eps group, Inc.
Engineers, Planners & Surveyors

Final Design Concept Report

Riggs Road

Ellsworth Road to Meridian Road

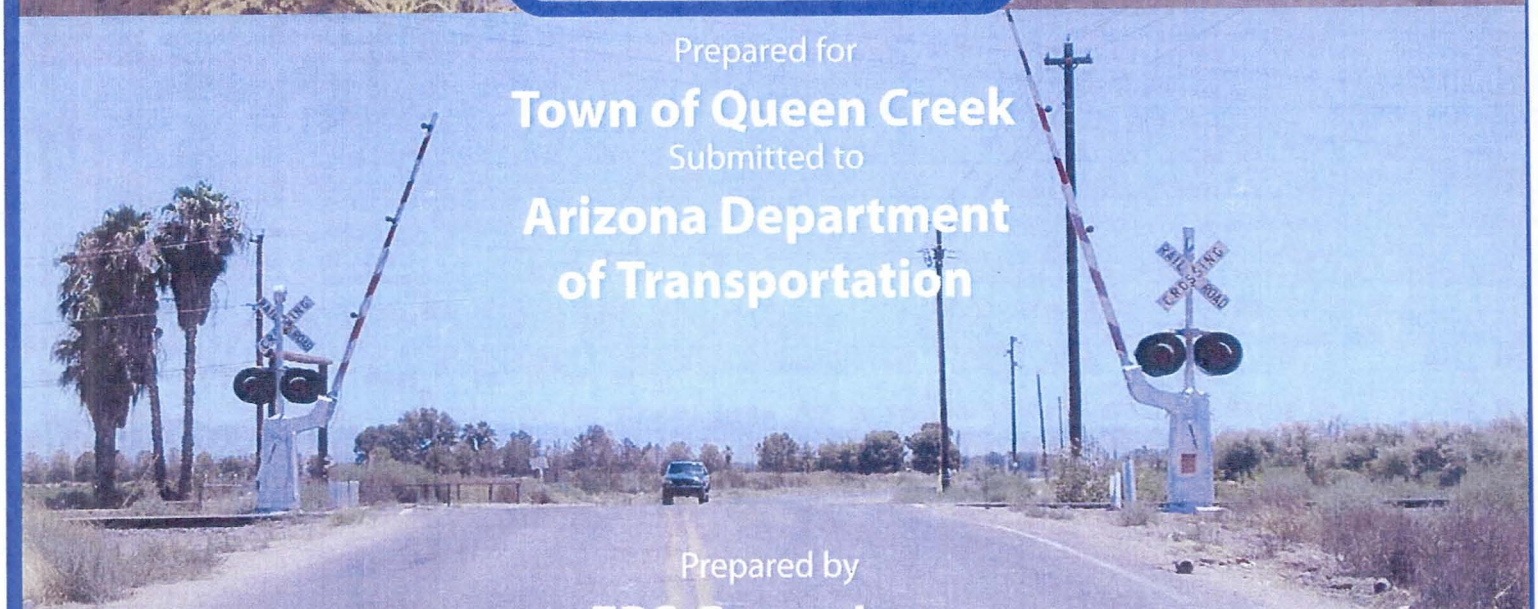
Tracs No. SS60503D
Federal Project No. STP-QCR-0 (001A)

Prepared for

Town of Queen Creek

Submitted to

Arizona Department of Transportation



Prepared by

EPS Group Inc.,

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October, 2006

FINAL
DESIGN CONCEPT REPORT

RIGGS ROAD
ELLSWORTH ROAD TO MERIDIAN ROAD

Prepared For:

Submitted To:

ARIZONA DEPARTMENT OF TRANSPORTATION
LOCAL GOVERNMENT SECTION

Prepared by:

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OCTOBER, 2006

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1.0 INTRODUCTION

1.1 Forward

This Design Concept Report (DCR) has been prepared for the Town of Queen Creek and submitted in accordance with the Arizona Department of Transportation (ADOT) guidelines to document the development and evaluation of Riggs Road from Ellsworth Road to Meridian Road. Other agencies participating in this study are the Federal Highways Administration (FHWA), Maricopa County Department of Transportation (MCDOT), Flood Control District of Maricopa County (FCDMC), and Pinal County. In addition, the development of this project was coordinated with the landowners and developers along the proposed corridor.

A DCR for Riggs Road – Ellsworth Road to Meridian Road has been previously submitted and approved by MCDOT in October, 2002. This DCR references the MCDOT DCR, but has been modified to address current conditions, ADOT requirements and current AASHTO design standards. A recommended alternative for Riggs Road is included in this DCR.

A Categorical Exclusion (CE) will be prepared in conjunction with this study. It will contain the results of the environmental analysis and discuss anticipated impacts that may result from the proposed improvements.

1.2 Need for the Project

Riggs Road has been designated as a 'Road of Regional Significance' by The Maricopa Association of Governments (MAG) and the Town of Queen Creek classifies Riggs Road as a Principal Arterial roadway.

Riggs Road begins at SR 347 (Maricopa Road) and extends east along a section line a distance of 23.5 miles to the Pinal County line at Meridian Road. From Ellsworth Road to Meridian Road there is a 3.0 mile un-constructed gap of Riggs Road. At Meridian Road the paved road begins again and continues eastward an additional 3.5 miles in Pinal County as Combs Road. Completion of the un-constructed gap of Riggs Road is the subject of this project and Design Concept Report.

Planned development, coupled with the overall population growth in the area, will dramatically increase traffic demand. Riggs Road serves as one of only two east-west connections between the communities of Pinal County, Queen Creek, Gilbert, Chandler, and I-10. Completion of this project will complete the last remaining segment of Riggs Road. Queen Creek Wash, the Union Pacific Railroad Tracks (UPRR), Williams Gateway Airport (WGA), Pegasus Airpark, and the San Tan Mountains all hinder the

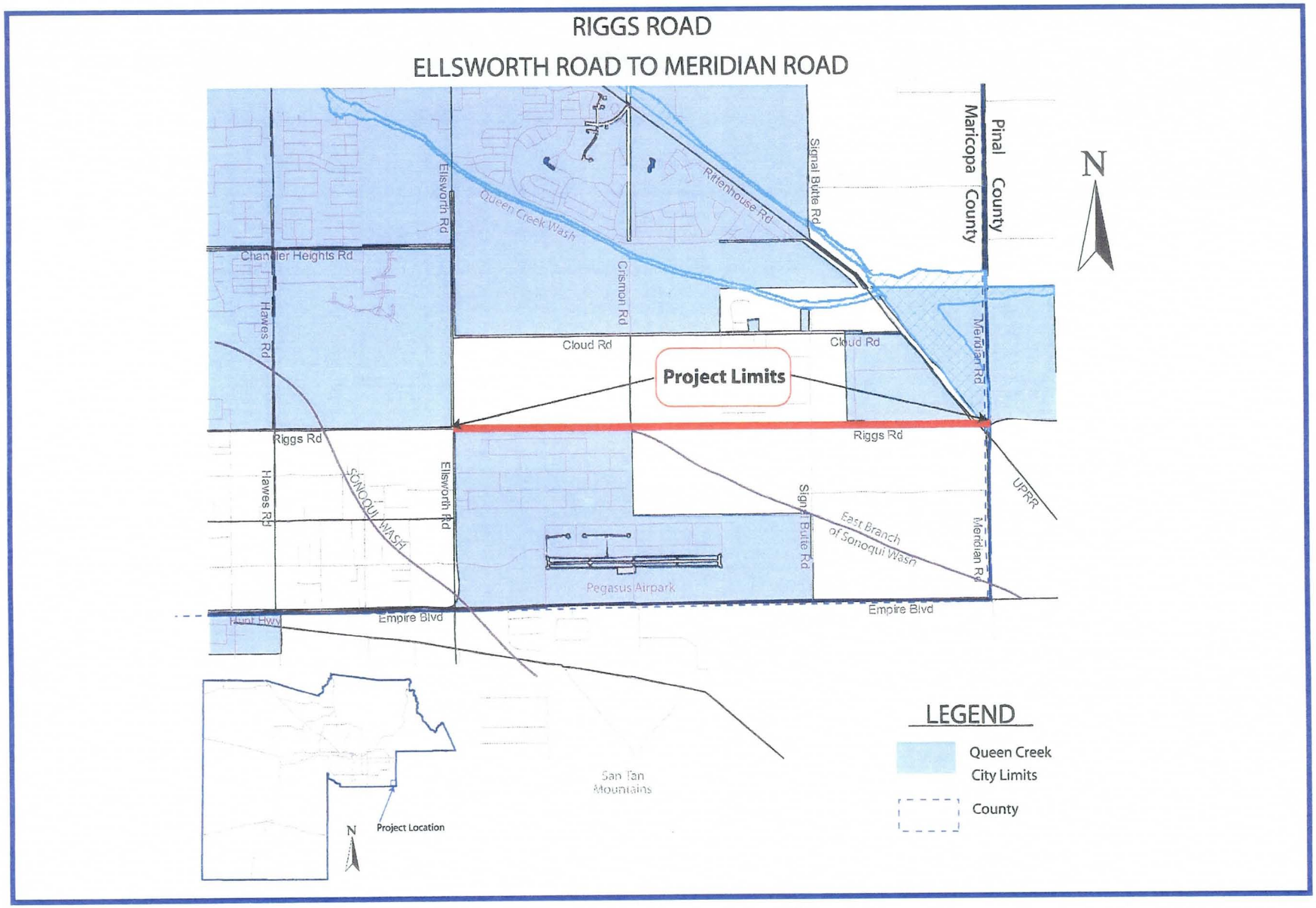


Figure 1.2 Project Vicinity Map

1.4 The Study Process

Initial Design Concept Report

The purpose of the Initial Design Concept Report is to develop alternatives for Riggs Road and a recommendation on which alternative to carry forward into the Final Design Concept Report. A Draft Categorical Exclusion (CE) will be prepared in conjunction with the Initial DCR and submitted for review by ADOT and FHWA. A public meeting was held to present the Initial DCR and receive public input.

Final Design Concept Report

This Final Design Concept Report has been prepared following a public meeting on July 26, 2006 and a review of the Initial Design Concept Report by ADOT, the Town of Queen Creek, FHWA and other agencies participating in the study. Final approval of this DCR is required by ADOT. A Categorical Exclusion (CE) will be prepared following the Final DCR and submitted for review and approval by ADOT and FHWA.

1.5 Characteristics of the Corridor

West of the project limits, Riggs Road is a two-lane paved rural roadway with its centerline located on the section line. The right-of-way limits are 55 feet north and 40 feet south of the section line. No other portions of Riggs Road currently exist within the project limits until approximately 170' west of the UPRR tracks. At this location, Rittenhouse Road terminates and a small, two-lane portion of Riggs Road is constructed over the UPRR tracks to connect Rittenhouse Road with Combs Road in Pinal County. Riggs Road crosses the UPRR tracks at-grade where crossing signs, signals and gates are provided.

East of the project, Combs Road (Riggs Road) is a 2-lane paved roadway centered on the section line. The Riggs Road and Combs Road section lines are offset approximately 60' at the County Line (Meridian Road). East of the Meridian Road alignment there is 40' of right-of-way north and south of the section line. Planned developments north and south of Combs Road east of Meridian Road will widen Combs from a two-lane roadway to a four-lane facility with a curb, gutter and medians.

Intersecting Roadways

Ellsworth Road is the western terminus of the project. It is currently a two-lane rural roadway that provides access to the Town of Queen Creek downtown and municipal buildings. Ellsworth Road also serves as the primary north-south route connecting Hunt Highway with US 60. The Town has designated Ellsworth Road as a Principal Arterial Roadway and numerous widening projects are currently underway along Ellsworth Road north and south of Riggs Road to increase its capacity. This includes a proposed

MCDOT widening project from Empire Road to Cloud Road including improvements of the Riggs Road intersection. Construction is planned to begin in the fall of 2007.

Crismon Road and Signal Butte Road are the primary section line intersecting roads within the project limits. Crismon Road does not currently exist and, when constructed, will not extend north of Queen Creek Wash. Signal Butte Road exists as an un-paved roadway north and south of Riggs Road, providing access to a few local residences.

Rittenhouse Road is a two-lane paved roadway and is west of, and parallel to, the UPRR tracks, which are on a diagonal, northwest to southeast alignment. Rittenhouse Road terminates into the small section of Riggs Road described above. The current Rittenhouse Road alignment intersects Riggs Road at approximately a 50 degree angle.

South of Riggs Road at the Rittenhouse Road intersection, Pinal County has recently completed the construction of Gary Road. This three-lane, rural roadway follows the County Boundary (Meridian Road) alignment connecting the Riggs/ Rittenhouse Road intersection with Hunt Highway.

Meridian Road does not currently exist. However, MCDOT has recently completed the *Meridian Road Access Control and Corridor Improvement Study* to examine Meridian Road and has evaluated alternatives for the Riggs Road/Combs Road intersection. The recommended alternative included an intersection on fill with bridged crossings over the UPRR, Rittenhouse Road, Riggs Road, and Meridian Road. See Appendix D for plan sheets from the *Meridian Road Access Control and Corridor Improvement Study*. The estimated cost of this future elevated intersection is listed at approximately $21 million. This improvement is beyond the scope of this project.

Land Use

Land use in the vicinity of this project consists mainly of agricultural fields with open channel irrigation. A few homes access onto the Riggs Road alignment west of Signal Butte Road. Other features near the project include overhead power lines, irrigation ditches and well sites.

The majority of the land ownership is private, with the exception of the land north of the Riggs Road section line between ¼ mile east of Ellsworth Road and Crismon Road. This property is currently State Trust Land. The Queen Creek Unified School District has expressed interest in acquiring this property for a proposed middle school, high school and bus maintenance facility.

There are a number of planned or proposed developments within the project limits. The majority of the adjacent land is planned for residential development. The exceptions are the potential school sites mentioned above and a planned mixed use project on the south side of Riggs Road between Signal Butte Road and the UPRR tracks known as "Meridian Crossing".

Drainage

The terrain in the project area is relatively uniform and consists of an average east to west slope of 0.33%. The project site is protected from offsite flows by the elevated UPRR tracks on the east end of the project. An 1100-foot wide strip of land east of the UPRR is within the 100-year floodplain.

Some offsite flows, however, continue to reach Riggs Road. Between Ellsworth Road and Signal Butte Road, offsite drainage flows approach Riggs Road from the southeast predominately as sheet flow. Between Signal Butte Road and Meridian Road, the runoff sheet flows toward the southwest and the East Branch of the Sonoqui Wash. Those offsite flows tend to concentrate at the one mile intersecting streets as a result of farm field grading.

Concentrated flow from the East Branch of Sonoqui Wash intersects the project at the southeast corner of the Riggs Road and Crismon Road intersection. South of Riggs Road the East Branch of Sonoqui Wash flows from the San Tan Mountains in a northwesterly direction in a defined channel. North of Riggs Road the flow is not defined and sheet flows through farm fields to the northwest and west until it reaches the Sonoqui Wash approximately 0.75 miles west of Ellsworth Road.

In general, flows crossing Riggs Road to the northwest during the 100-year peak event are relatively small (17 cfs at Signal Butte Road and 187 cfs at Ellsworth Road). However, the East Branch of the Sonoqui Wash carries a more substantial 100-year flow of 2200 cfs (per the *Sonoqui Wash Floodplain Delineation Study* by Entellus, FCD Contract #2002C033-2 and -3). The hydrology for this area was approved by FEMA on April 26, 2006. Flows from the East Branch of the Sonoqui Wash split into two directions at its intersection with Riggs Road. Flow models indicate that approximately 800 cfs crosses Riggs Road to the north while the remaining 1400 cfs continues west along the Riggs Road alignment.

Although not currently programmed, FCDMC intends to construct a channel to connect the East Branch of Sonoqui Wash with the Sonoqui Wash. The channel is proposed to begin at Crismon Road and run along the south side of the Riggs Road alignment.

2.0 TRAFFIC

2.1 Existing Conditions

Traffic Volumes

Traffic volumes within the study area were obtained for the MCDOT DCR in 2002. Representative traffic volumes from these counts are presented in Table 2-1.

Table 2.1
Year 2002 Traffic Counts

Roadway Segment	24 Hour Volume (veh.)	Peak Hour Volume (veh./hour)	Peak Hour
Riggs Road, west of Ellsworth	2,342 (both directions) 1,176 (EB) 1,166 (WB)	194 (both directions) 99 (EB) 118 (WB)	6-7 a.m. 4-5 p.m. 6-7 a.m.
Ellsworth Road, north of Riggs	7,842 (both directions) 3,916 (NB) 3,926 (SB)	569 (both directions) 314 (NB) 305 (SB)	3-4 p.m. 2-3 p.m. 3-4 p.m.
Ellsworth Road, south of Riggs	7,346 (both directions) 3,713 (NB) 3,633 (SB)	546 (both directions) 305 (NB) 294 (SB)	2-3 p.m. 2-3 p.m. 5-6 p.m.
Cloud Road	1,742 (both directions) 836 (EB) 906 (WB)	136 (both directions) 78 (EB) 96 (WB)	4-5 p.m. 4-5 p.m. 6-7 a.m.
Rittenhouse Road	2,869 (both directions) 1,368 (NB) 1,501 (SB)	219 (both directions) 125 (NB) 125 (SB)	7-8 a.m. 6-7 a.m. 4-5 p.m.

Given the complete change in the circulation patterns associated with this project, new traffic counts were not obtained for this update of the DCR.

2.2 Future Traffic Operations

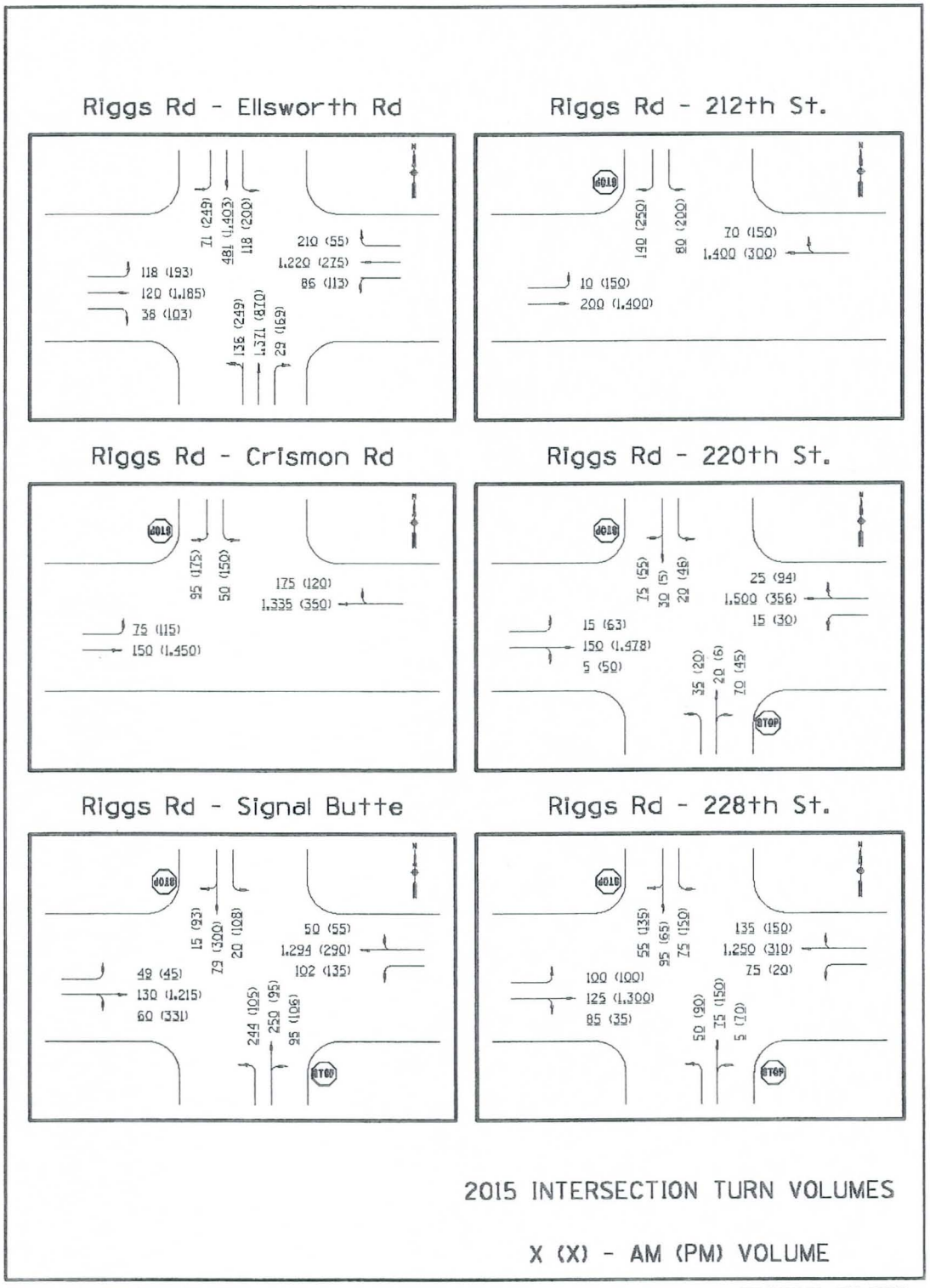
Traffic Volumes

Traffic volume projections were obtained from the Maricopa Association of Governments (MAG) for the years 2015 and 2026. These years were chosen to be consistent with the most recent model runs in the project area. Traffic volumes for cross roads not included in the MAG model (212th Street, Crismon Road, 220th Street, and 228th Street) were estimated based upon the current land use and the applicable Institute

of Transportation Engineers (ITE) trip generation rates. The area adjacent to Riggs Road was assumed to be fully built out by 2015.

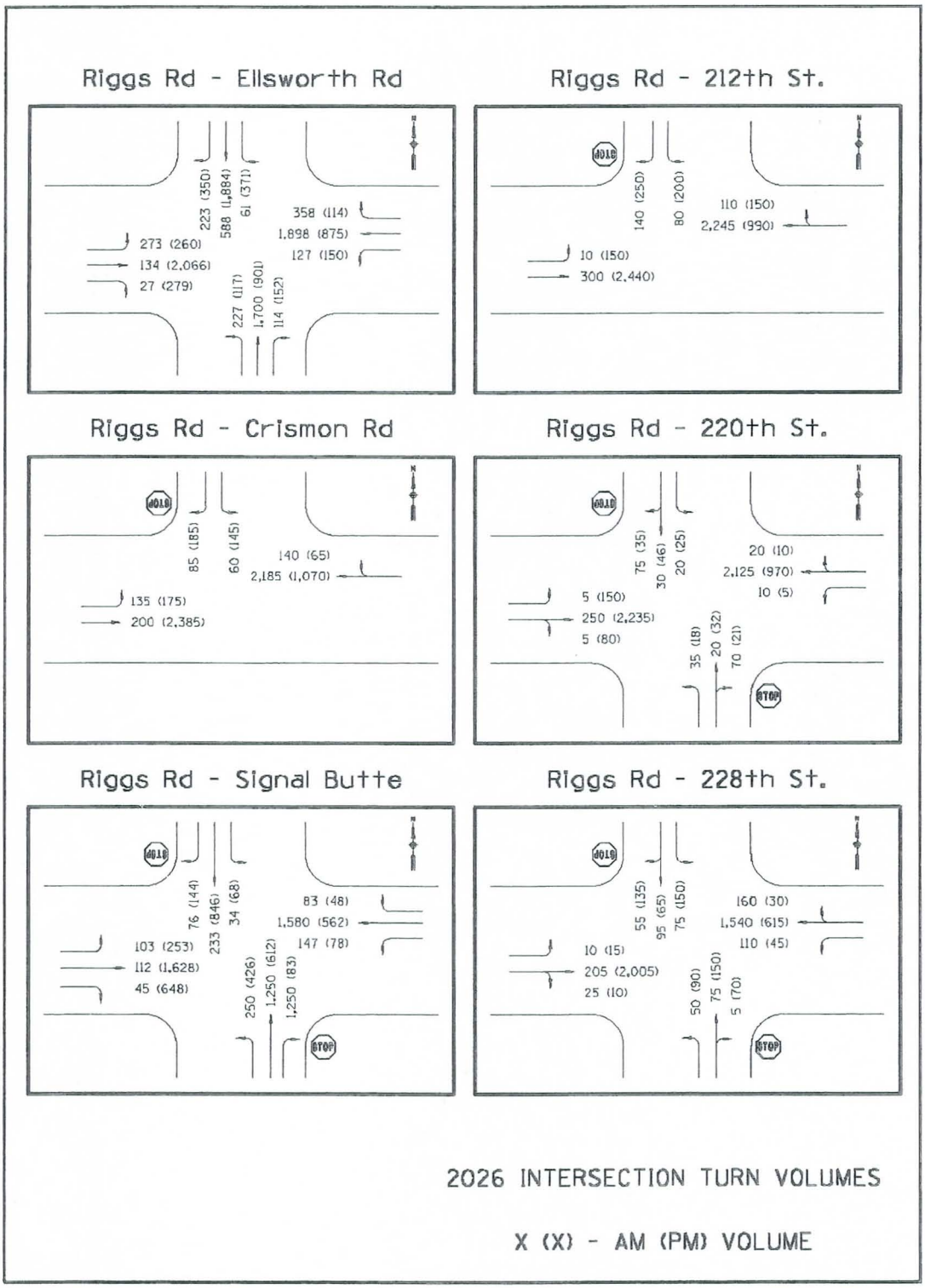
Implementation year (2008 – 2009) traffic volumes with the proposed roadway configuration were not readily available from MAG. The implementation year traffic volumes utilized in the evaluation were obtained by extrapolating from the 2015 and 2026 projections using the average growth rates from the projections. Additionally, turning movement percentages were obtained by balancing the MAG volumes for each leg, and from other reports in the area.

Figure 2-1, 2-2, and 2-3 show traffic volumes for 2008, 2015 and 2026 respectively.



NOTE: RIGGS ROAD – RITTENHOUSE ROAD/MERIDIAN ROAD INTERSECTION WAS ASSUMED TO BE GRADE SEPARATED BY 2015

FIGURE 2.2



NOTE: RIGGS ROAD – RITTENHOUSE ROAD/MERIDIAN ROAD INTERSECTION WAS ASSUMED TO BE GRADE SEPARATED BY 2015

FIGURE 2.3

2.3 Level of Service Analysis

The findings from *Traffic Analysis, Riggs Road to Ellsworth Road to Meridian Road,* prepared by Lee Engineering, Inc. and submitted to MCDOT on September 10, 2002 are reproduced in Table 2-2.

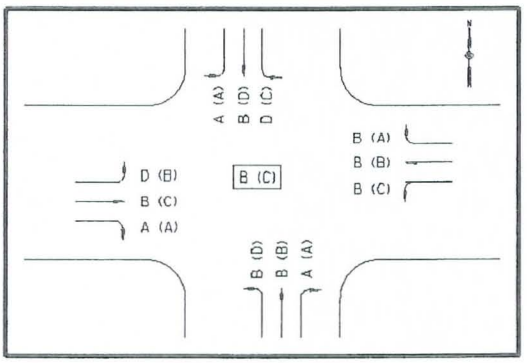
Table 2.2
Year 2002 Intersection Operation

Intersection	Peak Hour	PHF	LOS Side Street	LOS Left turn
Riggs Rd. & Ellsworth Rd.	7-8 a.m. 3-4 p.m.	0.88 0.93	B B	A A
Ellsworth & Cloud Rds.	8-9 a.m. 3-4 p.m.	0.86 0.92	B B	A A
Rittenhouse & Cloud Rds.	7-8 a.m. 4-5 p.m.	0.95 0.94	A A	A A

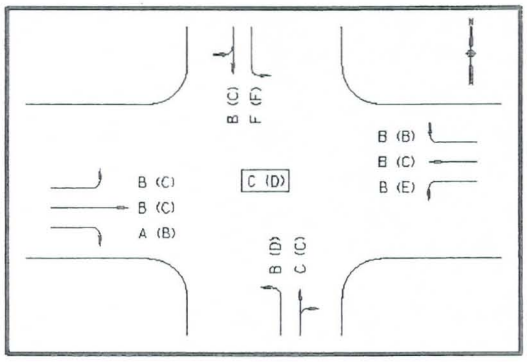
The analysis indicates the intersections are currently operating at a satisfactory level of service.

Figure 2-4, 2-5 and 2-6 show the estimated level of service for 2008, 2015, and 2026 respectively.

Riggs Rd - Ellsworth Rd



Riggs Rd - Rittenhouse Rd



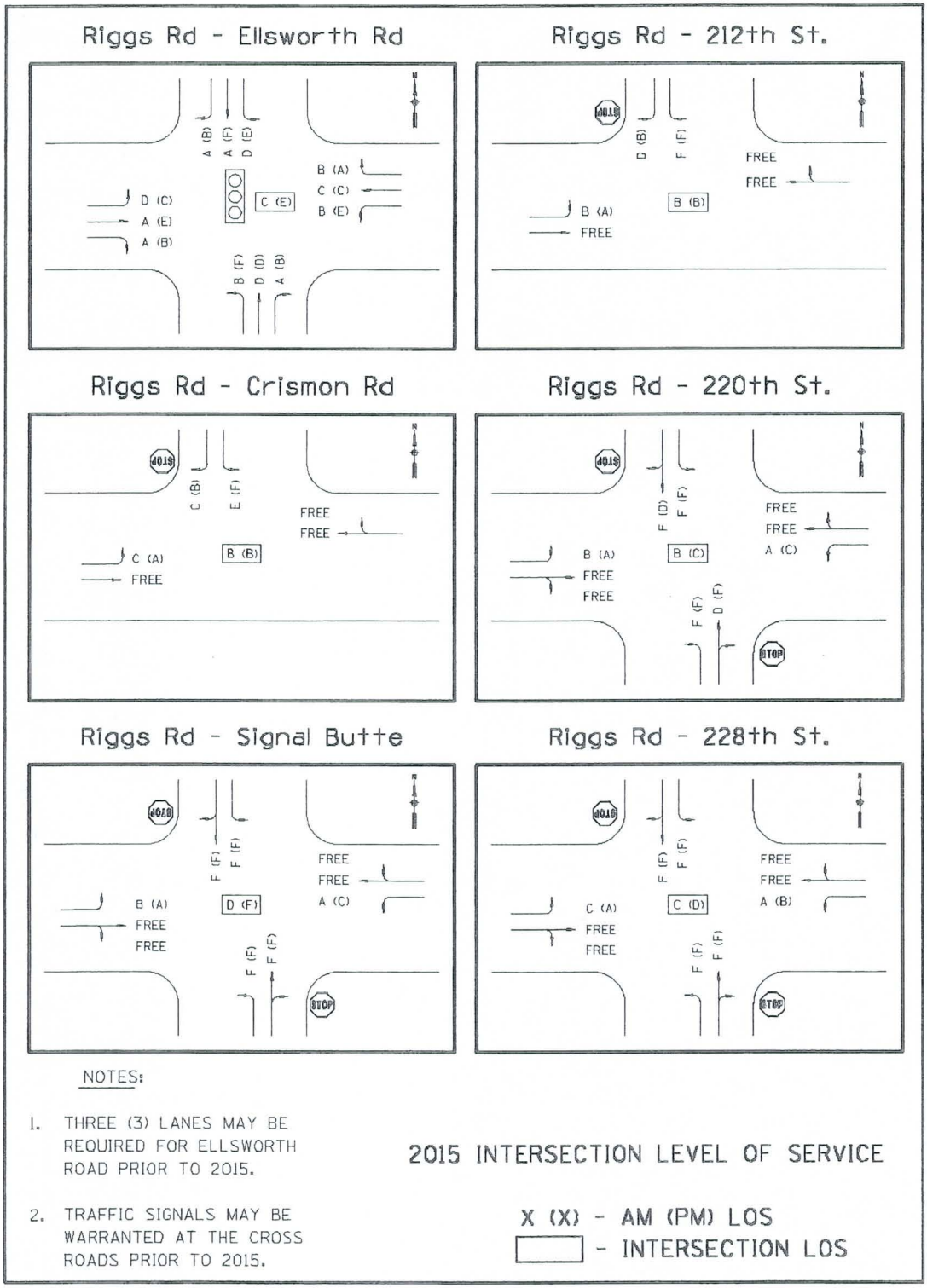
2008 INTERSECTION LEVEL OF SERVICE

X (X) - AM (PM) LOS

☐ - INTERSECTION LOS

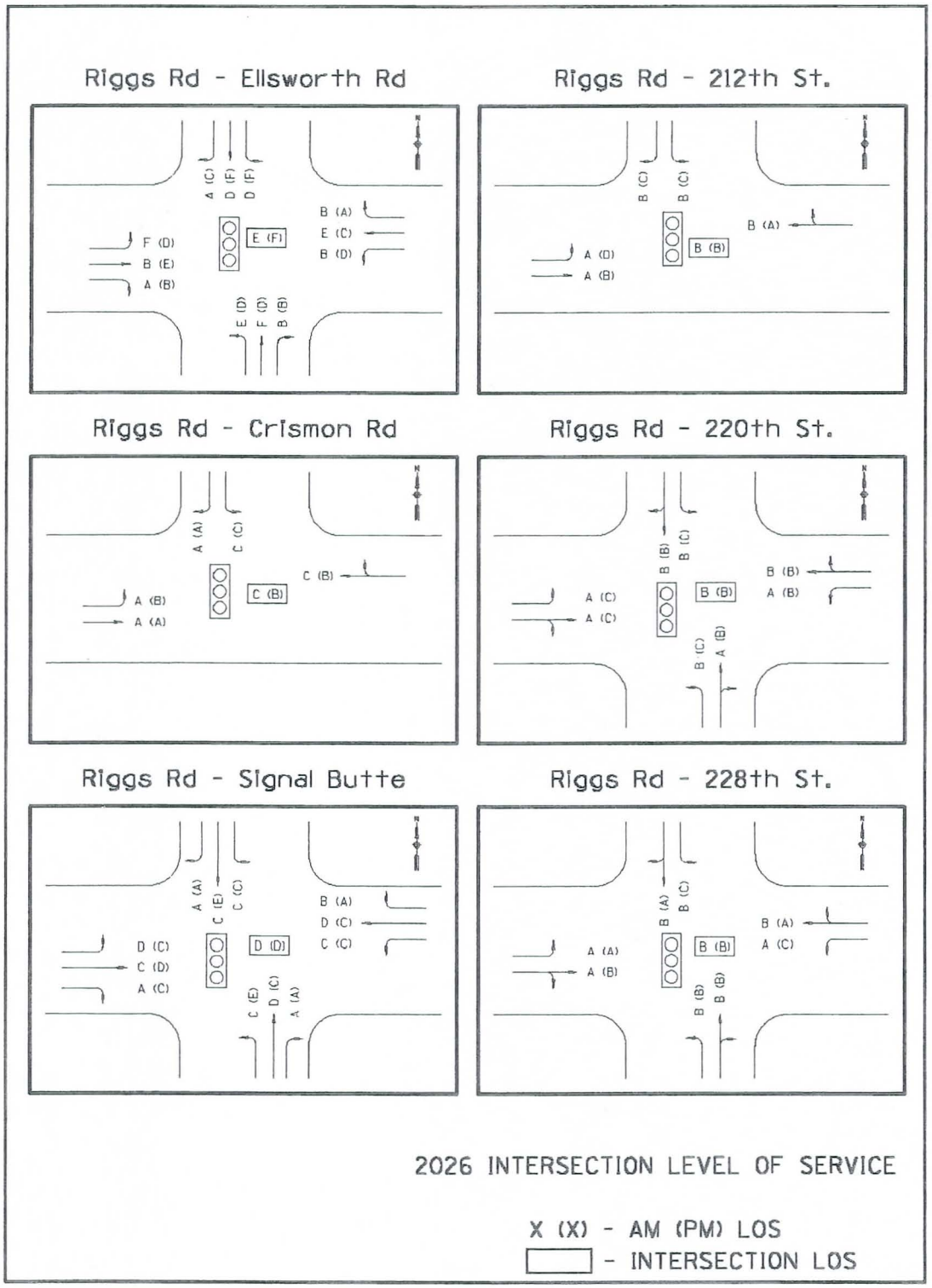
I:\Projects\Queen Creek\projections\Cadd\V-8_2008_LOS.dgn TIME: 11:41:57 AM DATE: 8/18/2008

FIGURE 2.4



NOTE: RIGGS ROAD – RITTENHOUSE ROAD/MERIDIAN ROAD INTERSECTION WAS ASSUMED TO BE GRADE SEPARATED PRIOR TO 2026.

FIGURE 2.5



NOTE: RIGGS ROAD – RITTENHOUSE ROAD/MERIDIAN ROAD INTERSECTION WAS ASSUMED TO BE GRADE SEPARATED PRIOR TO 2026.

FIGURE 2.6

2.4 Turn Bay Lengths

Each interior turn bay should be able to accommodate the greater of the build out queue length or the minimum storage length. Table 2.3 presents the minimum turn bay queuing requirements.

Table 2.3
Left and Right Turn Lane Queue Length
Riggs Road Intersections

Intersection	Eastbound (ft, min.)		Westbound (ft, min.)		Northbound (ft, min.)		Southbound (ft, min.)	
	Right	Left	Right	Left	Right	Left	Right	Left
Ellsworth Road	70[2]	210[1]	120[2]	170	80[2]	230	165[2]	225[2]
212th Street[3]	NA	205	Future	NA	NA	NA	Future	Future
Crismon Road[3]	NA	87	Future	NA	NA	NA	Future	Future
220th Street[3]	Future	175	Future	25	Future	Future	Future	Future
Signal Butte Road[3]	Future	185	50	130	Future	Future	Future	Future
228th Street[3]	NA	100	NA	100	NA	NA	NA	NA
Rittenhouse Road[4]	80	85	140	185	Future	60	Future	205[1]

[1] 50th percentile queue.
[2] Based upon 2015 volumes
[3] Future cross road construction by others
[4] Based upon 2008 volumes

Notes: A. 95th percentile queue used unless otherwise noted.
B. 2015 volumes used for right turn lane lengths, 2026 volumes used for left turn lane lengths.
C. The minimum queue lengths per the governing agency should be used for the design.
D. Values are the queue lengths only, no deceleration length is included.

2.5 Conclusions and Recommendations

A. Riggs Road

- A four-lane Principle Arterial on Riggs Road is acceptable through approximately the year 2015, using the projected MAG traffic volumes. A six-lane Principal Arterial roadway will be required before the year 2026 using the MAG traffic volume projections. This is consistent with the MAG roadway network used for the projections. However, the projected volumes for Meridian Crossing will accelerate the requirement for the six-lane Principal Arterial roadway.
- Prepare a corridor access control plan to guide access to future residential communities and businesses.
- Future traffic signal spacing should ideally be ½ mile, or ¼ mile minimum.
- A traffic signal coordination plan should be considered when traffic signals are one mile or less apart. If the progression plan evaluation is found to be favorable, the coordination plan should be implemented.

- Provide right-turn deceleration lanes at each crossroad. Though not necessarily required per the operational analysis, the safety benefits are significant.
- Consider installing Intelligent Transportation System (ITS) infrastructure (conduit and pull boxes) to facilitate the future installation of traffic signal communication equipment. Give consideration to preparing an ITS plan for other equipment, such as dynamic message signs (DMS), closed circuit television (CCTV) cameras, and traffic monitoring stations.

B. Ellsworth Road

- A four-lane Principal Arterial roadway on Ellsworth Road is approaching capacity at approximately the year 2015 using the MAG traffic volumes.
- A six-lane Principal Arterial roadway will be required at approximately the year 2015. Again, the projected volumes for Meridian Crossing may accelerate the requirement for the six-lane Principal Arterial.

C. Riggs Road at Ellsworth Road Intersection

- A traffic signal will be needed at or near the time of the opening of the proposed section of Riggs Road. This is consistent with the Town of Queen Creek's *General Plan*.
- Right turn lanes on each approach should be provided.
- A two-phase traffic signal will probably be sufficient initially, however, by 2015 left turn phasing will probably be required. The traffic signal should be designed to accommodate left turn phasing.

D. Riggs Road at 212th Street Intersection

- Stop control on 212th Street will suffice initially, though by the year 2015 cross street delay will be significant.
- A traffic signal will be required prior to the year 2026. The traffic signal warrants should be based upon actual traffic counts.
- Exclusive left and right turn lanes on 212th Street should be provided initially.

E. Riggs Road at Crismon Road Intersection

- Stop control on Crismon Road will suffice initially, though by the year 2015 cross street delay will be significant.
- A traffic signal will be required prior to the year 2026. The traffic signal warrants should be based upon actual traffic counts.
- Exclusive left and right turn lanes on Crismon Road should be provided initially.

F. Riggs Road at 220th Street Intersection

- Stop control on 220th Street will suffice initially, though by the year 2015 cross street delay will be significant.

- A traffic signal will be required prior to the year 2026. The traffic signal warrants should be based upon actual traffic counts.
- An exclusive left turn lane and a shared through-right turn lane, at a minimum, should be provided on 220th Street initially.

G. Riggs Road at Signal Butte Road Intersection

- Stop control on Signal Butte Road will suffice initially, though by the year 2015 cross street delay will be significant.
- A traffic signal will be required prior to the year 2026. The traffic signal warrants should be based upon actual traffic counts.
- An exclusive left turn lane and a shared through-right turn lane, at a minimum, should be provided on 220th Street initially, with width provided for a dual northbound left turn lane.

H. Riggs Road at 228th Street Intersection

- Stop control on 228th Street will suffice initially, though by the year 2015 cross street delay will be significant.
- A traffic signal will be required prior to the year 2026. The traffic signal warrants should be based upon actual traffic counts.
- An exclusive left turn lane and a shared through-right turn lane, at a minimum, should be provided on 228th Street initially.

I. Riggs Road at Meridian/Rittenhouse/Gary Road Intersection

- A traffic signal at the intersection of Riggs Road and Rittenhouse/Gary Road is recommended initially, based upon the expected traffic volumes.
- Queuing onto the railroad track must be prevented by the traffic signal, pavement marking, and signing design.
- An exclusive left turn lane, an exclusive through lane, and a shared through-right turn lane should be provided as a minimum on Rittenhouse/Gary Road initially.
- The grade separation of this intersection is recommended prior to 2015 given the poor level of service at this intersection. The grade separation should also occur prior to the extension of Meridian Road to the north for anything other than local access.

3.0 ALTERNATIVES

3.1 Evaluation Considerations

The factors used in evaluating the alternatives included the following:

- Horizontal Geometrics
- Right-of-way
- Environmental Considerations

The alternatives evaluated are the "No Build" alternative, the MCDOT DCR alternative, and a South-Shifted alternative. A section line alternative was eliminated early in the MCDOT DCR process due to the impacts to existing residences backing and fronting on Riggs Road east of the 220th Street alignment. A cost estimate was prepared for the recommended alternative.

3.2 No Build Alternative

A "No Build" alternative would not construct Riggs Road between Ellsworth Road and Meridian Road. Recent and planned developments in the area, along with the need for east-west connectivity, necessitate the construction of this project. Therefore, the "no-build" alternative is not recommended.

3.3 MCDOT DCR Alternative

The MCDOT DCR alternative was submitted and reviewed by MCDOT in October, 2002. The horizontal alignment is on the section line west of Ellsworth Road to approximately 600' east of Crismon Road. The alignment then shifts 70' south of the section line through reverse curves to avoid adverse impacts on existing residential lots and structures on the north side of the section line. The alignment remains 70' south of the section line to approximately 860' east of Signal Butte Road where the alignment utilizes reverse curves to shift to the Combs Road section line alignment which is approximately 60' north of the Riggs Road section line. The alignment remains on the Combs Road section line alignment to the project terminus.

3.4 South-Shifted Alternative

There is a 330-foot strip of private lands on the south side of the section line of Riggs Road between Ellsworth Road and Crismon Road. A majority of this property is required for the proposed East Branch of the Sonoqui Wash improvement and a 70-foot dedication of right-of-way shown in the MCDOT DCR Alternative. A narrow unusable strip of land would be left thus a total take of these lands will be required. The south alternative shifts

the roadway 70' to the south and uses this "remainder strip" of land as roadway right-of-way. This eliminates the acquisition of any State Trust Land and reduces the overall right-of-way acquisition costs for the project.

This South-Shifted alternative begins on the section line at Ellsworth Road and shifts Riggs Road to the south approximately 300' east of Ellsworth Road via reverse curves. The shift is accomplished within the first ¼ mile and effectively places the north Riggs Road right-of-way line on the section line. This 70' southerly shift is continued east of Crismon Road joining the MCDOT DCR alignment at Station 179+17.85. The alignment is then coincident with the MCDOT DCR through the project terminus. See Figure 3.1 for a plan view of the MCDOT DCR alternative and the South-Shifted alternative.

3.5 Alternative Evaluation

The two "build" alternatives were evaluated for suitability based on the criteria identified above. An evaluation matrix was created to assist in the analysis and is shown below.

Evaluation Criteria	MCDOT DCR	South-Shifted Alternative
Horizontal Geometrics	• Requires the installation of two sets of reverse curves (Radius = 14,436')	• Requires the installation of two sets of reverse curves (first set Radius = 3,000' and second set R=14,436')
State Trust Land – Right-of-Way Costs	• Will require the acquisition of 6.4 acres of State Trust Land	• No State Trust Land acquired
Environmental Considerations	• Alignment will locate travel lanes within 20' of proposed schools (property line) North of Riggs Road	• Alignment will locate travel lanes within 90' of proposed schools (property line) North of Riggs Road

Table 3.1 Evaluation Matrix

3.6 Conclusions

While the MCDOT DCR alternative has flatter radii for the first set of reverse curves, the right-of-way (cost) and environmental benefits of the South-Shifted Alternative outweigh its benefit. The South-Shifted alternative is recommended.

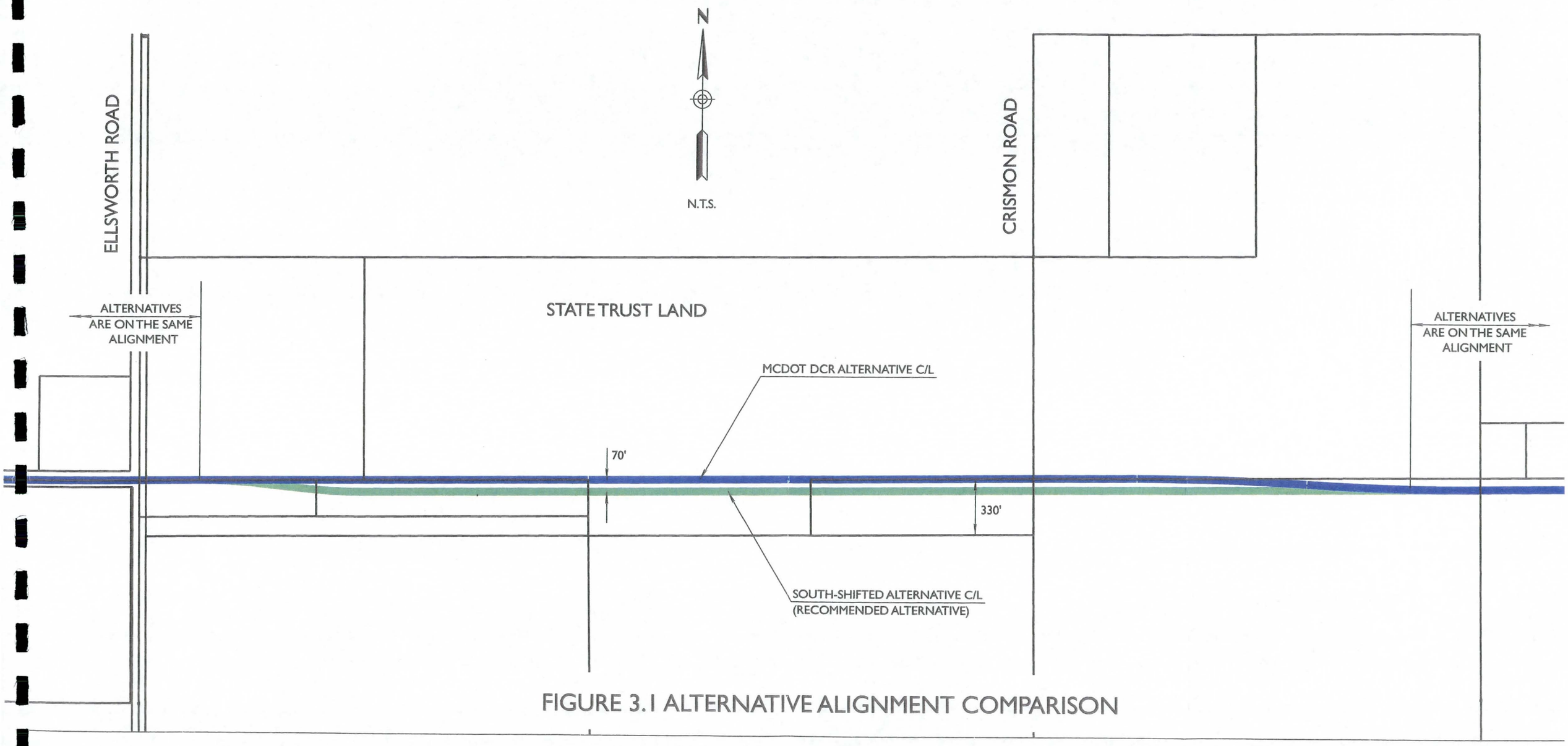


FIGURE 3.1 ALTERNATIVE ALIGNMENT COMPARISON

4.0 MAJOR DESIGN FEATURES

4.1 Design Controls

The following design controls were used in the development of alternatives. All design controls are Town of Queen Creek standards except where noted. All design controls meet or exceed the minimum requirements of the 2004 AASHTO Geometric Design of Highways and Streets.

- Design Year: 2026
- Roadway Classification: Principal Arterial
- Design Speed: 55 MPH
- Posted Speed Limit: 45MPH
- Typical Cross Section:
  - Lane Width: 12 feet (Typical)
    14 feet (Adjacent to Raised Median)
  - Shoulder Widths 6 feet
  - Median Width 14 feet
  - Cross Slope 2%
- Slope Criteria: 6:1 Typical, 4:1 Maximum
- Maximum Superelevation: 2%
- Minimum Radius Curve, not requiring super: 1800 feet
- Minimum Grade: 0.30% **(AASHTO)**
- Full Access Points: 1/2 Mile Desirable
  1/4 Mile Minimum

4.2 Typical Section

The Phase I recommended Riggs Road 4-Lane typical section consists of a 14' inside lane, a 12' outside lane, and a 6' shoulder in each direction with a 14' raised median and 140' of proposed right-of-way. This typical section is shown in Appendix A sheet 1 of 2.

The Ultimate Riggs Road 6-Lane typical section consists of a 14' inside lane, two 12' lanes and a 6' bike lane in each direction with a 14' raised median, 140' of proposed right-of-way, vertical curb and gutter on the outside edges of the roadway, and a 6' sidewalk on both sides. This typical section is shown in Appendix A sheet 2 of 2.

4.3 Riggs Road – Meridian Road Intersection

The recommended alignment for the Phase I Riggs Road 4-lane roadway is at-grade and on the section line at the intersection of the Meridian Road section line.

The recommended alignments per the *Meridian Road Access Control and Corridor Improvement Study* for the Ultimate Riggs Road 6-lane roadway and Meridian Road are grade separated from Rittenhouse Road and the UPRR and intersect on section lines.

4.4 Roadway

Horizontal Alignment

The recommended Riggs Road horizontal alignment begins on the section line at Ellsworth Road. The alignment consists of 3000 foot radius reverse curves that begin approximately 300 feet east of Ellsworth Road which shift the alignment from the section line to 70 feet south of the section line. The alignment remains 70 feet south of the section line for nearly 2 miles. Approximately 860 feet east of Signal Butte Road, the alignment utilizes 14,436 foot radius reverse curves to shift to the Combs Road section line alignment, which is approximately 60 feet north of the Riggs Road section line.

At-Grade Railroad Crossing

Just west of Meridian Road is an existing two-lane at-grade roadway crossing of the Union Pacific Railroad tracks. The recommended Phase I Riggs Road improvements cross the railroad tracks at-grade. Coordination will be necessary with Union Pacific Railroad to reconstruct the existing railroad crossing, signals, and gates.

Vertical Alignment

The proposed Riggs Road profile will begin west of Ellsworth Road and end east of Meridian Road matching the existing profiles at each end. The profile will tie in with the UPRR tracks east of Rittenhouse Road. The Riggs Road profile will closely follow the existing topography which has an approximate slope of 0.33% from east to west. The proposed vertical alignment will meet the minimum AASHTO requirement of 0.30% grades for roadways with curb and gutter. The interim four-lane section will be designed to accommodate the drainage requirements for curb and gutter on the ultimate six-lane section.

The proposed profile will meet all AASHTO sight distance requirements. Adequate cover will be provided for all culvert crossings.

4.5 Right-of-Way

Existing Right-of-Way

Existing right-of-way for Riggs Road, Ellsworth Road and Combs Road are as follows:

Riggs Road (west of Ellsworth Road):	55 feet north of section line, 40 feet south of section line 70 feet (proposed by new development)
Ellsworth Road (north of Riggs Road):	55 feet west of section line, 40 feet east of section line
Ellsworth Road (south of Riggs Road):	40 feet west of section line, 40 feet east of section line
Rittenhouse Road (south of Riggs Road):	80 feet west of and parallel to Railroad right-of-way
Meridian Road (north of Riggs Road):	0 feet, west of section line 0 feet, east of section line
Meridian Road (south of Riggs Road):	0 feet, west of section line 0 feet, east of section line
Combs Road (east of Meridian Road):	40 feet, north of section line 40 feet, south of section line 65 feet (proposed by new development)

Proposed Right-of-Way

The Town of Queen Creek has classified Riggs Road as a Principal Arterial Roadway with a future ultimate six-lane urban roadway section with bicycle lanes, curb, gutter and sidewalk. In accordance with Town of Queen Creek standards, 70 feet of right-of-way will be provided on each side of the proposed Riggs Road alignment for a total width of 140 feet. This is more than adequate for the proposed four-lane roadway with raised median (Phase I improvements), and will accommodate future widening to a six-lane roadway with bicycle lanes. The recommended right-of-way is shown on the Plan and Profile sheets provided in Appendix B. Land within the recommended right-of-way is privately owned. The properties that are affected by the proposed Riggs Road right-of-way are shown in Figure 4.1.

Drainage easements and temporary construction easements will also be required at retention basin locations throughout the project. Additional permits and easements will be required at the UPRR crossing.

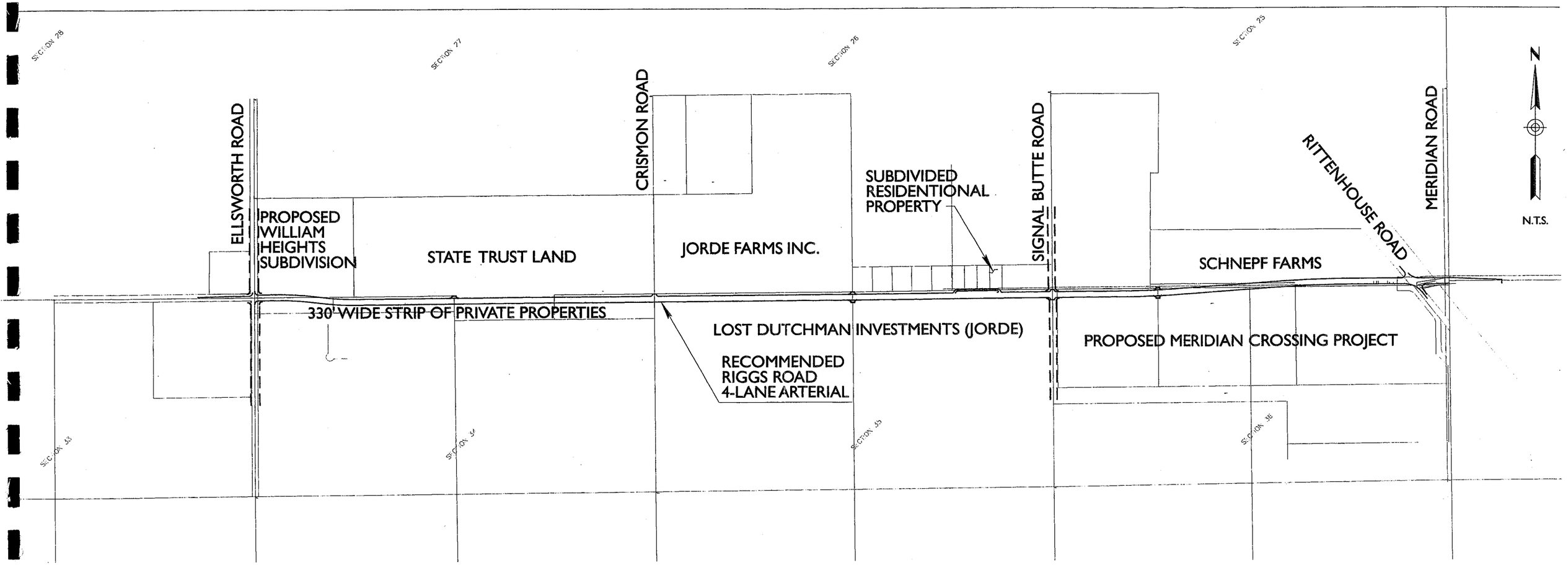


FIGURE 4.1 PROPERTY OWNERS

4.6 Earthwork

The general terrain is flat within the project limits. The project will require minimal roadway cuts and fills, typically within one foot of the existing ground. The roadway profile was designed to balance the earthwork. With additional excavation for retention basins it is not anticipated that this project will require borrow material.

4.7 Traffic Control and Constructability

Construction Activities: Construct the Phase I 4-lane Riggs Road section with a raised median from Ellsworth Road to Meridian Road.

Activate the new traffic signals and open roadway to traffic.

Traffic Control: Traffic would generally not be impacted on the existing roadways. At the tie connections to the existing roadway network, two-way traffic shall be maintained, with flagger operations allowable during work hours. In non-work hours, no lane restrictions are allowed. Construction near the UPRR tracks will require the presence of a UPRR flagger.

4.8 Drainage

Onsite

Ultimately, Riggs Road will be a six-lane principal arterial roadway with raised medians, curb, gutter, and sidewalk. When the ultimate roadway is built, permanent retention basins and catch basins will be constructed to accommodate onsite street runoff. The Town of Queen Creek will require that these facilities be constructed as adjacent development occurs and at the development's cost.

For the recommended Phase I alternative, roadside drainage swales and longitudinal retention basins meeting AASHTO clear zone requirements will be constructed. Consistent with Town of Queen Creek standards, all roadside swales will be designed to handle the 10 year peak event and retention basins will be sized to accommodate the 100 year – 2 hour runoff volume. These facilities will be constructed within the proposed 140' of total right-of-way. All proposed street grades will be designed such that when Riggs Road is widened to its ultimate configuration, the gutter grades will be adequate to handle the street runoff during the 100-year storm maintaining a minimum of one dry traffic lane in each direction.

The project will encroach on the 100-year floodplain east of the UPRR tracks; therefore a Floodplain Use Permit from FCDMC will be required.

Offsite

The primary offsite drainage contributor is the East Branch of the Sonoqui Wash. The *Queen Creek/Sonoqui Wash Hydraulic Master Plan Study Report* was prepared for the FCDMC in November, 2000. This report recommends the construction of a new channel for the East Branch of Sonoqui Wash. Construction of the channel is not currently in FCDMC's five-year plan. The future channel would be located on the south side of Riggs Road between Ellsworth Road and Crismon Road and continue west approximately 0.75 miles where it would join the Sonoqui Wash. The proposed future location of the channel is shown in the Appendix of this Design Concept Report relative to the ultimate six-lane typical section.

Prior to the construction of the FCDMC channel, care must be taken in the design of Riggs Road to ensure that the existing 100 year peak flow patterns are not altered. Flows from the East Branch of the Sonoqui Wash split into two directions at its intersection with Riggs Road. According to flow models approximately 800 cfs crosses Riggs Road to the north while the remaining 1400 cfs continues west along the Riggs Road alignment (per the *Sonoqui Wash Floodplain Delineation Study* by Entellus, FCD Contract #2002C033-2 and -3). Preliminary analysis prepared for this DCR of the existing flow patterns at, or near, the proposed Riggs Road and Crismon Road intersection indicates that approximately 200 cfs of the East Branch of the Sonoqui Wash flow is conveyed to the west, south of the section line. The remaining flow overtops the Riggs Road alignment. The proposed Riggs Road alignment and profile will convey approximately 200 cfs to the west, south of the proposed Riggs Road centerline at or near the Riggs Road and Crismon Road intersection and the remaining flow will overtop Riggs Road and its proposed median. The drainage will be analyzed in more detail during final design and, if necessary, the Riggs Road profile will be adjusted to minimize the effect on existing flow patterns at this intersection.

The proposed Riggs Road profile will have a limited effect on the existing flow patterns at the Signal Butte Road and Ellsworth Road intersections where the flows are considerably less than the flows at the Crismon Road intersection.

4.9 Utilities

Utility companies having facilities in the vicinity of the project have been notified of this study. Following is a list of the contacts and companies whose facilities are known to be within the project area:

CONTACT	TELEPHONE / EMAIL	UTILITY/ADDRESS
Daniel Tarango or Steve Aldrege	Tel: (602) 278-2320	Kinder Morgan Energy Petroleum Attn: Pipeline Engineering, Don Quinn 1100 Town & Country, Orange, CA 92868
Matt Williams	Tel: (720) 888-3813 networkrelocations@level3.com	Level 3 Communications Attn: Network Relocations Dept.1025 El Dorado Blvd., Broomfield, CO 80021
Beth Seubert (972) Steve Cherry (602)	Tel: (972) 656-6028 or (602) 370-5891	MCI Worldcom (Mailing Address) Attn: Beth Seubert 2250 Lakeside Blvd., Richardson, TX 75082
Al Baizel	Tel: (602) 236-0840 ambaizel@srpnet.com	SRP - Electric (UG & OH) P.O. Box 52025, Phoenix, AZ 85072-2025 xct341
James Florez	Tel: (602) 484-5302	Southwest Gas 9 South 43rd Avenue, Mail Station 420586 (Engineering Dept.), Phoenix, AZ 85009
Colin Sword, Field Engineer	Tel: (602) 417-0970 Colin.sword@sprint.com	Sprint Communication (Fiber Optic) 401 West Harrison Street Phoenix, AZ 85003
Marsha Kidd	Tel: (888) 265-2283	Williams Communication 1 Technology Center 100 South Cincinnati Mail Drop TC11S, Tulsa, OK 74103
Dean Griffith	Tel: (480) 987-3002	Queen Creek Irrigation District P.O. Box 690, Queen Creek, AZ 85242
Paul Gardner	Tel: (480) 987-3240	Queen Creek Water Company 22036 South Ellsworth Road, Queen Creek, AZ 85242
Kim Jordan	Tel: (800) 283-4237	Qwest – Fiber Optic 930 15th Street, Room 130 Denver, CO 80202
Paul Farrell	Tel: (402) 544-8620	Union Pacific Railroad 1400 Douglas Street, Stop 1690 Omaha, NE 68179
Jim Smith	Tel: (916) 789-6352	Union Pacific Railroad 10031 Foothills Blvd. Roseville, CA 95747
Gary Larson	Tel: (480) 987-9870	Johnson Utility (Sewer) 968 E. Hunt Highway Queen Creek, AZ 85243
Bill Van Allen	Tel: (480) 221-4441	New Magma Irrigation & Drainage District 34630 North Schnepf Road Queen Creek, AZ 85242
Heather Carnahan	Tel: (480) 921-4080	Davey-Cairo Engineering Inc. 2121 West University Drive, Suite #123 Tempe, AZ 85281

Table 4.1 Utility Company Contacts

Table 4.2 below displays approximate locations of known utilities within the project limits. Exact locations of all utilities within the project limits will be determined during final design.

LOCATION	UTILITIES
East Side of Riggs Road\Ellsworth Road Intersection	Gas, Overhead Power, Cable TV
Riggs Road\Crismon Road Intersection	Gas, Overhead Power and Telephone
Riggs Road\Signal Butte Road Intersection	Overhead Power and Telephone
Between Rittenhouse Road and the Union Pacific Railroad	Gas, Fiber Optics, Overhead Power
Parallel to Riggs Road from Signal Butte to Meridian	Overhead Power and Telephone, Water

Table 4.2 Location/ Known Utilities

4.10 Pavement Design

The following pavement structural section has been selected to use as a basis for estimating pavement quantities.

Table 4.3 Preliminary Pavement Structural Section

AC and AB over Native Subgrade	
Pavement Section	Thickness in
Asphalt Concrete	5.0
Aggregate Base	12.0
Native Subgrade	--

The pavement section in Table 4.3, above, meets or exceeds the Town of Queen Creek minimum suggested pavement sections for a Principal Arterial. The pavement structural section thicknesses may change during final design when the Pavement Design Summary and Materials Design Report are finalized.

5. 0 ENVIRONMENTAL CONSIDERATIONS

The following information is a summary of the environmental considerations associated with the proposed project. Federal funds may be used for the project. The Categorical Exclusion to be prepared for the project will disclose the anticipated project impacts and applicable mitigation measures.

5.1 Potential Hazardous Waste Sites

There may be hazardous materials concerns due to agricultural activities along the project corridor. A Pre-Initial Site Assessment (PISA) for hazardous materials will be completed during the environmental analysis. A review of applicable Environmental Protection Agency and Arizona Department of Environmental Quality databases will also be conducted to identify potential hazardous materials sites. The PISA will identify any hazardous materials concerns. If suspected hazardous materials are encountered during construction, work will cease at that location, and arrangements will be made for proper treatment of those materials.

5.2 Clean Water Act Section 404 Permit Requirements

A Jurisdictional Delineation is currently being prepared to identify any waters of the United States (WOUS) under the jurisdiction of the US Army Corps of Engineers (COE). Drainage channels within the project area, including the East Branch of the Sonoqui Wash, are likely not considered WOUS. If the COE agrees that there are no WOUS in the project area that will be affected by construction, then no Clean Water Act Section 404 permit will be required.

If the COE determines that the East Branch of the Sonoqui Wash is a WOUS, impacts on the wash will require a Section 404 permit. Mitigation requirements and/or in lieu fees to compensate for the loss of WOUS would be determined during the Section 404 permit application process.

5.3 Section 4(f) Resources

Schools are proposed along the north side of the proposed Riggs Road between Ellsworth Road and Crismon Road. The proposed schools may have playgrounds with public access, which would be considered Section 4(f) resources. The proposed construction of Riggs Road will not be considered a use of a Section 4(f) resource because the schools will be located outside the proposed roadway right-of-way. Furthermore, initial school concepts show that the playgrounds would not be constructed adjacent to the proposed Riggs Road, which would mitigate any potential proximity impacts. Potential proximity impacts on the playgrounds will be identified in the Categorical Exclusion.

The proposed Riggs Road alignment would cross the Union Pacific Railroad, which would be considered a Section 4(f) resource due to its eligibility for listing in the National Register of Historic Places under Criterion A, meaning it is associated with a historic event. However, the proposed construction of Riggs Road would not be considered a use of this Section 4(f) resource because occupancy of the property would be temporary, changes to the railroad would be minimal, there would be no interference with railroad activities, and no adverse changes to the property would occur.

Pedestrian, bike, and equestrian trails are planned within the project area. An unpaved trail is planned south of and parallel to the proposed roadway between Ellsworth Road and Crismon Road. East of Crismon Road, the trail would veer to the south. Unpaved trails are planned parallel to Ellsworth Road, Crismon Road, and Signal Butte Road—each of which would cross the proposed Riggs Road. A paved trail is also planned parallel to Rittenhouse Road that would cross the proposed Riggs Road. These proposed trails are shown in the *Queen Creek Parks, Trails and Open Space Master Plan* (2005). The area that will be used for Riggs Road is shown in the Town of Queen Creek *General Plan 2002* (2002) as being reserved for the roadway. Planned trails that are on public land are considered Section 4(f) resources; however, the requirements of Section 4(f) do not apply if the land has been reserved for the use of a roadway before the planning of the trail. Because the project area was reserved for the roadway before the establishment of a trail plan, and the trails have been planned on land that is currently owned by private parties, the planned trails would not be considered Section 4(f) resources.

5.4 Floodplain Encroachment

A review of the Federal Emergency Management Agency Flood Insurance Rate Map indicates that the eastern edge of the project area, near the border of Pinal County, is within a 100-year floodplain. Impacts on floodplains typically occur when the topography of the project area is substantially modified by either placement or removal of materials within the floodplain. The potential for the project to affect the 100-year floodplain will be determined during hydrological analysis associated with the design process and will be incorporated into the Categorical Exclusion.

5.5 Wetlands or Riparian Areas

No wetlands or riparian areas are present in the project area.

5.6 Scenic or Historic Routes

No scenic or historic routes are present in the project area.

5.7 Archaeological Impacts

The project area has been surveyed for the presence of cultural resources. Cultural sites exist within the project limits and may be affected by construction. If the sites cannot be avoided by construction, testing and excavation may be required. Currently, it cannot be determined whether the alternative that would follow the section line or the alternative located to the south of the section line would have greater impacts on cultural resources. Both alternatives would cross through a cultural resources site. Consultation with applicable agencies and tribes under Section 106 will be completed during the environmental clearance process. Specific archaeological requirements and mitigation measures will be addressed in the Categorical Exclusion.

5.8 Biological Impacts

A Biological Evaluation will be completed for this project. The Biological Evaluation will evaluate the US Fish and Wildlife Service's list of endangered, threatened, proposed, and candidate species potentially occurring in Maricopa County and will determine the presence of suitable habitat for sensitive species within or near the project area. Additionally, the Arizona Game and Fish Department will be contacted to determine the presence of wildlife of special concern in Arizona. The project limits will be surveyed for the presence of the Arizona Department of Agriculture's listed protected native plants. Any biological concerns and mitigation measures will be identified and addressed in the Categorical Exclusion.

5.9 Social and Economic Impacts

The project area falls within the jurisdictional boundaries of the Town of Queen Creek. No residential or commercial properties are located within the proposed roadway right-of-way. The proposed new right-of-way would be on land that is currently undeveloped. Residential development exists approximately 330 feet south of the proposed Riggs Road alignment between Ellsworth Road and Crismon Road and north of and adjacent to the proposed Riggs Road alignment between 220th Street and Signal Butte Road. Agricultural use occurs on all other lands along the proposed Riggs Road alignment. Future land uses will include residential, institutional (schools), transportation (bus facility), and commercial. Temporary access restrictions may occur on existing roads that will intersect the proposed Riggs Road. No existing low-income or minority neighborhoods are anticipated to be divided or isolated because of the Riggs Road construction.

Access restrictions, displacements, pedestrian/bicycle/vehicular traffic impacts, as well as possible effects on minority, low income, elderly, or female head of household populations will be identified during the environmental analysis and will be documented in the Categorical Exclusion.

5.10 Prime and Unique Farmland

Farmland within the project limits is classified as prime if irrigated and either protected from flooding or not frequently flooded during the growing season. Impacts to prime farmlands will be addressed in the Categorical Exclusion.

5.11 Air and Noise

The project limits are located in the Phoenix nonattainment area for particulate matter and ozone and in the Phoenix maintenance area for carbon monoxide. A qualitative air quality analysis and a discussion of mobile source air toxics will be required as part of the environmental clearance. Operation of equipment during construction will result in a temporary, localized deterioration of air quality. In addition, a quantitative noise analysis will be required to determine the impacts to noise-sensitive customers near the proposed Riggs Road. Air quality and noise impacts will be addressed in the Categorical Exclusion.

5.12 Visual Resources

The visual setting of the project area consists of agricultural fields and residential buildings in the foreground, with the Santan Mountains visible in the background. Construction of Riggs Road will result in a change to the visual character of the project area. The project area is not within an area managed by an agency with visual resource management objectives, and it is not located on a designated scenic road or byway. Impacts on visual resources will be addressed in the Categorical Exclusion.

6.0 ITEMIZED COST ESTIMATE

A detailed construction cost estimate has been prepared for the South-Shifted Alternative and is shown on page 37.

The unit prices are based on recent ADOT bid results. The basis for the quantity estimates and unit prices is summarized below.

- **Clearing and Grubbing per Acre** – Construction area quantities were computed by subtracting the existing farm road areas from the modeled limits of construction.

- **Removal of Structures and Obstructions per Lump Sum** – Quantities were based on anticipated removals of fence, signs, trees, propane and water tanks, irrigation structures, pipes, headwalls and concrete lined ditches.

- **Roadway Excavation per Square Yard** – Quantities were calculated as part of the InRoads computer modeling using the appropriate typical section, 3-D DTM files, and calculated at 100-foot intervals. Preliminary assumptions for an earthwork shrink factor are 15%.

- **Drainage Excavation** – Quantities were calculated based on the required number and size of retention basins.

- **Single Curb** – Quantities were based on the length of median curb required for the project.

- **Structural Roadway Section** – Quantities for the aggregate base and asphalt items were based upon the initial structural sections determined by preliminary geotechnical investigations.

- **Signing and Pavement Marking** – The cost was based on 3.25 miles of a 4-lane roadway.

- **Concrete Irrigation Ditches** – Quantities were based on the length of existing concrete irrigation ditches which would need to be replaced.

- **Utility Relocation** – The cost was based on the relocation of overhead power lines to underground, the relocation of a utility vault and transformer, and the relocation of gas and water valves/meters.

- **Lighting** – The cost was based on lighting the Riggs Road intersections of Ellsworth Road, Crismon Road, Signal Butte Road, and Rittenhouse Road and providing lighting control cabinets at Ellsworth Road and Rittenhouse Road.

- **Traffic Signals** – The cost was based on providing a traffic signal at the Riggs Road intersection of Rittenhouse Road and providing conduits for lighting at the Riggs Road intersections of Crismon Road, Signal Butte Road, 212th, 220th, and 228th Streets. The cost of the Ellsworth Road traffic signal will be included in a future MCDOT project.

- **Noise Mitigation** – The cost was based on a preliminary noise analysis. Recommended mitigation includes 9-10 foot tall masonry walls to benefit properties between 220th Street and Signal Butte Road. The unit cost used for the masonry walls was $20/SF based on recent ADOT bid results.

- **Right-of-Way** – The right-of-way costs for the project were based on the assumption that no right-of-way will be dedicated and that the cost is $150,000 per acre.

Table 6.1

ARIZONA DEPARTMENT OF TRANSPORTATION

Estimated Engineering Construction Cost

ITEMIZED ESTIMATE

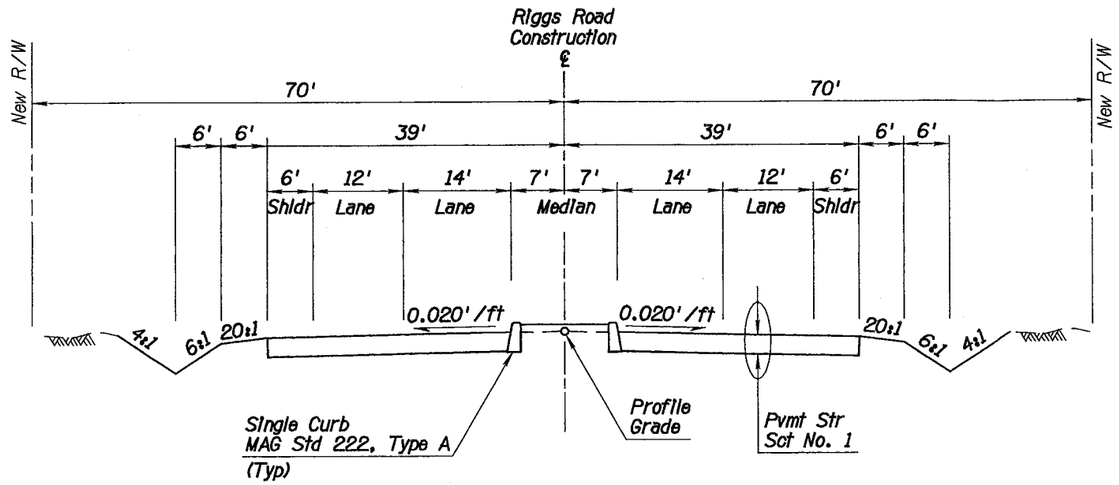
TRACS Number: SS60503D
Project Location: Riggs Road - Ellsworth to Meridian
Project Description: New 4-Lane Roadway with Raised Medians

Item Number	Item Description	Unit	Quantity	Unit Price	Amount
2010011	Clearing & Grubbing	AC	44	$300.00	$13,200
2020001	Removal of Structures and Obstructions	LSUM	1	$100,000.00	$100,000
2030301	Roadway Excavation	CY	46050	$6.00	$276,300
2030401	Drainage Excavation	CY	9000	$6.00	$54,000
2030901	Borrow	CY	0	N/A	$0
	Pavement (5" AC, 12" AB)	SY	133600	$30.00	$4,008,000
	MAG Single Curb, Std 222, Type A	LF	29350	$14.00	$410,900
	Signing and Marking	LSUM	1	$37,000.00	$37,000
	Concrete Irrigation Ditches	LF	8850	$50.00	$442,500
	Drainage	LSUM	1	N/A	$0
	Traffic Signal & Lighting @ Rittenhouse	LSUM	1	$320,000.00	$320,000
	Additional Lighting @ Other Intersections	LSUM	1	$140,000.00	$140,000
	Additional Traffic Signals (Conduits)	LSUM	1	$60,000.00	$60,000
	Noise Mitigation	LSUM	1	$455,000.00	$455,000
				SUBTOTAL =	**$6,317,000**
	Contingencies	COST	15%		**$947,550**
				SUBTOTAL =	**$7,265,000**
	EROSION CONTROL AND POLLUTION PREVENTION	COST	1%		$72,650
	CONTRACTOR QUALITY CONTROL	COST	2%		$145,300
	FURNISH WATER	COST	1%		$72,650
	DUST PALLIATIVE	COST	1%		$72,650
	MAINTENANCE AND PROTECTION OF TRAFFIC	COST	1%		$72,650
				SUBTOTAL =	**$7,701,000**
	MOBILIZATION	COST	4%		$308,040
				SUBTOTAL =	**$8,009,000**
	Construction Engineering	COST	10%		$800,900
				SUBTOTAL =	**$8,810,000**
	UTILITY RELOCATION	COST			$1,100,000
	RAILROAD CROSSING	COST			$400,000
				SUBTOTAL =	**$10,310,000**
	ACQUIRED RIGHT-OF-WAY	COST		**SUBTOTAL =**	**$7,600,000**
				PROJECT TOTAL =	**$17,910,000**

APPENDIX

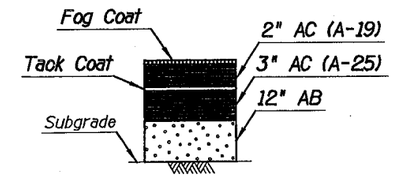
A. TYPICAL SECTIONS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			



PHASE I
RIGGS ROAD
4-LANE SECTION

ELLSWORTH ROAD TO MERIDIAN ROAD



Total Thickness = 17"

SECTION NO. 1
PAVEMENT STRUCTURAL SECTIONS

	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
1526 E. Broadway, 25th Dr., Ste. 33, Mesa, Arizona 85204
Phone (480) 892-0028 Fax (480) 543-2358

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

DESIGN SHEET
TYPICAL SECTIONS

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

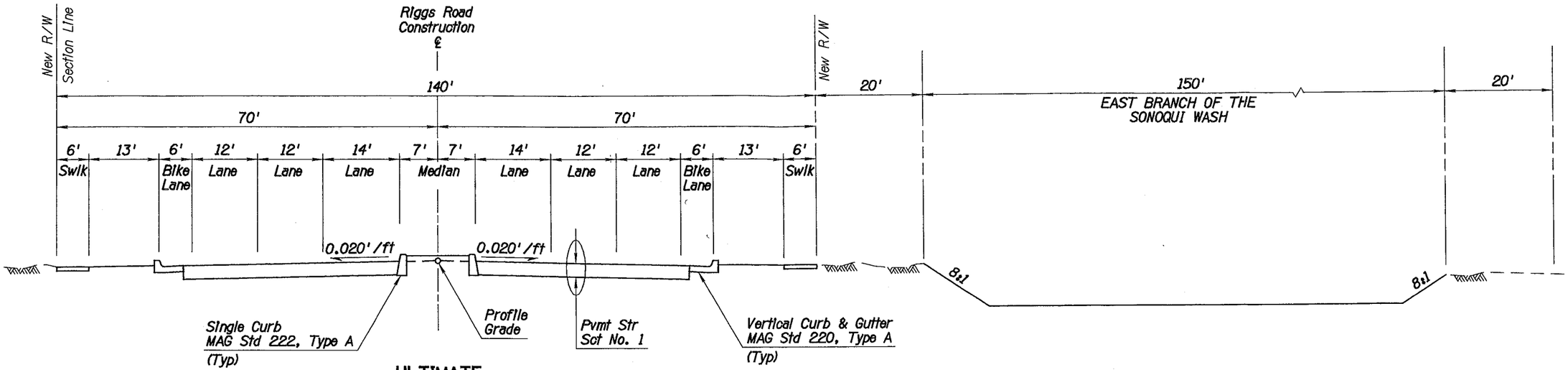
SHEET 1 OF 2

TRACS NO. SS60503D | STP-QCR-0(001A | ___ OF ___

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

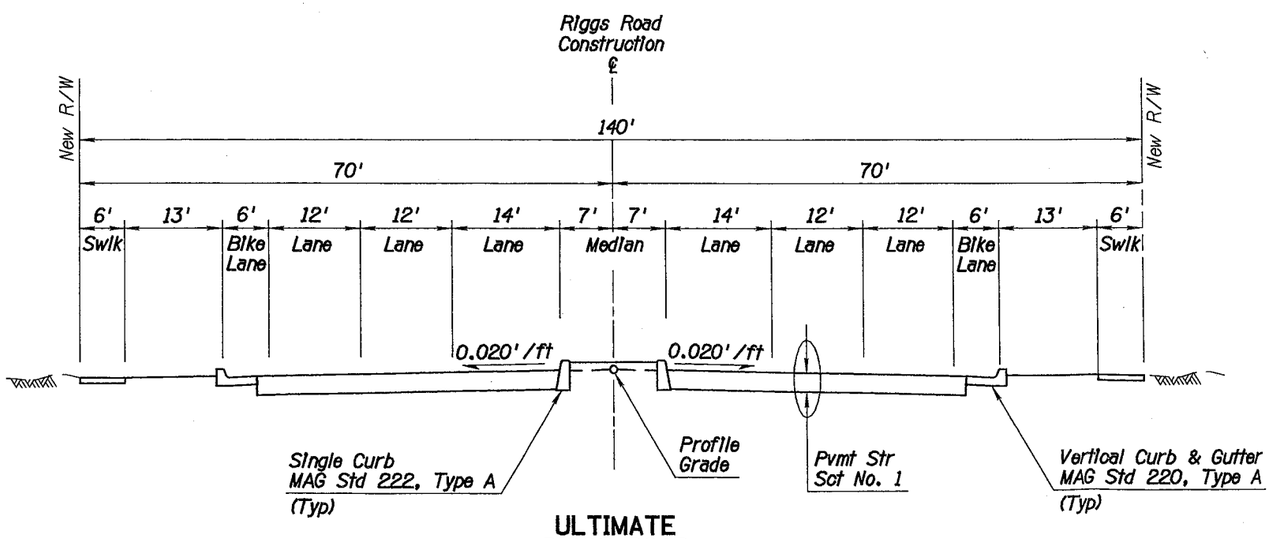
oooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			



ULTIMATE RIGGS ROAD 6-LANE SECTION

1/4 MILE EAST OF ELLSWORTH ROAD TO CRISMON ROAD
(Alignment varies between Ellsworth Road and a 1/4 mile east)



ULTIMATE RIGGS ROAD 6-LANE SECTION

CRISMON ROAD TO MERIDIAN ROAD

	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

eps group, Inc.
Engineers, Planners & Surveyors
7250-1 N. Country Club Dr., Ste. 33, Mesa, Arizona 85210
Phone (480) 962-5250 Fax (480) 962-5259

DESIGN SHEET
TYPICAL SECTIONS

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

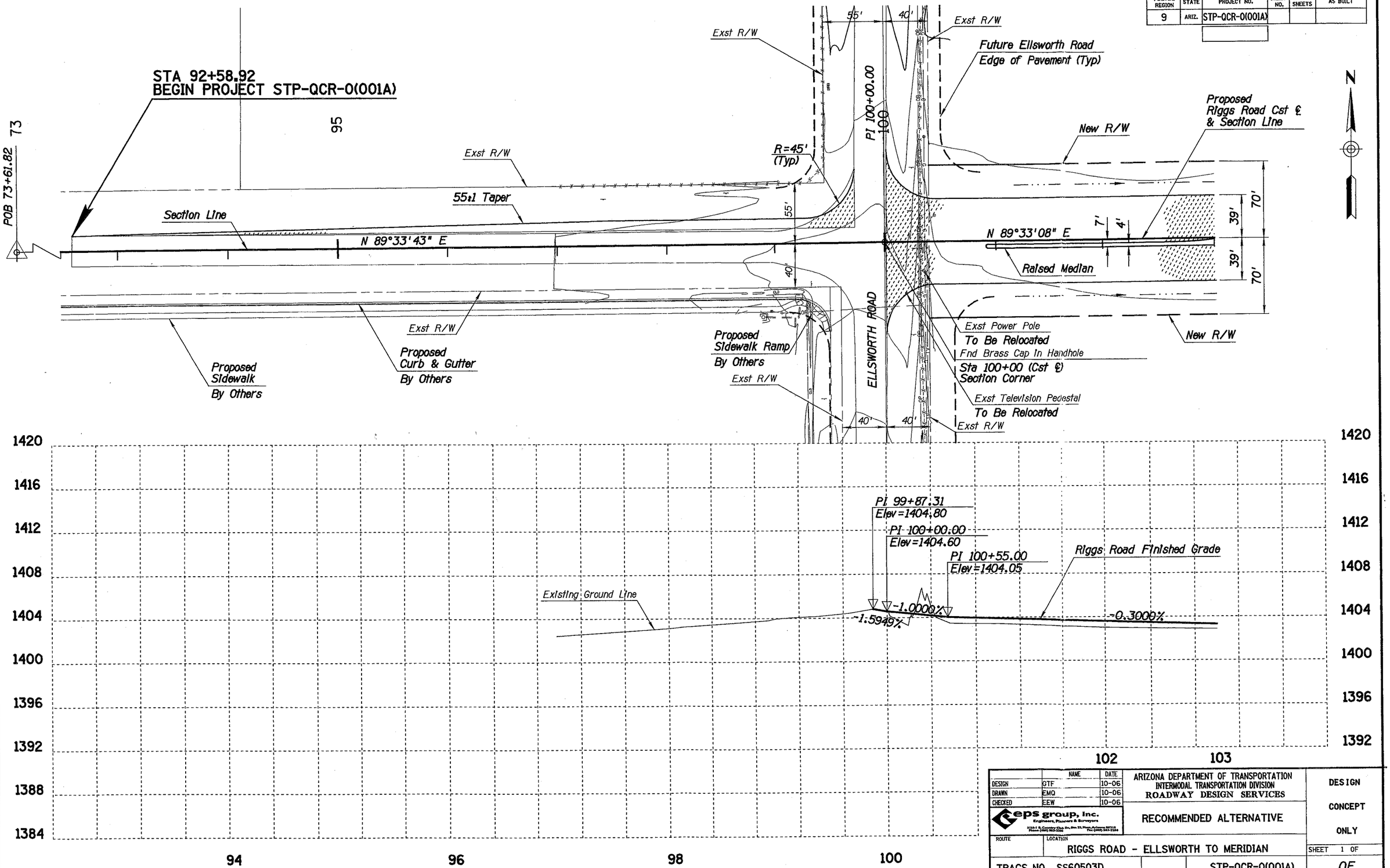
SHEET 2 OF 2

TRACS NO. SS60503D | STP-QCR-0(001A | ___ OF ___

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

• B. PLAN PROFILE FOR RECOMMENDED ALTERNATIVE

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			



	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 1 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS | REVISIONS | LOCATION | DATE

oooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

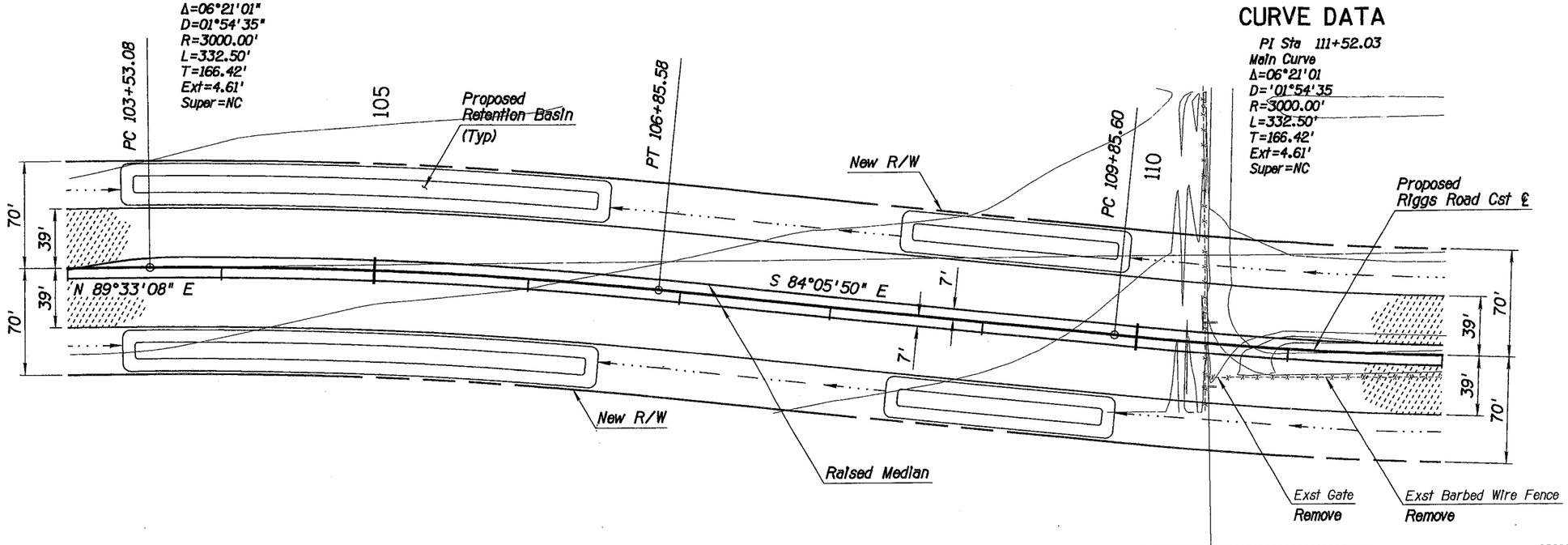
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			

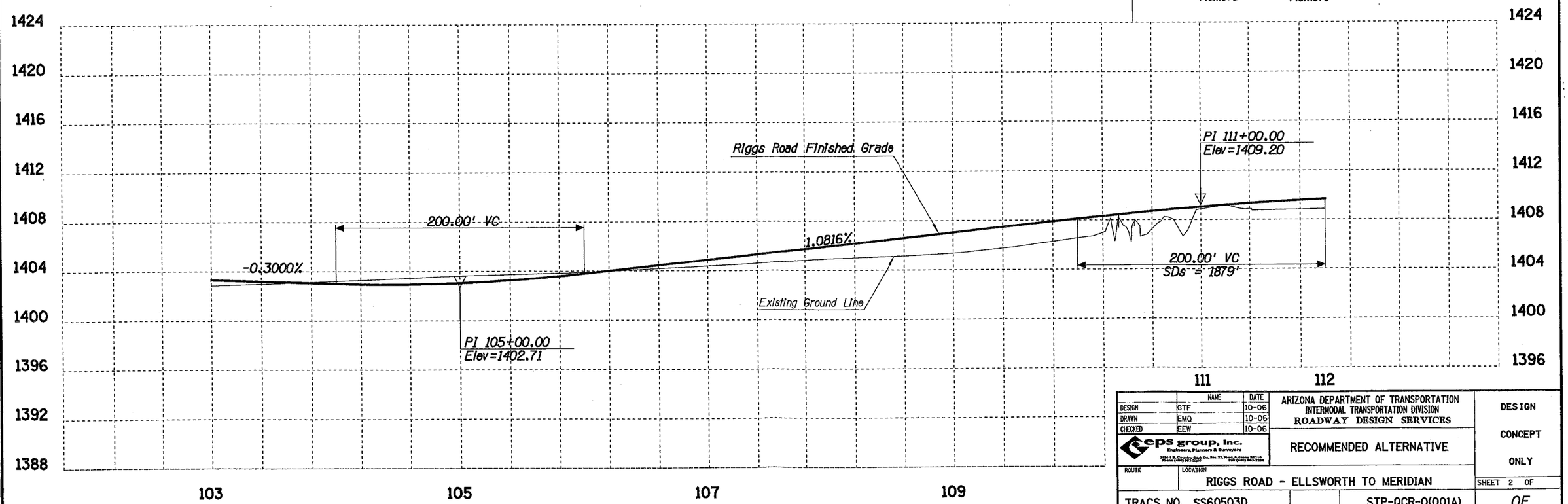
CURVE DATA

PI Sta 105+19.50
Main Curve
Δ=06°21'01"
D=01°54'35"
R=3000.00'
L=332.50'
T=166.42'
Ext=4.61'
Super=NC

CURVE DATA

PI Sta 111+52.03
Main Curve
Δ=06°21'01
D='01°54'35
R=3000.00'
L=332.50'
T=166.42'
Ext=4.61'
Super=NC





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
3226 E. Chandler Blvd. Ste. 72, Phoenix, Arizona 85048
Phone (480) 940-2320 Fax (480) 940-2324

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

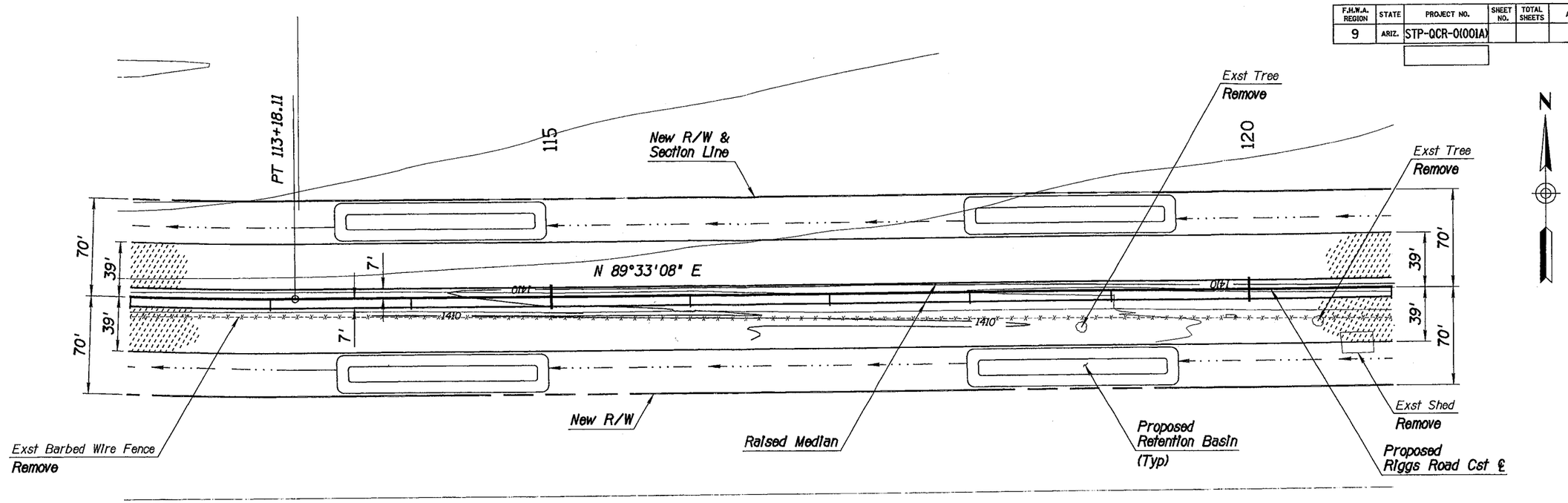
SHEET 2 OF ___ OF ___

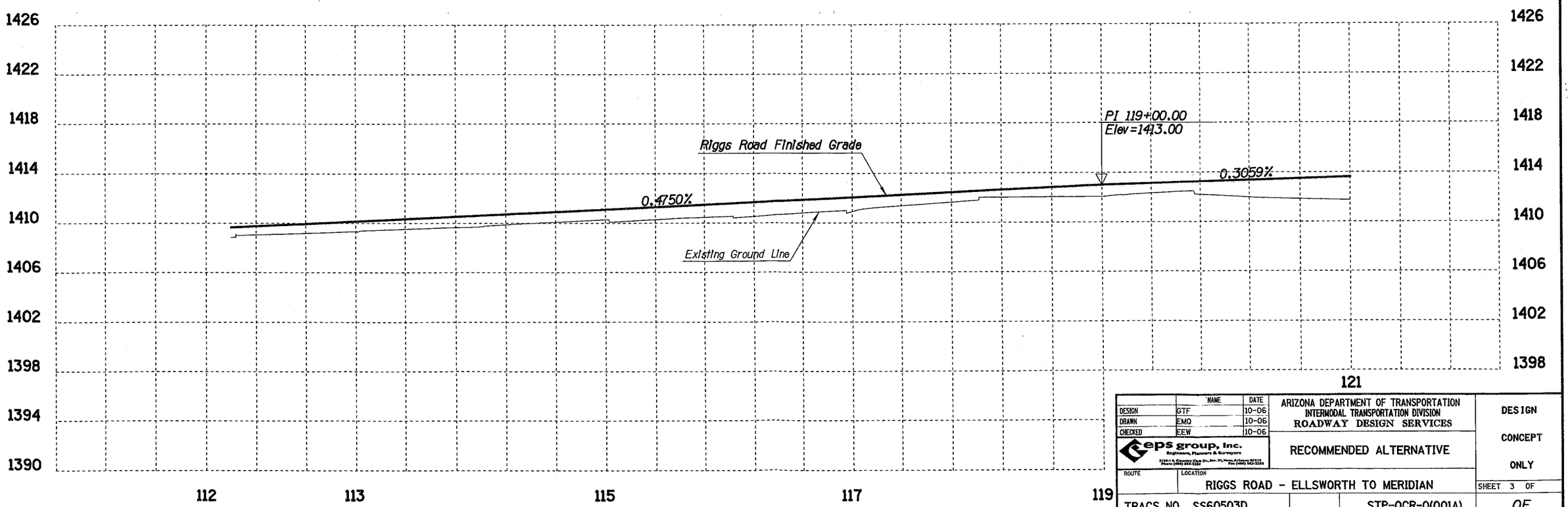
TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

oooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMO	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
3124-1 N. Country Club Dr., Ste. 11, Mesa, Arizona 85215
Phone (480) 892-2220 Fax (480) 962-3539

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

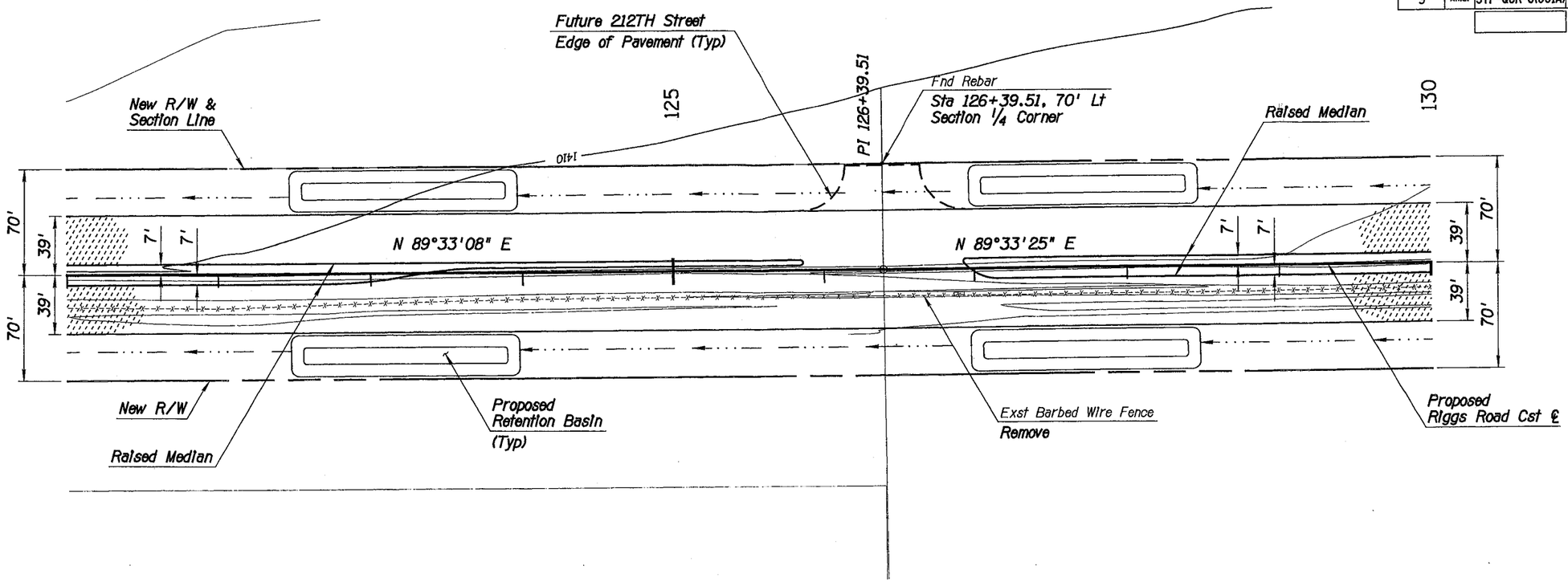
ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

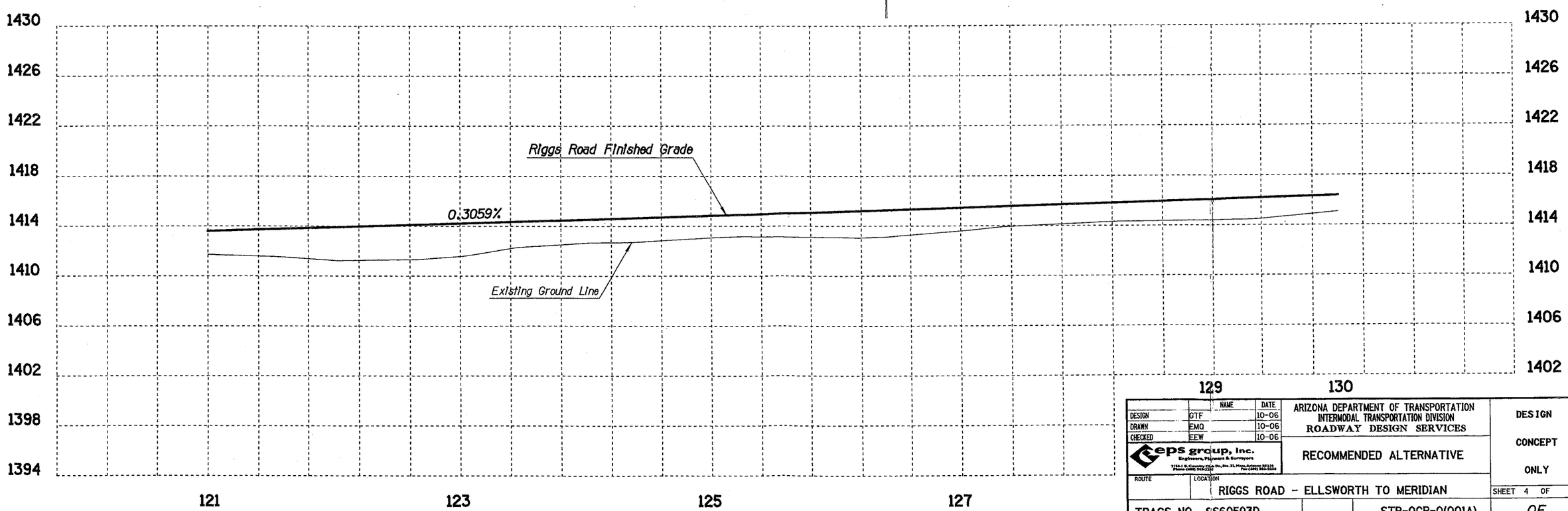
SHEET 3 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
23564 N. Gateway Circle Dr., Ste. 23, Surprise, Arizona 85388
Phone (480) 502-2232 Fax (480) 502-2234

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

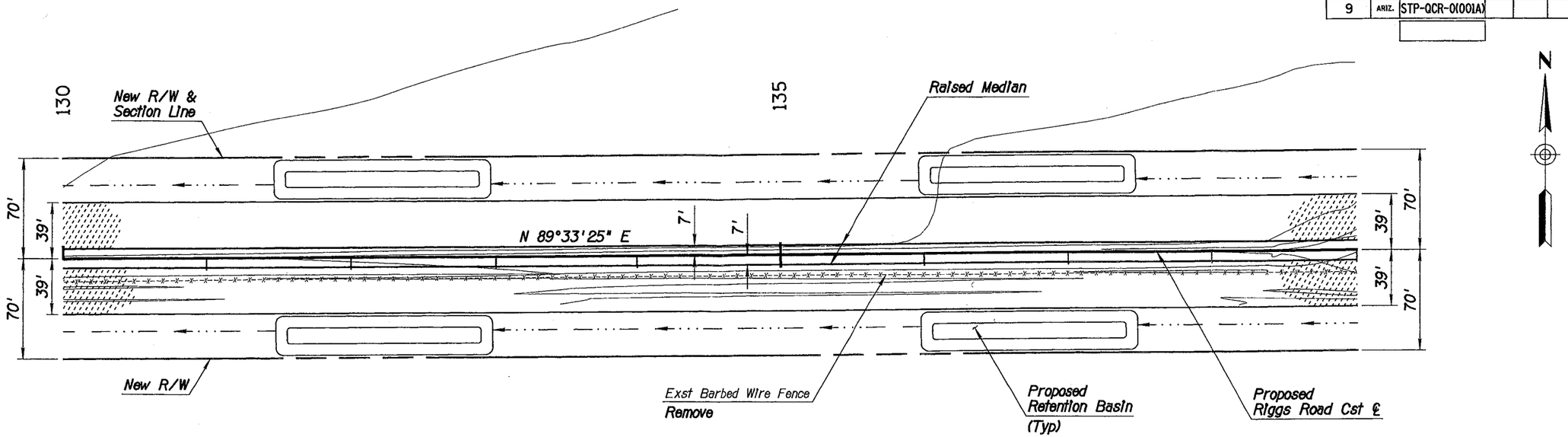
SHEET 4 OF ___ OF ___

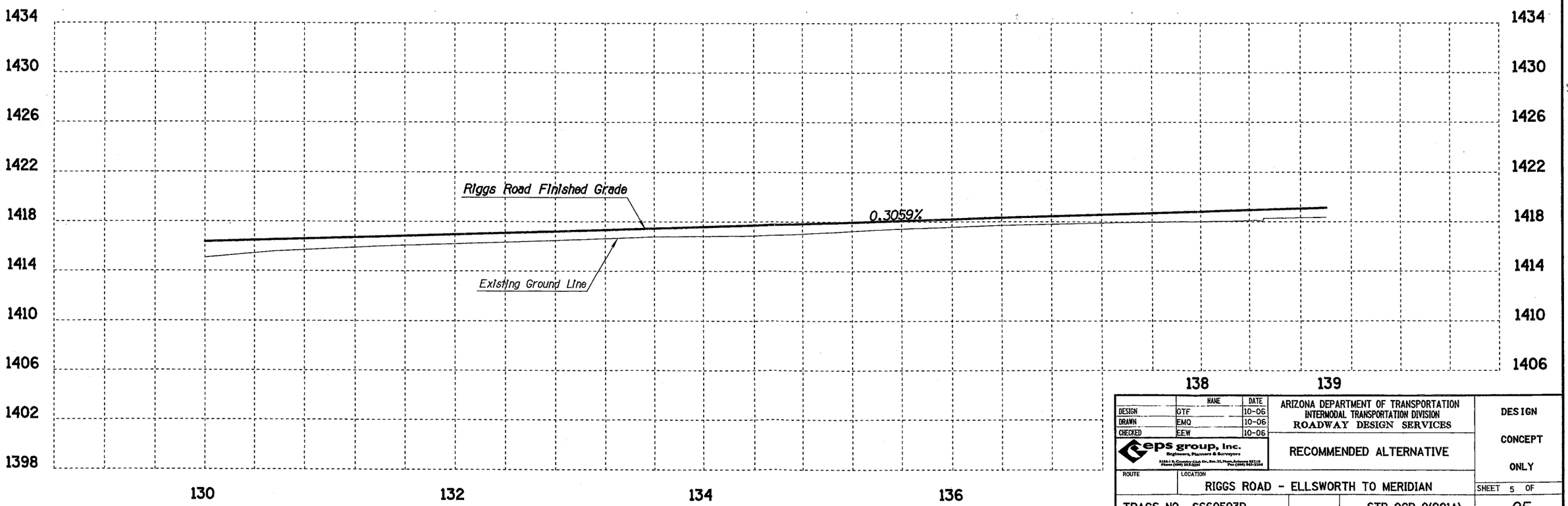
TRACS NO. SS60503D | STP-QCR-0(001A)

DATE- | LOCATION- | REVISIONS- | FINISHED PLANS- | SURVEY NO.

ooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc.
Engineers, Planners & Surveyors
9255 E. Country Club Dr., Ste. 31, Mesa, Arizona 85115
Phone (480) 854-8200 Fax (480) 945-2044

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

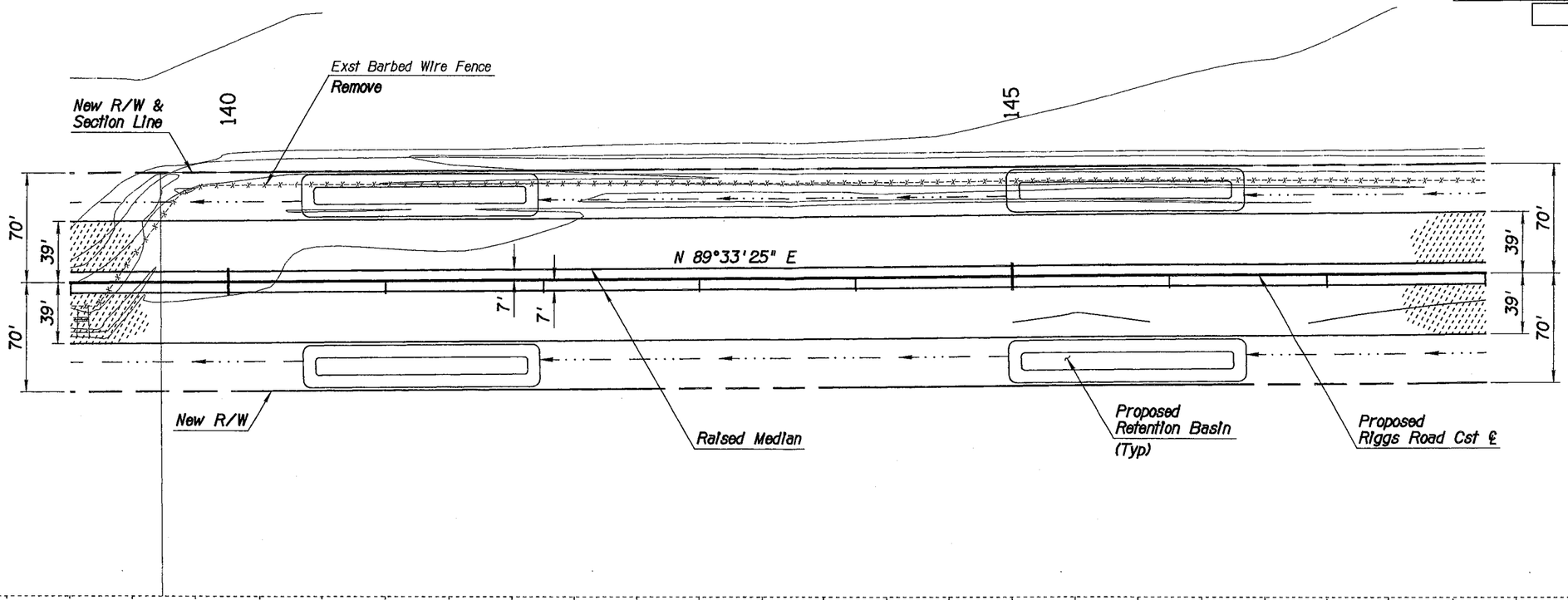
ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

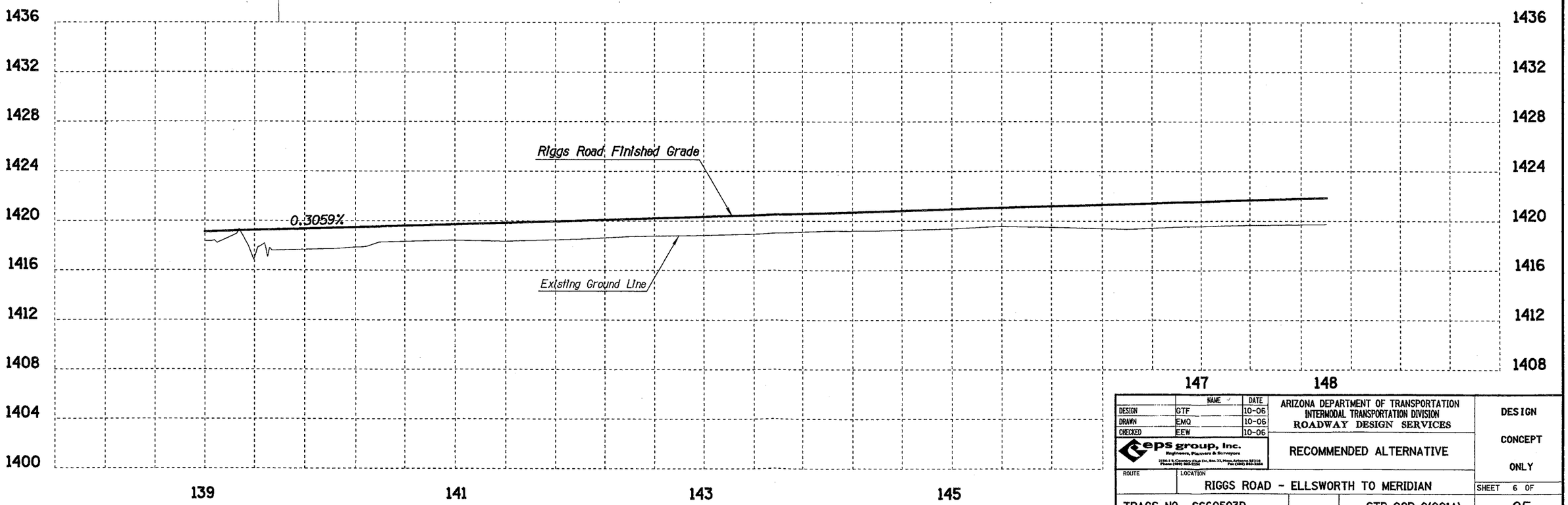
SHEET 5 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
3150-1 S. Country Club Dr., Box 33, Mesa, Arizona 85210
Phone (480) 835-8300 Fax (480) 962-3884

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

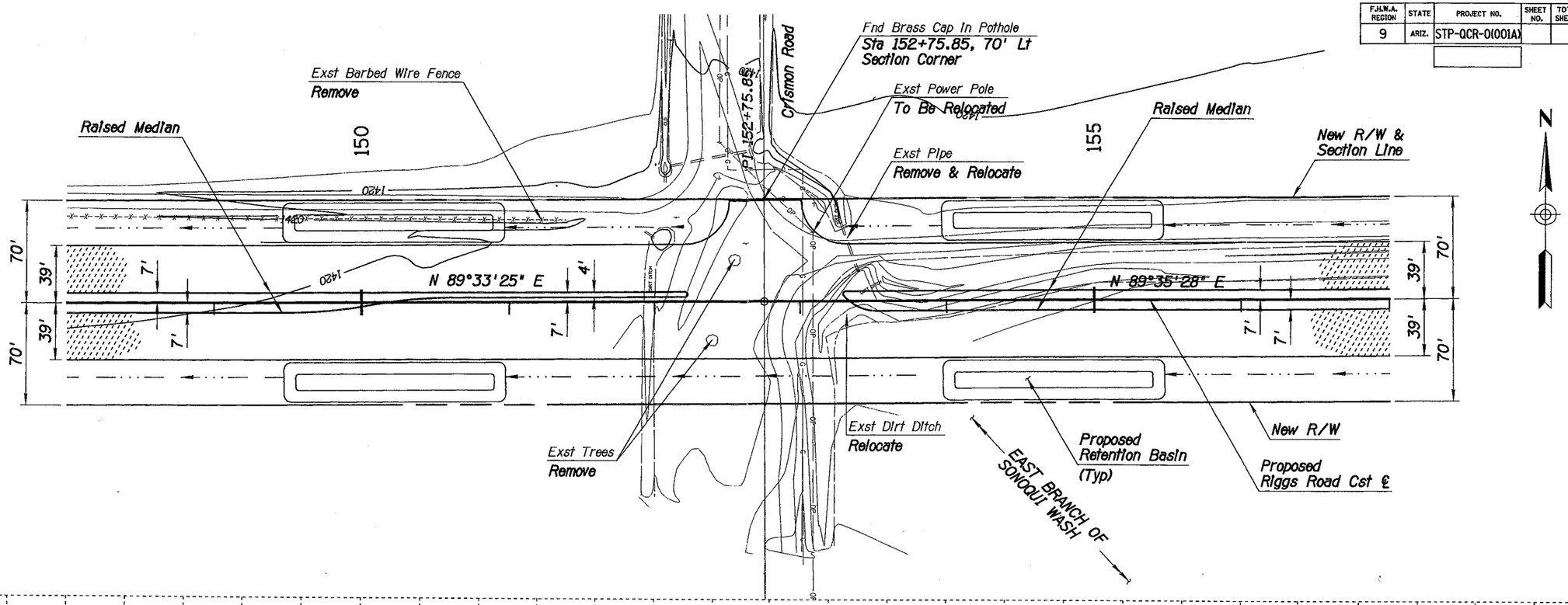
SHEET 6 OF ___ OF ___

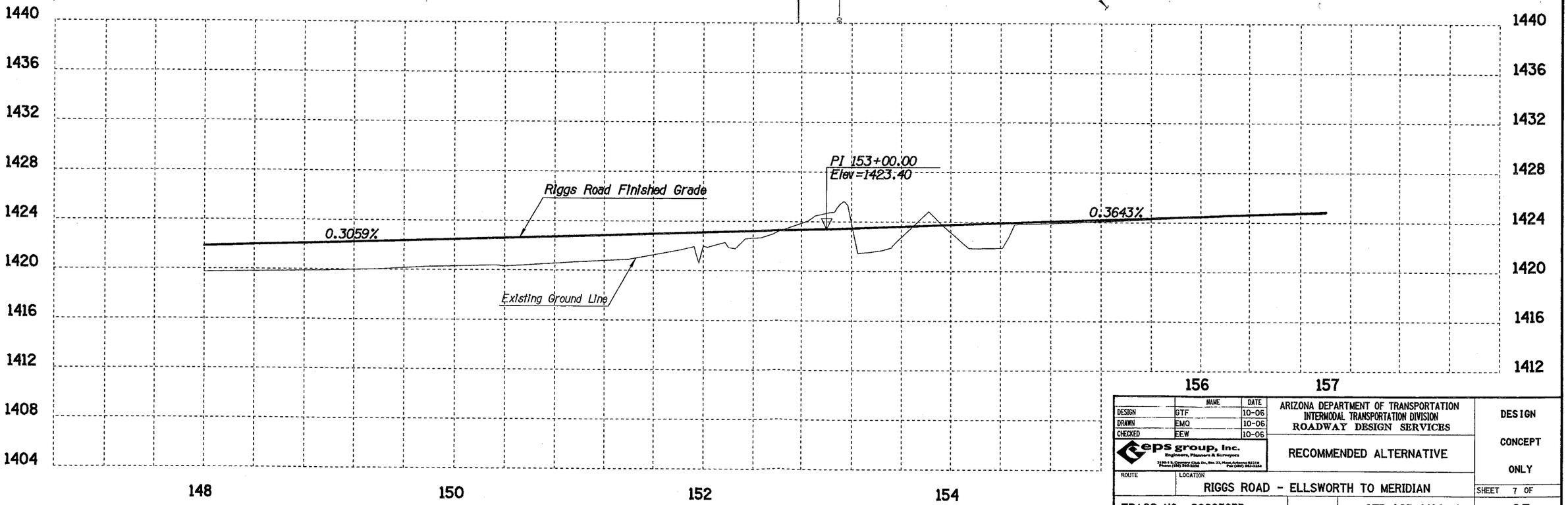
TRACS NO. SS60503D | STP-QCR-0(001A)

DATE- | LOCATION- | REVISIONS- | FINISHED PLANS- | SURVEY NO.

ooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
7135 E. Camelback Club Dr., Ste. 33, Hotel, Arizona 85310
Phone (480) 994-0338 Fax (480) 945-5184

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

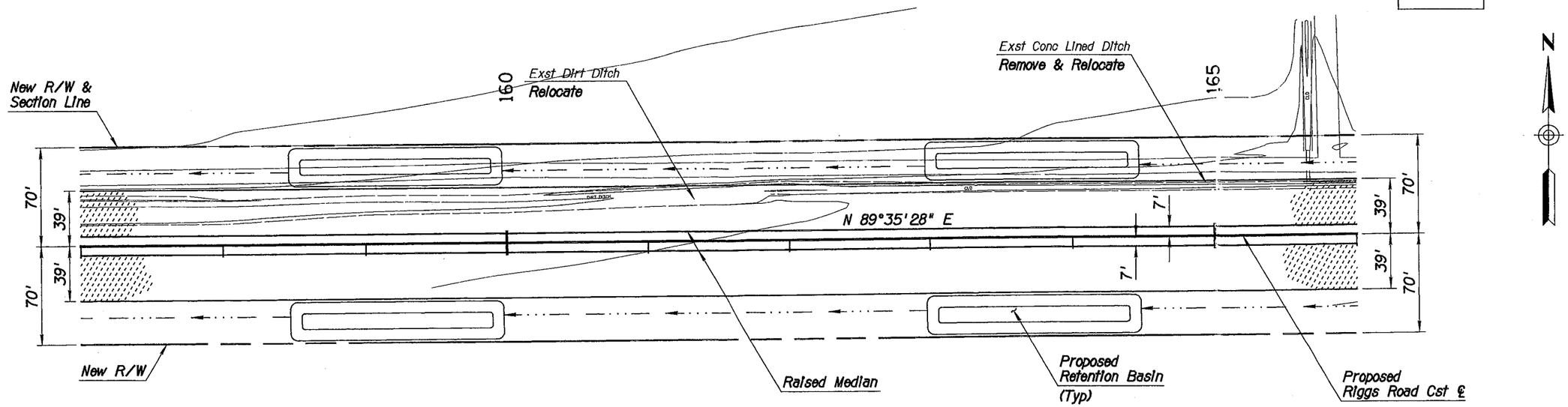
SHEET 7 OF ___ OF ___

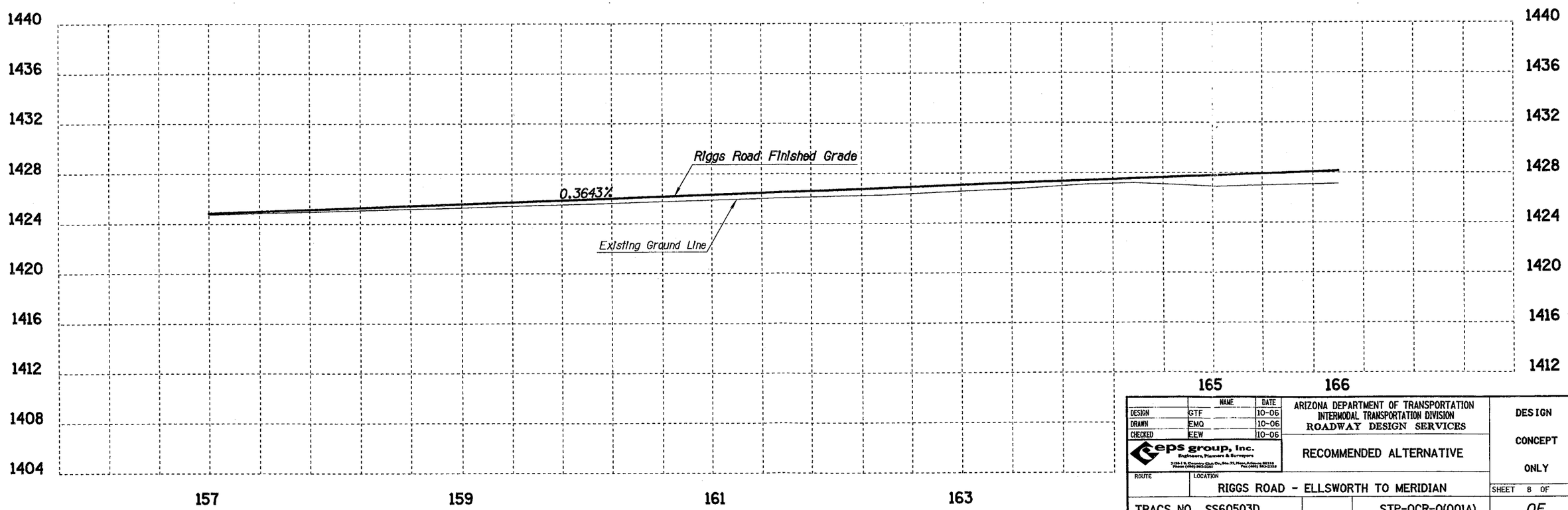
TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

oooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc.
Engineers, Planners & Surveyors
3100 S. Gilbert Rd., Ste. 2, Chandler, Arizona 85286
Phone (480) 895-0320 Fax (480) 895-0338

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

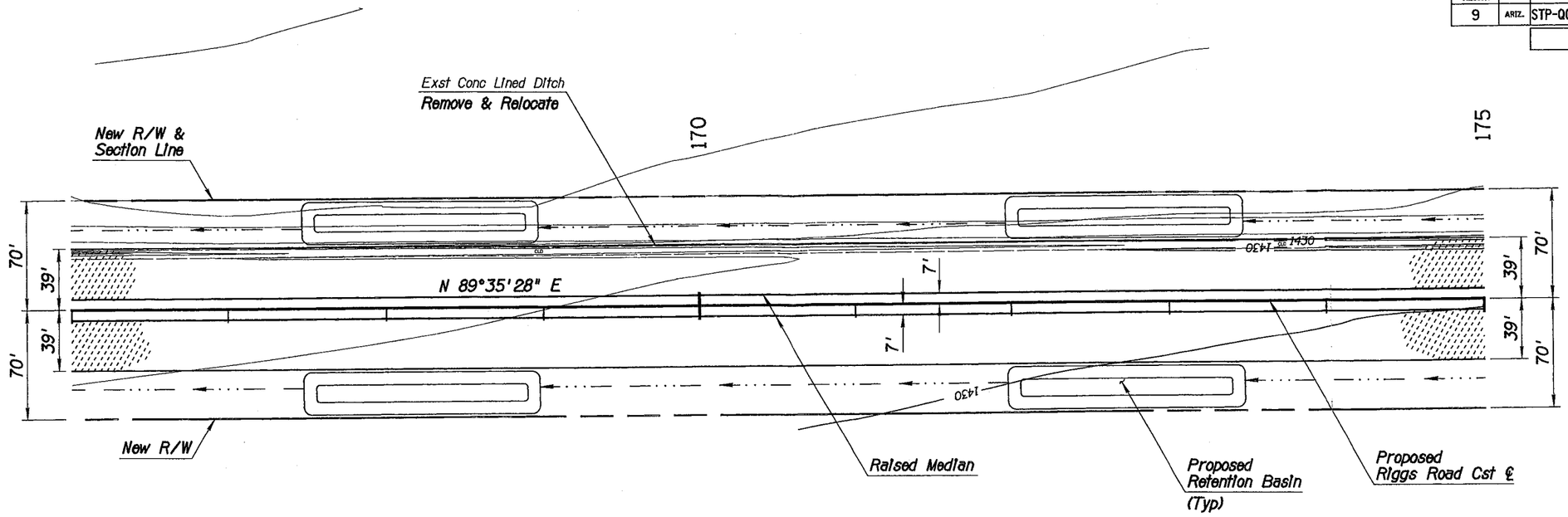
ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

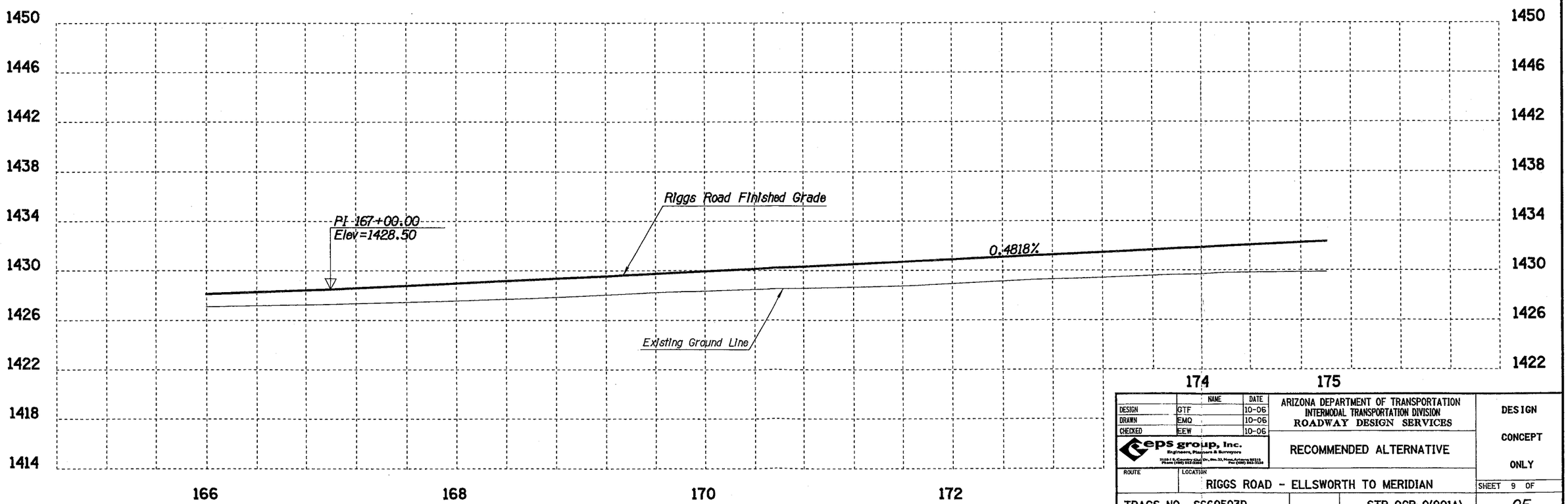
SHEET 8 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
7144 E Stetson Dr., Ste. 33, Mesa, Arizona 85251
Phone (480) 922-2280 Fax (480) 922-2284

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE

LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 9 OF ___ OF ___

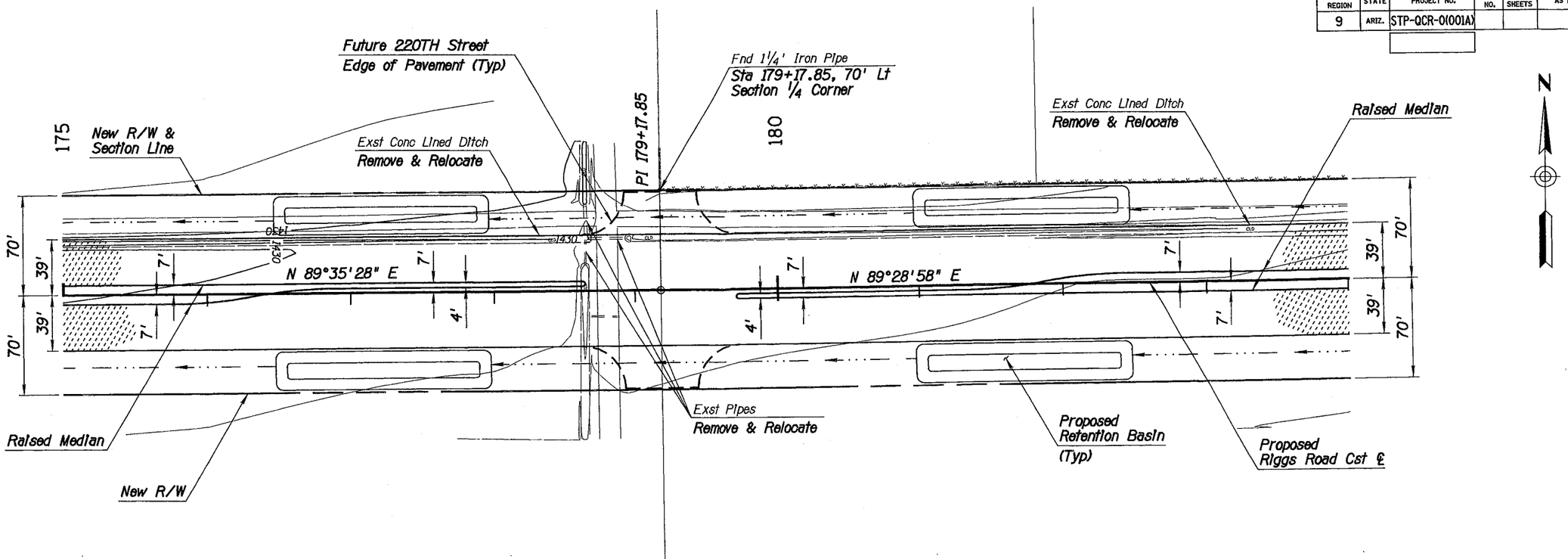
TRACS NO. SS60503D

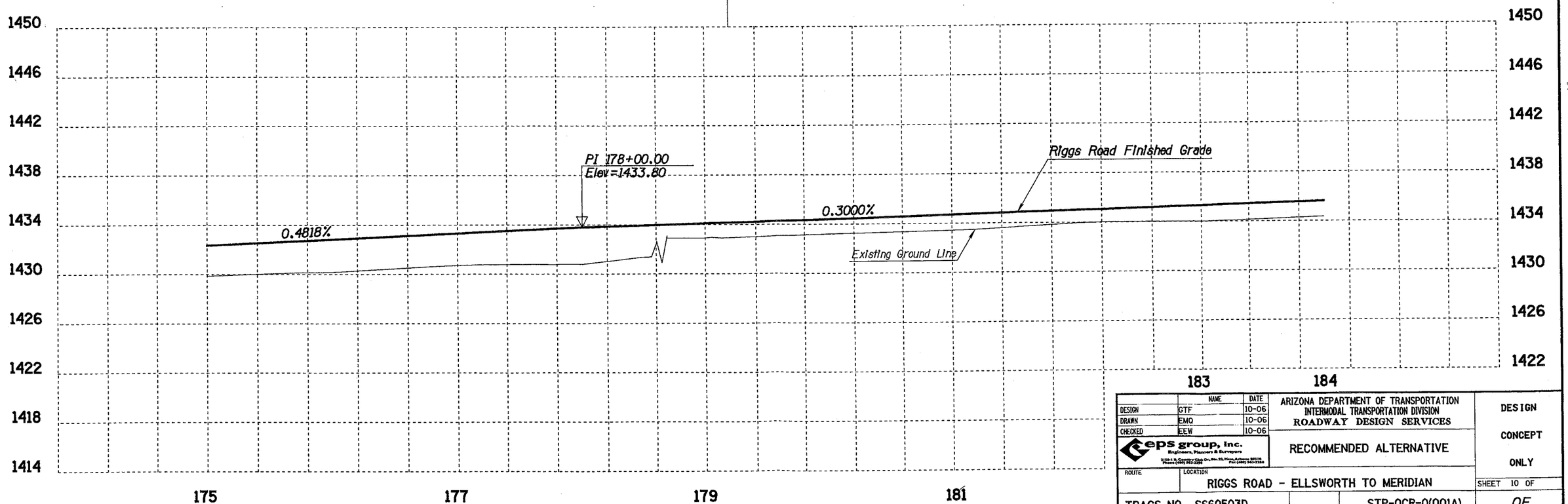
STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

ooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc.
Engineers, Planners & Surveyors
3120-1 N. Country Club Dr., Ste. 33, Mesa, Arizona 85215
Phone (480) 962-5305 Fax (480) 962-3388

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

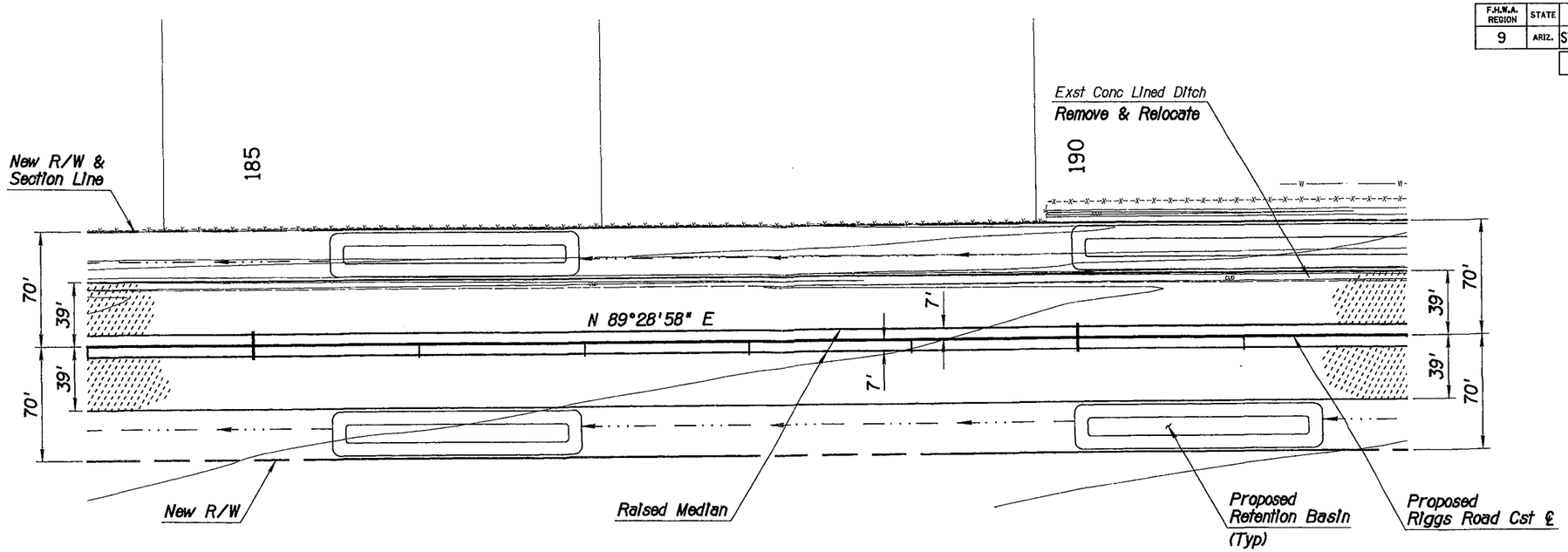
ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

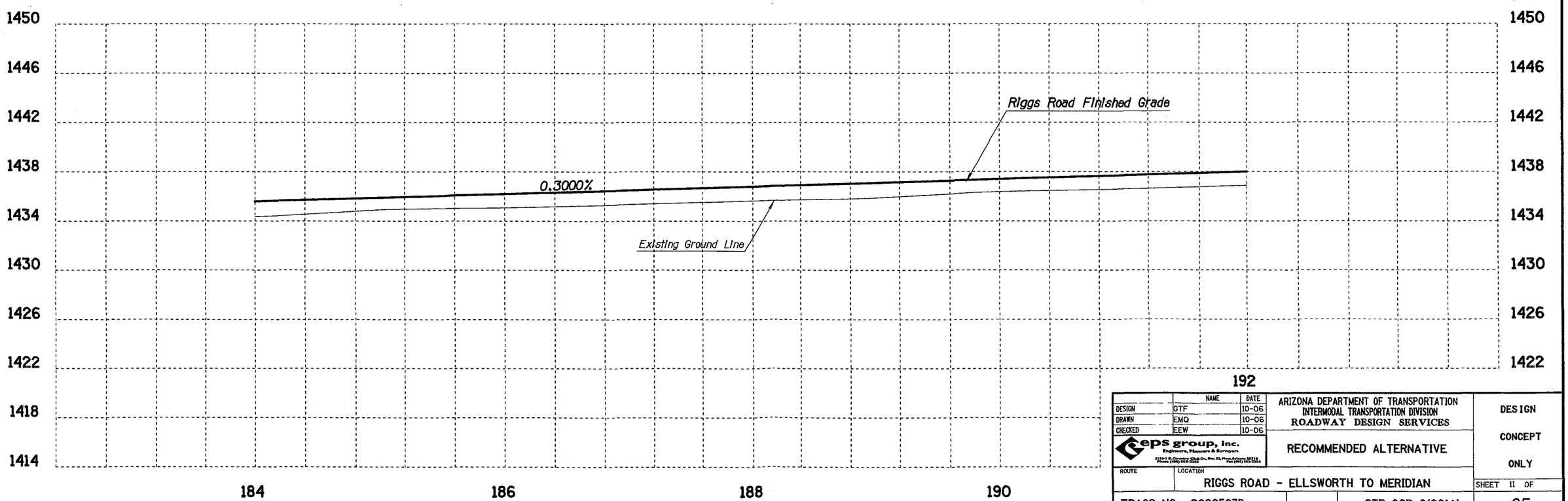
SHEET 10 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

DATE- | LOCATION- | REVISIONS- | FINISHED PLANS- | SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
3200 E. Broadway Blvd., Ste. 33, Tucson, Arizona 85716
Phone (520) 882-3350 Fax (520) 882-3384

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

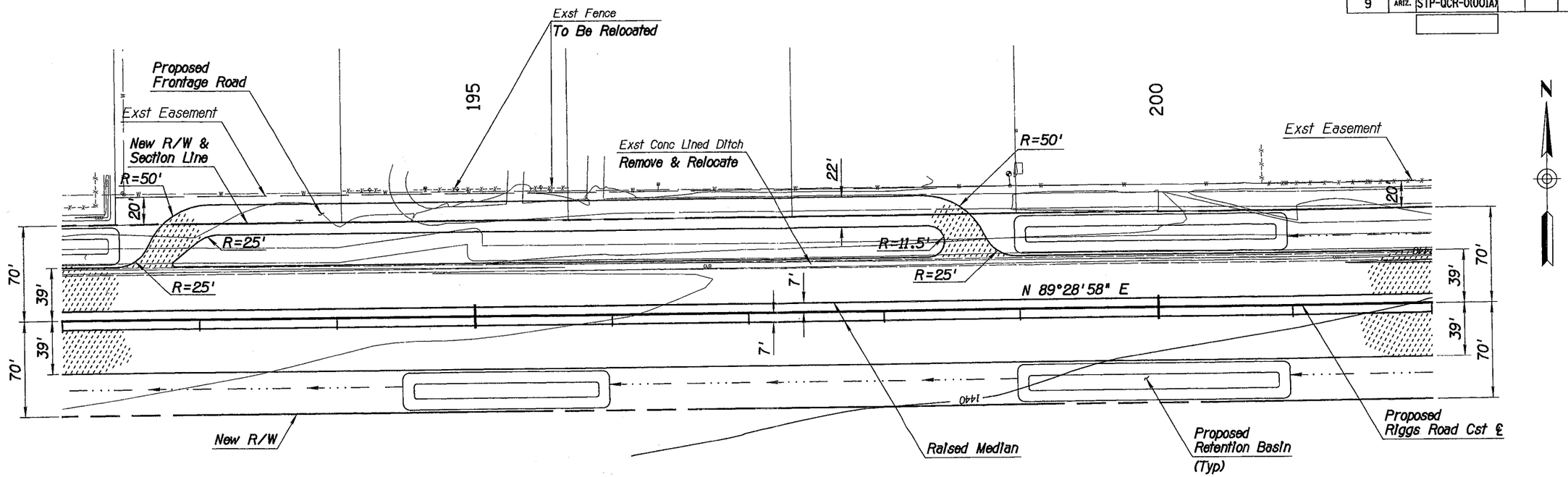
SHEET 11 OF ___ OF ___

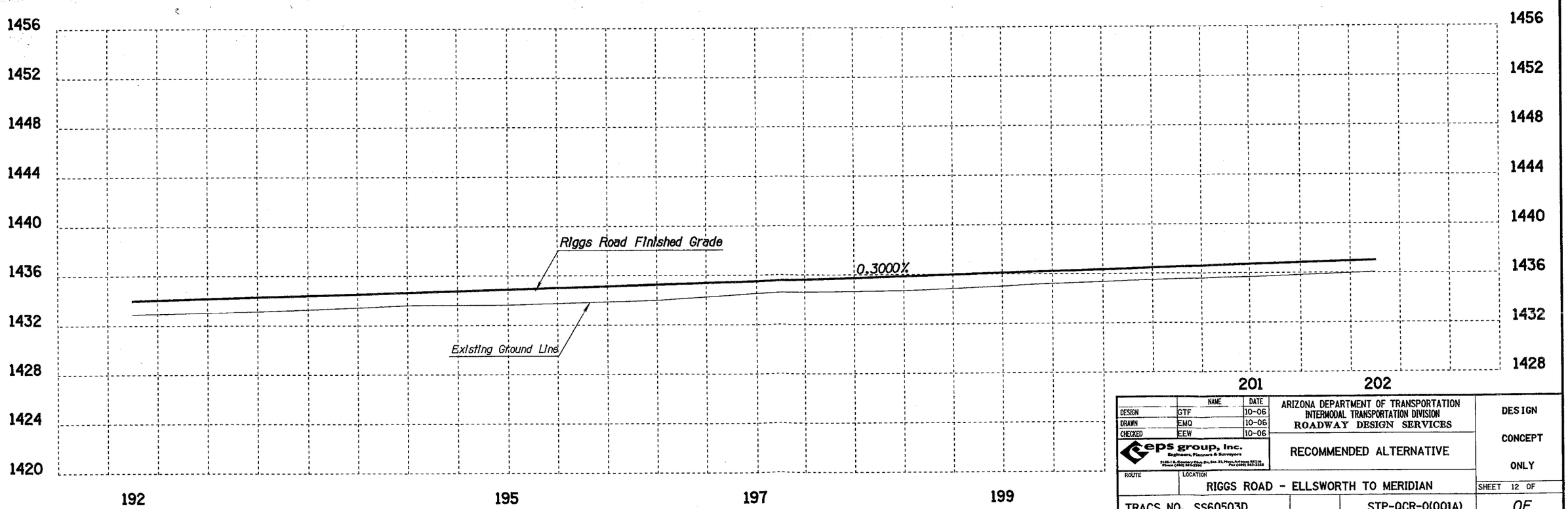
TRACS NO. SS60503D | STP-QCR-0(001A)

DATE- | LOCATION- | REVISIONS- | FINISHED PLANS- | SURVEY NO.

SYSTIME DGNSPECIFICATION

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
7135 E. Camelback Road, Ste. 33, Mesa, Arizona 85251
Phone (480) 945-3356 Fax (480) 945-3154

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

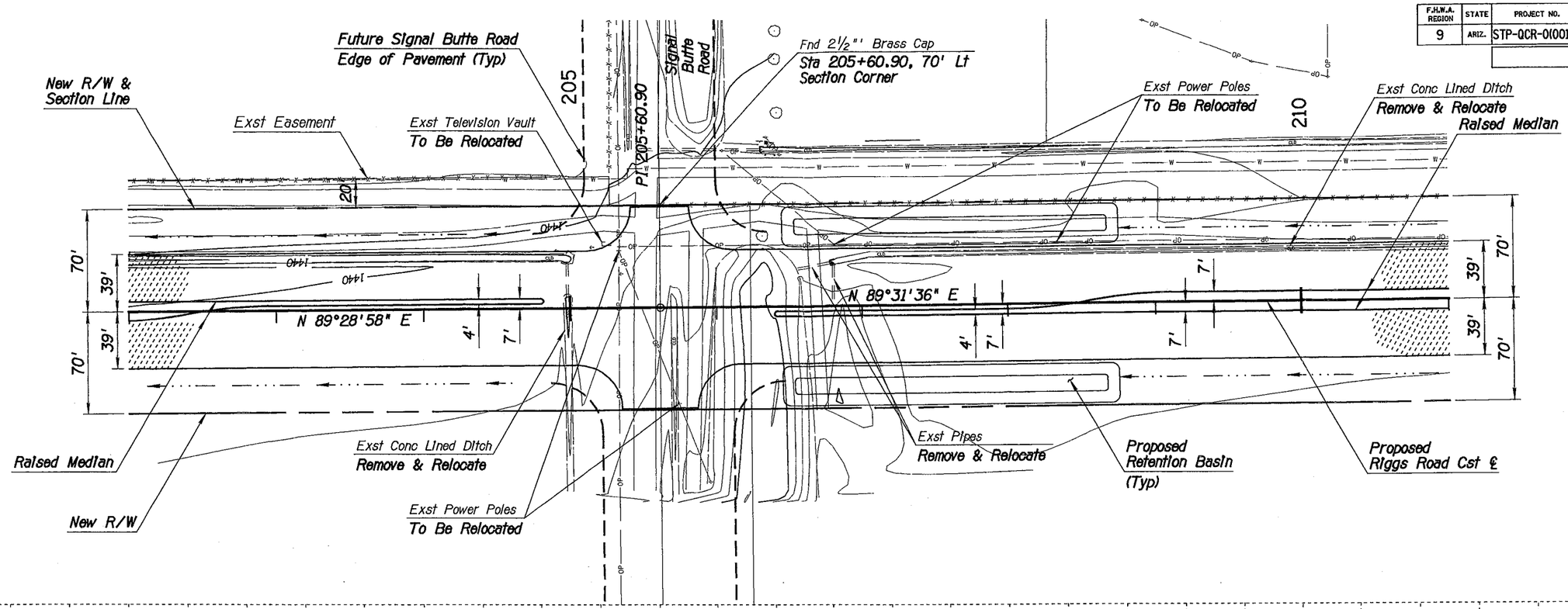
SHEET 12 OF ___ OF ___

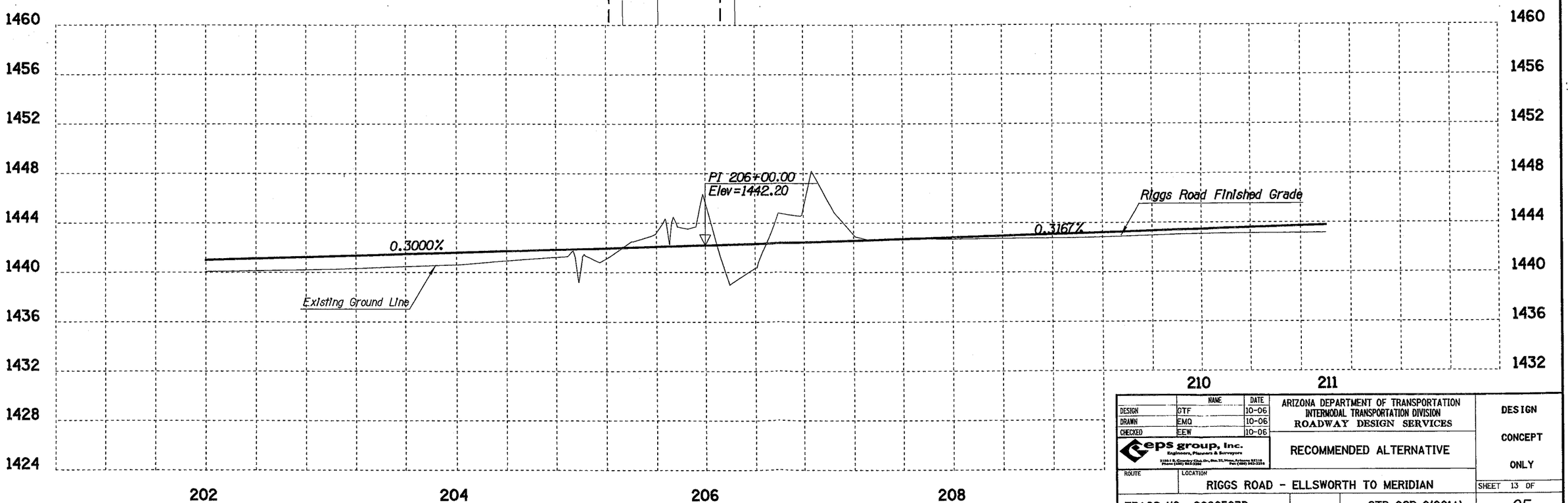
TRACS NO. SS60503D | STP-QCR-0(001A)

DATE- | LOCATION- | REVISIONS- | FINISHED PLANS- | SURVEY NO.

oooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
3150 S. Country Club Dr., Ste. 31, Mesa, Arizona 85210
Phone (480) 892-2266 Fax (480) 892-3356

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

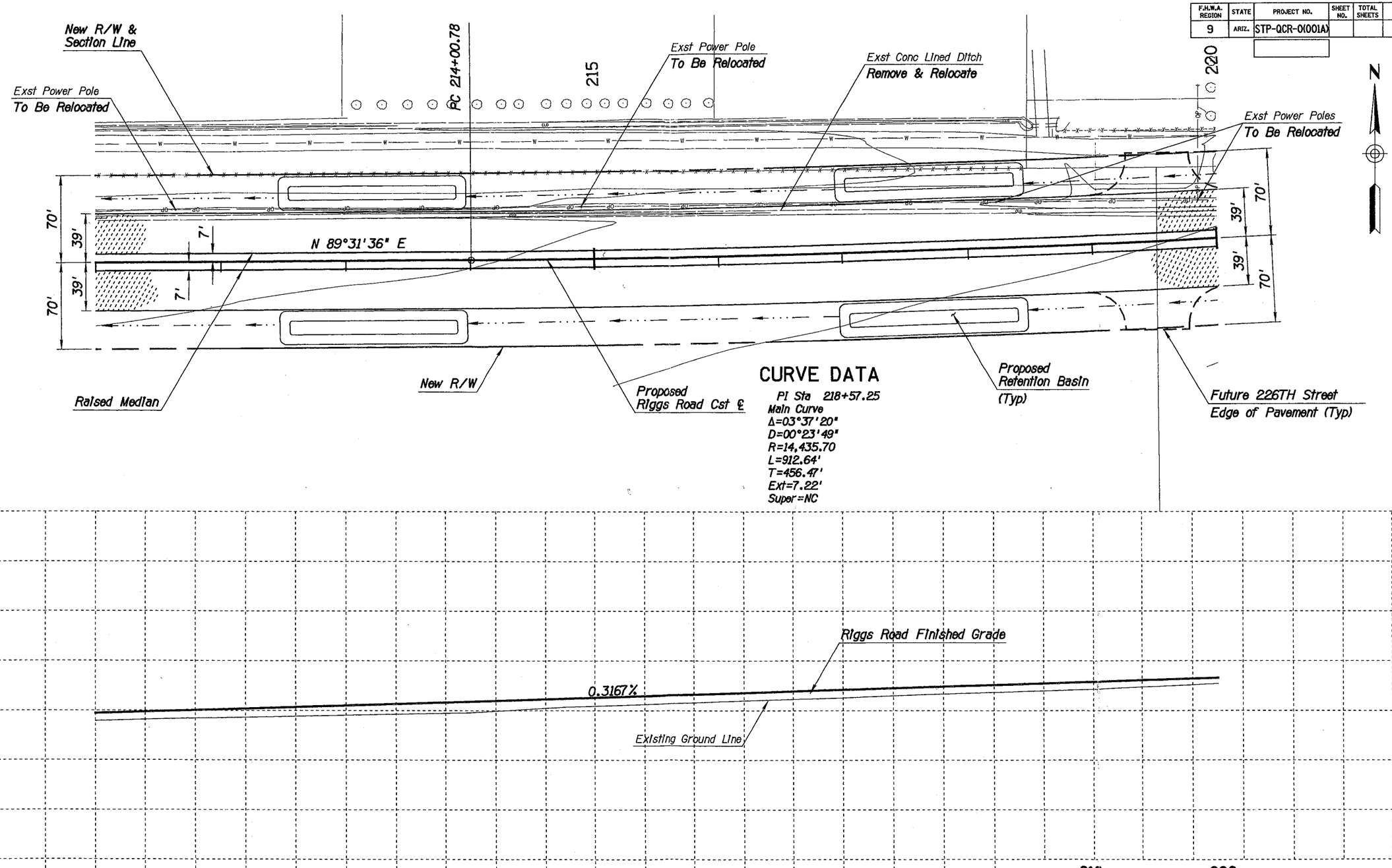
SHEET 13 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

DATE- | LOCATION- | REVISIONS- | FINISHED PLANS- | SURVEY NO.

oooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			



	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc. Engineers, Planners & Surveyors

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 14 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

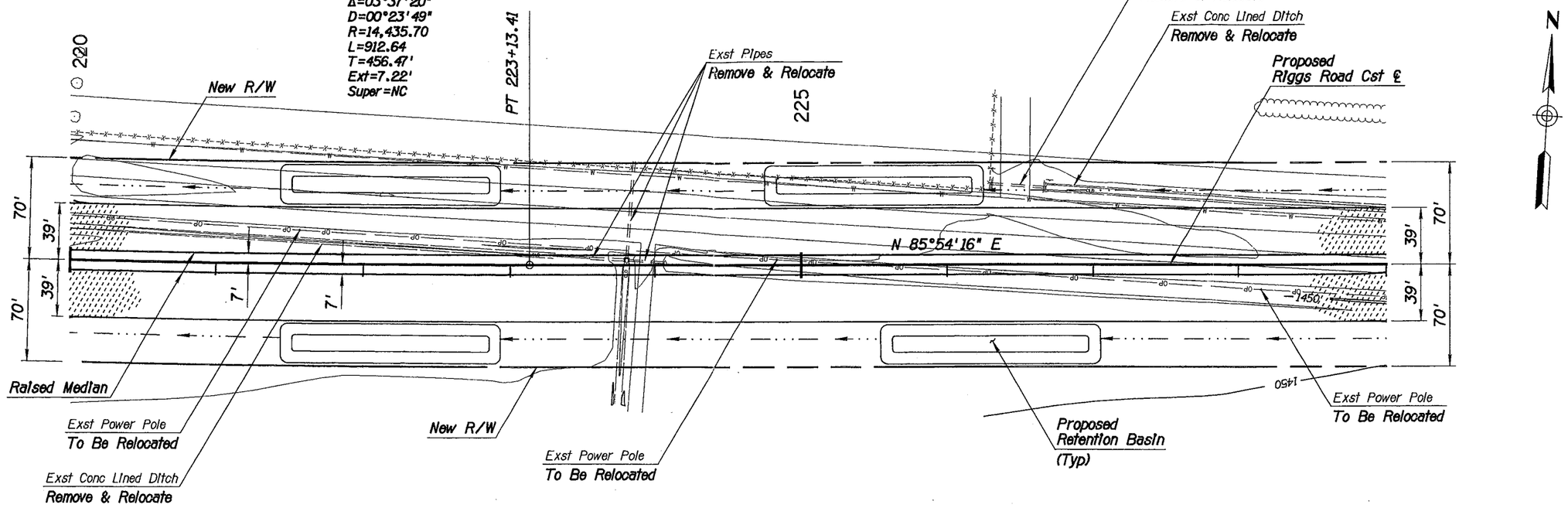
DATE | LOCATION | REVISIONS | FINISHED PLANS | SURVEY NO.

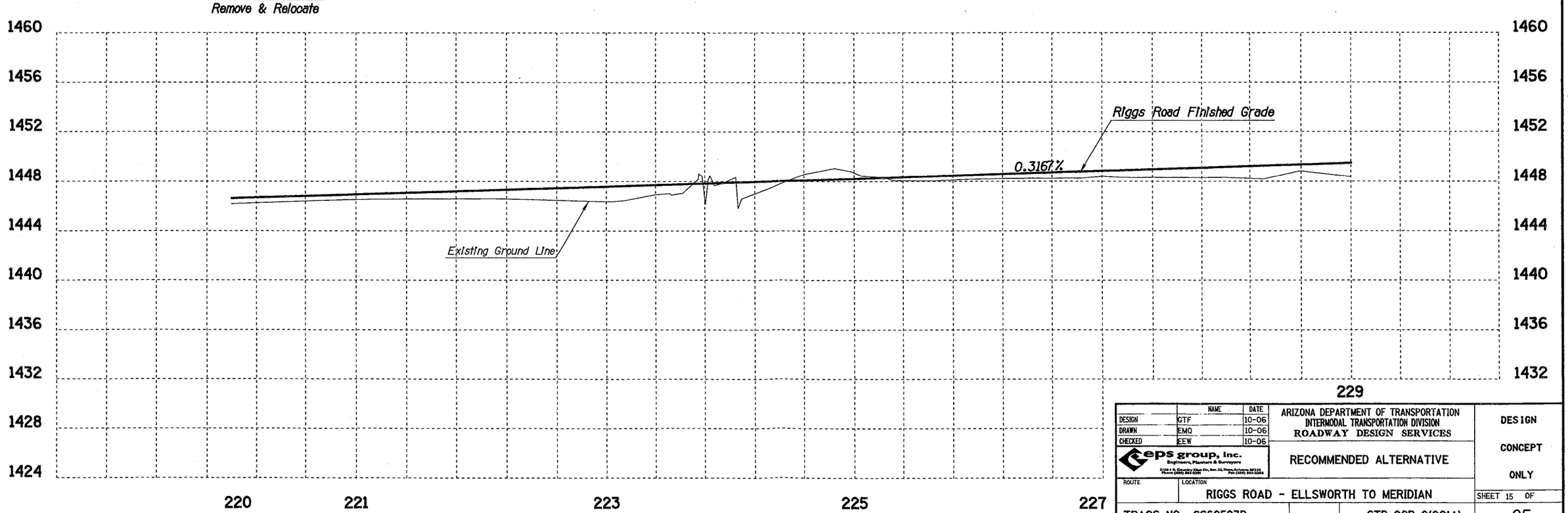
SYSTIME DGNSPECIFICATION

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			

CURVE DATA

PI Sta 218+57.25
Main Curve
Δ=03°37'20"
D=00°23'49"
R=14,435.70
L=912.64
T=456.47'
Ext=7.22'
Super=NC





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
3200 E. Camelback Road, Suite 350, Phoenix, Arizona 85018
Phone (602) 952-0291 Fax (602) 952-0286

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 15 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

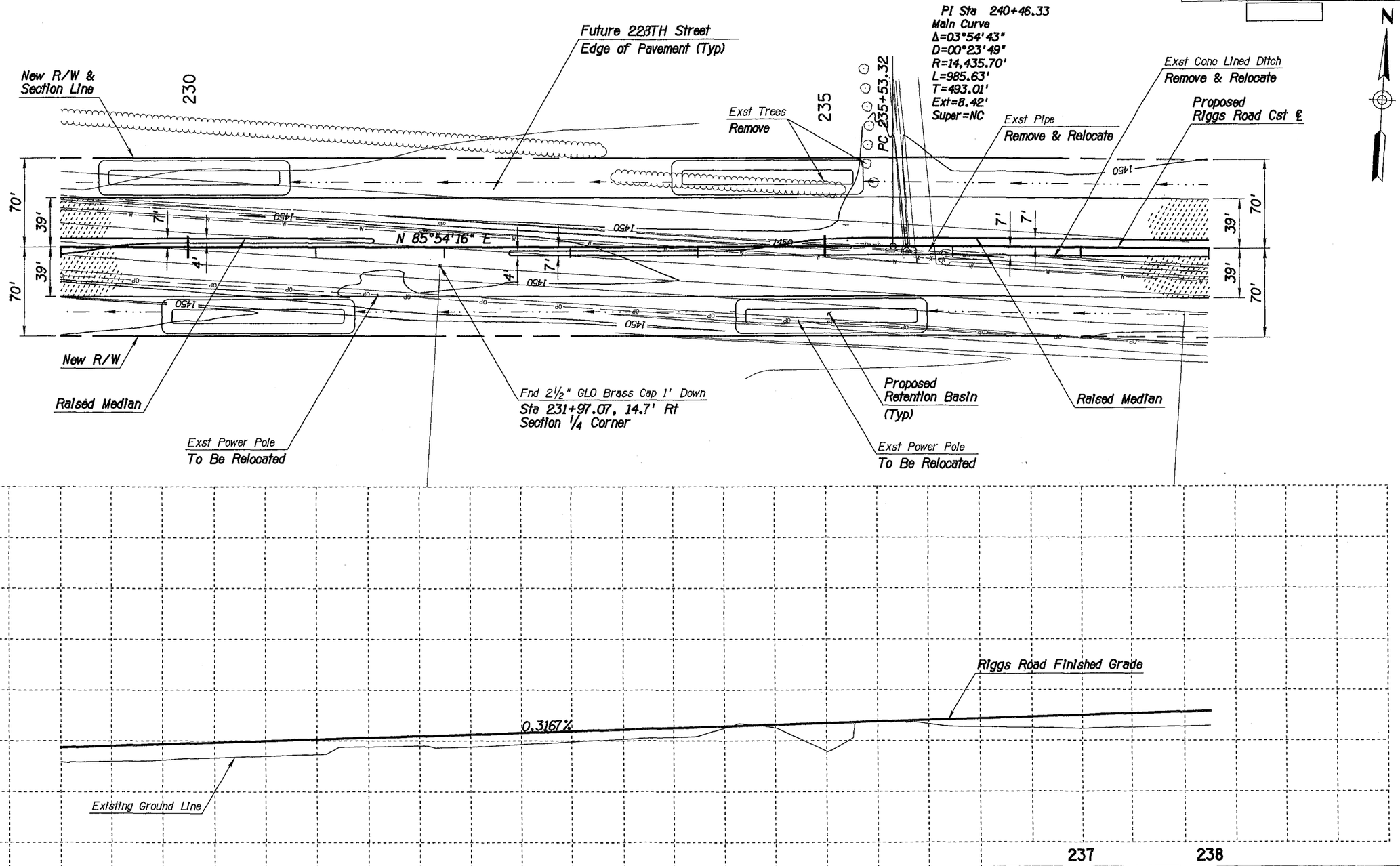
SURVEY NO. | FINISHED PLANS | REVISIONS | LOCATION | DATE

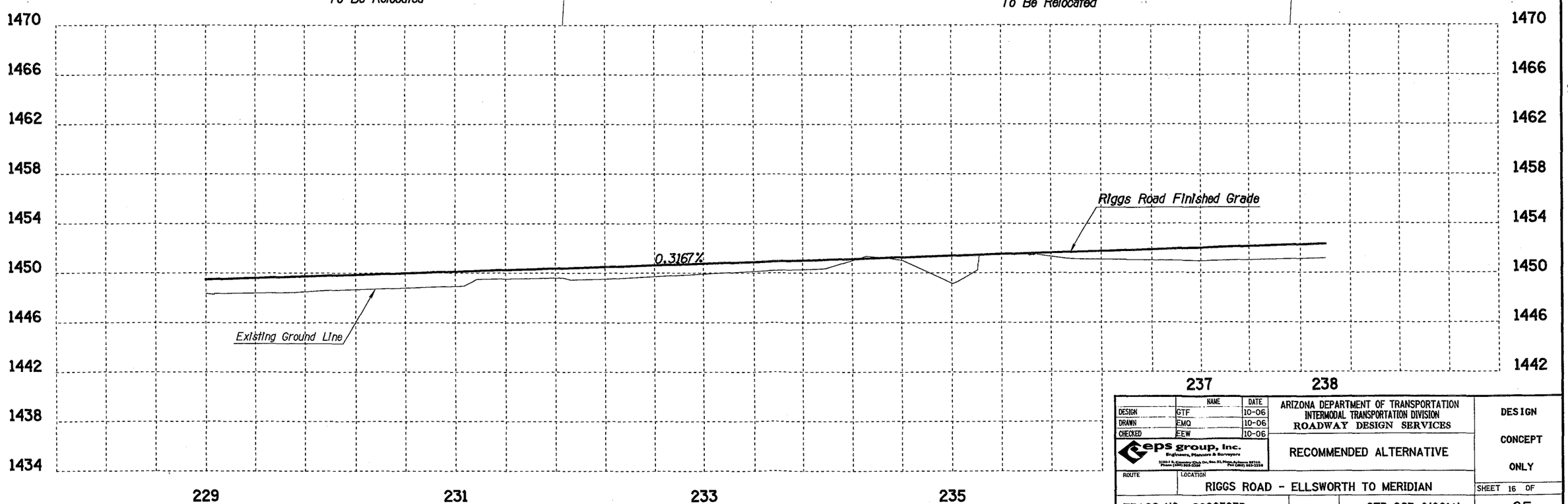
ooooSYSTIMEoooooo ooooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			

CURVE DATA

PI Sta 240+46.33
Main Curve
Δ=03°54'43"
D=00°23'49"
R=14,435.70'
L=985.63'
T=493.01'
Ext=8.42'
Super=NC





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc.
Engineers, Planners & Surveyors
3100-E N. Country Club Dr., Ste. 51, Mesa, Arizona 85210
Phone (480) 892-2320 Fax (480) 892-1538

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 16 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			

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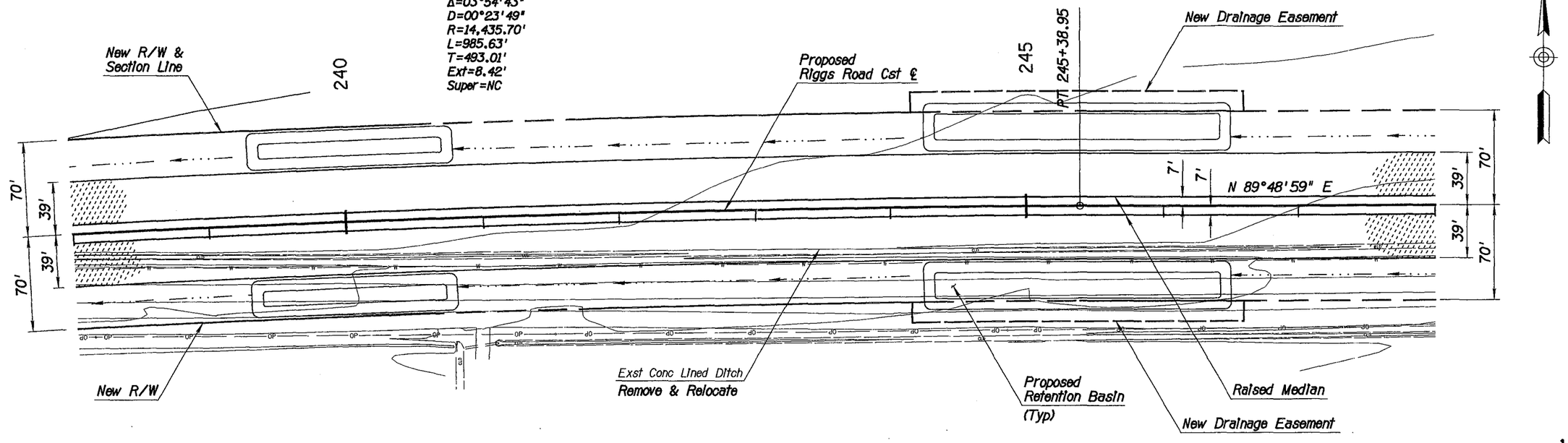

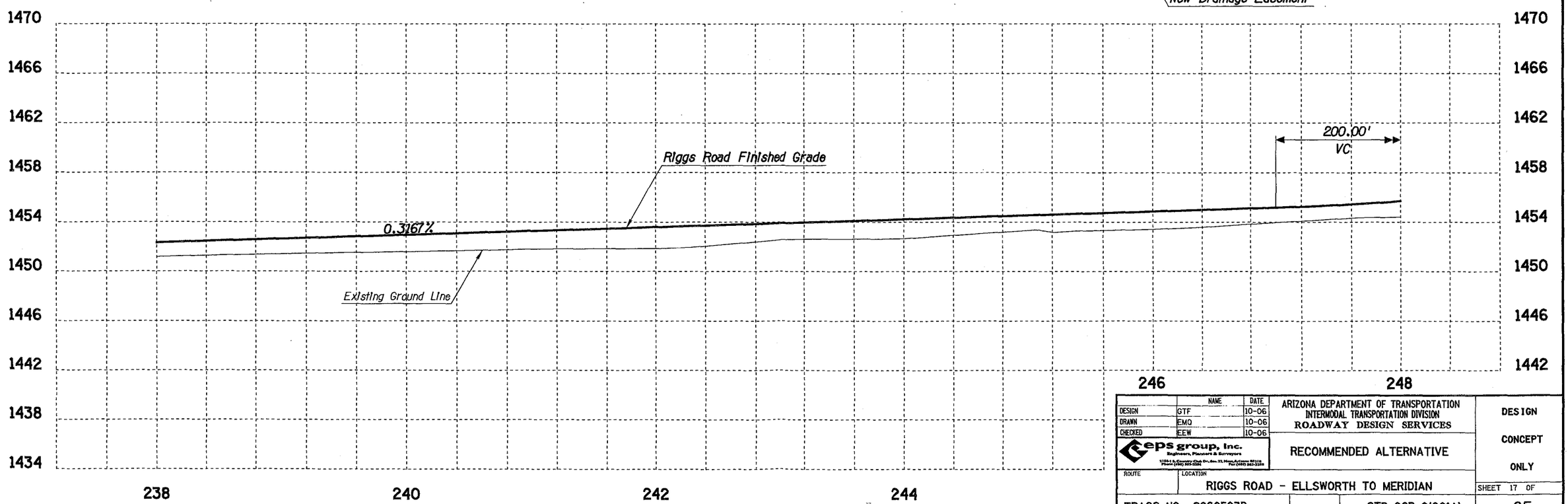

	NAME	DATE
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DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors
11884 S. Country Club Dr., Ste. 21, Mesa, Arizona 85212
Phone (480) 807-3388 Fax (480) 983-3289

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 17 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

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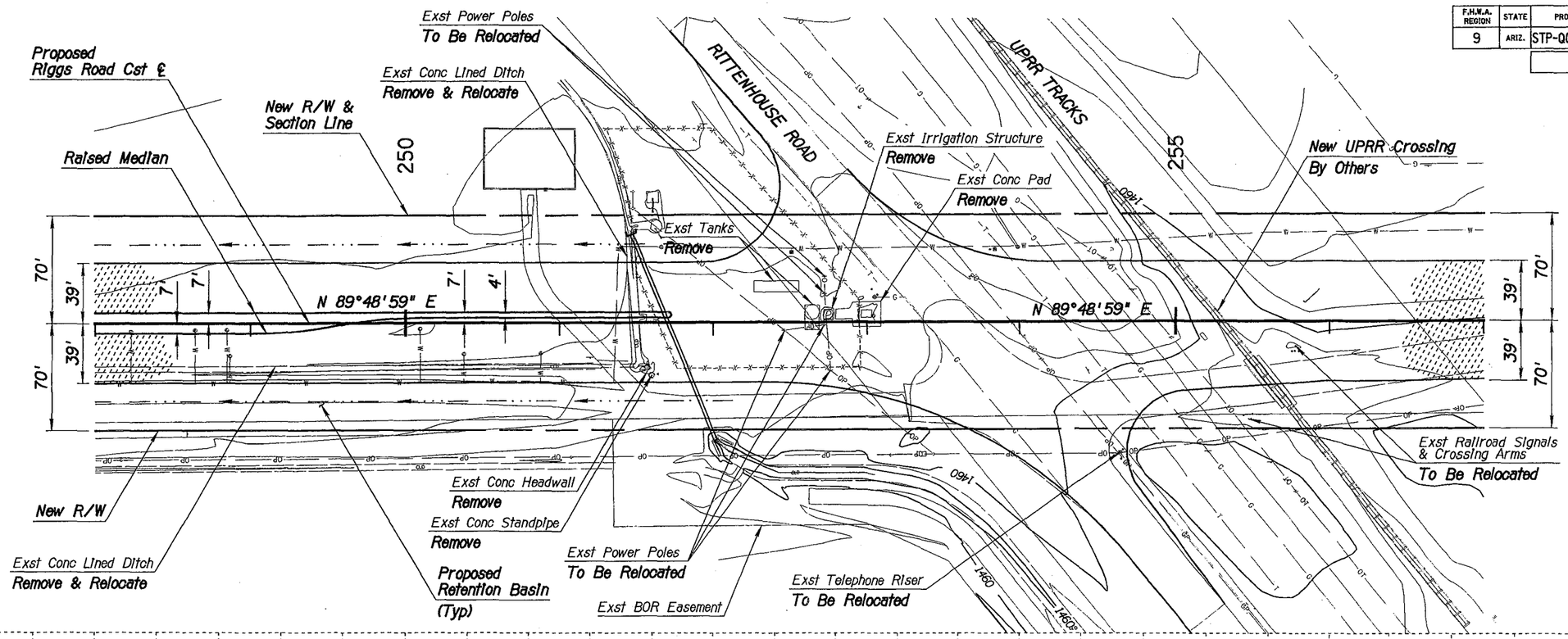
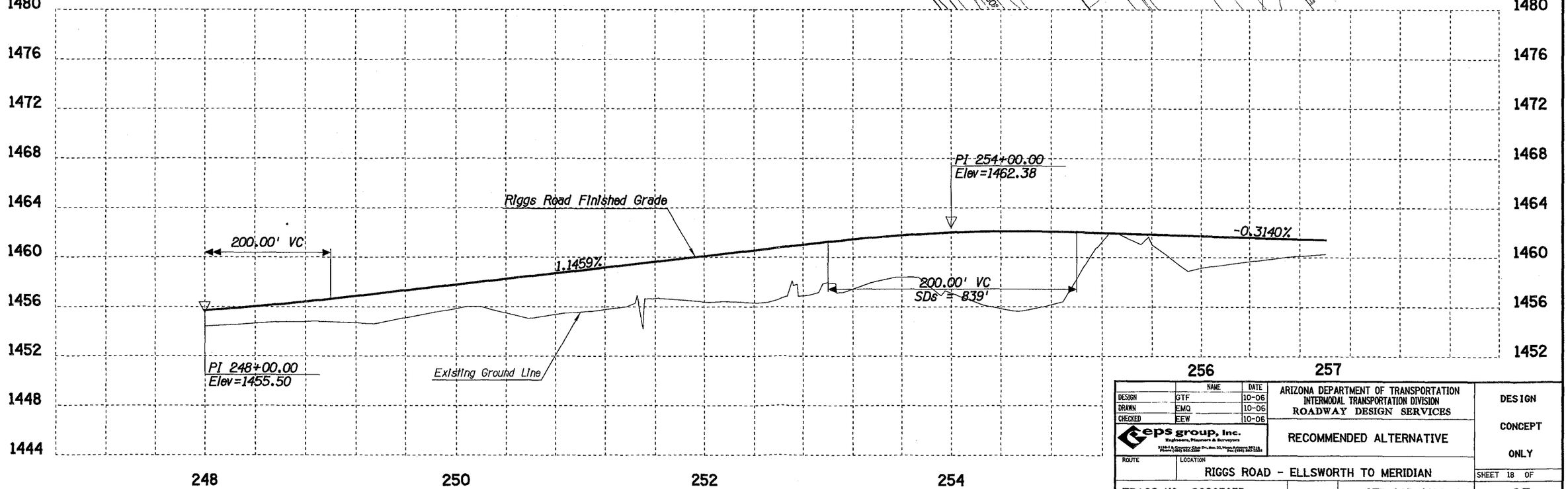
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			





	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, Inc.
Engineers, Planners & Surveyors

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

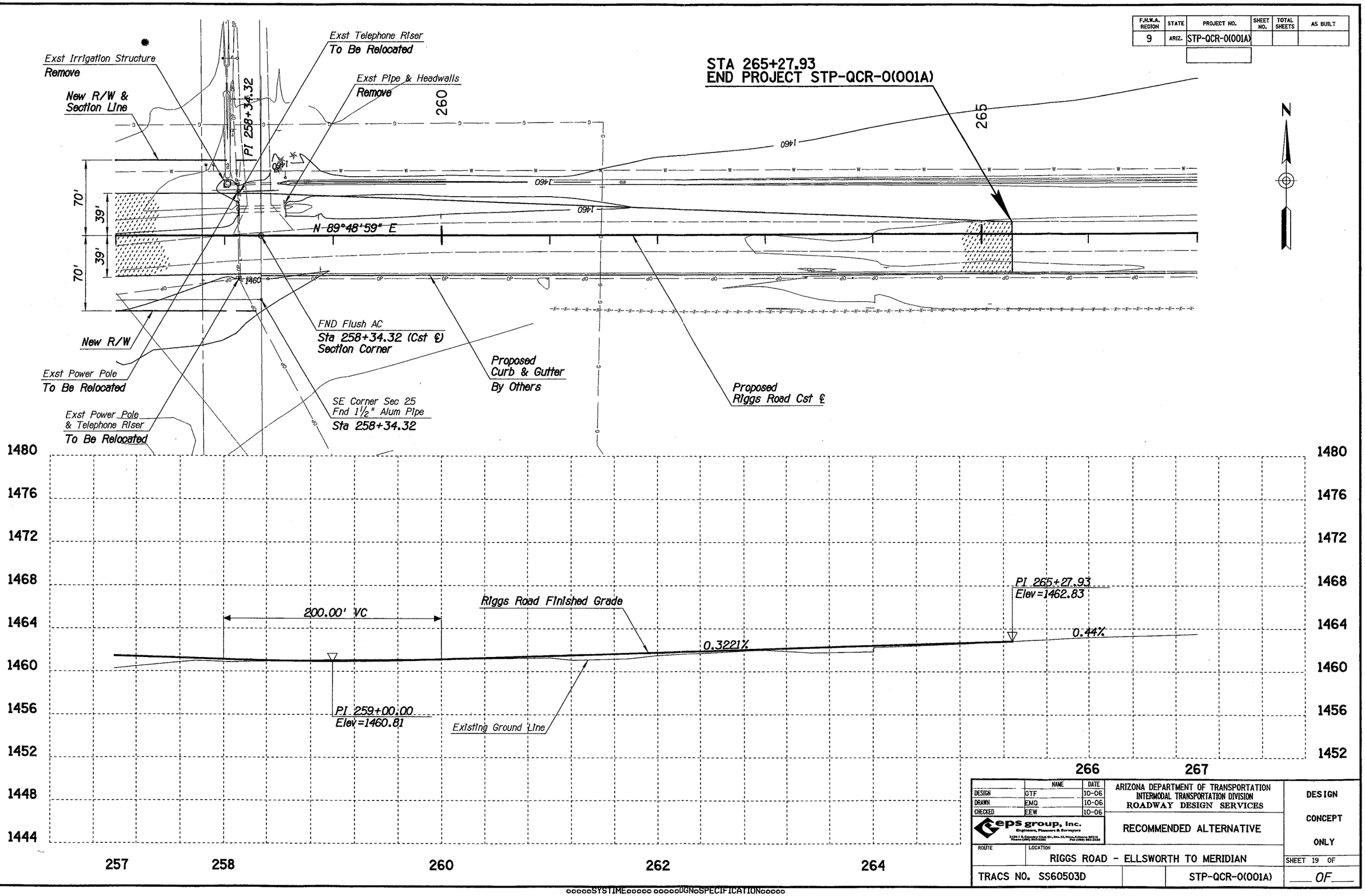
SHEET 18 OF ___ OF ___

TRACS NO. SS60503D | STP-QCR-0(001A)

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

ooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			



	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc.
Engineers, Planners & Surveyors
3125 S. Country Club Dr., Ste. 33, Mesa, Arizona 85210
Phone (480) 892-6380 Fax (480) 892-3258

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

RECOMMENDED ALTERNATIVE

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 19 OF ___

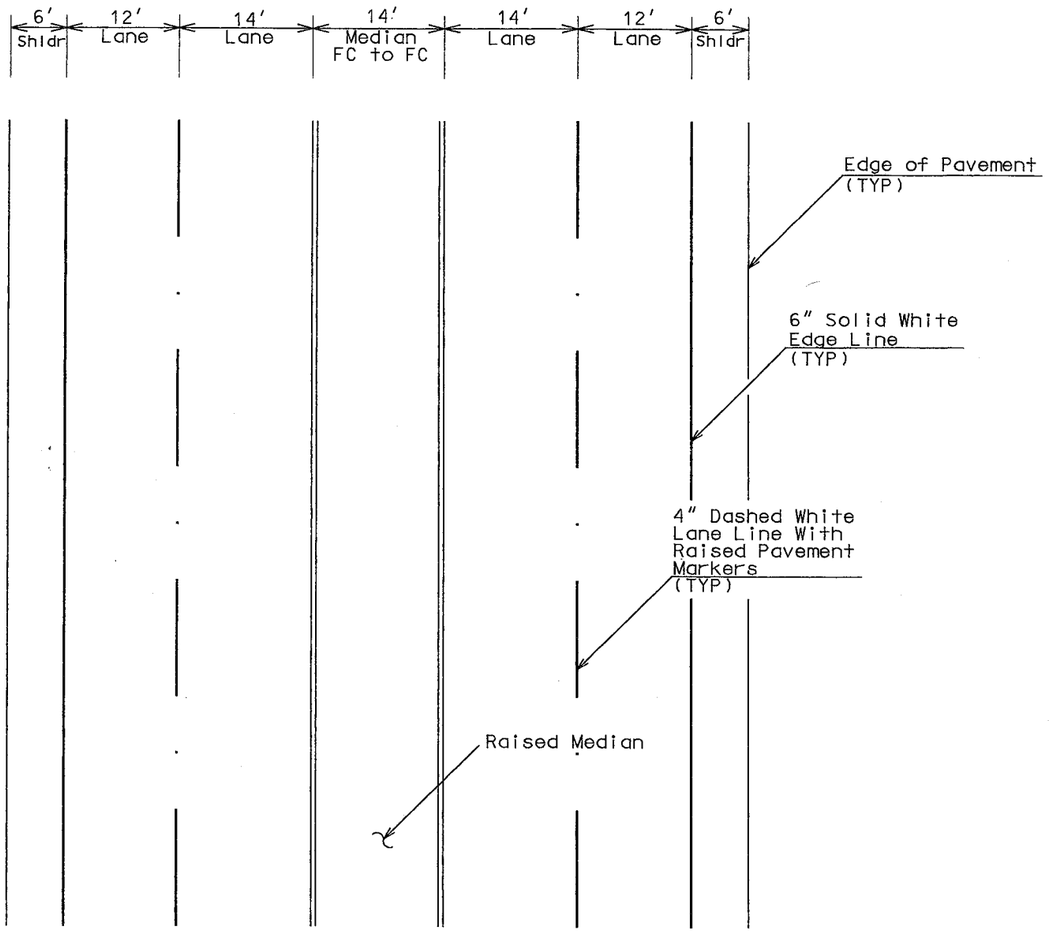
TRACS NO. SS60503D | STP-QCR-0(001A) | ___ OF ___

SURVEY NO. | FINISHED PLANS | REVISIONS | LOCATION | DATE

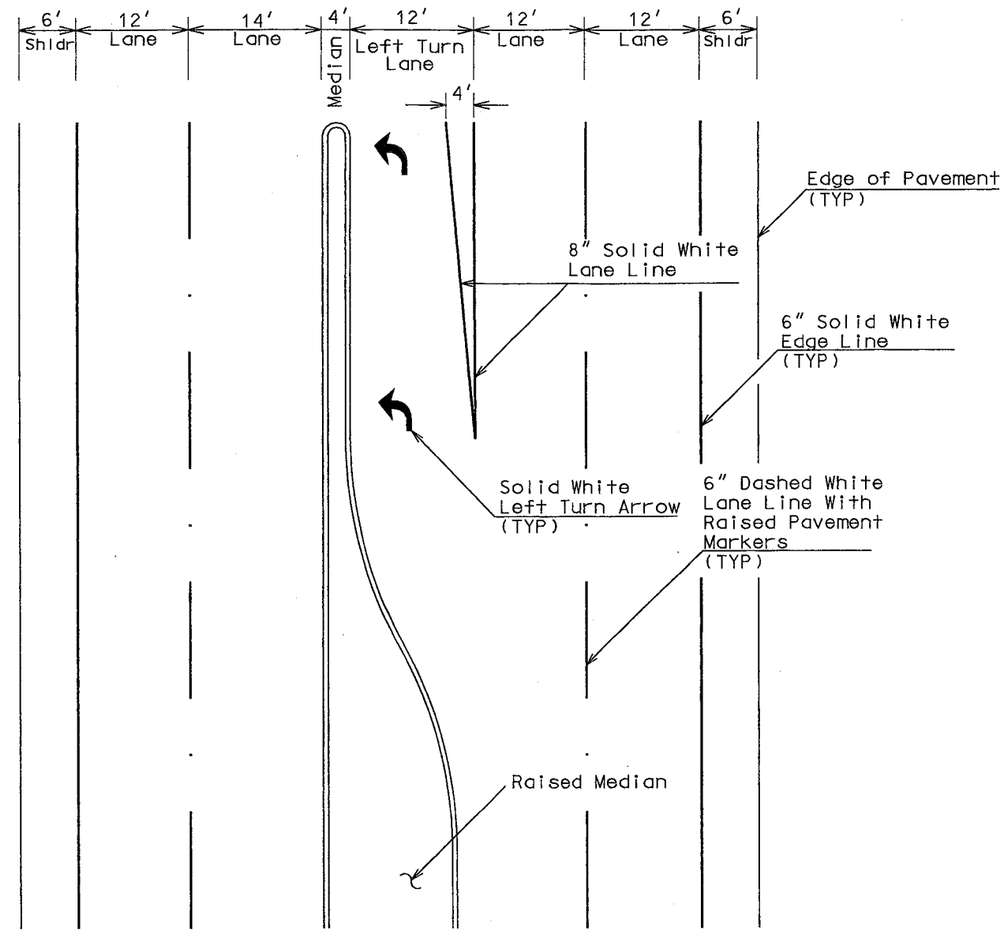
ooooSYSTIMEoooooo oooooDGNoSPECIFICATIONoooooo

• C. TYPICAL STRIPING PLAN

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	STP-QCR-0(001A)			



TYPICAL STRIPING PLAN
N.T.S.



TYPICAL STRIPING PLAN (LEFT TURN LANES)
N.T.S.

NOTE: STORAGE & DECELARATION LENGTHS FOR LEFT TURN LANES
VARY PER TRAFFIC REQUIREMENTS.

	NAME	DATE
DESIGN	GTF	10-06
DRAWN	EMQ	10-06
CHECKED	EEW	10-06

eps group, inc.
Engineers, Planners & Surveyors
3120-1 E. Country Club Dr., Ste. 33, Mesa, Arizona 85213
Phone (480) 962-5584 Fax (480) 962-5584

ARIZONA DEPARTMENT OF TRANSPORTATION
INTERMODAL TRANSPORTATION DIVISION
ROADWAY DESIGN SERVICES

TYPICAL STRIPING PLAN

DESIGN CONCEPT ONLY

ROUTE | LOCATION: RIGGS ROAD - ELLSWORTH TO MERIDIAN

SHEET 1 OF 1

TRACS NO. SS60503D | STP-QCR-0(001A) | ___ OF ___

SURVEY NO. | FINISHED PLANS- | REVISIONS- | LOCATION- | DATE-

D. MERIDIAN ROAD ACCESS CONTROL AND CORRIDOR IMPROVEMENT STUDY (PLAN SHEETS)

MERIDIAN ROAD ACCESS CONTROL AND CORRIDOR IMPROVEMENT STUDY

FINAL REPORT

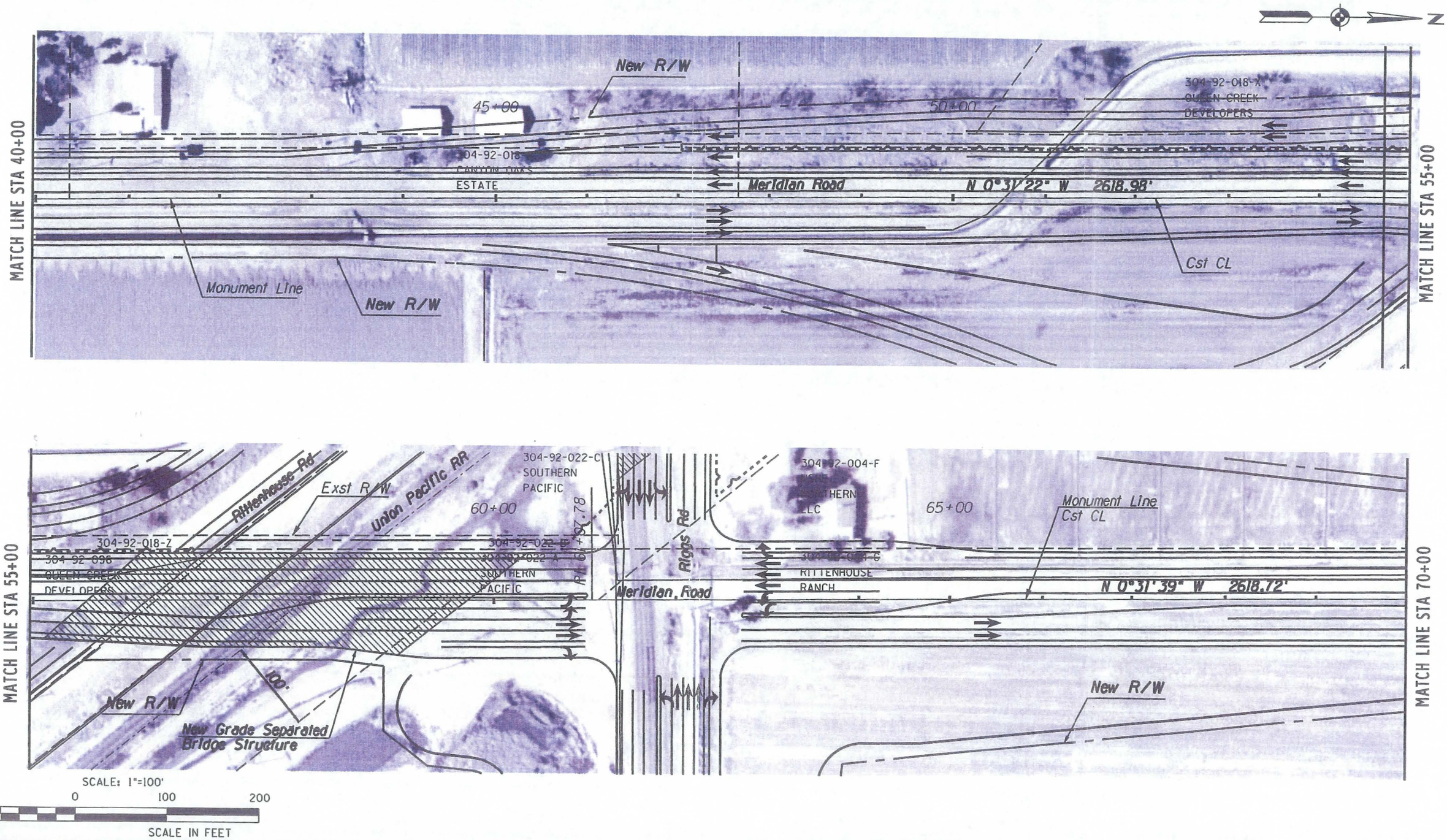
Prepared For:

Prepared By:

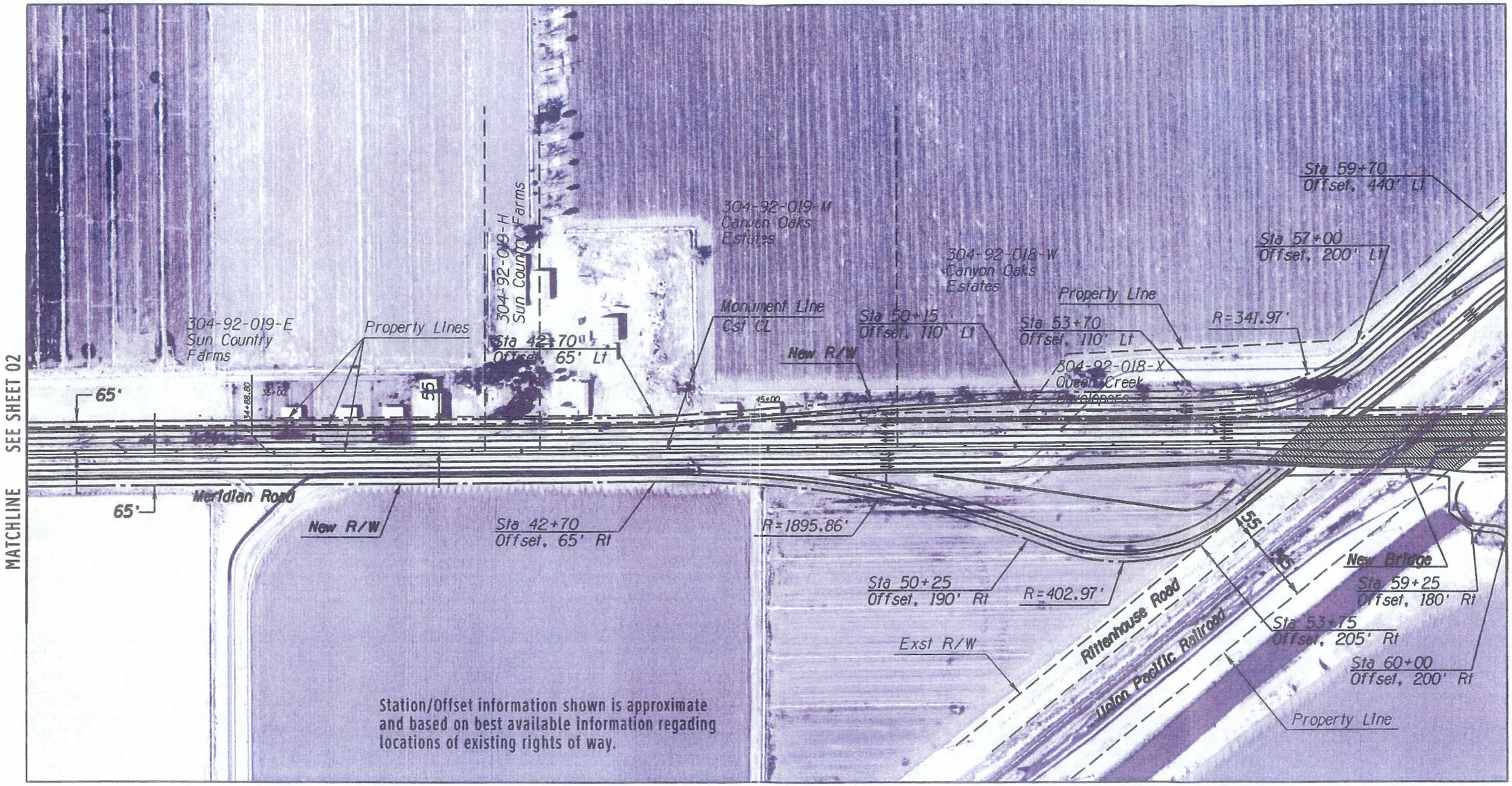
URS

VOLUME 1 OF 4

January 2006



MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION	MERIDIAN ROAD CORRIDOR STUDY (Rittenhouse Rd to US 60)	RECOMMENDED ALTERNATIVE Sheet 03 of 31	URS 7720 N. 16th Street Phoenix, AZ. 85020 (602) 371-1100



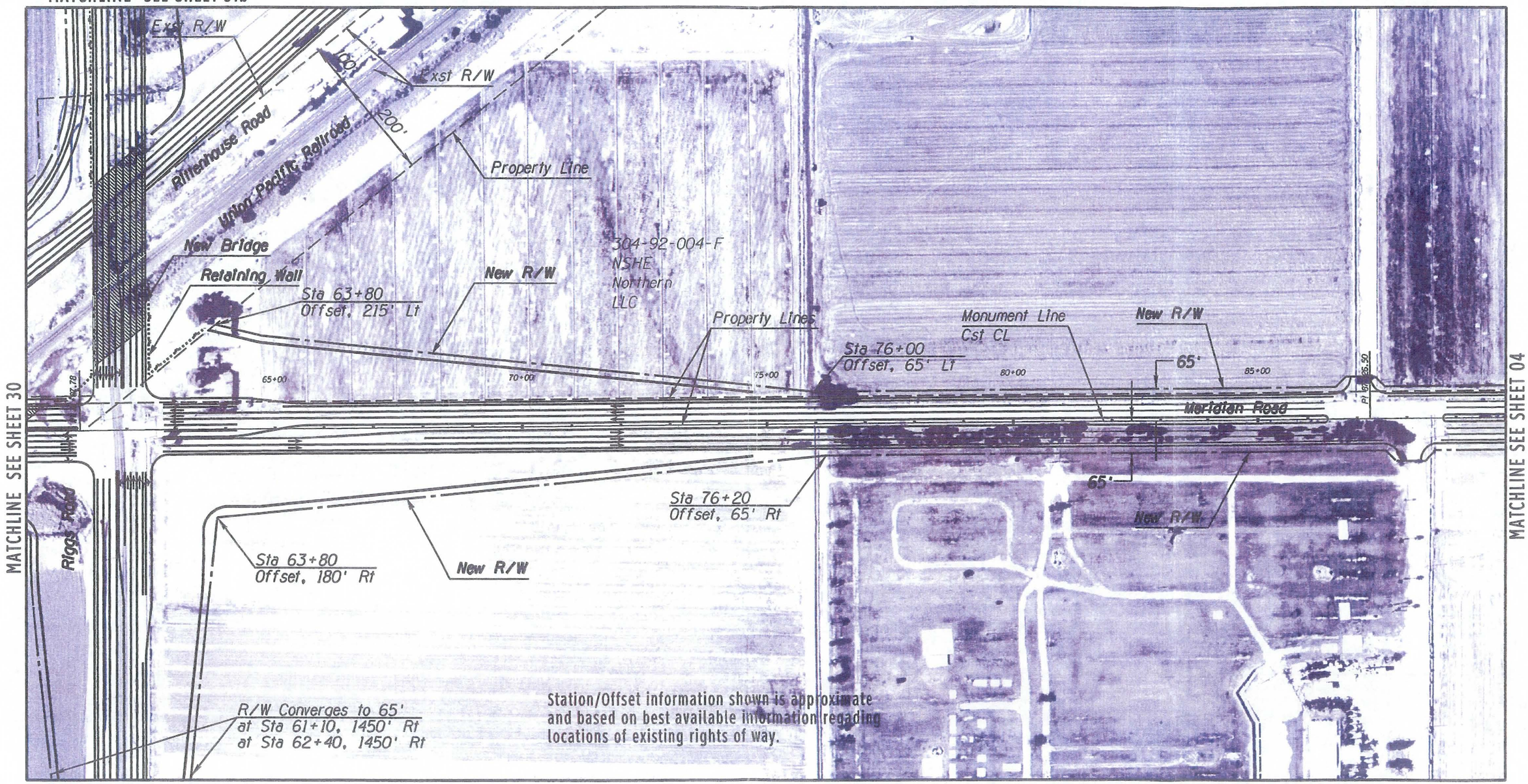
SCALE: 1"=200'

200 0 200 400

SCALE IN FEET

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION	MERIDIAN ROAD CORRIDOR STUDY (Rittenhouse Rd / Riggs Rd Intersection)	RECOMMENDED ALTERNATIVE Sheet 30 of 31	URS 7720 N. 16th Street Phoenix, AZ. 85020 (602) 371-1100

MATCHLINE SEE SHEET 31b



SCALE: 1"=200'

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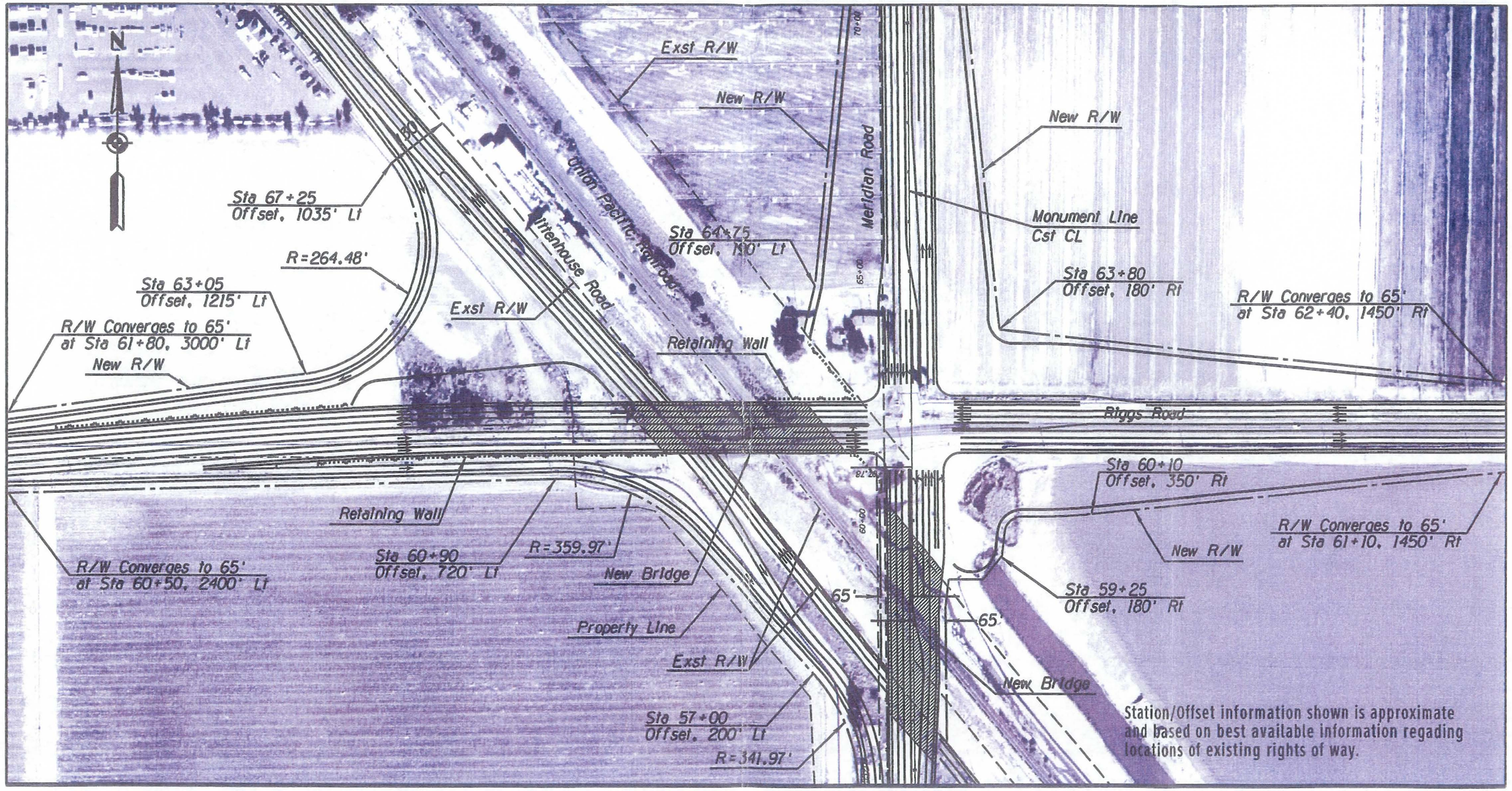
SCALE IN FEET

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION	MERIDIAN ROAD CORRIDOR STUDY (Rittenhouse Rd / Riggs Rd Intersection)	RECOMMENDED ALTERNATIVE Sheet 31a of 31	URS 7720 N. 16th Street Phoenix, AZ. 85020 (602) 371-1100

MATCHLINE SEE SHEET 31a



MATCHLINE SEE SHEET 30

SCALE: 1"=200'

200 0 200 400

SCALE IN FEET

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION	MERIDIAN ROAD CORRIDOR STUDY (Rittenhouse Rd / Riggs Rd Intersection)	RECOMMENDED ALTERNATIVE Sheet 31b of 31	URS 7720 N. 16th Street Phoenix, AZ. 85020 (602) 371-1100

• E. PROJECT MEETINGS AND PUBLIC/AGENCY INVOLVEMENT (FROM MCDOT DCR)

The original Design Concept Report submitted to MCDOT in October 2002 and prepared by PBS&J included the following meeting minutes and are included in this DCR as supplemental information.

PROJECT MEETINGS AND PUBLIC/AGENCY INVOLVEMENT
Following are copies of the minutes of three project meetings:

1. Project Progress Meeting and Field Review – May 8, 2002
2. Property Owners Meeting – June 6, 2002
3. Public Information Meeting – June 17, 2002

PROJECT PROGRESS MEETING AND FIELD REVIEW
MEETING MINUTES

Date:	May 8, 2002
Time:	1:00 PM
Location:	Town of Queen Creek – Council Chambers
Project:	Riggs Road Design Concept Report
Subject:	Field Review and Progress Meeting
Prepared by:	Howard Pilkington

Meeting Format:
Part 1 was a project progress meeting held in the Queen Creek Council Chambers, beginning at 1:00 PM.
Part 2 was a drive-through field review of the Riggs Road project alignment and other features.
Part 3 is a report on follow-up actions during the week following the Part 1 and Part 2 meetings.

<u>Part 1 Queen Creek Council Chambers, Progress Meeting – Beginning at 1:00 PM.</u>

Attendees:

- Dick Schaner, Town Engineer, Town of Queen Creek – 480-987-9887
- Bruce C. Varker, Pinal County Department of Public Works – 520-868-6345 (Substituting for Jennifer Jack, Pinal County Department of Public Works – 520-868-6402)
- Ray Olsen, Circle G Development Company – 480-632-7272
- Leo Trinidad, Maricopa County Department of Transportation – 602-506-2826
- Joe Pinto, Maricopa County Department of Transportation – 602-506-8068
- Jim Schumann, PBS&J – 602-943-1003 Ext. 140
- David Smith, PBS&J – 602-943-1003 Ext. 120
- Howard Pilkington, PBS&J – 602-943-1003 Ext. 340

Leo Trinidad, Project Manager for Maricopa County Department of Transportation (MCDOT), opened the review meeting. He discussed MCDOT's goal of developing the design concepts and defining right-of-way needs for this section of Riggs Road in preparation for the future design of a roadway project and to assist area planning by the Town of Queen Creek and land developers.

Leo noted that Maricopa County was discussing, with Pinal County, the potential of a joint county arrangement to extend the preparation of roadway design and right-of-way concepts eastward on Combs Road for one mile to Vineyard Road. Bruce Varker and Ray Olsen both agreed that this would be highly desirable to guide the designation of future right-of-way on Combs Road. Ray indicated that he would pursue this topic with some of his contacts in Pinal County.

Howard Pilkington of PBS&J then opened a discussion of the recommended design features of this section of Riggs Road.

- Project Definition
  This DCR will provide the design concepts for construction of Riggs Road from Ellsworth Road to Meridian Road, a distance of 4.8 km (3.0 miles). There is no existing public roadway on the Riggs Road alignment for this 4.8 km (3.0 mi) segment.

- Prior Studies
  Basic corridor recommendations were provided in the Riggs Road Access Control and Corridor Improvement Study, published on June 30, 1999.

- Design Concept Report (DCR) Schedule
  Howard Pilkington outlined the schedule as follows:
  - Public Meeting June 13
  - Preliminary Draft June 21
  - Final DCR September 6

- Typical Roadway Section
  The Study recommended construction of a four-lane divided roadway with a right-of way width of 42.6 m (140 ft), raised medians and bicycle lanes. Median openings and public road intersections were recommended at intervals of ½ mile with a potential for openings at ¼ mile locations. Protected left turns lanes would be constructed at the median openings.

In response to a question on access control, Mr. Pilkington stated that it was not planned to acquire access control, but that limiting the number and locations of median openings would assist in managing access from adjacent properties.

Dick Schaner requested that the four-lane divided roadway section be specified as an interim development of a future six-lane divided roadway.

A review of the recommended 42.6 m (140 ft) right-of-way indicated that 42.6 m (140 ft) would be adequate to accommodate the future six-lane divided roadway.

Action: The typical sections will show a four-lane divided roadway with adequate right-of-way for future widening to a six-lane divided roadway.

Dick Schaner recommended the following typical sections on cross roads:
- Rittenhouse Road – 5 lanes.
- Meridian Road north of Riggs Road/Combs Road – 5 lanes. (See Part 3)

- Alignment
  The Study recommended that the centerline for Riggs Road be located on the east west section line except for a segment of about 2400 m (7870 ft) located east of Crismon Road. In this segment it would be located 21.3 m (70 ft) south and parallel to the section line (except for reverse curve transitions at both ends) to avoid the need to acquire right-of-way from a series of the developed residential lots with houses on the adjacent north parcels. Mr. Schaner concurred with this concept. (See Part 2 and Part 3.)

- Additional Right-of-Way for Sonoqui Wash.
  The concept plans in the Corridor Study identified an additional right-of-way width of 75 feet on the south side of the recommended Riggs Road right-of-way, from Ellsworth Road easterly to about 1000 feet east of Crismon Road. The intent of this right-of-way is to provide for a planned channel to convey the flows of Sonoqui Wash from its intersection with the Riggs Road alignment, near Crismon Road, westerly beyond the limits of this project.

David Smith, PBS&J, summarized the Queen Creek/Sonoqui Wash Hydraulic Master Plan prepared for the Flood Control District of Maricopa County (FCDMC) and published in November, 2000, as it applies to this project. In essence, the Master Plan recommends a right-of-way width of 210 feet for the planned East Branch Sonoqui Wash channel within the limits of this project.

Leo Trinidad, MCDOT, commented that the Flood Control District project for Sonoqui Wash would be coordinated with MCDOT and that the Flood Control District would provide funding for acquisition of the right-of-way for the channel.

Mr. Schaner stated that storm water overflows the Riggs Road alignment during storm events. He commented that a preliminary review of the Nov 2000 FCDMC report modeling suggests that the modeling doesn't account for the overflow onto/over the Riggs Road alignment – rather, the Riggs Road alignment is a break point used for the modeling.

Action: Leo Trinidad, MCDOT, commented that he will follow-up with Dave Degerness (FCDMC) for more details on the drainage situation.

- Rittenhouse Road Intersection with Riggs Road
  The Corridor Study originally examined three alternatives for relocation of Rittenhouse Road, which is now on a NW to SE diagonal alignment parallel to the UPRR, to form a right-angle intersection with Riggs Road. The alternatives would realign Rittenhouse Road to curve to a north-south alignment and then intersect (future) Riggs Road at a right angle.

  1. Along the (north-south) mid-section line.
  2. Along the (north-south) easterly ¼ section line.
  3. On a north-south alignment about 500 feet east of the easterly ¼ section line.

Alternative 3 was discontinued in the Corridor Study because it would intersect (future) Riggs Road at a distance of less than the desirable ¼ mile from the next intersection – Meridian Road.

The effected property would be the Schnepf Farms Development. Marc Schnepf has previously stated a concern that Alternatives 1 and 2 (above) would have adverse affects on the development property and the lumber yard.

Mr. Schaner commented that any Rittenhouse Road relocation concept acceptable to the property owners and MCDOT would also be acceptable to the Town of Queen Creek.

Action: Howard Pilkington stated that PBS&J will continue the evaluation of alternatives for the relocation of Rittenhouse Road. (See Part 2 and Part 3).

- General Discussion and Comments
  - Ray Olsen suggested that a blow up of the vicinity of the intersection of Riggs Road and Rittenhouse Road be prepared to address issues in the intersection. He stated that his firm (Circle G Development Company) had retained a consultant (AMEC, Bill Lund or Darrel Truitt – 480-830-3700) to prepare detailed mapping in the area of the Riggs Road / Rittenhouse Road intersection.

  Action: Ray Olsen stated that he would arrange to have a copy forwarded to PBS&J to assist in developing the Riggs Road alignment in that vicinity.

- Mr. Olsen also brought up the question of any UPRR studies and/or plans in the area.

Action: David Smith of PBS&J will follow-up with this and other utility issues.

- Bruce Varker, Pinal Co. Public Works stated that the two (2) major issues that Pinal County would like addressed are:
  a.) Meridian Road is a major north-south roadway that needs to tie into Riggs Road.
  b.) The jog in the east-west section lines at Meridian Road needs to be addressed.

- Dick Schaner, Town of Queen Creek, suggested that the DCR contain an exhibit of the irrigation system. Mr. Schaner also suggested that interim irrigation facilities need to be provided.

- Jim Schumann, PBS&J, requested (1) a copy of the Town of Queen Creek typical sections for the roads of regional significance in the area, and (2) the Flood Control District's (FCD) typical sections for the East Branch Sonoqui Wash channel as proposed in the Nov 2000 Queen Creek Hydraulic Master Plan.

Action: (1) The FCD's typical sections for the proposed channel in the Nov 2000 Queen Creek Hydraulic Master Plan were obtained at the end of the meeting.
(2) Typical sections for the roads of regional significance can be found on the Town of Queen Creek's website. David Smith to follow-up on this.

- Mr. Schumann made the recommendation to expand the right-of-way by at least 5-feet on either side of Riggs Road at the intersections to accommodate an exclusive right turn lane. Mr. Schaner concurred and requested that this be included in the typical sections provided in the DCR.

- Mr. Olsen brought to the attention of the group that Johnson Utilities was planning the construction of a sewage disposal facility on the east side of the UPRR immediately south of Riggs Road/Combs Road.

Action: David Smith will follow-up on this.

Part 2 Drive -Through Field Review of the Riggs Road Alignment

Attendees:

- Bruce C. Varker, Pinal County Department of Public Works – 520-868-6345
- Leo Trinidad, Maricopa County Department of Transportation – 602-506-2826
- Joe Pinto, Maricopa County Department of Transportation – 602-506-8068
- Howard Pilkington, PBS&J – 602-943-1003 Ext. 340

The following observations and recommendations were made concerning the roadway concept as viewed from the drive-through field review:

- Riggs Road Alignment – Rittenhouse Road intersection:
  It was noted that an active well and pump are located at the northwest corner of the existing Riggs Road / Rittenhouse Road intersection. If the Riggs Road alignment is centered on the section line at this location the well and pump will be adversely impacted – possibly resulting in a significant cost to the project.

  The property to the south is presently undeveloped, allowing room to shift the alignment south of the section line to avoid the well site. It was noted that it is currently planned to shift the alignment south of the section line at a location about one mile west from the site of the well to avoid adverse impacts on an existing housing development that borders the north side of the section line. The field review group therefore agreed that it would be advisable to continue the southerly shift in alignment eastward from the housing development to the vicinity of the well and pump. It was recommended that the centerline be located 70 feet south of the section line so that the north boundary of the 140-foot right-of-way would be located on the section line. This alignment would continue from the location of the housing development easterly to the vicinity of Rittenhouse Road.

- Riggs Road/Combs Road Alignment:
  It was noted that the future alignment of Combs Road (in Pinal county) will also determine the alignment of Riggs Road at the west leg of the Riggs Road / Meridian intersection. Review of Combs Road indicated that an existing elementary school is located at the southwest corner of the intersecting section lines at the Combs Road / Vineyard Road intersection. For this reason, future widening of Combs Road will need to be on the north side of the existing roadway.

  Bruce Varker indicated that Pinal County would therefore very likely designate the future south right-of-way limits of Combs Road, from Meridian Road to Vineyard Road, as the existing 10 m (33 ft) line. All new right-of-way would be obtained to the north.

  Moving in a west to east direction from Riggs Road to Combs Road, the roadway centerline would transition from a tangent alignment, located 70 feet south of the section line, to a tangent alignment located 70 feet north of the section line on the east side of the UPRR.

Part 3 Report On Follow-up Actions During the Week Following The Part 1 and Part 2

Meetings.

- Telephone Discussion – Howard Pilkington and Mark Schnepf, May 10
  Mark Schnepf, who was invited to the May 8 field review, was unable to attend on that date. He called Howard on May 10 for a briefing on the review meeting and to express some thoughts on the project. He expressed support for the project and his interest, as an affected property owner, in working closely with MCDOT and the Town of Queen Creek in making the project a success.

  Mr. Schnepf is concerned about the recommended alignment for relocation of Rittenhouse Road Each of the two alternatives retained in the Corridor Study would have adverse impacts on the Schnepf Farms present and future developments. He recommended a location somewhat further east from the eastern ¼ section line.
  As noted earlier, this concept was previously considered in the Corridor Study but was not recommended because it would result in a distance between Rittenhouse Road and Meridian Road significantly less than the minimum ¼ mile needed between signalized intersections for good traffic progression. Howard indicated that this would be reevaluated.

- Telephone Discussion – Howard Pilkington and Leo Trinidad, May 15
  Howard and Leo discussed the issue of a preferred location for the relocation of Rittenhouse Road alignment. It was agreed that the location requested by Mr. Schnepf would be included as one of three alternatives for evaluation.

  It was also noted that the existing Meridian Road intersection with Riggs Road/Combs Road is located a very short distance east of the UPRR crossing. This short distance could cause eastbound traffic to back-up onto the railroad tracks when:
  - eastbound traffic wishing to turn left at Meridian Road is delayed by opposing traffic.
  - a traffic signal is installed at the intersection.

  It was agreed that, for this reason, consideration should be given to relocating the Meridian Road intersection several hundred feet east of the existing intersection.

- Telephone Discussion – Howard Pilkington and Jennifer Jack (Pinal County), May 15
  Howard discussed the results of the review meetings and the follow-up discussions, to date, with Jennifer. Jennifer agreed with the concept suggested by Bruce Varker of widening Combs Road on the north side of the existing roadway to avoid adverse impacts on several buildings and the elementary school that are on the immediate south side of the existing right-of-way. She also agreed that relocating Meridian Road easterly to move its intersection with Combs Road further away from the railroad tracks is desirable from a traffic safety viewpoint.

- Telephone Discussion – Howard Pilkington and Dick Shaner, May 16
  Howard and Dick discussed the possibility of relocating Meridian Road easterly from its present intersection with Riggs Road/Combs Road (The property located east of Meridian Road and north of Combs Road is within the Town of Queen Creek.). Dick commented that this easterly move of the Meridian Road intersection is currently under consideration by the Town of Queen Creek and the owner/developer of the involved private property.

- Telephone Discussion – Howard Pilkington and Leo Trinidad, May 16
  After reviewing the foregoing series of discussions, Howard and Leo agreed that moving the Meridian Road intersection with Riggs Road/Combs Road about 500 to 600 feet east from its existing intersection would offer at least three significant benefits:

  1. It would provide sufficient distance on Riggs Road/Combs Road, from the railroad crossing to the Meridian Road intersection, for storage of eastbound traffic (through traffic and left-turn traffic) without traffic back up onto the tracks. This is a major traffic-safety consideration and is based on the traffic study (see Appendix C).

  2. It would provide about ¼ mile distance between the intersections of the Rittenhouse Road relocation proposed by Mr. Schnepf and the relocated Meridian Road intersection, satisfying the concern expressed in the Corridor Study about this alternative for relocation of Rittenhouse Road.

  3. It would make it feasible to extend Meridian Road south from Combs Road to provide local access at that intersection.

PROPERTY OWNERS MEETING
MEETING MINUTES

Date:	June 6, 2002
Time:	1:30 PM
Location:	Conference Room, Landmark Interiors – Mesa
Project:	Riggs Road Design Concept Report
Subject:	Meeting with Land Owners and Developers
Prepared by:	Howard Pilkington

Attendees:
- Dennis Barney, Circle G Development Company – 480-632-07272- info@circleg.com
- Devin Barney, w/Dennis Barney – 602-358-2605 – devinbarney@hotmail
- Ray Olsen, Circle G Development Company – 480-632-07272- info@circleg.com
- Gerry Ricke, Circle G Development Company – 480-632-07272 – info@circleg.com
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- Bill Lund, Canyon Oaks Estates – 480-607-3443 – wlss@cox.net
- Stacy Brimhall, Langley Properties – 480-633-0999 – mcleanfarm@aol.com
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- Mike Ganzel – 480-982-3187Perry Rea – 480-756-8899
- Jim Schumann, PBS&J – 602-943-1003 Ext. 140 – jschumann@pbsj.com
- Howard Pilkington, PBS&J – 602-943-1003 Ext. 340 – hpilkington@pbsj.com

Dennis Barney, Circle G Development Company, opened the meeting with introductions. He then stated that the purpose of the meeting was to bring the affected property owners and developers together with MCDOTs consultant to obtain information on the planned improvement for this section of Riggs Road, to offer comments and suggestions and to coordinate property development plans with MCDOTs Riggs Road development plans.

Howard Pilkington, PBS&J, then proceeded with an informal presentation of the most current concepts for improvement of this section of Riggs Road. Following is a summary of the concepts presented and the associated questions and comments from members of the group:

- Riggs Road is classified as a Road of Regional Significance. The proposed typical roadway section would be a four-lane divided roadway with a median. Provisions would be made for median openings and protected left-turn lanes at the one-mile (section line) and ½ mile locations. There would be a potential for median openings at the ¼-mile locations where justified.
- The right-of-way width would be 140 feet. This would provide sufficient width for future widening to six lanes.
- The roadway alignment developed thus-far is described as follows, running from west to east:
    - Ellsworth Road to ½ mile east of Crismon Road – 1-½ miles (farm land). The roadway centerline would be located on the east-west section line. 70 feet of right-of-way would need to be obtained from properties north of the section line and 70 feet from properties south of the section line.
    - ½ mile East of Crismon Road to Rittenhouse Road – 1-¼ miles (the north side of the first ½ mile is developed lots – otherwise it is all farm land. A well site is located on the north side near Rittenhouse Road) The roadway centerline would shift to an east-west alignment parallel to the section line, located 70 feet south of the section line. This would avoid impacting and obtaining right-of-way from a group of developed lots on the north side of the section line (approximately 1/2 mile in

length) and would avoid impacting the well site. 140 feet of right-of-way would need to be obtained from properties south of the section line, none from properties north of the section line.

Comments: The property owner on the south side expressed concern that the entire 140-foot width of right-of-way would be obtained from his property. The property owner on the north side stated that about 20 feet could be obtained from his property without adversely impacting an existing concrete lined irrigation ditch and another 10 feet without adversely impacting the well site. It was generally concluded that obtaining about 20 feet from the north side property owner and about 120 feet from the south side owner may be acceptable.

- <u>Rittenhouse Road to Meridian Road – ¼ mile (farm land and a railroad crossing)</u>
  The roadway centerline would transition from 70 feet south of the section line in Maricopa County to 22 feet north of the section line in Pinal County. The section line in Pinal County is about 58.6 feet north of the Maricopa County section line. Therefore, the total centerline shift would be 150.6 feet (70+58.6+22).

- The proposed Riggs Road/Combs Road centerline location at 22 feet north of the section line in Pinal County is based on a review with representatives of the Pinal County Department of Public Works. It was determined at that review that when Combs Road is widened all the added right-of-way for widening should be on the north side of the existing right-of-way to avoid an elementary school facility located on the immediate south side of existing right-of-way at Vineyard Road – located one mile east of Meridian Road.

Comment: One of the property owners noted that there is a well site on the north side of the existing Combs Road right-of-way between Meridian Road and Vineyard Road. Widening Combs Road entirely on the north side would adversely impact this well site. It therefore appears that Combs Road widening may need to be on both sides of the existing roadway from Meridian Road easterly to a location east of the well site before shifting north to miss the elementary school at Vineyard Road.

- <u>Railroad Crossing and the Need for Relocation of Meridian Road (North of Riggs Road)</u>
- The Meridian Road intersection with Riggs Road/Combs Road is about 150 feet east of the rails of the Union Pacific Railroad crossing and about 70 feet from the railroad crossing gates. This does not provide an adequate safe distance for left-turn storage (back-up) of eastbound traffic on Riggs Road, wishing to turn left (north) onto Meridian Road. And, if in the future a traffic signal is to be considered for the intersection there would be inadequate storage distance for all eastbound traffic waiting for a green signal. For this reason, it has been recommended that the Meridian Road intersection with Riggs Road/Combs Road be relocated about 500 feet east from the existing