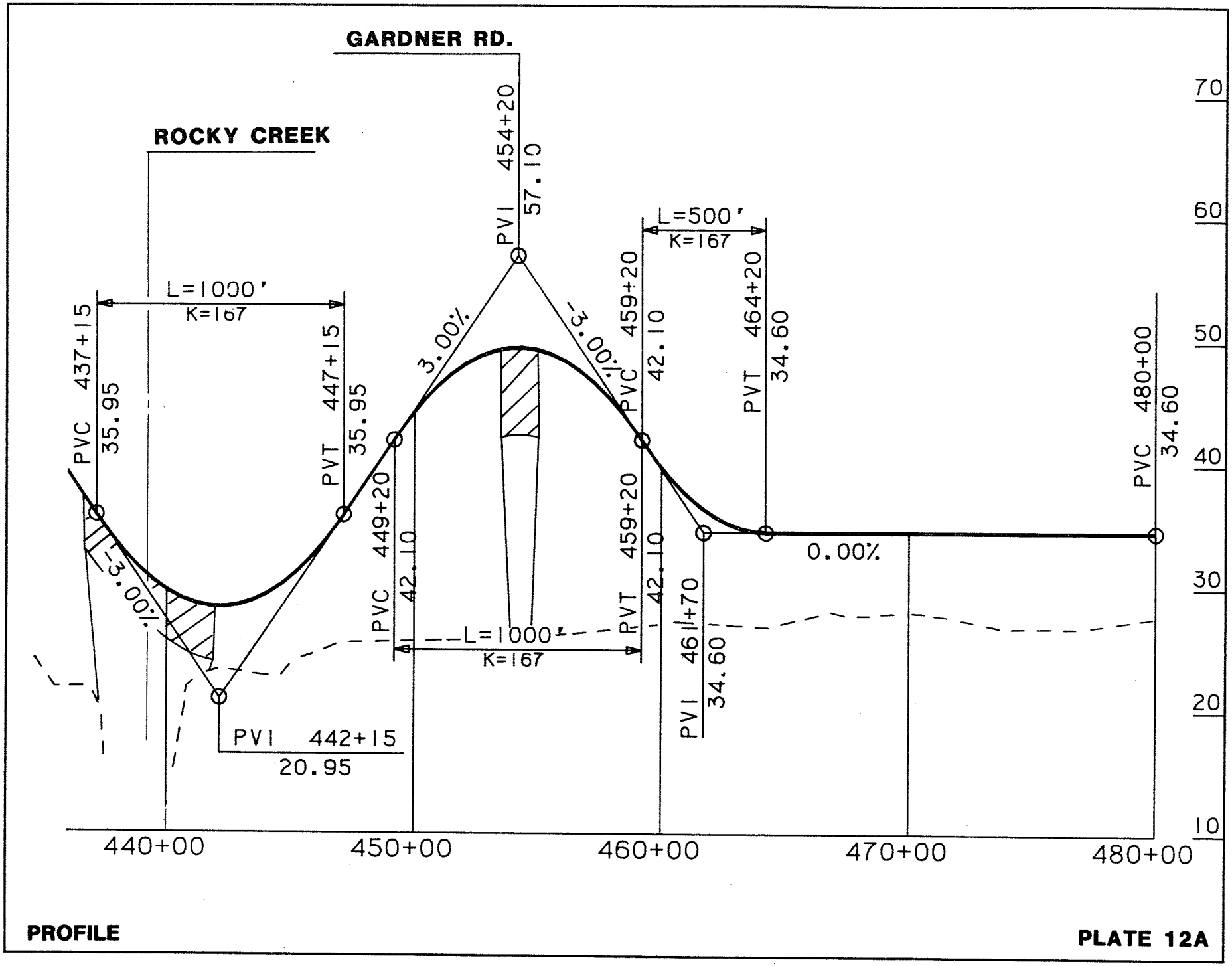
PROFILE

PLATE 11A



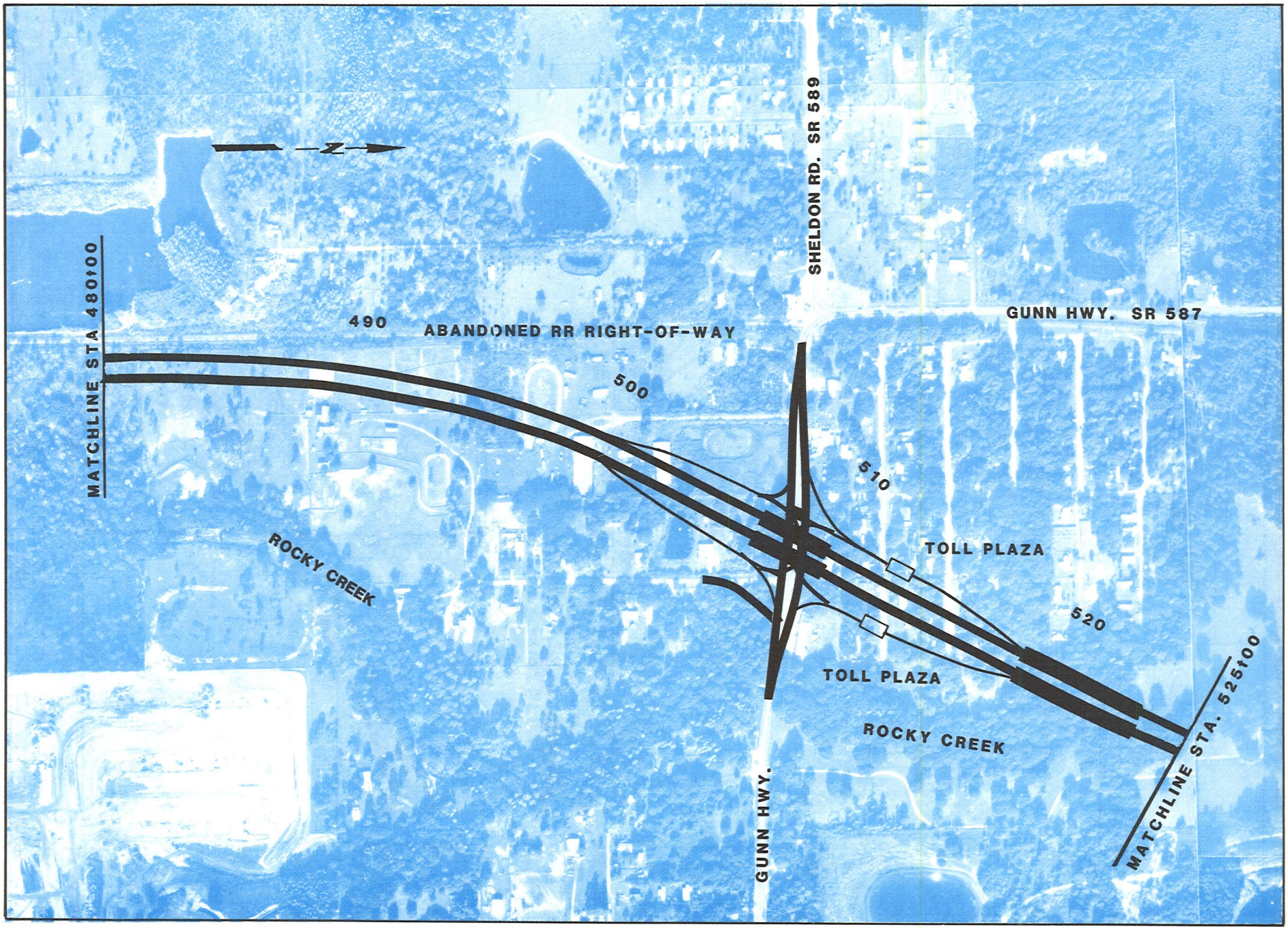
PLAN

PLATE 12



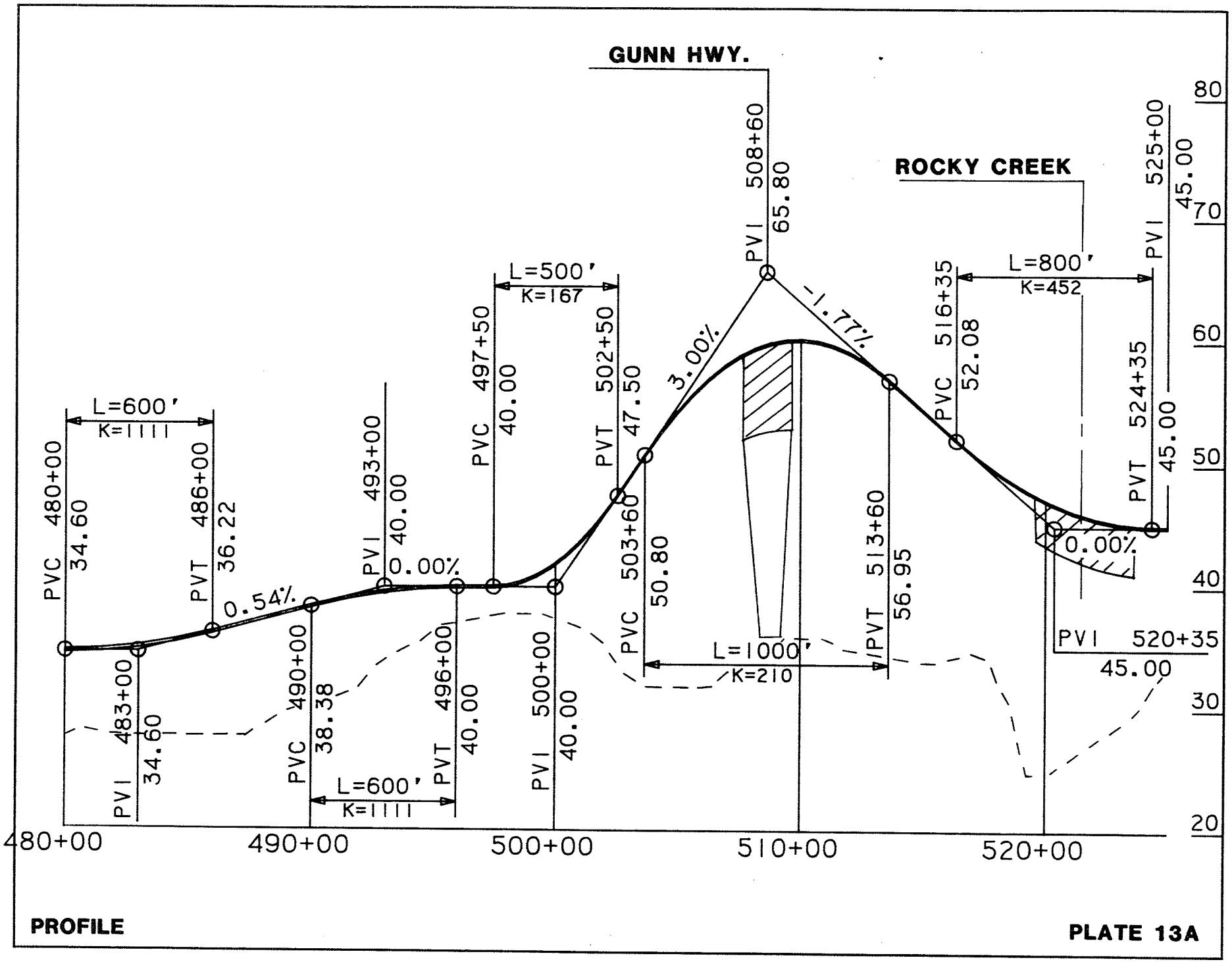
PROFILE

PLATE 12A



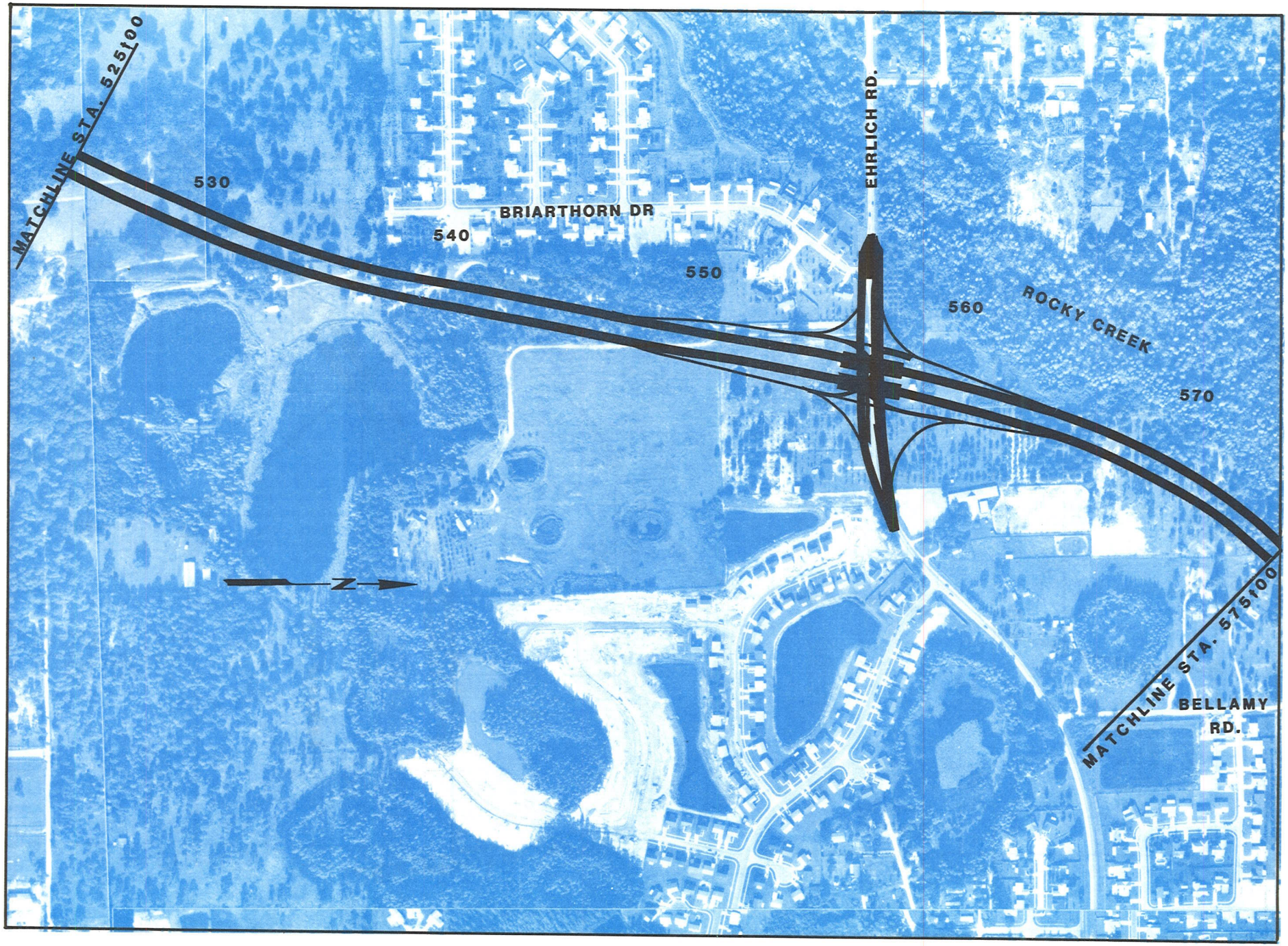
PLAN

PLATE 13



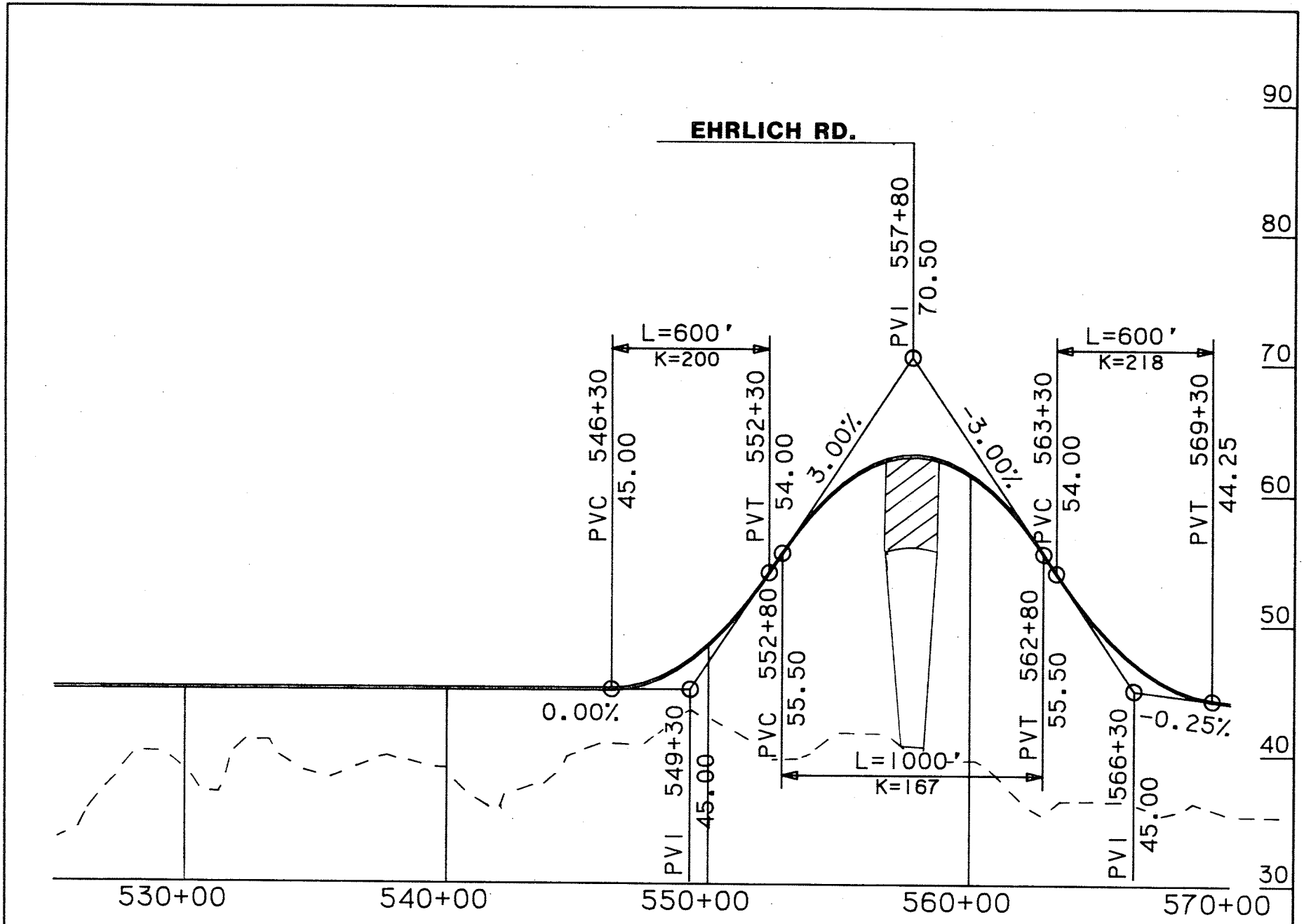
PROFILE

PLATE 13A



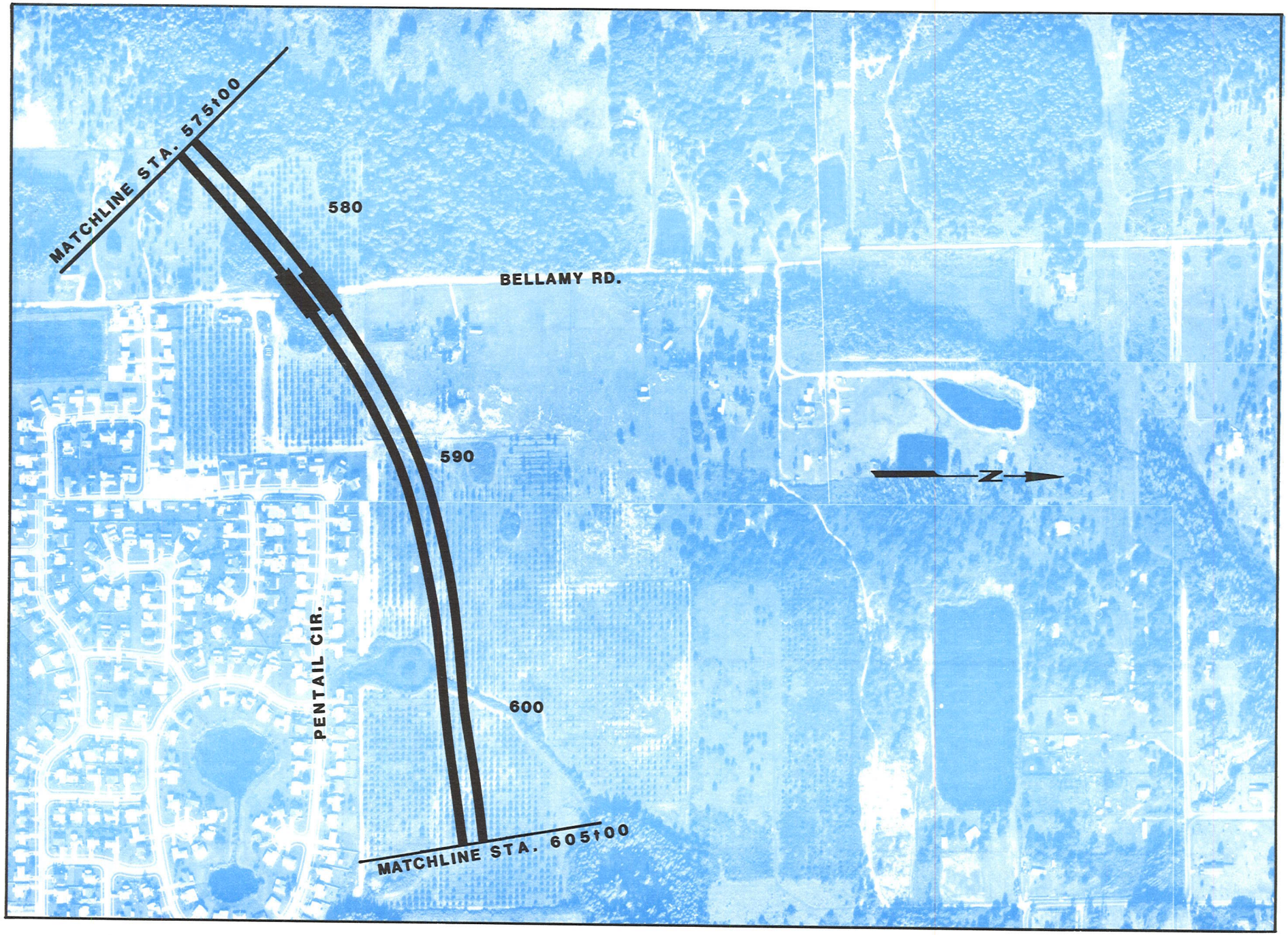
PLAN

PLATE 14



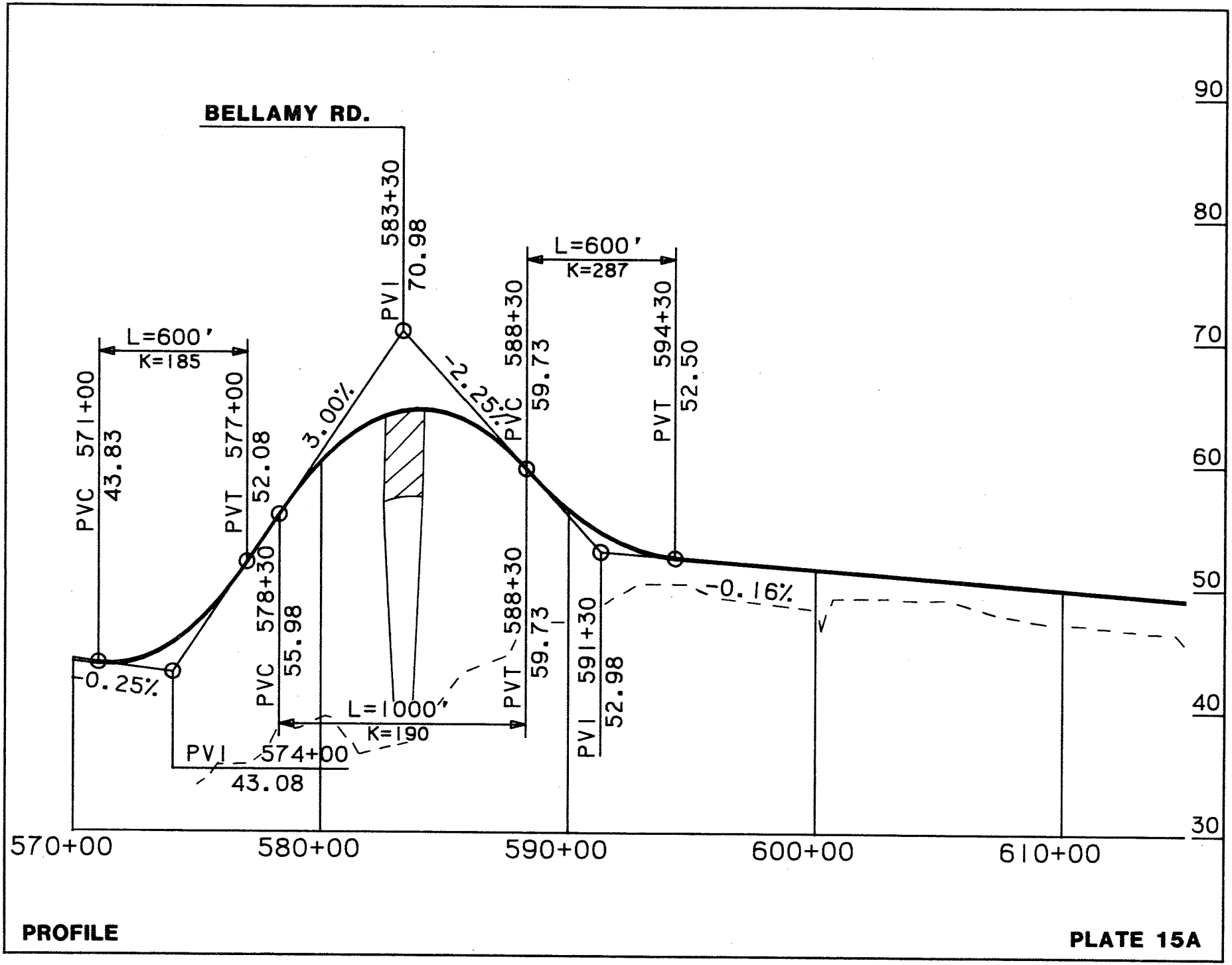
PROFILE

PLATE 14A



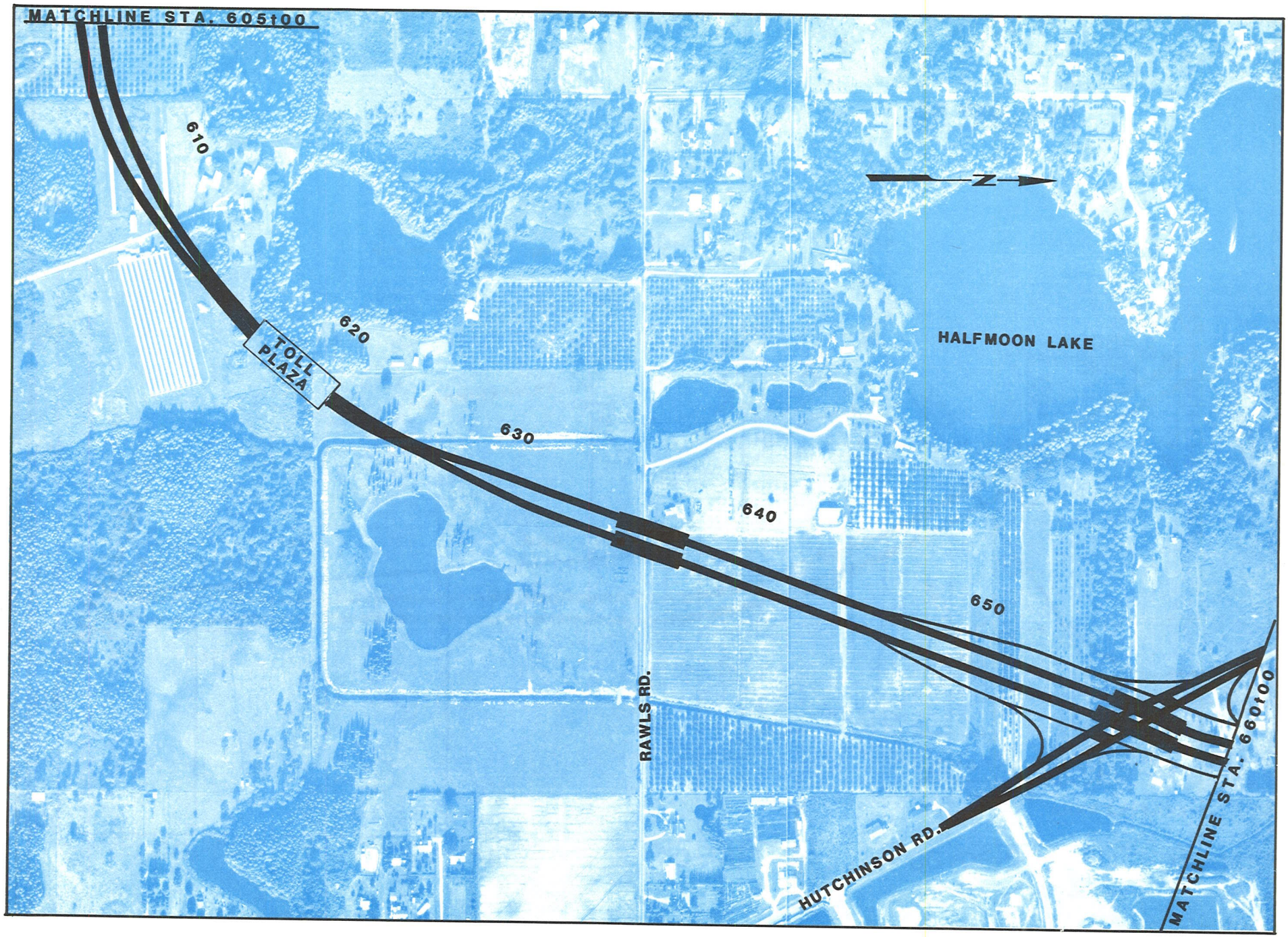
PLAN

PLATE 15



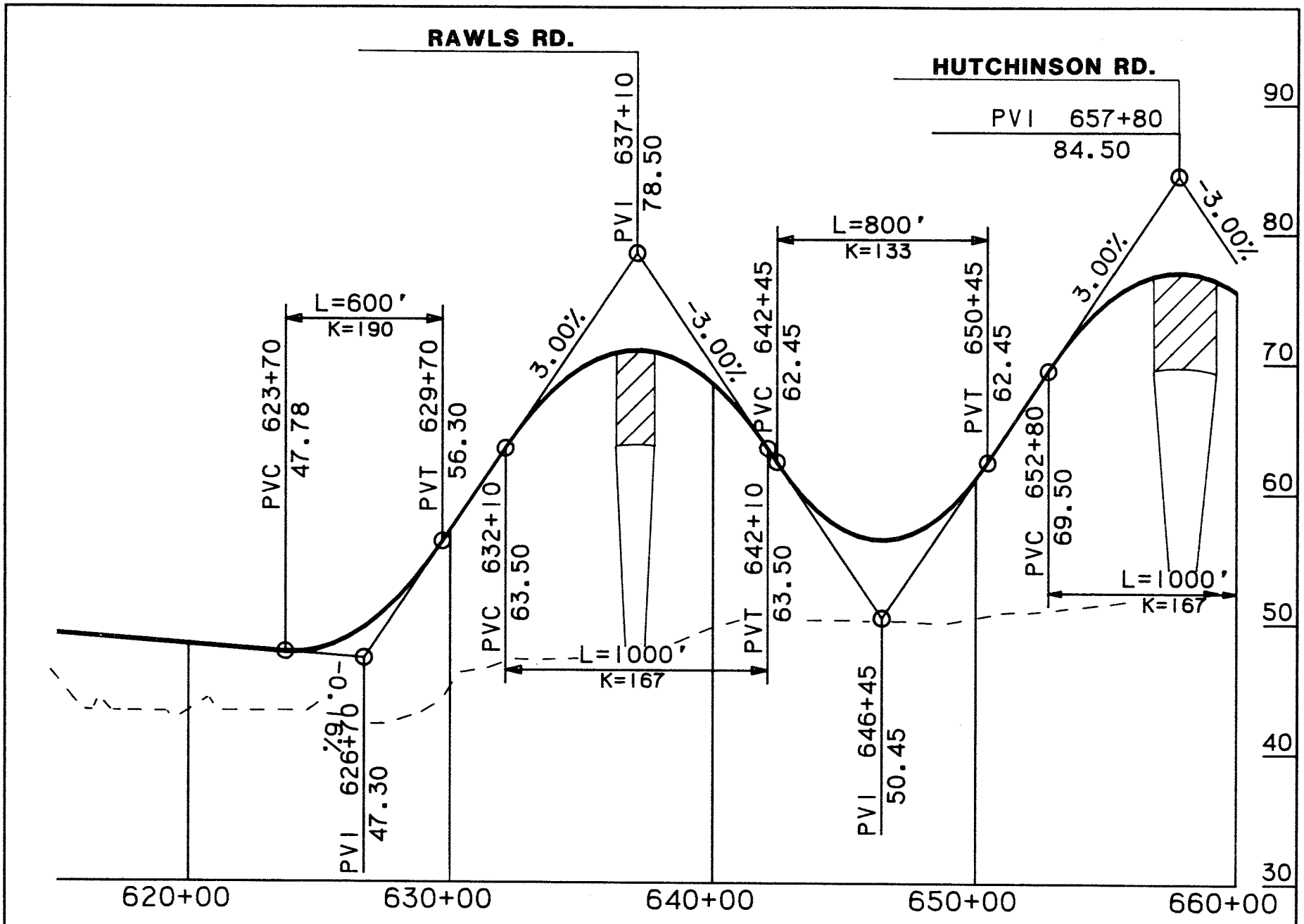
PROFILE

PLATE 15A



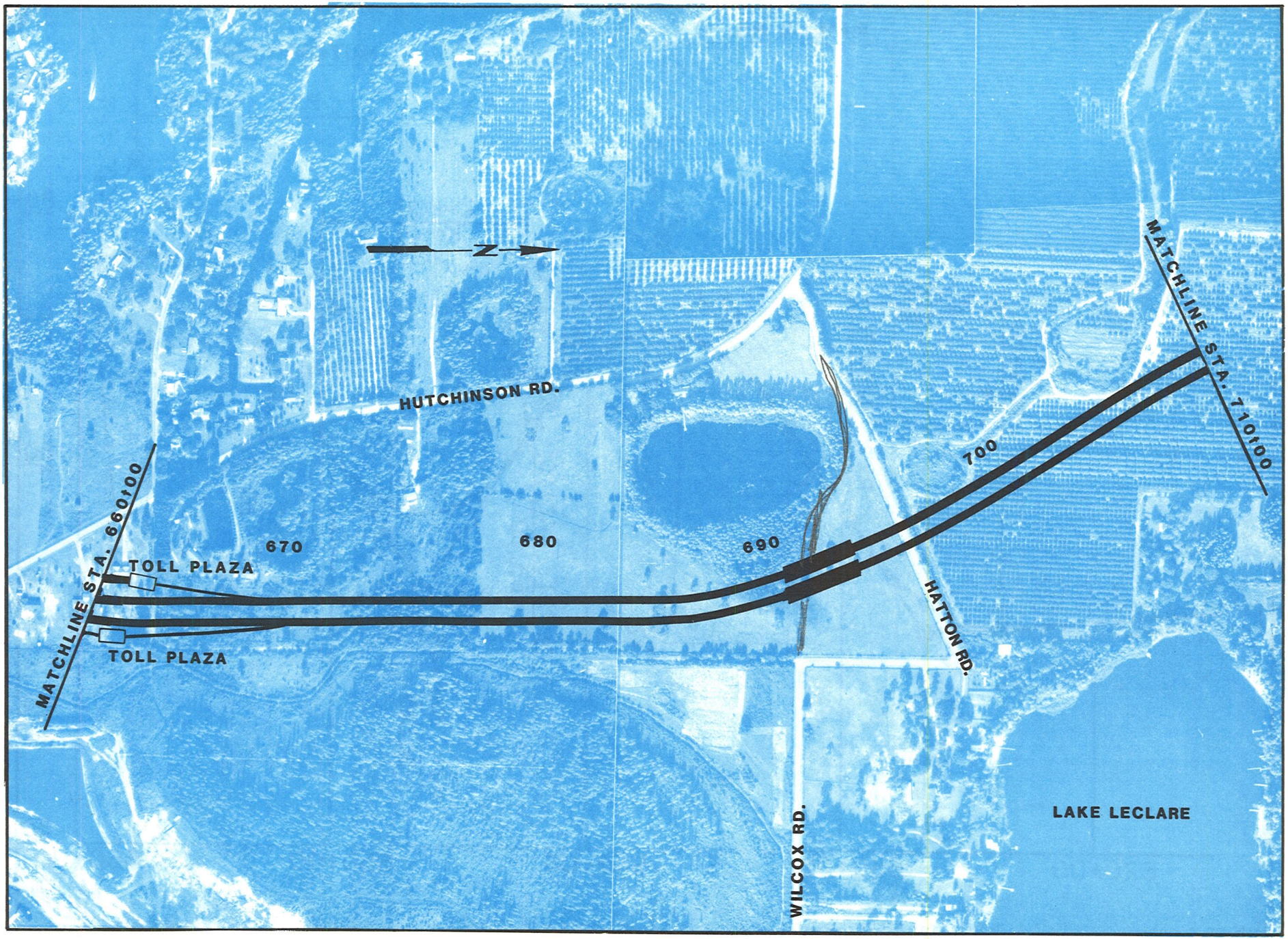
PLAN

PLATE 16



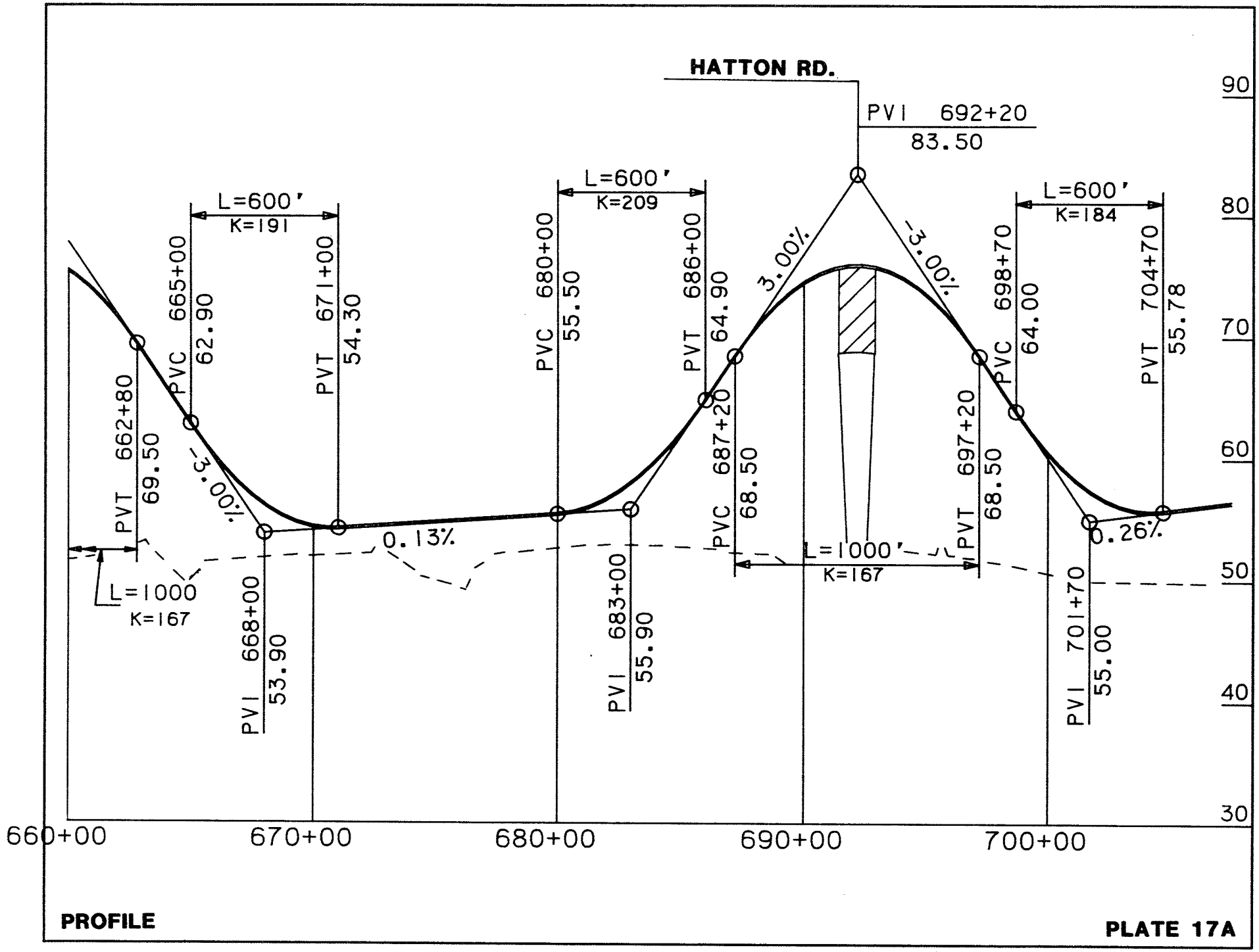
PROFILE

PLATE 16A



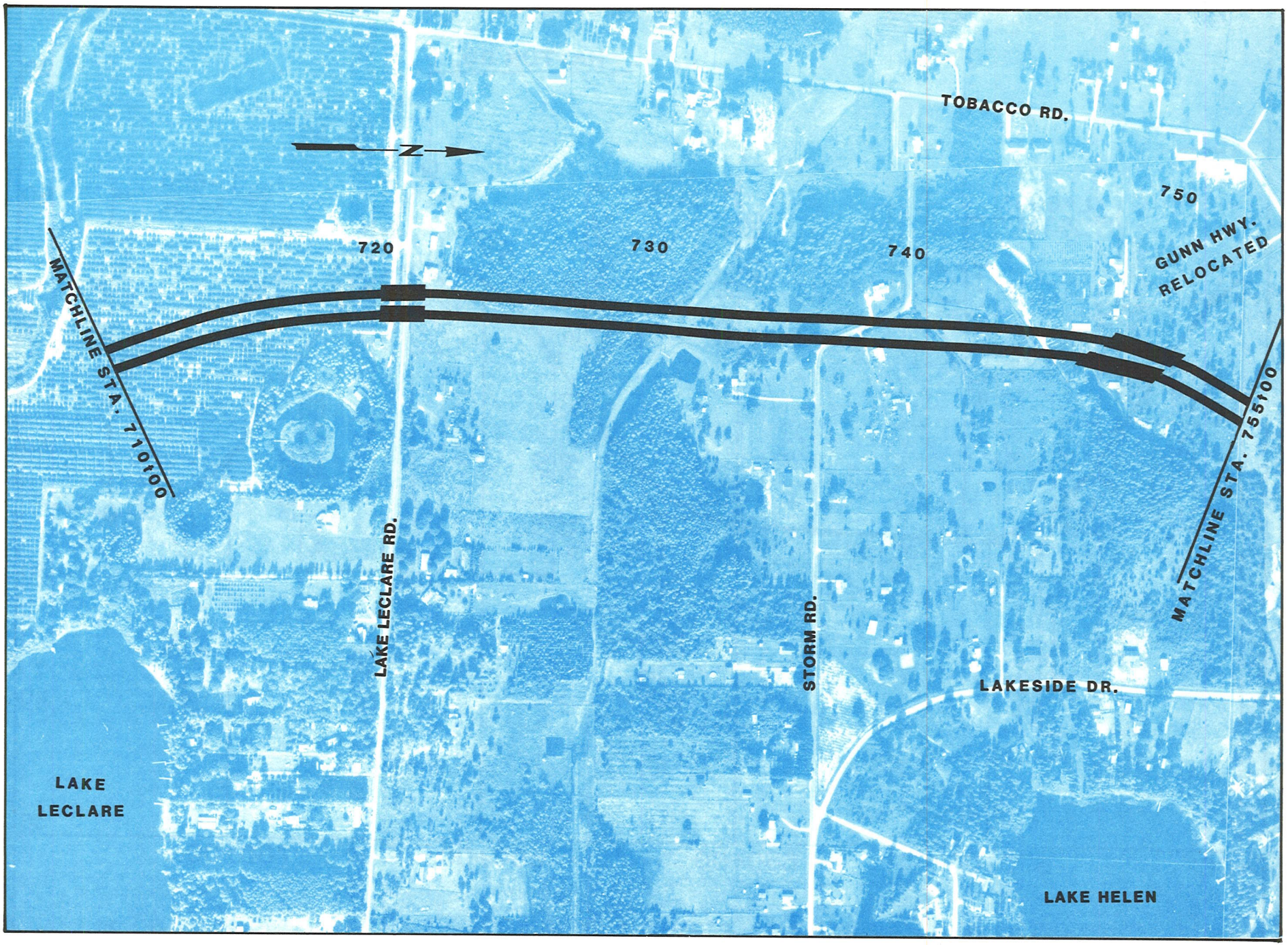
PLAN

PLATE 17



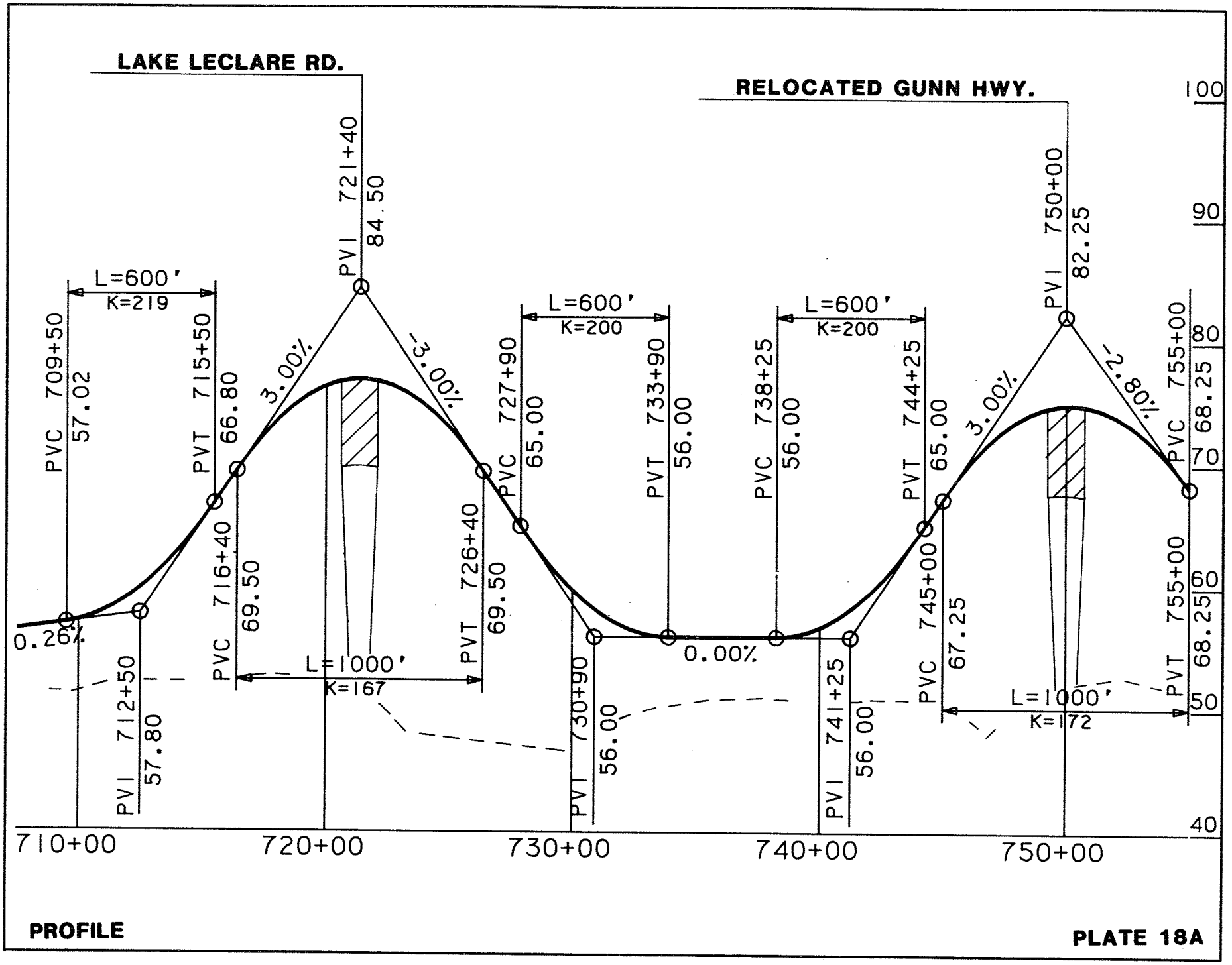
PROFILE

PLATE 17A



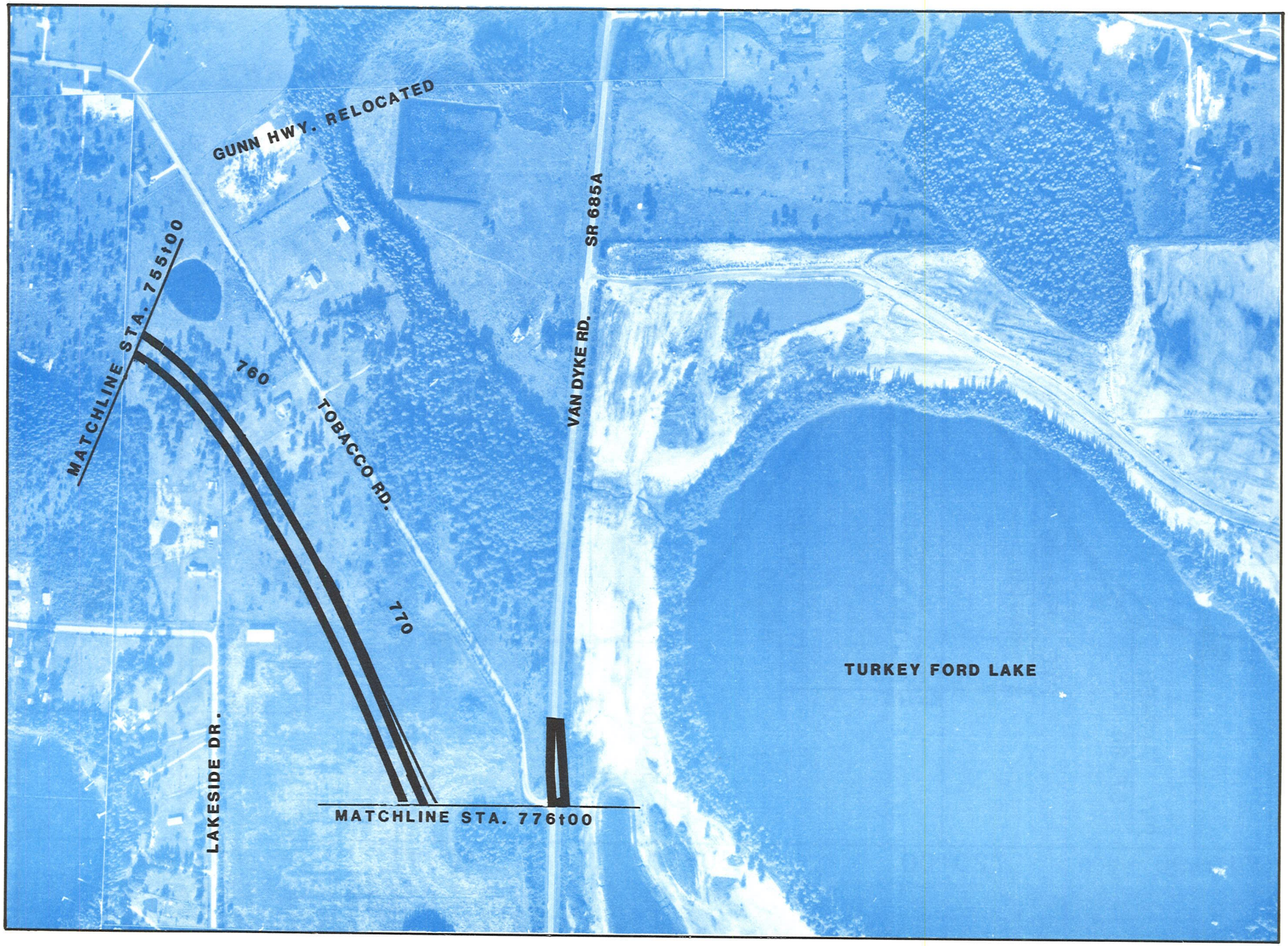
PLAN

PLATE 18



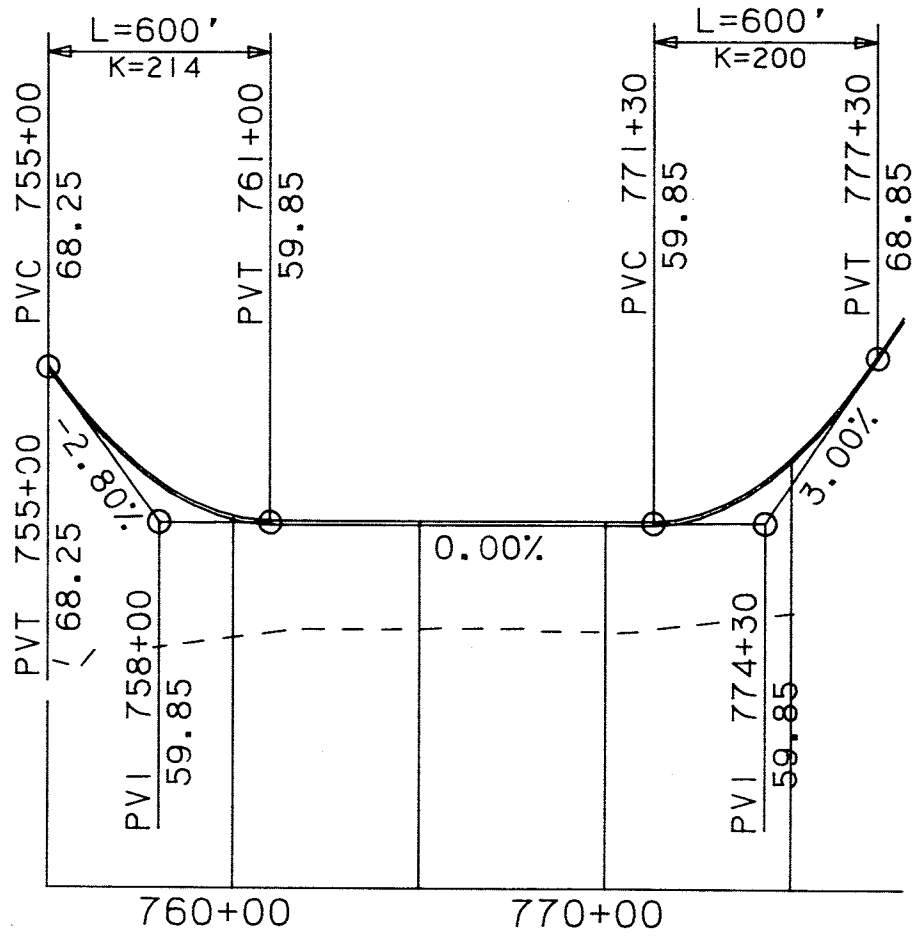
PROFILE

PLATE 18A



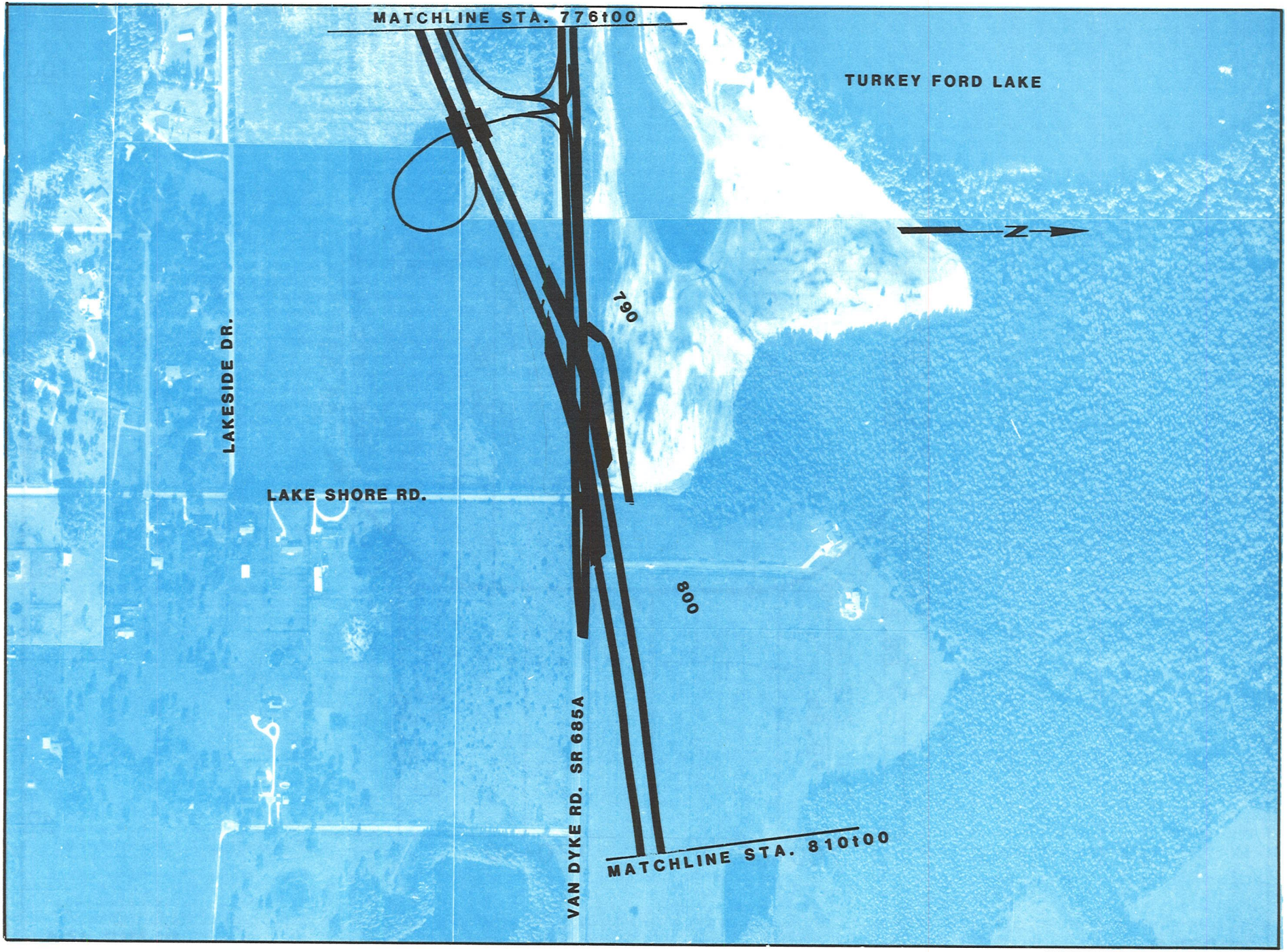
PLAN

PLATE 19



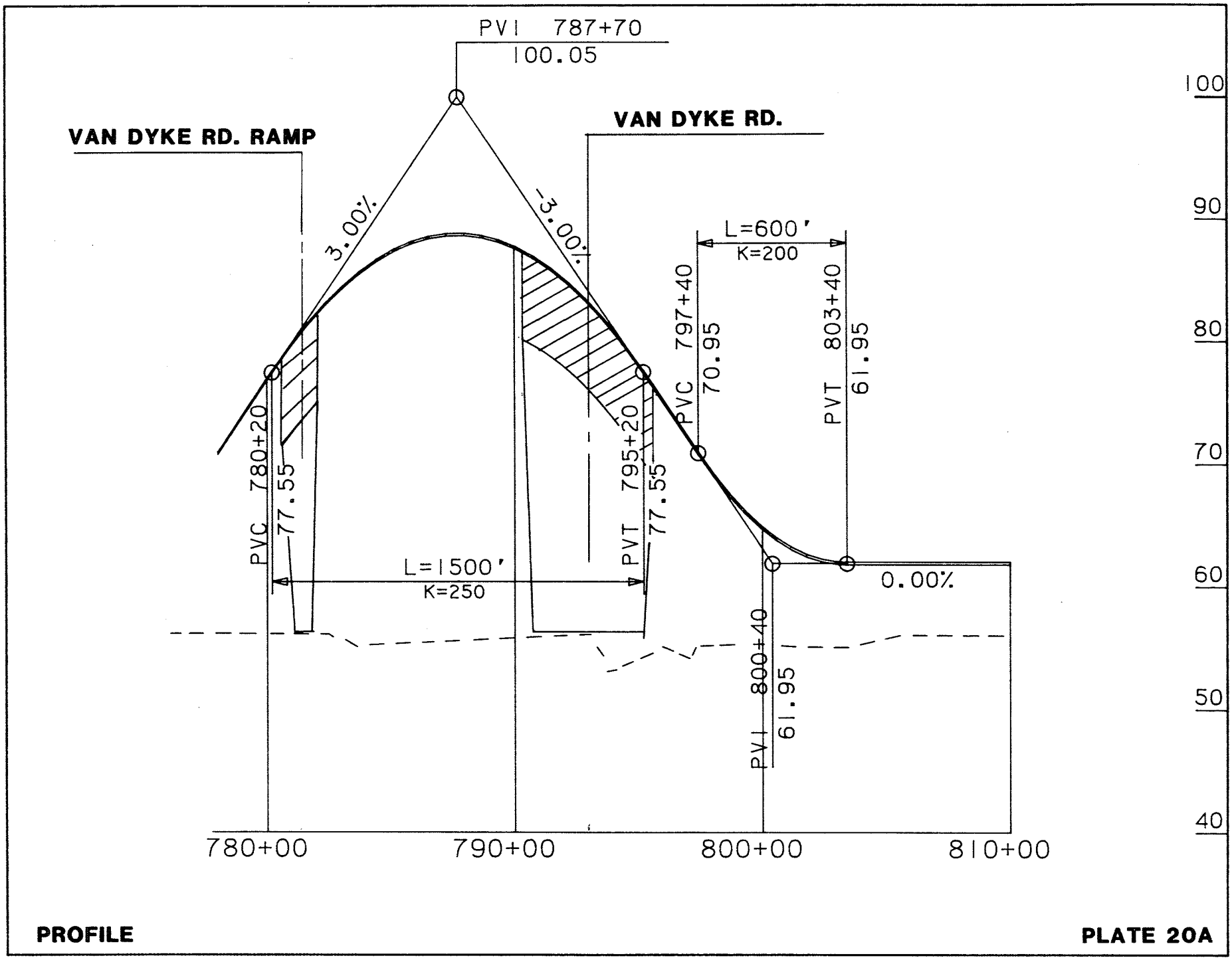
PROFILE

PLATE 19A



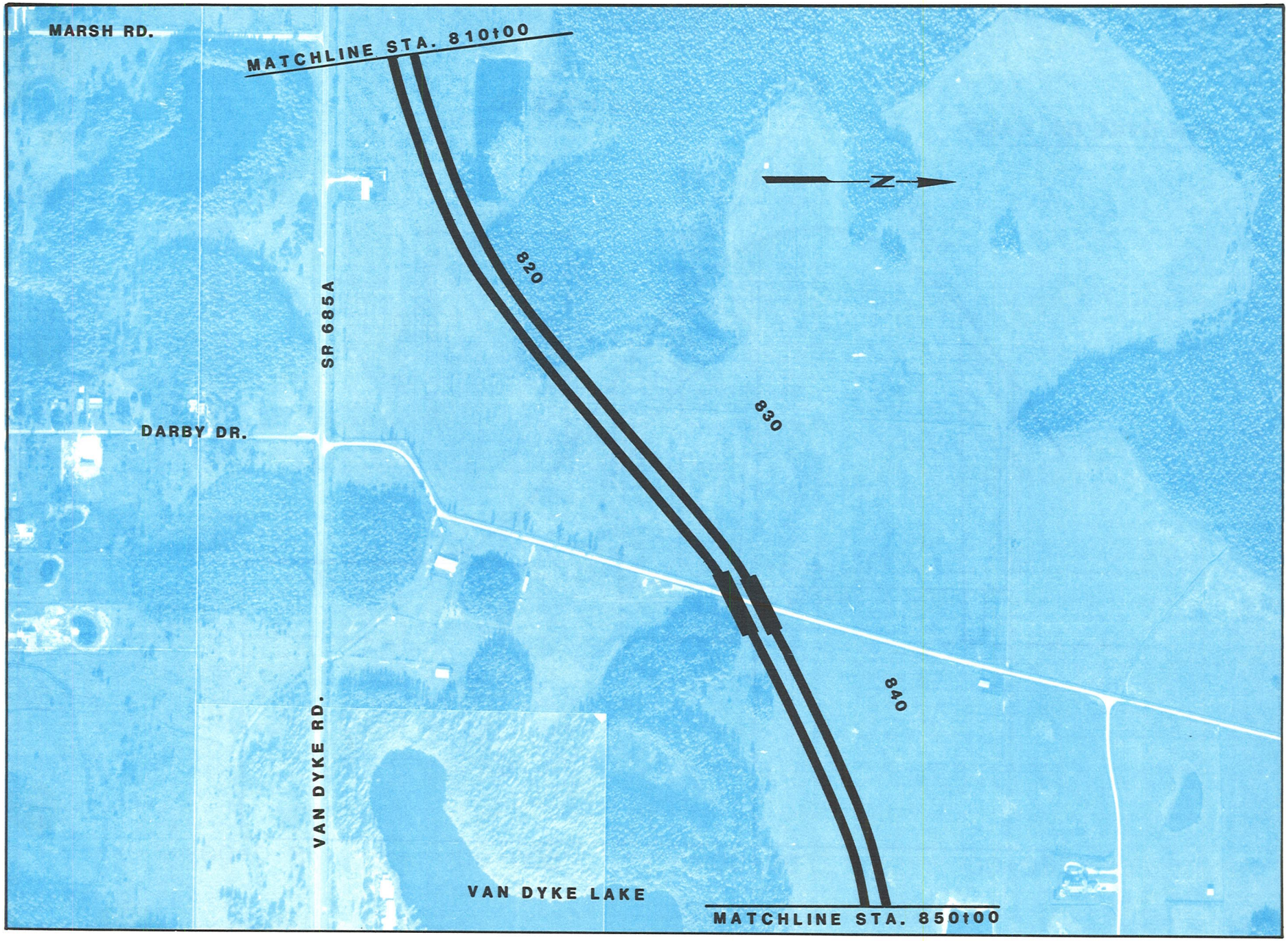
PLAN

PLATE 20



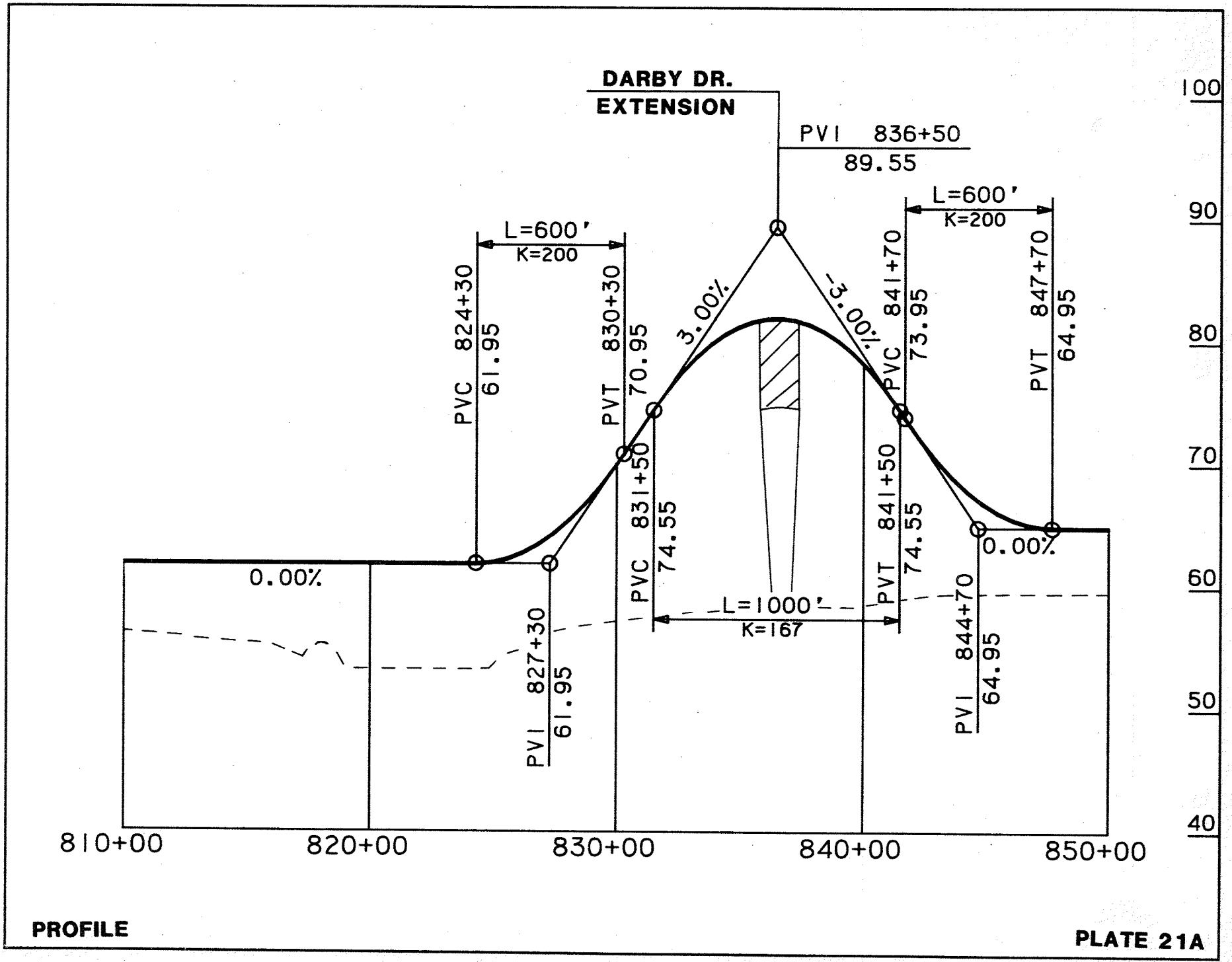
PROFILE

PLATE 20A



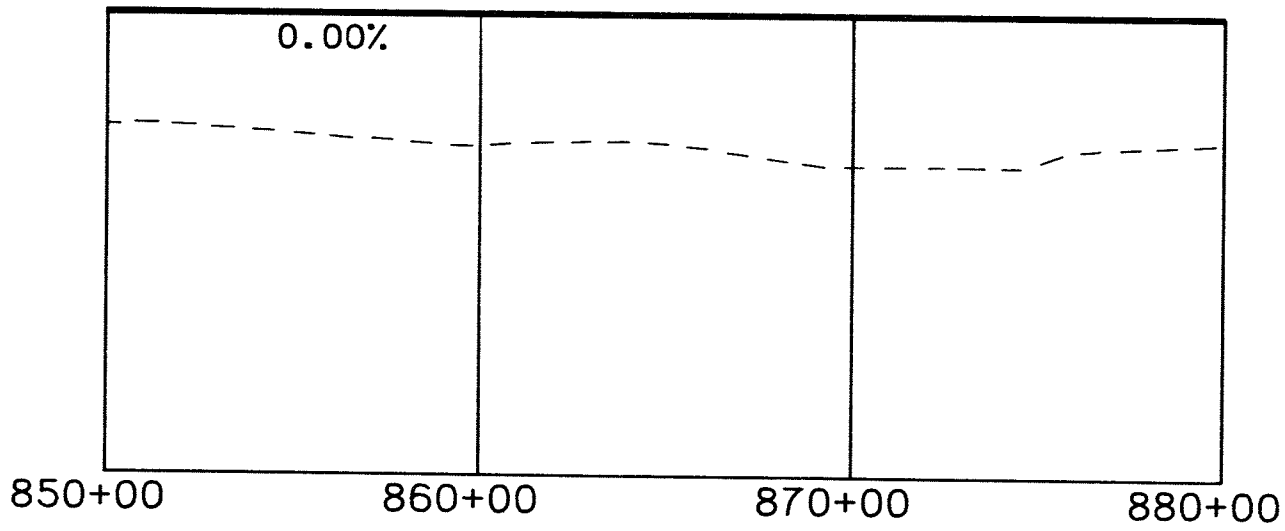
PLAN

PLATE 21



PROFILE

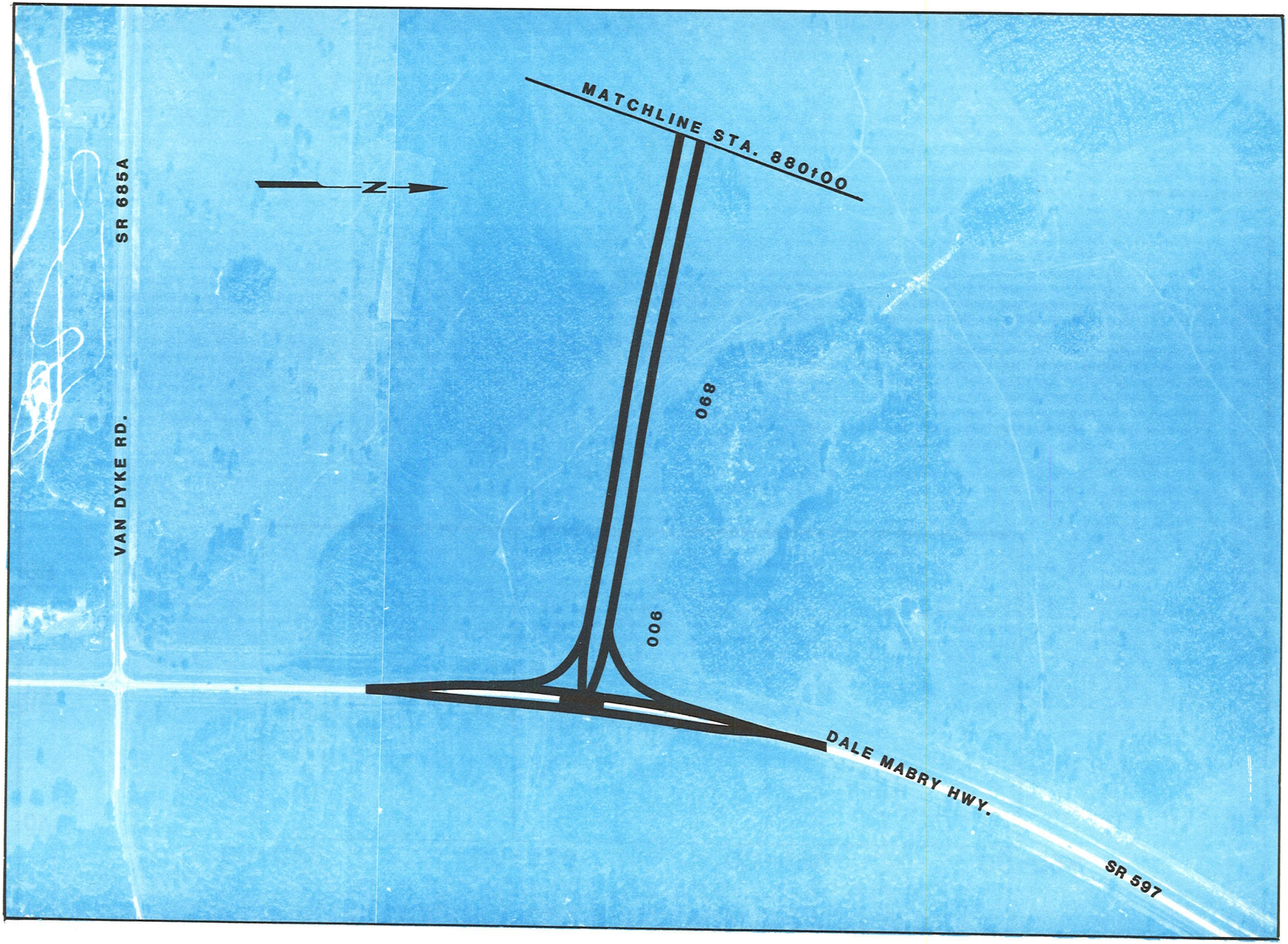
PLATE 21A



100
90
80
70
60
50
40

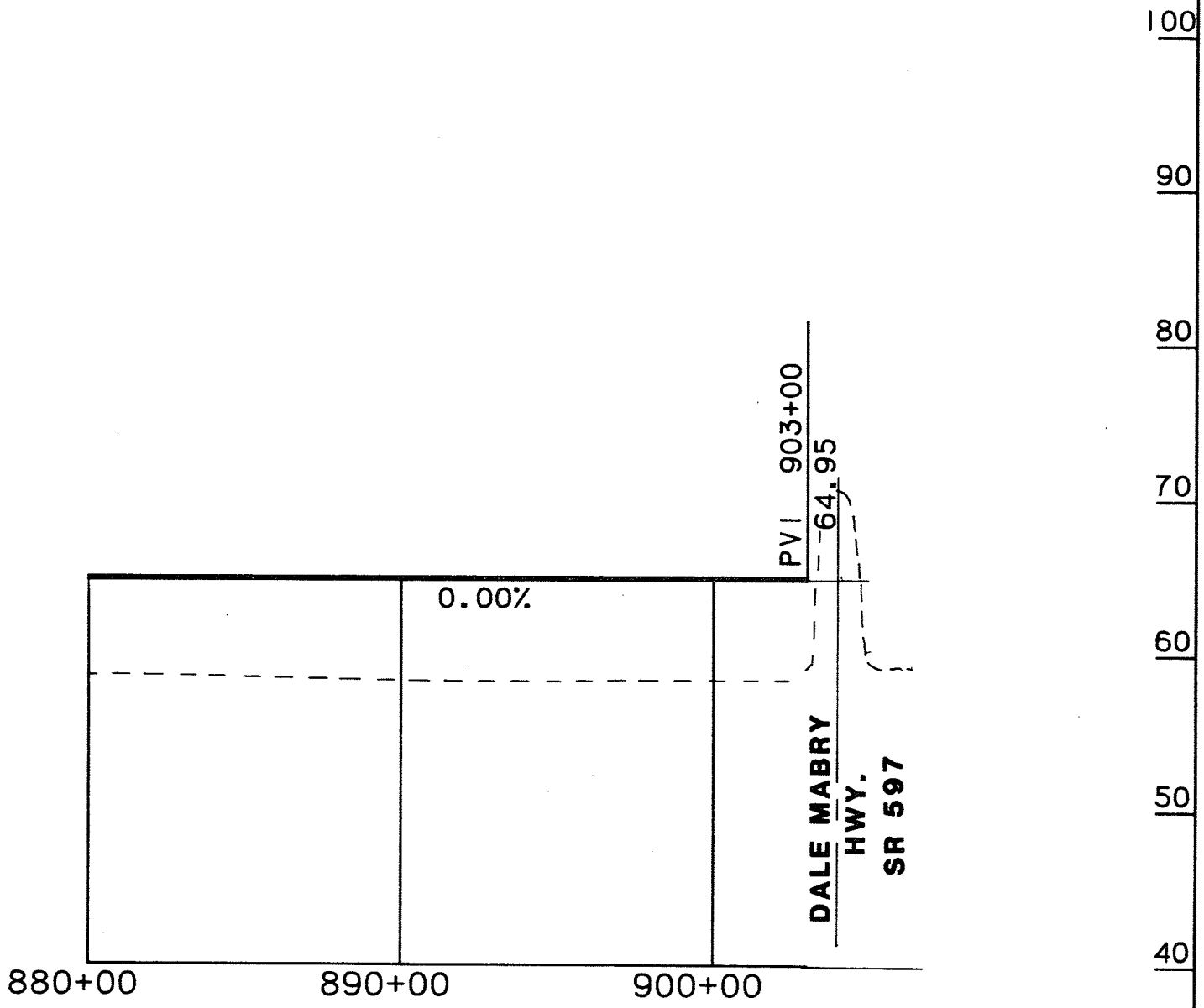
PROFILE

PLATE 22A



PLAN

PLATE 23



PROFILE

PLATE 23A