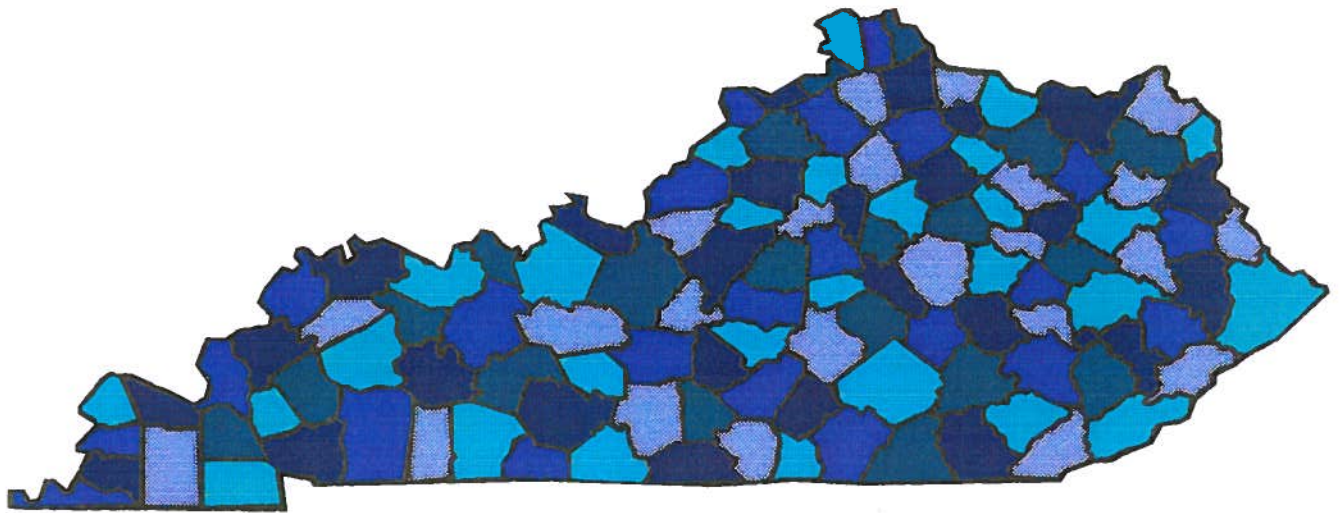
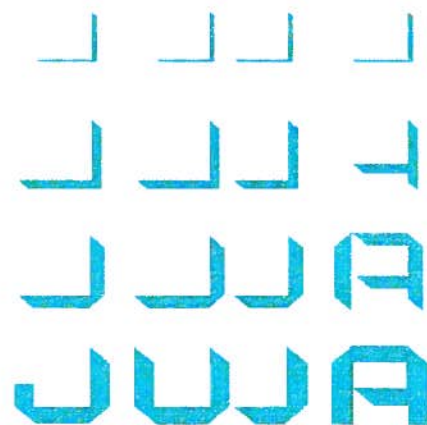


KY 4  
New Circle Road  
Fayette County



Scoping Study



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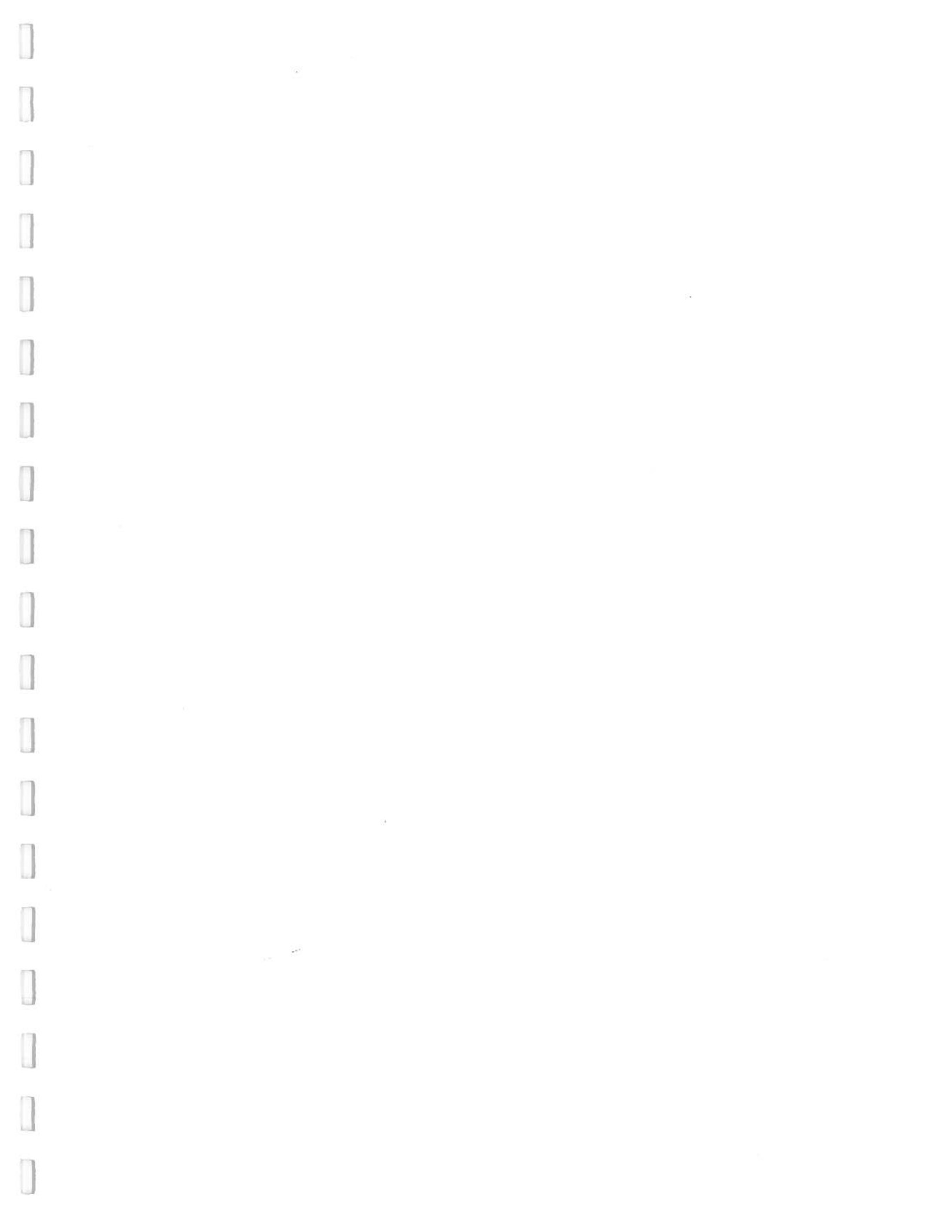
1

### List of Exhibits

#### Exhibit

1. Location Map
2. Vicinity Map
3. 1996 Average Daily Traffic
4. 2020 Average Daily Traffic
5. 1996 Design Hourly Volumes
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7. Existing Typical Section
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49. Alternate 2 Key Map
- 50.-76. Alternate 2 Plan Sheets (including Versailles Road Alternate)





**SCOPING STUDY**  
**NEW CIRCLE ROAD KY 4**  
**FAYETTE COUNTY**

**I. PURPOSE AND NEED**

New Circle Road is <sup>the</sup> a major component of the transportation system for the Lexington-Fayette Metropolitan area. It serves as the hub of the transportation network around the city of Lexington with major arterial routes coming into the city. With continual growth in the population of the Lexington-Fayette urban county area the traffic demands for this transportation hub are exceeding the capacity of the current facility.

The purpose of this study is to identify alternates for the reconstruction and widening of this facility which will provide an adequate level of service for the traveling public. With the ever increasing development and traffic demands of the area it is apparent that <sup>improving</sup> widening this facility will be necessary to accommodate future traffic.

**II. PROJECT DESCRIPTION**

**A. LOCATION**

The project lies totally in the Lexington-Fayette urban county area. The project corridor circles the city of Lexington. A location map of the project corridor is shown in Exhibit 1 and a vicinity map in Exhibit 2.

**B. ROUTE**

New Circle Road is a circular route around the city of Lexington. It is a major arterial with fully controlled access for the limits of this project. Within the project termini the current facility is a four lane divided highway with nine interchanges. The interchanges along the route are US 25 (Georgetown Road), US 421 (Leestown Road), KY 1685 (Old Frankfort Pike), US 60 (Versailles Road), US 68 (Harrodsburg Road), US 27 (Nicholasville Road), KY 1974 (Tates Creek Road), Alumni Drive, and US 25 (Richmond Road). Eight of these are diamond interchanges while Versailles Road has a partial clover leaf interchange with loop ramps in three quadrants.

**C. TERMINI LENGTH**

The project begins between the KY 922 (Newtown Pike) and US 25 (Georgetown Road) interchanges and proceeds in a counterclockwise direction around the city of Lexington to a point north of the ramp termini of the US 25 (Richmond Road) interchange. The length of the project is 22.95 Kilometers (14.3 miles).

**D. EXISTING GEOMETRICS**

The existing facility is a four lane divided highway with fully controlled access. The driving lanes and outside shoulders are 3.6 meters (12 feet) wide. The median is a 6 meter (20 feet) wide raised grass median from the beginning of the project to a point just south of the Leestown Road interchange. From this point the median transition to an 11 meter (36 feet) wide depressed grass median for the remainder of the project.

The design speed for the existing facility was 95 kilometers per hour (60 mph). The maximum curvature used is a radius of 582.125 meters (3 curve). The vertical alignment is gently rolling with a maximum gradient of 3 percent and a minimum sight distance of 150 meters (492 feet).

**E. LEVEL OF SERVICE**

A method that is commonly used to evaluate how a roadway is functioning is to determine its level of service (LOS). Level of service is defined as a qualitative measure of operational conditions and the perception of these conditions by motorists and/or passengers. These conditions are usually defined in terms of factors such as speed and travel time, maneuverability, delay and safety. There are six levels of service, which are designated by the letters "A" through "F." Level of service "A" represents the best operating conditions while level of service "F" defines the worst. See Exhibit 15 through 17 for the levels of service of the alternatives.

Analyses have been performed to determine the existing LOS as well as the LOS for design year 2020 for existing conditions and three proposed alternatives. Analyses are performed for freeway traffic flow between the interchanges and the merge/diverge movements at the ramp termini. For a new freeway through an urban area it is desirable to have a minimum LOS of C, however, LOS D is acceptable as a minimum when widening an existing urban freeway. Capacity analysis for the intersections of the ramps with the cross roads were also performed for design year 2020 traffic projection.

**F. RAILROADS**

Norfolk Southern has three crossings of New Circle Road and CSX railroad has a single crossing. Each of these crossings has a grade separation with three being the roadway over the railroad and one being the railroad over the roadway. Each of the roadway bridges over the railroad would be widened and replaced without disturbance to rail traffic. The railroad will require a minimum vertical clearance of 7 meters (23 feet) and horizontal clearance of 7.6 meters (25 feet) without a crash wall.

The Norfolk Southern railroad crossing over New Circle Road west of US 27 is proposed to be shifted 15 meters westward and built on a new parallel location. This will require additional right of way, but should cause less disruption to rail traffic and eliminate any necessity of a temporary structure. The geometrics for this relocation will comply with railroad design criteria. The existing structure will be removed after installation of the new bridge.

**G. SYSTEMS**

New Circle Road is classified as an Urban Principal Arterial. It is the hub of the transportation network for the Lexington-Fayette urban county area. The major arterial routes coming into the city each have interchanges with New Circle Road. It is also on the State Primary System and the National Highway System.

**H. ACCIDENT RATE**

Accident data for New Circle Road in the project area was analyzed for the three year period from January 1994 to December 1996. (See Appendix III). Accidents for each section of the route are totaled by type (property damage, injury and fatality) and an accident rate per 100 million vehicle miles of travel was determined for each type and for the total. These accident rates when compared with the average accident rates on similar highways for the five year period from 1992 - 1996. The critical rate (CR) in Appendix III represents the minimum accident rate for which it can be said with 99.5% confidence that some type of accident problem exists which cannot be attributed to random occurrence.

With the low critical rate factors shown in Appendix III, it can be concluded that the accidents on this roadway can be attributed to random occurrence. This is highly attributable to the excellent geometrics on this roadway.

**III. TRAFFIC**

Average Daily Traffic (ADT) volumes for 1996 range from 51,000 vehicles per day (VPD) to 61,800 VPD with Design Hourly Volumes (DHV) for 1996 ranging from 4250 to 6760. Projected design year (2020) ADT range from 76,000 to 103,800 while the 2020 DHV range from 5730 to 10,030. See exhibits 3 through 6 for traffic schematics showing the volumes on various roadway segments as well as ramps and side roads.

**IV. PROPOSED IMPROVEMENT**

**A. DESIGN CRITERIA**

The design speed for the New Circle Road project is 90 kilometers per hour (55 mph) for the mainline and 70 kilometers per hour (45 mph) for ramps and side roads. Based on the AASHTO Green Book, A Policy on Geometric Design of Highways and Streets, the pavement width for through lanes of freeway traffic is 3.6 meters (12 feet). This was held for this project but a 4.2 meter (14 ft.) lane adjacent to the median was used as a potential high occupancy vehicle (HOV) lane. The outside shoulder was designed for a width of 4.2 meters (14 ft.) with 3.6 meters (12 ft.) usable. The median width is 7.8 meters (25.5 ft.) with a concrete median barrier at the centerline. See Exhibits 7 through 13 for typical sections.

A summary of geometric design criteria for the project is as follows:

Design Criteria	Required	Alt. 1 Utilized	Alt. 2 Utilized
Lane width	3.6 m	3.6 m	3.6 m
Shoulder Width	3.6 m	4.2 m	4.2 m
Ditch Width, Slope	3.6, 1:4	3.6, 1:4	3.6, 1:4
Maximum Curvature	305 m	582 m	582 m
Maximum Grade	4.5%	3.0%	3.0%
Minimum Sight Distance	140 m	150 m	150 m

The 70 km/hour (45 mph) design speed for side roads and ramps is generally met. The only exceptions are loop ramps at the Versailles Road interchange and ramps approaching road intersections with stop conditions.

Consideration was given to a depressed median for this project. This was suggested in order to increase green space and maintain the aesthetic nature of the Central Kentucky area. Due to limited space for widening the roadway within the existing rights of way a more narrow concrete barrier median was used. This median will minimize right of way requirements and/or retaining wall costs. Landscaping and green space areas should be incorporated into final design of this project at ramp gore areas and along the roadway as geometrics permit.

Although drainage design is not included in the scope of services for this scoping study, it will be necessary to consider additional runoff created by the widened pavement. In the design phases of the project mitigation measures should be planned to minimize the effects of the increased runoff. These measures will include implementation of retention basins, energy dissipators and erosion control. One specific location to be investigated during Phase I Design is the roadway flooding which occurs west of the Nicholasville Road Interchange.

## **B. ALTERNATIVES**

### **1. NO BUILD ALTERNATIVE**

The No-Build Alternative would leave residents of this area of the Lexington-Fayette urban county with an inadequate transportation facility. As the amount of traffic using the facility continues to grow, this road will become increasingly inadequate. Other impacts associated with the No-Build Alternative include such travel-related problems as decreased speed, diminished local and regional accessibility (increased travel time), lessened freedom to maneuver, and increases in traffic interruptions and restrictions, as well as adverse impacts on safety, driving comfort, convenience and economy of travel.

In addition, the No-Build Alternative will result in a failure to provide adequate transportation support for the existing and future economic growth of this area. An inadequate transportation system can result in increased costs in obtaining supplies, and can impact accessibility to employment. In general, the No-Build Alternative is not consistent with the regional land use planning recommendations and guidelines, nor does it address the travel and safety needs of the present roadway network.

No residential, commercial or other displacements would occur from the implementation of the No-Build Alternative, nor would there be any negative aesthetic impacts as the result of the removal of trees and shrubs or landscaping during construction. There would also be no need for the expenditure of funds with this alternative.

The impact of the No-Build Alternative on driving comfort, convenience, economy and safety would, however, be expected to restrict the potential for future growth in the area, while unpleasant driving conditions would likely offset any aesthetic appeal that currently exists along the roadway.

## 2. ALTERNATE 1

Alternate 1 begins with the addition of an auxiliary lane in each direction between the Newtown Pike and Georgetown Road and proceeds to add lanes up to five lanes in each direction prior to the Leestown Road interchange. This five lane configuration is maintained with reductions to four lanes between ramps within the interchanges up to Tates Creek Pike. There is a collector-distributor in this alternate at the Versailles Road interchange for the northbound traffic. From Tates Creek Pike to the Richmond Road interchange Alternate 1 has 4 lanes in each direction. At the Richmond Road ramp termini this alternate drops one lane in each direction and becomes a 6 lane facility.

The centerline for Alternate 1 primarily follows the existing centerline except for three areas. The centerline is shifted prior to the Leestown interchange to avoid a right of way taking at the Meadowthorpe Elementary School and comes back to the existing alignment at the Old Frankfort Pike interchange. Two other alignment shifts are between the Versailles Road and Harrodsburg Road interchanges and between the Harrodsburg Road and Nicholasville Road interchanges. The primary reason for these shifts is to move the alignment away from highly developed properties and toward undeveloped properties.

All interchanges in this alternate were designed with their original configuration except two. Nearly one half of the ramps were changed from one lane to two lane ramp. The two exceptions were the Versailles Road interchange where a collector distributor was included for northbound traffic and the Tates Creek interchange was designed as an urban diamond.

Frontage roads at the Georgetown Road and Old Frankfort Pike interchanges are part of this Alternate. These frontage roads are provided to eliminate uncontrolled access from New Circle Road and to move access points further from the ramp termini on Old Frankfort Pike.

Exhibits 21 through 48 show the geometrics, disturb limits and right of way requirements for Alternate 1.

## 3. ALTERNATE 2

Alternate 2 begins with the addition of auxiliary lanes between the Newtown Pike and Georgetown Road interchanges. An additional lane is added just beyond the Georgetown Road ramps which provides 4 lanes in each direction. This lane configuration is maintained throughout the project except between ramps within the interchanges and three other locations. An additional auxiliary lane is provided between the Leestown Road and Old Frankfort and one lane is dropped between Tates Creek Pike and Alumni Drive. The third location is at the end of the project where three lanes are used.

The alignment for Alternate 2 follows the existing alignment except for the shift at the Leestown and Old Frankfort Pike interchange which avoids any right of way taking on the

Meadowthorpe Elementary School.

All interchanges on this alternate are designed with their original configuration except Tates Creek Pike which is an urban diamond and the Versailles Road interchange. The urban diamond design was selected because of large left turn volumes and the proximity of the exiting ramps. The Versailles Road interchange has a collector-distributor on the interior side of the interchange. A loop ramp was also studied for eastbound U.S. 60 traffic going to southbound New Circle Road. This ramp is in the quadrant of the interchange on the historic Calumet Farm. The decision of whether to construct this loop configuration versus the existing conventional exit ramp should be made during the Phase I/Environmental phase of the project. Sixteen ramps on this alternate are two lanes at the entrance or exit nose location.

Frontage roads at the Georgetown Road and Old Frankfort Pike interchange are included in this alternate. These frontage roads are provided to eliminate uncontrolled access from New Circle Road and to move access further from ramp termini Old Frankfort Pike.

Exhibits 49 through 76 show the geometrics, disturb limits and right of way requirement for Alternate 2.

#### 4. ALTERNATE 3

Alternate 3 primarily consists of adding one lane in each direction with no additional improvements to interchange ramps. Exhibits 8 and 9 show the typical sections for this alternate. Widening on the outside is shown on Exhibit 8 and widening on the inside is shown on Exhibit 9.

Level of Service computations were also performed for this alternate. For the majority of the route the projected level of service for this alternate is E which is not acceptable. Operations at this level are volatile, because there are virtually no usable gaps in the traffic stream. Manuverablility within the traffic system is exteremely limited and the level of physical and psychological comfort afforded the driver is extremely poor. For this reason no further study was developed for this alternate.

#### C. COST ESTIMATES

The estimated quantities for these alternates were developed using aerial mapping with roadway software. Paving costs are based on rehabilitating the existing pavement and widening with a full depth pavement section. Structure costs also reflect removal of existing structures and replacement of the bridges. Construction costs were determined using 1997 average unit prices. The cabinet furnished right of way and utility relocation estimates. The cost estimates are divided into construction sections for planning purposes. See appendix 1 for construction cost estimates.

A summary of the total costs for Alternates 1 and 2 is as follows:

	Alternate 1	Alternate 2
Construction	\$169,990,619	\$171,285,497
Right of Way	\$48,000,000	\$13,000,000
Utilities	\$33,255,000	\$33,255,000
<b>TOTAL</b>	<b>\$251,245,619</b>	<b>\$217,540,497</b>

**D. MAINTENANCE OF TRAFFIC**

Through traffic should be maintained for as long as possible on existing New Circle Road, ramps, and crossroads during construction. Detours and temporary connectors must be a part of the construction plans. Part width construction, partial paving and temporary pavement all will be a part of the final design. Detailed design will be required at the bridge locations. A concept to be investigated during Phase I design is to construct the bridges prior to roadway construction. The maintenance of traffic must be an integral part of the location of both the horizontal and vertical alignment. See exhibits 18 and 19 for typical sections of phase construction.

**VI. Conclusion**

**A. Recommendations**

This study indicates that improvements to New Circle Road are needed based on the projected traffic for Design Year 2020. The study also indicates that the most obvious solution of adding one lane in each direction will not provide the required level of service for the project traffic.

The other alternates considered are:

**Alternate 1**

In summary this alternate has 5 lanes in each direction for the major length of the project. This alternate has a shift in the alignment at three locations, uses less retaining walls and has more right of way acquisitions and utility relocations.

**Alternate 2**

In summary this alternate has 4 lanes in each direction for the major length of the project. The alignment follows the existing centerline and the use of retaining walls is maximized in order to minimize right of way acquisitions and utility relocations.

The primary concern is deciding which alternate to recommend are: 1) environmental

impacts, 2)right of way and utility impacts, 3) cost and 4) providing an adequate level of service for the traveling public.

Both alternates have similar environmental impacts, however, Alternate 2 has considerably less right of way acquisition and utility relocations. The cost of Alternate 2 is also less than Alternate 1. As stated earlier, LOS D is considered as an acceptable minimum when widening an existing urban freeway. Based on these considerations the recommended design is Alternate 2.

## **B. Construction Priority**

Traffic projections indicate that the major increase and larger volumes of traffic will occur at the Richmond Road area. For this reason it is logical to begin the reconstruction and widening of New Circle Road at this end of the project. For traffic control purposes each construction section should include the entire interchange and sufficient length beyond the ramp termini to transition from the proposed to the existing section.

The construction should proceed sequentially around the circle to minimize the disturbance and confusion to the traveling public. Addition of multiple through lanes and dual ramps will necessitate some adjustments by the roadway users. Sequential construction will provide a more consistent roadway sections which are being constructed congruently will require coordination and cooperation between both contractors but could be done in a manner to reduce the maintenance of traffic costs.

**VI. ADDITIONAL INFORMATION**

**A. REYNOLDS ROAD INTERCHANGE**

As part of this study a new interchange was investigated. The location of this interchange was on the R.J. Reynolds property between Clays Mill Road and Nicholasville Road. The interchange configuration was a diamond with the exception of the southeast quadrant. The ramp for this quadrant was located as a loop ramp in the southwest quadrant. The bridge over New Circle Road is a two lane bridge with full shoulders.

This proposed interchange is constrained by the Clays Mill Road bridge on the west and the CSX Railroad bridge on the east. The proximity of the ramp termini to the ramps at the Nicholasville Road Interchange will cause capacity problems for weaving traffic at merge and diverge movements. The proximity of this interchange will also make proper signing very difficult. The proposed interchange will have significant impacts to the area on both sides of New Circle Road. With the configuration shown Stone Street would be closed or relocated and the development planned on the outside of New Circle Road would be severely impacted.

The construction cost for this interchange is \$4,106,240.00. This interchange should not be constructed because of the traffic capacity problems it will cause as well as the additional cost and associated impacts.

Purpose and Need Considerations  
and  
Environmental Overview

Widening of New Circle Road (KY 4)  
From Georgetown Road to Richmond Road  
Fayette County, Kentucky  
Item No 7-18.00

Submitted to  
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Re-submitted with minor editorial changes  
March 4, 1998

Preliminary Overview  
**“Purpose and Need” Considerations**  
New Circle Road Widening Project

The Project “Purpose and Need” section for Environmental Assessments is becoming increasingly important to the EA’s acceptance by state and federal officials. Since New Circle Road is such a major transportation corridor, some very good analyses need to be provided, to the firm producing the EA, related to the general (safety, economic, transportation, etc.) purposes for which the Project has been designed, and the specific transportation needs it is intended to meet. Some of the analyses require appreciable time to complete, and should therefore be started as soon as possible. These are as follows:

**Project Role in the Region’s Transportation System.**

The role of New Circle Road in the region’s transportation system must be explained in some detail, including how it is intended to function by itself, and in concert with other related Projects, in the future. Related areas that will need to be included in the EA are:

- Highway network systems.
- System linkage
- Intermodal relationships.
- Logical termini

**Traffic Surveys and Forecasts.**

The eventual EA must present the results of analyses of the consequences of Project construction on area traffic and traffic-related issues, especially:

- Traffic volumes (current surveys; build and no-build projections) for New Circle Road and the major arterials with which it will intersect.
- Relationship of anticipated traffic volume to design capacity.
- The extent to which the Project will offset any increases in designed capacity by attracting more traffic onto the facility (perceived to be a more efficient bypass).

- Effects on commuting patterns and traffic volumes.
- Proportion of heavy trucks in the increased traffic.
- Extent to which this Project will mitigate congestion on New Circle Road and the primary intersecting arterials.
- Safety improvements and accident reduction.
- Present roadway conditions and deficiencies.
- Level-of-Service analyses (existing and design year).

The background information to be included with any projections of future conditions should carefully delineate whether the traffic models utilized have or have not included the effects of other major interacting Projects, such as the Viley Road Extension Project, arterial widening projects, the proposed Georgetown interchange; and other improved interchanges.

#### **Secondary and Tertiary Traffic Impacts.**

Secondary traffic impacts will likely be especially important, for example:

- If the improved facility attracts increased general traffic (or increased truck traffic), what will be the consequences for the unimproved urban section of new Circle Road on the north and northeast sections?
- What are the anticipated consequences for the roadway network surrounding the unimproved north and north-east sections? Might a growing traffic volume on the improved section seek to bypass the congestion on the unimproved section by increasingly detouring through nearby neighborhoods? Might an unintended consequence be to encourage a growing volume of trucks to seek to avoid congestion by going through neighborhoods where they are prohibited?
- Effects of detours and maintenance of traffic during construction.

#### **Associated Intersections and/or Interchanges.**

Analysis should be included on the Project's effects on existing and future intersections and interchanges. For example:

- Will this Project increase pressure to convert non-cloverleaf interchanges to the cloverleaf or other forms, as a way of countering present congestion there?
- Will it increase pressure for longer entrance and exit ramps at interchanges to provide more traffic storage to accommodate the anticipated traffic increases? If not, will any new traffic signalization requirements arise as traffic increases?

**Environmentally Important Project and Construction Features.**

Sufficient details should be provided to the EA consultant to be able to accurately describe the features of (and so to assess the environmental issues regarding):

- Highway and railroad bridges.
- Highway and railroad overpasses.
- Culverts, retention ponds, and other stormwater control measures.
- Utility relocations (electrical, water and sewer, telephone, cable, etc.).
- Temporary detours and maintenance of traffic.
- New traffic signalization.
- Fences and guardrails.
- Removal of trees or retention ponds.

Also, sufficient details should be included to explain the decision to include, or not to include, the following features:

- Bicycle lanes.
- Sidewalks.
- Noise barriers near subdivisions.
- Trees and landscaping.

## AIR QUALITY

The project corridor is located in the Bluegrass Intrastate Air Quality Control Region and is urban in nature. Fayette County was redesignated (November 13, 1995) from a marginal nonattainment area for ozone to an attainment area for ozone; the Final Guidance Conformity Procedures implemented December 27, 1993 do apply. This project originates from the Transportation Improvement Plan for FY 1994-1996 for Fayette County, approved on May 11, 1993. Fayette County is in attainment for all transportation related pollutants pursuant to the 1990 Clean Air Acts Amendments.

The proposed project consists of widening KY 4 (New Circle Road) from the U.S. 25 (Georgetown Road) Interchange to the U.S. 25 (Richmond Road) Interchange. By widening the roadway, the concentration of the transportation related pollutants is lowered by having more roadway width for dispersal, however receptors will be closer to the traffic if the roadway is widened on the outside of the existing roadway. 2020 traffic volumes range from 45900 ADT to 101700 ADT.

Approximately 733 receptors were identified along the project corridor. These receptors include 642 residential homes, 84 multi-family dwellings, 2 churches, and 5 schools.

Since the Project corridor is now in a non-attainment area, and the Project will widen the road and reduce congestion, it is anticipated that concentrations of Carbon Monoxide, along all parts of the Project corridor, will remain below the 1-hour standard (35 ppm) and the 8-hour standard (9 ppm); and that the total burden of transportation-related pollutants will be low enough to avoid having an adverse impact on ambient air quality.

## NOISE IMPACTS

Existing New Circle Road carries a large volume of traffic and the numerous receptors are already exposed to fairly high levels traffic noise. Obviously, the proposed new roadway will increase the traffic sound level for many receptors, but the amount of increase may, in many cases, not be a significant increase ( $> 3\text{dBA}$ ) over the No-Build level. Many sound levels along the corridor probably already exceed the Noise Abatement Criteria (NAC) of 67 dBA for a residential receptor.

A preliminary count indicates that 642 single-family residences, 84 multi-family residences, 2 churches and 5 schools are close enough to the anticipated Project roadway that they may be considered to be "sensitive" receptors. Many businesses are also located near enough to the proposed roadway to receive substantial traffic noise, but such business sites are not normally considered to be "sensitive" receptors.

A computer noise analysis, to be conducted during the Environmental Assessment, will assess potential impacts on all sensitive receptors. A determination will be made at this time as to the feasibility of noise barriers. Some barriers might be warranted on this project since many new lanes will be closer to sensitive receptors. In the case where barriers are not deemed feasible some vegetative screening may, in addition to being aesthetically pleasing, provide some psychological relief from noise.

**Ecological Overview  
for  
Proposed Improvements  
to KY 4, New Circle Road  
Fayette County**

**Written By:  
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**for  
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**Date: 1997**

### Water Quality

Town Branch and a tributary of West Hickman Creek are the main streams in the project area. Kentucky's Natural Resources and Environmental Protection Cabinet-Division of Water classified all streams in the project area to be warmwater aquatic habitat. Silt barriers should be put in place when working adjacent to all streams in order to prevent runoff of sediments. Any necessary stream crossings should be constructed during low flow periods of the year. Streambanks should immediately be re-seeded with native vegetation upon completion of the stream crossing.

### Channel Work

No stream channel changes are anticipated at this time, but if channelization becomes necessary, precautions must be taken to minimize impact to the environment. The degree of impact will depend on the extent of the channelization activities, location and whether or not mitigation techniques are used. If channelization does occur, permits will be required through the Army Corps of Engineers (Section 404) and a water quality certification (Section 401) through the Kentucky Division of Water pursuant to the Clean Water Act.

### Floodplain

Flood Insurance Rate maps show that floodplain will be crossed in the areas of Town Creek and Wolf Run, and again at Stonewall Estates and the Tates Creek Road area. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment so that the 100 year flood can be carried without substantial increases in flood heights. Encroachment on the flood plain reduces the flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. These areas are special flood hazard areas inundated by 100-year flooding. Construction in the floodplain limits the stage increase to one foot and no increase in the floodway. Any significant encroachment into Floodplain will require a Department of the Army permit pursuant to Section 404 of the Clean Water Act.

### Permits

Encroachment into wetlands, floodplain, or any rechanneling of area streams, as well as stream crossings may require permits. Permits will be required through the Army Corps of Engineers Permit (Section 404), and a 401 water quality certification through the Kentucky Division of Water pursuant to the Clean Water Act. Any encroachment into the area of the reservoirs will require a water quality certification (Section 401).

### Ecosystem Effects

During the construction phase of the roadway, essentially all flora and fauna in the construction path will be eliminated. Short-term impacts from bridge construction, rechanneling, and culverts will include the direct disturbance of benthic and riparian habitats. This will likely lead to an increase in downstream turbidity, dissolved solids, suspended solids, conductivity, and nutrients. Increased sedimentation may be a problem

during road construction. Soil lost during construction from exposed erodible soils may directly enter surface waters, and impact groundwater through sinkholes in the area.

Some aquatic and terrestrial habitats will be permanently altered or lost by the project's construction, inevitably affecting the wildlife and plants in the area. Construction activities causing dust, noise, and other short-term effects will force wildlife from the immediate area. With time, this loss will be stabilized with re-vegetation, but the disturbed areas will provide new habitat with less diversity.

Streams that may be impacted are Town Branch, Wolf Run, and West Hickman Creek, all of which have been already crossed by KY 4. Sedimentation in these areas must be minimized in order to protect these streams from increased turbidity. Three (3) reservoirs are located in the immediate project area, and one is located southeast of the project corridor. Reservoirs No. 1, 2, and 3, which serve as sources of water to the city of Lexington, could be potentially impacted by the road construction because of their close proximity, west of KY 4 and Richmond Road, to the project area. Sedimentation must be controlled to prevent impacts to these reservoirs which supply water to the city of Lexington. A fourth reservoir, Lexington Reservoir No. 4, is located southeast of the project and should not be impacted.

The Kentucky Department of Fish and Wildlife Resources indicated that the Indiana bat (*Myotis sodalis*) inhabits the general area of the project. Any caves that are located in the project area will be thoroughly searched for the presence of the Indiana bat. The US Fish and Wildlife Service notes one status review (candidate) species that has the potential to be in the project area. That species is the Henslow's Sparrow (*Ammodramus henslowii*). If this species is identified during the field investigations for the baseline study, protection should be provided.

The Kentucky State Nature Preserves Commission reports the possibility that the Running buffalo clover (*Trifolium stoloniferum*) may occur in Fayette County in areas topographically similar to those being impacted by this project. The Running buffalo clover may be found along terraces, footpaths, stream banks, dirt roads, and grazed bottomlands in mesic soils receiving filtered light. Field investigations for this species should occur during the flowering season which occurs in May. A thorough search of potential habitats will be accomplished during the baseline studies.

### Wetlands

National Wetlands Inventory maps indicate the presence of some wetland areas near/within the project area. One is identified in the area of the Tates Creek/New Circle interchange. This is a wooded area along a tributary of West Hickman Creek and has a Huntington soil mapping unit as identified by the Soil Survey of Fayette County. A second wetland is indicated in the area of Stonewall Estates near Clays Mill Road. The soil mapping unit for this wetland is the Egan. Another is located in a wooded area along Town Branch just inside New Circle Road. It has a soil mapping unit of Made Land. Other areas indicated on the NWI maps are mostly constructed ponds and not naturally occurring wetland areas requiring protection.

## Flora and Fauna

Information from the US Fish and Wildlife Service does not indicate the presence of any federally listed or proposed endangered or threatened species within the impact area of the project. One status review (candidate) species that has the potential to be in the project area is the Henslow's Sparrow (*Ammodramus henslowii*). The Kentucky Department of Fish and Wildlife Resources notes that the Indiana Bat (*Myotis sodalis*) inhabits the general area. This species forms maternity colonies and roosts with young in trees along streams and adjacent upland areas. Any disturbance to riparian areas from mid-May to mid-August should be avoided. The Running Buffalo Clover (*Trifolium stoloniferum*) also has the potential to occur in the project area. It is known from topographically similar areas in the Bluegrass region. Several other rare species are known from the general area. They are listed in Exhibit 1.

## Other Areas of Consideration

There are two karst groundwater basins in the area of the proposed project. One is the Lindsey Spring Groundwater Basin which is northeast of the project area. Because of this spring's location to the project area, it should not be impacted. The other spring is the Royal Springs Groundwater Basin which is north of the project. This spring is the drinking water source for the city of Georgetown. The underground flow for the Royal Spring is parallel to the surface flow of Cane Run. There are a number of sinkholes near Cane Run which act as recharge sites for this spring.

The sinkholes that are recharge areas for the springs must be protected with the application of Best Management Practices which strictly adhere to the Kentucky Transportation Cabinet and Federal Highway Administration guidelines. Because sinkholes recharge the groundwater, erosion control methods to minimize sedimentation must be implemented to prevent degradation of the groundwater. Sediment control structures such as straw bale dikes and silt traps in accordance with KY DOT standard drawing for "Treatment of Open Sinkholes," 2/10/92, should minimize the impact to the sinkholes. Special precautions should be taken in regard to spill protection because any chemicals entering the aquifer in this area will be in the Georgetown drinking water supply. At this time, the City of Lexington is developing a stringent plan for sinkhole protection, and coordination between the design engineer and the city is recommended.

There are a series of springs and sinkholes that run parallel to KY 4 in the Idle Hour/Liberty Heights area. See Exhibit 2. The springs indicate underground movement of water in this area. KY 4 crosses this underground flow near Idle Hour Drive. Also, a spring, located near Colonial Drive, supplies water to a local farmer. Because sinkholes recharge the groundwater by diverting surface water underground, erosion control methods to minimize sedimentation must be implemented to prevent degradation of the groundwater.

No caves were found along the project's corridor. As long as the project stays within the right-of-way, no caves should be impacted by this project.

### Natural Areas

According to information provided by the Kentucky State Nature Preserves Commission, the Kentucky Department of Fish and Wildlife Resources, and Kentucky's Natural Resources and Environmental Protection Cabinet, there are no registered natural areas in the vicinity of the proposed project.

### Topography and Geology

The proposed project area is located in Fayette County in the Inner Bluegrass Physiographic region. The topography is characterized by gently rolling terrain over dominantly thick-bedded limestones of Middle Ordovician age. These are among the oldest rocks exposed in Kentucky. The rolling topography is modified in some areas by karst development such as springs, sinking streams, and sinkholes. Some caves have been documented from near existing New Circle Road area. The proposed highway route crosses two known karst groundwater basins, the Lindsey Spring and the Royal Springs groundwater basins. The Royal Spring groundwater basin is the recharge area for the water supply spring for the city of Georgetown. See Exhibit-----.

Soils are thick and fertile residual soils. Some of the limestone strata are phosphatic, and weathering of the rocks has enhanced the fertility of the soil. Soil associations of the project area are Maury-McAfee association and Lowell-Loradale-Mercer association. These are well-drained soils of uplands. The Maury-McAfee soils generally overlie phosphatic limestone. Maury soils are on broad ridgetops and on some side slopes. McAfee soils occur on steep slopes around drainageways and sinkholes. Lowell-Loradale-Mercer soils generally overlie limestone that is interbedded with thin layers of calcareous shale. Lowell and Loradale soils occur both on ridgetops and on somewhat steeper side slopes. Mercer soils are located on the broadest ridgetops and around the head of drains.

Sinkholes, through which surface water passes into underground channels, are common in places in Fayette County (Soil Survey). There are numerous sinkholes located within the project area, especially in the western part of the project. Because sinkholes recharge the groundwater, erosion control methods to minimize sedimentation must be implemented to prevent degradation of the groundwater. Sediment control structures such as straw bale dikes and silt traps in accordance with KY DOT standard drawing for "Treatment of Open Sinkholes", 2/10/92, should diminish the impact to the sinkholes.

### 4(f) Involvement

There are no wild or scenic rivers or outstanding resource waters within the project corridor. There are no exemplary natural communities that are monitored by the KSNPC in the project area.

### 6(f) Involvement

There are no recreational land and water areas within the proposed alignment area. There are no facilities established from grants-in-aid from the Land and Water Conservation Fund Act (LWCF). There could be a 6(f) involvement because of the

Meadow-Thorpe School playground, located within the project area. Final determination will be made at a later date.

#### Comments and Coordination

This project was coordinated with a number of different agencies. The US Fish and Wildlife Service (USFWS) was consulted pursuant to Section 7(c) of the Endangered Species Act of 1973 for information on federally protected species that may be affected by the project. Kentucky's Natural Resources and Environmental Protection Cabinet-Division of Water (DOW) was contacted for water quality impacts and information on groundwater, wild and scenic rivers, and other significant aquatic concerns. The Data Processing Branch of the Natural Resources and Environmental Protection Cabinet (NREPC) provided us with National Wetlands Inventory (NWI) maps. The Kentucky Department of Fish and Wildlife Resources (KDFWR) and the Kentucky State Nature Preserves Commission (KSNPC) were contacted for endangered species occurrences and critical natural areas information. Soils information was obtained from the Natural Resources Conservation Service, and topographic maps were obtained from U.S. Geological Survey (USGS). The U.S. Army Corps of Engineers (USACOE) provided floodplain information and information on any necessary permits. The topographic maps, soils maps, endangered and proposed listings of species, as well as aerial photographs from the project were studied for this overview. Copies of the coordination letters are attached to this overview report.

**Exhibit 1**  
**Rare Species With the Potential to Occur in the Project Area**

Scientific Name	Common Name	Federally endangered	Federally proposed	State endangered	State Threatened	Special Concern
Milk Snake	<i>Lampropeltis triangulum</i>					X
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			X		
Yellow-crowned Night Heron	<i>Nycticorax violaceus</i>				X	
Great Blue Heron	<i>Ardea herodias</i>					X
Loggerhead Shrike	<i>Lanius ludovicianus</i>		X			
Savannah Sparrow	<i>Passerculus sandwichensis</i>		X			
Henslow's Sparrow	<i>Ammodramus henslowii</i>		X			X
Bobolink	<i>Dolichonyx oryzivorus</i>					X
Common Barn-owl	<i>Tyto alba</i>					X
Indiana Myotis	<i>Myotis sodalis</i>	X		X		
Running Buffalo Clover	<i>Trifolium stoloniferum</i>	X			X	



## HAZARDOUS MATERIALS AND UNDERGROUND TANKS

A search was conducted by ERIIS (Environmental Risk Information and Imaging Service) of pertinent databases in the project corridor. Databases searched included, among others, RCRIS (Resource Conservation and Recovery Information System), CERCLIS (Comprehensive Environmental Response, Compensation, and Liability Information System) and Kentucky UST (Underground Storage Tanks). A windshield survey was also conducted on the project site.

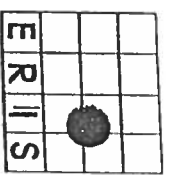
The search revealed, in or near the corridor, 86 registered storage tank sites (many of which are very near the existing corridor), 2 RCRIS-TS (Treatment, Storage and Disposal) facilities, 8 RCRIS-LG (Large Quantity Generator) sites, 9 RCRIS-SG (Small Quantity Generator) sites, 1 CERCLIS site, 6 TRI (Toxic Release Inventory System) sites, 1 NFRAP (No Further Remedial Action) site, 95 FINDS (Facility Index System) sites and 1 HWS (Hazardous Waste) site were located by the database search within the specified search corridor. See attached Exhibit. Several other sites were listed in the database search as unplotable. They included 1 RCRIS-TS site, 5 NFRAP sites, 5 RCRIS-SG sites, 1 TRI site, 75 FINDS sites, 2 Nuclear sites and 68 registered storage tank sites. Many of these sites will probably not be affected by the project with the constraint that the project should take no new right-of-way, however, where that becomes necessary, some of these sites could be encroached upon.

The Old Lexington Landfill, located near the intersection of New Circle Road and Old Frankfort Pike is designated as an NFRAP site indicating that it has been removed from the U.S. EPA's CERCLIS database. NFRAP sites may be sites where, following an initial investigation, either no contamination was found, contamination was removed quickly without need for the site to be placed on the National Priorities List, or the contamination was not serious enough to require federal Superfund action or NPL consideration. This does not necessarily mean, however, that no contamination would be found at this site. The design team should be very aware that possible contamination could exist near this site, since it is very extensive; that the potential exists for soft, unstable soils at the edges of the landfill; and that if new right-of-way is required at any portion of the landfill margins, there will be associated costs (possibly substantial) for cleanup, relocating of contents, and resealing the landfill. Disturbance could also have adverse aquatic consequences. It is recommended that the precise boundaries of the actual landfill contents be clearly established. Follow-up Phase II studies would probably be recommended if any right-of-way was taken from this site.

Some other hazardous sites may require Phase II studies if they are encroached upon by this project. The final selection of Phase II study sites is generally determined after a preferred alternate has been selected.

Following is a selected list of plottable and unplottable ERIIS database sites:

Sites (plottable and unplottable)	Map ID (plottable)
RCRIS-TS	
Safety-Kleen Corp	38
Lexmark International	24
Bluegrass Army Depot	
CERCLIS	
Viley Road Construction Dump	132
NFRAP	
IBM Corp.	54
Benge Dump	
University of Kentucky South Farm	
Raven Run Park	
Blue Grass Army Depot	
Old Lexington Landfill	
RCRIS-LG	
Chevron USA, Inc.	171
Ashland Petroleum Corp.	75
SMC, Inc.	156
Whayne Supply Co.	76
Armed Forces Reserve Center	416
H & R Oil Co.	360
Square D Co.	61
Trane Co.	52
HWS	
Viley Road Construction Dump	132



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**SITE INFORMATION**

Ky4 - New Circle Road  
 Lexington, KY  
 Fayette County  
 Job Number: 132305A  
 Map Plotted: Dec 17, 1996

**MAP LEGEND**

- ▬ Study Site
- ▭ 1000,2000,& 4000 Foot Buffer
- Hydrography
- Railroads
- Roads
- Highways
- ★ NPL 0 Sites
- RCRIS\_TS 2 Sites
- CERCLIS 1 Site
- NFRAP 1 Site
- RCRIS\_LG 8 Sites
- RCRIS\_SG 9 Sites
- △ DOCKET 0 Sites
- △ TRI 6 Sites
- ⊕ FRDS 0 Sites
- ⊕ ERNS 0 Sites
- HWS 1 Site
- ◇ RST 86 Sites



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Preliminary Overview  
**Socio-Economic Impacts**  
New Circle Road Widening Project

Following are some very preliminary assessments, based upon the limited kinds of information available in the very early stages of the Project and a limited corridor "windshield" reconnaissance. The study, at this date, has included no literature review, interviews, field studies, or agency coordination.

**Social Impacts.**

The social impacts appear to be largely positive, being primarily the result of improved access between residential, employment, and shopping areas.

The kinds of negative social impacts generally of concern revolve around the creation of new divisions between different social or economic classes; between racial groups; or between residents and nearby shopping or institutional areas. Since this Project involves widening an existing corridor rather than creating a new one, the possibility for these kinds of impacts appears to be quite unlikely.

**Economic Impacts.**

The economic impacts of the Project appear to be largely positive because the Project will enable tourist, commercial, and industrial traffic to move with greater safety and efficiency around a primary urban beltway, improving access for intra-city commercial ties, and for intra-state commercial and industrial traffic.

The negative economic impacts which are now obvious appear to be small, and dependent upon the extent to which additional Right-of-Way will be required. If more is required, there will be a small conversion of existing urban and agricultural land for transportation purposes, with small attendant impacts on farming; and property taxes.

Less obvious at the present time are the impacts the Project could have on longer-term economic trends. The analyses of these must await traffic studies and projections, but could include the location of more traffic-generating industrial and commercial firms adjacent to new Circle Road to take advantage of what is perceived to be improved

access; and additional pressure on Calumet Farm to sell some land for development purposes.

### **Farmland Impacts.**

The Project corridor passes through or beside a few tracts of land which are still agriculturally active within the Urban Services Area. However, since it merely expands an existing roadway, rather than building a new one, this Project will not bisect or segment any farms. Direct impacts on farmlands would come only as a result of any farmland taken by any expended Right-of-Way required. Any such changes would likely be in accordance with the approved Comprehensive plan.

Because of its historic importance to Lexington, and its highly visible aesthetic value, Calumet Farm is the most potentially sensitive agricultural site which may be impacted. Existing New Circle Road has already segmented a small portion of the original farm into a tract on the east side of the road, a tract which has long attracted development interest. It is recommended that the Planning and Zoning office be consulted to assess whether any development plans are already on file, or anticipated. If this Project takes any Right-of-Way from this parcel, it could further reduce its value for strictly agricultural purposes and thus stimulate its development. Other farm tracts potentially impacted include lands located south of the Project's intersection with Versailles Road. It is likely that all such agricultural lands are ranked as "Prime Farmlands", but the amount of land directly impacted would not be sufficient to override the need for the Project.

The existing Beaumont development, and the planned Reynolds development, will increasingly require conversions of former agricultural lands for urban development purposes. Any Right-of-Way taken by the Project would therefore impact developing rather than agricultural land.

### **Land Use Impacts.**

The Project is anticipated to be in general conformance with the current approved Comprehensive Plan, and is not anticipated to be the direct cause of any substantial land

use impacts which have not already been anticipated and approved. The large Beaumont and Reynolds Road developments, for example, are consistent with that Plan.

A cursory inspection of current land use plans suggests that a few smaller land use changes have already been proposed for tracts near the intersection of New Circle Road with Richmond Road. But few tracts remain along new Circle Road in the Project corridor which have not already been developed, or for which development is not already being considered. This Project is not likely to stimulate any major, new land use changes which have not already been anticipated.

The Project might stimulate a change in land-use on intersecting arterials, and on the segmented portion of Calumet Farm located northwest of the Project's interchange with Versailles Road. The EA should address this prospect in some detail.

#### **Aesthetic Impacts.**

Lexington is becoming increasingly sensitive to roadway improvements which do not adequately provide for collateral aesthetic improvements as well, particularly with regard to landscaping, scenic vistas, and utility placement. This is especially so for primary "gateway" or "entry" corridors serving traffic which enters the Lexington area, and primary circumferentials which connect these arterials, such as New Circle Road and Man-O-War. Objections may therefore be anticipated if the Project requires additional Right-of-Way which removes (and does not replace) existing plantings, scenic retention ponds (e.g., Paragon Center), or trees; and if it does not provide new landscaping or greenspace as a part of the Project design (not as a later, possible "add-on"); there have already been, for example, official and citizen complaints that the recent Man-O-War circumferential Project did not include landscaping.

The kinds of aesthetic values and features recommended to be considered as part of the Project design are discussed in:

- The Corridor Enhancement Study (scenic protection, buffering, screening, parkway effects, coordination of design with the Tree Board, Corridors Committee, Environmental Commission, LFUCG Transportation Planning Commission, etc.).
- The city Greenway Plan.

- City policies and ordinances on tree planting; protection of sinkholes and stone fences; creation and preservation of scenic views, vistas, and corridors; and landscaping.

In order to preclude later controversy regarding the aesthetic impacts of the Project, aesthetic design features should be considered in concert with:

- Widened overpasses.
- Roadside utility lines, poles, and towers; and road-crossing utility lines.
- Intersection lighting and signage.
- Combining Right-of-Way conservation measures (stabilization walls, minimized shoulders, etc.), with any needed noise barriers, drainage features, lighting, signage, and landscaping or beautification treatments.

#### **Relocation Impacts.**

It does not appear that any business will have to be relocated; and, if no additional Right-of-Way is required, that any residences will require relocation. If, however, additional Right-of-Way is required, it appears that several residences, apartments, and outbuildings may be encroached so severely as to constitute a “property take”.

The selection of the Alternate alignment to be utilized may be expected to vary the property damage considerably, an effect that could be minimized by “snaking” the alignment slightly so as to avoid properties on first one side and then the other.

If property takes are required, the Design Engineer should be particularly careful about the requirements of Executive Order 128998 (Environmental Justice), which prohibits alignment layouts designed to reduce project costs by taking properties primarily from particular age, income level, or racial/cultural groups.

#### **Impacts on Parks and Recreation.**

If the Project Right-of-Way is widened, it may encroach upon:

- IBM Park.
- Meadowthorpe School playground.

- A new park which the city intends to develop along the New Circle side of the Beaumont development. It also intends to preserve the present farm access road there for use as a bicycle access to the park.

- Lexington Reservoir Number 3, near Richmond Road (has recreational and public water supply characteristics).

Other parks which are near New Circle Road, but from which it is not anticipated that encroachment is required, include the Whitney Young Park, Meadowthorpe Park, Preston's Spring Park, Valley Park, and Beaumont Park.

It is recommended that Project designers carefully evaluate the potential need to incorporate features to mitigate adverse impacts on parks from the direct effects of construction, and from both construction-siltation and contamination in operational runoff.

It has not yet been determined whether any of these parks have been developed from grants-in-aid from the Land and Water Conservation Fund, or whether they may contain archaeological resources requiring protection. If so, 6(f) requirements will have to be met (this is not anticipated).

#### **Other Special Economic/Environmental Considerations.**

1. Blasting. Lexington home and apartment owners have, in the past, taken highly-visible legal actions against construction-related blast damage to their properties. Since so many properties are in very close proximity to the existing Project Right-of-Way, it is recommended that pre-blast surveys be provided as part of construction requirements, and that stringent limits be placed on the charge-weight-versus-distance and timing sequence of any blast agents utilized (the weights of blasting agents which are legal in Kentucky are still capable of causing blast damage so some, particularly older properties).

2. Stormwater. The addition of such a large paved surface poses stormwater runoff issues for neighborhoods which the Project passes through, and sinkholes it passes near. It will be important to consider the secondary social, economic, and environmental impacts this Project may generate by virtue of any off-site structures required (e.g, retention ponds, culverts, sinkhole protective measures, etc.).

Summary  
of the Cultural/Historic Resources Overview  
New Circle Road Widening Project

During the overview, a records search was conducted for previously surveyed cultural resources along the corridor. This included a search of the Fayette County files at the Kentucky Heritage Council in Frankfort; interviews with staff in the Lexington-Fayette Urban County Government's Office of Historic Preservation, for recent additions to the list; and a literature search in the Special Collections Division of the Margaret King and Geology Libraries at the University of Kentucky; and research in the Local History Index at the Lexington Public Library regarding the history of New Circle Road development. No field work was done. The purpose of the search was to identify sites and structures which are listed on, or eligible for listing on, the National Register of Historic Places.

Eleven historic sites were found to exist along or near New Circle Road in the Project corridor:

- Rose Hill (FAW-0048).
- Calumet Farm (Fa-343), part of the West Fayette Rural Historic District.
- Dr. D L. Price House (Fa-344).
- U. S. Veterans Administration Hospital (Fa-400).
- Moore-Redd-Frazier House (Fa-403).
- John Clay House (Fa-523).
- Bardwell or Wolf Run Farm (Fa-609).
- Carr House (Fa-610).
- Beaumont Farm (Fa-0781).
- George Wilmott House (Fa-0782).
- Beaumont Farm (Fa-0783).

Detailed locations and descriptions may be found in the Cultural Resource Overview (April 17, 1996). All are on the western end of the Project. Two are between Harrodsburg and Parkers Mill Road; two are between Parkers Mill and Versailles Road; three are between Versailles Road and Old Frankfort Pike; two are between Old Frankfort Pike and Leestown Road; and two are between Leestown Road and Georgetown Road.

During the EA Phase of the Project, a field reconnaissance will be conducted to locate and evaluate other properties which are not now listed in the National Register, but which meet criteria for listing; and to conduct a more detailed analysis of all identified properties with regard to the extent to which new Project Right-of-Way (for New Circle widening or expanded interchanges) may encroach upon property boundaries. No final judgment on such issues is made at this time. However, a preliminary examination suggests that, of the eleven properties so far identified, eight appear to be far-enough removed, insignificant enough, or developed enough (in accordance with the approved Comprehensive Plan) that they would not pose problems for the Project. Three of the sites (Calumet Farm, the Dr. D. L. Price House, and the Bardwell or Wolf Run Farm) appear to be close enough to warrant the most caution during initial Alternate layout.

Calumet Farm, which is listed on the National Register, appears to be the most substantial potential encroachment since it forms part of the West Fayette County Rural Historic District, and has an eastern boundary which follows the west Right-of-Way for New Circle Road. If additional Right-of-Way is required in this area, it is recommended that it be taken from the eastern side of the roadway.

Summary  
of the Archaeological Resources Overview  
New Circle Road Widening Project

During the overview, a records search was conducted for recorded archaeological sites along the corridor. This included searches of the files of the Office of State Archaeology at the University of Kentucky and the Kentucky Heritage Council in Frankfort. Eleven recorded sites were found to be within or near the New Circle Road Project corridor:

- Fa 56. Open habitation without mound.
- Fa 55 (two sites). Open habitation without mound.
- Fa 54. Indeterminate.
- Fa 159. Open habitation without mound.
- Fa 160. Open habitation without mound.
- Fa 83. Open habitation without mound.
- Fa 82. Open habitation without mound.
- Fa 117. Open habitation without mound.
- Fa 175. Cemetery.
- Fa 192. Undesignated.

Detailed locations and descriptions may be found in the Archaeological Overview (November 1, 1995). Most of the identified sites are prehistoric open-habitation sites without mounds, located along floodplains or on level areas overlooking, or near, a permanent stream. The sites are fairly evenly distributed around the Project portion of New Circle Road. Three are between Tates Creek Pike and Richmond Road, near Mount Tabor Road; one is between Tates Creek Pike and Nicholasville Road; two are between Nicholasville Road and Harrodsburg Road; two are between Harrodsburg Road and Versailles Road; one is between Versailles Road and Old Frankfort Pike; and two are between Old Frankfort Pike and Leestown Road.

During the EA Phase of the Project, a field reconnaissance will be conducted to locate and evaluate other properties which are not now listed in the registry files, but which meet criteria for listing; and to conduct a more detailed analysis of all identified sites with regard to the extent to which new Project Right-of-Way (for New Circle widening or expanded interchanges) may encroach upon site boundaries. No final judgment on such

issues is made at this time. However, a preliminary examination suggests that, of the eleven sites so far identified, nine appear to be far-enough removed from New Circle Road that they would not pose problems for the Project. Two of the sites (Fa 55) appear to be close enough to warrant caution during initial Alternate layout.

Based upon the sites already identified, and the fact that prehistoric earth mounds are a common prehistoric site type in this area of Fayette County, it is anticipated that there is a high probability of finding a few more open prehistoric sites, and possibly some mounds, along alternates that parallel permanent streams with nearly level undisturbed ground, or knolls that overlook these streams.

**APPENDIX I**

**CONSTRUCTION COST ESTIMATES**

## **NEW CIRCLE ROAD**

### **ALTERNATIVE 1**

#### **CONSTRUCTION COST SUMMARY**

<b>SECTION #</b>	<b>INTERCHANGE</b>	<b>LENGTH</b> <i>kilometers</i>	<b>LENGTH</b> <i>miles</i>	<b>COST</b>
1	GEORGETOWN ROAD	1.9	1.2	\$13,986,351.76
2	LEESTOWN ROAD	2.1	1.3	\$16,062,924.66
3	OLD FRANKFORT PIKE	1.8	1.1	\$15,681,291.47
4	VERSAILLES ROAD	2.4	1.5	\$20,141,856.64
5	HARRODSBURG ROAD	3.8	2.4	\$22,628,636.40
6	NICHOLASVILLE ROAD	3.4	2.1	\$24,971,850.60
7	TATES CREEK ROAD	2.6	1.6	\$23,530,476.00
8	ALUMNI DRIVE	2.5	1.6	\$16,647,890.40
9	RICHMOND ROAD	2.45	1.5	\$16,339,341.00
	<b>TOTALS</b>	<b>22.95</b>	<b>14.3</b>	<b>\$169,990,618.93</b>

# SECTION # 1 ALT.1

## STA. 9+000 -- STA 10+900

### *Georgetown Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	1.9	km	148500	\$282,150.00
Drainage (Georgetown Road)	0.525	km	95000	\$49,875.00
Drainage (Ramps & Frontage Roads)	2.828	km	80000	\$226,240.00
Clearing & Grubbing (mainline)	1.9	km	55000	\$104,500.00
Clearing & Grubbing (Georgetown Road)	0.525	km	25000	\$13,125.00
Clearing & Grubbing (Ramps & Frontage Roads)	2.828	km	20000	\$56,560.00
Erosion Control (mainline)	1.9	km	66000	\$125,400.00
Erosion Control (Georgetown Road)	0.525	km	36000	\$18,900.00
Erosion Control (Ramps & Frontage Roads)	2.828	km	36000	\$101,808.00
Remove & Replace R/W Fence (mainline)	1.9	km	30000	\$57,000.00
Maintenance of Traffic (mainline)	1.9	km	325000	\$617,500.00
Maintenance of Traffic (Georgetown Road)	0.525	km	225000	\$118,125.00
Maintenance of Traffic (Ramps & Frontage Roads)	2.828	km	200000	\$565,600.00
Striping (mainline)	1.9	km	35000	\$66,500.00
Striping (Georgetown Road)	0.525	km	30000	\$15,750.00
Striping (Ramps & Frontage Roads)	2.828	km	25000	\$70,700.00
Concrete Median Barrier (mainline)	1.9	km	135000	\$256,500.00
Remove Bridge (Georgetown Road)	1	lp. sm	60000	\$60,000.00
Remove Bridge (Railroad)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Georgetown Road)	2097.6	sq. m	550	\$1,153,680.00
Replace Bridge (Railroad)	2818.2	sq. m	550	\$1,550,010.00
Retaining Walls	0	sq. m	375	\$0.00
Earthwork	95000	cu. m	7.5	\$712,500.00
Noise Walls	311	sq.m	160	\$49,760.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$2,627,735.00
Paving (Georgetown Road & Ramps & Frontage Rd)				\$1,835,375.13
<b>COST</b>				<b>\$11,655,293.13</b>
+ 20% Engineering & Contingencies				\$2,331,058.63
<b>TOTAL COST</b>				<b>\$13,986,351.76</b>

## SECTION #2 ALT. 1

### STA. 10+900 -- STA 13+000

#### *Leestown Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.1	km	148500	\$311,850.00
Drainage (Leestown Road)	0.503	km	95000	\$47,785.00
Drainage (Ramps)	1.644	km	80000	\$131,520.00
Clearing & Grubbing (mainline)	2.1	km	55000	\$115,500.00
Clearing & Grubbing (Leestown Road)	0.503	km	25000	\$12,575.00
Clearing & Grubbing (Ramps)	1.644	km	20000	\$32,880.00
Erosion Control (mainline)	2.1	km	66000	\$138,600.00
Erosion Control (Leestown Road)	0.503	km	36000	\$18,108.00
Erosion Control (Ramps)	1.644	km	36000	\$59,184.00
Remove & Replace R/W Fence (mainline)	2.1	km	30000	\$63,000.00
Maintenance of Traffic (mainline)	2.1	km	325000	\$682,500.00
Maintenance of Traffic (Leestown Road)	0.503	km	225000	\$113,175.00
Maintenance of Traffic (Ramps)	1.644	km	200000	\$328,800.00
Striping (mainline)	2.1	km	35000	\$73,500.00
Striping (Leestown Road)	0.503	km	30000	\$15,090.00
Striping (Ramps)	1.644	km	25000	\$41,100.00
Concrete Median Barrier (mainline)	2.1	km	135000	\$283,500.00
Remove Bridge (Leestown Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (L&N Railroad)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Leestown Road)	3326.4	sq. m	550	\$1,829,520.00
Replace Bridge (L&N Railroad)	2399.4	sq. m	550	\$1,319,670.00
Retaining Walls	0	sq. m	375	\$0.00
Earthwork	160000	cu. m	7.5	\$1,200,000.00
Noise Walls	444	sq.m	160	\$71,040.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$3,762,609.00
Paving (Leestown Road & Ramps)				\$1,694,264.55
<b>COST</b>				<b>\$13,385,770.55</b>
+ 20% Engineering & Contingencies				\$2,677,154.11
<b>TOTAL COST</b>				<b>\$16,062,924.66</b>

## SECTION #3 ALT. 1

### STA. 13+000 -- STA 14+800

#### *Old Frankfort Pike Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	1.8	km	148500	\$267,300.00
Drainage (Old Frankfort Pike)	0.849	km	95000	\$80,655.00
Drainage (Ramps & Frontage Roads)	2.737	km	80000	\$218,960.00
Clearing & Grubbing (mainline)	1.8	km	55000	\$99,000.00
Clearing & Grubbing (Old Frankfort Pike)	0.849	km	25000	\$21,225.00
Clearing & Grubbing (Ramps & Frontage Roads)	2.737	km	20000	\$54,740.00
Erosion Control (mainline)	1.8	km	66000	\$118,800.00
Erosion Control (Old Frankfort Pike)	0.849	km	36000	\$30,564.00
Erosion Control (Ramps & Frontage Roads)	2.737	km	36000	\$98,532.00
Remove & Replace R/W Fence (mainline)	1.8	km	30000	\$54,000.00
Maintenance of Traffic (mainline)	1.8	km	325000	\$585,000.00
Maintenance of Traffic (Old Frankfort Pike)	0.849	km	225000	\$191,025.00
Maintenance of Traffic (Ramps & Frontage Roads)	2.737	km	200000	\$547,400.00
Striping (mainline)	1.8	km	35000	\$63,000.00
Striping (Old Frankfort Pike)	0.849	km	30000	\$25,470.00
Striping (Ramps & Frontage Roads)	2.737	km	25000	\$68,425.00
Concrete Median Barrier (mainline)	1.8	km	135000	\$243,000.00
Remove (Old Frankfort Pike)	1	lp. sm	60000	\$60,000.00
Remove (Railroad Bridge)	1	lp. sm	120000	\$120,000.00
Replace (Old Frankfort Pike)	3312	sq. m	750	\$2,484,000.00
Replace (Railroad Bridge)	2688	sq. m	550	\$1,478,400.00
Retaining Walls	0	sq. m	375	\$0.00
Earthwork	108000	cu. m	7.5	\$810,000.00
Noise Walls	267	sq.m	160	\$42,720.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$2,867,702.00
Paving (Old Frankfort Pike & Ramps & Frontage Rd)				\$1,637,824.89
<b>COST</b>				<b>\$13,067,742.89</b>
+ 20% Engineering & Contingencies				\$2,613,548.58
<b>TOTAL COST</b>				<b>\$15,681,291.47</b>

## SECTION #4 ALT. 1

STA. 14+800 -- STA 17+200

### *Versailles Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.4	km	148500	\$356,400.00
Drainage (Versailles Road)	0.7	km	95000	\$66,500.00
Drainage (Ramps)	3.635	km	80000	\$290,800.00
Clearing & Grubbing (mainline)	2.4	km	55000	\$132,000.00
Clearing & Grubbing (Versailles Road)	0.7	km	25000	\$17,500.00
Clearing & Grubbing (Ramps)	3.635	km	20000	\$72,700.00
Erosion Control (mainline)	2.4	km	66000	\$158,400.00
Erosion Control (Versailles Road)	0.7	km	36000	\$25,200.00
Erosion Control (Ramps)	3.635	km	36000	\$130,860.00
Remove & Replace R/W Fence (mainline)	2.4	km	30000	\$72,000.00
Maintenance of Traffic (mainline)	2.4	km	325000	\$780,000.00
Maintenance of Traffic (Versailles Road)	0.7	km	225000	\$157,500.00
Maintenance of Traffic (Ramps)	3.635	km	200000	\$727,000.00
Striping (mainline)	2.4	km	35000	\$84,000.00
Striping (Versailles Road)	0.7	km	30000	\$21,000.00
Striping (Ramps)	3.635	km	25000	\$90,875.00
Concrete Median Barrier (mainline)	2.4	km	135000	\$324,000.00
Remove Bridge (Versailles Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Viley Pike)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Versailles Road)	5624	sq. m	550	\$3,093,200.00
Replace Bridge (Viley Pike)	2402.4	sq. m	550	\$1,321,320.00
Retaining Walls	0	sq. m	375	\$0.00
Earthwork	138000	cu. m	7.5	\$1,035,000.00
Signing				\$500,000.00
Lighting				\$400,000.00
Paving (mainline)				\$4,370,924.00
Paving (Versailles Road & Ramps)				\$2,317,701.53
COST				\$16,784,880.53
+ 20% Engineering & Contingencies				\$3,356,976.11
<b>TOTAL COST</b>				<b>\$20,141,856.64</b>

## SECTION #5 ALT. 1

### STA. 17+200 -- STA 21+000

#### *Harrodsburg Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	3.8	km	148500	\$564,300.00
Drainage (Harrodsburg Road)	0.577	km	95000	\$54,815.00
Drainage (Ramps)	1.756	km	80000	\$140,480.00
Clearing & Grubbing (mainline)	3.8	km	55000	\$209,000.00
Clearing & Grubbing (Harrodsburg Road)	0.577	km	25000	\$14,425.00
Clearing & Grubbing (Ramps)	1.756	km	20000	\$35,120.00
Erosion Control (mainline)	3.8	km	66000	\$250,800.00
Erosion Control (Harrodsburg Road)	0.577	km	36000	\$20,772.00
Erosion Control (Ramps)	1.756	km	36000	\$63,216.00
Remove & Replace R/W Fence (mainline)	3.8	km	30000	\$114,000.00
Maintenance of Traffic (mainline)	3.8	km	325000	\$1,235,000.00
Maintenance of Traffic (Harrodsburg Road)	0.577	km	225000	\$129,825.00
Maintenance of Traffic (Ramps)	1.756	km	200000	\$351,200.00
Striping (mainline)	3.8	km	35000	\$133,000.00
Striping (Harrodsburg Road)	0.577	km	30000	\$17,310.00
Striping (Ramps)	1.756	km	25000	\$43,900.00
Concrete Median Barrier (mainline)	3.8	km	135000	\$513,000.00
Remove Bridge (Harrodsburg Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Parker's Mill Road)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Harrodsburg Road)	3883.6	sq. m	550	\$2,135,980.00
Replace Bridge (Parker's Mill Road)	2349.6	sq. m	550	\$1,292,280.00
Retaining Walls	0	sq. m	375	\$0.00
Earthwork	175000	cu. m	7.5	\$1,312,500.00
Noise Walls	1156	sq.m	160	\$184,960.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$6,937,155.00
Paving (Harrodsburg Road & Ramps)				\$2,064,159.00
<b>COST</b>				<b>\$18,857,197.00</b>
+ 20% Engineering & Contingencies				\$3,771,439.40
<b>TOTAL COST</b>				<b>\$22,628,636.40</b>

## SECTION #6 ALT. 1

### STA. 21+000 -- STA 24+400

#### *Nicholasville Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	3.4	km	148500	\$504,900.00
Drainage (Nicholasville Road)	0.879	km	95000	\$83,505.00
Drainage (Ramps)	2.243	km	80000	\$179,440.00
Clearing & Grubbing (mainline)	3.4	km	55000	\$187,000.00
Clearing & Grubbing (Nicholasville Road)	0.879	km	25000	\$21,975.00
Clearing & Grubbing (Ramps)	2.243	km	20000	\$44,860.00
Erosion Control (mainline)	3.4	km	66000	\$224,400.00
Erosion Control (Nicholasville Road)	0.879	km	36000	\$31,644.00
Erosion Control (Ramps)	2.243	km	36000	\$80,748.00
Remove & Replace R/W Fence (mainline)	3.4	km	30000	\$102,000.00
Maintenance of Traffic (mainline)	3.4	km	325000	\$1,105,000.00
Maintenance of Traffic (Nicholasville Road)	0.879	km	225000	\$197,775.00
Maintenance of Traffic (Ramps)	2.243	km	200000	\$448,600.00
Striping (mainline)	3.4	km	35000	\$119,000.00
Striping (Nicholasville Road)	0.879	km	30000	\$26,370.00
Striping (Ramps)	2.243	km	25000	\$56,075.00
Concrete Median Barrier (mainline)	3.4	km	135000	\$459,000.00
Remove Bridge (Nicholasville Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Clay's Mill Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Railroad over New Circle)	1	lp. sm	80000	\$80,000.00
Replace Bridge (Nicholasville Road)	3802	sq. m	550	\$2,091,100.00
Replace Bridge (Clay's Mill Road)	2990.4	sq. m	550	\$1,644,720.00
Replace Bridge (Railroad over New Circle)	900	sq. m	1900	\$1,710,000.00
Retaining Walls	1328.5	sq. m	375	\$498,187.50
Earthwork	200000	cu. m	7.5	\$1,500,000.00
Noise Walls	311	sq.m	160	\$49,760.00
RR Relocation	480	m	350	\$168,000.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$5,780,319.00
Paving (Nicholasville Road & Ramps)				\$2,375,497.00
<b>COST</b>				<b>\$20,809,875.50</b>
+ 20% Engineering & Contingencies				\$4,161,975.10
<b>TOTAL COST</b>				<b>\$24,971,850.60</b>

## SECTION #7 ALT.1

### STA. 24+400 -- STA 27+000

#### *Tates Creek Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.6	km	148500	\$386,100.00
Drainage (Tates Creek Road)	0.552	km	95000	\$52,440.00
Drainage (Ramps)	1.728	km	80000	\$138,240.00
Clearing & Grubbing (mainline)	2.6	km	55000	\$143,000.00
Clearing & Grubbing (Tates Creek Road)	0.552	km	25000	\$13,800.00
Clearing & Grubbing (Ramps)	1.728	km	20000	\$34,560.00
Erosion Control (mainline)	2.6	km	66000	\$171,600.00
Erosion Control (Tates Creek Road)	0.552	km	36000	\$19,872.00
Erosion Control (Ramps)	1.728	km	36000	\$62,208.00
Remove & Replace R/W Fence (mainline)	2.6	km	30000	\$78,000.00
Maintenance of Traffic (mainline)	2.6	km	325000	\$845,000.00
Maintenance of Traffic (Tates Creek Road)	0.552	km	225000	\$124,200.00
Maintenance of Traffic (Ramps)	1.728	km	200000	\$345,600.00
Striping (mainline)	2.6	km	35000	\$91,000.00
Striping (Tates Creek Road)	0.552	km	30000	\$16,560.00
Striping (Ramps)	1.728	km	25000	\$43,200.00
Concrete Median Barrier (mainline)	2.6	km	135000	\$351,000.00
Remove Bridge (Tates Creek Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Landsdowne Drive)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Tates Creek Road)	4986.2	sq. m	750	\$3,739,650.00
Replace Bridge (Landsdowne Drive)	2136	sq. m	550	\$1,174,800.00
Retaining Walls	6221	sq. m	375	\$2,332,875.00
Earthwork	229000	cu. m	7.5	\$1,717,500.00
Noise Walls	1511	sq.m	160	\$241,760.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$60,000.00
Paving (mainline)				\$4,566,873.00
Paving (Tates Creek Road & Ramps)				\$1,918,892.00
<b>COST</b>				<b>\$19,608,730.00</b>
+ 20% Engineering & Contingencies				\$3,921,746.00
<b>TOTAL COST</b>				<b>\$23,530,476.00</b>

## SECTION #8 ALT. 1

### STA. 27+000 -- STA 29+500

#### *Alumni Drive Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.5	km	148500	\$371,250.00
Drainage (Alumni Drive)	0.471	km	95000	\$44,745.00
Drainage (Ramps)	1.617	km	80000	\$129,360.00
Clearing & Grubbing (mainline)	2.5	km	55000	\$137,500.00
Clearing & Grubbing (Alumni Drive)	0.471	km	25000	\$11,775.00
Clearing & Grubbing (Ramps)	1.617	km	20000	\$32,340.00
Erosion Control (mainline)	2.5	km	66000	\$165,000.00
Erosion Control (Alumni Drive)	0.471	km	36000	\$16,956.00
Erosion Control (Ramps)	1.617	km	36000	\$58,212.00
Remove & Replace R/W Fence (mainline)	2.5	km	30000	\$75,000.00
Maintenance of Traffic (mainline)	2.5	km	325000	\$812,500.00
Maintenance of Traffic (Alumni Drive)	0.471	km	225000	\$105,975.00
Maintenance of Traffic (Ramps)	1.617	km	200000	\$323,400.00
Striping (mainline)	2.5	km	35000	\$87,500.00
Striping (Alumni Drive)	0.471	km	30000	\$14,130.00
Striping (Ramps)	1.617	km	25000	\$40,425.00
Concrete Median Barrier (mainline)	2.5	km	135000	\$337,500.00
Remove Bridge (Alumni Drive)	1	lp. sm	60000	\$60,000.00
Remove Bridge (Chinoe Road)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Alumni Drive)	3168	sq. m	550	\$1,742,400.00
Replace Bridge (Chinoe Road)	1848	sq. m	550	\$1,016,400.00
Retaining Walls	1869	sq. m	375	\$700,875.00
Earthwork	117000	cu. m	7.5	\$877,500.00
Noise Walls	1422	sq.m	160	\$227,520.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$4,019,937.00
Paving (Alumni Drive & Ramps)				\$1,545,042.00
<b>COST</b>				<b>\$13,873,242.00</b>
+ 20% Engineering & Contingencies				\$2,774,648.40
<b>TOTAL COST</b>				<b>\$16,647,890.40</b>

## SECTION #9 ALT. 1

### STA. 29+500 -- STA 101+200

#### *Richmond Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.45	km	148500	\$363,825.00
Drainage (Richmond Road)	0.538	km	95000	\$51,110.00
Drainage (Ramps)	2.005	km	80000	\$160,400.00
Clearing & Grubbing (mainline)	2.45	km	55000	\$134,750.00
Clearing & Grubbing (Richmond Road)	0.538	km	25000	\$13,450.00
Clearing & Grubbing (Ramps)	2.005	km	20000	\$40,100.00
Erosion Control (mainline)	2.45	km	66000	\$161,700.00
Erosion Control (Richmond Road)	0.538	km	36000	\$19,368.00
Erosion Control (Ramps)	2.005	km	36000	\$72,180.00
Remove & Replace R/W Fence (mainline)	2.45	km	30000	\$73,500.00
Maintenance of Traffic (mainline)	2.45	km	325000	\$796,250.00
Maintenance of Traffic (Richmond Road)	0.538	km	225000	\$121,050.00
Maintenance of Traffic (Ramps)	2.005	km	200000	\$401,000.00
Striping (mainline)	2.45	km	35000	\$85,750.00
Striping (Richmond Road)	0.538	km	30000	\$16,140.00
Striping (Ramps)	2.005	km	25000	\$50,125.00
Concrete Median Barrier (mainline)	2.45	km	135000	\$330,750.00
Remove Bridge (Richmond Road)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Richmond Road)	3664	sq. m	550	\$2,015,200.00
Retaining Walls	4358.5	sq. m	375	\$1,634,437.50
Earthwork	121000	cu. m	7.5	\$907,500.00
Noise Walls	578	sq.m	160	\$92,480.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$3,461,865.00
Paving (Richmond Road & Ramps)				\$1,693,187.00
<b>COST</b>				<b>\$13,616,117.50</b>
+ 20% Engineering & Contingencies				\$2,723,223.50
<b>TOTAL COST</b>				<b>\$16,339,341.00</b>

**GRAND TOTAL**

**\$169,789,018.92**

# ALT. 1

## *R.J. Reynolds Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (R.J. Reynold's Road)	0.4	km	95000	\$38,000.00
Drainage (Ramps)	1.72	km	80000	\$137,600.00
Clearing & Grubbing (R.J. Reynold's Road)	0.4	km	25000	\$10,000.00
Clearing & Grubbing (Ramps)	1.72	km	20000	\$34,400.00
Erosion Control (Ramps)	0.4	km	36000	\$14,400.00
Erosion Control (R.J. Reynold's Road)	1.72	km	36000	\$61,920.00
Striping (R.J. Reynold's Road)	0.4	km	30000	\$12,000.00
Striping (Ramps)	1.72	km	25000	\$43,000.00
Bridge	1440	sq. m	550	\$792,000.00
Retaining Walls	375	sq. m	375	\$140,625.00
Earthwork	68600	cu. m	7.5	\$514,500.00
Paving (R.J. Reynold's Road & Ramps)				\$1,023,423.19
Signing				\$300,000.00
Lighting				\$250,000.00
Signal				\$50,000.00
COST				\$3,421,868.19
+ 20% Engineering & Contingencies				\$684,373.64
<b>TOTAL COST</b>				<b>\$4,106,241.83</b>

## **NEW CIRCLE ROAD**

### **ALTERNATIVE 2**

#### **CONSTRUCTION COST SUMMARY**

<b>SECTION #</b>	<b>INTERCHANGE</b>	<b>LENGTH</b> <i>kilometers</i>	<b>LENGTH</b> <i>miles</i>	<b>COST</b>
1	GEORGETOWN ROAD	1.9	1.2	\$14,256,741.76
2	LEESTOWN ROAD	2.1	1.3	\$15,508,567.07
3	OLD FRANKFORT PIKE	1.8	1.1	\$16,901,657.39
4	VERSAILLES ROAD	2.4	1.5	\$20,518,311.70
5	HARRODSBURG ROAD	3.8	2.4	\$23,580,924.30
6	NICHOLASVILLE ROAD	3.4	2.1	\$24,650,760.90
7	TATES CREEK ROAD	2.6	1.6	\$21,475,608.00
8	ALUMNI DRIVE	2.5	1.6	\$16,901,101.80
9	RICHMOND ROAD	2.45	1.5	\$17,491,824.60
	<b>TOTALS</b>	<b>22.95</b>	<b>14.3</b>	<b>\$171,285,497.52</b>

**SECTION #1 ALT. 2**  
**STA. 9+000 -- STA 10+900**

***Georgetown Road Interchange***

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	1.9	km	135000	\$256,500.00
Drainage (Georgetown Road)	0.525	km	95000	\$49,875.00
Drainage (Ramps & Frontage Roads)	2.828	km	80000	\$226,240.00
Clearing & Grubbing (mainline)	1.9	km	50000	\$95,000.00
Clearing & Grubbing (Georgetown Road)	0.525	km	25000	\$13,125.00
Clearing & Grubbing (Ramps & Frontage Roads)	2.828	km	20000	\$56,560.00
Erosion Control (mainline)	1.9	km	60000	\$114,000.00
Erosion Control (Georgetown Road)	0.525	km	36000	\$18,900.00
Erosion Control (Ramps & Frontage Roads)	2.828	km	36000	\$101,808.00
Remove & Replace R/W Fence (mainline)	1.9	km	30000	\$57,000.00
Maintenance of Traffic (mainline)	1.9	km	325000	\$617,500.00
Maintenance of Traffic (Georgetown Road)	0.525	km	225000	\$118,125.00
Maintenance of Traffic (Ramps & Frontage Roads)	2.828	km	200000	\$565,600.00
Striping (mainline)	1.9	km	35000	\$66,500.00
Striping (Georgetown Road)	0.525	km	30000	\$15,750.00
Striping (Ramps & Frontage Roads)	2.828	km	25000	\$70,700.00
Concrete Median Barrier (mainline)	1.9	km	135000	\$256,500.00
Remove Bridge (Georgetown Road)	1	lp. sm	60000	\$60,000.00
Remove Bridge (Railroad)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Georgetown Road)	2097.6	sq. m	550	\$1,153,680.00
Replace Bridge (Railroad)	2818.2	sq. m	550	\$1,550,010.00
Retaining Walls	725	sq. m	375	\$271,875.00
Earthwork	95000	cu. m	7.5	\$712,500.00
Noise Walls	311	sq. m	160	\$49,760.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$2,627,735.00
Paving (Georgetown Road & Ramps & Frontage Rd)				\$1,835,375.13
<b>COST</b>				<b>\$11,880,618.13</b>
+ 20% Engineering & Contingencies				\$2,376,123.63
<b>TOTAL COST</b>				<b>\$14,256,741.76</b>

**SECTION #2 ALT. 2**  
**STA. 10+900 -- STA 13+000**

***Leestown Road Interchange***

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.1	km	135000	\$283,500.00
Drainage (Leestown Road)	0.503	km	95000	\$47,785.00
Drainage (Ramps)	1.599	km	80000	\$127,920.00
Clearing & Grubbing (mainline)	2.1	km	50000	\$105,000.00
Clearing & Grubbing (Leestown Road)	0.503	km	25000	\$12,575.00
Clearing & Grubbing (Ramps)	1.599	km	20000	\$31,980.00
Erosion Control (mainline)	2.1	km	60000	\$126,000.00
Erosion Control (Leestown Road)	0.503	km	36000	\$18,108.00
Erosion Control (Ramps)	1.599	km	36000	\$57,564.00
Remove & Replace R/W Fence (mainline)	2.1	km	30000	\$63,000.00
Maintenance of Traffic (mainline)	2.1	km	325000	\$682,500.00
Maintenance of Traffic (Leestown Road)	0.503	km	225000	\$113,175.00
Maintenance of Traffic (Ramps)	1.599	km	200000	\$319,800.00
Striping (mainline)	2.1	km	35000	\$73,500.00
Striping (Leestown Road)	0.503	km	30000	\$15,090.00
Striping (Ramps)	1.599	km	25000	\$39,975.00
Concrete Median Barrier (mainline)	2.1	km	135000	\$283,500.00
Remove Bridge (Leestown Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (L&N Railroad)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Leestown Road)	3326.4	sq. m	550	\$1,829,520.00
Replace Bridge (L&N Railroad)	2399.4	sq. m	550	\$1,319,670.00
Retaining Walls	1056.25	sq. m	375	\$396,093.75
Earthwork	154000	cu. m	7.5	\$1,155,000.00
Noise Walls	444	sq. m	160	\$71,040.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$3,369,449.00
Paving (Leestown Road & Ramps)				\$1,342,061.14
<b>COST</b>				<b>\$12,923,805.89</b>
<b>+ 20% Engineering &amp; Contingencies</b>				<b>\$2,584,761.18</b>
<b>TOTAL COST</b>				<b>\$15,508,567.07</b>

## SECTION #3 ALT. 2

### STA. 13+000 -- STA 14+800

#### *Old Frankfort Pike Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	1.8	km	135000	\$243,000.00
Drainage (Old Frankfort Pike)	0.848	km	95000	\$80,560.00
Drainage (Ramps & Frontage Roads)	2.794	km	80000	\$223,520.00
Clearing & Grubbing (mainline)	1.8	km	50000	\$90,000.00
Clearing & Grubbing (Old Frankfort Pike)	0.848	km	25000	\$21,200.00
Clearing & Grubbing (Ramps & Frontage Roads)	2.794	km	20000	\$55,880.00
Erosion Control (mainline)	1.8	km	60000	\$108,000.00
Erosion Control (Old Frankfort Pike)	0.848	km	36000	\$30,528.00
Erosion Control (Ramps & Frontage Roads)	2.794	km	36000	\$100,584.00
Remove & Replace R/W Fence (mainline)	1.8	km	30000	\$54,000.00
Maintenance of Traffic (mainline)	1.8	km	325000	\$585,000.00
Maintenance of Traffic (Old Frankfort Pike)	0.848	km	225000	\$190,800.00
Maintenance of Traffic (Ramps & Frontage Roads)	2.794	km	200000	\$558,800.00
Striping (mainline)	1.8	km	35000	\$63,000.00
Striping (Old Frankfort Pike)	0.848	km	30000	\$25,440.00
Striping (Ramps & Frontage Roads)	2.794	km	25000	\$69,850.00
Concrete Median Barrier (mainline)	1.8	km	135000	\$243,000.00
Remove (Old Frankfort Pike)	1	lp. sm	60000	\$60,000.00
Remove (Railroad Bridge)	1	lp. sm	120000	\$120,000.00
Replace (Old Frankfort Pike)	3422.4	sq. m	750	\$2,566,800.00
Replace (Railroad Bridge)	2688	sq. m	550	\$1,478,400.00
Retaining Walls	2215.25	sq. m	375	\$830,718.75
Earthwork	120000	cu. m	7.5	\$900,000.00
Noise Walls	267	sq. m	160	\$42,720.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$2,855,804.00
Paving (Old Frankfort Pike & Ramps & Frontage Rd)				\$1,687,109.74
<b>COST</b>				<b>\$14,084,714.49</b>
+ 20% Engineering & Contingencies				\$2,816,942.90
<b>TOTAL COST</b>				<b>\$16,901,657.39</b>

## SECTION #4 ALT. 2

### STA. 14+800 -- STA 17+200

#### *Versailles Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.4	km	135000	\$324,000.00
Drainage (Versailles Road)	0.7	km	95000	\$66,500.00
Drainage (Ramps)	3.538	km	80000	\$283,040.00
Clearing & Grubbing (mainline)	2.4	km	50000	\$120,000.00
Clearing & Grubbing (Versailles Road)	0.7	km	25000	\$17,500.00
Clearing & Grubbing (Ramps)	3.538	km	20000	\$70,760.00
Erosion Control (mainline)	2.4	km	60000	\$144,000.00
Erosion Control (Versailles Road)	0.7	km	36000	\$25,200.00
Erosion Control (Ramps)	3.538	km	36000	\$127,368.00
Remove & Replace R/W Fence (mainline)	2.4	km	30000	\$72,000.00
Maintenance of Traffic (mainline)	2.4	km	325000	\$780,000.00
Maintenance of Traffic (Versailles Road)	0.7	km	225000	\$157,500.00
Maintenance of Traffic (Ramps)	3.538	km	200000	\$707,600.00
Striping (mainline)	2.4	km	35000	\$84,000.00
Striping (Versailles Road)	0.7	km	30000	\$21,000.00
Striping (Ramps)	3.538	km	25000	\$88,450.00
Concrete Median Barrier (mainline)	2.4	km	135000	\$324,000.00
Remove Bridge (Versailles Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Viley Pike)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Versailles Road)	4712	sq. m	550	\$2,591,600.00
Replace Bridge (Viley Pike)	2402.4	sq. m	550	\$1,321,320.00
Retaining Walls	4310.25	sq. m	375	\$1,616,343.75
Earthwork	103000	cu. m	7.5	\$772,500.00
Signing				\$500,000.00
Lighting				\$400,000.00
Paving (mainline)				\$4,039,124.00
Paving (Versailles Road & Ramps)				\$2,204,787.33
COST				\$17,098,593.08
+ 20% Engineering & Contingencies				\$3,419,718.62
<b>TOTAL COST</b>				<b>\$20,518,311.70</b>

## SECTION #5 ALT. 2

### STA. 17+200 -- STA 21+000

#### *Harrodsburg Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	3.8	km	135000	\$513,000.00
Drainage (Harrodsburg Road)	0.577	km	95000	\$54,815.00
Drainage (Ramps)	1.729	km	80000	\$138,320.00
Clearing & Grubbing (mainline)	3.8	km	50000	\$190,000.00
Clearing & Grubbing (Harrodsburg Road)	0.577	km	25000	\$14,425.00
Clearing & Grubbing (Ramps)	1.729	km	20000	\$34,580.00
Erosion Control (mainline)	3.8	km	60000	\$228,000.00
Erosion Control (Harrodsburg Road)	0.577	km	36000	\$20,772.00
Erosion Control (Ramps)	1.729	km	36000	\$62,244.00
Remove & Replace R/W Fence (mainline)	3.8	km	30000	\$114,000.00
Maintenance of Traffic (mainline)	3.8	km	325000	\$1,235,000.00
Maintenance of Traffic (Harrodsburg Road)	0.577	km	225000	\$129,825.00
Maintenance of Traffic (Ramps)	1.729	km	200000	\$345,800.00
Striping (mainline)	3.8	km	35000	\$133,000.00
Striping (Harrodsburg Road)	0.577	km	30000	\$17,310.00
Striping (Ramps)	1.729	km	25000	\$43,225.00
Concrete Median Barrier (mainline)	3.8	km	135000	\$513,000.00
Remove Bridge (Harrodsburg Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Parker's Mill Road)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Harrodsburg Road)	3275.6	sq. m	550	\$1,801,580.00
Replace Bridge (Parker's Mill Road)	2032.8	sq. m	550	\$1,118,040.00
Retaining Walls	8339.75	sq. m	375	\$3,127,406.25
Earthwork	104000	cu. m	7.5	\$780,000.00
Noise Walls	1156	sq. m	160	\$184,960.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$5,747,309.00
Paving (Harrodsburg Road & Ramps)				\$2,064,159.00
<b>COST</b>				<b>\$19,650,770.25</b>
+ 20% Engineering & Contingencies				\$3,930,154.05
<b>TOTAL COST</b>				<b>\$23,580,924.30</b>

## SECTION #6 ALT. 2

### STA. 21+000 -- STA 24+400

#### *Nicholasville Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	3.4	km	135000	\$459,000.00
Drainage (Nicholasville Road)	0.879	km	95000	\$83,505.00
Drainage (Ramps)	1.991	km	80000	\$159,280.00
Clearing & Grubbing (mainline)	3.4	km	50000	\$170,000.00
Clearing & Grubbing (Nicholasville Road)	0.879	km	25000	\$21,975.00
Clearing & Grubbing (Ramps)	1.991	km	20000	\$39,820.00
Erosion Control (mainline)	3.4	km	60000	\$204,000.00
Erosion Control (Nicholasville Road)	0.879	km	36000	\$31,644.00
Erosion Control (Ramps)	1.991	km	36000	\$71,676.00
Remove & Replace R/W Fence (mainline)	3.4	km	30000	\$102,000.00
Maintenance of Traffic (mainline)	3.4	km	325000	\$1,105,000.00
Maintenance of Traffic (Nicholasville Road)	0.879	km	225000	\$197,775.00
Maintenance of Traffic (Ramps)	1.991	km	200000	\$398,200.00
Striping (mainline)	3.4	km	35000	\$119,000.00
Striping (Nicholasville Road)	0.879	km	30000	\$26,370.00
Striping (Ramps)	1.991	km	25000	\$49,775.00
Concrete Median Barrier (mainline)	3.4	km	135000	\$459,000.00
Remove Bridge (Nicholasville Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Clay's Mill Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Railroad over New Circle)	1	lp. sm	80000	\$80,000.00
Replace Bridge (Nicholasville Road)	3499	sq. m	550	\$1,924,450.00
Replace Bridge (Clay's Mill Road)	2587.2	sq. m	550	\$1,422,960.00
Replace Bridge (Railroad over New Circle)	816	sq. m	1900	\$1,550,400.00
Retaining Walls	5475.45	sq. m	375	\$2,053,293.75
Earthwork	146000	cu. m	7.5	\$1,095,000.00
Noise Walls	311	sq. m	160	\$49,760.00
RR Relocation	480	m	350	\$168,000.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$5,084,920.00
Paving (Nicholasville Road & Ramps)				\$2,375,497.00
<b>COST</b>				<b>\$20,542,300.75</b>
+ 20% Engineering & Contingencies				\$4,108,460.15
<b>TOTAL COST</b>				<b>\$24,650,760.90</b>

## SECTION #7 ALT. 2

### STA. 24+400 -- STA 27+000

#### *Tates Creek Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.6	km	135000	\$351,000.00
Drainage (Tates Creek Road)	0.552	km	95000	\$52,440.00
Drainage (Ramps)	1.867	km	80000	\$149,360.00
Clearing & Grubbing (mainline)	2.6	km	50000	\$130,000.00
Clearing & Grubbing (Tates Creek Road)	0.552	km	25000	\$13,800.00
Clearing & Grubbing (Ramps)	1.867	km	20000	\$37,340.00
Erosion Control (mainline)	2.6	km	60000	\$156,000.00
Erosion Control (Tates Creek Road)	0.552	km	36000	\$19,872.00
Erosion Control (Ramps)	1.867	km	36000	\$67,212.00
Remove & Replace R/W Fence (mainline)	2.6	km	30000	\$78,000.00
Maintenance of Traffic (mainline)	2.6	km	325000	\$845,000.00
Maintenance of Traffic (Tates Creek Road)	0.552	km	225000	\$124,200.00
Maintenance of Traffic (Ramps)	1.867	km	200000	\$373,400.00
Striping (mainline)	2.6	km	35000	\$91,000.00
Striping (Tates Creek Road)	0.552	km	30000	\$16,560.00
Striping (Ramps)	1.867	km	25000	\$46,675.00
Concrete Median Barrier (mainline)	2.6	km	135000	\$351,000.00
Remove Bridge (Tates Creek Road)	1	lp. sm	120000	\$120,000.00
Remove Bridge (Landsdowne Drive)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Tates Creek Road)	4212	sq. m	750	\$3,159,000.00
Replace Bridge (Landsdowne Drive)	1848	sq. m	550	\$1,016,400.00
Retaining Walls	7303	sq. m	375	\$2,738,625.00
Earthwork	142000	cu. m	7.5	\$1,065,000.00
Noise Walls	1511	sq. m	160	\$241,760.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$60,000.00
Paving (mainline)				\$3,805,359.00
Paving (Tates Creek Road & Ramps)				\$1,967,337.00
COST				\$17,896,340.00
+ 20% Engineering & Contingencies				\$3,579,268.00
<b>TOTAL COST</b>				<b>\$21,475,608.00</b>

## SECTION #8 ALT. 2

### STA. 27+000 -- STA 29+500

#### *Alumni Drive Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.5	km	135000	\$337,500.00
Drainage (Alumni Drive)	0.471	km	95000	\$44,745.00
Drainage (Ramps)	1.559	km	80000	\$124,720.00
Clearing & Grubbing (mainline)	2.5	km	50000	\$125,000.00
Clearing & Grubbing (Alumni Drive)	0.471	km	25000	\$11,775.00
Clearing & Grubbing (Ramps)	1.559	km	20000	\$31,180.00
Erosion Control (mainline)	2.5	km	60000	\$150,000.00
Erosion Control (Alumni Drive)	0.471	km	36000	\$16,956.00
Erosion Control (Ramps)	1.559	km	36000	\$56,124.00
Remove & Replace R/W Fence (mainline)	2.5	km	30000	\$75,000.00
Maintenance of Traffic (mainline)	2.5	km	325000	\$812,500.00
Maintenance of Traffic (Alumni Drive)	0.471	km	225000	\$105,975.00
Maintenance of Traffic (Ramps)	1.559	km	200000	\$311,800.00
Striping (mainline)	2.5	km	35000	\$87,500.00
Striping (Alumni Drive)	0.471	km	30000	\$14,130.00
Striping (Ramps)	1.559	km	25000	\$38,975.00
Concrete Median Barrier (mainline)	2.5	km	135000	\$337,500.00
Remove Bridge (Alumni Drive)	1	lp. sm	60000	\$60,000.00
Remove Bridge (Chinoe Road)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Alumni Drive)	3168	sq. m	550	\$1,742,400.00
Replace Bridge (Chinoe Road)	1704	sq. m	550	\$937,200.00
Retaining Walls	4914.1	sq. m	375	\$1,842,787.50
Earthwork	100000	cu. m	7.5	\$750,000.00
Noise Walls	1422	sq. m	160	\$227,520.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$3,310,745.00
Paving (Alumni Drive & Ramps)				\$1,612,219.00
<b>COST</b>				<b>\$14,084,251.50</b>
+ 20% Engineering & Contingencies				\$2,816,850.30
<b>TOTAL COST</b>				<b>\$16,901,101.80</b>

## SECTION #9 ALT. 2

### STA. 29+500 -- STA 101+200

#### *Richmond Road Interchange*

	Quantity	Unit	Unit Cost	Cost
Drainage (mainline)	2.45	km	135000	\$330,750.00
Drainage (Richmond Road)	0.538	km	95000	\$51,110.00
Drainage (Ramps)	2.005	km	80000	\$160,400.00
Clearing & Grubbing (mainline)	2.45	km	50000	\$122,500.00
Clearing & Grubbing (Richmond Road)	0.538	km	25000	\$13,450.00
Clearing & Grubbing (Ramps)	2.005	km	20000	\$40,100.00
Erosion Control (mainline)	2.45	km	60000	\$147,000.00
Erosion Control (Richmond Road)	0.538	km	36000	\$19,368.00
Erosion Control (Ramps)	2.005	km	36000	\$72,180.00
Remove & Replace R/W Fence (mainline)	2.45	km	30000	\$73,500.00
Maintenance of Traffic (mainline)	2.45	km	325000	\$796,250.00
Maintenance of Traffic (Richmond Road)	0.538	km	225000	\$121,050.00
Maintenance of Traffic (Ramps)	2.005	km	200000	\$401,000.00
Striping (mainline)	2.45	km	35000	\$85,750.00
Striping (Richmond Road)	0.538	km	30000	\$16,140.00
Striping (Ramps)	2.005	km	25000	\$50,125.00
Concrete Median Barrier (mainline)	2.45	km	135000	\$330,750.00
Remove Bridge (Richmond Road)	1	lp. sm	120000	\$120,000.00
Replace Bridge (Richmond Road)	3664	sq. m	550	\$2,015,200.00
Retaining Walls	6978.5	sq. m	375	\$2,616,937.50
Earthwork	113000	cu. m	7.5	\$847,500.00
Noise Walls	578	sq. m	160	\$92,480.00
Signing				\$400,000.00
Lighting				\$300,000.00
Signals				\$100,000.00
Paving (mainline)				\$3,461,865.00
Paving (Richmond Road & Ramps)				\$1,791,115.00
<b>COST</b>				<b>\$14,576,520.50</b>
+ 20% Engineering & Contingencies				\$2,915,304.10
<b>TOTAL COST</b>				<b>\$17,491,824.60</b>

**GRAND TOTAL**

**\$170,749,122.71**

APPENDIX III  
ACCIDENT ANALYSIS

# ACCIDENT ANALYSIS

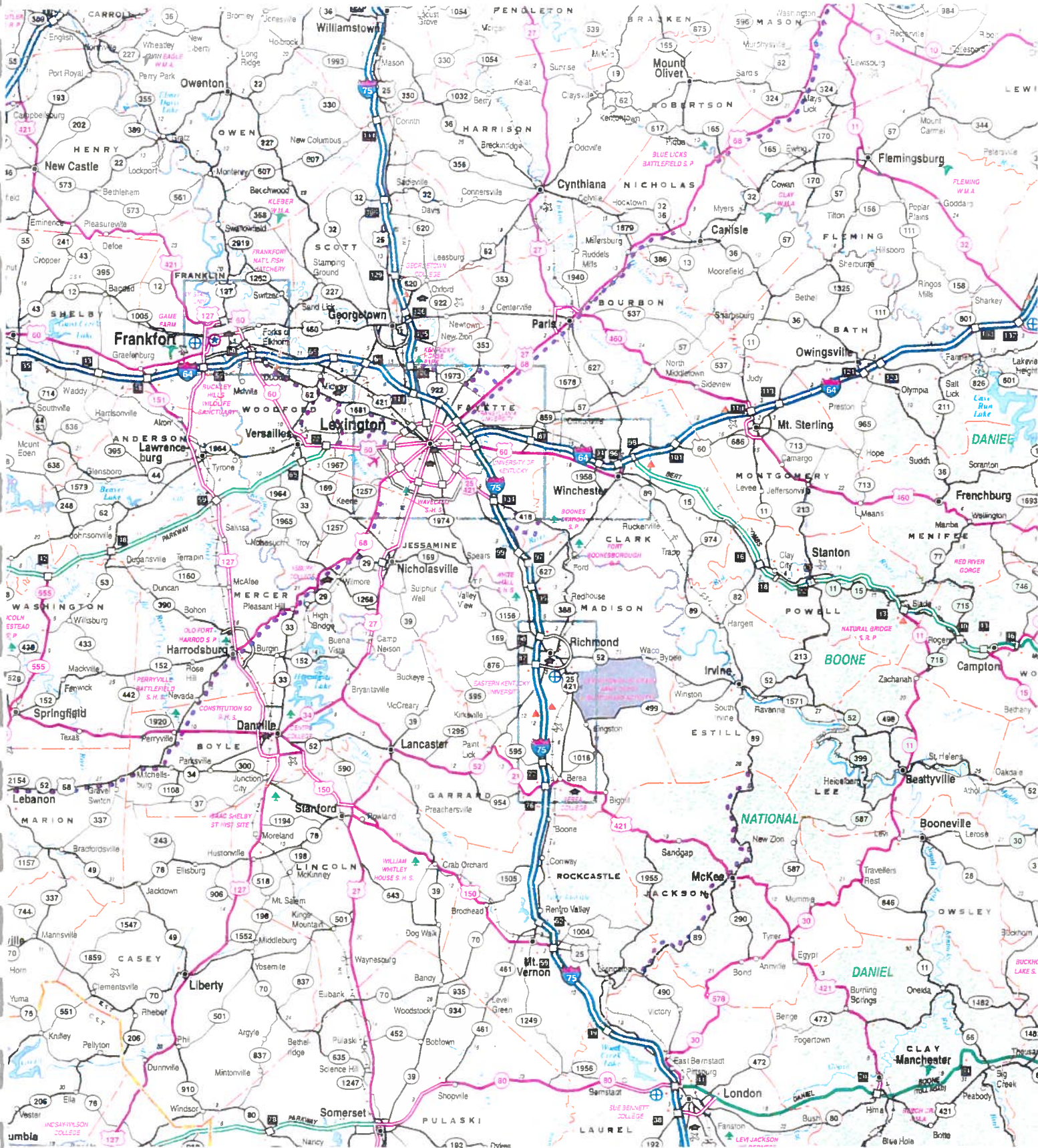
FAYETTE COUNTY

NEW CIRCLE ROAD - KY 4

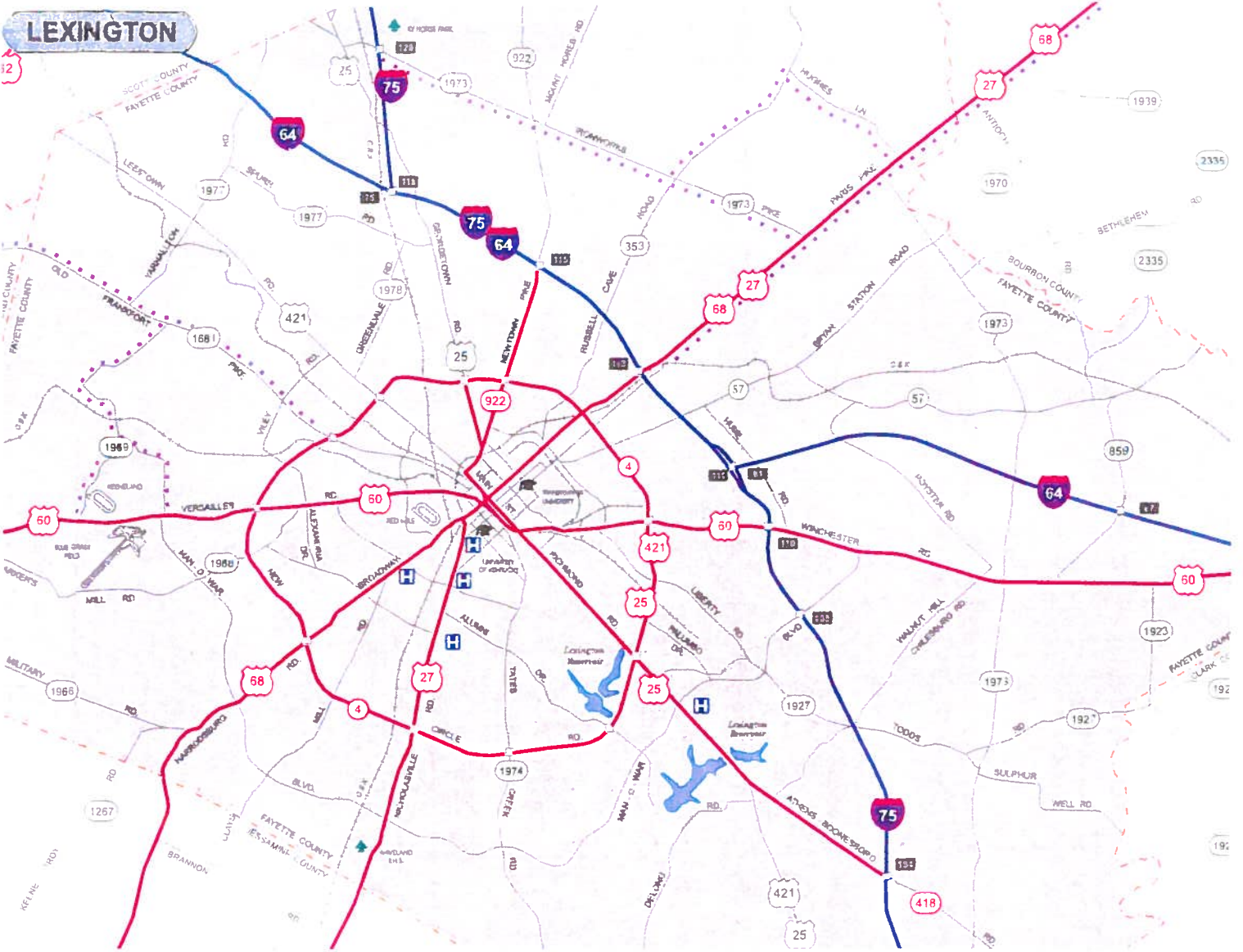
JANUARY 1, 1994 - DECEMBER 31, 1996

ROUTE NO.	ROUTE DESCRIPTION		LENGTH (miles)	AADT (VPD)	ACCIDENTS			
	FROM	TO			FATAL	INJURY	PDO	TOTAL
NCR	U.S. 25	U.S. 421	1.492	45733	0	25	0	25
NCR	U.S. 421	KY 1681	0.904	51633	0	14	0	14
NCR	KY 1681	U.S. 60	1.524	52400	0	10	0	10
NCR	U.S. 60	U.S. 68	2.587	49000	0	62	0	62
NCR	U.S. 68	U.S. 27	2.224	50067	2	40	1	43
NCR	U.S. 27	KY 1974	1.535	58800	1	49	0	50
NCR	KY 1974	ALUMNI RD	1.625	51267	0	40	1	41
NCR	ALUMNI RD	U.S. 25	1.28	53200	0	30	0	30

ROUTE NO.	ROUTE DESCRIPTION		RATES PER 100M VMT				TOTALS			
	FROM	TO	HMVM	FUNCT CLASS RATE	FATAL	INJURY	PDO	TOTAL ACC. RATE	RC	CRITICAL RATE FACTOR
NCR	U.S. 25	U.S. 421	0.74716	309	0	33	0	33	362.137	0.09
NCR	U.S. 421	KY 1681	0.5111	309	0	27	0	27	373.415	0.07
NCR	KY 1681	U.S. 60	0.87444	309	0	11	0	11	358.071	0.03
NCR	U.S. 60	U.S. 68	1.38805	309	0	45	0	45	347.854	0.13
NCR	U.S. 68	U.S. 27	1.21927	309	2	33	1	35	350.482	0.10
NCR	U.S. 27	KY 1974	0.98833	309	1	50	0	51	355.125	0.14
NCR	KY 1974	ALUMNI RD	0.91223	309	0	44	1	45	357.032	0.13
NCR	ALUMNI RD	U.S. 25	0.74565	309	0	40	0	40	362.191	0.11

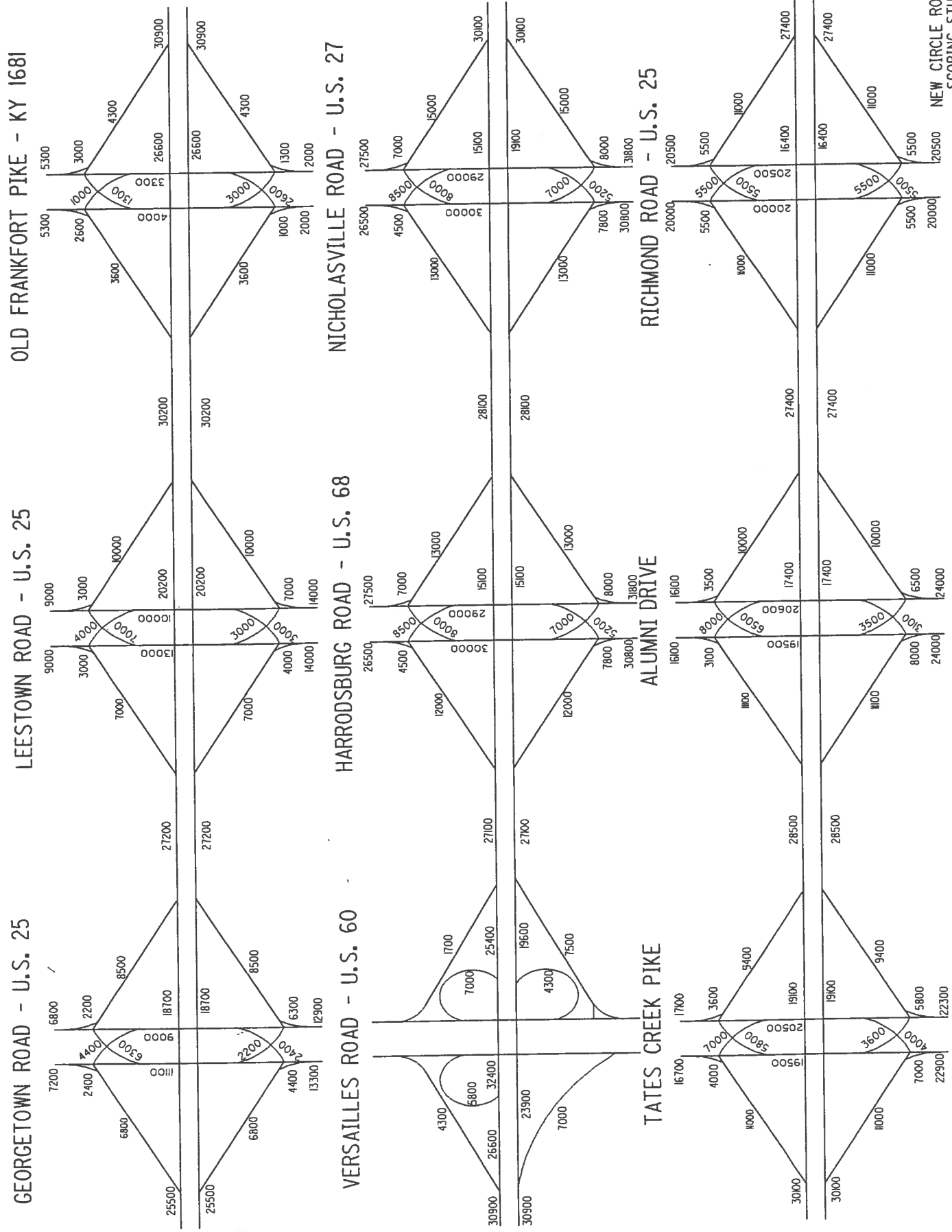


**New Circle Road Scoping Study**  
**Exhibit 1**  
**Location Map**



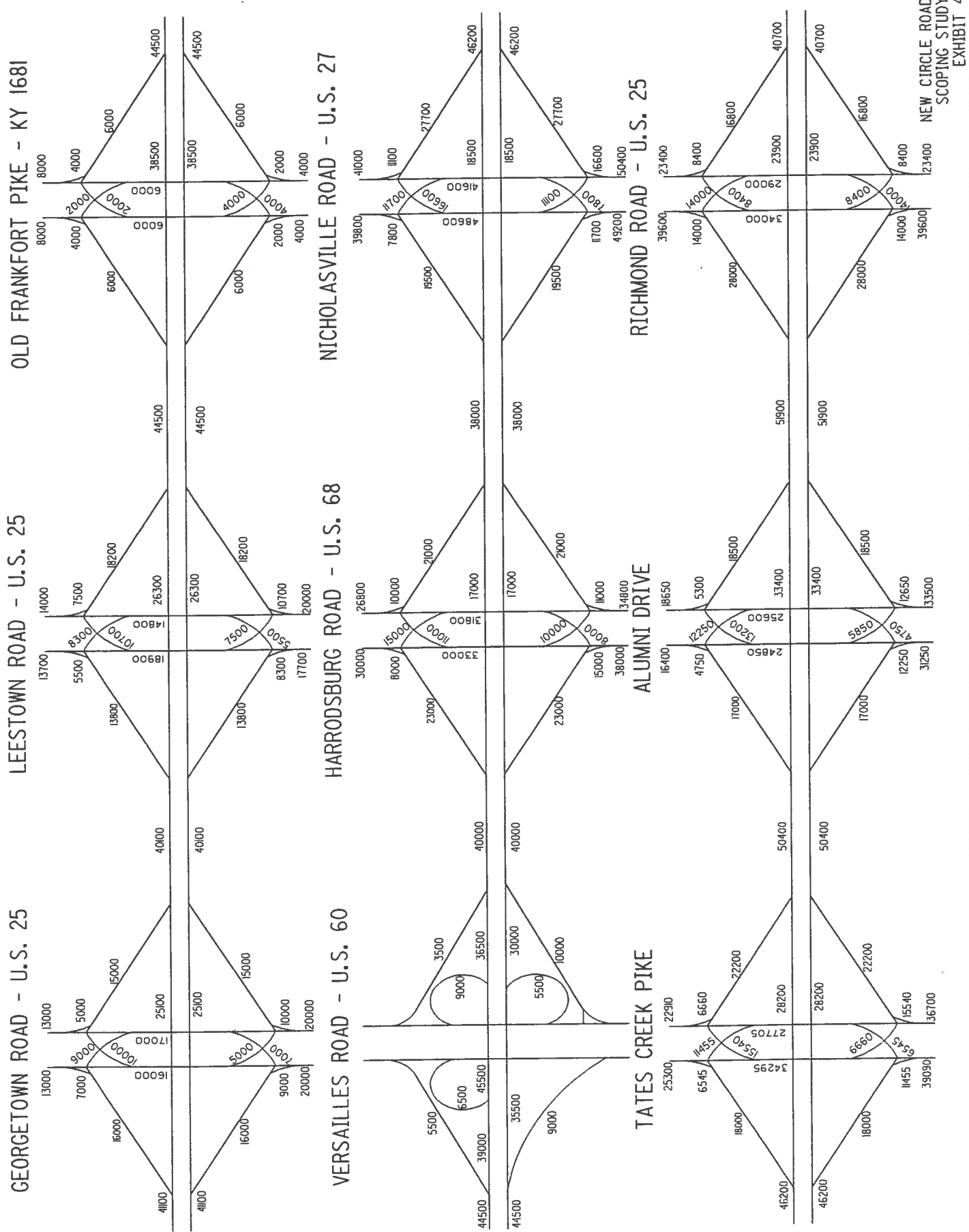
**New Circle Road Scoping Study  
Exhibit 2  
Vicinity Map**

# NEW CIRCLE ROAD - TRAFFIC VOLUMES (1996 ADT)



PREPARED BY \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_  
 DATE \_\_\_\_\_  
 DATE \_\_\_\_\_  
 DATE \_\_\_\_\_

# NEW CIRCLE ROAD - TRAFFIC VOLUMES (2020 ADT)



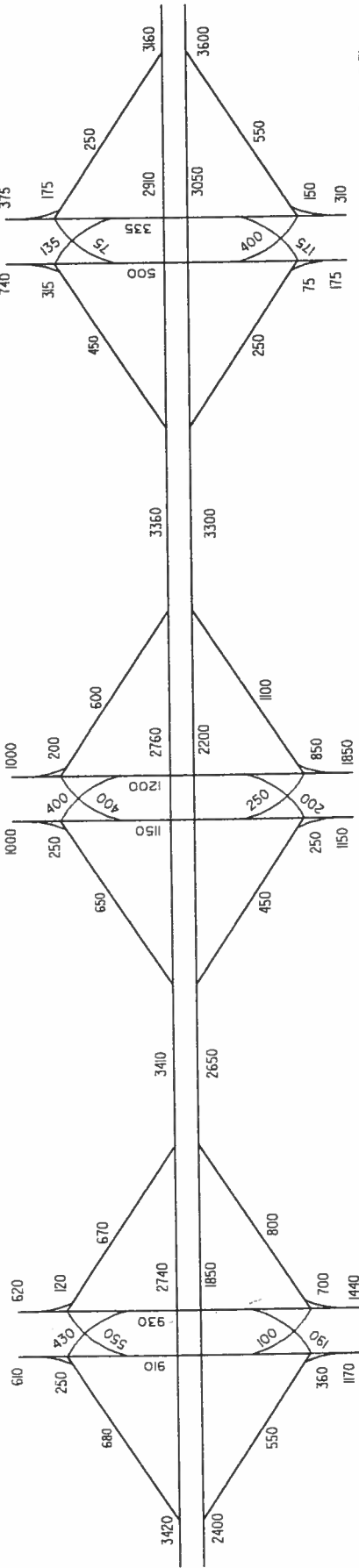
# NEW CIRCLE ROAD - TRAFFIC VOLUMES (1996 DHV)

COUNTY	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
NEW CIRCLE ROAD			

GEORGETOWN ROAD - U.S. 25

LEESTOWN ROAD - U.S. 25

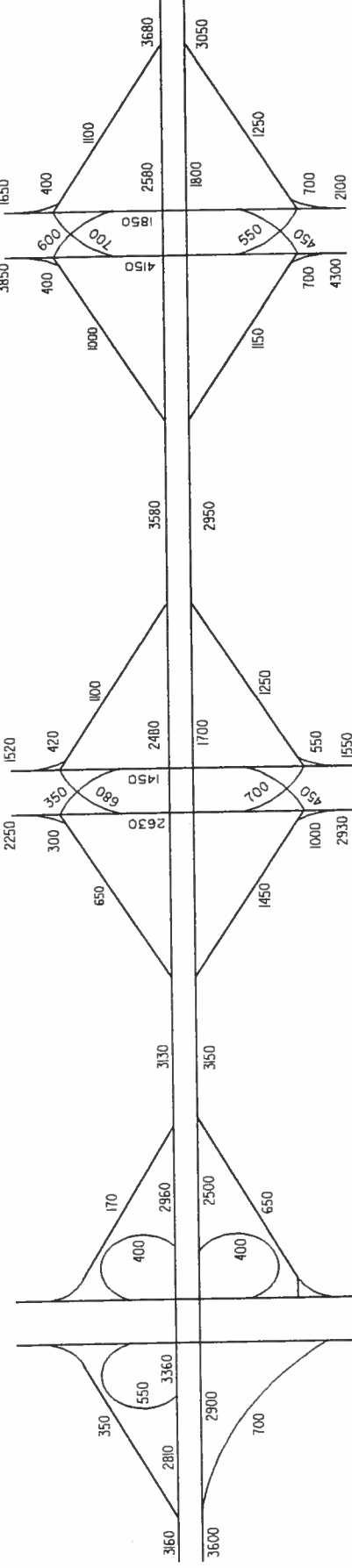
OLD FRANKFORT PIKE - KY 1681



VERSAILLES ROAD - U.S. 60

HARRODSBURG ROAD - U.S. 68

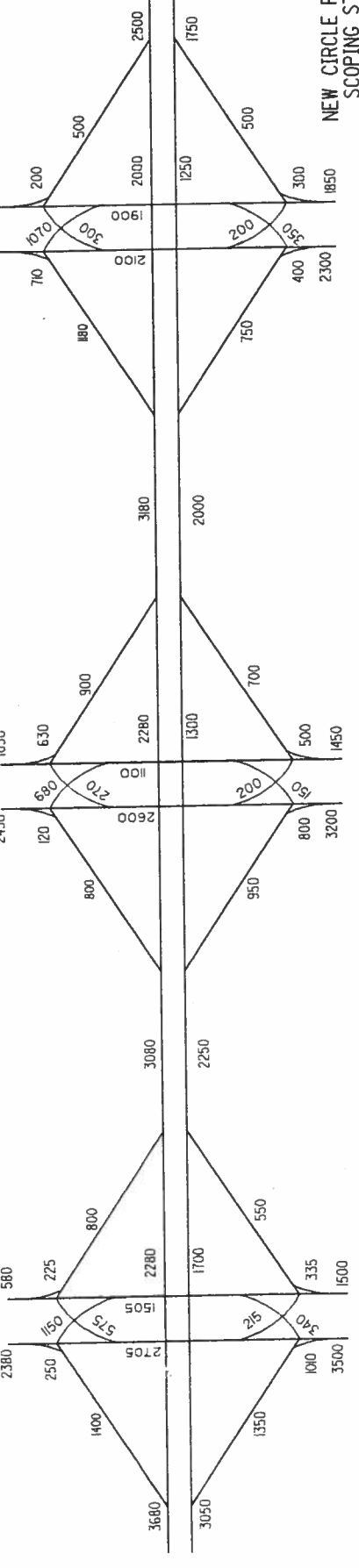
NICHOLASVILLE ROAD - U.S. 27



TATES CREEK PIKE

ALUMNI DRIVE

RICHMOND ROAD - U.S. 25



NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 5

DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_  
 DATE \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_  
 DATE \_\_\_\_\_

COUNTRY	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OF			

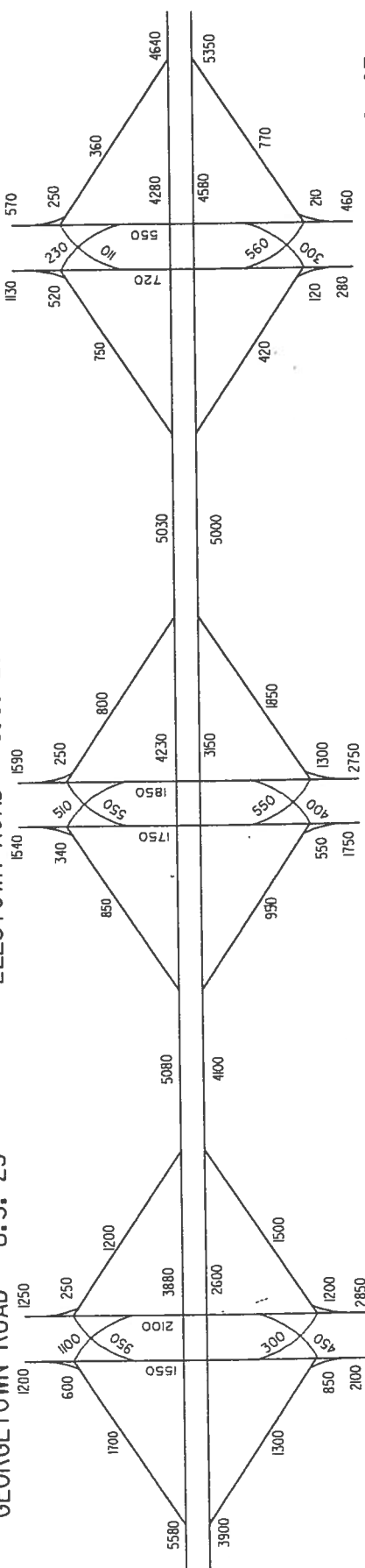
# NEW CIRCLE ROAD - TRAFFIC VOLUMES (2020 DHV)

NEW CIRCLE ROAD

OLD FRANKFORT PIKE - KY 1681

LEESTOWN ROAD - U.S. 25

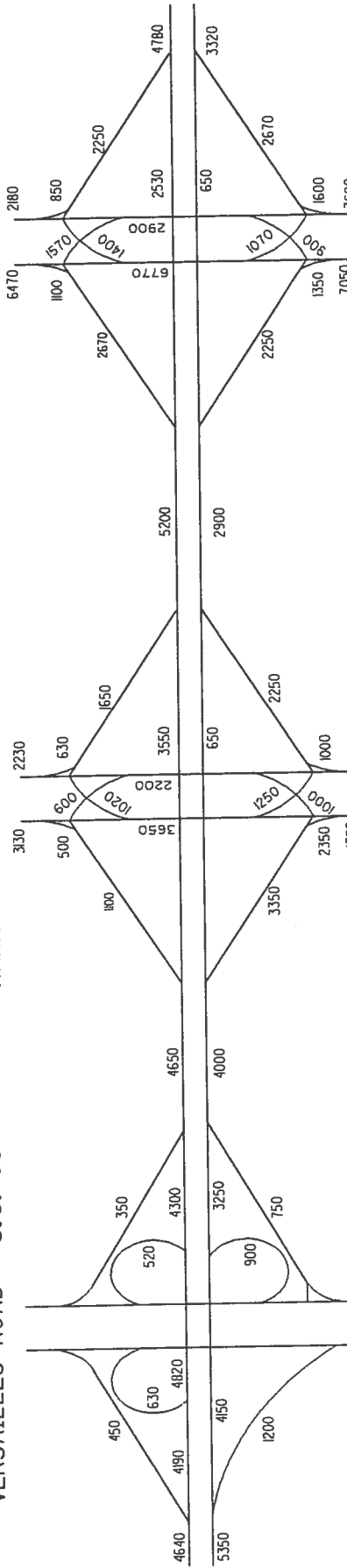
GEORGETOWN ROAD - U.S. 25



NICHOLASVILLE ROAD - U.S. 27

HARRODSBURG ROAD - U.S. 68

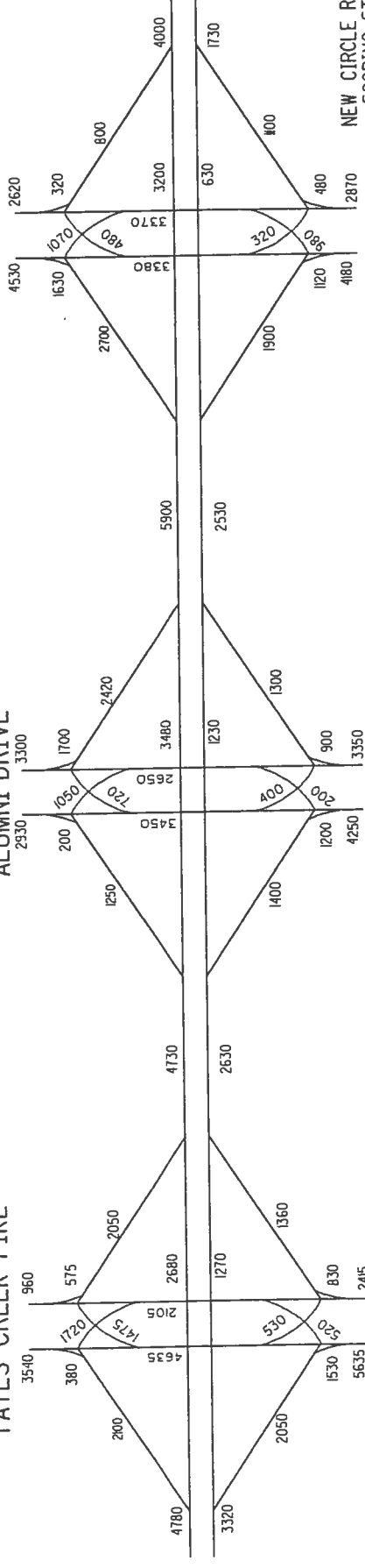
VERSAILLES ROAD - U.S. 60



RICHMOND ROAD - U.S. 25

ALUMNI DRIVE

TATES CREEK PIKE



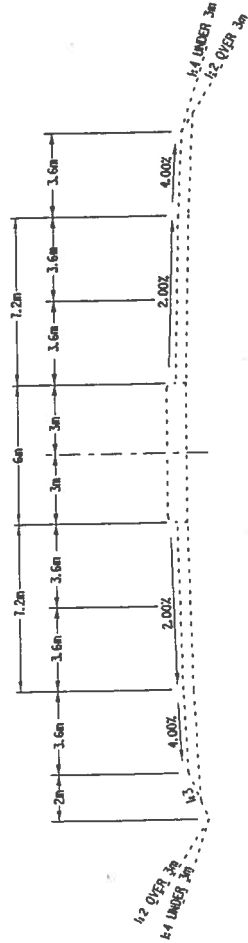
NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 6

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

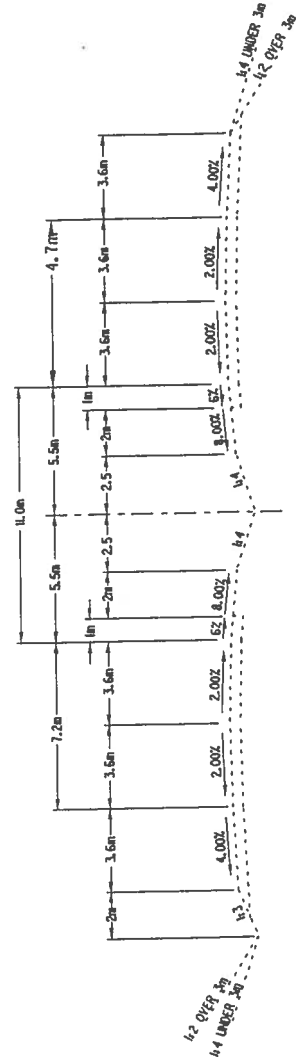
COUNTY	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OK			

NEW CIRCLE ROAD

# NEW CIRCLE ROAD EXISTING TYPICAL SECTIONS



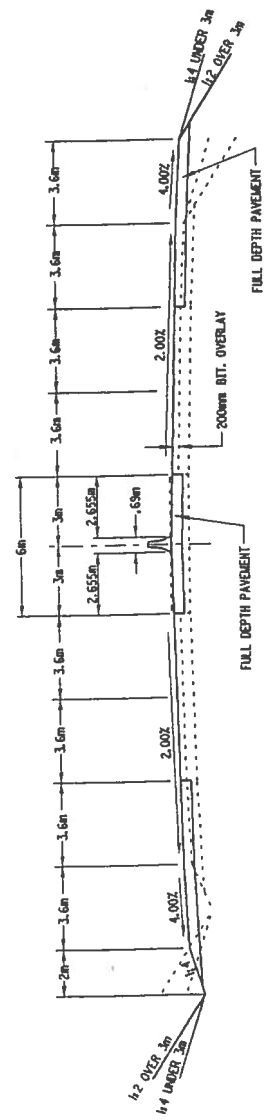
EXISTING SECTION



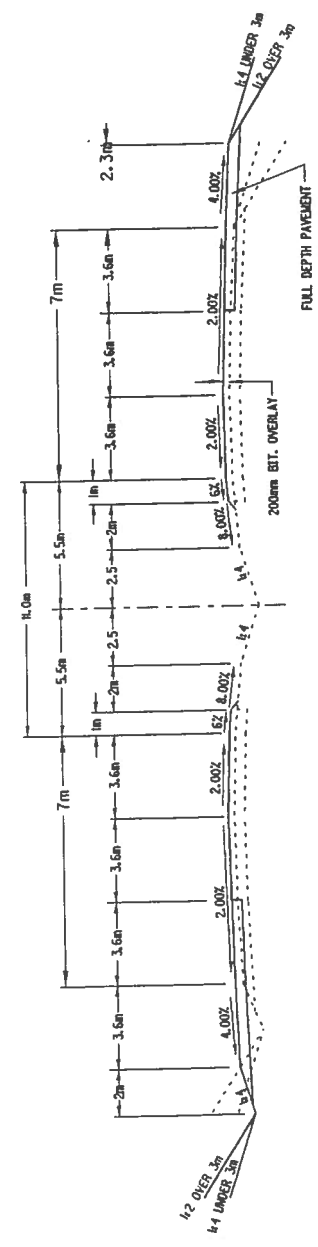
EXISTING SECTION

APPROVED BY	DATE
CHECKED BY	DATE
DRAWN BY	DATE

# NEW CIRCLE ROAD TYPICAL SECTIONS



EXISTING SECTION  
WITH ADDITIONAL LANE ON OUTSIDE

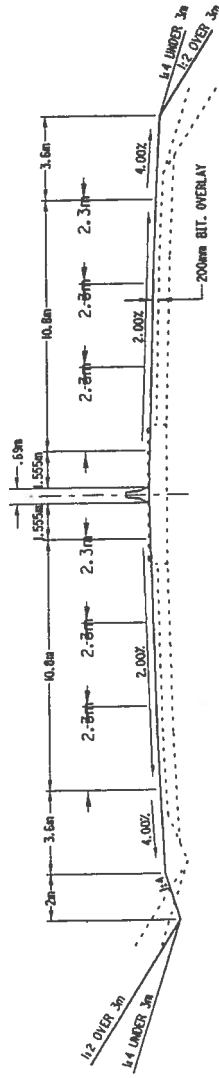


EXISTING SECTION  
WITH ADDITIONAL LANE ON OUTSIDE

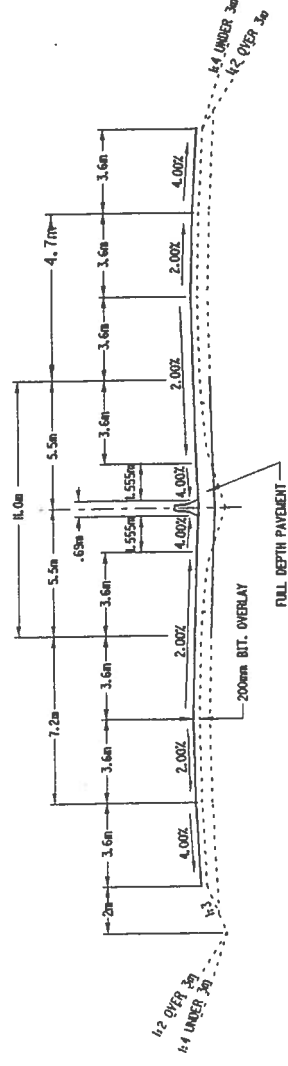
COUNTY OF	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

NEW CIRCLE ROAD

# NEW CIRCLE ROAD TYPICAL SECTIONS



EXISTING SECTION  
WITH ADDITIONAL LANE IN MEDIAN

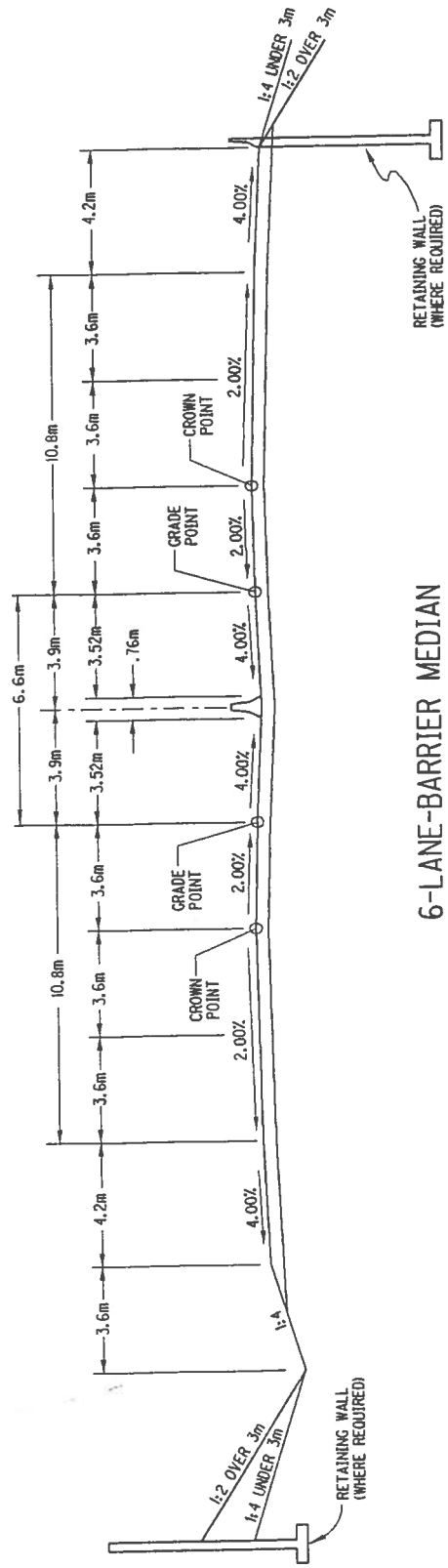


EXISTING SECTION  
WITH ADDITIONAL LANE IN MEDIAN

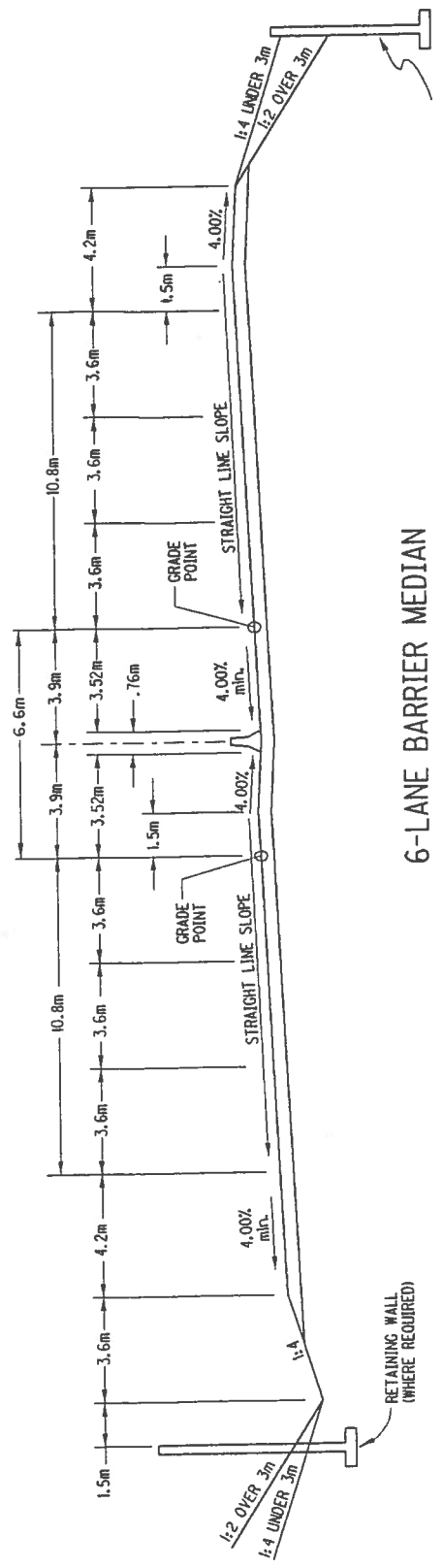
NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 9

APPROVED BY	DATE
CHECKED BY	DATE
DRAWN BY	DATE

# NEW CIRCLE ROAD TYPICAL SECTIONS



6-LANE-BARRIER MEDIAN  
NORMAL SECTION

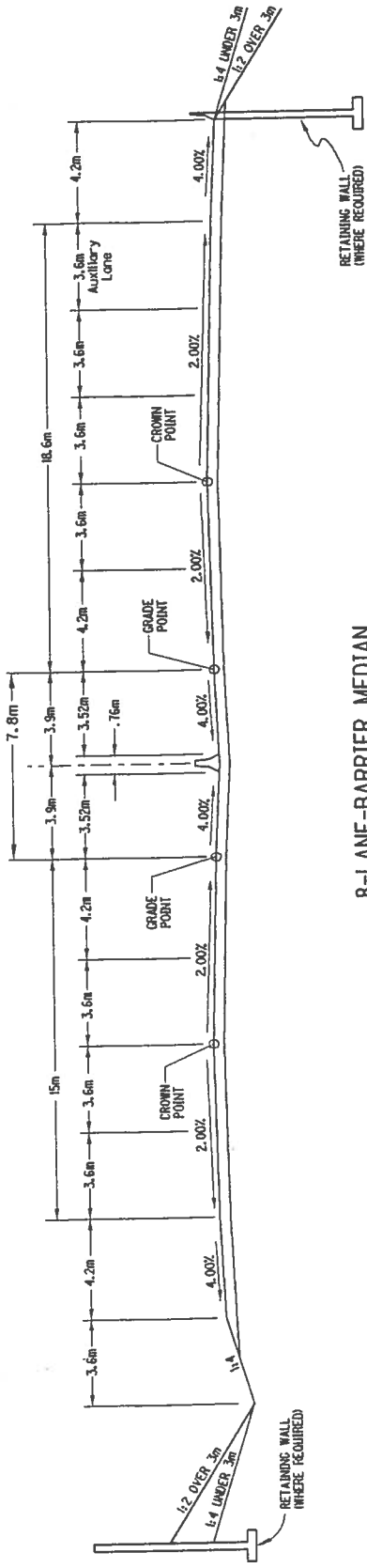


6-LANE BARRIER MEDIAN  
SUPERELEVATED SECTION

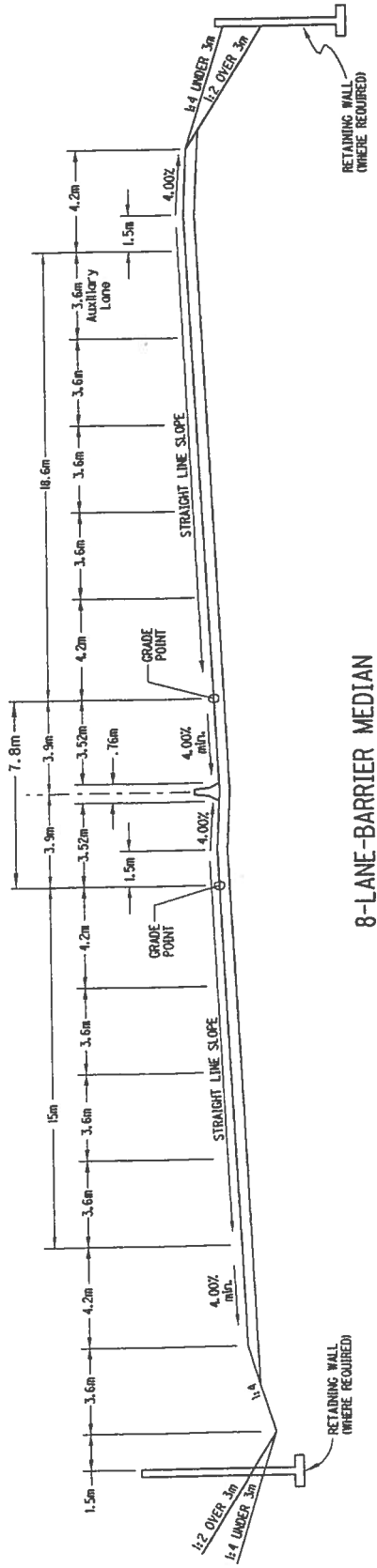
RETAINING WALL  
(WHERE REQUIRED)

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

# NEW CIRCLE ROAD TYPICAL SECTIONS



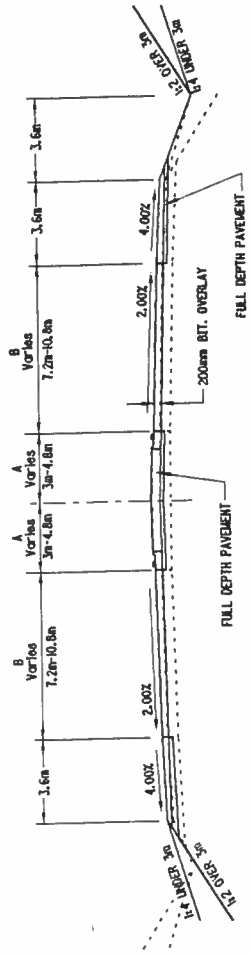
8-LANE-BARRIER MEDIAN  
NORMAL SECTION  
WITH AUXILIARY LANE



8-LANE-BARRIER MEDIAN  
SUPERELEVATED SECTION  
WITH AUXILIARY LANE

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

# NEW CIRCLE ROAD SIDE ROAD TYPICAL SECTIONS

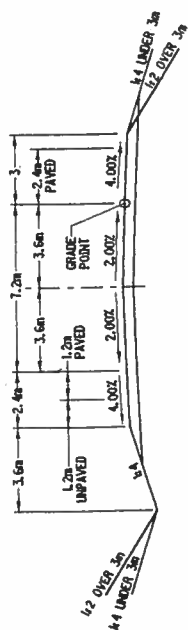


- NORMAL SECTION**
- GEORGETOWN ROAD
  - LEESTOWN ROAD
  - OLD FRANKFORT PIKE
  - VERSAILLES ROAD
  - HARRODSBURG ROAD
  - NICHOLASVILLE ROAD
  - TATES CREEK ROAD
  - ALUMNI DRIVE
  - RICHMOND ROAD

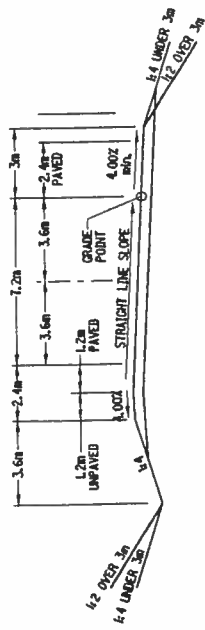
SIDE ROAD	A	B
GEORGETOWN ROAD	Varies 0-3.0	Varies 3.6-7.2
LEESTOWN ROAD	Varies 3.0-4.8	Varies 7.2-10.8
OLD FRANKFORT PIKE	Varies 0-3	Varies 3.3-7.2
VERSAILLES ROAD	Varies 0-3	Varies 1.2-10.8
HARRODSBURG ROAD	4.8	7.2
NICHOLASVILLE ROAD	4.8	10.8
TATES CREEK ROAD	4.8	7.2
ALUMNI DRIVE	4.8	7.2
RICHMOND ROAD	4.8	7.2

# NEW CIRCLE ROAD TYPICAL RAMP SECTIONS

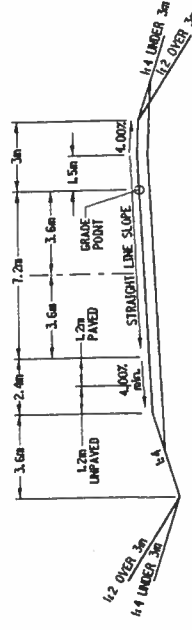
TWO LANE RAMPS



NORMAL SECTION

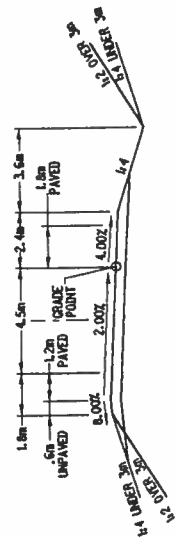


SUPERELEVATED RIGHT

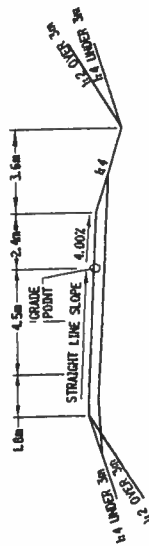


SUPERELEVATED LEFT

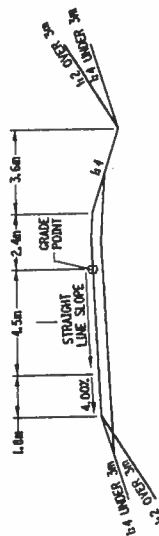
ONE LANE RAMPS



NORMAL SECTION

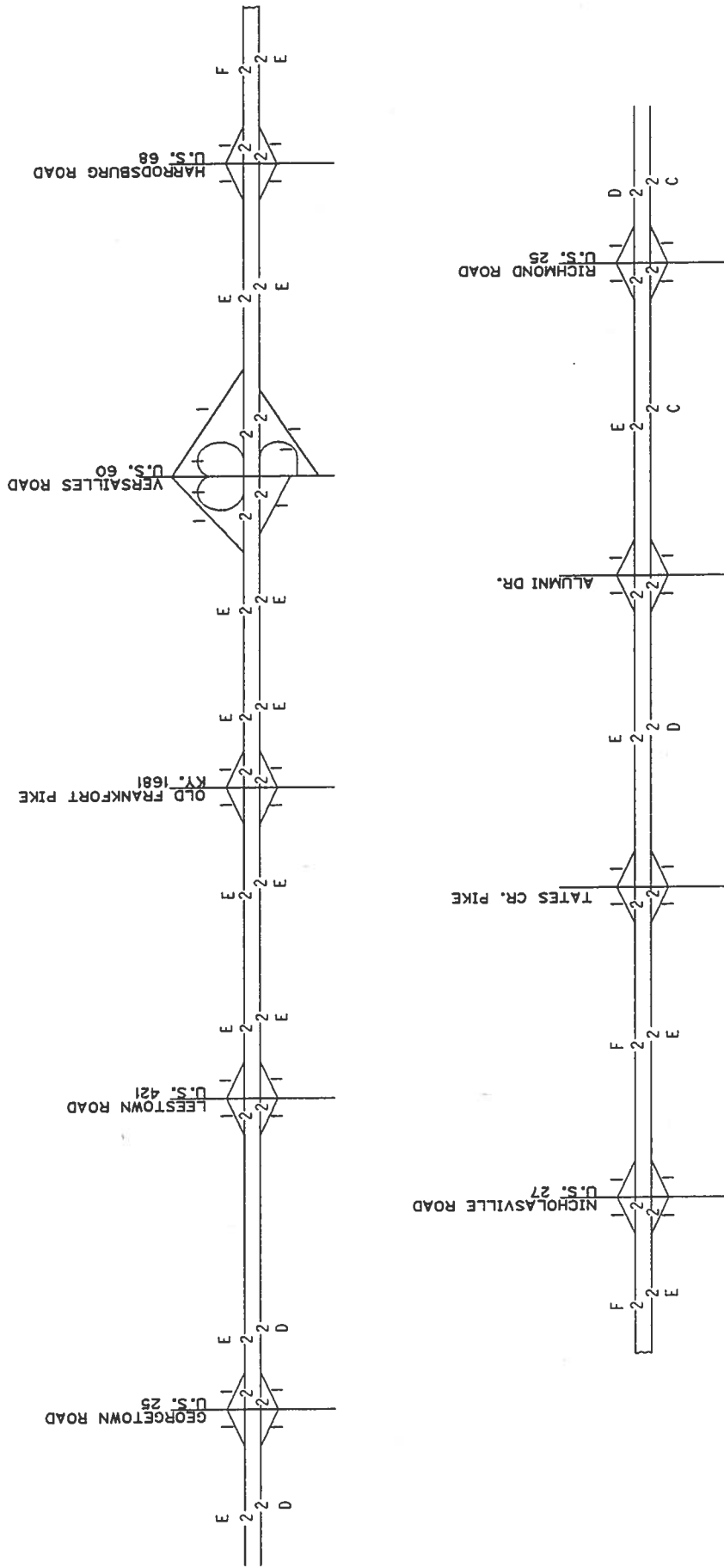


SUPERELEVATED RIGHT



SUPERELEVATED LEFT

# NEW CIRCLE ROAD LANE SCHEMATIC & LEVEL OF SERVICE EXISTING CONDITIONS



NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 14

COUNTY OF	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

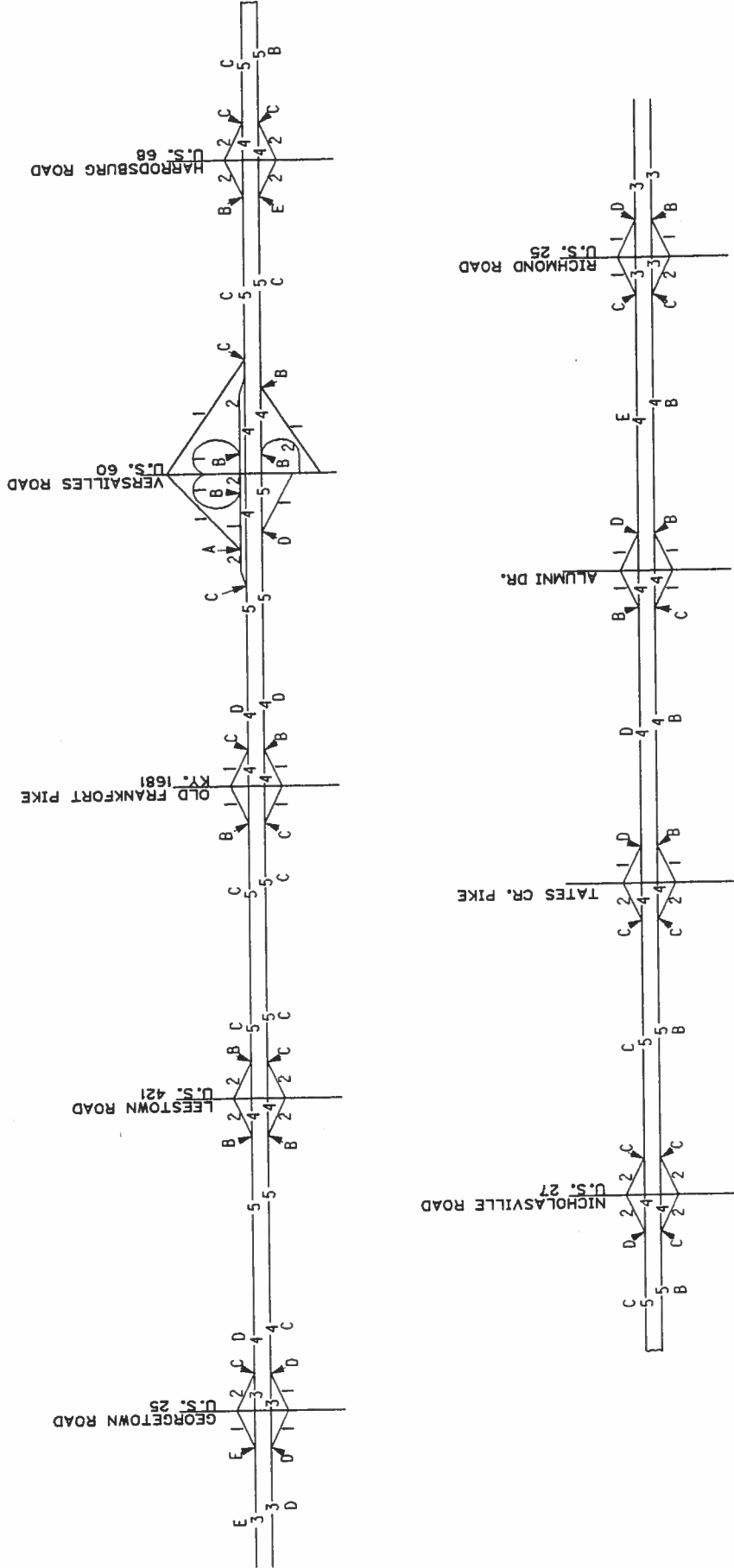
NEW CIRCLE ROAD

PREPARED BY \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_  
 DATE \_\_\_\_\_  
 DATE \_\_\_\_\_  
 DATE \_\_\_\_\_

COUNTY OF	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

NEW CIRCLE ROAD

# NEW CIRCLE ROAD LANE SCHEMATIC & LEVEL OF SERVICE ALTERNATE 1



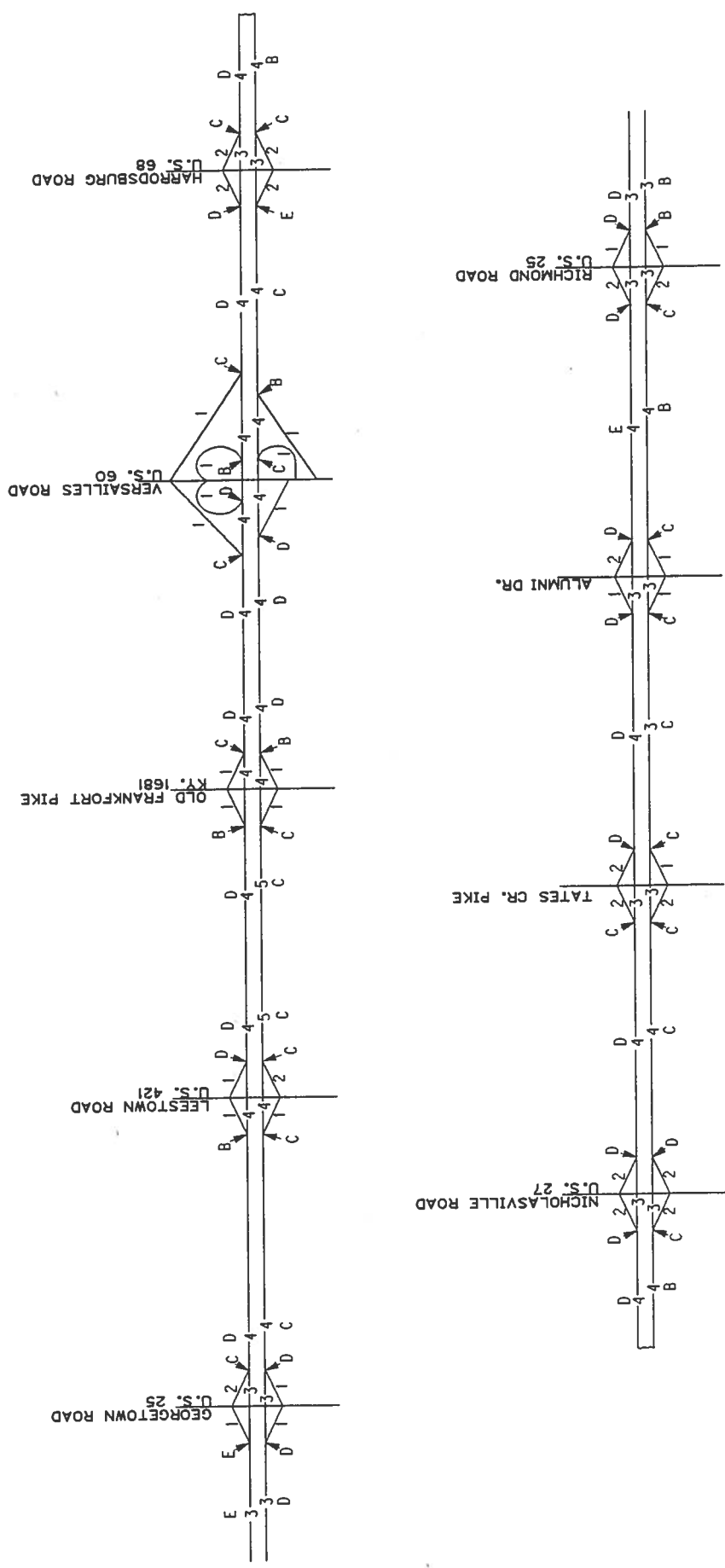
NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 15

PREPARED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE

COUNTY OF	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

NEW CIRCLE ROAD

# NEW CIRCLE ROAD LANE SCHEMATIC & LEVEL OF SERVICE ALTERNATE 2



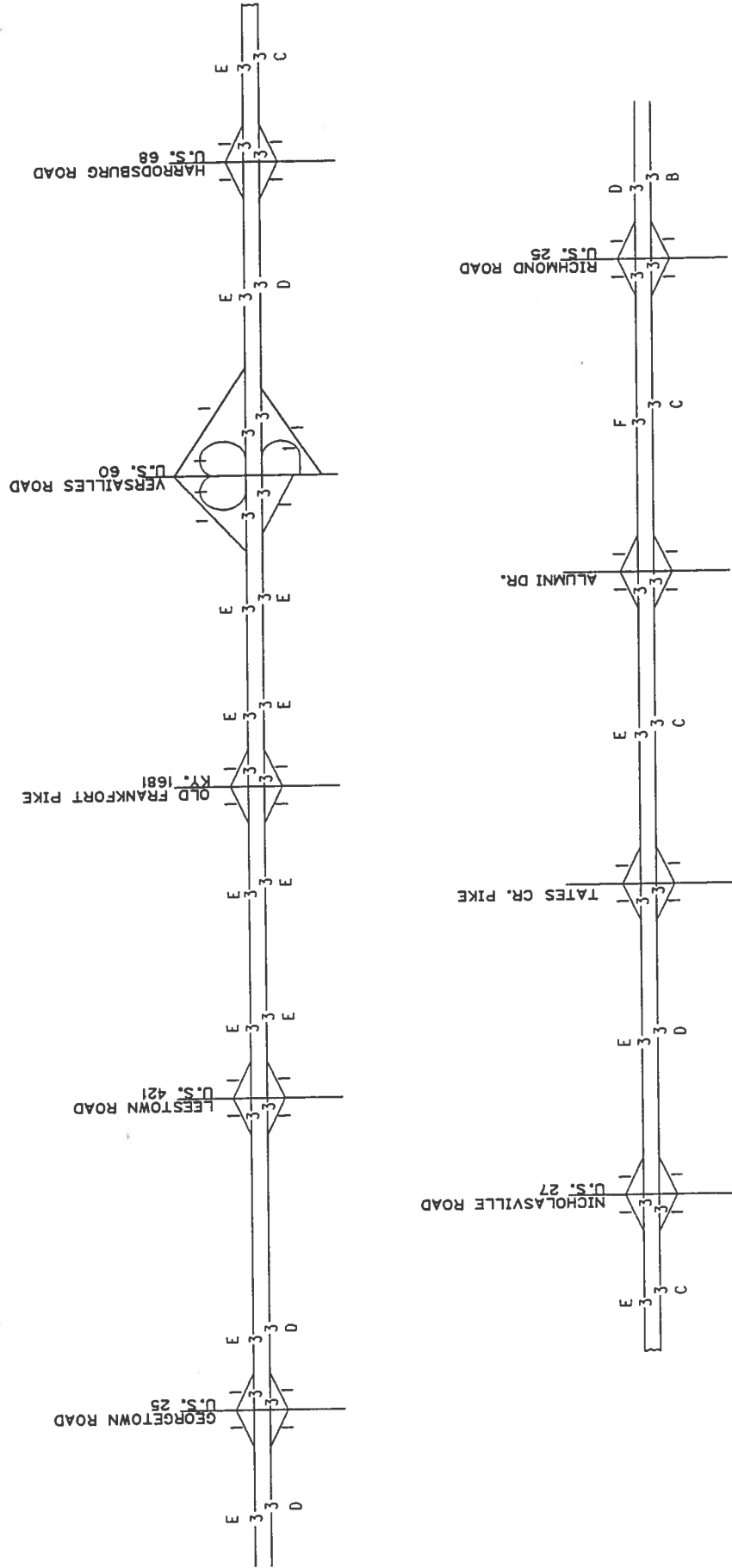
NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 16

PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

COUNTY	FISCAL YEAR	SHEET NO.	TOTAL SHEETS

NEW CIRCLE ROAD

# NEW CIRCLE ROAD LANE SCHEMATIC & LEVEL OF SERVICE ALTERNATE 3

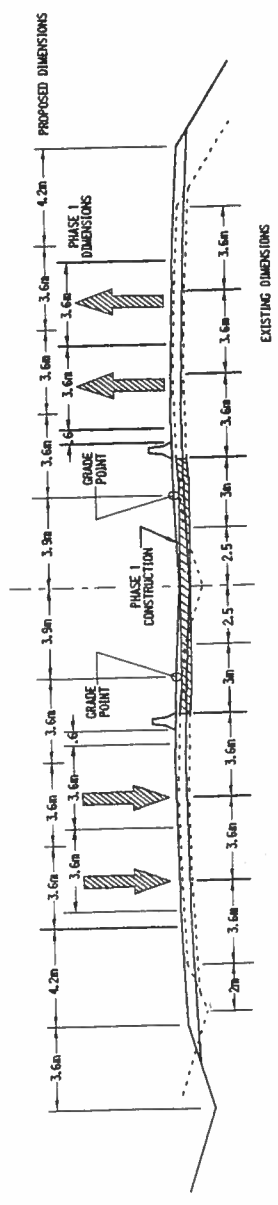


NEW CIRCLE ROAD  
SCOPING STUDY  
EXHIBIT 17

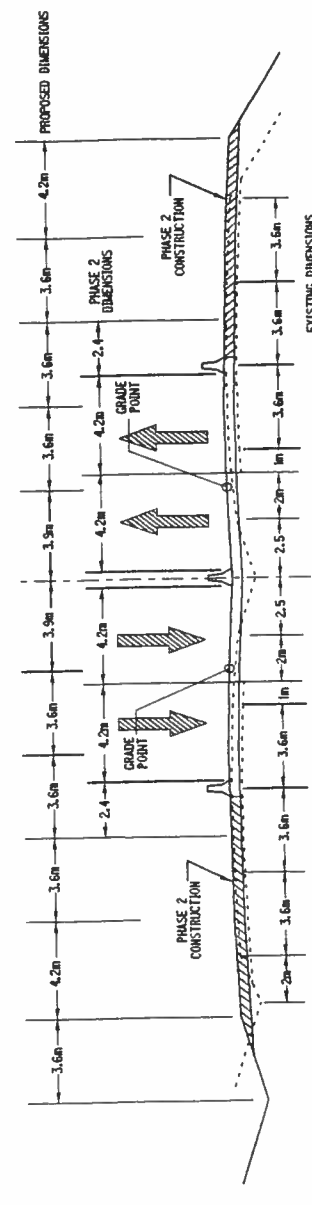
APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 PREPARED BY \_\_\_\_\_ DATE \_\_\_\_\_

# NEW CIRCLE ROAD MAINTENANCE OF TRAFFIC 6 LANE BARRIER MEDIAN

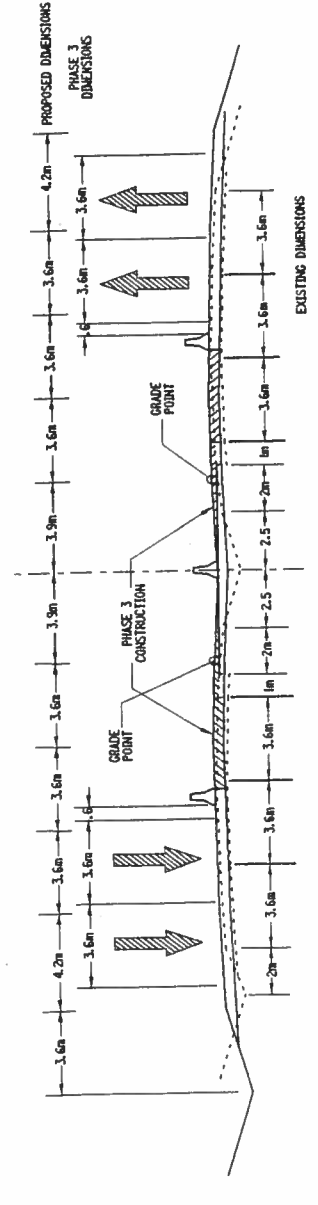
PHASE 1



PHASE 2

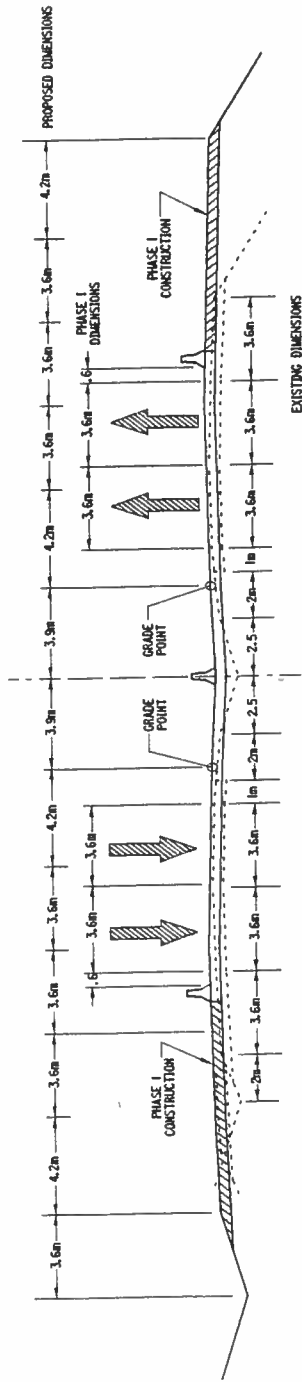


PHASE 3

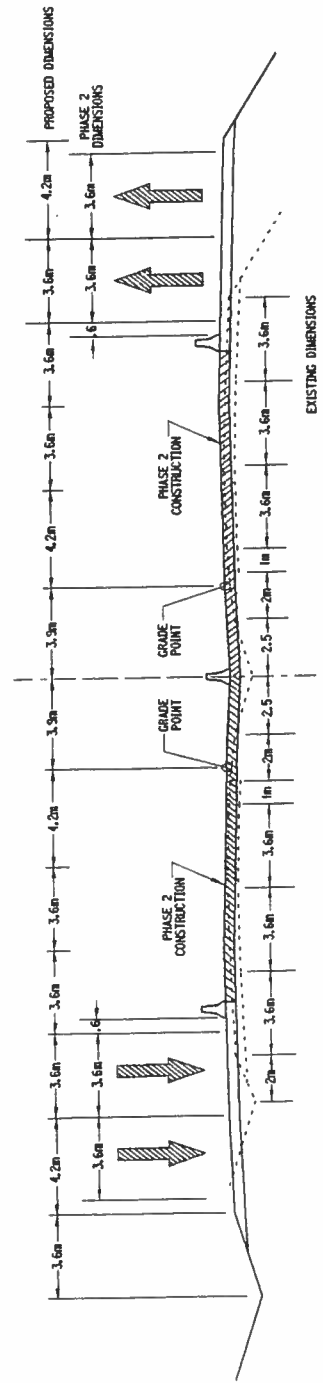


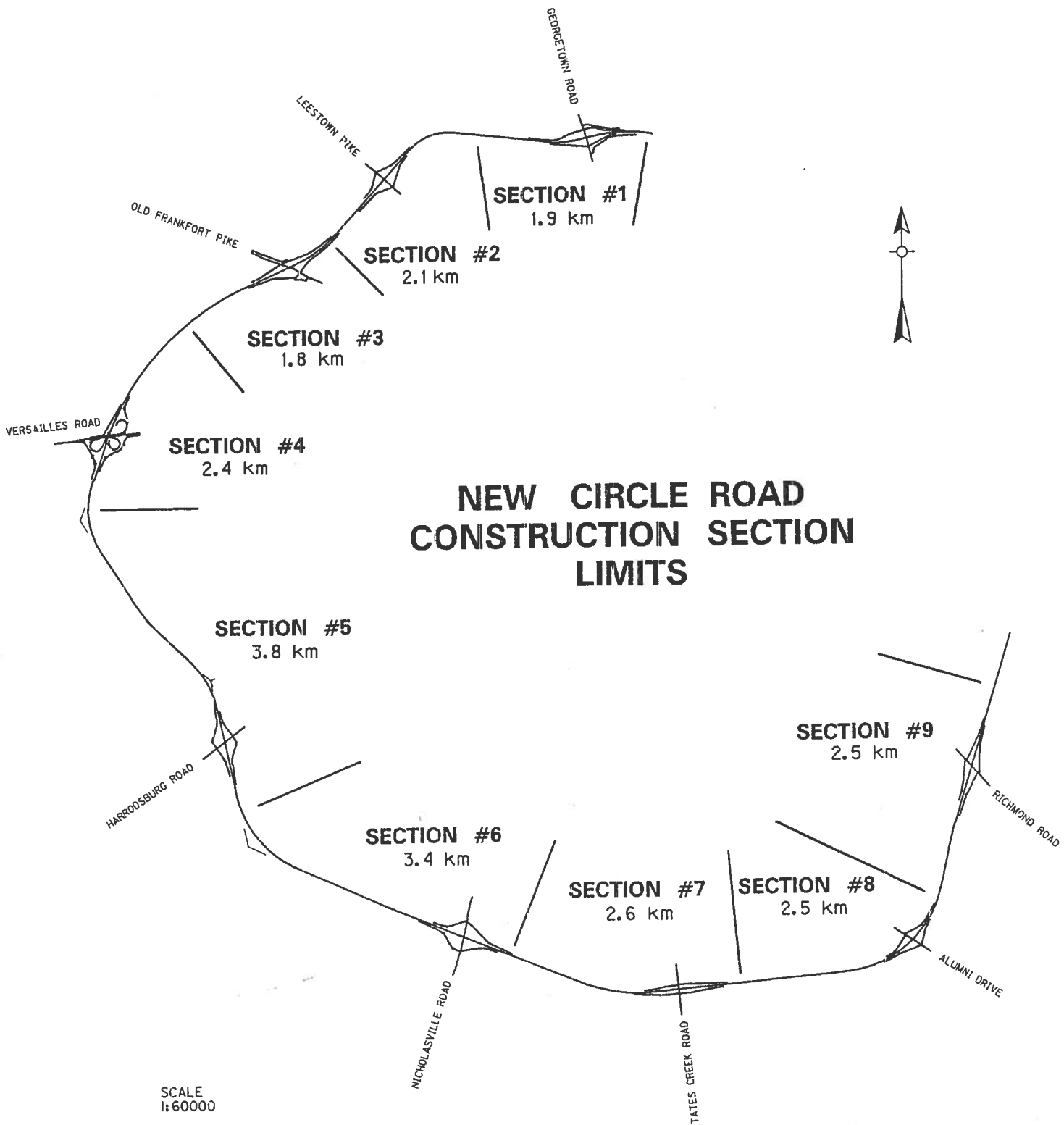
# NEW CIRCLE ROAD MAINTENANCE OF TRAFFIC 8 LANE BARRIER MEDIAN

PHASE 1



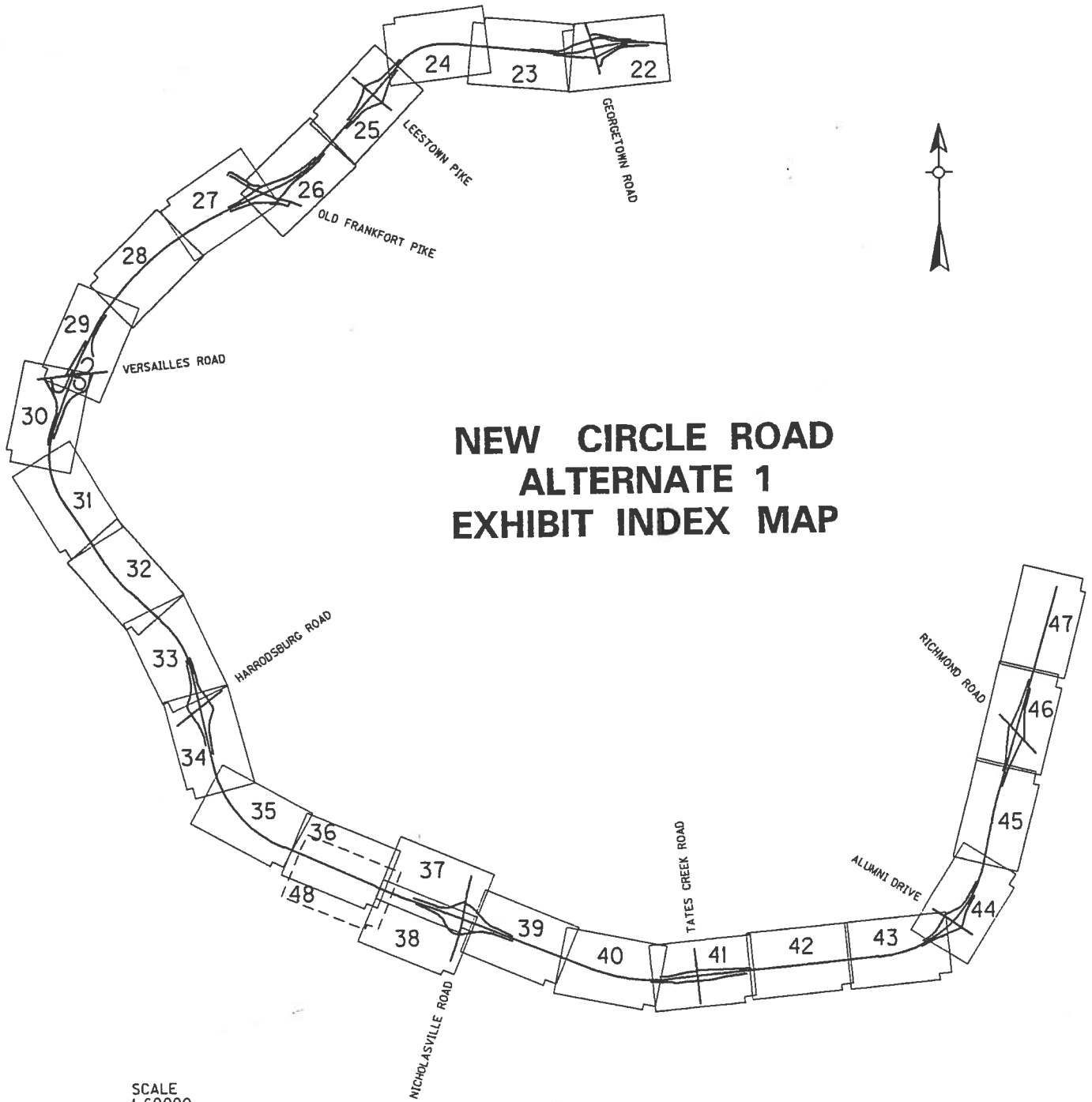
PHASE 2





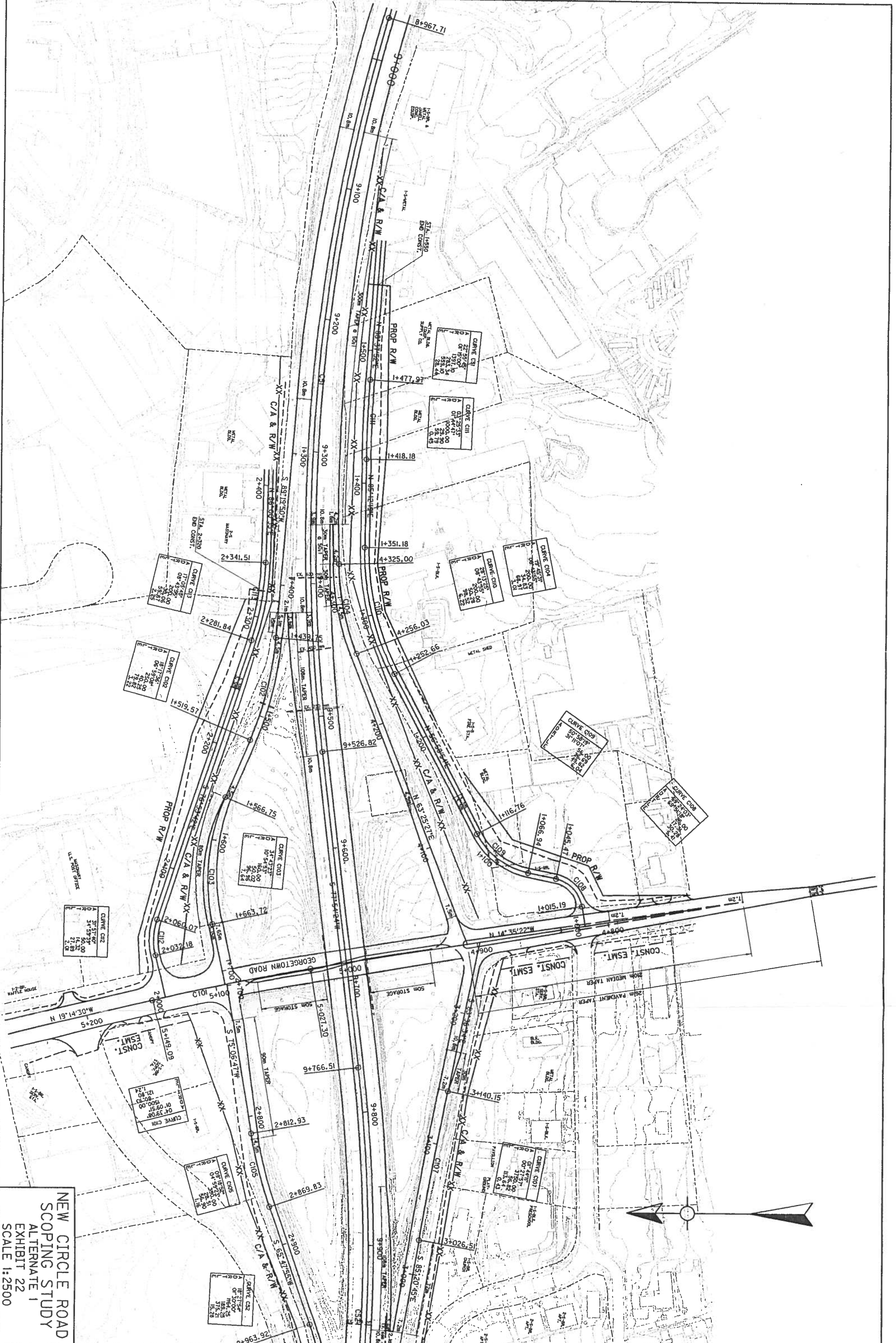
# NEW CIRCLE ROAD CONSTRUCTION SECTION LIMITS

SCALE  
1:60000

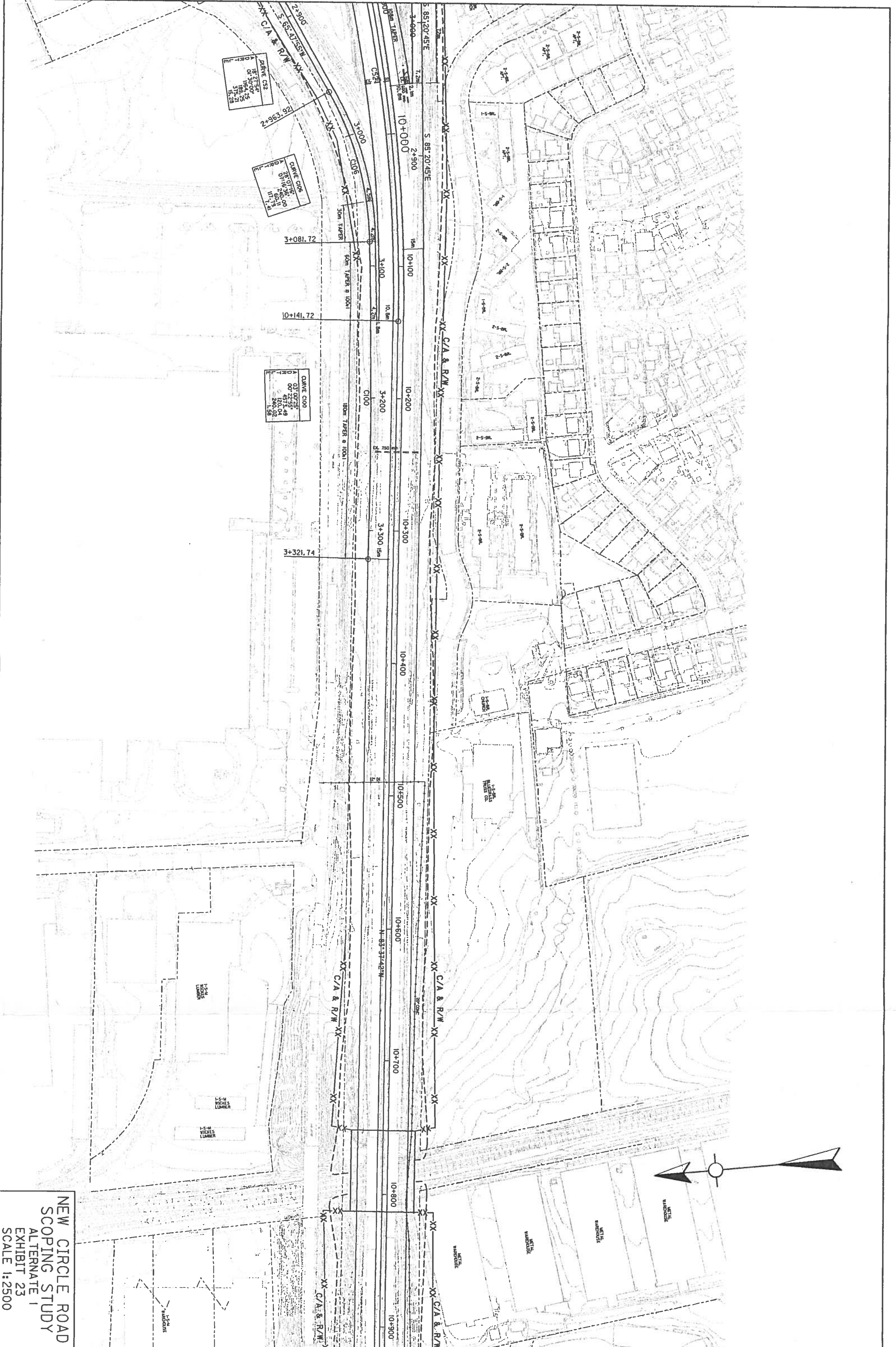


**NEW CIRCLE ROAD  
ALTERNATE 1  
EXHIBIT INDEX MAP**

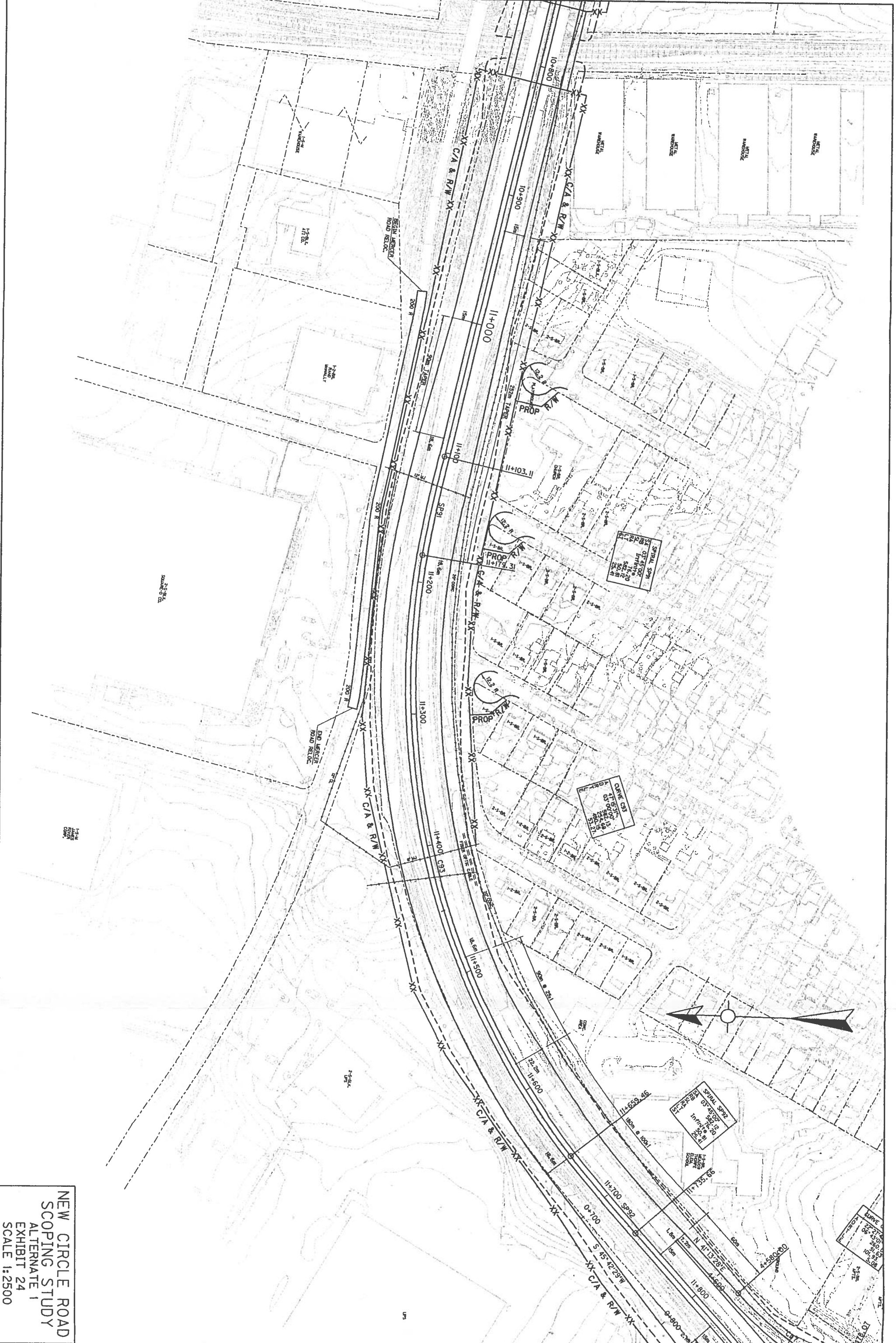
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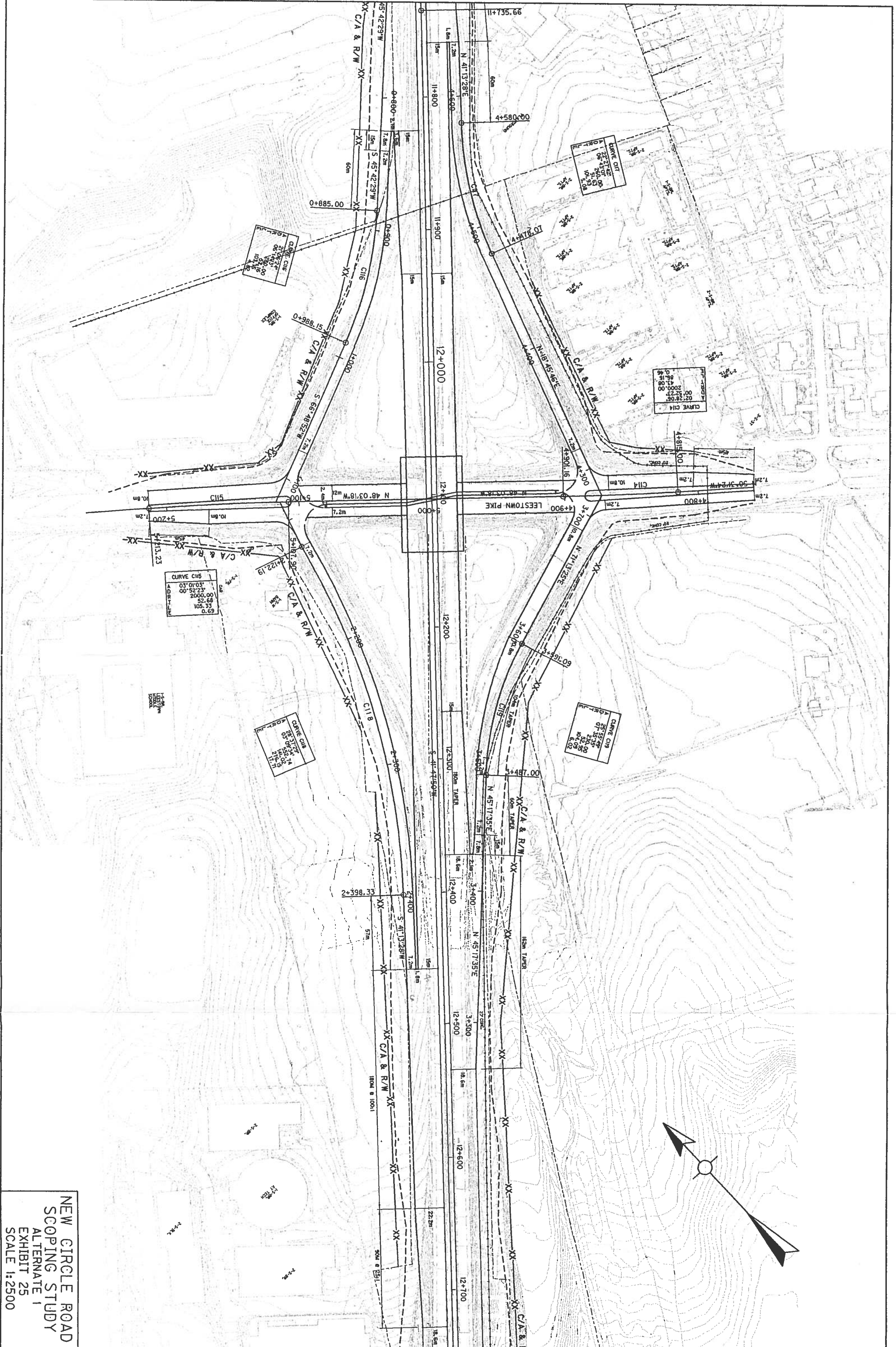
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 22  
SCALE 1:2500



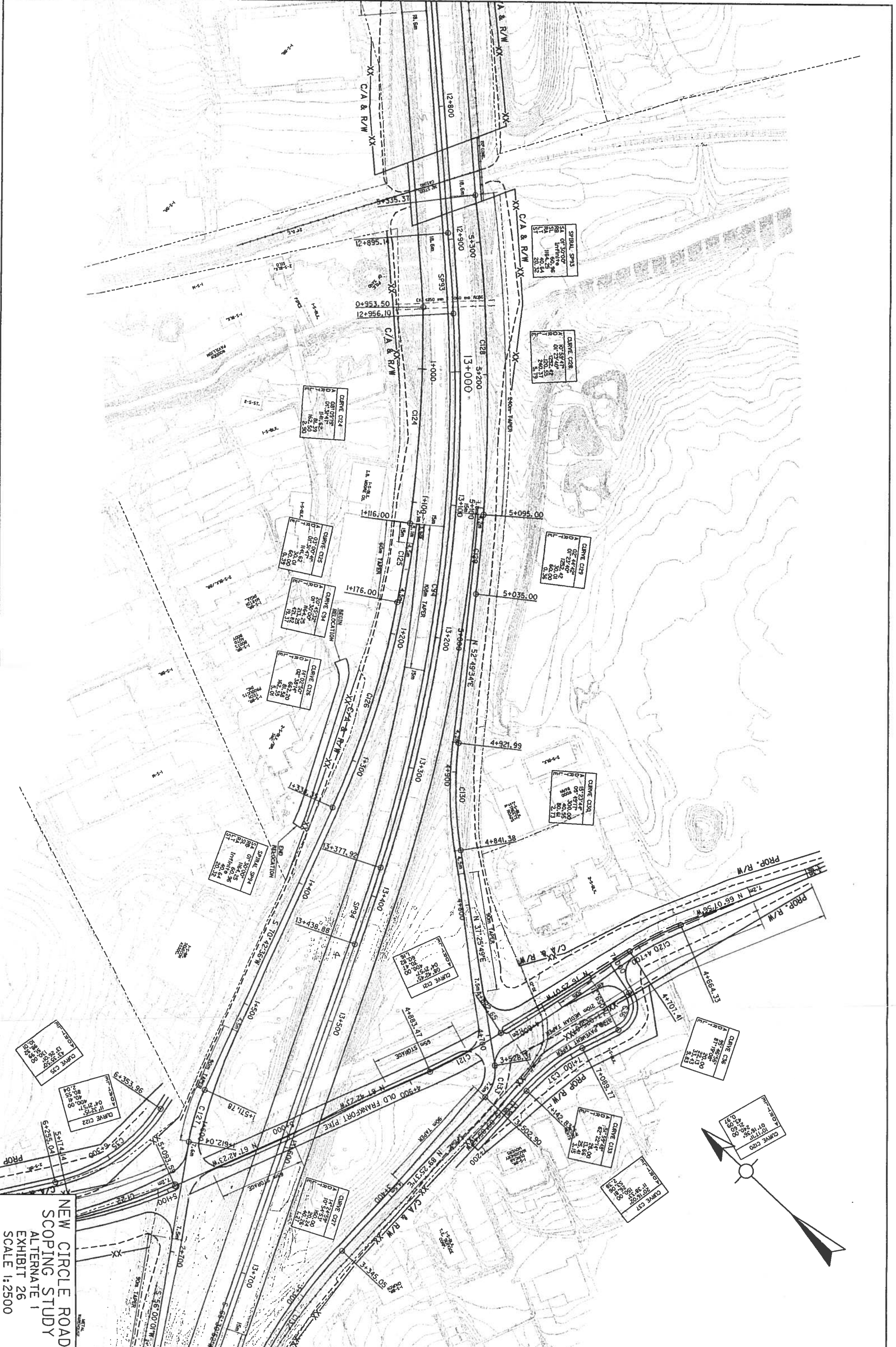
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 23  
SCALE 1:2500



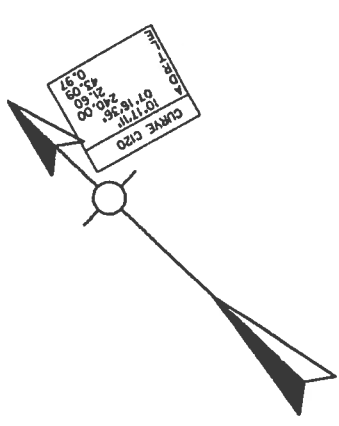
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 24  
SCALE 1:2500

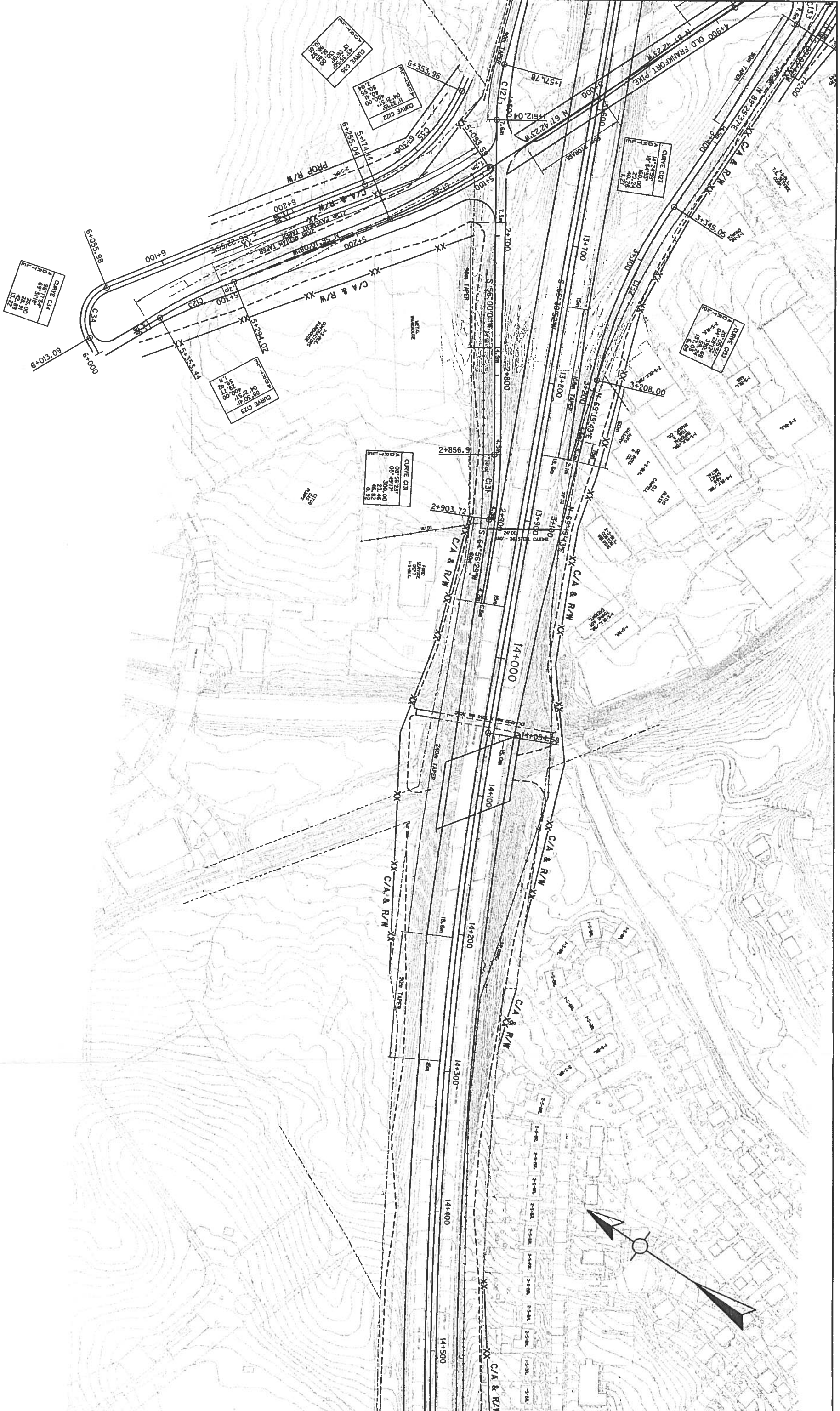


NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 1  
 EXHIBIT 25  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 26  
SCALE 1:2500





CLARE C14

OKR-JUL	10/13/00
DATE	08/11/98
BY	98/11/98
CHKD	08/11/98
APPD	08/11/98
SCALE	1:2500

CLARE C123

OKR-JUL	10/13/00
DATE	08/11/98
BY	98/11/98
CHKD	08/11/98
APPD	08/11/98
SCALE	1:2500

CLARE C131

OKR-JUL	10/13/00
DATE	08/11/98
BY	98/11/98
CHKD	08/11/98
APPD	08/11/98
SCALE	1:2500

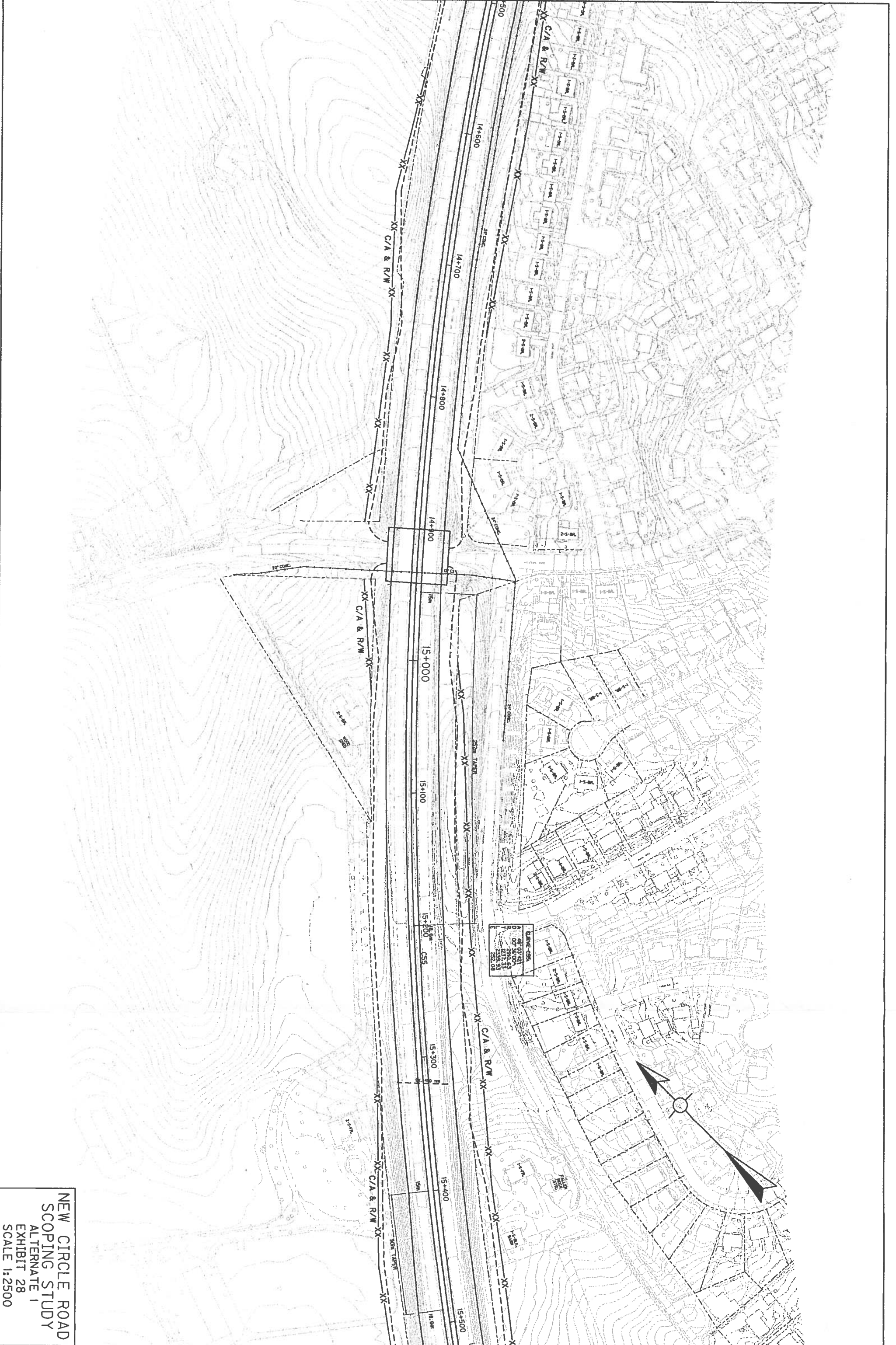
CLARE C127

OKR-JUL	10/13/00
DATE	08/11/98
BY	98/11/98
CHKD	08/11/98
APPD	08/11/98
SCALE	1:2500

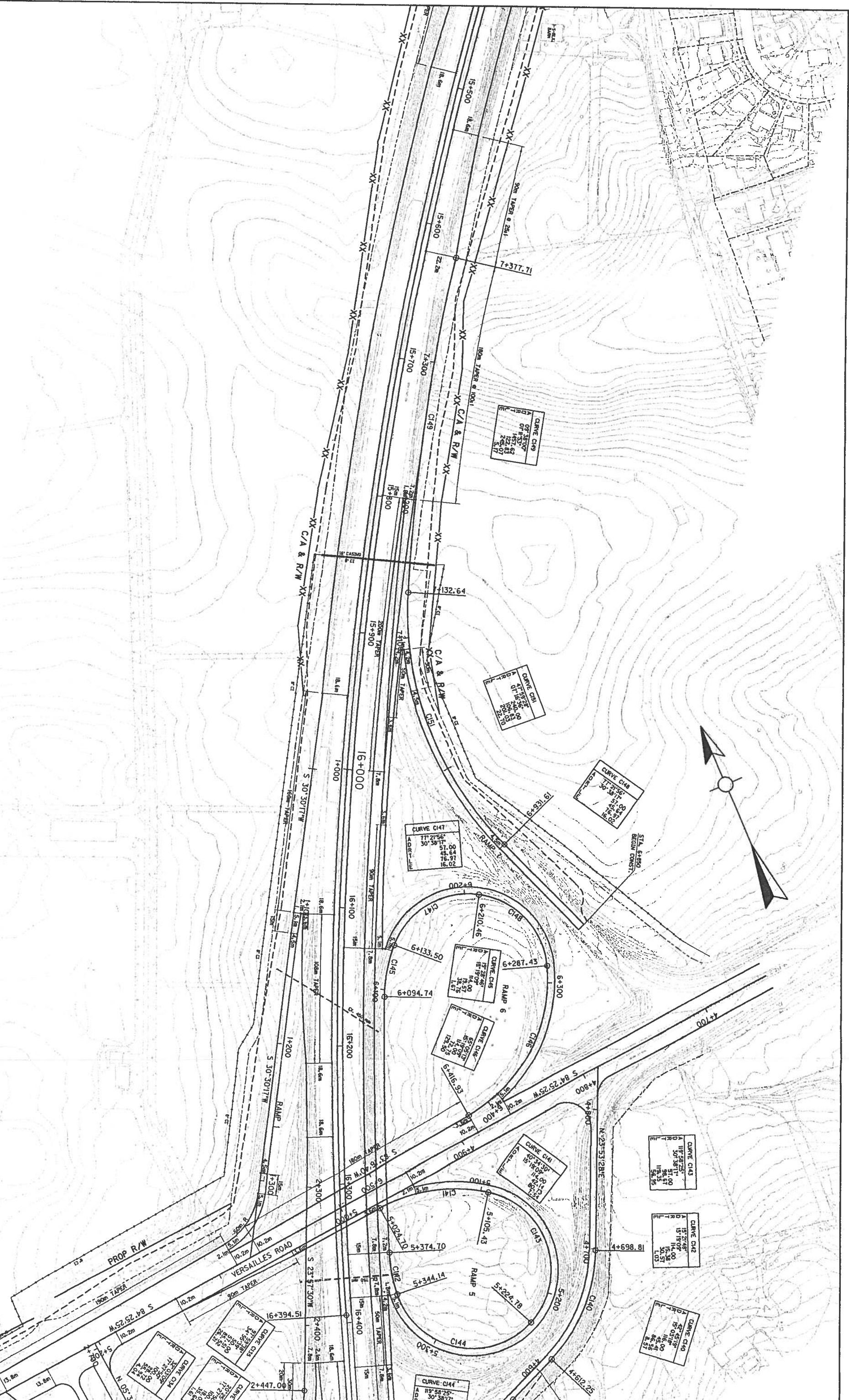
CLARE C12

OKR-JUL	10/13/00
DATE	08/11/98
BY	98/11/98
CHKD	08/11/98
APPD	08/11/98
SCALE	1:2500

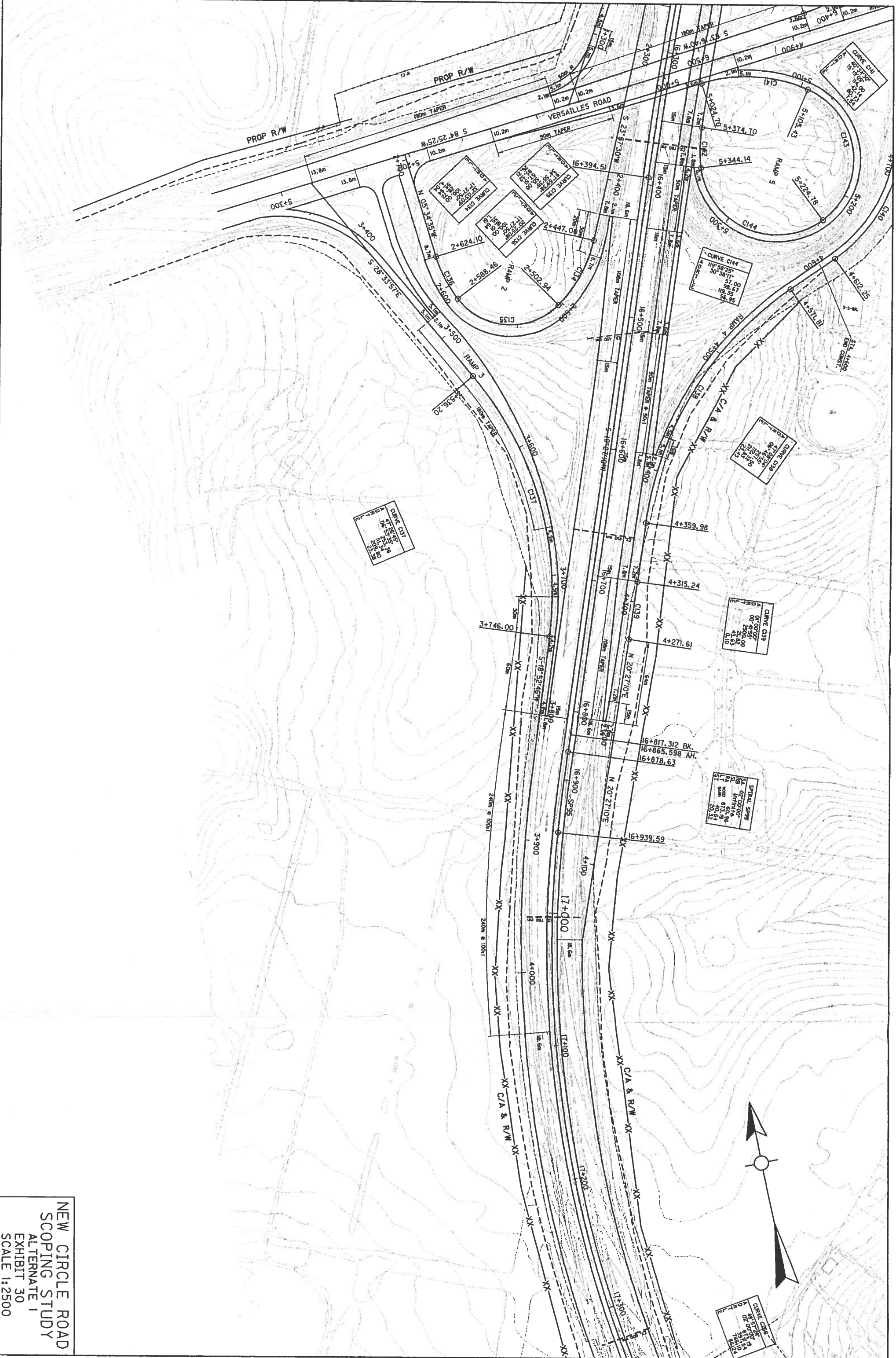
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 27  
SCALE 1:2500



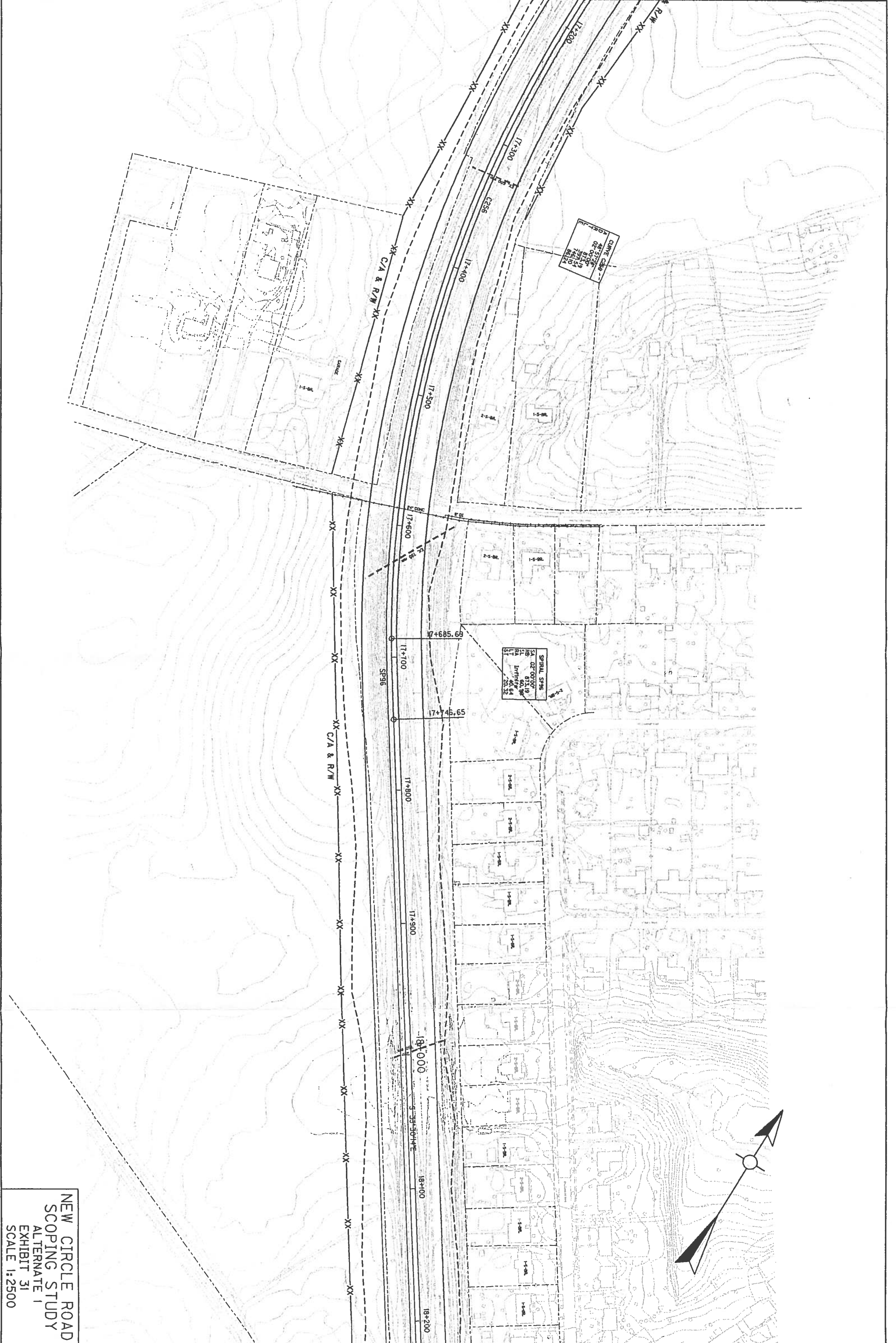
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 28  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 29  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 30  
SCALE 1:2500

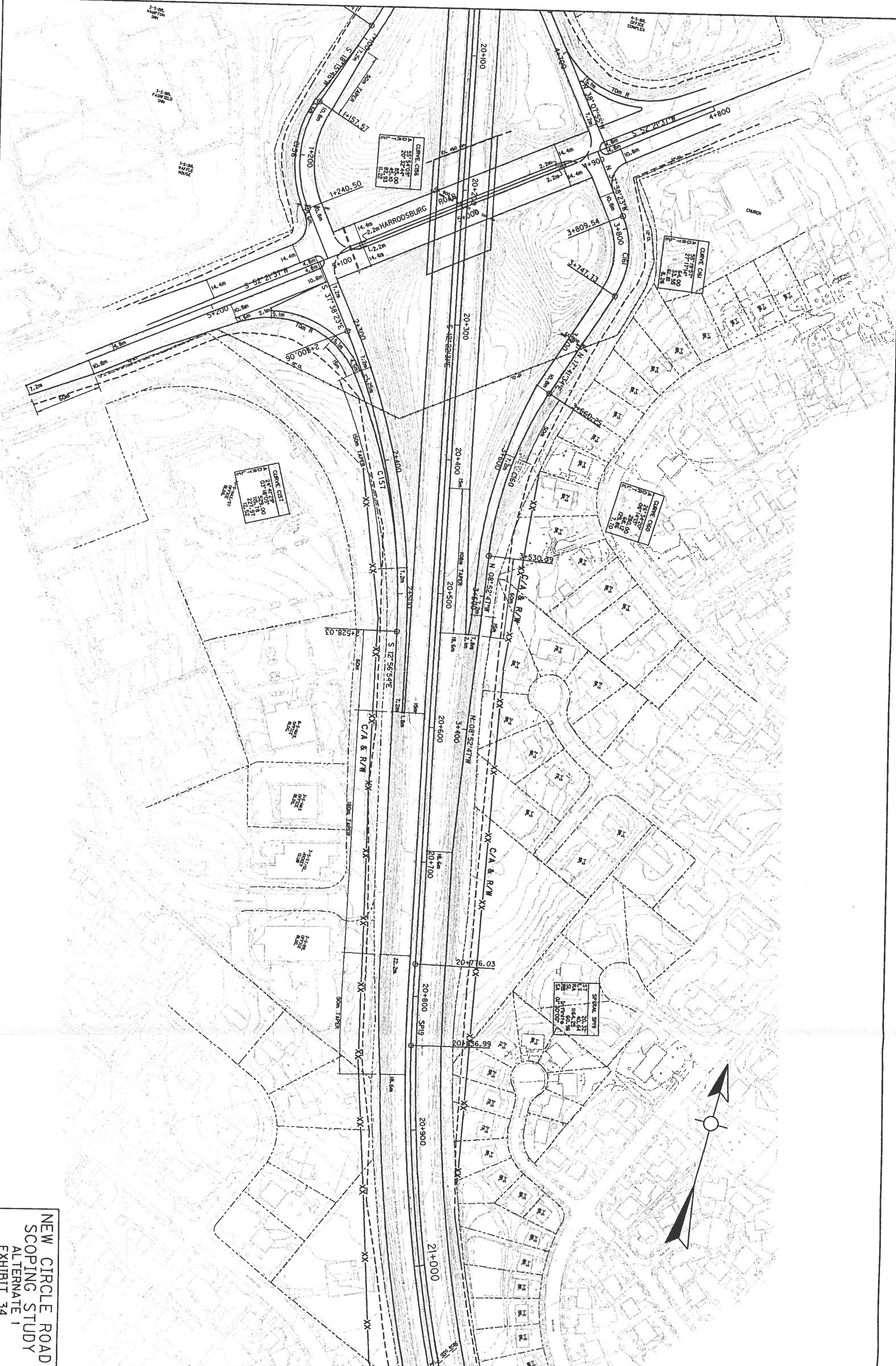


NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 31  
SCALE 1:2500

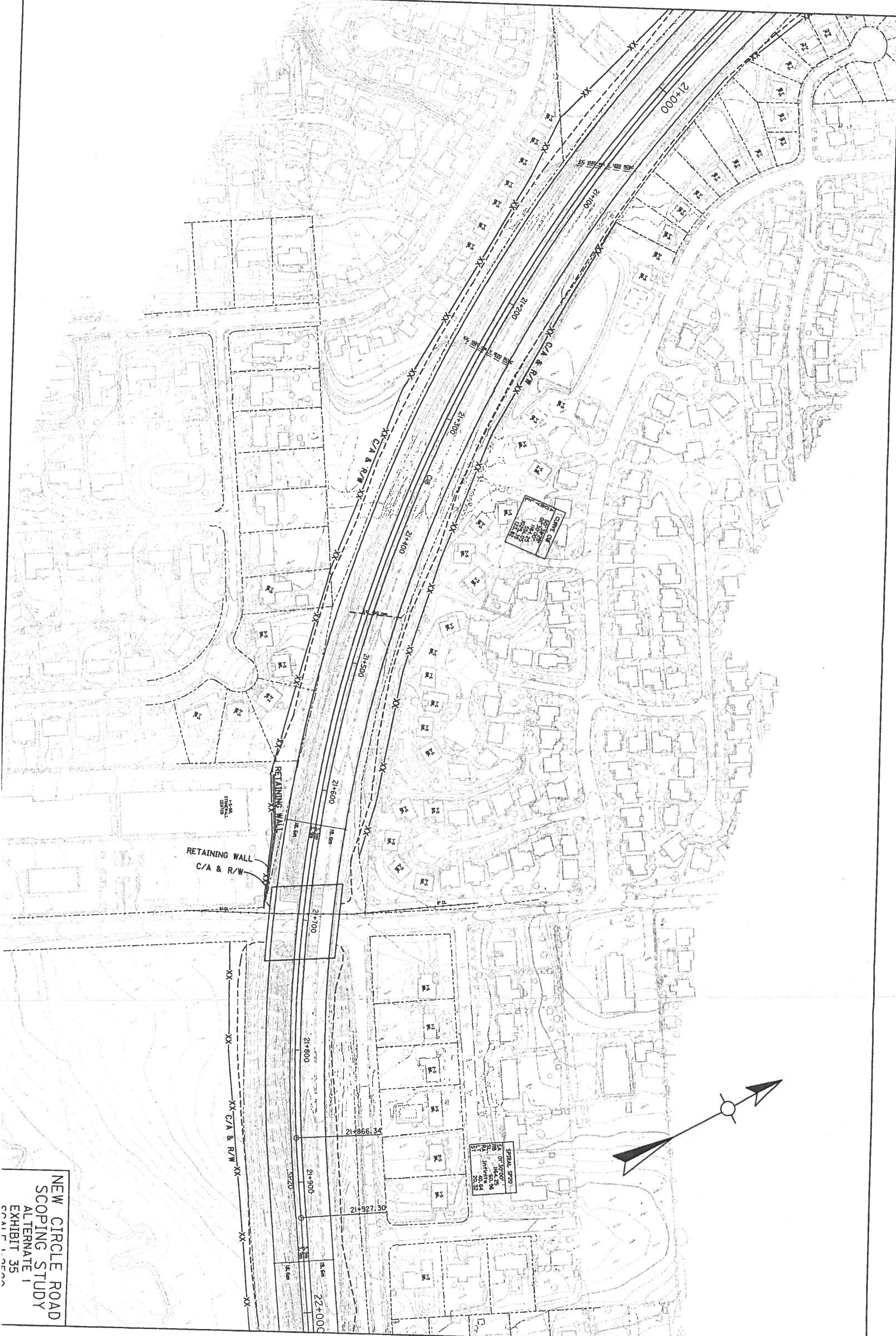


NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 32  
SCALE 1:2500





NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 34  
SCALE 1:2500



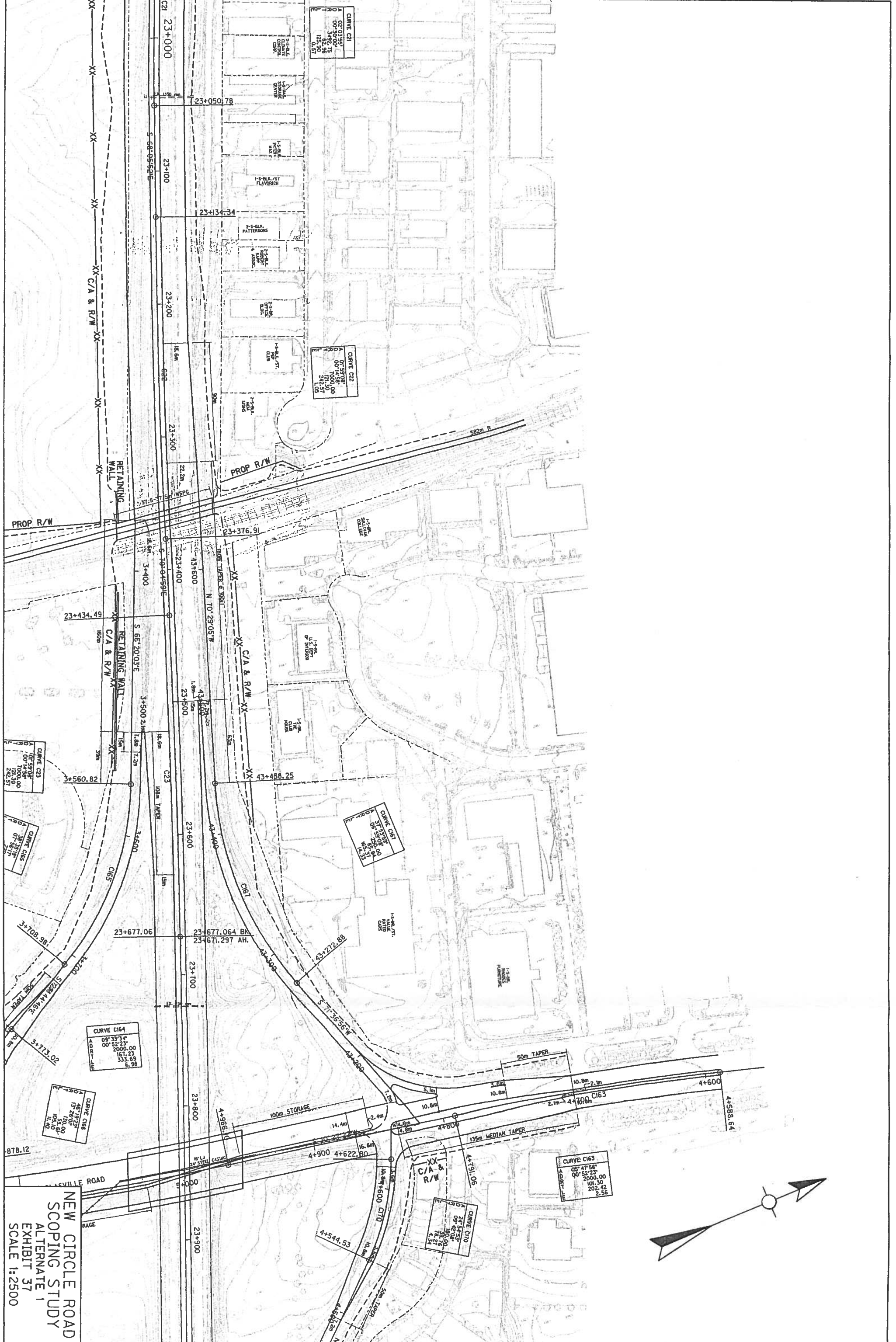
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 35  
SCALE: 1"=50'



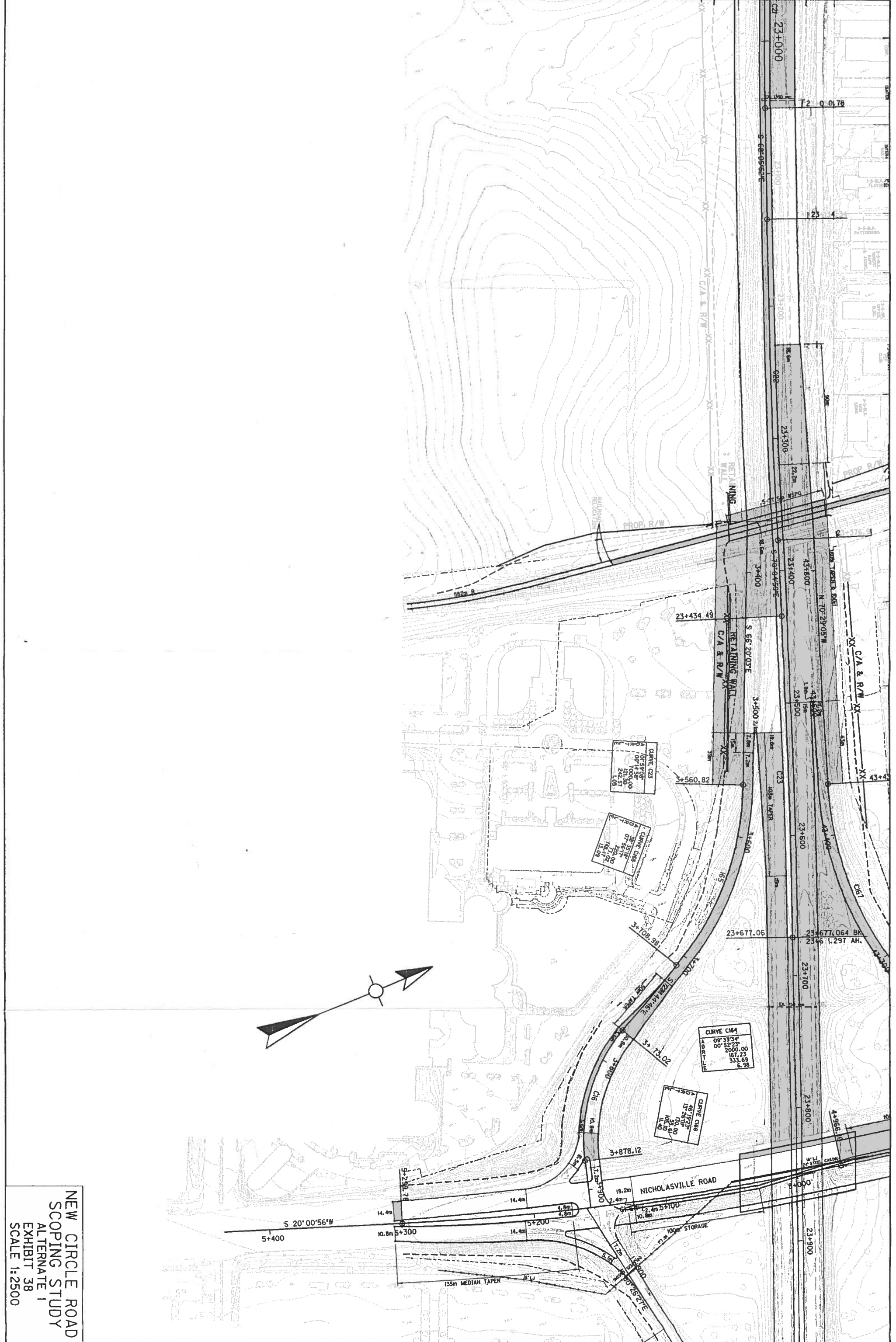
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 36

DATE: 08/03/98  
BY: J. R. [unreadable]  
CHECKED: [unreadable]  
SCALE: AS SHOWN

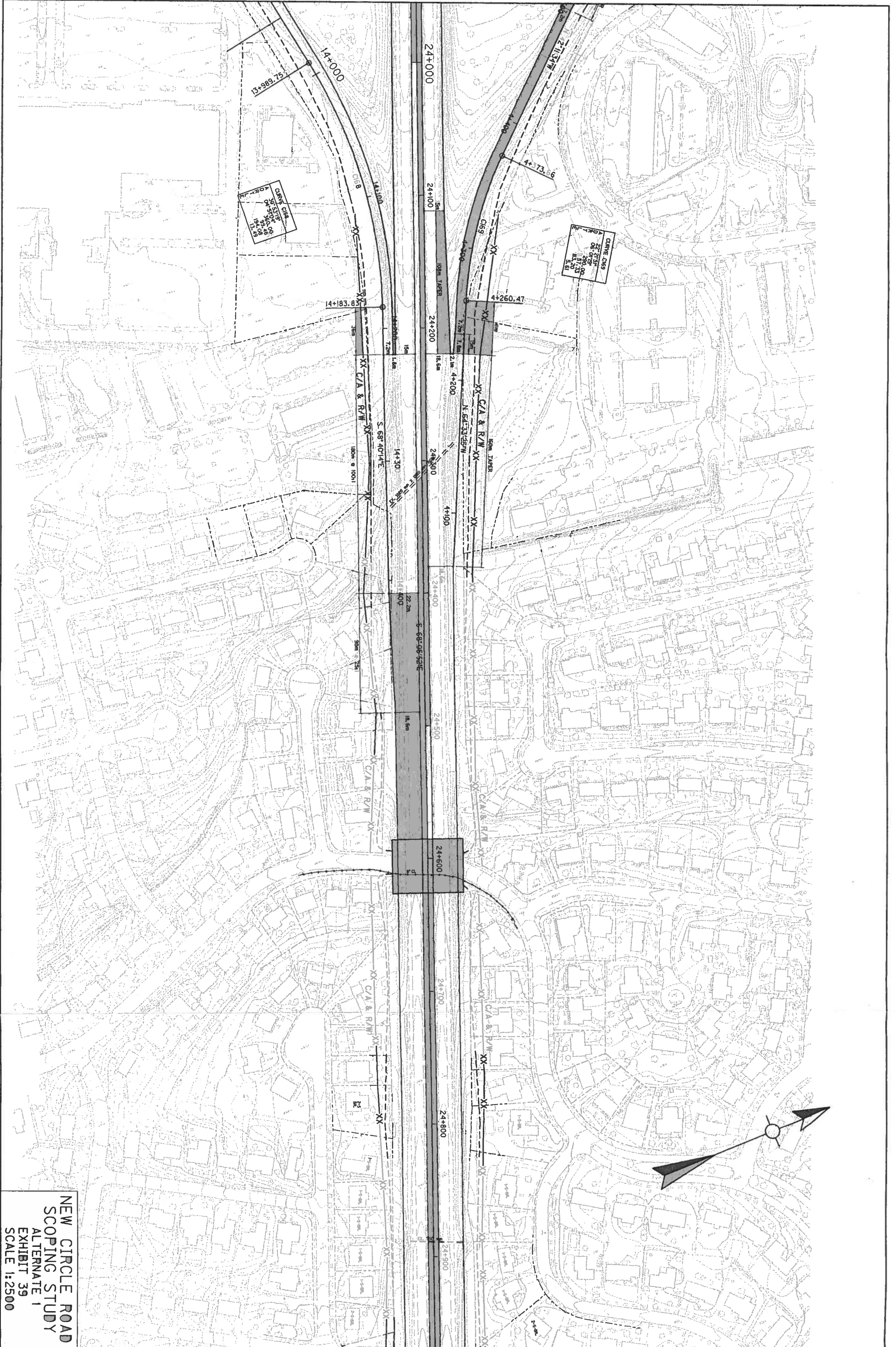
1-1/2" = 1'-0"  
1-1/4" = 1'-0"  
1-1/8" = 1'-0"  
1/2" = 1'-0"  
1/4" = 1'-0"  
1/8" = 1'-0"



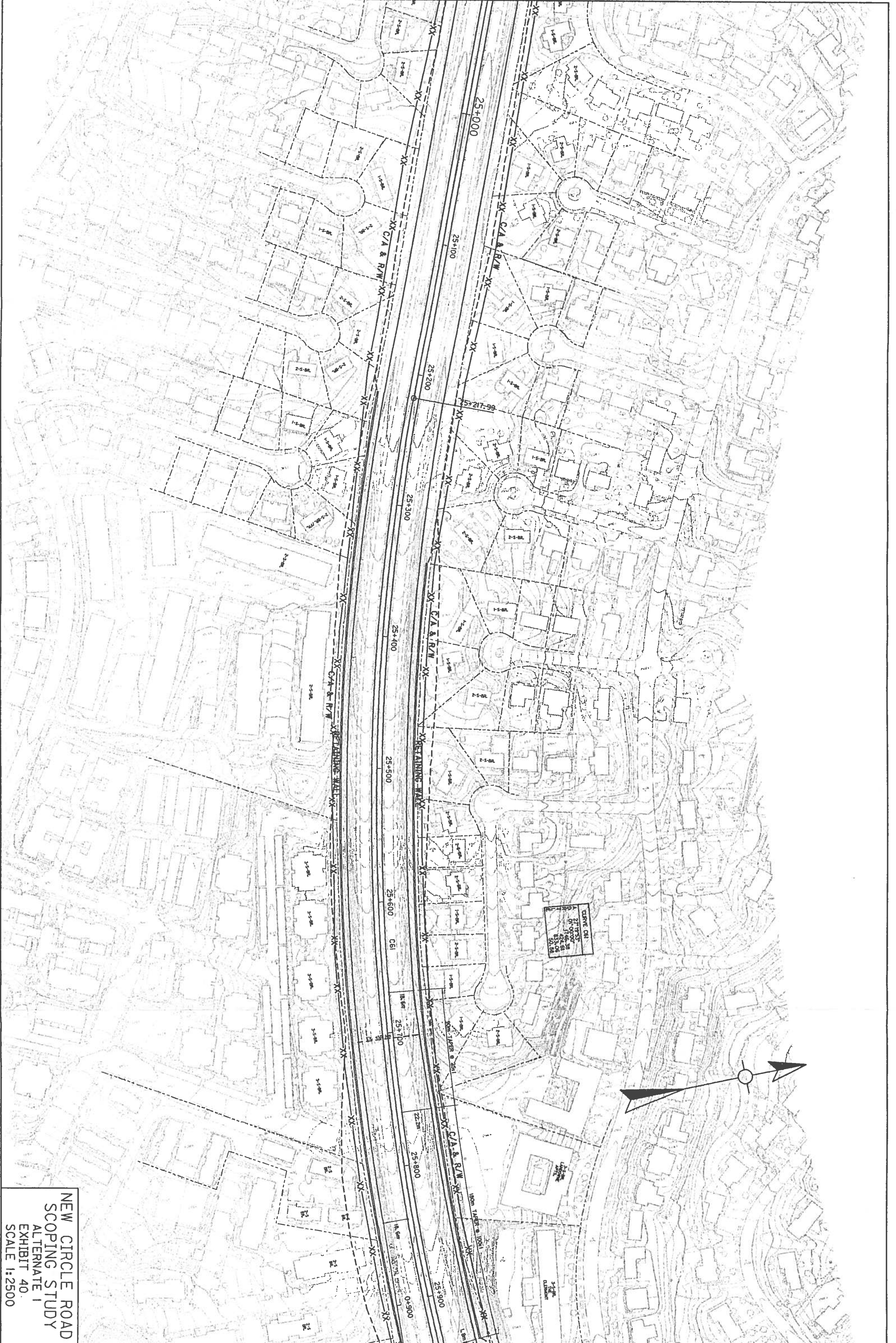
NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 1  
 EXHIBIT 37  
 SCALE 1:2500



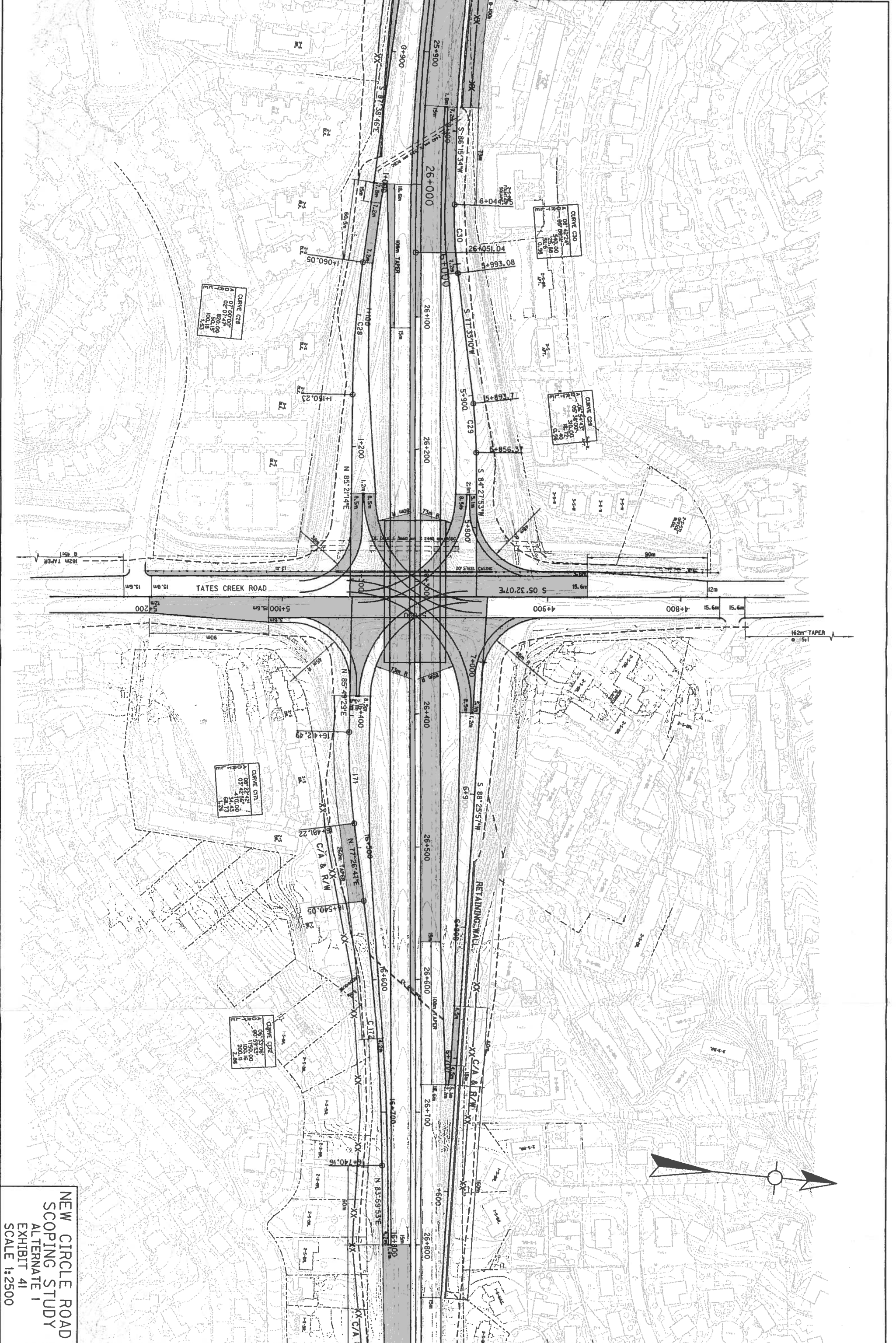
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 38  
SCALE 1:2500



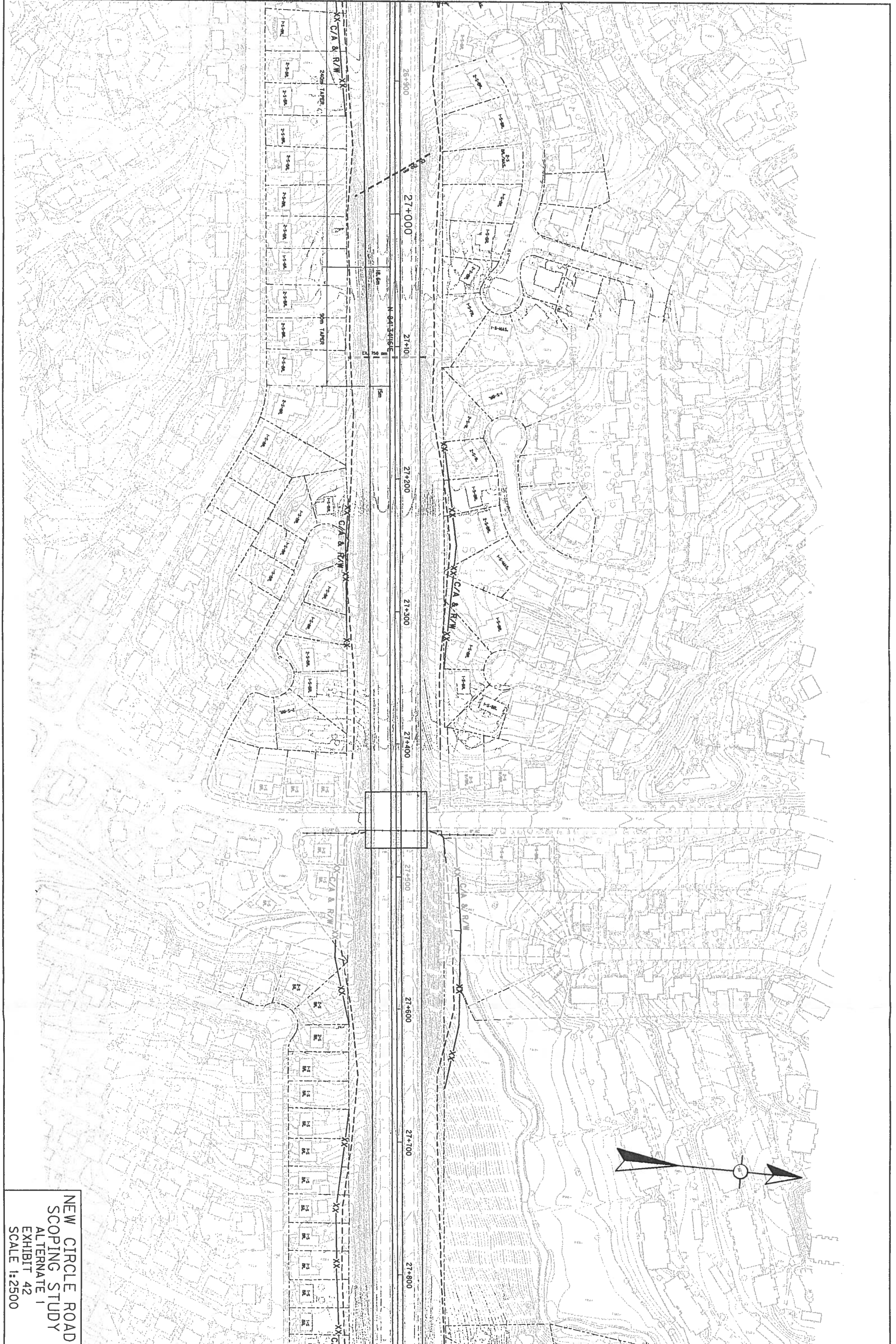
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 39  
SCALE 1:2500



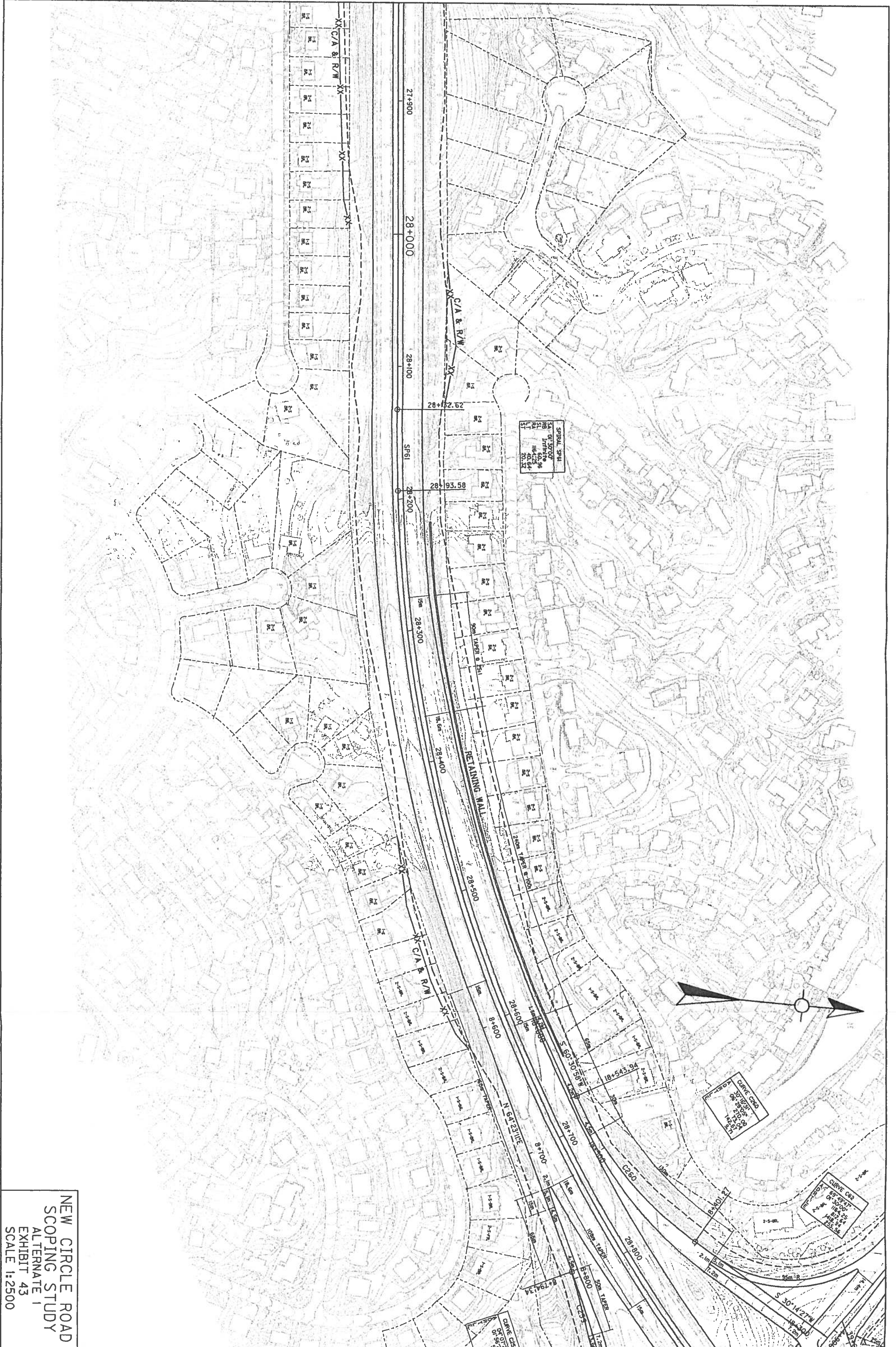
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 40  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 41  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 42  
SCALE 1:2500



SPIRAL SPIR

RA OF CURVE	116.4234
RA	60.21
RA	60.21
RA	20.37

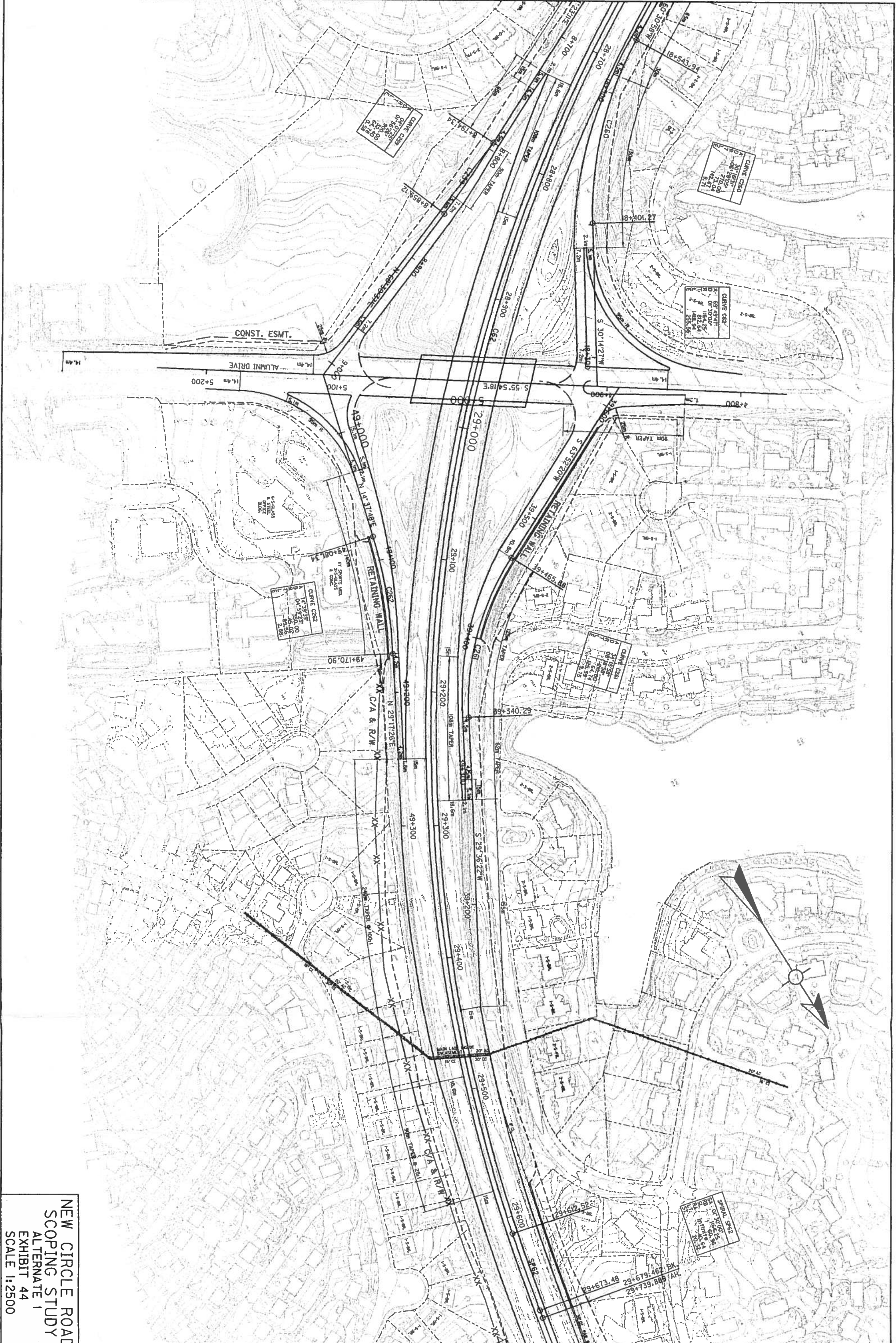
CURVE C62

RA OF CURVE	116.4234
RA	60.21
RA	60.21
RA	20.37

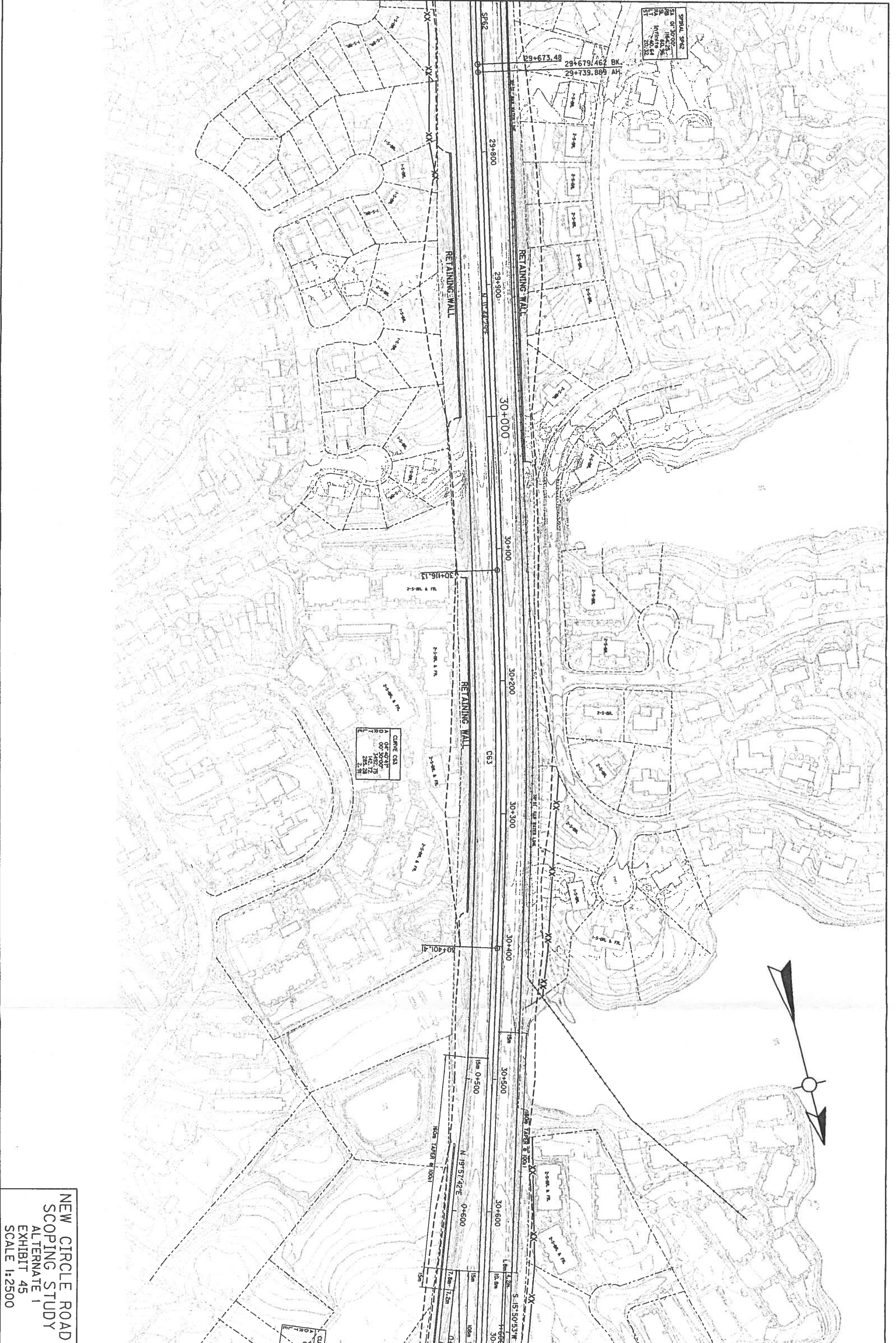
CURVE C63

RA OF CURVE	116.4234
RA	60.21
RA	60.21
RA	20.37

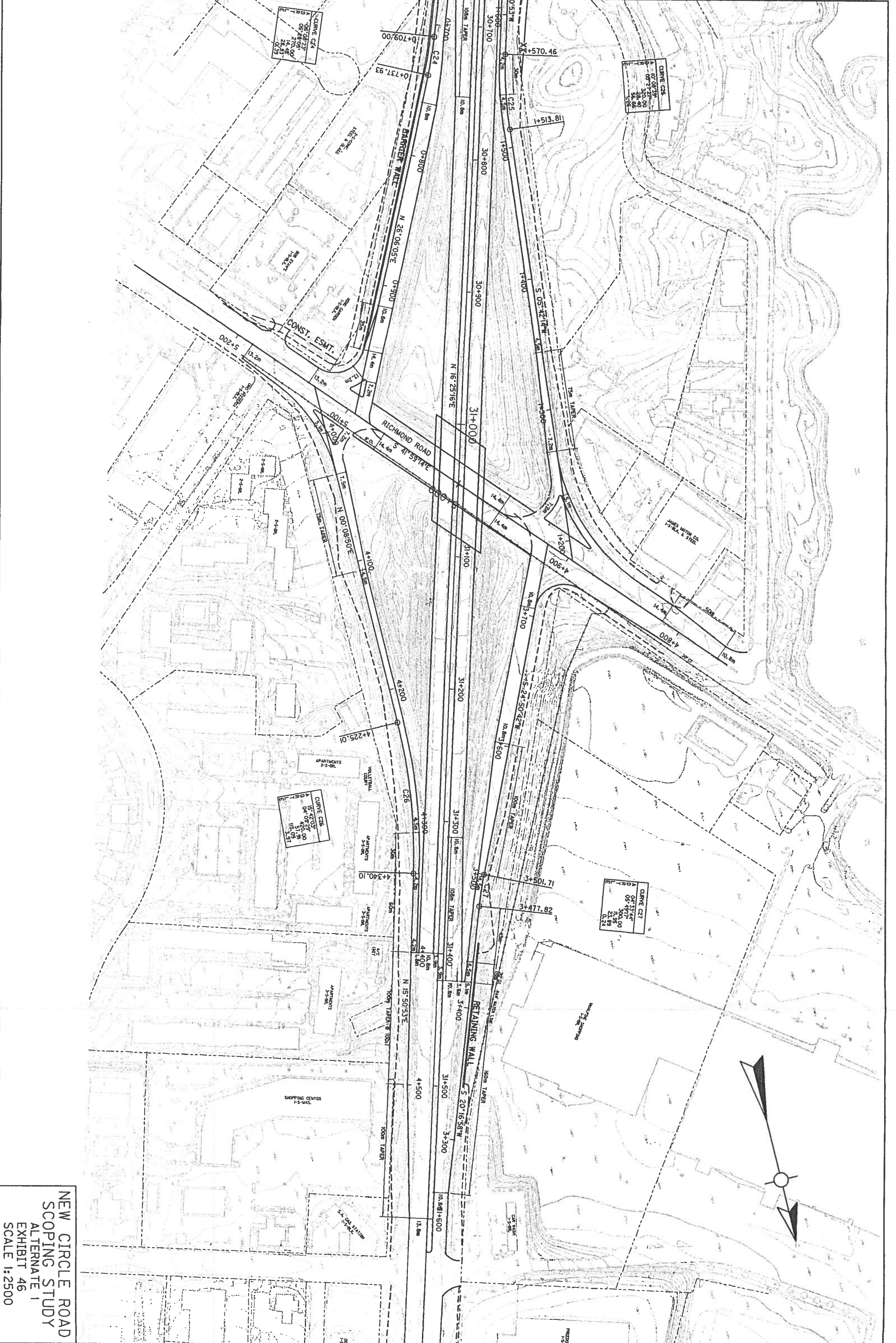
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 43  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 44  
SCALE 1:2500



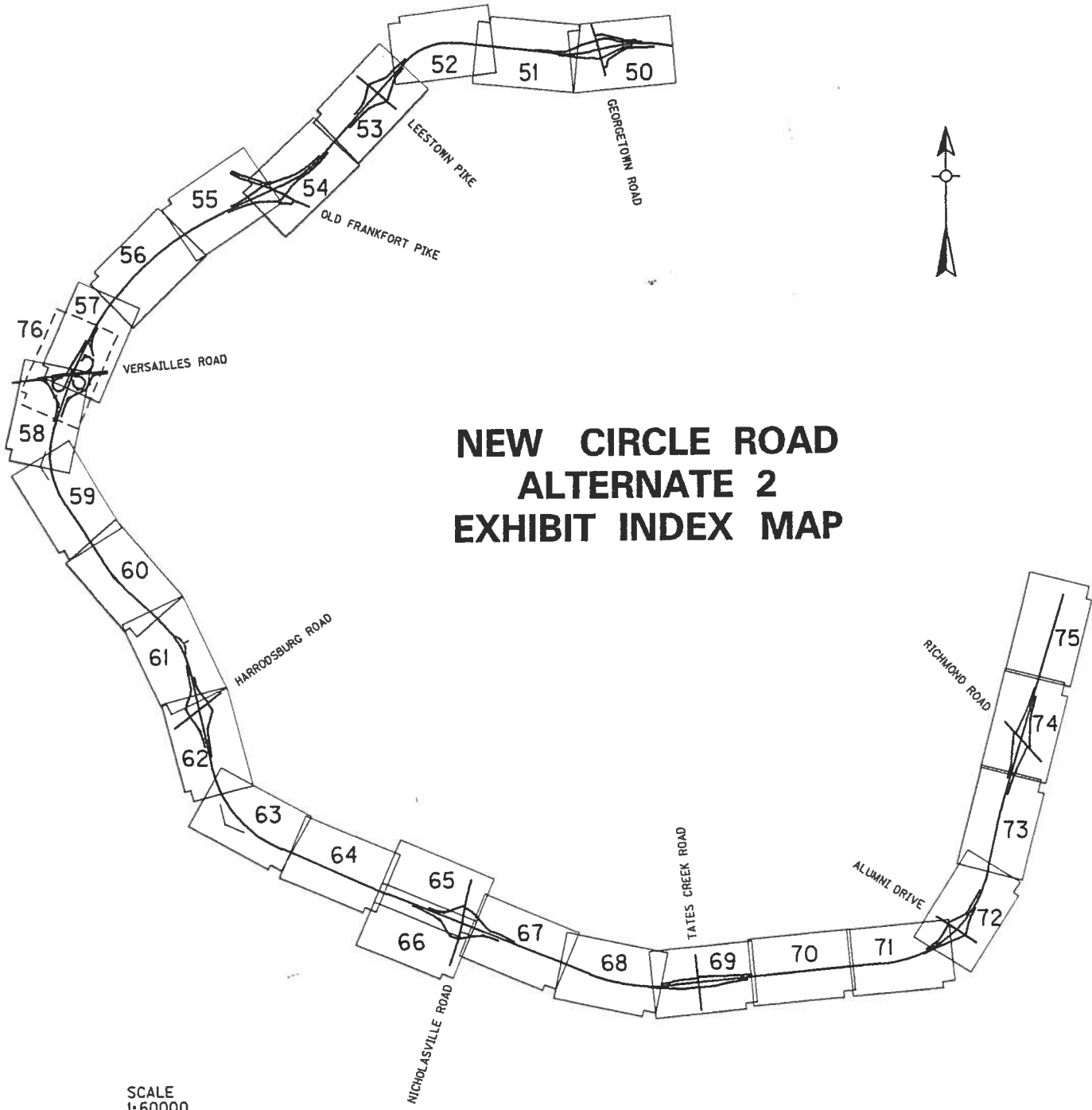
NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 1  
 EXHIBIT 45  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 46  
SCALE 1:2500



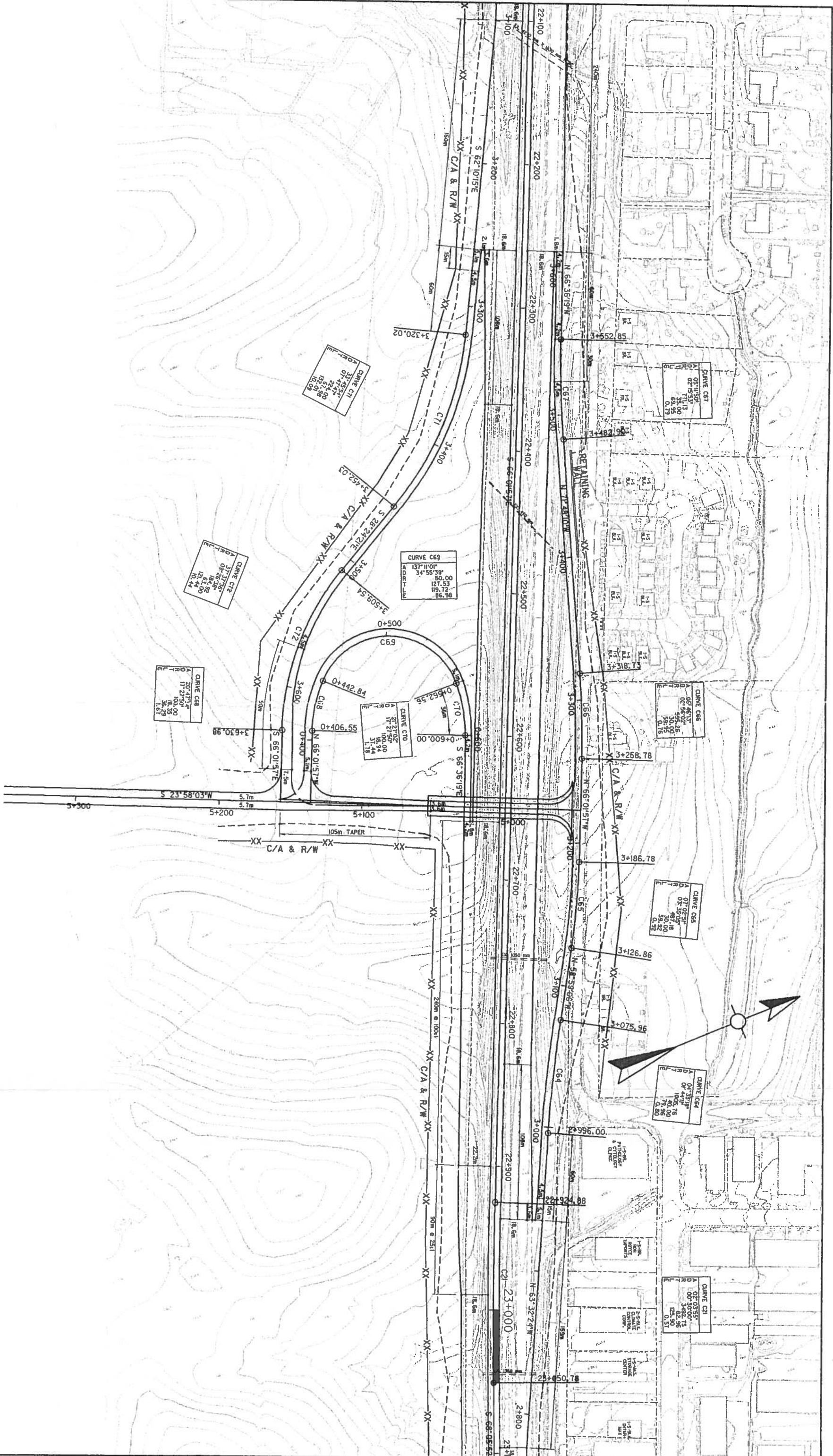
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 1  
EXHIBIT 47  
SCALE 1:2500



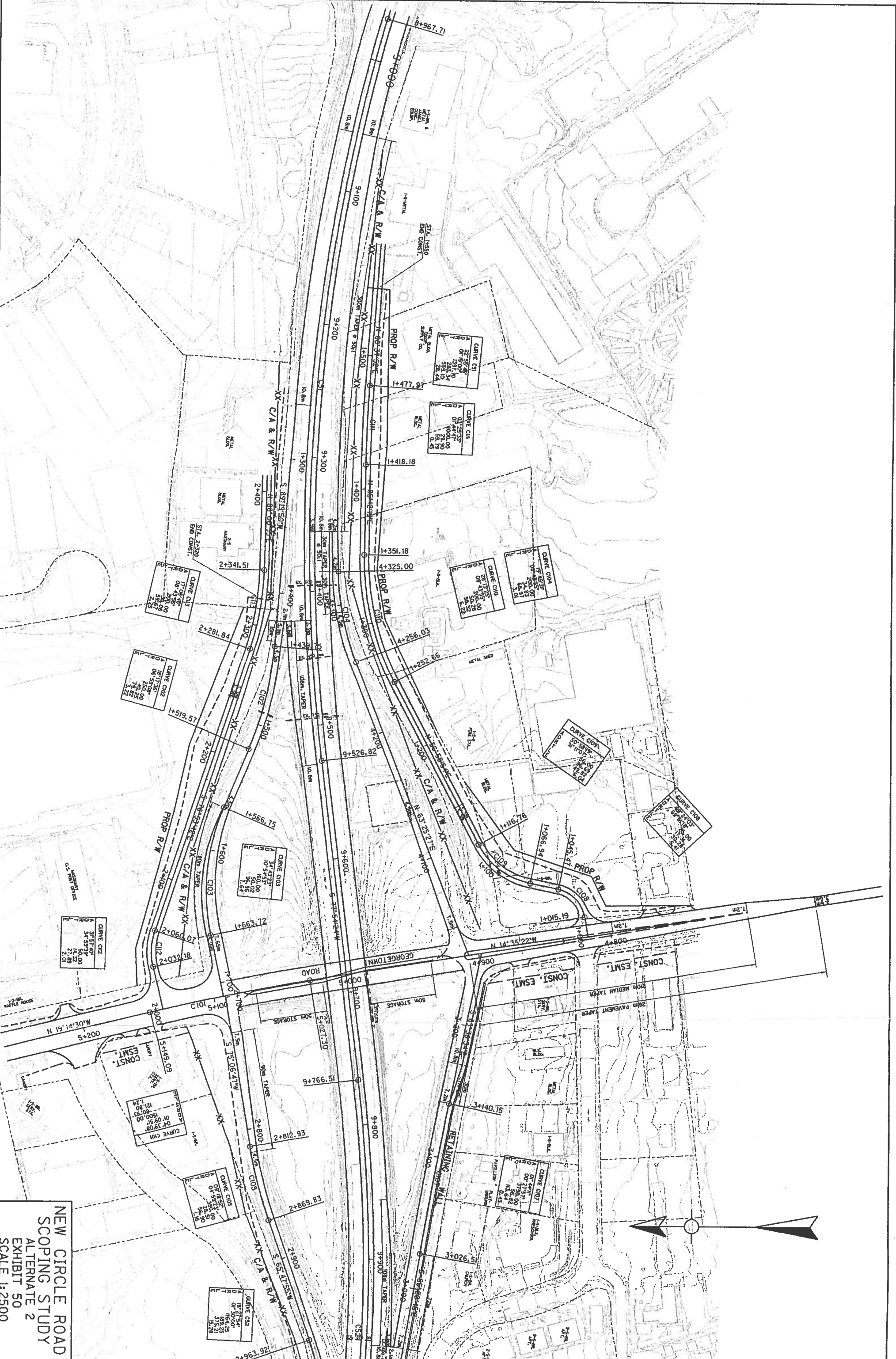
**NEW CIRCLE ROAD  
ALTERNATE 2  
EXHIBIT INDEX MAP**

SCALE  
1:60000

REYNOLDS ROAD INTERCHANGE

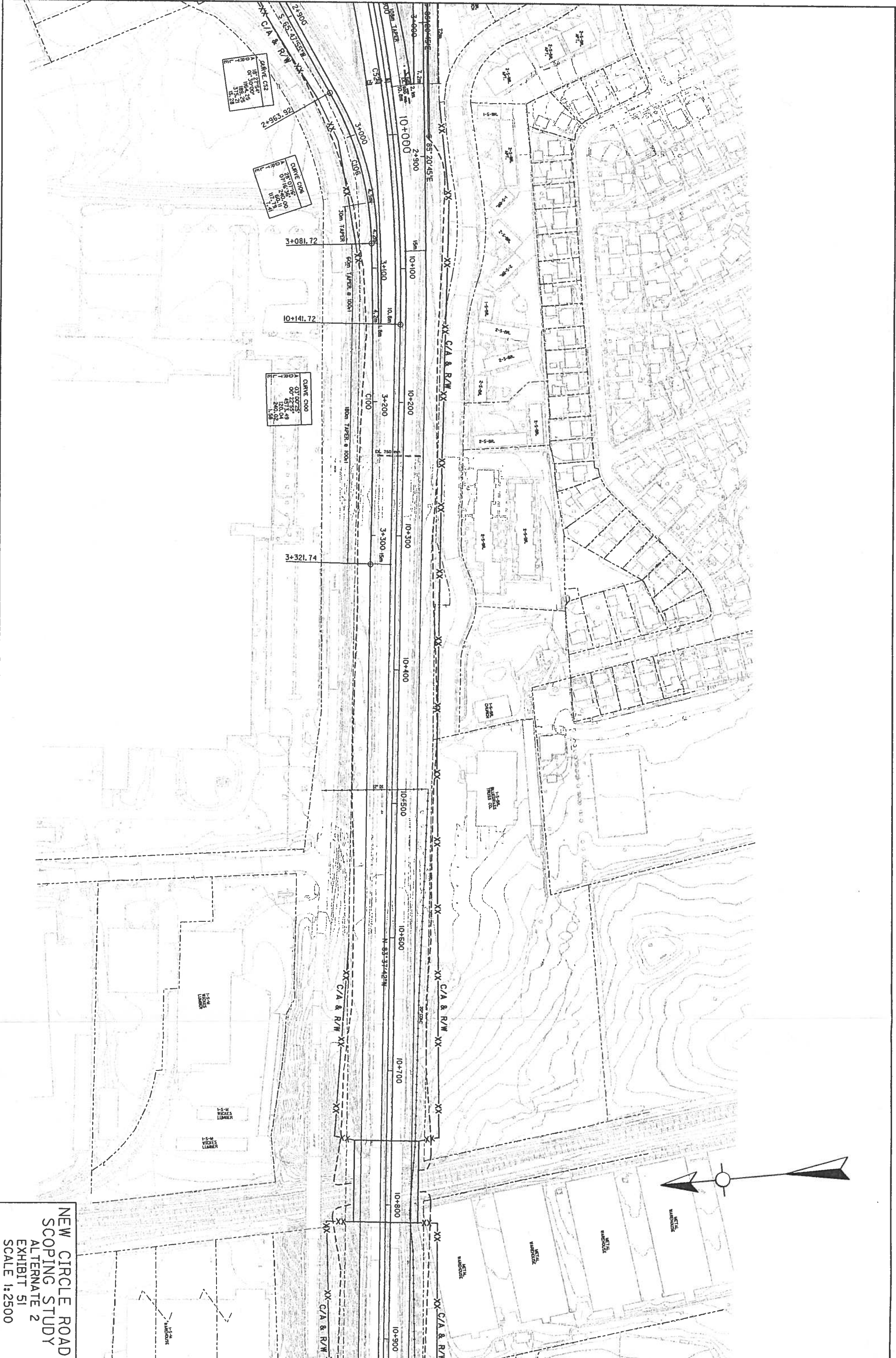


NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 1  
 EXHIBIT 48  
 SCALE 1:2500

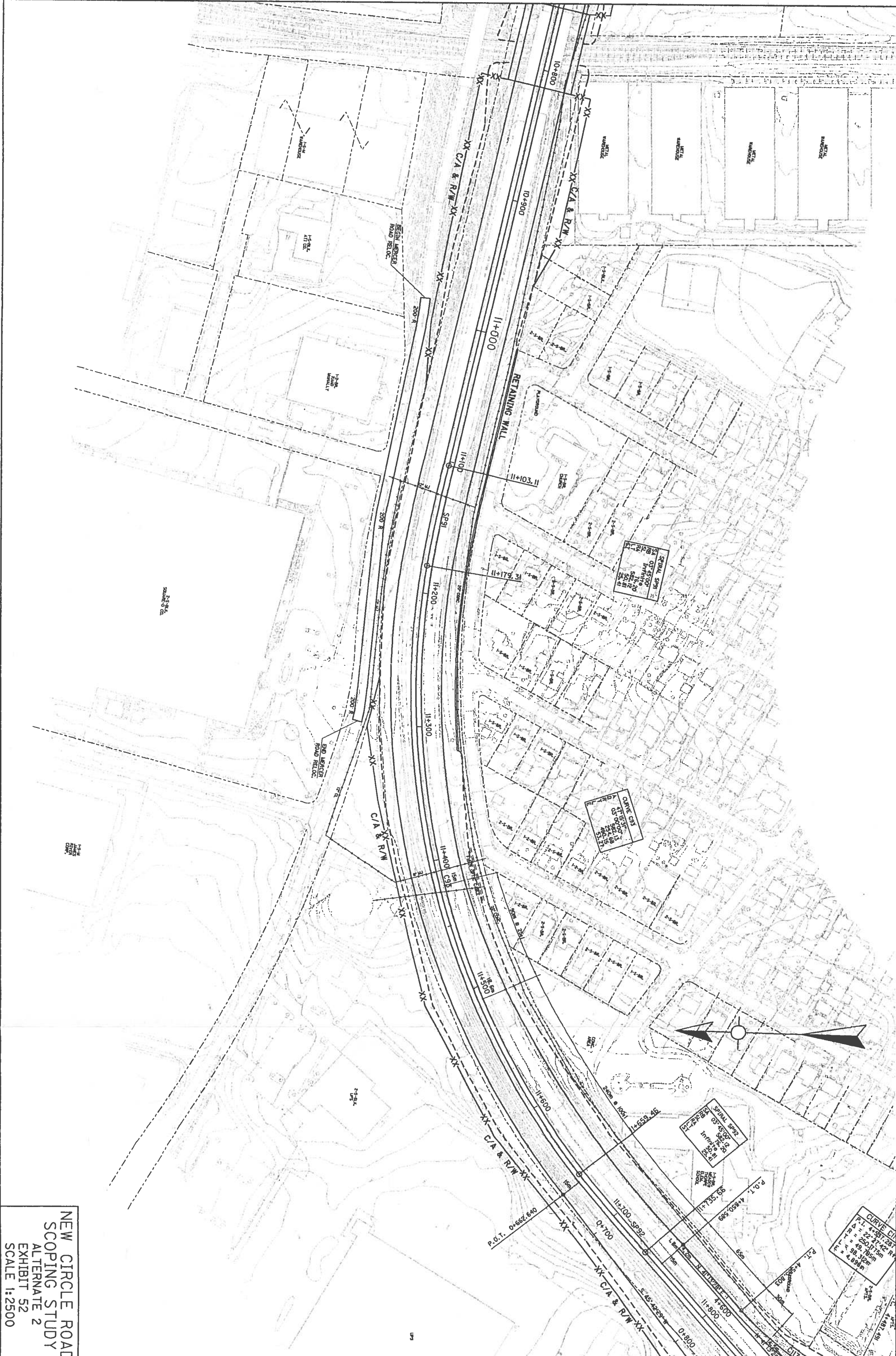


NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 50  
SCALE 1:2500





NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 2  
 EXHIBIT 51  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 52  
SCALE 1:2500

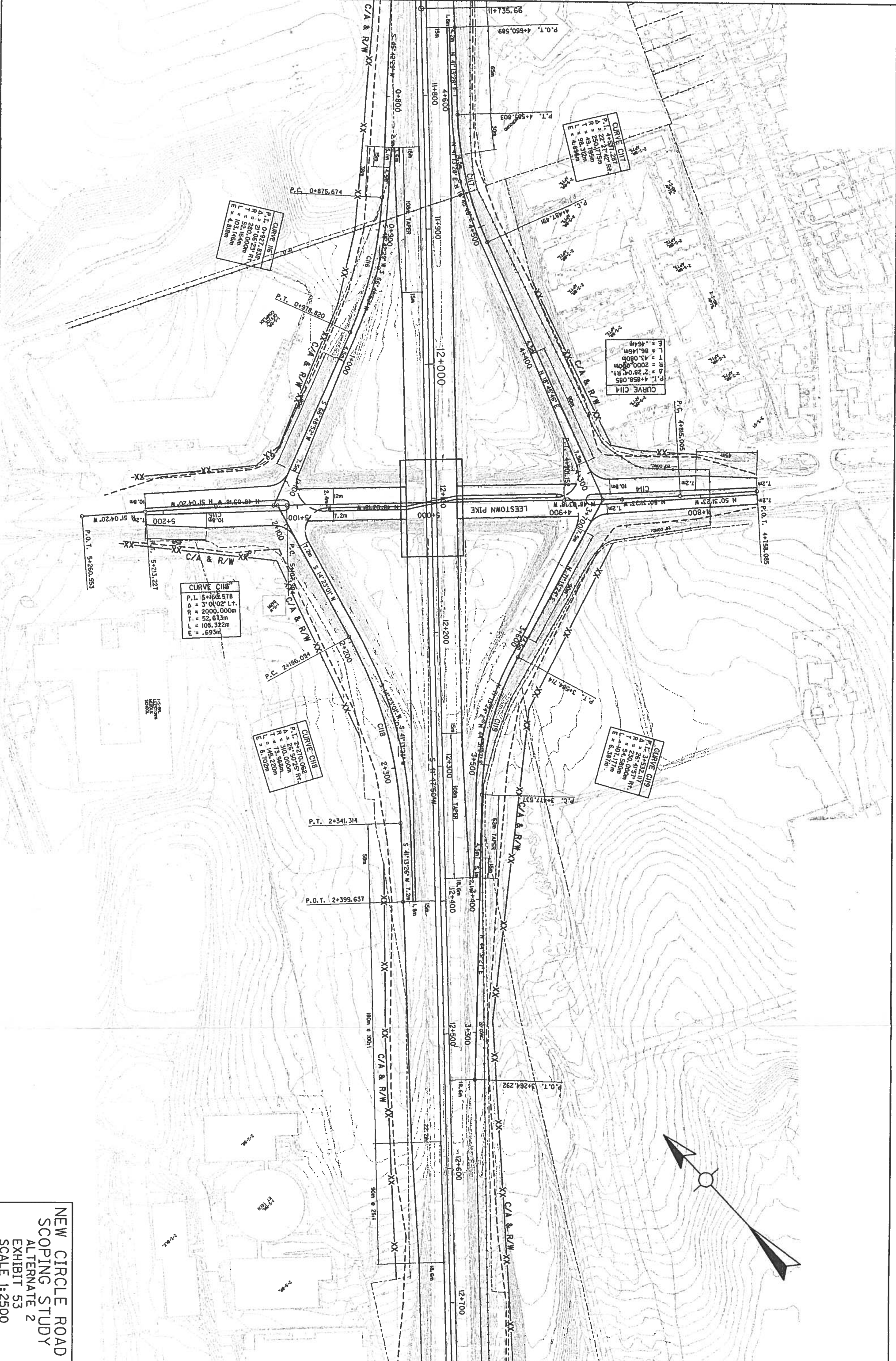
SERIAL SP91  
INVERT 11+111.31  
11+111.31  
11+111.31  
11+111.31

CURVE DATA  
R = 110.00  
L = 110.00  
E = 110.00

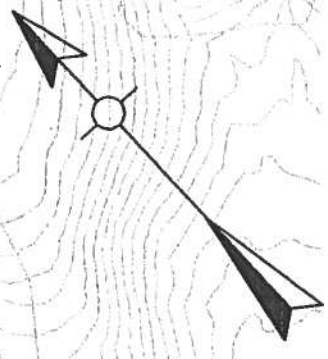


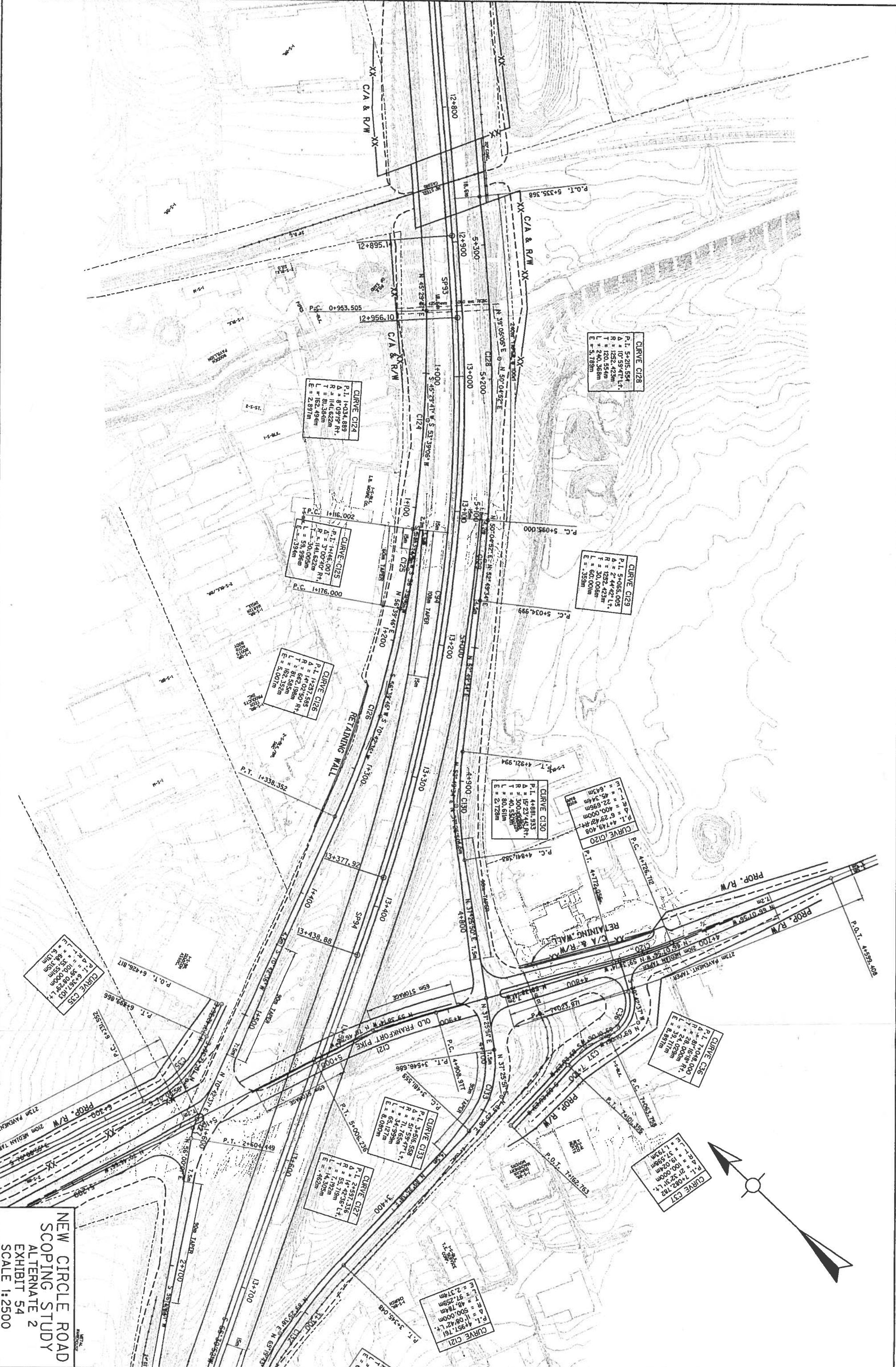
SERIAL SP92  
INVERT 11+735.99  
11+735.99  
11+735.99  
11+735.99

CURVE DATA  
P.O.C. = 11+557.20  
P.O.T. = 11+735.99  
L = 178.79  
E = 178.79

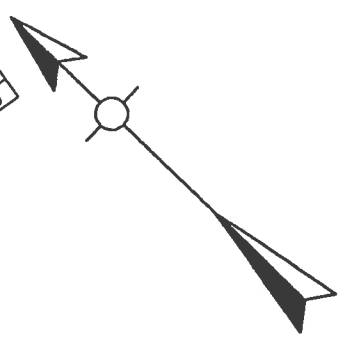


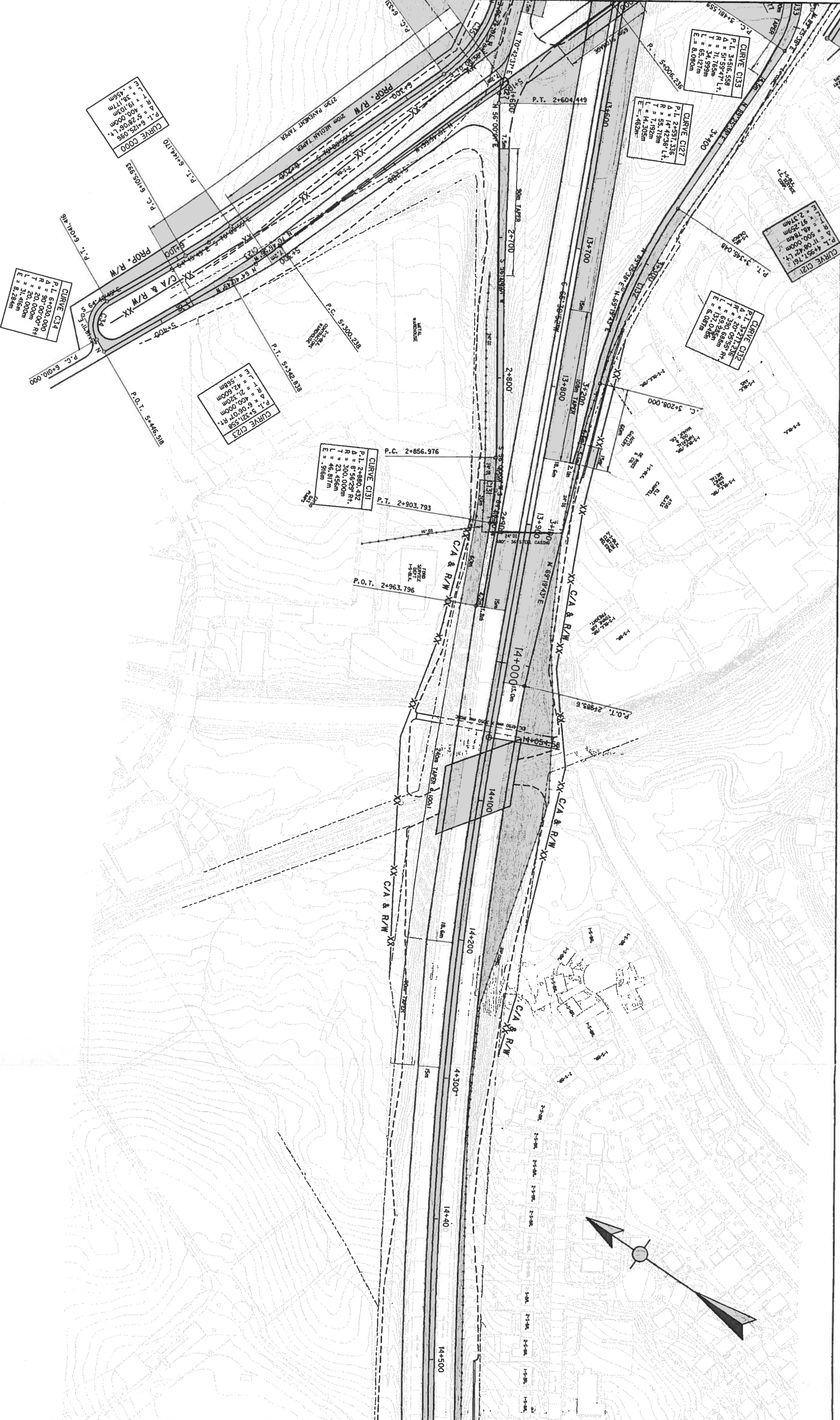
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 53  
SCALE 1:2500



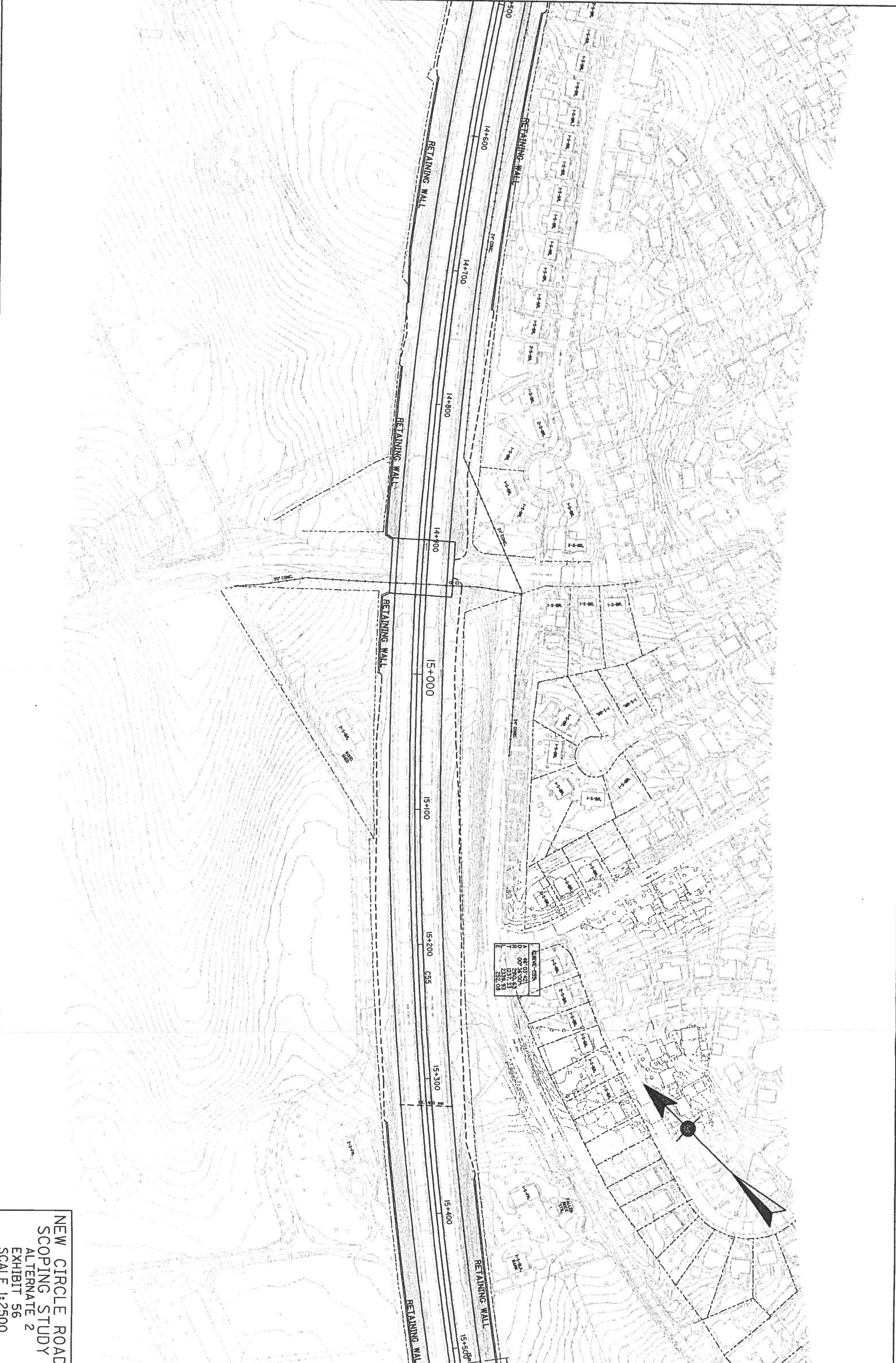


NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 54  
SCALE 1:2500

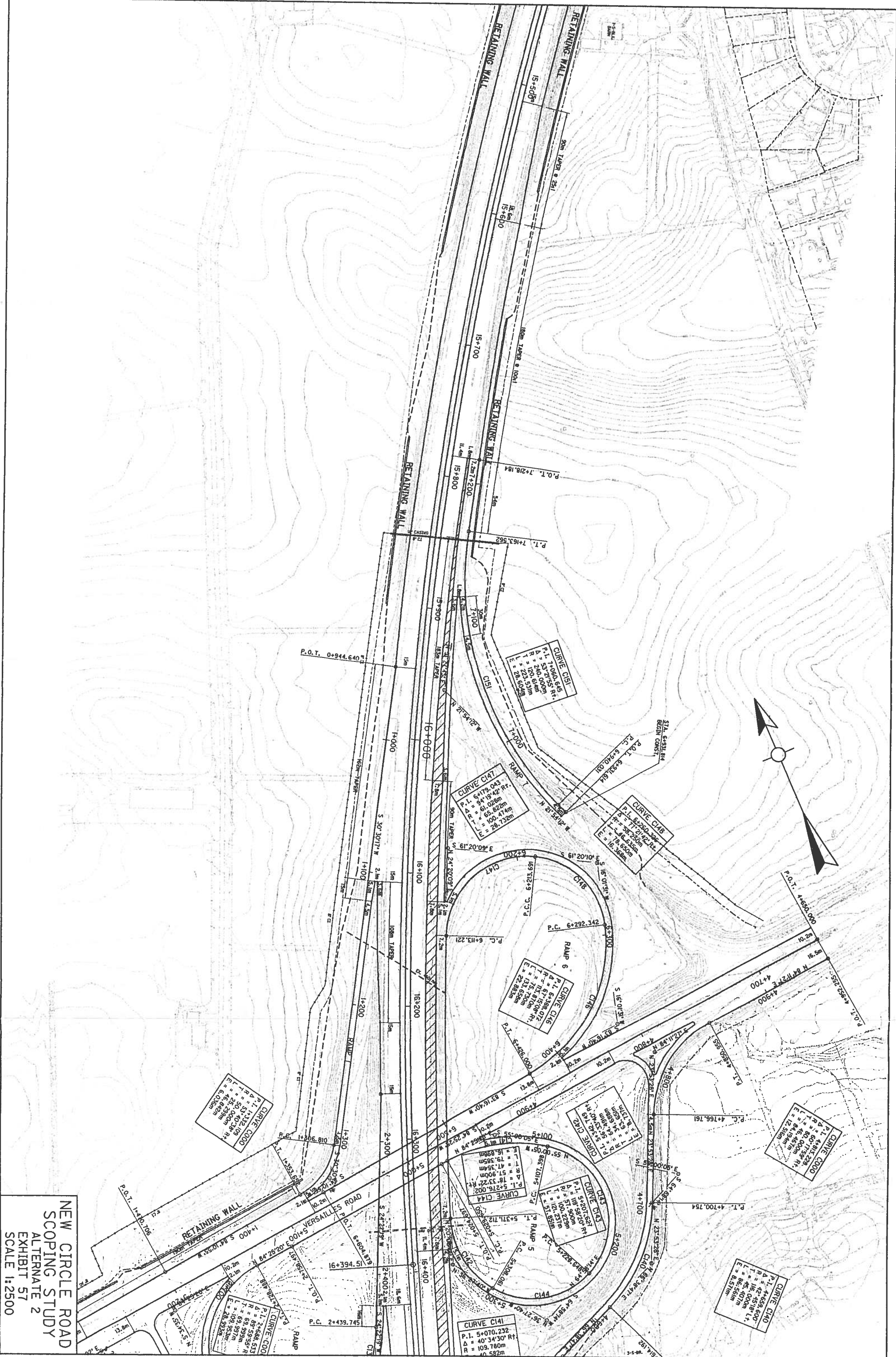




NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 2  
 EXHIBIT 55  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 56  
SCALE 1:2500



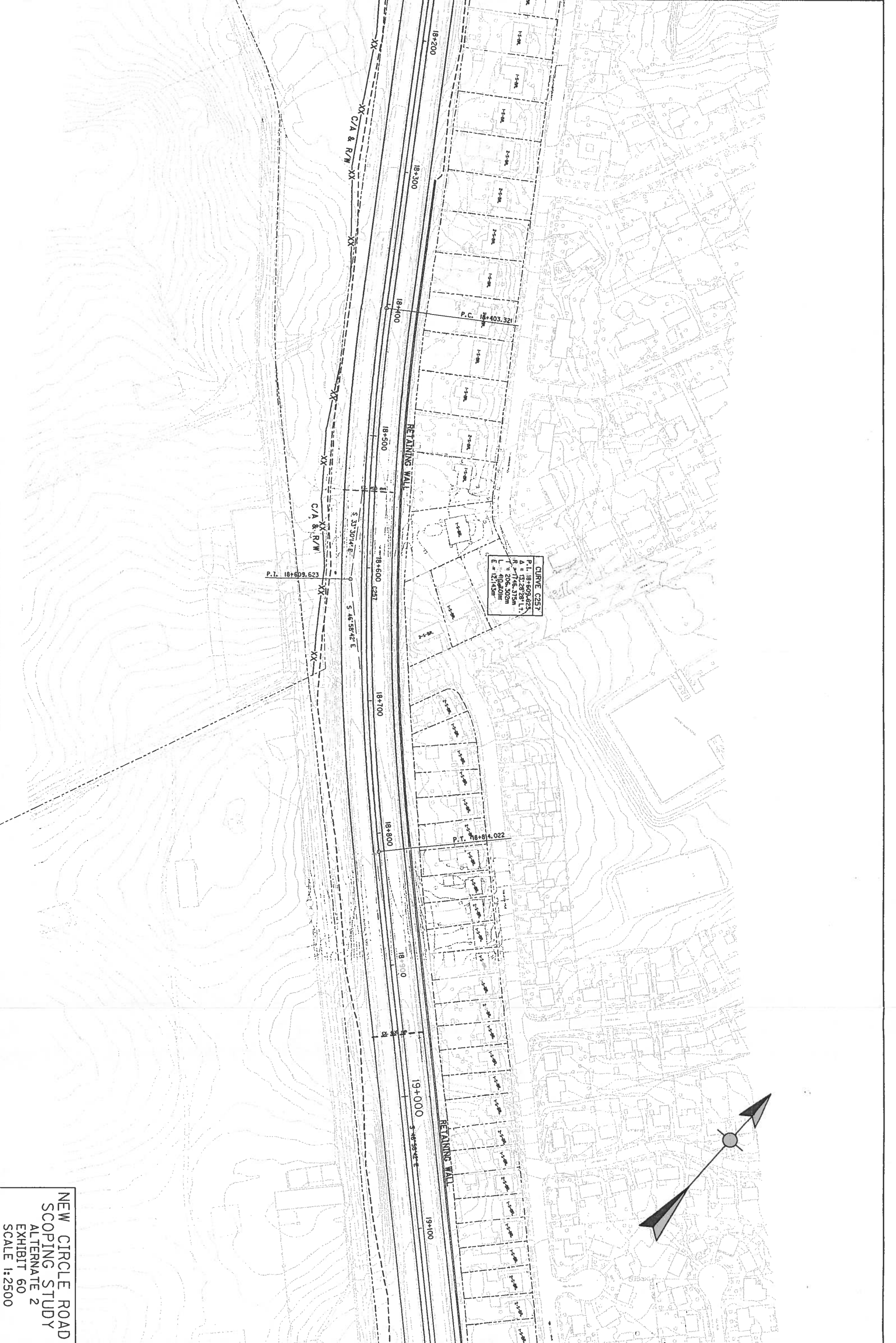
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 57  
SCALE 1:2500



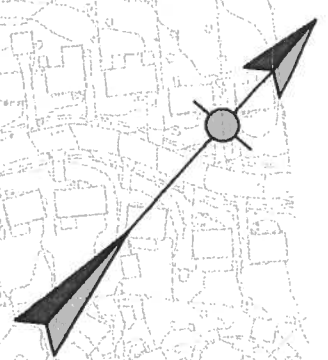


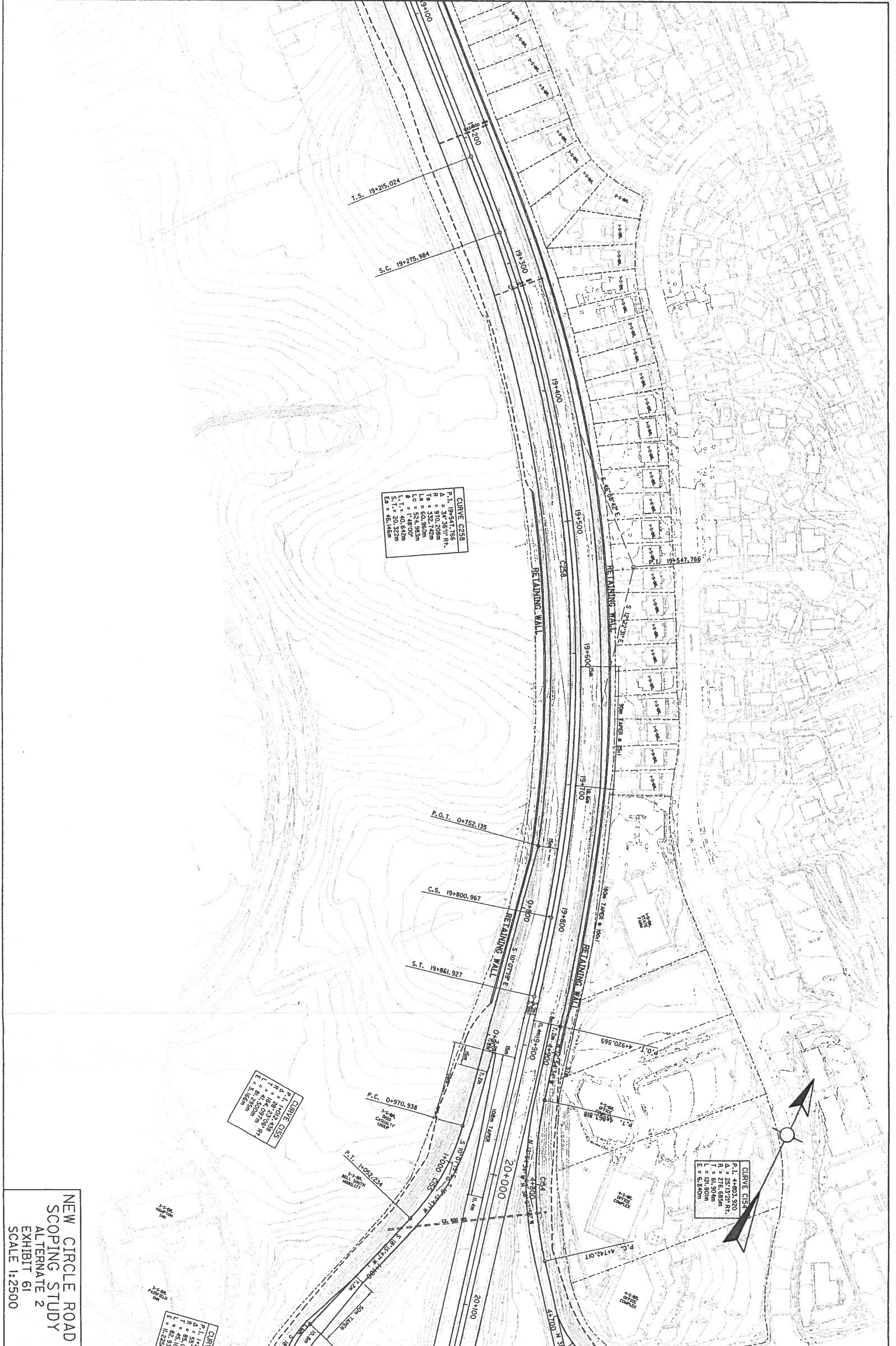
CURVE C285	
P.I.	17+331.110
A	52+712+1.4
R	811.18m
Ls	605.96m
Lt	246.10m
S.T.	17+000.00
Es	102.927m

NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 59  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 60  
SCALE 1:2500



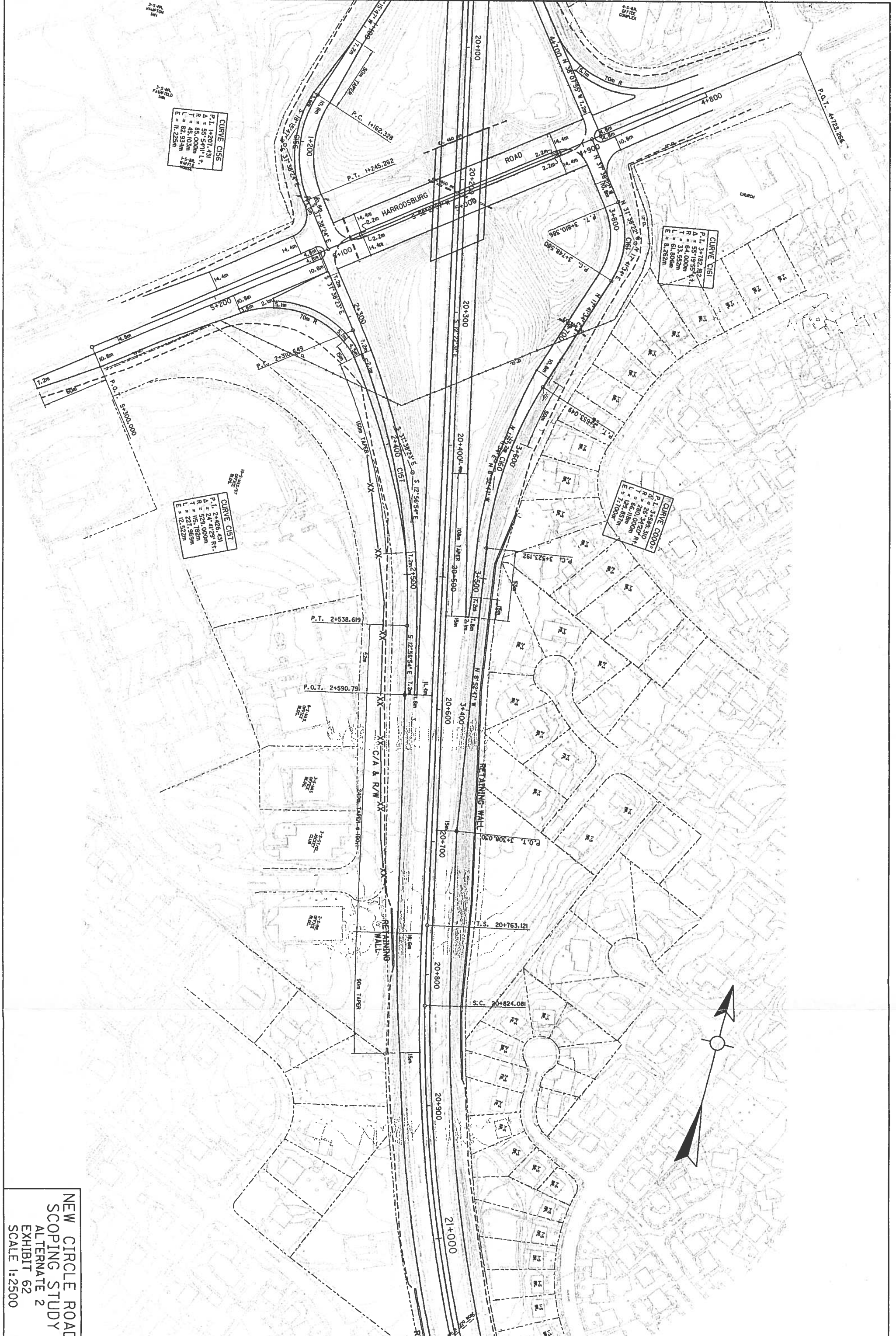


CURVE C258	
P.I.	19+547.766
Δ	34°36'11" Rt.
R	910.200m
Ls	322.560m
Lc	604.983m
θ	74°00'
T	140.642m
S.T.	20.122m
S.P.	16.146m

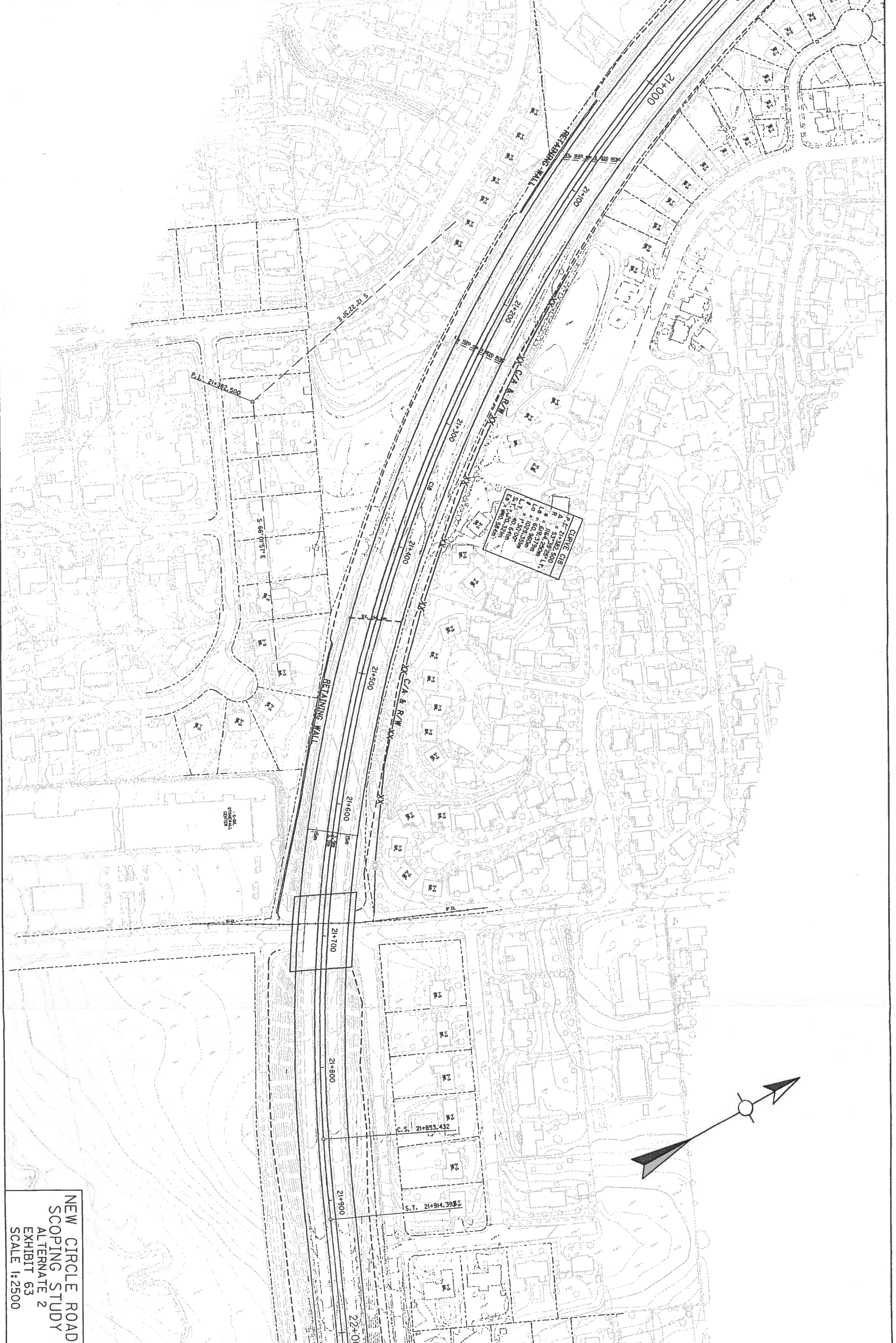
CURVE C155	
P.I.	19+02.438
Δ	28°22'43" Rt.
R	164.030m
L	81.509m
E	5.185m

CURVE C154	
P.I.	19+801.920
Δ	25°12'24" Rt.
R	276.685m
T	61.904m
L	121.800m
E	6.184m

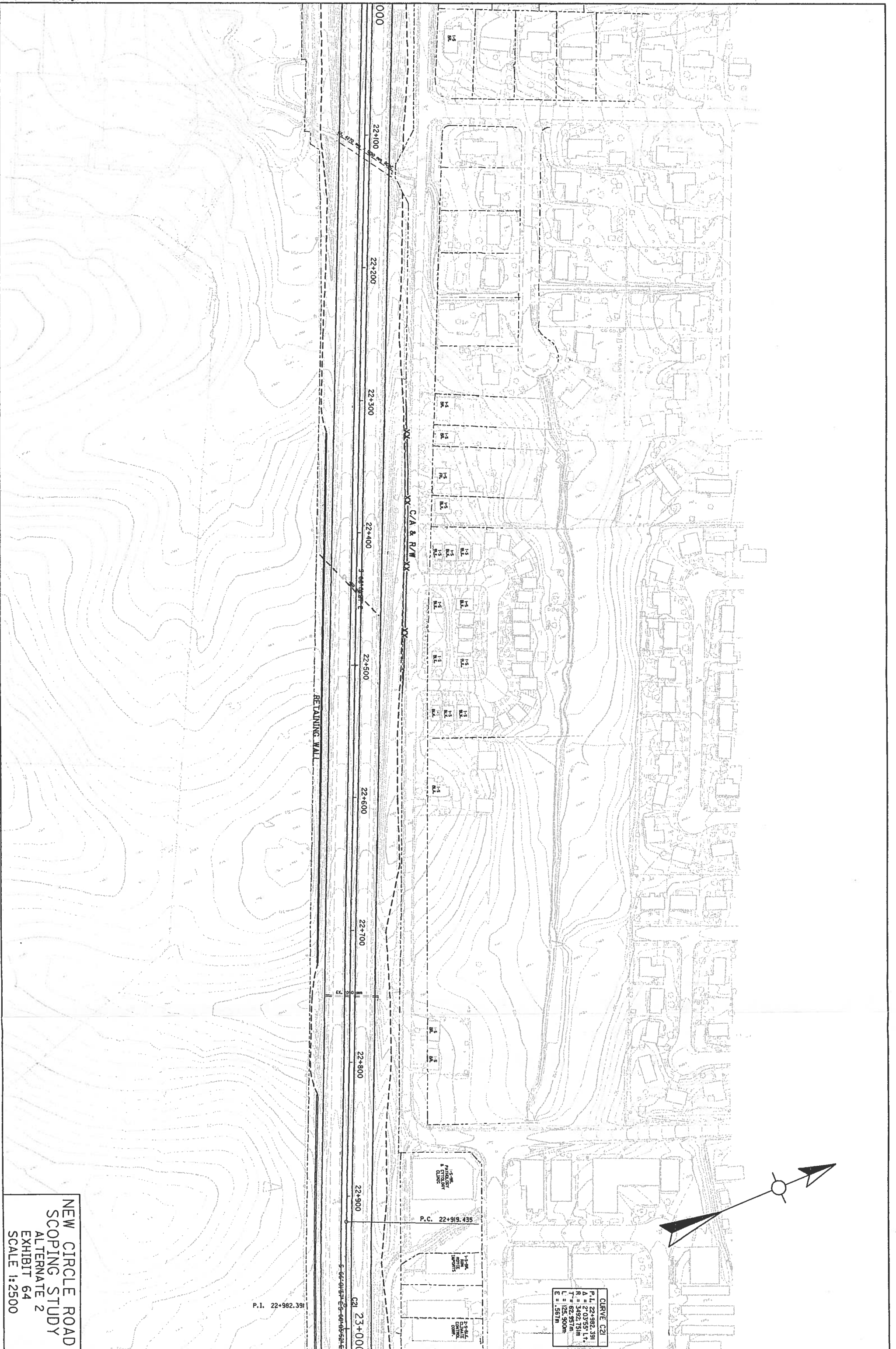
NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 2  
 EXHIBIT 61  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 62  
SCALE 1:2500



NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 2  
 EXHIBIT 63  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 64  
SCALE 1:2500

P.I. 22+982.391

C21 23+000

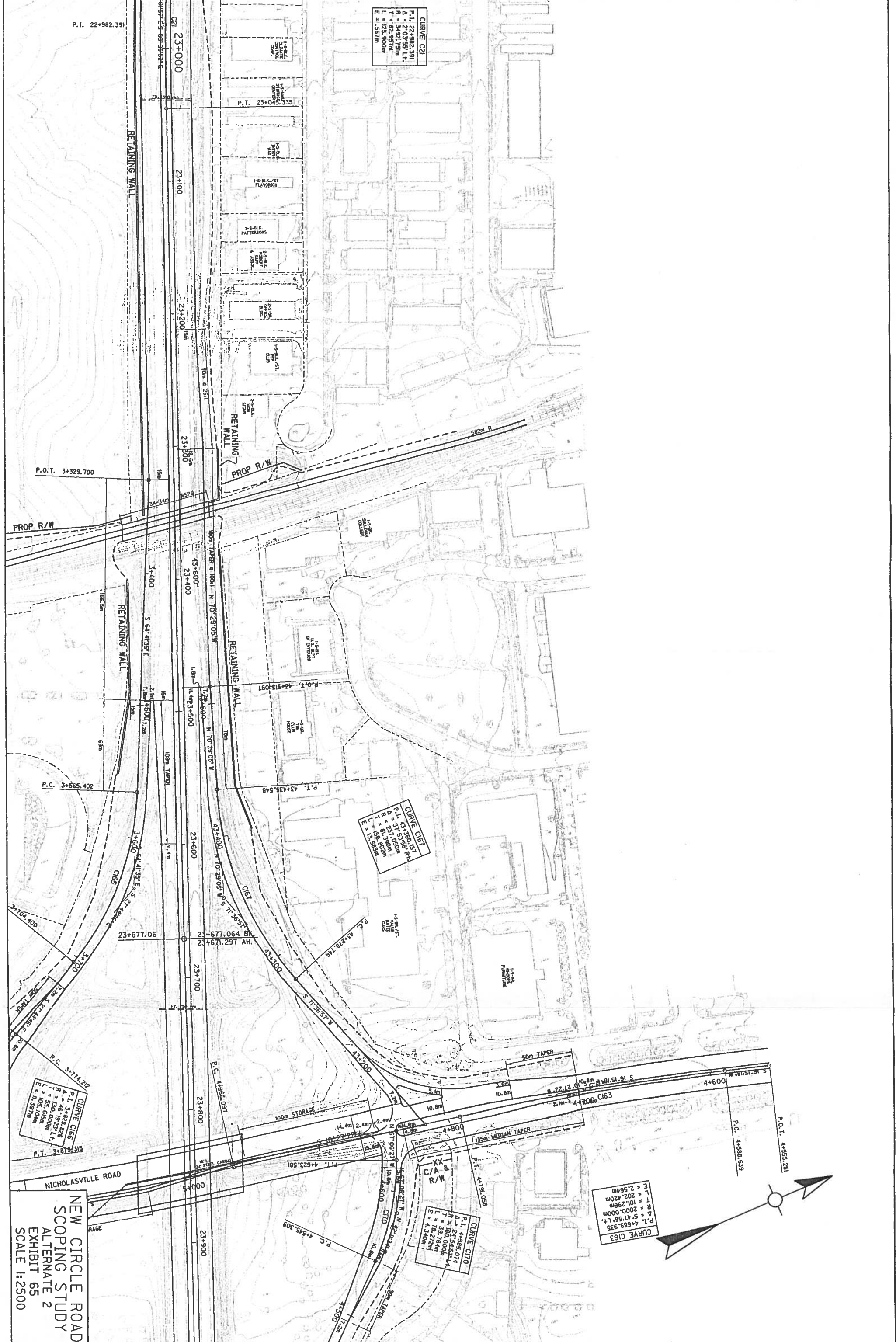
5-20' WIDE  
PARKING  
& CLUMP

5-20' WIDE  
WALKWAYS  
& CLUMP

5-20' WIDE  
WALKWAYS  
& CLUMP

P.C. 22+919.435

CURVE C21
P.I. 22+982.391
A = 2703.9514'
R = 3492.751m
T = 62.9517m
L = 123.900m
E = .3617m



**CURVE C21**  
 P.I. 22+982.391  
 Δ = 2°03'57" L.  
 R = 3492.751m  
 T = 62.9571m  
 L = 125.900m  
 E = 1.567m

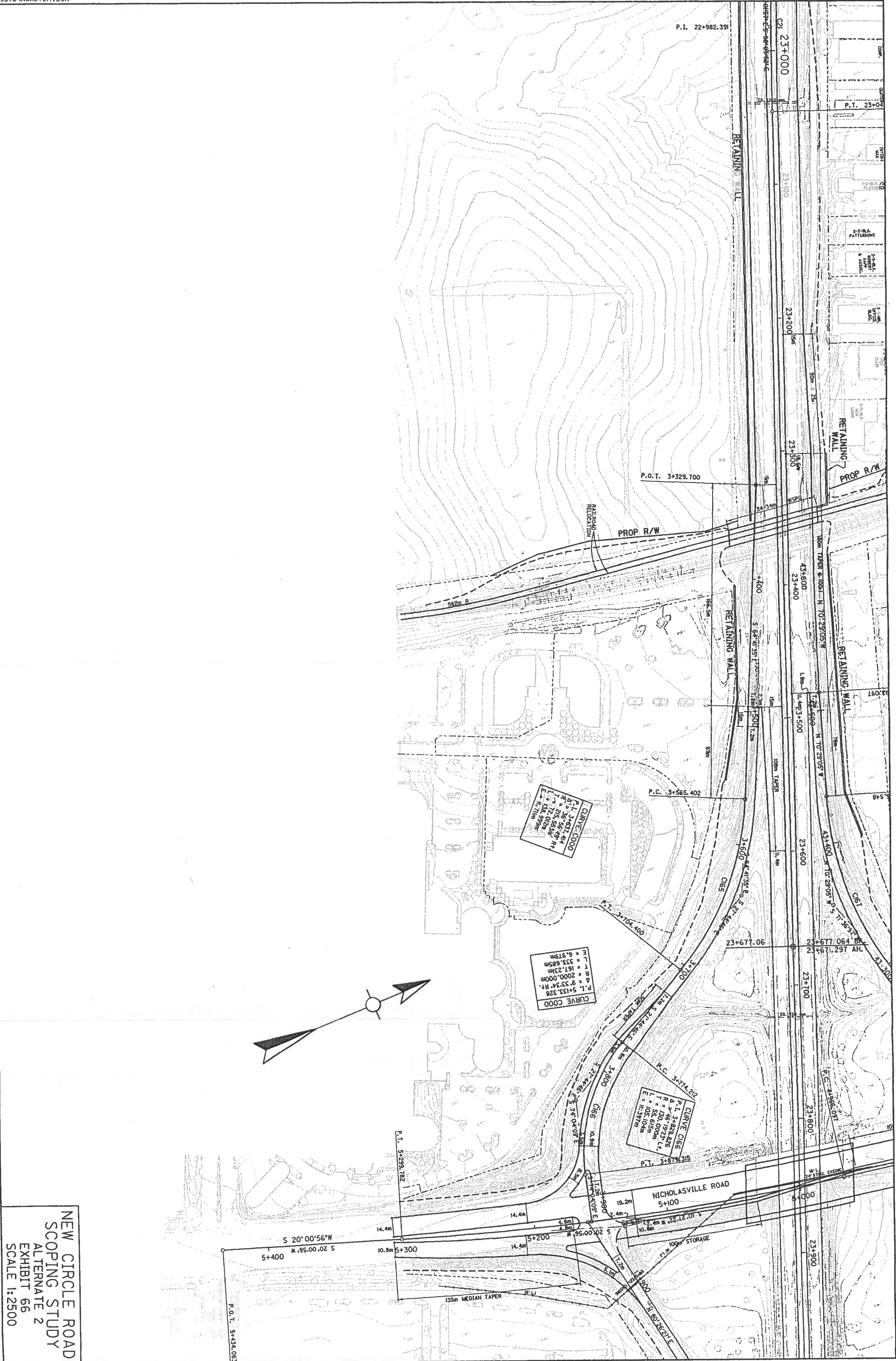
**CURVE C161**  
 P.I. 43+369.137  
 Δ = 3°17'56"  
 R = 231.560m  
 T = 81.500m  
 L = 156.802m  
 E = 0.1

**CURVE C166**  
 P.I. 3+823.825  
 Δ = 45°18'23" L.  
 R = 120.000m  
 T = 55.615m  
 L = 105.104m  
 E = 11.397m

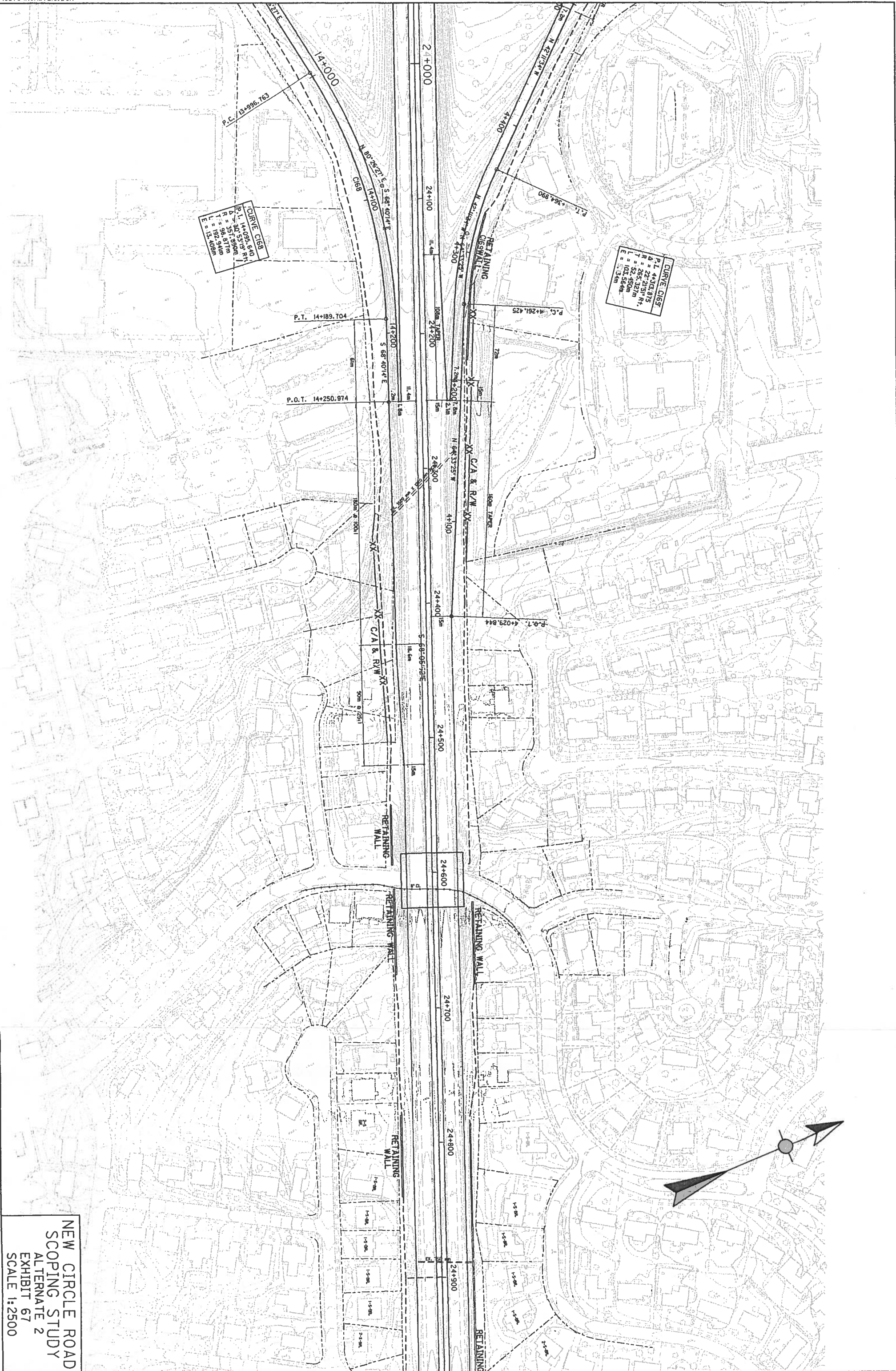
**CURVE C163**  
 P.I. 4+689.935  
 Δ = 5°47'56" L.  
 R = 2000.000m  
 T = 101.296m  
 L = 202.426m  
 E = 2.564m

**CURVE C170**  
 P.I. 4+585.074  
 Δ = 24°34'53" L.  
 R = 180.000m  
 T = 39.000m  
 L = 78.272m  
 E = 4.346m

**NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 2  
 EXHIBIT 65  
 SCALE 1:2500**

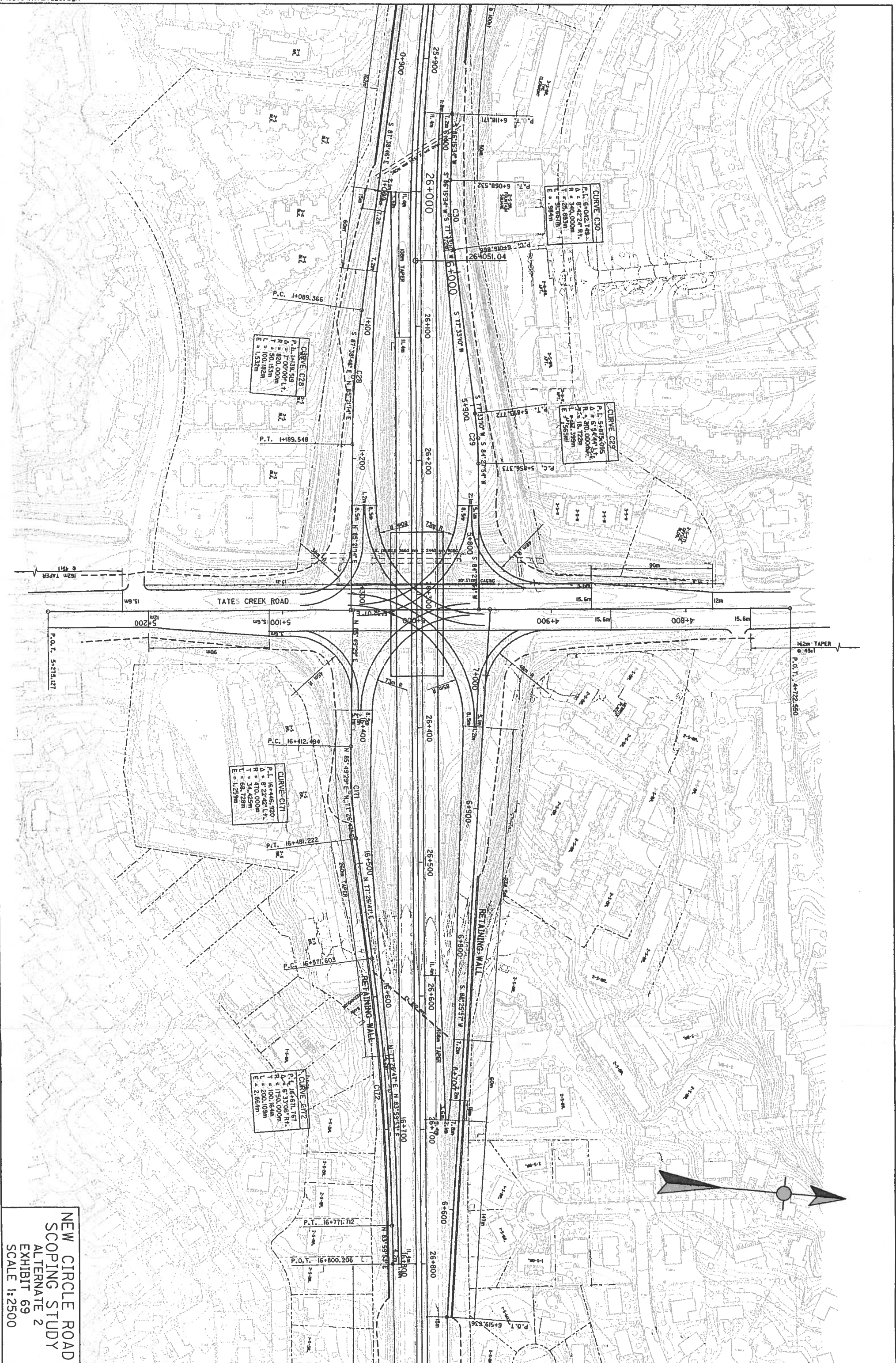


NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 66  
SCALE 1:2500

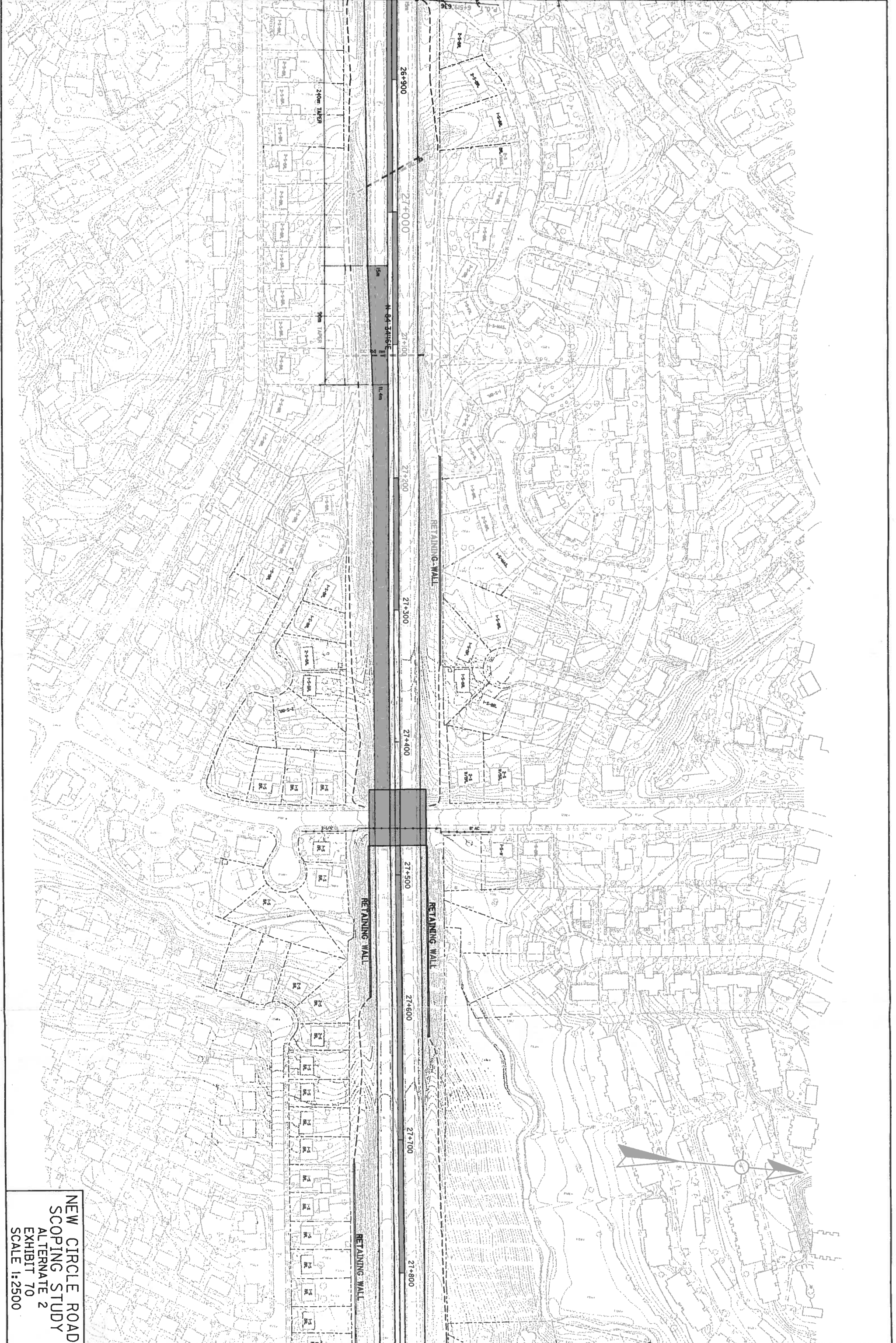


NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 67  
SCALE 1:2500

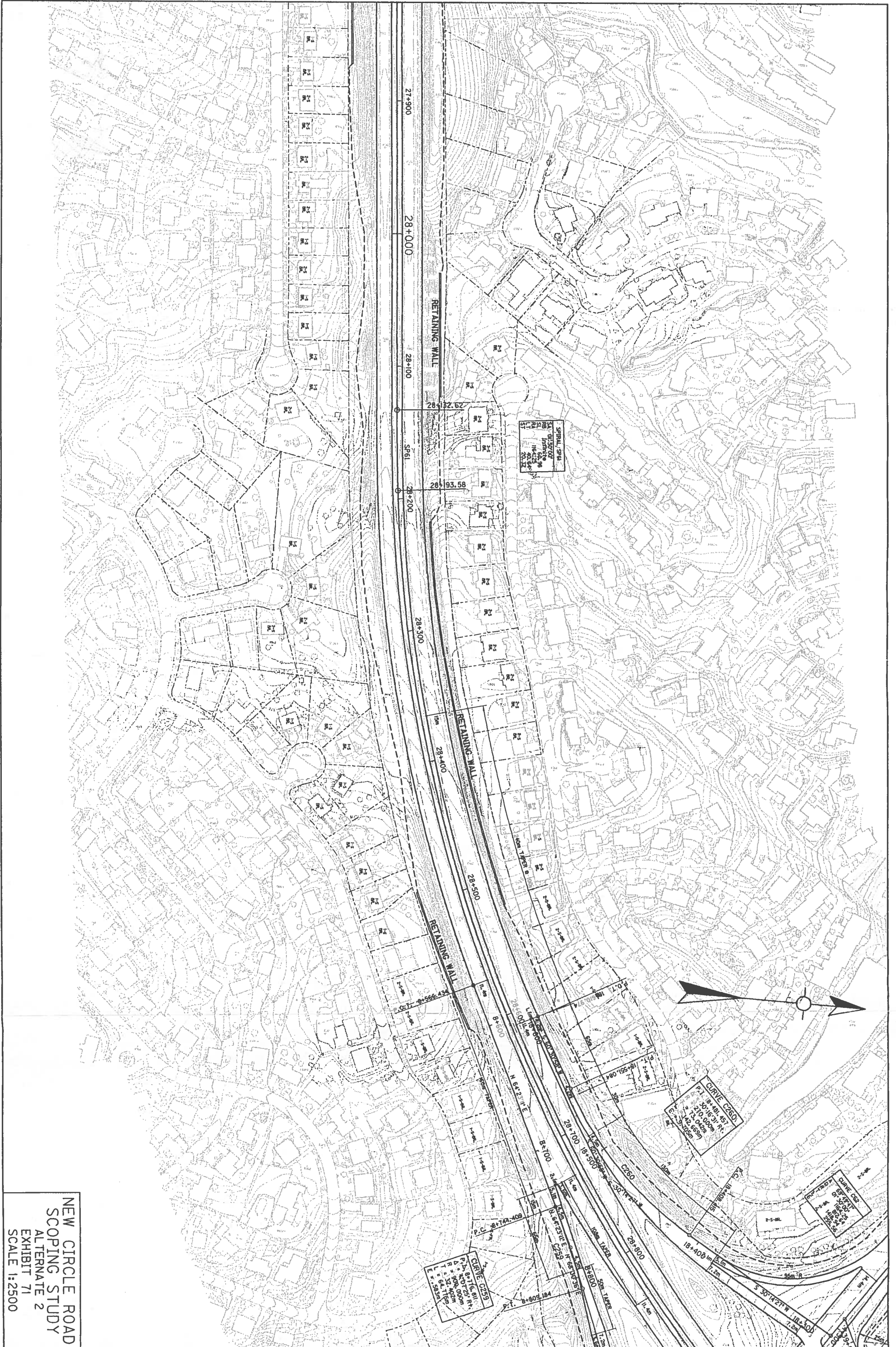




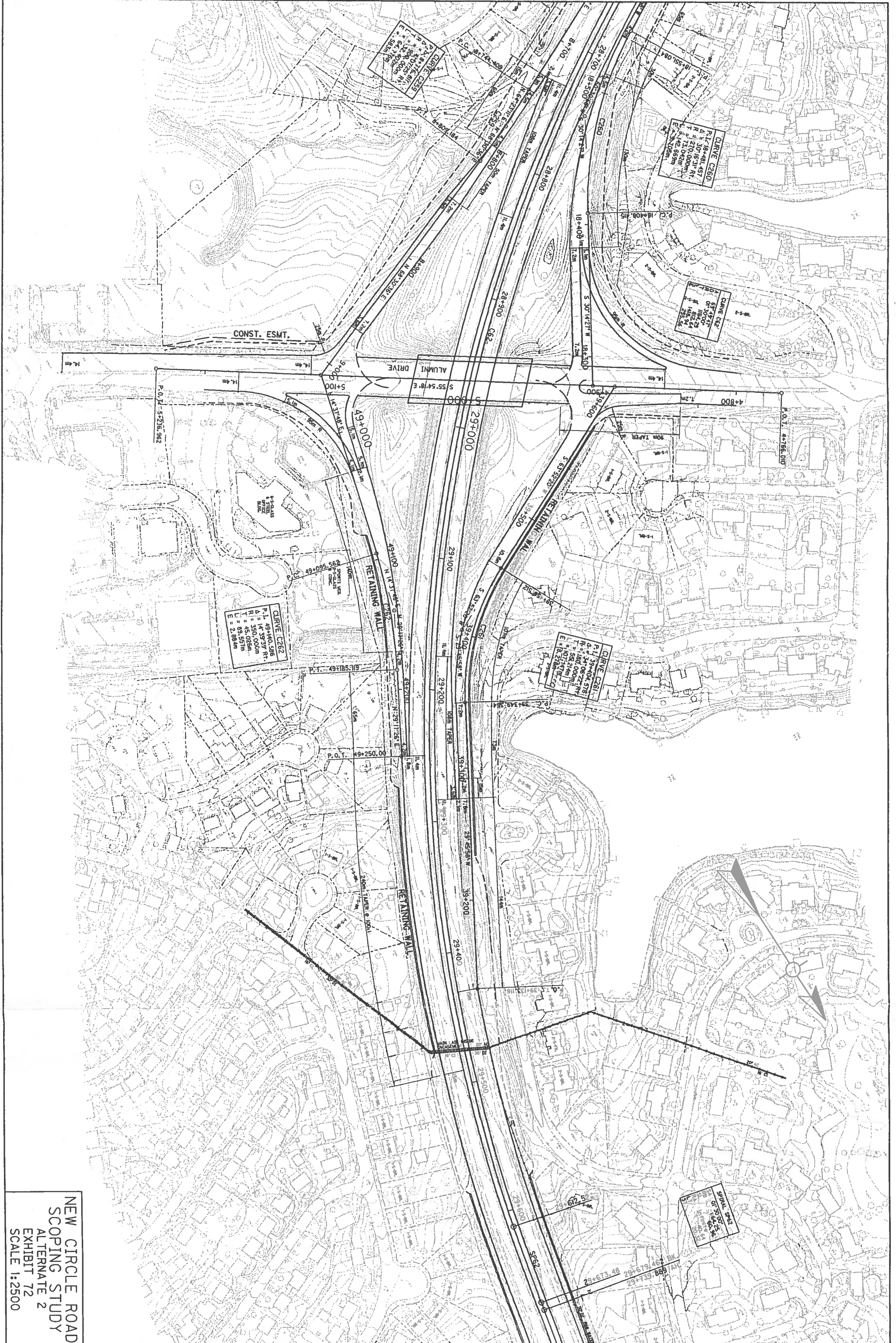
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 69  
SCALE 1:2500



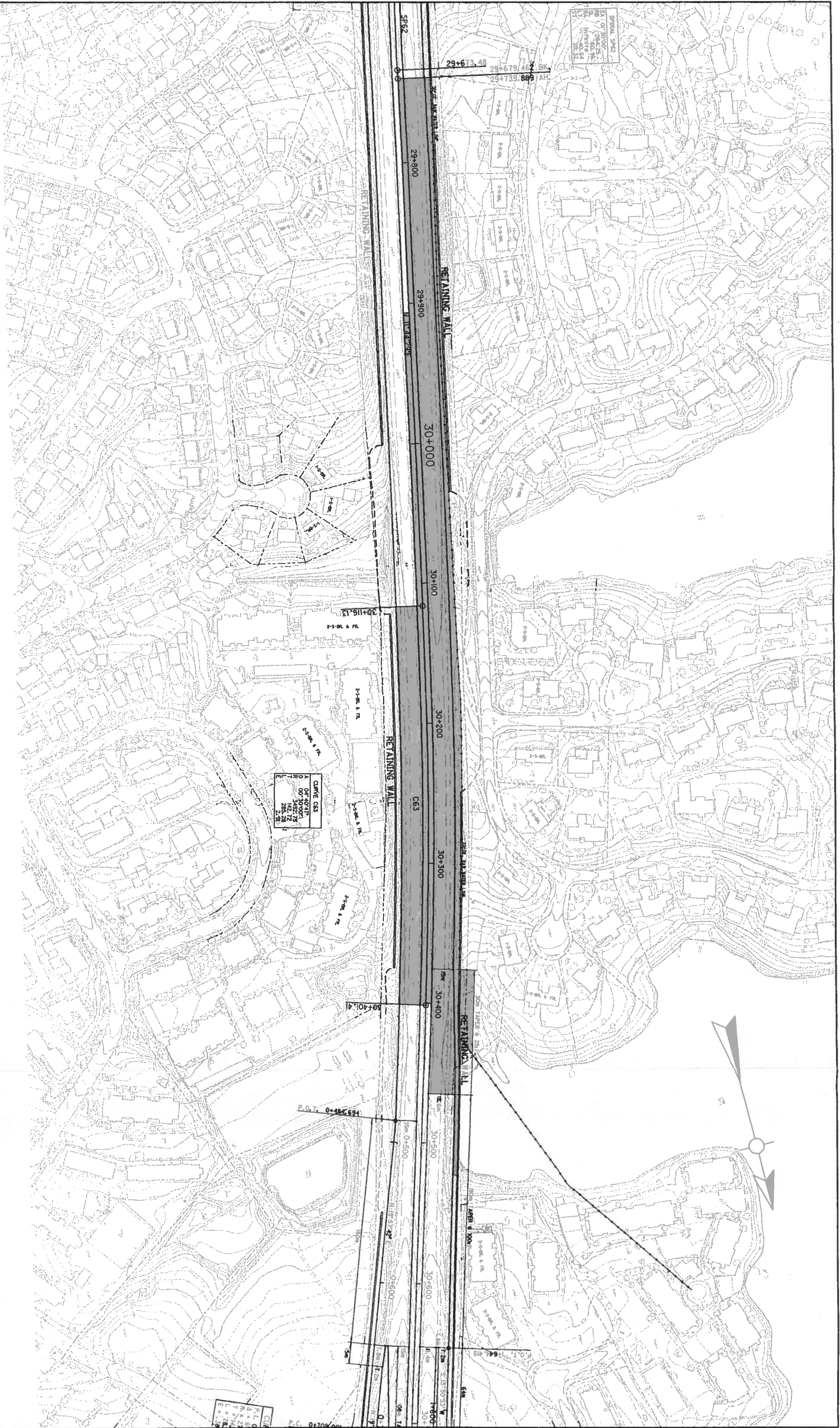
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 70  
SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 71  
SCALE 1:2500



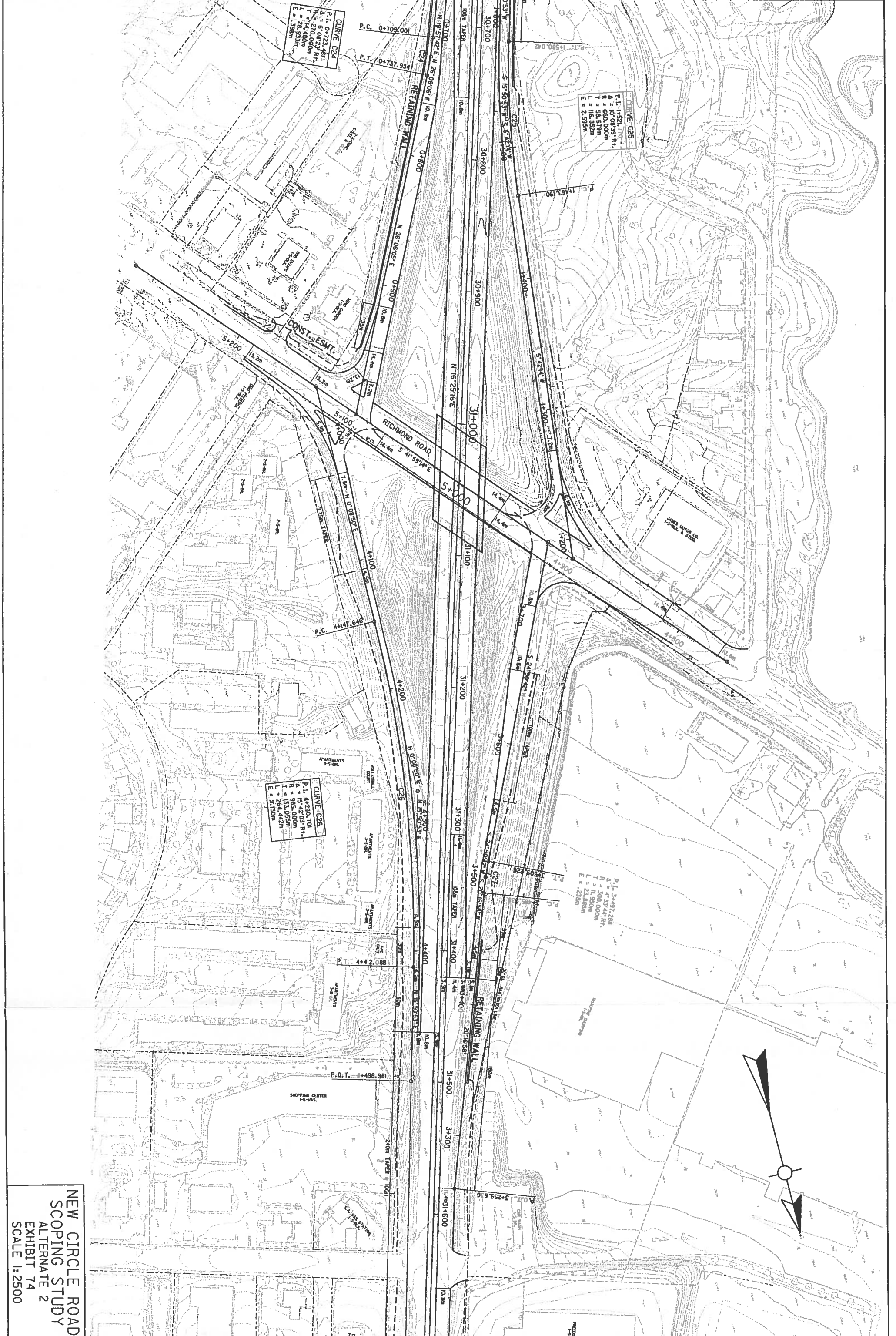
NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 72  
SCALE 1:2500



GENERAL NOTES:  
1. ALL DIMENSIONS ARE IN FEET AND INCHES.  
2. THE SHOWN ELEVATIONS ARE IN FEET.  
3. THE SHOWN DISTANCES ARE IN FEET.  
4. THE SHOWN ANGLES ARE IN DEGREES AND MINUTES.  
5. THE SHOWN BEARINGS ARE IN DEGREES AND MINUTES.  
6. THE SHOWN CURVE DATA IS AS FOLLOWS:  
CURVE DATA:  
C63  
RADIUS: 100.00  
CHORD BEARING: 112.12  
CHORD DISTANCE: 200.00  
PI: 2.51

CURVE DATA:  
C63  
RADIUS: 100.00  
CHORD BEARING: 112.12  
CHORD DISTANCE: 200.00  
PI: 2.51

NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 73  
SCALE 1:2500

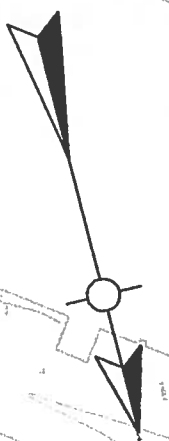


CURVE C24  
 P.I. 0+713.481  
 Δ = 87°02'31" Rt.  
 R = 270.023 m  
 T = 14.000 m  
 L = 28.031 m  
 E = 1.388 m

CURVE C25  
 P.I. 10+083.93  
 Δ = 66.000 m  
 R = 58.519 m  
 T = 16.852 m  
 L = 2.595 m

CURVE C26  
 P.I. 4+280.101  
 Δ = 157°42'03" Rt.  
 R = 965.000 m  
 T = 131.055 m  
 L = 264.442 m  
 E = 5.130 m

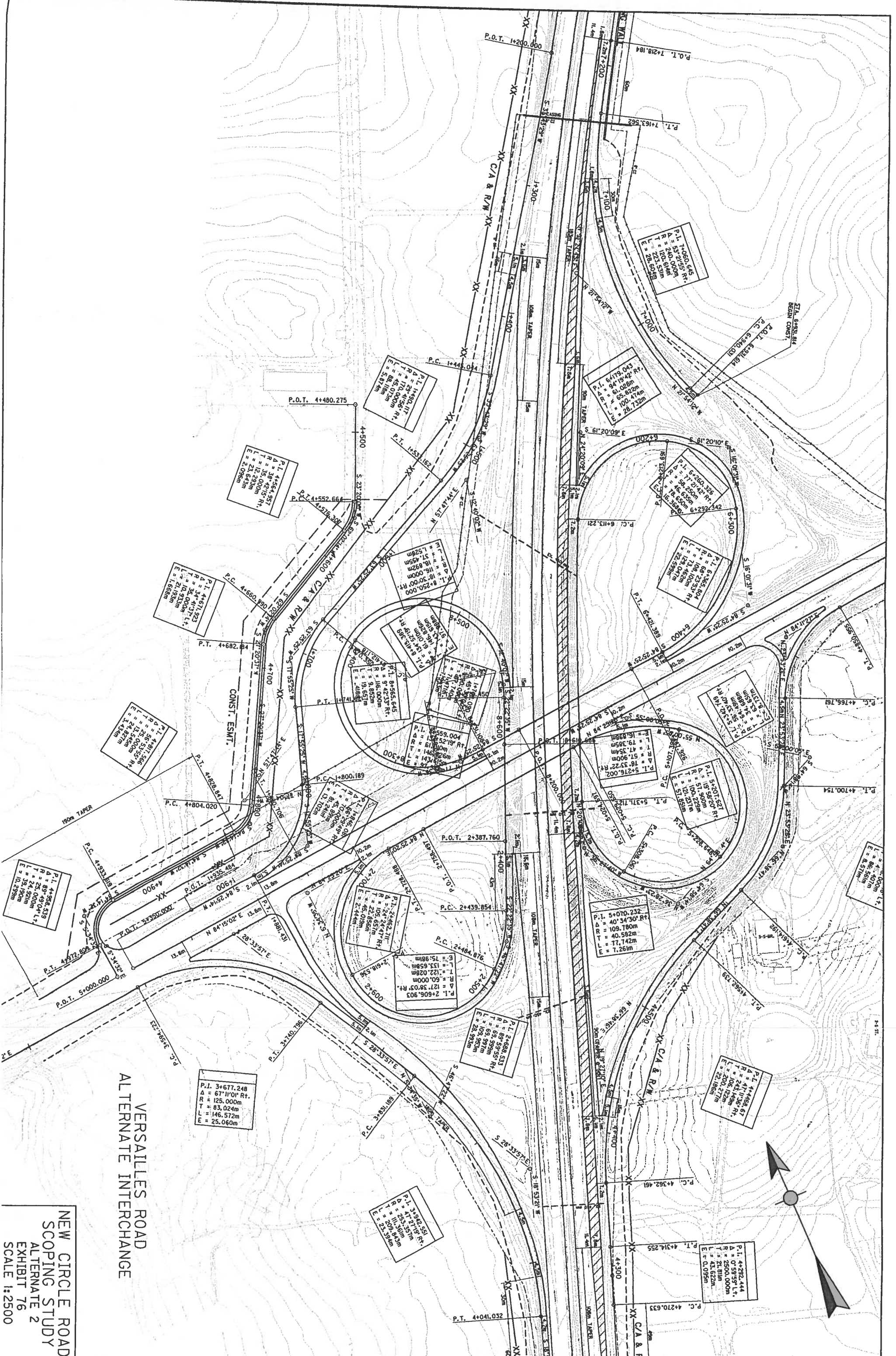
P.I. 3+497.288  
 Δ = 43°34'44" Rt.  
 R = 300.000 m  
 T = 11.950 m  
 L = 23.888 m  
 E = 2.388 m



NEW CIRCLE ROAD  
 SCOPING STUDY  
 ALTERNATE 2  
 EXHIBIT 74  
 SCALE 1:2500



NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 75  
SCALE 1:2500



VERSAILLES ROAD  
ALTERNATE INTERCHANGE

NEW CIRCLE ROAD  
SCOPING STUDY  
ALTERNATE 2  
EXHIBIT 76  
SCALE 1:2500