

AMENDMENT

to

**1997 TRAFFIC SEPARATION STUDY
CHARLOTTE NORTHEAST CORRIDOR
(NCRR/NS)
Project No. 9.9085004 (P-3309)**

PREPARED FOR

**NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION**

AND

CITY OF CHARLOTTE

PREPARED BY

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CHARLOTTE, NC**

JANUARY 2001

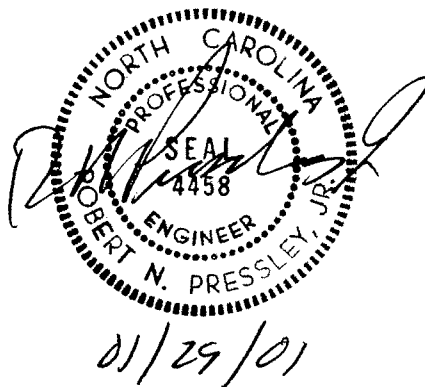


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**EXECUTIVE SUMMARY
TRAFFIC SEPARATION STUDY
NORTHEAST CORRIDOR
CHARLOTTE, NORTH CAROLINA
TIP #: P-3814**

FINDINGS:

Rail freight traffic along the Norfolk Southern (NS) continues to increase due to the division of CONRAIL routes between Norfolk Southern (NS) and CSXT. NS expects freight traffic to increase from 5 to possibly 10 additional trains per day over the next two years.

Vehicular traffic in the Charlotte Metropolitan Area continues to increase as growth and expansion to the northeast continues.

Safety concerns at the Sugar Creek Rd., Craighead Rd. and the 36th Street crossings have been considerably mitigated by the installation of gates and signals in all four quadrants at the crossings. The crossing at Orr Road, while experiencing a considerable increase in roadway traffic, remains one of the safer crossings. There are significant safety issues requiring treatment at the four remaining crossings.

Mobility is an issue at the Sugar Creek Rd. crossing due to the high volume of trains (36-45/day) and the high volume (+/- 28,000 vehicles per day) of roadway traffic. As the area served by Newell-Hickory Grove Rd., Rocky River Rd., McLean Rd., and Back Creek Church Rd. continues to develop, mobility has become an issue at these crossings as well, especially at McLean Road.

RECOMMENDATIONS:

Near-term (Implementation within 2 years)

1. **36th Street-** Clear foliage/install signing & marking \$1,775.00
 2. **Craighead Road-** Close the crossing \$12,000.00
 Construct turn-a-round \$50,000.00
 Install landscaping \$5,000.00
 Install left-turn lane/ signal at Davidson/Sugar Creek \$100,000.00
 3. **Sugar Creek Road -** Replace median separator with concrete \$10,000.00
 Resurface/install pavement markings *
- *See Craighead Road recommendations

4.	Newell-Hickory Grove Road - Construct left-turn lane	\$82,500.00
5.	Rocky River Road - Close and remove crossing	\$12,000.00
	Landscape	\$2,500.00
	Install turn-a-round	\$15,000.00
6.	McLean Road - Widen the crossing with like material	\$6,000.00
	Widen the roadway and install median separator	\$60,000.00
	Revise railroad gates and signals	\$100,000.00
	Widen right-turn-only lane	\$10,000.00
	Re-phase signal	No Charge
7.	Back Creek Church Road - Widen crossing with like material	\$6,000.00
	Widen roadway and install median separator	\$60,000.00
	Revise railroad gates and signals	\$100,000.00
Total Estimated Cost		\$632,775.00

Mid-term (Implementation within 2 to 5 years. Costs are in year 2000 dollars.)

1.	36th Street - Resurface/remark as 3-lane roadway (City)	\$36,000.00
2.	Craighead Road - Realign Davidson Street (City)	\$225,000.00

Long-term (Implementation beyond 5 years. Cost sharing arrangements for Long-Term projects will be determined at time of project programming in the TIP. The cost estimate shown below is in year 2000 dollars.)

1.	Sugar Creek Road - Construct grade separation	\$10,500,000.00
2.	Orr Road - Monitor for accident/safety issues	No Cost
3.	Rocky River Road -	See Report Section VII. F
4.	McLean Road -	See Report Section VII. G
5.	Back Creek Church Road -	See Report Section VII. H

**TRAFFIC SEPARATION STUDY
2001 EDITION
CHARLOTTE NORTHEAST (NS/NCRR) CORRIDOR**

**PREPARED FOR
THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
AND
THE CITY OF CHARLOTTE
January 2001**

This document is a supplement to the Traffic Separation Study for Charlotte, North Carolina and the North Carolina Department of Transportation and dated June 1997. Certain sections of that report not requiring updating are considered a part of this document as if reproduced herein. Those sections are: EVALUATION CRITERIA and MENU OF AVAILABLE TRANSPORTATION SYSTEM ENHANCEMENTS. Those sections requiring updating are included below.

Since the June 1997 date of the original report, the City of Charlotte has undertaken a series of studies along 5 major transportation corridors to determine the feasibility of implementing fixed-guideway mass transit services. In order to not confuse the NS/NCRR corridor with the efforts of the City, this study corridor has been designated the CHARLOTTE NORTHEAST (NS/NCRR) CORRIDOR.

I. PURPOSE OF THE STUDY

The City of Charlotte and the North Carolina Department of Transportation (NCDOT) entered into a cooperative agreement in October of 1996, to evaluate certain local street at-grade crossings of the **Norfolk Southern Railway (North Carolina Railroad Company)** in **NE Charlotte**. The purpose of the evaluation was to determine if any of the crossings were candidates for closure or grade separation, or if not, were there improvements that could be made to the local street and crossing network that would enhance public safety. The study included eight (8) public street crossings of the railroad from 36th St. north to Back Creek Church Rd.

For purposes of this study, the railroad will be referred to as the Norfolk Southern or NS. However, the corridor upon which the NS operates is owned by the State of North Carolina and has been designated as the **North Carolina Railroad or NCRR**, since the 1850's. The NCRR corridor extends from Charlotte through Greensboro and Raleigh and terminates at Morehead City. While NS continues to operate over the NCRR from Greensboro to Raleigh, the main traffic movement extends north from Greensboro over NS owned rails to Danville

and Roanoke, VA.

II. PREAMBLE

Highway/railway at-grade crossing collisions are the number one cause of death in the railroad industry. In 1999, there were 3,090 train-vehicle collisions with 402 deaths nationwide. North Carolina had 99 collisions (22 at private crossings), 3 deaths and 30 injuries. North Carolina had 15 fatalities in 1998. *(In 1998, trespasser fatalities along North Carolina's railroads exceeded the number of fatalities associated with train/vehicle collisions for the first time. Trespasser incidents are not a part of this study).*

Deaths and injuries at grade crossings have steadily declined in this country since 1978 due to an aggressive safety program by the United States Department of Transportation, the various state Departments of Transportation and the railroad companies. These efforts have included improved automatic warning devices, roadway improvements, elimination of sight obstructions, construction of crossing separation structures, and closure of some crossings.

The NCDOT, through its **Rail Division**, has a substantial program in place to improve rail crossing safety. The program is endorsed and supported by the **USDOT, Federal Railroad Administration** and **Federal Highway Administration**, and the various railroad operating companies. To be successful, however, requires the support of local government and the citizens of North Carolina. These series of studies, undertaken through a cooperative agreement between state and local government, are part of a continuing effort to enhance the safety of motorists, rail passengers and train crews in North Carolina.

III. THE CHARLOTTE STUDY

The City of Charlotte is a major operations center for the NS. Daily train movements over the eight crossings included in this study, range from a high of 49 at 36th St. to 36 trains per day from Newell-Hickory Grove Rd. north to Back Creek Church Rd. While most of the crossings have automobile traffic volumes ranging from just over 2,000 to less than 10,000 vehicles (VPD) per day, Sugar Creek Rd. has a 24 hour volume that exceeds 28,000 vehicles per day.

All crossings have experienced one or more train/vehicle crashes in the last 10 years except for two: 36th Street and Orr Road. During this same period of time, only one fatality has occurred and that was at Sugar Creek Road in 1994. In the decade of the 1980's, three fatalities occurred at the Craighead Road crossing. The reduction in severe accidents can be directly attributable to the "Sealed Corridor" program undertaken in 1995 by the NCDOT Rail Division in cooperation with the Federal Railroad Administration. This program, which includes such advanced crossing protection devices as 4-quadrant gates, longer gate arms and

median separators, has led to substantial reductions in the numbers of motorists who attempt to drive around lowered gates at grade crossings.

In cooperation with the City of Charlotte and NS, the NCDOT has installed 4-quadrant gates at 36th Street, Craighead Road, Sugar Creek Road and Newell-Hickory Grove Road. In addition, median separators have been installed at Sugar Creek Road and Back Creek Church Road. At Orr Road, which serves a large industrial area, longer gate arms have been installed.

The initial evaluation of the Charlotte crossings included the following:

- Twenty-four hour automatic traffic counts were obtained for the crossings as well as other streets within the network.
- Due to the nearness of the McLean Rd. crossing to the signalized intersection of Old Concord Rd./McLean Rd., a Level of Service (LOS) analysis was conducted for this intersection.
- Interviews with local transportation officials (NCDOT & CDOT) were conducted to gain local insight into problems and potential improvements to each crossing.
- Data were collected from the Charlotte-Mecklenburg School System, the Charlotte Fire Department, and the Mecklenburg County Emergency Medical Service as to frequency of use of each crossing, as well as service impacts that might occur should a crossing be closed or modified.
- Available historic information and mapping was utilized in the development of report conclusions and recommendations.

For the 2001 update:

- New 24-hour automatic traffic counts were taken at all eight (8) crossings during the weeks of September 25 and October 2, 2000.
- Local transportation officials were again consulted to gather information concerning problems and potential improvements at the crossings.
- Data was again collected from the Charlotte-Mecklenburg School System, the Charlotte Fire Department and the Emergency Medical Services to determine crossing use, frequency and impact on services if a crossing were closed.

IV. EXISTING TRANSPORTATION SETTING

The City of Charlotte is the largest city in the Carolinas with a population that approaches 550,000. Traffic volumes on the roadway network have continued to grow with annual increases of 2-4%.

Railroad traffic along the NS continues to grow due to a major intermodal operation at the Charlotte yard located between 16th Street and 36th Street, as well as the increases brought about by the NS purchase of a portion of the Conrail System.

Of the eight (8) crossings evaluated, Sugar Creek Rd. is the only major thoroughfare while 36th St. and Back Creek Church Rd. are both minor thoroughfares. Craighead Rd., Orr Rd., and Newell-Hickory Grove Rd. provide industrial access while Rocky River Rd. is designated as a collector. McLean Rd. provides access primarily to residential property. Paralleling roadways are not adjacent to any of the crossings with the exception of a segment of Orr Rd. that extends southerly from Newell-Hickory Grove Rd. and Old Concord Rd. which parallels the tracks on the westside and intersects with Newell-Hickory Grove Rd., Rocky River Rd., and McLean Rd.

All crossings are routinely used by local emergency responders (police, fire, medic) as well as by buses from the Charlotte-Mecklenburg School System.

Nearby traffic signals impact the crossings at Orr Road, McLean Road and Back Creek Church Road. Traffic has been observed to queue over the crossings at McLean and Back Creek Church roads and to reach but not extend over the crossing at Orr. Traffic also queues over the crossings at both Newell-Hickory Grove Road and Rocky River Road. These queues are typically caused by the increasing volume of traffic along Old Concord Road and the decreasing gaps in traffic that would allow side-street traffic to enter the flow.

Norfolk Southern (NS) operates two main line tracks from south of 36th St. to just south of the Orr Rd. crossing where it drops to a single track. Freight train operating speeds range from 25 MPH at 36th St. to 50 MPH for merchandise trains and 60 MPH for intermodal trains, while passenger trains operate at a maximum of 79 MPH over the entire segment.

Due to the increasing volume of freight traffic on the railroad as well as the possible increase in the frequency of passenger trains, a second mainline track is planned to be added throughout the study area within the next few years. Should this event occur, additional safety devices will be warranted at all of the affected Charlotte area crossings.

V. CROSSING EVALUATION UPDATE

Since the initial report was published in 1997, train volume has continued to increase in the corridor as NS has incorporated more and more of the Conrail operations into its system. Current estimates of daily train traffic run from 49 at the 36th Street crossing to 36 at Back Creek Church Road. All indicators point to a continuing increase in train traffic. This increase may result in dual mainline tracks being extended from just south of Orr Road to beyond the crossing at Back Creek Church Road.

a. 36th Street - since the initial report was written, the most significant change that has taken place is that 4-quadrant gates and signals were installed at the crossing on 4/25/00. Minor maintenance is required on both roadway approaches to the crossing. On the eastbound approach, the railroad crossing sign, R1-1, is missing and foliage obscures the railroad gates and signals. On the westbound approach, the R1-1 sign is also obscured and the railroad crossing pavement markings are only in fair condition.

The 1997 report recommended that the section of 36th Street between N. Davidson Street and N. Tryon Street be resurfaced and re-marked as a 3-lane roadway in order to provide 12-foot lanes to handle turning maneuvers for tractors-trailers more efficiently. That recommendation has not been implemented and the Charlotte Department of Transportation (CDOT) reports that 36th Street is not on the resurfacing list for at least the next two years. The 24-hour traffic volume has shown an increase of about 1.5 % per year since the count of 1997.

There have been no reported accidents at the crossing since 1991. The recent installation of 4-quadrant gates and signals at the crossing should further reduce the accident potential. The street continues to serve as a primary emergency responder route in that there is a nearby fire station on N. Davidson Street.

Of the eight (8) grade crossings evaluated in this study, 36th Street is the closest to the NS Charlotte Yard. This means that the crossing is frequently impacted by switching maneuvers in the yard which cause the gates and signals to activate. From time to time, a train may occupy the crossing for several minutes while cars are being coupled or un-coupled. These activities impede the flow of vehicular traffic over the crossing.

The 1997 study determined that the intersection of N. Tryon Street and 36th Street could be improved to an **LOS** of **D** from **F** by adding a NB thru-lane on Tryon Street and re-phasing and re-timing the signal. These improvements have been completed as part of the North Tryon Corridor Improvement Project.

b. Craighead Road - the only changes that have occurred at the Craighead crossing is that one of two siding tracks on the eastbound approach has been removed and the road

has been resurfaced. However, the ride quality at the crossing is only fair due to the difference in elevation of the mainline and siding tracks and the humped condition on both approaches to the crossing. The 24-hour traffic volume at the crossing has remained almost constant since the 1997 count.

On the northbound Davidson Street approach to the crossing, the R1-1 sign is obscured by overhanging foliage.

Although 4-quadrant gates and signals were installed at the crossing in 1995, two train/vehicle crashes have occurred since then. A crash in 1999 resulted in two injuries, one of which was a Class A (transported to hospital). This accident occurred when the driver of the vehicle drove onto the tracks as the gate arms were coming down.

c. Sugar Creek Road - at the Sugar Creek Road crossing, a concrete modular crossing has been installed on the siding track west of the mainline tracks. This installation has greatly improved the overall ride quality of the crossing. The modular crossing material was purchased by CDOT and installed by NS. The cost for the material was approximately \$35,000. The panels on the median separator on the eastbound approach have been damaged. It also appears that at least one and maybe both, of the existing industrial buildings on the westside of the crossing adjacent the tracks are now vacant. The siding mentioned above which serves both buildings, appears not to have been used in some time.

Traffic volume at the crossing has continued to increase since the 1997 count with annual growth of about 2.6% per year.

Since the installation of the 4-quad gates and signals at the crossing in 1995, there have been no reported train/vehicle crashes.

d. Orr Road - the only significant change in the crossing at Orr Road is the addition of the longer gate arms. There have been no reported accidents at the crossing since 1991. Automobile traffic volume at the crossing has grown substantially since 1997, however, primarily due to the construction of several new industrial operations in the area including a major bus maintenance facility for the Charlotte-Mecklenburg School System. The traffic volume has grown at an annual rate of over 18%.

e. Newell-Hickory Grove Road - this crossing has received a significant safety upgrade in that 4-quadrant gates and signals were installed on 7/20/99. The only other change is that the eastbound approach to the crossing has been resurfaced as a result of resurfacing of Old Concord Road. Only one accident has been reported at the crossing since 1991 and none since the 4-quadrant gates and signals were installed.

Due to growth in the area and the increasing volume of traffic along Old Concord Road, traffic has been observed on several occasions to queue over the tracks. The queue distance, the distance between the lowered gate arm and the edge of pavement on Old Concord, for westbound traffic on Newell-Hickory Grove is less than 25 feet. Queuing over the tracks is not generally a problem for vehicles turning right onto Old Concord Road, but for the left-turning traffic, it is a problem. Traffic volume at the crossing has shown a drop of just over 35% since the count of 1997. This drop is most likely attributable to drivers electing to use other roads in the area to avoid the traffic along Old Concord Road.

There is no left-turn lane from southbound Old Concord Road to Newell-Hickory Grove Road which causes congestion on Old Concord when trains are present at the crossing. Once the train has cleared the crossing, due to the backup of traffic on Old Concord, it may be several minutes before the queue clears on Newell-Hickory Grove. Once the train has passed, most motorists have no qualms about pulling onto the crossing while attempting to enter the flow of traffic on Old Concord Road.

f. Rocky River Road - physically, the crossing is unchanged from the initial assessment in 1997 except the track elevation has increased about 3 inches due to maintenance. This only worsens the "humped" crossing condition. Automobile traffic over the crossing has remained virtually unchanged (4,000 in 1997 vs. 3,995 in 2000).

Considerable development is taking place in the Newell community with a large subdivision under construction just north of the crossing on the westside of Old Concord Road. The entrance to this subdivision is approximately 185 feet north of the Rocky River crossing. Although a northbound left-turn lane has been constructed for this project, additional traffic in the area will only worsen the situation at the crossing.

The most significant event to occur since the 1997 report, however, is a problem solving initiative undertaken by a study group of area citizens and staff from the Charlotte-Mecklenburg Planning Commission and CDOT. As a result of this effort, the study group has decided to support closing the crossing. In the collective opinion of the study group, the previously recommended grade separation at the Rocky River crossing would attract more through traffic into the Newell community leading to a further deterioration of the quality of life.

Growth and traffic congestion have made a bad situation at Rocky River Road worse. The queue distance, the distance between the lowered gate arm and the edge of pavement along Old Concord Road is approximately 30 feet. Since the initial TSS was completed, Duke Power Company has opened a large operations facility on Harris Boulevard at Rocky River Road. Many of the line trucks from this facility, some with trailers attached, use the crossing to access Old Concord rather than use Harris

Boulevard. These trucks have been observed to frequently queue over the tracks during morning peak hours.

The most recent reported accident at the crossing (2/29/00) involved an eastbound truck pulling a low-boy trailer carrying a back-hoe. The truck cleared the crossing but the trailer became hung on the tracks and was struck by a southbound freight train. No personal injuries were reported but the accident illustrates once again the problems associated with badly humped crossings. In an attempt to warn truck drivers of the perils of such crossings, the NCDOT has installed "low vehicles may drag" signage, but it was ignored in this case and field observations indicate frequent disregard of such signage. A total of two accidents have occurred at the crossing since 1991.

When trains are present at the crossing, traffic backs up along Old Concord Road in both directions. This backup frequently extends beyond the intersection of Old Concord and Rocky River Road West causing turning movement conflicts at this intersection as well. These backups will also affect the new subdivision now under construction just north of the crossing.

The Charlotte Fire Department (CFD) is constructing a new fire station at the intersection of Rocky River Road and Grier Road near the entrance to Reedy Creek Park. This station, when occupied, will be first responder for fire and medical emergencies to the Newell Community. From the new station to the intersection of Old Concord Road and Rocky River Road is 1.1 miles via Rocky River Road. Using District Drive and Newell-Hickory Grove Road, the distance to the same intersection is 2.2 miles, or double the direct routing. The CFD staff reports that utilization of either route will allow responses to commercial properties within the area within the six (6) minute standard, however, using the District Drive/Newell-Hickory Grove Road route will take approximately 5 minutes and 45 seconds as opposed to the 3 minutes and 30 seconds currently being experienced. CFD opposes closing Rocky River Road without provisions for crossing the track in the same vicinity. The CFD recommends that a grade-separation structure be built at this location if the grade crossing is eliminated.

g. McLean Road - continued residential development has worsened the congestion problem at this crossing since the 1997 report. A large apartment complex with 372 residential units is under development immediately across Old Concord Road from the McLean crossing and will connect to Old Concord Road opposite McLean. Connected to this complex is another development of 705 units that also has access to Harris Boulevard. Both of these complexes are expected to generate 7-9 trips per day per unit and could add from 4,000 to 6,000 trips per day to the intersection.

Further east along McLean Road, single-family residential homes are being added in several neighborhoods including some fronting on John Russell Road which intersects

with McLean. The Faires Farm neighborhood, which is just east of the crossing continues to expand. This large neighborhood has only one entrance and it connects to McLean Road about 450 feet east of the crossing. A significant majority of the Faires Farm traffic uses the crossing several times per day.

The continued development in the area is reflected in the automobile traffic volume at the crossing. That volume has increased just about 22% per year since the 1997 count was taken.

Traffic has been observed during both the morning and afternoon peak-hours to queue over the crossing (the queue distance is approximately 75 feet). This is a significant change from the initial report and is a direct result of the continued residential growth in the area. The queuing problem frequently causes vehicles to attempt to maneuver around other vehicles waiting for a green signal at Old Concord Road. Motorists have also been observed driving around the lowered crossing gates.

A recent accident at the crossing (5/31/2000) involved a motorist attempting to pass queued vehicles on the right then driving off the crossing and getting hung on the tracks. A police officer helped the driver and two passengers from the vehicle before it was struck by the northbound 'Carolinian' passenger train. A major factor in this accident is the narrow crossing width of only 22 feet. This is the only reported accident at the crossing since 1991.

h. Back Creek Church Road - like McLean Road, residential development is changing the traffic volumes along Back Creek Church Road. Significant development has taken place since the initial study was performed with a large neighborhood now nearing completion just east of the crossing on the south side of Back Creek Church Road. Further down the road, other neighborhoods continue to expand and, thereby, increasing traffic on the crossing. Other factors contributing to the growth in traffic at the crossing include the completion of the widening of NC 49 to a multi-lane facility with a left-turn lane to Back Creek Church, the recent opening of a portion of the Charlotte Outer Loop (I-485) just north of the crossing and the continued expansion of residential development along Pavilion Boulevard which intersects NC 49 directly opposite Back Creek Church Road. The automobile traffic volume over the crossing has increased from 3,500 VPD in 1997 to 8,600 VPD in 2000 - an annual increase of almost 49% per year.

The most recent reported accident at the crossing occurred in 1994 and resulted in a Class A injury.

The NCDOT has begun the next phase of construction on the Charlotte Outer Loop (I-485) by constructing the railroad overpass just north of the Back Creek Church Road

crossing. This project has required that a portion of the railroad be placed on a detour track while the new bridge is being constructed. The detour track has moved the crossing approximately 16 feet further east along Back Creek Church Road. This I-485 project is scheduled to be completed in 2001.

The 1997 study recommended that the Back Creek Church Road crossing receive a median separator and that the crossing be widened. The median separator has been installed (Quik-Kurb system) as part of the Sealed Corridor project, but the crossing has not been widened. Due to the relatively narrow lanes and a crossing width of only 22 feet, the median separator is frequently stuck by passing vehicles requiring a higher level of maintenance than what would normally be expected. The median has several damaged panels on the westbound approach at this time.

Again due to significant growth in both residential and commercial development in the area, traffic has been observed to frequently queue over the crossing during peak travel times. As part of the project to widen NC 49 to a 6-lane facility, the NCDOT added a left-turn lane on the westbound approach of Back Creek Church Road, however, the lane did not extend over the crossing resulting in a queue distance of approximately 85 feet.

VI. 2000 TRAFFIC VOLUMES

Automatic 24-hour traffic counts were taken at all eight (8) of the crossings during the week of September 25, 2000.

TABLE 1

STREET NAME	CROSSING #	2000 VOLUME	1997 VOLUME	% Change
36 TH Street	715 356K	7,324 VPD	7,000 VPD	4.6
Craighead Road	715 355D	6,843 VPD	6,890 VPD	0.6 (-)
Sugar Creek Road	715 352H	28,102 VPD	26,100 VPD	7.7
Orr Road	715 350U	9,746 VPD	6,300 VPD	54.7
Newell-Hickory Grove Road	715 348T	2,199 VPD	3,400 VPD	35.3 (-)
Rocky River Road	715 346E	3,995 VPD	4,000 VPD	0.1 (-)
McLean Road	715 343J	8,392 VPD	5,100 VPD	64.6
Back Creek Church Road	715 339U	8,591 VPD	3,500 VPD	145.5

VII. RECOMMENDATIONS

For purposes of this report, implementation schedules for recommendations are classified as follows:

Near-term (0-2 years)

Mid-term (2-5 years)

Long-term (5+ years)

A. 36th Street

Near-term Recommendation: foliage on both roadway approaches to the crossing now blocking the motorists view of the signs and signals needs to be removed. An advanced warning sign, R1-1, needs to be installed on the eastbound approach and on the westbound approach, railroad crossing pavement markings need to be replaced. See graphic on page 41 in the Appendix.

Estimated cost:

Clear foliage	\$500.00
Install signage	\$75.00
Replace RR pavement markings both approaches	\$1,200.00
Total estimated cost	\$1,775.00

Mid-term Recommendation: at such time as 36th Street is scheduled for resurfacing by the City, it should be marked as a 3-lane roadway from N. Davidson Street to N. Tryon Street with a center two-way left-turn lane.

Estimated cost:

Resurface & remark as 3-lane roadway	\$36,000.00
Total estimated cost	\$36,000.00

Impacts of Recommendation: All impacts associated with the above recommendations are deemed to have a positive effect. The installation of the 4-quadrant gates and signals has already had a positive impact on the crossing in that the potential for motorists to violate grade crossing safety devices has been greatly reduced based upon experience at other similar installations. Clearing foliage that obscures safety devices and maintaining safety devices is a constant issue but one that yields positive impacts. The re-marking of 36th St. to a three-lane roadway will improve maneuverability for large vehicles and, thereby enhance roadway safety and improve access to abutting property.

B. Craighead Road

Near-term Recommendation:

A system LOS analysis which included 36th St., Craighead Rd., Sugar Creek Rd., N. Tryon St. and N. Davidson St., was conducted as part of the 1997 study. This study recommended that the crossing at Craighead Road be closed due to its very poor safety record. The analysis indicated that the only impact closing Craighead would have on the network was that the Level of Service (a measure of traffic delay in seconds/vehicle) at the 36th St./Davidson St. intersection will drop from B to C (Levels of Service of D or better are generally considered acceptable for low-speed urban streets).

Given the poor geometry at this crossing, its safety record and the fact that it can be closed without a serious impact to the level of service of the area street system, it is recommended that the Craighead Road crossing be closed and a turn-a-round constructed west of the NCRR/NS.

The NCDOT had previously committed to install a traffic signal with left-turn lanes at Sugar Creek Road and N. Davidson Street to facilitate overall traffic movement within the area. It is recommended that this commitment be met concurrently with the decision of the Charlotte City Council to close the Craighead Road crossing.

It is recommended in the following section C., that the existing median separator on Sugar Creek Road be replaced with a 4-foot concrete median separator and that the lanes on Sugar Creek Road be narrowed from 12 feet to 11 feet to accommodate the median (11-foot lanes have been accepted by NCDOT and CDOT for urban streets operating at 45 mph or less). This will require that a portion of Sugar Creek Road at the crossing also be resurfaced prior to the installation of the pavement markings. The installation of the turn lane at Davidson Street, the replacement of the median separator and the resurfacing and installation of pavement markings for both projects should be done concurrently. See graphic on page 42 in the Appendix.

Estimated cost:

Close and remove the grade crossing	\$12,000.00.
Construct turn-a-round at Abernathy Lumber Co.	\$50,000.00.*
Install traffic signal/left-turn lanes at Sugar Creek/N. Davidson intersection	\$100,000.00.**
Total estimated cost	\$162,000.00.

*Includes pavement removal and restoration costs.

**See Page 43/Sugar Creek Road. Includes resurfacing approximately 1000 feet of existing Sugar Creek Road to accommodate new pavement markings.

Mid-term Recommendation:

It was recommended in the 1997 report that Davidson Street east of the crossing be realigned by the City once the crossing was removed. This is still a desirable project given the very poor alignment and sight distance that currently exist along this section of Davidson Street. The Charlotte Department of Transportation supports the realignment and will recommend its construction at such time as the City can make funds available.

Estimated cost	\$225,000.00.
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Impacts of Near-term Recommendation: Even though this recommendation will close a crossing of the railroad and will require an increased travel time and distance for some area businesses, overall impacts are positive. For example, vehicles leaving Abernathy Lumber Co. and wishing to access Sugar Creek Rd. at N. Davidson St. will use Raleigh and Greensboro streets and drive an additional quarter mile to reach the intersection. There is a traffic signal in place at Sugar Creek Road and Greensboro Street to allow trucks to enter the

flow of traffic along Sugar Creek Road.

The greatest overall impact of the recommendation is significantly enhanced public safety. The Craighead Rd. crossing, based on its accident history for the last 10 years, continues as the most dangerous of all evaluated in this study. It can be closed with no appreciable impact on area Level of Service.

The installation of the traffic signal at Sugar Creek Rd. and N. Davidson Street will improve overall traffic safety and mobility in the area and will allow traffic on N. Davidson Street bound for N. Tryon Street and the Interstate system to safely make a left-turn onto Sugar Creek Road and proceed west. The signal will also facilitate access for the many heavy trucks that serve the industrial operations along N. Davidson between Craighead Road and Sugar Creek Road.

Closing Craighead Rd. will eliminate the potential for rail/highway collisions as well as eliminating the noise impacts associated with the blowing of train horns.

C. Sugar Creek Road

Near-term Recommendation:

The existing median separator, which was installed at the crossing under the Sealed Corridor project for both safety and evaluation purposes, continues to be a maintenance problem due to the narrow median base and the use of plastic materials for the base. It is recommended that the existing barrier be replaced with a 4-foot concrete median separator (Std. 852.01) with minimum 2-inch reflectorized tubular markers spaced at 8 feet on-center on both roadway approaches to the crossing. The barrier should extend a minimum of 100 feet on each side of the crossing measured from the location of the crossing gate mast. On the west side of the crossing, the median should extend 100 feet from the signal mast on the siding track.

The existing travel lanes on Sugar Creek Road are 12 feet wide. The lanes will need to be remarked to 11-foot lanes in order to accommodate the installation of the median (See comments on lane width under **B. Craighead Road** above.) See graphic on page 43 in the Appendix.

Estimated Cost:

Remove and replace median barrier	\$10,000.00.
Resurface and install new pavement markings	*
Total estimated cost	\$11,500.00.

*Costs to resurface and remark approximately 1000 feet of Sugar Creek Road are included in

the recommendations for the Craighead Road crossing as described above.

Long-term Recommendation:

Given the volume of automobiles traffic and the increasing railroad traffic at the crossing, the potential for a significant accident still exists. The installation of the 4-quadrant gates and signals and the median separator have resulted in a significant reduction in accidents, but no system of this type is completely safe. Increasing traffic on the railroad will continue to increase traffic delays on the street further exacerbating the Mecklenburg County air quality problem. It is recommended that a grade separation structure be constructed that will allow Sugar Creek Rd. to pass beneath the NCRR/NS mainline. In order to build the railroad overpass, approximately 2,000 LF of the railroad will have to be placed on detour tracks while the structure is completed. See graphic on page 44 in the Appendix.

Estimated Cost (estimate is in year 2000 dollars):

Right-of-way	\$2,650,000
Roadway Construction-L Line	\$3,700,000
Roadway Construction-Y Lines	\$350,000
Railroad Bridge	\$2,650,000
Railroad Track-Mainline	\$1,000,000
Railroad Track-Spur	<u>\$100,000</u>
TOTAL \$10,450,000	

Total Estimated Cost \$10,500,000

Impacts of Recommendation: Building a grade-separation structure at Sugar Creek Rd. and the NCRR/NS will have considerable positive and negative impacts on the community. However, the long-term positive benefits far outweigh the short-term costs. To build the overpass will require the taking of a considerable amount of privately held property and converting it into public right-of-way. Several modest residential structures (8) will have to be acquired and demolished as well as all, or portions, of six commercial buildings. Construction will also cause significant delays and/or detours for traffic in the area and will require some disruption in rail operations from time to time. However, the resultant project will eliminate the possibility of rail/vehicle crashes at the crossing as well as future mobility delays that will become more significant as rail and highway traffic continues to increase. The grade separation will also eliminate the noise impacts associated with the blowing of train horns at the grade crossing. Air quality is an issue in the Charlotte/Mecklenburg Urbanized Area, and the pollution caused by idling vehicles queued at a signalized intersection or a railroad grade crossing is a significant concern. The construction of the overpass will enhance overall air quality for the community.

D. Orr Road

Near-term Recommendation:

There are no near-term recommendations for this crossing.

Long-term Recommendation:

There has been a substantial increase in traffic volume at the crossing during the last three (3) years. Also, the possible addition of a second mainline freight track will require modifications to the crossing safety devices. The crossing should continue to be monitored for possible accident/safety issues that need to be dealt with in the future.

E. Newell-Hickory Grove Road

Near-term Recommendation:

Add a left-turn lane on the southbound approach of Old Concord Road. See graphic on page 46 in the Appendix.

Estimated Cost **\$82,500**

F. Rocky River Road

Near-term Recommendation:

Close and remove the crossing.

Construct turn-a-round on the eastside of the crossing.

Remove the railroad gates and signals and pavement and landscape the area. See graphic on page 47 in the Appendix.

Estimated Cost:

Close and remove the crossing	\$12,000.00.
Install turn-a-round	\$15,000.00.
Landscape the area	\$2,500.00.
Total estimated cost	\$29,500.00

Impacts of Recommendation: Closing the crossing will require the 4,000 motorists per day (including those Newell community residents) currently using the crossing, to utilize other

streets in the area such as Harris Boulevard and Newell-Hickory Grove Road. Also, all emergency responder and school bus routes will have to be re-drawn to account for the closed crossing. Closing the crossing will increase the response times for fire and medical emergency responders.

The most significant positive impact closing the crossing will have is an improvement in public safety from a traffic accident standpoint. The potential for vehicle/train crashes at the crossing is eliminated along with the personal injuries and property damage generally associated with such crashes.

Long-term Recommendation:

As part of the 1997 Traffic Separation Study, a parallel roadway was recommended on the eastside of the railroad to connect Harris Boulevard to Newell-Hickory Grove Road at Orr Road on the south end and connect to University East Drive in the Crosland business park on the north end. The primary purpose for the roadway, at that time, was to allow for the closure of the crossing at Newell-Hickory Grove Road and to allow traffic in the area to utilize the grade separation at Rocky River Road.

There are several tracts of land east of the railroad that are either under-developed or undeveloped that will require connectivity to the existing roadway network in the future as the land develops or as development becomes more intense. There are also several properties of developed land in both residential and commercial use that front along the railroad track. These properties now have access to Old Concord Road via a private grade crossing of the NCRR/NS. In the recent past, another private crossing served the area but has now been closed and removed by the NCRR/NS railroad because of safety concerns. Staff of the NCRR/NS have indicated that their preference is to remove the remaining private crossing as part of an overall plan to improve the railroad infrastructure and safety. Closing this remaining private crossing will require the construction of alternative access to these properties.

As part of its continued development of the University East Business Park, which lies between Harris Boulevard, Rocky River Road and the railroad, the Crosland Group has indicated that its future plans call for University East Drive to ultimately extend southerly to connect to existing Rocky River Road somewhere east of the railroad.

Local staff feels strongly that the parallel roadway should be added to the local Thoroughfare Plan and constructed as part of the land development process. The roadway would connect to University East Drive and would extend southerly across Rocky River Road to connect with Newell-Hickory Grove Road opposite Orr Road. **The Mecklenburg/Union Technical Coordinating Committee should establish a preliminary alignment for the roadway and have it adopted as part of the Mecklenburg-Union Thoroughfare Plan.** It should be

recognized, however, that the alignment will need to be modified from time to time to accommodate land development proposals.

G. McLean Road

Near-term Recommendation:

Add a 150-foot left-turn lane on the westbound approach to Old Concord Road. This will require a revision to the railroad gates and signals as well as widening of the grade crossing itself.

Widen the crossing to 45 feet.

Install a 4-foot wide concrete median separator with minimum 2-inch diameter reflectorized tubular markers spaced 8 feet on-center on both roadway approaches to the crossing. The median should extend from the stop bar at Old Concord Road to within 12 feet of the crossing and from 12 feet east of the crossing an additional 100 feet.

Improve the northbound right-turn-only lane on Old Concord Road by extending it to include 200 feet of storage and widened to a standard 11-foot lane.

Relocate the existing railroad gates and signals to accommodate the widened crossing.

Following the completion of the above recommended improvements, the traffic signal at Old Concord Road will need to be re-phased and re-timed. See graphic on page 48 in the Appendix.

Estimated Cost:

Widen the crossing with like material	\$6,000.00
Widen roadway at the crossing and install median separator	\$60,000.00
Relocate railroad gates and signals (NS)	\$100,000.00
Extend & widen right-turn-only lane (Old Concord Rd.)	\$10,000.00
Re-phase traffic signal (CDOT)	No charge
Total estimated cost	\$176,000.00

Impacts of Recommendation: other than the necessary and temporary traffic delays associated with roadway construction, there are no other negative impacts associated with this recommendation. Positive benefits include enhanced roadway safety and maneuverability associated with the improvements. The installation of the wider concrete median separator will result in more positive control at the crossing resulting in fewer attempts by motorists to drive around the lowered crossing gates. The wider median will also result in lower

maintenance costs.

Long-term Recommendation:

The Faires Farm neighborhood is a large residential area that continues to expand but has only one entrance/exit. The City should continue to pursue the opening of an additional entrance/exit from Faires Farm to Back Creek Church Road through the land development process. Also a connector to link McLean Road to Harris Boulevard should also continue to be explored to allow for ingress/egress to the McLean Road area should an incident, such as a derailment, occur at the crossing. Two options for such a link were developed in the original TSS and were presented to the City of Charlotte for further action.

H. Back Creek Church Road

Near-term Recommendation:

Extend the existing left-turn lane at NC 49 eastward over the crossing to provide a 150-foot lane. This will require that the crossing be widened and that the railroad gates and signals be relocated. (This recommendation will need to be coordinated with Charlotte/Mecklenburg land development staff as some improvements may be required through the land development process).

Widen the grade crossing to 45 feet.

Install a 4-foot wide concrete median separator (Std. 852.01) with minimum 2-inch diameter reflectorized tubular markers spaced 8 feet on-center on both roadway approaches to the crossing. The median should extend eastward from the stop bar at NC 49 to within 12 feet of the crossing and from 12 feet east of the crossing an additional 100 feet.

All approach lanes to the crossing should be 11 feet wide with 4-foot shoulders on each side of the roadway. This will result in a total crossing width of 45 feet. See graphic on page 49 in the Appendix.

Estimated Cost:

Widen crossing with like material	\$6,000.00
Widen roadway and install median separator	\$60,000.00
Relocate railroad gates and signals	\$100,000.00
Total estimated cost	\$166,000.00

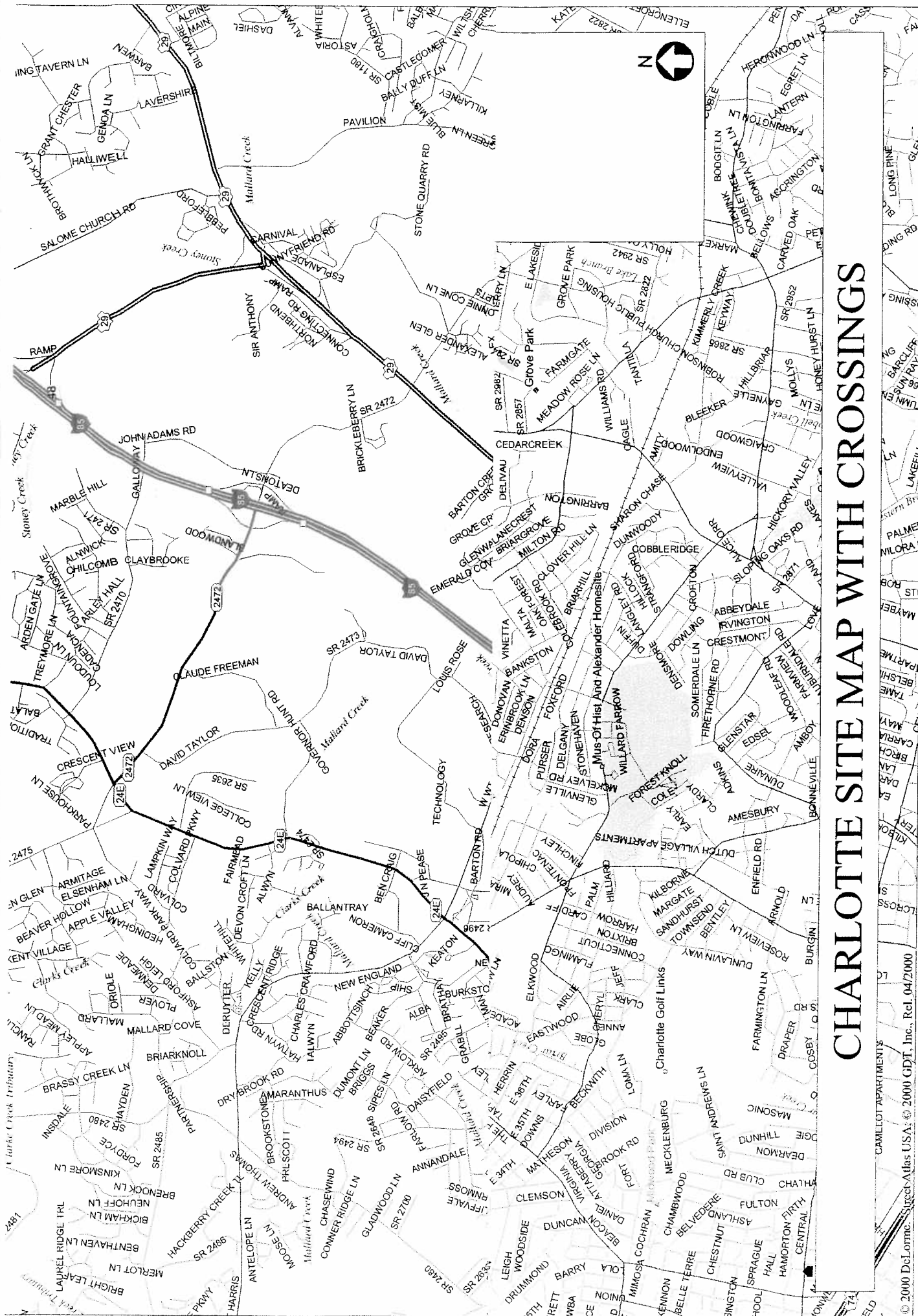
Impacts of Recommendation: Other than the necessary and temporary traffic delays associated with roadway construction, there are no other negative impacts associated with this

recommendation. Positive benefits include enhanced roadway safety and maneuverability associated with wider travel lanes. The installation of the wider concrete median will result in more positive control at the crossing resulting in fewer attempts by motorists to drive around lowered crossing gates. The wider median will also reduce maintenance costs.

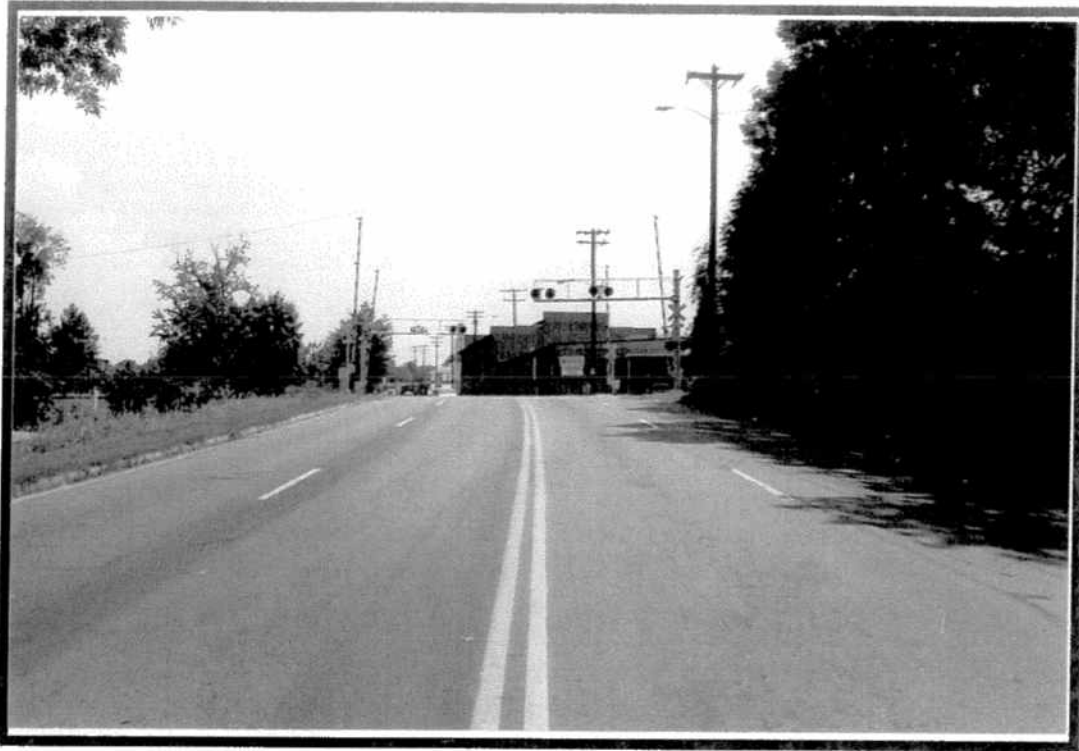
Long-term Recommendation: The **Mecklenburg-Union Thoroughfare Plan** anticipates that Back Creek Church Rd. and Pavilion Boulevard will continue as collector roadways even after Mallard Creek Church Road is extended over/under the railroad and connected to Back Creek Church Road. It will be necessary to continue to monitor the crossing as the Thoroughfare Plan is periodically updated and a future study may result in a recommendation for more active safety devices, such as 4-quadrant gates, at the crossing. Given that the intersection with NC 49 is so close to the I-485 intersection with NC 49, a grade separation may be warranted at the railroad/NC 49 some time in the future.

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APPENDIX



CHARLOTTE SITE MAP WITH CROSSINGS



EASTBOUND APPROACH



WESTBOUND APPROACH

Crossing #: 715 356K

East 36th Street



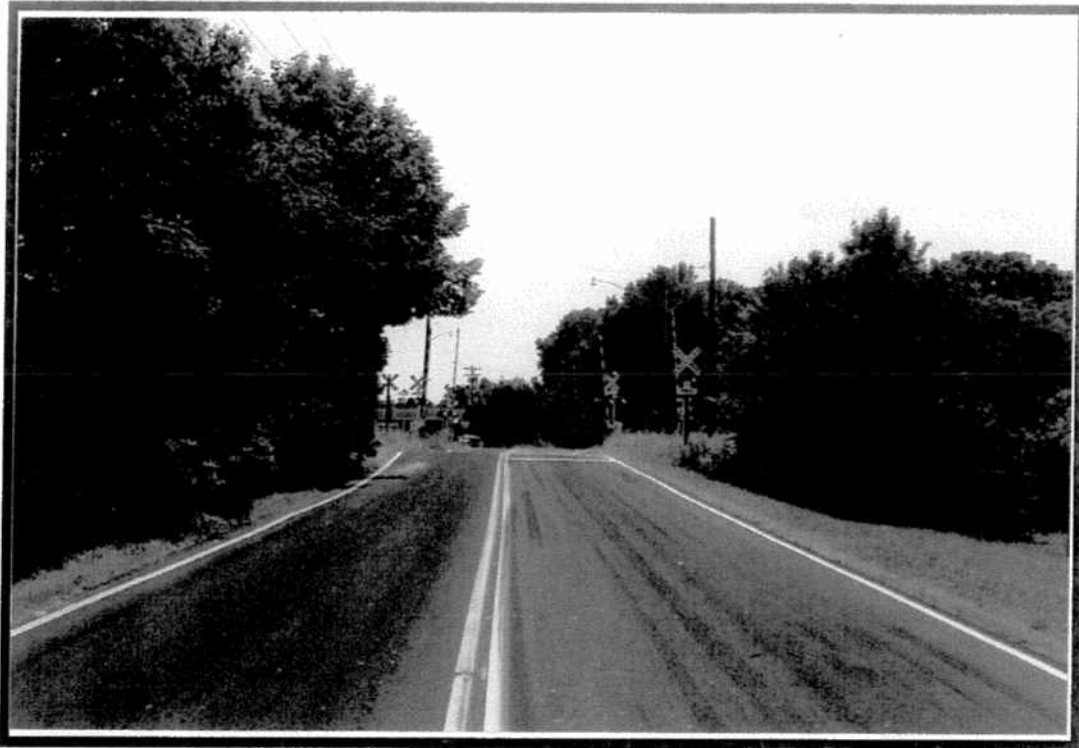
NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 355D

E. Craighead Road



EASTBOUND APPROACH



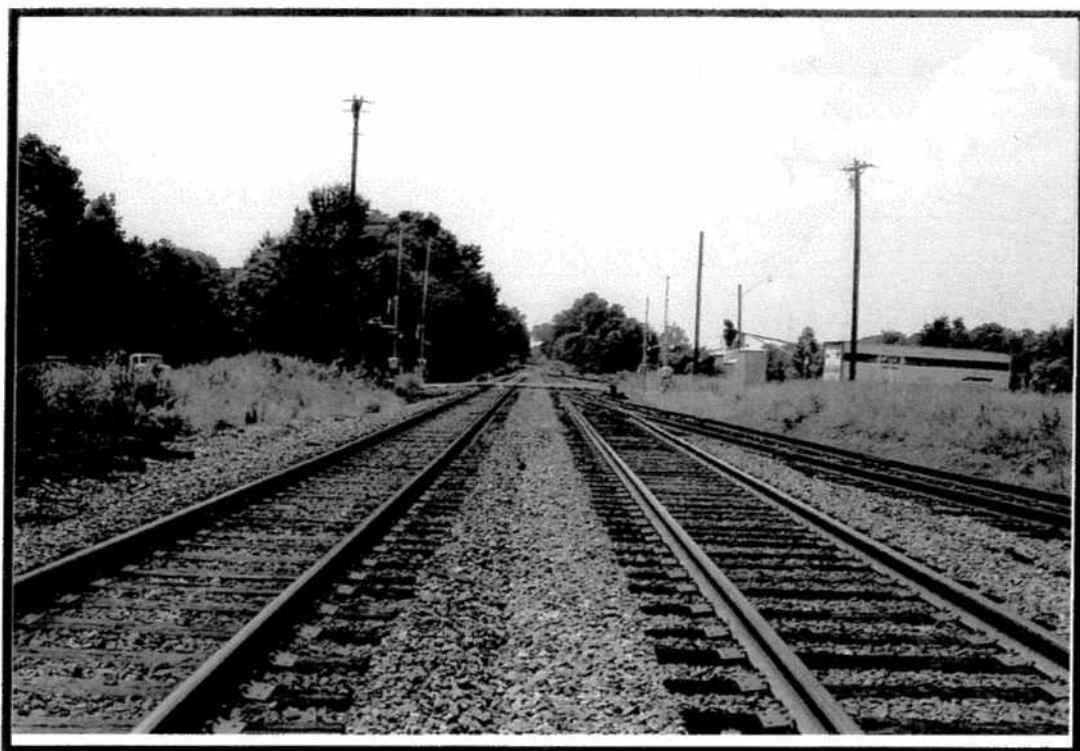
WESTBOUND APPROACH

Crossing #: 715 355D

E. Craighead Road



NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 352H

E. Sugar Creek Road



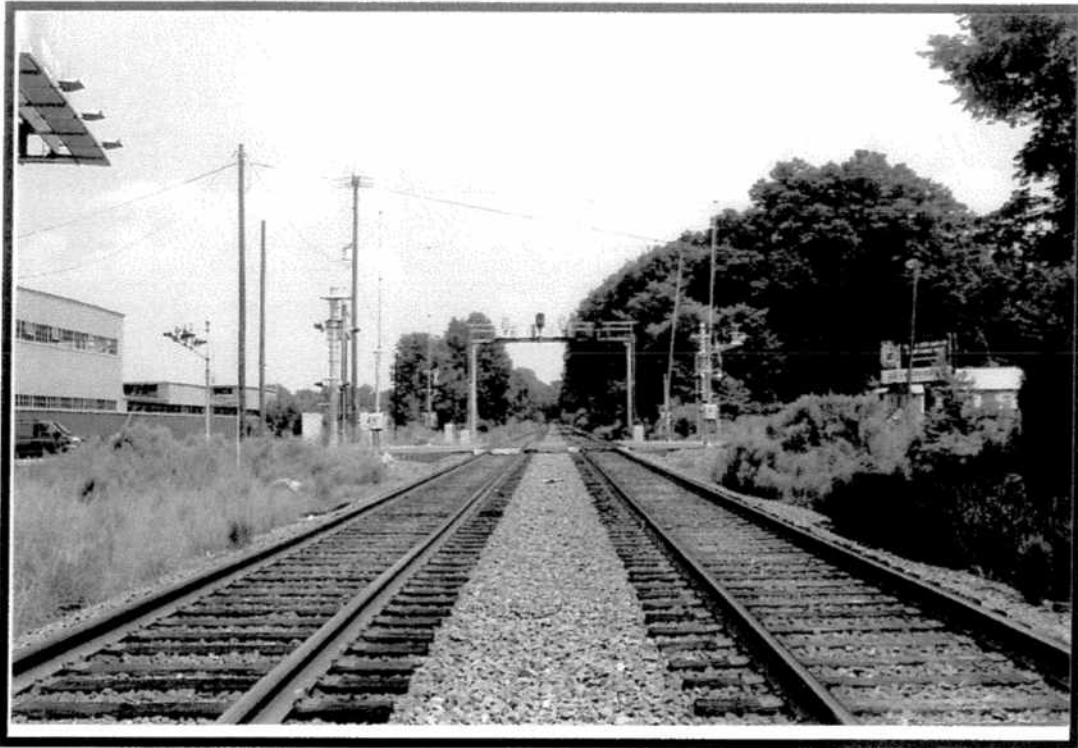
EASTBOUND APPROACH



WESTBOUND APPROACH

Crossing #: 715 352H

E. Sugar Creek Road



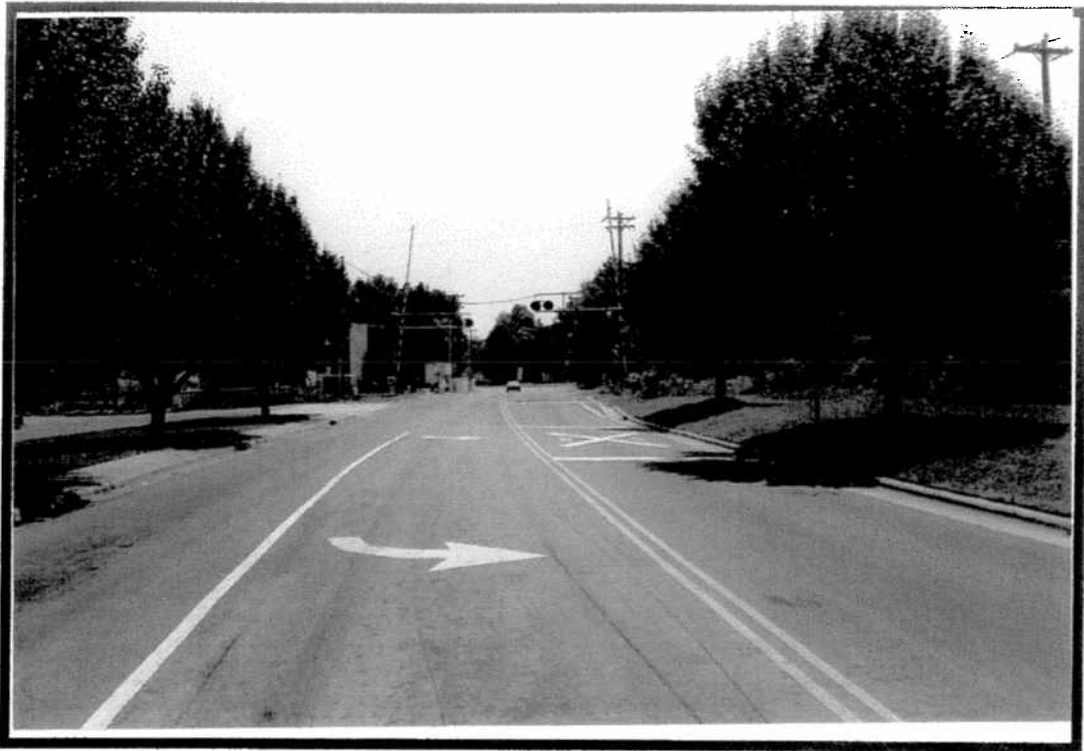
NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 350U

Orr Road



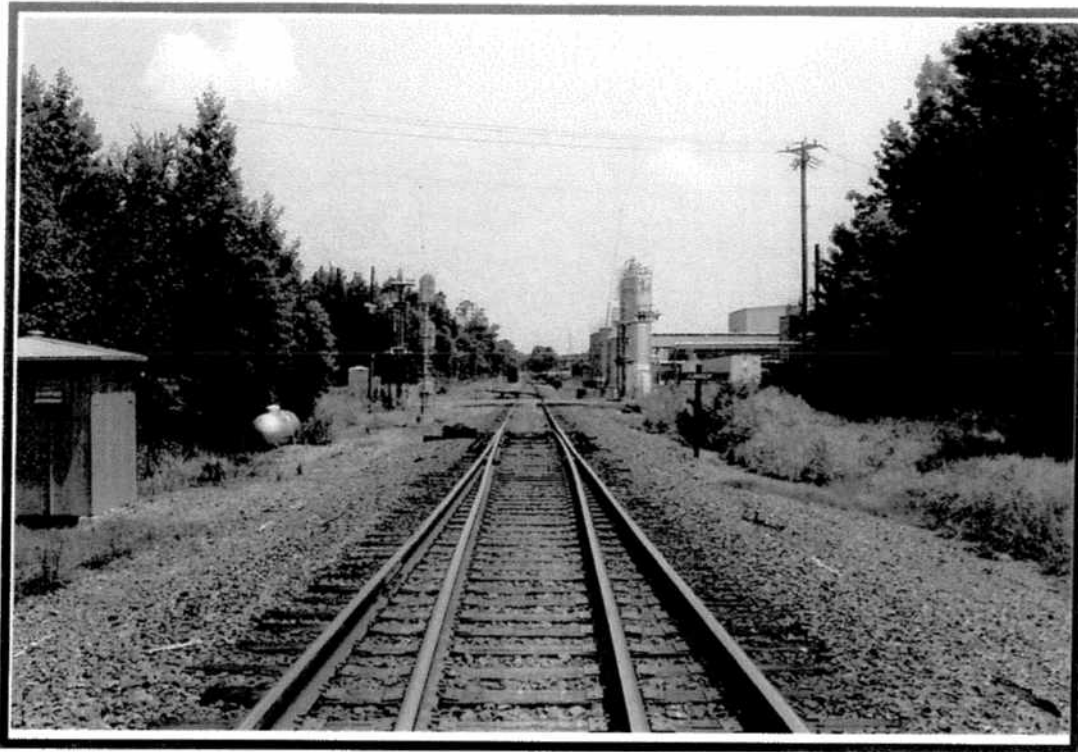
EASTBOUND APPROACH



WESTBOUND APPROACH

Crossing #: 715 350U

Orr Road



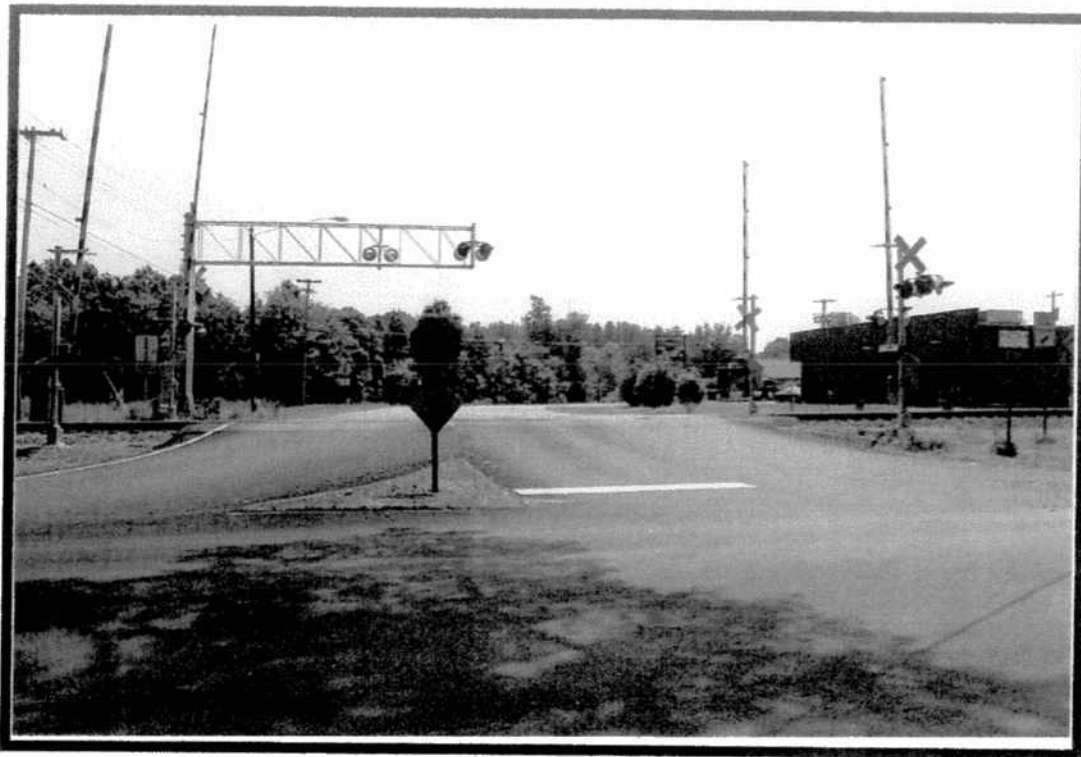
NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 348T

Newell-Hickory Grove Road



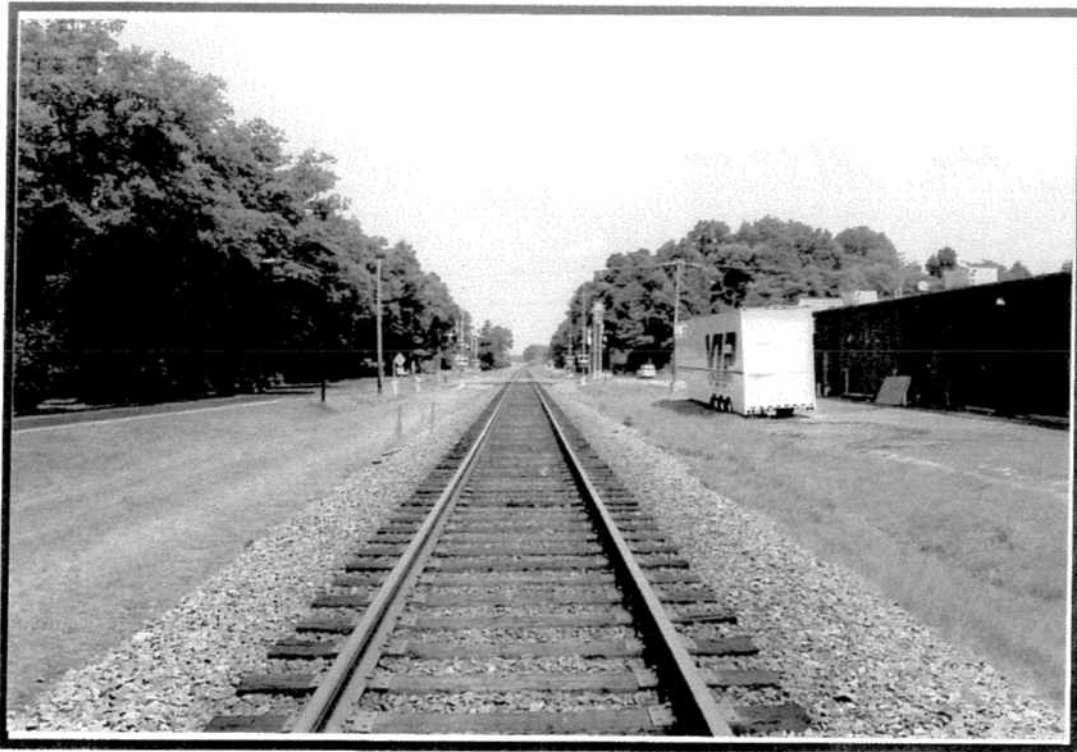
EASTBOUND APPROACH



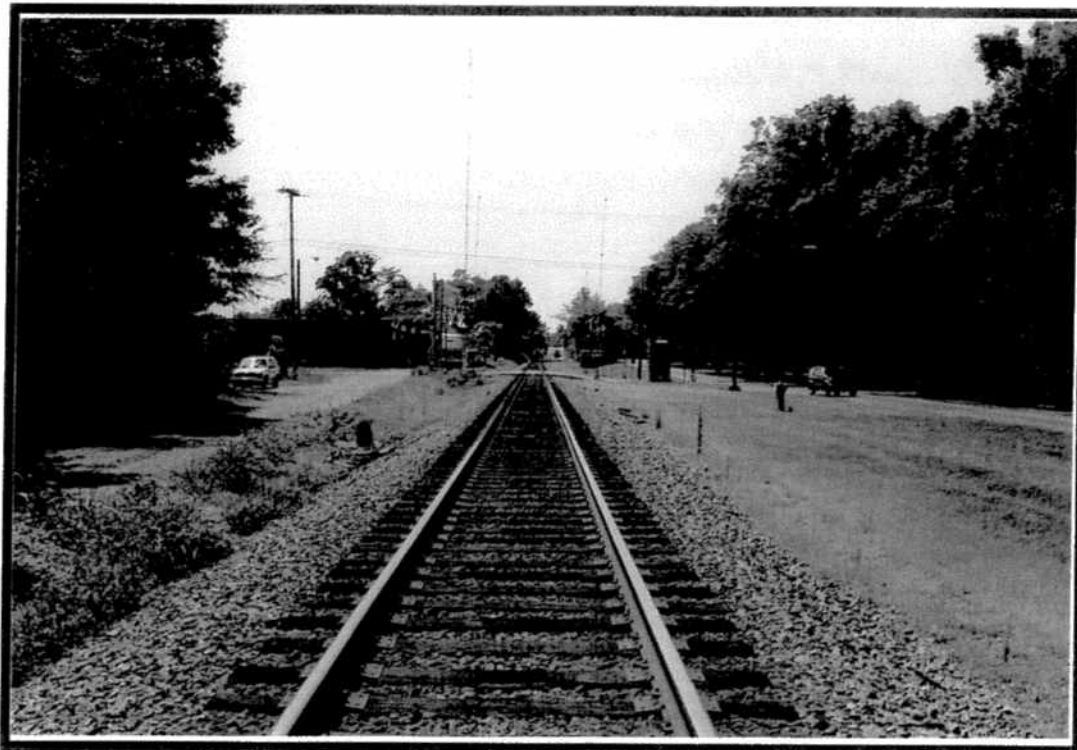
WESTBOUND APPROACH

Crossing #: 715 348T

Newell-Hickory Grove Road



NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 346E

E. Rocky River Road



EASTBOUND APPROACH



WESTBOUND APPROACH

Crossing #: 715 46E

E. Rocky River Road



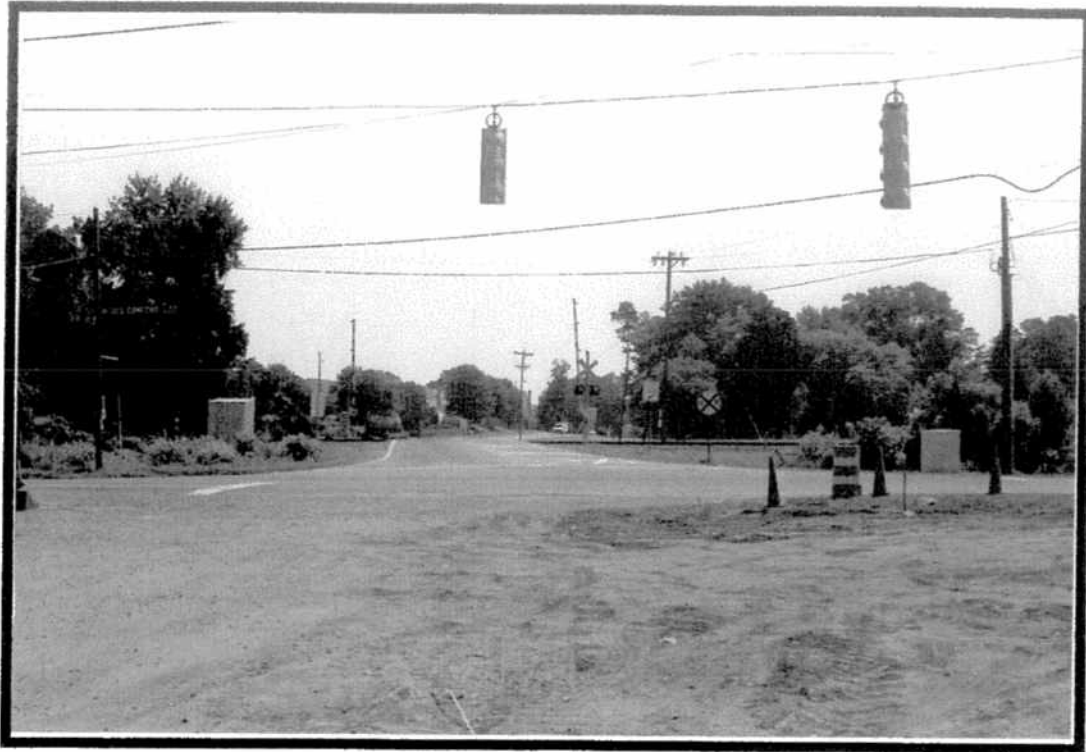
NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 343J

McLean Road



EASTBOUND APPROACH



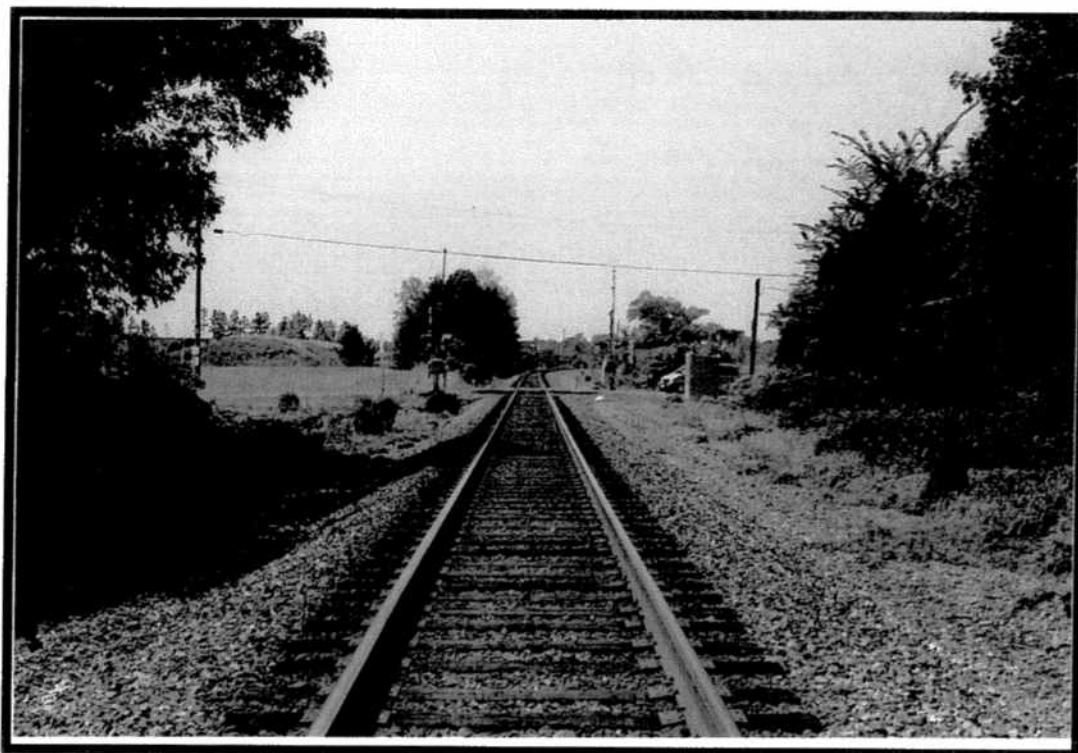
WESTBOUND APPROACH

Crossing #: 715 343J

McLean Road



NORTHBOUND APPROACH



SOUTHBOUND APPROACH

Crossing #: 715 339U

Back Creek Church Road



EASTBOUND APPROACH



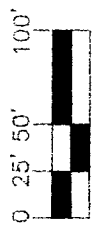
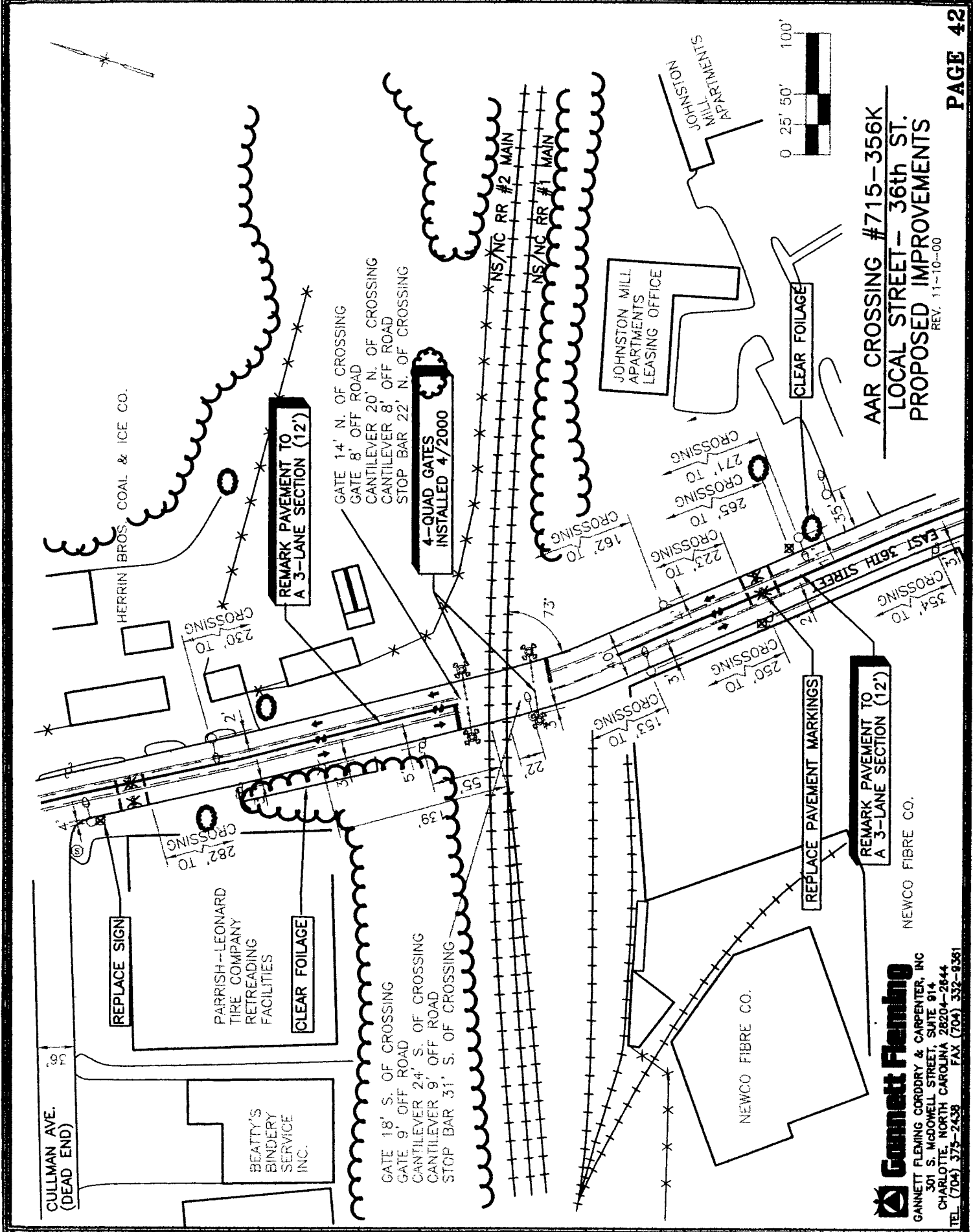
WESTBOUND APPROACH



NORTHBOUND APPROACH



SOUTHBOUND APPROACH



AAR CROSSING #715-356K
LOCAL STREET - 36th ST.
PROPOSED IMPROVEMENTS

REV. 11-10-00

Gannett Fleming
 GANNETT FLEMING CORDRY & CARPENTER, INC.
 301 S. McDOWELL STREET, SUITE 914
 CHARLOTTE, NORTH CAROLINA 28204-2844
 TEL. (704) 375-2438 FAX (704) 332-9381

NEWCO FIBRE CO.

NEWCO FIBRE CO.

JOHNSTON MILL
 APARTMENTS
 LEASING OFFICE

JOHNSTON
 MILL
 APARTMENTS

HERRIN BROS. COAL & ICE CO.

PARRISH-LEONARD
 TIRE COMPANY
 RETREADING
 FACILITIES

BEATTY'S
 BINDERY
 SERVICE
 INC.

CULLMAN AVE.
 (DEAD END)

REMARK PAVEMENT TO
 A 3-LANE SECTION (12')

4-QUAD GATES
 INSTALLED 4/2000

REPLACE PAVEMENT MARKINGS

REMARK PAVEMENT TO
 A 3-LANE SECTION (12')

GATE 14' N. OF CROSSING
 GATE 8' OFF ROAD
 CANTILEVER 20' N. OF CROSSING
 CANTILEVER 8' OFF ROAD
 STOP BAR 22' N. OF CROSSING

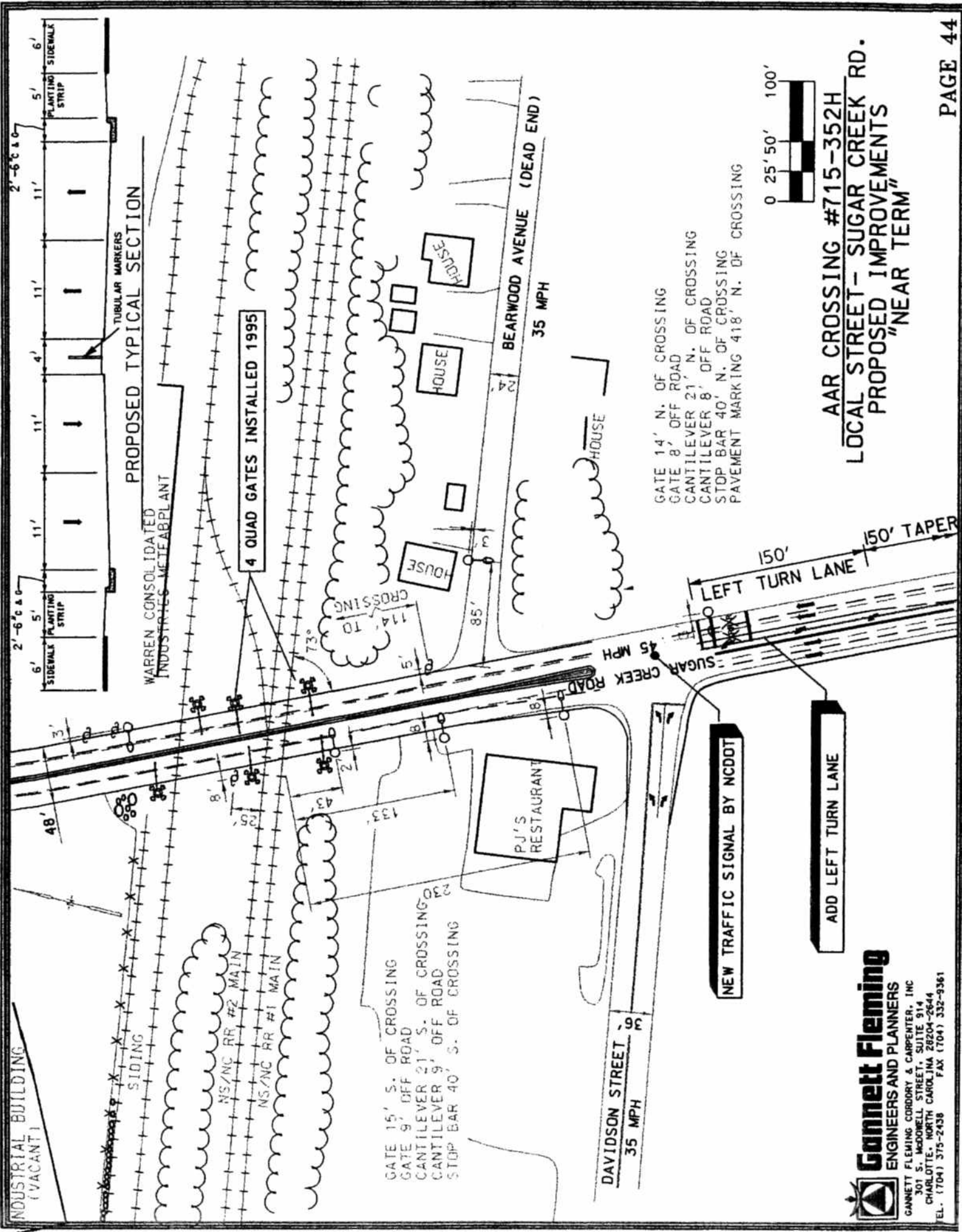
GATE 18' S. OF CROSSING
 GATE 9' OFF ROAD
 CANTILEVER 24' S. OF CROSSING
 CANTILEVER 9' OFF ROAD
 STOP BAR 31' S. OF CROSSING

CROSSING 271' TO
 CROSSING 265' TO
 CROSSING 222' TO
 CROSSING 162' TO

CROSSING 250' TO
 CROSSING 153' TO

CROSSING 354' TO
 CROSSING 354' TO



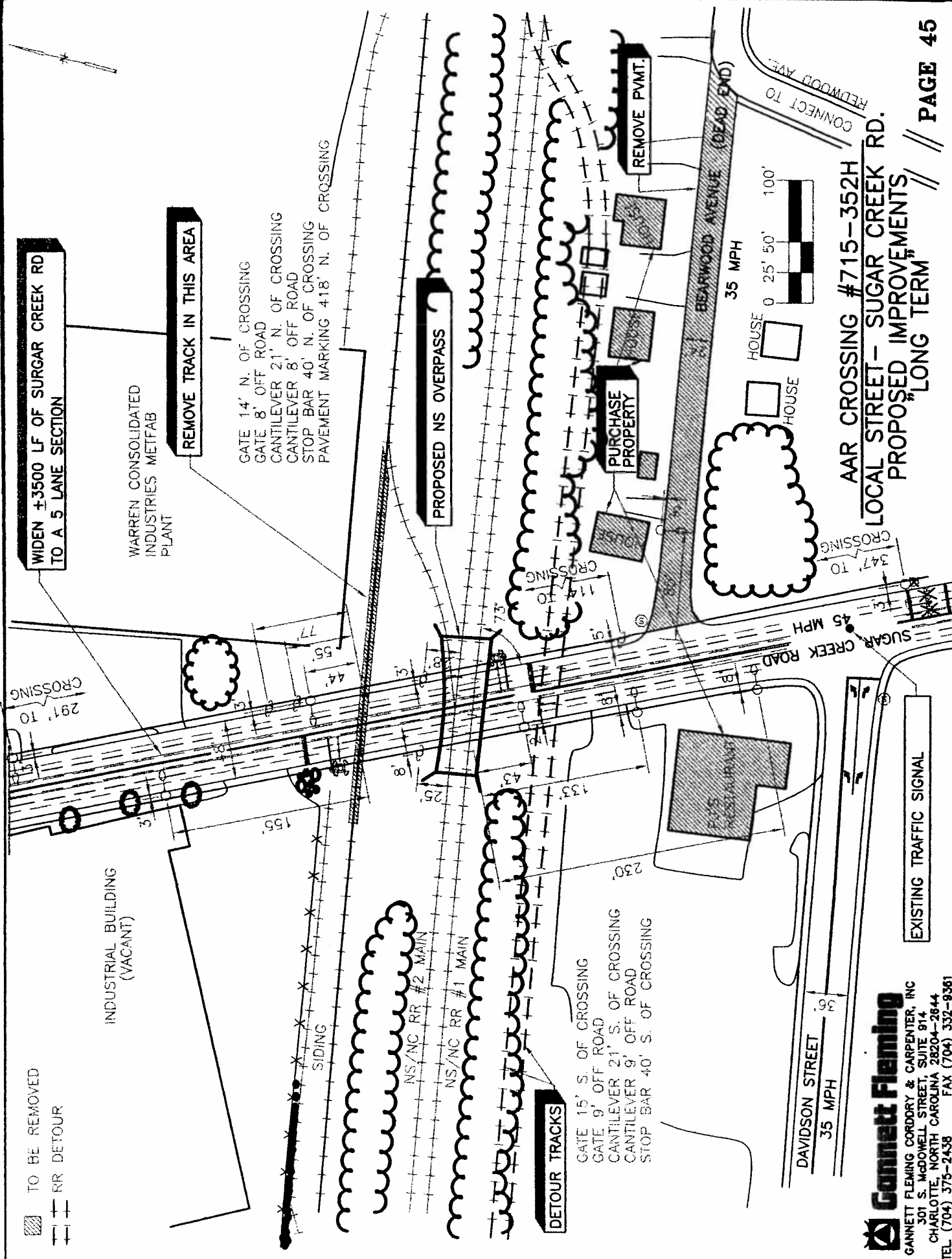


GATE 14' N. OF CROSSING
 GATE 8' OFF ROAD
 CANTILEVER 21' N. OF CROSSING
 CANTILEVER 8' OFF ROAD
 STOP BAR 40' N. OF CROSSING
 PAVEMENT MARKING 418' N. OF CROSSING



AAR CROSSING #715-352H
LOCAL STREET - SUGAR CREEK RD.
PROPOSED IMPROVEMENTS
"NEAR TERM"

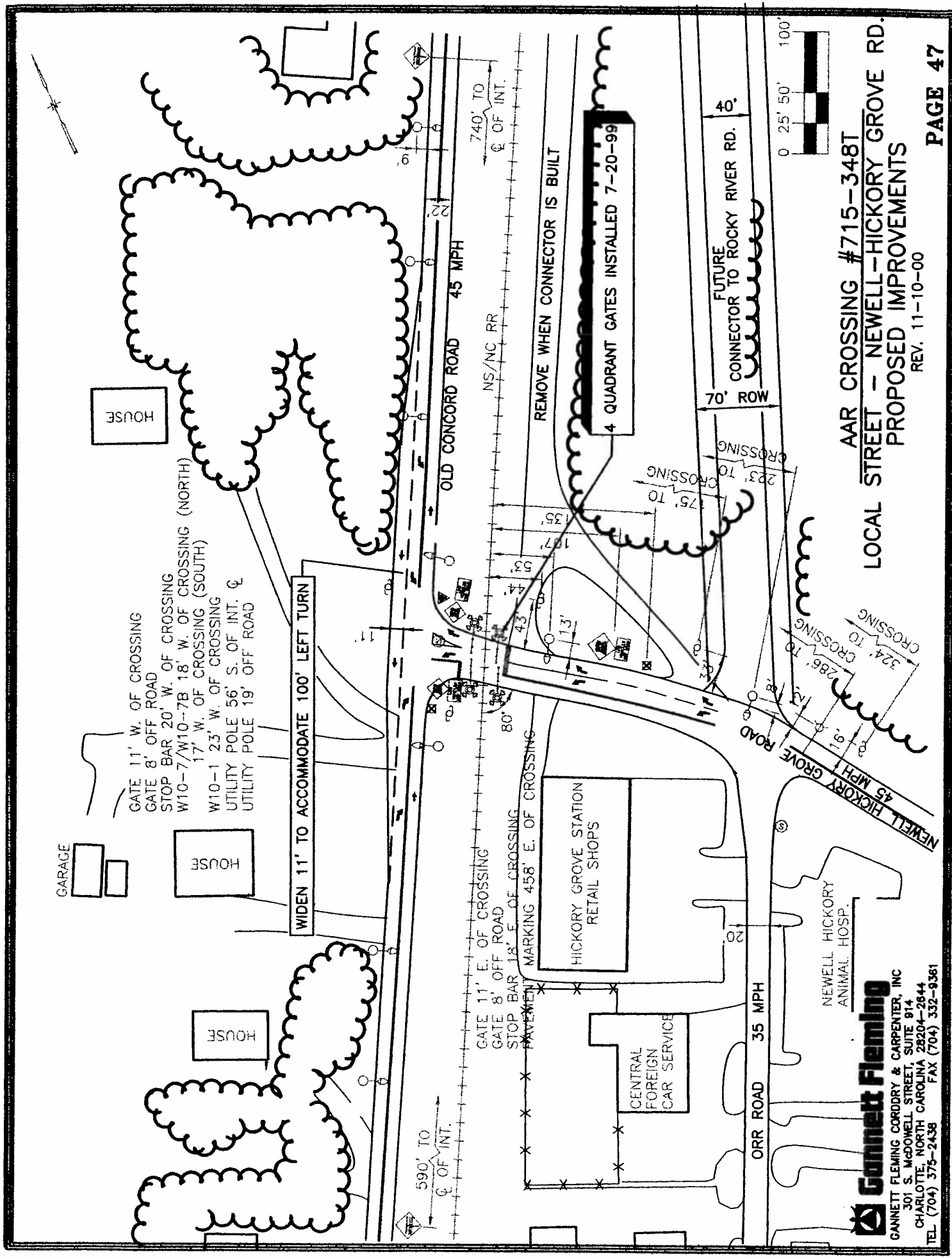
Gannett Fleming
 ENGINEERS AND PLANNERS
 GANNETT FLEMING CORDOBY & CARPENTER, INC.
 301 S. McDOWELL STREET, SUITE 914
 CHARLOTTE, NORTH CAROLINA 28204-2644
 TEL. (704) 375-2438 FAX (704) 332-9361



AAR CROSSING #715-352H
LOCAL STREET- SUGAR CREEK RD.
PROPOSED IMPROVEMENTS
"LONG TERM"

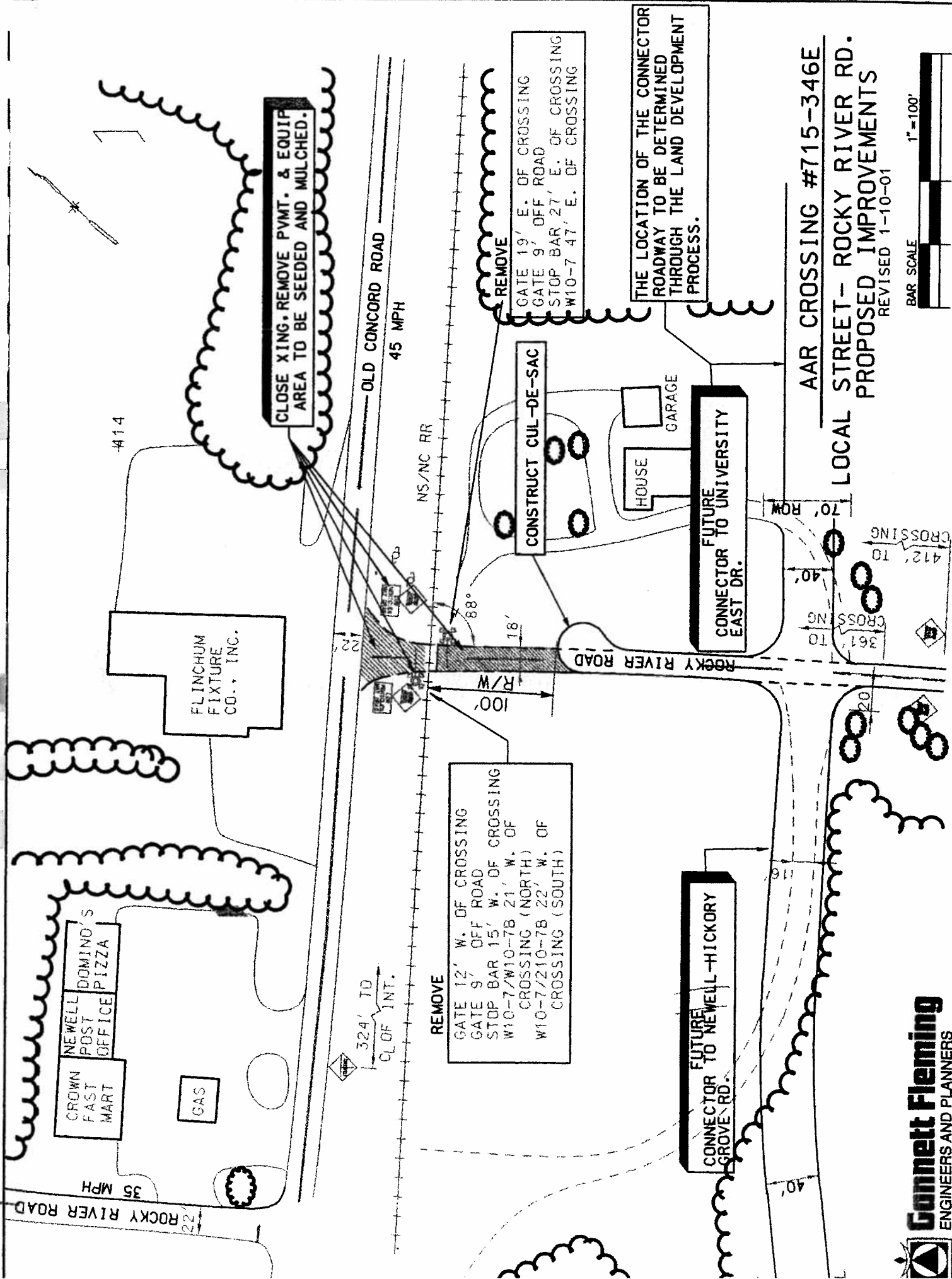
EXISTING TRAFFIC SIGNAL

Gannett Fleming
 GANNETT FLEMING CORDROY & CARPENTER, INC
 301 S. McDOWELL STREET, SUITE 914
 CHARLOTTE, NORTH CAROLINA 28204-2844
 TEL (704) 375-2438 FAX (704) 332-9361

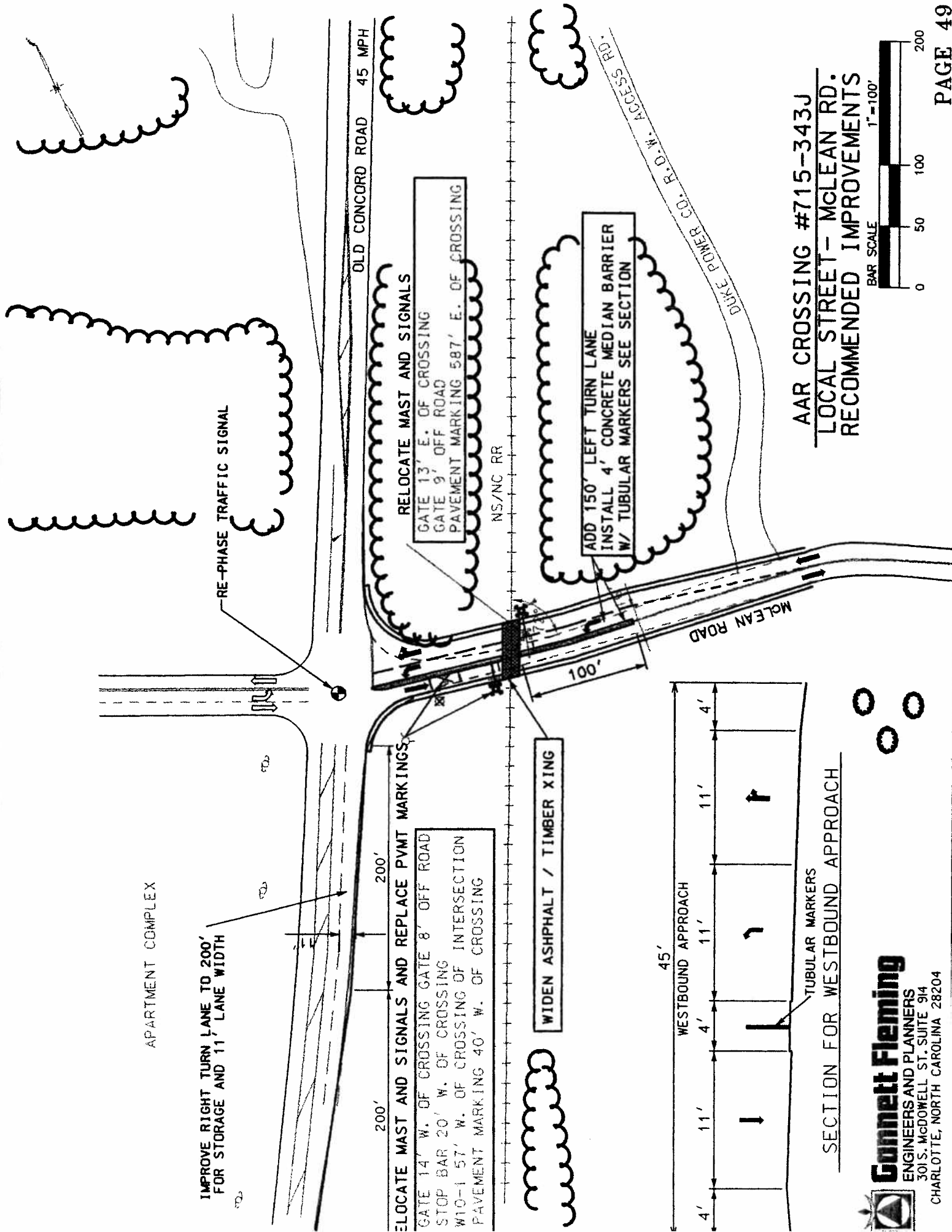


AAR CROSSING #715-348T
 LOCAL STREET - NEWELL-HICKORY GROVE RD.
 PROPOSED IMPROVEMENTS
 REV. 11-10-00

Gannett Fleming
 GANNETT FLEMING CORDRY & CARPENTER, INC
 301 S. McDOWELL STREET, SUITE 914
 CHARLOTTE, NORTH CAROLINA 28204-2844
 TEL (704) 375-2438 FAX (704) 332-9361



AAR CROSSING #715-346E
LOCAL STREET- ROCKY RIVER RD.
PROPOSED IMPROVEMENTS
REVISED 1-10-01



AAR CROSSING #715-343J
LOCAL STREET- MCLEAN RD.
RECOMMENDED IMPROVEMENTS

